

**ALMANACCO  
ASTRONOMICO  
ASTRONOMICAL  
ALMANAC  
2011**



**Pier Paolo Ricci**

**Questo Almanacco è il frutto di centinaia di ore di lavoro, la sua realizzazione ha richiesto infatti un anno intero.**

**Se il volume ti è piaciuto è gradita una donazione come contributo allo sviluppo di volumi futuri.  
Buona lettura.**

**Ricci Pier Paolo**

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**This Almanac is the result of hundreds hours of job, its creation has required in fact one whole year.**

**If you like the volume it is pleasant a donation as contribution to the development of future volumes. Good reading.**

**Ricci Pier Paolo**

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# INTRODUZIONE - PREFACE

Anche questo anno l'Almanacco si presenta bilingue, con l'intento di permettere la consultazione ad un pubblico internazionale. Vista infatti la sua diffusione esclusivamente tramite il web si è reso necessario fondere le due versioni italiana ed inglese in una unica. La struttura delle tabelle è rimasta la stessa, così come i contenuti, seppur con qualche ampliamento e miglioria grafica.

I grandi eventi sono dettagliati adesso per tutte le maggiori città del mondo, ma pur sempre particolareggiati per l'Italia. Oltre 450 pagine per non perdere nessun evento, con dati ordinati in comode tabelle per ogni tipologia di fenomeno.

L'imponente mole di dati contenuta in questo Almanacco è rivolta a soddisfare tutte le necessità di chi osserva la volta celeste, tanto del professionista quanto dell'astrofilo. Vi sono inclusi sia i fenomeni che si renderanno visibili a occhio nudo, sia quelli notevoli per la spettacolarità e la rarità.

Oltre alle classiche effemeridi di Sole, pianeti e Luna, sono state prese in considerazione congiunzioni di ogni tipo, tra pianeti, con la Luna, con le comete, le posizioni dei satelliti di Giove e Saturno, i fenomeni mutui tra gli stessi, le eclissi solari e lunari, i raggruppamenti planetari e stellari, i prospetti di visibilità degli oggetti, le occultazioni lunari e asteroidali e tanto altro, il tutto corredato da grafici esplicativi e decine di pagine di informazioni varie.

È stato posto il massimo rigore nei calcoli e, salvo ove diversamente indicato, tutti i tempi sono espressi in Tempo Universale (TU): per avere i tempi segnati dai nostri orologi occorre ricordarsi pertanto di aggiungere un'ora in inverno e due ore in estate, quando è in vigore l'Ora Estiva. Generalmente gli eventi topocentrici sono espressi in TU, mentre quelli geocentrici in TDT. La differenza TDT-UT nel 2011 sarà di 68 secondi.

Talvolta sono stati inclusi anche eventi che iniziano o finiscono sotto l'orizzonte ma che si rendono visibili nel corso dei crepuscoli.

Le tabelle sono state create mediante l'utilizzo di software da me sviluppati o reperibili in Internet e tutti i dati sono aggiornatissimi. Per ulteriori aggiornamenti consultate il sito [www.pierpaoloricci.it](http://www.pierpaoloricci.it) o contattatemi alla mia email [almanacco.ricci@libero.it](mailto:almanacco.ricci@libero.it).

This year the Almanac is bilanguage too, with the intent to allow the consultation to an international public. In fact because its diffusion exclusively through the web it was necessary to melt the two versions Italian and English in one.

The structure of the charts has remained the same one as the contents, even though with some amplifications and graphic improvements.

The great events are detailed for the greatest cities of the world now. About 450 pages for any event, with orderly data in comfortable charts for every typology of phenomenon.

The massive structure of the data contained in this Almanac is turned to satisfy all the necessities of whom observes the sky, the professional or the amateur. They are included the phenomena that they will be visible by naked eye and those notable for the spectacularity and the rarity too. Besides the classical ephemerides of Sun, planets and Moon, they are data about conjunctions of every type, between planets, with the Moon, with the comets, the positions of the satellites of Jupiter and Saturn, the mutual phenomena between the same, the solar and lunar eclipses, the planetary and stellar groupings, the prospecta of visibility of the objects, the lunar and asteroidal occultations and so much other, all with many explanatory graphics.

The maximum precision has been set in the calculations and, except where otherwise suitable, every time is in Universal Time. Generally the events topocentric are in U.T., while those geocentric in TDT. The difference TDT-UT in 2011 will be 68 seconds. Sometimes they have also been included events that begin or end under the horizon but that they are visible during the twilights.

The charts are been created with softwares developed by me or available in Internet and all the data are updated. For further updatings consulted the site [www.pierpaoloricci.it](http://www.pierpaoloricci.it) or [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm) or contacted me by email [almanacco.ricci@libero.it](mailto:almanacco.ricci@libero.it).

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Pierpaolo Ricci, sono laureato in ingegneria presso il Politecnico di Milano, sono appassionato di meccanica celeste ed ho scritto numerosi software per il calcolo di fenomeni astronomici di ogni tipo. Sono iscritto all'Associazione Astronomica di Rovereto (TN) e gestisco attivamente il mio sito di astronomia: [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

In copertina : Camille Flammarion, Universum.

Pierpaolo Ricci is born in the '70 in Milan (Italy), he is graduated in mechanical engineering at Polytechnic and currently he lives in Rovereto (TN, Italy), where he works in a metalmeccanic industry. He is amateur of astronomy since the young age and he devoted his free time to the celestial mechanic writing numerous softwares for the calculation of phenomena of every type.

In the years 90 he take care of a scientific page on a monthly local magazine, writing articles about astronomy and astronautics.

Currently he collaborates for a local Astronomic Association and he manage an astronomical site, [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

On the cover : Camille Flammarion, Universum.







# CALENDARIO - CALENDAR

	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
1	S	M	M	V	D	m	V	L	G	S	M	G
2	D	m	m	S	L	G	S	M	V	D	m	V
3	L	G	G	D	M	V	D	m	S	L	G	S
4	M	V	V	L	m	S	L	G	D	M	V	D
5	m	S	S	M	G	D	M	V	L	m	S	L
6	G	D	D	m	V	L	m	S	M	G	D	M
7	V	L	L	G	S	M	G	D	m	V	L	m
8	S	M	M	V	D	m	V	L	G	S	M	G
9	D	m	m	S	L	G	S	M	V	D	m	V
10	L	G	G	D	M	V	D	m	S	L	G	S
11	M	V	V	L	m	S	L	G	D	M	V	D
12	m	S	S	M	G	D	M	V	L	m	S	L
13	G	D	D	m	V	L	m	S	M	G	D	M
14	V	L	L	G	S	M	G	D	m	V	L	m
15	S	M	M	V	D	m	V	L	G	S	M	G
16	D	m	m	S	L	G	S	M	V	D	m	V
17	L	G	G	D	M	V	D	m	S	L	G	S
18	M	V	V	L	m	S	L	G	D	M	V	D
19	m	S	S	M	G	D	M	V	L	m	S	L
20	G	D	D	m	V	L	m	S	M	G	D	M
21	V	L	L	G	S	M	G	D	m	V	L	m
22	S	M	M	V	D	m	V	L	G	S	M	G
23	D	m	m	S	L	G	S	M	V	D	m	V
24	L	G	G	D	M	V	D	m	S	L	G	S
25	M	V	V	L	m	S	L	G	D	M	V	D
26	m	S	S	M	G	D	M	V	L	m	S	L
27	G	D	D	m	V	L	m	S	M	G	D	M
28	V	L	L	G	S	M	G	D	m	V	L	m
29	S		M	V	D	m	V	L	G	S	M	G
30	D		m	S	L	G	S	M	V	D	m	V
31	L		G		M		D	m		L		S

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	S	T	T	F	S	W	F	M	T	S	T	T
2	S	W	W	S	M	T	S	T	F	S	W	F
3	M	T	T	S	T	F	S	W	S	M	T	S
4	T	F	F	M	W	S	M	T	S	T	F	S
5	W	S	S	T	T	S	T	F	M	W	S	M
6	T	S	S	W	F	M	W	S	T	T	S	T
7	F	M	M	T	S	T	T	S	W	F	M	W
8	S	T	T	F	S	W	F	M	T	S	T	T
9	S	W	W	S	M	T	S	T	F	S	W	F
10	M	T	T	S	T	F	S	W	S	M	T	S
11	T	F	F	M	W	S	M	T	S	T	F	S
12	W	S	S	T	T	S	T	F	M	W	S	M
13	T	S	S	W	F	M	W	S	T	T	S	T
14	F	M	M	T	S	T	T	S	W	F	M	W
15	S	T	T	F	S	W	F	M	T	S	T	T
16	S	W	W	S	M	T	S	T	F	S	W	F
17	M	T	T	S	T	F	S	W	S	M	T	S
18	T	F	F	M	W	S	M	T	S	T	F	S
19	W	S	S	T	T	S	T	F	M	W	S	M
20	T	S	S	W	F	M	W	S	T	T	S	T
21	F	M	M	T	S	T	T	S	W	F	M	W
22	S	T	T	F	S	W	F	M	T	S	T	T
23	S	W	W	S	M	T	S	T	F	S	W	F
24	M	T	T	S	T	F	S	W	S	M	T	S
25	T	F	F	M	W	S	M	T	S	T	F	S
26	W	S	S	T	T	S	T	F	M	W	S	M
27	T	S	S	W	F	M	W	S	T	T	S	T
28	F	M	M	T	S	T	T	S	W	F	M	W
29	S		T	F	S	W	F	M	T	S	T	T
30	S		W	S	M	T	S	T	F	S	W	F
31	M		T		T		S	W		M		S

# PASQUA - EASTER

07/04/1901	20/04/1924	06/04/1947	29/03/1970	11/04/1993	27/03/2016	10/04/2039	26/03/2062	15/04/2085
30/03/1902	12/04/1925	28/03/1948	11/04/1971	03/04/1994	16/04/2017	01/04/2040	15/04/2063	31/03/2086
12/04/1903	04/04/1926	17/04/1949	02/04/1972	16/04/1995	01/04/2018	21/04/2041	06/04/2064	20/04/2087
03/04/1904	17/04/1927	09/04/1950	22/04/1973	07/04/1996	21/04/2019	06/04/2042	29/03/2065	11/04/2088
23/04/1905	08/04/1928	25/03/1951	14/04/1974	30/03/1997	12/04/2020	29/03/2043	11/04/2066	03/04/2089
15/04/1906	31/03/1929	13/04/1952	30/03/1975	12/04/1998	04/04/2021	17/04/2044	03/04/2067	16/04/2090
31/03/1907	20/04/1930	05/04/1953	18/04/1976	04/04/1999	17/04/2022	09/04/2045	22/04/2068	08/04/2091
19/04/1908	05/04/1931	18/04/1954	10/04/1977	23/04/2000	09/04/2023	25/03/2046	14/04/2069	30/03/2092
11/04/1909	27/03/1932	10/04/1955	26/03/1978	15/04/2001	31/03/2024	14/04/2047	30/03/2070	12/04/2093
27/03/1910	16/04/1933	01/04/1956	15/04/1979	31/03/2002	20/04/2025	05/04/2048	19/04/2071	04/04/2094
16/04/1911	01/04/1934	21/04/1957	06/04/1980	20/04/2003	05/04/2026	18/04/2049	10/04/2072	24/04/2095
07/04/1912	21/04/1935	06/04/1958	19/04/1981	11/04/2004	28/03/2027	10/04/2050	26/03/2073	15/04/2096
23/03/1913	12/04/1936	29/03/1959	11/04/1982	27/03/2005	16/04/2028	02/04/2051	15/04/2074	31/03/2097
12/04/1914	28/03/1937	17/04/1960	03/04/1983	16/04/2006	01/04/2029	21/04/2052	07/04/2075	20/04/2098
04/04/1915	17/04/1938	02/04/1961	22/04/1984	08/04/2007	21/04/2030	06/04/2053	19/04/2076	12/04/2099
23/04/1916	09/04/1939	22/04/1962	07/04/1985	23/03/2008	13/04/2031	29/03/2054	11/04/2077	28/03/2100
08/04/1917	24/03/1940	14/04/1963	30/03/1986	12/04/2009	28/03/2032	18/04/2055	03/04/2078	
31/03/1918	13/04/1941	29/03/1964	19/04/1987	04/04/2010	17/04/2033	17/04/2056	02/04/2079	
20/04/1919	05/04/1942	18/04/1965	03/04/1988	24/04/2011	09/04/2034	22/04/2057	07/04/2080	
04/04/1920	25/04/1943	10/04/1966	26/03/1989	08/04/2012	25/03/2035	14/04/2058	30/03/2081	
27/03/1921	09/04/1944	26/03/1967	15/04/1990	31/03/2013	13/04/2036	30/03/2059	19/04/2082	
16/04/1922	01/04/1945	14/04/1968	31/03/1991	20/04/2014	05/04/2037	18/04/2060	04/04/2083	
01/04/1923	21/04/1946	06/04/1969	19/04/1992	05/04/2015	25/04/2038	10/04/2061	26/03/2084	

# CALENDARIO PERPETUO - PERPETUAL CALENDAR

## SECOLO / CENTURY

0	100	200	300	400	500	600
700	800	900	1000	1100	1200	1300
1400	1500			1500	1600	
1700		1800		1900	2000	
2100		2200		2300	2400	
2500		2600		2700	2800	

## LETTERA DOMENICALE / SUNDAY CODE

## ANNI / YEARS

DC	ED	FE	GF	AG	BA	CB	00
B	C	D	E	F	G	A	01 29 57 85
A	B	C	D	E	F	G	02 30 58 86
G	A	B	C	D	E	F	03 31 59 87
FE	GF	AG	BA	CB	DC	ED	04 32 60 88
D	E	F	G	A	B	C	05 33 61 89
C	D	E	F	G	A	B	06 34 62 90
B	C	D	E	F	G	A	07 35 63 91
AG	BA	CB	DC	ED	FE	GF	08 36 64 92
F	G	A	B	C	D	E	09 37 65 93
E	F	G	A	B	C	D	10 38 66 94
D	E	F	G	A	B	C	11 39 67 95
CB	DC	ED	FE	GF	AG	BA	12 40 68 96
A	B	C	D	E	F	G	13 41 69 97
G	A	B	C	D	E	F	14 42 70 98
F	G	A	B	C	D	E	15 43 71 99
ED	FE	GF	AG	BA	CB	DC	16 44 72
C	D	E	F	G	A	B	17 45 73
B	C	D	E	F	G	A	18 46 74
A	B	C	D	E	F	G	19 47 75
GF	AG	BA	CB	DC	ED	FE	20 48 76
E	F	G	A	B	C	D	21 49 77
D	E	F	G	A	B	C	22 50 78
C	D	E	F	G	A	B	23 51 79
BA	CB	DC	ED	FE	GF	AG	24 52 80
G	A	B	C	D	E	F	25 53 81
F	G	A	B	C	D	E	26 54 82
E	F	G	A	B	C	D	27 55 83
DC	ED	FE	GF	AG	BA	CB	28 56 84

## MESE

## MONTHS

gennaio, ottobre	A B C D E F G	january, october	A B C D E F G
febbraio, marzo, novembre	D E F G A B C	february, march, november	D E F G A B C
aprile, luglio	G A B C D E F	april, july	G A B C D E F
maggio	B C D E F G A	may	B C D E F G A
giugno	E F G A B C D	june	E F G A B C D
agosto	C D E F G A B	august	C D E F G A B
settembre, dicembre	F G A B C D E	september, december	F G A B C D E

## DATA

## DAYS

1	8	15	22	29	D S V G m M L	1	8	15	22	29	S S F T W T M
2	9	16	23	30	L D S V G m M	2	9	16	23	30	M S S F T W T
3	10	17	24	31	M L D S V G m	3	10	17	24	31	T M S S F T W
4	11	18	25		m M L D S V G	4	11	18	25		W T M S S F T
5	12	19	26		G m M L D S V	5	12	19	26		T W T M S S F
6	13	20	27		V G m M L D S	6	13	20	27		F T W T M S S
7	14	21	28		S V G m M L D	7	14	21	28		S F T W T M S

Utilizzo: stabilita la data (per esempio 03-07-2011), trovare la lettera domenicale (per gli anni bisestili sono due, la prima da usarsi per i mesi di gennaio e febbraio, e la seconda per gli altri mesi) che è posta nel punto di incrocio fra la colonna del secolo che interessa (nel nostro caso 2000) e la riga in cui si trovano le ultime due cifre dell'anno che consideriamo (nel nostro caso 11): quindi B.

Per le date tra il 1500 e il 4-10-1582 si utilizza la seconda colonna, dove sta il 1500 del calendario giuliano, e per quelle dal 15-10-1582 al 1599 si utilizza la quinta colonna, dove sta il 1500 del calendario gregoriano.

Ricordo che i giorni che vanno dal 5 ottobre al 14 ottobre 1582 non sono mai esistiti.

Si cerca poi, nel settore dei mesi, in quale colonna la lettera appare sulla stessa linea orizzontale del mese considerato (luglio): nel nostro caso, nella terza colonna. Infine, nella stessa colonna verticale (cioè la terza), nel settore dei giorni, si individua il giorno della settimana che appare all'incrocio con la riga in cui sta il giorno del mese considerato (il 3): ed abbiamo che è D, domenica.

Si tenga presente che M (maiuscolo) sta per martedì ed m (minuscolo) sta per mercoledì.

How to use: set a date (for example 03-July-2011), find the Sunday code (in the leap years they are two, the first for january and february, and the second for the others months) in the cross of the column of the century (in this example 2000) and the row of the last two figures of the year (in this case 10): B.

In the dates since 1500 to 4-10-1582 we use the second column, for the julian calendar, since 15-10-1582 al 1599 we use the fourth column, for the Gregorian Calendar.

The days from 5 october to 14 october 1582 don't exist.

We look then, in the sector of the months, in what column the letter appears on the same horizontal line of the considered month (July): in our case, in the third column. Finally, in the same vertical column (the third), in the sector of the days, we individualize the day of the week that appears to the intersection with the line in which it is the day (3) of the considered month: and we have that it is S Sunday.

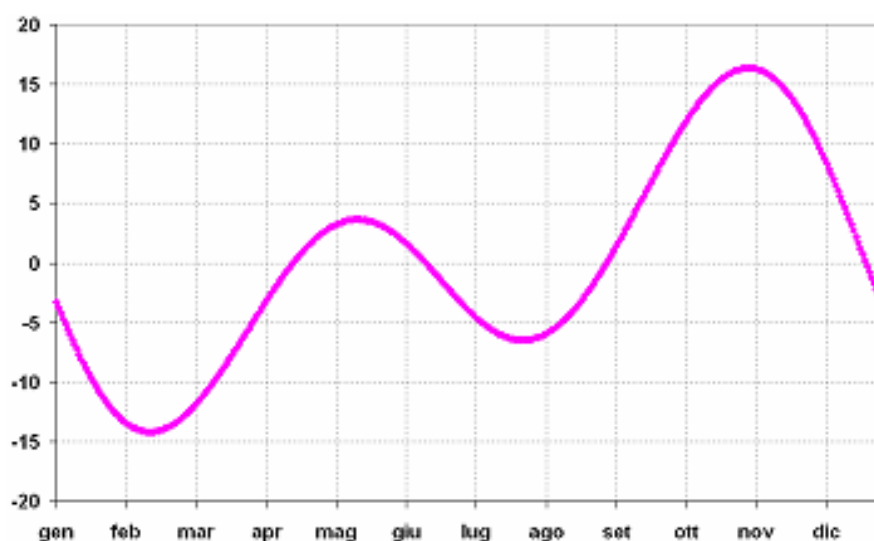
# EQUAZIONE DEL TEMPO – EQUATION OF TIME

L'equazione del tempo è la differenza tra il tempo solare vero e il tempo solare medio. E' espressa in minuti e secondi.

Tale differenza dipende dal fatto che il tempo solare medio è basato sul movimento di un Sole ipotetico (il Sole medio) che nel corso dell'anno si muove con moto uniforme lungo l'equatore celeste, mentre il moto annuo del Sole vero lungo l'eclittica non è uniforme.

The equation of the time is the difference between the true solar time and the medium solar time. It is showed in minutes and seconds. Such difference depends on the fact that the medium solar time is based on the movement of a hypothetical Sun (the medium Sun) that moves with uniform motion along the celestial equator during the year, while the annual motion of the true Sun along the ecliptica is not uniform.

	Gen/Jan	Feb	Mar	Apr	Mag/Maj	Giu/Jun	Lug/Jul	Ago/Aug	Set/Sep	Ott/Oct	Nov	Dic/Dec
1	-3m 40s	-13m 37s	-12m 19s	-3m 50s	2m 55s	2m 9s	-3m 54s	-6m 20s	0m 3s	10m 23s	16m 25s	10m 55s
2	-4m 8s	-13m 44s	-12m 7s	-3m 32s	3m 2s	2m 0s	-4m 5s	-6m 15s	0m 22s	10m 42s	16m 26s	10m 32s
3	-4m 36s	-13m 51s	-11m 54s	-3m 14s	3m 9s	1m 50s	-4m 16s	-6m 10s	0m 42s	11m 1s	16m 26s	10m 9s
4	-5m 3s	-13m 56s	-11m 41s	-2m 57s	3m 14s	1m 40s	-4m 27s	-6m 5s	1m 1s	11m 20s	16m 25s	9m 45s
5	-5m 30s	-14m 1s	-11m 28s	-2m 40s	3m 19s	1m 29s	-4m 37s	-5m 59s	1m 22s	11m 38s	16m 24s	9m 20s
6	-5m 56s	-14m 5s	-11m 14s	-2m 22s	3m 24s	1m 18s	-4m 47s	-5m 52s	1m 42s	11m 56s	16m 22s	8m 55s
7	-6m 22s	-14m 8s	-11m 0s	-2m 6s	3m 28s	1m 7s	-4m 57s	-5m 45s	2m 2s	12m 13s	16m 19s	8m 29s
8	-6m 47s	-14m 11s	-10m 45s	-1m 49s	3m 32s	0m 56s	-5m 6s	-5m 37s	2m 23s	12m 30s	16m 15s	8m 3s
9	-7m 12s	-14m 13s	-10m 30s	-1m 32s	3m 35s	0m 44s	-5m 15s	-5m 29s	2m 44s	12m 47s	16m 10s	7m 36s
10	-7m 36s	-14m 13s	-10m 14s	-1m 16s	3m 37s	0m 32s	-5m 23s	-5m 20s	3m 5s	13m 3s	16m 4s	7m 9s
11	-8m 0s	-14m 13s	-9m 59s	-1m 0s	3m 39s	0m 20s	-5m 31s	-5m 10s	3m 26s	13m 18s	15m 58s	6m 42s
12	-8m 23s	-14m 13s	-9m 42s	-0m 44s	3m 40s	0m 8s	-5m 39s	-5m 0s	3m 47s	13m 33s	15m 50s	6m 14s
13	-8m 46s	-14m 11s	-9m 26s	-0m 29s	3m 41s	-0m 4s	-5m 46s	-4m 49s	4m 8s	13m 48s	15m 42s	5m 46s
14	-9m 7s	-14m 9s	-9m 9s	-0m 14s	3m 41s	-0m 17s	-5m 53s	-4m 38s	4m 30s	14m 2s	15m 33s	5m 17s
15	-9m 29s	-14m 6s	-8m 53s	0m 1s	3m 40s	-0m 30s	-5m 59s	-4m 27s	4m 51s	14m 15s	15m 23s	4m 48s
16	-9m 49s	-14m 3s	-8m 36s	0m 15s	3m 39s	-0m 43s	-6m 5s	-4m 14s	5m 12s	14m 28s	15m 12s	4m 19s
17	-10m 9s	-13m 59s	-8m 18s	0m 29s	3m 37s	-0m 56s	-6m 10s	-4m 2s	5m 34s	14m 40s	15m 0s	3m 49s
18	-10m 28s	-13m 54s	-8m 1s	0m 42s	3m 35s	-1m 9s	-6m 14s	-3m 49s	5m 55s	14m 52s	14m 48s	3m 20s
19	-10m 47s	-13m 48s	-7m 43s	0m 55s	3m 32s	-1m 22s	-6m 19s	-3m 35s	6m 16s	15m 3s	14m 34s	2m 50s
20	-11m 4s	-13m 42s	-7m 26s	1m 8s	3m 29s	-1m 35s	-6m 22s	-3m 21s	6m 38s	15m 13s	14m 20s	2m 20s
21	-11m 21s	-13m 35s	-7m 8s	1m 20s	3m 25s	-1m 48s	-6m 25s	-3m 6s	6m 59s	15m 23s	14m 5s	1m 51s
22	-11m 38s	-13m 28s	-6m 50s	1m 32s	3m 21s	-2m 1s	-6m 28s	-2m 51s	7m 20s	15m 32s	13m 49s	1m 21s
23	-11m 53s	-13m 19s	-6m 32s	1m 43s	3m 16s	-2m 14s	-6m 30s	-2m 35s	7m 41s	15m 41s	13m 33s	0m 51s
24	-12m 8s	-13m 11s	-6m 14s	1m 54s	3m 10s	-2m 27s	-6m 31s	-2m 19s	8m 2s	15m 49s	13m 16s	0m 21s
25	-12m 22s	-13m 1s	-5m 56s	2m 4s	3m 4s	-2m 40s	-6m 32s	-2m 3s	8m 23s	15m 56s	12m 58s	-0m 9s
26	-12m 35s	-12m 52s	-5m 38s	2m 14s	2m 57s	-2m 53s	-6m 32s	-1m 46s	8m 43s	16m 2s	12m 39s	-0m 38s
27	-12m 47s	-12m 41s	-5m 20s	2m 23s	2m 50s	-3m 6s	-6m 31s	-1m 29s	9m 4s	16m 8s	12m 19s	-1m 8s
28	-12m 59s	-12m 30s	-5m 2s	2m 32s	2m 43s	-3m 18s	-6m 30s	-1m 11s	9m 24s	16m 13s	11m 59s	-1m 37s
29	-13m 10s		-4m 44s	2m 40s	2m 35s	-3m 30s	-6m 29s	-0m 53s	9m 44s	16m 17s	11m 38s	-2m 6s
30	-13m 19s		-4m 26s	2m 48s	2m 27s	-3m 42s	-6m 26s	-0m 35s	10m 4s	16m 20s	11m 17s	-2m 35s
31	-13m 28s		-4m 8s		2m 18s		-6m 23s	-0m 16s		16m 23s		-3m 4s



Esempio : il 3 luglio il Sole passa in meridiano alle 12.04 circa, ossia 5 minuti in ritardo rispetto al mezzogiorno del nostro orologio.

Example: on July 3 the Sun passes in meridian at 12.04 o'clock, 5 minutes late in comparison to the midday of our clock





# FUSI ORARI - TIME ZONES

UTC-12 : Isola Baker, Isola Howland

UTC-11 (BEST - Bering Standard Time) : Isole Midway ,Niue ,Samoa ,Samoa Americane

UTC-10 (HST - Hawaii-Aleutian Standard Time) : Atollo Johnston , Polinesia Francese (Tahiti, Arcipelago Tuamotu, Isole Tubuai) ,Stati Uniti (Hawaii) ,Stati Uniti (Isole Aleutine dell'Alaska)\*

UTC-9:30 : Polinesia Francese (Isole Marchesi)

UTC-9 (AKST - Alaska Standard Time) : Polinesia Francese (Isole Gambier) ,Stati Uniti (Alaska\*)

UTC-8 (PST - Pacific Standard Time) : Canada (Columbia Britannica\*, Yukon\*), Messico (Bassa California\*), Stati Uniti (California\*, Idaho (settentrionale)\*, Nevada\*, Oregon \*, Stato di Washington\*)

UTC-7 (MST - Mountain Standard Time) : Canada (Alberta\*,Territori del Nord-Ovest\*,Nunavut\*), Messico,Stati Uniti (Arizona, Colorado\*, Idaho (meridionale)\*, Montana\*, Nebraska (occidentale)\*, Nuovo Messico\*, Dakota del Nord\*, Oregon\*, Dakota del Sud\*, Utah\*, Wyoming\*)

UTC-6 (CST - Central Standard Time) : Belize , Canada (Manitoba\*, Nunavut (Isola Southampton), Nunavut (centrale)\*, Ontario (occidentale)\*, Saskatchewan) , Cile (Isola di Pasqua), Costa Rica , Ecuador (Isole Galapagos), El Salvador, Guatemala, Honduras, Messico\* (Città del Messico e tutti gli stati non menzionati), Nicaragua, Stati Uniti (Alabama\*, Arkansas\*, Illinois\*, Indiana\*, Iowa\*, Kansas\*, Kentucky (occidentale)\*, Louisiana\*, Minnesota\*, Mississippi\*, Missouri\*, Nebraska (orientale)\*, Dakota del Nord\*, Oklahoma\*, Dakota del Sud (orientale)\*, Tennessee centrale e occidentale)\*, Texas\*, Wisconsin\*)

UTC-5 (EST - Eastern Standard Time) : Brasile (Acre) ,Canada (Nunavut (orientale)\*, Ontario\*, Quebec\*), Colombia , Cuba\*, Ecuador, Giamaica, Haiti, Isole Cayman, Isole Turks e Caicos\* , Panamá, Perù, Stati Uniti (Connecticut\*, Delaware\*, Distretto di Columbia\*, Florida\*, Georgia\*, Indiana (gran parte dello stato), Kentucky (orientale e centrale)\*, Maine\*, Maryland\*, Massachusetts\*, Michigan\*, New Hampshire\*, New Jersey\*, New York\*, Carolina del Nord\*, Ohio\*, Pennsylvania\*, Rhode Island\*, Carolina del Sud\*, Tennessee (orientale)\*, Vermont\*, Virginia\*, Virginia Occidentale\*)

UTC-4 (AST - Atlantic Standard Time) : Anguilla , Antigua e Barbuda, Antille Olandesi, Aruba, Barbados, Bolivia, Brasile (Amazonas, Mato Grosso\*, Mato Grosso do Sul\*, Para (occidentale), Rondonia, Roraima), Canada (Labrador\*, New Brunswick\*, Nuova Scozia\*, Isola del Principe Edoardo\*) , Cile\*, Dominica, Grenada, Guadalupa , Guyana, Isole Falkland\*, Isole Vergini, Martinica, Montserrat, Paraguay\*, Porto Rico, Repubblica Dominicana, Saint Kitts e Nevis, Saint Vincent e le Grenadine, Santa Lucia, Trinidad e Tobago, Venezuela

UTC-3:30 (NST - Newfoundland Standard Time) : Canada (Terranova\*)

UTC-3 : Argentina ,Bahamas\* ,Brasile (Alagoas, Amapa, Bahia\*, Ceara, Distrito Federal\*, Espirito Santo\*, Goias\*, Maranhao, Minas Gerais\*, Para (orientale), Paraiba, Parana\*, Pernambuco, Piaui, Rio de Janeiro\*, Rio Grande do Norte, Rio Grande do Sul\*, Santa Catarina\*, Sao Paulo\*, Sergipe, Tocantins\*) ,Groenlandia, Guiana Francese\* ,Saint Pierre e Miquelon\* ,Suriname ,Uruguay

UTC-2 : Bermuda\* , Brasile (Fernando de Noronha)

UTC-1 : Capo Verde , Portogallo (Azzorre\*)

UTC (WET - West European Time) : Burkina Faso , Costa d'Avorio , Gambia ,Ghana ,Guinea ,Guinea-Bissau , Irlanda\* , Islanda ,Isole Faroe\* ,Liberia ,Mali ,Mauritania ,Marocco ,Portogallo\* ,Regno Unito\* , Sant'Elena ,São Tomé e Príncipe ,Senegal ,Sierra Leone ,Spagna\* (Canarie) ,Togo

UTC+1 (CET - Central European Time) : Albania\* ,Andorra\* ,Angola ,Austria\* ,Belgio\* ,Benin ,Bosnia-Erzegovina\* ,Camerun ,Ciad ,Croazia\* ,Danimarca\* ,Francia\* ,Gabon ,Germania\* ,Gibilterra\* ,Guinea Equatoriale ,Italia\* ,Isole Svalbard e Jan Mayen\*,Liechtenstein\* ,Lussemburgo\* ,Macedonia\* , Malta\* Principato di Monaco\*,Montenegro\*,Namibia\*, Niger ,Nigeria ,Norvegia\*,Paesi Bassi\*, Polonia\*, Repubblica Ceca\* ,Repubblica Centrafricana ,Repubblica del Congo ,Repubblica Democratica del Congo (Kinshasa, Bandundu, Bas-Congo, Équateur) ,San Marino\* ,Serbia\* ,Slovacchia\* ,Slovenia\* ,Spagna\*, Svezia\*, Svizzera\* ,Tunisia\* ,Ungheria\*

UTC+2 (EET - East European Time) : Bielorussia\* ,Botswana ,Bulgaria\* ,Burundi ,Cipro\* ,Cisgiordania\* , Egitto\* ,Estonia\* ,Finlandia\* ,Giordania ,Grecia\* ,Israele\* ,Lettonia\* ,Lesotho ,Libano\* ,Libia ,Lituania\* Malawi ,Moldavia\* ,Mozambico ,Repubblica Democratica del Congo (Kasai-Occidental, Kasai-Oriental, Alto Zaire, Katanga) ,Romania\* ,Russia (Zona 1\*, compresa Kaliningrad) ,Ruanda ,Striscia di Gaza\* ,Sudafrica , Swaziland ,Siria\* ,Turchia\* ,Ucraina\* ,Zambia ,Zimbabwe

UTC+3 (MSK - Moscow Time) : Arabia Saudita , Bahrain , Comore ,Eritrea ,Etiopia ,Gibuti ,Iraq\* ,Kenya , Kuwait ,Madagascar ,Mayotte ,Qatar ,Russia (Zona 2\*, include Mosca e San Pietroburgo; questo fuso orario si applica anche alle ferrovie di tutta la Russia) ,Somalia ,Sudan ,Tanzania ,Uganda ,Yemen

UTC+3:30 : Iran

UTC+4 : Emirati Arabi Uniti , Georgia , Mauritius , Oman ,Reunion ,Russia (Zona 3\*) ,Seychelles

UTC+4:30 : Afghanistan

UTC+5 : Armenia , Azerbaigian\* ,Kazakistan (Occidentale)\* ,Maldive ,Pakistan ,Russia (Zona 4\*, comprende Ekaterinburg e Perm) ,Tagikistan ,Turkmenistan ,Uzbekistan

UTC+5:30 (IST - Indian Standard Time) : India ,Sri Lanka

UTC+5:45 : Nepal

UTC+6 : Bangladesh ,Bhutan ,Kazakistan (orientale) ,Kirghizistan ,Russia (Zona 5\*, comprende Novosibirsk e Omsk) ,Sri Lanka

UTC+6:30 : Isole Cocos , Myanmar

UTC+7 : Cambogia ,Indonesia (occidentale) ,Isola Christmas (Australia) ,Laos ,Russia (Zona 6\*) ,Thailandia ,Vietnam

UTC+8 (AWST - Australian Western Standard Time) : Australia (Australia Occidentale) ,Brunei ,Cina (continentale),Filippine ,Hong Kong ,Indonesia (centrale),Macao ,Malesia ,Mongolia ,Russia (Zona 7\*),Singapore, Taiwan

Si noti che l'intera Cina ha lo stesso orario, il che rende questo fuso orario eccezionalmente ampio. All'estremità occidentale della Cina il Sole raggiunge lo zenit alle 15:00, all'estremità orientale alle 11:00.

UTC+8:45 : Caiguna, Eucla (Australia Occidentale)

UTC+9 : Corea del Nord ,Corea del Sud (KST - tempo standard della Corea) ,Giappone (JST - Tempo standard del Giappone) ,Indonesia (orientale) ,Palau ,Russia (Zona 8\*, comprende Yakutsk) ,Timor Est

UTC+9:30 (ACST - Australian Central Standard Time) : Australia (Broken Hill (Nuovo Galles del Sud); Territori del Nord; Australia Meridionale\*)

UTC+10 (AEST - Australian Eastern Standard Time) : Australia (Australian Capital Territory\*, Nuovo Galles del Sud\* (eccetto Broken Hill), Queensland, Victoria\*, Tasmania\*) ,Guam ,Isole Cook ,Isole Marianne Settentrionali, Papua Nuova Guinea ,Russia (Zona 9\*, comprende Vladivostok) ,Stati Federati di Micronesia

UTC+10:30 : Australia (Isola Lord Howe\*) (DST solo 0:30)

UTC+11 : Isole Salomone ,Nuova Caledonia ,Russia (Zona 10\*) ,Stati Federati di Micronesia (Kosrae e Pohnpei), Vanuatu

UTC+11:30 : Isole Norfolk

UTC+12 : Figi\* ,Isola Wake ,Isole Marshall ,Kiribati (Isole Gilbert) ,Nauru ,Nuova Zelanda (Aotearoa)\* , Russia (Zona 11\*) ,Tuvalu ,Wallis e Futuna

UTC+12:45 : Nuova Zelanda (Aotearoa) (Isole Chatham\*)

UTC+13 : Kiribati (Isole Phoenix) , Tonga

UTC+14 : Kiribati (Isole della Linea o Sporadi equatoriali)

Gli stati che riportano l'asterisco \* adottano l'ora legale in estate

\* daylight saving time in the summer

## ORA LEGALE - DAYLIGHT SAVING

Anno	Inizio		Fine	
2011	"	27 marzo	"	30 ottobre
2012	"	25 marzo	"	28 ottobre
2013	"	31 marzo	"	27 ottobre

U.S. Daylight Saving Time

Year	Start	End
2011	2 a.m. March 13	2 a.m. Nov. 6
2012	2 a.m. March 11	2 a.m. Nov. 4
2013	2 a.m. March 10	2 a.m. Nov. 3

# TEMPO SIDERALE – SIDEREAL TIME

Tempo siderale per Roma – Sidereal time for Rome

Greenwich Apparent					Sidereal Times Mean					Local Apparent Sidereal Time				
Julian date	Year	Mon	Da	h m s	h m s	h m s	h m s	h m s	h m s	Julian date	Year	Mon	Da	h m s
2455562.5	2011-01-	1		6 41 12.8097	6 41 11.7401	7 29 12.8097				2455664.5	2011-04-13	13	23	21.4030
2455563.5	2011-01-2			6 45 09.3734	6 45 08.2955	7 33 09.3734				2455665.5	2011-04-14	13	27	17.9549
2455564.5	2011-01-3			6 49 05.9382	6 49 04.8508	7 37 05.9382				2455666.5	2011-04-15	13	31	14.5039
2455565.5	2011-01-4			6 53 02.5025	6 53 01.4062	7 41 02.5025				2455667.5	2011-04-16	13	35	11.0510
2455566.5	2011-01-5			6 56 59.0651	6 56 57.9616	7 44 59.0651				2455668.5	2011-04-17	13	39	07.5983
2455567.5	2011-01-6			7 00 55.6253	7 00 54.5170	7 48 55.6253				2455669.5	2011-04-18	13	43	04.1478
2455568.5	2011-01-7			7 04 52.1827	7 04 51.0723	7 52 52.1827				2455670.5	2011-04-19	13	47	00.7010
2455569.5	2011-01-8			7 08 48.7375	7 08 47.6277	7 56 48.7375				2455671.5	2011-04-20	13	50	57.2581
2455570.5	2011-01-9			7 12 45.2904	7 12 44.1831	8 00 45.2904				2455672.5	2011-04-21	13	54	53.8182
2455571.5	2011-01-10			7 16 41.8420	7 16 40.7384	8 04 41.8420				2455673.5	2011-04-22	13	58	50.3796
2455572.5	2011-01-11			7 20 38.3933	7 20 37.2938	8 08 38.3933				2455674.5	2011-04-23	14	02	46.9404
2455573.5	2011-01-12			7 24 34.9453	7 24 33.8492	8 12 34.9453				2455675.5	2011-04-24	14	06	43.4995
2455574.5	2011-01-13			7 28 31.4988	7 28 30.4045	8 16 31.4988				2455676.5	2011-04-25	14	10	40.0561
2455575.5	2011-01-14			7 32 28.0545	7 32 26.9599	8 20 28.0545				2455677.5	2011-04-26	14	14	36.6101
2455576.5	2011-01-15			7 36 24.6129	7 36 23.5153	8 24 24.6129				2455678.5	2011-04-27	14	18	33.1615
2455577.5	2011-01-16			7 40 21.1740	7 40 20.0706	8 28 21.1740				2455679.5	2011-04-28	14	22	29.7111
2455578.5	2011-01-17			7 44 17.7375	7 44 16.6260	8 32 17.7375				2455680.5	2011-04-29	14	26	26.2595
2455579.5	2011-01-18			7 48 14.3021	7 48 13.1814	8 36 14.3021				2455681.5	2011-04-30	14	30	22.8078
2455580.5	2011-01-19			7 52 10.8664	7 52 09.7367	8 40 10.8664				2455682.5	2011-05- 1	14	34	19.3568
2455581.5	2011-01-20			7 56 07.4285	7 56 06.2921	8 44 07.4285				2455683.5	2011-05- 2	14	38	15.9074
2455582.5	2011-01-21			8 00 03.9870	8 00 02.8475	8 48 03.9870				2455684.5	2011-05- 3	14	42	12.4601
2455583.5	2011-01-22			8 04 00.5416	8 03 59.4028	8 52 00.5416				2455685.5	2011-05- 4	14	46	09.0153
2455584.5	2011-01-23			8 07 57.0931	8 07 55.9582	8 55 57.0931				2455686.5	2011-05- 5	14	50	05.5730
2455585.5	2011-01-24			8 11 53.6431	8 11 52.5136	8 59 53.6431				2455687.5	2011-05- 6	14	54	02.1328
2455586.5	2011-01-25			8 15 50.1937	8 15 49.0690	9 03 50.1937				2455688.5	2011-05- 7	14	57	58.6937
2455587.5	2011-01-26			8 19 46.7464	8 19 45.6243	9 07 46.7464				2455689.5	2011-05- 8	15	01	55.2548
2455588.5	2011-01-27			8 23 43.3023	8 23 42.1797	9 11 43.3023				2455690.5	2011-05- 9	15	05	51.8147
2455589.5	2011-01-28			8 27 39.8611	8 27 38.7351	9 15 39.8611				2455691.5	2011-05-10	15	09	48.3725
2455590.5	2011-01-29			8 31 36.4223	8 31 35.2904	9 19 36.4223				2455692.5	2011-05-11	15	13	44.9273
2455591.5	2011-01-30			8 35 32.9846	8 35 31.8458	9 23 32.9846				2455693.5	2011-05-12	15	17	41.4792
2455592.5	2011-01-31			8 39 29.5467	8 39 28.4012	9 27 29.5467				2455694.5	2011-05-13	15	21	38.0291
2455593.5	2011-02- 1			8 43 26.1074	8 43 24.9565	9 31 26.1074				2455695.5	2011-05-14	15	25	34.5784
2455594.5	2011-02- 2			8 47 22.6659	8 47 21.5119	9 35 22.6659				2455696.5	2011-05-15	15	29	31.1291
2455595.5	2011-02- 3			8 51 19.2218	8 51 18.0673	9 39 19.2218				2455697.5	2011-05-16	15	33	27.6829
2455596.5	2011-02- 4			8 55 15.7749	8 55 14.6226	9 43 15.7749				2455698.5	2011-05-17	15	37	24.2406
2455597.5	2011-02- 5			8 59 12.3258	8 59 11.1780	9 47 12.3258				2455699.5	2011-05-18	15	41	20.8019
2455598.5	2011-02- 6			9 03 08.8753	9 03 07.7334	9 51 08.8753				2455700.5	2011-05-19	15	45	17.3654
2455599.5	2011-02- 7			9 07 05.4241	9 07 04.2887	9 55 05.4241				2455701.5	2011-05-20	15	49	13.9293
2455600.5	2011-02- 8			9 11 01.9732	9 11 00.8441	9 59 01.9732				2455702.5	2011-05-21	15	53	10.4918
2455601.5	2011-02- 9			9 14 58.5235	9 14 57.3995	10 02 58.5235				2455703.5	2011-05-22	15	57	07.0520
2455602.5	2011-02-10			9 18 55.0757	9 18 53.9548	10 06 55.0757				2455704.5	2011-05-23	16	01	03.6093
2455603.5	2011-02-11			9 22 51.6303	9 22 50.5102	10 10 51.6303				2455705.5	2011-05-24	16	05	00.1639
2455604.5	2011-02-12			9 26 48.1875	9 26 47.0656	10 14 48.1875				2455706.5	2011-05-25	16	08	56.7163
2455605.5	2011-02-13			9 30 44.7470	9 30 43.6210	10 18 44.7470				2455707.5	2011-05-26	16	12	53.2673
2455606.5	2011-02-14			9 34 41.3082	9 34 40.1763	10 22 41.3082				2455708.5	2011-05-27	16	16	49.8177
2455607.5	2011-02-15			9 38 37.8698	9 38 36.7317	10 26 37.8698				2455709.5	2011-05-28	16	20	46.3687
2455608.5	2011-02-16			9 42 34.4301	9 42 33.2871	10 30 34.4301				2455710.5	2011-05-29	16	24	42.9209
2455609.5	2011-02-17			9 46 30.9877	9 46 29.8424	10 34 30.9877				2455711.5	2011-05-30	16	28	39.4751
2455610.5	2011-02-18			9 50 27.5414	9 50 26.3978	10 38 27.5414				2455712.5	2011-05-31	16	32	36.0318
2455611.5	2011-02-19			9 54 24.0914	9 54 22.9532	10 42 24.0914				2455713.5	2011-06- 1	16	36	32.5911
2455612.5	2011-02-20			9 58 20.6390	9 58 19.5085	10 46 20.6390				2455714.5	2011-06- 2	16	40	29.1526
2455613.5	2011-02-21			10 02 17.1864	10 02 16.0639	10 50 17.1864				2455715.5	2011-06- 3	16	44	25.7156
2455614.5	2011-02-22			10 06 13.7357	10 06 12.6193	10 54 13.7357				2455716.5	2011-06- 4	16	48	22.2789
2455615.5	2011-02-23			10 10 10.2881	10 10 09.1746	10 58 10.2881				2455717.5	2011-06- 5	16	52	18.8412
2455616.5	2011-02-24			10 14 06.8438	10 14 05.7300	11 02 06.8438				2455718.5	2011-06- 6	16	56	15.4015
2455617.5	2011-02-25			10 18 03.4021	10 18 02.2854	11 06 03.4021				2455719.5	2011-06- 7	17	00	11.9588
2455618.5	2011-02-26			10 21 59.9618	10 21 58.8407	11 09 59.9618				2455720.5	2011-06- 8	17	04	08.5131
2455619.5	2011-02-27			10 25 56.5215	10 25 55.3961	11 13 56.5215				2455721.5	2011-06- 9	17	08	05.0651
2455620.5	2011-02-28			10 29 53.0801	10 29 51.9515	11 17 53.0801				2455722.5	2011-06-10	17	12	01.6161
2455621.5	2011-03- 1			10 33 49.6365	10 33 48.5068	11 21 49.6365				2455723.5	2011-06-11	17	15	58.1679
2455622.5	2011-03- 2			10 37 46.1905	10 37 45.0622	11 25 46.1905				2455724.5	2011-06-12	17	19	54.7221
2455623.5	2011-03- 3			10 41 42.7418	10 41 41.6176	11 29 42.7418				2455725.5	2011-06-13	17	23	51.2798
2455624.5	2011-03- 4			10 45 39.2909	10 45 38.1730	11 33 39.2909				2455726.5	2011-06-14	17	27	47.8411
2455625.5	2011-03- 5			10 49 35.8383	10 49 34.7283	11 37 35.8383				2455727.5	2011-06-15	17	31	44.4051
2455626.5	2011-03- 6			10 53 32.3849	10 53 31.2837	11 41 32.3849				2455728.5	2011-06-16	17	35	40.9702
2455627.5	2011-03- 7			10 57 28.9316	10 57 27.8391	11 45 28.9316				2455729.5	2011-06-17	17	39	37.5348
2455628.5	2011-03- 8			11 01 25.4793	11 01 24.3944	11 49 25.4793				2455730.5	2011-06-18	17	43	34.0973
2455629.5	2011-03- 9			11 05 22.0288	11 05 20.9498	11 53 22.0288				2455731.5	2011-06-19	17	47	30.6571
2455630.5	2011-03-10			11 09 18.5805	11 09 17.5052	11 57 18.5805				2455732.5	2011-06-20	17	51	27.2138
2455631.5	2011-03-11			11 13 15.1347	11 13 14.0605	12 01 15.1347				2455733.5	2011-06-21	17	55	23.7680
2455632.5	2011-03-12			11 17 11.6912	11 17 10.6159	12 05 11.6912				2455734.5	2011-06-22	17	59	20.3204
2455633.5	2011-03-13			11 21 08.2495	11 21 07.1713	12 09 08.2495				2455735.5	2011-06-23	18	03	16.8719
2455634.5	2011-03-14			11 25 04.8087	11 25 03.7266	12 13 04.8087				2455736.5	2011-06-24	18	07	13.4234
2455635.5	2011-03-15			11 29 01.3673	11 29 00.2820	12 17 01.3673				2455737.5	2011-06-25	18	11	09.9759
2455636.5	2011-03-16			11 32 57.9241	11 32 56.8374</									

Greenwich Sidereal Times Local Apparent											Greenwich Sidereal Times Local Apparent												
Julian date			Apparent			Mean			Sidereal Time			Julian date			Apparent			Mean			Sidereal Time		
Year	Mon	Da	h	m	s	h	m	s	h	m	s	Year	Mon	Da	h	m	s	h	m	s	h	m	s
2455766.5	2011-07-24	20	05	30.1307	20	05	29.0353	20	53	30.1307	2455847.5	2011-10-13	1	24	50.9802	1	24	50.0201	2	12	50.9802		
2455767.5	2011-07-25	20	09	26.6874	20	09	25.5906	20	57	26.6874	2455848.5	2011-10-14	1	28	47.5313	1	28	46.5755	2	16	47.5313		
2455768.5	2011-07-26	20	13	23.2465	20	13	22.1460	21	01	23.2465	2455849.5	2011-10-15	1	32	44.0848	1	32	43.1309	2	20	44.0848		
2455769.5	2011-07-27	20	17	19.8075	20	17	18.7014	21	05	19.8075	2455850.5	2011-10-16	1	36	40.6404	1	36	39.6862	2	24	40.6404		
2455770.5	2011-07-28	20	21	16.3697	20	21	15.2568	21	09	16.3697	2455851.5	2011-10-17	1	40	37.1978	1	40	36.2416	2	28	37.1978		
2455771.5	2011-07-29	20	25	12.9319	20	25	11.8121	21	13	12.9319	2455852.5	2011-10-18	1	44	33.7561	1	44	32.7970	2	32	33.7561		
2455772.5	2011-07-30	20	29	09.4927	20	29	08.3675	21	17	09.4927	2455853.5	2011-10-19	1	48	30.3146	1	48	29.3523	2	36	30.3146		
2455773.5	2011-07-31	20	33	06.0507	20	33	04.9229	21	21	06.0507	2455854.5	2011-10-20	1	52	26.8721	1	52	25.9077	2	40	26.8721		
2455774.5	2011-08- 1	20	37	02.6054	20	37	01.4782	21	25	02.6054	2455855.5	2011-10-21	1	56	23.4276	1	56	22.4631	2	44	23.4276		
2455775.5	2011-08- 2	20	40	59.1568	20	40	58.0336	21	28	59.1568	2455856.5	2011-10-22	2	00	19.9805	2	00	19.0184	2	48	19.9805		
2455776.5	2011-08- 3	20	44	55.7062	20	44	54.5890	21	32	55.7062	2455857.5	2011-10-23	2	04	16.5306	2	04	15.5738	2	52	16.5306		
2455777.5	2011-08- 4	20	48	52.2553	20	48	51.1443	21	36	52.2553	2455858.5	2011-10-24	2	08	13.0786	2	08	12.1292	2	56	13.0786		
2455778.5	2011-08- 5	20	52	48.8061	20	52	47.6997	21	40	48.8061	2455859.5	2011-10-25	2	12	09.6260	2	12	08.6846	3	00	09.6260		
2455779.5	2011-08- 6	20	56	45.3596	20	56	44.2551	21	44	45.3596	2455860.5	2011-10-26	2	16	06.1749	2	16	05.2399	3	04	06.1749		
2455780.5	2011-08- 7	21	00	41.9164	21	00	40.8104	21	48	41.9164	2455861.5	2011-10-27	2	20	02.7270	2	20	01.7953	3	08	02.7270		
2455781.5	2011-08- 8	21	04	38.4761	21	04	37.3658	21	52	38.4761	2455862.5	2011-10-28	2	23	59.2833	2	23	58.3507	3	11	59.2833		
2455782.5	2011-08- 9	21	08	35.0376	21	08	33.9212	21	56	35.0376	2455863.5	2011-10-29	2	27	55.8433	2	27	54.9060	3	15	55.8433		
2455783.5	2011-08-10	21	12	31.5993	21	12	30.4765	22	00	31.5993	2455864.5	2011-10-30	2	31	52.4052	2	31	51.4614	3	19	52.4052		
2455784.5	2011-08-11	21	16	28.1599	21	16	27.0319	22	04	28.1599	2455865.5	2011-10-31	2	35	48.9673	2	35	48.0168	3	23	48.9673		
2455785.5	2011-08-12	21	20	24.7183	21	20	23.5873	22	08	24.7183	2455866.5	2011-11- 1	2	39	45.5277	2	39	44.5721	3	27	45.5277		
2455786.5	2011-08-13	21	24	21.2739	21	24	20.1427	22	12	21.2739	2455867.5	2011-11- 2	2	43	42.0855	2	43	41.1275	3	31	42.0855		
2455787.5	2011-08-14	21	28	17.8266	21	28	16.6980	22	16	17.8266	2455868.5	2011-11- 3	2	47	38.6404	2	47	37.6829	3	35	38.6404		
2455788.5	2011-08-15	21	32	14.3769	21	32	13.2534	22	20	14.3769	2455869.5	2011-11- 4	2	51	35.1927	2	51	34.2382	3	39	35.1927		
2455789.5	2011-08-16	21	36	10.9257	21	36	09.8088	22	24	10.9257	2455870.5	2011-11- 5	2	55	31.7430	2	55	30.7936	3	43	31.7430		
2455790.5	2011-08-17	21	40	07.4737	21	40	06.3641	22	28	07.4737	2455871.5	2011-11- 6	2	59	28.2921	2	59	27.3490	3	47	28.2921		
2455791.5	2011-08-18	21	44	04.0221	21	44	02.9195	22	32	04.0221	2455872.5	2011-11- 7	3	03	24.8410	3	03	23.9043	3	51	24.8410		
2455792.5	2011-08-19	21	48	00.5716	21	47	59.4749	22	36	00.5716	2455873.5	2011-11- 8	3	07	21.3906	3	07	20.4597	3	55	21.3906		
2455793.5	2011-08-20	21	51	57.1228	21	51	56.0302	22	39	57.1228	2455874.5	2011-11- 9	3	11	17.9416	3	11	17.0151	3	59	17.9416		
2455794.5	2011-08-21	21	55	53.6763	21	55	52.5856	22	43	53.6763	2455875.5	2011-11-10	3	15	14.4946	3	15	13.5704	4	03	14.4946		
2455795.5	2011-08-22	21	59	50.2320	21	59	49.1410	22	47	50.2320	2455876.5	2011-11-11	3	19	11.0500	3	19	10.1258	4	07	11.0500		
2455796.5	2011-08-23	22	03	46.7899	22	03	45.6963	22	51	46.7899	2455877.5	2011-11-12	3	23	07.6076	3	23	06.6812	4	11	07.6076		
2455797.5	2011-08-24	22	07	43.3491	22	07	42.2517	22	55	43.3491	2455878.5	2011-11-13	3	27	04.1671	3	27	03.2366	4	15	04.1671		
2455798.5	2011-08-25	22	11	39.9089	22	11	38.8071	22	59	39.9089	2455879.5	2011-11-14	3	31	00.7278	3	30	59.7919	4	19	00.7278		
2455799.5	2011-08-26	22	15	36.4679	22	15	35.3624	23	03	36.4679	2455880.5	2011-11-15	3	34	57.2887	3	34	56.3473	4	22	57.2887		
2455800.5	2011-08-27	22	19	33.0249	22	19	31.9178	23	07	33.0249	2455881.5	2011-11-16	3	38	53.8488	3	38	52.9027	4	26	53.8488		
2455801.5	2011-08-28	22	23	29.5787	22	23	28.4732	23	11	29.5787	2455882.5	2011-11-17	3	42	50.4072	3	42	49.4580	4	30	50.4072		
2455802.5	2011-08-29	22	27	26.1291	22	27	25.0285	23	15	26.1291	2455883.5	2011-11-18	3	46	46.9633	3	46	46.0134	4	34	46.9633		
2455803.5	2011-08-30	22	31	22.6769	22	31	21.5839	23	19	22.6769	2455884.5	2011-11-19	3	50	43.5166	3	50	42.5688	4	38	43.5166		
2455804.5	2011-08-31	22	35	19.2236	22	35	18.1393	23	23	19.2236	2455885.5	2011-11-20	3	54	40.0678	3	54	39.1241	4	42	40.0678		
2455805.5	2011-09- 1	22	39	15.7715	22	39	14.6947	23	27	15.7715	2455886.5	2011-11-21	3	58	36.6180	3	58	35.6795	4	46	36.6180		
2455806.5	2011-09- 2	22	43	12.3221	22	43	11.2500	23	31	12.3221	2455887.5	2011-11-22	4	02	33.1687	4	02	32.2349	4	50	33.1687		
2455807.5	2011-09- 3	22	47	08.8761	22	47	07.8054	23	35	08.8761	2455888.5	2011-11-23	4	06	29.7219	4	06	28.7902	4	54	29.7219		
2455808.5	2011-09- 4	22	51	05.4333	22	51	04.3608	23	39	05.4333	2455889.5	2011-11-24	4	10	26.2788	4	10	25.3456	4	58	26.2788		
2455809.5	2011-09- 5	22	55	01.9925	22	55	00.9161	23	43	01.9925	2455890.5	2011-11-25	4	14	22.8398	4	14	21.9010	5	02	22.8398		
2455810.5	2011-09- 6	22	58	58.5522	22	58	57.4715	23	46	58.5522	2455891.5	2011-11-26	4	18	19.4039	4	18	18.4563	5	06	19.4039		
2455811.5	2011-09- 7	23	02	55.1111	23	02	54.0269	23	50	55.1111	2455892.5	2011-11-27	4	22	15.9691	4	22	15.0117	5	10	15.9691		
2455812.5	2011-09- 8	23	06	51.6679	23	06	50.5822	23	54	51.6679	2455893.5	2011-11-28	4	26	12.5334	4	26	11.5671	5	14	12.5334		
2455813.5	2011-09- 9	23	10	48.2222																			

# CALENDARIO GENERALE EVENTI

## GENERAL CALENDAR OF EVENTS

Gennaio			
d	h	d	h
1	19	Antares 2.6S della Luna	12 11 Primo quarto
2	10	Minima declinaz. lunare (-24.2)	16 22 Massima declinaz. lunare (24.1)
2	14	Mercurio 3.7N della Luna	18 5 Mercurio 4.1S di Plutone
3	17	Plutone 4.2N della Luna	19 21 Luna piena
3	18	Terra al perielio	21 23 Regolo 4.8N della Luna
4	9	Luna nuova	22 0 Luna al perigeo
4	12	Giove 0.5S di Urano	25 16 Spica 2.8N della Luna
4	23	Marte 2.7S della Luna	26 13 Ultimo quarto
7	20	Nettuno 4.7S della Luna	27 8 Saturno stazionario
8	18	Venere massima elong W(47)	29 0 Antares 2.6S della Luna
9	20	Mercurio massima elong W(23)	29 16 Minima declinaz. lunare (-24.1)
10	5	Luna all'apogeo	30 3 Venere 3.4N della Luna
10	9	Regolo 5.9S della Luna	31 2 Plutone 4.1N della Luna

Febbraio			
d	h	d	h
1	16	Mercurio 3.5S della Luna	18 9 Regolo 4.8N della Luna
3	2	Luna nuova	19 7 Luna al perigeo
3	3	Marte 4.5S della Luna	20 22 Mercurio 1.0S di Marte
4	6	Nettuno 4.7S della Luna	21 0 Mercurio 1.6S di Nettuno
4	16	Marte in congiunzione	21 4 Marte 0.6S di Nettuno
6	19	Regolo 5.8S della Luna	21 23 Spica 2.6N della Luna
6	22	Luna all'apogeo	24 23 Ultimo quarto
10	1	Venere 2.3S di Plutone	25 6 Antares 2.8S della Luna
11	7	Primo quarto	25 8 Mercurio congiunzione superiore
13	8	Massima declinaz. lunare (24.0)	25 21 Minima declinaz. lunare (-24.0)
17	9	Nettuno in congiunzione	27 8 Plutone 3.9N della Luna
18	8	Luna piena	

Marzo			
d	h	d	h
1	3	Venere 1.6S della Luna	19 18 Luna al perigeo
3	14	Nettuno 4.8S della Luna	20 23 Equinozio
4	7	Marte 5.7S della Luna	21 9 Spica 2.4N della Luna
4	20	Luna nuova	21 12 Regolo in congiunzione
5	12	Mercurio 6.0S della Luna	22 22 Mercurio massima elong E(19)
6	4	Regolo 5.7S della Luna	24 13 Antares 3.0S della Luna
6	7	Luna all'apogeo	25 4 Minima declinaz. lunare (-23.8)
9	16	Mercurio 0.3N di Urano	26 12 Ultimo quarto
12	16	Massima declinaz. lunare (23.8)	26 15 Plutone 3.6N della Luna
12	23	Primo quarto	27 1 Venere 0.1S di Nettuno
16	3	Mercurio 2.0N di Giove	30 19 Mercurio stazionario
17	20	Regolo 4.9N della Luna	30 22 Nettuno 5.0S della Luna
19	18	Luna piena	31 8 Venere 5.5S della Luna

Aprile			
d	h	d	h
2	8	Luna all'apogeo	14 6 Regolo 5.0N della Luna
2	11	Marte 5.9S della Luna	17 5 Luna al perigeo
2	13	Regolo 5.7S della Luna	17 20 Spica 2.4N della Luna
3	14	Luna nuova	18 2 Luna piena
3	19	Giove 5.8S della Luna	19 17 Mercurio 0.6N di Marte
3	20	Marte 0.2S di Urano	20 23 Antares 3.2S della Luna
3	23	Saturno in opposizione	21 13 Minima declinaz. lunare (-23.6)
4	9	Mercurio 1.3S della Luna	22 5 Mercurio stazionario
6	14	Giove in congiunzione	22 23 Plutone 3.4N della Luna
8	22	Massima declinaz. lunare (23.6)	23 2 Venere 0.9S di Urano
9	6	Plutone stazionario	25 2 Ultimo quarto
9	19	Mercurio congiunzione inferiore	27 6 Nettuno 5.2S della Luna
11	11	Primo quarto	29 18 Luna all'apogeo
12	5	Mercurio 2.9N di Giove	29 22 Regolo 5.8S della Luna

Maggio			
d	h	d	h
1	4	Marte 0.4N di Giove	17 11 Luna piena
1	14	Giove 5.6S della Luna	18 9 Antares 3.3S della Luna
1	15	Marte 5.2S della Luna	18 23 Minima declinaz. lunare (-23.5)
3	6	Luna nuova	20 8 Plutone 3.4N della Luna
6	3	Massima declinaz. lunare (23.5)	21 1 Mercurio 2.1S di Marte
7	20	Mercurio massima elong W(27)	23 8 Venere 1.0S di Marte
10	5	Mercurio 1.5S di Venere	24 14 Nettuno 5.3S della Luna
10	20	Primo quarto	24 18 Ultimo quarto
11	13	Regolo 5.2N della Luna	27 8 Regolo 5.8S della Luna
11	14	Venere 0.6S di Giove	27 10 Luna all'apogeo
11	17	Mercurio 2.0S di Giove	29 10 Giove 5.4S della Luna
15	6	Spica 2.4N della Luna	30 17 Marte 3.7S della Luna



15	10	Luna al perigeo	31	1	Venere 4.3S della Luna
15	21	Mercurio 1.4S di Venere	31	15	Mercurio 3.7S della Luna

#### Giugno

d	h		d	h	
1	21	Luna nuova	16	17	Plutone 3.3N della Luna
2	10	Massima declinaz. lunare (23.4)	17	18	Venere 4.7N di Aldebaran
3	15	Nettuno stazionario	20	22	Nettuno 5.4S della Luna
7	14	Mercurio 5.4N di Aldebaran	21	17	Solstizio
7	19	Regolo 5.3N della Luna	23	11	Ultimo quarto
9	2	Primo quarto	23	17	Regolo 5.9S della Luna
11	14	Spica 2.4N della Luna	24	4	Luna all'apogeo
12	0	Luna al perigeo	26	5	Giove 5.1S della Luna
12	23	Mercurio congiunzione superiore	28	5	Plutone in opposizione
14	4	Saturno stazionario	28	11	Mercurio 4.8S di Polluce
14	19	Antares 3.3S della Luna	28	18	Marte 1.7S della Luna
15	9	Minima declinaz. lunare (-23.4)	29	17	Massima declinaz. lunare (23.4)
15	20	Luna piena	30	7	Venere 0.1S della Luna Occn

#### Luglio

d	h		d	h	
1	8	Luna nuova	15	6	Luna piena
2	23	Mercurio 4.9N della Luna	18	6	Nettuno 5.3S della Luna
4	16	Terra all'afelio	20	2	Mercurio massima elong E(27)
5	1	Regolo 5.3N della Luna	21	1	Regolo 5.8S della Luna
5	3	Marte 5.4N di Aldebaran	21	22	Luna all'apogeo
7	13	Luna al perigeo	23	5	Ultimo quarto
8	6	Primo quarto	23	21	Giove 4.9S della Luna
8	20	Spica 2.4N della Luna	27	2	Massima declinaz. lunare (23.3)
10	7	Regolo stazionario	27	16	Marte 0.5N della Luna Occn
12	2	Antares 3.4S della Luna	28	23	Mercurio 3.1S di Regolo
12	17	Minima declinaz. lunare (-23.4)	30	9	Venere 4.1N della Luna
14	0	Plutone 3.3N della Luna	30	18	Luna nuova

#### Agosto

d	h		d	h	
1	8	Regolo 5.2N della Luna	17	8	Regolo 5.7S della Luna
1	10	Mercurio 1.3N della Luna	18	15	Luna all'apogeo
2	6	Mercurio stazionario	20	9	Giove 4.7S della Luna
2	21	Luna al perigeo	21	21	Ultimo quarto
5	1	Spica 2.3N della Luna	21	22	Venere 0.9N di Regolo
6	11	Primo quarto	22	23	Nettuno in opposizione
8	4	Mercurio 5.0S di Regolo	23	11	Massima declinaz. lunare (23.1)
8	8	Antares 3.5S della Luna	25	12	Marte 2.7N della Luna
8	23	Minima declinaz. lunare (-23.2)	26	1	Mercurio stazionario
10	6	Plutone 3.2N della Luna	28	0	Mercurio 2.4N della Luna
13	19	Luna piena	28	18	Regolo 5.1N della Luna
14	12	Nettuno 5.2S della Luna	29	3	Luna nuova
16	12	Venere superior conjunction	30	17	Giove stazionario
16	23	Mercurio 5.9S di Venere	30	18	Luna al perigeo
17	1	Mercurio congiunzione inferiore			

#### Settembre

d	h		d	h	
1	9	Spica 2.1N della Luna	16	15	Giove 4.6S della Luna
3	7	Mercurio massima elong W(18)	19	19	Massima declinaz. lunare (22.9)
4	14	Antares 3.7S della Luna	20	13	Ultimo quarto
4	17	Primo quarto	23	6	Marte 4.6N della Luna
5	4	Minima declinaz. lunare (-23.1)	23	9	Equinozio
6	11	Plutone 2.9N della Luna	25	4	Regolo 5.3N della Luna
8	9	Marte 5.9S di Polluce	26	0	Regolo in opposizione
9	4	Mercurio 0.6N di Regolo	27	11	Luna nuova
10	17	Nettuno 5.3S della Luna	28	1	Luna al perigeo
12	9	Luna piena	28	6	Venere 5.4N della Luna
13	13	Regolo 5.6S della Luna	28	18	Spica 2.0N della Luna
15	6	Luna all'apogeo	28	20	Mercurio congiunzione superiore
16	11	Plutone stazionario	29	23	Venere 1.3S di Saturno

#### Ottobre

d	h		d	h	
1	21	Antares 3.9S della Luna	17	1	Massima declinaz. lunare (22.7)
2	11	Minima declinaz. lunare (-22.9)	20	3	Ultimo quarto
3	17	Plutone 2.6N della Luna	22	14	Regolo 5.4N della Luna
4	3	Primo quarto	26	5	Spica 1.9N della Luna
4	10	Venere 2.9N of Spica	26	12	Luna al perigeo
6	22	Mercurio 1.7S di Saturno	26	19	Luna nuova
7	22	Nettuno 5.4S della Luna	28	2	Mercurio 0.3N della Luna Occn
9	18	Mercurio 2.3N of Spica	28	4	Venere 1.9N della Luna
10	16	Regolo 5.6S della Luna	29	1	Giove in opposizione
12	2	Luna piena	29	6	Antares 4.0S della Luna
12	12	Luna all'apogeo	29	20	Minima declinaz. lunare (-22.7)
13	16	Giove 4.7S della Luna	31	1	Plutone 2.3N della Luna
13	21	Saturno in congiunzione			

		Novembre	
d	h	d	h
2	16	15	0
4	3	18	15
6	21	18	22
8	12	22	16
9	15	23	23
9	20	24	6
10	8	25	6
10	12	25	18
10	20	26	7
11	4	26	9
12	15	27	4
13	7	27	13
14	3		

Primo quarto	Saturno 4.3N of Spica
Nettuno 5.6S della Luna	Ultimo quarto
Regolo 5.7S della Luna	Regolo 5.6N della Luna
Luna all'apogeo	Spica 1.9N della Luna
Giove 4.8S della Luna	Luna al perigeo
Nettuno stazionario	Mercurio stazionario
Venere 3.9N di Antares	Luna nuova                      Eclisse
Mercurio 1.9N di Antares	Antares 4.1S della Luna
Luna piena	Minima declinaz. lunare (-22.6)
Marte 1.3N di Regolo	Mercurio 1.6S della Luna
Aldebaran 5.9S della Luna	Venere 2.7S della Luna
Massima declinaz. lunare (22.6)	Plutone 2.1N della Luna
Mercurio massima elong E(23)	

© (8)

## Diary of Astronomical Phenomena 2011

March			
d	h		d h
1	3	Venus 1.6S of Moon	19 18 Moon at perigee
3	14	Neptune 4.8S of Moon	20 23 Equinox
4	7	Mars 5.7S of Moon	21 9 Spica 2.4N of Moon
4	20	NEW MOON	21 12 Uranus at conjunction
5	12	Mercury 6.0S of Moon	22 22 Mercury greatest elong E(19)
6	4	Uranus 5.7S of Moon	24 13 Antares 3.0S of Moon
6	7	Moon at apogee	25 4 Moon furthest South (-23.8)
9	16	Mercury 0.3N of Uranus	26 12 LAST QUARTER
12	16	Moon furthest North (23.8)	26 15 Pluto 3.6N of Moon
12	23	FIRST QUARTER	27 1 Venus 0.1S of Neptune
16	3	Mercury 2.0N of Jupiter	30 19 Mercury stationary
17	20	Regulus 4.9N of Moon	30 22 Neptune 5.0S of Moon
19	18	FULL MOON	31 8 Venus 5.5S of Moon
April			
d	h		d h
2	8	Moon at apogee	14 6 Regulus 5.0N of Moon
2	11	Mars 5.9S of Moon	17 5 Moon at perigee
2	13	Uranus 5.7S of Moon	17 20 Spica 2.4N of Moon
3	14	NEW MOON	18 2 FULL MOON
3	19	Jupiter 5.8S of Moon	19 17 Mercury 0.6N of Mars
3	20	Mars 0.2S of Uranus	20 23 Antares 3.2S of Moon
3	23	Saturn at opposition	21 13 Moon furthest South (-23.6)
4	9	Mercury 1.3S of Moon	22 5 Mercury stationary
6	14	Jupiter at conjunction	22 23 Pluto 3.4N of Moon
8	22	Moon furthest North (23.6)	23 2 Venus 0.9S of Uranus
9	6	Pluto stationary	25 2 LAST QUARTER
9	19	Mercury inferior conjunction	27 6 Neptune 5.2S of Moon
11	11	FIRST QUARTER	29 18 Moon at apogee
12	5	Mercury 2.9N of Jupiter	29 22 Uranus 5.8S of Moon
May			
d	h		d h
1	4	Mars 0.4N of Jupiter	17 11 FULL MOON
1	14	Jupiter 5.6S of Moon	18 9 Antares 3.3S of Moon
1	15	Mars 5.2S of Moon	18 23 Moon furthest South (-23.5)
3	6	NEW MOON	20 8 Pluto 3.4N of Moon
6	3	Moon furthest North (23.5)	21 1 Mercury 2.1S of Mars
7	20	Mercury greatest elong W(27)	23 8 Venus 1.0S of Mars
10	5	Mercury 1.5S of Venus	24 14 Neptune 5.3S of Moon
10	20	FIRST QUARTER	24 18 LAST QUARTER
11	13	Regulus 5.2N of Moon	27 8 Uranus 5.8S of Moon
11	14	Venus 0.6S of Jupiter	27 10 Moon at apogee
11	17	Mercury 2.0S of Jupiter	29 10 Jupiter 5.4S of Moon
15	6	Spica 2.4N of Moon	30 17 Mars 3.7S of Moon
15	10	Moon at perigee	31 1 Venus 4.3S of Moon
15	21	Mercury 1.4S of Venus	31 15 Mercury 3.7S of Moon
June			
d	h		d h
1	21	NEW MOON Eclipse	16 17 Pluto 3.3N of Moon
2	10	Moon furthest North (23.4)	17 18 Venus 4.7N of Aldebaran
3	15	Neptune stationary	20 22 Neptune 5.4S of Moon
7	14	Mercury 5.4N of Aldebaran	21 17 Solstice
7	19	Regulus 5.3N of Moon	23 11 LAST QUARTER
9	2	FIRST QUARTER	23 17 Uranus 5.9S of Moon
11	14	Spica 2.4N of Moon	24 4 Moon at apogee
12	0	Moon at perigee	26 5 Jupiter 5.1S of Moon
12	23	Mercury superior conjunction	28 5 Pluto at opposition
14	4	Saturn stationary	28 11 Mercury 4.8S of Pollux
14	19	Antares 3.3S of Moon	28 18 Mars 1.7S of Moon
15	9	Moon furthest South (-23.4)	29 17 Moon furthest North (23.4)
15	20	FULL MOON Eclipse	30 7 Venus 0.1S of Moon Occn
July			
d	h		d h
1	8	NEW MOON Eclipse	15 6 FULL MOON
2	23	Mercury 4.9N of Moon	18 6 Neptune 5.3S of Moon
4	16	Earth at aphelion	20 2 Mercury greatest elong E(27)
5	1	Regulus 5.3N of Moon	21 1 Uranus 5.8S of Moon
5	3	Mars 5.4N of Aldebaran	21 22 Moon at apogee
7	13	Moon at perigee	23 5 LAST QUARTER
8	6	FIRST QUARTER	23 21 Jupiter 4.9S of Moon
8	20	Spica 2.4N of Moon	27 2 Moon furthest North (23.3)
10	7	Uranus stationary	27 16 Mars 0.5N of Moon Occn
12	2	Antares 3.4S of Moon	28 23 Mercury 3.1S of Regulus
12	17	Moon furthest South (-23.4)	30 9 Venus 4.1N of Moon
14	0	Pluto 3.3N of Moon	30 18 NEW MOON
August			
d	h		d h
1	8	Regulus 5.2N of Moon	17 8 Uranus 5.7S of Moon
1	10	Mercury 1.3N of Moon	18 15 Moon at apogee

2	6	Mercury stationary	20	9	Jupiter 4.7S of Moon
2	21	Moon at perigee	21	21	LAST QUARTER
5	1	Spica 2.3N of Moon	21	22	Venus 0.9N of Regulus
6	11	FIRST QUARTER	22	23	Neptune at opposition
8	4	Mercury 5.0S of Regulus	23	11	Moon furthest North (23.1)
8	8	Antares 3.5S of Moon	25	12	Mars 2.7N of Moon
8	23	Moon furthest South (-23.2)	26	1	Mercury stationary
10	6	Pluto 3.2N of Moon	28	0	Mercury 2.4N of Moon
13	19	FULL MOON	28	18	Regulus 5.1N of Moon
14	12	Neptune 5.2S of Moon	29	3	NEW MOON
16	12	Venus superior conjunction	30	17	Jupiter stationary
16	23	Mercury 5.9S of Venus	30	18	Moon at perigee
17	1	Mercury inferior conjunction			
September					
d	h		d	h	
1	9	Spica 2.1N of Moon	16	15	Jupiter 4.6S of Moon
3	7	Mercury greatest elong W(18)	19	19	Moon furthest North (22.9)
4	14	Antares 3.7S of Moon	20	13	LAST QUARTER
4	17	FIRST QUARTER	23	6	Mars 4.6N of Moon
5	4	Moon furthest South (-23.1)	23	9	Equinox
6	11	Pluto 2.9N of Moon	25	4	Regulus 5.3N of Moon
8	9	Mars 5.9S of Pollux	26	0	Uranus at opposition
9	4	Mercury 0.6N of Regulus	27	11	NEW MOON
10	17	Neptune 5.3S of Moon	28	1	Moon at perigee
12	9	FULL MOON	28	6	Venus 5.4N of Moon
13	13	Uranus 5.6S of Moon	28	18	Spica 2.0N of Moon
15	6	Moon at apogee	28	20	Mercury superior conjunction
16	11	Pluto stationary	29	23	Venus 1.3S of Saturn
October					
d	h		d	h	
1	21	Antares 3.9S of Moon	17	1	Moon furthest North (22.7)
2	11	Moon furthest South (-22.9)	20	3	LAST QUARTER
3	17	Pluto 2.6N of Moon	22	14	Regulus 5.4N of Moon
4	3	FIRST QUARTER	26	5	Spica 1.9N of Moon
4	10	Venus 2.9N of Spica	26	12	Moon at perigee
6	22	Mercury 1.7S of Saturn	26	19	NEW MOON
7	22	Neptune 5.4S of Moon	28	2	Mercury 0.3N of Moon Occn
9	18	Mercury 2.3N of Spica	28	4	Venus 1.9N of Moon
10	16	Uranus 5.6S of Moon	29	1	Jupiter at opposition
12	2	FULL MOON	29	6	Antares 4.0S of Moon
12	12	Moon at apogee	29	20	Moon furthest South (-22.7)
13	16	Jupiter 4.7S of Moon	31	1	Pluto 2.3N of Moon
13	21	Saturn at conjunction			
November					
d	h		d	h	
2	16	FIRST QUARTER	15	0	Saturn 4.3N of Spica
4	3	Neptune 5.6S of Moon	18	15	LAST QUARTER
6	21	Uranus 5.7S of Moon	18	22	Regulus 5.6N of Moon
8	12	Moon at apogee	22	16	Spica 1.9N of Moon
9	15	Jupiter 4.8S of Moon	23	23	Moon at perigee
9	20	Neptune stationary	24	6	Mercury stationary
10	8	Venus 3.9N of Antares	25	6	NEW MOON Eclipse
10	12	Mercury 1.9N of Antares	25	18	Antares 4.1S of Moon
10	20	FULL MOON	26	7	Moon furthest South (-22.6)
11	4	Mars 1.3N of Regulus	26	9	Mercury 1.6S of Moon
12	15	Aldebaran 5.9S of Moon	27	4	Venus 2.7S of Moon
13	7	Moon furthest North (22.6)	27	13	Pluto 2.1N of Moon
14	3	Mercury greatest elong E(23)			
December					
d	h		d	h	
1	11	Neptune 5.6S of Moon	20	0	Spica 1.9N of Moon
1	13	Venus 5.4S of Pluto	22	2	Moon at perigee
2	9	FIRST QUARTER	22	5	Solstice
4	3	Uranus 5.8S of Moon	23	3	Mercury 2.6N of Moon
4	9	Mercury inferior conjunction	23	4	Antares 4.2S of Moon
6	1	Moon at apogee	23	11	Mercury greatest elong W(22)
6	16	Jupiter 4.9S of Moon	23	17	Moon furthest South (-22.5)
9	22	Aldebaran 5.9S of Moon	24	18	NEW MOON
10	13	Moon furthest North (22.6)	25	1	Pluto 1.9N of Moon
10	14	FULL MOON Eclipse	26	11	Jupiter stationary
10	15	Uranus stationary	28	21	Neptune 5.6S of Moon
14	5	Mercury stationary	29	7	Pluto at conjunction
16	3	Regulus 5.6N of Moon	31	11	Uranus 5.7S of Moon
18	0	LAST QUARTER			

The values of this charts are approximate, for greater precisions to consult the following chapters

# EFFEMERIDI DEL SOLE - EPHEMERIDES OF THE SUN

Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
01/01/2011	18h 44m 23.73s	-23° 02' 44.0"	18h 44m 23.83s	-23° 02' 47.0"	0.9833559	8,18	8,9	1951,8
02/01/2011	18h 48m 48.70s	-22° 57' 49.1"	18h 48m 48.80s	-22° 57' 52.0"	0.9833472	8,18	8,9	1951,8
03/01/2011	18h 53m 13.36s	-22° 52' 26.6"	18h 53m 13.46s	-22° 52' 29.5"	0.9833424	8,18	8,9	1951,8
04/01/2011	18h 57m 37.66s	-22° 46' 36.8"	18h 57m 37.76s	-22° 46' 39.8"	0.9833414	8,18	8,9	1951,8
05/01/2011	19h 02m 01.58s	-22° 40' 19.9"	19h 02m 01.67s	-22° 40' 22.9"	0.9833441	8,18	8,9	1951,8
06/01/2011	19h 06m 25.06s	-22° 33' 36.0"	19h 06m 25.15s	-22° 33' 39.0"	0.9833506	8,18	8,9	1951,8
07/01/2011	19h 10m 48.09s	-22° 26' 25.4"	19h 10m 48.18s	-22° 26' 28.4"	0.9833610	8,18	8,9	1951,7
08/01/2011	19h 15m 10.63s	-22° 18' 48.3"	19h 15m 10.72s	-22° 18' 51.3"	0.9833754	8,18	8,9	1951,7
09/01/2011	19h 19m 32.66s	-22° 10' 44.8"	19h 19m 32.75s	-22° 10' 47.9"	0.9833940	8,18	8,9	1951,7
10/01/2011	19h 23m 54.14s	-22° 02' 15.3"	19h 23m 54.22s	-22° 02' 18.4"	0.9834169	8,18	8,9	1951,6
11/01/2011	19h 28m 15.05s	-21° 53' 20.0"	19h 28m 15.14s	-21° 53' 23.1"	0.9834443	8,18	8,9	1951,6
12/01/2011	19h 32m 35.37s	-21° 43' 59.2"	19h 32m 35.45s	-21° 44' 02.3"	0.9834764	8,18	8,9	1951,5
13/01/2011	19h 36m 55.07s	-21° 34' 13.1"	19h 36m 55.16s	-21° 34' 16.2"	0.9835134	8,18	8,9	1951,4
14/01/2011	19h 41m 14.14s	-21° 24' 02.0"	19h 41m 14.23s	-21° 24' 05.2"	0.9835556	8,18	8,9	1951,4
15/01/2011	19h 45m 32.56s	-21° 13' 26.3"	19h 45m 32.64s	-21° 13' 29.4"	0.9836032	8,18	8,9	1951,3
16/01/2011	19h 49m 50.30s	-21° 02' 26.1"	19h 49m 50.38s	-21° 02' 29.3"	0.9836565	8,18	8,9	1951,2
17/01/2011	19h 54m 07.35s	-20° 51' 01.9"	19h 54m 07.43s	-20° 51' 05.1"	0.9837155	8,18	8,9	1951,0
18/01/2011	19h 58m 23.69s	-20° 39' 13.9"	19h 58m 23.77s	-20° 39' 17.2"	0.9837807	8,18	8,9	1950,9
19/01/2011	20h 02m 39.32s	-20° 27' 02.5"	20h 02m 39.40s	-20° 27' 05.8"	0.9838521	8,18	8,9	1950,8
20/01/2011	20h 06m 54.21s	-20° 14' 28.0"	20h 06m 54.29s	-20° 14' 31.3"	0.9839300	8,18	8,9	1950,6
21/01/2011	20h 11m 08.36s	-20° 01' 30.6"	20h 11m 08.44s	-20° 01' 34.0"	0.9840142	8,18	8,9	1950,4
22/01/2011	20h 15m 21.76s	-19° 48' 10.8"	20h 15m 21.84s	-19° 48' 14.2"	0.9841049	8,18	8,9	1950,3
23/01/2011	20h 19m 34.41s	-19° 34' 28.8"	20h 19m 34.49s	-19° 34' 32.1"	0.9842017	8,19	8,9	1950,1
24/01/2011	20h 23m 46.29s	-19° 20' 24.9"	20h 23m 46.37s	-19° 20' 28.3"	0.9843045	8,19	8,9	1949,9
25/01/2011	20h 27m 57.41s	-19° 05' 59.5"	20h 27m 57.49s	-19° 06' 03.0"	0.9844130	8,19	8,9	1949,7
26/01/2011	20h 32m 07.77s	-18° 51' 13.0"	20h 32m 07.84s	-18° 51' 16.4"	0.9845267	8,19	8,9	1949,4
27/01/2011	20h 36m 17.34s	-18° 36' 05.7"	20h 36m 17.42s	-18° 36' 09.2"	0.9846452	8,19	8,9	1949,2
28/01/2011	20h 40m 26.14s	-18° 20' 38.0"	20h 40m 26.22s	-18° 20' 41.5"	0.9847683	8,19	8,9	1949,0
29/01/2011	20h 44m 34.16s	-18° 04' 50.3"	20h 44m 34.23s	-18° 04' 53.9"	0.9848956	8,19	8,9	1948,7
30/01/2011	20h 48m 41.37s	-17° 48' 43.1"	20h 48m 41.45s	-17° 48' 46.8"	0.9850267	8,19	8,9	1948,4
31/01/2011	20h 52m 47.79s	-17° 32' 16.8"	20h 52m 47.87s	-17° 32' 20.4"	0.9851615	8,19	8,9	1948,2
01/02/2011	20h 56m 53.40s	-17° 15' 31.7"	20h 56m 53.48s	-17° 15' 35.4"	0.9852996	8,19	8,9	1947,9
02/02/2011	21h 00m 58.20s	-16° 58' 28.3"	21h 00m 58.28s	-16° 58' 32.0"	0.9854411	8,20	8,9	1947,6
03/02/2011	21h 05m 02.19s	-16° 41' 07.0"	21h 05m 02.26s	-16° 41' 10.8"	0.9855857	8,20	8,9	1947,3
04/02/2011	21h 09m 05.35s	-16° 23' 28.3"	21h 09m 05.42s	-16° 23' 32.1"	0.9857334	8,20	8,9	1947,0
05/02/2011	21h 13m 07.70s	-16° 05' 32.5"	21h 13m 07.77s	-16° 05' 36.4"	0.9858842	8,20	8,9	1946,7
06/02/2011	21h 17m 09.23s	-15° 47' 20.1"	21h 17m 09.30s	-15° 47' 24.0"	0.9860382	8,20	8,9	1946,4
07/02/2011	21h 21m 09.95s	-15° 28' 51.5"	21h 21m 10.02s	-15° 28' 55.5"	0.9861953	8,20	8,9	1946,1
08/02/2011	21h 25m 09.85s	-15° 10' 07.2"	21h 25m 09.92s	-15° 10' 11.2"	0.9863558	8,20	8,9	1945,8
09/02/2011	21h 29m 08.95s	-14° 51' 07.5"	21h 29m 09.02s	-14° 51' 11.5"	0.9865196	8,20	8,9	1945,5
10/02/2011	21h 33m 07.25s	-14° 31' 52.9"	21h 33m 07.32s	-14° 31' 57.0"	0.9866870	8,21	8,9	1945,2
11/02/2011	21h 37m 04.76s	-14° 12' 23.8"	21h 37m 04.83s	-14° 12' 27.9"	0.9868580	8,21	8,9	1944,8
12/02/2011	21h 41m 01.48s	-13° 52' 40.6"	21h 41m 01.55s	-13° 52' 44.8"	0.9870330	8,21	8,9	1944,5
13/02/2011	21h 44m 57.42s	-13° 32' 43.8"	21h 44m 57.49s	-13° 32' 48.0"	0.9872120	8,21	8,9	1944,1
14/02/2011	21h 48m 52.60s	-13° 12' 33.8"	21h 48m 52.67s	-13° 12' 38.1"	0.9873953	8,21	8,9	1943,8
15/02/2011	21h 52m 47.02s	-12° 52' 11.0"	21h 52m 47.09s	-12° 52' 15.3"	0.9875831	8,21	8,9	1943,4
16/02/2011	21h 56m 40.69s	-12° 31' 35.7"	21h 56m 40.76s	-12° 31' 40.1"	0.9877757	8,22	8,9	1943,0
17/02/2011	22h 00m 33.63s	-12° 10' 48.5"	22h 00m 33.70s	-12° 10' 52.9"	0.9879732	8,22	8,9	1942,6
18/02/2011	22h 04m 25.86s	-11° 49' 49.6"	22h 04m 25.93s	-11° 49' 54.0"	0.9881758	8,22	8,9	1942,2
19/02/2011	22h 08m 17.39s	-11° 28' 39.5"	22h 08m 17.46s	-11° 28' 44.0"	0.9883835	8,22	8,9	1941,8
20/02/2011	22h 12m 08.24s	-11° 07' 18.5"	22h 12m 08.31s	-11° 07' 23.0"	0.9885963	8,22	8,9	1941,4
21/02/2011	22h 15m 58.43s	-10° 45' 47.0"	22h 15m 58.50s	-10° 45' 51.6"	0.9888139	8,22	8,8	1941,0
22/02/2011	22h 19m 47.98s	-10° 24' 05.4"	22h 19m 48.05s	-10° 24' 10.0"	0.9890362	8,23	8,8	1940,5
23/02/2011	22h 23m 36.92s	-10° 02' 14.0"	22h 23m 36.99s	-10° 02' 18.7"	0.9892627	8,23	8,8	1940,1
24/02/2011	22h 27m 25.27s	-09° 40' 13.3"	22h 27m 25.34s	-09° 40' 18.0"	0.9894930	8,23	8,8	1939,6
25/02/2011	22h 31m 13.03s	-09° 18' 03.6"	22h 31m 13.10s	-09° 18' 08.4"	0.9897267	8,23	8,8	1939,2
26/02/2011	22h 35m 00.22s	-08° 55' 45.5"	22h 35m 00.29s	-08° 55' 50.3"	0.9899635	8,23	8,8	1938,7
27/02/2011	22h 38m 46.86s	-08° 33' 19.2"	22h 38m 46.93s	-08° 33' 24.1"	0.9902030	8,24	8,8	1938,3
28/02/2011	22h 42m 32.97s	-08° 10' 45.3"	22h 42m 33.04s	-08° 10' 50.2"	0.9904447	8,24	8,8	1937,8
01/03/2011	22h 46m 18.55s	-07° 48' 04.1"	22h 46m 18.62s	-07° 48' 09.1"	0.9906886	8,24	8,8	1937,3
02/03/2011	22h 50m 03.62s	-07° 25' 16.1"	22h 50m 03.69s	-07° 25' 21.1"	0.9909342	8,24	8,8	1936,8
03/03/2011	22h 53m 48.20s	-07° 02' 21.7"	22h 53m 48.27s	-07° 02' 26.8"	0.9911815	8,24	8,8	1936,3
04/03/2011	22h 57m 32.30s	-06° 39' 21.3"	22h 57m 32.37s	-06° 39' 26.4"	0.9914302	8,25	8,8	1935,9
05/03/2011	23h 01m 15.94s	-06° 16' 15.3"	23h 01m 16.01s	-06° 16' 20.5"	0.9916802	8,25	8,8	1935,4
06/03/2011	23h 04m 59.14s	-05° 53' 04.1"	23h 04m 59.21s	-05° 53' 09.3"	0.9919315	8,25	8,8	1934,9
07/03/2011	23h 08m 41.91s	-05° 29' 48.2"	23h 08m 41.98s	-05° 29' 53.4"	0.9921839	8,25	8,8	1934,4
08/03/2011	23h 12m 24.27s	-05° 06' 27.9"	23h 12m 24.34s	-05° 06' 33.1"	0.9924375	8,25	8,8	1933,9
09/03/2011	23h 16m 06.24s	-04° 43' 03.5"	23h 16m 06.31s	-04° 43' 08.9"	0.9926923	8,26	8,8	1933,4
10/03/2011	23h 19m 47.83s	-04° 19' 35.6"	23h 19m 47.90s	-04° 19' 41.0"	0.9929483	8,26	8,8	1932,9
11/03/2011	23h 23m 29.07s	-03° 56' 04.6"	23h 23m 29.14s	-03° 56' 10.0"	0.9932057	8,26	8,8	1932,4
12/03/2011	23h 27m 09.97s	-03° 32' 30.7"	23h 27m 10.04s	-03° 32' 36.1"	0.9934646	8,26	8,8	1931,9
13/03/2011	23h 30m 50.54s	-03° 08' 54.4"	23h 30m 50.62s	-03° 08' 59.9"	0.9937251	8,26	8,8	1931,4
14/03/2011	23h 34m 30.82s	-02° 45' 16.1"	23h 34m 30.90s	-02° 45' 21.6"	0.9939873	8,27	8,8	1930,9
15/03/2011	23h 38m 10.81s	-02° 21' 36.1"	23h 38m 10.89s	-02° 21' 41.7"	0.9942516	8,27	8,8	1930,4
16/03/2011	23h 41m 50.54s	-01° 57' 54.9"	23h 41m 50.62s	-01° 58' 00.5"	0.9945182	8,27	8,8	1929,8
17/03/2011	23h 45m 30.03s	-01° 34' 12.7"	23h 45m 30.11s	-01° 34' 18.4"	0.9947872	8,27	8,8	1929,3
18/03/2011	23h 49m 09.29s	-01° 10' 29.9"	23h 49m 09.37s	-01° 10' 35.7"	0.9950589	8,28	8,8	1928,8
19/03/2011	23h 52m 48.36s	-00° 46' 47.0"	23h 52m 48.44s	-00° 46' 52.7"	0.9953335	8,28	8,8	1928,3
20/03/2011	23h 56m 27.26s	-00° 23' 04.1"	23h 56m 27.34s	-00° 23' 09.9"	0.9956110	8,28	8,8	1927,7
21/03/2011	00h 00m 06.01s	+00° 00' 38.4"	00h 00m 06.09s	+00° 00' 43.6"	0.9958913	8,28	8,8	1927,2
22/03/2011	00h 03m 44.66s	+00° 24' 20.2"	00h 03m 44.74s	+00° 24' 25.4"	0.9961743	8,28	8,8	1926,6
23/03/2011	00h 07m 23.21s	+00° 48' 00.9"	00h 07m 23.29s	+00° 48' 06.1"	0.9964598	8,29	8,8	1926,1
24/03/2011	00h 11m 01.70s	+01° 11' 40.3"	00h 11m 01.78s	+01° 11' 45.7"	0.9967472	8,29	8,8	1925,5
25/03/2011	00h 14m 40.15s	+01° 35' 17.8"	00h 14m 40.23s	+01° 35' 23.2"	0.9970363	8,29	8,8	1925,0
26/03/2011	00h 18m 18.57s	+01° 58' 53.3"	00h 18m 18.66s	+01° 59' 08.7"	0.9973267	8,29	8,8	1924,4
27/03/2011	00h 21m 56.99s	+02° 22' 26.2"	00h 21m 57.08s	+02° 22' 31.6"	0.9976179	8,30	8,8	1923,8
28/03/2011	00h 25m 35.43s	+02° 45' 56.3"	00h 25m 35.51s	+02° 46' 01.7"	0.9979096	8,30	8,8	1923,3
29/03/2011	00h 29m 13.90s	+03° 09' 23.2"	00h 29m 13.98s	+03° 09' 28.6"	0.9982015	8,30	8,8	1922,7
30/03/2011	00h 32m 52.42s	+03° 32' 46.4"	00h 32m 52.50s	+03° 32' 51.8"	0.9984932	8,30	8,8	1922,2
31/03/2011	00h 36m 31.01s	+03° 56' 05.7"	00h 36m 31.09s	+03° 56' 11.1"	0.9987845	8,31	8,8	1921,6



Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
01/04/2011	00h 40m 09.68s	+04° 19' 20.6"	00h 40m 09.77s	+04° 19' 14.3"	0,9990751	8,31	8,8	1921,0
02/04/2011	00h 43m 48.47s	+04° 42' 30.9"	00h 43m 48.55s	+04° 42' 24.5"	0,9993648	8,31	8,8	1920,5
03/04/2011	00h 47m 27.37s	+05° 05' 36.0"	00h 47m 27.46s	+05° 05' 29.6"	0,9996534	8,31	8,8	1919,9
04/04/2011	00h 51m 06.41s	+05° 28' 35.7"	00h 51m 06.50s	+05° 28' 29.3"	0,9999409	8,32	8,7	1919,4
05/04/2011	00h 54m 45.61s	+05° 51' 29.7"	00h 54m 45.70s	+05° 51' 23.2"	1,0002271	8,32	8,7	1918,8
06/04/2011	00h 58m 24.98s	+06° 14' 17.4"	00h 58m 25.07s	+06° 14' 10.9"	1,0005120	8,32	8,7	1918,3
07/04/2011	01h 02m 04.54s	+06° 36' 58.7"	01h 02m 04.63s	+06° 36' 52.2"	1,0007956	8,32	8,7	1917,7
08/04/2011	01h 05m 44.30s	+06° 59' 33.1"	01h 05m 44.39s	+06° 59' 26.6"	1,0010778	8,33	8,7	1917,2
09/04/2011	01h 09m 24.28s	+07° 22' 00.3"	01h 09m 24.37s	+07° 21' 53.7"	1,0013587	8,33	8,7	1916,7
10/04/2011	01h 13m 04.48s	+07° 44' 19.9"	01h 13m 04.58s	+07° 44' 13.3"	1,0016385	8,33	8,7	1916,1
11/04/2011	01h 16m 44.94s	+08° 06' 31.6"	01h 16m 45.03s	+08° 06' 25.0"	1,0019173	8,33	8,7	1915,6
12/04/2011	01h 20m 25.65s	+08° 28' 35.1"	01h 20m 25.74s	+08° 28' 28.4"	1,0021953	8,34	8,7	1915,1
13/04/2011	01h 24m 06.63s	+08° 50' 29.9"	01h 24m 06.73s	+08° 50' 23.2"	1,0024728	8,34	8,7	1914,5
14/04/2011	01h 27m 47.91s	+09° 12' 15.8"	01h 27m 48.00s	+09° 12' 09.0"	1,0027499	8,34	8,7	1914,0
15/04/2011	01h 31m 29.49s	+09° 33' 52.4"	01h 31m 29.58s	+09° 33' 45.5"	1,0030269	8,34	8,7	1913,5
16/04/2011	01h 35m 11.39s	+09° 55' 19.4"	01h 35m 11.49s	+09° 55' 12.5"	1,0033041	8,34	8,7	1912,9
17/04/2011	01h 38m 53.65s	+10° 16' 36.5"	01h 38m 53.75s	+10° 16' 29.6"	1,0035816	8,35	8,7	1912,4
18/04/2011	01h 42m 36.27s	+10° 37' 43.4"	01h 42m 36.37s	+10° 37' 36.5"	1,0038596	8,35	8,7	1911,9
19/04/2011	01h 46m 19.29s	+10° 58' 39.8"	01h 46m 19.39s	+10° 58' 32.9"	1,0041379	8,35	8,7	1911,4
20/04/2011	01h 50m 02.71s	+11° 19' 25.5"	01h 50m 02.81s	+11° 19' 18.6"	1,0044165	8,35	8,7	1910,8
21/04/2011	01h 53m 46.57s	+11° 40' 00.1"	01h 53m 46.67s	+11° 39' 53.1"	1,0046952	8,36	8,7	1910,3
22/04/2011	01h 57m 30.86s	+12° 00' 23.2"	01h 57m 30.96s	+12° 00' 16.2"	1,0049735	8,36	8,7	1909,8
23/04/2011	02h 01m 15.61s	+12° 20' 34.6"	02h 01m 15.71s	+12° 20' 27.6"	1,0052512	8,36	8,7	1909,2
24/04/2011	02h 05m 00.83s	+12° 40' 33.9"	02h 05m 00.93s	+12° 40' 26.9"	1,0055279	8,36	8,7	1908,7
25/04/2011	02h 08m 46.54s	+13° 00' 20.8"	02h 08m 46.64s	+13° 00' 13.7"	1,0058032	8,37	8,7	1908,2
26/04/2011	02h 12m 32.73s	+13° 19' 54.9"	02h 12m 32.83s	+13° 19' 47.7"	1,0060767	8,37	8,7	1907,7
27/04/2011	02h 16m 19.43s	+13° 39' 15.8"	02h 16m 19.53s	+13° 39' 08.7"	1,0063482	8,37	8,7	1907,2
28/04/2011	02h 20m 06.64s	+13° 58' 23.3"	02h 20m 06.74s	+13° 58' 16.2"	1,0066173	8,37	8,7	1906,6
29/04/2011	02h 23m 54.37s	+14° 17' 17.0"	02h 23m 54.47s	+14° 17' 09.9"	1,0068837	8,37	8,7	1906,1
30/04/2011	02h 27m 42.63s	+14° 35' 56.6"	02h 27m 42.73s	+14° 35' 49.4"	1,0071472	8,38	8,7	1905,6
01/05/2011	02h 31m 31.42s	+14° 54' 21.8"	02h 31m 31.53s	+14° 54' 14.6"	1,0074076	8,38	8,7	1905,2
02/05/2011	02h 35m 20.76s	+15° 12' 32.2"	02h 35m 20.87s	+15° 12' 24.9"	1,0076647	8,38	8,7	1904,7
03/05/2011	02h 39m 10.65s	+15° 30' 27.5"	02h 39m 10.75s	+15° 30' 20.2"	1,0079182	8,38	8,7	1904,2
04/05/2011	02h 43m 01.08s	+15° 48' 07.3"	02h 43m 01.19s	+15° 48' 00.0"	1,0081682	8,38	8,7	1903,7
05/05/2011	02h 46m 52.07s	+16° 05' 31.4"	02h 46m 52.18s	+16° 05' 24.1"	1,0084144	8,39	8,7	1903,3
06/05/2011	02h 50m 43.61s	+16° 22' 39.5"	02h 50m 43.72s	+16° 22' 32.1"	1,0086570	8,39	8,7	1902,8
07/05/2011	02h 54m 35.71s	+16° 39' 31.1"	02h 54m 35.81s	+16° 39' 23.8"	1,0088958	8,39	8,7	1902,3
08/05/2011	02h 58m 28.35s	+16° 56' 06.1"	02h 58m 28.46s	+16° 55' 58.7"	1,0091310	8,39	8,7	1901,9
09/05/2011	03h 02m 21.55s	+17° 12' 24.1"	03h 02m 21.66s	+17° 12' 16.7"	1,0093626	8,39	8,7	1901,5
10/05/2011	03h 06m 15.30s	+17° 28' 24.7"	03h 06m 15.40s	+17° 28' 17.3"	1,0095909	8,40	8,7	1901,0
11/05/2011	03h 10m 09.59s	+17° 44' 07.7"	03h 10m 09.70s	+17° 44' 00.3"	1,0098161	8,40	8,7	1900,6
12/05/2011	03h 14m 04.44s	+17° 59' 32.8"	03h 14m 04.54s	+17° 59' 25.4"	1,0100385	8,40	8,7	1900,2
13/05/2011	03h 17m 59.83s	+18° 14' 39.7"	03h 17m 59.93s	+18° 14' 32.3"	1,0102582	8,40	8,7	1899,8
14/05/2011	03h 21m 55.77s	+18° 29' 28.1"	03h 21m 55.88s	+18° 29' 20.7"	1,0104757	8,40	8,7	1899,4
15/05/2011	03h 25m 52.27s	+18° 43' 57.8"	03h 25m 52.37s	+18° 43' 50.3"	1,0106911	8,41	8,7	1899,0
16/05/2011	03h 29m 49.32s	+18° 58' 08.5"	03h 29m 49.43s	+18° 58' 01.0"	1,0109047	8,41	8,7	1898,6
17/05/2011	03h 33m 46.94s	+19° 12' 00.0"	03h 33m 47.05s	+19° 11' 52.5"	1,0111166	8,41	8,7	1898,2
18/05/2011	03h 37m 45.12s	+19° 25' 32.0"	03h 37m 45.22s	+19° 25' 24.4"	1,0113268	8,41	8,7	1897,8
19/05/2011	03h 41m 43.85s	+19° 38' 44.2"	03h 41m 43.96s	+19° 38' 36.6"	1,0115351	8,41	8,6	1897,4
20/05/2011	03h 45m 43.15s	+19° 51' 36.4"	03h 45m 43.26s	+19° 51' 28.9"	1,0117416	8,41	8,6	1897,0
21/05/2011	03h 49m 43.00s	+20° 04' 08.4"	03h 49m 43.11s	+20° 04' 00.8"	1,0119457	8,42	8,6	1896,6
22/05/2011	03h 53m 43.40s	+20° 16' 19.9"	03h 53m 43.50s	+20° 16' 12.3"	1,0121474	8,42	8,6	1896,2
23/05/2011	03h 57m 44.34s	+20° 28' 10.5"	03h 57m 44.44s	+20° 28' 02.9"	1,0123462	8,42	8,6	1895,9
24/05/2011	04h 01m 45.81s	+20° 39' 40.1"	04h 01m 45.92s	+20° 39' 32.5"	1,0125419	8,42	8,6	1895,5
25/05/2011	04h 05m 47.81s	+20° 50' 48.5"	04h 05m 47.92s	+20° 50' 40.9"	1,0127341	8,42	8,6	1895,1
26/05/2011	04h 09m 50.33s	+21° 01' 35.3"	04h 09m 50.44s	+21° 01' 27.7"	1,0129226	8,42	8,6	1894,8
27/05/2011	04h 13m 53.36s	+21° 12' 00.4"	04h 13m 53.47s	+21° 11' 52.7"	1,0131070	8,43	8,6	1894,4
28/05/2011	04h 17m 56.88s	+21° 22' 03.5"	04h 17m 56.99s	+21° 21' 55.8"	1,0132871	8,43	8,6	1894,1
29/05/2011	04h 22m 00.88s	+21° 31' 44.4"	04h 22m 00.99s	+21° 31' 36.7"	1,0134626	8,43	8,6	1893,8
30/05/2011	04h 26m 05.35s	+21° 41' 02.8"	04h 26m 05.46s	+21° 40' 55.2"	1,0136333	8,43	8,6	1893,5
31/05/2011	04h 30m 10.27s	+21° 49' 58.7"	04h 30m 10.38s	+21° 49' 51.0"	1,0137990	8,43	8,6	1893,1
01/06/2011	04h 34m 15.62s	+21° 58' 31.8"	04h 34m 15.73s	+21° 58' 24.1"	1,0139595	8,43	8,6	1892,8
02/06/2011	04h 38m 21.38s	+22° 06' 42.0"	04h 38m 21.49s	+22° 06' 34.3"	1,0141147	8,43	8,6	1892,6
03/06/2011	04h 42m 27.54s	+22° 14' 29.0"	04h 42m 27.64s	+22° 14' 21.3"	1,0142645	8,44	8,6	1892,3
04/06/2011	04h 46m 34.06s	+22° 21' 52.7"	04h 46m 34.16s	+22° 21' 44.9"	1,0144088	8,44	8,6	1892,0
05/06/2011	04h 50m 40.92s	+22° 28' 52.9"	04h 50m 41.03s	+22° 28' 45.1"	1,0145477	8,44	8,6	1891,7
06/06/2011	04h 54m 48.11s	+22° 35' 29.4"	04h 54m 48.21s	+22° 35' 21.7"	1,0146812	8,44	8,6	1891,5
07/06/2011	04h 58m 55.59s	+22° 41' 42.3"	04h 58m 55.70s	+22° 41' 34.5"	1,0148096	8,44	8,6	1891,3
08/06/2011	05h 03m 03.35s	+22° 47' 31.1"	05h 03m 03.46s	+22° 47' 23.4"	1,0149331	8,44	8,6	1891,0
09/06/2011	05h 07m 11.36s	+22° 52' 56.0"	05h 07m 11.47s	+22° 52' 48.2"	1,0150519	8,44	8,6	1890,8
10/06/2011	05h 11m 19.61s	+22° 57' 56.7"	05h 11m 19.71s	+22° 57' 48.9"	1,0151662	8,44	8,6	1890,6
11/06/2011	05h 15m 28.07s	+23° 02' 33.1"	05h 15m 28.17s	+23° 02' 25.3"	1,0152766	8,44	8,6	1890,4
12/06/2011	05h 19m 36.73s	+23° 06' 45.2"	05h 19m 36.83s	+23° 06' 37.4"	1,0153832	8,44	8,6	1890,2
13/06/2011	05h 23m 45.56s	+23° 10' 32.9"	05h 23m 45.66s	+23° 10' 25.1"	1,0154863	8,45	8,6	1890,0
14/06/2011	05h 27m 54.56s	+23° 13' 56.1"	05h 27m 54.66s	+23° 13' 48.3"	1,0155862	8,45	8,6	1889,8
15/06/2011	05h 32m 03.70s	+23° 16' 54.8"	05h 32m 03.80s	+23° 16' 47.0"	1,0156830	8,45	8,6	1889,6
16/06/2011	05h 36m 12.96s	+23° 19' 28.8"	05h 36m 13.06s	+23° 19' 21.0"	1,0157768	8,45	8,6	1889,5
17/06/2011	05h 40m 22.32s	+23° 21' 38.2"	05h 40m 22.42s	+23° 21' 30.4"	1,0158675	8,45	8,6	1889,3
18/06/2011	05h 44m 31.77s	+23° 23' 22.9"	05h 44m 31.87s	+23° 23' 15.1"	1,0159550	8,45	8,6	1889,1
19/06/2011	05h 48m 41.28s	+23° 24' 42.9"	05h 48m 41.37s	+23° 24' 35.1"	1,0160392	8,45	8,6	1889,0
20/06/2011	05h 52m 50.83s	+23° 25' 38.0"	05h 52m 50.92s	+23° 25' 30.2"	1,0161198	8,45	8,6	1888,8
21/06/2011	05h 57m 00.40s	+23° 26' 08.3"	05h 57m 00.49s	+23° 26' 00.6"	1,0161966	8,45	8,6	1888,7
22/06/2011	06h 01m 09.97s	+23° 26' 13.8"	06h 01m 10.06s	+23° 26' 06.1"	1,0162693	8,45	8,6	1888,5
23/06/2011	06h 05m 19.51s	+23° 25' 54.5"	06h 05m 19.61s	+23° 25' 46.7"	1,0163378	8,45	8,6	1888,4
24/06/2011	06h 09m 29.02s	+23° 25' 10.4"	06h 09m 29.12s	+23° 25' 02.6"	1,0164016	8,45	8,6	1888,3
25/06/2011	06h 13m 38.46s	+23° 24' 01.4"	06h 13m 38.55s	+23° 23' 53.6"	1,0164607	8,45	8,6	1888,2
26/06/2011	06h 17m 47.81s	+23° 22' 27.7"	06h 17m 47.90s	+23° 22' 19.9"	1,0165146	8,45	8,6	1888,1
27/06/2011	06h 21m 57.04s	+23° 20' 29.2"	06h 21m 57.14s	+23° 20' 21.5"	1,0165633	8,45	8,6	1888,0
28/06/2011	06h 26m 06.14s	+23° 18' 06.2"	06h 26m 06.23s	+23° 17' 58.4"	1,0166064	8,45	8,6	1887,9
29/06/2011	06h 30m 15.07s	+23° 15' 18.5"	06h 30m 15.16s	+23° 15' 10.7"	1,0166437	8,46	8,6	1887,8
30/06/2011	06h 34m 23.81s	+23° 12' 06.3"	06h 34m 23.91s	+23° 11' 58.6"	1,0166751	8,46	8,6	1887,8
01/07/2011	06h 38m 32.34s	+23° 08' 29.8"	06h 38m 32.4					

Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
05/07/2011	06h 55m 03.71s	+22° 50' 01.9"	06h 55m 03.81s	+22° 49' 54.1"	1,0167400	8,46	8,6	1887,7
06/07/2011	06h 59m 10.75s	+22° 44' 25.1"	06h 59m 10.84s	+22° 44' 17.3"	1,0167349	8,46	8,6	1887,7
07/07/2011	07h 03m 17.41s	+22° 38' 24.6"	07h 03m 17.50s	+22° 38' 16.9"	1,0167242	8,46	8,6	1887,7
08/07/2011	07h 07m 23.69s	+22° 32' 00.6"	07h 07m 23.78s	+22° 31' 52.9"	1,0167083	8,46	8,6	1887,7
09/07/2011	07h 11m 29.56s	+22° 25' 13.3"	07h 11m 29.65s	+22° 25' 05.6"	1,0166875	8,46	8,6	1887,8
10/07/2011	07h 15m 35.00s	+22° 18' 02.8"	07h 15m 35.09s	+22° 17' 55.1"	1,0166622	8,46	8,6	1887,8
11/07/2011	07h 19m 40.01s	+22° 10' 29.4"	07h 19m 40.10s	+22° 10' 21.6"	1,0166327	8,46	8,6	1887,9
12/07/2011	07h 23m 44.57s	+22° 02' 33.1"	07h 23m 44.66s	+22° 02' 25.4"	1,0165993	8,45	8,6	1887,9
13/07/2011	07h 27m 48.66s	+21° 54' 14.2"	07h 27m 48.75s	+21° 54' 06.5"	1,0165623	8,45	8,6	1888,0
14/07/2011	07h 31m 52.28s	+21° 45' 32.8"	07h 31m 52.37s	+21° 45' 25.1"	1,0165218	8,45	8,6	1888,1
15/07/2011	07h 35m 55.41s	+21° 36' 29.2"	07h 35m 55.49s	+21° 36' 21.5"	1,0164780	8,45	8,6	1888,2
16/07/2011	07h 39m 58.03s	+21° 27' 03.5"	07h 39m 58.12s	+21° 26' 55.8"	1,0164308	8,45	8,6	1888,2
17/07/2011	07h 44m 00.15s	+21° 17' 15.9"	07h 44m 00.23s	+21° 17' 08.3"	1,0163802	8,45	8,6	1888,3
18/07/2011	07h 48m 01.75s	+21° 07' 06.7"	07h 48m 01.83s	+21° 06' 59.0"	1,0163261	8,45	8,6	1888,4
19/07/2011	07h 52m 02.82s	+20° 56' 35.9"	07h 52m 02.91s	+20° 56' 28.3"	1,0162685	8,45	8,6	1888,5
20/07/2011	07h 56m 03.36s	+20° 45' 43.9"	07h 56m 03.45s	+20° 45' 36.3"	1,0162071	8,45	8,6	1888,7
21/07/2011	08h 00m 03.36s	+20° 34' 30.9"	08h 00m 03.45s	+20° 34' 23.3"	1,0161418	8,45	8,6	1888,8
22/07/2011	08h 04m 02.82s	+20° 22' 57.0"	08h 04m 02.91s	+20° 22' 49.4"	1,0160724	8,45	8,6	1888,9
23/07/2011	08h 08m 01.73s	+20° 11' 02.6"	08h 08m 01.81s	+20° 10' 55.0"	1,0159986	8,45	8,6	1889,0
24/07/2011	08h 12m 00.07s	+19° 58' 47.8"	08h 12m 00.16s	+19° 58' 40.2"	1,0159203	8,45	8,6	1889,2
25/07/2011	08h 15m 57.86s	+19° 46' 13.0"	08h 15m 57.94s	+19° 46' 05.4"	1,0158372	8,45	8,6	1889,3
26/07/2011	08h 19m 55.07s	+19° 33' 18.4"	08h 19m 55.16s	+19° 33' 10.8"	1,0157491	8,45	8,6	1889,5
27/07/2011	08h 23m 51.71s	+19° 20' 04.2"	08h 23m 51.80s	+19° 19' 56.7"	1,0156558	8,45	8,6	1889,7
28/07/2011	08h 27m 47.76s	+19° 06' 30.9"	08h 27m 47.85s	+19° 06' 23.4"	1,0155571	8,45	8,6	1889,9
29/07/2011	08h 31m 43.23s	+18° 52' 38.5"	08h 31m 43.31s	+18° 52' 31.1"	1,0154528	8,45	8,6	1890,1
30/07/2011	08h 35m 38.09s	+18° 38' 27.6"	08h 35m 38.18s	+18° 38' 20.1"	1,0153427	8,44	8,6	1890,3
31/07/2011	08h 39m 32.35s	+18° 23' 58.3"	08h 39m 32.44s	+18° 23' 50.8"	1,0152267	8,44	8,6	1890,5
01/08/2011	08h 43m 26.00s	+18° 09' 10.9"	08h 43m 26.08s	+18° 09' 03.5"	1,0151049	8,44	8,6	1890,7
02/08/2011	08h 47m 19.02s	+17° 54' 05.8"	08h 47m 19.11s	+17° 53' 58.4"	1,0149772	8,44	8,6	1890,9
03/08/2011	08h 51m 11.43s	+17° 38' 43.2"	08h 51m 11.52s	+17° 38' 35.8"	1,0148438	8,44	8,6	1891,2
04/08/2011	08h 55m 03.22s	+17° 23' 03.5"	08h 55m 03.30s	+17° 22' 56.2"	1,0147051	8,44	8,6	1891,5
05/08/2011	08h 58m 54.38s	+17° 07' 07.0"	08h 58m 54.47s	+17° 06' 59.6"	1,0145612	8,44	8,6	1891,7
06/08/2011	09h 02m 44.93s	+16° 50' 54.0"	09h 02m 45.02s	+16° 50' 46.6"	1,0144127	8,44	8,6	1892,0
07/08/2011	09h 06m 34.86s	+16° 34' 24.7"	09h 06m 34.95s	+16° 34' 17.3"	1,0142598	8,44	8,6	1892,3
08/08/2011	09h 10m 24.19s	+16° 17' 39.5"	09h 10m 24.27s	+16° 17' 32.2"	1,0141030	8,43	8,6	1892,6
09/08/2011	09h 14m 12.90s	+16° 00' 38.7"	09h 14m 12.99s	+16° 00' 31.4"	1,0139426	8,43	8,6	1892,9
10/08/2011	09h 18m 01.02s	+15° 43' 22.5"	09h 18m 01.11s	+15° 43' 15.3"	1,0137789	8,43	8,6	1893,2
11/08/2011	09h 21m 48.55s	+15° 25' 51.4"	09h 21m 48.63s	+15° 25' 44.1"	1,0136122	8,43	8,6	1893,5
12/08/2011	09h 25m 35.49s	+15° 08' 05.5"	09h 25m 35.58s	+15° 07' 58.3"	1,0134427	8,43	8,6	1893,8
13/08/2011	09h 29m 21.86s	+14° 50' 05.2"	09h 29m 21.95s	+14° 49' 58.0"	1,0132706	8,43	8,6	1894,1
14/08/2011	09h 33m 07.67s	+14° 31' 50.7"	09h 33m 07.76s	+14° 31' 43.5"	1,0130960	8,43	8,6	1894,5
15/08/2011	09h 36m 52.93s	+14° 13' 22.3"	09h 36m 53.02s	+14° 13' 15.1"	1,0129188	8,42	8,6	1894,8
16/08/2011	09h 40m 37.66s	+13° 54' 40.3"	09h 40m 37.75s	+13° 54' 33.2"	1,0127391	8,42	8,6	1895,1
17/08/2011	09h 44m 21.86s	+13° 35' 45.0"	09h 44m 21.95s	+13° 35' 37.9"	1,0125568	8,42	8,6	1895,5
18/08/2011	09h 48m 05.56s	+13° 16' 36.8"	09h 48m 05.65s	+13° 16' 29.7"	1,0123718	8,42	8,6	1895,8
19/08/2011	09h 51m 48.77s	+12° 57' 15.8"	09h 51m 48.86s	+12° 57' 08.7"	1,0121841	8,42	8,6	1896,2
20/08/2011	09h 55m 31.49s	+12° 37' 42.4"	09h 55m 31.58s	+12° 37' 35.3"	1,0119934	8,42	8,6	1896,5
21/08/2011	09h 59m 13.75s	+12° 17' 56.9"	09h 59m 13.84s	+12° 17' 49.9"	1,0117997	8,41	8,6	1896,9
22/08/2011	10h 02m 55.56s	+11° 57' 59.6"	10h 02m 55.65s	+11° 57' 52.6"	1,0116028	8,41	8,6	1897,3
23/08/2011	10h 06m 36.93s	+11° 37' 50.9"	10h 06m 37.02s	+11° 37' 43.9"	1,0114025	8,41	8,6	1897,6
24/08/2011	10h 10m 17.87s	+11° 17' 31.0"	10h 10m 17.96s	+11° 17' 24.1"	1,0111985	8,41	8,7	1898,0
25/08/2011	10h 13m 58.40s	+10° 57' 00.3"	10h 13m 58.49s	+10° 56' 53.4"	1,0109907	8,41	8,7	1898,4
26/08/2011	10h 17m 38.53s	+10° 36' 19.2"	10h 17m 38.62s	+10° 36' 12.3"	1,0107789	8,41	8,7	1898,8
27/08/2011	10h 21m 18.27s	+10° 15' 27.9"	10h 21m 18.36s	+10° 15' 21.1"	1,0105628	8,40	8,7	1899,2
28/08/2011	10h 24m 57.62s	+09° 54' 26.9"	10h 24m 57.71s	+09° 54' 20.1"	1,0103423	8,40	8,7	1899,6
29/08/2011	10h 28m 36.61s	+09° 33' 16.4"	10h 28m 36.70s	+09° 33' 09.6"	1,0101173	8,40	8,7	1900,0
30/08/2011	10h 32m 15.23s	+09° 11' 56.8"	10h 32m 15.33s	+09° 11' 50.1"	1,0098877	8,40	8,7	1900,5
31/08/2011	10h 35m 53.51s	+08° 50' 28.5"	10h 35m 53.61s	+08° 50' 21.8"	1,0096537	8,40	8,7	1900,9
01/09/2011	10h 39m 31.46s	+08° 28' 51.8"	10h 39m 31.56s	+08° 28' 45.1"	1,0094154	8,40	8,7	1901,4
02/09/2011	10h 43m 09.10s	+08° 07' 07.0"	10h 43m 09.19s	+08° 07' 00.3"	1,0091731	8,39	8,7	1901,8
03/09/2011	10h 46m 46.42s	+07° 45' 14.4"	10h 46m 46.52s	+07° 45' 07.8"	1,0089271	8,39	8,7	1902,3
04/09/2011	10h 50m 23.46s	+07° 23' 14.5"	10h 50m 23.56s	+07° 23' 08.0"	1,0086779	8,39	8,7	1902,8
05/09/2011	10h 54m 00.23s	+07° 01' 07.5"	10h 54m 00.33s	+07° 01' 01.0"	1,0084259	8,39	8,7	1903,2
06/09/2011	10h 57m 36.74s	+06° 38' 53.8"	10h 57m 36.84s	+06° 38' 47.3"	1,0081715	8,38	8,7	1903,7
07/09/2011	11h 01m 13.02s	+06° 16' 33.6"	11h 01m 13.12s	+06° 16' 27.2"	1,0079150	8,38	8,7	1904,2
08/09/2011	11h 04m 49.07s	+05° 54' 07.4"	11h 04m 49.17s	+05° 54' 01.0"	1,0076569	8,38	8,7	1904,7
09/09/2011	11h 08m 24.92s	+05° 31' 35.4"	11h 08m 25.02s	+05° 31' 29.0"	1,0073972	8,38	8,7	1905,2
10/09/2011	11h 12m 00.60s	+05° 08' 57.8"	11h 12m 00.70s	+05° 08' 51.5"	1,0071364	8,38	8,7	1905,7
11/09/2011	11h 15m 36.12s	+04° 46' 15.1"	11h 15m 36.22s	+04° 46' 08.8"	1,0068746	8,37	8,7	1906,2
12/09/2011	11h 19m 11.51s	+04° 23' 27.4"	11h 19m 11.61s	+04° 23' 21.2"	1,0066120	8,37	8,7	1906,7
13/09/2011	11h 22m 46.78s	+04° 00' 35.2"	11h 22m 46.88s	+04° 00' 29.0"	1,0063486	8,37	8,7	1907,2
14/09/2011	11h 26m 21.97s	+03° 37' 38.7"	11h 26m 22.07s	+03° 37' 32.5"	1,0060845	8,37	8,7	1907,7
15/09/2011	11h 29m 57.09s	+03° 14' 38.2"	11h 29m 57.20s	+03° 14' 32.1"	1,0058197	8,37	8,7	1908,2
16/09/2011	11h 33m 32.18s	+02° 51' 34.1"	11h 33m 32.28s	+02° 51' 28.0"	1,0055543	8,36	8,7	1908,7
17/09/2011	11h 37m 07.25s	+02° 28' 26.6"	11h 37m 07.35s	+02° 28' 20.5"	1,0052880	8,36	8,7	1909,2
18/09/2011	11h 40m 42.32s	+02° 05' 16.0"	11h 40m 42.43s	+02° 05' 10.0"	1,0050210	8,36	8,7	1909,7
19/09/2011	11h 44m 17.42s	+01° 42' 02.8"	11h 44m 17.53s	+01° 41' 56.8"	1,0047530	8,36	8,7	1910,2
20/09/2011	11h 47m 52.57s	+01° 18' 47.2"	11h 47m 52.68s	+01° 18' 41.2"	1,0044840	8,35	8,7	1910,7
21/09/2011	11h 51m 27.79s	+00° 55' 29.5"	11h 51m 27.90s	+00° 55' 23.6"	1,0042137	8,35	8,7	1911,2
22/09/2011	11h 55m 03.10s	+00° 32' 10.2"	11h 55m 03.21s	+00° 32' 04.3"	1,0039420	8,35	8,7	1911,7
23/09/2011	11h 58m 38.52s	+00° 08' 49.5"	11h 58m 38.62s	+00° 08' 43.6"	1,0036687	8,35	8,7	1912,2
24/09/2011	12h 02m 14.06s	-00° 14' 32.2"	12h 02m 14.17s	-00° 14' 38.0"	1,0033936	8,34	8,7	1912,8
25/09/2011	12h 05m 49.75s	-00° 37' 54.5"	12h 05m 49.86s	-00° 38' 00.3"	1,0031164	8,34	8,7	1913,3
26/09/2011	12h 09m 25.60s	-01° 01' 17.1"	12h 09m 25.71s	-01° 01' 22.8"	1,0028369	8,34	8,7	1913,8
27/09/2011	12h 13m 01.63s	-01° 24' 39.5"	12h 13m 01.74s	-01° 24' 45.2"	1,0025551	8,34	8,7	1914,4
28/09/2011	12h 16m 37.86s	-01° 48' 01.5"	12h 16m 37.97s	-01° 48' 07.1"	1,0022708	8,34	8,7	1914,9
29/09/2011	12h 20m 14.31s	-02° 11' 22.6"	12h 20m 14.42s	-02° 11' 28.2"	1,0019842	8,33	8,7	1915,5
30/09/2011	12h 23m 50.98s	-02° 34' 42.5"	12h 23m 51.10s	-02° 34' 48.0"	1,0016954	8,33	8,7	1916,0
01/10/2011	12h 27m 27.91s	-02° 58' 00.8"	12h 27m 28.02s	-02° 58' 06.3"	1,0014048	8,33	8,7	1916,6
02/10/2011	12h 31m 05.10s	-03° 21' 17.2"	12h 31m 05.22s	-03° 21' 22.7"	1,0011127	8,33	8,7	1917,1
03/10/2011	12h 34m 42.57s	-03° 44' 31.3"	12h 34m 42.69s	-03° 44' 36.7"	1,0008195	8,32	8,7	1917,7
04/10/2011	12h 38m 20.34s	-04° 07' 42.7"	12h 38m 20.4					

Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
08/10/2011	12h 52m 54.80s	-05° 39' 54.4"	12h 52m 54.91s	-05° 39' 59.6"	0.9993513	8,31	8,8	1920,5
09/10/2011	12h 56m 34.36s	-06° 02' 47.1"	12h 56m 34.48s	-06° 02' 52.3"	0.9990596	8,31	8,8	1921,1
10/10/2011	13h 00m 14.35s	-06° 25' 35.1"	13h 00m 14.47s	-06° 25' 40.2"	0.9987691	8,31	8,8	1921,6
11/10/2011	13h 03m 54.78s	-06° 48' 17.9"	13h 03m 54.90s	-06° 48' 22.9"	0.9984800	8,30	8,8	1922,2
12/10/2011	13h 07m 35.69s	-07° 10' 55.3"	13h 07m 35.81s	-07° 11' 00.3"	0.9981925	8,30	8,8	1922,7
13/10/2011	13h 11m 17.09s	-07° 33' 26.8"	13h 11m 17.21s	-07° 33' 31.8"	0.9979067	8,30	8,8	1923,3
14/10/2011	13h 14m 59.01s	-07° 55' 52.2"	13h 14m 59.13s	-07° 55' 57.1"	0.9976226	8,30	8,8	1923,8
15/10/2011	13h 18m 41.46s	-08° 18' 11.0"	13h 18m 41.59s	-08° 18' 15.9"	0.9973403	8,29	8,8	1924,4
16/10/2011	13h 22m 24.48s	-08° 40' 23.0"	13h 22m 24.60s	-08° 40' 27.8"	0.9970598	8,29	8,8	1924,9
17/10/2011	13h 26m 08.07s	-09° 02' 27.7"	13h 26m 08.19s	-09° 02' 32.5"	0.9967810	8,29	8,8	1925,5
18/10/2011	13h 29m 52.26s	-09° 24' 24.7"	13h 29m 52.38s	-09° 24' 29.5"	0.9965039	8,29	8,8	1926,0
19/10/2011	13h 33m 37.07s	-09° 46' 13.8"	13h 33m 37.19s	-09° 46' 18.5"	0.9962283	8,29	8,8	1926,5
20/10/2011	13h 37m 22.51s	-10° 07' 54.4"	13h 37m 22.63s	-10° 07' 59.0"	0.9959540	8,28	8,8	1927,1
21/10/2011	13h 41m 08.60s	-10° 29' 26.1"	13h 41m 08.73s	-10° 29' 30.8"	0.9956810	8,28	8,8	1927,6
22/10/2011	13h 44m 55.36s	-10° 50' 48.7"	13h 44m 55.49s	-10° 50' 53.3"	0.9954090	8,28	8,8	1928,1
23/10/2011	13h 48m 42.80s	-11° 12' 01.6"	13h 48m 42.93s	-11° 12' 06.2"	0.9951377	8,28	8,8	1928,6
24/10/2011	13h 52m 30.94s	-11° 33' 04.5"	13h 52m 31.06s	-11° 33' 09.0"	0.9948669	8,27	8,8	1929,2
25/10/2011	13h 56m 19.79s	-11° 53' 57.0"	13h 56m 19.91s	-11° 54' 01.4"	0.9945964	8,27	8,8	1929,7
26/10/2011	14h 00m 09.35s	-12° 14' 38.5"	14h 00m 09.48s	-12° 14' 42.9"	0.9943260	8,27	8,8	1930,2
27/10/2011	14h 03m 59.66s	-12° 35' 08.8"	14h 03m 59.79s	-12° 35' 13.2"	0.9940556	8,27	8,8	1930,7
28/10/2011	14h 07m 50.70s	-12° 55' 27.4"	14h 07m 50.83s	-12° 55' 31.8"	0.9937854	8,27	8,8	1931,3
29/10/2011	14h 11m 42.49s	-13° 15' 34.0"	14h 11m 42.62s	-13° 15' 38.2"	0.9935154	8,26	8,8	1931,8
30/10/2011	14h 15m 35.03s	-13° 35' 28.0"	14h 15m 35.16s	-13° 35' 32.2"	0.9932460	8,26	8,8	1932,3
31/10/2011	14h 19m 28.33s	-13° 55' 09.0"	14h 19m 28.46s	-13° 55' 13.2"	0.9929774	8,26	8,8	1932,8
01/11/2011	14h 23m 22.40s	-14° 14' 36.7"	14h 23m 22.53s	-14° 14' 40.9"	0.9927101	8,26	8,8	1933,4
02/11/2011	14h 27m 17.23s	-14° 33' 50.6"	14h 27m 17.36s	-14° 33' 54.7"	0.9924445	8,25	8,8	1933,9
03/11/2011	14h 31m 12.85s	-14° 52' 50.4"	14h 31m 12.98s	-14° 52' 54.4"	0.9921809	8,25	8,8	1934,4
04/11/2011	14h 35m 09.25s	-15° 11' 35.5"	14h 35m 09.38s	-15° 11' 39.6"	0.9919196	8,25	8,8	1934,9
05/11/2011	14h 39m 06.45s	-15° 30' 05.7"	14h 39m 06.58s	-15° 30' 09.7"	0.9916611	8,25	8,8	1935,4
06/11/2011	14h 43m 04.46s	-15° 48' 20.6"	14h 43m 04.59s	-15° 48' 24.5"	0.9914057	8,25	8,8	1935,9
07/11/2011	14h 47m 03.28s	-16° 06' 19.6"	14h 47m 03.41s	-16° 06' 23.6"	0.9911535	8,24	8,8	1936,4
08/11/2011	14h 51m 02.93s	-16° 24' 02.6"	14h 51m 03.06s	-16° 24' 06.5"	0.9909048	8,24	8,8	1936,9
09/11/2011	14h 55m 03.42s	-16° 41' 29.0"	14h 55m 03.55s	-16° 41' 32.8"	0.9906599	8,24	8,8	1937,4
10/11/2011	14h 59m 04.74s	-16° 58' 38.5"	14h 59m 04.87s	-16° 58' 42.3"	0.9904189	8,24	8,8	1937,8
11/11/2011	15h 03m 06.91s	-17° 15' 30.7"	15h 03m 07.04s	-17° 15' 34.5"	0.9901819	8,24	8,8	1938,3
12/11/2011	15h 07m 09.93s	-17° 32' 05.2"	15h 07m 10.06s	-17° 32' 08.9"	0.9899491	8,23	8,8	1938,8
13/11/2011	15h 11m 13.80s	-17° 48' 21.7"	15h 11m 13.93s	-17° 48' 25.3"	0.9897205	8,23	8,8	1939,2
14/11/2011	15h 15m 18.53s	-18° 04' 19.6"	15h 15m 18.66s	-18° 04' 23.3"	0.9894961	8,23	8,8	1939,6
15/11/2011	15h 19m 24.12s	-18° 19' 58.8"	15h 19m 24.25s	-18° 20' 02.4"	0.9892760	8,23	8,8	1940,1
16/11/2011	15h 23m 30.57s	-18° 35' 18.6"	15h 23m 30.70s	-18° 35' 22.2"	0.9890599	8,23	8,8	1940,5
17/11/2011	15h 27m 37.88s	-18° 50' 18.9"	15h 27m 38.01s	-18° 50' 22.4"	0.9888478	8,22	8,8	1940,9
18/11/2011	15h 31m 46.04s	-19° 04' 59.1"	15h 31m 46.17s	-19° 05' 02.6"	0.9886395	8,22	8,8	1941,3
19/11/2011	15h 35m 55.05s	-19° 19' 18.9"	15h 35m 55.18s	-19° 19' 22.3"	0.9884349	8,22	8,9	1941,7
20/11/2011	15h 40m 04.91s	-19° 33' 17.9"	15h 40m 05.04s	-19° 33' 21.3"	0.9882336	8,22	8,9	1942,1
21/11/2011	15h 44m 15.60s	-19° 46' 55.6"	15h 44m 15.73s	-19° 46' 59.0"	0.9880354	8,22	8,9	1942,5
22/11/2011	15h 48m 27.13s	-20° 00' 11.9"	15h 48m 27.26s	-20° 00' 15.2"	0.9878400	8,22	8,9	1942,9
23/11/2011	15h 52m 39.47s	-20° 13' 06.2"	15h 52m 39.60s	-20° 13' 09.5"	0.9876471	8,21	8,9	1943,3
24/11/2011	15h 56m 52.62s	-20° 25' 38.2"	15h 56m 52.75s	-20° 25' 41.5"	0.9874567	8,21	8,9	1943,6
25/11/2011	16h 01m 06.56s	-20° 37' 47.5"	16h 01m 06.69s	-20° 37' 50.8"	0.9872685	8,21	8,9	1944,0
26/11/2011	16h 05m 21.27s	-20° 49' 34.0"	16h 05m 21.40s	-20° 49' 37.2"	0.9870825	8,21	8,9	1944,4
27/11/2011	16h 09m 36.73s	-21° 00' 57.1"	16h 09m 36.85s	-21° 01' 00.3"	0.9868990	8,21	8,9	1944,7
28/11/2011	16h 13m 52.90s	-21° 11' 56.5"	16h 13m 53.03s	-21° 11' 59.7"	0.9867180	8,21	8,9	1945,1
29/11/2011	16h 18m 09.78s	-21° 22' 32.0"	16h 18m 09.90s	-21° 22' 35.2"	0.9865398	8,20	8,9	1945,5
30/11/2011	16h 22m 27.33s	-21° 32' 43.1"	16h 22m 27.45s	-21° 32' 46.3"	0.9863648	8,20	8,9	1945,8
01/12/2011	16h 26m 45.54s	-21° 42' 29.7"	16h 26m 45.66s	-21° 42' 32.9"	0.9861932	8,20	8,9	1946,1
02/12/2011	16h 31m 04.38s	-21° 51' 51.4"	16h 31m 04.51s	-21° 51' 54.5"	0.9860256	8,20	8,9	1946,5
03/12/2011	16h 35m 23.84s	-22° 00' 47.9"	16h 35m 23.97s	-22° 00' 51.0"	0.9858620	8,20	8,9	1946,8
04/12/2011	16h 39m 43.90s	-22° 09' 19.0"	16h 39m 44.02s	-22° 09' 22.0"	0.9857029	8,20	8,9	1947,1
05/12/2011	16h 44m 04.53s	-22° 17' 24.4"	16h 44m 04.65s	-22° 17' 27.4"	0.9855485	8,20	8,9	1947,4
06/12/2011	16h 48m 25.71s	-22° 25' 03.8"	16h 48m 25.83s	-22° 25' 06.8"	0.9853990	8,20	8,9	1947,7
07/12/2011	16h 52m 47.42s	-22° 32' 17.1"	16h 52m 47.54s	-22° 32' 20.1"	0.9852548	8,19	8,9	1948,0
08/12/2011	16h 57m 09.64s	-22° 39' 04.0"	16h 57m 09.76s	-22° 39' 07.0"	0.9851160	8,19	8,9	1948,3
09/12/2011	17h 01m 32.34s	-22° 45' 24.3"	17h 01m 32.46s	-22° 45' 27.3"	0.9849828	8,19	8,9	1948,5
10/12/2011	17h 05m 55.50s	-22° 51' 17.8"	17h 05m 55.62s	-22° 51' 20.8"	0.9848554	8,19	8,9	1948,8
11/12/2011	17h 10m 19.08s	-22° 56' 44.3"	17h 10m 19.20s	-22° 56' 47.3"	0.9847338	8,19	8,9	1949,0
12/12/2011	17h 14m 43.08s	-23° 01' 43.7"	17h 14m 43.20s	-23° 01' 46.6"	0.9846181	8,19	8,9	1949,2
13/12/2011	17h 19m 07.45s	-23° 06' 15.7"	17h 19m 07.56s	-23° 06' 18.6"	0.9845084	8,19	8,9	1949,5
14/12/2011	17h 23m 32.17s	-23° 10' 20.3"	17h 23m 32.28s	-23° 10' 23.2"	0.9844046	8,19	8,9	1949,7
15/12/2011	17h 27m 57.21s	-23° 13' 57.2"	17h 27m 57.32s	-23° 14' 00.1"	0.9843066	8,19	8,9	1949,9
16/12/2011	17h 32m 22.54s	-23° 17' 06.3"	17h 32m 22.65s	-23° 17' 09.2"	0.9842143	8,19	8,9	1950,0
17/12/2011	17h 36m 48.13s	-23° 19' 47.5"	17h 36m 48.25s	-23° 19' 50.4"	0.9841274	8,18	8,9	1950,2
18/12/2011	17h 41m 13.96s	-23° 22' 00.7"	17h 41m 14.07s	-23° 22' 03.6"	0.9840456	8,18	8,9	1950,4
19/12/2011	17h 45m 39.99s	-23° 23' 45.8"	17h 45m 40.10s	-23° 23' 48.6"	0.9839688	8,18	8,9	1950,5
20/12/2011	17h 50m 06.19s	-23° 25' 02.7"	17h 50m 06.30s	-23° 25' 05.5"	0.9838965	8,18	8,9	1950,7
21/12/2011	17h 54m 32.53s	-23° 25' 51.4"	17h 54m 32.64s	-23° 25' 54.2"	0.9838285	8,18	8,9	1950,8
22/12/2011	17h 58m 58.96s	-23° 26' 11.8"	17h 58m 59.07s	-23° 26' 14.6"	0.9837644	8,18	8,9	1950,9
23/12/2011	18h 03m 25.46s	-23° 26' 03.9"	18h 03m 25.57s	-23° 26' 06.8"	0.9837041	8,18	8,9	1951,1
24/12/2011	18h 07m 51.98s	-23° 25' 27.8"	18h 07m 52.09s	-23° 25' 30.7"	0.9836474	8,18	8,9	1951,2
25/12/2011	18h 12m 18.48s	-23° 24' 23.5"	18h 12m 18.58s	-23° 24' 26.3"	0.9835941	8,18	8,9	1951,3
26/12/2011	18h 16m 44.91s	-23° 22' 50.9"	18h 16m 45.02s	-23° 22' 53.8"	0.9835444	8,18	8,9	1951,4
27/12/2011	18h 21m 11.24s	-23° 20' 50.2"	18h 21m 11.35s	-23° 20' 53.0"	0.9834983	8,18	8,9	1951,5
28/12/2011	18h 25m 37.43s	-23° 18' 21.3"	18h 25m 37.53s	-23° 18' 24.2"	0.9834560	8,18	8,9	1951,6
29/12/2011	18h 30m 03.44s	-23° 15' 24.5"	18h 30m 03.54s	-23° 15' 27.3"	0.9834178	8,18	8,9	1951,6
30/12/2011	18h 34m 29.23s	-23° 11' 59.6"	18h 34m 29.33s	-23° 12' 02.5"	0.9833838	8,18	8,9	1951,7
31/12/2011	18h 38m 54.78s	-23° 08' 06.9"	18h 38m 54.88s	-23° 08' 09.8"	0.9833544	8,18	8,9	1951,8

Date = data nel formato gg/mm/aaaa

A.R. e DEC. = coordinate apparenti geocentriche e topocentriche per Roma (42°N, 12°E)

Distance = distanza in U.A.

Light = distanza in minuti-luce

Parall. = parallasse in "

Diam. = diametro in "

Date = date in the format dd/mm/yyyy  
A.R. e DEC. = geocentric and topocentric apparent coordinates for Rome (42°N, 12°E)  
Distance = distance in A.U.  
Light = distance in minutes  
Parall. = parallax in "  
Diam. = diameter in "

## TRANSITI DEL MERIDIANO CENTRALE TRANSITS OF THE SOLAR CENTRAL MERIDIAN

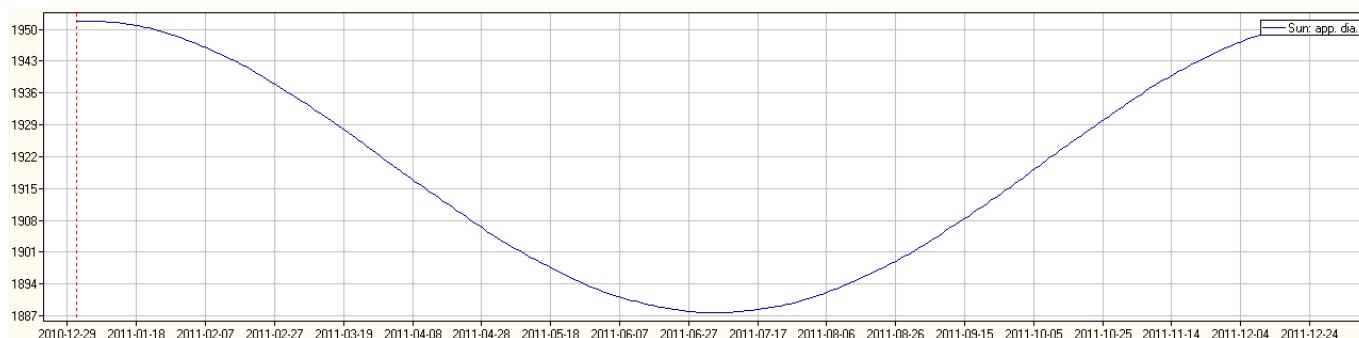
20/01/2011	09:14:50	05/06/2011	19:23:49	19/10/2011	23:45:17
16/02/2011	17:26:55	03/07/2011	00:08:28	16/11/2011	06:59:34
16/03/2011	01:18:58	30/07/2011	05:05:45	13/12/2011	14:34:22
12/04/2011	08:20:24	26/08/2011	10:39:14		
09/05/2011	14:17:57	22/09/2011	16:55:03		

## SOLSTIZI ED EQUINOZI - SOLSTICES AND EQUINOXES

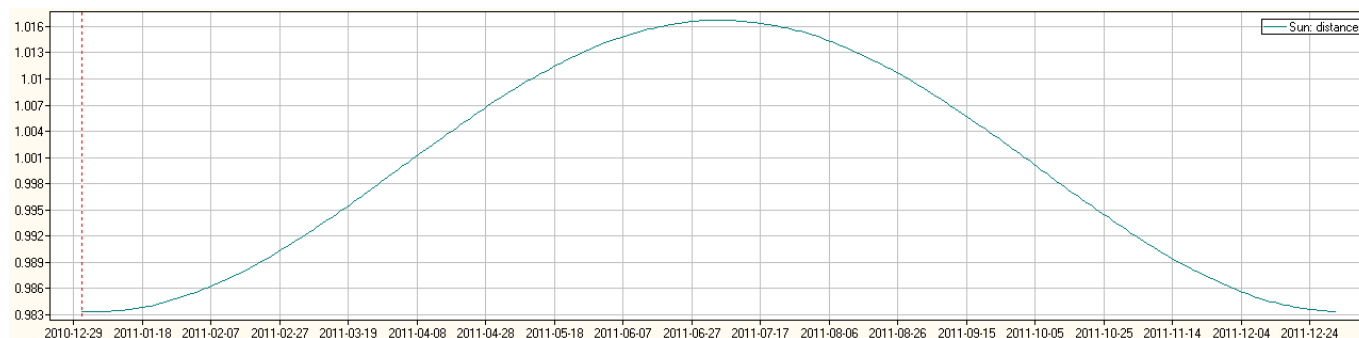
Equinozio di primavera- Spring equinox	20/03	23.20.48
Solstizio d'estate- Summer solstice	21/06	17.16.35
Equinozio d'autunno- Autumn equinox	23/09	09.04.43
Solstizio d'inverno- Winter solstice	22/12	05.30.07

## PERIGEO ED APOGEO - PERIGEE AND APOGEE

Perigeo - Perigee	03/01	18.32.23	0.98334 U.A.
Apogeo - Apogee	04/07	14.54.13	1.01674 U.A.



Diametro del Sole in " nel corso dell'anno - Diameter of the Sun in " during the year



Distanza del Sole in U.A. nel corso dell'anno - Distance of the Sun in A.U. during the year

# EFFEMERIDI FISICHE DEL SOLE

## PHYSICAL EPHEMERIDES OF THE SUN

Date year mth d	Po o	Bo o	LoCarring. o Rotat.	Date year mth d	Po o	Bo o	LoCarring. o Rotat.	Date year mth d	Po o	Bo o	LoCarring. o Rotat.
2011 01 1	2.22	-2.98	255.42 2105	2011 04 12	-26.19	-5.87	4.74 2108	2011 07 22	6.51	4.94	108.79 2112
2011 01 2	1.74	-3.10	242.25 2105	2011 04 13	-26.15	-5.80	351.54 2109	2011 07 23	6.94	5.02	95.56 2112
2011 01 3	1.25	-3.21	229.08 2105	2011 04 14	-26.11	-5.72	338.34 2109	2011 07 24	7.36	5.11	82.33 2112
2011 01 4	0.77	-3.33	215.92 2105	2011 04 15	-26.06	-5.65	325.13 2109	2011 07 25	7.78	5.20	69.10 2112
2011 01 5	0.28	-3.44	202.75 2105	2011 04 16	-25.99	-5.57	311.93 2109	2011 07 26	8.20	5.28	55.87 2112
2011 01 6	-0.20	-3.55	189.58 2105	2011 04 17	-25.93	-5.49	298.72 2109	2011 07 27	8.62	5.36	42.65 2112
2011 01 7	-0.69	-3.66	176.41 2105	2011 04 18	-25.85	-5.41	285.52 2109	2011 07 28	9.03	5.44	29.42 2112
2011 01 8	-1.17	-3.78	163.24 2105	2011 04 19	-25.77	-5.32	272.31 2109	2011 07 29	9.44	5.52	16.19 2112
2011 01 9	-1.65	-3.88	150.07 2105	2011 04 20	-25.68	-5.24	259.10 2109	2011 07 30	9.85	5.60	2.96 2112
2011 01 10	-2.13	-3.99	136.90 2105	2011 04 21	-25.58	-5.15	245.90 2109	2011 07 31	10.26	5.68	349.74 2113
2011 01 11	-2.61	-4.10	123.73 2105	2011 04 22	-25.48	-5.06	232.69 2109	2011 08 1	10.66	5.75	336.51 2113
2011 01 12	-3.08	-4.21	110.57 2105	2011 04 23	-25.36	-4.98	219.48 2109	2011 08 2	11.05	5.82	323.29 2113
2011 01 13	-3.56	-4.31	97.40 2105	2011 04 24	-25.24	-4.88	206.27 2109	2011 08 3	11.45	5.89	310.06 2113
2011 01 14	-4.03	-4.41	84.23 2105	2011 04 25	-25.12	-4.79	193.06 2109	2011 08 4	11.84	5.96	296.84 2113
2011 01 15	-4.50	-4.51	71.06 2105	2011 04 26	-24.98	-4.70	179.85 2109	2011 08 5	12.22	6.03	283.61 2113
2011 01 16	-4.97	-4.61	57.89 2105	2011 04 27	-24.84	-4.61	166.63 2109	2011 08 6	12.61	6.10	270.39 2113
2011 01 17	-5.44	-4.71	44.73 2105	2011 04 28	-24.69	-4.51	153.42 2109	2011 08 7	12.98	6.16	257.17 2113
2011 01 18	-5.90	-4.81	31.56 2105	2011 04 29	-24.54	-4.41	140.21 2109	2011 08 8	13.36	6.23	243.94 2113
2011 01 19	-6.36	-4.91	18.39 2105	2011 04 30	-24.37	-4.31	126.99 2109	2011 08 9	13.73	6.29	230.72 2113
2011 01 20	-6.82	-5.00	5.22 2105	2011 05 1	-24.20	-4.22	113.78 2109	2011 08 10	14.09	6.35	217.50 2113
2011 01 21	-7.27	-5.09	352.06 2106	2011 05 2	-24.02	-4.11	100.56 2109	2011 08 11	14.46	6.41	204.28 2113
2011 01 22	-7.72	-5.18	338.89 2106	2011 05 3	-23.84	-4.01	87.34 2109	2011 08 12	14.81	6.46	191.06 2113
2011 01 23	-8.17	-5.27	325.72 2106	2011 05 4	-23.65	-3.91	74.13 2109	2011 08 13	15.17	6.52	177.84 2113
2011 01 24	-8.61	-5.36	312.56 2106	2011 05 5	-23.45	-3.81	60.91 2109	2011 08 14	15.51	6.57	164.62 2113
2011 01 25	-9.05	-5.45	299.39 2106	2011 05 6	-23.24	-3.70	47.69 2109	2011 08 15	15.86	6.62	151.40 2113
2011 01 26	-9.49	-5.53	286.22 2106	2011 05 7	-23.03	-3.60	34.47 2109	2011 08 16	16.20	6.67	138.18 2113
2011 01 27	-9.92	-5.61	273.06 2106	2011 05 8	-22.81	-3.49	21.25 2109	2011 08 17	16.53	6.71	124.96 2113
2011 01 28	-10.35	-5.69	259.89 2106	2011 05 9	-22.58	-3.38	8.03 2109	2011 08 18	16.86	6.76	111.74 2113
2011 01 29	-10.77	-5.77	246.72 2106	2011 05 10	-22.34	-3.27	354.81 2110	2011 08 19	17.19	6.80	98.53 2113
2011 01 30	-11.19	-5.85	233.56 2106	2011 05 11	-22.10	-3.16	341.59 2110	2011 08 20	17.51	6.84	85.31 2113
2011 01 31	-11.61	-5.92	220.39 2106	2011 05 12	-21.86	-3.05	328.36 2110	2011 08 21	17.82	6.88	72.09 2113
2011 02 1	-12.02	-6.00	207.23 2106	2011 05 13	-21.60	-2.94	315.14 2110	2011 08 22	18.13	6.92	58.88 2113
2011 02 2	-12.43	-6.07	194.06 2106	2011 05 14	-21.34	-2.83	301.91 2110	2011 08 23	18.44	6.96	45.66 2113
2011 02 3	-12.83	-6.14	180.89 2106	2011 05 15	-21.07	-2.72	288.69 2110	2011 08 24	18.74	6.99	32.45 2113
2011 02 4	-13.23	-6.21	167.73 2106	2011 05 16	-20.80	-2.60	275.46 2110	2011 08 25	19.04	7.02	19.24 2113
2011 02 5	-13.62	-6.27	154.56 2106	2011 05 17	-20.51	-2.49	262.24 2110	2011 08 26	19.33	7.05	6.02 2113
2011 02 6	-14.01	-6.33	141.40 2106	2011 05 18	-20.23	-2.38	249.01 2110	2011 08 27	19.61	7.08	352.81 2114
2011 02 7	-14.39	-6.40	128.23 2106	2011 05 19	-19.93	-2.26	235.78 2110	2011 08 28	19.89	7.10	339.60 2114
2011 02 8	-14.77	-6.46	115.06 2106	2011 05 20	-19.63	-2.14	222.55 2110	2011 08 29	20.17	7.13	326.39 2114
2011 02 9	-15.15	-6.51	101.90 2106	2011 05 21	-19.33	-2.03	209.33 2110	2011 08 30	20.44	7.15	313.18 2114
2011 02 10	-15.51	-6.57	88.73 2106	2011 05 22	-19.01	-1.91	196.10 2110	2011 08 31	20.70	7.17	299.97 2114
2011 02 11	-15.88	-6.62	75.56 2106	2011 05 23	-18.70	-1.79	182.87 2110	2011 09 1	20.96	7.19	286.76 2114
2011 02 12	-16.23	-6.67	62.40 2106	2011 05 24	-18.37	-1.68	169.64 2110	2011 09 2	21.21	7.20	273.55 2114
2011 02 13	-16.58	-6.72	49.23 2106	2011 05 25	-18.04	-1.56	156.41 2110	2011 09 3	21.46	7.22	260.34 2114
2011 02 14	-16.93	-6.77	36.06 2106	2011 05 26	-17.70	-1.44	143.18 2110	2011 09 4	21.70	7.23	247.13 2114
2011 02 15	-17.27	-6.81	22.89 2106	2011 05 27	-17.36	-1.32	129.95 2110	2011 09 5	21.94	7.24	233.92 2114
2011 02 16	-17.61	-6.86	9.72 2106	2011 05 28	-17.01	-1.20	116.71 2110	2011 09 6	22.17	7.24	220.72 2114
2011 02 17	-17.94	-6.90	356.56 2107	2011 05 29	-16.66	-1.08	103.48 2110	2011 09 7	22.39	7.25	207.51 2114
2011 02 18	-18.26	-6.94	343.39 2107	2011 05 30	-16.30	-0.96	90.25 2110	2011 09 8	22.61	7.25	194.30 2114
2011 02 19	-18.58	-6.97	330.22 2107	2011 05 31	-15.94	-0.84	77.02 2110	2011 09 9	22.82	7.25	181.10 2114
2011 02 20	-18.89	-7.01	317.05 2107	2011 06 1	-15.57	-0.72	63.78 2110	2011 09 10	23.03	7.25	167.89 2114
2011 02 21	-19.20	-7.04	303.88 2107	2011 06 2	-15.20	-0.60	50.55 2110	2011 09 11	23.23	7.25	154.69 2114
2011 02 22	-19.50	-7.07	290.71 2107	2011 06 3	-14.82	-0.48	37.32 2110	2011 09 12	23.43	7.24	141.48 2114
2011 02 23	-19.79	-7.10	277.54 2107	2011 06 4	-14.44	-0.36	24.08 2110	2011 09 13	23.62	7.23	128.28 2114
2011 02 24	-20.08	-7.12	264.37 2107	2011 06 5	-14.05	-0.24	10.85 2110	2011 09 14	23.80	7.22	115.07 2114
2011 02 25	-20.36	-7.14	251.20 2107	2011 06 6	-13.66	-0.12	357.62 2111	2011 09 15	23.98	7.21	101.87 2114
2011 02 26	-20.64	-7.16	238.03 2107	2011 06 7	-13.26	0.00	344.38 2111	2011 09 16	24.15	7.20	88.67 2114
2011 02 27	-20.91	-7.18	224.86 2107	2011 06 8	-12.86	0.13	331.15 2111	2011 09 17	24.31	7.18	75.47 2114
2011 02 28	-21.17	-7.20	211.69 2107	2011 06 9	-12.46	0.25	317.91 2111	2011 09 18	24.47	7.17	62.26 2114
2011 03 1	-21.43	-7.21	198.51 2107	2011 06 10	-12.05	0.37	304.67 2111	2011 09 19	24.62	7.15	49.06 2114
2011 03 2	-21.68	-7.23	185.34 2107	2011 06 11	-11.64	0.49	291.44 2111	2011 09 20	24.77	7.12	35.86 2114
2011 03 3	-21.92	-7.24	172.17 2107	2011 06 12	-11.22	0.61	278.20 2111	2011 09 21	24.91	7.10	22.66 2114
2011 03 4	-22.16	-7.24	159.00 2107	2011 06 13	-10.80	0.73	264.97 2111	2011 09 22	25.04	7.07	9.46 2114
2011 03 5	-22.40	-7.25	145.82 2107	2011 06 14	-10.38	0.85	251.73 2111	2011 09 23	25.17	7.04	356.26 2115
2011 03 6	-22.62	-7.25	132.65 2107	2011 06 15	-9.96	0.97	238.49 2111	2011 09 24	25.29	7.01	343.06 2115
2011 03 7	-22.84	-7.25	119.47 2107	2011 06 16	-9.53	1.09	225.26 2111	2011 09 25	25.40	6.98	329.87 2115
2011 03 8	-23.05	-7.25	106.30 2107	2011 06 17	-9.10	1.21	212.02 2111	2011 09 26	25.51	6.95	316.67 2115
2011 03 9	-23.26	-7.25	93.12 2107	2011 06 18	-8.67	1.32	198.78 2111	2011 09 27	25.61	6.91	303.47 2115
2011 03 10	-23.46	-7.24	79.95 2107	2011 06 19	-8.23	1.44	185.54 2111	2011 09 28	25.70	6.87	290.27 2115
2011 03 11	-23.65	-7.23	66.77 2107	2011 06 20	-7.79	1.56	172.31 2111	2011 09 29	25.79	6.83	277.08 2115
2011 03 12	-23.84	-7.22	53.59 2107	2011 06 21	-7.35	1.68	159.07 2111	2011 09 30	25.86	6.79	263.88 2115
2011 03 13	-24.02	-7.21	40.41 2107	2011 06 22	-6.91	1.79	145.83 2111	2011 10 1	25.94	6.74	250.69 2115
2011 03 14	-24.19	-7.19	27.23 2107	2011 06 23	-6.47	1.91	132.60 2111	2011 10 2	26.00	6.69	237.49 2115
2011 03 15	-24.36	-7.18	14.05 2107	2011 06 24	-6.02	2.03	119.36 2111	2011 10 3	26.06	6.65	224.30 2115
2011 03 16	-24.52	-7.16	0.87 2107	2011 06 25	-5.57	2.14	106.12 2111	2011 10 4	26.11	6.59	211.10 2115
2011 03 17	-24.67	-7.14	347.69 2108	2011 06 26	-5.12	2.26	92.89 2111	2011 10 5	26.16	6.54	197.91 2115
2011 03 18	-24.82	-7.11	334.51 2108	2011 06 27	-4.67	2.37	79.65 2111	2011 10 6	26.20	6.49	184.71 2115
2011 03 19	-24.96	-7.09	321.33 2108	2011 06 28	-4.22	2.48	66.41 2111	2011 10 7	26.23	6.43	171.52 2115
2011 03 20	-25.09	-7.06	308.15 2108	2011 06 29	-3.77	2.60	53.18 2111	2011 10 8	26.25	6.37	158.32 2115
2011 03 21	-25.22	-7.03	294.96 2108	2011 06 30	-3.32	2.71	39.94 2111	2011 10 9	26.27	6.31	145.13 2115
2011 03 22	-25.34	-7.00	281								



Date year mth d	Po o	Bo o	LoCarring. o Rotat.	Date year mth d	Po o	Bo o	LoCarring. o Rotat.	Date year mth d	Po o	Bo o	LoCarring. o Rotat.
2011 10 31	24.72	4.53	214.96 2116	2011 11 20	20.06	2.31	311.27 2117	2011 12 10	12.58	-0.21	47.69 2117
2011 11 1	24.56	4.43	201.77 2116	2011 11 21	19.74	2.19	298.09 2117	2011 12 11	12.15	-0.34	34.51 2117
2011 11 2	24.39	4.33	188.59 2116	2011 11 22	19.42	2.07	284.91 2117	2011 12 12	11.71	-0.47	21.34 2117
2011 11 3	24.22	4.22	175.40 2116	2011 11 23	19.10	1.94	271.73 2117	2011 12 13	11.27	-0.59	8.16 2117
2011 11 4	24.03	4.12	162.21 2116	2011 11 24	18.76	1.82	258.55 2117	2011 12 14	10.83	-0.72	354.98 2118
2011 11 5	23.84	4.01	149.03 2116	2011 11 25	18.42	1.70	245.37 2117	2011 12 15	10.38	-0.85	341.81 2118
2011 11 6	23.64	3.91	135.84 2116	2011 11 26	18.08	1.57	232.19 2117	2011 12 16	9.93	-0.98	328.63 2118
2011 11 7	23.44	3.80	122.66 2116	2011 11 27	17.72	1.45	219.01 2117	2011 12 17	9.47	-1.10	315.46 2118
2011 11 8	23.22	3.69	109.47 2116	2011 11 28	17.36	1.32	205.83 2117	2011 12 18	9.01	-1.23	302.28 2118
2011 11 9	23.00	3.58	96.29 2116	2011 11 29	17.00	1.19	192.65 2117	2011 12 19	8.55	-1.36	289.11 2118
2011 11 10	22.77	3.47	83.10 2116	2011 11 30	16.62	1.07	179.47 2117	2011 12 20	8.08	-1.48	275.94 2118
2011 11 11	22.53	3.36	69.92 2116	2011 12 1	16.24	0.94	166.29 2117	2011 12 21	7.61	-1.61	262.76 2118
2011 11 12	22.29	3.25	56.73 2116	2011 12 2	15.86	0.81	153.11 2117	2011 12 22	7.14	-1.73	249.59 2118
2011 11 13	22.04	3.13	43.55 2116	2011 12 3	15.47	0.69	139.93 2117	2011 12 23	6.67	-1.86	236.42 2118
2011 11 14	21.78	3.02	30.37 2116	2011 12 4	15.07	0.56	126.76 2117	2011 12 24	6.19	-1.98	223.24 2118
2011 11 15	21.51	2.90	17.18 2116	2011 12 5	14.67	0.43	113.58 2117	2011 12 25	5.72	-2.11	210.07 2118
2011 11 16	21.23	2.79	4.00 2116	2011 12 6	14.26	0.30	100.40 2117	2011 12 26	5.24	-2.23	196.90 2118
2011 11 17	20.95	2.67	350.82 2117	2011 12 7	13.85	0.18	87.22 2117	2011 12 27	4.76	-2.35	183.73 2118
2011 11 18	20.66	2.55	337.64 2117	2011 12 8	13.43	0.05	74.04 2117	2011 12 28	4.27	-2.47	170.56 2118
2011 11 19	20.36	2.43	324.45 2117	2011 12 9	13.01	-0.08	60.87 2117	2011 12 29	3.79	-2.59	157.39 2118
								2011 12 30	3.31	-2.71	144.22 2118
								2011 12 31	2.82	-2.83	131.04 2118

# Moto del meridiano centrale - Motion of the central meridian

Day	0h	3h	6h	9h	12h	15h	18h	21h	24h
0	0.0	1.7	3.3	5.0	6.6	8.3	9.9	11.6	13.2
1	13.2	14.9	16.5	18.2	19.8	21.5	23.1	24.8	26.4
2	26.4	28.1	29.7	31.4	33.0	34.7	36.3	38.0	39.6

Date = data nel formato anno/mese/giorno

Day = giorni

Po = angolo di posizione del polo nord del Sole, in °

Bo = latitudine della Terra, riferita all'equatore del Sole, in °

Lo = longitudine del meridiano centrale del Sole, in °

Po = position angle of the north pole of the Sun, in °

Bo = latitude of the Earth, referred to the solar equator, in °

Lo = longitude of the central meridian of the Sun, in °

# LEVATA E TRAMONTO DEL SOLE - SUNRISE AND SUNSET

for Greenwich Meridian			for Rome :			Longitude E 12 00.0		
						Latitude N 42 00.0		
						Time Zone UT +1		
Date	Ephemeris TDT JD	Transit TDT Time	Rise (Azim)			Trans (Alt)		
			h	m	s	h	m	s
2011-01- 1	2455563.002373	12 03 25.0	7 40	(121)		12 16	(25)	16 51 (239)
2011-01- 2	2455564.002700	12 03 53.3	7 40	(121)		12 16	(25)	16 52 (239)
2011-01- 3	2455565.003023	12 04 21.2	7 40	(121)		12 16	(25)	16 53 (239)
2011-01- 4	2455566.003342	12 04 48.7	7 40	(120)		12 17	(25)	16 54 (240)
2011-01- 5	2455567.003656	12 05 15.9	7 40	(120)		12 17	(25)	16 55 (240)
2011-01- 6	2455568.003965	12 05 42.6	7 40	(120)		12 18	(26)	16 55 (240)
2011-01- 7	2455569.004269	12 06 08.8	7 40	(120)		12 18	(26)	16 56 (240)
2011-01- 8	2455570.004567	12 06 34.6	7 40	(120)		12 19	(26)	16 57 (240)
2011-01- 9	2455571.004859	12 06 59.8	7 40	(120)		12 19	(26)	16 59 (240)
2011-01-10	2455572.005144	12 07 24.4	7 39	(119)		12 19	(26)	17 00 (241)
2011-01-11	2455573.005423	12 07 48.5	7 39	(119)		12 20	(26)	17 01 (241)
2011-01-12	2455574.005694	12 08 12.0	7 39	(119)		12 20	(26)	17 02 (241)
2011-01-13	2455575.005958	12 08 34.8	7 39	(119)		12 21	(27)	17 03 (241)
2011-01-14	2455576.006215	12 08 57.0	7 38	(118)		12 21	(27)	17 04 (242)
2011-01-15	2455577.006464	12 09 18.5	7 38	(118)		12 21	(27)	17 05 (242)
2011-01-16	2455578.006706	12 09 39.4	7 37	(118)		12 22	(27)	17 06 (242)
2011-01-17	2455579.006939	12 09 59.5	7 37	(118)		12 22	(27)	17 07 (242)
2011-01-18	2455580.007163	12 10 18.9	7 36	(117)		12 22	(27)	17 09 (243)
2011-01-19	2455581.007380	12 10 37.6	7 36	(117)		12 23	(28)	17 10 (243)
2011-01-20	2455582.007588	12 10 55.6	7 35	(117)		12 23	(28)	17 11 (243)
2011-01-21	2455583.007787	12 11 12.8	7 34	(117)		12 23	(28)	17 12 (244)
2011-01-22	2455584.007978	12 11 29.3	7 34	(116)		12 23	(28)	17 14 (244)
2011-01-23	2455585.008159	12 11 45.0	7 33	(116)		12 24	(29)	17 15 (244)
2011-01-24	2455586.008332	12 11 59.9	7 32	(116)		12 24	(29)	17 16 (245)
2011-01-25	2455587.008497	12 12 14.1	7 32	(115)		12 24	(29)	17 17 (245)
2011-01-26	2455588.008652	12 12 27.5	7 31	(115)		12 24	(29)	17 19 (245)
2011-01-27	2455589.008798	12 12 40.1	7 30	(114)		12 25	(30)	17 20 (246)
2011-01-28	2455590.008935	12 12 52.0	7 29	(114)		12 25	(30)	17 21 (246)
2011-01-29	2455591.009063	12 13 03.0	7 28	(114)		12 25	(30)	17 22 (246)
2011-01-30	2455592.009182	12 13 13.3	7 27	(113)		12 25	(30)	17 24 (247)
2011-01-31	2455593.009291	12 13 22.7	7 26	(113)		12 25	(31)	17 25 (247)
2011-02- 1	2455594.009391	12 13 31.4	7 25	(113)		12 26	(31)	17 26 (248)
2011-02- 2	2455595.009481	12 13 39.2	7 24	(112)		12 26	(31)	17 28 (248)
2011-02- 3	2455596.009563	12 13 46.2	7 23	(112)		12 26	(31)	17 29 (248)
2011-02- 4	2455597.009634	12 13 52.4	7 22	(111)		12 26	(32)	17 30 (249)
2011-02- 5	2455598.009697	12 13 57.8	7 21	(111)		12 26	(32)	17 31 (249)
2011-02- 6	2455599.009750	12 14 02.4	7 20	(111)		12 26	(32)	17 33 (250)
2011-02- 7	2455600.009793	12 14 06.1	7 19	(110)		12 26	(33)	17 34 (250)
2011-02- 8	2455601.009827	12 14 09.1	7 18	(110)		12 26	(33)	17 35 (250)
2011-02- 9	2455602.009852	12 14 11.2	7 16	(109)		12 26	(33)	17 37 (251)
2011-02-10	2455603.009867	12 14 12.5	7 15	(109)		12 26	(34)	17 38 (251)
2011-02-11	2455604.009874	12 14 13.1	7 14	(108)		12 26	(34)	17 39 (252)
2011-02-12	2455605.009871	12 14 12.8	7 13	(108)		12 26	(34)	17 40 (252)
2011-02-13	2455606.009859	12 14 11.8	7 11	(107)		12 26	(35)	17 42 (253)
2011-02-14	2455607.009839	12 14 10.1	7 10	(107)		12 26	(35)	17 43 (253)
2011-02-15	2455608.009810	12 14 07.6	7 09	(107)		12 26	(35)	17 44 (254)
2011-02-16	2455609.009772	12 14 04.3	7 07	(106)		12 26	(36)	17 46 (254)
2011-02-17	2455610.009726	12 14 00.3	7 06	(106)		12 26	(36)	17 47 (255)
2011-02-18	2455611.009672	12 13 55.6	7 04	(105)		12 26	(36)	17 48 (255)
2011-02-19	2455612.009610	12 13 50.3	7 03	(105)		12 26	(37)	17 49 (256)
2011-02-20	2455613.009540	12 13 44.2	7 02	(104)		12 26	(37)	17 51 (256)
2011-02-21	2455614.009462	12 13 37.5	7 00	(104)		12 26	(37)	17 52 (257)
2011-02-22	2455615.009378	12 13 30.2	6 59	(103)		12 26	(38)	17 53 (257)
2011-02-23	2455616.009286	12 13 22.3	6 57	(103)		12 25	(38)	17 54 (258)
2011-02-24	2455617.009188	12 13 13.8	6 56	(102)		12 25	(39)	17 55 (258)
2011-02-25	2455618.009082	12 13 04.7	6 54	(102)		12 25	(39)	17 57 (259)
2011-02-26	2455619.008971	12 12 55.1	6 53	(101)		12 25	(39)	17 58 (259)
2011-02-27	2455620.008853	12 12 44.9	6 51	(101)		12 25	(40)	17 59 (260)
2011-02-28	2455621.008729	12 12 34.1	6 49	(100)		12 25	(40)	18 00 (260)
2011-03- 1	2455622.008599	12 12 22.9	6 48	(100)		12 24	(40)	18 02 (261)
2011-03- 2	2455623.008463	12 12 11.2	6 46	( 99)		12 24	(41)	18 03 (261)
2011-03- 3	2455624.008322	12 11 59.0	6 45	( 99)		12 24	(41)	18 04 (262)
2011-03- 4	2455625.008175	12 11 46.3	6 43	( 98)		12 24	(42)	18 05 (262)
2011-03- 5	2455626.008023	12 11 33.2	6 41	( 98)		12 24	(42)	18 06 (263)
2011-03- 6	2455627.007866	12 11 19.6	6 40	( 97)		12 23	(42)	18 08 (263)
2011-03- 7	2455628.007704	12 11 05.6	6 38	( 97)		12 23	(43)	18 09 (264)
2011-03- 8	2455629.007537	12 10 51.2	6 37	( 96)		12 23	(43)	18 10 (264)
2011-03- 9	2455630.007366	12 10 36.5	6 35	( 95)		12 23	(43)	18 11 (265)
2011-03-10	2455631.007191	12 10 21.3	6 33	( 95)		12 22	(44)	18 12 (265)
2011-03-11	2455632.007012	12 10 05.8	6 32	( 94)		12 22	(44)	18 13 (266)
2011-03-12	2455633.006829	12 09 50.0	6 30	( 94)		12 22	(45)	18 15 (266)
2011-03-13	2455634.006642	12 09 33.9	6 28	( 93)		12 22	(45)	18 16 (267)
2011-03-14	2455635.006452	12 09 17.4	6 26	( 93)		12 21	(45)	18 17 (267)
2011-03-15	2455636.006259	12 09 00.8	6 25	( 92)		12 21	(46)	18 18 (268)

Ephemeris		Transit		Rise	(Azm)	Trans	(Alt)	Set	(Azm)				
Date	TDT JD	TDT Time											
		h	m	s	h	m	h	m	h	m			
2011-03-16	2455637.006063	12	08	43.8	6	23	( 92)	12	21	(46)	18	19	(268)
2011-03-17	2455638.005864	12	08	26.6	6	21	( 91)	12	20	(47)	18	20	(269)
2011-03-18	2455639.005663	12	08	09.2	6	20	( 91)	12	20	(47)	18	21	(270)
2011-03-19	2455640.005459	12	07	51.7	6	18	( 90)	12	20	(47)	18	22	(270)
2011-03-20	2455641.005254	12	07	34.0	6	16	( 90)	12	20	(48)	18	24	(271)
2011-03-21	2455642.005048	12	07	16.1	6	15	( 89)	12	19	(48)	18	25	(271)
2011-03-22	2455643.004840	12	06	58.2	6	13	( 89)	12	19	(49)	18	26	(272)
2011-03-23	2455644.004631	12	06	40.1	6	11	( 88)	12	19	(49)	18	27	(272)
2011-03-24	2455645.004422	12	06	22.0	6	09	( 88)	12	18	(49)	18	28	(273)
2011-03-25	2455646.004212	12	06	03.9	6	08	( 87)	12	18	(50)	18	29	(273)
2011-03-26	2455647.004002	12	05	45.8	6	06	( 86)	12	18	(50)	18	30	(274)
2011-03-27	2455648.003792	12	05	27.7	6	04	( 86)	12	17	(51)	18	31	(274)
2011-03-28	2455649.003583	12	05	09.5	6	02	( 85)	12	17	(51)	18	33	(275)
2011-03-29	2455650.003374	12	04	51.5	6	01	( 85)	12	17	(51)	18	34	(275)
2011-03-30	2455651.003166	12	04	33.5	5	59	( 84)	12	17	(52)	18	35	(276)
2011-03-31	2455652.002958	12	04	15.6	5	57	( 84)	12	16	(52)	18	36	(276)
2011-04- 1	2455653.002752	12	03	57.8	5	56	( 83)	12	16	(53)	18	37	(277)
2011-04- 2	2455654.002547	12	03	40.1	5	54	( 83)	12	16	(53)	18	38	(277)
2011-04- 3	2455655.002344	12	03	22.5	5	52	( 82)	12	15	(53)	18	39	(278)
2011-04- 4	2455656.002142	12	03	05.1	5	51	( 82)	12	15	(54)	18	40	(279)
2011-04- 5	2455657.001942	12	02	47.8	5	49	( 81)	12	15	(54)	18	41	(279)
2011-04- 6	2455658.001745	12	02	30.7	5	47	( 81)	12	15	(54)	18	43	(280)
2011-04- 7	2455659.001549	12	02	13.8	5	46	( 80)	12	14	(55)	18	44	(280)
2011-04- 8	2455660.001356	12	01	57.1	5	44	( 80)	12	14	(55)	18	45	(281)
2011-04- 9	2455661.001165	12	01	40.7	5	42	( 79)	12	14	(56)	18	46	(281)
2011-04-10	2455662.000977	12	01	24.5	5	41	( 79)	12	13	(56)	18	47	(282)
2011-04-11	2455663.000792	12	01	08.5	5	39	( 78)	12	13	(56)	18	48	(282)
2011-04-12	2455664.000611	12	00	52.8	5	37	( 78)	12	13	(57)	18	49	(283)
2011-04-13	2455665.000432	12	00	37.3	5	36	( 77)	12	13	(57)	18	50	(283)
2011-04-14	2455666.000257	12	00	22.2	5	34	( 77)	12	12	(57)	18	51	(284)
2011-04-15	2455667.000086	12	00	07.4	5	32	( 76)	12	12	(58)	18	53	(284)
2011-04-16	2455667.999918	11	59	53.0	5	31	( 76)	12	12	(58)	18	54	(285)
2011-04-17	2455668.999755	11	59	38.8	5	29	( 75)	12	12	(58)	18	55	(285)
2011-04-18	2455669.999596	11	59	25.1	5	28	( 75)	12	11	(59)	18	56	(286)
2011-04-19	2455670.999442	11	59	11.8	5	26	( 74)	12	11	(59)	18	57	(286)
2011-04-20	2455671.999292	11	58	58.9	5	25	( 74)	12	11	(59)	18	58	(286)
2011-04-21	2455672.999148	11	58	46.4	5	23	( 73)	12	11	(60)	18	59	(287)
2011-04-22	2455673.999008	11	58	34.3	5	22	( 73)	12	11	(60)	19	00	(287)
2011-04-23	2455674.998874	11	58	22.7	5	20	( 72)	12	10	(60)	19	01	(288)
2011-04-24	2455675.998746	11	58	11.7	5	19	( 72)	12	10	(61)	19	03	(288)
2011-04-25	2455676.998623	11	58	01.0	5	17	( 72)	12	10	(61)	19	04	(289)
2011-04-26	2455677.998506	11	57	50.9	5	16	( 71)	12	10	(61)	19	05	(289)
2011-04-27	2455678.998395	11	57	41.3	5	14	( 71)	12	10	(62)	19	06	(290)
2011-04-28	2455679.998290	11	57	32.3	5	13	( 70)	12	10	(62)	19	07	(290)
2011-04-29	2455680.998191	11	57	23.7	5	11	( 70)	12	09	(62)	19	08	(291)
2011-04-30	2455681.998098	11	57	15.7	5	10	( 69)	12	09	(63)	19	09	(291)
2011-05- 1	2455682.998012	11	57	08.2	5	09	( 69)	12	09	(63)	19	10	(291)
2011-05- 2	2455683.997931	11	57	01.3	5	07	( 68)	12	09	(63)	19	11	(292)
2011-05- 3	2455684.997857	11	56	54.9	5	06	( 68)	12	09	(64)	19	12	(292)
2011-05- 4	2455685.997790	11	56	49.0	5	05	( 68)	12	09	(64)	19	14	(293)
2011-05- 5	2455686.997728	11	56	43.7	5	04	( 67)	12	09	(64)	19	15	(293)
2011-05- 6	2455687.997673	11	56	39.0	5	02	( 67)	12	09	(65)	19	16	(293)
2011-05- 7	2455688.997625	11	56	34.8	5	01	( 66)	12	09	(65)	19	17	(294)
2011-05- 8	2455689.997583	11	56	31.1	5	00	( 66)	12	09	(65)	19	18	(294)
2011-05- 9	2455690.997547	11	56	28.0	4	59	( 66)	12	08	(65)	19	19	(295)
2011-05-10	2455691.997518	11	56	25.5	4	58	( 65)	12	08	(66)	19	20	(295)
2011-05-11	2455692.997495	11	56	23.5	4	56	( 65)	12	08	(66)	19	21	(295)
2011-05-12	2455693.997478	11	56	22.1	4	55	( 65)	12	08	(66)	19	22	(296)
2011-05-13	2455694.997468	11	56	21.2	4	54	( 64)	12	08	(66)	19	23	(296)
2011-05-14	2455695.997464	11	56	20.9	4	53	( 64)	12	08	(67)	19	24	(296)
2011-05-15	2455696.997466	11	56	21.1	4	52	( 64)	12	08	(67)	19	25	(297)
2011-05-16	2455697.997475	11	56	21.9	4	51	( 63)	12	08	(67)	19	26	(297)
2011-05-17	2455698.997491	11	56	23.2	4	50	( 63)	12	08	(67)	19	27	(297)
2011-05-18	2455699.997513	11	56	25.1	4	49	( 63)	12	08	(68)	19	28	(298)
2011-05-19	2455700.997541	11	56	27.6	4	48	( 62)	12	08	(68)	19	29	(298)
2011-05-20	2455701.997576	11	56	30.6	4	47	( 62)	12	09	(68)	19	30	(298)
2011-05-21	2455702.997617	11	56	34.1	4	47	( 62)	12	09	(68)	19	31	(299)
2011-05-22	2455703.997665	11	56	38.2	4	46	( 61)	12	09	(68)	19	32	(299)
2011-05-23	2455704.997719	11	56	42.9	4	45	( 61)	12	09	(69)	19	33	(299)
2011-05-24	2455705.997779	11	56	48.1	4	44	( 61)	12	09	(69)	19	34	(299)
2011-05-25	2455706.997845	11	56	53.8	4	43	( 60)	12	09	(69)	19	35	(300)
2011-05-26	2455707.997917	11	57	00.0	4	43	( 60)	12	09	(69)	19	36	(300)
2011-05-27	2455708.997995	11	57	06.7	4	42	( 60)	12	09	(69)	19	37	(300)
2011-05-28	2455709.998078	11	57	13.9	4	41	( 60)	12	09	(69)	19	37	(300)
2011-05-29	2455710.998167	11	57	21.6	4	41	( 60)	12	09	(70)	19	38	(301)
2011-05-30	2455711.998261	11	57	29.8	4	40	( 59)	12	09	(70)	19	39	(301)
2011-05-31	2455712.998360	11	57	38.3	4	40	( 59)	12	10	(70)	19	40	(301)
2011-06- 1	2455713.998465	11	57	47.3	4	39	( 59)	12	10	(70)	19	41	(301)
2011-06- 2	2455714.998573	11	57	56.7	4	39	( 59)	12	10	(70)	19	41	(301)
2011-06- 3	2455715.998687	11	58	06.5	4	38	( 58)	12	10	(70)	19	42	(302)
2011-06- 4	2455716.998804	11	58	16.7	4	38	( 58)	12	10	(70)	19	43	(302)
2011-06- 5	2455717.998925	11	58	27.1	4	38	( 58)	12	10	(71)	19	44	(302)

Ephemeris Transit									
Date	TDT JD	TDT Time	Rise	(Azm)	Trans	(Alt)	Set	(Azm)	
		h m s	h m	°	h m	°	h m	°	
2011-06- 6	2455718.999050	11 58 37.9	4 37	( 58)	12 11	(71)	19 44	(302)	
2011-06- 7	2455719.999178	11 58 49.0	4 37	( 58)	12 11	(71)	19 45	(302)	
2011-06- 8	2455720.999309	11 59 00.3	4 37	( 58)	12 11	(71)	19 46	(302)	
2011-06- 9	2455721.999443	11 59 11.9	4 36	( 58)	12 11	(71)	19 46	(303)	
2011-06-10	2455722.999580	11 59 23.7	4 36	( 57)	12 11	(71)	19 47	(303)	
2011-06-11	2455723.999719	11 59 35.7	4 36	( 57)	12 12	(71)	19 47	(303)	
2011-06-12	2455724.999860	11 59 47.9	4 36	( 57)	12 12	(71)	19 48	(303)	
2011-06-13	2455726.000003	12 00 00.3	4 36	( 57)	12 12	(71)	19 48	(303)	
2011-06-14	2455727.000148	12 00 12.8	4 36	( 57)	12 12	(71)	19 49	(303)	
2011-06-15	2455728.000294	12 00 25.4	4 36	( 57)	12 12	(71)	19 49	(303)	
2011-06-16	2455729.000442	12 00 38.2	4 36	( 57)	12 13	(71)	19 50	(303)	
2011-06-17	2455730.000590	12 00 51.0	4 36	( 57)	12 13	(71)	19 50	(303)	
2011-06-18	2455731.000740	12 01 03.9	4 36	( 57)	12 13	(71)	19 50	(303)	
2011-06-19	2455732.000890	12 01 16.9	4 36	( 57)	12 13	(71)	19 50	(303)	
2011-06-20	2455733.001041	12 01 29.9	4 36	( 57)	12 13	(71)	19 51	(303)	
2011-06-21	2455734.001191	12 01 42.9	4 36	( 57)	12 14	(71)	19 51	(303)	
2011-06-22	2455735.001342	12 01 55.9	4 37	( 57)	12 14	(71)	19 51	(303)	
2011-06-23	2455736.001492	12 02 08.9	4 37	( 57)	12 14	(71)	19 51	(303)	
2011-06-24	2455737.001642	12 02 21.8	4 37	( 57)	12 14	(71)	19 51	(303)	
2011-06-25	2455738.001790	12 02 34.7	4 38	( 57)	12 15	(71)	19 52	(303)	
2011-06-26	2455739.001938	12 02 47.4	4 38	( 57)	12 15	(71)	19 52	(303)	
2011-06-27	2455740.002084	12 03 00.0	4 38	( 57)	12 15	(71)	19 52	(303)	
2011-06-28	2455741.002228	12 03 12.5	4 39	( 57)	12 15	(71)	19 52	(303)	
2011-06-29	2455742.002370	12 03 24.8	4 39	( 57)	12 15	(71)	19 52	(303)	
2011-06-30	2455743.002510	12 03 36.9	4 40	( 57)	12 16	(71)	19 52	(303)	
2011-07- 1	2455744.002647	12 03 48.7	4 40	( 57)	12 16	(71)	19 51	(303)	
2011-07- 2	2455745.002781	12 04 00.3	4 41	( 57)	12 16	(71)	19 51	(303)	
2011-07- 3	2455746.002912	12 04 11.6	4 41	( 57)	12 16	(71)	19 51	(303)	
2011-07- 4	2455747.003039	12 04 22.6	4 42	( 58)	12 16	(71)	19 51	(302)	
2011-07- 5	2455748.003162	12 04 33.2	4 42	( 58)	12 17	(71)	19 51	(302)	
2011-07- 6	2455749.003282	12 04 43.5	4 43	( 58)	12 17	(71)	19 50	(302)	
2011-07- 7	2455750.003397	12 04 53.5	4 43	( 58)	12 17	(71)	19 50	(302)	
2011-07- 8	2455751.003507	12 05 03.0	4 44	( 58)	12 17	(70)	19 50	(302)	
2011-07- 9	2455752.003612	12 05 12.1	4 45	( 58)	12 17	(70)	19 49	(302)	
2011-07-10	2455753.003712	12 05 20.8	4 46	( 58)	12 17	(70)	19 49	(301)	
2011-07-11	2455754.003808	12 05 29.0	4 46	( 59)	12 17	(70)	19 48	(301)	
2011-07-12	2455755.003897	12 05 36.7	4 47	( 59)	12 18	(70)	19 48	(301)	
2011-07-13	2455756.003982	12 05 44.0	4 48	( 59)	12 18	(70)	19 47	(301)	
2011-07-14	2455757.004061	12 05 50.8	4 49	( 59)	12 18	(70)	19 47	(301)	
2011-07-15	2455758.004134	12 05 57.2	4 49	( 59)	12 18	(70)	19 46	(300)	
2011-07-16	2455759.004201	12 06 03.0	4 50	( 60)	12 18	(69)	19 46	(300)	
2011-07-17	2455760.004262	12 06 08.3	4 51	( 60)	12 18	(69)	19 45	(300)	
2011-07-18	2455761.004318	12 06 13.1	4 52	( 60)	12 18	(69)	19 44	(300)	
2011-07-19	2455762.004367	12 06 17.3	4 53	( 60)	12 18	(69)	19 43	(299)	
2011-07-20	2455763.004410	12 06 21.0	4 54	( 61)	12 18	(69)	19 43	(299)	
2011-07-21	2455764.004447	12 06 24.2	4 54	( 61)	12 18	(68)	19 42	(299)	
2011-07-22	2455765.004477	12 06 26.8	4 55	( 61)	12 18	(68)	19 41	(299)	
2011-07-23	2455766.004501	12 06 28.9	4 56	( 62)	12 18	(68)	19 40	(298)	
2011-07-24	2455767.004519	12 06 30.4	4 57	( 62)	12 19	(68)	19 39	(298)	
2011-07-25	2455768.004530	12 06 31.4	4 58	( 62)	12 19	(68)	19 38	(298)	
2011-07-26	2455769.004534	12 06 31.7	4 59	( 62)	12 19	(67)	19 37	(297)	
2011-07-27	2455770.004531	12 06 31.5	5 00	( 63)	12 19	(67)	19 36	(297)	
2011-07-28	2455771.004522	12 06 30.7	5 01	( 63)	12 19	(67)	19 35	(297)	
2011-07-29	2455772.004506	12 06 29.3	5 02	( 63)	12 18	(67)	19 34	(296)	
2011-07-30	2455773.004483	12 06 27.3	5 03	( 64)	12 18	(67)	19 33	(296)	
2011-07-31	2455774.004452	12 06 24.7	5 04	( 64)	12 18	(66)	19 32	(296)	
2011-08- 1	2455775.004415	12 06 21.5	5 05	( 64)	12 18	(66)	19 31	(295)	
2011-08- 2	2455776.004371	12 06 17.6	5 06	( 65)	12 18	(66)	19 30	(295)	
2011-08- 3	2455777.004319	12 06 13.2	5 07	( 65)	12 18	(66)	19 29	(295)	
2011-08- 4	2455778.004261	12 06 08.1	5 08	( 66)	12 18	(65)	19 28	(294)	
2011-08- 5	2455779.004195	12 06 02.4	5 09	( 66)	12 18	(65)	19 26	(294)	
2011-08- 6	2455780.004121	12 05 56.1	5 10	( 66)	12 18	(65)	19 25	(293)	
2011-08- 7	2455781.004041	12 05 49.2	5 11	( 67)	12 18	(64)	19 24	(293)	
2011-08- 8	2455782.003954	12 05 41.6	5 12	( 67)	12 18	(64)	19 23	(293)	
2011-08- 9	2455783.003860	12 05 33.5	5 13	( 67)	12 18	(64)	19 21	(292)	
2011-08-10	2455784.003758	12 05 24.7	5 14	( 68)	12 17	(64)	19 20	(292)	
2011-08-11	2455785.003651	12 05 15.4	5 15	( 68)	12 17	(63)	19 19	(291)	
2011-08-12	2455786.003536	12 05 05.5	5 16	( 69)	12 17	(63)	19 17	(291)	
2011-08-13	2455787.003415	12 04 55.0	5 17	( 69)	12 17	(63)	19 16	(291)	
2011-08-14	2455788.003287	12 04 44.0	5 18	( 70)	12 17	(62)	19 14	(290)	
2011-08-15	2455789.003154	12 04 32.5	5 19	( 70)	12 17	(62)	19 13	(290)	
2011-08-16	2455790.003014	12 04 20.4	5 20	( 70)	12 16	(62)	19 12	(289)	
2011-08-17	2455791.002868	12 04 07.8	5 21	( 71)	12 16	(61)	19 10	(289)	
2011-08-18	2455792.002716	12 03 54.7	5 22	( 71)	12 16	(61)	19 09	(288)	
2011-08-19	2455793.002559	12 03 41.1	5 23	( 72)	12 16	(61)	19 07	(288)	
2011-08-20	2455794.002396	12 03 27.0	5 25	( 72)	12 15	(60)	19 06	(288)	
2011-08-21	2455795.002228	12 03 12.5	5 26	( 73)	12 15	(60)	19 04	(287)	
2011-08-22	2455796.002055	12 02 57.5	5 27	( 73)	12 15	(60)	19 03	(287)	
2011-08-23	2455797.001877	12 02 42.2	5 28	( 74)	12 15	(59)	19 01	(286)	
2011-08-24	2455798.001694	12 02 26.3	5 29	( 74)	12 14	(59)	18 59	(286)	
2011-08-25	2455799.001506	12 02 10.1	5 30	( 75)	12 14	(59)	18 58	(285)	
2011-08-26	2455800.001313	12 01 53.5	5 31	( 75)	12 14	(58)	18 56	(285)	

Ephemeris		Transit									
Date	TDT JD	TDT Time	Rise	(Azm)	Trans	(Alt)	Set	(Azm)			
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2011-08-27	2455801.001117	12 01 36.5	5 32	( 75)	12 14	(58)	18 55	(284)			
2011-08-28	2455802.000915	12 01 19.1	5 33	( 76)	12 13	(58)	18 53	(284)			
2011-08-29	2455803.000710	12 01 01.3	5 34	( 76)	12 13	(57)	18 51	(283)			
2011-08-30	2455804.000501	12 00 43.3	5 35	( 77)	12 13	(57)	18 50	(283)			
2011-08-31	2455805.000287	12 00 24.8	5 36	( 77)	12 12	(57)	18 48	(282)			
2011-09- 1	2455806.000070	12 00 06.1	5 37	( 78)	12 12	(56)	18 46	(282)			
2011-09- 2	2455806.999850	11 59 47.0	5 38	( 78)	12 12	(56)	18 45	(281)			
2011-09- 3	2455807.999625	11 59 27.6	5 39	( 79)	12 11	(56)	18 43	(281)			
2011-09- 4	2455808.999398	11 59 08.0	5 40	( 79)	12 11	(55)	18 41	(280)			
2011-09- 5	2455809.999167	11 58 48.1	5 41	( 80)	12 11	(55)	18 40	(280)			
2011-09- 6	2455810.998934	11 58 27.9	5 42	( 80)	12 10	(54)	18 38	(279)			
2011-09- 7	2455811.998698	11 58 07.5	5 43	( 81)	12 10	(54)	18 36	(279)			
2011-09- 8	2455812.998460	11 57 46.9	5 44	( 81)	12 10	(54)	18 35	(278)			
2011-09- 9	2455813.998219	11 57 26.1	5 45	( 82)	12 09	(53)	18 33	(278)			
2011-09-10	2455814.997977	11 57 05.2	5 46	( 82)	12 09	(53)	18 31	(277)			
2011-09-11	2455815.997732	11 56 44.1	5 47	( 83)	12 09	(53)	18 29	(277)			
2011-09-12	2455816.997487	11 56 22.9	5 48	( 83)	12 08	(52)	18 28	(276)			
2011-09-13	2455817.997240	11 56 01.6	5 49	( 84)	12 08	(52)	18 26	(276)			
2011-09-14	2455818.996993	11 55 40.2	5 50	( 84)	12 08	(51)	18 24	(275)			
2011-09-15	2455819.996745	11 55 18.7	5 52	( 85)	12 07	(51)	18 22	(275)			
2011-09-16	2455820.996496	11 54 57.3	5 53	( 86)	12 07	(51)	18 21	(274)			
2011-09-17	2455821.996247	11 54 35.8	5 54	( 86)	12 07	(50)	18 19	(274)			
2011-09-18	2455822.995999	11 54 14.3	5 55	( 87)	12 06	(50)	18 17	(273)			
2011-09-19	2455823.995751	11 53 52.9	5 56	( 87)	12 06	(50)	18 15	(273)			
2011-09-20	2455824.995504	11 53 31.5	5 57	( 88)	12 06	(49)	18 14	(272)			
2011-09-21	2455825.995257	11 53 10.2	5 58	( 88)	12 05	(49)	18 12	(272)			
2011-09-22	2455826.995012	11 52 49.0	5 59	( 89)	12 05	(48)	18 10	(271)			
2011-09-23	2455827.994768	11 52 27.9	6 00	( 89)	12 04	(48)	18 08	(271)			
2011-09-24	2455828.994526	11 52 07.0	6 01	( 90)	12 04	(48)	18 07	(270)			
2011-09-25	2455829.994285	11 51 46.2	6 02	( 90)	12 04	(47)	18 05	(270)			
2011-09-26	2455830.994047	11 51 25.6	6 03	( 91)	12 03	(47)	18 03	(269)			
2011-09-27	2455831.993811	11 51 05.2	6 04	( 91)	12 03	(46)	18 01	(268)			
2011-09-28	2455832.993577	11 50 45.0	6 05	( 92)	12 03	(46)	18 00	(268)			
2011-09-29	2455833.993345	11 50 25.0	6 06	( 92)	12 02	(46)	17 58	(267)			
2011-09-30	2455834.993117	11 50 05.3	6 07	( 93)	12 02	(45)	17 56	(267)			
2011-10- 1	2455835.992891	11 49 45.8	6 08	( 93)	12 02	(45)	17 54	(266)			
2011-10- 2	2455836.992668	11 49 26.6	6 09	( 94)	12 01	(44)	17 53	(266)			
2011-10- 3	2455837.992449	11 49 07.6	6 11	( 94)	12 01	(44)	17 51	(265)			
2011-10- 4	2455838.992234	11 48 49.0	6 12	( 95)	12 01	(44)	17 49	(265)			
2011-10- 5	2455839.992022	11 48 30.7	6 13	( 95)	12 01	(43)	17 48	(264)			
2011-10- 6	2455840.991814	11 48 12.7	6 14	( 96)	12 00	(43)	17 46	(264)			
2011-10- 7	2455841.991610	11 47 55.1	6 15	( 96)	12 00	(43)	17 44	(263)			
2011-10- 8	2455842.991412	11 47 38.0	6 16	( 97)	12 00	(42)	17 43	(263)			
2011-10- 9	2455843.991217	11 47 21.2	6 17	( 98)	11 59	(42)	17 41	(262)			
2011-10-10	2455844.991028	11 47 04.8	6 18	( 98)	11 59	(41)	17 39	(262)			
2011-10-11	2455845.990844	11 46 49.0	6 19	( 99)	11 59	(41)	17 38	(261)			
2011-10-12	2455846.990666	11 46 33.6	6 20	( 99)	11 59	(41)	17 36	(261)			
2011-10-13	2455847.990494	11 46 18.7	6 22	(100)	11 58	(40)	17 34	(260)			
2011-10-14	2455848.990327	11 46 04.3	6 23	(100)	11 58	(40)	17 33	(260)			
2011-10-15	2455849.990167	11 45 50.5	6 24	(101)	11 58	(40)	17 31	(259)			
2011-10-16	2455850.990014	11 45 37.2	6 25	(101)	11 58	(39)	17 30	(259)			
2011-10-17	2455851.989867	11 45 24.5	6 26	(102)	11 57	(39)	17 28	(258)			
2011-10-18	2455852.989728	11 45 12.5	6 27	(102)	11 57	(38)	17 27	(258)			
2011-10-19	2455853.989595	11 45 01.0	6 28	(103)	11 57	(38)	17 25	(257)			
2011-10-20	2455854.989470	11 44 50.2	6 30	(103)	11 57	(38)	17 23	(257)			
2011-10-21	2455855.989353	11 44 40.1	6 31	(104)	11 57	(37)	17 22	(256)			
2011-10-22	2455856.989243	11 44 30.6	6 32	(104)	11 57	(37)	17 20	(256)			
2011-10-23	2455857.989142	11 44 21.9	6 33	(104)	11 56	(37)	17 19	(255)			
2011-10-24	2455858.989049	11 44 13.8	6 34	(105)	11 56	(36)	17 18	(255)			
2011-10-25	2455859.988963	11 44 06.4	6 36	(105)	11 56	(36)	17 16	(254)			
2011-10-26	2455860.988887	11 43 59.8	6 37	(106)	11 56	(36)	17 15	(254)			
2011-10-27	2455861.988819	11 43 53.9	6 38	(106)	11 56	(35)	17 13	(253)			
2011-10-28	2455862.988759	11 43 48.8	6 39	(107)	11 56	(35)	17 12	(253)			
2011-10-29	2455863.988708	11 43 44.4	6 40	(107)	11 56	(35)	17 11	(253)			
2011-10-30	2455864.988666	11 43 40.7	6 42	(108)	11 56	(34)	17 09	(252)			
2011-10-31	2455865.988632	11 43 37.8	6 43	(108)	11 56	(34)	17 08	(252)			
2011-11- 1	2455866.988608	11 43 35.7	6 44	(109)	11 56	(34)	17 07	(251)			
2011-11- 2	2455867.988592	11 43 34.4	6 45	(109)	11 56	(33)	17 05	(251)			
2011-11- 3	2455868.988586	11 43 33.8	6 46	(110)	11 56	(33)	17 04	(250)			
2011-11- 4	2455869.988589	11 43 34.1	6 48	(110)	11 56	(33)	17 03	(250)			
2011-11- 5	2455870.988601	11 43 35.1	6 49	(110)	11 56	(32)	17 02	(249)			
2011-11- 6	2455871.988622	11 43 37.0	6 50	(111)	11 56	(32)	17 01	(249)			
2011-11- 7	2455872.988653	11 43 39.6	6 51	(111)	11 56	(32)	16 59	(249)			
2011-11- 8	2455873.988694	11 43 43.1	6 53	(112)	11 56	(31)	16 58	(248)			
2011-11- 9	2455874.988744	11 43 47.5	6 54	(112)	11 56	(31)	16 57	(248)			
2011-11-10	2455875.988804	11 43 52.7	6 55	(112)	11 56	(31)	16 56	(247)			
2011-11-11	2455876.988874	11 43 58.7	6 56	(113)	11 56	(31)	16 55	(247)			
2011-11-12	2455877.988953	11 44 05.6	6 58	(113)	11 56	(30)	16 54	(247)			
2011-11-13	2455878.989043	11 44 13.3	6 59	(114)	11 56	(30)	16 53	(246)			
2011-11-14	2455879.989142	11 44 21.9	7 00	(114)	11 56	(30)	16 52	(246)			
2011-11-15	2455880.989252	11 44 31.3	7 01	(114)	11 57	(30)	16 51	(246)			
2011-11-16	2455881.989371	11 44 41.7	7 02	(115)	11 57	(29)	16 50	(245)			

Date	Ephemeris		Transit		Rise	(Azm)	Trans	(Alt)	Set	(Azm)
	TDT	JD	Time							
			h	s						
2011-11-17	2455882.989500	11	44	52.8	7 04	(115)	11 57	(29)	16 50	(245)
2011-11-18	2455883.989639	11	45	04.8	7 05	(115)	11 57	(29)	16 49	(245)
2011-11-19	2455884.989788	11	45	17.7	7 06	(116)	11 57	(29)	16 48	(244)
2011-11-20	2455885.989947	11	45	31.4	7 07	(116)	11 58	(28)	16 47	(244)
2011-11-21	2455886.990116	11	45	46.0	7 09	(116)	11 58	(28)	16 47	(244)
2011-11-22	2455887.990294	11	46	01.4	7 10	(117)	11 58	(28)	16 46	(243)
2011-11-23	2455888.990481	11	46	17.6	7 11	(117)	11 58	(28)	16 45	(243)
2011-11-24	2455889.990678	11	46	34.5	7 12	(117)	11 59	(28)	16 45	(243)
2011-11-25	2455890.990883	11	46	52.3	7 13	(118)	11 59	(27)	16 44	(242)
2011-11-26	2455891.991097	11	47	10.8	7 14	(118)	11 59	(27)	16 44	(242)
2011-11-27	2455892.991320	11	47	30.1	7 15	(118)	11 59	(27)	16 43	(242)
2011-11-28	2455893.991551	11	47	50.0	7 17	(118)	12 00	(27)	16 43	(242)
2011-11-29	2455894.991790	11	48	10.7	7 18	(119)	12 00	(27)	16 42	(241)
2011-11-30	2455895.992037	11	48	32.0	7 19	(119)	12 01	(26)	16 42	(241)
2011-12- 1	2455896.992292	11	48	54.0	7 20	(119)	12 01	(26)	16 42	(241)
2011-12- 2	2455897.992553	11	49	16.6	7 21	(119)	12 01	(26)	16 41	(241)
2011-12- 3	2455898.992822	11	49	39.8	7 22	(119)	12 02	(26)	16 41	(240)
2011-12- 4	2455899.993097	11	50	03.6	7 23	(120)	12 02	(26)	16 41	(240)
2011-12- 5	2455900.993379	11	50	28.0	7 24	(120)	12 02	(26)	16 41	(240)
2011-12- 6	2455901.993667	11	50	52.9	7 25	(120)	12 03	(26)	16 41	(240)
2011-12- 7	2455902.993961	11	51	18.3	7 26	(120)	12 03	(25)	16 40	(240)
2011-12- 8	2455903.994261	11	51	44.2	7 27	(120)	12 04	(25)	16 40	(240)
2011-12- 9	2455904.994567	11	52	10.6	7 28	(121)	12 04	(25)	16 40	(239)
2011-12-10	2455905.994877	11	52	37.4	7 29	(121)	12 05	(25)	16 40	(239)
2011-12-11	2455906.995192	11	53	04.6	7 29	(121)	12 05	(25)	16 41	(239)
2011-12-12	2455907.995512	11	53	32.2	7 30	(121)	12 06	(25)	16 41	(239)
2011-12-13	2455908.995836	11	54	00.2	7 31	(121)	12 06	(25)	16 41	(239)
2011-12-14	2455909.996164	11	54	28.6	7 32	(121)	12 06	(25)	16 41	(239)
2011-12-15	2455910.996495	11	54	57.2	7 33	(121)	12 07	(25)	16 41	(239)
2011-12-16	2455911.996830	11	55	26.1	7 33	(121)	12 07	(25)	16 41	(239)
2011-12-17	2455912.997168	11	55	55.3	7 34	(121)	12 08	(25)	16 42	(239)
2011-12-18	2455913.997508	11	56	24.7	7 35	(121)	12 08	(25)	16 42	(239)
2011-12-19	2455914.997850	11	56	54.3	7 35	(121)	12 09	(25)	16 42	(239)
2011-12-20	2455915.998194	11	57	24.0	7 36	(121)	12 09	(25)	16 43	(239)
2011-12-21	2455916.998540	11	57	53.8	7 36	(121)	12 10	(25)	16 43	(239)
2011-12-22	2455917.998886	11	58	23.8	7 37	(121)	12 10	(25)	16 44	(239)
2011-12-23	2455918.999233	11	58	53.7	7 37	(121)	12 11	(25)	16 44	(239)
2011-12-24	2455919.999579	11	59	23.7	7 38	(121)	12 11	(25)	16 45	(239)
2011-12-25	2455920.999926	11	59	53.6	7 38	(121)	12 12	(25)	16 46	(239)
2011-12-26	2455922.000271	12	00	23.4	7 39	(121)	12 12	(25)	16 46	(239)
2011-12-27	2455923.000615	12	00	53.1	7 39	(121)	12 13	(25)	16 47	(239)
2011-12-28	2455924.000957	12	01	22.7	7 39	(121)	12 13	(25)	16 48	(239)
2011-12-29	2455925.001297	12	01	52.1	7 39	(121)	12 14	(25)	16 48	(239)
2011-12-30	2455926.001634	12	02	21.2	7 40	(121)	12 14	(25)	16 49	(239)
2011-12-31	2455927.001968	12	02	50.1	7 40	(121)	12 15	(25)	16 50	(239)

for Greenwich Meridian = per il meridiano di Greenwich

for Rome : per Roma

Longitude = longitudine

Latitude = latitudine

Time Zone = fuso orario

UT = tempo universale

Ephemeris Transit = transito

Date = data nel formato anno/mese/giorno

JD = giorno giuliano

Time = ora

Rise, trans, set = orari di levata, altezza in gradi durante il transito a sud e tramonto.

Azm = azimut in ° calcolato da nord

Per località differenti da quella calcolata (42°N, 12°E) fare riferimento alla tabella correttiva posta in fondo all'almanacco.

Tempi in T.U.+1, aggiungere un'ora quando si adotta l'ora legale

Date = date in the format yyyy/mm/dd

Rise, transits, set = times of rising, transit and setting, altitude in ° during the south transit.

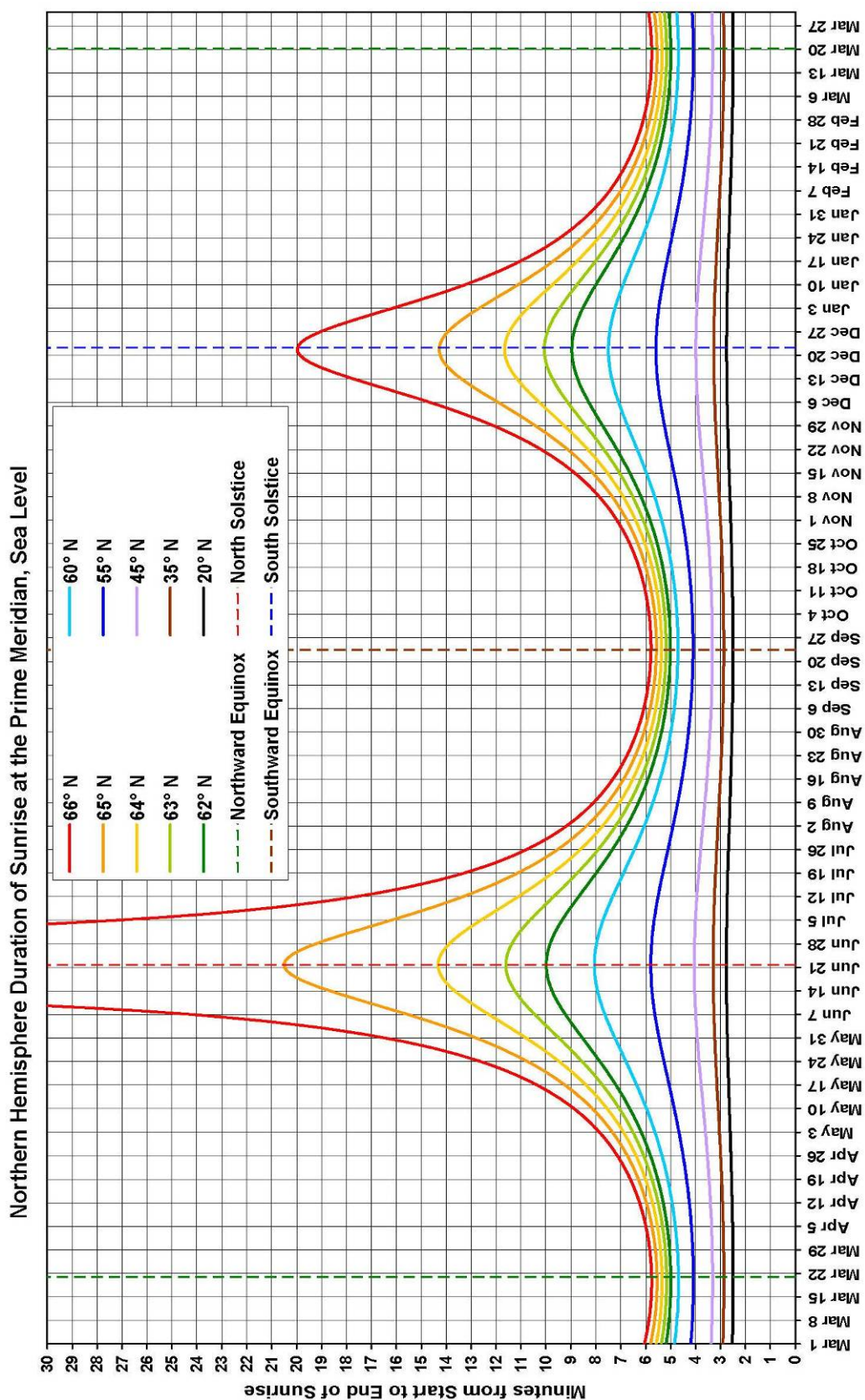
Azm = azimuth in ° from north

For different places (42°N, 12°E) to refer to the corrective table in the last pages of the almanac.

Times in local time, to add an hour when it is in use daylight saving time

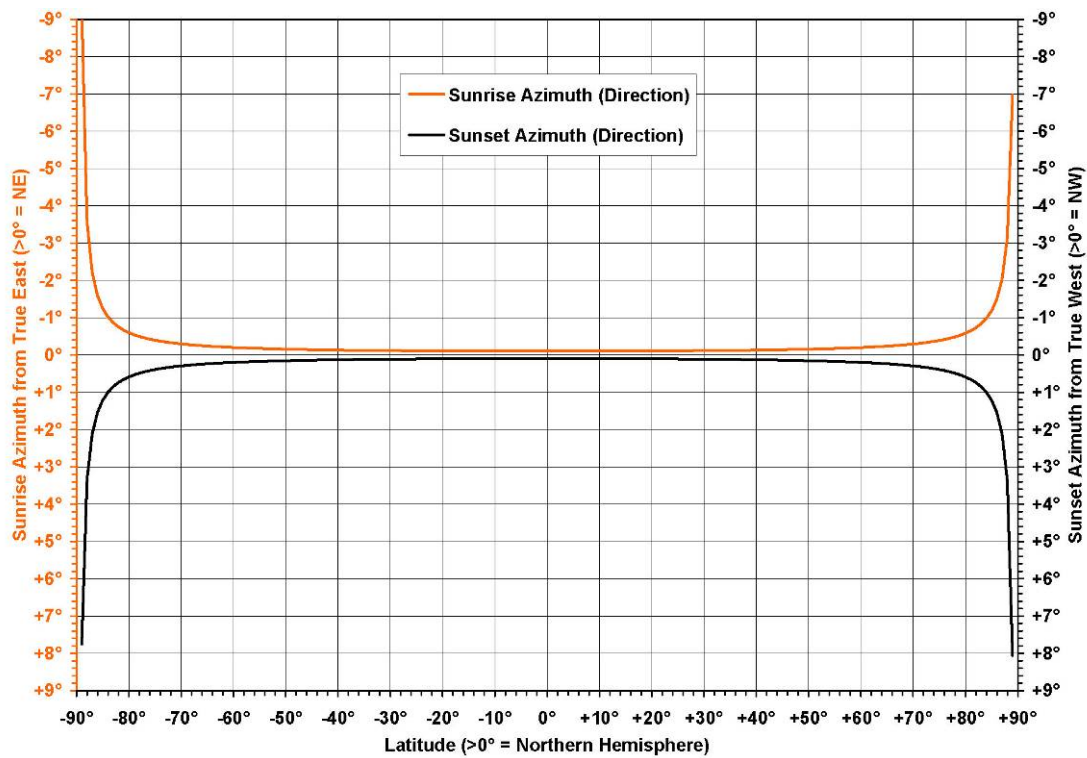
# DURATA DELLA LEVATA E DEL TRAMONTO

## DURATION OF THE SUNRISE AND OF THE SUNSET



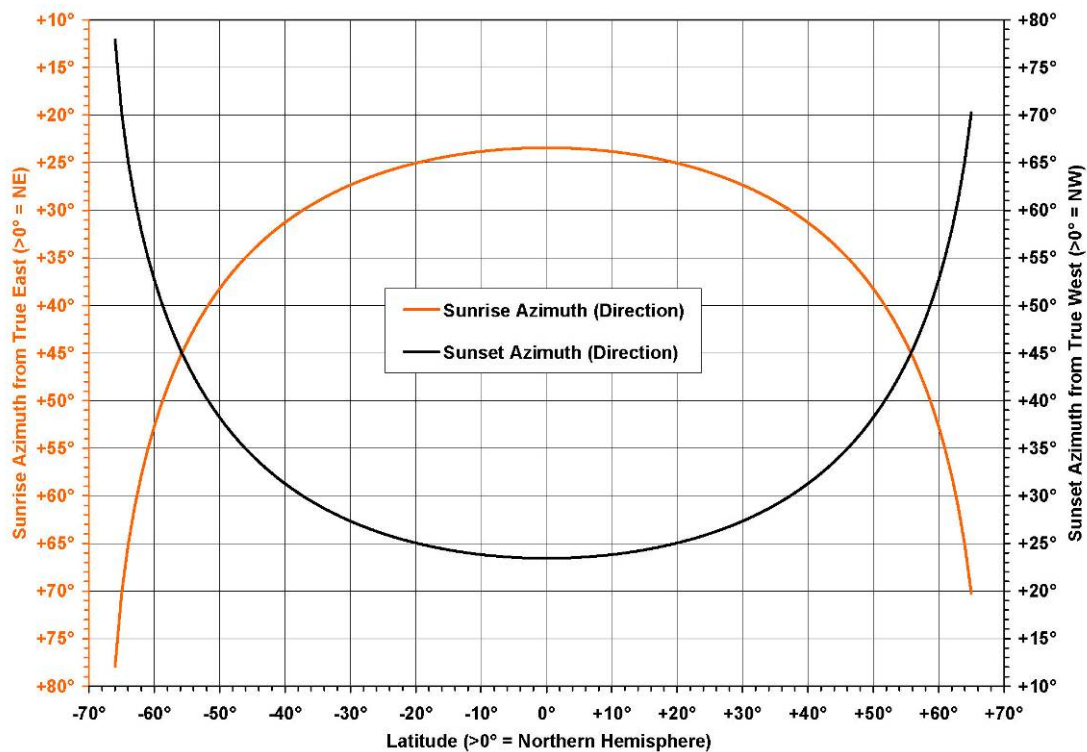
Il grafico mostra quanti minuti impiega il Sole per sorgere o tramontare alle varie latitudini

The graph shows how many minutes needs the Sun to rise or to set at the various latitudes



Posizione dell'azimut del Sole all'alba ed al tramonto, all'equinozio di primavera, alle varie latitudini, rispetto all'est ed all'ovest veri

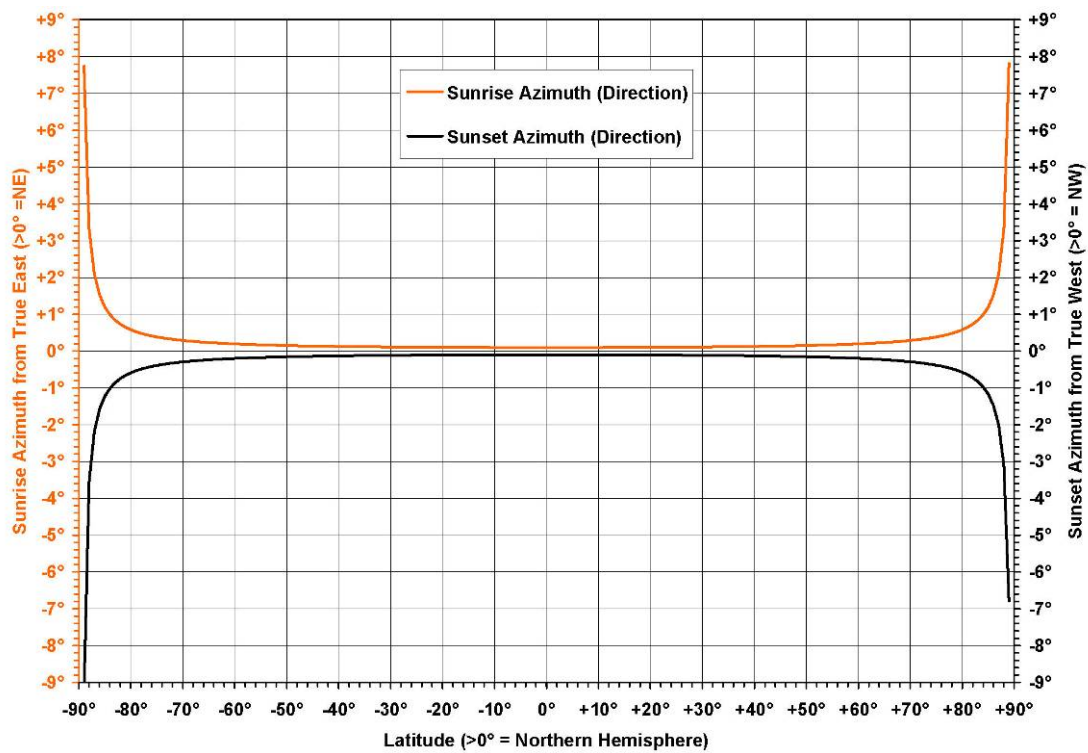
Position of the azimuth of the Sun at the rising and setting, at the spring equinox, at the various latitudes, in comparison to the true east and to the true west



Posizione dell'azimut del Sole all'alba ed al tramonto, al solstizio d'estate, alle varie latitudini, rispetto all'est ed all'ovest veri

Position of the azimuth of the Sun at the rising and setting, at the summer solstice, at the various latitudes, in comparison to the true east and to the true west



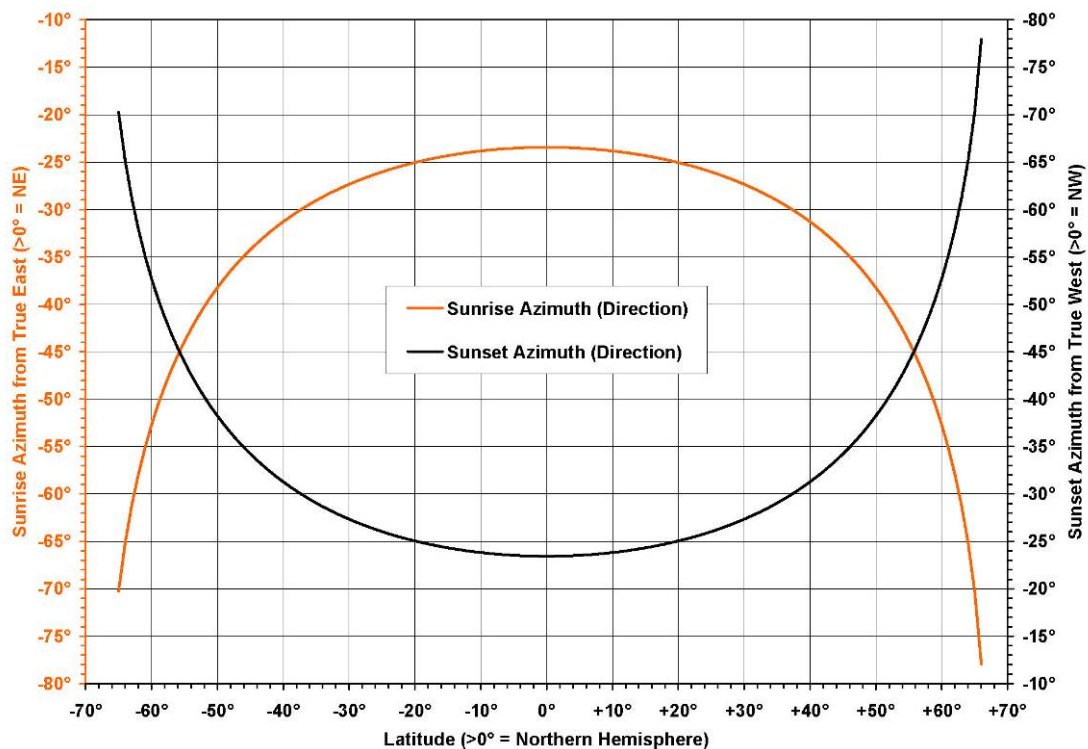


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/seasons/>

Posizione dell'azimut del Sole all'alba ed al tramonto, all'equinozio d'autunno, alle varie latitudini, rispetto all'est ed all'ovest veri

Position of the azimuth of the Sun at the rising and setting, at the autumn equinox, at the various latitudes, in comparison to the true east and to the true west

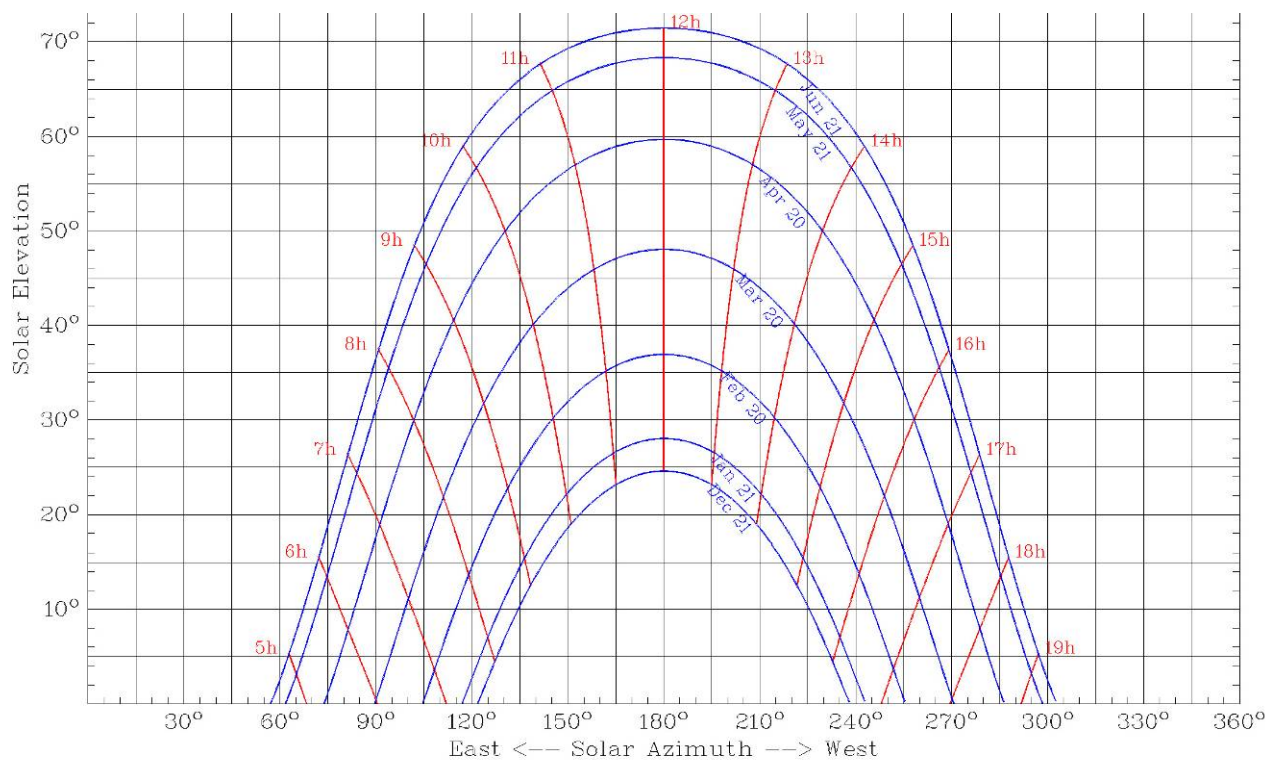


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/seasons/>

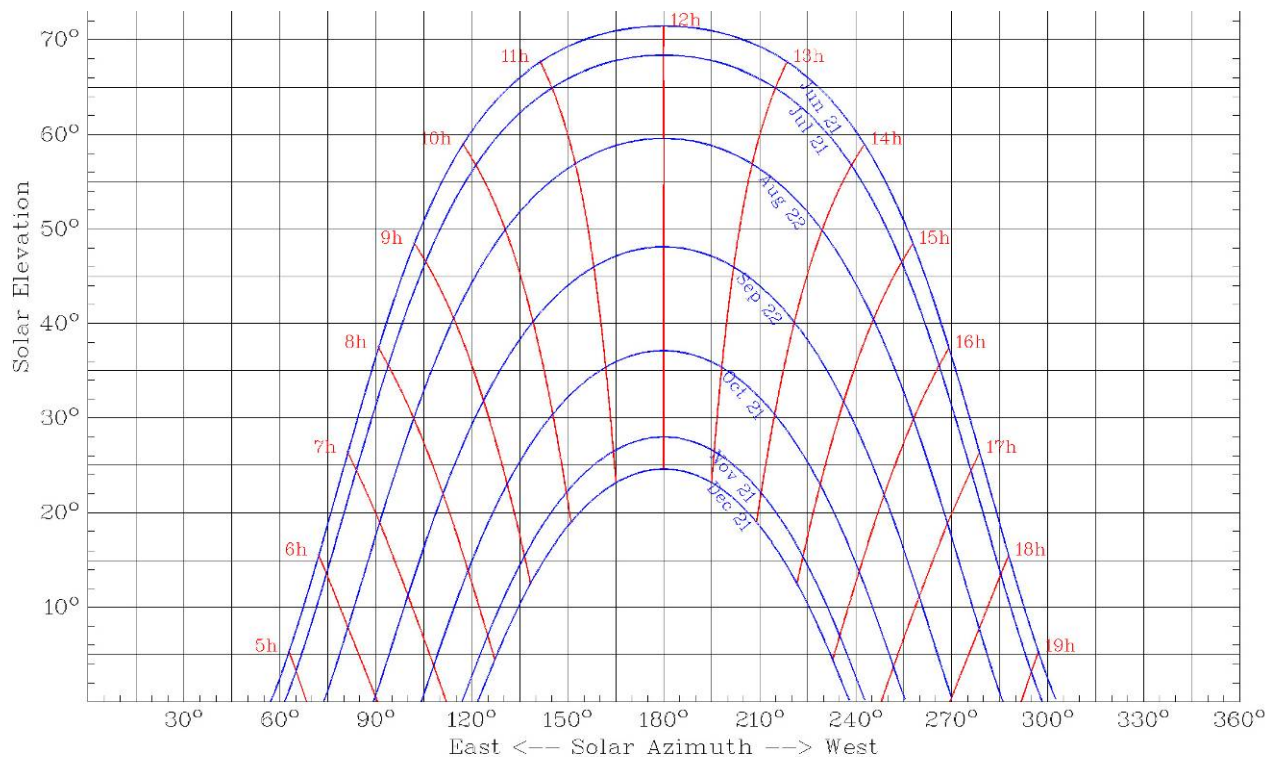
Posizione dell'azimut del Sole all'alba ed al tramonto, al solstizio d'inverno, alle varie latitudini, rispetto all'est ed all'ovest veri

Position of the azimuth of the Sun at the rising and setting, at the winter solstice, at the various latitudes, in comparison to the true east and to the true west



Altezza sull'orizzonte ed azimut del Sole per ogni mese ed ora, periodo gennaio-giugno  
Calcolato per Roma

Altitude and azimuth of the Sun above the horizon for each month and hour, january-june  
For Rome



Altezza sull'orizzonte ed azimut del Sole per ogni mese ed ora, periodo luglio-dicembre  
Calcolato per Roma

Altitude and azimuth of the Sun above the horizon for each month and hour, july-december  
For Rome

# CREPUSCOLI - TWILIGHTS

Longitude:E 12 00.0 Latitude:N 42 00.0 (Rome) Time Zone: UT+1

Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
	h m	h m	h m	h m	h m	h m
2011-01- 1	7 09	17 23	6 34	17 58	6 00	18 32
2011-01- 2	7 09	17 23	6 34	17 58	6 00	18 32
2011-01- 3	7 09	17 24	6 34	17 59	6 00	18 33
2011-01- 4	7 09	17 25	6 34	18 00	6 00	18 34
2011-01- 5	7 09	17 26	6 34	18 01	6 00	18 35
2011-01- 6	7 09	17 27	6 34	18 02	6 00	18 36
2011-01- 7	7 09	17 28	6 34	18 03	6 00	18 36
2011-01- 8	7 09	17 29	6 34	18 04	6 00	18 37
2011-01- 9	7 08	17 30	6 34	18 05	6 00	18 38
2011-01-10	7 08	17 31	6 34	18 06	6 00	18 39
2011-01-11	7 08	17 32	6 33	18 06	6 00	18 40
2011-01-12	7 08	17 33	6 33	18 07	6 00	18 41
2011-01-13	7 08	17 34	6 33	18 08	5 59	18 42
2011-01-14	7 07	17 35	6 33	18 09	5 59	18 43
2011-01-15	7 07	17 36	6 32	18 11	5 59	18 44
2011-01-16	7 07	17 37	6 32	18 12	5 59	18 45
2011-01-17	7 06	17 38	6 32	18 13	5 58	18 46
2011-01-18	7 06	17 39	6 31	18 14	5 58	18 47
2011-01-19	7 05	17 40	6 31	18 15	5 58	18 48
2011-01-20	7 05	17 42	6 30	18 16	5 57	18 49
2011-01-21	7 04	17 43	6 30	18 17	5 57	18 50
2011-01-22	7 03	17 44	6 29	18 18	5 56	18 51
2011-01-23	7 03	17 45	6 29	18 19	5 56	18 52
2011-01-24	7 02	17 46	6 28	18 20	5 55	18 53
2011-01-25	7 01	17 47	6 28	18 21	5 55	18 54
2011-01-26	7 01	17 49	6 27	18 22	5 54	18 55
2011-01-27	7 00	17 50	6 26	18 24	5 53	18 57
2011-01-28	6 59	17 51	6 25	18 25	5 53	18 58
2011-01-29	6 58	17 52	6 25	18 26	5 52	18 59
2011-01-30	6 57	17 53	6 24	18 27	5 51	19 00
2011-01-31	6 57	17 55	6 23	18 28	5 50	19 01
2011-02- 1	6 56	17 56	6 22	18 29	5 49	19 02
2011-02- 2	6 55	17 57	6 21	18 30	5 49	19 03
2011-02- 3	6 54	17 58	6 20	18 32	5 48	19 04
2011-02- 4	6 53	18 00	6 19	18 33	5 47	19 05
2011-02- 5	6 52	18 01	6 18	18 34	5 46	19 07
2011-02- 6	6 51	18 02	6 17	18 35	5 45	19 08
2011-02- 7	6 50	18 03	6 16	18 36	5 44	19 09
2011-02- 8	6 48	18 04	6 15	18 37	5 43	19 10
2011-02- 9	6 47	18 06	6 14	18 39	5 42	19 11
2011-02-10	6 46	18 07	6 13	18 40	5 41	19 12
2011-02-11	6 45	18 08	6 12	18 41	5 40	19 13
2011-02-12	6 44	18 09	6 11	18 42	5 38	19 15
2011-02-13	6 42	18 11	6 10	18 43	5 37	19 16
2011-02-14	6 41	18 12	6 08	18 44	5 36	19 17
2011-02-15	6 40	18 13	6 07	18 46	5 35	19 18
2011-02-16	6 39	18 14	6 06	18 47	5 34	19 19
2011-02-17	6 37	18 15	6 05	18 48	5 32	19 20
2011-02-18	6 36	18 17	6 03	18 49	5 31	19 22
2011-02-19	6 35	18 18	6 02	18 50	5 30	19 23
2011-02-20	6 33	18 19	6 01	18 51	5 28	19 24
2011-02-21	6 32	18 20	5 59	18 53	5 27	19 25
2011-02-22	6 30	18 21	5 58	18 54	5 26	19 26
2011-02-23	6 29	18 23	5 56	18 55	5 24	19 27
2011-02-24	6 27	18 24	5 55	18 56	5 23	19 28
2011-02-25	6 26	18 25	5 54	18 57	5 21	19 30
2011-02-26	6 24	18 26	5 52	18 58	5 20	19 31
2011-02-27	6 23	18 27	5 51	19 00	5 18	19 32
2011-02-28	6 21	18 28	5 49	19 01	5 17	19 33
2011-03- 1	6 20	18 30	5 48	19 02	5 15	19 34
2011-03- 2	6 18	18 31	5 46	19 03	5 14	19 36
2011-03- 3	6 17	18 32	5 44	19 04	5 12	19 37
2011-03- 4	6 15	18 33	5 43	19 05	5 11	19 38
2011-03- 5	6 14	18 34	5 41	19 07	5 09	19 39
2011-03- 6	6 12	18 35	5 40	19 08	5 07	19 40
2011-03- 7	6 10	18 37	5 38	19 09	5 06	19 41
2011-03- 8	6 09	18 38	5 36	19 10	5 04	19 43
2011-03- 9	6 07	18 39	5 35	19 11	5 02	19 44
2011-03-10	6 05	18 40	5 33	19 12	5 01	19 45
2011-03-11	6 04	18 41	5 31	19 14	4 59	19 46
2011-03-12	6 02	18 42	5 30	19 15	4 57	19 48
2011-03-13	6 00	18 44	5 28	19 16	4 55	19 49
2011-03-14	5 59	18 45	5 26	19 17	4 54	19 50
2011-03-15	5 57	18 46	5 25	19 18	4 52	19 51
2011-03-16	5 55	18 47	5 23	19 19	4 50	19 52
2011-03-17	5 54	18 48	5 21	19 21	4 48	19 54
2011-03-18	5 52	18 49	5 19	19 22	4 46	19 55
2011-03-19	5 50	18 50	5 18	19 23	4 45	19 56
2011-03-20	5 48	18 52	5 16	19 24	4 43	19 57
2011-03-21	5 47	18 53	5 14	19 25	4 41	19 59
2011-03-22	5 45	18 54	5 12	19 27	4 39	20 00
2011-03-23	5 43	18 55	5 11	19 28	4 37	20 01
2011-03-24	5 41	18 56	5 09	19 29	4 35	20 03
2011-03-25	5 40	18 57	5 07	19 30	4 33	20 04
2011-03-26	5 38	18 58	5 05	19 31	4 31	20 05
2011-03-27	5 36	19 00	5 03	19 33	4 29	20 07
2011-03-28	5 34	19 01	5 01	19 34	4 28	20 08

Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
	h m	h m	h m	h m	h m	h m
2011-03-29	5 33	19 02	5 00	19 35	4 26	20 09
2011-03-30	5 31	19 03	4 58	19 36	4 24	20 11
2011-03-31	5 29	19 04	4 56	19 37	4 22	20 12
2011-04- 1	5 28	19 05	4 54	19 39	4 20	20 13
2011-04- 2	5 26	19 06	4 52	19 40	4 18	20 15
2011-04- 3	5 24	19 08	4 51	19 41	4 16	20 16
2011-04- 4	5 22	19 09	4 49	19 42	4 14	20 17
2011-04- 5	5 21	19 10	4 47	19 44	4 12	20 19
2011-04- 6	5 19	19 11	4 45	19 45	4 10	20 20
2011-04- 7	5 17	19 12	4 43	19 46	4 08	20 22
2011-04- 8	5 15	19 13	4 41	19 47	4 06	20 23
2011-04- 9	5 14	19 15	4 40	19 49	4 04	20 25
2011-04-10	5 12	19 16	4 38	19 50	4 02	20 26
2011-04-11	5 10	19 17	4 36	19 51	4 00	20 27
2011-04-12	5 09	19 18	4 34	19 53	3 58	20 29
2011-04-13	5 07	19 19	4 32	19 54	3 56	20 30
2011-04-14	5 05	19 20	4 31	19 55	3 54	20 32
2011-04-15	5 03	19 22	4 29	19 57	3 52	20 33
2011-04-16	5 02	19 23	4 27	19 58	3 50	20 35
2011-04-17	5 00	19 24	4 25	19 59	3 48	20 36
2011-04-18	4 59	19 25	4 23	20 00	3 46	20 38
2011-04-19	4 57	19 26	4 22	20 02	3 44	20 40
2011-04-20	4 55	19 28	4 20	20 03	3 42	20 41
2011-04-21	4 54	19 29	4 18	20 04	3 40	20 43
2011-04-22	4 52	19 30	4 16	20 06	3 38	20 44
2011-04-23	4 50	19 31	4 15	20 07	3 36	20 46
2011-04-24	4 49	19 32	4 13	20 09	3 34	20 47
2011-04-25	4 47	19 34	4 11	20 10	3 32	20 49
2011-04-26	4 46	19 35	4 09	20 11	3 30	20 51
2011-04-27	4 44	19 36	4 08	20 13	3 28	20 52
2011-04-28	4 43	19 37	4 06	20 14	3 26	20 54
2011-04-29	4 41	19 38	4 04	20 15	3 25	20 56
2011-04-30	4 40	19 40	4 03	20 17	3 23	20 57
2011-05- 1	4 38	19 41	4 01	20 18	3 21	20 59
2011-05- 2	4 37	19 42	4 00	20 19	3 19	21 00
2011-05- 3	4 35	19 43	3 58	20 21	3 17	21 02
2011-05- 4	4 34	19 44	3 56	20 22	3 15	21 04
2011-05- 5	4 33	19 46	3 55	20 24	3 13	21 05
2011-05- 6	4 31	19 47	3 53	20 25	3 11	21 07
2011-05- 7	4 30	19 48	3 52	20 26	3 10	21 09
2011-05- 8	4 29	19 49	3 50	20 28	3 08	21 11
2011-05- 9	4 27	19 50	3 49	20 29	3 06	21 12
2011-05-10	4 26	19 51	3 47	20 30	3 04	21 14
2011-05-11	4 25	19 53	3 46	20 32	3 03	21 16
2011-05-12	4 24	19 54	3 45	20 33	3 01	21 17
2011-05-13	4 23	19 55	3 43	20 34	2 59	21 19
2011-05-14	4 21	19 56	3 42	20 36	2 57	21 21
2011-05-15	4 20	19 57	3 41	20 37	2 56	21 22
2011-05-16	4 19	19 58	3 39	20 38	2 54	21 24
2011-05-17	4 18	19 59	3 38	20 40	2 53	21 25
2011-05-18	4 17	20 01	3 37	20 41	2 51	21 27
2011-05-19	4 16	20 02	3 35	20 42	2 49	21 29
2011-05-20	4 15	20 03	3 34	20 44	2 48	21 30
2011-05-21	4 14	20 04	3 33	20 45	2 46	21 32
2011-05-22	4 13	20 05	3 32	20 46	2 45	21 33
2011-05-23	4 12	20 06	3 31	20 47	2 44	21 35
2011-05-24	4 11	20 07	3 30	20 48	2 42	21 37
2011-05-25	4 10	20 08	3 29	20 50	2 41	21 38
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2011-05-27	4 09	20 10	3 27	20 52	2 38	21 41
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2011-05-29	4 08	20 12	3 25	20 54	2 36	21 44
2011-05-30	4 07	20 13	3 24	20 55	2 35	21 45
2011-05-31	4 06	20 14	3 24	20 56	2 34	21 47
2011-06- 1	4 06	20 14	3 23	20 57	2 33	21 48
2011-06- 2	4 05	20 15	3 22	20 58	2 32	21 49
2011-06- 3	4 05	20 16	3 22	20 59	2 31	21 50
2011-06- 4	4 04	20 17	3 21	21 00	2 30	21 52
2011-06- 5	4 04	20 18	3 20	21 01	2 29	21 53
2011-06- 6	4 03	20 18	3 20	21 02	2 28	21 54
2011-06- 7	4 03	20 19	3 19	21 03	2 27	21 55
2011-06- 8	4 03	20 20	3 19	21 04	2 27	21 56
2011-06- 9	4 02	20 20	3 19	21 04	2 26	21 57
2011-06-10	4 02	20 21	3 18	21 05	2 26	21 58
2011-06-11	4 02	20 22	3 18	21 06	2 25	21 59
2011-06-12	4 02	20 22	3 18	21 06	2 25	21 59
2011-06-13	4 02	20 23	3 17	21 07	2 24	22 00
2011-06-14	4 01	20 23	3 17	21 07	2 24	22 01
2011-06-15	4 01	20 24	3 17	21 08	2 24	22 01
2011-06-16	4 01	20 24	3 17	21 08	2 24	22 02
2011-06-17	4 01	20 24	3 17	21 09	2 23	22 03
2011-06-18	4 02	20 25	3 17	21 09	2 23	22 03
2011-06-19	4 02	20 25	3 17	21 09	2 23	22 03
2011-06-20	4 02	20 25	3 17	21 10	2 23	22 04
2011-06-21	4 02	20 26	3 17	21 10	2 24	22 04
2011-06-22	4 02	20 26	3 18	21 10	2 24	22 04
2011-06-23	4 02	20 26	3 18	21 10	2 24	22 04
2011-06-24	4 03	20 26	3 18	21 10	2 24	22 04
2011-06-25	4 03	20 26	3 19	21 10	2 25	22 04
2011-06-26	4 03	20 26	3 19	21 10	2 25	22 04
2011-06-27	4 04	20 26	3 19	21 10	2 26	22 04
2011-06-28	4 04	20 26	3 20	21 10	2 26	22 04
2011-06-29	4 05	20 26	3 20	21 10	2 27	22 03
2011-06-30	4 05	20 26	3 21	21 10	2 28	22 03

Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
	h m	h m	h m	h m	h m	h m
2011-07- 1	4 06	20 26	3 22	21 10	2 28	22 03
2011-07- 2	4 06	20 26	3 22	21 09	2 29	22 02
2011-07- 3	4 07	20 25	3 23	21 09	2 30	22 02
2011-07- 4	4 07	20 25	3 24	21 09	2 31	22 01
2011-07- 5	4 08	20 25	3 24	21 08	2 32	22 00
2011-07- 6	4 09	20 24	3 25	21 08	2 33	22 00
2011-07- 7	4 09	20 24	3 26	21 07	2 34	21 59
2011-07- 8	4 10	20 24	3 27	21 07	2 35	21 58
2011-07- 9	4 11	20 23	3 28	21 06	2 36	21 57
2011-07-10	4 12	20 23	3 29	21 06	2 38	21 56
2011-07-11	4 12	20 22	3 30	21 05	2 39	21 55
2011-07-12	4 13	20 21	3 30	21 04	2 40	21 54
2011-07-13	4 14	20 21	3 31	21 03	2 41	21 53
2011-07-14	4 15	20 20	3 33	21 03	2 43	21 52
2011-07-15	4 16	20 19	3 34	21 02	2 44	21 51
2011-07-16	4 17	20 19	3 35	21 01	2 45	21 50
2011-07-17	4 18	20 18	3 36	21 00	2 47	21 48
2011-07-18	4 19	20 17	3 37	20 59	2 48	21 47
2011-07-19	4 20	20 16	3 38	20 58	2 50	21 46
2011-07-20	4 21	20 15	3 39	20 57	2 51	21 44
2011-07-21	4 22	20 15	3 40	20 56	2 53	21 43
2011-07-22	4 23	20 14	3 41	20 55	2 54	21 42
2011-07-23	4 24	20 13	3 43	20 53	2 56	21 40
2011-07-24	4 25	20 12	3 44	20 52	2 57	21 39
2011-07-25	4 26	20 11	3 45	20 51	2 59	21 37
2011-07-26	4 27	20 10	3 46	20 50	3 00	21 35
2011-07-27	4 28	20 09	3 48	20 49	3 02	21 34
2011-07-28	4 29	20 07	3 49	20 47	3 04	21 32
2011-07-29	4 30	20 06	3 50	20 46	3 05	21 31
2011-07-30	4 31	20 05	3 51	20 45	3 07	21 29
2011-07-31	4 32	20 04	3 53	20 43	3 08	21 27
2011-08- 1	4 33	20 03	3 54	20 42	3 10	21 25
2011-08- 2	4 34	20 01	3 55	20 40	3 12	21 24
2011-08- 3	4 36	20 00	3 57	20 39	3 13	21 22
2011-08- 4	4 37	19 59	3 58	20 37	3 15	21 20
2011-08- 5	4 38	19 58	3 59	20 36	3 17	21 18
2011-08- 6	4 39	19 56	4 01	20 34	3 18	21 16
2011-08- 7	4 40	19 55	4 02	20 33	3 20	21 15
2011-08- 8	4 41	19 53	4 03	20 31	3 21	21 13
2011-08- 9	4 42	19 52	4 04	20 30	3 23	21 11
2011-08-10	4 43	19 51	4 06	20 28	3 25	21 09
2011-08-11	4 45	19 49	4 07	20 26	3 26	21 07
2011-08-12	4 46	19 48	4 08	20 25	3 28	21 05
2011-08-13	4 47	19 46	4 10	20 23	3 29	21 03
2011-08-14	4 48	19 45	4 11	20 21	3 31	21 01
2011-08-15	4 49	19 43	4 12	20 20	3 32	20 59
2011-08-16	4 50	19 42	4 14	20 18	3 34	20 57
2011-08-17	4 51	19 40	4 15	20 16	3 36	20 55
2011-08-18	4 53	19 38	4 16	20 15	3 37	20 53
2011-08-19	4 54	19 37	4 18	20 13	3 39	20 51
2011-08-20	4 55	19 35	4 19	20 11	3 40	20 50
2011-08-21	4 56	19 34	4 20	20 09	3 42	20 48
2011-08-22	4 57	19 32	4 21	20 08	3 43	20 46
2011-08-23	4 58	19 30	4 23	20 06	3 45	20 44
2011-08-24	4 59	19 29	4 24	20 04	3 46	20 42
2011-08-25	5 00	19 27	4 25	20 02	3 48	20 39
2011-08-26	5 02	19 25	4 26	20 00	3 49	20 37
2011-08-27	5 03	19 24	4 28	19 59	3 51	20 35
2011-08-28	5 04	19 22	4 29	19 57	3 52	20 33
2011-08-29	5 05	19 20	4 30	19 55	3 53	20 31
2011-08-30	5 06	19 19	4 31	19 53	3 55	20 29
2011-08-31	5 07	19 17	4 33	19 51	3 56	20 27
2011-09- 1	5 08	19 15	4 34	19 49	3 58	20 25
2011-09- 2	5 09	19 13	4 35	19 48	3 59	20 23
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2011-09- 4	5 12	19 10	4 37	19 44	4 02	20 19
2011-09- 5	5 13	19 08	4 39	19 42	4 03	20 17
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2011-09- 8	5 16	19 03	4 42	19 36	4 07	20 11
2011-09- 9	5 17	19 01	4 43	19 35	4 08	20 09
2011-09-10	5 18	18 59	4 45	19 33	4 10	20 07
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2011-09-12	5 20	18 56	4 47	19 29	4 12	20 03
2011-09-13	5 21	18 54	4 48	19 27	4 14	20 01
2011-09-14	5 22	18 52	4 49	19 25	4 15	19 59
2011-09-15	5 23	18 50	4 50	19 23	4 16	19 57
2011-09-16	5 24	18 49	4 51	19 22	4 17	19 55
2011-09-17	5 26	18 47	4 53	19 20	4 19	19 54
2011-09-18	5 27	18 45	4 54	19 18	4 20	19 52
2011-09-19	5 28	18 43	4 55	19 16	4 21	19 50
2011-09-20	5 29	18 42	4 56	19 14	4 22	19 48
2011-09-21	5 30	18 40	4 57	19 12	4 24	19 46
2011-09-22	5 31	18 38	4 58	19 11	4 25	19 44
2011-09-23	5 32	18 36	4 59	19 09	4 26	19 42
2011-09-24	5 33	18 34	5 00	19 07	4 27	19 40
2011-09-25	5 34	18 33	5 02	19 05	4 28	19 38
2011-09-26	5 35	18 31	5 03	19 03	4 29	19 36
2011-09-27	5 36	18 29	5 04	19 02	4 31	19 35
2011-09-28	5 37	18 27	5 05	19 00	4 32	19 33
2011-09-29	5 38	18 26	5 06	18 58	4 33	19 31
2011-09-30	5 39	18 24	5 07	18 56	4 34	19 29
2011-10- 1	5 41	18 22	5 08	18 55	4 35	19 27
2011-10- 2	5 42	18 21	5 09	18 53	4 36	19 26

Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
	h m	h m	h m	h m	h m	h m
2011-10- 3	5 43	18 19	5 10	18 51	4 38	19 24
2011-10- 4	5 44	18 17	5 11	18 49	4 39	19 22
2011-10- 5	5 45	18 16	5 12	18 48	4 40	19 20
2011-10- 6	5 46	18 14	5 14	18 46	4 41	19 19
2011-10- 7	5 47	18 12	5 15	18 44	4 42	19 17
2011-10- 8	5 48	18 11	5 16	18 43	4 43	19 15
2011-10- 9	5 49	18 09	5 17	18 41	4 44	19 14
2011-10-10	5 50	18 07	5 18	18 40	4 45	19 12
2011-10-11	5 51	18 06	5 19	18 38	4 47	19 10
2011-10-12	5 52	18 04	5 20	18 36	4 48	19 09
2011-10-13	5 54	18 02	5 21	18 35	4 49	19 07
2011-10-14	5 55	18 01	5 22	18 33	4 50	19 05
2011-10-15	5 56	17 59	5 23	18 32	4 51	19 04
2011-10-16	5 57	17 58	5 24	18 30	4 52	19 02
2011-10-17	5 58	17 56	5 26	18 29	4 53	19 01
2011-10-18	5 59	17 55	5 27	18 27	4 54	18 59
2011-10-19	6 00	17 53	5 28	18 26	4 55	18 58
2011-10-20	6 01	17 52	5 29	18 24	4 56	18 56
2011-10-21	6 02	17 50	5 30	18 23	4 58	18 55
2011-10-22	6 04	17 49	5 31	18 21	4 59	18 54
2011-10-23	6 05	17 47	5 32	18 20	5 00	18 52
2011-10-24	6 06	17 46	5 33	18 19	5 01	18 51
2011-10-25	6 07	17 45	5 34	18 17	5 02	18 50
2011-10-26	6 08	17 43	5 35	18 16	5 03	18 48
2011-10-27	6 09	17 42	5 37	18 15	5 04	18 47
2011-10-28	6 10	17 41	5 38	18 13	5 05	18 46
2011-10-29	6 12	17 39	5 39	18 12	5 06	18 45
2011-10-30	6 13	17 38	5 40	18 11	5 07	18 43
2011-10-31	6 14	17 37	5 41	18 10	5 08	18 42
2011-11- 1	6 15	17 36	5 42	18 09	5 10	18 41
2011-11- 2	6 16	17 34	5 43	18 07	5 11	18 40
2011-11- 3	6 17	17 33	5 44	18 06	5 12	18 39
2011-11- 4	6 18	17 32	5 45	18 05	5 13	18 38
2011-11- 5	6 20	17 31	5 46	18 04	5 14	18 37
2011-11- 6	6 21	17 30	5 48	18 03	5 15	18 36
2011-11- 7	6 22	17 29	5 49	18 02	5 16	18 35
2011-11- 8	6 23	17 28	5 50	18 01	5 17	18 34
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2011-11-10	6 25	17 26	5 52	17 59	5 19	18 32
2011-11-11	6 27	17 25	5 53	17 58	5 20	18 31
2011-11-12	6 28	17 24	5 54	17 57	5 21	18 30
2011-11-13	6 29	17 23	5 55	17 57	5 22	18 30
2011-11-14	6 30	17 22	5 56	17 56	5 23	18 29
2011-11-15	6 31	17 21	5 57	17 55	5 25	18 28
2011-11-16	6 32	17 21	5 59	17 54	5 26	18 27
2011-11-17	6 34	17 20	6 00	17 54	5 27	18 27
2011-11-18	6 35	17 19	6 01	17 53	5 28	18 26
2011-11-19	6 36	17 18	6 02	17 52	5 29	18 25
2011-11-20	6 37	17 18	6 03	17 52	5 30	18 25
2011-11-21	6 38	17 17	6 04	17 51	5 31	18 24
2011-11-22	6 39	17 16	6 05	17 51	5 32	18 24
2011-11-23	6 40	17 16	6 06	17 50	5 33	18 23
2011-11-24	6 41	17 15	6 07	17 50	5 34	18 23
2011-11-25	6 42	17 15	6 08	17 49	5 35	18 23
2011-11-26	6 44	17 14	6 09	17 49	5 36	18 22
2011-11-27	6 45	17 14	6 10	17 48	5 37	18 22
2011-11-28	6 46	17 14	6 11	17 48	5 38	18 22
2011-11-29	6 47	17 13	6 12	17 48	5 39	18 21
2011-11-30	6 48	17 13	6 13	17 48	5 40	18 21
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2011-12- 2	6 50	17 13	6 15	17 47	5 41	18 21
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2011-12- 4	6 52	17 12	6 17	17 47	5 43	18 21
2011-12- 5	6 53	17 12	6 18	17 47	5 44	18 21
2011-12- 6	6 54	17 12	6 19	17 47	5 45	18 21
2011-12- 7	6 54	17 12	6 20	17 47	5 46	18 21
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2011-12-11	6 58	17 12	6 23	17 47	5 49	18 21
2011-12-12	6 59	17 12	6 24	17 47	5 50	18 21
2011-12-13	6 59	17 12	6 24	17 48	5 50	18 22
2011-12-14	7 00	17 13	6 25	17 48	5 51	18 22
2011-12-15	7 01	17 13	6 26	17 48	5 52	18 22
2011-12-16	7 02	17 13	6 26	17 48	5 52	18 22
2011-12-17	7 02	17 13	6 27	17 49	5 53	18 23
2011-12-18	7 03	17 14	6 28	17 49	5 54	18 23
2011-12-19	7 03	17 14	6 28	17 49	5 54	18 24
2011-12-20	7 04	17 15	6 29	17 50	5 55	18 24
2011-12-21	7 05	17 15	6 29	17 50	5 55	18 24
2011-12-22	7 05	17 16	6 30	17 51	5 56	18 25
2011-12-23	7 06	17 16	6 30	17 51	5 56	18 25
2011-12-24	7 06	17 17	6 31	17 52	5 57	18 26
2011-12-25	7 06	17 17	6 31	17 53	5 57	18 27
2011-12-26	7 07	17 18	6 32	17 53	5 58	18 27
2011-12-27	7 07	17 19	6 32	17 54	5 58	18 28
2011-12-28	7 08	17 19	6 32	17 54	5 58	18 28
2011-12-29	7 08	17 20	6 33	17 55	5 59	18 29
2011-12-30	7 08	17 21	6 33	17 56	5 59	18 30
2011-12-31	7 08	17 22	6 33	17 57	5 59	18 31

Longitude = longitudine  
 Latitude = latitudine  
 Time Zone = fuso orario  
 Date = data nel formato anno/mese/giorno  
 Civil = civile  
 Nautical = nautico  
 Astronomical = astronomico  
 Morning = mattino  
 Evening = sera  
 Data nel formato aaaa/mm/gg

Tempi in T.U.+1, aggiungere un'ora quando si adotta l'ora legale

Times in local time, to add an hour when it is in use daylight saving time

© (1)

## DURATA DEL GIORNO - DURATION OF THE DAY

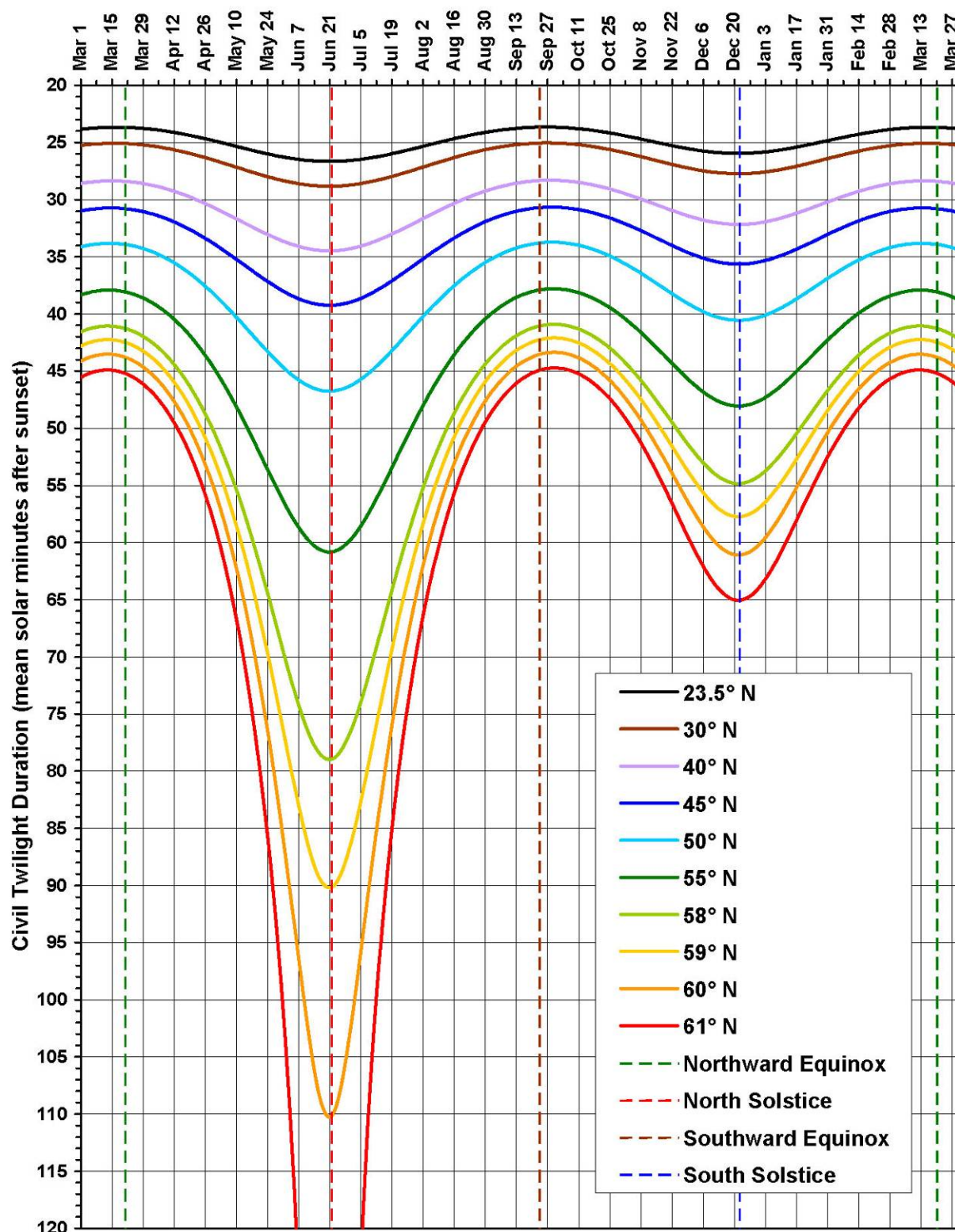
### 42°N - 12°E

G	Gen.	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
D	Jan.	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
01	09:11	10:02	11:14	12:42	14:02	15:02	15:11	14:26	13:09	11:45	10:22	09:21
02	09:12	10:04	11:17	12:45	14:05	15:03	15:11	14:24	13:06	11:43	10:20	09:20
03	09:13	10:06	11:20	12:48	14:07	15:04	15:10	14:21	13:03	11:40	10:17	09:19
04	09:14	10:09	11:23	12:50	14:09	15:05	15:09	14:19	13:01	11:37	10:15	09:18
05	09:15	10:11	11:26	12:53	14:12	15:06	15:08	14:17	12:58	11:34	10:12	09:16
06	09:16	10:13	11:28	12:56	14:14	15:07	15:07	14:15	12:55	11:32	10:10	09:15
07	09:17	10:16	11:31	12:59	14:16	15:08	15:06	14:12	12:52	11:29	10:07	09:14
08	09:18	10:18	11:34	13:02	14:19	15:09	15:05	14:10	12:50	11:26	10:05	09:13
09	09:19	10:21	11:37	13:04	14:21	15:10	15:04	14:08	12:47	11:23	10:03	09:13
10	09:20	10:23	11:40	13:07	14:23	15:11	15:03	14:05	12:44	11:20	10:01	09:12
11	09:22	10:26	11:42	13:10	14:25	15:11	15:02	14:03	12:41	11:18	09:58	09:11
12	09:23	10:29	11:45	13:13	14:27	15:12	15:01	14:00	12:39	11:15	09:56	09:10
13	09:25	10:31	11:48	13:15	14:29	15:12	14:59	13:58	12:36	11:12	09:54	09:10
14	09:26	10:34	11:51	13:18	14:32	15:13	14:58	13:56	12:33	11:09	09:52	09:09
15	09:28	10:36	11:54	13:21	14:34	15:13	14:57	13:53	12:30	11:07	09:50	09:08
16	09:29	10:39	11:57	13:23	14:36	15:14	14:55	13:51	12:27	11:04	09:48	09:08
17	09:31	10:42	12:00	13:26	14:38	15:14	14:54	13:48	12:25	11:01	09:45	09:08
18	09:33	10:44	12:02	13:29	14:39	15:14	14:52	13:46	12:22	10:59	09:43	09:07
19	09:35	10:47	12:05	13:31	14:41	15:14	14:50	13:43	12:19	10:56	09:41	09:07
20	09:36	10:50	12:08	13:34	14:43	15:15	14:49	13:40	12:16	10:53	09:40	09:07
21	09:38	10:52	12:11	13:37	14:45	15:15	14:47	13:38	12:13	10:50	09:38	09:07
22	09:40	10:55	12:14	13:39	14:47	15:15	14:45	13:35	12:11	10:48	09:36	09:07
23	09:42	10:58	12:17	13:42	14:48	15:14	14:43	13:33	12:08	10:45	09:34	09:07
24	09:44	11:01	12:19	13:45	14:50	15:14	14:42	13:30	12:05	10:43	09:32	09:07
25	09:46	11:03	12:22	13:47	14:52	15:14	14:40	13:27	12:02	10:40	09:31	09:07
26	09:48	11:06	12:25	13:50	14:53	15:14	14:38	13:25	11:59	10:37	09:29	09:08
27	09:50	11:09	12:28	13:52	14:55	15:13	14:36	13:22	11:57	10:35	09:27	09:08
28	09:53	11:12	12:31	13:55	14:56	15:13	14:34	13:20	11:54	10:32	09:26	09:08
29	09:55		12:34	13:57	14:58	15:12	14:32	13:17	11:51	10:30	09:24	09:09
30	09:57		12:36	14:00	14:59	15:12	14:30	13:14	11:48	10:27	09:23	09:10
31	09:59		12:39		15:01		14:28	13:11		10:24		09:10



# DURATA DEI CREPUSCOLI

## DURATION OF THE TWILIGHTS



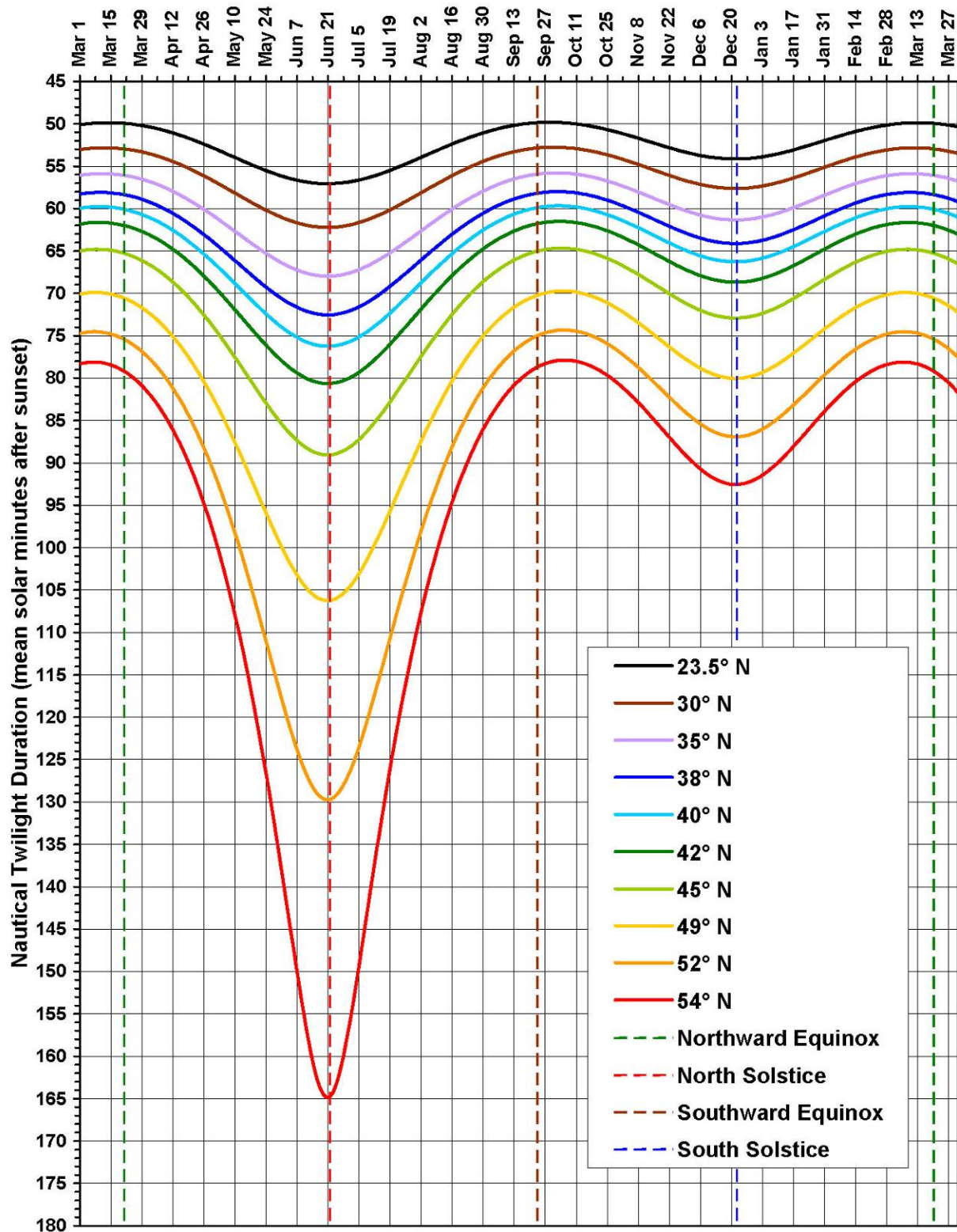
Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/twilight/>

Durata in minuti del crepuscolo civile alle varie latitudini, emisfero nord.  
(I grafici dei crepuscoli per alba e tramonto, o per l'emisfero sud, sono simmetrici o capovolti)

Duration of the civil twilight for every latitude, north hemisphere.  
(The graphics for dawn and sunset, or for south hemisphere, are simmetrical or upside-down)



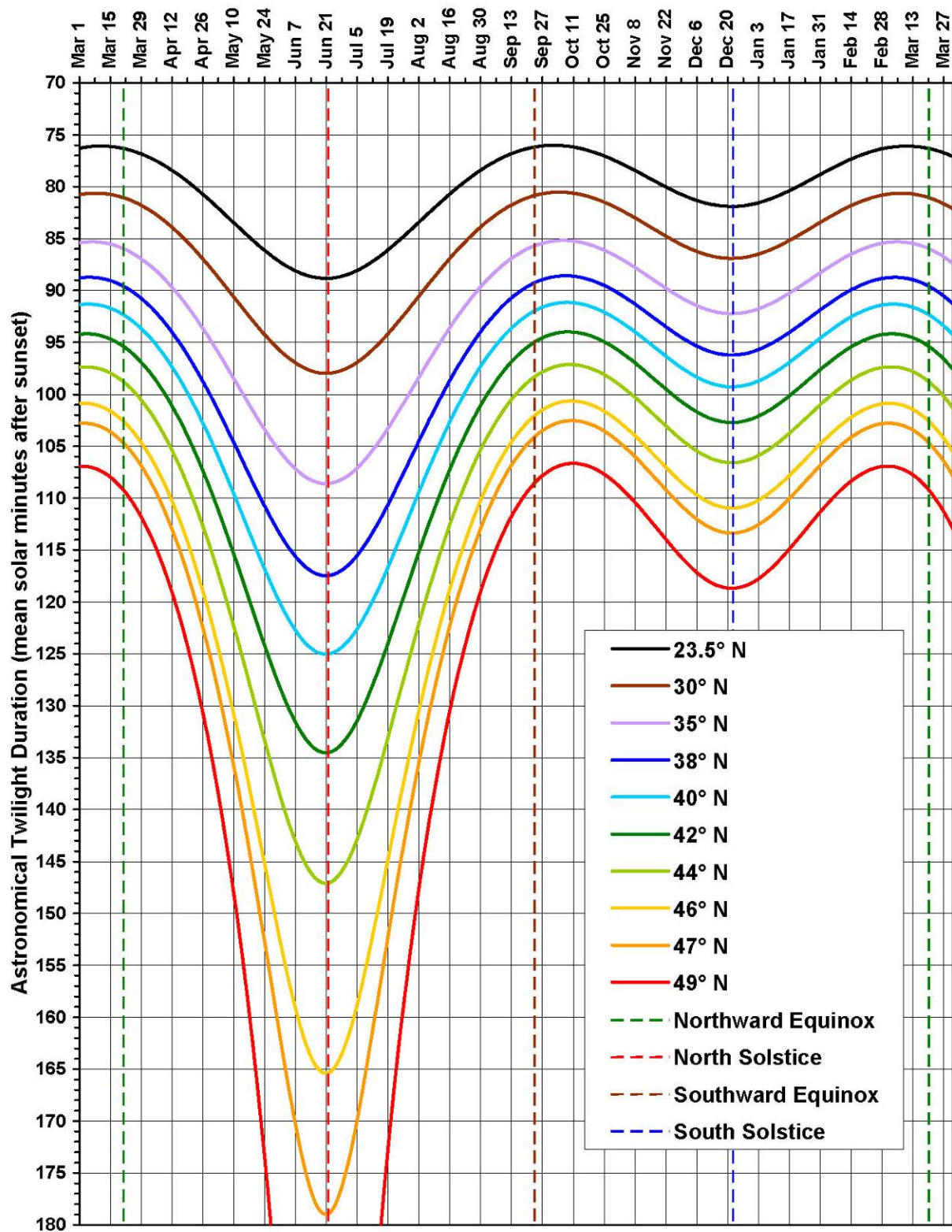


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/twilight/>

Durata in minuti del crepuscolo nautico alle varie latitudini, emisfero nord.  
(I grafici dei crepuscoli per alba e tramonto, o per l'emisfero sud, sono simmetrici o capovolti)

Duration of the nautical twilight for every latitude, north hemisphere.  
(The graphics for dawn and sunset, of for south hemisphere, are simmetrical or upside-down)

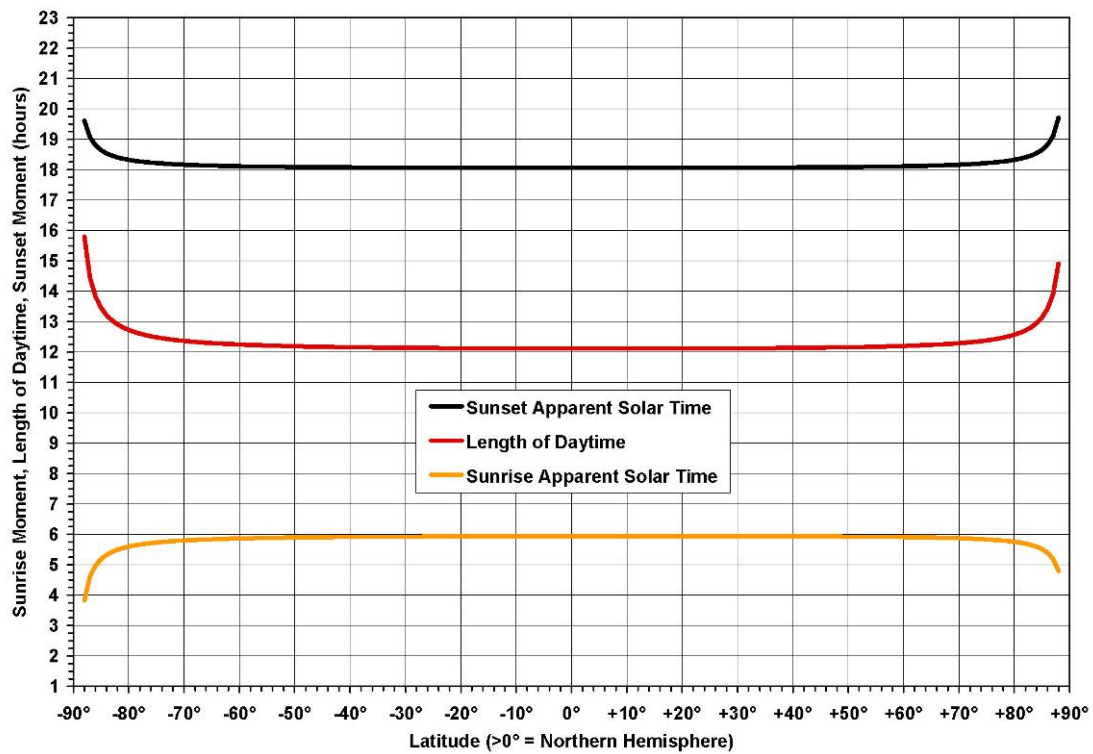


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/twilight/>

Durata in minuti del crepuscolo astronomico alle varie latitudini, emisfero nord.  
(I grafici dei crepuscoli per alba e tramonto, o per l'emisfero sud, sono simmetrici o capovolti)

Duration of the astronomical twilight for every latitude, north hemisphere.  
(The graphics for dawn and sunset, of for south hemisphere, are simmetrical or upside-down)

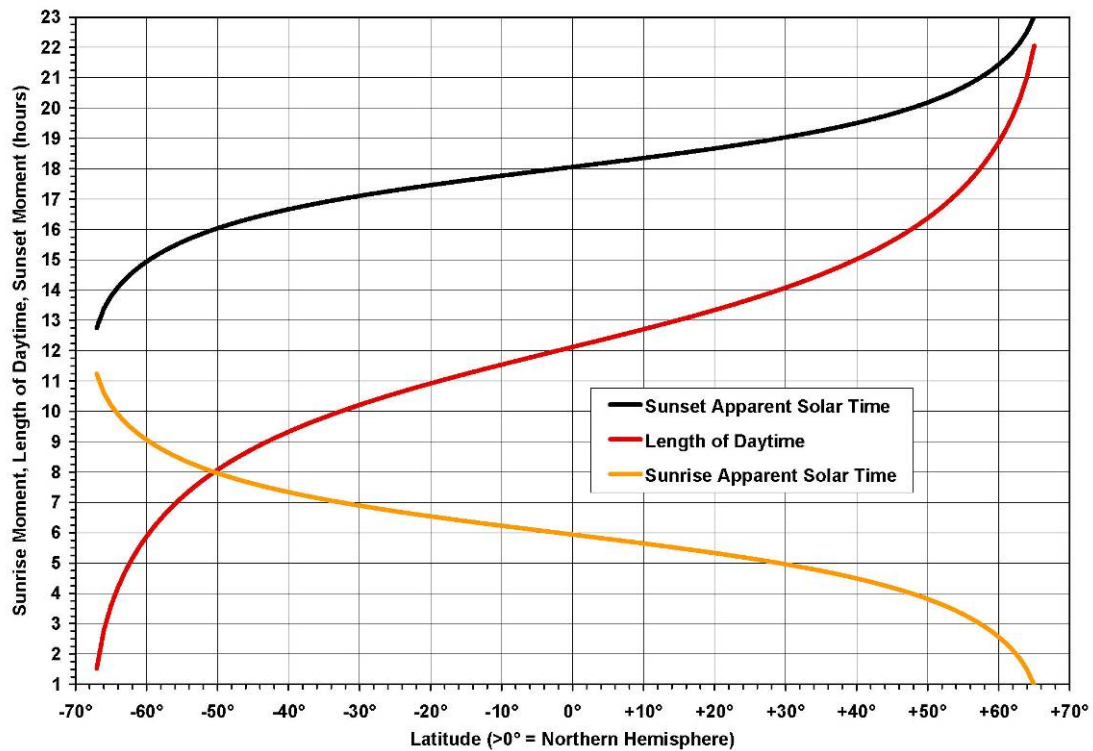


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/seasons/>

Equinozio di primavera: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini

Spring equinox: times of rising and setting of the Sun and duration of the day at various latitudes



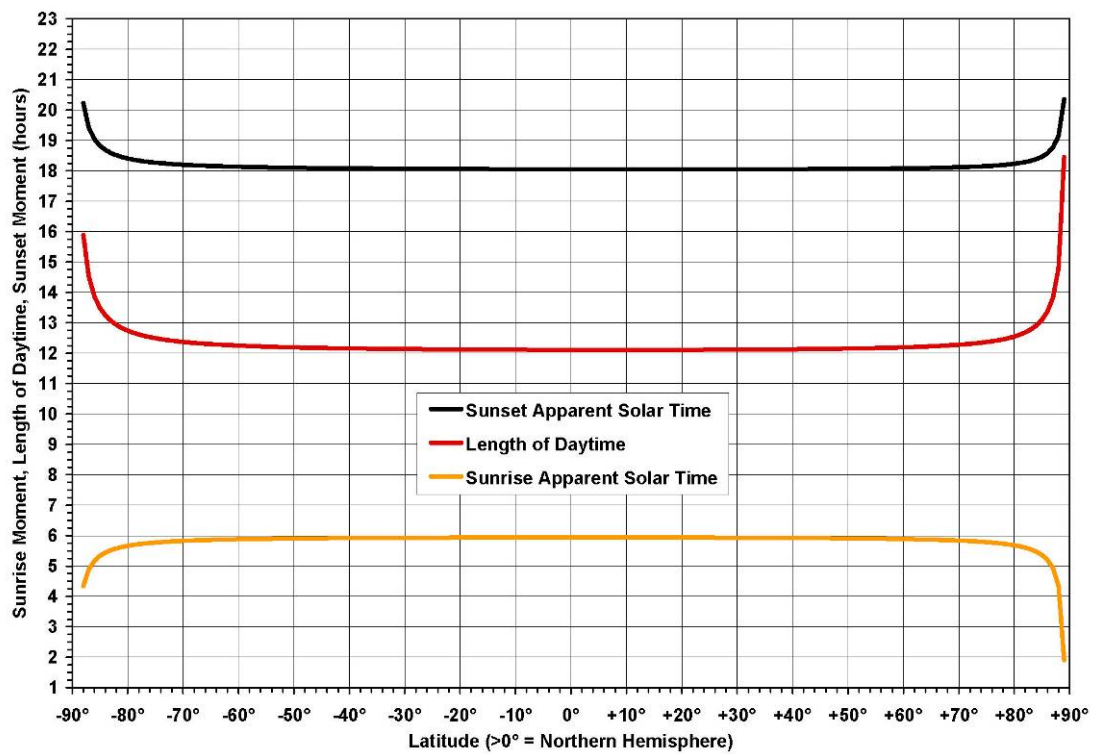
Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/seasons/>

Solstizio d'estate: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini

Summer solstice: times of rising and setting of the Sun and duration of the day at various latitudes



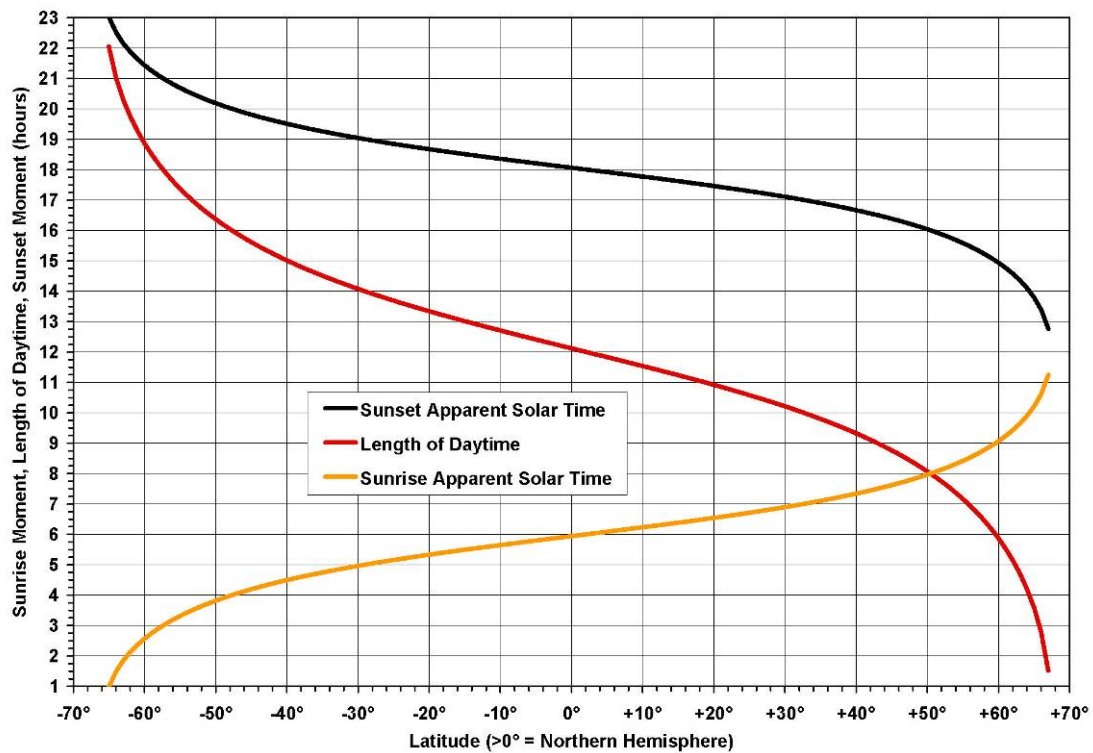


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/seasons/>

Equinozio d'autunno: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini

Autumn equinox: times of rising and setting of the Sun and duration of the day at various latitudes

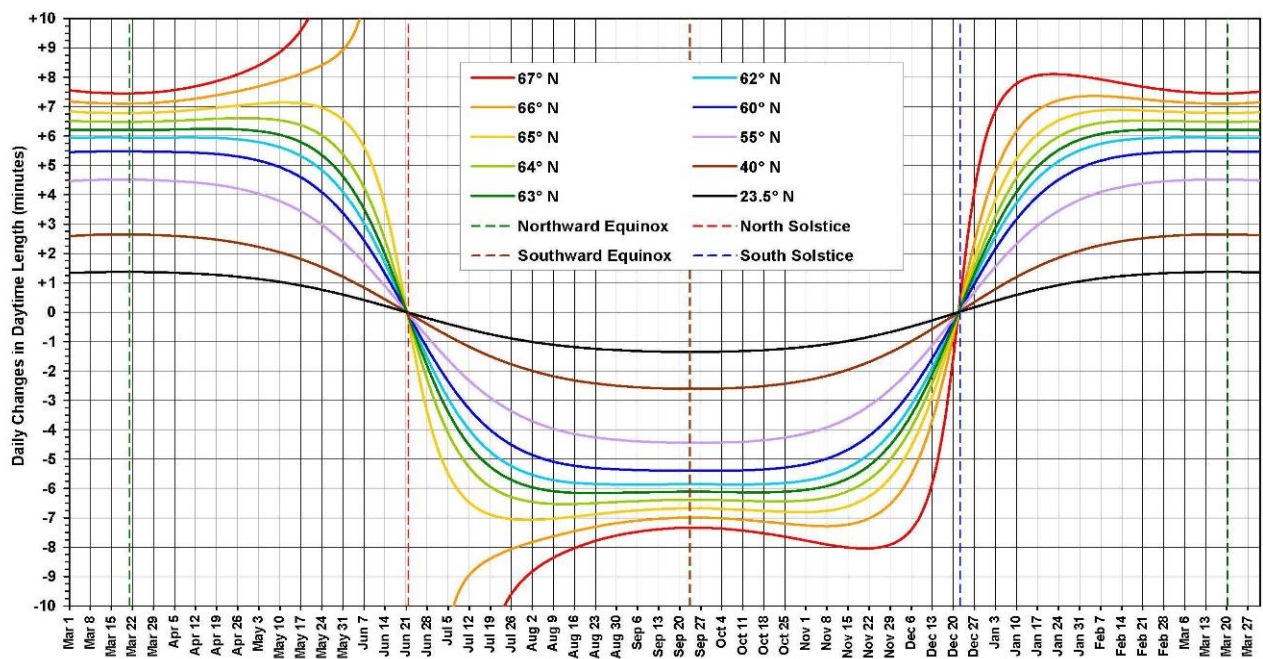


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/seasons/>

Solstizio d'inverno: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini

Winter solstice: times of rising and setting of the Sun and duration of the day at various latitudes

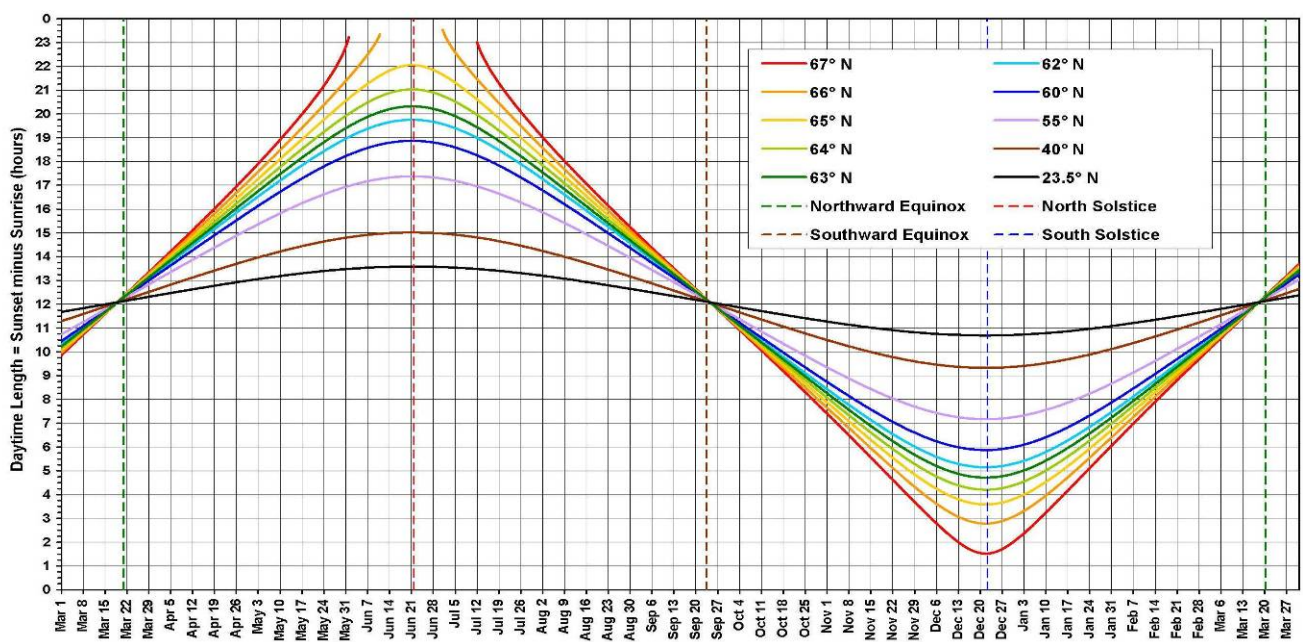


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.syr454.org/seasons/>

Variazione incrementale della durata del giorno nel corso dell'anno alle varie latitudini

Incremental variation of the duration of the day during the year for various latitudes



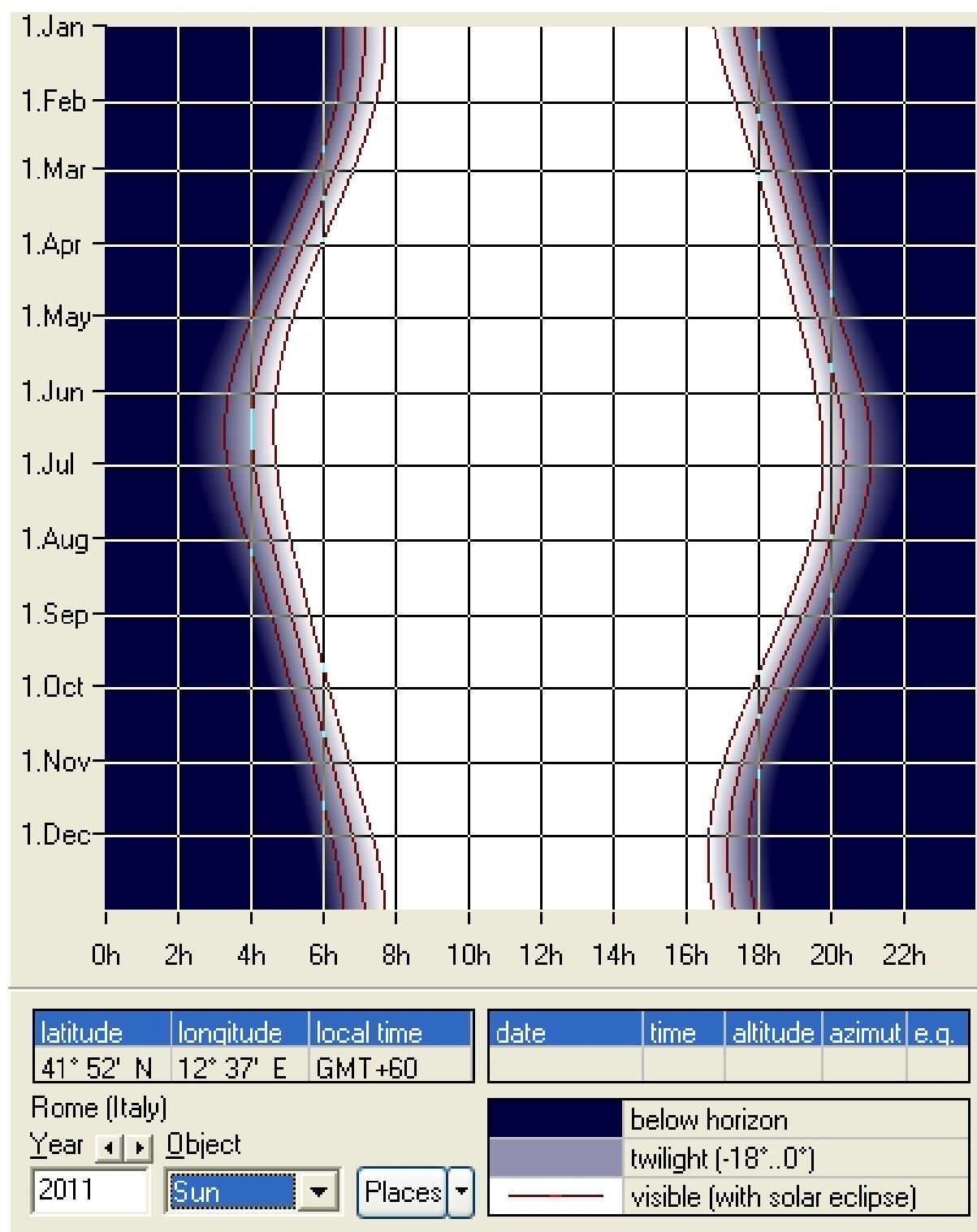
Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.syr454.org/seasons/>

Durata del giorno nel corso dell'anno alle varie latitudini (emisfero nord)

Duration of the day during the year for various latitudes (north hemisphere)

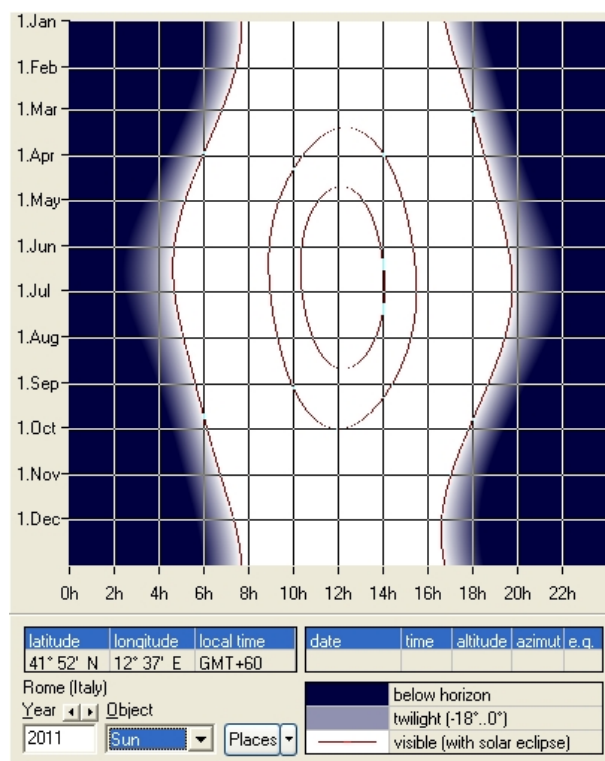
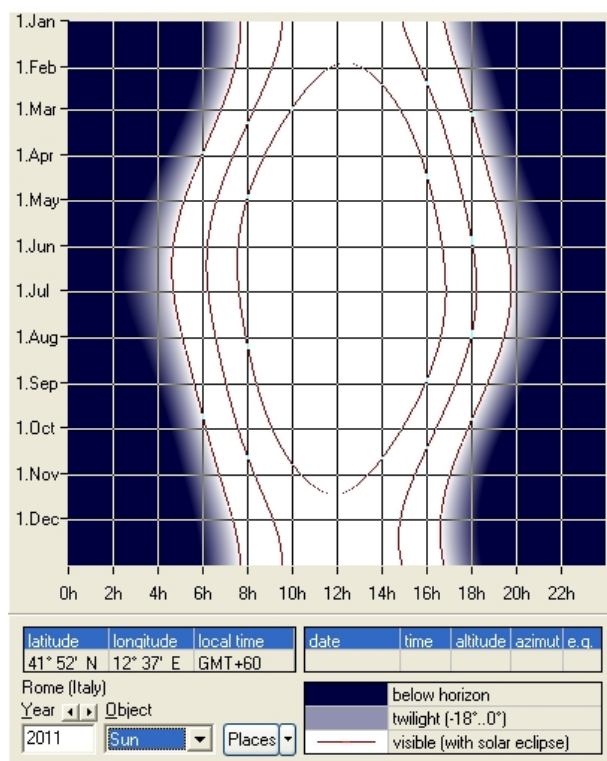
# VISIBILITA' DEL SOLE - VISIBILITY OF THE SUN



Visibilità del Sole nel corso dell'anno  
Visibility of the Sun during the year

Le 2 righe rosse più interne indicano gli istanti in cui il Sole è sull'orizzonte  
 Le 2 righe rosse intermedie indicano gli istanti in cui il Sole è a  $-6^\circ$  dall'orizzonte, inizia o finisce il crepuscolo civile  
 Le 2 righe rosse più esterne indicano gli istanti in cui il Sole è a  $-12^\circ$  dall'orizzonte, inizia o finisce il crepuscolo nautico

Inner red lines : sunset or sunrise  
 Medium red lines : Sun at  $-6^\circ$ , civil twilights  
 Exterior red lines: Sun at  $-12^\circ$ , nautical twilights



Altezza del Sole sull'orizzonte nel corso dell'anno  
Altitude of the Sun above the horizon during the year

Figura di sinistra:

la linea rossa continua interna indica gli istanti del giorno in cui il Sole supera i 30° sull'orizzonte  
le 2 linee rosse intermedie indicano gli istanti del giorno in cui il Sole supera i 15° sull'orizzonte

Figura di destra:

la linea rossa continua interna indica gli istanti del giorno in cui il Sole supera i 60° sull'orizzonte  
la linea rossa continua intermedia indica gli istanti del giorno in cui il Sole supera i 45° sull'orizzonte

Esempio : il 1° luglio il Sole sorge alle 4.45 circa, alle 6.15 circa si trova a 15° sull'orizzonte, alle 7.30 circa a 30°, alle 9 a 45°, dalle 10.30 alle 14 circa sarà ad oltre 60°, ecc.

Left:

inner red line, the Sun is over 30°  
medium red line, the Sun is over 15°

Right:

inner red line, the Sun is over 60°  
medium red line, the Sun is over 45°

© (3)

# EFFEMERIDI DI MERCURIO - EPHEMERIDES OF MERCURY

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang'	Rise	Transit	Set
01/01/2011	17h 16m 42.41s	-20° 13' 01.6"	0.3554378	0.8365013	6.96	20.6	8.0	0.2	0.382	103.7	5.58	10.44	15.29
02/01/2011	17h 17m 59.90s	-20° 20' 41.6"	0.3611620	0.8576124	7.13	21.2	7.8	0.1	0.418	99.4	5.56	10.41	15.26
03/01/2011	17h 19m 48.63s	-20° 29' 33.4"	0.3669466	0.8788489	7.31	21.8	7.7	0	0.454	95.3	5.55	10.39	15.24
04/01/2011	17h 22m 05.72s	-20° 39' 21.8"	0.3727541	0.9000746	7.48	22.3	7.5	-0.1	0.487	91.5	5.54	10.38	15.22
05/01/2011	17h 24m 48.46s	-20° 49' 52.2"	0.3785503	0.9211762	7.66	22.6	7.3	-0.1	0.518	87.9	5.54	10.37	15.20
06/01/2011	17h 27m 54.33s	-21° 00' 51.6"	0.3843041	0.9420608	7.83	22.9	7.1	-0.1	0.547	84.6	5.54	10.36	15.19
07/01/2011	17h 31m 21.05s	-21° 12' 07.6"	0.3899874	0.9626530	8.00	23.1	7.0	-0.2	0.574	81.4	5.54	10.36	15.17
08/01/2011	17h 35m 06.53s	-21° 23' 29.5"	0.3955749	0.9828921	8.17	23.2	6.8	-0.2	0.600	78.5	5.55	10.36	15.17
09/01/2011	17h 39m 08.89s	-21° 34' 47.4"	0.4010438	1.0027301	8.34	23.3	6.7	-0.2	0.624	75.7	5.56	10.36	15.16
10/01/2011	17h 43m 26.46s	-21° 45' 52.6"	0.4063738	1.0221296	8.50	23.3	6.6	-0.2	0.646	73.0	5.57	10.36	15.16
11/01/2011	17h 47m 57.73s	-21° 56' 37.2"	0.4115468	1.0410621	8.66	23.2	6.5	-0.2	0.667	70.5	5.58	10.37	15.16
12/01/2011	17h 52m 41.38s	-22° 06' 54.3"	0.4165467	1.0595061	8.81	23.1	6.3	-0.2	0.686	68.1	6.00	10.38	15.16
13/01/2011	17h 57m 36.22s	-22° 16' 37.9"	0.4213591	1.0774465	8.96	23.0	6.2	-0.2	0.704	65.9	6.02	10.39	15.16
14/01/2011	18h 02m 41.17s	-22° 25' 42.4"	0.4259715	1.0948726	9.10	22.9	6.1	-0.2	0.721	63.7	6.03	10.40	15.17
15/01/2011	18h 07m 55.31s	-22° 34' 03.1"	0.4303724	1.1117782	9.25	22.7	6.0	-0.2	0.737	61.7	6.05	10.42	15.18
16/01/2011	18h 13m 17.78s	-22° 41' 35.6"	0.4345520	1.1281600	9.38	22.4	6.0	-0.2	0.752	59.7	6.07	10.43	15.19
17/01/2011	18h 18m 47.83s	-22° 48' 16.2"	0.4385016	1.1440171	9.51	22.2	5.9	-0.2	0.766	57.9	6.09	10.45	15.20
18/01/2011	18h 24m 24.78s	-22° 54' 01.5"	0.4422134	1.1593508	9.64	21.9	5.8	-0.2	0.779	56.1	6.12	10.46	15.21
19/01/2011	18h 30m 08.04s	-22° 58' 48.4"	0.4456807	1.1741639	9.76	21.6	5.7	-0.2	0.791	54.4	6.14	10.48	15.23
20/01/2011	18h 35m 57.05s	-23° 02' 34.3"	0.4488975	1.1884601	9.88	21.3	5.7	-0.2	0.803	52.8	6.16	10.50	15.24
21/01/2011	18h 41m 51.33s	-23° 05' 16.8"	0.4518587	1.2022440	10.00	21.0	5.6	-0.2	0.813	51.2	6.18	10.52	15.26
22/01/2011	18h 47m 50.43s	-23° 06' 53.5"	0.4545597	1.2155208	10.11	20.6	5.5	-0.2	0.824	49.6	6.20	10.54	15.28
23/01/2011	18h 53m 53.94s	-23° 07' 22.7"	0.4569966	1.2282956	10.21	20.2	5.5	-0.3	0.834	48.2	6.22	10.56	15.30
24/01/2011	19h 00m 01.51s	-23° 06' 42.5"	0.4591661	1.2405741	10.32	19.9	5.4	-0.3	0.843	46.7	6.25	10.59	15.33
25/01/2011	19h 06m 12.81s	-23° 04' 51.3"	0.4610654	1.2523615	10.41	19.5	5.4	-0.3	0.852	45.3	6.27	11.01	15.35
26/01/2011	19h 12m 27.53s	-23° 01' 47.8"	0.4626919	1.2636634	10.51	19.0	5.3	-0.3	0.860	44.0	6.29	11.03	15.38
27/01/2011	19h 18m 45.39s	-22° 57' 30.6"	0.4640437	1.2744846	10.60	18.6	5.3	-0.3	0.868	42.6	6.31	11.06	15.41
28/01/2011	19h 25m 06.14s	-22° 51' 58.7"	0.4651193	1.2848300	10.68	18.2	5.2	-0.3	0.875	41.3	6.33	11.08	15.43
29/01/2011	19h 31m 29.53s	-22° 45' 11.0"	0.4659173	1.2947041	10.77	17.7	5.2	-0.3	0.883	40.1	6.35	11.10	15.46
30/01/2011	19h 37m 55.36s	-22° 37' 06.5"	0.4664368	1.3041107	10.85	17.3	5.2	-0.3	0.890	38.8	6.37	11.13	15.50
31/01/2011	19h 44m 23.42s	-22° 27' 44.3"	0.4666773	1.3130534	10.92	16.8	5.1	-0.3	0.896	37.6	6.38	11.15	15.53
01/02/2011	19h 50m 53.52s	-22° 17' 03.8"	0.4666384	1.3215348	10.99	16.3	5.1	-0.3	0.903	36.3	6.40	11.18	15.56
02/02/2011	19h 57m 25.51s	-22° 05' 04.2"	0.4663203	1.3295571	11.06	15.8	5.1	-0.4	0.909	35.1	6.42	11.21	16.00
03/02/2011	20h 03m 59.22s	-21° 51' 44.8"	0.4657232	1.3371218	11.12	15.3	5.0	-0.4	0.915	33.9	6.43	11.23	16.04
04/02/2011	20h 10m 34.53s	-21° 37' 05.1"	0.4648479	1.3442295	11.18	14.8	5.0	-0.4	0.921	32.7	6.45	11.26	16.07
05/02/2011	20h 17m 11.30s	-21° 21' 04.4"	0.4636954	1.3508798	11.23	14.2	5.0	-0.4	0.926	31.5	6.46	11.29	16.11
06/02/2011	20h 23m 49.42s	-21° 03' 42.4"	0.4622670	1.3570716	11.29	13.7	5.0	-0.5	0.932	30.3	6.48	11.31	16.15
07/02/2011	20h 30m 28.80s	-20° 44' 58.5"	0.4605643	1.3628026	11.33	13.1	4.9	-0.5	0.937	29.1	6.49	11.34	16.20
08/02/2011	20h 37m 09.34s	-20° 24' 52.4"	0.4585897	1.3680695	11.38	12.6	4.9	-0.5	0.942	27.9	6.50	11.37	16.24
09/02/2011	20h 43m 50.97s	-20° 03' 23.6"	0.4563455	1.3728677	11.42	12.0	4.9	-0.6	0.947	26.7	6.52	11.40	16.28
10/02/2011	20h 50m 33.62s	-19° 40' 31.9"	0.4538347	1.3771915	11.45	11.4	4.9	-0.6	0.952	25.4	6.53	11.42	16.33
11/02/2011	20h 57m 17.24s	-19° 16' 16.9"	0.4510609	1.3810337	11.49	10.8	4.9	-0.7	0.956	24.1	6.54	11.45	16.37
12/02/2011	21h 04m 01.77s	-18° 50' 38.5"	0.4480281	1.3843859	11.51	10.2	4.9	-0.7	0.961	22.9	6.55	11.48	16.42
13/02/2011	21h 10m 47.17s	-18° 23' 36.4"	0.4447411	1.3872380	11.54	9.5	4.8	-0.8	0.965	21.6	6.56	11.51	16.47
14/02/2011	21h 17m 33.40s	-17° 55' 10.4"	0.4412051	1.3895781	11.56	8.9	4.8	-0.8	0.969	20.2	6.57	11.54	16.52
15/02/2011	21h 24m 20.46s	-17° 25' 20.4"	0.4374264	1.3913929	11.57	8.2	4.8	-0.9	0.973	18.9	6.57	11.57	16.56
16/02/2011	21h 31m 08.30s	-16° 54' 06.5"	0.4334120	1.3926670	11.58	7.6	4.8	-0.9	0.977	17.5	6.58	11.59	17.02
17/02/2011	21h 37m 56.93s	-16° 21' 28.4"	0.4291698	1.3933830	11.59	6.9	4.8	-1	0.981	16.0	6.59	12.02	17.07
18/02/2011	21h 44m 46.32s	-15° 47' 26.5"	0.4247090	1.3935214	11.59	6.2	4.8	-1.1	0.984	14.5	6.59	12.05	17.12
19/02/2011	21h 51m 36.48s	-15° 12' 00.6"	0.4200398	1.3930606	11.59	5.5	4.8	-1.1	0.987	13.0	7.00	12.08	17.17
20/02/2011	21h 58m 27.40s	-14° 35' 11.2"	0.4151738	1.3919761	11.58	4.8	4.8	-1.2	0.990	11.5	7.00	12.11	17.23
21/02/2011	22h 05m 19.07s	-13° 56' 58.6"	0.4101242	1.3902414	11.56	4.1	4.8	-1.3	0.992	10.0	7.01	12.14	17.28
22/02/2011	22h 12m 11.50s	-13° 17' 23.3"	0.4049058	1.3878271	11.54	3.4	4.8	-1.4	0.995	8.4	7.01	12.17	17.34
23/02/2011	22h 19m 04.67s	-12° 36' 26.0"	0.3995352	1.3847014	11.52	2.8	4.9	-1.5	0.996	6.9	7.02	12.20	17.39
24/02/2011	22h 25m 58.55s	-11° 54' 07.7"	0.3940312	1.3808298	11.48	2.3	4.9	-1.5	0.998	5.7	7.02	12.23	17.45
25/02/2011	22h 32m 53.09s	-11° 10' 29.6"	0.3884146	1.3761751	11.45	1.9	4.9	-1.6	0.998	4.9	7.02	12.26	17.51
26/02/2011	22h 39m 48.25s	-10° 25' 33.1"	0.3827090	1.3706981	11.40	1.9	4.9	-1.6	0.998	4.9	7.02	12.29	17.57
27/02/2011	22h 46m 43.92s	-09° 39' 20.3"	0.3769404	1.3643570	11.35	2.2	4.9	-1.6	0.997	5.9	7.02	12.32	18.03
28/02/2011	22h 53m 40.00s	-08° 51' 53.4"	0.3711377	1.3571082	11.29	2.8	5.0	-1.6	0.996	7.6	7.02	12.35	18.09
01/03/2011	23h 00m 36.32s	-08° 03' 15.2"	0.3653329	1.3489068	11.22	3.6	5.0	-1.6	0.993	9.7	7.02	12.38	18.15
02/03/2011	23h 07m 32.70s	-07° 13' 29.2"	0.3595612	1.3397067	11.14	4.3	5.0	-1.6	0.989	12.0	7.02	12.41	18.21
03/03/2011	23h 14m 28.86s	-06° 22' 39.4"	0.3538609	1.3294621	11.06	5.2	5.1	-1.6	0.984	14.6	7.02	12.44	18.27
04/03/2011	23h 21m 24.50s	-05° 30' 50.6"	0.3482734	1.3181281	10.96	6.0	5.1	-1.5	0.977	17.4	7.02	12.47	18.33
05/03/2011	23h 28m 19.22s	-04° 38' 08.6"	0.3428436	1.3056619	10.86	6.9	5.2	-1.5	0.969	20.4	7.02	12.50	18.39
06/03/2011	23h 35m 12.53s	-03° 44' 40.1"	0.3376187	1.2920249	10.75	7.8	5.2	-1.5	0.958	23.6	7.02	12.53	18.45
07/03/2011	23h 42m 03.85s	-02° 50' 32.9"	0.3326486	1.2771841	10.62	8.7	5.3	-1.4	0.946	26.9	7.01	12.56	18.52
08/03/2011	23h 48m 52.49s	-01° 55' 55.8"	0.3279847	1.2611146	10.49	9.6	5.3	-1.4	0.931	30.5	7.01	12.58	18.58
09/03/2011	23h 55m 37.63s	-01° 00' 58.9"	0.3236792	1.2438014	10.35	10.5	5.4	-1.3	0.914	34.1	7.00	13.01	19.04
10/03/2011	00h 02m 18.34s	-00° 05' 53.8"	0.3197843	1.2252425	10.19	11.4	5.5	-1.3	0.894	38.0	7.00	13.04	19.10
11/03/2011	00h 08m 53.54s	+00° 49' 07.1"	0.3163501	1.2054507	10.03	12.3	5.6	-1.3	0.872	42.0	6.59	13.06	19.16
12/03/2011	00h 15m 22.04s	+01° 43' 50.0"	0.3134237	1.1844559	9.85	13.2	5.7	-1.2	0.846	46.2	6.58	13.09	19.21
13/03/2011	00h 21m 42.52s	+02° 37' 00.0"	0.3110477	1.1623072	9.67	14.0	5.8	-1.1	0.818	50.5	6.57	13.11	19.27
14/03/2011	00h 27m 53.55s	+03° 31' 21.4"	0.3092578	1.1390734	9.47	14.7	5.9	-1.1	0.787	54.9	6.56	13.13	19.32
15/03/2011	00h 33m 53.60s	+04° 23' 3											



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang°	Rise	Transit	Set
09/04/2011	01h 10m 47.54s	+10° 17' 08.4"	0.4117055	0.5915441	4.92	2.9	11.4	5.2	0.004	172.8	5.31	12.10	18.47
10/04/2011	01h 08m 14.75s	+09° 48' 14.4"	0.4166998	0.5861614	4.88	2.4	11.5	5.4	0.003	174.2	5.27	12.03	18.39
11/04/2011	01h 05m 41.84s	+09° 17' 59.8"	0.4215062	0.5822929	4.84	3.0	11.5	5.3	0.004	172.9	5.22	11.57	18.31
12/04/2011	01h 03m 11.88s	+08° 46' 54.3"	0.4261121	0.5798976	4.82	4.3	11.6	4.9	0.008	169.9	5.18	11.50	18.22
13/04/2011	01h 00m 47.74s	+08° 15' 28.0"	0.4305063	0.5789261	4.81	5.8	11.6	4.5	0.014	166.4	5.13	11.44	18.14
14/04/2011	00h 58m 32.01s	+07° 44' 09.8"	0.4346790	0.5793212	4.82	7.4	11.6	4.2	0.022	162.7	5.09	11.38	18.06
15/04/2011	00h 56m 27.01s	+07° 13' 27.2"	0.4386213	0.5810194	4.83	9.0	11.6	3.8	0.033	159.1	5.05	11.32	17.58
16/04/2011	00h 54m 34.73s	+06° 43' 45.1"	0.4423256	0.5839529	4.86	10.5	11.5	3.5	0.045	155.5	5.01	11.26	17.51
17/04/2011	00h 52m 56.81s	+06° 15' 26.2"	0.4457852	0.5880504	4.89	12.1	11.4	3.2	0.059	152.0	4.57	11.21	17.44
18/04/2011	00h 51m 34.55s	+05° 48' 49.7"	0.4489942	0.5932392	4.93	13.5	11.3	2.9	0.074	148.5	4.53	11.16	17.37
19/04/2011	00h 50m 28.92s	+05° 24' 11.9"	0.4519474	0.5994459	4.99	14.9	11.2	2.6	0.090	145.2	4.50	11.11	17.31
20/04/2011	00h 49m 40.61s	+05° 01' 45.8"	0.4546402	0.6065983	5.04	16.2	11.1	2.4	0.106	141.9	4.47	11.06	17.25
21/04/2011	00h 49m 10.01s	+04° 41' 41.4"	0.4570689	0.6146257	5.11	17.4	10.9	2.2	0.124	138.8	4.43	11.02	17.20
22/04/2011	00h 48m 57.30s	+04° 24' 05.9"	0.4592301	0.6234603	5.18	18.6	10.8	2	0.142	135.8	4.40	10.58	17.15
23/04/2011	00h 49m 02.43s	+04° 09' 04.1"	0.4611209	0.6330378	5.26	19.6	10.6	1.8	0.160	132.9	4.37	10.54	17.11
24/04/2011	00h 49m 25.21s	+03° 56' 38.5"	0.4627390	0.6432975	5.35	20.6	10.5	1.7	0.178	130.1	4.35	10.51	17.07
25/04/2011	00h 50m 05.31s	+03° 46' 50.0"	0.4640823	0.6541828	5.44	21.5	10.3	1.5	0.197	127.3	4.32	10.48	17.03
26/04/2011	00h 51m 02.31s	+03° 39' 37.6"	0.4651493	0.6656414	5.54	22.3	10.1	1.4	0.215	124.7	4.29	10.45	17.00
27/04/2011	00h 52m 15.72s	+03° 34' 59.5"	0.4659386	0.6776252	5.64	23.1	9.9	1.3	0.234	122.2	4.27	10.42	16.57
28/04/2011	00h 53m 44.98s	+03° 32' 52.6"	0.4664495	0.6900900	5.74	23.7	9.7	1.2	0.252	119.7	4.25	10.40	16.55
29/04/2011	00h 55m 29.53s	+03° 33' 13.3"	0.4666813	0.7029957	5.85	24.3	9.6	1.1	0.270	117.4	4.22	10.38	16.53
30/04/2011	00h 57m 28.78s	+03° 35' 57.4"	0.4666338	0.7163060	5.96	24.8	9.4	1	0.288	115.1	4.20	10.36	16.52
01/05/2011	00h 59m 42.15s	+03° 41' 00.1"	0.4663070	0.7299879	6.07	25.2	9.2	0.9	0.306	112.9	4.18	10.34	16.50
02/05/2011	01h 02m 09.08s	+03° 48' 16.6"	0.4657014	0.7440117	6.19	25.6	9.0	0.8	0.323	110.7	4.16	10.33	16.50
03/05/2011	01h 04m 49.02s	+03° 57' 42.0"	0.4648174	0.7583507	6.31	25.9	8.9	0.8	0.341	108.6	4.15	10.32	16.49
04/05/2011	01h 07m 41.44s	+04° 09' 11.0"	0.4636563	0.7729805	6.43	26.2	8.7	0.7	0.358	106.5	4.13	10.31	16.49
05/05/2011	01h 10m 45.87s	+04° 22' 38.7"	0.4622193	0.7878794	6.55	26.3	8.5	0.7	0.375	104.5	4.11	10.30	16.49
06/05/2011	01h 14m 01.84s	+04° 37' 59.9"	0.4605083	0.8030276	6.68	26.5	8.4	0.6	0.392	102.5	4.10	10.29	16.50
07/05/2011	01h 17m 28.95s	+04° 55' 09.7"	0.4585252	0.8184070	6.81	26.5	8.2	0.5	0.408	100.6	4.08	10.29	16.50
08/05/2011	01h 21m 06.83s	+05° 14' 03.2"	0.4562726	0.8340011	6.94	26.6	8.1	0.5	0.425	98.7	4.07	10.29	16.51
09/05/2011	01h 24m 55.15s	+05° 34' 35.6"	0.4537536	0.8497945	7.07	26.5	7.9	0.4	0.441	96.8	4.05	10.29	16.53
10/05/2011	01h 28m 53.61s	+05° 56' 42.3"	0.4509717	0.8657728	7.20	26.4	7.8	0.4	0.458	94.9	4.04	10.29	16.54
11/05/2011	01h 33m 01.97s	+06° 20' 18.7"	0.4479309	0.8819222	7.33	26.3	7.6	0.3	0.474	93.0	4.03	10.29	16.56
12/05/2011	01h 37m 20.03s	+06° 45' 20.5"	0.4446360	0.8982291	7.47	26.1	7.5	0.3	0.490	91.1	4.02	10.29	16.58
13/05/2011	01h 41m 47.63s	+07° 11' 43.2"	0.4410924	0.9146802	7.61	25.9	7.4	0.2	0.507	89.3	4.00	10.30	17.00
14/05/2011	01h 46m 24.65s	+07° 39' 22.7"	0.4373063	0.9312617	7.74	25.6	7.2	0.2	0.523	87.4	3.99	10.31	17.03
15/05/2011	01h 51m 11.00s	+08° 08' 14.8"	0.4332846	0.9479596	7.88	25.3	7.1	0.1	0.539	85.5	3.98	10.32	17.06
16/05/2011	01h 56m 06.65s	+08° 38' 15.3"	0.4290355	0.9647587	8.02	24.9	7.0	0.1	0.556	83.6	3.98	10.33	17.09
17/05/2011	02h 01m 11.59s	+09° 09' 20.0"	0.4245679	0.9816428	8.16	24.5	6.9	0	0.573	81.6	3.97	10.34	17.12
18/05/2011	02h 06m 25.85s	+09° 41' 25.0"	0.4198924	0.9985940	8.30	24.1	6.7	0	0.590	79.7	3.96	10.35	17.15
19/05/2011	02h 11m 49.50s	+10° 14' 25.9"	0.4150204	1.0155926	8.45	23.6	6.6	-0.1	0.607	77.6	3.96	10.37	17.19
20/05/2011	02h 17m 22.62s	+10° 48' 18.4"	0.4099653	1.0326168	8.59	23.1	6.5	-0.1	0.624	75.6	3.95	10.38	17.23
21/05/2011	02h 23m 05.34s	+11° 22' 58.2"	0.4047418	1.0496422	8.73	22.5	6.4	-0.2	0.642	73.5	3.95	10.40	17.27
22/05/2011	02h 28m 57.81s	+11° 58' 20.8"	0.3993666	1.0666413	8.87	22.0	6.3	-0.2	0.660	71.3	3.94	10.42	17.31
23/05/2011	02h 35m 00.21s	+12° 34' 21.2"	0.3938587	1.0835834	9.01	21.3	6.2	-0.3	0.678	69.1	3.94	10.44	17.36
24/05/2011	02h 41m 12.74s	+13° 10' 54.7"	0.3882389	1.1004340	9.15	20.6	6.1	-0.3	0.697	66.8	3.94	10.47	17.41
25/05/2011	02h 47m 35.62s	+13° 47' 55.9"	0.3825308	1.1171542	9.29	19.9	6.0	-0.4	0.716	64.4	3.94	10.49	17.46
26/05/2011	02h 54m 09.10s	+14° 25' 19.1"	0.3767606	1.1337006	9.43	19.2	5.9	-0.5	0.735	62.0	3.94	10.52	17.51
27/05/2011	03h 00m 53.39s	+15° 02' 58.6"	0.3709572	1.1500245	9.56	18.4	5.8	-0.6	0.754	59.4	3.95	10.55	17.56
28/05/2011	03h 07m 48.76s	+15° 40' 47.7"	0.3651528	1.1660717	9.70	17.5	5.8	-0.6	0.774	56.8	3.95	10.58	18.02
29/05/2011	03h 14m 55.44s	+16° 18' 39.5"	0.3593826	1.1817823	9.83	16.7	5.7	-0.7	0.794	54.0	3.96	11.01	18.08
30/05/2011	03h 22m 13.63s	+16° 56' 26.6"	0.3536850	1.1970902	9.95	15.8	5.6	-0.8	0.813	51.2	3.96	11.05	18.14
31/05/2011	03h 29m 43.51s	+17° 34' 00.8"	0.3481017	1.2119232	10.08	14.8	5.5	-0.9	0.833	48.2	3.97	11.08	18.20
01/06/2011	03h 37m 25.22s	+18° 11' 13.4"	0.3426774	1.2262031	10.20	13.9	5.5	-1	0.853	45.1	3.99	11.12	18.27
02/06/2011	03h 45m 18.82s	+18° 47' 54.9"	0.3374595	1.2398462	10.31	12.8	5.4	-1.1	0.872	41.9	4.00	11.16	18.34
03/06/2011	03h 53m 24.29s	+19° 23' 55.2"	0.3324980	1.2527640	10.42	11.8	5.4	-1.1	0.891	38.6	4.02	11.20	18.41
04/06/2011	04h 01m 41.52s	+19° 59' 03.6"	0.3278444	1.2648642	10.52	10.7	5.3	-1.2	0.909	35.1	4.04	11.25	18.48
05/06/2011	04h 10m 10.25s	+20° 33' 08.8"	0.3235509	1.2760526	10.61	9.6	5.3	-1.4	0.926	31.5	4.06	11.29	18.55
06/06/2011	04h 18m 50.11s	+21° 05' 59.0"	0.3196694	1.2862348	10.70	8.5	5.2	-1.5	0.942	27.9	4.08	11.34	19.02
07/06/2011	04h 27m 40.56s	+21° 37' 22.1"	0.3162503	1.2953185	10.77	7.3	5.2	-1.6	0.957	24.1	4.11	11.39	19.09
08/06/2011	04h 36m 40.90s	+22° 07' 06.0"	0.3133404	1.3032168	10.84	6.1	5.2	-1.7	0.969	20.2	4.13	11.44	19.17
09/06/2011	04h 45m 50.24s	+22° 34' 58.6"	0.3109820	1.3098505	10.89	4.9	5.1	-1.8	0.980	16.3	4.17	11.50	19.24
10/06/2011	04h 55m 07.53s	+23° 00' 48.3"	0.3092108	1.3151517	10.94	3.7	5.1	-1.9	0.989	12.3	4.20	11.55	19.31
11/06/2011	05h 04m 31.58s	+23° 24' 24.2"	0.3080547	1.3190662	10.97	2.5	5.1	-2.1	0.995	8.4	4.24	12.01	19.39
12/06/2011	05h 14m 01.02s	+23° 45' 36.6"	0.3075321	1.3215561	10.99	1.4	5.1	-2.2	0.998	4.8	4.28	12.06	19.46
13/06/2011	05h 23m 34.39s	+24° 04' 16.9"	0.3076516	1.3226014	11.00	0.9	5.1	-2.3	0.999	3.0	4.32	12.12	19.53
14/06/2011	05h 33m 10.15s	+24° 20' 18.1"	0.3084113	1.3222008	11.00	1.7	5.1	-2.2	0.998	5.5	4.36	12.18	20.00
15/06/2011	05h 42m 46.69s	+24° 33' 35.0"	0.3097988	1.3203719	10.98	2.8	5.1	-2	0.994	9.2	4.41	12.23	20.06
16/06/2011	05h 52m 22.42s	+24° 44' 04.2"	0.3117919	1.3171500	10.95	4.0	5.1	-1.9	0.987	13.0	4.46	12.29	20.12
17/06/2011	06h 01m 55.80s	+24° 51' 44.2"	0.3143599	1.3125863	10.92	5.2	5.1	-1.8	0.978	16.9	4.51	12.34	20.19
18/06/2011	06h 11m 25.33s	+24° 56' 35.2"	0.3174643	1.3067457	10.87	6.3	5.1	-1.6	0.968	20.7	4.56	12.40	20.24
19/06/2011	06h 20m 49.64s	+24° 58' 39.0"	0.3210610	1.2997038	10.81	7.5	5.2	-1.5	0.955	24.4	5.01	12.45	20.30
20/06/2011	06h 30m 07.46s	+24° 57' 59.0"	0.3251016	1.2915441	10.74	8.6	5.2	-1.4	0.941	28.0	5.07	12.51	20.35
21/06/2011	06h 39m 17.68s	+24° 54' 39.8"	0.3295304	1.2823549	10.6								

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang°	Rise	Transit	Set
22/07/2011	09h 49m 48.86s	+11° 53' 34.3"	0.4641202	0.8270137	6.88	26.7	8.1	0.6	0.413	100.0	7.15	14.01	20.46
23/07/2011	09h 52m 42.60s	+11° 25' 08.2"	0.4651785	0.8124442	6.76	26.6	8.3	0.6	0.397	101.9	7.16	14.00	20.43
24/07/2011	09h 55m 22.45s	+10° 57' 33.8"	0.4659593	0.7980700	6.64	26.4	8.4	0.7	0.380	103.9	7.16	13.59	20.40
25/07/2011	09h 57m 48.02s	+10° 30' 57.4"	0.4664615	0.7839104	6.52	26.2	8.6	0.7	0.363	105.9	7.16	13.57	20.37
26/07/2011	09h 59m 58.87s	+10° 05' 26.1"	0.4666847	0.7699871	6.40	25.9	8.7	0.8	0.346	107.9	7.16	13.55	20.33
27/07/2011	10h 01m 54.55s	+09° 41' 06.8"	0.4666285	0.7563245	6.29	25.6	8.9	0.8	0.329	110.0	7.16	13.53	20.29
28/07/2011	10h 03m 34.57s	+09° 18' 07.0"	0.4662931	0.7429494	6.18	25.2	9.1	0.9	0.311	112.2	7.15	13.50	20.26
29/07/2011	10h 04m 58.44s	+08° 56' 34.4"	0.4656787	0.7298922	6.07	24.7	9.2	1	0.293	114.5	7.13	13.48	20.22
30/07/2011	10h 06m 05.66s	+08° 36' 36.9"	0.4647862	0.7171866	5.97	24.1	9.4	1.1	0.275	116.8	7.12	13.45	20.17
31/07/2011	10h 06m 55.73s	+08° 18' 22.8"	0.4636166	0.7048704	5.86	23.5	9.5	1.2	0.256	119.2	7.10	13.42	20.13
01/08/2011	10h 07m 28.18s	+08° 02' 00.4"	0.4621711	0.6929854	5.76	22.8	9.7	1.3	0.237	121.7	7.07	13.38	20.08
02/08/2011	10h 07m 42.59s	+07° 47' 38.2"	0.4604516	0.6815782	5.67	22.0	9.9	1.4	0.218	124.3	7.04	13.34	20.04
03/08/2011	10h 07m 38.59s	+07° 35' 24.6"	0.4584601	0.6706998	5.58	21.2	10.0	1.5	0.199	127.0	7.01	13.30	19.59
04/08/2011	10h 07m 15.93s	+07° 25' 28.0"	0.4561993	0.6604066	5.49	20.2	10.2	1.7	0.180	129.8	6.57	13.26	19.54
05/08/2011	10h 06m 34.46s	+07° 17' 56.1"	0.4536722	0.6507599	5.41	19.2	10.3	1.8	0.161	132.6	6.53	13.21	19.49
06/08/2011	10h 05m 34.20s	+07° 12' 56.3"	0.4508822	0.6418260	5.34	18.1	10.5	2	0.143	135.6	6.48	13.16	19.43
07/08/2011	10h 04m 15.39s	+07° 10' 35.0"	0.4478336	0.6336760	5.27	16.9	10.6	2.2	0.124	138.7	6.43	13.10	19.38
08/08/2011	10h 02m 38.50s	+07° 10' 57.2"	0.4445310	0.6263855	5.21	15.7	10.7	2.4	0.106	141.9	6.37	13.05	19.32
09/08/2011	10h 00m 44.26s	+07° 14' 06.6"	0.4409798	0.6200340	5.16	14.4	10.8	2.6	0.089	145.2	6.31	12.59	19.26
10/08/2011	09h 58m 33.75s	+07° 20' 04.8"	0.4371863	0.6147040	5.11	13.0	10.9	2.9	0.073	148.6	6.24	12.52	19.21
11/08/2011	09h 56m 08.41s	+07° 28' 50.9"	0.4331576	0.6104797	5.08	11.6	11.0	3.2	0.058	152.0	6.17	12.46	19.15
12/08/2011	09h 53m 30.01s	+07° 40' 21.6"	0.4289017	0.6074462	5.05	10.1	11.1	3.5	0.045	155.5	6.10	12.39	19.09
13/08/2011	09h 50m 40.75s	+07° 54' 30.3"	0.4244277	0.6056876	5.04	8.7	11.1	3.8	0.033	158.9	6.02	12.33	19.03
14/08/2011	09h 47m 43.19s	+08° 11' 07.6"	0.4197459	0.6052851	5.03	7.3	11.1	4.1	0.024	162.2	5.55	12.26	18.57
15/08/2011	09h 44m 40.25s	+08° 30' 00.8"	0.4148682	0.6063155	5.04	6.0	11.1	4.4	0.017	165.2	5.46	12.19	18.52
16/08/2011	09h 41m 35.13s	+08° 50' 53.9"	0.4098077	0.6088489	5.06	5.1	11.0	4.7	0.012	167.4	5.38	12.12	18.46
17/08/2011	09h 38m 31.31s	+09° 13' 28.5"	0.4045794	0.6129472	5.10	4.6	11.0	4.8	0.010	168.5	5.30	12.05	18.40
18/08/2011	09h 35m 32.41s	+09° 37' 23.3"	0.3992000	0.6186619	5.15	4.8	10.9	4.7	0.011	167.8	5.21	11.58	18.35
19/08/2011	09h 32m 42.13s	+10° 02' 15.7"	0.3936884	0.6260326	5.21	5.5	10.7	4.4	0.015	165.7	5.13	11.51	18.30
20/08/2011	09h 30m 04.11s	+10° 27' 41.4"	0.3880656	0.6350860	5.28	6.6	10.6	4.1	0.023	162.5	5.05	11.45	18.25
21/08/2011	09h 27m 41.92s	+10° 53' 15.7"	0.3823553	0.6458349	5.37	7.9	10.4	3.7	0.034	158.8	4.57	11.39	18.21
22/08/2011	09h 25m 38.85s	+11° 18' 34.0"	0.3765838	0.6582773	5.47	9.2	10.2	3.3	0.048	154.7	4.50	11.33	18.17
23/08/2011	09h 23m 57.94s	+11° 43' 12.3"	0.3707800	0.6723962	5.59	10.4	10.0	2.9	0.065	150.3	4.43	11.27	18.13
24/08/2011	09h 22m 41.84s	+12° 06' 47.5"	0.3649762	0.6881595	5.72	11.7	9.8	2.5	0.086	145.9	4.36	11.22	18.10
25/08/2011	09h 21m 52.82s	+12° 28' 58.2"	0.3592078	0.7055202	5.87	12.9	9.5	2.1	0.110	141.2	4.30	11.18	18.07
26/08/2011	09h 21m 32.70s	+12° 49' 24.4"	0.3535132	0.7244163	6.02	13.9	9.3	1.8	0.137	136.6	4.24	11.14	18.04
27/08/2011	09h 21m 42.87s	+13° 07' 47.9"	0.3479341	0.7447713	6.19	14.9	9.0	1.5	0.167	131.8	4.20	11.10	18.02
28/08/2011	09h 22m 24.27s	+13° 23' 52.5"	0.3425155	0.7664942	6.37	15.7	8.8	1.2	0.199	127.0	4.15	11.07	18.00
29/08/2011	09h 23m 37.42s	+13° 37' 23.6"	0.3373049	0.7894797	6.56	16.4	8.5	0.9	0.234	122.1	4.12	11.05	17.58
30/08/2011	09h 25m 22.43s	+13° 48' 08.6"	0.3323521	0.8136088	6.77	17.0	8.3	0.7	0.271	117.2	4.09	11.03	17.57
31/08/2011	09h 27m 39.02s	+13° 55' 56.4"	0.3277088	0.8387489	6.97	17.5	8.0	0.4	0.310	112.3	4.07	11.01	17.56
01/09/2011	09h 30m 26.54s	+14° 00' 37.9"	0.3234272	0.8647546	7.19	17.8	7.8	0.2	0.351	107.3	4.06	11.00	17.55
02/09/2011	09h 33m 44.03s	+14° 02' 05.5"	0.3195592	0.8914688	7.41	18.0	7.5	0	0.393	102.3	4.05	11.00	17.55
03/09/2011	09h 37m 30.21s	+14° 00' 13.7"	0.3161549	0.9187237	7.64	18.1	7.3	-0.1	0.436	97.3	4.05	11.00	17.55
04/09/2011	09h 41m 43.52s	+13° 54' 58.8"	0.3132613	0.9463433	7.87	18.1	7.1	-0.3	0.480	92.3	4.06	11.00	17.55
05/09/2011	09h 46m 22.17s	+13° 46' 19.0"	0.3109204	0.9741459	8.10	17.9	6.9	-0.4	0.524	87.3	4.07	11.01	17.55
06/09/2011	09h 51m 24.16s	+13° 34' 14.8"	0.3091677	1.0019473	8.33	17.7	6.7	-0.6	0.567	82.3	4.09	11.02	17.55
07/09/2011	09h 56m 47.36s	+13° 18' 48.4"	0.3080306	1.0295646	8.56	17.3	6.5	-0.7	0.610	77.3	4.12	11.04	17.56
08/09/2011	10h 02m 29.49s	+13° 00' 04.5"	0.3075275	1.0568204	8.79	16.9	6.4	-0.8	0.651	72.4	4.15	11.06	17.57
09/09/2011	10h 08m 28.25s	+12° 38' 09.6"	0.3076666	1.0835468	9.01	16.4	6.2	-0.9	0.690	67.6	4.18	11.08	17.57
10/09/2011	10h 14m 41.30s	+12° 13' 11.9"	0.3084457	1.1095891	9.23	15.8	6.1	-0.9	0.728	62.9	4.22	11.10	17.58
11/09/2011	10h 21m 06.38s	+11° 45' 21.6"	0.3098520	1.1348094	9.44	15.2	5.9	-1	0.763	58.3	4.26	11.13	17.59
12/09/2011	10h 27m 41.29s	+11° 14' 49.9"	0.3118631	1.1590887	9.64	14.5	5.8	-1.1	0.796	53.8	4.31	11.16	17.59
13/09/2011	10h 34m 23.97s	+10° 41' 49.1"	0.3144479	1.1823286	9.83	13.7	5.7	-1.1	0.825	49.4	4.36	11.19	17.58
14/09/2011	10h 41m 12.54s	+10° 06' 32.3"	0.3175679	1.2044520	10.02	12.9	5.6	-1.2	0.852	45.2	4.41	11.21	18.01
15/09/2011	10h 48m 05.28s	+09° 29' 12.7"	0.3211788	1.2254023	10.19	12.1	5.5	-1.2	0.877	41.1	4.46	11.24	18.01
16/09/2011	10h 55m 00.68s	+08° 50' 03.8"	0.3252321	1.2451424	10.35	11.3	5.4	-1.2	0.898	37.2	4.52	11.27	18.02
17/09/2011	11h 01m 57.42s	+08° 09' 18.6"	0.3296766	1.2636527	10.51	10.4	5.3	-1.3	0.917	33.5	4.57	11.30	18.02
18/09/2011	11h 08m 54.38s	+07° 27' 09.9"	0.3344601	1.2809294	10.65	9.6	5.3	-1.3	0.933	29.9	5.03	11.33	18.02
19/09/2011	11h 15m 50.62s	+06° 43' 49.8"	0.3395307	1.2969813	10.79	8.7	5.2	-1.3	0.947	26.5	5.09	11.36	18.03
20/09/2011	11h 22m 45.39s	+05° 59' 29.4"	0.3448373	1.3118280	10.91	7.8	5.1	-1.4	0.959	23.3	5.14	11.39	18.03
21/09/2011	11h 29m 38.08s	+05° 14' 19.3"	0.3503310	1.3254972	11.02	6.9	5.1	-1.4	0.969	20.3	5.20	11.42	18.03
22/09/2011	11h 36m 28.22s	+04° 28' 29.2"	0.3559653	1.3380231	11.13	6.1	5.0	-1.4	0.977	17.4	5.26	11.45	18.03
23/09/2011	11h 43m 15.46s	+03° 42' 07.9"	0.3616968	1.3494436	11.22	5.2	5.0	-1.5	0.984	14.6	5.31	11.48	18.03
24/09/2011	11h 49m 59.56s	+02° 55' 23.5"	0.3674850	1.3597997	11.31	4.4	4.9	-1.5	0.989	12.1	5.37	11.51	18.03
25/09/2011	11h 56m 40.37s	+02° 08' 23.0"	0.3732928	1.3691337	11.39	3.6	4.9	-1.5	0.993	9.7	5.43	11.54	18.03
26/09/2011	12h 03m 17.79s	+01° 21' 13.2"	0.3790864	1.3774882	11.46	2.8	4.9	-1.6	0.996	7.5	5.48	11.56	18.03
27/09/2011	12h 09m 51.82s	+00° 33' 59.6"	0.3848348	1.3849051	11.52	2.1	4.9	-1.6	0.998	5.5	5.54	11.59	18.03
28/09/2011	12h 16m 22.47s	-00° 13' 12.3"	0.3905103	1.3914257	11.57	1.6	4.8	-1.6	0.999	4.0	5.59	12.01	18.02
29/09/2011	12h 22m 49.81s	-01° 00' 18.0"	0.3960876	1.3970893	11.62	1.3	4.8	-1.6	0.999	3.4	6.04	12.04	18.02
30/09/2011	12h 29m 13.93s	-01° 47' 13.3"	0.4015445	1.4019336	11.66	1.6	4.8	-1.5	0.999	3.1	6.10	12.06	18.02
01/10/2011	12h 35m 34.96s	-02° 33' 54.5"	0.4068607	1.4059942	11.69	2.1	4.8	-1.4	0.998	5.1	6.15	12.09	18.01
02/10/2011	12h 41m 53.03s	-03° 20' 18.2"	0.4120183	1.4093045	11.72	2.7	4.8	-1.4	0.997	6.6	6.20	12.11	18.01
03/10/2011	12h 48m 08.29s	-04° 06' 21.5"	0.4170014	1.41									

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang°	Rise	Transit	Set
03/11/2011	15h 50m 53.06s	-22° 27' 39.4"	0.4477420	1.2165637	10,12	20,3	5,5	-0,3	0,819	50,3	8,37	13,14	17,49
04/11/2011	15h 56m 31.35s	-22° 48' 36.8"	0.4444320	1.2019963	10,00	20,7	5,6	-0,3	0,808	52,0	8,41	13,15	17,49
05/11/2011	16h 02m 06.94s	-23° 08' 22.9"	0.4408736	1.1868796	9,87	21,0	5,7	-0,3	0,796	53,7	8,44	13,17	17,50
06/11/2011	16h 07m 39.33s	-23° 26' 56.1"	0.4370731	1.1712098	9,74	21,3	5,7	-0,3	0,783	55,5	8,47	13,18	17,50
07/11/2011	16h 13m 07.92s	-23° 44' 14.4"	0.4330375	1.1549841	9,61	21,6	5,8	-0,3	0,769	57,4	8,49	13,20	17,50
08/11/2011	16h 18m 32.03s	-24° 00' 15.7"	0.4287750	1.1382011	9,47	21,9	5,9	-0,3	0,755	59,4	8,52	13,21	17,50
09/11/2011	16h 23m 50.89s	-24° 14' 58.2"	0.4242946	1.1208613	9,32	22,1	6,0	-0,3	0,739	61,4	8,54	13,23	17,51
10/11/2011	16h 29m 03.60s	-24° 28' 19.7"	0.4196069	1.1029675	9,17	22,3	6,1	-0,3	0,722	63,6	8,57	13,24	17,51
11/11/2011	16h 34m 09.15s	-24° 40' 18.2"	0.4147236	1.0845258	9,02	22,5	6,2	-0,3	0,704	65,9	8,59	13,25	17,51
12/11/2011	16h 39m 06.38s	-24° 50' 51.4"	0.4096578	1.0655457	8,86	22,6	6,3	-0,3	0,685	68,3	9,00	13,26	17,51
13/11/2011	16h 43m 53.97s	-24° 59' 57.2"	0.4044247	1.0460420	8,70	22,7	6,4	-0,3	0,664	70,8	9,02	13,27	17,51
14/11/2011	16h 48m 30.45s	-25° 07' 33.1"	0.3990410	1.0260347	8,53	22,7	6,6	-0,2	0,642	73,5	9,03	13,27	17,51
15/11/2011	16h 52m 54.12s	-25° 13' 36.8"	0.3935257	1.0055513	8,36	22,7	6,7	-0,2	0,618	76,3	9,04	13,28	17,51
16/11/2011	16h 57m 03.10s	-25° 18' 05.7"	0.3878998	0.9846278	8,19	22,7	6,8	-0,2	0,593	79,3	9,04	13,28	17,51
17/11/2011	17h 00m 55.28s	-25° 20' 57.0"	0.3821872	0.9633105	8,01	22,5	7,0	-0,2	0,565	82,5	9,04	13,27	17,50
18/11/2011	17h 04m 28.30s	-25° 22' 07.8"	0.3764140	0.9416584	7,83	22,3	7,1	-0,1	0,536	85,9	9,04	13,27	17,50
19/11/2011	17h 07m 39.58s	-25° 21' 35.0"	0.3706096	0.9197448	7,65	22,0	7,3	-0,1	0,505	89,5	9,03	13,26	17,49
20/11/2011	17h 10m 26.26s	-25° 19' 15.0"	0.3644801	0.8976607	7,47	21,6	7,5	-0,1	0,471	93,3	9,01	13,24	17,48
21/11/2011	17h 12m 45.30s	-25° 15' 04.0"	0.3590390	0.8755169	7,28	21,1	7,7	0	0,436	97,4	8,59	13,23	17,46
22/11/2011	17h 14m 33.47s	-25° 08' 57.8"	0.3533469	0.8534473	7,10	20,5	7,9	0,1	0,398	101,7	8,56	13,20	17,44
23/11/2011	17h 15m 47.41s	-25° 00' 51.6"	0.3477717	0.8316116	6,92	19,7	8,1	0,2	0,359	106,4	8,53	13,17	17,42
24/11/2011	17h 16m 23.79s	-24° 50' 40.3"	0.3423582	0.8101978	6,74	18,8	8,3	0,4	0,318	111,3	8,48	13,14	17,39
25/11/2011	17h 16m 19.46s	-24° 38' 18.6"	0.3371541	0.7894243	6,57	17,8	8,5	0,6	0,277	116,5	8,43	13,09	17,36
26/11/2011	17h 15m 31.67s	-24° 23' 41.0"	0.3322094	0.7695400	6,40	16,6	8,7	0,8	0,234	122,1	8,37	13,04	17,32
27/11/2011	17h 13m 58.37s	-24° 06' 43.0"	0.3275756	0.7508231	6,25	15,2	9,0	1,1	0,192	128,0	8,30	12,58	17,27
28/11/2011	17h 11m 38.60s	-23° 47' 21.6"	0.3233052	0.7335770	6,10	13,6	9,2	1,5	0,151	134,2	8,22	12,52	17,22
29/11/2011	17h 08m 32.83s	-23° 25' 36.6"	0.3194498	0.7181222	5,97	11,8	9,4	1,9	0,113	140,8	8,13	12,44	17,16
30/11/2011	17h 04m 43.39s	-23° 01' 32.7"	0.3160596	0.7047854	5,86	9,9	9,5	2,4	0,078	147,6	8,03	12,36	17,10
01/12/2011	17h 00m 14.69s	-22° 35' 21.4"	0.3131815	0.6938830	5,77	7,8	9,7	3	0,048	154,7	7,53	12,28	17,03
02/12/2011	16h 55m 13.42s	-22° 07' 22.6"	0.3108572	0.6857024	5,70	5,6	9,8	3,7	0,025	162,0	7,42	12,18	16,56
03/12/2011	16h 49m 48.32s	-21° 38' 05.6"	0.3091220	0.6804816	5,66	3,4	9,9	4,5	0,009	169,2	7,30	12,09	16,49
04/12/2011	16h 44m 09.84s	-21° 08' 09.4"	0.3080032	0.6783892	5,64	1,4	9,9	5,2	0,002	175,4	7,18	11,59	16,41
05/12/2011	16h 38m 29.38s	-20° 38' 20.8"	0.3075188	0.6795097	5,65	2,1	9,9	5	0,003	173,3	7,07	11,50	16,34
06/12/2011	16h 32m 58.46s	-20° 09' 30.6"	0.3076768	0.6838343	5,69	4,3	9,8	4,2	0,014	166,3	6,55	11,41	16,27
07/12/2011	16h 27m 47.85s	-19° 42' 29.9"	0.3084744	0.6912620	5,75	6,5	9,7	3,4	0,034	158,9	6,45	11,32	16,20
08/12/2011	16h 23m 06.77s	-19° 18' 05.0"	0.3098989	0.7016074	5,83	8,6	9,6	2,7	0,061	151,5	6,35	11,23	16,13
09/12/2011	16h 19m 02.46s	-18° 56' 53.9"	0.3119274	0.7146174	5,94	10,6	9,4	2,1	0,094	144,4	6,25	11,16	16,07
10/12/2011	16h 15m 39.93s	-18° 39' 23.4"	0.3145287	0.7299900	6,07	12,5	9,2	1,6	0,132	137,4	6,17	11,09	16,01
11/12/2011	16h 13m 02.05s	-18° 25' 48.9"	0.3176640	0.7473957	6,22	14,1	9,0	1,2	0,173	130,8	6,10	11,03	15,56
12/12/2011	16h 11m 09.79s	-18° 16' 14.5"	0.3212887	0.7664965	6,37	15,6	8,8	0,9	0,217	124,5	6,04	10,57	15,51
13/12/2011	16h 10m 02.58s	-18° 10' 34.9"	0.3253544	0.7869615	6,54	16,9	8,5	0,6	0,262	118,5	5,58	10,52	15,46
14/12/2011	16h 09m 38.73s	-18° 08' 37.7"	0.3298099	0.8084788	6,72	18,0	8,3	0,4	0,306	112,8	5,54	10,48	15,43
15/12/2011	16h 09m 55.77s	-18° 10' 05.1"	0.3346029	0.8307633	6,91	18,9	8,1	0,2	0,350	107,5	5,51	10,45	15,39
16/12/2011	16h 10m 50.79s	-18° 14' 36.2"	0.3396814	0.8535608	7,10	19,7	7,9	0,1	0,392	102,4	5,48	10,42	15,36
17/12/2011	16h 12m 20.66s	-18° 21' 48.8"	0.3449944	0.8766495	7,29	20,3	7,7	0	0,433	97,7	5,46	10,40	15,33
18/12/2011	16h 14m 22.23s	-18° 31' 05.4"	0.3504932	0.8998395	7,48	20,8	7,5	-0,1	0,472	93,3	5,45	10,38	15,31
19/12/2011	16h 16m 52.44s	-18° 42' 48.9"	0.3561312	0.9229704	7,67	21,2	7,3	-0,2	0,508	89,1	5,45	10,37	15,29
20/12/2011	16h 19m 48.43s	-18° 55' 53.8"	0.3618652	0.9459095	7,87	21,5	7,1	-0,3	0,542	85,2	5,45	10,36	15,27
21/12/2011	16h 23m 07.53s	-19° 10' 15.7"	0.3676548	0.9685478	8,05	21,7	6,9	-0,3	0,574	81,5	5,45	10,36	15,26
22/12/2011	16h 26m 47.31s	-19° 25' 37.3"	0.3734630	0.9907979	8,24	21,8	6,8	-0,3	0,604	78,0	5,46	10,35	15,24
23/12/2011	16h 30m 45.60s	-19° 41' 42.6"	0.3792559	1.0125903	8,42	21,8	6,6	-0,3	0,631	74,8	5,47	10,36	15,23
24/12/2011	16h 35m 00.43s	-19° 58' 17.5"	0.3850028	1.0338708	8,60	21,8	6,5	-0,4	0,657	71,7	5,49	10,36	15,23
25/12/2011	16h 39m 30.09s	-20° 15' 09.5"	0.3906759	1.0545984	8,77	21,7	6,4	-0,4	0,680	68,8	5,51	10,37	15,22
26/12/2011	16h 44m 13.03s	-20° 32' 07.3"	0.3962503	1.0747426	8,94	21,6	6,3	-0,4	0,702	66,1	5,53	10,37	15,22
27/12/2011	16h 49m 07.90s	-20° 49' 01.0"	0.4017035	1.0942819	9,10	21,5	6,1	-0,4	0,723	63,5	5,55	10,39	15,22
28/12/2011	16h 54m 13.50s	-21° 05' 42.0"	0.4070154	1.1132019	9,26	21,2	6,0	-0,4	0,742	61,1	5,57	10,40	15,22
29/12/2011	16h 59m 28.80s	-21° 22' 02.5"	0.4121683	1.1314941	9,41	21,0	5,9	-0,4	0,759	58,8	6,00	10,41	15,22
30/12/2011	17h 04m 52.87s	-21° 37' 55.6"	0.4171463	1.1491544	9,56	20,7	5,9	-0,4	0,775	56,6	6,02	10,43	15,22
31/12/2011	17h 10m 24.91s	-21° 53' 15.4"	0.4219351	1.1661825	9,70	20,5	5,8	-0,4	0,790	54,5	6,05	10,44	15,23

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

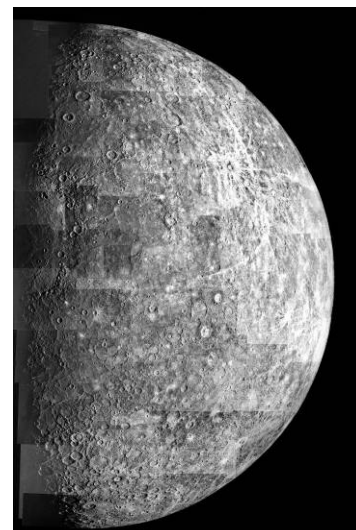
R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

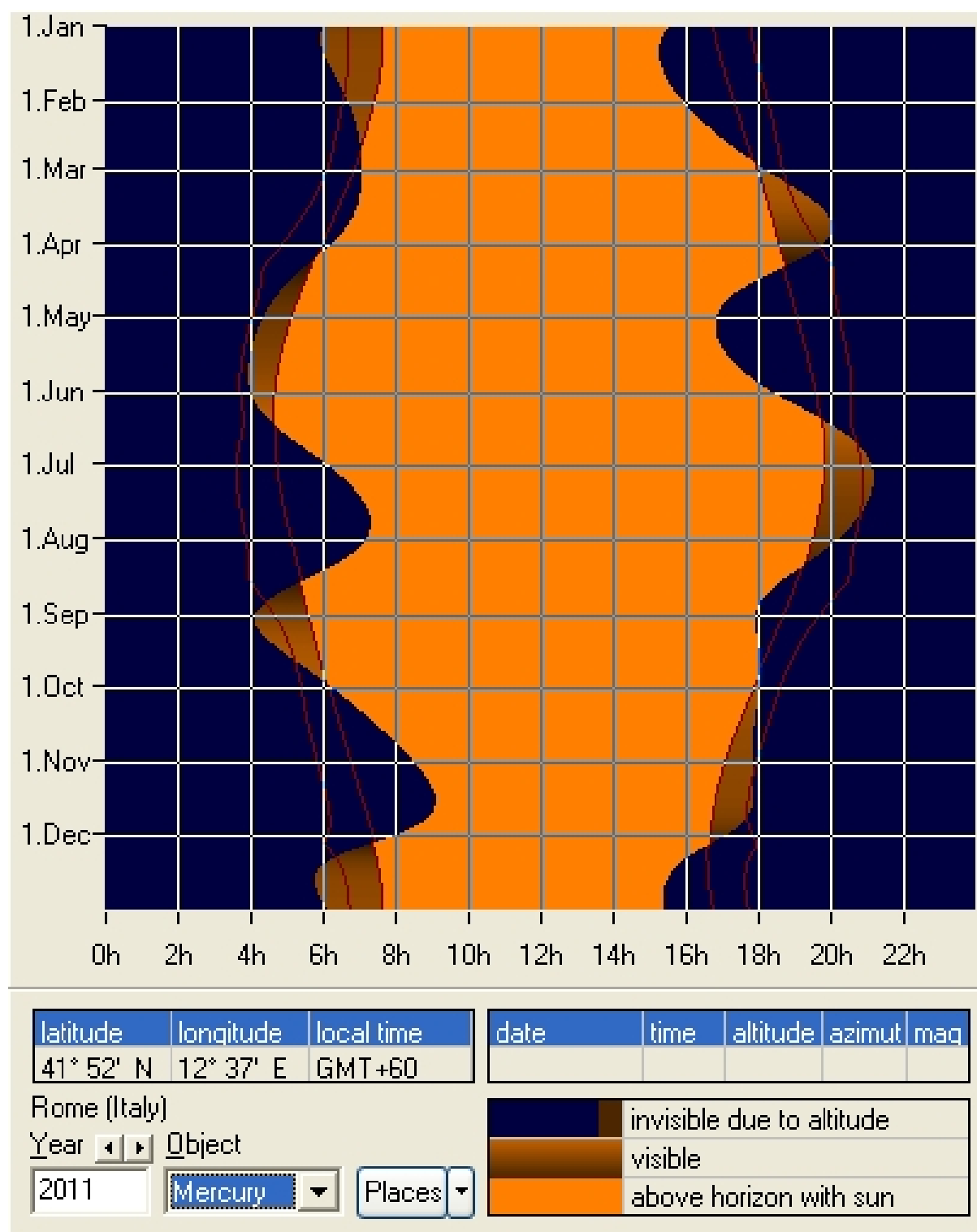
# FENOMENI DI MERCURIO - PHENOMENA OF MERCURY

Perielio - Perihelion	16/03/2011	08:17:26	0,30750 AU
Perielio - Perihelion	12/06/2011	07:32:36	0,30750 AU
Perielio - Perihelion	08/09/2011	06:48:44	0,30750 AU
Perielio - Perihelion	05/12/2011	06:06:34	0,30750 AU
Afelio - Aphelion	31/01/2011	08:40:00	0,46670 AU
Afelio - Aphelion	29/04/2011	07:55:23	0,46670 AU
Afelio - Aphelion	26/07/2011	07:10:45	0,46670 AU
Afelio - Aphelion	22/10/2011	06:28:10	0,46670 AU
Perigeo - Perigee	13/04/2011	05:36:08	0,57889 AU
Perigeo - Perigee	13/08/2011	18:14:33	0,60528 AU
Perigeo - Perigee	04/12/2011	03:40:16	0,67835 AU
Apogeo - Apogee	17/02/2011	18:21:42	1,39354 AU
Apogeo - Apogee	13/06/2011	05:19:50	1,32264 AU
Apogeo - Apogee	06/10/2011	11:06:42	1,41569 AU
Magnit. Max - Brightness maximum	14/01/2011	21:31:21	-0,2 mag
Magnit. Max - Brightness maximum	26/02/2011	21:07:17	-1,6 mag
Magnit. Max - Brightness maximum	12/06/2011	21:31:59	-2,3 mag
Magnit. Max - Brightness maximum	27/09/2011	21:20:38	-1,6 mag
Magnit. Max - Brightness maximum	09/11/2011	06:43:21	-0,3 mag
Magnit. Max - Brightness maximum	27/12/2011	23:19:53	-0,4 mag
Magnit. Min - Brightness minimum	18/01/2011	02:11:59	-0,2 mag
Magnit. Min - Brightness minimum	10/04/2011	00:35:14	5,4 mag
Magnit. Min - Brightness minimum	17/08/2011	01:36:07	4,8 mag
Magnit. Min - Brightness minimum	04/11/2011	13:17:58	-0,3 mag
Max el. Est - Greatest elong.east	23/03/2011	01:02:10	18,6 °
Max el. Est - Greatest elong.east	20/07/2011	05:01:41	26,8 °
Max el. Est - Greatest elong.east	14/11/2011	08:15:33	22,7 °
Max el. Ovest - Greatest elong. west	09/01/2011	14:39:58	23,3 °
Max el. Ovest - Greatest elong. west	07/05/2011	19:05:32	26,6 °
Max el. Ovest - Greatest elong. west	03/09/2011	06:03:15	18,1 °
Max el. Ovest - Greatest elong. west	23/12/2011	03:35:10	21,8 °
Cong. Infer. - Inferior conjunction	09/04/2011	19:36:21	
Cong. Infer. - Inferior conjunction	17/08/2011	01:04:04	
Cong. Infer. - Inferior conjunction	04/12/2011	08:52:19	
Cong. Super. - Superior conjunction	25/02/2011	08:47:42	
Cong. Super. - Superior conjunction	12/06/2011	23:44:27	
Cong. Super. - Superior conjunction	28/09/2011	20:15:47	
Moto retrogr. - Retrograde motion	30/03/2011	17:14:30	
Moto retrogr. - Retrograde motion	02/08/2011	06:50:34	
Moto retrogr. - Retrograde motion	24/11/2011	09:24:46	
Moto diretto - Prograde motion	22/04/2011	05:04:40	
Moto diretto - Prograde motion	26/08/2011	04:04:50	
Moto diretto - Prograde motion	14/12/2011	01:56:19	
Max ang. Fase - Maximum phase angle	10/04/2011	00:03:35	174,3 °
Max ang. Fase - Maximum phase angle	17/08/2011	02:59:30	168,4 °
Max ang. Fase - Maximum phase angle	04/12/2011	08:07:02	175,4 °
Min ang. Fase - Minimum phase angle	25/02/2011	10:15:24	4,8 °
Min ang. Fase - Minimum phase angle	12/06/2011	21:52:31	2,9 °
Min ang. Fase - Minimum phase angle	29/09/2011	01:33:03	3,4 °

© (5)



# VISIBILITA' DI MERCURIO - VISIBILITY OF MERCURY



Visibilità di Mercurio nel corso dell'anno - Visibility of Mercury during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

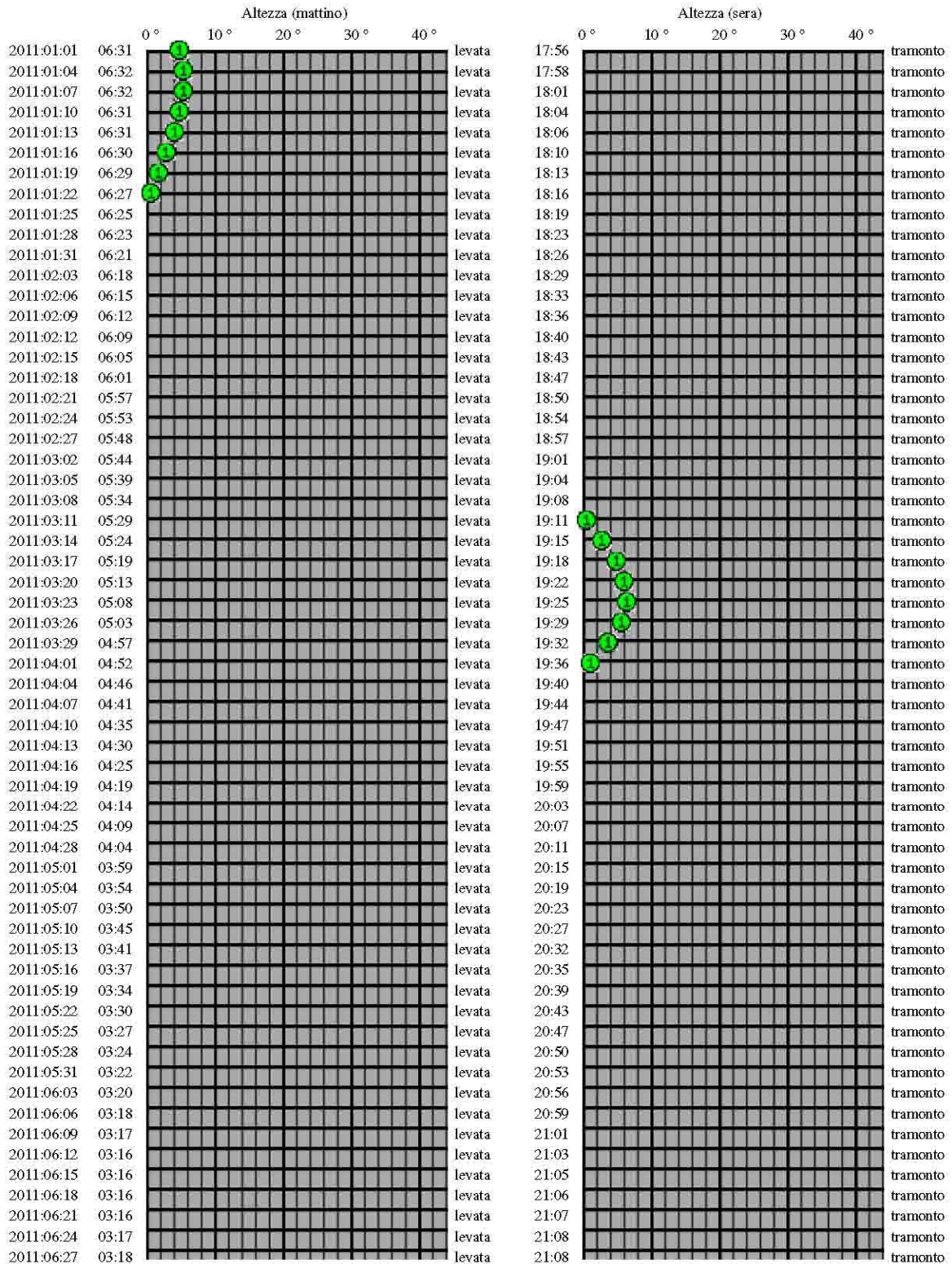


# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

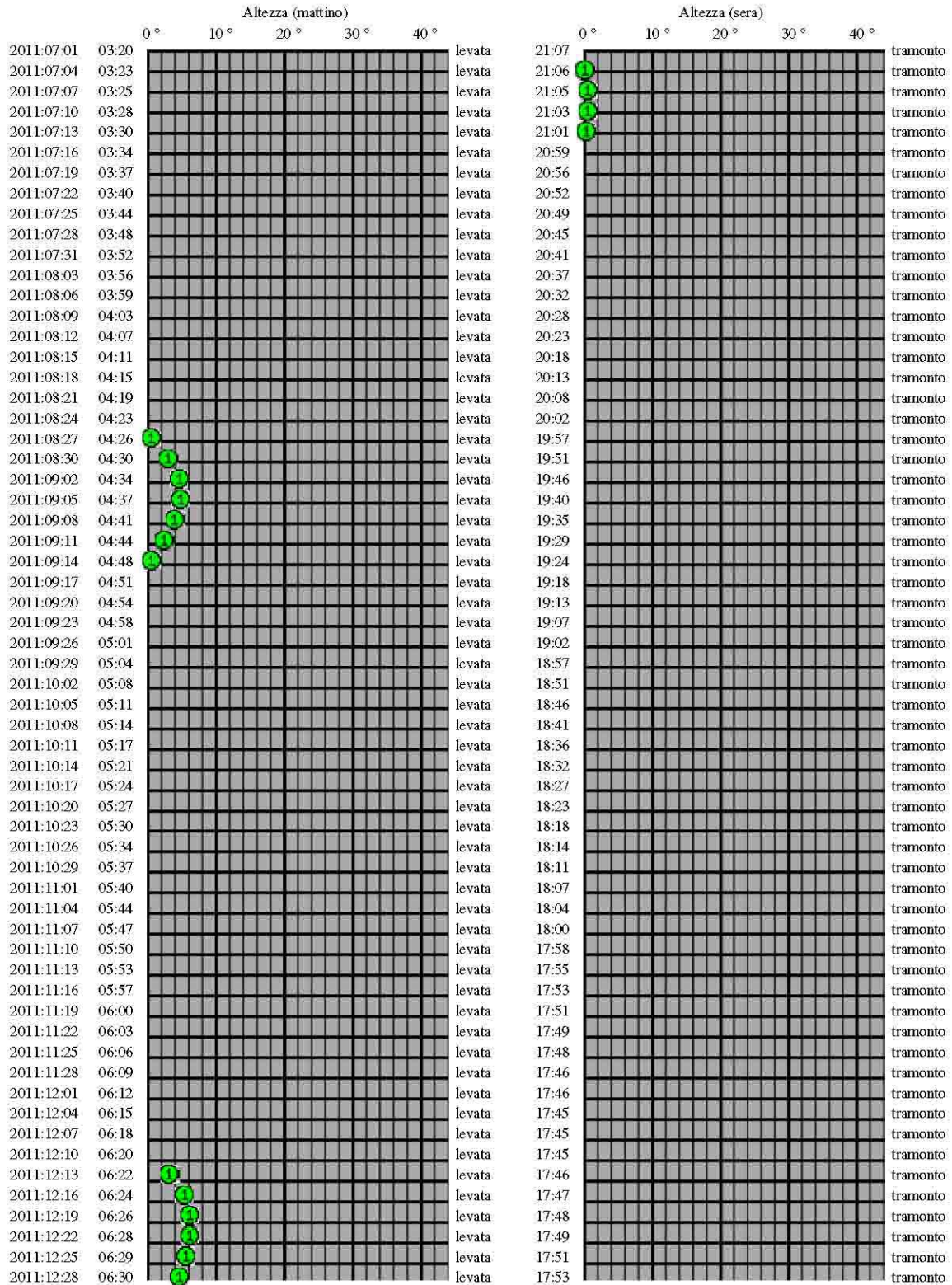


# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 12° sotto l'orizzonte

Altitude in the twilights. The Sun is 12° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	06:31	4.7	122.7	20.7	17:56	-26.6	265.9	21.1
2011:01:04	06:32	5.3	124.1	22.4	17:58	-28.3	266.7	22.5
2011:01:07	06:32	5.3	124.9	23.1	18:01	-29.5	266.9	23.2
2011:01:10	06:31	4.8	125.1	23.3	18:04	-30.2	266.7	23.3
2011:01:13	06:31	3.9	124.9	23.0	18:06	-30.5	266.3	22.9
2011:01:16	06:30	2.9	124.4	22.4	18:10	-30.6	265.7	22.3
2011:01:19	06:29	1.7	123.5	21.5	18:13	-30.3	265.2	21.4
2011:01:22	06:27	0.4	122.3	20.5	18:16	-29.9	264.6	20.3
2011:01:25	06:25	-0.9	120.9	19.4	18:19	-29.2	264.2	19.2
2011:01:28	06:23	-2.2	119.2	18.1	18:23	-28.3	263.8	17.9
2011:01:31	06:21	-3.5	117.3	16.7	18:26	-27.3	263.6	16.4
2011:02:03	06:18	-4.8	115.1	15.2	18:29	-26.1	263.5	14.9
2011:02:06	06:15	-6.1	112.8	13.6	18:33	-24.7	263.5	13.3
2011:02:09	06:12	-7.4	110.2	11.9	18:36	-23.2	263.7	11.5
2011:02:12	06:09	-8.7	107.4	10.0	18:40	-21.5	264.0	9.7
2011:02:15	06:05	-9.9	104.4	8.1	18:43	-19.6	264.4	7.7
2011:02:18	06:01	-11.1	101.2	6.1	18:47	-17.6	264.9	5.7
2011:02:21	05:57	-12.2	97.7	4.0	18:50	-15.4	265.6	3.6
2011:02:24	05:53	-13.3	93.9	2.2	18:54	-13.1	266.4	2.0
2011:02:27	05:48	-14.3	90.0	2.4	18:57	-10.5	267.2	2.7
2011:03:02	05:44	-15.3	85.8	4.5	19:01	-7.9	268.2	5.0
2011:03:05	05:39	-16.0	81.4	7.1	19:04	-5.1	269.3	7.6
2011:03:08	05:34	-16.7	76.9	9.8	19:08	-2.3	270.4	10.3
2011:03:11	05:29	-17.1	72.5	12.5	19:11	0.3	271.7	13.0
2011:03:14	05:24	-17.3	68.3	14.9	19:15	2.7	273.2	15.3
2011:03:17	05:19	-17.3	64.4	16.9	19:18	4.7	274.8	17.2
2011:03:20	05:13	-17.0	61.3	18.2	19:22	5.9	276.6	18.3
2011:03:23	05:08	-16.5	59.0	18.6	19:25	6.2	278.6	18.6
2011:03:26	05:03	-15.7	57.8	18.0	19:29	5.6	280.9	17.8
2011:03:29	04:57	-14.8	57.8	16.4	19:32	3.8	283.3	15.9
2011:04:01	04:52	-13.7	58.9	13.6	19:36	0.9	286.0	12.9
2011:04:04	04:46	-12.4	61.0	9.8	19:40	-3.0	288.9	8.9
2011:04:07	04:41	-11.1	64.0	5.4	19:44	-7.6	292.0	4.5
2011:04:10	04:35	-9.7	67.4	2.4	19:47	-12.6	295.2	2.8
2011:04:13	04:30	-8.4	71.0	6.0	19:51	-17.6	298.4	7.0
2011:04:16	04:25	-7.2	74.3	10.8	19:55	-22.1	301.7	11.7
2011:04:19	04:19	-6.3	77.0	15.1	19:59	-26.1	304.9	15.9
2011:04:22	04:14	-5.5	79.1	18.7	20:03	-29.3	308.1	19.4
2011:04:25	04:09	-4.9	80.5	21.6	20:07	-31.8	311.0	22.2
2011:04:28	04:04	-4.5	81.2	23.8	20:11	-33.5	313.8	24.2
2011:05:01	03:59	-4.2	81.2	25.3	20:15	-34.5	316.4	25.5
2011:05:04	03:54	-4.1	80.7	26.2	20:19	-35.0	318.7	26.3
2011:05:07	03:50	-4.0	79.7	26.5	20:23	-34.9	320.7	26.6
2011:05:10	03:45	-4.1	78.2	26.4	20:27	-34.4	322.4	26.3
2011:05:13	03:41	-4.2	76.4	25.9	20:32	-33.5	323.8	25.7
2011:05:16	03:37	-4.3	74.2	24.9	20:35	-32.3	324.8	24.6
2011:05:19	03:34	-4.6	71.8	23.6	20:39	-30.8	325.6	23.2
2011:05:22	03:30	-4.9	69.0	21.9	20:43	-29.0	325.9	21.4
2011:05:25	03:27	-5.3	66.0	19.8	20:47	-26.9	325.9	19.3
2011:05:28	03:24	-5.8	62.7	17.5	20:50	-24.7	325.5	16.8
2011:05:31	03:22	-6.5	59.2	14.7	20:53	-22.2	324.7	14.0
2011:06:03	03:20	-7.3	55.5	11.7	20:56	-19.6	323.5	10.9
2011:06:06	03:18	-8.3	51.6	8.4	20:59	-16.8	321.9	7.5
2011:06:09	03:17	-9.5	47.7	4.8	21:01	-14.1	319.9	3.9
2011:06:12	03:16	-10.8	43.7	1.3	21:03	-11.4	317.6	0.9
2011:06:15	03:16	-12.3	39.9	2.9	21:05	-8.9	315.1	3.8
2011:06:18	03:16	-13.9	36.3	6.4	21:06	-6.6	312.4	7.3
2011:06:21	03:16	-15.6	33.1	9.9	21:07	-4.6	309.6	10.7
2011:06:24	03:17	-17.4	30.3	13.0	21:08	-3.0	306.9	13.8
2011:06:27	03:18	-19.1	28.0	15.9	21:08	-1.7	304.2	16.6
2011:06:30	03:20	-20.9	26.2	18.4	21:07	-0.7	301.5	19.0

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	03:20	-21.5	25.7	19.2	21:07	-0.4	300.7	19.8
2011:07:04	03:23	-23.3	24.5	21.3	21:06	0.1	298.2	21.8
2011:07:07	03:25	-25.0	23.9	23.1	21:05	0.4	295.8	23.5
2011:07:10	03:28	-26.6	23.8	24.6	21:03	0.5	293.6	24.9
2011:07:13	03:30	-28.2	24.1	25.7	21:01	0.3	291.6	25.9
2011:07:16	03:34	-29.6	25.1	26.4	20:59	-0.1	289.8	26.5
2011:07:19	03:37	-30.8	26.6	26.8	20:56	-0.8	288.3	26.8
2011:07:22	03:40	-31.7	28.6	26.7	20:52	-1.6	287.1	26.6
2011:07:25	03:44	-32.3	31.2	26.2	20:49	-2.7	286.2	26.0
2011:07:28	03:48	-32.4	34.5	25.1	20:45	-4.0	285.9	24.8
2011:07:31	03:52	-31.9	38.2	23.4	20:41	-5.6	286.1	22.9
2011:08:03	03:56	-30.7	42.4	21.0	20:37	-7.4	287.0	20.4
2011:08:06	03:59	-28.6	47.0	18.0	20:32	-9.4	288.6	17.2
2011:08:09	04:03	-25.7	51.7	14.2	20:28	-11.5	290.9	13.3
2011:08:12	04:07	-21.8	56.4	9.9	20:23	-13.6	294.0	8.9
2011:08:15	04:11	-17.3	60.8	5.9	20:18	-15.6	297.6	5.2
2011:08:18	04:15	-12.3	64.7	4.8	20:13	-17.3	301.5	5.3
2011:08:21	04:19	-7.4	68.0	8.0	20:08	-18.4	305.1	8.9
2011:08:24	04:23	-3.0	70.7	11.9	20:02	-19.1	308.0	12.6
2011:08:27	04:26	0.6	72.7	15.0	19:57	-19.2	309.9	15.5
2011:08:30	04:30	3.1	74.1	17.1	19:51	-19.0	310.5	17.4
2011:09:02	04:34	4.5	75.1	18.0	19:46	-18.4	309.9	18.1
2011:09:05	04:37	4.7	75.7	17.9	19:40	-17.7	308.1	17.8
2011:09:08	04:41	4.0	76.2	16.8	19:35	-16.8	305.4	16.5
2011:09:11	04:44	2.5	76.6	15.1	19:29	-15.9	302.0	14.6
2011:09:14	04:48	0.5	77.0	12.8	19:24	-14.9	298.1	12.3
2011:09:17	04:51	-1.8	77.5	10.3	19:18	-14.0	294.0	9.8
2011:09:20	04:54	-4.3	78.2	7.7	19:13	-13.1	289.8	7.2
2011:09:23	04:58	-6.9	78.9	5.1	19:07	-12.2	285.6	4.6
2011:09:26	05:01	-9.3	79.8	2.7	19:02	-11.4	281.5	2.3
2011:09:29	05:04	-11.8	80.8	1.4	18:57	-10.6	277.5	1.5
2011:10:02	05:08	-14.1	81.9	2.8	18:51	-9.9	273.6	3.2
2011:10:05	05:11	-16.2	83.0	4.9	18:46	-9.2	269.9	5.3
2011:10:08	05:14	-18.3	84.2	6.9	18:41	-8.5	266.4	7.3
2011:10:11	05:17	-20.3	85.4	8.8	18:36	-7.9	263.0	9.2
2011:10:14	05:21	-22.1	86.6	10.7	18:32	-7.3	259.7	11.0
2011:10:17	05:24	-23.8	87.7	12.4	18:27	-6.6	256.6	12.7
2011:10:20	05:27	-25.4	88.9	14.1	18:23	-6.0	253.6	14.4
2011:10:23	05:30	-27.0	89.9	15.6	18:18	-5.4	250.8	15.9
2011:10:26	05:34	-28.4	90.9	17.1	18:14	-4.7	248.1	17.3
2011:10:29	05:37	-29.6	91.8	18.4	18:11	-4.1	245.6	18.6
2011:11:01	05:40	-30.8	92.6	19.6	18:07	-3.4	243.2	19.8
2011:11:04	05:44	-31.8	93.4	20.7	18:04	-2.8	241.1	20.9
2011:11:07	05:47	-32.6	94.0	21.6	18:00	-2.1	239.2	21.8
2011:11:10	05:50	-33.2	94.6	22.3	17:58	-1.6	237.6	22.4
2011:11:13	05:53	-33.4	95.1	22.7	17:55	-1.1	236.4	22.7
2011:11:16	05:57	-33.2	95.7	22.6	17:53	-0.8	235.8	22.6
2011:11:19	06:00	-32.3	96.5	21.9	17:51	-0.8	235.7	21.8
2011:11:22	06:03	-30.6	97.6	20.4	17:49	-1.2	236.6	20.0
2011:11:25	06:06	-27.8	99.1	17.5	17:48	-2.4	238.7	17.0
2011:11:28	06:09	-23.6	101.4	13.2	17:46	-4.5	242.1	12.4
2011:12:01	06:12	-18.1	104.4	7.3	17:46	-7.6	246.8	6.3
2011:12:04	06:15	-11.6	107.9	1.3	17:45	-11.5	252.3	1.6
2011:12:07	06:18	-5.3	111.7	7.0	17:45	-15.6	257.6	8.0
2011:12:10	06:20	-0.2	115.2	12.9	17:45	-19.1	262.0	13.7
2011:12:13	06:22	3.4	118.2	17.1	17:46	-21.9	264.8	17.7
2011:12:16	06:24	5.3	120.4	19.9	17:47	-24.0	266.4	20.2
2011:12:19	06:26	6.1	122.1	21.3	17:48	-25.4	266.9	21.4
2011:12:22	06:28	6.1	123.1	21.8	17:49	-26.4	266.6	21.8
2011:12:25	06:29	5.5	123.7	21.7	17:51	-26.9	265.9	21.7
2011:12:28	06:30	4.6	123.9	21.2	17:53	-27.2	265.0	21.1
2011:12:31	06:31	3.4	123.8	20.4	17:55	-27.2	263.9	20.2

Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza del pianeta sull'orizzonte, in °  
 Az = azimut del pianeta, in °  
 Elong = elongazione del pianeta, in °  
  
 Alt = altitude of the planet above the horizon, in °  
 Az = azimuth of the planet, in °  
 Elong = elongation of the planet, in °

# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

		Altezza (mattino)					Altezza (sera)				
		0 °	10 °	20 °	30 °	40 °	0 °	10 °	20 °	30 °	40 °
2011-01-01	05:57						levata	18:30			tramonto
2011-01-04	05:58						levata	18:32			tramonto
2011-01-07	05:58						levata	18:34			tramonto
2011-01-10	05:58						levata	18:37			tramonto
2011-01-13	05:57						levata	18:40			tramonto
2011-01-16	05:56						levata	18:43			tramonto
2011-01-19	05:55						levata	18:46			tramonto
2011-01-22	05:54						levata	18:49			tramonto
2011-01-25	05:52						levata	18:52			tramonto
2011-01-28	05:50						levata	18:55			tramonto
2011-01-31	05:48						levata	18:59			tramonto
2011-02-03	05:45						levata	19:02			tramonto
2011-02-06	05:43						levata	19:06			tramonto
2011-02-09	05:40						levata	19:09			tramonto
2011-02-12	05:36						levata	19:12			tramonto
2011-02-15	05:33						levata	19:16			tramonto
2011-02-18	05:29						levata	19:19			tramonto
2011-02-21	05:25						levata	19:23			tramonto
2011-02-24	05:20						levata	19:26			tramonto
2011-02-27	05:16						levata	19:30			tramonto
2011-03-02	05:11						levata	19:33			tramonto
2011-03-05	05:07						levata	19:37			tramonto
2011-03-08	05:02						levata	19:40			tramonto
2011-03-11	04:56						levata	19:44			tramonto
2011-03-14	04:51						levata	19:47			tramonto
2011-03-17	04:46						levata	19:51			tramonto
2011-03-20	04:40						levata	19:55			tramonto
2011-03-23	04:35						levata	19:59			tramonto
2011-03-26	04:29						levata	20:03			tramonto
2011-03-29	04:23						levata	20:07			tramonto
2011-04-01	04:17						levata	20:11			tramonto
2011-04-04	04:12						levata	20:15			tramonto
2011-04-07	04:06						levata	20:19			tramonto
2011-04-10	04:00						levata	20:23			tramonto
2011-04-13	03:54						levata	20:28			tramonto
2011-04-16	03:48						levata	20:32			tramonto
2011-04-19	03:42						levata	20:37			tramonto
2011-04-22	03:36						levata	20:41			tramonto
2011-04-25	03:30						levata	20:46			tramonto
2011-04-28	03:24						levata	20:51			tramonto
2011-05-01	03:19						levata	20:56			tramonto
2011-05-04	03:13						levata	21:01			tramonto
2011-05-07	03:08						levata	21:06			tramonto
2011-05-10	03:02						levata	21:11			tramonto
2011-05-13	02:57						levata	21:16			tramonto
2011-05-16	02:52						levata	21:20			tramonto
2011-05-19	02:48						levata	21:25			tramonto
2011-05-22	02:43						levata	21:30			tramonto
2011-05-25	02:39						levata	21:35			tramonto
2011-05-28	02:35						levata	21:39			tramonto
2011-05-31	02:32						levata	21:43			tramonto
2011-06-03	02:29						levata	21:47			tramonto
2011-06-06	02:27						levata	21:50			tramonto
2011-06-09	02:25						levata	21:54			tramonto
2011-06-12	02:23						levata	21:56			tramonto
2011-06-15	02:23						levata	21:58			tramonto
2011-06-18	02:22						levata	22:00			tramonto
2011-06-21	02:23						levata	22:01			tramonto
2011-06-24	02:24						levata	22:01			tramonto
2011-06-27	02:25						levata	22:01			tramonto

# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

		Altezza (mattino)					Altezza (sera)				
		0 °	10 °	20 °	30 °	40 °	0 °	10 °	20 °	30 °	40 °
2011-07-01	02:28						levata	22:00			tramonto
2011-07-04	02:30						levata	21:58			tramonto
2011-07-07	02:33						levata	21:56			tramonto
2011-07-10	02:37						levata	21:54			tramonto
2011-07-13	02:41						levata	21:51			tramonto
2011-07-16	02:45						levata	21:47			tramonto
2011-07-19	02:49						levata	21:44			tramonto
2011-07-22	02:54						levata	21:39			tramonto
2011-07-25	02:58						levata	21:35			tramonto
2011-07-28	03:03						levata	21:30			tramonto
2011-07-31	03:08						levata	21:25			tramonto
2011-08-03	03:13						levata	21:20			tramonto
2011-08-06	03:17						levata	21:15			tramonto
2011-08-09	03:22						levata	21:09			tramonto
2011-08-12	03:27						levata	21:03			tramonto
2011-08-15	03:32						levata	20:58			tramonto
2011-08-18	03:36						levata	20:52			tramonto
2011-08-21	03:41						levata	20:46			tramonto
2011-08-24	03:45						levata	20:40			tramonto
2011-08-27	03:49						levata	20:34			tramonto
2011-08-30	03:54						levata	20:28			tramonto
2011-09-02	03:58						levata	20:22			tramonto
2011-09-05	04:02						levata	20:16			tramonto
2011-09-08	04:06						levata	20:10			tramonto
2011-09-11	04:10						levata	20:04			tramonto
2011-09-14	04:14						levata	19:58			tramonto
2011-09-17	04:17						levata	19:52			tramonto
2011-09-20	04:21						levata	19:46			tramonto
2011-09-23	04:25						levata	19:40			tramonto
2011-09-26	04:28						levata	19:35			tramonto
2011-09-29	04:32						levata	19:29			tramonto
2011-10-02	04:35						levata	19:24			tramonto
2011-10-05	04:38						levata	19:19			tramonto
2011-10-08	04:42						levata	19:14			tramonto
2011-10-11	04:45						levata	19:09			tramonto
2011-10-14	04:48						levata	19:04			tramonto
2011-10-17	04:52						levata	18:59			tramonto
2011-10-20	04:55						levata	18:55			tramonto
2011-10-23	04:58						levata	18:51			tramonto
2011-10-26	05:01						levata	18:47			tramonto
2011-10-29	05:05						levata	18:43			tramonto
2011-11-01	05:08						levata	18:39			tramonto
2011-11-04	05:11						levata	18:36			tramonto
2011-11-07	05:14						levata	18:33			tramonto
2011-11-10	05:17						levata	18:30			tramonto
2011-11-13	05:21						levata	18:28			tramonto
2011-11-16	05:24						levata	18:26			tramonto
2011-11-19	05:27						levata	18:24			tramonto
2011-11-22	05:30						levata	18:22			tramonto
2011-11-25	05:33						levata	18:21			tramonto
2011-11-28	05:36						levata	18:20			tramonto
2011-12-01	05:39						levata	18:19			tramonto
2011-12-04	05:41						levata	18:19			tramonto
2011-12-07	05:44						levata	18:19			tramonto
2011-12-10	05:46						levata	18:19			tramonto
2011-12-13	05:48						levata	18:20			tramonto
2011-12-16	05:50						levata	18:21			tramonto
2011-12-19	05:52						levata	18:22			tramonto
2011-12-22	05:54						levata	18:23			tramonto
2011-12-25	05:55						levata	18:25			tramonto
2011-12-28	05:56						levata	18:27			tramonto

Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	-0.8	116.9	20.7	18:30	-32.9	271.4	21.1
2011:01:04	05:58	-0.0	118.3	22.4	18:32	-34.6	272.3	22.5
2011:01:07	05:58	-0.0	119.1	23.1	18:34	-35.8	272.5	23.2
2011:01:10	05:58	-0.5	119.4	23.3	18:37	-36.5	272.3	23.3
2011:01:13	05:57	-1.4	119.3	23.0	18:40	-36.8	271.8	22.9
2011:01:16	05:56	-2.4	118.8	22.4	18:43	-36.8	271.2	22.3
2011:01:19	05:55	-3.6	118.0	21.5	18:46	-36.5	270.6	21.4
2011:01:22	05:54	-4.9	116.9	20.5	18:49	-36.0	270.0	20.3
2011:01:25	05:52	-6.3	115.5	19.4	18:52	-35.3	269.5	19.2
2011:01:28	05:50	-7.7	113.9	18.1	18:55	-34.4	269.1	17.8
2011:01:31	05:48	-9.0	112.1	16.7	18:59	-33.4	268.8	16.4
2011:02:03	05:45	-10.4	110.0	15.2	19:02	-32.1	268.7	14.9
2011:02:06	05:43	-11.8	107.7	13.6	19:06	-30.8	268.7	13.3
2011:02:09	05:40	-13.2	105.2	11.9	19:09	-29.2	268.9	11.5
2011:02:12	05:36	-14.5	102.4	10.0	19:12	-27.5	269.2	9.7
2011:02:15	05:33	-15.8	99.3	8.1	19:16	-25.6	269.7	7.7
2011:02:18	05:29	-17.0	96.0	6.1	19:19	-23.6	270.2	5.7
2011:02:21	05:25	-18.2	92.4	4.0	19:23	-21.4	270.9	3.6
2011:02:24	05:20	-19.3	88.6	2.2	19:26	-19.0	271.7	2.0
2011:02:27	05:16	-20.3	84.5	2.3	19:30	-16.5	272.6	2.7
2011:03:02	05:11	-21.2	80.2	4.5	19:33	-13.9	273.6	5.0
2011:03:05	05:07	-22.0	75.6	7.1	19:37	-11.1	274.7	7.6
2011:03:08	05:02	-22.5	71.0	9.8	19:40	-8.3	275.9	10.3
2011:03:11	04:56	-22.8	66.3	12.4	19:44	-5.7	277.2	13.0
2011:03:14	04:51	-22.9	61.9	14.9	19:47	-3.3	278.7	15.3
2011:03:17	04:46	-22.7	57.9	16.8	19:51	-1.4	280.3	17.2
2011:03:20	04:40	-22.3	54.6	18.2	19:55	-0.2	282.1	18.3
2011:03:23	04:35	-21.6	52.2	18.6	19:59	0.2	284.1	18.6
2011:03:26	04:29	-20.8	51.0	18.0	20:03	-0.5	286.4	17.8
2011:03:29	04:23	-19.9	50.9	16.4	20:07	-2.3	289.0	15.9
2011:04:01	04:17	-18.9	52.0	13.6	20:11	-5.2	291.9	12.9
2011:04:04	04:12	-17.9	54.2	9.8	20:15	-9.0	295.0	8.9
2011:04:07	04:06	-16.8	57.2	5.4	20:19	-13.6	298.4	4.5
2011:04:10	04:00	-15.7	60.8	2.4	20:23	-18.5	302.0	2.8
2011:04:13	03:54	-14.7	64.4	6.0	20:28	-23.3	305.8	7.1
2011:04:16	03:48	-13.7	67.7	10.7	20:32	-27.8	309.7	11.8
2011:04:19	03:42	-13.0	70.4	15.0	20:37	-31.5	313.7	16.0
2011:04:22	03:36	-12.4	72.4	18.7	20:41	-34.6	317.5	19.5
2011:04:25	03:30	-12.0	73.7	21.6	20:46	-36.8	321.1	22.2
2011:04:28	03:24	-11.7	74.3	23.8	20:51	-38.3	324.5	24.2
2011:05:01	03:19	-11.6	74.2	25.3	20:56	-39.2	327.6	25.6
2011:05:04	03:13	-11.6	73.5	26.2	21:01	-39.4	330.3	26.3
2011:05:07	03:08	-11.6	72.4	26.5	21:06	-39.2	332.7	26.6
2011:05:10	03:02	-11.8	70.7	26.4	21:11	-38.6	334.7	26.3
2011:05:13	02:57	-12.0	68.7	25.9	21:16	-37.6	336.2	25.7
2011:05:16	02:52	-12.2	66.3	24.9	21:20	-36.4	337.4	24.6
2011:05:19	02:48	-12.5	63.6	23.6	21:25	-34.8	338.1	23.2
2011:05:22	02:43	-12.8	60.6	21.9	21:30	-33.1	338.4	21.4
2011:05:25	02:39	-13.2	57.3	19.9	21:35	-31.1	338.3	19.3
2011:05:28	02:35	-13.6	53.8	17.5	21:39	-29.0	337.7	16.8
2011:05:31	02:32	-14.1	50.0	14.8	21:43	-26.7	336.7	14.0
2011:06:03	02:29	-14.6	45.9	11.7	21:47	-24.4	335.2	10.9
2011:06:06	02:27	-15.3	41.7	8.4	21:50	-22.0	333.3	7.5
2011:06:09	02:25	-16.0	37.4	4.9	21:54	-19.6	331.0	3.9
2011:06:12	02:23	-16.9	33.0	1.4	21:56	-17.3	328.4	0.9
2011:06:15	02:23	-17.9	28.8	2.8	21:58	-15.1	325.5	3.8
2011:06:18	02:22	-19.0	24.9	6.4	22:00	-13.3	322.6	7.4
2011:06:21	02:23	-20.1	21.3	9.8	22:01	-11.7	319.6	10.7
2011:06:24	02:24	-21.4	18.2	13.0	22:01	-10.4	316.6	13.8
2011:06:27	02:25	-22.8	15.6	15.9	22:01	-9.4	313.7	16.6
2011:06:30	02:27	-24.2	13.5	18.4	22:00	-8.6	310.8	19.0

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	-24.7	12.9	19.2	22:00	-8.4	309.9	19.8
2011:07:04	02:30	-26.2	11.6	21.3	21:58	-8.0	307.2	21.8
2011:07:07	02:33	-27.8	10.8	23.1	21:56	-7.8	304.7	23.5
2011:07:10	02:37	-29.4	10.5	24.5	21:54	-7.8	302.3	24.9
2011:07:13	02:41	-30.9	10.8	25.7	21:51	-8.0	300.2	25.9
2011:07:16	02:45	-32.4	11.7	26.4	21:47	-8.4	298.2	26.6
2011:07:19	02:49	-33.8	13.2	26.8	21:44	-9.0	296.5	26.8
2011:07:22	02:54	-35.0	15.4	26.7	21:39	-9.8	295.2	26.6
2011:07:25	02:58	-35.9	18.3	26.2	21:35	-10.7	294.3	26.0
2011:07:28	03:03	-36.3	21.9	25.1	21:30	-11.9	293.8	24.7
2011:07:31	03:08	-36.3	26.1	23.4	21:25	-13.3	293.9	22.9
2011:08:03	03:13	-35.5	31.0	21.1	21:20	-14.9	294.7	20.4
2011:08:06	03:17	-33.9	36.4	18.0	21:15	-16.6	296.3	17.1
2011:08:09	03:22	-31.3	41.9	14.2	21:09	-18.5	298.7	13.2
2011:08:12	03:27	-27.8	47.5	10.0	21:03	-20.3	301.9	8.9
2011:08:15	03:32	-23.5	52.6	5.9	20:58	-21.9	305.6	5.2
2011:08:18	03:36	-18.7	57.2	4.8	20:52	-23.2	309.5	5.4
2011:08:21	03:41	-13.9	61.0	8.0	20:46	-24.0	313.2	8.9
2011:08:24	03:45	-9.5	64.1	11.8	20:40	-24.3	316.1	12.6
2011:08:27	03:49	-5.9	66.4	15.0	20:34	-24.2	317.9	15.6
2011:08:30	03:54	-3.3	68.1	17.1	20:28	-23.8	318.4	17.4
2011:09:02	03:58	-1.9	69.2	18.0	20:22	-23.2	317.6	18.1
2011:09:05	04:02	-1.5	69.9	17.9	20:16	-22.6	315.6	17.7
2011:09:08	04:06	-2.2	70.4	16.9	20:10	-21.8	312.7	16.5
2011:09:11	04:10	-3.6	70.8	15.1	20:04	-21.1	309.0	14.6
2011:09:14	04:14	-5.5	71.2	12.8	19:58	-20.3	304.8	12.3
2011:09:17	04:17	-7.8	71.7	10.3	19:52	-19.6	300.5	9.7
2011:09:20	04:21	-10.3	72.4	7.7	19:46	-18.8	296.0	7.1
2011:09:23	04:25	-12.8	73.1	5.1	19:40	-18.1	291.6	4.6
2011:09:26	04:28	-15.3	74.0	2.7	19:35	-17.3	287.3	2.3
2011:09:29	04:32	-17.7	75.0	1.4	19:29	-16.6	283.2	1.5
2011:10:02	04:35	-20.0	76.1	2.8	19:24	-15.9	279.2	3.2
2011:10:05	04:38	-22.2	77.3	4.9	19:19	-15.3	275.4	5.3
2011:10:08	04:42	-24.3	78.4	6.9	19:14	-14.6	271.8	7.3
2011:10:11	04:45	-26.2	79.7	8.8	19:09	-13.9	268.3	9.2
2011:10:14	04:48	-28.0	80.9	10.7	19:04	-13.2	264.9	11.0
2011:10:17	04:52	-29.8	82.1	12.4	18:59	-12.5	261.8	12.7
2011:10:20	04:55	-31.4	83.2	14.1	18:55	-11.8	258.8	14.4
2011:10:23	04:58	-32.9	84.3	15.6	18:51	-11.1	255.9	15.9
2011:10:26	05:01	-34.3	85.4	17.1	18:47	-10.4	253.2	17.3
2011:10:29	05:05	-35.6	86.3	18.4	18:43	-9.6	250.7	18.6
2011:11:01	05:08	-36.8	87.2	19.6	18:39	-8.9	248.4	19.8
2011:11:04	05:11	-37.8	88.0	20.7	18:36	-8.2	246.3	20.9
2011:11:07	05:14	-38.6	88.7	21.6	18:33	-7.5	244.4	21.8
2011:11:10	05:17	-39.2	89.3	22.3	18:30	-6.8	242.9	22.4
2011:11:13	05:21	-39.5	89.9	22.7	18:28	-6.3	241.7	22.7
2011:11:16	05:24	-39.3	90.5	22.6	18:26	-6.0	241.1	22.6
2011:11:19	05:27	-38.5	91.3	22.0	18:24	-6.0	241.1	21.7
2011:11:22	05:30	-36.8	92.4	20.4	18:22	-6.5	242.0	20.0
2011:11:25	05:33	-34.0	94.0	17.6	18:21	-7.8	244.0	16.9
2011:11:28	05:36	-29.8	96.3	13.3	18:20	-10.1	247.4	12.3
2011:12:01	05:39	-24.2	99.2	7.4	18:19	-13.5	252.1	6.2
2011:12:04	05:41	-17.7	102.7	1.3	18:19	-17.6	257.6	1.6
2011:12:07	05:44	-11.3	106.3	6.9	18:19	-21.8	263.0	8.0
2011:12:10	05:46	-6.0	109.7	12.8	18:19	-25.4	267.4	13.7
2011:12:13	05:48	-2.4	112.5	17.1	18:20	-28.3	270.4	17.7
2011:12:16	05:50	-0.3	114.6	19.8	18:21	-30.3	272.0	20.2
2011:12:19	05:52	0.6	116.2	21.3	18:22	-31.7	272.5	21.4
2011:12:22	05:54	0.6	117.3	21.8	18:23	-32.7	272.3	21.8
2011:12:25	05:55	0.1	117.9	21.7	18:25	-33.2	271.5	21.7
2011:12:28	05:56	-0.8	118.2	21.2	18:27	-33.5	270.5	21.1
2011:12:31	05:57	-2.0	118.1	20.4	18:29	-33.5	269.3	20.2

Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza del pianeta sull'orizzonte, in °  
 Az = azimut del pianeta, in °  
 Elong = elongazione del pianeta, in °  
  
 Alt = altitude of the planet above the horizon, in °  
 Az = azimuth of the planet, in °  
 Elong = elongation of the planet, in °



heliacal dates for Mercury in 2011  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Mercurio  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E

visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
morning visibility ends	2011-01-29	06:34	07:25	-0:50h	-27d 03h	-0.2
evening visibility begins	2011-03-09	19:03	18:08	0:54h	12d 10h	-1.2
evening visibility ends	2011-04-02	19:38	18:35	1:02h	-7d 01h	1.8
evening visibility begins	2011-06-26	20:56	19:48	1:08h	13d 20h	-0.7
evening visibility ends	2011-07-22	20:45	19:38	1:06h	-25d 05h	0.8
morning visibility begins	2011-08-28	04:15	05:30	-1:15h	11d 02h	1.0
morning visibility ends	2011-09-18	05:03	05:52	-0:48h	-10d 16h	-1.2
evening visibility begins	2011-11-09	17:50	16:54	0:55h	41d 21h	-0.1
evening visibility ends	2011-11-22	17:43	16:43	1:00h	-11d 16h	0.3
morning visibility begins	2011-12-11	06:10	07:26	-1:16h	6d 20h	0.9

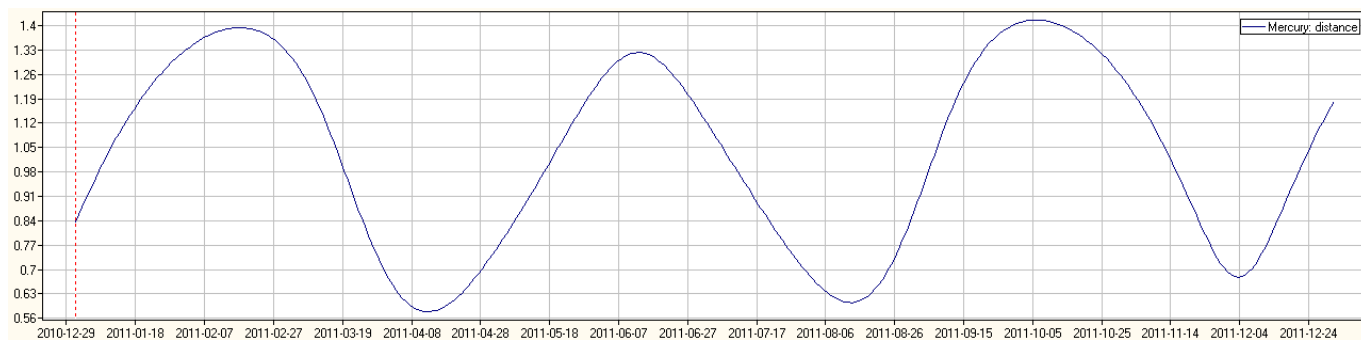
Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins = inizio visibilità mattutina  
Morning visibility ends = fine visibilità mattutina  
Evening visibility begins = inizio visibilità serale  
Evening visibility ends = fine visibilità serale

Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

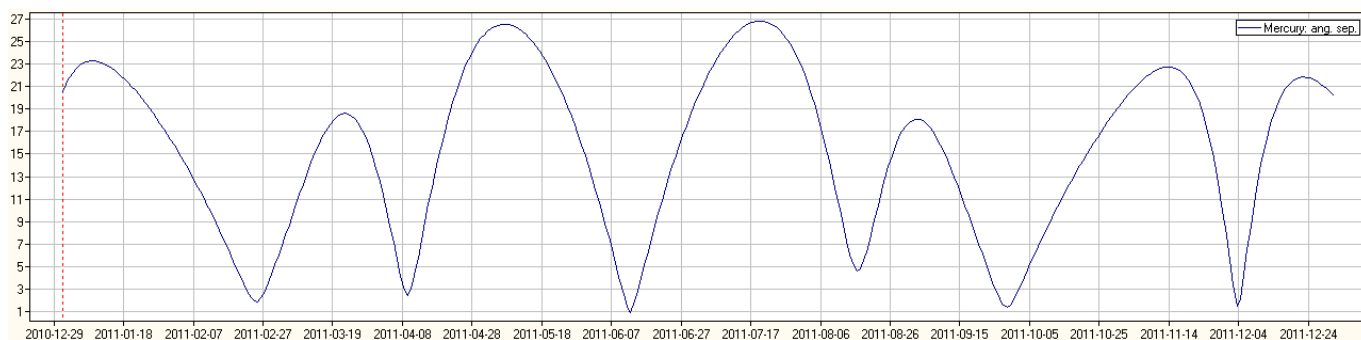
	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
ML	01-29	06:34	07:25	-9° 41'	308° 57'	291° 21'	-1° 00'	-0.2	15° 08'	-17° 36'
EF	03-09	19:03	18:08	-11° 01'	348° 49'	0° 01'	-0° 22'	-1.2	-3° 56'	11° 12'
EL	04-02	19:38	18:35	-12° 09'	12° 41'	23° 52'	3° 19'	1.8	-1° 04'	11° 11'
EF	06-26	20:56	19:48	-10° 41'	94° 53'	110° 24'	1° 56'	-0.7	-11° 57'	15° 32'
EL	07-22	20:45	19:38	-11° 09'	119° 40'	146° 17'	-1° 20'	0.8	-24° 34'	26° 37'
MF	08-28	04:15	05:30	-13° 51'	154° 30'	138° 48'	-1° 51'	1.0	8° 35'	-15° 42'
ML	09-18	05:03	05:52	-9° 47'	174° 55'	165° 40'	1° 49'	-1.2	1° 24'	-9° 14'
EF	11-09	17:50	16:54	-10° 38'	226° 56'	249° 01'	-2° 38'	-0.1	-19° 56'	22° 05'
EL	11-22	17:43	16:43	-11° 13'	240° 02'	259° 55'	-2° 01'	0.3	-17° 01'	19° 54'
MF	12-11	06:10	07:26	-13° 45'	258° 48'	244° 35'	2° 43'	0.9	5° 53'	-14° 13'

MF : prima visibilità mattutina  
ML : ultima visibilità mattutina  
EF : prima visibilità serale  
EL : ultima visibilità serale  
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimuth tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità

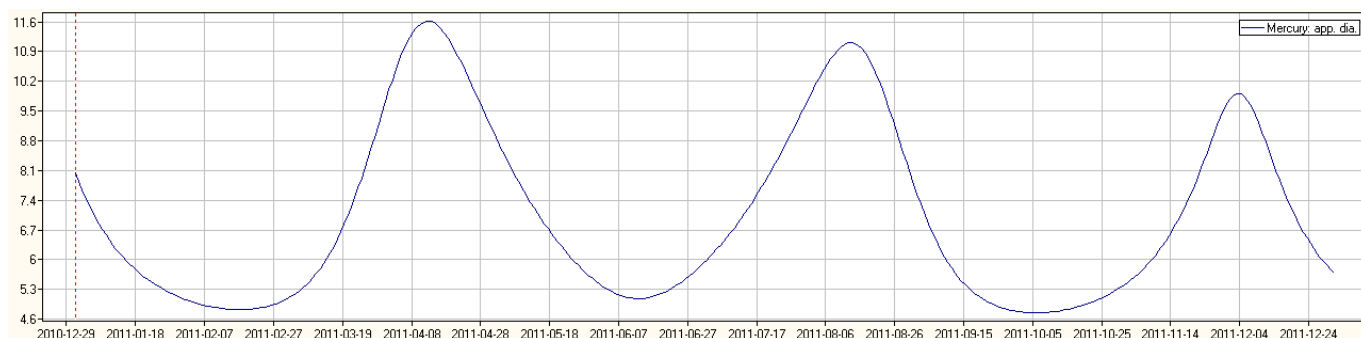
Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility



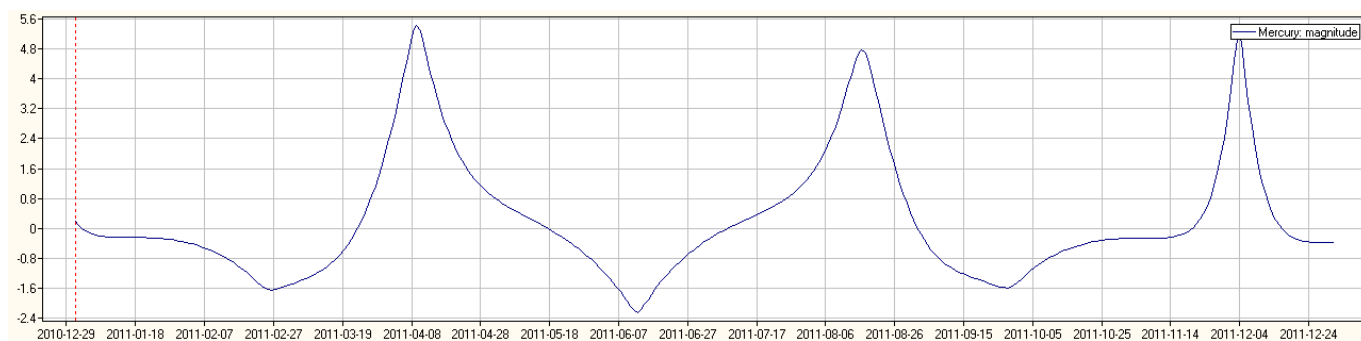
Distanza di Mercurio in U.A. nel corso dell'anno - Distance of Mercury in A.U. during the year



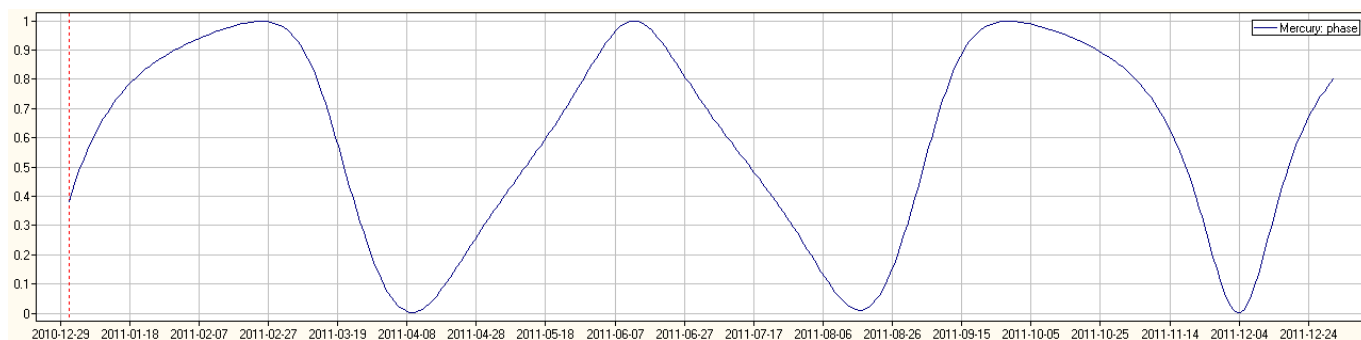
Elongazione di Mercurio in ° nel corso dell'anno - Elongation of Mercury in ° during the year



Diametro di Mercurio in " nel corso dell'anno - Diameter of Mercury in " during the year



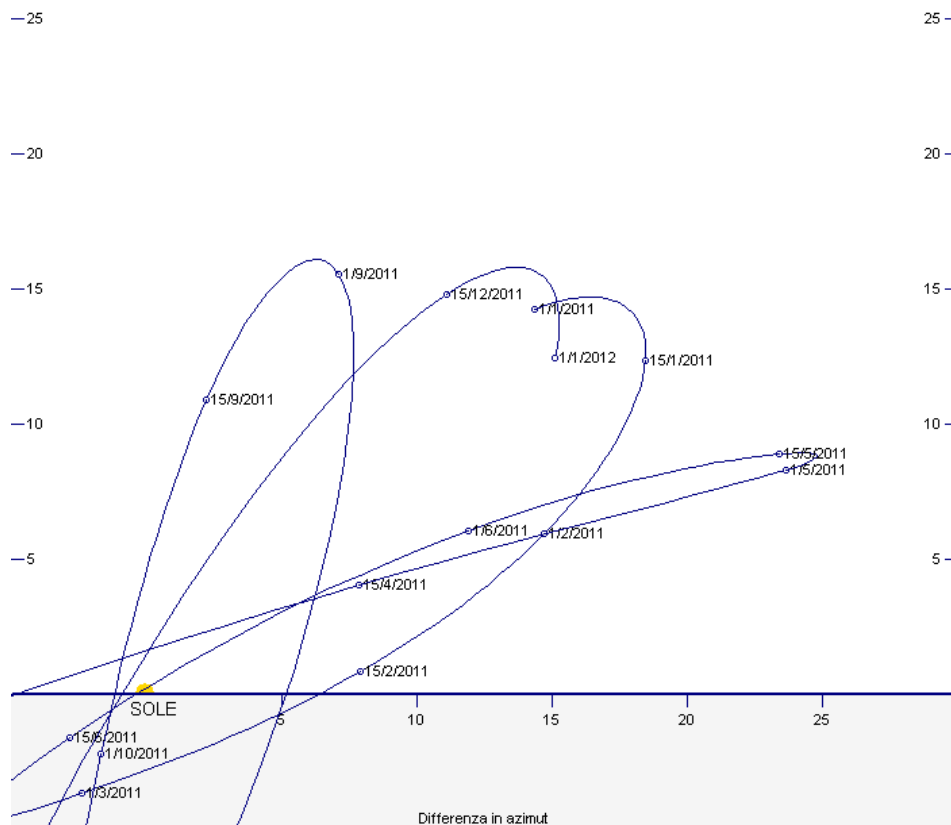
Magnitudine di Mercurio nel corso dell'anno - Magnitude of Mercury during the year



Fase di Mercurio nel corso dell'anno - Phase of Mercury during the year

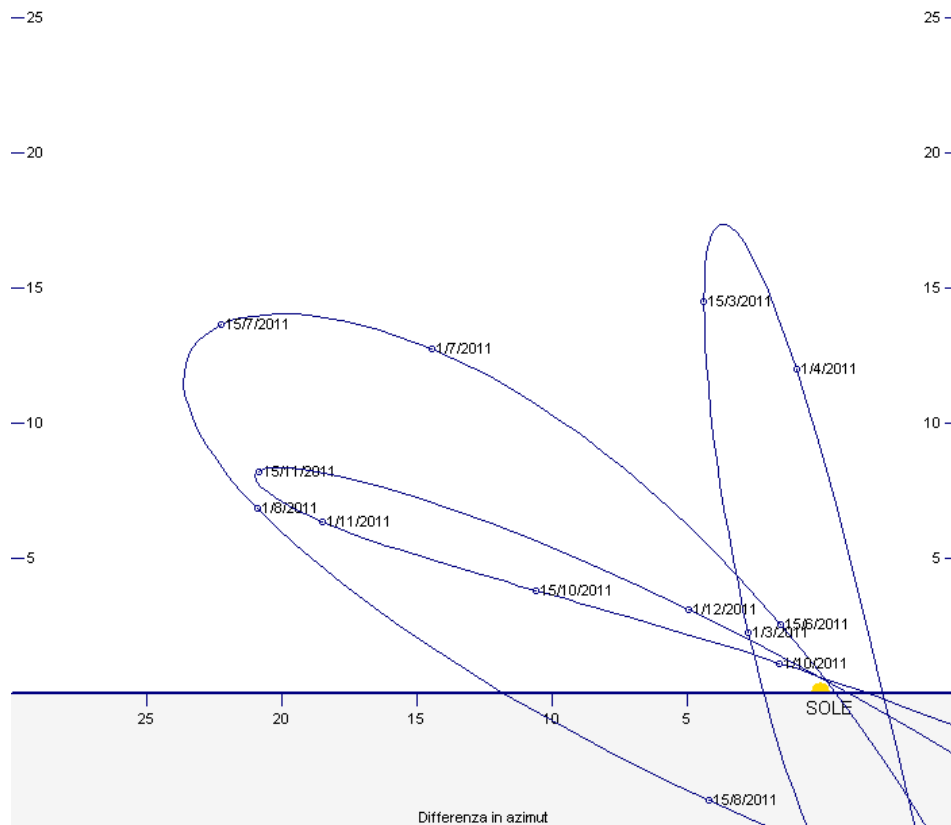
### Posizione di Mercurio al mattino rispetto al sorgere del Sole

Luogo : Roma  
 Latitudine: 42° 00' 00" N  
 Longitudine: 12° 00' 00" E



### Posizione di Mercurio alla sera rispetto al tramonto del Sole

Luogo : Roma  
 Latitudine: 42° 00' 00" N  
 Longitudine: 12° 00' 00" E



Posizione relativa di Mercurio rispetto al Sole al suo momento del sorgere e del tramonto

Relative position of Mercury respect to the sunrising and sunsetting

© (4)



# EFFEMERIDI DI VENERE - EPHEMERIDES OF VENUS

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
01/01/2011	15h 28m 19.90s	-15° 16' 29.9"	0,7184848	0,6160021	5,12	46,7	27,1	-4,5	0,460	94,6	3,50	8,57	14,03
02/01/2011	15h 32m 12.99s	-15° 30' 00.6"	0,7185033	0,6235809	5,19	46,8	26,8	-4,5	0,466	94,0	3,51	8,57	14,02
03/01/2011	15h 36m 08.52s	-15° 43' 30.2"	0,7185256	0,6311660	5,25	46,8	26,4	-4,5	0,471	93,3	3,52	8,57	14,01
04/01/2011	15h 40m 06.41s	-15° 56' 57.3"	0,7185517	0,6387565	5,31	46,9	26,1	-4,5	0,477	92,7	3,53	8,57	14,00
05/01/2011	15h 44m 06.63s	-16° 10' 20.7"	0,7185817	0,6463514	5,37	46,9	25,8	-4,5	0,482	92,0	3,54	8,57	13,59
06/01/2011	15h 48m 09.12s	-16° 23' 39.3"	0,7186153	0,6539500	5,44	46,9	25,5	-4,5	0,488	91,4	3,55	8,57	13,58
07/01/2011	15h 52m 13.83s	-16° 36' 51.7"	0,7186527	0,6615516	5,50	47,0	25,2	-4,4	0,493	90,8	3,56	8,57	13,58
08/01/2011	15h 56m 20.72s	-16° 49' 56.9"	0,7186938	0,6691556	5,56	47,0	24,9	-4,4	0,499	90,2	3,57	8,57	13,57
09/01/2011	16h 00m 29.74s	-17° 02' 53.6"	0,7187386	0,6767612	5,63	47,0	24,7	-4,4	0,504	89,6	3,58	8,57	13,56
10/01/2011	16h 04m 40.87s	-17° 15' 40.8"	0,7187870	0,6843678	5,69	47,0	24,4	-4,4	0,509	89,0	3,59	8,58	13,56
11/01/2011	16h 08m 54.05s	-17° 28' 17.4"	0,7188390	0,6919749	5,75	46,9	24,1	-4,4	0,514	88,4	4,00	8,58	13,55
12/01/2011	16h 13m 09.26s	-17° 40' 42.4"	0,7188946	0,6995818	5,82	46,9	23,8	-4,4	0,519	87,8	4,01	8,58	13,55
13/01/2011	16h 17m 26.45s	-17° 52' 54.5"	0,7189536	0,7071880	5,88	46,9	23,6	-4,4	0,524	87,2	4,03	8,59	13,54
14/01/2011	16h 21m 45.59s	-18° 04' 53.0"	0,7190161	0,7147930	5,94	46,9	23,3	-4,4	0,529	86,6	4,04	8,59	13,54
15/01/2011	16h 26m 06.64s	-18° 16' 36.7"	0,7190821	0,7223960	6,01	46,8	23,1	-4,4	0,534	86,1	4,05	8,59	13,53
16/01/2011	16h 30m 29.57s	-18° 28' 04.6"	0,7191513	0,7299967	6,07	46,8	22,9	-4,4	0,539	85,5	4,06	9,00	13,53
17/01/2011	16h 34m 54.34s	-18° 39' 15.8"	0,7192239	0,7375944	6,13	46,7	22,6	-4,4	0,544	84,9	4,07	9,00	13,53
18/01/2011	16h 39m 20.92s	-18° 50' 09.3"	0,7192997	0,7451885	6,20	46,7	22,4	-4,4	0,549	84,4	4,09	9,01	13,53
19/01/2011	16h 43m 49.27s	-19° 00' 44.2"	0,7193787	0,7527783	6,26	46,6	22,2	-4,3	0,554	83,8	4,10	9,01	13,52
20/01/2011	16h 48m 19.34s	-19° 10' 59.6"	0,7194608	0,7603632	6,32	46,6	21,9	-4,3	0,558	83,3	4,11	9,02	13,52
21/01/2011	16h 52m 51.10s	-19° 20' 54.5"	0,7195460	0,7679422	6,39	46,5	21,7	-4,3	0,563	82,8	4,12	9,02	13,52
22/01/2011	16h 57m 24.52s	-19° 30' 28.1"	0,7196341	0,7755147	6,45	46,4	21,5	-4,3	0,568	82,2	4,14	9,03	13,52
23/01/2011	17h 01m 59.55s	-19° 39' 39.5"	0,7197252	0,7830796	6,51	46,4	21,3	-4,3	0,572	81,7	4,15	9,04	13,52
24/01/2011	17h 06m 36.14s	-19° 48' 27.8"	0,7198190	0,7906361	6,57	46,3	21,1	-4,3	0,577	81,2	4,16	9,04	13,52
25/01/2011	17h 11m 14.26s	-19° 56' 52.2"	0,7199157	0,7981834	6,64	46,2	20,9	-4,3	0,581	80,7	4,18	9,05	13,52
26/01/2011	17h 15m 53.85s	-20° 04' 52.0"	0,7200150	0,8057205	6,70	46,1	20,7	-4,3	0,585	80,2	4,19	9,06	13,53
27/01/2011	17h 20m 34.86s	-20° 12' 26.4"	0,7201169	0,8132468	6,76	46,0	20,5	-4,3	0,590	79,7	4,20	9,07	13,53
28/01/2011	17h 25m 17.25s	-20° 19' 34.7"	0,7202214	0,8207616	6,83	45,9	20,3	-4,3	0,594	79,1	4,21	9,07	13,53
29/01/2011	17h 30m 00.96s	-20° 26' 16.3"	0,7203283	0,8282643	6,89	45,8	20,1	-4,3	0,598	78,6	4,23	9,08	13,53
30/01/2011	17h 34m 45.92s	-20° 32' 30.4"	0,7204375	0,8357544	6,95	45,7	20,0	-4,3	0,603	78,2	4,24	9,09	13,54
31/01/2011	17h 39m 32.09s	-20° 38' 16.4"	0,7205490	0,8432315	7,01	45,6	19,8	-4,3	0,607	77,7	4,25	9,10	13,54
01/02/2011	17h 44m 19.41s	-20° 43' 33.7"	0,7206627	0,8506952	7,07	45,5	19,6	-4,3	0,611	77,2	4,26	9,11	13,55
02/02/2011	17h 49m 07.81s	-20° 48' 21.8"	0,7207784	0,8581452	7,14	45,4	19,4	-4,3	0,615	76,7	4,28	9,12	13,55
03/02/2011	17h 53m 57.25s	-20° 52' 40.1"	0,7208962	0,8655813	7,20	45,3	19,3	-4,3	0,619	76,2	4,29	9,12	13,56
04/02/2011	17h 58m 47.67s	-20° 56' 28.1"	0,7210158	0,8730033	7,26	45,1	19,1	-4,2	0,623	75,7	4,30	9,13	13,57
05/02/2011	18h 03m 39.00s	-20° 59' 45.3"	0,7211373	0,8804111	7,32	45,0	19,0	-4,2	0,627	75,3	4,31	9,14	13,57
06/02/2011	18h 08m 31.21s	-21° 02' 31.2"	0,7212604	0,8878044	7,38	44,9	18,8	-4,2	0,631	74,8	4,32	9,15	13,58
07/02/2011	18h 13m 24.22s	-21° 04' 45.4"	0,7213852	0,8951831	7,44	44,8	18,6	-4,2	0,635	74,3	4,33	9,16	13,59
08/02/2011	18h 18m 18.00s	-21° 06' 27.5"	0,7215115	0,9025472	7,51	44,6	18,5	-4,2	0,639	73,8	4,34	9,17	14,00
09/02/2011	18h 23m 12.48s	-21° 07' 37.2"	0,7216392	0,9098966	7,57	44,5	18,3	-4,2	0,643	73,4	4,36	9,18	14,01
10/02/2011	18h 28m 07.60s	-21° 08' 14.1"	0,7217681	0,9172311	7,63	44,4	18,2	-4,2	0,647	72,9	4,37	9,19	14,02
11/02/2011	18h 33m 03.32s	-21° 08' 17.9"	0,7218983	0,9245506	7,69	44,2	18,0	-4,2	0,651	72,5	4,38	9,20	14,03
12/02/2011	18h 37m 59.59s	-21° 07' 48.4"	0,7220296	0,9318552	7,75	44,1	17,9	-4,2	0,654	72,0	4,38	9,21	14,04
13/02/2011	18h 42m 56.34s	-21° 06' 45.2"	0,7221619	0,9391146	7,81	43,9	17,8	-4,2	0,658	71,6	4,39	9,22	14,05
14/02/2011	18h 47m 53.53s	-21° 05' 08.2"	0,7222951	0,9464188	7,87	43,8	17,6	-4,2	0,662	71,1	4,40	9,23	14,06
15/02/2011	18h 52m 51.09s	-21° 02' 57.2"	0,7224290	0,9536776	7,93	43,7	17,5	-4,2	0,665	70,7	4,41	9,24	14,07
16/02/2011	18h 57m 48.99s	-21° 00' 12.0"	0,7225637	0,9609209	7,99	43,5	17,4	-4,2	0,669	70,2	4,42	9,25	14,08
17/02/2011	19h 02m 47.16s	-20° 56' 52.5"	0,7226989	0,9681484	8,05	43,3	17,2	-4,2	0,673	69,8	4,43	9,26	14,10
18/02/2011	19h 07m 45.55s	-20° 52' 58.5"	0,7228346	0,9753598	8,11	43,2	17,1	-4,2	0,676	69,3	4,43	9,27	14,11
19/02/2011	19h 12m 44.12s	-20° 48' 29.9"	0,7229706	0,9825546	8,17	43,0	17,0	-4,2	0,680	68,9	4,44	9,28	14,12
20/02/2011	19h 17m 42.82s	-20° 43' 26.8"	0,7231069	0,9897324	8,23	42,9	16,9	-4,2	0,683	68,5	4,45	9,29	14,14
21/02/2011	19h 22m 41.60s	-20° 37' 48.9"	0,7232434	0,9968925	8,29	42,7	16,7	-4,1	0,687	68,0	4,45	9,30	14,15
22/02/2011	19h 27m 40.41s	-20° 31' 36.5"	0,7233799	1,0040343	8,35	42,6	16,6	-4,1	0,690	67,6	4,46	9,31	14,17
23/02/2011	19h 32m 39.20s	-20° 24' 49.4"	0,7235163	1,0111573	8,41	42,4	16,5	-4,1	0,694	67,2	4,47	9,32	14,18
24/02/2011	19h 37m 37.92s	-20° 17' 27.9"	0,7236526	1,0182608	8,47	42,2	16,4	-4,1	0,697	66,8	4,47	9,33	14,20
25/02/2011	19h 42m 36.51s	-20° 09' 32.0"	0,7237886	1,0253443	8,53	42,1	16,3	-4,1	0,701	66,3	4,48	9,34	14,22
26/02/2011	19h 47m 34.94s	-20° 01' 02.0"	0,7239241	1,0324074	8,59	41,9	16,2	-4,1	0,704	65,9	4,48	9,35	14,23
27/02/2011	19h 52m 33.14s	-19° 51' 57.9"	0,7240592	1,0394496	8,64	41,7	16,1	-4,1	0,707	65,5	4,48	9,36	14,25
28/02/2011	19h 57m 31.07s	-19° 42' 20.1"	0,7241937	1,0464707	8,70	41,5	15,9	-4,1	0,711	65,1	4,49	9,38	14,27
01/03/2011	20h 02m 28.67s	-19° 32' 08.6"	0,7243276	1,0534705	8,76	41,4	15,8	-4,1	0,714	64,7	4,49	9,39	14,28
02/03/2011	20h 07m 25.92s	-19° 21' 23.9"	0,7244606	1,0604486	8,82	41,2	15,7	-4,1	0,717	64,3	4,49	9,40	14,30
03/03/2011	20h 12m 22.76s	-19° 10' 06.1"	0,7245926	1,0674049	8,88	41,0	15,6	-4,1	0,720	63,8	4,49	9,41	14,32
04/03/2011	20h 17m 19.15s	-18° 58' 15.7"	0,7247237	1,0743392	8,93	40,8	15,5	-4,1	0,724	63,4	4,50	9,42	14,34
05/03/2011	20h 22m 15.05s	-18° 45' 52.8"	0,7248537	1,0812516	8,99	40,6	15,4	-4,1	0,727	63,0	4,50	9,43	14,36
06/03/2011	20h 27m 10.44s	-18° 32' 57.8"	0,7249824	1,0881418	9,05	40,5	15,3	-4,1	0,730	62,6	4,50	9,43	14,38
07/03/2011	20h 32m 05.29s	-18° 19' 31.2"	0,7251099	1,0950099	9,11	40,3	15,2	-4,1	0,733	62,2	4,50	9,44	14,39
08/03/2011	20h 36m 59.55s	-18° 05' 33.3"	0,7252359	1,1018558	9,16	40,1	15,1	-4,1	0,736	61,8	4,50	9,45	14,41
09/03/2011	20h 41m 53.20s	-17° 51' 04.4"	0,7253604	1,1086796	9,22	39,9	15,0	-4,1	0,739	61,4	4,50	9,46	14,43
10/03/2011	20h 46m 46.23s	-17° 36' 05.1"	0,7254834	1,1154812	9,28	39,7	15,0	-4,1	0,742	61,0	4,50	9,47	14,45
11/03/2011	20h 51m 38.60s	-17° 20' 35.8"	0,7256046	1,1222607	9,33	39,5	14,9	-4,1	0,745	60,6	4,50	9,48	14,47
12/03/2011	20h 56m 30.29s	-17° 04' 36.9"	0,7257240	1,1290180	9,39	39,3	14,8	-4,1	0,748	60,2	4,49	9,49	14,49
13/03/2011	21h 01m 21.29s	-16° 48' 08.9"	0,7258416	1,1357532	9,44	39,1	14,7	-4,1	0,751	59,8	4,49	9,50	14,51
14/03/2011	21h 06m 11.58s	-16° 31' 12.3"	0,7259571	1,1424664	9,50	39,0	14,6	-4,1	0,754	59,4	4,49	9,51	14,53
15/03/2011	21h 11m 01.14s	-16° 13' 47.5"	0,726										

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
09/04/2011	23h 07m 43.75s	-06° 53' 26.6"	0.7280184	1,3083725	10.88	33.5	12.8	-4	0.825	49.4	4.31	10.10	15.49
10/04/2011	23h 12m 15.48s	-06° 27' 14.8"	0.7280538	1,3143793	10.93	33.3	12.7	-4	0.828	49.0	4.30	10.10	15.51
11/04/2011	23h 16m 46.73s	-06° 00' 51.4"	0.7280854	1,3203570	10.98	33.1	12.6	-4	0.830	48.7	4.29	10.11	15.54
12/04/2011	23h 21m 17.53s	-05° 34' 17.0"	0.7281135	1,3263054	11.03	32.9	12.6	-3.9	0.833	48.3	4.28	10.12	15.56
13/04/2011	23h 25m 47.91s	-05° 07' 32.4"	0.7281378	1,3322245	11.08	32.6	12.5	-3.9	0.835	47.9	4.27	10.12	15.58
14/04/2011	23h 30m 17.90s	-04° 40' 38.2"	0.7281584	1,3381143	11.13	32.4	12.5	-3.9	0.837	47.6	4.26	10.13	16.00
15/04/2011	23h 34m 47.53s	-04° 13' 35.0"	0.7281752	1,3439747	11.18	32.2	12.4	-3.9	0.840	47.2	4.25	10.13	16.02
16/04/2011	23h 39m 16.83s	-03° 46' 23.4"	0.7281884	1,3498057	11.23	31.9	12.4	-3.9	0.842	46.8	4.24	10.14	16.04
17/04/2011	23h 43m 45.85s	-03° 19' 04.2"	0.7281977	1,3556068	11.27	31.7	12.3	-3.9	0.845	46.4	4.23	10.14	16.07
18/04/2011	23h 48m 14.62s	-02° 51' 37.8"	0.7282033	1,3613779	11.32	31.5	12.3	-3.9	0.847	46.1	4.22	10.15	16.09
19/04/2011	23h 52m 43.17s	-02° 24' 05.0"	0.7282052	1,3671184	11.37	31.3	12.2	-3.9	0.849	45.7	4.21	10.15	16.11
20/04/2011	23h 57m 11.55s	-01° 56' 26.4"	0.7282032	1,3728278	11.42	31.0	12.2	-3.9	0.852	45.3	4.20	10.16	16.13
21/04/2011	00h 01m 39.79s	-01° 28' 42.6"	0.7281975	1,3785055	11.46	30.8	12.1	-3.9	0.854	44.9	4.18	10.16	16.15
22/04/2011	00h 06m 07.91s	-01° 00' 54.4"	0.7281881	1,3841508	11.51	30.6	12.1	-3.9	0.856	44.6	4.17	10.17	16.18
23/04/2011	00h 10m 35.96s	-00° 33' 02.4"	0.7281749	1,3897631	11.56	30.3	12.0	-3.9	0.858	44.2	4.16	10.18	16.20
24/04/2011	00h 15m 03.97s	-00° 05' 07.2"	0.7281579	1,3953418	11.60	30.1	12.0	-3.9	0.861	43.8	4.15	10.18	16.22
25/04/2011	00h 19m 31.97s	+00° 22' 50.3"	0.7281373	1,4008864	11.65	29.9	11.9	-3.9	0.863	43.5	4.14	10.19	16.24
26/04/2011	00h 23m 59.99s	+00° 50' 49.5"	0.7281129	1,4063962	11.70	29.6	11.9	-3.9	0.865	43.1	4.13	10.19	16.26
27/04/2011	00h 28m 28.07s	+01° 18' 49.8"	0.7280848	1,4118707	11.74	29.4	11.8	-3.9	0.867	42.7	4.12	10.20	16.29
28/04/2011	00h 32m 56.24s	+01° 46' 50.5"	0.7280530	1,4173096	11.79	29.1	11.8	-3.9	0.870	42.3	4.10	10.20	16.31
29/04/2011	00h 37m 24.54s	+02° 14' 50.9"	0.7280176	1,4227123	11.83	28.9	11.7	-3.9	0.872	42.0	4.09	10.21	16.33
30/04/2011	00h 41m 53.00s	+02° 42' 50.2"	0.7279786	1,4280785	11.88	28.7	11.7	-3.9	0.874	41.6	4.08	10.21	16.35
01/05/2011	00h 46m 21.66s	+03° 10' 47.9"	0.7279359	1,4334078	11.92	28.4	11.6	-3.9	0.876	41.2	4.07	10.22	16.37
02/05/2011	00h 50m 50.55s	+03° 38' 43.3"	0.7278897	1,4386998	11.96	28.2	11.6	-3.9	0.878	40.8	4.06	10.22	16.40
03/05/2011	00h 55m 19.70s	+04° 06' 35.6"	0.7278400	1,4439542	12.01	28.0	11.6	-3.9	0.880	40.5	4.05	10.23	16.42
04/05/2011	00h 59m 49.16s	+04° 34' 24.2"	0.7277868	1,4491708	12.05	27.7	11.5	-3.9	0.882	40.1	4.04	10.23	16.44
05/05/2011	01h 04m 18.95s	+05° 02' 08.4"	0.7277302	1,4543492	12.09	27.5	11.5	-3.9	0.885	39.7	4.02	10.24	16.46
06/05/2011	01h 08m 49.11s	+05° 29' 47.5"	0.7276701	1,4594894	12.14	27.2	11.4	-3.9	0.887	39.4	4.01	10.25	16.49
07/05/2011	01h 13m 19.66s	+05° 57' 20.8"	0.7276067	1,4645910	12.18	27.0	11.4	-3.9	0.889	39.0	4.00	10.25	16.51
08/05/2011	01h 17m 50.65s	+06° 24' 47.6"	0.7275400	1,4696541	12.22	26.7	11.4	-3.9	0.891	38.6	3.99	10.26	16.53
09/05/2011	01h 22m 22.11s	+06° 52' 07.4"	0.7274700	1,4746785	12.26	26.5	11.3	-3.9	0.893	38.2	3.98	10.26	16.55
10/05/2011	01h 26m 54.06s	+07° 19' 19.2"	0.7273968	1,4796640	12.31	26.3	11.3	-3.9	0.895	37.9	3.97	10.27	16.58
11/05/2011	01h 31m 26.54s	+07° 46' 22.6"	0.7273205	1,4846108	12.35	26.0	11.2	-3.9	0.897	37.5	3.96	10.27	17.00
12/05/2011	01h 35m 59.59s	+08° 13' 16.7"	0.7272411	1,4895186	12.39	25.8	11.2	-3.9	0.899	37.1	3.95	10.28	17.02
13/05/2011	01h 40m 33.24s	+08° 40' 00.9"	0.7271586	1,4943875	12.43	25.5	11.2	-3.9	0.901	36.8	3.94	10.29	17.04
14/05/2011	01h 45m 07.53s	+09° 06' 34.6"	0.7270732	1,4992173	12.47	25.3	11.1	-3.9	0.903	36.4	3.93	10.29	17.07
15/05/2011	01h 49m 42.48s	+09° 32' 57.0"	0.7269848	1,5040079	12.51	25.0	11.1	-3.9	0.904	36.0	3.92	10.30	17.09
16/05/2011	01h 54m 18.15s	+09° 59' 07.6"	0.7268937	1,5087590	12.55	24.8	11.1	-3.9	0.906	35.6	3.91	10.31	17.11
17/05/2011	01h 58m 54.57s	+10° 25' 05.5"	0.7267997	1,5134703	12.59	24.5	11.0	-3.9	0.908	35.3	3.90	10.31	17.14
18/05/2011	02h 03m 31.75s	+10° 50' 50.2"	0.7267031	1,5181413	12.63	24.3	11.0	-3.9	0.910	34.9	3.89	10.32	17.16
19/05/2011	02h 08m 09.75s	+11° 16' 21.0"	0.7266038	1,5227715	12.66	24.0	11.0	-3.9	0.912	34.5	3.88	10.33	17.18
20/05/2011	02h 12m 48.58s	+11° 41' 37.0"	0.7265020	1,5273603	12.70	23.8	10.9	-3.9	0.914	34.1	3.87	10.33	17.21
21/05/2011	02h 17m 28.27s	+12° 06' 37.7"	0.7263977	1,5319071	12.74	23.5	10.9	-3.9	0.916	33.8	3.86	10.34	17.23
22/05/2011	02h 22m 08.86s	+12° 31' 22.3"	0.7262911	1,5364112	12.78	23.3	10.9	-3.9	0.918	33.4	3.85	10.35	17.25
23/05/2011	02h 26m 50.35s	+12° 55' 50.1"	0.7261821	1,5408720	12.81	23.0	10.8	-3.9	0.919	33.0	3.84	10.36	17.28
24/05/2011	02h 31m 32.78s	+13° 20' 00.4"	0.7260709	1,5452888	12.85	22.7	10.8	-3.9	0.921	32.6	3.84	10.36	17.30
25/05/2011	02h 36m 16.18s	+13° 43' 52.3"	0.7259576	1,5496612	12.89	22.5	10.8	-3.9	0.923	32.3	3.83	10.37	17.32
26/05/2011	02h 41m 00.55s	+14° 07' 25.3"	0.7258422	1,5539884	12.92	22.2	10.7	-3.9	0.925	31.9	3.82	10.38	17.35
27/05/2011	02h 45m 45.93s	+14° 30' 38.6"	0.7257249	1,5582701	12.96	22.0	10.7	-3.9	0.926	31.5	3.81	10.39	17.37
28/05/2011	02h 50m 32.33s	+14° 53' 31.5"	0.7256056	1,5625055	12.99	21.7	10.7	-3.9	0.928	31.1	3.81	10.40	17.39
29/05/2011	02h 55m 19.76s	+15° 16' 03.3"	0.7254847	1,5666944	13.03	21.5	10.7	-3.9	0.930	30.7	3.80	10.40	17.42
30/05/2011	03h 00m 08.25s	+15° 38' 13.3"	0.7253620	1,5708362	13.06	21.2	10.6	-3.9	0.931	30.4	3.80	10.41	17.44
31/05/2011	03h 04m 57.80s	+16° 00' 00.7"	0.7252377	1,5749305	13.10	20.9	10.6	-3.9	0.933	30.0	3.79	10.42	17.46
01/06/2011	03h 09m 48.43s	+16° 21' 24.8"	0.7251119	1,5789768	13.13	20.7	10.6	-3.9	0.935	29.6	3.78	10.43	17.49
02/06/2011	03h 14m 40.14s	+16° 42' 25.0"	0.7249847	1,5829750	13.16	20.4	10.5	-3.9	0.936	29.2	3.78	10.44	17.51
03/06/2011	03h 19m 32.95s	+17° 03' 00.6"	0.7248562	1,5869246	13.20	20.2	10.5	-3.9	0.938	28.8	3.77	10.45	17.53
04/06/2011	03h 24m 26.84s	+17° 23' 10.8"	0.7247265	1,5908253	13.23	19.9	10.5	-3.9	0.940	28.5	3.77	10.46	17.56
05/06/2011	03h 29m 21.83s	+17° 42' 54.9"	0.7245957	1,5946772	13.26	19.7	10.5	-3.9	0.941	28.1	3.77	10.47	17.58
06/06/2011	03h 34m 17.92s	+18° 02' 12.3"	0.7244640	1,5984799	13.29	19.4	10.4	-3.9	0.943	27.7	3.76	10.48	18.00
07/06/2011	03h 39m 15.10s	+18° 21' 02.3"	0.7243313	1,6022334	13.32	19.1	10.4	-3.9	0.944	27.3	3.76	10.49	18.03
08/06/2011	03h 44m 13.37s	+18° 39' 24.1"	0.7241978	1,6059377	13.36	18.9	10.4	-3.9	0.946	27.0	3.76	10.50	18.05
09/06/2011	03h 49m 12.73s	+18° 57' 17.2"	0.7240636	1,6095928	13.39	18.6	10.4	-3.9	0.947	26.6	3.75	10.51	18.07
10/06/2011	03h 54m 13.19s	+19° 14' 40.9"	0.7239288	1,6131987	13.42	18.3	10.3	-3.9	0.949	26.2	3.75	10.52	18.10
11/06/2011	03h 59m 14.72s	+19° 31' 34.5"	0.7237935	1,6167553	13.45	18.1	10.3	-3.9	0.950	25.8	3.75	10.53	18.12
12/06/2011	04h 04m 17.33s	+19° 47' 57.3"	0.7236579	1,6202627	13.47	17.8	10.3	-3.9	0.952	25.4	3.75	10.54	18.14
13/06/2011	04h 09m 21.01s	+20° 03' 48.9"	0.7235219	1,6237207	13.50	17.6	10.3	-3.9	0.953	25.0	3.75	10.55	18.17
14/06/2011	04h 14m 25.75s	+20° 19' 08.5"	0.7233858	1,6271292	13.53	17.3	10.3	-3.9	0.954	24.7	3.75	10.57	18.19
15/06/2011	04h 19m 31.54s	+20° 33' 55.7"	0.7232497	1,6304880	13.56	17.0	10.2	-3.9	0.956	24.3	3.75	10.58	18.21
16/06/2011	04h 24m 38.35s	+20° 48' 09.7"	0.7231136	1,6337967	13.59	16.8	10.2	-3.9	0.957	23.9	3.75	10.59	18.23
17/06/2011	04h 29m 46.17s	+21° 01' 50.0"	0.7229776	1,6370550	13.61	16.5	10.2	-3.9	0.958	23.5	3.76	11.00	18.25
18/06/2011	04h 34m 54.97s	+21° 14' 56.0"	0.7228419	1,6402624	13.64	16.2	10.2	-3.9	0.960	23.1	3.76	11.01	18.28
19/06/2011	04h 40m 04.73s	+21° 27' 27.2"	0.7227065	1,6434184	13.67	16.0	10.2	-3.9	0.961	22.7	3.76	11.03	18.30
20/06/2011	04h 45m 15.43s	+21° 39' 23.0"	0.7225717	1,6465226	13.69	15.7	10.1	-3.9	0.962	22.4	3.76</		

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
22/07/2011	07h 34m 51.20s	+22° 15' 38.5"	0.7190966	1.7166119	14.28	7.0	9.7	-3.9	0.992	10.0	4.17	11.47	19.17
23/07/2011	07h 40m 06.93s	+22° 05' 38.8"	0.7190307	1.7178706	14.29	6.8	9.7	-3.9	0.993	9.6	4.19	11.49	19.17
24/07/2011	07h 45m 21.96s	+21° 55' 00.1"	0.7189681	1.7190715	14.30	6.5	9.7	-3.9	0.994	9.2	4.22	11.50	19.18
25/07/2011	07h 50m 36.27s	+21° 43' 43.0"	0.7189090	1.7202143	14.31	6.2	9.7	-3.9	0.994	8.8	4.24	11.51	19.18
26/07/2011	07h 55m 49.80s	+21° 31' 47.7"	0.7188534	1.7212987	14.32	6.0	9.7	-3.9	0.995	8.4	4.26	11.53	19.19
27/07/2011	08h 01m 02.53s	+21° 19' 14.7"	0.7188013	1.7223247	14.32	5.7	9.7	-3.9	0.995	8.1	4.28	11.54	19.19
28/07/2011	08h 06m 14.41s	+21° 06' 04.6"	0.7187528	1.7232920	14.33	5.4	9.7	-3.9	0.996	7.7	4.30	11.55	19.19
29/07/2011	08h 11m 25.42s	+20° 52' 17.6"	0.7187079	1.7242004	14.34	5.2	9.7	-3.9	0.996	7.3	4.33	11.56	19.19
30/07/2011	08h 16m 35.51s	+20° 37' 54.5"	0.7186667	1.7250499	14.35	4.9	9.7	-3.9	0.996	6.9	4.35	11.57	19.19
31/07/2011	08h 21m 44.66s	+20° 22' 55.6"	0.7186292	1.7258403	14.35	4.6	9.7	-3.9	0.997	6.5	4.37	11.59	19.19
01/08/2011	08h 26m 52.84s	+20° 07' 21.6"	0.7185954	1.7265717	14.36	4.4	9.7	-3.9	0.997	6.2	4.40	12.00	19.20
02/08/2011	08h 32m 00.03s	+19° 51' 12.9"	0.7185653	1.7272442	14.36	4.1	9.7	-3.9	0.997	5.8	4.42	12.01	19.19
03/08/2011	08h 37m 06.20s	+19° 34' 30.2"	0.7185390	1.7278580	14.37	3.8	9.7	-3.9	0.998	5.4	4.44	12.02	19.19
04/08/2011	08h 42m 11.34s	+19° 17' 13.9"	0.7185165	1.7284134	14.37	3.6	9.7	-3.9	0.998	5.1	4.47	12.03	19.19
05/08/2011	08h 47m 15.42s	+18° 59' 24.8"	0.7184977	1.7289109	14.38	3.3	9.7	-3.9	0.998	4.7	4.49	12.04	19.19
06/08/2011	08h 52m 18.45s	+18° 41' 03.3"	0.7184829	1.7293507	14.38	3.1	9.7	-3.9	0.999	4.4	4.51	12.06	19.19
07/08/2011	08h 57m 20.40s	+18° 22' 10.2"	0.7184718	1.7297334	14.39	2.8	9.6	-3.9	0.999	4.0	4.54	12.07	19.19
08/08/2011	09h 02m 21.27s	+18° 02' 46.0"	0.7184646	1.7300593	14.39	2.6	9.6	-3.9	0.999	3.7	4.56	12.08	19.18
09/08/2011	09h 07m 21.06s	+17° 42' 51.5"	0.7184613	1.7303290	14.39	2.4	9.6	-3.9	0.999	3.3	4.59	12.09	19.18
10/08/2011	09h 12m 19.76s	+17° 22' 27.2"	0.7184618	1.7305426	14.39	2.1	9.6	-3.9	0.999	3.0	5.01	12.10	19.17
11/08/2011	09h 17m 17.36s	+17° 01' 33.8"	0.7184661	1.7307007	14.39	1.9	9.6	-3.9	0.999	2.7	5.04	12.11	19.17
12/08/2011	09h 22m 13.88s	+16° 40' 11.9"	0.7184744	1.7308034	14.39	1.8	9.6	-3.9	1.000	2.5	5.06	12.12	19.17
13/08/2011	09h 27m 09.31s	+16° 18' 22.3"	0.7184864	1.7308510	14.40	1.6	9.6	-3.9	1.000	2.2	5.09	12.13	19.16
14/08/2011	09h 32m 03.66s	+15° 56' 05.6"	0.7185023	1.7308437	14.39	1.5	9.6	-3.9	1.000	2.1	5.11	12.14	19.15
15/08/2011	09h 36m 56.94s	+15° 33' 22.4"	0.7185220	1.7307817	14.39	1.4	9.6	-3.9	1.000	1.9	5.14	12.15	19.15
16/08/2011	09h 41m 49.17s	+15° 10' 13.4"	0.7185456	1.7306650	14.39	1.3	9.6	-3.9	1.000	1.9	5.16	12.16	19.14
17/08/2011	09h 46m 40.35s	+14° 46' 39.4"	0.7185729	1.7304937	14.39	1.3	9.6	-3.9	1.000	1.9	5.19	12.16	19.14
18/08/2011	09h 51m 30.50s	+14° 22' 40.9"	0.7186040	1.7302679	14.39	1.4	9.6	-3.9	1.000	2.0	5.21	12.17	19.13
19/08/2011	09h 56m 19.63s	+13° 58' 18.8"	0.7186388	1.7299876	14.39	1.5	9.6	-3.9	1.000	2.1	5.23	12.18	19.12
20/08/2011	10h 01m 07.77s	+13° 33' 33.6"	0.7186773	1.7296528	14.39	1.7	9.6	-3.9	1.000	2.3	5.26	12.19	19.11
21/08/2011	10h 05m 54.94s	+13° 08' 26.2"	0.7187195	1.7292636	14.38	1.8	9.7	-3.9	0.999	2.6	5.28	12.20	19.10
22/08/2011	10h 10m 41.15s	+12° 42' 57.3"	0.7187654	1.7288200	14.38	2.0	9.7	-3.9	0.999	2.9	5.31	12.21	19.10
23/08/2011	10h 15m 26.43s	+12° 17' 07.5"	0.7188149	1.7283219	14.37	2.3	9.7	-3.9	0.999	3.2	5.33	12.22	19.09
24/08/2011	10h 20m 10.80s	+11° 50' 57.6"	0.7188679	1.7277694	14.37	2.5	9.7	-3.9	0.999	3.5	5.36	12.22	19.08
25/08/2011	10h 24m 54.28s	+11° 24' 28.3"	0.7189245	1.7271623	14.36	2.7	9.7	-3.9	0.999	3.8	5.38	12.23	19.07
26/08/2011	10h 29m 36.90s	+10° 57' 40.4"	0.7189845	1.7265008	14.36	3.0	9.7	-3.9	0.999	4.2	5.41	12.24	19.06
27/08/2011	10h 34m 18.68s	+10° 30' 34.6"	0.7190480	1.7257847	14.35	3.2	9.7	-3.9	0.998	4.5	5.43	12.25	19.05
28/08/2011	10h 38m 59.65s	+10° 03' 11.6"	0.7191149	1.7250141	14.35	3.5	9.7	-3.9	0.998	4.9	5.46	12.25	19.04
29/08/2011	10h 43m 39.83s	+09° 35' 32.2"	0.7191851	1.7241890	14.34	3.7	9.7	-3.9	0.998	5.2	5.48	12.26	19.03
30/08/2011	10h 48m 19.25s	+09° 07' 37.2"	0.7192586	1.7233097	14.33	4.0	9.7	-3.9	0.998	5.6	5.51	12.27	19.02
31/08/2011	10h 52m 57.94s	+08° 39' 27.2"	0.7193353	1.7223762	14.32	4.2	9.7	-3.9	0.997	5.9	5.53	12.27	19.01
01/09/2011	10h 57m 35.94s	+08° 11' 03.0"	0.7194151	1.7213891	14.32	4.5	9.7	-3.9	0.997	6.3	5.56	12.28	19.00
02/09/2011	11h 02m 13.27s	+07° 42' 25.4"	0.7194980	1.7203487	14.31	4.7	9.7	-3.9	0.997	6.7	5.58	12.29	18.99
03/09/2011	11h 06m 49.98s	+07° 13' 35.0"	0.7195840	1.7192556	14.30	5.0	9.7	-3.9	0.996	7.0	6.00	12.30	18.98
04/09/2011	11h 11m 26.09s	+06° 44' 32.6"	0.7196729	1.7181103	14.29	5.3	9.7	-3.9	0.996	7.4	6.03	12.30	18.96
05/09/2011	11h 16m 01.64s	+06° 15' 19.0"	0.7197646	1.7169135	14.28	5.5	9.7	-3.9	0.995	7.8	6.05	12.31	18.95
06/09/2011	11h 20m 36.67s	+05° 45' 54.8"	0.7198592	1.7156656	14.27	5.8	9.7	-3.9	0.995	8.1	6.08	12.31	18.94
07/09/2011	11h 25m 11.20s	+05° 16' 20.8"	0.7199565	1.7143674	14.26	6.1	9.7	-3.9	0.995	8.5	6.10	12.32	18.93
08/09/2011	11h 29m 45.29s	+04° 46' 37.8"	0.7200565	1.7130194	14.25	6.3	9.7	-3.9	0.994	8.9	6.13	12.33	18.92
09/09/2011	11h 34m 18.96s	+04° 16' 46.4"	0.7201591	1.7116219	14.24	6.6	9.8	-3.9	0.994	9.2	6.15	12.33	18.91
10/09/2011	11h 38m 52.26s	+03° 46' 47.3"	0.7202641	1.7101756	14.22	6.8	9.8	-3.9	0.993	9.6	6.18	12.34	18.89
11/09/2011	11h 43m 25.23s	+03° 16' 41.4"	0.7203715	1.7086808	14.21	7.1	9.8	-3.9	0.992	10.0	6.20	12.35	18.88
12/09/2011	11h 47m 57.91s	+02° 46' 29.2"	0.7204813	1.7071380	14.20	7.4	9.8	-3.9	0.992	10.3	6.22	12.35	18.87
13/09/2011	11h 52m 30.35s	+02° 16' 11.5"	0.7205932	1.7055474	14.18	7.6	9.8	-3.9	0.991	10.7	6.25	12.36	18.86
14/09/2011	11h 57m 02.59s	+01° 45' 49.0"	0.7207074	1.7039095	14.17	7.9	9.8	-3.9	0.991	11.1	6.27	12.36	18.85
15/09/2011	12h 01m 34.68s	+01° 15' 22.5"	0.7208236	1.7022244	14.16	8.2	9.8	-3.9	0.990	11.4	6.30	12.37	18.84
16/09/2011	12h 06m 06.65s	+00° 44' 52.5"	0.7209417	1.7004924	14.14	8.4	9.8	-3.9	0.989	11.8	6.32	12.38	18.82
17/09/2011	12h 10m 38.55s	+00° 14' 20.0"	0.7210617	1.6987137	14.13	8.7	9.8	-3.9	0.989	12.1	6.34	12.38	18.81
18/09/2011	12h 15m 10.43s	-00° 16' 14.5"	0.7211835	1.6968885	14.11	8.9	9.8	-3.9	0.988	12.5	6.37	12.39	18.80
19/09/2011	12h 19m 42.32s	-00° 46' 50.2"	0.7213069	1.6950170	14.10	9.2	9.8	-3.9	0.987	12.9	6.39	12.39	18.83
20/09/2011	12h 24m 14.28s	-01° 17' 26.4"	0.7214319	1.6930994	14.08	9.5	9.9	-3.9	0.987	13.2	6.42	12.40	18.37
21/09/2011	12h 28m 46.35s	-01° 48' 02.2"	0.7215584	1.6911356	14.07	9.7	9.9	-3.9	0.986	13.6	6.44	12.40	18.36
22/09/2011	12h 33m 18.56s	-02° 18' 37.1"	0.7216863	1.6891258	14.05	10.0	9.9	-3.9	0.985	14.0	6.47	12.41	18.35
23/09/2011	12h 37m 50.96s	-02° 49' 10.2"	0.7218154	1.6870700	14.03	10.2	9.9	-3.9	0.984	14.3	6.49	12.42	18.33
24/09/2011	12h 42m 23.59s	-03° 19' 40.8"	0.7219457	1.6849683	14.01	10.5	9.9	-3.9	0.984	14.7	6.51	12.42	18.32
25/09/2011	12h 46m 56.49s	-03° 50' 08.1"	0.7220771	1.6828206	14.00	10.8	9.9	-3.9	0.983	15.0	6.54	12.43	18.31
26/09/2011	12h 51m 29.71s	-04° 20' 31.4"	0.7222095	1.6806269	13.98	11.0	9.9	-3.9	0.982	15.4	6.56	12.43	18.30
27/09/2011	12h 56m 03.28s	-04° 50' 50.0"	0.7223427	1.6783874	13.96	11.3	9.9	-3.9	0.981	15.8	6.59	12.44	18.29
28/09/2011	13h 00m 37.24s	-05° 21' 03.0"	0.7224766	1.6761021	13.94	11.5	10.0	-3.9	0.980	16.1	7.01	12.45	18.27
29/09/2011	13h 05m 11.65s	-05° 51' 09.7"	0.7226112	1.6737713	13.92	11.8	10.0	-3.9	0.979	16.5	7.04	12.45	18.26
30/09/2011	13h 09m 46.53s	-06° 21' 09.4"	0.7227464	1.6713952	13.90	12.1	10.0	-3.9	0.979	16.8	7.06	12.46	18.25
01/10/2011	13h 14m 21.92s	-06° 51' 01.3"	0.7228820	1.6689743	13.88	12.3	10.0	-3.9	0.978	17.2	7.09	12.47	18.24
02/10/2011	13h 18m 57.86s	-07° 20' 44.6"	0.7230179	1.6665092	13.86	12.6	10.0	-3.9	0.977	17.5	7.11	12.47	18.23
03/10/2011	13h 23m 34.40s	-07° 50' 18.5"	0.7231540	1.6640004	13.84	12.8	10.0	-3.9	0.976	17.9	7.14	12	

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
03/11/2011	15h 54m 14.48s	-20° 39' 02.9"	0.7269226	1.5666969	13.03	20.6	10.7	-3.9	0.939	28.7	8.32	13.17	18.01
04/11/2011	15h 59m 24.64s	-20° 56' 46.8"	0.7270129	1.5629619	13.00	20.8	10.7	-3.9	0.937	29.0	8.35	13.18	18.00
05/11/2011	16h 04m 35.97s	-21° 13' 55.8"	0.7271003	1.5591923	12.97	21.1	10.7	-3.9	0.936	29.4	8.37	13.19	18.01
06/11/2011	16h 09m 48.45s	-21° 30' 29.3"	0.7271848	1.5553886	12.94	21.3	10.7	-3.9	0.934	29.7	8.40	13.21	18.01
07/11/2011	16h 15m 02.05s	-21° 46' 26.5"	0.7272663	1.5515511	12.90	21.5	10.8	-3.9	0.933	30.0	8.42	13.22	18.01
08/11/2011	16h 20m 16.77s	-22° 01' 46.8"	0.7273447	1.5476804	12.87	21.8	10.8	-3.9	0.931	30.4	8.45	13.23	18.01
09/11/2011	16h 25m 32.56s	-22° 16' 29.5"	0.7274201	1.5437766	12.84	22.0	10.8	-3.9	0.930	30.7	8.47	13.24	18.01
10/11/2011	16h 30m 49.41s	-22° 30' 34.0"	0.7274922	1.5398402	12.81	22.3	10.8	-3.9	0.928	31.1	8.50	13.26	18.02
11/11/2011	16h 36m 07.28s	-22° 43' 59.8"	0.7275611	1.5358715	12.77	22.5	10.9	-3.9	0.927	31.4	8.52	13.27	18.02
12/11/2011	16h 41m 26.14s	-22° 56' 46.2"	0.7276268	1.5318706	12.74	22.7	10.9	-3.9	0.925	31.7	8.54	13.29	18.02
13/11/2011	16h 46m 45.94s	-23° 08' 52.7"	0.7276891	1.5278380	12.71	23.0	10.9	-3.9	0.924	32.1	8.57	13.30	18.03
14/11/2011	16h 52m 06.65s	-23° 20' 18.7"	0.7277481	1.5237737	12.67	23.2	11.0	-3.9	0.922	32.4	8.59	13.31	18.04
15/11/2011	16h 57m 28.23s	-23° 31' 03.8"	0.7278036	1.5196779	12.64	23.5	11.0	-3.9	0.921	32.8	9.01	13.33	18.04
16/11/2011	17h 02m 50.62s	-23° 41' 07.4"	0.7278556	1.5155507	12.61	23.7	11.0	-3.9	0.919	33.1	9.03	13.34	18.05
17/11/2011	17h 08m 13.78s	-23° 50' 29.0"	0.7279042	1.5113922	12.57	23.9	11.0	-3.9	0.917	33.4	9.05	13.36	18.06
18/11/2011	17h 13m 37.67s	-23° 59' 08.3"	0.7279492	1.5072024	12.54	24.2	11.1	-3.9	0.916	33.8	9.07	13.37	18.07
19/11/2011	17h 19m 02.22s	-24° 07' 04.7"	0.7279907	1.5029811	12.50	24.4	11.1	-3.9	0.914	34.1	9.10	13.39	18.07
20/11/2011	17h 24m 27.39s	-24° 14' 17.9"	0.7280285	1.4987283	12.47	24.6	11.1	-3.9	0.912	34.4	9.12	13.40	18.08
21/11/2011	17h 29m 53.11s	-24° 20' 47.5"	0.7280627	1.4944438	12.43	24.9	11.2	-3.9	0.911	34.8	9.14	13.42	18.09
22/11/2011	17h 35m 19.33s	-24° 26' 33.2"	0.7280933	1.4901274	12.39	25.1	11.2	-3.9	0.909	35.1	9.15	13.43	18.11
23/11/2011	17h 40m 45.99s	-24° 31' 34.7"	0.7281201	1.4857789	12.36	25.3	11.2	-3.9	0.907	35.5	9.17	13.45	18.12
24/11/2011	17h 46m 13.03s	-24° 35' 51.8"	0.7281433	1.4813980	12.32	25.6	11.3	-3.9	0.906	35.8	9.19	13.46	18.13
25/11/2011	17h 51m 40.38s	-24° 39' 24.2"	0.7281627	1.4769845	12.28	25.8	11.3	-3.9	0.904	36.1	9.21	13.48	18.14
26/11/2011	17h 57m 07.96s	-24° 42' 11.9"	0.7281784	1.4725384	12.25	26.0	11.3	-3.9	0.902	36.5	9.23	13.49	18.16
27/11/2011	18h 02m 35.71s	-24° 44' 14.5"	0.7281904	1.4680596	12.21	26.2	11.4	-3.9	0.900	36.8	9.24	13.51	18.17
28/11/2011	18h 08m 03.56s	-24° 45' 32.1"	0.7281986	1.4635483	12.17	26.5	11.4	-3.9	0.898	37.2	9.26	13.52	18.18
29/11/2011	18h 13m 31.42s	-24° 46' 04.6"	0.7282030	1.4590045	12.14	26.7	11.4	-3.9	0.897	37.5	9.27	13.54	18.20
30/11/2011	18h 18m 59.23s	-24° 45' 51.9"	0.7282037	1.4544285	12.10	26.9	11.5	-3.9	0.895	37.8	9.29	13.55	18.21
01/12/2011	18h 24m 26.91s	-24° 44' 53.9"	0.7282006	1.4498205	12.06	27.2	11.5	-3.9	0.893	38.2	9.30	13.57	18.23
02/12/2011	18h 29m 54.39s	-24° 43' 10.8"	0.7281938	1.4451810	12.02	27.4	11.5	-3.9	0.891	38.5	9.32	13.58	18.25
03/12/2011	18h 35m 21.61s	-24° 40' 42.5"	0.7281832	1.4405101	11.98	27.6	11.6	-3.9	0.889	38.9	9.33	14.00	18.27
04/12/2011	18h 40m 48.50s	-24° 37' 29.3"	0.7281688	1.4358082	11.94	27.8	11.6	-3.9	0.887	39.2	9.34	14.01	18.28
05/12/2011	18h 46m 14.99s	-24° 33' 31.2"	0.7281507	1.4310755	11.90	28.1	11.7	-3.9	0.886	39.6	9.35	14.03	18.30
06/12/2011	18h 51m 41.01s	-24° 28' 48.4"	0.7281289	1.4263124	11.86	28.3	11.7	-3.9	0.884	39.9	9.37	14.04	18.32
07/12/2011	18h 57m 06.50s	-24° 23' 21.0"	0.7281033	1.4215192	11.82	28.5	11.7	-3.9	0.882	40.2	9.38	14.06	18.34
08/12/2011	19h 02m 31.40s	-24° 17' 09.4"	0.7280741	1.4166960	11.78	28.7	11.8	-3.9	0.880	40.6	9.39	14.07	18.36
09/12/2011	19h 07m 55.65s	-24° 10' 13.9"	0.7280412	1.4118432	11.74	29.0	11.8	-3.9	0.878	40.9	9.39	14.09	18.38
10/12/2011	19h 13m 19.18s	-24° 02' 34.6"	0.7280046	1.4069610	11.70	29.2	11.9	-3.9	0.876	41.3	9.40	14.10	18.40
11/12/2011	19h 18m 41.93s	-23° 54' 12.1"	0.7279645	1.4020497	11.66	29.4	11.9	-4	0.874	41.6	9.41	14.12	18.42
12/12/2011	19h 24m 03.86s	-23° 45' 06.5"	0.7279207	1.3971094	11.62	29.6	11.9	-4	0.872	42.0	9.42	14.13	18.44
13/12/2011	19h 29m 24.90s	-23° 35' 18.4"	0.7278734	1.3921403	11.58	29.8	12.0	-4	0.870	42.3	9.42	14.14	18.47
14/12/2011	19h 34m 45.00s	-23° 24' 48.0"	0.7278226	1.3871424	11.54	30.1	12.0	-4	0.868	42.7	9.43	14.16	18.49
15/12/2011	19h 40m 04.11s	-23° 13' 36.0"	0.7277683	1.3821160	11.50	30.3	12.1	-4	0.866	43.0	9.43	14.17	18.51
16/12/2011	19h 45m 22.20s	-23° 01' 42.7"	0.7277106	1.3770608	11.45	30.5	12.1	-4	0.864	43.4	9.44	14.18	18.53
17/12/2011	19h 50m 39.20s	-22° 49' 08.5"	0.7276495	1.3719769	11.41	30.7	12.2	-4	0.861	43.7	9.44	14.20	18.56
18/12/2011	19h 55m 55.09s	-22° 35' 54.1"	0.7275850	1.3668642	11.37	30.9	12.2	-4	0.859	44.1	9.45	14.21	18.58
19/12/2011	20h 01m 09.83s	-22° 22' 00.0"	0.7275172	1.3617224	11.33	31.2	12.3	-4	0.857	44.4	9.45	14.22	19.00
20/12/2011	20h 06m 23.37s	-22° 07' 26.7"	0.7274462	1.3565512	11.28	31.4	12.3	-4	0.855	44.8	9.45	14.24	19.03
21/12/2011	20h 11m 35.70s	-21° 52' 14.8"	0.7273720	1.3513505	11.24	31.6	12.3	-4	0.853	45.1	9.45	14.25	19.05
22/12/2011	20h 16m 46.77s	-21° 36' 25.0"	0.7272946	1.3461198	11.20	31.8	12.4	-4	0.851	45.5	9.45	14.26	19.08
23/12/2011	20h 21m 56.56s	-21° 19' 57.8"	0.7272142	1.3408589	11.15	32.0	12.4	-4	0.848	45.8	9.45	14.27	19.10
24/12/2011	20h 27m 05.03s	-21° 02' 54.0"	0.7271308	1.3355674	11.11	32.2	12.5	-4	0.846	46.2	9.45	14.29	19.12
25/12/2011	20h 32m 12.16s	-20° 45' 14.4"	0.7270444	1.3302451	11.06	32.4	12.5	-4	0.844	46.5	9.45	14.30	19.15
26/12/2011	20h 37m 17.92s	-20° 26' 59.4"	0.7269551	1.3248919	11.02	32.7	12.6	-4	0.842	46.9	9.45	14.31	19.17
27/12/2011	20h 42m 22.28s	-20° 08' 10.0"	0.7268630	1.3195077	10.97	32.9	12.6	-4	0.839	47.2	9.45	14.32	19.20
28/12/2011	20h 47m 25.22s	-19° 48' 46.7"	0.7267681	1.3140925	10.93	33.1	12.7	-4	0.837	47.6	9.44	14.33	19.22
29/12/2011	20h 52m 26.73s	-19° 28' 50.4"	0.7266706	1.3086464	10.88	33.3	12.8	-4	0.835	48.0	9.44	14.34	19.25
30/12/2011	20h 57m 26.80s	-19° 08' 21.8"	0.7265704	1.3031694	10.84	33.5	12.8	-4	0.832	48.3	9.44	14.35	19.27
31/12/2011	21h 02m 25.42s	-18° 47' 21.6"	0.7264678	1.2976618	10.79	33.7	12.9	-4	0.830	48.7	9.43	14.36	19.30

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

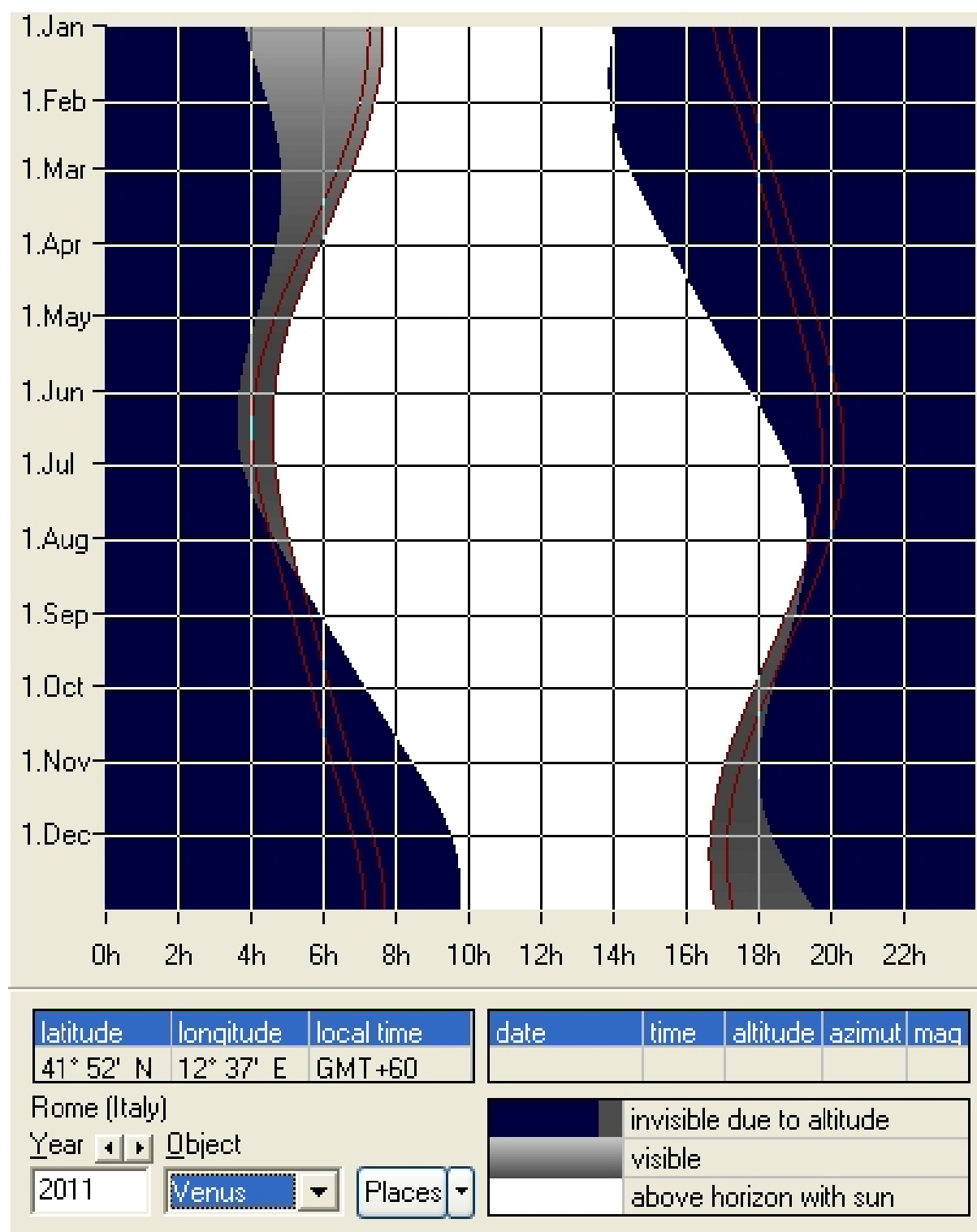
# FENOMENI DI VENERE - PHENOMENA OF VENUS

Perielio - Perihelion	09/08/2011	08:50:09	0,71846 AU
Afelio - Aphelion	18/04/2011	23:43:02	0,72821 AU
Afelio - Aphelion	29/11/2011	16:18:21	0,72820 AU
Perigeo - Perigee	Questo anno non avviene - No phenomenon		
Apogeo - Apogee	13/08/2011	08:48:40	1,73085 AU
Magnit. Max - Brightness maximum	17/08/2011	13:39:30	-3,9 mag
Magnit. Min - Brightness minimum	03/06/2011	20:11:28	-3,9 mag
Magnit. Min - Brightness minimum	17/10/2011	12:05:41	-3,9 mag
Max el. est - Greatest elong.east	Questo anno non avviene - No phenomenon		
Max el. ovest - Greatest elong. west	08/01/2011	16:18:47	47,0 °
Cong. Infer. - Inferior conjunction	Questo anno non avviene - No phenomenon		
Cong. Super. - Superior conjunction	16/08/2011	12:07:51	
Moto retrogr. - Retrograde motion	Questo anno non avviene - No phenomenon		
Moto diretto - Prograde motion	Questo anno non avviene - No phenomenon		
Max ang. Fase - Maximum phase angle	Questo anno non avviene - No phenomenon		
Min ang. Fase - Minimum phase angle	16/08/2011	04:33:25	1,8 °

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# VISIBILITA' DI VENERE - VISIBILITY OF VENUS



Visibilità di Venere nel corso dell'anno - Visibility of Venus during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

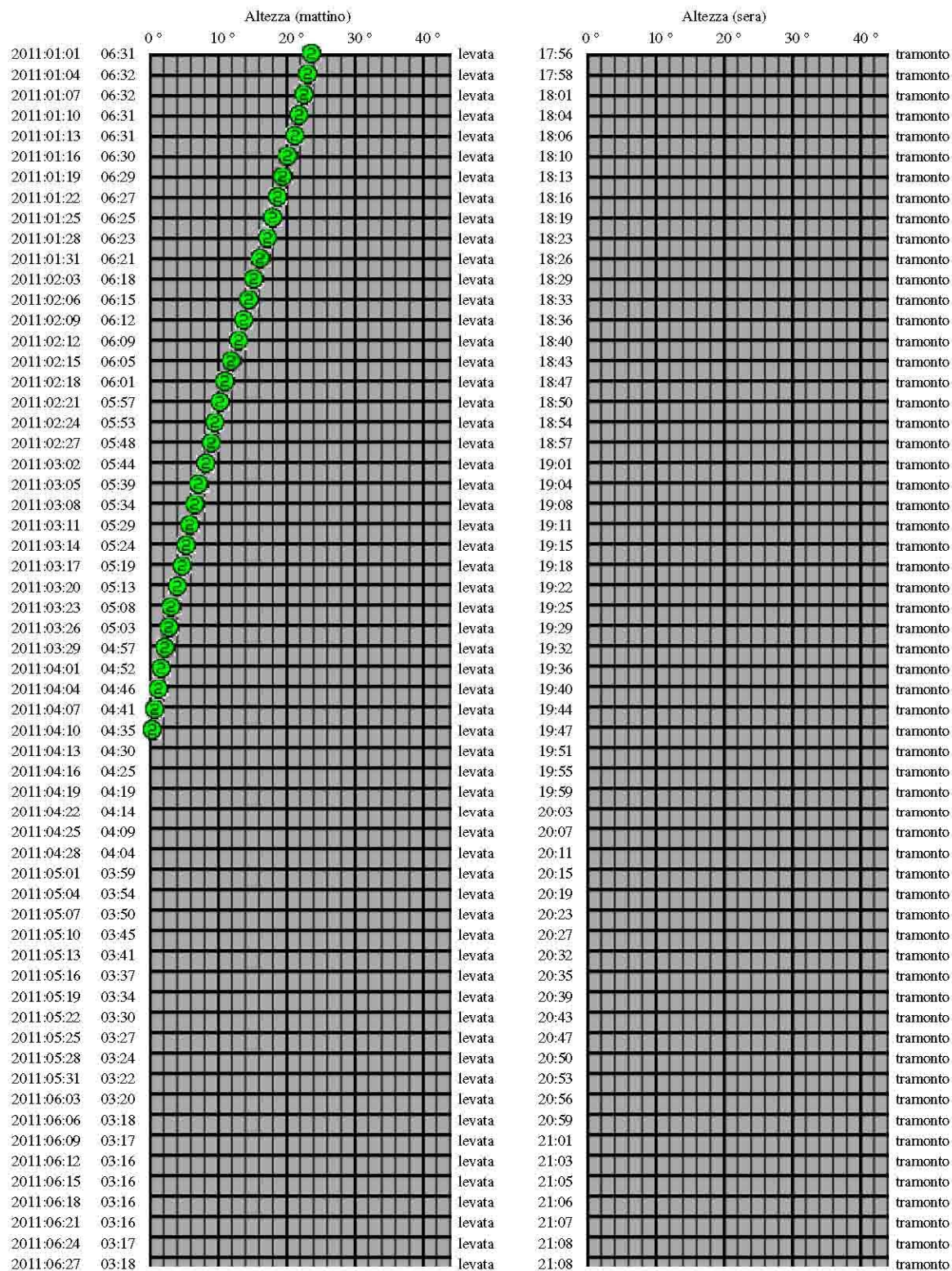


# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

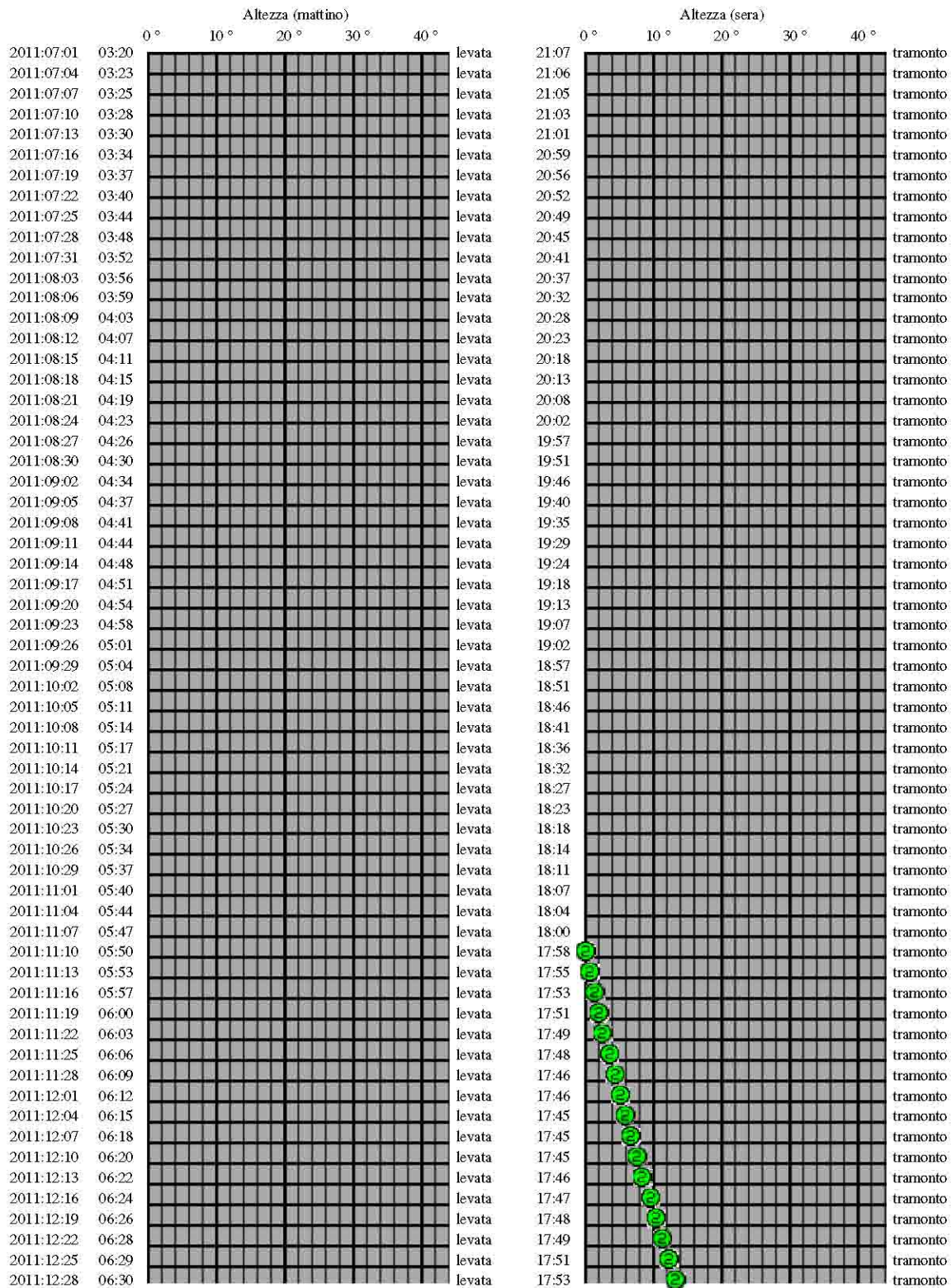


# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)





Altezza ai crepuscoli. Il Sole è 12° sotto l'orizzonte

Altitude in the twilights. The Sun is 12° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	06:31	23.6	141.3	46.8	17:56	-43.0	290.3	46.8
2011:01:04	06:32	23.1	141.7	46.9	17:58	-43.9	290.2	46.9
2011:01:07	06:32	22.5	142.0	47.0	18:01	-44.7	290.0	47.0
2011:01:10	06:31	21.8	142.1	47.0	18:04	-45.5	289.9	46.9
2011:01:13	06:31	21.1	142.1	46.9	18:06	-46.3	289.7	46.9
2011:01:16	06:30	20.3	141.9	46.8	18:10	-47.0	289.4	46.8
2011:01:19	06:29	19.5	141.6	46.6	18:13	-47.6	289.2	46.6
2011:01:22	06:27	18.7	141.1	46.4	18:16	-48.2	289.0	46.4
2011:01:25	06:25	17.9	140.5	46.2	18:19	-48.7	288.8	46.1
2011:01:28	06:23	17.1	139.8	45.9	18:23	-49.1	288.7	45.8
2011:01:31	06:21	16.2	139.0	45.6	18:26	-49.5	288.6	45.5
2011:02:03	06:18	15.4	138.0	45.2	18:29	-49.8	288.5	45.2
2011:02:06	06:15	14.5	136.9	44.9	18:33	-50.0	288.5	44.8
2011:02:09	06:12	13.7	135.8	44.5	18:36	-50.2	288.6	44.4
2011:02:12	06:09	12.8	134.5	44.1	18:40	-50.2	288.7	44.0
2011:02:15	06:05	12.0	133.1	43.6	18:43	-50.2	288.9	43.5
2011:02:18	06:01	11.2	131.7	43.2	18:47	-50.2	289.3	43.1
2011:02:21	05:57	10.4	130.2	42.7	18:50	-50.1	289.7	42.6
2011:02:24	05:53	9.6	128.6	42.2	18:54	-49.9	290.2	42.1
2011:02:27	05:48	8.8	126.9	41.7	18:57	-49.7	290.8	41.6
2011:03:02	05:44	8.1	125.2	41.2	19:01	-49.4	291.5	41.1
2011:03:05	05:39	7.3	123.4	40.6	19:04	-49.0	292.3	40.5
2011:03:08	05:34	6.6	121.5	40.1	19:08	-48.7	293.2	40.0
2011:03:11	05:29	5.9	119.6	39.5	19:11	-48.2	294.2	39.4
2011:03:14	05:24	5.3	117.7	38.9	19:15	-47.8	295.3	38.8
2011:03:17	05:19	4.6	115.7	38.3	19:18	-47.3	296.5	38.2
2011:03:20	05:13	4.0	113.7	37.7	19:22	-46.7	297.7	37.6
2011:03:23	05:08	3.4	111.6	37.1	19:25	-46.2	299.0	37.0
2011:03:26	05:03	2.8	109.6	36.5	19:29	-45.6	300.4	36.4
2011:03:29	04:57	2.2	107.5	35.9	19:32	-44.9	301.9	35.7
2011:04:01	04:52	1.7	105.3	35.2	19:36	-44.3	303.4	35.1
2011:04:04	04:46	1.2	103.2	34.6	19:40	-43.6	304.9	34.4
2011:04:07	04:41	0.7	101.0	33.9	19:44	-42.8	306.5	33.8
2011:04:10	04:35	0.3	98.9	33.3	19:47	-42.1	308.1	33.1
2011:04:13	04:30	-0.1	96.7	32.6	19:51	-41.3	309.7	32.4
2011:04:16	04:25	-0.5	94.5	31.9	19:55	-40.5	311.4	31.8
2011:04:19	04:19	-0.9	92.3	31.2	19:59	-39.7	313.0	31.1
2011:04:22	04:14	-1.2	90.2	30.5	20:03	-38.8	314.6	30.4
2011:04:25	04:09	-1.6	88.0	29.8	20:07	-38.0	316.2	29.7
2011:04:28	04:04	-1.8	85.9	29.1	20:11	-37.1	317.8	29.0
2011:05:01	03:59	-2.1	83.7	28.4	20:15	-36.2	319.3	28.2
2011:05:04	03:54	-2.4	81.6	27.7	20:19	-35.2	320.8	27.5
2011:05:07	03:50	-2.6	79.6	27.0	20:23	-34.3	322.2	26.8
2011:05:10	03:45	-2.8	77.5	26.2	20:27	-33.3	323.6	26.1
2011:05:13	03:41	-2.9	75.5	25.5	20:32	-32.4	324.9	25.3
2011:05:16	03:37	-3.1	73.6	24.7	20:35	-31.4	326.0	24.6
2011:05:19	03:34	-3.2	71.7	24.0	20:39	-30.4	327.1	23.8
2011:05:22	03:30	-3.3	69.8	23.2	20:43	-29.4	328.1	23.0
2011:05:25	03:27	-3.4	68.1	22.5	20:47	-28.5	329.0	22.3
2011:05:28	03:24	-3.5	66.3	21.7	20:50	-27.5	329.7	21.5
2011:05:31	03:22	-3.5	64.7	20.9	20:53	-26.5	330.3	20.7
2011:06:03	03:20	-3.6	63.2	20.1	20:56	-25.6	330.8	20.0
2011:06:06	03:18	-3.6	61.7	19.4	20:59	-24.7	331.2	19.2
2011:06:09	03:17	-3.7	60.3	18.6	21:01	-23.8	331.4	18.4
2011:06:12	03:16	-3.7	59.0	17.8	21:03	-22.9	331.4	17.6
2011:06:15	03:16	-3.8	57.8	17.0	21:05	-22.1	331.3	16.8
2011:06:18	03:16	-3.8	56.8	16.2	21:06	-21.2	331.0	16.0
2011:06:21	03:16	-3.9	55.8	15.4	21:07	-20.5	330.6	15.2
2011:06:24	03:17	-4.0	54.9	14.6	21:08	-19.7	330.0	14.4
2011:06:27	03:18	-4.1	54.2	13.8	21:08	-19.0	329.3	13.6
2011:06:30	03:20	-4.2	53.6	13.0	21:07	-18.3	328.5	12.8

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	03:20	-4.3	53.4	12.7	21:07	-18.1	328.2	12.5
2011:07:04	03:23	-4.4	52.9	11.9	21:06	-17.4	327.1	11.7
2011:07:07	03:25	-4.7	52.5	11.1	21:05	-16.8	326.0	10.9
2011:07:10	03:28	-4.9	52.3	10.3	21:03	-16.2	324.7	10.1
2011:07:13	03:30	-5.2	52.1	9.5	21:01	-15.7	323.3	9.3
2011:07:16	03:34	-5.5	52.1	8.6	20:59	-15.2	321.8	8.4
2011:07:19	03:37	-5.9	52.2	7.8	20:56	-14.7	320.1	7.6
2011:07:22	03:40	-6.3	52.4	7.0	20:52	-14.2	318.4	6.8
2011:07:25	03:44	-6.8	52.7	6.2	20:49	-13.7	316.6	6.0
2011:07:28	03:48	-7.3	53.1	5.4	20:45	-13.3	314.8	5.2
2011:07:31	03:52	-7.8	53.5	4.6	20:41	-12.9	312.8	4.4
2011:08:03	03:56	-8.4	54.1	3.8	20:37	-12.5	310.8	3.6
2011:08:06	03:59	-9.0	54.8	3.1	20:32	-12.1	308.7	2.9
2011:08:09	04:03	-9.6	55.6	2.3	20:28	-11.7	306.6	2.2
2011:08:12	04:07	-10.3	56.4	1.7	20:23	-11.3	304.5	1.6
2011:08:15	04:11	-11.0	57.4	1.3	20:18	-11.0	302.2	1.3
2011:08:18	04:15	-11.7	58.3	1.4	20:13	-10.6	300.0	1.5
2011:08:21	04:19	-12.4	59.4	1.9	20:08	-10.3	297.7	2.0
2011:08:24	04:23	-13.2	60.5	2.5	20:02	-10.0	295.4	2.7
2011:08:27	04:26	-13.9	61.7	3.2	19:57	-9.6	293.1	3.4
2011:08:30	04:30	-14.7	63.0	4.0	19:51	-9.3	290.7	4.2
2011:09:02	04:34	-15.5	64.3	4.8	19:46	-9.0	288.4	5.0
2011:09:05	04:37	-16.3	65.6	5.6	19:40	-8.7	286.0	5.7
2011:09:08	04:41	-17.1	67.0	6.4	19:35	-8.4	283.6	6.5
2011:09:11	04:44	-17.9	68.4	7.1	19:29	-8.1	281.3	7.3
2011:09:14	04:48	-18.7	69.8	7.9	19:24	-7.7	278.9	8.1
2011:09:17	04:51	-19.5	71.2	8.7	19:18	-7.4	276.5	8.9
2011:09:20	04:54	-20.3	72.7	9.5	19:13	-7.1	274.1	9.7
2011:09:23	04:58	-21.1	74.1	10.3	19:07	-6.8	271.8	10.4
2011:09:26	05:01	-21.9	75.6	11.1	19:02	-6.4	269.4	11.2
2011:09:29	05:04	-22.7	77.0	11.8	18:57	-6.1	267.1	12.0
2011:10:02	05:08	-23.5	78.5	12.6	18:51	-5.8	264.8	12.8
2011:10:05	05:11	-24.3	79.9	13.4	18:46	-5.4	262.5	13.5
2011:10:08	05:14	-25.0	81.2	14.2	18:41	-5.0	260.3	14.3
2011:10:11	05:17	-25.8	82.6	14.9	18:36	-4.7	258.0	15.1
2011:10:14	05:21	-26.5	83.9	15.7	18:32	-4.3	255.9	15.8
2011:10:17	05:24	-27.2	85.1	16.4	18:27	-3.9	253.7	16.6
2011:10:20	05:27	-27.9	86.3	17.2	18:23	-3.4	251.6	17.3
2011:10:23	05:30	-28.6	87.4	17.9	18:18	-3.0	249.6	18.1
2011:10:26	05:34	-29.3	88.5	18.7	18:14	-2.5	247.6	18.8
2011:10:29	05:37	-29.9	89.5	19.4	18:11	-2.0	245.7	19.5
2011:11:01	05:40	-30.6	90.4	20.1	18:07	-1.5	243.8	20.3
2011:11:04	05:44	-31.2	91.1	20.9	18:04	-1.0	242.0	21.0
2011:11:07	05:47	-31.8	91.8	21.6	18:00	-0.4	240.3	21.7
2011:11:10	05:50	-32.3	92.4	22.3	17:58	0.2	238.7	22.4
2011:11:13	05:53	-32.9	92.9	23.0	17:55	0.8	237.1	23.1
2011:11:16	05:57	-33.4	93.2	23.7	17:53	1.4	235.6	23.9
2011:11:19	06:00	-33.8	93.5	24.4	17:51	2.1	234.3	24.6
2011:11:22	06:03	-34.3	93.6	25.1	17:49	2.8	233.0	25.3
2011:11:25	06:06	-34.6	93.5	25.8	17:48	3.5	231.9	25.9
2011:11:28	06:09	-35.0	93.4	26.5	17:46	4.3	230.8	26.6
2011:12:01	06:12	-35.3	93.1	27.2	17:46	5.1	229.9	27.3
2011:12:04	06:15	-35.5	92.7	27.9	17:45	5.9	229.1	28.0
2011:12:07	06:18	-35.7	92.2	28.6	17:45	6.7	228.5	28.7
2011:12:10	06:20	-35.9	91.5	29.2	17:45	7.6	227.9	29.3
2011:12:13	06:22	-36.0	90.7	29.9	17:46	8.5	227.5	30.0
2011:12:16	06:24	-36.0	89.8	30.6	17:47	9.4	227.3	30.7
2011:12:19	06:26	-36.0	88.8	31.2	17:48	10.4	227.1	31.3
2011:12:22	06:28	-36.0	87.6	31.9	17:49	11.3	227.2	32.0
2011:12:25	06:29	-35.9	86.4	32.5	17:51	12.3	227.3	32.6
2011:12:28	06:30	-35.7	85.1	33.1	17:53	13.3	227.6	33.2
2011:12:31	06:31	-35.5	83.6	33.8	17:55	14.3	228.0	33.8

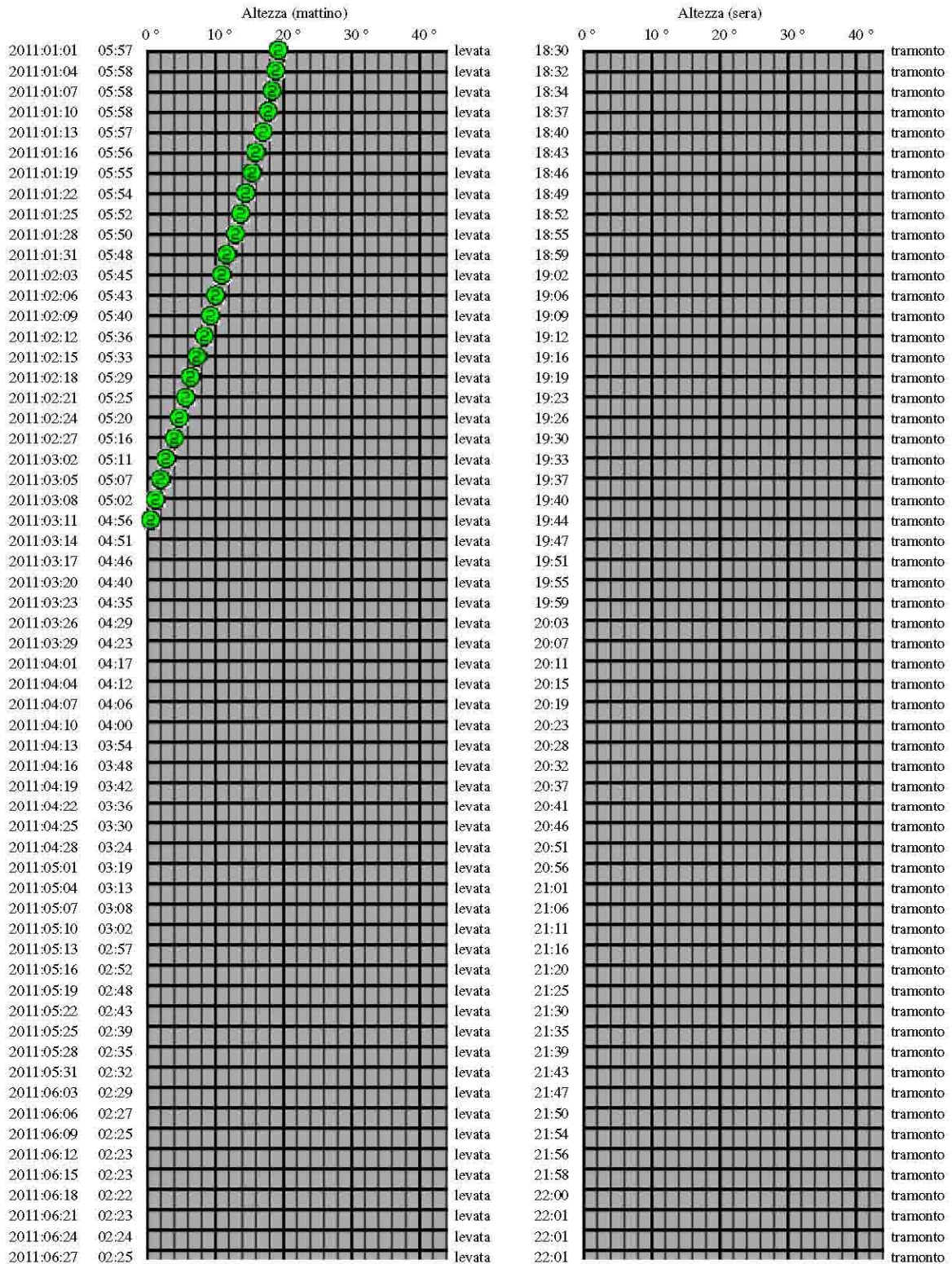
Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza del pianeta sull'orizzonte, in °  
 Az = azimut del pianeta, in °  
 Elong = elongazione del pianeta, in °  
  
 Alt = altitude of the planet above the horizon, in °  
 Az = azimuth of the planet, in °  
 Elong = elongation of the planet, in °

# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

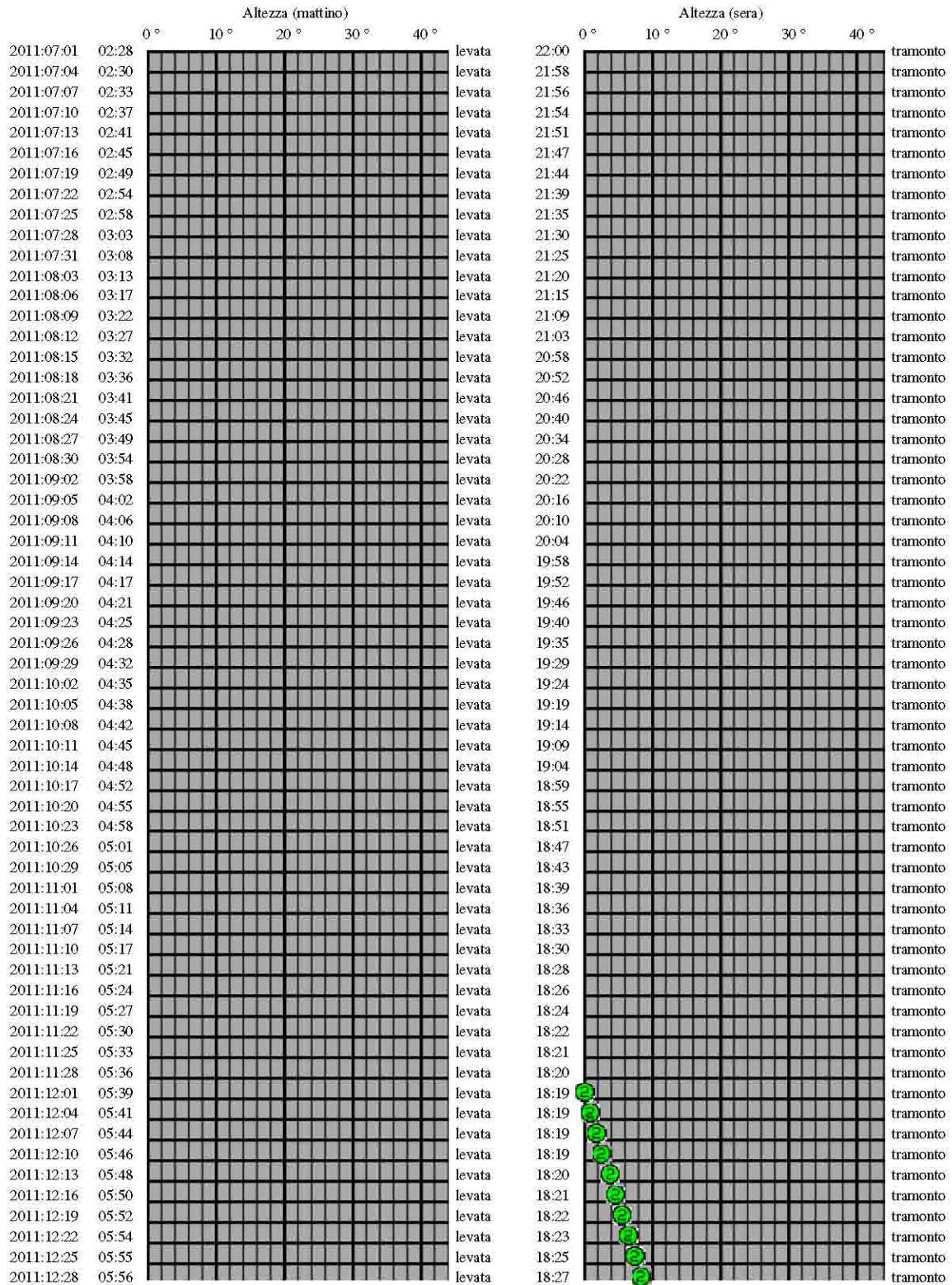


# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	19.4	133.8	46.8	18:30	-48.7	298.7	46.8
2011:01:04	05:58	18.9	134.3	46.9	18:32	-49.6	298.6	46.9
2011:01:07	05:58	18.3	134.6	47.0	18:34	-50.4	298.5	47.0
2011:01:10	05:58	17.7	134.8	47.0	18:37	-51.2	298.3	46.9
2011:01:13	05:57	17.0	134.9	46.9	18:40	-52.0	298.2	46.9
2011:01:16	05:56	16.2	134.8	46.8	18:43	-52.7	298.0	46.8
2011:01:19	05:55	15.4	134.6	46.6	18:46	-53.3	297.8	46.6
2011:01:22	05:54	14.6	134.2	46.4	18:49	-53.9	297.6	46.4
2011:01:25	05:52	13.7	133.7	46.2	18:52	-54.3	297.4	46.1
2011:01:28	05:50	12.8	133.1	45.9	18:55	-54.8	297.2	45.8
2011:01:31	05:48	12.0	132.4	45.6	18:59	-55.1	297.1	45.5
2011:02:03	05:45	11.0	131.5	45.2	19:02	-55.4	297.0	45.2
2011:02:06	05:43	10.1	130.6	44.9	19:06	-55.6	297.0	44.8
2011:02:09	05:40	9.2	129.5	44.5	19:09	-55.7	297.1	44.4
2011:02:12	05:36	8.3	128.3	44.1	19:12	-55.8	297.2	44.0
2011:02:15	05:33	7.4	127.1	43.6	19:16	-55.8	297.5	43.5
2011:02:18	05:29	6.5	125.7	43.2	19:19	-55.7	297.8	43.1
2011:02:21	05:25	5.6	124.3	42.7	19:23	-55.5	298.3	42.6
2011:02:24	05:20	4.7	122.7	42.2	19:26	-55.3	298.8	42.1
2011:02:27	05:16	3.8	121.1	41.7	19:30	-55.1	299.5	41.6
2011:03:02	05:11	3.0	119.5	41.2	19:33	-54.8	300.3	41.0
2011:03:05	05:07	2.1	117.7	40.6	19:37	-54.4	301.1	40.5
2011:03:08	05:02	1.3	115.9	40.1	19:40	-54.0	302.1	39.9
2011:03:11	04:56	0.5	114.0	39.5	19:44	-53.6	303.2	39.4
2011:03:14	04:51	-0.3	112.1	38.9	19:47	-53.1	304.4	38.8
2011:03:17	04:46	-1.0	110.1	38.3	19:51	-52.5	305.7	38.2
2011:03:20	04:40	-1.8	108.1	37.7	19:55	-51.9	307.1	37.6
2011:03:23	04:35	-2.5	106.1	37.1	19:59	-51.3	308.6	37.0
2011:03:26	04:29	-3.2	103.9	36.5	20:03	-50.7	310.1	36.4
2011:03:29	04:23	-3.9	101.8	35.9	20:07	-50.0	311.7	35.7
2011:04:01	04:17	-4.5	99.6	35.2	20:11	-49.3	313.4	35.1
2011:04:04	04:12	-5.2	97.4	34.6	20:15	-48.5	315.1	34.4
2011:04:07	04:06	-5.8	95.2	33.9	20:19	-47.7	316.8	33.8
2011:04:10	04:00	-6.3	92.9	33.3	20:23	-46.9	318.6	33.1
2011:04:13	03:54	-6.9	90.7	32.6	20:28	-46.1	320.4	32.4
2011:04:16	03:48	-7.4	88.4	31.9	20:32	-45.2	322.2	31.8
2011:04:19	03:42	-7.9	86.1	31.2	20:37	-44.3	324.0	31.1
2011:04:22	03:36	-8.3	83.8	30.5	20:41	-43.4	325.8	30.4
2011:04:25	03:30	-8.8	81.5	29.8	20:46	-42.4	327.5	29.7
2011:04:28	03:24	-9.2	79.2	29.1	20:51	-41.4	329.3	29.0
2011:05:01	03:19	-9.5	76.9	28.4	20:56	-40.5	331.0	28.2
2011:05:04	03:13	-9.9	74.6	27.7	21:01	-39.4	332.6	27.5
2011:05:07	03:08	-10.2	72.3	27.0	21:06	-38.4	334.2	26.8
2011:05:10	03:02	-10.5	70.1	26.2	21:11	-37.4	335.7	26.0
2011:05:13	02:57	-10.7	67.9	25.5	21:16	-36.3	337.1	25.3
2011:05:16	02:52	-10.9	65.7	24.7	21:20	-35.3	338.5	24.6
2011:05:19	02:48	-11.1	63.6	24.0	21:25	-34.2	339.7	23.8
2011:05:22	02:43	-11.3	61.5	23.2	21:30	-33.2	340.8	23.0
2011:05:25	02:39	-11.4	59.5	22.5	21:35	-32.2	341.8	22.3
2011:05:28	02:35	-11.5	57.6	21.7	21:39	-31.2	342.6	21.5
2011:05:31	02:32	-11.6	55.8	20.9	21:43	-30.2	343.3	20.7
2011:06:03	02:29	-11.7	54.0	20.2	21:47	-29.2	343.8	19.9
2011:06:06	02:27	-11.7	52.4	19.4	21:50	-28.3	344.2	19.2
2011:06:09	02:25	-11.7	50.8	18.6	21:54	-27.4	344.4	18.4
2011:06:12	02:23	-11.7	49.4	17.8	21:56	-26.6	344.4	17.6
2011:06:15	02:23	-11.7	48.1	17.0	21:58	-25.8	344.2	16.8
2011:06:18	02:22	-11.6	47.0	16.2	22:00	-25.0	343.9	16.0
2011:06:21	02:23	-11.6	46.0	15.4	22:01	-24.3	343.3	15.2
2011:06:24	02:24	-11.6	45.1	14.6	22:01	-23.7	342.6	14.4
2011:06:27	02:25	-11.6	44.4	13.8	22:01	-23.1	341.7	13.6
2011:06:30	02:27	-11.6	43.8	13.0	22:00	-22.5	340.6	12.8

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	-11.6	43.7	12.7	22:00	-22.3	340.2	12.5
2011:07:04	02:30	-11.7	43.3	11.9	21:58	-21.8	338.9	11.7
2011:07:07	02:33	-11.7	43.0	11.1	21:56	-21.4	337.5	10.9
2011:07:10	02:37	-11.8	42.9	10.3	21:54	-20.9	335.9	10.1
2011:07:13	02:41	-12.0	42.9	9.5	21:51	-20.5	334.2	9.3
2011:07:16	02:45	-12.2	43.0	8.7	21:47	-20.1	332.3	8.4
2011:07:19	02:49	-12.5	43.2	7.8	21:44	-19.7	330.4	7.6
2011:07:22	02:54	-12.8	43.5	7.0	21:39	-19.4	328.4	6.8
2011:07:25	02:58	-13.1	44.0	6.2	21:35	-19.0	326.3	6.0
2011:07:28	03:03	-13.5	44.5	5.4	21:30	-18.7	324.1	5.2
2011:07:31	03:08	-14.0	45.2	4.6	21:25	-18.4	321.8	4.4
2011:08:03	03:13	-14.5	45.9	3.8	21:20	-18.1	319.5	3.6
2011:08:06	03:17	-15.0	46.7	3.1	21:15	-17.8	317.2	2.9
2011:08:09	03:22	-15.6	47.6	2.3	21:09	-17.5	314.8	2.2
2011:08:12	03:27	-16.2	48.6	1.7	21:03	-17.2	312.4	1.6
2011:08:15	03:32	-16.9	49.6	1.3	20:58	-16.9	309.9	1.3
2011:08:18	03:36	-17.6	50.8	1.4	20:52	-16.6	307.5	1.5
2011:08:21	03:41	-18.3	51.9	1.9	20:46	-16.4	305.0	2.0
2011:08:24	03:45	-19.0	53.2	2.5	20:40	-16.1	302.5	2.7
2011:08:27	03:49	-19.8	54.5	3.2	20:34	-15.8	299.9	3.4
2011:08:30	03:54	-20.5	55.8	4.0	20:28	-15.5	297.4	4.2
2011:09:02	03:58	-21.3	57.2	4.8	20:22	-15.2	294.9	5.0
2011:09:05	04:02	-22.1	58.6	5.6	20:16	-14.9	292.4	5.7
2011:09:08	04:06	-22.9	60.1	6.3	20:10	-14.6	289.8	6.5
2011:09:11	04:10	-23.7	61.6	7.1	20:04	-14.3	287.3	7.3
2011:09:14	04:14	-24.5	63.1	7.9	19:58	-14.0	284.8	8.1
2011:09:17	04:17	-25.3	64.6	8.7	19:52	-13.6	282.3	8.9
2011:09:20	04:21	-26.2	66.1	9.5	19:46	-13.3	279.8	9.7
2011:09:23	04:25	-27.0	67.7	10.3	19:40	-12.9	277.4	10.4
2011:09:26	04:28	-27.8	69.2	11.1	19:35	-12.6	275.0	11.2
2011:09:29	04:32	-28.6	70.7	11.8	19:29	-12.2	272.6	12.0
2011:10:02	04:35	-29.4	72.2	12.6	19:24	-11.8	270.2	12.8
2011:10:05	04:38	-30.1	73.7	13.4	19:19	-11.4	267.9	13.5
2011:10:08	04:42	-30.9	75.2	14.1	19:14	-11.0	265.6	14.3
2011:10:11	04:45	-31.7	76.6	14.9	19:09	-10.6	263.3	15.1
2011:10:14	04:48	-32.4	77.9	15.7	19:04	-10.2	261.1	15.8
2011:10:17	04:52	-33.2	79.3	16.4	18:59	-9.7	258.9	16.6
2011:10:20	04:55	-33.9	80.5	17.2	18:55	-9.2	256.8	17.3
2011:10:23	04:58	-34.6	81.7	17.9	18:51	-8.7	254.8	18.1
2011:10:26	05:01	-35.3	82.8	18.7	18:47	-8.2	252.8	18.8
2011:10:29	05:05	-35.9	83.8	19.4	18:43	-7.6	250.9	19.5
2011:11:01	05:08	-36.6	84.8	20.1	18:39	-7.1	249.0	20.3
2011:11:04	05:11	-37.2	85.6	20.9	18:36	-6.5	247.3	21.0
2011:11:07	05:14	-37.8	86.3	21.6	18:33	-5.8	245.6	21.7
2011:11:10	05:17	-38.4	86.9	22.3	18:30	-5.2	244.0	22.4
2011:11:13	05:21	-39.0	87.4	23.0	18:28	-4.5	242.5	23.1
2011:11:16	05:24	-39.5	87.8	23.7	18:26	-3.8	241.1	23.9
2011:11:19	05:27	-40.0	88.0	24.4	18:24	-3.1	239.8	24.6
2011:11:22	05:30	-40.4	88.1	25.1	18:22	-2.3	238.6	25.3
2011:11:25	05:33	-40.8	88.0	25.8	18:21	-1.5	237.5	26.0
2011:11:28	05:36	-41.2	87.9	26.5	18:20	-0.7	236.5	26.6
2011:12:01	05:39	-41.5	87.5	27.2	18:19	0.1	235.7	27.3
2011:12:04	05:41	-41.8	87.1	27.9	18:19	1.0	235.0	28.0
2011:12:07	05:44	-42.0	86.5	28.6	18:19	1.8	234.4	28.7
2011:12:10	05:46	-42.2	85.7	29.2	18:19	2.7	233.9	29.3
2011:12:13	05:48	-42.3	84.8	29.9	18:20	3.7	233.6	30.0
2011:12:16	05:50	-42.3	83.8	30.5	18:21	4.6	233.4	30.7
2011:12:19	05:52	-42.3	82.7	31.2	18:22	5.5	233.4	31.3
2011:12:22	05:54	-42.3	81.5	31.8	18:23	6.5	233.5	32.0
2011:12:25	05:55	-42.1	80.1	32.5	18:25	7.4	233.7	32.6
2011:12:28	05:56	-42.0	78.7	33.1	18:27	8.4	234.0	33.2
2011:12:31	05:57	-41.7	77.1	33.7	18:29	9.4	234.5	33.9

Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza del pianeta sull'orizzonte, in °  
 Az = azimut del pianeta, in °  
 Elong = elongazione del pianeta, in °  
  
 Alt = altitude of the planet above the horizon, in °  
 Az = azimuth of the planet, in °  
 Elong = elongation of the planet, in °



heliacal dates for Venus in 2011  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Venere  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E  
visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
morning visibility ends	2011-07-24	04:21	04:54	-0:33h	-23d 08h	-3.4
evening visibility begins	2011-09-25	18:30	18:02	0:27h	40d 06h	-3.4

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins = inizio visibilità mattutina  
Morning visibility ends = fine visibilità mattutina  
Evening visibility begins = inizio visibilità serale  
Evening visibility ends = fine visibilità serale

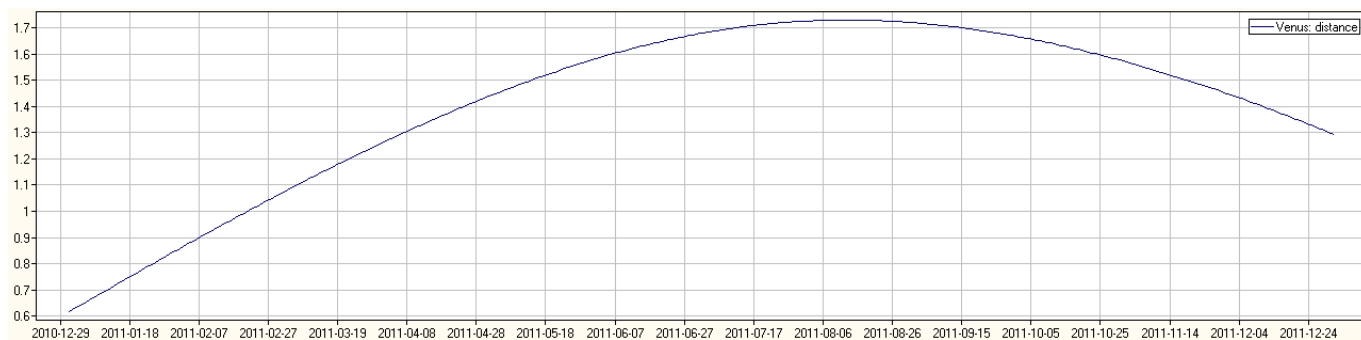
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
ML	07-24	04:21	04:54	-6° 07'	120° 55'	114° 29'	0° 41'	-3.4	3° 15'	-6° 26'
EF	09-25	18:30	18:02	-6° 01'	182° 18'	193° 12'	1° 05'	-3.4	-9° 26'	10° 54'

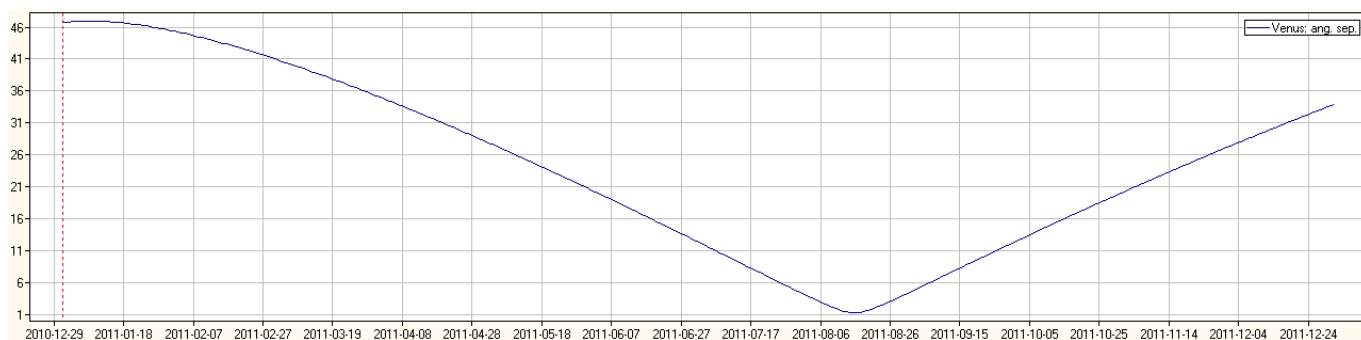
MF : prima visibilità mattutina  
ML : ultima visibilità mattutina  
EF : prima visibilità serale  
EL : ultima visibilità serale  
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

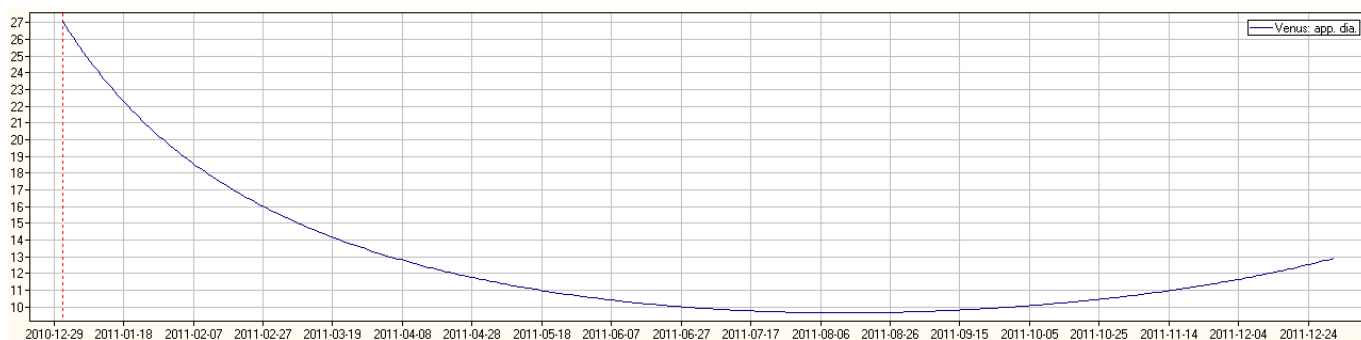
© (3)



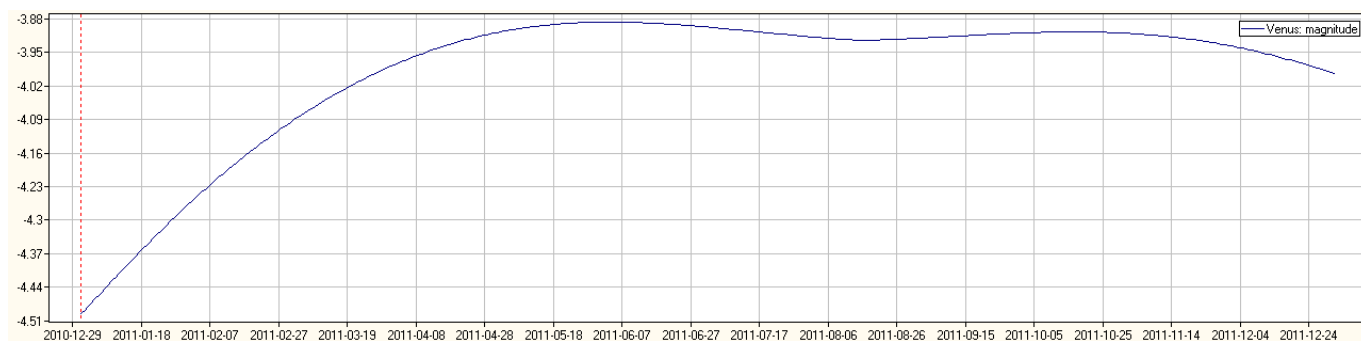
Distanza di Venere in U.A. nel corso dell'anno - Distance of Venus in A.U. during the year



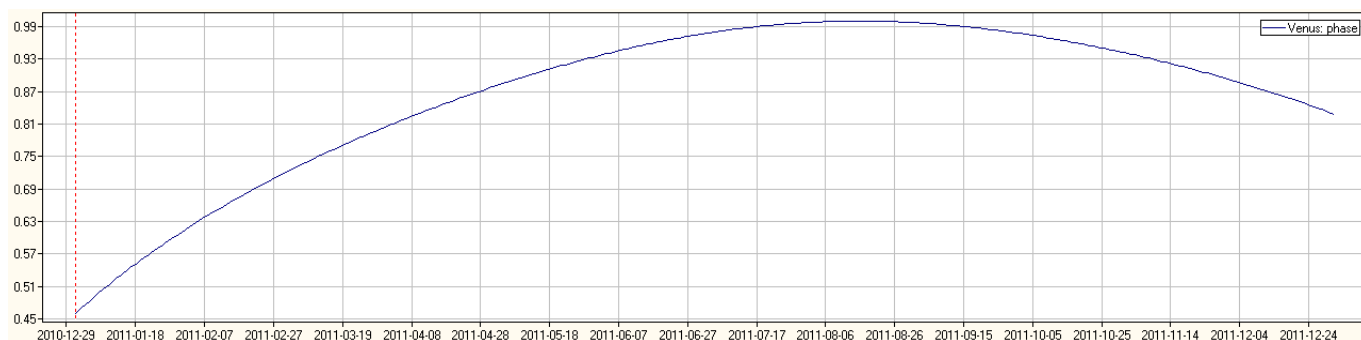
Elongazione di Venere in ° nel corso dell'anno - Elongation of Venus in ° during the year



Diametro di Venere in " nel corso dell'anno - Diameter of Venus in " during the year

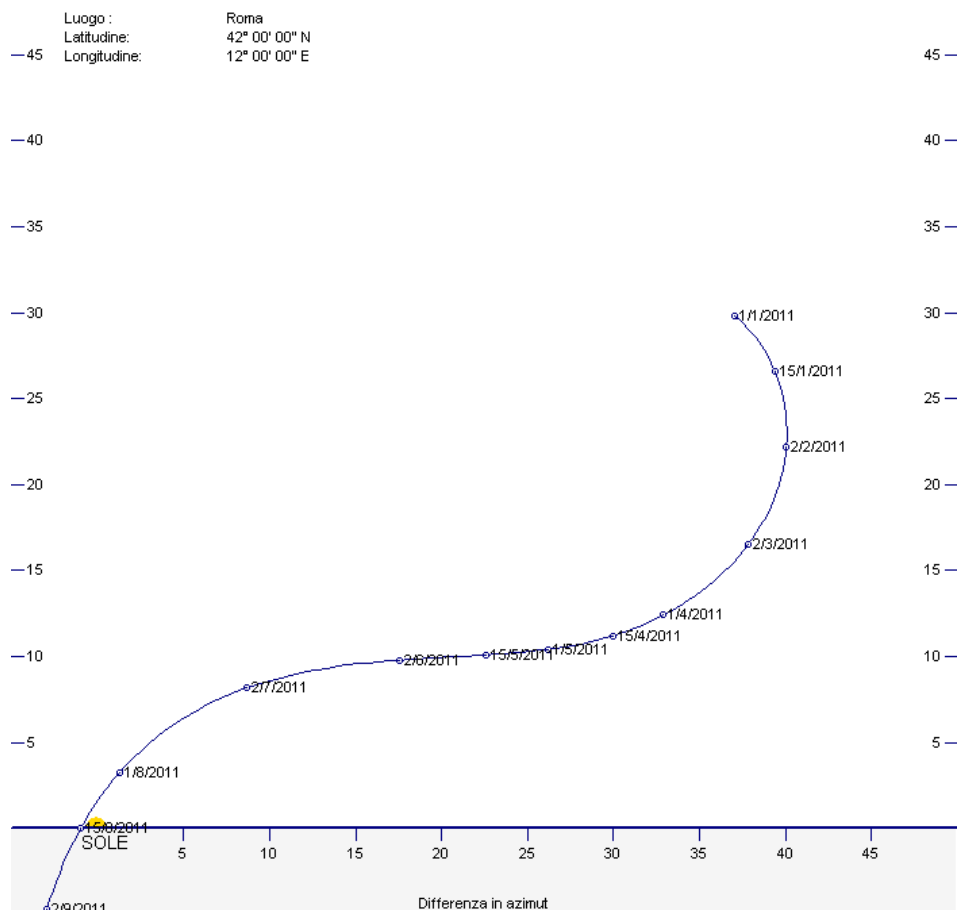


Magnitudine di Venere nel corso dell'anno - Magnitude of Venus during the year

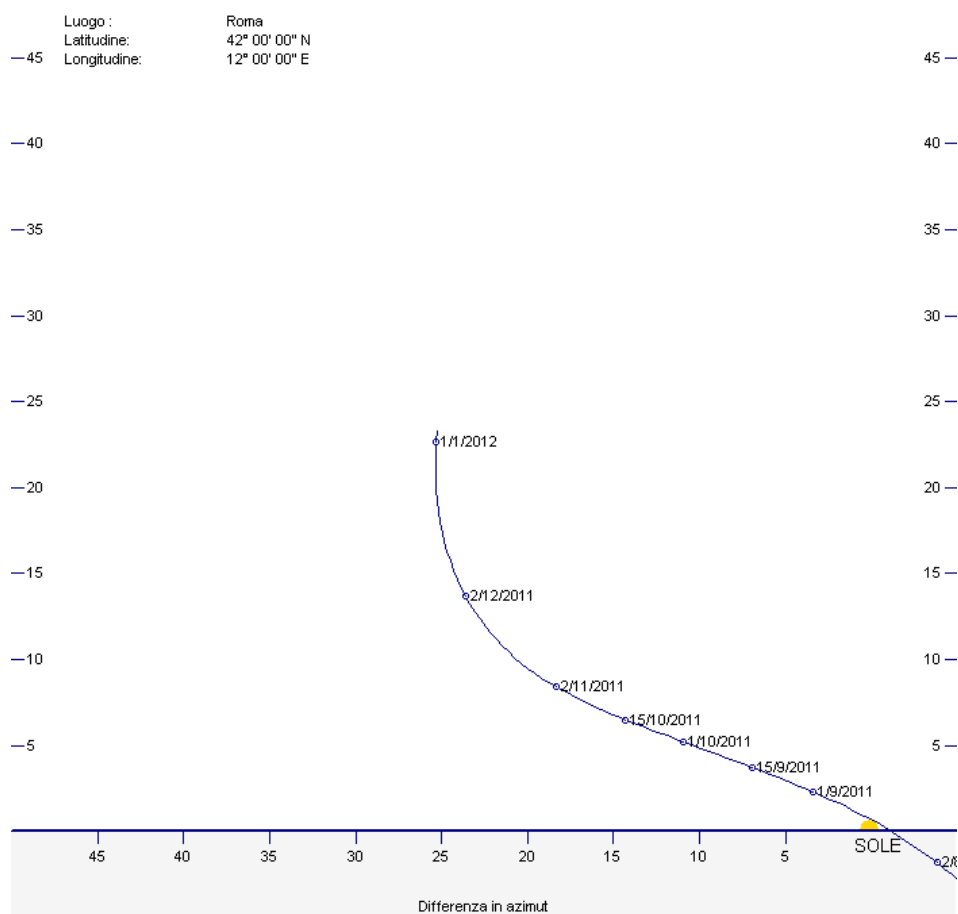


Fase di Venere nel corso dell'anno - Phase of Venus during the year

### Posizione di Venere al mattino rispetto al sorgere del Sole



### Posizione di Venere alla sera rispetto al tramonto del Sole



Posizione relativa di Venere rispetto al Sole al suo momento del sorgere e del tramonto

Relative position of Venus respect to the sunrising and sunsetting

© (4)

# EFFEMERIDI DI MARTE - EPHEMERIDES OF MARS

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle'	Rise	Transit	Set
01/01/2011	19h 20m 10.81s	-23° 09' 33.1"	1.4127211	2,3789068	19,79	8,2	3,9	1,2	0,998	5,7	8.15	12.48	17.22
02/01/2011	19h 23m 30.98s	-23° 03' 20.9"	1.4118477	2,3790167	19,79	8,0	3,9	1,2	0,998	5,6	8.14	12.48	17.22
03/01/2011	19h 26m 51.00s	-22° 56' 52.9"	1.4109846	2,3791090	19,79	7,7	3,9	1,2	0,998	5,4	8.13	12.47	17.22
04/01/2011	19h 30m 10.86s	-22° 50' 09.2"	1.4101320	2,3791838	19,79	7,5	3,9	1,2	0,998	5,2	8.11	12.46	17.21
05/01/2011	19h 33m 30.54s	-22° 43' 10.0"	1.4092899	2,3792413	19,79	7,3	3,9	1,2	0,998	5,1	8.10	12.46	17.21
06/01/2011	19h 36m 50.02s	-22° 35' 55.3"	1.4084585	2,3792818	19,79	7,0	3,9	1,2	0,998	4,9	8.09	12.45	17.21
07/01/2011	19h 40m 09.29s	-22° 28' 25.2"	1.4076379	2,3793057	19,79	6,8	3,9	1,2	0,998	4,7	8.08	12.44	17.21
08/01/2011	19h 43m 28.34s	-22° 20' 39.8"	1.4068282	2,3793133	19,79	6,5	3,9	1,2	0,998	4,6	8.07	12.44	17.21
09/01/2011	19h 46m 47.14s	-22° 12' 39.2"	1.4060295	2,3793051	19,79	6,3	3,9	1,2	0,999	4,4	8.06	12.43	17.21
10/01/2011	19h 50m 05.70s	-22° 04' 23.5"	1.4052418	2,3792815	19,79	6,1	3,9	1,2	0,999	4,2	8.04	12.43	17.21
11/01/2011	19h 53m 23.99s	-21° 55' 52.9"	1.4044654	2,3792430	19,79	5,8	3,9	1,2	0,999	4,1	8.03	12.42	17.21
12/01/2011	19h 56m 42.01s	-21° 47' 07.3"	1.4037003	2,3791901	19,79	5,6	3,9	1,2	0,999	3,9	8.02	12.41	17.21
13/01/2011	19h 59m 59.74s	-21° 38' 07.1"	1.4029466	2,3791233	19,79	5,4	3,9	1,1	0,999	3,8	8.00	12.41	17.21
14/01/2011	20h 03m 17.18s	-21° 28' 52.2"	1.4022044	2,3790430	19,79	5,1	3,9	1,1	0,999	3,6	7.59	12.40	17.21
15/01/2011	20h 06m 34.32s	-21° 19' 22.8"	1.4014738	2,3789499	19,79	4,9	3,9	1,1	0,999	3,4	7.58	12.39	17.21
16/01/2011	20h 09m 51.14s	-21° 09' 39.1"	1.4007549	2,3788444	19,78	4,7	3,9	1,1	0,999	3,3	7.56	12.39	17.21
17/01/2011	20h 13m 07.65s	-20° 59' 41.2"	1.4000478	2,3787272	19,78	4,5	3,9	1,1	0,999	3,1	7.55	12.38	17.21
18/01/2011	20h 16m 23.82s	-20° 49' 29.2"	1.3993526	2,3785986	19,78	4,2	3,9	1,1	0,999	3,0	7.54	12.37	17.21
19/01/2011	20h 19m 39.65s	-20° 39' 03.2"	1.3986693	2,3784593	19,78	4,0	3,9	1,1	0,999	2,8	7.52	12.37	17.21
20/01/2011	20h 22m 55.14s	-20° 28' 23.5"	1.3979981	2,3783096	19,78	3,8	3,9	1,1	0,999	2,7	7.51	12.36	17.22
21/01/2011	20h 26m 10.27s	-20° 17' 30.2"	1.3973391	2,3781498	19,78	3,6	3,9	1,1	1,000	2,5	7.49	12.35	17.22
22/01/2011	20h 29m 25.04s	-20° 06' 23.3"	1.3966924	2,3779802	19,78	3,3	3,9	1,1	1,000	2,4	7.48	12.35	17.22
23/01/2011	20h 32m 39.44s	-19° 55' 03.0"	1.3960580	2,3778009	19,78	3,1	3,9	1,1	1,000	2,2	7.46	12.34	17.22
24/01/2011	20h 35m 53.47s	-19° 43' 29.5"	1.3954360	2,3776119	19,77	2,9	3,9	1,1	1,000	2,0	7.45	12.33	17.22
25/01/2011	20h 39m 07.14s	-19° 31' 42.9"	1.3948265	2,3774131	19,77	2,7	3,9	1,1	1,000	1,9	7.43	12.32	17.22
26/01/2011	20h 42m 20.43s	-19° 19' 43.4"	1.3942296	2,3772044	19,77	2,5	3,9	1,1	1,000	1,7	7.42	12.32	17.22
27/01/2011	20h 45m 33.34s	-19° 07' 31.0"	1.3936454	2,3769857	19,77	2,3	3,9	1,1	1,000	1,6	7.40	12.31	17.22
28/01/2011	20h 48m 45.87s	-18° 55' 06.1"	1.3930739	2,3767568	19,77	2,1	3,9	1,1	1,000	1,4	7.38	12.30	17.22
29/01/2011	20h 51m 58.02s	-18° 42' 28.9"	1.3925153	2,3765176	19,76	1,9	3,9	1,1	1,000	1,3	7.37	12.30	17.23
30/01/2011	20h 55m 09.76s	-18° 29' 39.3"	1.3919696	2,3762680	19,76	1,7	3,9	1,1	1,000	1,2	7.35	12.29	17.23
31/01/2011	20h 58m 21.11s	-18° 16' 37.8"	1.3914368	2,3760080	19,76	1,5	3,9	1,1	1,000	1,1	7.33	12.28	17.23
01/02/2011	21h 01m 32.05s	-18° 03' 24.5"	1.3909172	2,3757376	19,76	1,3	3,9	1,1	1,000	0,9	7.32	12.27	17.23
02/02/2011	21h 04m 42.58s	-17° 49' 59.5"	1.3904106	2,3754570	19,76	1,2	3,9	1,1	1,000	0,8	7.30	12.26	17.23
03/02/2011	21h 07m 52.69s	-17° 36' 23.1"	1.3899173	2,3751661	19,75	1,1	3,9	1,1	1,000	0,8	7.28	12.26	17.23
04/02/2011	21h 11m 02.37s	-17° 22' 35.5"	1.3894372	2,3748652	19,75	1,0	3,9	1,1	1,000	0,7	7.27	12.25	17.24
05/02/2011	21h 14m 11.64s	-17° 08' 36.7"	1.3889704	2,3745545	19,75	1,0	3,9	1,1	1,000	0,7	7.25	12.24	17.24
06/02/2011	21h 17m 20.47s	-16° 54' 27.1"	1.3885171	2,3742342	19,75	1,1	3,9	1,1	1,000	0,8	7.23	12.23	17.24
07/02/2011	21h 20m 28.88s	-16° 40' 06.7"	1.3880772	2,3739047	19,74	1,2	3,9	1,1	1,000	0,8	7.21	12.23	17.24
08/02/2011	21h 23m 36.86s	-16° 25' 35.9"	1.3876509	2,3735662	19,74	1,3	3,9	1,1	1,000	0,9	7.20	12.22	17.24
09/02/2011	21h 26m 44.41s	-16° 10' 54.8"	1.3872381	2,3732191	19,74	1,4	3,9	1,1	1,000	1,0	7.18	12.21	17.24
10/02/2011	21h 29m 51.53s	-15° 56' 03.6"	1.3868390	2,3728637	19,73	1,6	3,9	1,1	1,000	1,1	7.16	12.20	17.25
11/02/2011	21h 32m 58.23s	-15° 41' 02.5"	1.3864536	2,3725004	19,73	1,8	4,0	1,1	1,000	1,3	7.14	12.19	17.25
12/02/2011	21h 36m 04.50s	-15° 25' 51.8"	1.3860819	2,3721296	19,73	2,0	4,0	1,1	1,000	1,4	7.12	12.18	17.25
13/02/2011	21h 39m 10.34s	-15° 10' 31.6"	1.3857240	2,3717517	19,73	2,2	4,0	1,1	1,000	1,5	7.11	12.18	17.25
14/02/2011	21h 42m 15.75s	-14° 55' 02.1"	1.3853200	2,3713672	19,72	2,4	4,0	1,1	1,000	1,7	7.09	12.17	17.25
15/02/2011	21h 45m 20.74s	-14° 39' 23.5"	1.3850500	2,3709764	19,72	2,6	4,0	1,1	1,000	1,8	7.07	12.16	17.25
16/02/2011	21h 48m 25.30s	-14° 23' 36.1"	1.3847338	2,3705798	19,72	2,8	4,0	1,1	1,000	2,0	7.05	12.15	17.25
17/02/2011	21h 51m 29.44s	-14° 07' 40.1"	1.3844317	2,3701777	19,71	3,0	4,0	1,1	1,000	2,1	7.03	12.14	17.26
18/02/2011	21h 54m 33.16s	-13° 51' 35.5"	1.3841436	2,3697704	19,71	3,2	4,0	1,1	1,000	2,3	7.01	12.13	17.26
19/02/2011	21h 57m 36.47s	-13° 35' 22.7"	1.3838696	2,3693582	19,71	3,4	4,0	1,1	1,000	2,4	6.59	12.12	17.26
20/02/2011	22h 00m 39.36s	-13° 19' 01.8"	1.3836097	2,3689411	19,70	3,6	4,0	1,1	1,000	2,6	6.57	12.11	17.26
21/02/2011	22h 03m 41.86s	-13° 02' 32.9"	1.3833640	2,3685190	19,70	3,8	4,0	1,1	0,999	2,7	6.55	12.10	17.26
22/02/2011	22h 06m 43.96s	-12° 45' 56.3"	1.3831324	2,3680918	19,69	4,0	4,0	1,1	0,999	2,8	6.53	12.10	17.26
23/02/2011	22h 09m 45.67s	-12° 29' 12.2"	1.3829151	2,3676592	19,69	4,2	4,0	1,1	0,999	3,0	6.51	12.09	17.27
24/02/2011	22h 12m 47.01s	-12° 12' 20.7"	1.3827120	2,3672210	19,69	4,4	4,0	1,1	0,999	3,1	6.49	12.08	17.27
25/02/2011	22h 15m 47.97s	-11° 55' 22.1"	1.3825233	2,3667768	19,68	4,6	4,0	1,1	0,999	3,3	6.47	12.07	17.27
26/02/2011	22h 18m 48.55s	-11° 38' 16.6"	1.3823489	2,3663265	19,68	4,8	4,0	1,1	0,999	3,4	6.45	12.06	17.27
27/02/2011	22h 21m 48.76s	-11° 21' 04.5"	1.3821888	2,3658697	19,68	5,0	4,0	1,1	0,999	3,6	6.43	12.05	17.27
28/02/2011	22h 24m 48.60s	-11° 03' 45.9"	1.3820430	2,3654062	19,67	5,2	4,0	1,1	0,999	3,7	6.41	12.04	17.27
01/03/2011	22h 27m 48.08s	-10° 46' 21.1"	1.3819117	2,3649359	19,67	5,4	4,0	1,1	0,999	3,9	6.39	12.03	17.27
02/03/2011	22h 30m 47.20s	-10° 28' 50.2"	1.3817947	2,3644587	19,66	5,6	4,0	1,1	0,999	4,0	6.37	12.02	17.28
03/03/2011	22h 33m 45.96s	-10° 11' 13.5"	1.3816922	2,3639744	19,66	5,9	4,0	1,1	0,999	4,2	6.35	12.01	17.28
04/03/2011	22h 36m 44.36s	-09° 53' 31.3"	1.3816041	2,3634830	19,66	6,1	4,0	1,1	0,999	4,3	6.33	12.00	17.28
05/03/2011	22h 39m 42.42s	-09° 35' 43.7"	1.3815305	2,3629846	19,65	6,3	4,0	1,1	0,998	4,5	6.31	11.59	17.28
06/03/2011	22h 42m 40.13s	-09° 17' 50.9"	1.3814713	2,3624791	19,65	6,5	4,0	1,1	0,998	4,7	6.29	11.58	17.28
07/03/2011	22h 45m 37.51s	-08° 59' 53.2"	1.3814266	2,3619666	19,64	6,7	4,0	1,1	0,998	4,8	6.27	11.57	17.28
08/03/2011	22h 48m 34.56s	-08° 41' 50.7"	1.3813964	2,3614472	19,64	6,9	4,0	1,1	0,998	5,0	6.25	11.56	17.28
09/03/2011	22h 51m 31.28s	-08° 23' 43.7"	1.3813806	2,3609211	19,64	7,1	4,0	1,1	0,998	5,1	6.23	11.55	17.28
10/03/2011	22h 54m 27.68s	-08° 05' 32.4"	1.3813794	2,3603884	19,63	7,3	4,0	1,1	0,998	5,3	6.20	11.54	17.29
11/03/2011	22h 57m 23.78s	-07° 47' 16.9"	1.3813926	2,3598493	19,63	7,5	4,0	1,1	0,998	5,4	6.18	11.53	17.29
12/03/2011	23h 00m 19.56s	-07° 28' 57.6"	1.3814203	2,3593040	19,62	7,7	4,0	1,1	0,998	5,6	6.16	11.52	17.29
13/03/2011	23h 03m 15.05s	-07° 10' 34.5"	1.3814625	2,3587527	19,62	8,0	4,0	1,1	0,998	5,7	6.14	11.51	17.29
14/03/2011	23h 06m 10.24s	-06° 52' 08.0"	1.3815191	2,3581957	19,61	8,2	4,0	1,1	0,997	5,9	6.12	11.50	17.29
15/03/2011	23h 09m 05.14s	-06° 33' 38.2"	1.3815903	2,3576333	19,61	8,4	4,0	1,1	0,997	6,0			

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
09/04/2011	00h 20m 49.40s	+01° 17' 08.2"	1.3880049	2,3415783	19,47	13.5	4.0	1,2	0,993	9,7	5.15	11.22	17.30
10/04/2011	00h 23m 39.76s	+01° 35' 55.2"	1.3884427	2,3408279	19,47	13.7	4.0	1,2	0,993	9,9	5.12	11.21	17.30
11/04/2011	00h 26m 30.05s	+01° 54' 40.3"	1.3888940	2,3400682	19,46	14.0	4.0	1,2	0,992	10,0	5.10	11.20	17.30
12/04/2011	00h 29m 20.27s	+02° 13' 23.3"	1.3893587	2,3392993	19,46	14.2	4.0	1,2	0,992	10,2	5.08	11.19	17.30
13/04/2011	00h 32m 10.42s	+02° 32' 04.0"	1.3898368	2,3385214	19,45	14.4	4.0	1,2	0,992	10,3	5.06	11.18	17.30
14/04/2011	00h 35m 00.52s	+02° 50' 42.1"	1.3903282	2,3377345	19,44	14.6	4.0	1,2	0,992	10,5	5.04	11.17	17.30
15/04/2011	00h 37m 50.57s	+03° 09' 17.6"	1.3908329	2,3369388	19,44	14.8	4.0	1,2	0,991	10,6	5.01	11.16	17.30
16/04/2011	00h 40m 40.58s	+03° 27' 50.2"	1.3913507	2,3361344	19,43	15.0	4.0	1,2	0,991	10,7	4.99	11.15	17.31
17/04/2011	00h 43m 30.57s	+03° 46' 19.8"	1.3918816	2,3353212	19,42	15.2	4.0	1,2	0,991	10,9	4.97	11.13	17.31
18/04/2011	00h 46m 20.54s	+04° 04' 46.3"	1.3924255	2,3344990	19,42	15.4	4.0	1,2	0,991	11,0	4.95	11.12	17.31
19/04/2011	00h 49m 10.51s	+04° 23' 09.5"	1.3929824	2,3336675	19,41	15.6	4.0	1,2	0,991	11,2	4.92	11.11	17.31
20/04/2011	00h 52m 00.49s	+04° 41' 29.3"	1.3935521	2,3328264	19,40	15.8	4.0	1,2	0,990	11,3	4.90	11.10	17.31
21/04/2011	00h 54m 50.48s	+04° 59' 45.4"	1.3941346	2,3319752	19,39	16.0	4.0	1,2	0,990	11,5	4.88	11.09	17.30
22/04/2011	00h 57m 40.49s	+05° 17' 57.8"	1.3947298	2,3311133	19,39	16.2	4.0	1,2	0,990	11,6	4.86	11.08	17.30
23/04/2011	01h 00m 30.53s	+05° 36' 06.1"	1.3953377	2,3302401	19,38	16.4	4.0	1,2	0,990	11,8	4.84	11.07	17.30
24/04/2011	01h 03m 20.61s	+05° 54' 10.4"	1.3959581	2,3293550	19,37	16.6	4.0	1,2	0,989	11,9	4.81	11.06	17.30
25/04/2011	01h 06m 10.72s	+06° 12' 10.2"	1.3965909	2,3284575	19,36	16.8	4.0	1,2	0,989	12,0	4.79	11.05	17.30
26/04/2011	01h 09m 00.88s	+06° 30' 05.6"	1.3972362	2,3275471	19,36	17.1	4.0	1,2	0,989	12,2	4.77	11.03	17.30
27/04/2011	01h 11m 51.09s	+06° 47' 56.3"	1.3978937	2,3266233	19,35	17.3	4.0	1,2	0,988	12,3	4.75	11.02	17.30
28/04/2011	01h 14m 41.35s	+07° 05' 42.1"	1.3985654	2,3256855	19,34	17.5	4.0	1,2	0,988	12,5	4.73	11.01	17.30
29/04/2011	01h 17m 31.68s	+07° 23' 22.9"	1.3992453	2,3247333	19,33	17.7	4.0	1,2	0,988	12,6	4.70	11.00	17.30
30/04/2011	01h 20m 22.08s	+07° 40' 58.5"	1.3999391	2,3237665	19,33	17.9	4.0	1,2	0,988	12,8	4.68	10.59	17.30
01/05/2011	01h 23m 12.55s	+07° 58' 28.7"	1.4006449	2,3227844	19,32	18.1	4.0	1,2	0,987	12,9	4.66	10.58	17.30
02/05/2011	01h 26m 03.11s	+08° 15' 53.5"	1.4013625	2,3217870	19,31	18.3	4.0	1,3	0,987	13,1	4.64	10.57	17.30
03/05/2011	01h 28m 53.75s	+08° 33' 12.5"	1.4020919	2,3207737	19,30	18.5	4.0	1,3	0,987	13,2	4.62	10.56	17.30
04/05/2011	01h 31m 44.48s	+08° 50' 25.7"	1.4028329	2,3197445	19,29	18.7	4.0	1,3	0,987	13,3	4.60	10.55	17.30
05/05/2011	01h 34m 35.30s	+09° 07' 32.8"	1.4035855	2,3186990	19,28	18.9	4.0	1,3	0,986	13,5	4.58	10.54	17.30
06/05/2011	01h 37m 26.22s	+09° 24' 33.8"	1.4043495	2,3176371	19,27	19.1	4.0	1,3	0,986	13,6	4.56	10.52	17.30
07/05/2011	01h 40m 17.24s	+09° 41' 28.5"	1.4051248	2,3165587	19,27	19.4	4.0	1,3	0,986	13,8	4.54	10.51	17.30
08/05/2011	01h 43m 08.37s	+09° 58' 16.6"	1.4059114	2,3154637	19,26	19.6	4.0	1,3	0,985	13,9	4.51	10.50	17.30
09/05/2011	01h 45m 59.60s	+10° 14' 58.1"	1.4067091	2,3143520	19,25	19.8	4.0	1,3	0,985	14,1	4.49	10.49	17.30
10/05/2011	01h 48m 50.93s	+10° 31' 32.8"	1.4075179	2,3132238	19,24	20.0	4.1	1,3	0,985	14,2	4.47	10.48	17.30
11/05/2011	01h 51m 42.38s	+10° 48' 00.5"	1.4083376	2,3120789	19,23	20.2	4.1	1,3	0,984	14,3	4.45	10.47	17.30
12/05/2011	01h 54m 33.94s	+11° 04' 21.1"	1.4091681	2,3109175	19,22	20.4	4.1	1,3	0,984	14,5	4.43	10.46	17.30
13/05/2011	01h 57m 25.63s	+11° 20' 34.4"	1.4100094	2,3097395	19,21	20.6	4.1	1,3	0,984	14,6	4.40	10.45	17.30
14/05/2011	02h 00m 17.45s	+11° 36' 40.3"	1.4108612	2,3085449	19,20	20.9	4.1	1,3	0,983	14,8	4.38	10.44	17.30
15/05/2011	02h 03m 09.40s	+11° 52' 38.7"	1.4117236	2,3073336	19,19	21.1	4.1	1,3	0,983	14,9	4.36	10.43	17.30
16/05/2011	02h 06m 01.49s	+12° 08' 29.4"	1.4125964	2,3061056	19,18	21.3	4.1	1,3	0,983	15,1	4.34	10.42	17.30
17/05/2011	02h 08m 53.74s	+12° 24' 12.4"	1.4134794	2,3048604	19,17	21.5	4.1	1,3	0,983	15,2	4.32	10.41	17.30
18/05/2011	02h 11m 46.14s	+12° 39' 47.4"	1.4143726	2,3035978	19,16	21.7	4.1	1,3	0,982	15,3	4.30	10.40	17.30
19/05/2011	02h 14m 38.70s	+12° 55' 14.5"	1.4152759	2,3023171	19,15	21.9	4.1	1,3	0,982	15,5	4.28	10.38	17.29
20/05/2011	02h 17m 31.43s	+13° 10' 33.4"	1.4161891	2,3010178	19,14	22.1	4.1	1,3	0,982	15,6	4.26	10.37	17.29
21/05/2011	02h 20m 24.32s	+13° 25' 43.9"	1.4171122	2,2996994	19,13	22.4	4.1	1,3	0,981	15,8	4.24	10.36	17.29
22/05/2011	02h 23m 17.37s	+13° 40' 46.0"	1.4180449	2,2983610	19,11	22.6	4.1	1,3	0,981	15,9	4.22	10.35	17.29
23/05/2011	02h 26m 10.59s	+13° 55' 39.5"	1.4189873	2,2970022	19,10	22.8	4.1	1,3	0,981	16,0	4.20	10.34	17.29
24/05/2011	02h 29m 03.98s	+14° 10' 24.2"	1.4199391	2,2956222	19,09	23.0	4.1	1,3	0,980	16,2	4.18	10.33	17.29
25/05/2011	02h 31m 57.55s	+14° 25' 00.1"	1.4209004	2,2942205	19,08	23.2	4.1	1,3	0,980	16,3	4.16	10.32	17.29
26/05/2011	02h 34m 51.28s	+14° 39' 26.9"	1.4218708	2,2927964	19,07	23.4	4.1	1,3	0,979	16,5	4.14	10.31	17.29
27/05/2011	02h 37m 45.20s	+14° 53' 44.6"	1.4228504	2,2913494	19,06	23.7	4.1	1,3	0,979	16,6	4.12	10.30	17.29
28/05/2011	02h 40m 39.29s	+15° 07' 53.0"	1.4238390	2,2898791	19,04	23.9	4.1	1,3	0,979	16,8	4.10	10.29	17.29
29/05/2011	02h 43m 33.56s	+15° 21' 52.0"	1.4248365	2,2883848	19,03	24.1	4.1	1,3	0,978	16,9	4.08	10.28	17.29
30/05/2011	02h 46m 28.00s	+15° 35' 41.4"	1.4258427	2,2868662	19,02	24.3	4.1	1,3	0,978	17,0	4.06	10.27	17.28
31/05/2011	02h 49m 22.63s	+15° 49' 21.3"	1.4268576	2,2853229	19,01	24.6	4.1	1,3	0,978	17,2	4.04	10.26	17.28
01/06/2011	02h 52m 17.42s	+16° 02' 51.3"	1.4278811	2,2837543	18,99	24.8	4.1	1,3	0,977	17,3	4.02	10.25	17.28
02/06/2011	02h 55m 12.40s	+16° 16' 11.5"	1.4289129	2,2821603	18,98	25.0	4.1	1,3	0,977	17,5	4.00	10.24	17.28
03/06/2011	02h 58m 07.54s	+16° 29' 21.7"	1.4299530	2,2805405	18,97	25.2	4.1	1,3	0,977	17,6	3.98	10.23	17.28
04/06/2011	03h 01m 02.84s	+16° 42' 21.7"	1.4310013	2,2788947	18,95	25.5	4.1	1,3	0,976	17,7	3.96	10.22	17.28
05/06/2011	03h 03m 58.31s	+16° 55' 11.5"	1.4320576	2,2772227	18,94	25.7	4.1	1,3	0,976	17,9	3.94	10.21	17.28
06/06/2011	03h 06m 53.94s	+17° 07' 51.0"	1.4331218	2,2755245	18,92	25.9	4.1	1,3	0,975	18,0	3.92	10.20	17.28
07/06/2011	03h 09m 49.73s	+17° 20' 19.9"	1.4341937	2,2738000	18,91	26.1	4.1	1,3	0,975	18,2	3.90	10.19	17.27
08/06/2011	03h 12m 45.67s	+17° 32' 38.3"	1.4352734	2,2720492	18,90	26.4	4.1	1,3	0,975	18,3	3.88	10.18	17.27
09/06/2011	03h 15m 41.76s	+17° 44' 45.9"	1.4363606	2,2702721	18,88	26.6	4.1	1,3	0,974	18,4	3.86	10.17	17.27
10/06/2011	03h 18m 38.00s	+17° 56' 42.8"	1.4374551	2,2684687	18,87	26.8	4.1	1,3	0,974	18,6	3.84	10.16	17.27
11/06/2011	03h 21m 34.40s	+18° 08' 28.8"	1.4385570	2,2666389	18,85	27.1	4.1	1,3	0,974	18,7	3.82	10.15	17.27
12/06/2011	03h 24m 30.95s	+18° 20' 03.8"	1.4396660	2,2647827	18,83	27.3	4.1	1,3	0,973	18,9	3.80	10.14	17.26
13/06/2011	03h 27m 27.66s	+18° 31' 27.8"	1.4407821	2,2628999	18,82	27.5	4.1	1,4	0,973	19,0	3.78	10.13	17.26
14/06/2011	03h 30m 24.52s	+18° 42' 40.6"	1.4419050	2,2609902	18,80	27.7	4.1	1,4	0,972	19,1	3.76	10.12	17.26
15/06/2011	03h 33m 21.53s	+18° 53' 42.3"	1.4430347	2,2590534	18,79	28.0	4.1	1,4	0,972	19,3	3.74	10.11	17.26
16/06/2011	03h 36m 18.69s	+19° 04' 32.7"	1.4441711	2,2570889	18,77	28.2	4.2	1,4	0,972	19,4	3.72	10.10	17.26
17/06/2011	03h 39m 15.99s	+19° 15' 11.7"	1.4453140	2,2550962	18,75	28.4	4.2	1,4	0,971	19,6	3.70	10.09	17.25
18/06/2011	03h 42m 13.44s	+19° 25' 39.2"	1.4464632	2,2530748	18,74	28.7	4.2	1,4	0,971	19,7	3.68	10.08	17.25
19/06/2011	03h 45m 11.03s	+19° 35' 55.2"	1.4476188	2,2510240	18,72	28.9	4.2	1,4	0,970	19,8	3.66	10.07	17.25
20/06/2011	03h 48m 08.75s	+19° 45' 59.6"	1.4487804	2,2489431	18,70	29.2	4.2	1,4	0,970	20,0	3.64	10.06	17.25
21/06/2011	03h 51m 06.59s	+19° 55											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
22/07/2011	05h 23m 25.69s	+23° 20' 19.1"	1.4884301	2.1639568	18,00	37,3	4,3	1,4	0,955	24,4	2,01	9,35	17,09
23/07/2011	05h 26m 23.77s	+23° 23' 33.0"	1.4897229	2.1606741	17,97	37,5	4,3	1,4	0,955	24,6	1,59	9,34	17,09
24/07/2011	05h 29m 21.73s	+23° 26' 34.2"	1.4910176	2.1573486	17,94	37,8	4,3	1,4	0,954	24,7	1,58	9,33	17,08
25/07/2011	05h 32m 19.55s	+23° 29' 22.8"	1.4923140	2.1539800	17,91	38,1	4,4	1,4	0,954	24,8	1,57	9,32	17,07
26/07/2011	05h 35m 17.21s	+23° 31' 58.8"	1.4936120	2.1505678	17,88	38,4	4,4	1,4	0,953	25,0	1,56	9,31	17,06
27/07/2011	05h 38m 14.71s	+23° 34' 22.2"	1.4949116	2.1471115	17,86	38,6	4,4	1,4	0,953	25,1	1,55	9,30	17,06
28/07/2011	05h 41m 12.03s	+23° 36' 33.2"	1.4962124	2.1436107	17,83	38,9	4,4	1,4	0,952	25,2	1,53	9,29	17,05
29/07/2011	05h 44m 09.16s	+23° 38' 31.6"	1.4975146	2.1400651	17,80	39,2	4,4	1,4	0,952	25,4	1,52	9,28	17,04
30/07/2011	05h 47m 06.08s	+23° 40' 17.7"	1.4988179	2.1364744	17,77	39,5	4,4	1,4	0,951	25,5	1,51	9,27	17,03
31/07/2011	05h 50m 02.79s	+23° 41' 51.4"	1.5001222	2.1328385	17,74	39,8	4,4	1,4	0,951	25,6	1,50	9,26	17,02
01/08/2011	05h 52m 59.26s	+23° 43' 12.7"	1.5014274	2.1291573	17,71	40,0	4,4	1,4	0,950	25,8	1,49	9,25	17,01
02/08/2011	05h 55m 55.48s	+23° 44' 21.7"	1.5027334	2.1254307	17,68	40,3	4,4	1,4	0,950	25,9	1,48	9,24	17,00
03/08/2011	05h 58m 51.45s	+23° 45' 18.4"	1.5040400	2.1216590	17,64	40,6	4,4	1,4	0,949	26,1	1,47	9,23	16,59
04/08/2011	06h 01m 47.16s	+23° 46' 03.0"	1.5053473	2.1178421	17,61	40,9	4,4	1,4	0,949	26,2	1,46	9,22	16,58
05/08/2011	06h 04m 42.60s	+23° 46' 35.4"	1.5066549	2.1139803	17,58	41,2	4,4	1,4	0,948	26,3	1,45	9,21	16,57
06/08/2011	06h 07m 37.75s	+23° 46' 55.7"	1.5079629	2.1100736	17,55	41,5	4,4	1,4	0,948	26,5	1,44	9,20	16,56
07/08/2011	06h 10m 32.62s	+23° 47' 04.0"	1.5092711	2.1061222	17,52	41,8	4,4	1,4	0,947	26,6	1,43	9,19	16,55
08/08/2011	06h 13m 27.20s	+23° 47' 00.4"	1.5105794	2.1021260	17,48	42,1	4,5	1,4	0,947	26,7	1,42	9,18	16,54
09/08/2011	06h 16m 21.47s	+23° 46' 44.9"	1.5118876	2.0980850	17,45	42,4	4,5	1,4	0,946	26,9	1,41	9,17	16,53
10/08/2011	06h 19m 15.42s	+23° 46' 17.7"	1.5131958	2.0939991	17,41	42,6	4,5	1,4	0,946	27,0	1,40	9,16	16,52
11/08/2011	06h 22m 09.05s	+23° 45' 38.7"	1.5145037	2.0898681	17,38	42,9	4,5	1,4	0,945	27,1	1,39	9,15	16,51
12/08/2011	06h 25m 02.36s	+23° 44' 48.1"	1.5158112	2.0856916	17,35	43,2	4,5	1,4	0,944	27,3	1,38	9,14	16,50
13/08/2011	06h 27m 55.32s	+23° 43' 45.9"	1.5171183	2.0814693	17,31	43,5	4,5	1,4	0,944	27,4	1,37	9,13	16,49
14/08/2011	06h 30m 47.94s	+23° 42' 32.2"	1.5184248	2.0772009	17,27	43,8	4,5	1,4	0,943	27,5	1,36	9,12	16,48
15/08/2011	06h 33m 40.20s	+23° 41' 07.0"	1.5197306	2.0728859	17,24	44,1	4,5	1,4	0,943	27,7	1,35	9,11	16,46
16/08/2011	06h 36m 32.10s	+23° 39' 30.5"	1.5210357	2.0685238	17,20	44,5	4,5	1,4	0,942	27,8	1,34	9,09	16,45
17/08/2011	06h 39m 23.63s	+23° 37' 42.8"	1.5223398	2.0641143	17,17	44,8	4,5	1,4	0,942	27,9	1,33	9,08	16,44
18/08/2011	06h 42m 14.79s	+23° 35' 43.8"	1.5236430	2.0596569	17,13	45,1	4,5	1,4	0,941	28,1	1,32	9,07	16,43
19/08/2011	06h 45m 05.57s	+23° 33' 33.8"	1.5249450	2.0551510	17,09	45,4	4,6	1,4	0,941	28,2	1,31	9,06	16,41
20/08/2011	06h 47m 55.95s	+23° 31' 12.7"	1.5262458	2.0505963	17,05	45,7	4,6	1,4	0,940	28,3	1,30	9,05	16,40
21/08/2011	06h 50m 45.93s	+23° 28' 40.8"	1.5275453	2.0459924	17,02	46,0	4,6	1,4	0,940	28,5	1,29	9,04	16,39
22/08/2011	06h 53m 35.51s	+23° 25' 58.1"	1.5288434	2.0413388	16,98	46,3	4,6	1,4	0,939	28,6	1,28	9,03	16,37
23/08/2011	06h 56m 24.67s	+23° 23' 04.7"	1.5301399	2.0366351	16,94	46,6	4,6	1,4	0,939	28,7	1,27	9,02	16,36
24/08/2011	06h 59m 13.40s	+23° 20' 00.8"	1.5314348	2.0318810	16,90	46,9	4,6	1,4	0,938	28,8	1,26	9,01	16,35
25/08/2011	07h 02m 01.69s	+23° 16' 46.4"	1.5327280	2.0270762	16,86	47,3	4,6	1,4	0,937	29,0	1,25	8,59	16,33
26/08/2011	07h 04m 49.53s	+23° 13' 21.7"	1.5340193	2.0222203	16,82	47,6	4,6	1,4	0,937	29,1	1,25	8,58	16,32
27/08/2011	07h 07m 36.91s	+23° 09' 46.8"	1.5353087	2.0173133	16,78	47,9	4,6	1,4	0,936	29,2	1,24	8,57	16,30
28/08/2011	07h 10m 23.82s	+23° 06' 01.7"	1.5365960	2.0123549	16,74	48,2	4,7	1,4	0,936	29,4	1,23	8,56	16,29
29/08/2011	07h 13m 10.24s	+23° 02' 06.7"	1.5378812	2.0073453	16,69	48,5	4,7	1,4	0,935	29,5	1,22	8,55	16,28
30/08/2011	07h 15m 56.17s	+22° 58' 01.9"	1.5391642	2.0022844	16,65	48,9	4,7	1,4	0,935	29,6	1,21	8,54	16,26
31/08/2011	07h 18m 41.60s	+22° 53' 47.3"	1.5404448	1.9971725	16,61	49,2	4,7	1,4	0,934	29,7	1,20	8,52	16,24
01/09/2011	07h 21m 26.52s	+22° 49' 23.0"	1.5417230	1.9920099	16,57	49,5	4,7	1,4	0,934	29,9	1,19	8,51	16,23
02/09/2011	07h 24m 10.94s	+22° 44' 49.2"	1.5429986	1.9867968	16,52	49,9	4,7	1,4	0,933	30,0	1,19	8,50	16,21
03/09/2011	07h 26m 54.83s	+22° 40' 06.1"	1.5442716	1.9815336	16,48	50,2	4,7	1,4	0,932	30,1	1,18	8,49	16,20
04/09/2011	07h 29m 38.21s	+22° 35' 13.7"	1.5455419	1.9762206	16,43	50,5	4,7	1,4	0,932	30,3	1,17	8,48	16,18
05/09/2011	07h 32m 21.06s	+22° 30' 12.2"	1.5468094	1.9708579	16,39	50,9	4,8	1,4	0,931	30,4	1,16	8,46	16,17
06/09/2011	07h 35m 03.38s	+22° 25' 01.7"	1.5480739	1.9654457	16,35	51,2	4,8	1,4	0,931	30,5	1,15	8,45	16,15
07/09/2011	07h 37m 45.15s	+22° 19' 42.3"	1.5493354	1.9599840	16,30	51,5	4,8	1,4	0,930	30,6	1,14	8,44	16,13
08/09/2011	07h 40m 26.39s	+22° 14' 14.2"	1.5505938	1.9544728	16,25	51,9	4,8	1,4	0,930	30,8	1,14	8,43	16,12
09/09/2011	07h 43m 07.08s	+22° 08' 37.5"	1.5518491	1.9489120	16,21	52,2	4,8	1,4	0,929	30,9	1,13	8,41	16,10
10/09/2011	07h 45m 47.21s	+22° 02' 52.2"	1.5531010	1.9433015	16,16	52,6	4,8	1,4	0,929	31,0	1,12	8,40	16,08
11/09/2011	07h 48m 26.80s	+21° 56' 58.5"	1.5543495	1.9376411	16,11	52,9	4,8	1,4	0,928	31,1	1,11	8,39	16,06
12/09/2011	07h 51m 05.82s	+21° 50' 56.6"	1.5555946	1.9319307	16,07	53,3	4,8	1,4	0,927	31,2	1,10	8,38	16,05
13/09/2011	07h 53m 44.29s	+21° 44' 46.6"	1.5568361	1.9261699	16,02	53,6	4,9	1,4	0,927	31,4	1,09	8,36	16,03
14/09/2011	07h 56m 22.20s	+21° 38' 28.5"	1.5580740	1.9203585	15,97	54,0	4,9	1,4	0,926	31,5	1,08	8,35	16,01
15/09/2011	07h 58m 59.54s	+21° 32' 02.5"	1.5593081	1.9144962	15,92	54,3	4,9	1,4	0,926	31,6	1,08	8,34	15,59
16/09/2011	08h 01m 36.31s	+21° 25' 28.9"	1.5605384	1.9085829	15,87	54,7	4,9	1,4	0,925	31,7	1,07	8,32	15,57
17/09/2011	08h 04m 12.50s	+21° 18' 47.6"	1.5617648	1.9026182	15,82	55,0	4,9	1,4	0,925	31,8	1,06	8,31	15,56
18/09/2011	08h 06m 48.13s	+21° 11' 58.8"	1.5629872	1.8966018	15,77	55,4	4,9	1,4	0,924	32,0	1,05	8,30	15,54
19/09/2011	08h 09m 23.17s	+21° 05' 02.8"	1.5642055	1.8905336	15,72	55,8	5,0	1,3	0,924	32,1	1,04	8,28	15,52
20/09/2011	08h 11m 57.62s	+20° 57' 59.6"	1.5654196	1.8844132	15,67	56,1	5,0	1,3	0,923	32,2	1,03	8,27	15,50
21/09/2011	08h 14m 31.48s	+20° 50' 49.4"	1.5666295	1.8782406	15,62	56,5	5,0	1,3	0,923	32,3	1,03	8,25	15,48
22/09/2011	08h 17m 04.74s	+20° 43' 32.4"	1.5678350	1.8720155	15,57	56,9	5,0	1,3	0,922	32,4	1,02	8,24	15,46
23/09/2011	08h 19m 37.39s	+20° 36' 08.7"	1.5690362	1.8657379	15,52	57,2	5,0	1,3	0,921	32,5	1,01	8,23	15,44
24/09/2011	08h 22m 09.43s	+20° 28' 38.5"	1.5702328	1.8594076	15,46	57,6	5,0	1,3	0,921	32,7	1,00	8,21	15,42
25/09/2011	08h 24m 40.84s	+20° 21' 01.9"	1.5714248	1.8530248	15,41	58,0	5,1	1,3	0,920	32,8	0,99	8,20	15,40
26/09/2011	08h 27m 11.63s	+20° 13' 19.1"	1.5726122	1.8465895	15,36	58,4	5,1	1,3	0,920	32,9	0,98	8,18	15,38
27/09/2011	08h 29m 41.78s	+20° 05' 30.3"	1.5737948	1.8401020	15,30	58,7	5,1	1,3	0,919	33,0	0,97	8,17	15,36
28/09/2011	08h 32m 11.29s	+19° 57' 35.5"	1.5749726	1.8335627	15,25	59,1	5,1	1,3	0,919	33,1	0,97	8,16	15,34
29/09/2011	08h 34m 40.17s	+19° 49' 34.9"	1.5761455	1.8269720	15,19	59,5	5,1	1,3	0,918	33,2	0,96	8,14	15,32
30/09/2011	08h 37m 08.39s	+19° 41' 28.8"	1.5773135	1.8203306	15,14	59,9	5,1	1,3	0,918	33,3	0,95	8,13	15,30
01/10/2011	08h 39m 35.98s	+19° 33' 17.2"	1.5784763	1.8136389	15,08	60,3	5,2	1,3	0,917	33,4	0,94	8,11	15,28
02/10/2011	08h 42m 02.91s	+19° 25' 00.3"	1.5796341	1.8068975	15,03	60,7	5,2	1,3	0,917	33,5	0,93	8,10	15,26
03/10/2011	08h 44m 29.19s	+19° 16' 38.2"	1.5807866	1.8001068	14,97	61,1	5,2	1,3					



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
03/11/2011	09h 54m 27.07s	+14° 28' 26.6"	1.6135497	1,5661279	13,02	74,4	6,0	1,1	0,903	36,3	0,20	7,16	14,12
04/11/2011	09h 56m 30.90s	+14° 18' 41.7"	1.6144996	1,5578750	12,96	74,9	6,0	1,1	0,903	36,4	0,18	7,14	14,09
05/11/2011	09h 58m 33.95s	+14° 08' 57.0"	1.6154421	1,5495844	12,89	75,4	6,0	1,1	0,902	36,4	0,17	7,12	14,07
06/11/2011	10h 00m 36.23s	+13° 59' 12.5"	1.6163773	1,5412565	12,82	75,9	6,1	1	0,902	36,5	0,16	7,10	14,04
07/11/2011	10h 02m 37.73s	+13° 49' 28.4"	1.6173051	1,5328919	12,75	76,4	6,1	1	0,902	36,6	0,15	7,08	14,02
08/11/2011	10h 04m 38.44s	+13° 39' 44.9"	1.6182253	1,5244909	12,68	76,8	6,1	1	0,901	36,6	0,13	7,06	13,59
09/11/2011	10h 06m 38.37s	+13° 30' 02.1"	1.6191380	1,5160540	12,61	77,3	6,2	1	0,901	36,7	0,12	7,04	13,56
10/11/2011	10h 08m 37.50s	+13° 20' 20.2"	1.6200431	1,5075817	12,54	77,8	6,2	1	0,901	36,7	0,11	7,02	13,54
11/11/2011	10h 10m 35.83s	+13° 10' 39.3"	1.6209406	1,4990743	12,47	78,3	6,2	1	0,901	36,7	0,09	7,00	13,51
12/11/2011	10h 12m 33.36s	+13° 00' 59.7"	1.6218304	1,4905322	12,40	78,8	6,3	1	0,900	36,8	0,08	6,58	13,49
13/11/2011	10h 14m 30.07s	+12° 51' 21.4"	1.6227125	1,4819559	12,32	79,3	6,3	1	0,900	36,8	0,07	6,56	13,46
14/11/2011	10h 16m 25.97s	+12° 41' 44.8"	1.6235867	1,4733458	12,25	79,8	6,4	1	0,900	36,9	0,05	6,54	13,43
15/11/2011	10h 18m 21.03s	+12° 32' 10.0"	1.6244531	1,4647022	12,18	80,4	6,4	0,9	0,900	36,9	0,04	6,52	13,41
16/11/2011	10h 20m 15.25s	+12° 22' 37.1"	1.6253116	1,4560257	12,11	80,9	6,4	0,9	0,900	36,9	0,02	6,50	13,38
17/11/2011	10h 22m 08.62s	+12° 13' 06.5"	1.6261622	1,4473168	12,04	81,4	6,5	0,9	0,900	37,0	0,01	6,48	13,35
18/11/2011	10h 24m 01.12s	+12° 03' 38.2"	1.6270049	1,4385760	11,96	81,9	6,5	0,9	0,899	37,0	23,58	6,46	13,33
19/11/2011	10h 25m 52.74s	+11° 54' 12.5"	1.6278395	1,4298040	11,89	82,4	6,6	0,9	0,899	37,0	23,56	6,44	13,30
20/11/2011	10h 27m 43.47s	+11° 44' 49.6"	1.6286660	1,4210014	11,82	83,0	6,6	0,9	0,899	37,0	23,55	6,42	13,27
21/11/2011	10h 29m 33.30s	+11° 35' 29.6"	1.6294844	1,4121691	11,74	83,5	6,6	0,9	0,899	37,0	23,53	6,40	13,25
22/11/2011	10h 31m 22.21s	+11° 26' 12.9"	1.6302946	1,4033081	11,67	84,1	6,7	0,9	0,899	37,1	23,52	6,38	13,22
23/11/2011	10h 33m 10.19s	+11° 16' 59.5"	1.6310967	1,3944193	11,60	84,6	6,7	0,8	0,899	37,1	23,50	6,36	13,19
24/11/2011	10h 34m 57.22s	+11° 07' 49.7"	1.6318905	1,3855041	11,52	85,1	6,8	0,8	0,899	37,1	23,49	6,34	13,16
25/11/2011	10h 36m 43.30s	+10° 58' 43.6"	1.6326760	1,3765636	11,45	85,7	6,8	0,8	0,899	37,1	23,47	6,31	13,14
26/11/2011	10h 38m 28.40s	+10° 49' 41.6"	1.6334532	1,3675993	11,37	86,3	6,8	0,8	0,899	37,1	23,45	6,29	13,11
27/11/2011	10h 40m 12.51s	+10° 40' 43.7"	1.6342221	1,3586125	11,30	86,8	6,9	0,8	0,899	37,1	23,44	6,27	13,08
28/11/2011	10h 41m 55.62s	+10° 31' 50.2"	1.6349825	1,3496047	11,22	87,4	6,9	0,8	0,899	37,1	23,42	6,25	13,05
29/11/2011	10h 43m 37.72s	+10° 23' 01.3"	1.6357345	1,3405771	11,15	87,9	7,0	0,8	0,899	37,1	23,40	6,22	13,03
30/11/2011	10h 45m 18.78s	+10° 14' 17.1"	1.6364780	1,3315312	11,07	88,5	7,0	0,8	0,899	37,1	23,39	6,20	13,00
01/12/2011	10h 46m 58.79s	+10° 05' 37.9"	1.6372129	1,3224680	11,00	89,1	7,1	0,7	0,899	37,0	23,37	6,18	12,57
02/12/2011	10h 48m 37.75s	+09° 57' 03.7"	1.6379393	1,3133888	10,92	89,7	7,1	0,7	0,899	37,0	23,35	6,16	12,54
03/12/2011	10h 50m 15.65s	+09° 48' 34.9"	1.6386571	1,3042948	10,85	90,3	7,2	0,7	0,899	37,0	23,33	6,13	12,51
04/12/2011	10h 51m 52.46s	+09° 40' 11.4"	1.6393663	1,2951869	10,77	90,9	7,2	0,7	0,900	37,0	23,32	6,11	12,48
05/12/2011	10h 53m 28.18s	+09° 31' 53.6"	1.6400668	1,2860663	10,70	91,5	7,3	0,7	0,900	36,9	23,30	6,09	12,46
06/12/2011	10h 55m 02.78s	+09° 23' 41.7"	1.6407586	1,2769342	10,62	92,1	7,3	0,7	0,900	36,9	23,28	6,06	12,43
07/12/2011	10h 56m 36.26s	+09° 15' 35.8"	1.6414416	1,2677914	10,54	92,7	7,4	0,7	0,900	36,8	23,26	6,04	12,40
08/12/2011	10h 58m 08.61s	+09° 07' 36.1"	1.6421159	1,2586392	10,47	93,3	7,4	0,6	0,900	36,8	23,24	6,02	12,37
09/12/2011	10h 59m 39.79s	+08° 59' 42.9"	1.6427813	1,2494785	10,39	93,9	7,5	0,6	0,901	36,7	23,22	5,59	12,34
10/12/2011	11h 01m 09.79s	+08° 51' 56.3"	1.6434379	1,2403104	10,31	94,5	7,6	0,6	0,901	36,7	23,20	5,57	12,31
11/12/2011	11h 02m 38.60s	+08° 44' 16.6"	1.6440856	1,2311359	10,24	95,1	7,6	0,6	0,901	36,6	23,18	5,54	12,28
12/12/2011	11h 04m 06.18s	+08° 36' 44.0"	1.6447244	1,2219562	10,16	95,8	7,7	0,6	0,902	36,6	23,16	5,52	12,25
13/12/2011	11h 05m 32.52s	+08° 29' 18.8"	1.6453542	1,2127724	10,09	96,4	7,7	0,6	0,902	36,5	23,14	5,49	12,22
14/12/2011	11h 06m 57.60s	+08° 22' 01.1"	1.6459751	1,2035855	10,01	97,1	7,8	0,5	0,902	36,4	23,12	5,47	12,19
15/12/2011	11h 08m 21.37s	+08° 14' 51.3"	1.6465870	1,1943968	9,93	97,7	7,8	0,5	0,903	36,3	23,10	5,44	12,16
16/12/2011	11h 09m 43.83s	+08° 07' 49.6"	1.6471898	1,1852076	9,86	98,4	7,9	0,5	0,903	36,2	23,08	5,42	12,13
17/12/2011	11h 11m 04.93s	+08° 00' 56.3"	1.6477836	1,1760192	9,78	99,0	8,0	0,5	0,904	36,1	23,05	5,39	12,10
18/12/2011	11h 12m 24.66s	+07° 54' 11.5"	1.6483682	1,1668332	9,70	99,7	8,0	0,5	0,904	36,0	23,03	5,36	12,07
19/12/2011	11h 13m 42.98s	+07° 47' 35.6"	1.6489437	1,1576512	9,63	100,4	8,1	0,5	0,905	35,9	23,01	5,34	12,04
20/12/2011	11h 14m 59.86s	+07° 41' 08.9"	1.6495101	1,1484748	9,55	101,1	8,2	0,4	0,905	35,8	22,59	5,31	12,01
21/12/2011	11h 16m 15.28s	+07° 34' 51.5"	1.6500673	1,1393061	9,47	101,8	8,2	0,4	0,906	35,7	22,56	5,28	11,58
22/12/2011	11h 17m 29.19s	+07° 28' 43.7"	1.6506153	1,1301470	9,40	102,5	8,3	0,4	0,907	35,6	22,54	5,26	11,55
23/12/2011	11h 18m 41.57s	+07° 22' 45.8"	1.6511540	1,1209996	9,32	103,2	8,4	0,4	0,907	35,5	22,51	5,23	11,52
24/12/2011	11h 19m 52.38s	+07° 16' 58.1"	1.6516835	1,1118663	9,25	103,9	8,4	0,4	0,908	35,3	22,49	5,20	11,49
25/12/2011	11h 21m 01.59s	+07° 11' 20.7"	1.6522037	1,1027493	9,17	104,6	8,5	0,3	0,909	35,2	22,47	5,17	11,46
26/12/2011	11h 22m 09.17s	+07° 05' 54.0"	1.6527146	1,0936509	9,10	105,3	8,6	0,3	0,909	35,0	22,44	5,15	11,42
27/12/2011	11h 23m 15.08s	+07° 00' 38.3"	1.6532161	1,0845735	9,02	106,0	8,6	0,3	0,910	34,9	22,41	5,12	11,39
28/12/2011	11h 24m 19.29s	+06° 55' 33.6"	1.6537083	1,0755193	8,94	106,8	8,7	0,3	0,911	34,7	22,39	5,09	11,36
29/12/2011	11h 25m 21.78s	+06° 50' 40.2"	1.6541911	1,0664907	8,87	107,5	8,8	0,3	0,912	34,5	22,36	5,06	11,33
30/12/2011	11h 26m 22.51s	+06° 45' 58.4"	1.6546644	1,0574898	8,79	108,3	8,9	0,2	0,913	34,4	22,34	5,03	11,30
31/12/2011	11h 27m 21.44s	+06° 41' 28.4"	1.6551284	1,0485189	8,72	109,1	8,9	0,2	0,914	34,2	22,31	5,00	11,26

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

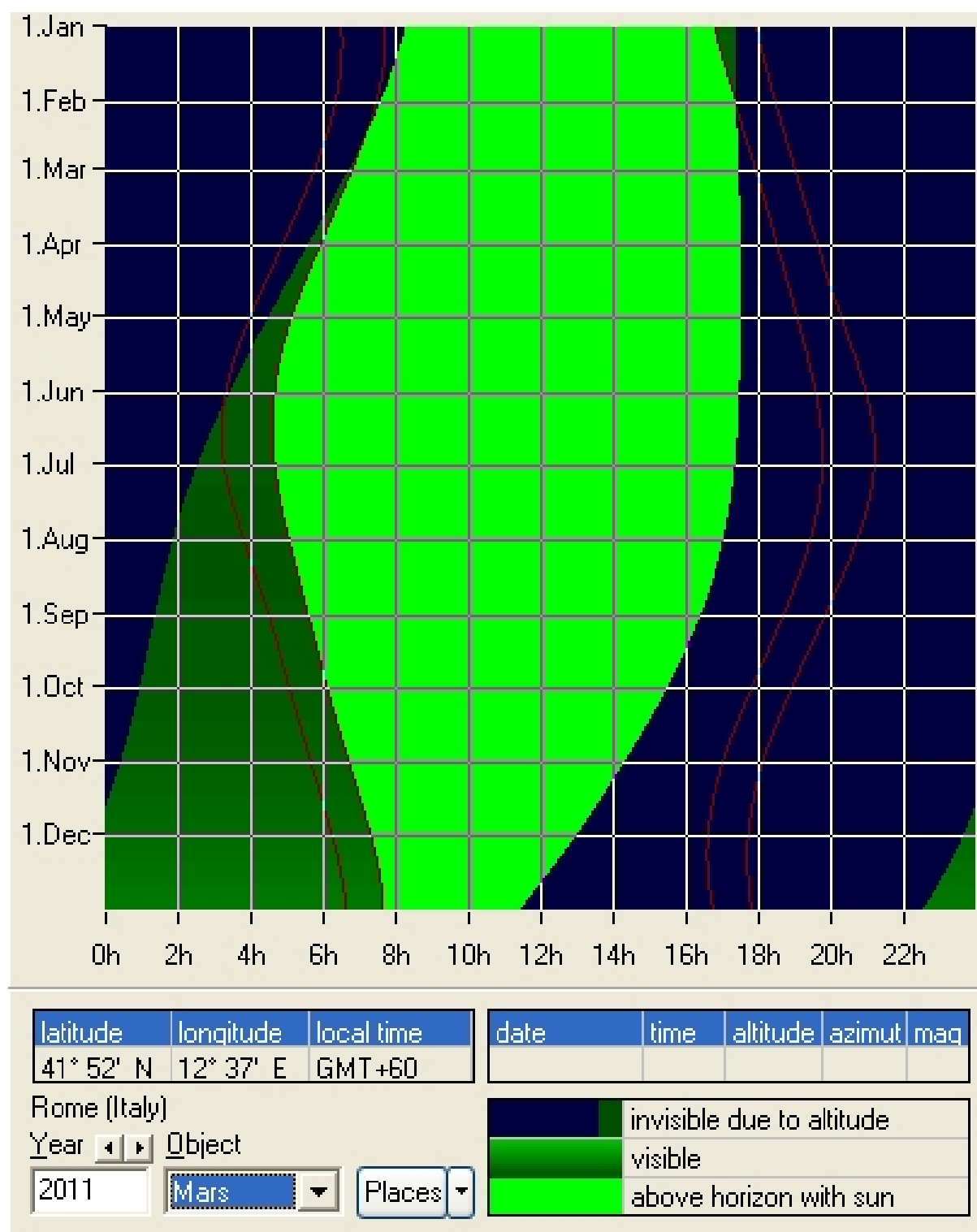
## FENOMENI DI MARTE - PHENOMENA OF MARS

Perielio - Perihelion	09/03/2011	14:05:53	1,38138 AU
Afelio - Aphelion	Questo anno non avviene - No phenomenon		
Perigeo - Perigee	Questo anno non avviene - No phenomenon		
Apogeo - Apogee	07/01/2011	23:27:00	2,37931 AU
Magnit. Max - Brightness maximum	06/02/2011	19:31:54	1,1 mag
Magnit. Min - Brightness minimum	05/08/2011	22:04:56	1,4 mag
Opposizione - Opposition	Questo anno non avviene - No phenomenon		
Congiunzione - Conjunction	04/02/2011	16:40:06	
Moto retrogr. - Retrograde motion	Questo anno non avviene - No phenomenon		
Moto diretto - Prograde motion	Questo anno non avviene - No phenomenon		
Max ang. Fase - Maximum phase angle	25/11/2011	18:12:09	37,1 °
Min ang. Fase - Minimum phase angle	04/02/2011	17:43:35	0,8 °
Estr. lat. Terra- Extremum lat. Earth	25/03/2011	05:27:18	-25,74 °
Estr. lat. Terra- Extremum lat. Earth	15/12/2011	17:08:26	23,93 °
Lat. Terra zero - Lat. Earth zero	24/07/2011	16:23:03	
Estr. lat. Sole - Extremum lat. Sun	08/04/2011	09:33:09	-25,19 °
Lat. Sole zero - Latitude Sun zero	13/09/2011	14:16:34	

© (5)



# VISIBILITA' DI MARTE - VISIBILITY OF MARS



Visibilità di Marte nel corso dell'anno - Visibility of Mars during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

# Altezza ai crepuscoli

## di Marte

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

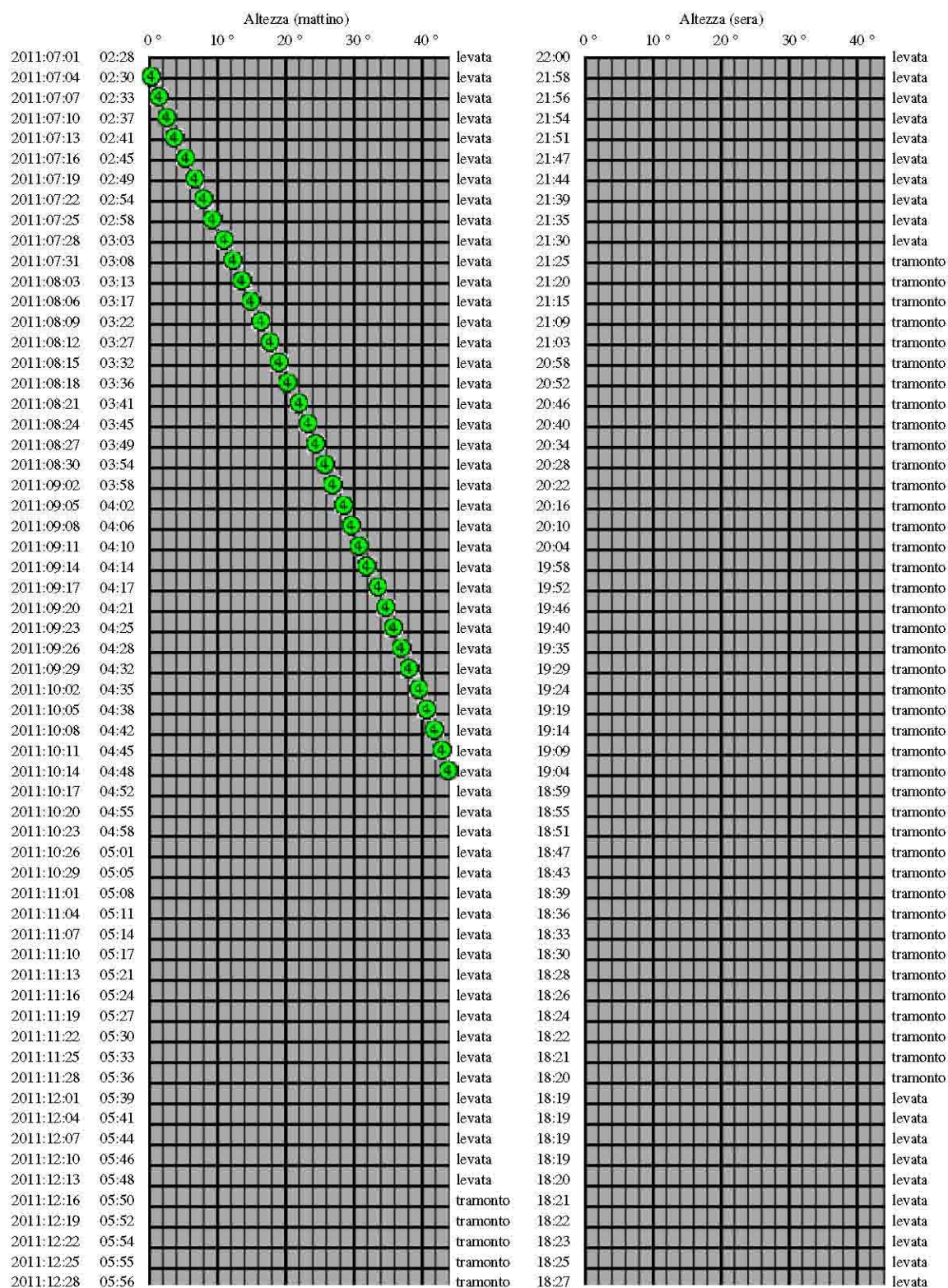
		Altezza (mattino)					Altezza (sera)				
		0 °	10 °	20 °	30 °	40 °	0 °	10 °	20 °	30 °	40 °
2011-01-01	05:57						levata	18:30			tramonto
2011-01-04	05:58						levata	18:32			tramonto
2011-01-07	05:58						levata	18:34			tramonto
2011-01-10	05:58						levata	18:37			tramonto
2011-01-13	05:57						levata	18:40			tramonto
2011-01-16	05:56						levata	18:43			tramonto
2011-01-19	05:55						levata	18:46			tramonto
2011-01-22	05:54						levata	18:49			tramonto
2011-01-25	05:52						levata	18:52			tramonto
2011-01-28	05:50						levata	18:55			tramonto
2011-01-31	05:48						levata	18:59			tramonto
2011-02-03	05:45						levata	19:02			tramonto
2011-02-06	05:43						levata	19:06			tramonto
2011-02-09	05:40						levata	19:09			tramonto
2011-02-12	05:36						levata	19:12			tramonto
2011-02-15	05:33						levata	19:16			tramonto
2011-02-18	05:29						levata	19:19			tramonto
2011-02-21	05:25						levata	19:23			tramonto
2011-02-24	05:20						levata	19:26			tramonto
2011-02-27	05:16						levata	19:30			tramonto
2011-03-02	05:11						levata	19:33			tramonto
2011-03-05	05:07						levata	19:37			tramonto
2011-03-08	05:02						levata	19:40			tramonto
2011-03-11	04:56						levata	19:44			tramonto
2011-03-14	04:51						levata	19:47			tramonto
2011-03-17	04:46						levata	19:51			tramonto
2011-03-20	04:40						levata	19:55			tramonto
2011-03-23	04:35						levata	19:59			tramonto
2011-03-26	04:29						levata	20:03			tramonto
2011-03-29	04:23						levata	20:07			tramonto
2011-04-01	04:17						levata	20:11			tramonto
2011-04-04	04:12						levata	20:15			tramonto
2011-04-07	04:06						levata	20:19			tramonto
2011-04-10	04:00						levata	20:23			tramonto
2011-04-13	03:54						levata	20:28			tramonto
2011-04-16	03:48						levata	20:32			tramonto
2011-04-19	03:42						levata	20:37			tramonto
2011-04-22	03:36						levata	20:41			tramonto
2011-04-25	03:30						levata	20:46			tramonto
2011-04-28	03:24						levata	20:51			tramonto
2011-05-01	03:19						levata	20:56			tramonto
2011-05-04	03:13						levata	21:01			tramonto
2011-05-07	03:08						levata	21:06			tramonto
2011-05-10	03:02						levata	21:11			tramonto
2011-05-13	02:57						levata	21:16			tramonto
2011-05-16	02:52						levata	21:20			tramonto
2011-05-19	02:48						levata	21:25			tramonto
2011-05-22	02:43						levata	21:30			tramonto
2011-05-25	02:39						levata	21:35			tramonto
2011-05-28	02:35						levata	21:39			tramonto
2011-05-31	02:32						levata	21:43			tramonto
2011-06-03	02:29						levata	21:47			tramonto
2011-06-06	02:27						levata	21:50			tramonto
2011-06-09	02:25						levata	21:54			tramonto
2011-06-12	02:23						levata	21:56			tramonto
2011-06-15	02:23						levata	21:58			tramonto
2011-06-18	02:22						levata	22:00			tramonto
2011-06-21	02:23						levata	22:01			tramonto
2011-06-24	02:24						levata	22:01			tramonto
2011-06-27	02:25						levata	22:01			levata

# Altezza ai crepuscoli

## di Marte

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	-24.5	99.8	8.2	18:30	-11.8	249.5	8.1
2011:01:04	05:58	-23.9	99.9	7.5	18:32	-12.3	250.4	7.3
2011:01:07	05:58	-23.3	99.9	6.7	18:34	-12.9	251.4	6.6
2011:01:10	05:58	-22.8	99.8	6.0	18:37	-13.4	252.4	5.9
2011:01:13	05:57	-22.2	99.7	5.3	18:40	-14.0	253.5	5.2
2011:01:16	05:56	-21.7	99.4	4.6	18:43	-14.5	254.6	4.5
2011:01:19	05:55	-21.2	99.1	3.9	18:46	-15.1	255.8	3.8
2011:01:22	05:54	-20.8	98.8	3.3	18:49	-15.7	257.1	3.2
2011:01:25	05:52	-20.3	98.4	2.6	18:52	-16.3	258.4	2.5
2011:01:28	05:50	-19.9	97.9	2.0	18:55	-16.9	259.7	1.9
2011:01:31	05:48	-19.5	97.4	1.5	18:59	-17.5	261.1	1.4
2011:02:03	05:45	-19.1	96.8	1.1	19:02	-18.1	262.6	1.1
2011:02:06	05:43	-18.8	96.1	1.1	19:06	-18.8	264.1	1.2
2011:02:09	05:40	-18.4	95.4	1.5	19:09	-19.4	265.6	1.6
2011:02:12	05:36	-18.1	94.7	2.0	19:12	-20.0	267.2	2.1
2011:02:15	05:33	-17.8	93.9	2.6	19:16	-20.6	268.8	2.7
2011:02:18	05:29	-17.5	93.0	3.2	19:19	-21.2	270.5	3.3
2011:02:21	05:25	-17.3	92.2	3.8	19:23	-21.8	272.2	3.9
2011:02:24	05:20	-17.0	91.2	4.4	19:26	-22.5	274.0	4.6
2011:02:27	05:16	-16.7	90.3	5.1	19:30	-23.1	275.7	5.2
2011:03:02	05:11	-16.5	89.3	5.7	19:33	-23.7	277.6	5.8
2011:03:05	05:07	-16.3	88.3	6.3	19:37	-24.3	279.5	6.4
2011:03:08	05:02	-16.1	87.2	6.9	19:40	-24.9	281.4	7.1
2011:03:11	04:56	-15.9	86.2	7.6	19:44	-25.4	283.4	7.7
2011:03:14	04:51	-15.7	85.1	8.2	19:47	-26.0	285.4	8.3
2011:03:17	04:46	-15.5	84.0	8.8	19:51	-26.6	287.4	8.9
2011:03:20	04:40	-15.3	82.8	9.4	19:55	-27.1	289.5	9.6
2011:03:23	04:35	-15.1	81.7	10.1	19:59	-27.7	291.7	10.2
2011:03:26	04:29	-14.9	80.5	10.7	20:03	-28.2	293.9	10.8
2011:03:29	04:23	-14.7	79.4	11.3	20:07	-28.7	296.1	11.4
2011:04:01	04:17	-14.6	78.2	11.9	20:11	-29.2	298.4	12.1
2011:04:04	04:12	-14.4	77.0	12.5	20:15	-29.7	300.7	12.7
2011:04:07	04:06	-14.2	75.9	13.1	20:19	-30.2	303.1	13.3
2011:04:10	04:00	-14.0	74.7	13.8	20:23	-30.6	305.5	13.9
2011:04:13	03:54	-13.9	73.5	14.4	20:28	-31.0	307.9	14.5
2011:04:16	03:48	-13.7	72.4	15.0	20:32	-31.4	310.4	15.1
2011:04:19	03:42	-13.5	71.2	15.6	20:37	-31.7	312.9	15.8
2011:04:22	03:36	-13.3	70.1	16.2	20:41	-32.0	315.5	16.4
2011:04:25	03:30	-13.1	69.0	16.9	20:46	-32.2	318.1	17.0
2011:04:28	03:24	-12.9	67.9	17.5	20:51	-32.4	320.7	17.6
2011:05:01	03:19	-12.7	66.8	18.1	20:56	-32.6	323.3	18.3
2011:05:04	03:13	-12.4	65.8	18.7	21:01	-32.7	325.9	18.9
2011:05:07	03:08	-12.2	64.8	19.4	21:06	-32.8	328.5	19.5
2011:05:10	03:02	-11.9	63.9	20.0	21:11	-32.8	331.1	20.2
2011:05:13	02:57	-11.6	63.0	20.6	21:16	-32.7	333.7	20.8
2011:05:16	02:52	-11.3	62.1	21.3	21:20	-32.6	336.3	21.5
2011:05:19	02:48	-11.0	61.3	21.9	21:25	-32.5	338.8	22.1
2011:05:22	02:43	-10.6	60.6	22.6	21:30	-32.2	341.2	22.8
2011:05:25	02:39	-10.2	59.9	23.2	21:35	-32.0	343.6	23.4
2011:05:28	02:35	-9.8	59.3	23.9	21:39	-31.6	345.8	24.1
2011:05:31	02:32	-9.3	58.8	24.6	21:43	-31.3	348.0	24.7
2011:06:03	02:29	-8.8	58.4	25.2	21:47	-30.9	350.0	25.4
2011:06:06	02:27	-8.2	58.1	25.9	21:50	-30.4	351.9	26.1
2011:06:09	02:25	-7.5	57.9	26.6	21:54	-30.0	353.6	26.8
2011:06:12	02:23	-6.8	57.8	27.3	21:56	-29.5	355.2	27.5
2011:06:15	02:23	-6.1	57.8	28.0	21:58	-29.0	356.6	28.2
2011:06:18	02:22	-5.3	57.9	28.7	22:00	-28.5	357.8	28.9
2011:06:21	02:23	-4.4	58.1	29.4	22:01	-28.0	358.9	29.6
2011:06:24	02:24	-3.4	58.5	30.1	22:01	-27.6	359.8	30.3
2011:06:27	02:25	-2.4	58.9	30.9	22:01	-27.1	0.5	31.1
2011:06:30	02:27	-1.3	59.5	31.6	22:00	-26.7	1.1	31.8

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	-1.0	59.7	31.8	22:00	-26.6	1.2	32.0
2011:07:04	02:30	0.2	60.3	32.6	21:58	-26.2	1.6	32.8
2011:07:07	02:33	1.4	61.1	33.3	21:56	-25.9	1.8	33.6
2011:07:10	02:37	2.7	61.9	34.1	21:54	-25.6	1.8	34.3
2011:07:13	02:41	4.0	62.8	34.9	21:51	-25.3	1.8	35.1
2011:07:16	02:45	5.3	63.7	35.7	21:47	-25.1	1.7	35.9
2011:07:19	02:49	6.6	64.7	36.5	21:44	-24.9	1.4	36.7
2011:07:22	02:54	8.0	65.7	37.3	21:39	-24.7	1.1	37.5
2011:07:25	02:58	9.4	66.8	38.1	21:35	-24.6	0.7	38.3
2011:07:28	03:03	10.8	67.9	38.9	21:30	-24.5	0.3	39.2
2011:07:31	03:08	12.2	69.0	39.8	21:25	-24.4	359.8	40.0
2011:08:03	03:13	13.6	70.1	40.6	21:20	-24.3	359.2	40.9
2011:08:06	03:17	15.0	71.3	41.5	21:15	-24.3	358.6	41.7
2011:08:09	03:22	16.4	72.5	42.4	21:09	-24.3	358.0	42.6
2011:08:12	03:27	17.8	73.7	43.3	21:03	-24.3	357.4	43.5
2011:08:15	03:32	19.2	75.0	44.2	20:58	-24.4	356.7	44.4
2011:08:18	03:36	20.5	76.2	45.1	20:52	-24.5	356.1	45.3
2011:08:21	03:41	21.9	77.5	46.0	20:46	-24.5	355.4	46.3
2011:08:24	03:45	23.2	78.8	47.0	20:40	-24.6	354.8	47.2
2011:08:27	03:49	24.5	80.1	47.9	20:34	-24.8	354.1	48.2
2011:08:30	03:54	25.8	81.5	48.9	20:28	-24.9	353.4	49.1
2011:09:02	03:58	27.1	82.9	49.9	20:22	-25.1	352.8	50.1
2011:09:05	04:02	28.4	84.3	50.9	20:16	-25.3	352.2	51.1
2011:09:08	04:06	29.7	85.8	51.9	20:10	-25.5	351.6	52.2
2011:09:11	04:10	30.9	87.3	53.0	20:04	-25.7	351.0	53.2
2011:09:14	04:14	32.2	88.8	54.0	19:58	-26.0	350.4	54.3
2011:09:17	04:17	33.4	90.4	55.1	19:52	-26.3	349.9	55.3
2011:09:20	04:21	34.7	92.1	56.2	19:46	-26.5	349.4	56.4
2011:09:23	04:25	35.9	93.8	57.3	19:40	-26.9	348.9	57.5
2011:09:26	04:28	37.1	95.5	58.4	19:35	-27.2	348.5	58.7
2011:09:29	04:32	38.3	97.4	59.6	19:29	-27.5	348.2	59.8
2011:10:02	04:35	39.5	99.3	60.7	19:24	-27.9	347.9	61.0
2011:10:05	04:38	40.7	101.2	61.9	19:19	-28.3	347.6	62.2
2011:10:08	04:42	41.9	103.3	63.1	19:14	-28.7	347.4	63.4
2011:10:11	04:45	43.0	105.4	64.3	19:09	-29.1	347.3	64.6
2011:10:14	04:48	44.2	107.7	65.6	19:04	-29.6	347.2	65.8
2011:10:17	04:52	45.3	110.0	66.9	18:59	-30.1	347.2	67.1
2011:10:20	04:55	46.4	112.5	68.2	18:55	-30.6	347.3	68.4
2011:10:23	04:58	47.5	115.1	69.5	18:51	-31.1	347.5	69.7
2011:10:26	05:01	48.6	117.8	70.8	18:47	-31.6	347.7	71.1
2011:10:29	05:05	49.6	120.6	72.2	18:43	-32.1	348.1	72.4
2011:11:01	05:08	50.7	123.6	73.6	18:39	-32.7	348.5	73.8
2011:11:04	05:11	51.6	126.8	75.0	18:36	-33.3	349.1	75.3
2011:11:07	05:14	52.5	130.0	76.4	18:33	-33.8	349.8	76.7
2011:11:10	05:17	53.4	133.5	77.9	18:30	-34.4	350.7	78.2
2011:11:13	05:21	54.2	137.1	79.4	18:28	-35.0	351.6	79.7
2011:11:16	05:24	54.9	140.9	81.0	18:26	-35.6	352.7	81.3
2011:11:19	05:27	55.5	144.8	82.5	18:24	-36.1	354.0	82.8
2011:11:22	05:30	56.0	148.9	84.2	18:22	-36.7	355.4	84.4
2011:11:25	05:33	56.5	153.1	85.8	18:21	-37.2	357.0	86.1
2011:11:28	05:36	56.8	157.4	87.5	18:20	-37.7	358.7	87.8
2011:12:01	05:39	57.0	161.7	89.2	18:19	-38.1	0.6	89.5
2011:12:04	05:41	57.1	166.2	91.0	18:19	-38.5	2.7	91.3
2011:12:07	05:44	57.0	170.6	92.8	18:19	-38.8	5.0	93.1
2011:12:10	05:46	56.9	175.0	94.6	18:19	-39.1	7.4	95.0
2011:12:13	05:48	56.6	179.4	96.5	18:20	-39.2	10.0	96.9
2011:12:16	05:50	56.2	183.7	98.5	18:21	-39.2	12.8	98.9
2011:12:19	05:52	55.7	187.9	100.5	18:22	-39.2	15.7	100.9
2011:12:22	05:54	55.0	192.0	102.6	18:23	-38.9	18.7	103.0
2011:12:25	05:55	54.3	196.0	104.7	18:25	-38.6	21.9	105.1
2011:12:28	05:56	53.5	199.9	106.9	18:27	-38.0	25.1	107.3
2011:12:31	05:57	52.6	203.6	109.2	18:29	-37.3	28.5	109.6

Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza del pianeta sull'orizzonte, in °  
 Az = azimut del pianeta, in °  
 Elong = elongazione del pianeta, in °  
  
 Alt = altitude of the planet above the horizon, in °  
 Az = azimuth of the planet, in °  
 Elong = elongation of the planet, in °

heliacal dates for Mars in 2011  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Marte  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E  
visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
first visibility	2011-06-17	02:53	04:33	-1:40h	132d 09h	1.6

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins = inizio visibilità mattutina  
Morning visibility ends = fine visibilità mattutina  
Evening visibility begins = inizio visibilità serale  
Evening visibility ends = fine visibilità serale  
Last visibility : ultimo giorno di visibilità  
Firs visibilità : primo giorno di visibilità

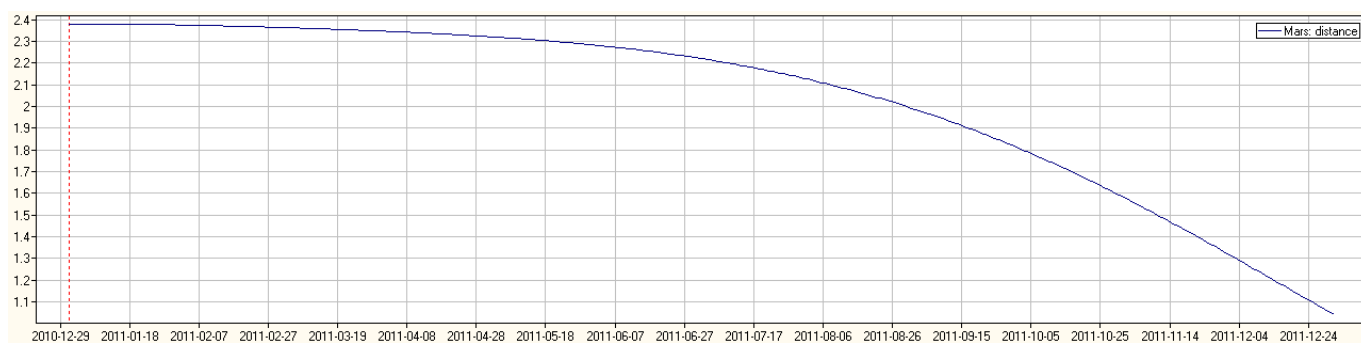
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
F	06-17	02:53	04:33	-14° 41'	85° 34'	57° 06'	-0° 15'	1.6	24° 58'	-28° 28'

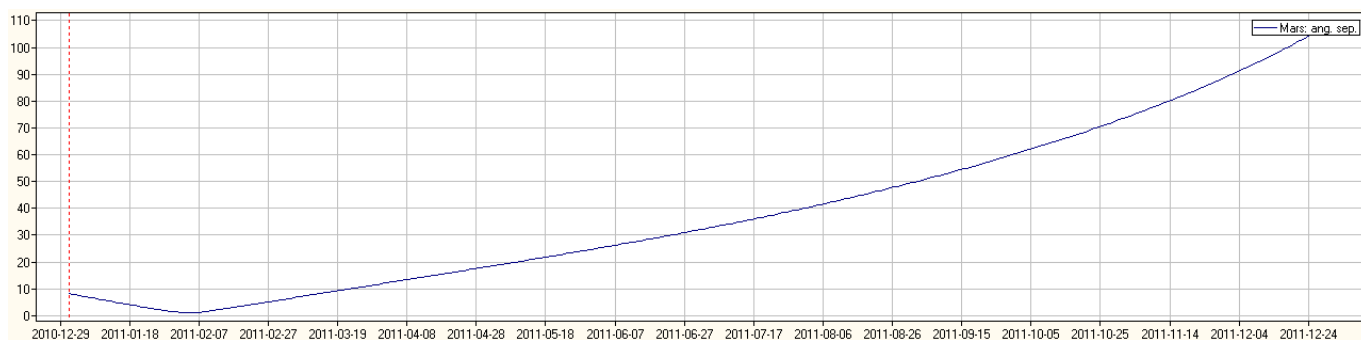
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità  
L = ultimo giorno di visibilità  
F = primo giorno di visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

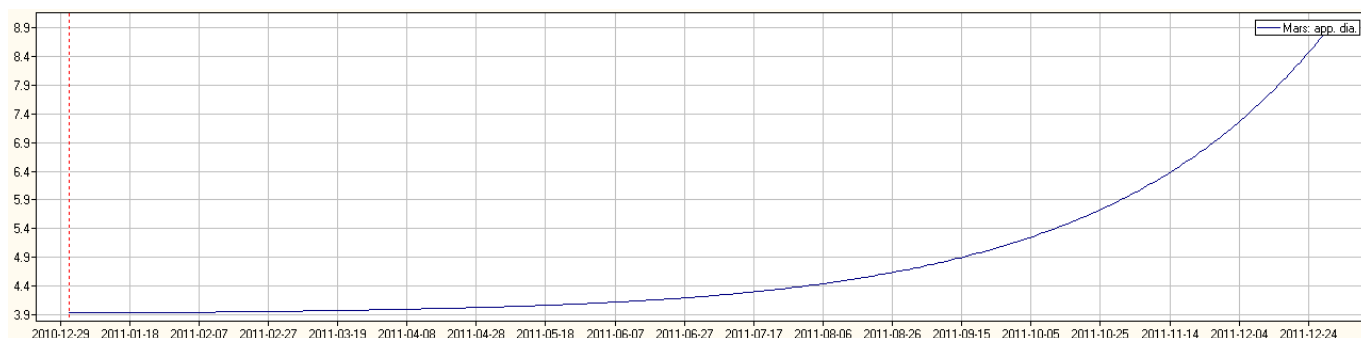
© (3)



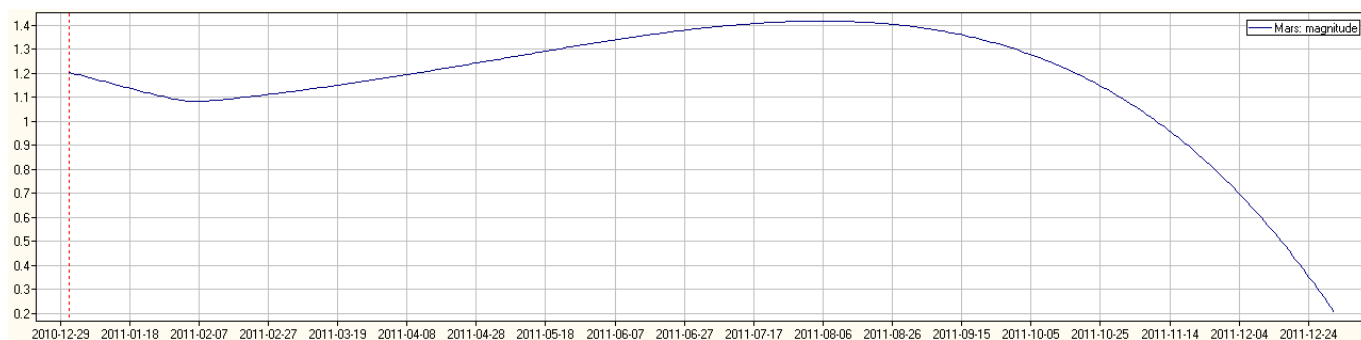
Distanza di Marte in U.A. nel corso dell'anno - Distance of Mars in A.U. during the year



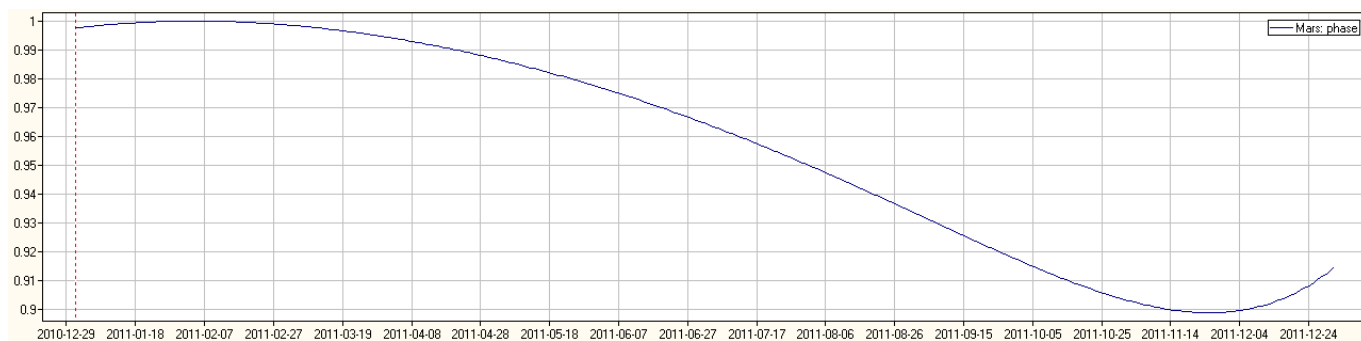
Elongazione di Marte in ° nel corso dell'anno - Elongation of Mars in ° during the year



Diametro di Marte in " nel corso dell'anno - Diameter of Mars in " during the year



Magnitudine di Marte nel corso dell'anno - Magnitude of Mars during the year



Fase di Marte nel corso dell'anno - Phase of Mars during the year

# MERIDIANO CENTRALE DI MARTE – TRANSITI

## CENTRAL MERIDIAN OF MARS – TRANSITS

Date	Time						
01/01/2011	16:08:14	03/04/2011	04:41:15	03/07/2011	16:49:02	03/10/2011	03:59:03
02/01/2011	16:48:43	04/04/2011	05:22:20	04/07/2011	17:29:01	04/10/2011	04:38:47
03/01/2011	17:29:03	05/04/2011	06:03:25	05/07/2011	18:09:07	05/10/2011	05:18:39
04/01/2011	18:09:33	06/04/2011	06:44:18	06/07/2011	18:49:05	06/10/2011	05:58:23
05/01/2011	18:49:55	07/04/2011	07:25:22	07/07/2011	19:29:11	07/10/2011	06:38:14
06/01/2011	19:30:26	08/04/2011	08:06:15	08/07/2011	20:09:08	08/10/2011	07:18:04
07/01/2011	20:10:49	09/04/2011	08:47:18	09/07/2011	20:49:13	09/10/2011	07:57:48
08/01/2011	20:51:21	10/04/2011	09:28:10	10/07/2011	21:29:09	10/10/2011	08:37:39
09/01/2011	21:31:45	11/04/2011	10:09:12	11/07/2011	22:09:13	11/10/2011	09:17:22
10/01/2011	22:12:18	12/04/2011	10:50:14	12/07/2011	22:49:16	12/10/2011	09:57:12
11/01/2011	22:52:52	13/04/2011	11:31:04	13/07/2011	23:29:12	13/10/2011	10:36:55
12/01/2011	23:33:18	14/04/2011	12:12:05	15/07/2011	00:09:14	14/10/2011	11:16:44
14/01/2011	00:13:53	15/04/2011	12:52:54	16/07/2011	00:49:09	15/10/2011	11:56:27
15/01/2011	00:54:20	16/04/2011	13:33:53	17/07/2011	01:29:11	16/10/2011	12:36:16
16/01/2011	01:34:57	17/04/2011	14:14:42	18/07/2011	02:09:05	17/10/2011	13:16:05
17/01/2011	02:15:25	18/04/2011	14:55:40	19/07/2011	02:49:06	18/10/2011	13:55:47
18/01/2011	02:56:03	19/04/2011	15:36:37	20/07/2011	03:29:00	19/10/2011	14:35:35
19/01/2011	03:36:41	20/04/2011	16:17:24	21/07/2011	04:09:00	20/10/2011	15:15:16
20/01/2011	04:17:11	21/04/2011	16:58:20	22/07/2011	04:49:01	21/10/2011	15:55:04
21/01/2011	04:57:51	22/04/2011	17:39:06	23/07/2011	05:28:53	22/10/2011	16:34:45
22/01/2011	05:38:22	23/04/2011	18:20:01	24/07/2011	06:08:53	23/10/2011	17:14:32
23/01/2011	06:19:03	24/04/2011	19:00:45	25/07/2011	06:48:45	24/10/2011	17:54:12
24/01/2011	06:59:35	25/04/2011	19:41:38	26/07/2011	07:28:45	25/10/2011	18:33:58
25/01/2011	07:40:18	26/04/2011	20:22:21	27/07/2011	08:08:36	26/10/2011	19:13:44
26/01/2011	08:20:52	27/04/2011	21:03:13	28/07/2011	08:48:35	27/10/2011	19:53:23
27/01/2011	09:01:36	28/04/2011	21:44:05	29/07/2011	09:28:26	28/10/2011	20:33:08
28/01/2011	09:42:20	29/04/2011	22:24:46	30/07/2011	10:08:24	29/10/2011	21:12:46
29/01/2011	10:22:56	30/04/2011	23:05:36	31/07/2011	10:48:22	30/10/2011	21:52:31
30/01/2011	11:03:42	01/05/2011	23:46:15	01/08/2011	11:28:13	31/10/2011	22:32:08
31/01/2011	11:44:19	03/05/2011	00:27:04	02/08/2011	12:08:11	01/11/2011	23:11:51
01/02/2011	12:25:06	04/05/2011	01:07:42	03/08/2011	12:48:01	02/11/2011	23:51:27
02/02/2011	13:05:45	05/05/2011	01:48:28	04/08/2011	13:27:58	04/11/2011	00:31:09
03/02/2011	13:46:34	06/05/2011	02:29:15	05/08/2011	14:07:47	05/11/2011	01:10:44
04/02/2011	14:27:23	07/05/2011	03:09:50	06/08/2011	14:47:44	06/11/2011	01:50:26
05/02/2011	15:08:03	08/05/2011	03:50:35	07/08/2011	15:27:34	07/11/2011	02:30:06
06/02/2011	15:48:54	09/05/2011	04:31:09	08/08/2011	16:07:30	08/11/2011	03:09:40
07/02/2011	16:29:36	10/05/2011	05:11:52	09/08/2011	16:47:19	09/11/2011	03:49:19
08/02/2011	17:10:28	11/05/2011	05:52:25	10/08/2011	17:27:15	10/11/2011	04:28:51
09/02/2011	17:51:10	12/05/2011	06:33:06	11/08/2011	18:07:11	11/11/2011	05:08:29
10/02/2011	18:32:04	13/05/2011	07:13:47	12/08/2011	18:47:00	12/11/2011	05:48:00
11/02/2011	19:12:58	14/05/2011	07:54:17	13/08/2011	19:26:55	13/11/2011	06:27:37
12/02/2011	19:53:42	15/05/2011	08:34:56	14/08/2011	20:06:44	14/11/2011	07:07:07
13/02/2011	20:34:38	16/05/2011	09:15:25	15/08/2011	20:46:39	15/11/2011	07:46:42
14/02/2011	21:15:23	17/05/2011	09:56:02	16/08/2011	21:26:27	16/11/2011	08:26:17
15/02/2011	21:56:20	18/05/2011	10:36:30	17/08/2011	22:06:22	17/11/2011	09:05:44
16/02/2011	22:37:07	19/05/2011	11:17:06	18/08/2011	22:46:10	18/11/2011	09:45:17
17/02/2011	23:18:04	20/05/2011	11:57:31	19/08/2011	23:26:05	19/11/2011	10:24:43
18/02/2011	23:58:52	21/05/2011	12:38:06	20/08/2011	00:06:00	20/11/2011	11:04:14
20/02/2011	00:39:51	22/05/2011	13:18:39	22/08/2011	00:45:48	21/11/2011	11:43:38
21/02/2011	01:20:51	23/05/2011	13:59:03	23/08/2011	01:25:42	22/11/2011	12:23:08
22/02/2011	02:01:40	24/05/2011	14:39:35	24/08/2011	02:05:30	23/11/2011	13:02:30
23/02/2011	02:42:41	25/05/2011	15:19:57	25/08/2011	02:45:24	24/11/2011	13:41:57
24/02/2011	03:23:31	26/05/2011	16:00:27	26/08/2011	03:25:12	25/11/2011	14:21:18
25/02/2011	04:04:33	27/05/2011	16:40:48	27/08/2011	04:05:06	26/11/2011	15:00:43
26/02/2011	04:45:24	28/05/2011	17:21:17	28/08/2011	04:44:53	27/11/2011	15:40:07
27/02/2011	05:26:26	29/05/2011	18:01:45	29/08/2011	05:24:47	28/11/2011	16:19:25
28/02/2011	06:07:29	30/05/2011	18:42:04	30/08/2011	06:04:41	29/11/2011	16:58:47
01/03/2011	06:48:22	31/05/2011	19:22:31	31/08/2011	06:44:28	30/11/2011	17:38:02
02/03/2011	07:29:26	01/06/2011	20:02:48	01/09/2011	07:24:22	01/12/2011	18:17:21
03/03/2011	08:10:19	02/06/2011	20:43:13	02/09/2011	08:04:09	02/12/2011	18:56:34
04/03/2011	08:51:24	03/06/2011	21:23:29	03/09/2011	08:44:03	03/12/2011	19:35:51
05/03/2011	09:32:18	04/06/2011	22:03:53	04/09/2011	09:23:49	04/12/2011	20:15:01
06/03/2011	10:13:23	05/06/2011	22:44:07	05/09/2011	10:03:43	05/12/2011	20:54:16
07/03/2011	10:54:29	06/06/2011	23:24:29	06/09/2011	10:43:29	06/12/2011	21:33:24
08/03/2011	11:35:24	08/06/2011	00:04:51	07/09/2011	11:23:23	07/12/2011	22:12:35
09/03/2011	12:16:30	09/06/2011	00:45:03	08/09/2011	12:03:17	08/12/2011	22:51:46
10/03/2011	12:57:26	10/06/2011	01:25:24	09/09/2011	12:43:03	09/12/2011	23:30:49
11/03/2011	13:38:32	11/06/2011	02:05:35	10/09/2011	13:22:56	11/12/2011	00:09:57
12/03/2011	14:19:28	12/06/2011	02:45:54	11/09/2011	14:02:42	12/12/2011	00:48:58
13/03/2011	15:00:35	13/06/2011	03:26:04	12/09/2011	14:42:36	13/12/2011	01:28:02
14/03/2011	15:41:42	14/06/2011	04:06:21	13/09/2011	15:22:22	14/12/2011	02:07:00
15/03/2011	16:22:38	15/06/2011	04:46:30	14/09/2011	16:02:15	15/12/2011	02:46:01
16/03/2011	17:03:45	16/06/2011	05:26:46	15/09/2011	16:42:01	16/12/2011	03:24:56
17/03/2011	17:44:42	17/06/2011	06:07:02	16/09/2011	17:21:54	17/12/2011	04:03:54
18/03/2011	18:25:49	18/06/2011	06:47:09	17/09/2011	18:01:47	18/12/2011	04:42:45
19/03/2011	19:06:46	19/06/2011	07:27:24	18/09/2011	18:41:33	19/12/2011	05:21:39
20/03/2011	19:47:53	20/06/2011	08:07:29	19/09/2011	19:21:26	20/12/2011	06:00:31
21/03/2011	20:29:01	21/06/2011	08:47:43	20/09/2011	20:01:11	21/12/2011	06:39:17
22/03/2011	21:09:57	22/06/2011	09:27:48	21/09/2011	20:41:04	22/12/2011	07:18:06
23/03/2011	21:51:04	23/06/2011	10:08:00	22/09/2011	21:20:50	23/12/2011	07:56:48
24/03/2011	22:32:01	24/06/2011	10:48:12	23/09/2011	22:00:42	24/12/2011	08:35:32
25/03/2011	23:13:08	25/06/2011	11:28:15	24/09/2011	22:40:28	25/12/2011	09:14:11
26/03/2011	23:54:04	26/06/2011	12:08:25	25/09/2011	23:20:20	26/12/2011	09:52:51
28/03/2011	00:35:11	27/06/2011	12:48:28	27/09/2011	00:00:13	27/12/2011	10:31:25
29/03/2011	01:16:18	28/06/2011	13:28:37	28/09/2011	00:39:58	28/12/2011	11:10:00
30/03/2011	01:57:13	29/06/2011	14:08:38	29/09/2011	01:19:50	29/12/2011	11:48:30
31/03/2011	02:38:19	30/06/2011	14:48:47	30/09/2011	01:59:35	30/12/2011	12:27:01
01/04/2011	03:19:15	01/07/2011	15:28:47	01/10/2011	02:39:27	31/12/2011	13:05:27
02/04/2011	04:00:20	02/07/2011	16:08:55	02/10/2011	03:19:11		

Orari in T.U. (hh.mm,m) in cui transita la Syrtis major

Times in U.T. (hh.mm,m) of the transits of the Syrtis major

# MERIDIANO CENTRALE DI MARTE

## CENTRAL MERIDIAN OF MARS

Data	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	o	o	o	o	o	o	o	o	o	o	o	o
1	56.3	110.6	192.5	243.3	305.0	359.3	65.9	124.4	183.7	253.0	313.1	24.7
2	46.5	100.7	182.5	233.4	295.1	349.4	56.1	114.6	174.0	243.3	303.5	15.2
3	36.7	90.8	172.6	223.4	285.2	339.6	46.4	104.9	164.3	233.6	293.8	5.6
4	26.8	80.9	162.6	213.4	275.3	329.8	36.6	95.2	154.6	223.9	284.2	356.1
5	17.0	71.0	152.6	203.4	265.4	320.0	26.9	85.5	144.9	214.3	274.5	346.5
6	7.2	61.1	142.7	193.5	255.5	310.2	17.1	75.8	135.2	204.6	264.9	337.0
7	357.3	51.2	132.7	183.5	245.6	300.4	7.4	66.1	125.5	194.9	255.3	327.4
8	347.5	41.3	122.7	173.6	235.7	290.6	357.7	56.4	115.8	185.2	245.6	317.9
9	337.6	31.3	112.8	163.6	225.8	280.8	347.9	46.7	106.1	175.5	236.0	308.4
10	327.8	21.4	102.8	153.6	215.9	271.0	338.2	37.0	96.5	165.9	226.4	298.9
11	318.0	11.5	92.8	143.7	206.1	261.2	328.5	27.3	86.8	156.2	216.7	289.4
12	308.1	1.6	82.8	133.7	196.2	251.4	318.7	17.6	77.1	146.5	207.1	279.9
13	298.3	351.6	72.9	123.8	186.3	241.6	309.0	7.9	67.4	136.8	197.5	270.4
14	288.4	341.7	62.9	113.8	176.4	231.9	299.3	358.2	57.7	127.1	187.8	260.9
15	278.6	331.8	52.9	103.9	166.6	222.1	289.5	348.5	48.0	117.5	178.2	251.4
16	268.7	321.8	42.9	93.9	156.7	212.3	279.8	338.8	38.3	107.8	168.6	241.9
17	258.8	311.9	33.0	84.0	146.9	202.5	270.1	329.1	28.6	98.1	159.0	232.4
18	249.0	302.0	23.0	74.0	137.0	192.7	260.4	319.4	18.9	88.4	149.4	222.9
19	239.1	292.0	13.0	64.1	127.1	183.0	250.6	309.7	9.2	78.8	139.8	213.5
20	229.2	282.1	3.0	54.2	117.3	173.2	240.9	300.0	359.6	69.1	130.2	204.0
21	219.4	272.1	353.0	44.2	107.4	163.4	231.2	290.3	349.9	59.4	120.5	194.6
22	209.5	262.2	343.1	34.3	97.6	153.7	221.5	280.6	340.2	49.8	110.9	185.1
23	199.6	252.2	333.1	24.4	87.7	143.9	211.8	270.9	330.5	40.1	101.4	175.7
24	189.7	242.3	323.1	14.4	77.9	134.1	202.1	261.2	320.8	30.4	91.8	166.3
25	179.9	232.3	313.1	4.5	68.1	124.4	192.3	251.5	311.1	20.8	82.2	156.9
26	170.0	222.4	303.2	354.6	58.2	114.6	182.6	241.8	301.4	11.1	72.6	147.4
27	160.1	212.4	293.2	344.7	48.4	104.9	172.9	232.2	291.7	1.4	63.0	138.0
28	150.2	202.5	283.2	334.7	38.6	95.1	163.2	222.5	282.0	351.8	53.4	128.6
29	140.3		273.2	324.8	28.7	85.4	153.5	212.8	272.4	342.1	43.9	119.3
30	130.4		263.3	314.9	18.9	75.6	143.8	203.1	262.7	332.5	34.3	109.9
31	120.5		253.3		9.1		134.1	193.4		322.8		100.5

Moto del meridiano centrale - Motion of the central meridian

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	o	o	o	o	o	o	o	o	o	o	o	o
0	0.0	14.6	29.2	43.9	58.5	73.1	87.7	102.3	117.0	131.6	146.2	160.8
10	2.4	17.1	31.7	46.3	60.9	75.5	90.2	104.8	119.4	134.0	148.6	163.3
20	4.9	19.5	34.1	48.7	63.4	78.0	92.6	107.2	121.8	136.5	151.1	165.7
30	7.3	21.9	36.6	51.2	65.8	80.4	95.0	109.7	124.3	138.9	153.5	168.1
40	9.7	24.4	39.0	53.6	68.2	82.8	97.5	112.1	126.7	141.3	156.0	170.6
50	12.2	26.8	41.4	56.0	70.7	85.3	99.9	114.5	129.1	143.8	158.4	173.0
60	14.6	29.2	43.9	58.5	73.1	87.7	102.3	117.0	131.6	146.2	160.8	175.4

Longitudine del meridiano che transita alle ore 0 T.U. del giorno indicato e moto medio in gradi

Longitude of the central meridian at 0 U.T. of the day and medium motion in °

# EFFEMERIDI DI GIOVE - EPHEMERIDES OF JUPITER

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.°	Diam. Pol.°	Mag.	Phase angle°	Rise	Transit	Set
01/01/2011	23h 49m 21.33s	-02° 31' 58.8"	4,950085	5,0890376	42,32	76,3	38,7	36,2	-2,3	11,1	11.22	17.15	23.09
02/01/2011	23h 49m 50.79s	-02° 28' 32.9"	4,950040	5,1044316	42,45	75,5	38,6	36,1	-2,3	11,1	11.18	17.12	23.05
03/01/2011	23h 50m 20.81s	-02° 25' 03.5"	4,949996	5,1197664	42,58	74,6	38,5	36,0	-2,3	11,0	11.15	17.08	23.02
04/01/2011	23h 50m 51.37s	-02° 21' 30.8"	4,949953	5,1350382	42,71	73,7	38,3	35,9	-2,3	11,0	11.11	17.05	22.59
05/01/2011	23h 51m 22.46s	-02° 17' 54.6"	4,949910	5,1502432	42,83	72,8	38,2	35,8	-2,3	10,9	11.08	17.02	22.56
06/01/2011	23h 51m 54.08s	-02° 14' 15.1"	4,949868	5,1653779	42,96	72,0	38,1	35,7	-2,3	10,9	11.04	16.58	22.53
07/01/2011	23h 52m 26.22s	-02° 10' 32.4"	4,949826	5,1804387	43,08	71,1	38,0	35,5	-2,3	10,8	11.00	16.55	22.49
08/01/2011	23h 52m 58.87s	-02° 06' 46.5"	4,949785	5,1954220	43,21	70,2	37,9	35,4	-2,3	10,8	10.57	16.51	22.46
09/01/2011	23h 53m 32.03s	-02° 02' 57.4"	4,949745	5,2103247	43,33	69,3	37,8	35,3	-2,3	10,7	10.53	16.48	22.43
10/01/2011	23h 54m 05.68s	-01° 59' 05.2"	4,949705	5,2251434	43,46	68,5	37,7	35,2	-2,3	10,7	10.50	16.45	22.40
11/01/2011	23h 54m 39.83s	-01° 55' 09.9"	4,949666	5,2398750	43,58	67,6	37,6	35,1	-2,3	10,6	10.46	16.41	22.37
12/01/2011	23h 55m 14.45s	-01° 51' 11.6"	4,949627	5,2545164	43,70	66,8	37,5	35,0	-2,3	10,5	10.42	16.38	22.34
13/01/2011	23h 55m 49.56s	-01° 47' 10.3"	4,949589	5,2690647	43,82	65,9	37,4	34,9	-2,3	10,5	10.39	16.35	22.31
14/01/2011	23h 56m 25.14s	-01° 43' 06.2"	4,949552	5,2835169	43,94	65,0	37,3	34,9	-2,3	10,4	10.35	16.31	22.28
15/01/2011	23h 57m 01.17s	-01° 38' 59.1"	4,949515	5,2978704	44,06	64,2	37,2	34,8	-2,3	10,3	10.32	16.28	22.24
16/01/2011	23h 57m 37.67s	-01° 34' 49.2"	4,949479	5,3121224	44,18	63,3	37,1	34,7	-2,2	10,2	10.28	16.25	22.21
17/01/2011	23h 58m 14.61s	-01° 30' 36.6"	4,949443	5,3262704	44,30	62,5	37,0	34,6	-2,2	10,2	10.24	16.21	22.18
18/01/2011	23h 58m 51.99s	-01° 26' 21.2"	4,949408	5,3403119	44,41	61,6	36,9	34,5	-2,2	10,1	10.21	16.18	22.15
19/01/2011	23h 59m 29.80s	-01° 22' 03.2"	4,949373	5,3542446	44,53	60,8	36,8	34,4	-2,2	10,0	10.17	16.15	22.12
20/01/2011	00h 00m 08.03s	-01° 17' 42.5"	4,949339	5,3680661	44,65	60,0	36,7	34,3	-2,2	9,9	10.14	16.11	22.09
21/01/2011	00h 00m 46.68s	-01° 13' 19.4"	4,949306	5,3817743	44,76	59,1	36,6	34,2	-2,2	9,8	10.10	16.08	22.06
22/01/2011	00h 01m 25.73s	-01° 08' 53.6"	4,949273	5,3953668	44,87	58,3	36,5	34,1	-2,2	9,7	10.07	16.05	22.03
23/01/2011	00h 02m 05.19s	-01° 04' 25.5"	4,949241	5,4088414	44,98	57,4	36,4	34,0	-2,2	9,6	10.03	16.02	22.00
24/01/2011	00h 02m 45.04s	-00° 59' 54.9"	4,949210	5,4221957	45,10	56,6	36,3	34,0	-2,2	9,6	10.00	15.58	21.57
25/01/2011	00h 03m 25.29s	-00° 55' 21.9"	4,949179	5,4354273	45,21	55,8	36,2	33,9	-2,2	9,5	9.56	15.55	21.54
26/01/2011	00h 04m 05.92s	-00° 50' 46.4"	4,949148	5,4485335	45,31	54,9	36,1	33,8	-2,2	9,4	9.53	15.52	21.51
27/01/2011	00h 04m 46.95s	-00° 46' 08.7"	4,949119	5,4615119	45,42	54,1	36,1	33,7	-2,2	9,3	9.49	15.49	21.48
28/01/2011	00h 05m 28.35s	-00° 41' 28.6"	4,949089	5,4743598	45,53	53,3	36,0	33,6	-2,2	9,2	9.45	15.45	21.45
29/01/2011	00h 06m 10.13s	-00° 36' 46.3"	4,949061	5,4870745	45,63	52,5	35,9	33,5	-2,2	9,1	9.42	15.42	21.42
30/01/2011	00h 06m 52.27s	-00° 32' 01.8"	4,949033	5,4996536	45,74	51,6	35,8	33,4	-2,2	9,0	9.38	15.39	21.39
31/01/2011	00h 07m 34.77s	-00° 27' 15.1"	4,949005	5,5120943	45,84	50,8	35,7	33,3	-2,2	8,9	9.35	15.36	21.36
01/02/2011	00h 08m 17.62s	-00° 22' 26.3"	4,948979	5,5243943	45,95	50,0	35,6	33,2	-2,2	8,8	9.31	15.32	21.34
02/02/2011	00h 09m 00.82s	-00° 17' 35.5"	4,948952	5,5365508	46,05	49,2	35,6	33,3	-2,2	8,7	9.28	15.29	21.31
03/02/2011	00h 09m 44.35s	-00° 12' 42.7"	4,948927	5,5485617	46,15	48,4	35,5	33,2	-2,2	8,6	9.24	15.26	21.28
04/02/2011	00h 10m 28.21s	-00° 07' 47.9"	4,948902	5,5604246	46,24	47,6	35,4	33,1	-2,1	8,5	9.21	15.23	21.25
05/02/2011	00h 11m 12.39s	-00° 02' 51.3"	4,948877	5,5721372	46,34	46,7	35,3	33,0	-2,1	8,3	9.17	15.20	21.22
06/02/2011	00h 11m 56.89s	+00° 02' 07.2"	4,948853	5,5836975	46,44	45,9	35,3	33,0	-2,1	8,2	9.14	15.16	21.19
07/02/2011	00h 12m 41.70s	+00° 07' 07.5"	4,948830	5,5951034	46,53	45,1	35,2	32,9	-2,1	8,1	9.10	15.13	21.16
08/02/2011	00h 13m 26.82s	+00° 12' 09.6"	4,948808	5,6063529	46,63	44,3	35,1	32,8	-2,1	8,0	9.07	15.10	21.13
09/02/2011	00h 14m 12.23s	+00° 17' 13.3"	4,948785	5,6174443	46,72	43,5	35,1	32,8	-2,1	7,9	9.03	15.07	21.10
10/02/2011	00h 14m 57.94s	+00° 22' 18.8"	4,948764	5,6283757	46,81	42,7	35,0	32,7	-2,1	7,8	9.00	15.04	21.08
11/02/2011	00h 15m 43.94s	+00° 27' 25.8"	4,948743	5,6391455	46,90	41,9	34,9	32,7	-2,1	7,7	8.57	15.01	21.05
12/02/2011	00h 16m 30.22s	+00° 32' 34.5"	4,948723	5,6497522	46,99	41,1	34,9	32,6	-2,1	7,5	8.53	14.57	21.02
13/02/2011	00h 17m 16.77s	+00° 37' 44.7"	4,948703	5,6601943	47,07	40,3	34,8	32,5	-2,1	7,4	8.50	14.54	20.59
14/02/2011	00h 18m 03.60s	+00° 42' 56.4"	4,948684	5,6704703	47,16	39,5	34,7	32,5	-2,1	7,3	8.46	14.51	20.56
15/02/2011	00h 18m 50.68s	+00° 48' 09.5"	4,948666	5,6805790	47,24	38,7	34,7	32,4	-2,1	7,2	8.43	14.48	20.53
16/02/2011	00h 19m 38.01s	+00° 53' 24.0"	4,948648	5,6905193	47,33	37,9	34,6	32,4	-2,1	7,0	8.39	14.45	20.50
17/02/2011	00h 20m 25.60s	+00° 58' 39.8"	4,948630	5,7002900	47,41	37,1	34,5	32,3	-2,1	6,9	8.36	14.42	20.48
18/02/2011	00h 21m 13.42s	+01° 03' 57.0"	4,948614	5,7098900	47,49	36,3	34,5	32,3	-2,1	6,8	8.32	14.38	20.45
19/02/2011	00h 22m 01.48s	+01° 09' 15.3"	4,948597	5,7193182	47,57	35,5	34,4	32,2	-2,1	6,7	8.29	14.35	20.42
20/02/2011	00h 22m 49.76s	+01° 14' 34.9"	4,948582	5,7285735	47,64	34,8	34,4	32,1	-2,1	6,5	8.25	14.32	20.39
21/02/2011	00h 23m 38.28s	+01° 19' 55.7"	4,948567	5,7376547	47,72	34,0	34,3	32,1	-2,1	6,4	8.22	14.29	20.36
22/02/2011	00h 24m 27.03s	+01° 25' 17.7"	4,948553	5,7465604	47,79	33,2	34,3	32,0	-2,1	6,3	8.19	14.26	20.34
23/02/2011	00h 25m 15.99s	+01° 30' 40.8"	4,948539	5,7552893	47,87	32,4	34,2	32,0	-2,1	6,2	8.15	14.23	20.31
24/02/2011	00h 26m 05.18s	+01° 36' 05.0"	4,948526	5,7638397	47,94	31,6	34,2	31,9	-2,1	6,0	8.12	14.20	20.28
25/02/2011	00h 26m 54.59s	+01° 41' 30.3"	4,948513	5,7722103	48,01	30,8	34,1	31,9	-2,1	5,9	8.08	14.17	20.25
26/02/2011	00h 27m 44.20s	+01° 46' 56.6"	4,948501	5,7803995	48,07	30,1	34,1	31,9	-2,1	5,8	8.05	14.14	20.22
27/02/2011	00h 28m 34.01s	+01° 52' 23.9"	4,948490	5,7884059	48,14	29,3	34,0	31,8	-2,1	5,6	8.01	14.10	20.20
28/02/2011	00h 29m 24.02s	+01° 57' 52.1"	4,948479	5,7962278	48,21	28,5	34,0	31,8	-2,1	5,5	7.58	14.07	20.17
01/03/2011	00h 30m 14.21s	+02° 03' 21.2"	4,948469	5,8038641	48,27	27,7	33,9	31,7	-2,1	5,3	7.55	14.04	20.14
02/03/2011	00h 31m 04.59s	+02° 08' 51.2"	4,948459	5,8113132	48,33	27,0	33,9	31,7	-2,1	5,2	7.51	14.01	20.11
03/03/2011	00h 31m 55.15s	+02° 14' 21.9"	4,948450	5,8185740	48,39	26,2	33,8	31,6	-2,1	5,1	7.48	13.58	20.09
04/03/2011	00h 32m 45.89s	+02° 19' 53.3"	4,948442	5,8256453	48,45	25,4	33,8	31,6	-2,1	4,9	7.44	13.55	20.06
05/03/2011	00h 33m 36.79s	+02° 25' 25.5"	4,948434	5,8325259	48,51	24,6	33,8	31,6	-2,1	4,8	7.41	13.52	20.03
06/03/2011	00h 34m 27.85s	+02° 30' 58.3"	4,948427	5,8392148	48,56	23,9	33,7	31,5	-2,1	4,7	7.37	13.49	20.00
07/03/2011	00h 35m 19.08s	+02° 36' 31.8"	4,948420	5,8457110	48,62	23,1	33,7	31,5	-2,1	4,5	7.34	13.46	19.58
08/03/2011	00h 36m 10.46s	+02° 42' 05.8"	4,948414	5,8520138	48,67	22,3	33,6	31,5	-2,1	4,4	7.31	13.43	19.55
09/03/2011	00h 37m 01.98s	+02° 47' 40.4"	4,948408	5,8581223	48,72	21,6	33,6	31,4	-2,1	4,2	7.27	13.40	19.52
10/03/2011	00h 37m 53.66s	+02° 53' 15.5"	4,948403	5,8640359	48,77	20,8	33,6	31,4	-2,1	4,1	7.24	13.36	19.49
11/03/2011	00h 38m 45.47s	+02° 58' 51.1"	4,948399	5,8697540	48,82	20,0	33,5	31,4	-2,1	3,9	7.20	13.33	19.47
12/03/2011	00h 39m 37.42s	+03° 04' 27.1"	4,948396	5,8752760	48,86	19,3	33,5	31,3	-2,1	3,8	7.17	13.30	19.44
13/03/2011	00h 40m 29.49s	+03° 10' 03.5"	4,948392	5,8806016	48,91	18,5	33,5	31,3	-2,1	3,7	7.14	13.27	19.41
14/03/2011	00h 41m 21.69s	+03° 15' 40.3"	4,948390	5,8857303	48,95	17,8	33,5	31,3	-2,1	3,5	7.10	13.24	19.38
15/03/2011	00h 42m 14.01s	+03° 21' 17.3"	4,948388	5,8906620									



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
09/04/2011	01h 04m 27.66s	+05° 41' 41.7"	4.948533	5.9491048	49,48	2.1	33.1	31.0	-2	0.4	5.42	12.05	18.28
10/04/2011	01h 05m 21.55s	+05° 47' 14.6"	4.948547	5.9488166	49,47	2.7	33.1	31.0	-2	0.6	5.39	12.02	18.25
11/04/2011	01h 06m 15.44s	+05° 52' 46.9"	4.948561	5.9483270	49,47	3.4	33.1	31.0	-2	0.7	5.35	11.59	18.23
12/04/2011	01h 07m 09.32s	+05° 58' 18.5"	4.948576	5.9476368	49,46	4.1	33.1	31.0	-2	0.8	5.32	11.56	18.20
13/04/2011	01h 08m 03.19s	+06° 03' 49.4"	4.948591	5.9467465	49,46	4.9	33.1	31.0	-2	1.0	5.29	11.53	18.17
14/04/2011	01h 08m 57.04s	+06° 09' 19.5"	4.948607	5.9456569	49,45	5.6	33.1	31.0	-2	1.1	5.25	11.50	18.14
15/04/2011	01h 09m 50.86s	+06° 14' 48.8"	4.948623	5.9443687	49,44	6.3	33.1	31.0	-2	1.3	5.22	11.47	18.12
16/04/2011	01h 10m 44.67s	+06° 20' 17.4"	4.948640	5.9428825	49,43	7.0	33.1	31.0	-2	1.4	5.19	11.44	18.09
17/04/2011	01h 11m 38.45s	+06° 25' 45.1"	4.948658	5.9411992	49,41	7.8	33.1	31.0	-2	1.6	5.15	11.41	18.06
18/04/2011	01h 12m 32.20s	+06° 31' 12.0"	4.948676	5.9393191	49,40	8.5	33.2	31.0	-2	1.7	5.12	11.38	18.04
19/04/2011	01h 13m 25.93s	+06° 36' 38.0"	4.948695	5.9372427	49,38	9.2	33.2	31.0	-2	1.9	5.08	11.35	18.01
20/04/2011	01h 14m 19.63s	+06° 42' 03.2"	4.948715	5.9349705	49,36	10.0	33.2	31.0	-2	2.0	5.05	11.32	17.58
21/04/2011	01h 15m 13.29s	+06° 47' 27.4"	4.948735	5.9325026	49,34	10.7	33.2	31.0	-2	2.2	5.02	11.29	17.56
22/04/2011	01h 16m 06.91s	+06° 52' 50.8"	4.948755	5.9298393	49,32	11.4	33.2	31.1	-2	2.3	4.58	11.25	17.53
23/04/2011	01h 17m 00.48s	+06° 58' 13.2"	4.948776	5.9269807	49,29	12.2	33.2	31.1	-2	2.5	4.55	11.22	17.50
24/04/2011	01h 17m 54.01s	+07° 03' 34.5"	4.948788	5.9239271	49,27	12.9	33.2	31.1	-2	2.6	4.52	11.19	17.47
25/04/2011	01h 18m 47.47s	+07° 08' 54.9"	4.948821	5.9206787	49,24	13.6	33.3	31.1	-2	2.7	4.48	11.16	17.45
26/04/2011	01h 19m 40.88s	+07° 14' 14.1"	4.948844	5.9172358	49,21	14.4	33.3	31.1	-2	2.9	4.45	11.13	17.42
27/04/2011	01h 20m 34.22s	+07° 19' 32.3"	4.948867	5.9135988	49,18	15.1	33.3	31.1	-2	3.0	4.41	11.10	17.39
28/04/2011	01h 21m 27.49s	+07° 24' 49.2"	4.948891	5.9097681	49,15	15.8	33.3	31.2	-2	3.2	4.38	11.07	17.36
29/04/2011	01h 22m 20.68s	+07° 30' 05.0"	4.948916	5.9057443	49,12	16.6	33.3	31.2	-2	3.3	4.35	11.04	17.34
30/04/2011	01h 23m 13.80s	+07° 35' 19.7"	4.948941	5.9015278	49,08	17.3	33.4	31.2	-2	3.5	4.31	11.01	17.31
01/05/2011	01h 24m 06.84s	+07° 40' 33.1"	4.948967	5.8971195	49,04	18.0	33.4	31.2	-2	3.6	4.28	10.58	17.28
02/05/2011	01h 24m 59.79s	+07° 45' 45.2"	4.948994	5.8925198	49,01	18.8	33.4	31.3	-2	3.8	4.25	10.55	17.26
03/05/2011	01h 25m 52.66s	+07° 50' 56.0"	4.949021	5.8877297	48,97	19.5	33.4	31.3	-2	3.9	4.21	10.52	17.23
04/05/2011	01h 26m 45.42s	+07° 56' 05.6"	4.949049	5.8827501	48,93	20.2	33.5	31.3	-2	4.0	4.18	10.49	17.20
05/05/2011	01h 27m 38.09s	+08° 01' 13.8"	4.949077	5.8775818	48,88	21.0	33.5	31.3	-2,1	4.2	4.14	10.46	17.17
06/05/2011	01h 28m 30.65s	+08° 06' 20.7"	4.949106	5.8722259	48,84	21.7	33.5	31.4	-2,1	4.3	4.11	10.43	17.15
07/05/2011	01h 29m 23.11s	+08° 11' 26.1"	4.949135	5.8666836	48,79	22.4	33.6	31.4	-2,1	4.5	4.08	10.40	17.12
08/05/2011	01h 30m 15.44s	+08° 16' 30.1"	4.949165	5.8609559	48,74	23.2	33.6	31.4	-2,1	4.6	4.04	10.37	17.09
09/05/2011	01h 31m 07.65s	+08° 21' 32.7"	4.949196	5.8550443	48,69	23.9	33.6	31.5	-2,1	4.7	4.01	10.34	17.06
10/05/2011	01h 31m 59.73s	+08° 26' 33.7"	4.949227	5.8489499	48,64	24.6	33.7	31.5	-2,1	4.9	3.58	10.30	17.04
11/05/2011	01h 32m 51.67s	+08° 31' 33.2"	4.949259	5.8426743	48,59	25.4	33.7	31.5	-2,1	5.0	3.54	10.27	17.01
12/05/2011	01h 33m 43.48s	+08° 36' 31.1"	4.949292	5.8362187	48,54	26.1	33.7	31.6	-2,1	5.2	3.51	10.24	16.58
13/05/2011	01h 34m 35.14s	+08° 41' 27.5"	4.949325	5.8295847	48,48	26.9	33.8	31.6	-2,1	5.3	3.47	10.21	16.55
14/05/2011	01h 35m 26.66s	+08° 46' 22.2"	4.949358	5.8227736	48,43	27.6	33.8	31.7	-2,1	5.4	3.44	10.18	16.52
15/05/2011	01h 36m 18.03s	+08° 51' 15.4"	4.949392	5.8157866	48,37	28.3	33.9	31.7	-2,1	5.6	3.41	10.15	16.50
16/05/2011	01h 37m 09.25s	+08° 56' 06.8"	4.949427	5.8086251	48,31	29.1	33.9	31.7	-2,1	5.7	3.37	10.12	16.47
17/05/2011	01h 38m 00.32s	+09° 00' 56.7"	4.949463	5.8012902	48,25	29.8	33.9	31.7	-2,1	5.8	3.34	10.09	16.44
18/05/2011	01h 38m 51.23s	+09° 05' 44.9"	4.949499	5.7937829	48,19	30.5	34.0	31.8	-2,1	6.0	3.31	10.06	16.41
19/05/2011	01h 39m 41.98s	+09° 10' 31.5"	4.949535	5.7861042	48,12	31.3	34.0	31.8	-2,1	6.1	3.27	10.03	16.39
20/05/2011	01h 40m 32.57s	+09° 15' 16.3"	4.949572	5.7782550	48,06	32.0	34.1	31.9	-2,1	6.2	3.24	10.00	16.36
21/05/2011	01h 41m 22.97s	+09° 19' 59.4"	4.949610	5.7702361	47,99	32.8	34.1	31.9	-2,1	6.4	3.20	9.57	16.33
22/05/2011	01h 42m 13.20s	+09° 24' 40.6"	4.949648	5.7620485	47,92	33.5	34.2	32.0	-2,1	6.5	3.17	9.53	16.30
23/05/2011	01h 43m 03.25s	+09° 29' 20.1"	4.949687	5.7536931	47,85	34.2	34.2	32.0	-2,1	6.6	3.14	9.50	16.27
24/05/2011	01h 43m 53.10s	+09° 33' 57.7"	4.949727	5.7451710	47,78	35.0	34.3	32.1	-2,1	6.7	3.10	9.47	16.24
25/05/2011	01h 44m 42.76s	+09° 38' 33.5"	4.949767	5.7364830	47,71	35.7	34.3	32.1	-2,1	6.9	3.07	9.44	16.22
26/05/2011	01h 45m 32.22s	+09° 43' 07.3"	4.949807	5.7276305	47,63	36.5	34.4	32.2	-2,1	7.0	3.03	9.41	16.19
27/05/2011	01h 46m 21.47s	+09° 47' 39.3"	4.949849	5.7186146	47,56	37.2	34.4	32.2	-2,1	7.1	3.00	9.38	16.16
28/05/2011	01h 47m 10.51s	+09° 52' 09.3"	4.949891	5.7094366	47,48	38.0	34.5	32.3	-2,1	7.2	2.57	9.35	16.13
29/05/2011	01h 47m 59.34s	+09° 56' 37.3"	4.949933	5.7000977	47,41	38.7	34.5	32.3	-2,1	7.4	2.53	9.32	16.10
30/05/2011	01h 48m 47.96s	+10° 01' 03.3"	4.949976	5.6905995	47,33	39.4	34.6	32.4	-2,1	7.5	2.50	9.29	16.07
31/05/2011	01h 49m 36.34s	+10° 05' 27.3"	4.950020	5.6809434	47,25	40.2	34.7	32.4	-2,1	7.6	2.46	9.25	16.05
01/06/2011	01h 50m 24.50s	+10° 09' 49.3"	4.950064	5.6711310	47,17	40.9	34.7	32.5	-2,1	7.7	2.43	9.22	16.02
02/06/2011	01h 51m 12.42s	+10° 14' 09.2"	4.950109	5.6611640	47,08	41.7	34.8	32.5	-2,1	7.8	2.40	9.19	15.59
03/06/2011	01h 52m 00.09s	+10° 18' 27.1"	4.950154	5.6510440	47,00	42.4	34.8	32.6	-2,1	7.9	2.36	9.16	15.56
04/06/2011	01h 52m 47.51s	+10° 22' 42.8"	4.950200	5.6407730	46,91	43.2	34.9	32.6	-2,1	8.1	2.33	9.13	15.53
05/06/2011	01h 53m 34.68s	+10° 26' 56.3"	4.950246	5.6303528	46,83	43.9	35.0	32.7	-2,1	8.2	2.29	9.10	15.50
06/06/2011	01h 54m 21.57s	+10° 31' 07.7"	4.950294	5.6197855	46,74	44.7	35.0	32.8	-2,1	8.3	2.26	9.07	15.47
07/06/2011	01h 55m 08.20s	+10° 35' 16.8"	4.950341	5.6090731	46,65	45.5	35.1	32.8	-2,1	8.4	2.23	9.03	15.44
08/06/2011	01h 55m 54.54s	+10° 39' 23.7"	4.950390	5.5982177	46,56	46.2	35.2	32.9	-2,1	8.5	2.19	9.00	15.41
09/06/2011	01h 56m 40.61s	+10° 43' 28.4"	4.950438	5.5872214	46,47	47.0	35.2	33.0	-2,1	8.6	2.16	8.57	15.39
10/06/2011	01h 57m 26.38s	+10° 47' 30.7"	4.950488	5.5760863	46,37	47.7	35.3	33.0	-2,1	8.7	2.12	8.54	15.36
11/06/2011	01h 58m 11.87s	+10° 51' 30.8"	4.950538	5.5648145	46,28	48.5	35.4	33.1	-2,1	8.8	2.09	8.51	15.33
12/06/2011	01h 58m 57.06s	+10° 55' 28.5"	4.950589	5.5534080	46,19	49.2	35.5	33.2	-2,1	8.9	2.05	8.48	15.30
13/06/2011	01h 59m 41.96s	+10° 59' 24.0"	4.950640	5.5418686	46,09	50.0	35.5	33.2	-2,2	9.0	2.02	8.44	15.27
14/06/2011	02h 00m 26.55s	+11° 03' 17.1"	4.950692	5.5301982	45,99	50.8	35.6	33.3	-2,2	9.1	1.59	8.41	15.24
15/06/2011	02h 01m 10.84s	+11° 07' 07.9"	4.950744	5.5183985	45,89	51.5	35.7	33.4	-2,2	9.2	1.55	8.38	15.21
16/06/2011	02h 01m 54.81s	+11° 10' 56.3"	4.950797	5.5064713	45,80	52.3	35.8	33.4	-2,2	9.3	1.52	8.35	15.18
17/06/2011	02h 02m 38.45s	+11° 14' 42.4"	4.950850	5.4944181	45,70	53.1	35.8	33.5	-2,2	9.4	1.48	8.32	15.15
18/06/2011	02h 03m 21.77s	+11° 18' 26.0"	4.950905	5.4822406	45,59	53.8	35.9	33.6	-2,2	9.5	1.45	8.28	15.12
19/06/2011	02h 04m 04.75s	+11° 22' 07.2"	4.950959	5.4699404	45,49	54.6	36.0	33.7	-2,2	9.6	1.41	8.25	15.09
20/06/2011	02h 04m 47.39s	+11° 25' 45.9"	4.951015	5.4575192	45,39	55.4	36.1	33.7	-2,2	9.7	1.38	8.22	15.06
21/06/2011	02h 05m 29.68s	+11° 29' 22.0"	4.951070	5.4449788	45,28	56.1	36.2	33.8	-2,2	9.8	1.34	8.19	15.03
22/06/2011	02h 06m 11.62s	+11° 32' 55.6"	4.951127	5.4323209	45,18	56.9	36.2	33					

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
22/07/2011	02h 23m 50.68s	+12° 58' 18.8"	4.953092	5.0098526	41.67	81,0	39,3	36,8	-2,4	11,7	23,41	6,35	13,25
23/07/2011	02h 24m 18.20s	+13° 00' 23.2"	4.953166	4.9947878	41,54	81,8	39,4	36,9	-2,4	11,7	23,38	6,31	13,22
24/07/2011	02h 24m 45.15s	+13° 02' 24.5"	4.953241	4.9796893	41,41	82,6	39,5	37,0	-2,4	11,7	23,34	6,28	13,18
25/07/2011	02h 25m 11.50s	+13° 04' 22.6"	4.953317	4.9645601	41,29	83,5	39,7	37,1	-2,4	11,8	23,31	6,24	13,15
26/07/2011	02h 25m 37.27s	+13° 06' 17.4"	4.953393	4.9494036	41,16	84,3	39,8	37,2	-2,4	11,8	23,27	6,21	13,11
27/07/2011	02h 26m 02.43s	+13° 08' 09.0"	4.953470	4.9342231	41,04	85,2	39,9	37,3	-2,4	11,8	23,23	6,17	13,08
28/07/2011	02h 26m 26.99s	+13° 09' 57.3"	4.953548	4.9190221	40,91	86,0	40,0	37,4	-2,4	11,8	23,20	6,14	13,05
29/07/2011	02h 26m 50.92s	+13° 11' 42.3"	4.953626	4.9038042	40,78	86,9	40,2	37,6	-2,4	11,8	23,16	6,10	13,01
30/07/2011	02h 27m 14.23s	+13° 13' 24.0"	4.953704	4.8885731	40,66	87,7	40,3	37,7	-2,4	11,8	23,12	6,07	12,58
31/07/2011	02h 27m 36.89s	+13° 15' 02.3"	4.953783	4.8733326	40,53	88,6	40,4	37,8	-2,4	11,8	23,09	6,03	12,54
01/08/2011	02h 27m 58.91s	+13° 16' 37.2"	4.953863	4.8580865	40,40	89,5	40,5	37,9	-2,4	11,8	23,05	6,00	12,51
02/08/2011	02h 28m 20.28s	+13° 18' 08.6"	4.953943	4.8428389	40,28	90,3	40,7	38,0	-2,4	11,8	23,01	5,56	12,47
03/08/2011	02h 28m 40.99s	+13° 19' 36.7"	4.954024	4.8275938	40,15	91,2	40,8	38,1	-2,4	11,8	22,58	5,53	12,44
04/08/2011	02h 29m 01.04s	+13° 21' 01.3"	4.954105	4.8123550	40,02	92,1	40,9	38,3	-2,5	11,8	22,54	5,49	12,40
05/08/2011	02h 29m 20.43s	+13° 22' 22.5"	4.954187	4.7971265	39,90	93,0	41,0	38,4	-2,5	11,8	22,50	5,45	12,37
06/08/2011	02h 29m 39.14s	+13° 23' 40.3"	4.954270	4.7819122	39,77	93,8	41,2	38,5	-2,5	11,8	22,47	5,42	12,33
07/08/2011	02h 29m 57.18s	+13° 24' 54.6"	4.954353	4.7667157	39,64	94,7	41,3	38,6	-2,5	11,8	22,43	5,38	12,30
08/08/2011	02h 30m 14.54s	+13° 26' 05.4"	4.954437	4.7515409	39,52	95,6	41,4	38,8	-2,5	11,8	22,39	5,34	12,26
09/08/2011	02h 30m 31.21s	+13° 27' 12.8"	4.954521	4.7363913	39,39	96,5	41,6	38,9	-2,5	11,7	22,35	5,31	12,22
10/08/2011	02h 30m 47.18s	+13° 28' 16.8"	4.954606	4.7212704	39,27	97,4	41,7	39,0	-2,5	11,7	22,32	5,27	12,19
11/08/2011	02h 31m 02.46s	+13° 29' 17.2"	4.954692	4.7061820	39,14	98,3	41,8	39,1	-2,5	11,7	22,28	5,23	12,15
12/08/2011	02h 31m 17.02s	+13° 30' 14.1"	4.954778	4.6911295	39,01	99,2	42,0	39,3	-2,5	11,6	22,24	5,20	12,12
13/08/2011	02h 31m 30.88s	+13° 31' 07.5"	4.954864	4.6761165	38,89	100,1	42,1	39,4	-2,5	11,6	22,20	5,16	12,08
14/08/2011	02h 31m 44.01s	+13° 31' 57.3"	4.954951	4.6611466	38,77	101,0	42,2	39,5	-2,5	11,6	22,17	5,12	12,04
15/08/2011	02h 31m 56.42s	+13° 32' 43.5"	4.955039	4.6462234	38,64	101,9	42,4	39,6	-2,5	11,5	22,13	5,09	12,01
16/08/2011	02h 32m 08.10s	+13° 33' 26.2"	4.955127	4.6313508	38,52	102,8	42,5	39,8	-2,5	11,5	22,09	5,05	11,57
17/08/2011	02h 32m 19.05s	+13° 34' 05.2"	4.955216	4.6165325	38,39	103,7	42,7	39,9	-2,5	11,5	22,05	5,01	11,53
18/08/2011	02h 32m 29.25s	+13° 34' 40.6"	4.955306	4.6017724	38,27	104,6	42,8	40,0	-2,5	11,4	22,01	4,57	11,49
19/08/2011	02h 32m 38.72s	+13° 35' 12.4"	4.955396	4.5870745	38,15	105,6	42,9	40,1	-2,6	11,3	21,58	4,54	11,46
20/08/2011	02h 32m 47.43s	+13° 35' 40.6"	4.955487	4.5724427	38,03	106,5	43,1	40,3	-2,6	11,3	21,54	4,50	11,42
21/08/2011	02h 32m 55.40s	+13° 36' 05.1"	4.955578	4.5578812	37,91	107,4	43,2	40,4	-2,6	11,2	21,50	4,46	11,38
22/08/2011	02h 33m 02.60s	+13° 36' 26.0"	4.955669	4.5433943	37,79	108,3	43,3	40,5	-2,6	11,2	21,46	4,42	11,34
23/08/2011	02h 33m 09.05s	+13° 36' 43.2"	4.955762	4.5289862	37,67	109,3	43,5	40,7	-2,6	11,1	21,42	4,38	11,31
24/08/2011	02h 33m 14.72s	+13° 36' 56.8"	4.955855	4.5146612	37,55	110,2	43,6	40,8	-2,6	11,0	21,38	4,34	11,27
25/08/2011	02h 33m 19.63s	+13° 37' 06.6"	4.955948	4.5004240	37,43	111,2	43,8	40,9	-2,6	11,0	21,34	4,31	11,23
26/08/2011	02h 33m 23.75s	+13° 37' 12.8"	4.956042	4.4862789	37,31	112,1	43,9	41,0	-2,6	10,9	21,31	4,27	11,19
27/08/2011	02h 33m 27.09s	+13° 37' 15.3"	4.956137	4.4722309	37,19	113,1	44,0	41,2	-2,6	10,8	21,27	4,23	11,15
28/08/2011	02h 33m 29.64s	+13° 37' 14.1"	4.956232	4.4582845	37,08	114,0	44,2	41,3	-2,6	10,7	21,23	4,19	11,11
29/08/2011	02h 33m 31.40s	+13° 37' 09.2"	4.956328	4.4444446	36,96	115,0	44,3	41,4	-2,6	10,6	21,19	4,15	11,07
30/08/2011	02h 33m 32.37s	+13° 37' 00.5"	4.956424	4.4307161	36,85	115,9	44,4	41,6	-2,6	10,6	21,15	4,11	11,03
31/08/2011	02h 33m 32.55s	+13° 36' 48.1"	4.956521	4.4171038	36,74	116,9	44,6	41,7	-2,6	10,5	21,11	4,07	10,59
01/09/2011	02h 33m 31.94s	+13° 36' 31.9"	4.956619	4.4036126	36,62	117,9	44,7	41,8	-2,6	10,4	21,07	4,03	10,55
02/09/2011	02h 33m 30.55s	+13° 36' 12.2"	4.956717	4.3902471	36,51	118,9	44,8	41,9	-2,7	10,3	21,03	3,59	10,52
03/09/2011	02h 33m 28.37s	+13° 35' 48.7"	4.956815	4.3770119	36,40	119,8	45,0	42,1	-2,7	10,2	20,59	3,55	10,48
04/09/2011	02h 33m 25.41s	+13° 35' 21.6"	4.956914	4.3639114	36,29	120,8	45,1	42,2	-2,7	10,1	20,55	3,51	10,43
05/09/2011	02h 33m 21.67s	+13° 34' 50.9"	4.957014	4.3509500	36,19	121,8	45,3	42,3	-2,7	10,0	20,51	3,47	10,39
06/09/2011	02h 33m 17.15s	+13° 34' 16.5"	4.957114	4.3381320	36,08	122,8	45,4	42,4	-2,7	9,8	20,47	3,43	10,35
07/09/2011	02h 33m 11.84s	+13° 33' 38.5"	4.957215	4.3254615	35,97	123,8	45,5	42,6	-2,7	9,7	20,43	3,39	10,31
08/09/2011	02h 33m 05.75s	+13° 32' 56.9"	4.957317	4.3129427	35,87	124,8	45,7	42,7	-2,7	9,6	20,39	3,35	10,27
09/09/2011	02h 32m 58.89s	+13° 32' 11.7"	4.957419	4.3005799	35,77	125,8	45,8	42,8	-2,7	9,5	20,35	3,31	10,23
10/09/2011	02h 32m 51.24s	+13° 31' 22.9"	4.957521	4.2883771	35,67	126,8	45,9	42,9	-2,7	9,4	20,31	3,27	10,19
11/09/2011	02h 32m 42.83s	+13° 30' 30.5"	4.957624	4.2763384	35,56	127,8	46,0	43,1	-2,7	9,2	20,27	3,23	10,15
12/09/2011	02h 32m 33.65s	+13° 29' 34.5"	4.957728	4.2644682	35,47	128,8	46,2	43,2	-2,7	9,1	20,23	3,19	10,11
13/09/2011	02h 32m 23.70s	+13° 28' 35.0"	4.957832	4.2527704	35,37	129,8	46,3	43,3	-2,7	9,0	20,19	3,15	10,07
14/09/2011	02h 32m 13.00s	+13° 27' 31.9"	4.957937	4.2412495	35,27	130,8	46,4	43,4	-2,7	8,8	20,15	3,11	10,02
15/09/2011	02h 32m 01.54s	+13° 26' 25.3"	4.958043	4.2299096	35,18	131,9	46,5	43,5	-2,7	8,7	20,11	3,07	9,58
16/09/2011	02h 31m 49.33s	+13° 25' 15.3"	4.958149	4.2187550	35,09	132,9	46,7	43,6	-2,8	8,5	20,07	3,03	9,54
17/09/2011	02h 31m 36.38s	+13° 24' 01.8"	4.958255	4.2077901	34,99	133,9	46,8	43,8	-2,8	8,4	20,03	2,58	9,50
18/09/2011	02h 31m 22.70s	+13° 22' 44.9"	4.958362	4.1970192	34,91	135,0	46,9	43,9	-2,8	8,2	19,59	2,54	9,46
19/09/2011	02h 31m 08.28s	+13° 21' 24.6"	4.958470	4.1864466	34,82	136,0	47,0	44,0	-2,8	8,1	19,55	2,50	9,41
20/09/2011	02h 30m 53.14s	+13° 20' 01.0"	4.958578	4.1760769	34,73	137,0	47,1	44,1	-2,8	7,9	19,51	2,46	9,37
21/09/2011	02h 30m 37.27s	+13° 18' 34.0"	4.958687	4.1659144	34,65	138,1	47,3	44,2	-2,8	7,8	19,47	2,42	9,33
22/09/2011	02h 30m 20.70s	+13° 17' 03.8"	4.958796	4.1559636	34,56	139,1	47,4	44,3	-2,8	7,6	19,42	2,38	9,28
23/09/2011	02h 30m 03.43s	+13° 15' 30.4"	4.958906	4.1462290	34,48	140,2	47,5	44,4	-2,8	7,4	19,38	2,33	9,24
24/09/2011	02h 29m 45.45s	+13° 13' 53.7"	4.959017	4.1367150	34,40	141,2	47,6	44,5	-2,8	7,3	19,34	2,29	9,20
25/09/2011	02h 29m 26.80s	+13° 12' 13.9"	4.959128	4.1274263	34,33	142,3	47,7	44,6	-2,8	7,1	19,30	2,25	9,15
26/09/2011	02h 29m 07.47s	+13° 10' 30.9"	4.959240	4.1183674	34,25	143,4	47,8	44,7	-2,8	6,9	19,26	2,21	9,11
27/09/2011	02h 28m 47.47s	+13° 08' 44.9"	4.959352	4.1095426	34,18	144,4	47,9	44,8	-2,8	6,8	19,22	2,16	9,07
28/09/2011	02h 28m 26.84s	+13° 06' 55.9"	4.959465	4.1009563	34,11	145,5	48,0	44,9	-2,8	6,6	19,18	2,12	9,02
29/09/2011	02h 28m 05.57s	+13° 05' 03.9"	4.959578	4.0926126	34,04	146,6	48,1	45,0	-2,8	6,4	19,13	2,08	8,58
30/09/2011	02h 27m 43.69s	+13° 03' 09.2"	4.959692	4.0845156	33,97	147,6	48,2	45,1	-2,8	6,2	19,09	2,03	8,53
01/10/2011	02h 27m 21.22s	+13° 01' 11.7"	4.959806	4.0766690	33,90	148,7	48,3	45,2	-2,8	6,0	19,05	1,59	8,49
02/10/2011	02h 26m 58.16s	+12° 59' 11.4"	4.959921	4.0690763	33,84	149,8	48,4	45,3	-2,8	5,8	19,01	1,55	8,44
03/10/2011	02h 26m 34.54s	+12° 57' 08.6"	4.960037	4.0617409	33,78	150,9	4						

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
03/11/2011	02h 11m 25.21s	+11° 40' 16.4"	4,963895	3,9757745	33,07	174,2	49,5	46,3	-2,9	1,2	16.45	23.29	6.18
04/11/2011	02h 10m 54.09s	+11° 37' 41.1"	4,964029	3,9778610	33,08	173,1	49,5	46,3	-2,9	1,4	16.40	23.25	6.14
05/11/2011	02h 10m 23.12s	+11° 35' 06.8"	4,964162	3,9802552	33,10	172,0	49,5	46,3	-2,9	1,6	16.36	23.20	6.09
06/11/2011	02h 09m 52.34s	+11° 32' 33.6"	4,964297	3,9829560	33,13	170,9	49,4	46,2	-2,9	1,8	16.32	23.16	6.04
07/11/2011	02h 09m 21.76s	+11° 30' 01.6"	4,964432	3,9859621	33,15	169,7	49,4	46,2	-2,9	2,0	16.27	23.11	6.00
08/11/2011	02h 08m 51.40s	+11° 27' 30.9"	4,964567	3,9892722	33,18	168,6	49,4	46,2	-2,9	2,3	16.23	23.07	5.55
09/11/2011	02h 08m 21.29s	+11° 25' 01.6"	4,964703	3,9928851	33,21	167,5	49,3	46,1	-2,9	2,5	16.19	23.02	5.51
10/11/2011	02h 07m 51.46s	+11° 22' 34.0"	4,964840	3,9967991	33,24	166,4	49,3	46,1	-2,9	2,7	16.15	22.58	5.46
11/11/2011	02h 07m 21.91s	+11° 20' 08.0"	4,964977	4,0010128	33,28	165,2	49,2	46,0	-2,9	2,9	16.10	22.54	5.41
12/11/2011	02h 06m 52.68s	+11° 17' 43.8"	4,965115	4,0055244	33,31	164,1	49,2	46,0	-2,9	3,1	16.06	22.49	5.37
13/11/2011	02h 06m 23.79s	+11° 15' 21.6"	4,965253	4,0103323	33,35	163,0	49,1	45,9	-2,9	3,3	16.02	22.45	5.32
14/11/2011	02h 05m 55.25s	+11° 13' 01.4"	4,965392	4,0154346	33,40	161,9	49,0	45,9	-2,9	3,6	15.58	22.40	5.28
15/11/2011	02h 05m 27.09s	+11° 10' 43.4"	4,965531	4,0208295	33,44	160,7	49,0	45,8	-2,9	3,8	15.53	22.36	5.23
16/11/2011	02h 04m 59.32s	+11° 08' 27.6"	4,965671	4,0265150	33,49	159,6	48,9	45,7	-2,9	4,0	15.49	22.32	5.19
17/11/2011	02h 04m 31.96s	+11° 06' 14.1"	4,965811	4,0324891	33,54	158,5	48,8	45,7	-2,9	4,2	15.45	22.27	5.14
18/11/2011	02h 04m 05.03s	+11° 04' 03.2"	4,965952	4,0387495	33,59	157,4	48,8	45,6	-2,9	4,4	15.41	22.23	5.10
19/11/2011	02h 03m 38.55s	+11° 01' 54.8"	4,966094	4,0452942	33,64	156,3	48,7	45,5	-2,9	4,6	15.36	22.19	5.05
20/11/2011	02h 03m 12.55s	+10° 59' 49.0"	4,966236	4,0521206	33,70	155,1	48,6	45,4	-2,9	4,8	15.32	22.14	5.01
21/11/2011	02h 02m 47.03s	+10° 57' 46.1"	4,966378	4,0592264	33,76	154,0	48,5	45,4	-2,9	5,0	15.28	22.10	4.56
22/11/2011	02h 02m 22.02s	+10° 55' 46.0"	4,966522	4,0666088	33,82	152,9	48,4	45,3	-2,8	5,2	15.24	22.05	4.52
23/11/2011	02h 01m 57.55s	+10° 53' 49.0"	4,966665	4,0742650	33,88	151,8	48,3	45,2	-2,8	5,4	15.20	22.01	4.47
24/11/2011	02h 01m 33.63s	+10° 51' 55.0"	4,966809	4,0821919	33,95	150,7	48,2	45,1	-2,8	5,6	15.15	21.57	4.43
25/11/2011	02h 01m 10.28s	+10° 50' 04.3"	4,966954	4,0903861	34,02	149,6	48,1	45,0	-2,8	5,8	15.11	21.53	4.38
26/11/2011	02h 00m 47.51s	+10° 48' 17.0"	4,967099	4,0988441	34,09	148,5	48,0	44,9	-2,8	6,0	15.07	21.48	4.34
27/11/2011	02h 00m 25.35s	+10° 46' 33.0"	4,967245	4,1075621	34,16	147,4	47,9	44,8	-2,8	6,2	15.03	21.44	4.29
28/11/2011	02h 00m 03.79s	+10° 44' 52.5"	4,967392	4,1165359	34,24	146,3	47,8	44,7	-2,8	6,3	14.59	21.40	4.25
29/11/2011	01h 59m 42.87s	+10° 43' 15.5"	4,967539	4,1257616	34,31	145,2	47,7	44,6	-2,8	6,5	14.54	21.35	4.21
30/11/2011	01h 59m 22.59s	+10° 41' 42.2"	4,967686	4,1352349	34,39	144,1	47,6	44,5	-2,8	6,7	14.50	21.31	4.16
01/12/2011	01h 59m 02.95s	+10° 40' 12.5"	4,967834	4,1449515	34,47	143,0	47,5	44,4	-2,8	6,9	14.46	21.27	4.12
02/12/2011	01h 58m 43.99s	+10° 38' 46.6"	4,967982	4,1549071	34,56	141,9	47,4	44,3	-2,8	7,0	14.42	21.23	4.08
03/12/2011	01h 58m 25.70s	+10° 37' 24.4"	4,968132	4,1650974	34,64	140,8	47,3	44,2	-2,8	7,2	14.38	21.18	4.03
04/12/2011	01h 58m 08.10s	+10° 36' 06.1"	4,968281	4,1755180	34,73	139,7	47,2	44,1	-2,8	7,4	14.34	21.14	3.99
05/12/2011	01h 57m 51.21s	+10° 34' 51.8"	4,968431	4,1861647	34,82	138,6	47,0	44,0	-2,8	7,5	14.30	21.10	3.95
06/12/2011	01h 57m 35.02s	+10° 33' 41.4"	4,968582	4,1970329	34,91	137,5	46,9	43,9	-2,8	7,7	14.25	21.06	3.90
07/12/2011	01h 57m 19.55s	+10° 32' 35.0"	4,968733	4,2081184	35,00	136,4	46,8	43,8	-2,8	7,9	14.21	21.02	3.86
08/12/2011	01h 57m 04.81s	+10° 31' 32.8"	4,968885	4,2194168	35,09	135,4	46,7	43,6	-2,8	8,0	14.17	20.57	3.82
09/12/2011	01h 56m 50.80s	+10° 30' 34.6"	4,969037	4,2309236	35,19	134,3	46,5	43,5	-2,7	8,2	14.13	20.53	3.78
10/12/2011	01h 56m 37.54s	+10° 29' 40.6"	4,969190	4,2426345	35,29	133,2	46,4	43,4	-2,7	8,3	14.09	20.49	3.74
11/12/2011	01h 56m 25.02s	+10° 28' 50.9"	4,969343	4,2545452	35,38	132,2	46,3	43,3	-2,7	8,4	14.05	20.45	3.69
12/12/2011	01h 56m 13.25s	+10° 28' 05.3"	4,969497	4,2666513	35,48	131,1	46,1	43,2	-2,7	8,6	14.01	20.41	3.65
13/12/2011	01h 56m 02.24s	+10° 27' 24.0"	4,969651	4,2789485	35,59	130,0	46,0	43,0	-2,7	8,7	13.57	20.37	3.61
14/12/2011	01h 55m 51.99s	+10° 26' 47.0"	4,969806	4,2914325	35,69	129,0	45,9	42,9	-2,7	8,9	13.53	20.33	3.57
15/12/2011	01h 55m 42.51s	+10° 26' 14.2"	4,969962	4,3040989	35,80	127,9	45,7	42,8	-2,7	9,0	13.49	20.29	3.53
16/12/2011	01h 55m 33.80s	+10° 25' 45.8"	4,970118	4,3169435	35,90	126,9	45,6	42,7	-2,7	9,1	13.45	20.25	3.49
17/12/2011	01h 55m 25.86s	+10° 25' 21.7"	4,970274	4,3299618	36,01	125,8	45,5	42,5	-2,7	9,2	13.41	20.21	3.45
18/12/2011	01h 55m 18.70s	+10° 25' 01.9"	4,970431	4,3431495	36,12	124,8	45,3	42,4	-2,7	9,4	13.37	20.17	3.41
19/12/2011	01h 55m 12.32s	+10° 24' 46.6"	4,970589	4,3565020	36,23	123,7	45,2	42,3	-2,7	9,5	13.33	20.12	3.37
20/12/2011	01h 55m 06.74s	+10° 24' 35.6"	4,970747	4,3700149	36,34	122,7	45,1	42,1	-2,7	9,6	13.29	20.08	3.33
21/12/2011	01h 55m 01.95s	+10° 24' 29.0"	4,970906	4,3836833	36,46	121,6	44,9	42,0	-2,7	9,7	13.25	20.04	3.29
22/12/2011	01h 54m 57.96s	+10° 24' 26.9"	4,971065	4,3975026	36,57	120,6	44,8	41,9	-2,6	9,8	13.21	20.00	3.25
23/12/2011	01h 54m 54.77s	+10° 24' 29.3"	4,971225	4,4114677	36,69	119,6	44,6	41,7	-2,6	9,9	13.17	19.57	3.21
24/12/2011	01h 54m 52.39s	+10° 24' 36.1"	4,971385	4,4255736	36,81	118,6	44,5	41,6	-2,6	10,0	13.13	19.53	3.17
25/12/2011	01h 54m 50.81s	+10° 24' 47.4"	4,971546	4,4398152	36,93	117,5	44,3	41,5	-2,6	10,1	13.09	19.49	3.13
26/12/2011	01h 54m 50.03s	+10° 25' 03.1"	4,971707	4,4541870	37,04	116,5	44,2	41,3	-2,6	10,2	13.05	19.45	3.09
27/12/2011	01h 54m 50.04s	+10° 25' 23.2"	4,971869	4,4686840	37,17	115,5	44,1	41,2	-2,6	10,3	13.01	19.41	3.05
28/12/2011	01h 54m 50.86s	+10° 25' 47.7"	4,972031	4,4833008	37,29	114,5	43,9	41,1	-2,6	10,4	12.57	19.37	3.01
29/12/2011	01h 54m 52.48s	+10° 26' 16.6"	4,972194	4,4980322	37,41	113,5	43,8	40,9	-2,6	10,5	12.53	19.33	2.97
30/12/2011	01h 54m 54.89s	+10° 26' 49.9"	4,972357	4,5128731	37,53	112,5	43,6	40,8	-2,6	10,5	12.49	19.29	2.93
31/12/2011	01h 54m 58.10s	+10° 27' 27.4"	4,972521	4,5278184	37,66	111,5	43,5	40,7	-2,6	10,6	12.45	19.25	2.89

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro equatoriale e polare in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

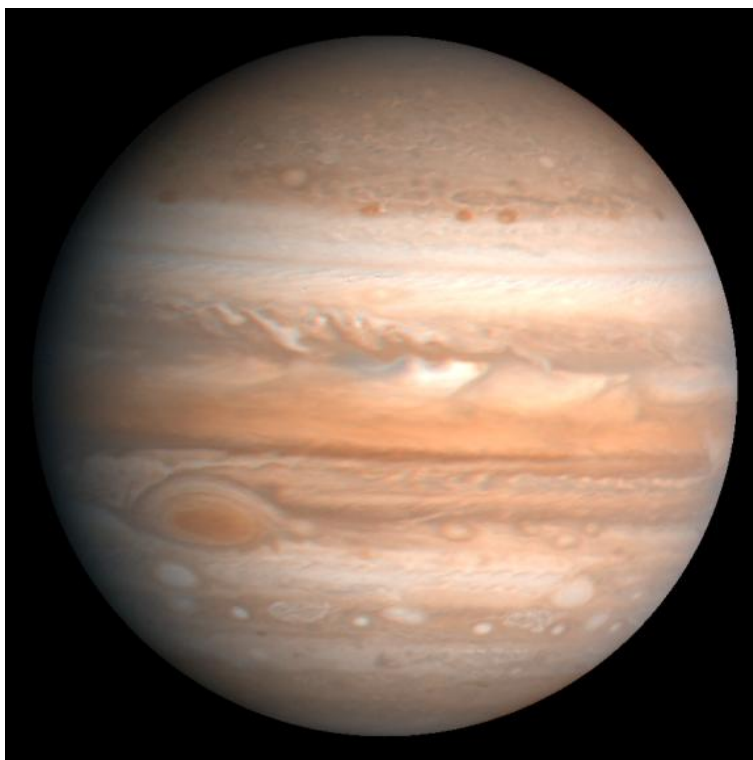
R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = equatorial and polar diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

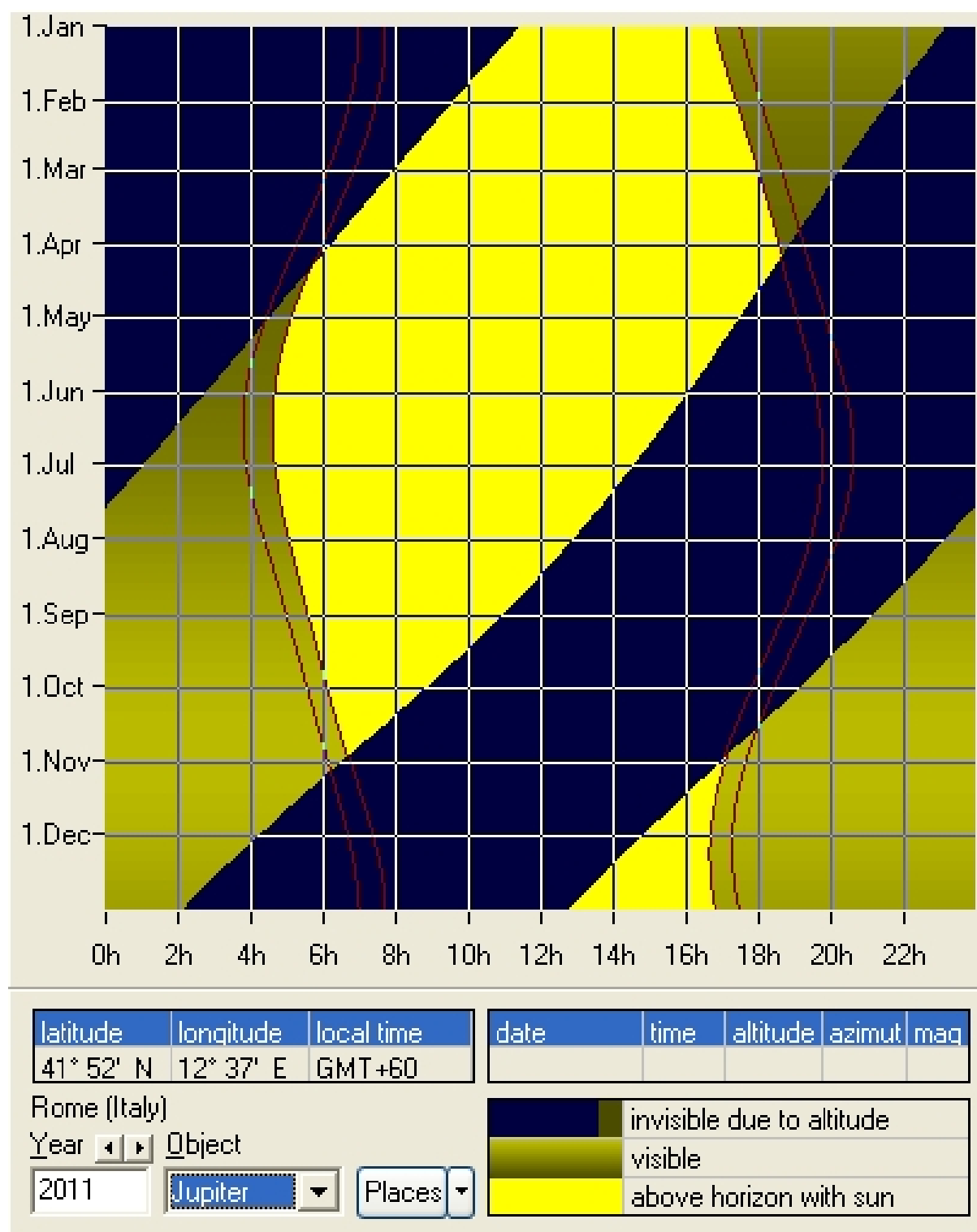
# FENOMENI DI GIOVE - PHENOMENA OF JUPITER

Perielio - Perihelion	17/03/2011	17:04:07	4,94839 AU
Afelio - Aphelion	Questo anno non avviene - No phenomenon		
Perigeo - Perigee	27/10/2011	18:44:29	3,96976 AU
Apogeo - Apogee	08/04/2011	01:44:32	5,94919 AU
Magnit. Max - Brightness maximum	28/10/2011	20:11:42	-2,9 mag
Magnit. Min - Brightness minimum	29/03/2011	04:22:17	-2,1 mag
Opposizione - Opposition	29/10/2011	01:42:02	
Congiunzione - Conjunction	06/04/2011	14:40:24	
Moto retrogr. - Retrograde motion	30/08/2011	17:29:56	
Moto diretto - Prograde motion	26/12/2011	11:26:34	
Max ang. Fase - Maximum phase angle	01/08/2011	00:37:17	11,8 °
Min ang. Fase - Minimum phase angle	06/04/2011	16:24:57	0,2 °
Min ang. Fase - Minimum phase angle	29/10/2011	01:44:12	0,3 °
Estr. lat. Terra- Extremum lat. Earth	30/09/2011	22:37:21	3,41 °

© (5)



# VISIBILITA' DI GIOVE - VISIBILITY OF JUPITER



Visibilità di Giove nel corso dell'anno - Visibility of Jupiter during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

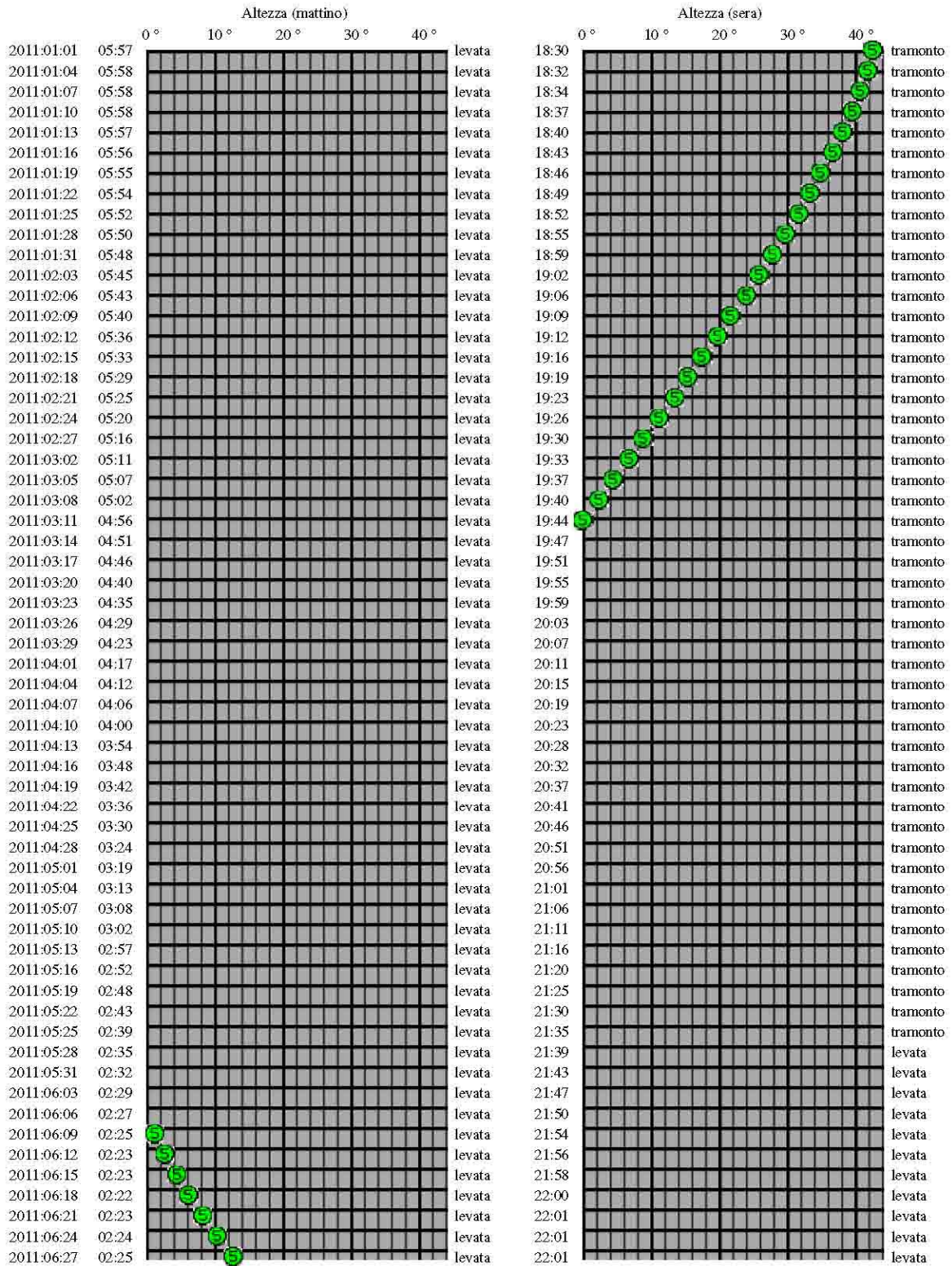


# Altezza ai crepuscoli

di Giove

nel momento in cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



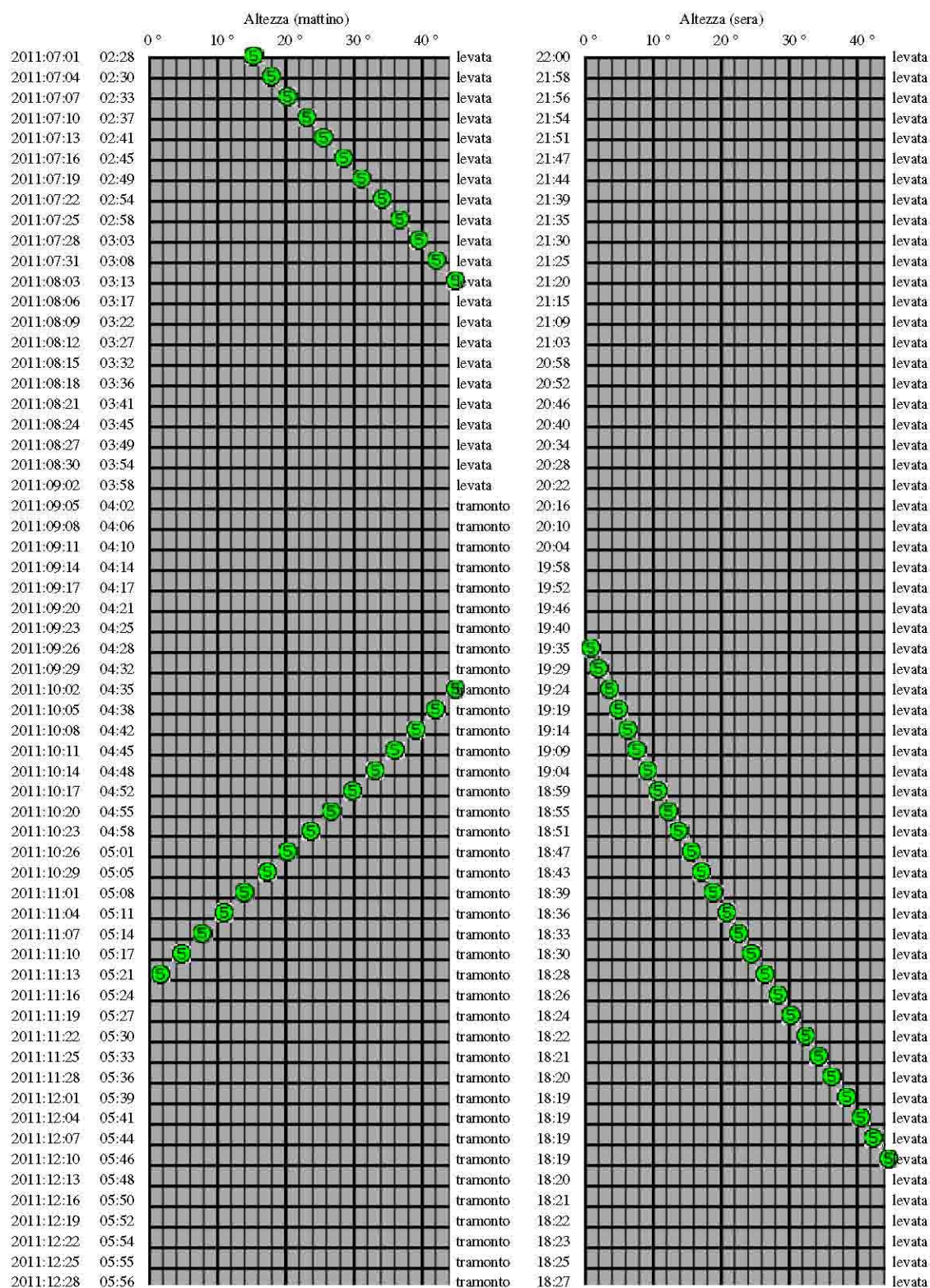


# Altezza ai crepuscoli

di Giove

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	-49.6	15.5	76.2	18:30	42.6	205.5	75.7
2011:01:04	05:58	-48.9	19.4	73.5	18:32	41.6	209.5	73.1
2011:01:07	05:58	-48.0	23.1	70.9	18:34	40.6	213.5	70.4
2011:01:10	05:58	-47.0	26.6	68.3	18:37	39.4	217.4	67.8
2011:01:13	05:57	-46.0	29.7	65.7	18:40	38.0	221.2	65.3
2011:01:16	05:56	-44.9	32.6	63.2	18:43	36.5	224.8	62.7
2011:01:19	05:55	-43.8	35.3	60.6	18:46	35.0	228.3	60.2
2011:01:22	05:54	-42.7	37.8	58.1	18:49	33.3	231.7	57.7
2011:01:25	05:52	-41.5	40.1	55.6	18:52	31.5	235.0	55.2
2011:01:28	05:50	-40.3	42.2	53.1	18:55	29.7	238.1	52.7
2011:01:31	05:48	-39.2	44.1	50.7	18:59	27.8	241.1	50.2
2011:02:03	05:45	-38.1	45.9	48.2	19:02	25.8	244.0	47.8
2011:02:06	05:43	-36.9	47.5	45.8	19:06	23.8	246.9	45.3
2011:02:09	05:40	-35.8	49.0	43.4	19:09	21.7	249.6	42.9
2011:02:12	05:36	-34.7	50.4	40.9	19:12	19.7	252.2	40.5
2011:02:15	05:33	-33.7	51.6	38.6	19:16	17.5	254.8	38.1
2011:02:18	05:29	-32.6	52.8	36.2	19:19	15.4	257.3	35.7
2011:02:21	05:25	-31.6	53.9	33.8	19:23	13.2	259.8	33.4
2011:02:24	05:20	-30.6	54.9	31.5	19:26	11.0	262.2	31.0
2011:02:27	05:16	-29.7	55.8	29.1	19:30	8.9	264.6	28.7
2011:03:02	05:11	-28.7	56.7	26.8	19:33	6.7	267.0	26.4
2011:03:05	05:07	-27.8	57.4	24.5	19:37	4.5	269.4	24.0
2011:03:08	05:02	-26.9	58.2	22.2	19:40	2.3	271.7	21.7
2011:03:11	04:56	-26.1	58.9	19.9	19:44	0.1	274.1	19.4
2011:03:14	04:51	-25.2	59.5	17.6	19:47	-2.1	276.4	17.2
2011:03:17	04:46	-24.4	60.1	15.4	19:51	-4.3	278.8	14.9
2011:03:20	04:40	-23.6	60.7	13.1	19:55	-6.5	281.2	12.6
2011:03:23	04:35	-22.8	61.2	10.9	19:59	-8.7	283.7	10.4
2011:03:26	04:29	-22.0	61.7	8.6	20:03	-10.8	286.1	8.1
2011:03:29	04:23	-21.2	62.2	6.4	20:07	-13.0	288.7	5.9
2011:04:01	04:17	-20.5	62.7	4.2	20:11	-15.1	291.3	3.7
2011:04:04	04:12	-19.7	63.1	2.1	20:15	-17.1	294.0	1.7
2011:04:07	04:06	-19.0	63.5	1.1	20:19	-19.2	296.8	1.4
2011:04:10	04:00	-18.3	64.0	2.8	20:23	-21.2	299.6	3.3
2011:04:13	03:54	-17.5	64.4	4.9	20:28	-23.1	302.6	5.4
2011:04:16	03:48	-16.8	64.8	7.1	20:32	-25.0	305.7	7.6
2011:04:19	03:42	-16.1	65.2	9.3	20:37	-26.8	308.9	9.8
2011:04:22	03:36	-15.3	65.6	11.5	20:41	-28.5	312.3	12.0
2011:04:25	03:30	-14.6	66.1	13.7	20:46	-30.2	315.8	14.2
2011:04:28	03:24	-13.8	66.5	15.9	20:51	-31.7	319.4	16.4
2011:05:01	03:19	-13.0	67.0	18.1	20:56	-33.1	323.2	18.6
2011:05:04	03:13	-12.2	67.4	20.3	21:01	-34.4	327.2	20.8
2011:05:07	03:08	-11.4	67.9	22.5	21:06	-35.5	331.2	23.0
2011:05:10	03:02	-10.5	68.4	24.7	21:11	-36.4	335.4	25.3
2011:05:13	02:57	-9.6	69.0	26.9	21:16	-37.2	339.7	27.5
2011:05:16	02:52	-8.7	69.6	29.1	21:20	-37.8	344.1	29.7
2011:05:19	02:48	-7.7	70.2	31.3	21:25	-38.2	348.5	31.9
2011:05:22	02:43	-6.7	70.9	33.6	21:30	-38.4	353.0	34.1
2011:05:25	02:39	-5.6	71.7	35.8	21:35	-38.4	357.3	36.4
2011:05:28	02:35	-4.5	72.5	38.0	21:39	-38.2	1.7	38.6
2011:05:31	02:32	-3.2	73.4	40.2	21:43	-37.8	5.9	40.8
2011:06:03	02:29	-1.9	74.3	42.5	21:47	-37.2	9.9	43.1
2011:06:06	02:27	-0.5	75.3	44.7	21:50	-36.5	13.8	45.4
2011:06:09	02:25	1.0	76.5	47.0	21:54	-35.7	17.5	47.6
2011:06:12	02:23	2.6	77.7	49.3	21:56	-34.8	21.0	49.9
2011:06:15	02:23	4.4	79.0	51.6	21:58	-33.7	24.3	52.2
2011:06:18	02:22	6.2	80.3	53.9	22:00	-32.6	27.3	54.5
2011:06:21	02:23	8.2	81.8	56.2	22:01	-31.5	30.1	56.8
2011:06:24	02:24	10.2	83.4	58.5	22:01	-30.4	32.7	59.1
2011:06:27	02:25	12.4	85.2	60.8	22:01	-29.2	35.1	61.5
2011:06:30	02:27	14.7	87.0	63.2	22:00	-28.1	37.3	63.8

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	15.5	87.6	64.0	22:00	-27.7	38.0	64.6
2011:07:04	02:30	18.0	89.6	66.4	21:58	-26.6	39.9	67.0
2011:07:07	02:33	20.5	91.6	68.8	21:56	-25.5	41.7	69.4
2011:07:10	02:37	23.1	93.8	71.2	21:54	-24.4	43.4	71.8
2011:07:13	02:41	25.8	96.2	73.6	21:51	-23.4	44.9	74.3
2011:07:16	02:45	28.5	98.6	76.1	21:47	-22.4	46.4	76.7
2011:07:19	02:49	31.3	101.2	78.5	21:44	-21.4	47.7	79.2
2011:07:22	02:54	34.0	104.0	81.0	21:39	-20.4	49.0	81.7
2011:07:25	02:58	36.8	107.0	83.6	21:35	-19.5	50.2	84.2
2011:07:28	03:03	39.6	110.2	86.1	21:30	-18.6	51.4	86.8
2011:07:31	03:08	42.3	113.6	88.7	21:25	-17.7	52.5	89.3
2011:08:03	03:13	45.0	117.3	91.3	21:20	-16.8	53.5	92.0
2011:08:06	03:17	47.6	121.4	93.9	21:15	-15.9	54.6	94.6
2011:08:09	03:22	50.1	125.8	96.6	21:09	-15.0	55.6	97.2
2011:08:12	03:27	52.4	130.7	99.3	21:03	-14.2	56.6	99.9
2011:08:15	03:32	54.6	136.0	102.0	20:58	-13.3	57.7	102.7
2011:08:18	03:36	56.6	141.9	104.7	20:52	-12.4	58.7	105.4
2011:08:21	03:41	58.3	148.4	107.5	20:46	-11.5	59.7	108.2
2011:08:24	03:45	59.7	155.4	110.3	20:40	-10.6	60.7	111.0
2011:08:27	03:49	60.8	162.9	113.2	20:34	-9.7	61.7	113.9
2011:08:30	03:54	61.5	170.9	116.1	20:28	-8.7	62.8	116.7
2011:09:02	03:58	61.7	179.0	119.0	20:22	-7.8	63.8	119.7
2011:09:05	04:02	61.5	187.2	121.9	20:16	-6.8	64.9	122.6
2011:09:08	04:06	60.9	195.3	124.9	20:10	-5.8	66.0	125.6
2011:09:11	04:10	59.9	202.9	127.9	20:04	-4.8	67.1	128.6
2011:09:14	04:14	58.5	210.1	131.0	19:58	-3.7	68.2	131.7
2011:09:17	04:17	56.8	216.7	134.1	19:52	-2.6	69.4	134.7
2011:09:20	04:21	54.8	222.8	137.2	19:46	-1.4	70.6	137.9
2011:09:23	04:25	52.6	228.3	140.3	19:40	-0.3	71.8	141.0
2011:09:26	04:28	50.2	233.3	143.5	19:35	0.9	73.1	144.2
2011:09:29	04:32	47.6	237.9	146.7	19:29	2.2	74.4	147.4
2011:10:02	04:35	44.9	242.2	150.0	19:24	3.5	75.7	150.6
2011:10:05	04:38	42.0	246.1	153.2	19:19	4.8	77.1	153.9
2011:10:08	04:42	39.1	249.7	156.5	19:14	6.2	78.4	157.2
2011:10:11	04:45	36.1	253.1	159.8	19:09	7.6	79.9	160.5
2011:10:14	04:48	33.1	256.3	163.2	19:04	9.1	81.3	163.8
2011:10:17	04:52	30.0	259.4	166.5	18:59	10.6	82.8	167.1
2011:10:20	04:55	26.8	262.3	169.8	18:55	12.2	84.4	170.5
2011:10:23	04:58	23.7	265.2	173.2	18:51	13.8	86.0	173.8
2011:10:26	05:01	20.5	267.9	176.4	18:47	15.5	87.6	177.0
2011:10:29	05:05	17.3	270.6	178.5	18:43	17.2	89.3	178.3
2011:11:01	05:08	14.1	273.2	176.2	18:39	18.9	91.1	175.6
2011:11:04	05:11	10.9	275.9	172.9	18:36	20.7	92.9	172.3
2011:11:07	05:14	7.8	278.5	169.5	18:33	22.6	94.8	168.9
2011:11:10	05:17	4.7	281.1	166.2	18:30	24.4	96.7	165.6
2011:11:13	05:21	1.6	283.7	162.8	18:28	26.3	98.8	162.2
2011:11:16	05:24	-1.4	286.3	159.4	18:26	28.3	100.9	158.8
2011:11:19	05:27	-4.4	289.0	156.1	18:24	30.3	103.1	155.5
2011:11:22	05:30	-7.3	291.8	152.7	18:22	32.3	105.4	152.1
2011:11:25	05:33	-10.1	294.5	149.4	18:21	34.3	107.9	148.8
2011:11:28	05:36	-12.8	297.4	146.0	18:20	36.3	110.4	145.5
2011:12:01	05:39	-15.4	300.3	142.8	18:19	38.4	113.2	142.2
2011:12:04	05:41	-17.9	303.3	139.5	18:19	40.4	116.1	138.9
2011:12:07	05:44	-20.2	306.3	136.2	18:19	42.5	119.2	135.7
2011:12:10	05:46	-22.5	309.5	133.0	18:19	44.5	122.5	132.4
2011:12:13	05:48	-24.5	312.7	129.8	18:20	46.4	126.1	129.3
2011:12:16	05:50	-26.5	315.9	126.6	18:21	48.3	129.9	126.1
2011:12:19	05:52	-28.3	319.2	123.5	18:22	50.1	134.1	123.0
2011:12:22	05:54	-29.9	322.6	120.4	18:23	51.9	138.5	119.9
2011:12:25	05:55	-31.3	326.0	117.3	18:25	53.5	143.4	116.8
2011:12:28	05:56	-32.6	329.4	114.3	18:27	54.9	148.6	113.7
2011:12:31	05:57	-33.7	332.9	111.3	18:29	56.2	154.1	110.7

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

heliacal dates for Jupiter in 2011  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Giove  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E

visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
last visibility	2011-03-26	19:05	18:27	0:37h	-10d 21h	-1.6
first visibility	2011-05-08	04:04	04:57	-0:52h	31d 12h	-1.6

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins : inizio visibilità mattutina  
Morning visibility ends : fine visibilità mattutina  
Evening visibility begins : inizio visibilità serale  
Evening visibility ends : fine visibilità serale  
Last visibility : ultimo giorno di visibilità  
Firs visibilità : primo giorno di visibilità

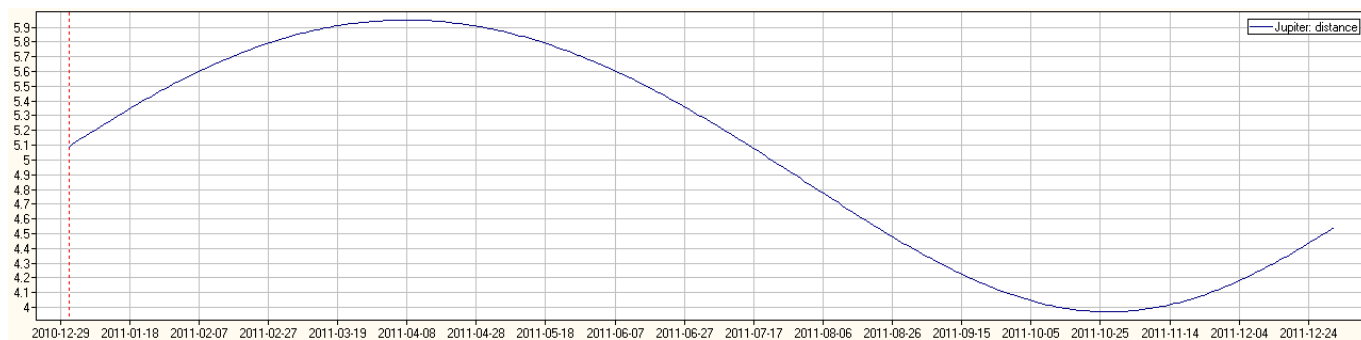
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
L	03-26	19:05	18:27	-7° 47'	5° 44'	13° 50'	-1° 05'	-1.6	-3° 43'	8° 06'
F	05-08	04:04	04:57	-9° 29'	47° 12'	23° 58'	-1° 05'	-1.6	21° 33'	-23° 14'

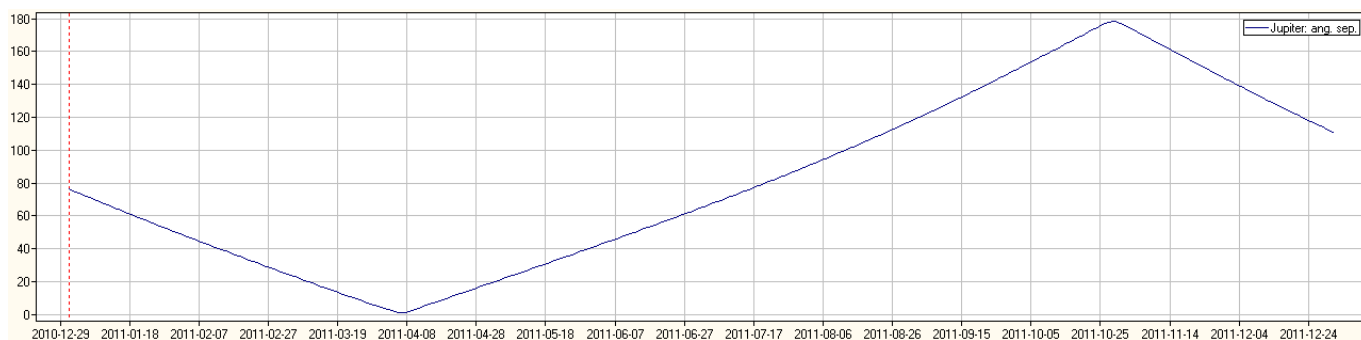
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità  
L = ultimo giorno di visibilità  
F = primo giorno di visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

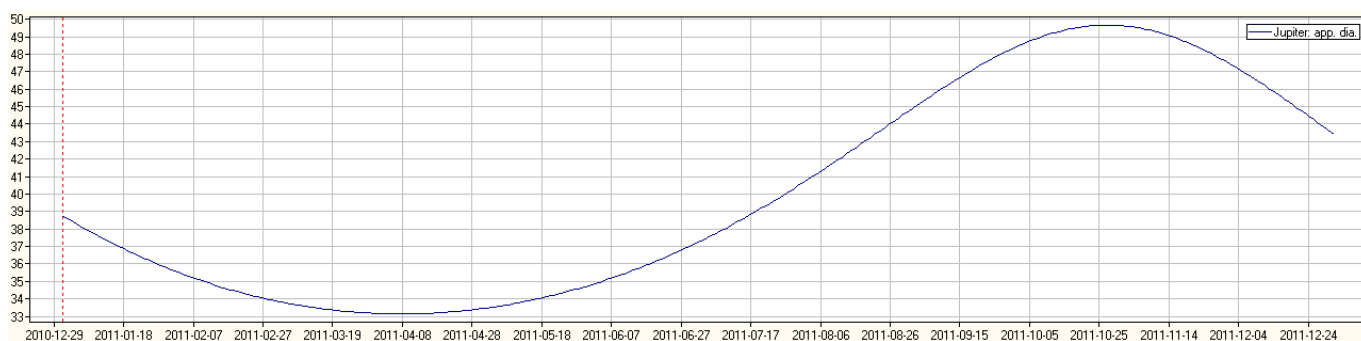
© (3)



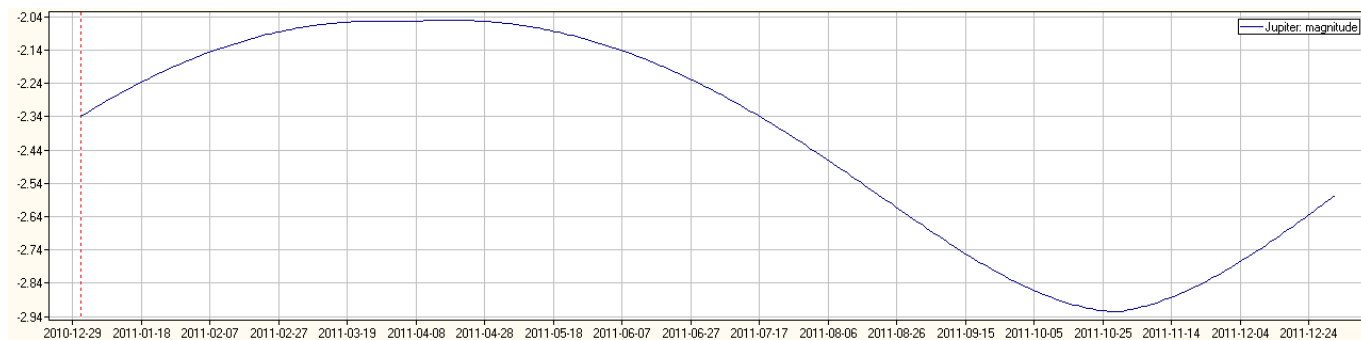
Distanza di Giove in U.A. nel corso dell'anno - Distance of Jupiter in A.U. during the year



Elongazione di Giove in ° nel corso dell'anno - Elongation of Jupiter in ° during the year



Diametro di Giove in " nel corso dell'anno - Diameter of Jupiter in " during the year



Magnitudine di Giove nel corso dell'anno - Magnitude of Jupiter during the year

# COORDINATE DEI SATELLITI DI GIOVE

## COORDINATES OF THE MOONS OF JUPITER

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
01/01/2011	2,6712	0,1758	5,2384	5,2507	0,1907	7,8911	-12,0484	0,3084	8,9192	7,3146	0,8668	25,1263
02/01/2011	-0,4217	-0,1990	-5,9086	-8,6069	0,1439	3,7031	-14,6146	-0,0899	-3,5121	-2,4991	0,8602	26,0396
03/01/2011	-2,0120	0,1868	5,5378	-1,7132	-0,2440	-9,1651	-6,7225	-0,4254	-13,4347	-11,9598	0,7324	23,2735
04/01/2011	3,9865	-0,1477	-4,3613	9,4554	-0,0428	0,1428	5,9860	-0,4570	-13,7501	-19,7427	0,5013	17,2245
05/01/2011	-5,4300	0,0799	2,3433	-1,7226	0,2646	9,2842	14,3741	-0,1603	-4,1957	-24,7677	0,1994	8,7584
06/01/2011	5,8895	-0,0038	-0,0840	-8,6347	-0,0542	-3,5180	12,3768	0,2519	8,3787	-26,3469	-0,1312	-0,9298
07/01/2011	-5,4586	-0,0775	-2,3188	5,3578	-0,2403	-7,7021	1,4413	0,4820	14,8909	-24,2826	-0,4446	-10,4900
08/01/2011	4,0705	0,1429	4,2431	6,7010	0,1522	6,7039	-10,5380	0,3648	10,6557	-18,8779	-0,6979	-18,6120
09/01/2011	-2,0990	-0,1875	-5,5425	-7,7028	0,1875	5,3450	-14,9744	-0,0153	-1,2376	-10,8904	-0,8568	-24,2016
10/01/2011	-0,3268	0,1994	5,8790	-3,5134	-0,2228	-8,6340	-8,7026	-0,3863	-12,2493	-1,4172	-0,8997	-26,5119
11/01/2011	2,5629	-0,1815	-5,3273	9,2923	-0,0958	-1,7315	3,8006	-0,4821	-14,5079	8,2482	-0,8209	-25,2399
12/01/2011	-4,5205	0,1301	3,8048	0,1535	0,2632	9,4475	13,5607	-0,2318	-6,3637	16,7886	-0,6308	-20,5548
13/01/2011	5,6171	-0,0619	-1,7863	-9,1674	-0,0008	-1,7128	13,5318	0,1857	6,3586	23,0388	-0,3550	-13,0839
14/01/2011	-5,8925	-0,0211	-0,6517	3,7032	-0,2613	-8,6111	3,7375	0,4694	14,4845	26,1339	-0,0308	-3,8300
15/01/2011	5,1291	0,0972	2,8770	7,8994	0,1064	5,2392	-8,7507	0,4152	12,1604	25,6351	0,2977	5,9476
16/01/2011	-3,6092	-0,1602	-4,7048	-6,4775	0,2253	6,7875	-14,9769	0,0619	1,0966	21,5911	0,5851	14,8977
17/01/2011	1,3957	0,1954	5,7170	-5,1851	-0,1921	-7,7446	-10,4955	-0,3378	-10,7552	14,5486	0,7912	21,7674
18/01/2011	0,9108	-0,2007	-5,8443	8,7540	-0,1469	-3,5513	1,4973	-0,4975	-14,9245	5,4771	0,8868	25,5810
19/01/2011	-3,2196	0,1706	4,9482	2,0410	0,2516	9,2313	12,4058	-0,3005	-8,4028	-4,3604	0,8581	25,7938
20/01/2011	4,8577	-0,1162	-3,3447	-9,3264	0,0547	0,1796	14,3656	0,1131	4,1593	-13,5877	0,7087	22,3727
21/01/2011	-5,8254	0,0385	1,0799	1,8835	-0,2727	-9,1741	5,9621	0,4458	13,7159	-20,9186	0,4595	15,8101
22/01/2011	5,7481	0,0420	1,2534	8,7889	0,0547	3,5507	-6,7348	0,4577	13,3780	-25,3395	0,1450	7,0389
23/01/2011	-4,8184	-0,1186	-3,4597	-4,9752	0,2557	7,9633	-14,6143	0,1402	3,4237	-26,2551	-0,1909	-2,7092
24/01/2011	3,0053	0,1745	5,0568	-6,6528	-0,1524	-6,5258	-12,0497	-0,2799	-8,9842	-23,5570	-0,5022	-12,0851
25/01/2011	-0,8294	-0,2034	-5,8602	7,8531	-0,1944	-5,2390	-0,8697	-0,5020	-14,9795	-17,6355	-0,7462	-19,8136
26/01/2011	-1,6342	0,1975	5,6677	3,8611	0,2293	8,6351	10,9268	-0,3649	-10,2592	-9,3124	-0,8899	-24,8559
27/01/2011	3,6706	-0,1620	-4,6203	-9,0958	0,1104	2,0794	14,8487	0,0351	1,8266	0,2742	-0,9139	-26,5458
28/01/2011	-5,2551	0,0965	2,7258	-0,0263	-0,2734	-9,3581	8,0622	0,4106	12,5908	9,8218	-0,8146	-24,6593
29/01/2011	5,8657	-0,0186	-0,4882	9,3246	-0,0017	1,7040	-4,5298	0,4909	14,2701	18,0353	-0,6050	-19,4473
30/01/2011	-5,6166	-0,0656	-1,9098	-3,2532	0,2770	8,8164	-13,8834	0,2180	5,6865	23,7912	-0,3129	-11,6025
31/01/2011	4,3579	0,1376	3,9492	-7,8485	-0,1043	-5,0228	-13,3174	-0,2132	-6,9711	26,2951	0,0223	-2,1781
01/02/2011	-2,5061	-0,1885	-5,3665	6,6203	-0,2361	-6,7190	-3,2374	-0,4947	-14,6565	25,1850	0,3549	7,5433
02/02/2011	0,1001	0,2079	5,8934	5,5349	0,1965	7,6760	9,1563	-0,4230	-11,8679	20,5953	0,6392	16,2204
03/02/2011	2,1551	-0,1952	-5,4965	-8,4772	0,1643	3,9050	14,9543	-0,0468	-0,5667	13,1454	0,8351	22,6336
04/02/2011	-4,2246	0,1480	4,1402	-1,9459	-0,2626	-9,1475	9,9692	0,3641	11,1382	3,8640	0,9149	25,8747
05/02/2011	5,4648	-0,0796	-2,1942	9,4758	-0,0609	-0,2246	-2,1960	0,5136	14,8062	-5,9556	0,8666	25,4800
06/02/2011	-5,9283	-0,0050	-0,1873	-1,3819	0,2878	9,3031	-12,7960	0,2938	7,8244	-14,9455	0,6967	21,5081
07/02/2011	5,3292	0,0873	2,4871	-8,7146	-0,0493	-3,2955	-14,2594	-0,1385	-4,7608	-21,8546	0,4286	14,5268
08/02/2011	-3,9702	-0,1565	-4,4008	5,1016	-0,2700	-7,9237	-5,5480	-0,4748	-13,9539	-25,7366	0,0995	5,5255
09/02/2011	1,8312	0,2003	5,5984	6,9874	0,1537	6,3885	7,1285	-0,4730	-13,1855	-26,0726	-0,2451	-4,2368
10/02/2011	0,4425	-0,2122	-5,8908	-7,4910	0,2140	5,5739	14,6702	-0,1312	-2,9663	-22,8385	-0,5582	-13,4206
11/02/2011	-2,8194	0,1882	5,1943	-3,7910	-0,2399	-8,5439	11,6311	0,3064	9,3855	-16,4929	-0,7971	-20,7818
12/02/2011	4,5753	-0,1357	-3,7113	9,2287	-0,1207	-2,1541	0,2111	0,5243	14,9631	-7,9090	-0,9295	-25,3385
13/02/2011	-5,7203	0,0583	1,5572	0,5601	0,2867	9,3960	-11,3699	0,3655	9,7755	1,7437	-0,9371	-26,4863
14/02/2011	5,8275	0,0271	0,7981	-9,2069	0,0108	-1,4170	-14,8360	-0,0569	-2,4127	11,1612	-0,8186	-24,0746
15/02/2011	-5,0893	-0,1093	-3,0442	3,3590	-0,2941	-8,7956	-7,7235	-0,4420	-12,8838	19,0652	-0,5891	-18,4196
16/02/2011	3,4035	0,1743	4,8034	8,1521	0,1018	4,8230	4,9067	-0,5130	-14,1631	24,3762	-0,2791	-10,2700
17/02/2011	-1,3157	-0,2109	-5,7636	-6,1748	0,2571	7,0105	14,0014	-0,2158	-5,2976	26,3539	0,0698	-0,7228
18/02/2011	-1,1613	0,2130	5,7900	-5,4785	-0,2054	-7,5681	12,9989	0,2383	7,3783	24,7099	0,4101	8,9226
19/02/2011	3,2731	-0,1818	-4,9010	8,5882	-0,1787	-3,9995	2,6298	0,5220	14,7302	19,6516	0,6947	17,3299
20/02/2011	-5,0065	0,1188	3,1682	2,4884	0,2731	9,0853	-9,6347	0,4312	11,4872	11,8645	0,8835	23,3208
21/02/2011	5,8033	-0,0379	-0,9670	-9,2985	0,0740	0,5318	-15,0270	0,0301	0,0196	2,4268	0,9496	26,0439
22/02/2011	-5,7609	-0,0505	-1,4143	1,4658	-0,3067	-9,2918	-9,7105	-0,3958	-11,4644	-7,3486	0,8830	25,1142
23/02/2011	4,6739	0,1315	3,5757	8,9737	0,0424	3,0446	2,5418	-0,5413	-14,7707	-16,0996	0,6926	20,6688
24/02/2011	-2,9617	-0,1903	-5,1225	-4,5834	0,2912	8,1472	12,9580	-0,2985	-7,4997	-22,6188	0,4047	13,3412
25/02/2011	0,6033	0,2196	5,8698	-6,9316	-0,1597	-6,2585	14,0295	0,1606	5,1649	-26,0154	0,0590	4,1662
26/02/2011	1,6728	-0,2131	-5,6538	7,5767	-0,2323	-5,6798	4,9910	0,5056	14,1033	-25,8418	-0,2972	-5,5828
27/02/2011	-3,8468	0,1710	4,5007	4,3179	0,2464	8,3798	-7,6368	0,4882	12,8979	-22,1430	-0,6151	-14,5714
28/02/2011	5,2548	-0,1021	-2,6487	-8,9805	0,1375	2,4637	-14,8190	0,1201	2,4563	-15,4369	-0,8517	-21,5913
01/03/2011	-5,9218	0,0154	0,3447	-0,4957	-0,3063	-9,3859	-11,4439	-0,3371	-9,7390	-6,6424	-0,9747	-25,7055
02/03/2011	5,5249	0,0747	2,0233	9,4127	-0,0226	1,1282	0,1019	-0,5564	-14,9896	3,0502	-0,9673	-26,3683
03/03/2011	-4,3469	-0,1516	-4,0223	-2,7842	0,3142	8,9306	11,5648	-0,3773	-9,5131	12,3284	-0,8297	-23,4904
04/03/2011	2,3160	0,2062	5,4226	-8,0823	-0,1040	-4,6702	14,6919	0,0746	2,7996	19,9362	-0,5795	-17,4481
05/03/2011	-0,0822	-0,2262	-5,8991	6,2352	-0,2787	-7,1188	7,2350	0,4746	13,0929	24,8307	-0,2498	-9,0438
06/03/2011	-2,3424	0,2098	5,4329	5,9672	0,2071	7,3067	-5,4207	0,5348	13,9700	26,3281	0,1151	0,5939
07/03/2011	4,2288	-0,1597	-4,0935	-8,2634	0,1985	4,2924	-14,2116	0,2112	4,8385	24,2042	0,4653	10,1462
08/03/2011	-5,5550	0,0826	2,0757	-2,4390	-0,2920	-9,0700	-12,8764	-0,2663	-7,7471	18,7335	0,7524	18,2906
09/03/2011	5,8764	0,0086	0,2856	9,4457	-0,0904	-0,8420	-2,3494	-0,5570	-14,8084	10,6628	0,9358	23,8832
10/03/2011	-5,3452	-0,0973	-2,5599	-0,8563	0,3243	9,3222	9,8534	-0,4495	-11,2783	1,1066	0,9893	26,1324
11/03/2011	3,8213	0,1733	4,4859	-8,8767	-0,0402	-2,8719	14,9571	-0,0177	0,3506	-8,6034	0,9048	24,7212
12/03/2011	-1,8331	-0,2190	-5,6129	4,6201	-0,3154	-8,2511	9,2855	0,4289	11,7247	-17,1195	0,6934	19,8549
13/03/2011	-0,6273	0,2310	5,8786	7,3610	0,1559	5,9115	-3,0580	0,5687	14,6650	-23,2681	0,3845	12,2293
14/03/2011	2,8172	-0,2049	-5,1687	-7,1770	0,2541	5,9338	-13,2240	0,3007	7,0927	-26,2153	0,0203	2,9136
15/03/2011	-4,6915	0,1452	3,6228	-4,2771	-0,2636	-8,3551	-13,9678	-0,1850	-5,5448	-25,5763	-0,3491	-6,8013
16/03/2011	5,6941	-0,0612	-1,4792	9,0684	-0,1584	-2,7801	-4,7468	-0,5422	-14,2300	-21,4568	-0,6736	-15,5935
17/03/2011	-5,8656	-0,0317	-0,8664	1,1145	0,3201	9,3021	7,8660	-0,5129	-12,7473	-14,4328	-0,9092	-22,2820
18/03/2011	4,9814	0,1229	3,1429	-9,2764	0,0292	-0,9442	14,8149	-0,1142	-2,1209	-5,4592	-1,0238	-25,9777



	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
19/03/2011	-3,4208	-0,1912	-4,8200	2,8017	-0,3399	-9,0245	11,0907	0,3687	10,0292	4,2494	-1,0014	-26,1904
20/03/2011	1,1444	0,2318	5,7957	8,4364	0,0944	4,2538	-0,6065	0,5882	14,9616	13,3830	-0,8441	-22,8855
21/03/2011	1,1479	-0,2330	-5,7755	-5,7682	0,3013	7,3130	-11,8783	0,3861	9,1593	20,7010	-0,5722	-16,4973
22/03/2011	-3,4080	0,1971	4,8459	-5,9263	-0,2213	-7,2714	-14,6853	-0,0945	-3,1879	25,1990	-0,2215	-7,8714
23/03/2011	4,9932	-0,1284	-3,1101	8,2956	-0,2233	-4,5991	-7,0209	-0,5115	-13,2640	26,2463	0,1608	1,8292
24/03/2011	-5,8605	0,0397	0,9060	3,0403	0,3008	8,8693	5,6611	-0,5647	-13,8684	23,6767	0,5223	11,2777
25/03/2011	5,6898	0,0588	1,5150	-9,2619	0,1015	1,0272	14,2665	-0,2119	-4,5317	17,8293	0,8129	19,1595
26/03/2011	-4,7014	-0,1444	-3,5919	0,8600	-0,3505	-9,4033	12,5916	0,2954	8,0630	9,5036	0,9914	24,3661
27/03/2011	2,8124	0,2111	5,1906	9,1439	0,0248	2,4074	1,8600	0,5921	14,8534	-0,1442	1,0322	26,1627
28/03/2011	-0,6271	-0,2405	-5,8585	-4,1001	0,3373	8,3664	-10,2120	0,4646	10,9816	-9,7733	0,9290	24,2968
29/03/2011	-1,8195	0,2331	5,6344	-7,3128	-0,1663	-5,8658	-15,0088	0,0030	-0,7381	-18,0471	0,6958	19,0424
30/03/2011	3,8370	-0,1864	-4,4579	7,1601	-0,2820	-6,2190	-9,1132	-0,4647	-11,9338	-23,8292	0,3645	11,1466
31/03/2011	-5,3303	0,1105	2,5976	4,8342	0,2664	8,0425	3,2916	-0,6028	-14,6132	-26,3419	-0,0191	1,7178
01/04/2011	5,8811	-0,0135	-0,2498	-8,8330	0,1733	2,9523	13,3231	-0,3082	-6,8229	-25,2603	-0,4027	-7,9466
02/04/2011	-5,5589	-0,0821	-2,0398	-1,1190	-0,3455	-9,3699	13,7489	0,2101	5,8744	-20,7512	-0,7344	-16,5353
03/04/2011	4,2257	0,1700	4,1173	9,4516	-0,0501	0,4531	4,2772	0,5793	14,3409	-13,4358	-0,9692	-22,8972
04/04/2011	-2,3459	-0,2259	-5,4104	-2,2474	0,3597	9,0460	-8,2675	0,5337	12,5072	-4,3093	-1,0751	-26,1881
05/04/2011	-0,0689	0,2490	5,9170	-8,3730	-0,1005	-4,2015	-14,9232	0,1050	1,7318	5,3992	-1,0370	-25,9678
06/04/2011	2,3313	-0,2294	-5,3998	5,7118	-0,3312	-7,5673	-10,9522	-0,4025	-10,2797	14,3784	-0,8592	-22,2592
07/04/2011	-4,3232	0,1742	4,0561	6,4163	0,2176	6,8581	0,8383	-0,6255	-14,9571	21,4052	-0,5643	-15,5439
08/04/2011	5,5376	-0,0877	-1,9905	-8,0087	0,2411	4,7446	12,0184	-0,4001	-8,9228	25,5112	-0,1915	-6,7172
09/04/2011	-5,9168	-0,0096	-0,3045	-3,0465	-0,3245	-8,9254	14,5318	0,1151	3,5285	26,1147	0,2089	3,0289
10/04/2011	5,2561	0,1112	2,6735	9,3455	-0,1272	-1,5211	6,5807	0,5495	13,4388	23,1145	0,5821	12,3561
11/04/2011	-3,8524	-0,1896	-4,4731	-0,2938	0,3665	9,3211	-6,0948	0,5909	13,6967	16,9071	0,8757	19,9633
12/04/2011	1,6858	0,2426	5,6684	-9,0600	-0,0262	-2,3526	-14,4310	0,2088	4,1612	8,3491	1,0485	24,7801
13/04/2011	0,6142	-0,2528	-5,8504	4,0151	-0,3682	-8,5848	-12,4941	-0,3259	-8,3417	-1,3703	1,0755	26,1263
14/04/2011	-2,9308	0,2244	5,1507	7,7152	0,1559	5,3703	-1,6376	-0,6311	-14,8915	-10,8995	0,9525	23,8209
15/04/2011	4,6913	-0,1568	-3,5484	-6,8271	0,3015	6,3225	10,3866	-0,4845	-10,7766	-18,9196	0,6963	18,1970
16/04/2011	-5,7444	0,0668	1,4572	-4,8374	-0,2874	-8,0902	14,9182	0,0124	1,0884	-24,3343	0,3420	10,0551
17/04/2011	5,8105	0,0397	0,9905	8,8310	-0,2028	-3,4285	8,7028	0,5026	12,1701	-26,4158	-0,0616	0,5319
18/04/2011	-5,0107	-0,1341	-3,1331	1,6720	0,3567	9,1801	-3,7607	0,6336	14,5088	-24,9025	-0,4596	-9,0656
19/04/2011	3,2868	0,2136	4,9121	-9,3433	0,0532	-0,4035	-13,5482	0,3109	6,4682	-20,0140	-0,7981	-17,4393
20/04/2011	-1,1575	-0,2535	-5,7707	2,1455	-0,3905	-9,2274	-13,6916	-0,2368	-6,1858	-12,4220	-1,0313	-23,4695
21/04/2011	-1,2790	0,2561	5,7842	8,6743	0,0835	3,6457	-4,0622	-0,6192	-14,4245	-3,1543	-1,1272	-26,3503
22/04/2011	3,4204	-0,2140	-4,7824	-5,3425	0,3512	7,6158	8,4753	-0,5589	-12,3367	6,5386	-1,0720	-25,6969
23/04/2011	-5,0592	0,1402	3,0871	-6,4115	-0,2352	-6,9027	14,8999	-0,0952	-1,3819	15,3453	-0,8719	-21,5849
24/04/2011	5,8399	-0,0383	-0,7787	7,9321	-0,2735	-5,1846	10,5910	0,4391	10,5681	22,0650	-0,5528	-14,5524
25/04/2011	-5,7180	-0,0640	-1,5128	3,5626	0,3298	8,6307	-1,3221	0,6600	14,9254	25,7640	-0,1571	-5,5372
26/04/2011	4,5907	0,1636	3,7176	-9,2120	0,1345	1,5591	-12,2977	0,4086	8,5975	25,9182	0,2615	4,2368
27/04/2011	-2,8229	-0,2306	-5,1701	0,1865	-0,3963	-9,4683	-14,5158	-0,1374	-3,8673	22,4861	0,6454	13,4218
28/04/2011	0,4837	0,2655	5,9018	9,2520	0,0034	1,7628	-6,3719	-0,5891	-13,5698	15,9304	0,9409	20,7367
29/04/2011	1,8417	-0,2535	-5,5820	-3,6226	0,3872	8,5674	6,3362	-0,6205	-13,5602	7,1555	1,1062	25,1487
30/04/2011	-3,9252	0,2037	4,4401	-7,7009	-0,1696	-5,4167	14,4746	-0,2047	-3,8092	-2,6167	1,1176	26,0388
01/05/2011	5,3432	-0,1159	-2,4739	6,6902	-0,3355	-6,7132	12,1831	0,3605	8,6839	-12,0260	0,9730	23,2890
02/05/2011	-5,9135	0,0148	0,2407	5,2931	0,2862	7,6999	1,1398	0,6687	14,9357	-19,7747	0,6924	17,3002
03/05/2011	5,4817	0,0966	2,1937	-8,6742	0,2136	3,4470	-10,7244	0,4985	10,4862	-24,8033	0,3143	8,9201
04/05/2011	-4,2323	-0,1854	-4,1058	-1,7760	-0,3845	-9,2992	-14,9500	-0,0302	-1,4538	-26,4413	-0,1093	-0,6840
05/05/2011	2,1996	0,2510	5,4953	9,4252	-0,0812	-0,1947	-8,5072	-0,5413	-12,3542	-24,4831	-0,5210	-10,1953
06/05/2011	0,0998	-0,2710	-5,8772	-1,7464	0,4071	9,1366	4,0267	-0,6670	-14,4184	-19,2111	-0,8648	-18,3316
07/05/2011	-2,4460	0,2509	5,3974	-8,6499	-0,0930	-3,7001	13,6560	-0,3130	-6,1331	-11,3450	-1,0943	-24,0033
08/05/2011	4,3677	-0,1857	-3,9427	5,1619	-0,3856	-7,9491	13,4428	0,2683	6,5649	-1,9474	-1,1778	-26,4544
09/05/2011	-5,5832	0,0953	1,9699	6,7883	0,2273	6,4316	3,5644	0,6587	14,5420	7,7114	-1,1031	-25,3504
10/05/2011	5,8819	0,0183	0,4787	-7,7568	0,2869	5,1769	-8,8704	0,5778	12,0877	16,3235	-0,8790	-20,8279
11/05/2011	-5,2609	-0,1215	-2,6765	-3,6552	-0,3550	-8,7308	-14,9848	0,0819	0,9912	22,7078	-0,5345	-13,4794
12/05/2011	3,7165	0,2130	4,6038	9,1894	-0,1663	-2,1397	-10,4083	-0,4763	-10,8115	25,9769	-0,1156	-4,2867
13/05/2011	-1,6476	-0,2641	-5,6449	0,2020	0,4094	9,3010	1,6179	-0,6965	-14,8841	25,6590	0,3206	5,4961
14/05/2011	-0,7549	0,2772	5,8766	-9,2197	-0,0087	-1,8298	12,4735	-0,4163	-8,2773	21,7808	0,7137	14,5157
15/05/2011	3,0038	-0,2409	-5,0548	3,4165	-0,4209	-8,8407	14,3346	0,1654	4,2845	14,8699	1,0086	21,5062
16/05/2011	-4,7608	0,1700	3,5217	7,9835	0,1552	4,8855	5,8804	0,6301	13,7648	5,8842	1,1636	25,4834
17/05/2011	5,7585	-0,0645	-1,2734	-6,5035	0,3505	6,6733	-6,7912	0,6439	13,3636	-3,9217	1,1564	25,8875
18/05/2011	-5,8202	-0,0441	-1,0127	-5,3708	-0,3083	-7,7910	-14,6248	0,1960	3,4041	-13,1845	0,9878	22,6735
19/05/2011	4,9017	0,1544	3,3098	8,5585	-0,2480	-3,9877	-12,0306	-0,3955	-8,9841	-20,6246	0,6811	16,3088
20/05/2011	-3,2437	-0,2327	-4,9101	2,1348	0,3931	9,0571	-0,8314	-0,7074	-14,9510	-25,2325	0,2785	7,6935
21/05/2011	0,9975	0,2793	5,8394	-9,3891	0,0798	0,1106	10,9588	-0,5116	-10,1933	-26,3942	-0,1647	-1,9748
22/05/2011	1,3762	-0,2759	-5,7135	1,5311	-0,4392	-9,3534	14,8403	0,0541	1,9003	-23,9695	-0,5884	-11,3770
23/05/2011	-3,5231	0,2320	4,7607	8,8298	0,0728	3,1316	8,0304	0,5830	12,6276	-18,3005	-0,9352	-19,2429
24/05/2011	5,1262	-0,1443	-2,9066	-4,9732	0,4011	7,8728	-4,5426	0,6946	14,2822	-10,1582	-1,1579	-24,5226
25/05/2011	-5,8651	0,0400	0,7364	-6,8497	-0,2459	-6,5248	-13,8809	0,3086	5,7150	-0,6430	-1,2258	-26,5074
26/05/2011	5,6533	0,0799	1,7302	7,5640	-0,3225	-5,6598	-13,3234	-0,3012	-6,9319	8,9612	-1,1285	-24,9227
27/05/2011	-4,5483	-0,1791	-3,7428	3,9684	0,3584	8,4200	-3,2393	-0,6991	-14,6235	17,3444	-0,8779	-19,9659
28/05/2011	2,6573	0,2565	5,2934	-9,1553	0,1685	2,0365	9,1675	-0,5959	-11,8270	23,3534	-0,5065	-12,2892
29/05/2011	-0,3682	-0,0645	-1,2734	-6,5035	0,3505	6,6733	-6,7912	0,6439	13,3636	-3,9217	1,1564	25,8875
30/05/2011	-1,9826	0,2753	5,5815	9,2944	-0,0165	1,2494	9,9621	0,5184	11,1667	25,3150	0,3879	6,8420
31/05/2011	4,0448	-0,2136	-4,2779	-3,2354	0,4359	8,7266	-2,1829	0,7281	14,8264	20,9607	0,7875	15,6550
01/06/2011	-5,3974	0,1232	2,4163	-8,0320	-0,1703	-4,9901	-12,7772	0,4166	7,8713	13,6802	1,0782	22,2741
02/06/2011	5,9091	-0,0041	0,0060	6,2536	-0,3860	-7,0865	-14,2628	-0,1954	-4,7052	4,4907	1,2188	25,7650
03/06/2011	-5,4493	-0,1075	-2,2504	5,6232	0,3063	7,4231	-5,5498	-0,6714	-13,9154	-5,3264	1,1893	25,6418
04/06/2011	4,0810	0,2101	4,2912	-8,5336	0,2533	3,8649	7,1485	-0,6666	-13,1424	-14,4041	0,9937	21,9349
05/06/2011	-2,0741	-0,2725	-5,4994	-2,3270	-0,4201	-9,1897	14,6816	-0,1804	-2,9086	-21,4935	0,6590	15,1800
06/06/2011	-0,2763	0,2955	5,91									

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
11/06/2011	5,1481	0,1438	2,9246	-7,5568	0,3302	5,5186	4,9605	-0,7215	-14,1141	0,7988	-1,2695	-26,4940
12/06/2011	-3,5923	-0,2331	-4,6566	-4,1354	-0,3825	-8,5320	14,0343	-0,2975	-5,2119	10,3133	-1,1456	-24,3792
13/06/2011	1,4467	0,2904	5,7450	9,0372	-0,2000	-2,5687	12,9823	0,3427	7,4486	18,4185	-0,8653	-18,9518
14/06/2011	0,9620	-0,2959	-5,7985	0,5441	0,4507	9,2848	2,5982	0,7381	14,7520	23,9898	-0,4656	-10,9332
15/06/2011	-3,1512	0,2577	5,0079	-9,3380	0,0080	-1,3995	-9,6503	0,6052	11,4764	26,2420	-0,0006	-1,4074
16/06/2011	4,9088	-0,1711	-3,2719	2,9355	-0,4683	-8,9908	-15,0128	0,0373	-0,0108	24,8454	0,4656	8,3121
17/06/2011	-5,7884	0,0638	1,1582	8,1353	0,1582	4,5554	-9,6370	-0,5610	-11,4873	19,9780	0,8680	16,8689
18/06/2011	5,7712	0,0630	1,3152	-6,2718	0,3956	6,9311	2,6624	-0,7589	-14,7225	12,3148	1,1497	23,0546
19/06/2011	-4,7936	-0,1720	-3,4152	-5,7636	-0,3274	-7,5304	13,0350	-0,4098	-7,3649	2,9269	1,2709	25,9959
20/06/2011	3,0393	0,2598	5,0860	8,3395	-0,2859	-4,3424	13,9984	0,2363	5,3024	-6,8704	1,2143	25,2870
21/06/2011	-0,7649	-0,3007	-5,8259	2,4218	0,4290	8,9783	4,8897	0,7140	14,1541	-15,7164	0,9879	21,0412
22/06/2011	-1,5769	0,2966	5,7046	-9,4194	0,1033	0,5008	-7,7257	0,6803	12,8450	-22,3930	0,6232	13,8723
23/06/2011	3,7503	-0,2390	-4,5452	1,0742	-0,4825	-9,4006	-14,8261	0,1581	2,3353	-25,9947	0,1704	4,7890
24/06/2011	-5,2113	0,1486	2,7777	8,8957	0,0682	2,8166	-11,3222	-0,4809	-9,8434	-26,0475	-0,3084	-4,9496
25/06/2011	5,9031	-0,0254	-0,3967	-4,7387	0,4464	8,0469	0,3121	-0,7776	-14,9626	-22,5572	-0,7480	-14,0183
26/06/2011	-5,5794	-0,0942	-1,8876	-7,1474	-0,2570	-6,2330	11,7155	-0,5146	-9,3218	-16,0065	-1,0888	-21,1929
27/06/2011	4,3689	0,2061	4,0031	7,3053	-0,3628	-5,9287	14,6582	0,1209	3,0376	-7,2826	-1,2839	-25,5069
28/06/2011	-2,4176	-0,2793	-5,3563	4,1865	0,3885	8,3029	7,0410	0,6708	13,2096	2,4298	-1,3060	-26,3756
29/06/2011	0,1220	0,3110	5,9192	-9,1203	0,1971	2,3653	-5,6307	0,7398	13,8858	11,8101	-1,1505	-23,6670
30/06/2011	2,2806	-0,2879	-5,4265	-0,8172	-0,4774	-9,4313	-14,2808	0,2776	4,6034	19,5689	-0,8373	-17,7302
01/07/2011	-4,1983	0,2227	4,1557	9,2874	-0,0275	0,9743	-12,7157	-0,3868	-7,9740	24,6235	-0,4078	-9,3539
02/07/2011	5,5396	-0,1137	-2,0652	-3,0257	0,4801	8,8265	-2,0219	-0,7769	-14,8329	26,2559	0,0792	0,3186
03/07/2011	-5,8897	-0,0063	-0,2084	-8,2363	-0,1741	-4,6990	10,1242	-0,6082	-11,0261	24,2193	0,5562	9,9469
04/07/2011	5,3280	0,1335	2,5936	5,9850	-0,4270	-7,2661	14,9536	0,0004	0,7287	18,7883	0,9563	18,1779
05/07/2011	-3,8569	-0,2332	-4,4373	5,7670	0,3305	7,2952	8,9971	0,6101	11,9596	10,7181	1,2227	23,8453
06/07/2011	1,8017	0,2994	5,6418	-8,4611	0,2855	4,1193	-3,4246	0,7822	14,5846	1,1444	1,3178	26,1491
07/07/2011	0,6285	-0,3133	-5,8476	-2,6621	-0,4529	-9,0905	-13,4015	0,3928	6,7417	-8,5907	1,2280	24,7723
08/07/2011	-2,8421	0,2797	5,1810	9,3029	-0,1249	-0,8931	-13,7946	-0,2810	-5,9289	-17,1329	0,9663	19,9293
09/07/2011	4,7188	-0,1945	-3,5515	-1,2079	0,4950	9,2454	-4,2894	-0,7567	-14,3480	-23,3079	0,5689	12,3152
10/07/2011	-5,7071	0,0842	1,4789	-8,9935	-0,0820	-2,9954	8,3030	-0,6886	-12,4492	-26,2817	0,0909	3,0022
11/07/2011	5,8435	0,0480	0,9801	4,4384	-0,4758	-8,3073	14,8885	-0,1225	-1,5720	-25,6611	-0,4023	-6,7233
12/07/2011	-4,9655	-0,1663	-3,1541	7,1036	0,2575	6,0044	10,7188	0,5333	10,4417	-21,5451	-0,8434	-15,5359
13/07/2011	3,3239	0,2624	4,9045	-7,4779	0,3646	5,6945	-1,1630	0,8062	14,9334	-14,4964	-1,1722	-22,2443
14/07/2011	-1,0648	-0,3126	-5,7814	-4,3877	-0,4097	-8,4017	-12,2183	0,5003	8,6966	-5,4728	-1,3435	-25,9433
15/07/2011	-1,2613	0,3145	5,7759	8,9512	-0,2198	-2,7100	-14,5345	-0,1668	-3,7729	4,2998	-1,3327	-26,1221
16/07/2011	3,5165	-0,2606	-4,7361	0,6398	0,4903	9,2962	-6,4224	-0,7178	-13,5354	13,4824	-1,1396	-22,7416
17/07/2011	-5,0567	0,1695	3,0345	-9,3982	0,0154	-1,1943	6,3156	-0,7534	-13,5622	20,8027	-0,7893	-16,2400
18/07/2011	5,8813	-0,0431	-0,7017	2,7338	-0,5070	-9,0188	14,4811	-0,2442	-3,8050	25,2337	-0,3289	-7,4927
19/07/2011	-5,6583	-0,0840	-1,6198	8,1492	0,1723	4,4899	12,1753	0,4426	8,7024	26,1367	0,1782	2,2998
20/07/2011	4,5681	0,2031	3,7762	-6,2176	0,4312	7,0343	1,1022	0,8115	14,9374	23,3705	0,6612	11,7691
21/07/2011	-2,6590	-0,2858	-5,2428	-5,9304	-0,3497	-7,4016	-10,7674	0,5978	10,4341	17,3139	1,0518	19,5751
22/07/2011	0,4110	0,3240	5,9007	8,2567	-0,3083	-4,4053	-14,9332	-0,0467	-1,5527	8,8197	1,2946	24,6110
23/07/2011	2,0379	-0,3064	-5,5282	2,4429	0,4661	8,9872	-8,3819	-0,6613	-12,4236	-0,9151	1,3553	26,1642
24/07/2011	-4,0015	0,2425	4,3344	-9,4452	0,1143	0,6326	4,2119	-0,8013	-14,3523	-10,5239	1,2254	24,0288
25/07/2011	5,4476	-0,1325	-2,3145	0,9416	-0,5193	-9,3833	13,7527	-0,3619	-5,9218	-18,6682	0,9233	18,5241
26/07/2011	-5,8876	0,0068	0,0350	8,8712	0,0786	2,8184	13,3387	0,3403	6,7903	-24,2317	0,4913	10,4415
27/07/2011	5,4402	0,1262	2,3559	-4,7382	0,4823	8,0931	3,3091	0,7980	14,6050	-26,4612	-0,0110	0,9148
28/07/2011	-4,0264	-0,2350	-4,2852	-7,2367	-0,2751	-6,1380	-9,1009	0,6824	11,9097	-25,0662	-0,5146	-8,7416
29/07/2011	2,0390	0,3075	5,5561	7,2566	-0,3866	-5,9177	-14,9953	0,0754	0,6632	-20,2437	-0,9505	-17,2077
30/07/2011	0,4080	-0,3281	-5,8722	4,1331	0,4235	8,3416	-10,1251	-0,5893	-11,0584	-12,6556	-1,2590	-23,3364
31/07/2011	-2,6356	0,2970	5,2801	-9,1441	0,2106	2,4140	2,0471	-0,8316	-14,8177	-3,3353	-1,3970	-26,2924
01/08/2011	4,5870	-0,2127	-3,7312	-0,8663	-0,5122	-9,3982	12,7333	-0,4728	-7,8815	6,4445	-1,3445	-25,6645
02/08/2011	-5,6457	0,0986	1,6747	9,2521	-0,0200	1,0592	14,1974	0,2289	4,7531	15,3332	-1,1068	-21,5168
03/08/2011	5,8798	0,0379	0,7626	-3,1025	0,5161	8,8401	5,4171	0,7661	13,9577	22,0909	-0,7155	-14,3985
04/08/2011	-5,0626	-0,1643	-2,9949	-8,2654	-0,1892	-4,6676	-7,2602	0,7525	13,1059	25,7585	-0,2239	-5,2772
05/08/2011	3,4953	0,2662	4,7805	6,0001	-0,4517	-7,1950	-14,7340	0,1968	2,8296	25,8063	0,2998	4,5847
06/08/2011	-1,2400	-0,3236	-5,7509	5,6497	0,3640	7,3954	-11,6238	-0,5037	-9,4803	22,2112	0,7818	13,7982
07/08/2011	-1,0745	0,3288	5,8059	-8,5181	0,3006	4,0860	-0,1279	-0,8437	-14,9607	15,4750	1,1536	21,0541
08/08/2011	3,3769	-0,2772	-4,8451	-2,6223	-0,4861	-9,0756	11,4575	-0,5740	-9,6413	6,5511	1,3625	25,3162
09/08/2011	-4,9638	0,1838	3,1702	9,2894	-0,1192	-0,7173	14,7382	0,1117	2,6509	-3,2991	1,3788	25,9863
10/08/2011	5,8628	-0,0546	-0,8755	-1,3776	0,5312	9,2583	7,3702	0,7174	13,0286	-12,6893	1,2005	22,9819
11/08/2011	-5,6941	-0,0795	-1,4817	-8,9894	-0,0952	-3,0512	-5,3054	0,8065	14,0068	-20,3125	0,8529	16,7475
12/08/2011	4,6719	0,2035	3,6450	4,5425	-0,5011	-8,1993	-14,1756	0,3145	4,8982	-25,1185	0,3848	8,1770
13/08/2011	-2,7771	-0,2935	-5,1852	6,9427	0,2904	6,1949	-12,8598	-0,4069	-7,7349	-26,4602	-0,1391	-1,5276
14/08/2011	0,5560	0,3352	5,8820	-7,6026	0,3807	5,5912	-2,2681	-0,8377	-14,7951	-24,1641	-0,6464	-11,0242
15/08/2011	1,9191	-0,3207	-5,5778	-4,2645	-0,4421	-8,4401	9,9627	-0,6637	-11,1774	-18,5510	-1,0676	-19,0158
16/08/2011	-3,9064	0,2557	4,4095	8,9946	-0,2154	-2,4460	14,9668	-0,0086	0,5251	-10,3909	-1,3443	-24,4106
17/08/2011	5,4023	-0,1440	-2,4321	0,3714	0,5273	9,3450	9,1401	0,6530	11,8481	-0,8005	-1,4377	-26,4706
18/08/2011	-5,8829	0,0125	0,1317	-9,3947	0,0031	-1,3526	-3,2797	0,8436	14,6093	8,8995	-1,3334	-24,8999
19/08/2011	5,4870	0,1245	2,2455	2,9449	-0,5330	-8,9051	-13,3454	0,4258	6,8323	17,3633	-1,0443	-19,8926
20/08/2011	-4,0880	-0,2402	-4,2300	7,9744	0,2055	4,7931	-13,8175	-0,3013	-5,8662	23,3963	-0,6092	-12,1183
21/08/2011	2,1306	0,3160	5,5154	-6,4409	0,4481	6,8838	-4,3224	-0,8142	-14,3370	26,1363	-0,0881	-2,6439
22/08/2011	0,3308	-0,3401	-5,8836	-5,7397	-0,3823	-7,5270	8,3001	-0,7394	-12,4582	25,1792	0,4457	7,2035
23/08/2011	-2,5645	0,3086	5,3059	8,3918	-0,3047	-4,0663	14,8957	-0,1286	-1,5642	20,6487	0,9166	16,0288
24/08/2011	4,5443	-0,2234	-3,7927	2,0814	0,5047	9,1104	10,6953	0,5754	10,4630	13,1838	1,2573	22,5660
25/08/2011	-5,6272	0,1044	1,7203	-9,4807	0,1019	0,3668	-1,2314	0,8637	14,9197	3,8462	1,4192	25,8805
26/08/2011	5,8900	0,0353	0,6937	1,2687	-0,5466	-9,3003	-12,2760	0,5287	8,6018	-6,0361	1,3795	25,5066
27/08/2011	-5,0800	-0,1681	-2,9679	8,7187	0,1128	3,2483	-14,4953	-0,1894	-3,9160	-15,0726	1,1444	21,5156
28/08/2011	3,5341	0,2728	4,7461	-5,0839	0,5004	7,9274	-6,2604	-0,7740	-13,6108	-22,0021	0,7472	14,4939
29/08/2011	-1,2659	-0,3339	-5,7515</									

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
03/09/2011	-5.6891	-0.0830	-1.5007	9,1630	0,0159	1,6187	-14,8890	-0,0746	-1,9372	2,1642	-1,4566	-26,3807
04/09/2011	4,6699	0,2093	3,6421	-3,5850	0,5359	8,6988	-8,0364	-0,7190	-12,6523	11,6571	-1,2902	-23,7243
05/09/2011	-2,7542	-0,3029	-5,2036	-8,0272	-0,2254	-5,0458	4,6361	-0,8446	-14,2260	19,5164	-0,9437	-17,7702
06/09/2011	0,5334	0,3441	5,8763	6,4052	-0,4503	-6,7862	13,9343	-0,3573	-5,4914	24,6254	-0,4645	-9,3246
07/09/2011	1,9529	-0,3292	-5,5732	5,1649	0,4088	7,7734	13,1021	0,3891	7,2287	26,2433	0,0803	0,4379
08/09/2011	-3,9397	0,2601	4,3711	-8,7494	0,2868	3,6377	2,7785	0,8531	14,7077	24,1246	0,6136	10,1384
09/09/2011	5,4211	-0,1458	-2,4001	-2,0812	-0,5185	-9,1721	-9,5533	0,7005	11,5418	18,5646	1,0589	18,3867
10/09/2011	-5,8828	-0,3480	0,0085	0,0599	-0,0816	-0,0377	-15,0106	0,0411	0,0408	10,3542	1,3526	23,9968
11/09/2011	5,4656	0,1304	2,2918	-1,9984	0,5538	9,1852	-9,6343	-0,6507	-11,4889	0,6688	1,4528	26,1638
12/09/2011	-4,0309	-0,2497	-4,2908	-8,7863	-0,1345	-3,5763	2,7247	-0,8728	-14,7101	-9,1143	1,3456	24,5877
13/09/2011	2,0605	0,3246	5,5343	5,1091	-0,5016	-7,8130	13,0974	-0,4612	-7,2647	-17,6127	1,0471	19,5147
14/09/2011	0,4196	-0,3480	-5,8848	6,4489	0,3397	6,7394	13,9365	0,2850	5,4571	-23,6432	0,5997	11,6838
15/09/2011	-2,6515	0,3125	5,2551	-7,9824	0,3665	5,0919	4,6670	0,8238	14,2194	-26,3761	0,0666	2,2133
16/09/2011	4,6063	-0,2242	-3,7255	-3,6496	-0,4788	-8,6805	-7,9767	0,7662	12,6779	-25,4423	-0,4780	-7,5701
17/09/2011	-5,6595	0,0995	1,6012	9,1561	-0,1760	-1,6683	-14,8760	0,1543	1,9698	-20,9795	-0,9582	-16,3082
18/09/2011	5,8763	0,0421	0,7959	-0,3767	0,5539	9,3845	-11,0339	-0,5715	-10,1615	-13,6053	-1,3073	-22,7983
19/09/2011	-5,0128	-0,1786	-3,0870	-9,2709	-0,0398	-2,0223	0,8085	-0,8849	-14,9406	-4,3406	-1,4761	-26,1449
20/09/2011	3,4316	0,2820	4,8129	3,6748	-0,5366	-8,5863	12,0594	-0,5558	-8,8842	5,5313	-1,4402	-25,8745
21/09/2011	-1,1275	-0,3422	-5,7870	7,5172	0,2601	5,5157	14,5263	0,1766	3,6256	14,6261	-1,2033	-22,0065
22/09/2011	-1,1915	0,3427	5,7671	-6,9916	0,4342	6,3735	6,4466	0,7796	13,5035	21,6560	-0,7975	-15,0563
23/09/2011	3,4846	-0,2868	-4,7839	-5,0869	-0,4241	-7,9382	-6,2980	0,8173	13,5838	25,6126	-0,2794	-5,9830
24/09/2011	-5,0469	0,1832	3,0178	8,7312	-0,2642	-3,2246	-14,5018	0,2633	3,8273	25,9159	0,2778	3,9420
25/09/2011	5,8851	-0,0489	-0,7404	1,2314	0,5365	9,3032	-12,2265	-0,4832	-8,6988	22,5102	0,7943	13,3012
26/09/2011	-5,6407	-0,0951	-1,6823	-9,4795	0,0553	-0,4316	-1,0830	-0,8811	-14,9273	15,8764	1,1959	20,7453
27/09/2011	4,5589	0,2199	3,7715	2,1507	-0,5543	-9,0947	10,8466	-0,6391	-10,3288	6,9684	1,4251	25,1983
28/09/2011	-2,5837	-0,3125	-5,2971	8,3471	0,1729	4,1466	14,8697	0,0668	1,7746	-2,9385	1,4494	26,0219
29/09/2011	0,3372	0,3488	5,8833	-5,8150	0,4879	7,4533	8,0835	0,7225	12,5890	-12,4309	1,2661	23,1124
30/09/2011	2,1388	-0,3293	-5,5119	-6,3587	-0,3568	-6,9767	-4,5592	0,8532	14,2575	-20,1672	0,9021	16,9046
01/10/2011	-4,0965	0,2538	4,2177	8,0545	-0,3433	-4,6654	-13,9128	0,3657	5,5871	-25,0682	0,4097	8,3039
02/10/2011	5,5019	-0,1362	-2,2146	2,7809	0,5027	8,9551	-13,2095	-0,3880	-7,1303	-26,4599	-0,1416	-1,4660
03/10/2011	-5,8818	-0,0054	-0,1755	-9,4179	0,1478	1,1499	-2,9276	-0,8620	-14,6854	-24,1607	-0,6746	-11,0344
04/10/2011	5,3747	0,1431	2,4871	0,5826	-0,5545	-9,3350	9,4829	-0,7103	-11,5928	-18,4934	-1,1148	-19,0728
05/10/2011	-3,8548	-0,2614	-4,4569	8,9253	0,0813	2,6750	14,9768	-0,0429	-0,0773	-10,2492	-1,4008	-24,4702
06/10/2011	1,8327	0,3309	5,6061	-4,4912	0,5261	8,3104	9,5698	0,6535	11,4945	-0,5732	-1,4920	-26,4761
07/10/2011	0,6616	-0,3491	-5,8698	-7,4367	-0,2795	-5,8307	-2,7816	0,8738	14,7032	9,1822	-1,3750	-24,8015
08/10/2011	-2,8789	0,3064	5,1273	7,1539	-0,4108	-5,9558	-13,1256	0,4602	7,2345	17,6415	-1,0652	-19,6564
09/10/2011	4,7600	-0,2137	-3,5333	4,2339	0,4540	8,3587	-13,9790	-0,2878	-5,4792	23,5968	-0,6055	-11,7420
10/10/2011	-5,7289	0,0839	1,3329	-9,0978	0,2346	2,6826	-4,6977	-0,8284	-14,2258	26,1843	-0,0610	-2,1598
11/10/2011	5,8336	0,0571	1,0475	-0,9861	-0,5379	-9,3105	8,0001	-0,7677	-12,6591	25,0213	0,4906	7,7311
12/10/2011	-4,8623	-0,1930	-3,3274	9,2447	-0,0116	1,1437	14,8587	-0,1495	-1,8936	20,2619	0,9700	16,5086
13/10/2011	3,1997	0,2908	4,9616	-3,0583	0,5481	8,9305	10,8904	0,5750	10,2501	12,5887	1,3083	22,8994
14/10/2011	-0,8501	-0,3451	-5,8415	-8,3009	-0,1949	-4,5348	-0,9901	0,8794	14,9290	3,1066	1,4569	25,9751
15/10/2011	-1,4777	0,3377	5,6938	6,0596	-0,4648	-7,0673	-12,1587	0,5454	8,7580	-6,8212	1,3955	25,3017
16/10/2011	3,7127	-0,2761	-4,6157	5,5556	0,3925	7,5369	-14,5382	-0,1843	-3,7640	-15,7795	1,1340	20,9921
17/10/2011	-5,1986	0,1665	2,7460	-8,5347	0,3132	4,1298	-6,3840	-0,7813	-13,5616	-22,5052	0,7108	13,6867
18/10/2011	5,9127	-0,0318	-0,4537	-2,5167	-0,5054	-9,0293	6,4119	-0,8113	-13,5289	-26,0599	0,1865	4,4417
19/10/2011	-5,5457	-0,1124	-1,9849	9,3041	-0,1027	-0,4077	14,5236	-0,2517	-3,6630	-25,9609	-0,3646	-5,4284
20/10/2011	4,3540	0,2317	3,9965	-1,5544	0,5537	9,3041	12,0400	0,4884	8,8708	-22,2307	-0,8652	-14,5423
21/10/2011	-2,3001	-0,3181	-5,4340	-8,9350	-0,1058	-3,1248	0,7986	0,8704	14,9386	-15,3950	-1,2455	-21,6371
22/10/2011	0,0158	0,3459	5,8859	4,8030	-0,5040	-7,9767	-11,0261	0,6200	10,1416	-6,4051	-1,4522	-25,7281
23/10/2011	2,4292	-0,3194	-5,3969	6,7174	0,3203	6,5139	-14,8810	-0,0798	-2,0132	3,4827	-1,4561	-26,2436
24/10/2011	-4,3292	0,2369	3,9752	-7,7472	0,3814	5,4589	-7,9578	-0,7223	-12,7106	12,8786	-1,2561	-23,0953
25/10/2011	5,6110	-0,1175	-1,9222	-3,9718	-0,4584	-8,5035	4,7498	-0,8405	-14,1964	20,4506	-0,8800	-16,7042
26/10/2011	-5,8649	-0,0252	-0,5161	9,1063	-0,1892	-1,9407	13,9858	-0,3478	-5,3651	25,1089	-0,3805	-7,9491
27/10/2011	5,2255	0,1578	2,7744	-0,0153	0,5430	9,4265	13,0140	0,3953	7,3739	26,1743	0,1710	1,9387
28/10/2011	-3,5980	-0,2703	-4,6752	-9,3283	-0,0152	-1,6350	2,5718	0,8475	14,7375	23,4798	0,6953	11,5453
29/10/2011	1,5070	0,3309	5,6946	3,4172	-0,5275	-8,6644	-9,7382	0,6835	11,3809	17,4081	1,1171	19,4834
30/10/2011	0,9905	-0,3410	-5,8301	7,6928	0,2399	5,3168	-15,0108	0,0244	-0,2337	8,8317	1,3758	24,5978
31/10/2011	-3,1774	0,2904	4,9440	-6,7557	0,4374	6,6408	-9,4141	-0,6524	-11,6791	-1,0130	1,4351	26,1508
01/11/2011	4,9487	-0,1943	-3,2672	-5,3189	-0,3987	-7,7476	3,0246	-0,8555	-14,6600	-10,7128	1,2876	23,9285
02/11/2011	-5,8008	0,0622	0,9864	8,6578	-0,2685	-3,4191	13,2504	-0,4366	-6,9880	-18,8900	0,9561	18,2732
03/11/2011	5,7609	0,0747	1,3720	1,5226	0,5167	9,2961	13,8027	0,2973	5,7725	-24,3949	0,4888	10,0143
04/11/2011	-4,6625	-0,2053	-3,6124	-9,4730	0,0743	-0,1001	4,3070	0,8111	14,3252	-26,4677	-0,0475	0,3378
05/11/2011	2,9029	0,2941	5,1322	1,9345	-0,5349	-9,1154	-8,3144	0,7346	12,4548	-24,8289	-0,5769	-9,3880
06/11/2011	-0,5141	-0,3398	-5,8877	8,4597	0,1539	3,9730	-14,9280	0,1261	1,5449	-19,7181	-1,0255	-17,8074
07/11/2011	-1,8150	0,3236	5,5908	-5,5828	0,4798	7,6483	-10,7369	-0,5735	-10,4844	-11,8518	-1,3307	-23,7530
08/11/2011	3,9656	-0,2571	-4,4050	-6,5258	-0,3285	-6,7791	1,2527	-0,8566	-14,9189	-2,3270	-1,4501	-26,4029
09/11/2011	-5,3556	0,1441	2,4281	7,9679	-0,3385	-4,8079	12,3231	-0,5172	-8,5213	7,5223	-1,3668	-25,3786
10/11/2011	5,9252	-0,0122	-0,1241	3,0248	0,4759	8,9141	14,4013	0,1957	4,0754	16,3090	-1,0924	-20,8080
11/11/2011	-5,4247	-0,1277	-2,3102	-9,3641	0,1601	1,4451	5,9969	0,7621	13,7022	22,7808	-0,6655	-13,3121
12/11/2011	4,1151	0,2384	4,2317	0,3907	-0,5264	-9,3167	-6,7582	0,7733	13,3576	26,0076	-0,1467	-3,9315
13/11/2011	-1,9907	-0,3161	-5,5623	8,9969	0,0649	2,5134	-14,6295	0,2242	3,3139	25,5127	0,3900	6,0073
14/11/2011	-0,3267	0,3347	5,8716	-4,2530	0,5077	8,4559	-11,9144	-0,4867	-9,1315	21,3570	0,8676	15,0806
15/11/2011	2,7198	-0,3018	-5,2618	-7,5624	-0,2498	-5,6179	-0,5523	-0,8442	-14,9655	14,1333	1,2176	21,9730
16/11/2011	-4,5535	0,2148	3,7159	7,0499	-0,3973	-6,0711	11,2067	-0,5885	-9,9444	4,8804	1,3904	25,6873
17/11/2011	5,7033	-0,0967	-1,6206	4,4539	0,4222	8,2853	14,7922	0,0925	2,3045	-5,0720	1,3623	25,6907
18/11/2011	-5,8315	-0,0430	-0,8482	-8,9998	0,2398	2,9642	7,6105	0,7018	12,8736	-14,3041	1,1390	21,9980
19/11/2011	5,0637	0,1677	3,0460	-1,1782	-0,5026	-9,2584	-5,0930	0,7991	14,0731	-21,5070	0,7537	15,1608
20/11/2011	-3,3443	-0,2718	-4,8684	9,2861	-0,0244	0,9713	-14,1176	0,3172	5,0519	-25,6777	0,2624	6,1731
21/11/2011	1,1934	0,3230	5,7624</									

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
26/11/2011	5,6818	0,0869	1,6467	-2,7314	-0,4642	-8,9347	-3,3266	0,8119	14,5873	11,2343	-1,2385	-23,9583
27/11/2011	-4,4835	-0,2100	-3,8428	9,3118	-0,1115	-0,6159	-13,3870	0,4043	6,7418	19,2207	-0,9064	-18,1343
28/11/2011	2,6459	0,2896	5,2619	-1,2422	0,5182	9,3754	-13,7744	-0,2951	-5,9876	24,4868	-0,4488	-9,7625
29/11/2011	-0,2450	-0,3275	-5,9114	-9,0074	-0,0771	-2,8190	-4,1932	-0,7802	-14,3924	26,2714	0,0693	-0,0115
30/11/2011	-2,0826	0,3053	5,4939	4,6043	-0,4752	-8,0814	8,4277	-0,6998	-12,3872	24,3078	0,5743	9,7401
01/12/2011	4,1519	-0,2371	-4,2314	6,9425	0,2825	6,3273	14,9104	-0,1135	-1,4013	18,8670	0,9938	18,0914
02/12/2011	-5,4660	0,1246	2,1779	-7,5175	0,3727	5,7672	10,5418	0,5509	10,6005	10,7244	1,2683	23,8358
03/12/2011	5,9197	0,0016	0,1216	-4,2270	-0,4126	-8,3442	-1,4787	0,8120	14,8865	1,0502	1,3593	26,1434
04/12/2011	-5,3259	-0,1351	-2,5449	9,0627	-0,1939	-2,2062	-12,4358	0,4842	8,3624	-8,7743	1,2552	24,6926
05/12/2011	3,9312	0,2370	4,3937	0,3684	0,5008	9,4458	-14,4190	-0,1927	-4,2145	-17,3539	0,9726	19,7105
06/12/2011	-1,7745	-0,3069	-5,6422	-9,3620	0,0120	-1,2442	-5,9859	-0,7297	-13,7523	-23,4859	0,5529	11,9284
07/12/2011	-0,5662	0,3192	5,8495	3,1289	-0,4924	-8,7594	6,7813	-0,7383	-13,3566	-26,3225	0,0563	2,4678
08/12/2011	2,9066	-0,2836	-5,1638	7,9235	0,2007	5,0330	14,6113	-0,2131	-3,2869	-25,4853	-0,4472	-7,3380
09/12/2011	-4,6969	0,1960	3,5370	-6,4196	0,4223	6,9681	11,8078	0,4629	9,1686	-21,1051	-0,8875	-16,1252
10/12/2011	5,7500	-0,0824	-1,4287	-5,6187	-0,3492	-7,4924	0,4325	0,7991	14,9517	-13,7949	-1,2042	-22,6866
11/12/2011	-5,8038	-0,0521	-1,0557	8,5331	-0,2693	-3,7537	-11,2620	0,5559	9,8812	-4,5717	-1,3537	-26,1209
12/12/2011	4,9549	0,1688	3,2069	1,9932	0,4688	9,2356	-14,8380	-0,0882	-2,3371	5,2861	-1,3155	-25,9525
13/12/2011	-3,1956	-0,2655	-4,9758	-9,4407	0,0996	0,3944	-7,7107	-0,6679	-12,8730	14,4029	-1,0953	-22,1935
14/12/2011	1,0071	0,3105	5,7929	1,5327	-0,4942	-9,1766	4,9928	-0,7645	-14,1218	21,4987	-0,7237	-15,3451
15/12/2011	1,4436	-0,3098	-5,7444	8,6772	0,1139	3,5643	14,0632	-0,3084	-5,1547	25,5624	-0,2530	-6,3476
16/12/2011	-3,5835	0,2525	4,6577	-5,1092	0,4587	7,9786	12,9052	0,3679	7,5520	26,0049	0,2505	3,5446
17/12/2011	5,1711	-0,1593	-2,8957	-6,8591	-0,2760	-6,3927	2,3834	0,7736	14,7671	22,7524	0,7151	12,9282
18/12/2011	-5,8708	0,0331	0,5250	7,7259	-0,3354	-5,2072	-9,8668	0,6183	11,2719	16,2595	1,0750	20,4610
19/12/2011	5,6354	0,0898	1,7762	3,5828	0,4230	8,7370	-15,0122	0,0174	-0,3709	7,4522	1,2795	25,0581
20/12/2011	-4,4028	-0,2062	-3,9460	-9,2274	0,1832	2,0499	-9,3417	-0,5954	-11,7487	-2,4145	1,3003	26,0620
21/12/2011	2,5253	0,2798	5,3145	-0,1399	-0,4804	-9,3069	3,0779	-0,7779	-14,6578	-11,9371	1,1360	23,3437
22/12/2011	-0,1394	-0,3137	-5,9195	9,1676	0,0245	1,9592	13,2569	-0,3981	-6,9737	-19,7775	0,8114	17,3103
23/12/2011	-2,1956	0,2900	5,4495	-3,6173	0,4808	8,7562	13,8003	0,2672	5,7650	-24,8469	0,3735	8,8385
24/12/2011	4,2112	-0,2239	-4,1704	-7,9006	-0,1948	-5,0681	4,3349	0,7351	14,3145	-26,4536	-0,1159	-0,8706
25/12/2011	-5,5075	0,1146	2,0844	6,6528	-0,3901	-6,5150	-8,2676	0,6699	12,4881	-24,3922	-0,5884	-10,4590
26/12/2011	5,9113	0,0054	0,1983	5,0841	0,3646	7,9511	-14,9216	0,1219	1,6394	-18,9587	-0,9789	-18,6070
27/12/2011	-5,2998	-0,1329	-2,6155	-8,7144	0,2603	3,6686	-10,8376	-0,5134	-10,3926	-10,9107	-1,2342	-24,2019
28/12/2011	3,8740	0,2292	4,4356	-1,8362	-0,4514	-9,1314	1,0660	-0,7781	-14,9422	-1,3563	-1,3192	-26,4788
29/12/2011	-1,7298	-0,2951	-5,6617	9,3647	-0,0648	0,2635	12,1900	-0,4810	-8,7095	8,3825	-1,2227	-25,1201
30/12/2011	-0,6278	0,3057	5,8417	-1,9829	0,4877	9,2636	14,4647	0,1619	3,8260	16,9532	-0,9578	-20,2972
31/12/2011	2,9285	-0,2715	-5,1514	-8,6979	-0,1080	-3,5520	6,2567	0,6840	13,5832	23,1537	-0,5614	-12,6612

Distanze in raggi di Giove dei satelliti : Io (I), Europa (II), Ganimede (III), Callisto (IV), alle ore 0 in T.U.

Distance in Jupiter's radii : Io (I), Europa (II), Ganimede (III), Callisto (IV), at 00.00 U.T.

# FENOMENI MUTUI DEI SATELLITI DI GIOVE

## MUTUAL PHENOMENA OF THE MOONS OF JUPITER

Ec.D. : inizio dell'eclisse  
 Ec.R. : fine dell'eclisse  
 Oc.D. : inizio dell'occultazione  
 Oc.R. : fine dell'occultazione  
 Tr.I. : inizio del transito  
 Tr.E. : fine del transito  
 Sh.I. : ingresso dell'ombra  
 Sh.E. : uscita dell'ombra

I : Io  
 II : Europa  
 III: Ganymede  
 IV : Callisto

TEMPI IN T.U.

Ec.D. : beginning of the eclipse  
 Ec.R. : ending of the eclipse  
 Oc.D. : beginning of the occultation  
 Oc.R. : ending of the occultation  
 Tr.I. : beginning of the transit  
 Tr.E. : ending of the transit  
 Sh.I. : beginning of the umbra transit  
 Sh.E. : ending of the umbra transit

I : Io  
 II : Europa  
 III: Ganymede  
 IV : Callisto

TIMES IN U.T.

Date	Time	M	Phe	Pha	h	h S
01/01/2011	02:02:37	I	Occ.	D.	-40,0	-50,5
01/01/2011	05:34:46	I	Ec.	R.	-47,1	-11,8
01/01/2011	06:42:16	II	Occ.	D.	-39,2	0,1
01/01/2011	12:07:48	II	Ec.	R.	18,2	23,9
01/01/2011	17:05:50	IV	Occ.	D.	44,2	-13,5
01/01/2011	18:48:09	IV	Occ.	R.	34,0	-32,0
01/01/2011	23:21:26	I	Tr.	I.	-13,7	-70,9
02/01/2011	00:41:13	I	Sh.	I.	-27,9	-63,9
02/01/2011	01:36:41	I	Tr.	E.	-36,8	-55,1
02/01/2011	02:54:47	I	Sh.	E.	-46,5	-41,0
02/01/2011	20:32:02	I	Occ.	D.	16,9	-51,0
03/01/2011	00:03:37	I	Ec.	R.	-21,9	-68,5
03/01/2011	01:05:14	II	Tr.	I.	-32,4	-60,3
03/01/2011	03:42:37	II	Sh.	I.	-49,9	-32,2
03/01/2011	03:51:05	II	Tr.	E.	-50,1	-30,6
03/01/2011	06:23:35	II	Sh.	E.	-40,7	-3,2
03/01/2011	11:10:52	III	Tr.	I.	9,4	25,2
03/01/2011	14:18:07	III	Tr.	E.	38,8	12,9
03/01/2011	16:37:40	III	Sh.	I.	45,2	-8,4
03/01/2011	17:50:58	I	Tr.	I.	40,2	-21,3
03/01/2011	19:10:10	I	Sh.	I.	29,9	-35,8
03/01/2011	19:24:24	III	Sh.	E.	27,7	-38,5
03/01/2011	20:06:13	I	Tr.	E.	20,9	-46,2
03/01/2011	21:23:42	I	Sh.	E.	7,1	-59,7
04/01/2011	15:01:32	I	Occ.	D.	43,2	7,2
04/01/2011	18:32:33	I	Ec.	R.	34,9	-28,7
04/01/2011	20:04:29	II	Occ.	D.	20,6	-45,7
05/01/2011	01:27:13	II	Ec.	R.	-36,7	-56,7
05/01/2011	12:20:40	I	Tr.	I.	22,9	23,8
05/01/2011	13:39:12	I	Sh.	I.	34,9	17,6
05/01/2011	14:35:53	I	Tr.	E.	41,4	10,9
05/01/2011	15:52:42	I	Sh.	E.	45,7	0,0
06/01/2011	09:31:03	I	Occ.	D.	-7,2	21,0
06/01/2011	13:01:24	I	Ec.	R.	30,0	21,2
06/01/2011	14:26:02	II	Tr.	I.	40,9	12,3
06/01/2011	17:00:58	II	Sh.	I.	43,8	-11,9
06/01/2011	17:11:52	II	Tr.	E.	43,0	-13,8
06/01/2011	19:41:49	II	Sh.	E.	23,4	-41,3
07/01/2011	01:04:33	III	Occ.	D.	-34,2	-60,4
07/01/2011	04:11:59	III	Occ.	R.	-50,1	-26,8
07/01/2011	06:24:27	III	Ec.	D.	-38,5	-3,0
07/01/2011	06:50:20	I	Tr.	I.	-34,7	1,2
07/01/2011	08:08:10	I	Sh.	I.	-21,7	12,2
07/01/2011	09:05:33	I	Tr.	E.	-11,3	18,7
07/01/2011	09:11:18	III	Ec.	R.	-10,2	19,3
07/01/2011	10:21:37	I	Sh.	E.	3,2	24,3
08/01/2011	04:00:39	I	Occ.	D.	-50,1	-28,9
08/01/2011	07:30:17	I	Ec.	R.	-27,6	7,0
08/01/2011	09:26:21	II	Occ.	D.	-6,8	20,7
08/01/2011	14:45:58	II	Ec.	R.	43,3	10,0
09/01/2011	01:20:08	I	Tr.	I.	-37,5	-57,9
09/01/2011	02:37:12	I	Sh.	I.	-46,6	-44,3
09/01/2011	03:35:20	I	Tr.	E.	-49,9	-33,6
09/01/2011	04:50:38	I	Sh.	E.	-47,9	-19,7
09/01/2011	22:30:16	I	Occ.	D.	-9,0	-67,6
10/01/2011	01:59:08	I	Ec.	R.	-43,0	-51,2
10/01/2011	02:47:30	IV	Tr.	I.	-47,7	-42,4
10/01/2011	03:47:15	II	Tr.	I.	-50,0	-31,4
10/01/2011	04:10:06	IV	Tr.	E.	-49,7	-27,1
10/01/2011	06:19:20	II	Sh.	I.	-37,7	-4,0
10/01/2011	06:33:04	II	Tr.	E.	-35,6	-1,1
10/01/2011	09:00:06	II	Sh.	E.	-10,3	18,4
10/01/2011	15:25:02	III	Tr.	I.	45,8	4,8
10/01/2011	18:31:44	III	Tr.	E.	32,4	-27,6
10/01/2011	19:49:53	I	Tr.	I.	19,9	-42,1
10/01/2011	20:40:18	III	Sh.	I.	11,0	-51,2
10/01/2011	21:06:08	I	Sh.	I.	6,3	-55,7
10/01/2011	22:05:03	I	Tr.	E.	-4,7	-64,6
10/01/2011	23:19:33	I	Sh.	E.	-18,5	-69,9

Date	Time	M	Phe	Pha	h	h S
10/01/2011	23:25:45	III	Sh.	E.	-19,6	-69,9
11/01/2011	17:00:00	I	Occ.	D.	42,9	-10,9
11/01/2011	20:28:03	I	Ec.	R.	12,6	-48,9
11/01/2011	22:49:21	II	Occ.	D.	-13,6	-68,7
12/01/2011	04:05:18	II	Ec.	R.	-49,5	-28,0
12/01/2011	14:19:46	I	Tr.	I.	42,5	14,1
12/01/2011	15:35:10	I	Sh.	I.	46,2	3,6
12/01/2011	16:34:55	I	Tr.	E.	44,5	-6,4
12/01/2011	17:48:32	I	Sh.	E.	37,5	-19,4
13/01/2011	11:29:43	I	Occ.	D.	19,2	26,5
13/01/2011	14:56:54	I	Ec.	R.	45,3	9,4
13/01/2011	17:08:54	II	Tr.	I.	41,6	-12,1
13/01/2011	19:37:43	II	Sh.	I.	20,4	-39,3
13/01/2011	19:54:40	II	Tr.	E.	17,5	-42,5
13/01/2011	22:18:21	II	Sh.	E.	-9,1	-65,6
14/01/2011	05:21:04	III	Occ.	D.	-43,2	-14,1
14/01/2011	08:27:53	III	Occ.	R.	-13,6	15,2
14/01/2011	08:49:37	I	Tr.	I.	-9,6	17,7
14/01/2011	10:04:06	I	Sh.	I.	4,5	24,3
14/01/2011	10:27:59	III	Ec.	D.	8,8	25,5
14/01/2011	11:04:45	I	Tr.	E.	15,5	26,6
14/01/2011	12:17:27	I	Sh.	E.	27,8	25,4
14/01/2011	13:13:34	III	Ec.	R.	36,0	21,6
15/01/2011	05:59:30	I	Occ.	D.	-37,8	-7,4
15/01/2011	09:25:47	I	Ec.	R.	-1,4	21,5
15/01/2011	12:11:58	II	Occ.	D.	27,5	25,8
15/01/2011	17:24:00	II	Ec.	R.	39,4	-14,5
16/01/2011	03:19:36	I	Tr.	I.	-49,5	-36,3
16/01/2011	04:33:08	I	Sh.	I.	-47,1	-22,7
16/01/2011	05:34:42	I	Tr.	E.	-40,7	-11,6
16/01/2011	06:46:27	I	Sh.	E.	-30,1	1,0
17/01/2011	00:29:18	I	Occ.	D.	-33,4	-64,5
17/01/2011	03:54:37	I	Ec.	R.	-49,0	-29,8
17/01/2011	06:30:57	II	Tr.	I.	-32,0	-1,1
17/01/2011	08:56:10	II	Sh.	I.	-6,4	18,8
17/01/2011	09:16:42	II	Tr.	E.	-1,8	20,9
17/01/2011	11:36:42	II	Sh.	E.	22,9	27,2
17/01/2011	19:42:22	III	Tr.	I.	17,5	-39,5
17/01/2011	21:49:31	I	Tr.	I.	-6,0	-61,1
17/01/2011	22:48:17	III	Tr.	E.	-16,8	-67,5
17/01/2011	23:02:03	I	Sh.	I.	-19,2	-68,2
18/01/2011	00:04:35	I	Tr.	E.	-30,0	-66,9
18/01/2011	00:42:48	III	Sh.	I.	-35,9	-62,7
18/01/2011	01:15:20	I	Sh.	E.	-40,4	-58,0
18/01/2011	03:26:59	III	Sh.	E.	-49,4	-34,8
18/01/2011	12:37:38	IV	Occ.	D.	33,1	25,1
18/01/2011	14:08:56	IV	Occ.	R.	43,7	16,6
18/01/2011	18:59:13	I	Occ.	D.	24,4	-31,3
18/01/2011	22:23:32	I	Ec.	R.	-12,8	-65,1
19/01/2011	01:35:35	II	Occ.	D.	-43,2	-54,7
19/01/2011	06:43:11	II	Ec.	R.	-28,8	0,8
19/01/2011	16:19:33	I	Tr.	I.	44,5	-1,8
19/01/2011	17:31:03	I	Sh.	I.	37,2	-15,0
19/01/2011	18:34:36	I	Tr.	E.	27,9	-26,6
19/01/2011	19:44:17	I	Sh.	E.	16,1	-39,5
20/01/2011	13:29:06	I	Occ.	D.	40,7	21,4
20/01/2011	16:52:23	I	Ec.	R.	41,4	-7,9
20/01/2011	19:53:25	II	Tr.	I.	13,9	-41,0
20/01/2011	22:14:37	II	Sh.	I.	-12,3	-63,7
20/01/2011	22:39:05	II	Tr.	E.	-16,7	-66,2
21/01/2011	00:55:01	II	Sh.	E.	-38,9	-60,7
21/01/2011	09:40:08	III	Occ.	D.	4,7	23,7
21/01/2011	10:49:34	I	Tr.	I.	17,2	27,6
21/01/2011	11:59:59	I	Sh.	I.	29,1	27,5
21/01/2011	12:46:03	III	Occ.	R.	35,9	25,2
21/01/2011	13:04:35	I	Tr.	E.	38,3	23,9
21/01/2011	14:13:11	I	Sh.	E.	44,9	16,8
21/01/2011	14:30:48	III	Ec.	D.	45,9	14,5
21/01/2011	17:15:06	III	Ec.	R.	38,5	-11,7

Date	Time	M	Phe	Pha	h	h S
22/01/2011	07:59:04	I	Occ.	D.	-13,6	12,4
22/01/2011	11:21:16	I	Ec.	R.	23,3	28,3
22/01/2011	14:58:52	II	Occ.	D.	46,9	10,9
22/01/2011	20:01:49	II	Ec.	R.	11,3	-42,1
23/01/2011	05:19:43	I	Tr.	I.	-39,2	-13,7
23/01/2011	06:29:00	I	Sh.	I.	-28,8	-0,8
23/01/2011	07:34:42	I	Tr.	E.	-17,4	9,0
23/01/2011	08:42:09	I	Sh.	E.	-4,9	18,1
24/01/2011	02:29:02	I	Occ.	D.	-48,3	-44,9
24/01/2011	05:50:06	I	Ec.	R.	-34,3	-8,2
24/01/2011	09:16:13	II	Tr.	I.	2,3	22,1
24/01/2011	11:33:07	II	Sh.	I.	26,5	28,8
24/01/2011	12:01:50	II	Tr.	E.	31,1	28,2
24/01/2011	14:13:27	II	Sh.	E.	45,7	17,4
24/01/2011	23:49:47	I	Tr.	I.	-30,9	-66,5
25/01/2011	00:02:56	III	Tr.	I.	-33,0	-65,7
25/01/2011	00:57:54	I	Sh.	I.	-40,7	-59,7
25/01/2011	02:04:44	I	Tr.	E.	-47,1	-49,1
25/01/2011	03:07:52	III	Tr.	E.	-48,9	-37,8
25/01/2011	03:11:01	I	Sh.	E.	-48,8	-37,2
25/01/2011	04:45:39	III	Sh.	I.	-42,4	-19,7
25/01/2011	07:28:34	III	Sh.	E.	-17,2	8,4
25/01/2011	20:59:06	I	Occ.	D.	-0,4	-51,6
26/01/2011	00:19:01	I	Ec.	R.	-35,8	-64,1
26/01/2011	04:23:04	II	Occ.	D.	-44,4	-23,7
26/01/2011	09:20:51	II	Ec.	R.	4,4	22,9
26/01/2011	18:19:58	I	Tr.	I.	27,0	-22,5
26/01/2011	19:26:52	I	Sh.	I.	15,5	-34,9
26/01/2011	20:34:53	I	Tr.	E.	3,2	-47,2
26/01/2011	21:39:57	I	Sh.	E.	-9,2	-57,8
26/01/2011	22:51:05	IV	Tr.	I.	-22,0	-65,6
26/01/2011	23:49:21	IV	Tr.	E.	-31,7	-66,0
27/01/2011	15:29:09	I	Occ.	D.	46,4	7,5
27/01/2011	18:47:52	I	Ec.	R.	21,8	-27,5
27/01/2011	22:39:21	II	Tr.	I.	-20,5	-64,5
28/01/2011	00:51:33	II	Sh.	I.	-40,9	-60,0
28/01/2011	01:24:52	II	Tr.	E.	-44,5	-55,2
28/01/2011	03:31:46	II	Sh.	E.	-47,6	-33,0
28/01/2011	12:50:07	I	Tr.	I.	39,8	26,7
28/01/2011	13:55:47	I	Sh.	I.	45,8	20,5
28/01/2011	14:02:14	III	Occ.	D.	46,1	19,8
28/01/2011	15:05:00	I	Tr.	E.	47,2	11,4
28/01/2011	16:08:50	I	Sh.	E.	43,6	1,6
28/01/2011	17:07:00	III	Occ.	R.	37,1	-8,9
28/01/2011	18:33:43	III	Ec.	D.	23,7	-24,7
28/01/2011	21:16:44	III	Ec.	R.	-10,6	-53,8
29/01/2011	09:59:16	I	Occ.	D.	13,3	26,9
29/01/2011	13:16:45	I	Ec.	R.	43,0	24,8
29/01/2011	17:46:57	II	Occ.	D.	30,9	-15,9
29/01/2011	22:39:27	II	Ec.	R.	-21,5	-63,9
30/01/2011	07:20:23	I	Tr.	I.	-15,5	8,0
30/01/2011	08:24:46	I	Sh.	I.	-3,3	17,3
30/01/2011	09:35:14	I	Tr.	E.	9,6	25,2
30/01/2011	10:37:47	I	Sh.	E.	20,8	29,3
31/01/2011	04:29:23	I	Occ.	D.	-41,7	-21,9
31/01/2011	07:45:35	I	Ec.	R.	-10,3	12,0
31/01/2011	12:02:52	II	Tr.	I.	35,0	30,0
31/01/2011	14:10:08	II	Sh.	I.	47,1	19,6
31/01/2011	14:48:18	II	Tr.	E.	47,5	14,5
31/01/2011	16:50:14	II	Sh.	E.	38,2	-5,2
01/02/2011	01:50:35	I	Tr.	I.	-47,1	-50,4
01/02/2011	02:53:39	I	Sh.	I.	-48,2	-39,4
01/02/2011	04:05:23	I	Tr.	E.	-43,8	-26,2
01/02/2011	04:26:18	III	Tr.	I.	-41,6	-22,3
01/02/2011	05:06:37	I	Sh.	E.	-36,4	-14,9
01/02/2011	07:30:00	III	Tr.	E.	-12,5	9,8
01/02/2011	08:48:30	III	Sh.	I.	2,4	20,7
01/02/2011	11:30:08	III	Sh.	E.	30,7	30,9
01/02/2011	22:59:36	I	Occ.	D.	-26,5	-64,4

Date	Time	M	Phe	Pha	h	h S
02/02/2011	02:14:30	I	Ec.	R.	-48,1	-46,2
02/02/2011	07:11:35	II	Occ.	D.	-15,2	7,2
02/02/2011	11:58:21	II	Ec.	R.	35,4	30,7
02/02/2011	20:20:53	I	Tr.	I.	2,0	-43,3
02/02/2011	21:22:36	I	Sh.	I.	-9,8	-53,5
02/02/2011	22:35:39	I	Tr.	E.	-22,9	-62,5
02/02/2011	23:35:32	I	Sh.	E.	-32,7	-64,6
03/02/2011	17:29:47	I	Occ.	D.	31,3	-11,7
03/02/2011	20:43:20	I	Ec.	R.	-2,5	-46,9
04/02/2011	01:26:39	II	Tr.	I.	-46,0	-53,6
04/02/2011	03:28:37	II	Sh.	I.	-45,9	-32,5
04/02/2011	04:11:56	II	Tr.	E.	-41,9	-24,5
04/02/2011	06:08:35	II	Sh.	E.	-25,0	-2,8
04/02/2011	08:53:49	IV	Occ.	D.	5,2	22,0
04/02/2011	09:56:59	IV	Occ.	R.	16,7	28,3
04/02/2011	14:51:09	I	Tr.	I.	47,5	15,1
04/02/2011	15:51:29	I	Sh.	I.	43,7	5,8
04/02/2011	17:05:53	I	Tr.	E.	34,5	-7,2
04/02/2011	18:04:24	I	Sh.	E.	25,3	-17,8
04/02/2011	18:26:07	III	Occ.	D.	21,6	-21,9
04/02/2011	21:29:34	III	Occ.	R.	-12,2	-54,1
04/02/2011	22:35:58	III	Ec.	D.	-23,9	-62,0
05/02/2011	01:17:42	III	Ec.	R.	-45,5	-54,7
05/02/2011	12:00:02	I	Occ.	D.	37,2	31,6
05/02/2011	15:12:12	I	Ec.	R.	46,5	12,2
05/02/2011	20:35:56	II	Occ.	D.	-2,1	-45,2
06/02/2011	01:16:51	II	Ec.	R.	-45,6	-54,6
06/02/2011	09:21:32	I	Tr.	I.	11,6	25,6
06/02/2011	10:20:27	I	Sh.	I.	22,1	30,4
06/02/2011	11:36:13	I	Tr.	E.	34,3	32,3
06/02/2011	12:33:19	I	Sh.	E.	41,8	30,3
07/02/2011	06:30:16	I	Occ.	D.	-19,4	1,5
07/02/2011	09:41:02	I	Ec.	R.	15,7	27,8
07/02/2011	14:50:49	II	Tr.	I.	47,4	15,9
07/02/2011	16:47:18	II	Sh.	I.	36,0	-2,7
07/02/2011	17:36:01	II	Tr.	E.	28,6	-12,0
07/02/2011	19:27:11	II	Sh.	E.	9,1	-32,5
08/02/2011	03:51:51	I	Tr.	I.	-42,4	-27,5
08/02/2011	04:49:18	I	Sh.	I.	-35,2	-16,9
08/02/2011	06:06:29	I	Tr.	E.	-22,9	-2,2
08/02/2011	07:02:09	I	Sh.	E.	-13,1	6,9
08/02/2011	08:52:49	III	Tr.	I.	7,6	22,9
08/02/2011	11:55:04	III	Tr.	E.	38,0	32,6
08/02/2011	12:52:07	III	Sh.	I.	44,5	29,7
08/02/2011	15:32:29	III	Sh.	E.	44,5	9,8
09/02/2011	01:00:37	I	Occ.	D.	-44,8	-56,1
09/02/2011	04:09:56	I	Ec.	R.	-39,9	-24,0
09/02/2011	10:00:57	II	Occ.	D.	20,5	30,0
09/02/2011	14:35:35	II	Ec.	R.	47,9	18,6
09/02/2011	22:22:15	I	Tr.	I.	-24,0	-59,3
09/02/2011	23:18:14	I	Sh.	I.	-33,0	-62,5
10/02/2011	00:36:50	I	Tr.	E.	-42,9	-58,6
10/02/2011	01:31:02	I	Sh.	E.	-46,8	-51,6
10/02/2011	19:30:55	I	Occ.	D.	6,8	-32,5
10/02/2011	22:38:45	I	Ec.	R.	-27,2	-60,4
11/02/2011	04:15:08	II	Tr.	I.	-38,3	-22,6
11/02/2011	06:05:46	II	Sh.	I.	-21,2	-1,6
11/02/2011	07:00:10	II	Tr.	E.	-11,5	7,2
11/02/2011	08:45:32	II	Sh.	E.	8,2	22,9
11/02/2011	16:52:37	I	Tr.	I.	33,7	-2,8
11/02/2011	17:47:06	I	Sh.	I.	24,9	-13,2
11/02/2011	19:07:10	I	Tr.	E.	10,7	-28,0
11/02/2011	19:59:52	I	Sh.	E.	1,2	-37,6
11/02/2011	22:52:06	III	Occ.	D.	-29,8	-60,9
12/02/2011	01:54:00	III	Occ.	R.	-47,4	-47,5
12/02/2011	02:38:09	III	Ec.	D.	-46,7	-40,0
12/02/2011	05:18:35	III	Ec.	R.	-28,5	-10,7
12/02/2011	14:01:17	I	Occ.	D.	48,6	23,9
12/02/2011	17:07:37	I	Ec.	R.	30,9	-5,7
12/02/2011	23:25:44	II	Occ.	D.	-35,2	-61,6
13/02/2011	03:54:01	II	Ec.	R.	-40,0	-26,1
13/02/2011	11:23:05	I	Tr.	I.	36,1	34,6
13/02/2011	12:16:02	I	Sh.	I.	42,9	33,5
13/02/2011	13:37:35	I	Tr.	E.	48,5	27,0
13/02/2011	14:28:46	I	Sh.	E.	48,1	20,6
14/02/2011	08:31:37	I	Occ.	D.	7,5	21,9
14/02/2011	11:36:26	I	Ec.	R.	38,5	34,9
14/02/2011	17:39:51	II	Tr.	I.	24,7	-11,2
14/02/2011	19:24:30	II	Sh.	I.	5,9	-30,5
14/02/2011	20:24:46	II	Tr.	E.	-5,4	-41,2
14/02/2011	22:04:10	II	Sh.	E.	-23,3	-55,9
15/02/2011	05:53:29	I	Tr.	I.	-20,9	-3,2
15/02/2011	06:44:52	I	Sh.	I.	-11,8	5,7
15/02/2011	08:07:56	I	Tr.	E.	3,9	18,9
15/02/2011	08:57:34	I	Sh.	E.	12,9	25,5
15/02/2011	13:20:32	III	Tr.	I.	48,3	29,4
15/02/2011	16:21:06	III	Tr.	E.	36,7	3,5

Date	Time	M	Phe	Pha	h	h S
15/02/2011	16:54:51	III	Sh.	I.	31,6	-2,1
15/02/2011	19:33:54	III	Sh.	E.	3,7	-32,0
16/02/2011	03:02:04	I	Occ.	D.	-44,0	-34,9
16/02/2011	06:05:20	I	Ec.	R.	-18,2	-0,5
16/02/2011	12:51:03	II	Occ.	D.	47,0	32,3
16/02/2011	17:12:40	II	Ec.	R.	28,3	-5,8
17/02/2011	00:23:58	I	Tr.	I.	-43,2	-57,6
17/02/2011	01:13:46	I	Sh.	I.	-46,4	-52,1
17/02/2011	02:38:22	I	Tr.	E.	-45,4	-38,8
17/02/2011	03:26:25	I	Sh.	E.	-41,4	-30,2
17/02/2011	21:32:28	I	Occ.	D.	-19,3	-51,0
18/02/2011	00:34:09	I	Ec.	R.	-44,3	-56,4
18/02/2011	07:04:38	II	Tr.	I.	-6,2	9,7
18/02/2011	08:43:00	II	Sh.	I.	12,2	24,6
18/02/2011	09:49:21	II	Tr.	E.	24,0	31,9
18/02/2011	11:22:31	II	Sh.	E.	38,6	36,4
18/02/2011	18:54:24	I	Tr.	I.	9,4	-24,1
18/02/2011	19:42:36	I	Sh.	I.	0,8	-32,9
18/02/2011	21:08:45	I	Tr.	E.	-15,6	-47,3
18/02/2011	21:55:13	I	Sh.	E.	-23,6	-53,7
19/02/2011	03:20:17	III	Occ.	D.	-41,2	-30,8
19/02/2011	06:20:26	III	Occ.	R.	-13,7	2,5
19/02/2011	06:40:44	III	Ec.	D.	-10,0	6,0
19/02/2011	09:19:52	III	Ec.	R.	19,4	29,3
19/02/2011	16:02:56	I	Occ.	D.	37,8	7,5
19/02/2011	19:03:02	I	Ec.	R.	7,3	-25,5
20/02/2011	02:16:07	II	Occ.	D.	-45,8	-41,8
20/02/2011	06:30:59	II	Ec.	R.	-11,2	4,6
20/02/2011	13:24:57	I	Tr.	I.	49,2	30,5
20/02/2011	14:11:30	I	Sh.	I.	48,5	24,9
20/02/2011	15:39:14	I	Tr.	E.	40,6	11,7
20/02/2011	16:24:05	I	Sh.	E.	34,3	4,1
21/02/2011	10:33:22	I	Occ.	D.	33,0	36,1
21/02/2011	13:31:50	I	Ec.	R.	49,4	30,0
21/02/2011	20:29:54	II	Tr.	I.	-10,1	-40,4
21/02/2011	22:01:50	II	Sh.	I.	-26,1	-53,5
21/02/2011	23:14:27	II	Tr.	E.	-36,9	-58,3
22/02/2011	00:41:16	II	Sh.	E.	-45,2	-54,3
22/02/2011	07:55:24	I	Tr.	I.	6,0	19,0
22/02/2011	08:40:19	I	Sh.	I.	14,2	25,5
22/02/2011	10:09:39	I	Tr.	E.	29,8	35,0
22/02/2011	10:52:52	I	Sh.	E.	36,5	37,3
22/02/2011	17:50:04	III	Tr.	I.	19,0	-11,4
22/02/2011	20:48:44	III	Tr.	E.	-14,0	-43,2
22/02/2011	20:57:34	III	Sh.	I.	-15,5	-44,6
22/02/2011	23:35:18	III	Sh.	E.	-39,7	-58,0
23/02/2011	05:03:54	I	Occ.	D.	-24,6	-10,7
23/02/2011	08:00:43	I	Ec.	R.	7,6	20,2
23/02/2011	15:41:39	II	Occ.	D.	39,3	12,0
23/02/2011	19:49:28	II	Ec.	R.	-3,2	-33,0
24/02/2011	02:25:57	I	Tr.	I.	-44,2	-39,0
24/02/2011	03:09:11	I	Sh.	I.	-40,3	-31,5
24/02/2011	04:40:08	I	Tr.	E.	-27,8	-14,8
24/02/2011	05:21:41	I	Sh.	E.	-21,0	-7,1
24/02/2011	23:34:23	I	Occ.	D.	-40,1	-57,3
25/02/2011	02:29:32	I	Ec.	R.	-43,6	-38,1
25/02/2011	09:55:06	II	Tr.	I.	29,1	34,9
25/02/2011	11:20:21	II	Sh.	I.	41,7	38,9
25/02/2011	12:39:27	II	Tr.	E.	48,8	36,2
25/02/2011	13:59:41	II	Sh.	E.	48,7	27,9
25/02/2011	20:56:27	I	Tr.	I.	-16,8	-43,6
25/02/2011	21:37:59	I	Sh.	I.	-23,9	-49,5
25/02/2011	23:10:35	I	Tr.	E.	-37,6	-56,8
25/02/2011	23:50:28	I	Sh.	E.	-42,0	-56,5
26/02/2011	07:50:05	III	Occ.	D.	7,5	19,4
26/02/2011	13:21:03	III	Ec.	R.	49,8	32,8
26/02/2011	18:04:56	I	Occ.	D.	14,3	-13,3
26/02/2011	20:58:23	I	Ec.	R.	-17,6	-43,6
27/02/2011	05:06:57	II	Occ.	D.	-21,7	-9,1
27/02/2011	09:07:40	II	Ec.	R.	22,2	30,7
27/02/2011	15:27:02	I	Tr.	I.	39,9	15,4
27/02/2011	16:06:52	I	Sh.	I.	34,1	8,6
27/02/2011	17:41:07	I	Tr.	E.	18,1	-8,6
27/02/2011	18:19:19	I	Sh.	E.	11,2	-15,7
28/02/2011	12:35:26	I	Occ.	D.	49,3	37,5
28/02/2011	15:27:10	I	Ec.	R.	39,5	15,6
28/02/2011	23:20:46	II	Tr.	I.	-39,7	-55,8
01/03/2011	00:39:13	II	Sh.	I.	-45,5	-52,0
01/03/2011	02:04:56	II	Tr.	E.	-44,1	-40,8
01/03/2011	03:18:27	II	Sh.	E.	-37,0	-28,4
01/03/2011	09:57:33	I	Tr.	I.	31,8	36,6
01/03/2011	10:35:39	I	Sh.	I.	37,7	39,2
01/03/2011	12:11:35	I	Tr.	E.	48,2	39,3
01/03/2011	12:48:05	I	Sh.	E.	49,9	36,9
01/03/2011	22:20:22	III	Tr.	I.	-32,2	-52,7
02/03/2011	00:59:40	III	Sh.	I.	-45,8	-49,5
02/03/2011	01:16:58	III	Tr.	E.	-45,8	-47,4

Date	Time	M	Phe	Pha	h	h S
02/03/2011	03:36:05	III	Sh.	E.	-34,2	-24,9
02/03/2011	07:06:02	I	Occ.	D.	2,1	13,5
02/03/2011	09:56:03	I	Ec.	R.	32,2	36,8
02/03/2011	18:32:40	II	Occ.	D.	7,2	-17,5
02/03/2011	22:26:03	II	Ec.	R.	-33,4	-52,8
03/03/2011	04:28:08	I	Tr.	I.	-25,8	-15,1
03/03/2011	05:04:29	I	Sh.	I.	-19,7	-8,4
03/03/2011	06:42:07	I	Tr.	E.	-1,3	9,6
03/03/2011	07:16:53	I	Sh.	E.	4,6	15,6
04/03/2011	01:36:35	I	Occ.	D.	-44,9	-44,1
04/03/2011	04:24:51	I	Ec.	R.	-25,8	-15,4
04/03/2011	12:46:20	II	Tr.	I.	50,3	38,0
04/03/2011	13:57:46	II	Sh.	I.	48,1	30,2
04/03/2011	15:30:15	II	Tr.	E.	37,7	16,1
04/03/2011	16:36:50	II	Sh.	E.	27,0	4,5
04/03/2011	22:58:41	I	Tr.	I.	-38,3	-53,9
04/03/2011	23:33:17	I	Sh.	I.	-41,8	-54,2
05/03/2011	01:12:36	I	Tr.	E.	-45,4	-46,9
05/03/2011	01:45:38	I	Sh.	E.	-44,2	-42,4
05/03/2011	12:22:03	III	Occ.	D.	49,8	40,1
05/03/2011	17:23:01	III	Ec.	R.	18,4	-3,7
05/03/2011	20:07:12	I	Occ.	D.	-11,9	-33,6
05/03/2011	22:53:41	I	Ec.	R.	-37,9	-53,3
06/03/2011	07:58:10	II	Occ.	D.	14,0	23,3
06/03/2011	11:44:12	II	Ec.	R.	47,8	42,1
06/03/2011	17:29:19	I	Tr.	I.	16,8	-4,8
06/03/2011	18:02:08	I	Sh.	I.	10,8	-11,0
06/03/2011	19:43:10	I	Tr.	E.	-8,1	-29,3
06/03/2011	20:14:26	I	Sh.	E.	-13,7	-34,6
07/03/2011	14:37:46	I	Occ.	D.	43,6	25,3
07/03/2011	17:22:28	I	Ec.	R.	17,6	-3,0
08/03/2011	02:12:23	II	Tr.	I.	-41,3	-37,3
08/03/2011	03:16:42	II	Sh.	I.	-33,8	-26,6
08/03/2011	04:56:05	II	Tr.	E.	-18,2	-8,4
08/03/2011	05:55:41	II	Sh.	E.	-7,5	2,9
08/03/2011	11:59:51	I	Tr.	I.	49,5	42,4
08/03/2011	12:30:53	I	Sh.	I.	50,6	40,6
08/03/2011	14:13:40	I	Tr.	E.	46,0	29,2
08/03/2011	14:43:10	I	Sh.	E.	42,7	24,8
09/03/2011	02:51:43	III	Tr.	I.	-36,6	-30,6
09/03/2011	05:01:37	III	Sh.	I.	-16,6	-7,1
09/03/2011	05:46:03	III	Tr.	E.	-8,7	1,6
09/03/2011	07:36:45	III	Sh.	E.	12,0	20,9
09/03/2011	09:08:26	I	Occ.	D.	28,3	34,4
09/03/2011	11:51:20	I	Ec.	R.	49,2	43,0
09/03/2011	21:23:55	II	Occ.	D.	-26,8	-44,0
10/03/2011	01:02:24	II	Ec.	R.	-44,9	-46,0
10/03/2011	06:30:28	I	Tr.	I.	0,7	9,7
10/03/2011	06:59:42	I	Sh.	I.	5,8	14,9
10/03/2011	08:44:13	I	Tr.	E.	24,8	31,5
10/03/2011	09:11:56	I	Sh.	E.	29,5	35,2
11/03/2011	03:39:02	I	Occ.	D.	-29,1	-21,6
11/03/2011	06:20:07	I	Ec.	R.	-0,4	8,2
11/03/2011	15:38:16	II	Tr.	I.	33,7	16,4
11/03/2011	16:35:17	II	Sh.	I.	24,0	6,3
11/03/2011	18:21:41	II	Tr.	E.	4,7	-13,5
11/03/2011	19:14:08	II	Sh.	E.	-5,1	-23,0
12/03/2011	01:01:02	I	Tr.	I.	-44,5	-45,6
12/03/2011	01:28:27	I	Sh.	I.	-43,3	-42,3
12/03/2011	03:14:43	I	Tr.	E.	-32,1	-25,6
12/03/2011	03:40:39	I	Sh.	E.	28,3	-21,0
12/03/2011	16:54:21	III	Occ.	D.	-20,2	3,1
12/03/2011	21:24:11	III	Ec.	R.	-28,1	-43,2
12/03/2011	22:09:41	I	Occ.	D.	-34,6	-48,0
13/03/2011	00:48:58	I	Ec.	R.	-44,7	-46,5
13/03/2011	10:49:32	II	Occ.	D.	45,2	44,5
13/03/2011	14:20:26	II	Ec.	R.	44,0	29,6
13/03/2011	19:31:41	I	Tr.	I.	-9,5	-25,6
13/03/2011	19:57:16	I	Sh.	I.	-14,0	-30,0
13/03/2011	21:45:18	I	Tr.	E.	-31,6	-45,3
13/03/2011	22:09:26	I	Sh.	E.	-34,9	-47,6
14/03/2011	16:40:17	I	Occ.	D.	21,7	6,1
14/03/2011	19:17:44	I	Ec.	R.	-7,4	-23,0
15/03/2011	05:04:38	II	Tr.	I.	-12,4	-4,5
15/03/2011	05:54:17	II	Sh.	I.	-2,9	4,8
15/03/2011	07:47:50	II	Tr.	E.	17,8	24,7
15/03/2011	08:33:03	II	Sh.	E.	25,8	31,8
15/03/2011	14:02:15	I	Tr.	I.	45,6	32,8
15/03/2011	14:26:00	I	Sh.	I.	42,7	29,3
15/03/2011	16:15:49	I	Tr.	E.	25,6	10,7
15/03/2011	16:38:08	I	Sh.	E.	21,6	6,7
16/03/2011	07:24:20	III	Tr.	I.	14,1	21,1
16/03/2011	09:03:54	III	Sh.	I.	31,7	36,4
16/03/2011	10:16:13	III	Tr.	E.	42,5	43,8
16/03/2011	11:11:00	I	Occ.	D.	48,5	46,2
16/03/2011	11:37:45	III	Sh.	E.	50,3	46,1
16/03/2011	13:46:35	I	Ec.	R.	47,0	35,3



Date	Time	M	Phe	Pha	h	h S
17/03/2011	00:15:19	II	Occ.	D.	-44,5	-47,8
17/03/2011	03:38:31	II	Ec.	R.	-25,9	-19,8
17/03/2011	08:32:52	I	Tr.	I.	27,0	32,5
17/03/2011	08:54:46	I	Sh.	I.	30,7	35,6
17/03/2011	10:46:22	I	Tr.	E.	46,5	45,9
17/03/2011	11:06:52	I	Sh.	E.	48,5	46,5
18/03/2011	05:41:38	I	Occ.	D.	-3,5	3,5
18/03/2011	08:15:22	I	Ec.	R.	24,5	30,2
18/03/2011	18:30:42	II	Tr.	I.	-0,1	-13,7
18/03/2011	19:12:51	II	Sh.	I.	-8,5	-21,2
18/03/2011	21:13:35	II	Tr.	E.	-28,8	-40,0
18/03/2011	21:51:26	II	Sh.	E.	-34,1	-44,3
19/03/2011	03:03:27	I	Tr.	I.	-30,1	-25,2
19/03/2011	03:23:30	I	Sh.	I.	-27,1	-21,8
19/03/2011	05:16:53	I	Tr.	E.	-7,8	-0,4
19/03/2011	05:35:34	I	Sh.	E.	-4,1	2,7
19/03/2011	21:27:33	III	Occ.	D.	-31,2	-41,4
20/03/2011	00:12:19	I	Occ.	D.	-44,2	-46,7
20/03/2011	01:25:24	III	Ec.	R.	-41,1	-39,7
20/03/2011	02:44:11	I	Ec.	R.	-32,3	-28,1
20/03/2011	13:41:00	II	Occ.	D.	46,6	37,2
20/03/2011	16:56:30	II	Ec.	R.	15,8	4,4
20/03/2011	21:34:05	I	Tr.	I.	-32,5	-41,8
20/03/2011	21:52:17	I	Sh.	I.	-34,9	-43,7
20/03/2011	23:47:28	I	Tr.	E.	-43,9	-47,5
21/03/2011	00:04:19	I	Sh.	E.	-44,1	-46,8
21/03/2011	18:42:57	I	Occ.	D.	-4,4	-15,2
21/03/2011	21:12:56	I	Ec.	R.	-29,8	-39,0
22/03/2011	07:57:20	II	Tr.	I.	23,8	28,7
22/03/2011	08:31:55	II	Sh.	I.	29,8	34,1
22/03/2011	10:39:57	II	Tr.	E.	47,8	47,7
22/03/2011	11:10:26	II	Sh.	E.	50,3	48,6
22/03/2011	16:04:40	I	Tr.	I.	24,2	14,2
22/03/2011	16:20:59	I	Sh.	I.	21,3	11,3
22/03/2011	18:17:59	I	Tr.	E.	0,2	-10,5
22/03/2011	18:33:00	I	Sh.	E.	-2,6	-13,2
23/03/2011	11:57:38	III	Tr.	I.	52,2	48,1
23/03/2011	13:06:08	III	Sh.	I.	49,3	42,5
23/03/2011	13:13:41	I	Occ.	D.	48,7	41,6
23/03/2011	14:46:53	III	Tr.	E.	36,8	28,0
23/03/2011	15:38:41	III	Sh.	E.	28,3	19,1
23/03/2011	15:41:46	I	Ec.	R.	27,8	18,5
24/03/2011	03:06:44	II	Occ.	D.	-27,0	-23,0
24/03/2011	06:14:27	II	Ec.	R.	6,2	11,3
24/03/2011	10:35:17	I	Tr.	I.	48,2	48,2
24/03/2011	10:49:44	I	Sh.	I.	49,4	48,9
24/03/2011	12:48:32	I	Tr.	E.	50,5	44,7
24/03/2011	13:01:43	I	Sh.	E.	49,5	43,3
25/03/2011	07:44:20	I	Occ.	D.	23,3	27,6
25/03/2011	10:10:32	I	Ec.	R.	45,9	47,0
25/03/2011	21:23:34	II	Tr.	I.	-32,7	-39,0
25/03/2011	21:50:29	II	Sh.	I.	-36,1	-41,8
26/03/2011	00:05:50	II	Tr.	E.	-43,5	-44,7
26/03/2011	00:28:51	II	Sh.	E.	-42,9	-43,2
26/03/2011	05:05:51	I	Tr.	I.	-5,4	-0,2
26/03/2011	05:18:26	I	Sh.	I.	-2,5	1,8
26/03/2011	07:19:03	I	Tr.	E.	19,3	23,6
26/03/2011	07:30:23	I	Sh.	E.	21,4	25,5
27/03/2011	02:00:39	III	Occ.	D.	-34,7	-32,3
27/03/2011	02:15:03	I	Occ.	D.	-32,8	-30,2
27/03/2011	04:39:21	I	Ec.	R.	-9,6	-5,5
27/03/2011	05:25:57	III	Ec.	R.	-0,4	3,4
27/03/2011	16:32:24	II	Occ.	D.	16,8	10,2
27/03/2011	19:32:18	II	Ec.	R.	-16,2	-22,4
27/03/2011	23:36:29	I	Tr.	I.	-43,4	-45,0
27/03/2011	23:47:12	I	Sh.	I.	-43,4	-44,7
28/03/2011	01:49:37	I	Tr.	E.	-35,5	-33,5
28/03/2011	01:59:06	I	Sh.	E.	-34,4	-32,2
28/03/2011	20:45:41	I	Occ.	D.	-28,5	-33,4
28/03/2011	23:08:04	I	Ec.	R.	-42,7	-44,8
29/03/2011	10:50:26	II	Tr.	I.	51,1	50,9
29/03/2011	11:09:39	II	Sh.	I.	52,1	51,3
29/03/2011	13:32:26	II	Tr.	E.	45,2	41,0
29/03/2011	13:47:55	II	Sh.	E.	43,2	38,8
29/03/2011	18:07:04	I	Tr.	I.	-1,1	-7,0
29/03/2011	18:15:53	I	Sh.	I.	-3,1	-8,6
29/03/2011	20:20:07	I	Tr.	E.	-25,0	-29,5
29/03/2011	20:27:45	I	Sh.	E.	-26,1	-30,6
30/03/2011	15:16:25	I	Occ.	D.	29,0	24,6
30/03/2011	16:32:10	III	Tr.	I.	15,4	10,9
30/03/2011	17:09:08	III	Sh.	I.	8,5	4,1
30/03/2011	17:36:54	I	Ec.	R.	3,5	-0,5
30/03/2011	19:18:35	III	Tr.	E.	-15,2	-19,4
30/03/2011	19:40:22	III	Sh.	E.	-18,9	-23,0
31/03/2011	05:58:05	II	Occ.	D.	7,6	10,5
31/03/2011	08:50:07	II	Ec.	R.	37,9	40,0
31/03/2011	12:37:40	I	Tr.	I.	50,4	48,0

Date	Time	M	Phe	Pha	h	h S
31/03/2011	12:44:35	I	Sh.	I.	49,8	47,3
31/03/2011	14:50:39	I	Tr.	E.	32,9	29,3
31/03/2011	14:56:25	I	Sh.	E.	31,9	28,3
01/04/2011	09:47:05	I	Occ.	D.	46,3	47,6
01/04/2011	12:05:39	I	Ec.	R.	52,2	50,9
02/04/2011	00:16:46	II	Tr.	I.	-41,8	-41,3
02/04/2011	00:28:13	II	Sh.	I.	-41,2	-40,5
02/04/2011	02:58:23	II	Tr.	E.	-23,3	-21,3
02/04/2011	03:06:18	II	Sh.	E.	-22,1	-20,0
02/04/2011	07:08:13	I	Tr.	I.	21,7	23,9
02/04/2011	07:13:15	I	Sh.	I.	22,6	24,8
02/04/2011	09:21:08	I	Tr.	E.	43,4	45,0
02/04/2011	09:25:04	I	Sh.	E.	44,0	45,5
03/04/2011	04:17:48	I	Occ.	D.	-9,2	-7,2
03/04/2011	06:34:02	III	Occ.	D.	16,1	18,1
03/04/2011	06:34:28	I	Ec.	R.	16,1	18,2
03/04/2011	09:26:25	III	Ec.	R.	44,6	46,0
03/04/2011	19:23:42	II	Occ.	D.	-17,9	-19,3
03/04/2011	22:07:53	II	Ec.	R.	-39,7	-40,1
04/04/2011	01:38:50	I	Tr.	I.	-33,7	-32,4
04/04/2011	01:41:59	I	Sh.	I.	-33,3	-32,0
04/04/2011	03:51:41	I	Tr.	E.	-13,2	-11,6
04/04/2011	03:53:45	I	Sh.	E.	-12,9	-11,2
04/04/2011	22:48:26	I	Occ.	D.	-42,1	-41,8
05/04/2011	01:03:10	I	Ec.	R.	-37,3	-36,2
05/04/2011	13:43:45	II	Tr.	I.	41,4	41,3
05/04/2011	13:47:25	II	Sh.	I.	40,8	40,7
05/04/2011	16:25:03	II	Tr.	E.	13,7	13,4
05/04/2011	16:25:24	II	Sh.	E.	13,6	13,3
05/04/2011	20:09:23	I	Tr.	I.	-26,1	-26,0
05/04/2011	20:10:38	I	Sh.	I.	-26,3	-26,2
05/04/2011	22:22:11	I	Tr.	E.	-40,9	-40,3
05/04/2011	22:22:22	I	Sh.	E.	-40,9	-40,3
06/04/2011	17:19:10	I	Occ.	D.	3,3	3,7
06/04/2011	19:32:44	I	Occ.	R.	-20,7	-20,1
06/04/2011	21:05:59	III	Tr.	I.	-34,1	-33,3
06/04/2011	21:11:10	III	Sh.	I.	-34,8	-33,9
06/04/2011	23:41:06	III	Sh.	E.	-42,1	-41,0
06/04/2011	23:49:27	III	Tr.	E.	-41,9	-40,7
07/04/2011	08:48:59	II	Ec.	D.	41,4	42,3
07/04/2011	11:29:00	II	Occ.	R.	53,4	54,7
07/04/2011	14:39:19	I	Sh.	I.	31,7	32,8
07/04/2011	14:39:58	I	Tr.	I.	31,6	32,7
07/04/2011	16:51:01	I	Sh.	E.	7,9	9,0
07/04/2011	16:52:41	I	Tr.	E.	7,6	8,7
08/04/2011	11:48:14	I	Ec.	D.	52,7	54,4
08/04/2011	14:03:20	I	Occ.	R.	37,2	39,0
09/04/2011	03:05:57	II	Sh.	I.	-18,1	-17,7
09/04/2011	03:10:07	II	Tr.	I.	-17,4	-17,0
09/04/2011	05:43:48	II	Sh.	E.	10,5	10,6
09/04/2011	05:51:01	II	Tr.	E.	11,9	12,0
09/04/2011	09:07:57	I	Sh.	I.	45,1	45,7
09/04/2011	09:10:29	I	Tr.	I.	45,4	46,1
09/04/2011	11:19:38	I	Sh.	E.	53,6	55,5
09/04/2011	11:23:09	I	Tr.	E.	53,6	55,5
10/04/2011	06:17:02	I	Ec.	D.	17,3	17,1
10/04/2011	08:34:01	I	Occ.	R.	40,8	41,1
10/04/2011	10:57:18	III	Ec.	D.	53,8	55,7
10/04/2011	13:50:35	III	Occ.	R.	38,4	41,5
10/04/2011	22:06:51	II	Ec.	D.	-40,5	-37,7
11/04/2011	00:54:01	II	Occ.	R.	-35,8	-34,9
11/04/2011	03:36:39	I	Sh.	I.	-11,7	-12,0
11/04/2011	03:41:04	I	Tr.	I.	-10,9	-11,2
11/04/2011	05:48:18	I	Sh.	E.	12,6	12,1
11/04/2011	05:53:40	I	Tr.	E.	13,6	13,0
12/04/2011	00:45:45	I	Ec.	D.	-36,3	-35,3
12/04/2011	03:04:34	I	Occ.	R.	-16,6	-17,0
12/04/2011	16:25:14	II	Sh.	I.	10,1	14,7
12/04/2011	16:37:12	II	Tr.	I.	7,9	12,5
12/04/2011	19:02:57	II	Sh.	E.	-18,4	-13,8
12/04/2011	19:17:45	II	Tr.	E.	-20,8	-16,2
12/04/2011	22:05:17	I	Sh.	I.	-40,5	-36,9
12/04/2011	22:11:35	I	Tr.	I.	-40,9	-37,3
13/04/2011	00:16:55	I	Sh.	E.	-38,6	-37,1
13/04/2011	00:24:07	I	Tr.	E.	-38,0	-36,6
13/04/2011	19:14:34	I	Ec.	D.	-20,7	-15,5
13/04/2011	21:35:15	I	Occ.	R.	-38,6	-34,2
14/04/2011	01:13:09	III	Sh.	I.	-32,3	-31,8
14/04/2011	01:39:47	III	Tr.	I.	-28,8	-28,7
14/04/2011	03:41:46	III	Sh.	E.	-9,0	-10,2
14/04/2011	04:20:04	III	Tr.	E.	-1,2	-3,0
14/04/2011	11:24:42	II	Ec.	D.	53,5	57,3
14/04/2011	14:18:57	II	Occ.	R.	32,0	37,8
14/04/2011	16:33:56	I	Sh.	I.	7,5	13,5
14/04/2011	16:42:07	I	Tr.	I.	6,0	12,0
14/04/2011	18:45:32	I	Sh.	E.	-16,4	-10,4
14/04/2011	18:54:35	I	Tr.	E.	-17,9	-12,0

Date	Time	M	Phe	Pha	h	h S
15/04/2011	13:43:17	I	Ec.	R.	37,5	43,8
15/04/2011	16:05:49	I	Occ.	R.	12,2	18,9
16/04/2011	05:43:48	II	Sh.	I.	14,9	12,6
16/04/2011	06:03:34	II	Tr.	I.	18,5	16,3
16/04/2011	08:21:22	II	Sh.	E.	42,0	40,9
16/04/2011	08:43:43	II	Tr.	E.	45,2	44,5
16/04/2011	11:02:33	I	Sh.	I.	54,2	58,0
16/04/2011	11:12:37	I	Tr.	I.	53,9	58,1
16/04/2011	13:14:07	I	Sh.	E.	41,6	48,4
16/04/2011	13:25:00	I	Tr.	E.	40,0	46,8
17/04/2011	08:12:05	I	Ec.	D.	41,2	39,7
17/04/2011	10:36:28	I	Occ.	R.	54,4	57,5
17/04/2011	14:59:23	III	Ec.	D.	23,4	31,4
17/04/2011	18:21:12	III	Occ.	R.	-13,6	-5,5
18/04/2011	00:42:29	II	Ec.	D.	-34,2	-33,4
18/04/2011	03:43:49	II	Occ.	R.	-6,2	-8,6
18/04/2011	05:31:13	I	Sh.	I.	13,8	10,9
18/04/2011	05:43:08	I	Tr.	I.	16,0	13,1
18/04/2011	07:42:45	I	Sh.	E.	37,1	34,9
18/04/2011	07:55:28	I	Tr.	E.	39,2	37,2
19/04/2011	02:40:46	I	Ec.	D.	-16,6	-18,6
19/04/2011	05:07:00	I	Occ.	R.	9,9	6,7
19/04/2011	19:03:05	II	Sh.	I.	-21,4	-12,3
19/04/2011	19:30:38	II	Tr.	I.	-25,6	-16,7
19/04/2011	21:40:31	II	Sh.	E.	-39,7	-32,8
19/04/2011	22:10:23	II	Tr.	E.	-41,0	-34,9
19/04/2011	23:59:50	I	Sh.	I.	-37,6	-35,5
20/04/2011	00:13:37	I	Tr.	I.	-36,4	-34,8
20/04/2011	02:11:20	I	Sh.	E.	-20,8	-22,6
20/04/2011	02:25:53	I	Tr.	E.	-18,5	-20,5
20/04/2011	21:09:34	I	Ec.	D.	-37,7	-29,6
20/04/2011	23:37:39	I	Occ.	R.	-39,0	-36,0
21/04/2011	05:14:31	III	Sh.	I.	12,6	8,6
21/04/2011	06:12:44	III	Tr.	I.	23,3	19,3
21/04/2011	07:41:49	III	Sh.	E.	38,7	35,6
21/04/2011	08:49:43	III	Tr.	E.	48,3	47,0
21/04/2011	14:00:14	II	Ec.	D.	32,0	42,5
21/04/2011	17:08:34	II	Occ.	R.	-1,8	8,4
21/04/2011	18:28:27	I	Sh.	I.	-16,6	-6,0
21/04/2011	18:44:05	I	Tr.	I.	-19,2	-8,7
21/04/2011	20:39:55	I	Sh.	E.	-35,1	-25,9
21/04/2011	20:56:18	I	Tr.	E.	-36,7	-27,9
22/04/2011	15:38:17	I	Ec.	D.	13,8	25,3
22/04/2011	18:08:11	I	Occ.	R.	-13,6	-1,5
23/04/2011	08:21:38	II	Sh.	I.	45,6	43,0
23/04/2011	08:56:55	II	Tr.	I.	49,9	48,6
23/04/2011	10:58:56	II	Sh.	E.	54,2	60,4
23/04/2011	11:36:13	II	Tr.	E.	51,6	60,0
23/04/2011	12:57:02	I	Sh.	I.	41,5	52,5
23/04/2011	13:14:32	I	Tr.	I.	38,7	50,1
23/04/2011	15:08:28	I	Sh.	E.	18,8	30,9
23/04/2011	15:26:40	I	Tr.	E.	15,4	27,6
24/04/2011	10:07:03	I	Ec.	D.	55,0	57,8
24/04/2011	12:38:48	I	Occ.	R.	43,8	55,1
24/04/2011	19:02:10	III	Ec.	D.	-23,3	-11,0
24/04/2011	22:52:08	III	Occ.	R.	-40,3	-34,9
25/04/2011	03:17:57	II	Ec.	D.	-6,6	-11,0
25/04/2011	06:33:15	II	Occ.	R.	29,4	24,2
25/04/2011	07:25:40	I	Sh.	I.	38,3	33,8
25/04/2011	07:45:00	I	Tr.	I.	41,3	37,2
25/04/2011	09:37:04	I	Sh.	E.	54,0	54,8
25/04/2011	09:57:05	I	Tr.	E.	54,9	57,1
26/04/2011	04:35:44	I	Ec.	D.	8,5	3,0
26/04/2011	07:09:17	I	Occ.	R.	36,2	31,0
26/04/2011	21:40:57	II	Sh.	I.	-40,1	-30,8
26/04/2011	22:23:56	II	Tr.	I.	-40,7	-33,4
27/04/2011	00:18:07	II	Sh.	E.	-33,1	-32,2
27/04/2011	01:02:50	II	Tr.	E.	-27,4	-28,6
27/04/2011	01:54:15	I	Sh.	I.	-19,7	-22,7
27/04/2011	02:15:26	I	Tr.	I.	-16,2	-19,9
27/04/2011	04:05:38	I	Sh.	E.	3,7	-1,6
27/04/2011	04:27:26	I	Tr.	E.	7,6	1,8
27/04/2011	23:04:31	I	Ec.	D.	-39,1	-34,0
28/04/2011	01:39:53	I	Occ.	R.	-21,4	-24,2
28/04/2011	09:15:45	III	Sh.	I.	53,4	52,8
28/04/2011	10:45:11	III	Tr.	I.	54,6	61,6
28/04/2011	11:41:45	III	Sh.	E.	49,9	61,3
28/04/2011	13:18:46	III	Tr.	E.	35,9	50,6
28/04/2011	16:35:34	II	Ec.	D.	0,6	15,8
28/04/2011	19:57:46	II	Occ.	R.	-32,2	-18,6
28/04/2011	20:22:51	I	Sh.	I.	-35,0	-22,0
28/04/2011	20:45:50	I	Tr.	I.	-37,1	-24,8
28/04/2011	22:34:12	I	Sh.	E.	-40,2	-33,2
28/04/2011	22:57:47	I	Tr.	E.	-39,2	-33,7
29/04/2011	17:33:13	I	Ec.	D.	-10,8	5,5
29/04/2011	20:10:23	I	Occ.	R.	-33,9	-20,1
30/04/2011	10:59:32	II	Sh.	I.	53,5	62,7

Date	Time	M	Phe	Pha	h	h S
30/04/2011	11:50:06	II	Tr.	I.	48,3	61,4
30/04/2011	13:36:30	II	Sh.	E.	31,9	48,3
30/04/2011	14:28:34	II	Tr.	E.	22,6	39,4
30/04/2011	14:51:25	I	Sh.	I.	18,4	35,3
30/04/2011	15:16:13	I	Tr.	I.	13,8	30,8
30/04/2011	17:02:45	I	Sh.	E.	-5,9	11,1
30/04/2011	17:28:06	I	Tr.	E.	-10,4	6,6
01/05/2011	12:01:59	I	Ec.	D.	46,5	60,8
01/05/2011	14:40:56	I	Occ.	R.	19,8	37,4
01/05/2011	23:04:09	III	Ec.	D.	-38,1	-32,8
02/05/2011	03:21:36	III	Occ.	R.	-0,8	-8,6
02/05/2011	05:53:12	II	Ec.	D.	26,5	18,3
02/05/2011	09:20:01	I	Sh.	I.	54,8	54,5
02/05/2011	09:22:10	II	Occ.	R.	54,9	54,8
02/05/2011	09:46:38	I	Tr.	I.	55,7	58,0
02/05/2011	11:31:20	I	Sh.	E.	50,0	62,9
02/05/2011	11:58:26	I	Tr.	E.	46,6	61,3
03/05/2011	06:30:39	I	Ec.	D.	33,7	25,5
03/05/2011	09:11:22	I	Occ.	R.	54,6	53,5
04/05/2011	00:18:53	II	Sh.	I.	-29,9	-30,0
04/05/2011	01:17:01	II	Tr.	I.	-21,7	-25,1
04/05/2011	02:55:44	II	Sh.	E.	-5,0	-12,2
04/05/2011	03:48:35	I	Sh.	I.	4,8	-3,3
04/05/2011	03:55:01	II	Tr.	E.	6,0	-1,8
04/05/2011	04:16:59	I	Tr.	I.	10,0	1,6
04/05/2011	05:59:52	I	Sh.	E.	28,9	20,0
04/05/2011	06:28:44	I	Tr.	E.	34,0	25,3
05/05/2011	00:59:25	I	Ec.	D.	-23,9	-26,6
05/05/2011	03:41:54	I	Occ.	R.	4,2	-4,4
05/05/2011	13:17:23	III	Sh.	I.	32,9	52,3
05/05/2011	15:17:28	III	Tr.	I.	11,1	31,4
05/05/2011	15:42:05	III	Sh.	E.	6,5	26,8
05/05/2011	17:47:29	III	Tr.	E.	-16,0	4,1
05/05/2011	19:10:45	II	Ec.	D.	-28,5	-10,1
05/05/2011	22:17:09	I	Sh.	I.	-39,4	-30,5
05/05/2011	22:46:26	II	Occ.	R.	-38,1	-31,4
05/05/2011	22:47:19	I	Tr.	I.	-38,0	-31,5
06/05/2011	00:28:24	I	Sh.	E.	-27,8	-28,8
06/05/2011	00:59:01	I	Tr.	E.	-23,4	-26,3
06/05/2011	19:28:06	I	Ec.	D.	-31,0	-12,5
06/05/2011	22:12:20	I	Occ.	R.	-39,4	-30,0
07/05/2011	13:37:24	II	Sh.	I.	28,4	49,5
07/05/2011	14:42:59	II	Tr.	I.	16,4	38,0
07/05/2011	16:14:06	II	Sh.	E.	0,1	21,2
07/05/2011	16:45:42	I	Sh.	I.	-6,3	15,4
07/05/2011	17:17:38	I	Tr.	I.	-11,9	9,7
07/05/2011	17:20:29	II	Tr.	E.	-12,4	9,1
07/05/2011	18:56:55	I	Sh.	E.	-27,3	-7,5
07/05/2011	19:29:15	I	Tr.	E.	-31,4	-12,5
08/05/2011	13:56:51	I	Ec.	D.	24,4	46,4
08/05/2011	16:42:49	I	Occ.	R.	-6,2	16,1
09/05/2011	03:06:07	III	Ec.	D.	0,4	-9,5
09/05/2011	07:50:11	III	Occ.	R.	49,1	41,2
09/05/2011	08:28:20	II	Ec.	D.	53,2	47,9
09/05/2011	11:14:17	I	Sh.	I.	50,0	65,3
09/05/2011	11:47:57	I	Tr.	I.	45,6	63,9
09/05/2011	12:10:35	II	Occ.	R.	42,2	62,0
09/05/2011	13:25:28	I	Sh.	E.	29,6	51,8
09/05/2011	13:59:31	I	Tr.	E.	23,4	46,1
10/05/2011	08:25:30	I	Ec.	D.	53,3	47,6
10/05/2011	11:13:11	I	Occ.	R.	49,9	65,6
11/05/2011	02:56:47	II	Sh.	I.	0,0	-10,5
11/05/2011	04:09:41	II	Tr.	I.	13,0	1,8
11/05/2011	05:33:19	II	Sh.	E.	28,4	16,4
11/05/2011	05:42:49	I	Sh.	I.	30,1	18,1
11/05/2011	06:18:14	I	Tr.	I.	36,3	24,7
11/05/2011	06:46:45	II	Tr.	E.	40,9	30,0
11/05/2011	07:53:59	I	Sh.	E.	50,4	42,3
11/05/2011	08:29:44	I	Tr.	E.	54,0	48,6
12/05/2011	02:54:15	I	Ec.	D.	0,2	-10,6
12/05/2011	05:43:38	I	Occ.	R.	30,8	18,4
12/05/2011	17:18:56	III	Sh.	I.	-14,4	10,2
12/05/2011	19:42:20	III	Sh.	E.	-34,1	-13,4
12/05/2011	19:48:48	III	Tr.	I.	-34,7	-14,3
12/05/2011	21:45:48	II	Ec.	D.	-39,1	-26,9
12/05/2011	22:15:07	III	Tr.	E.	-38,1	-28,6
13/05/2011	00:11:22	I	Sh.	I.	-26,7	-28,1
13/05/2011	00:48:29	I	Tr.	I.	-21,3	-25,5
13/05/2011	01:34:32	II	Occ.	R.	-13,9	-21,0
13/05/2011	02:22:30	I	Sh.	E.	-5,5	-15,0
13/05/2011	02:59:55	I	Tr.	E.	1,6	-9,6
13/05/2011	21:22:55	I	Ec.	D.	-39,3	-24,8
14/05/2011	00:13:59	I	Occ.	R.	-25,8	-27,7
14/05/2011	16:15:18	II	Sh.	I.	-4,1	22,1
14/05/2011	17:35:22	II	Tr.	I.	-17,9	7,7
14/05/2011	18:39:53	I	Sh.	I.	-27,5	-3,0
14/05/2011	18:51:39	II	Sh.	E.	-29,0	-5,3

Date	Time	M	Phe	Pha	h	h S
14/05/2011	19:18:43	I	Tr.	I.	-32,2	-9,6
14/05/2011	20:11:57	II	Tr.	E.	-36,9	-17,0
14/05/2011	20:50:59	I	Sh.	E.	-38,8	-21,5
14/05/2011	21:30:05	I	Tr.	E.	-39,1	-25,2
15/05/2011	15:51:39	I	Ec.	D.	0,1	26,6
15/05/2011	18:44:24	I	Occ.	R.	-28,4	-3,8
16/05/2011	07:07:29	III	Ec.	D.	46,7	34,6
16/05/2011	09:31:05	III	Ec.	R.	56,8	59,2
16/05/2011	09:51:53	III	Occ.	D.	56,0	61,9
16/05/2011	11:03:17	II	Ec.	D.	49,2	67,1
16/05/2011	12:17:07	III	Occ.	R.	38,1	62,9
16/05/2011	13:08:26	I	Sh.	I.	29,2	55,8
16/05/2011	13:48:57	I	Tr.	I.	21,8	49,1
16/05/2011	14:58:21	II	Occ.	R.	9,0	36,6
16/05/2011	15:19:32	I	Sh.	E.	5,1	32,7
16/05/2011	16:00:15	I	Tr.	E.	-1,8	25,2
17/05/2011	10:20:17	I	Ec.	D.	53,7	65,1
17/05/2011	13:14:40	I	Occ.	R.	27,5	55,0
18/05/2011	05:34:42	II	Sh.	I.	32,9	17,7
18/05/2011	07:01:52	II	Tr.	I.	46,9	33,8
18/05/2011	07:36:57	I	Sh.	I.	51,5	40,3
18/05/2011	08:10:55	II	Sh.	E.	54,8	46,4
18/05/2011	08:19:08	I	Tr.	I.	55,4	47,9
18/05/2011	09:37:55	II	Tr.	E.	56,5	60,5
18/05/2011	09:48:02	I	Sh.	E.	56,0	61,8
18/05/2011	10:30:23	I	Tr.	E.	52,5	66,1
19/05/2011	04:49:01	I	Ec.	D.	25,3	9,7
19/05/2011	07:45:02	I	Occ.	R.	52,8	41,9
19/05/2011	21:21:12	III	Sh.	I.	-38,6	-23,4
19/05/2011	23:43:19	III	Sh.	E.	-27,1	-27,7
20/05/2011	00:19:46	III	Tr.	I.	-21,9	-26,0
20/05/2011	00:20:42	II	Ec.	D.	-21,8	-26,0
20/05/2011	02:05:28	I	Sh.	I.	-4,2	-15,9
20/05/2011	02:42:16	III	Tr.	E.	2,6	-11,0
20/05/2011	02:49:18	I	Tr.	I.	3,9	-9,9
20/05/2011	04:16:32	I	Sh.	E.	19,9	4,2
20/05/2011	04:21:57	II	Occ.	R.	20,9	5,1
20/05/2011	05:00:29	I	Tr.	E.	28,0	11,8
20/05/2011	23:17:40	I	Ec.	D.	-29,8	-27,9
21/05/2011	02:15:18	I	Occ.	R.	-1,2	-14,5
21/05/2011	18:53:11	II	Sh.	I.	-31,2	-4,2
21/05/2011	20:27:15	II	Tr.	I.	-38,2	-17,5
21/05/2011	20:33:58	I	Sh.	I.	-38,3	-18,3
21/05/2011	21:19:26	I	Tr.	I.	-38,4	-22,9
21/05/2011	21:29:15	II	Sh.	E.	-38,1	-23,7
21/05/2011	22:45:01	I	Sh.	E.	-33,0	-27,5
21/05/2011	23:02:49	II	Tr.	E.	-31,1	-27,8
21/05/2011	23:30:33	I	Tr.	E.	-27,8	-27,6
22/05/2011	17:46:24	I	Ec.	D.	-22,9	7,0
22/05/2011	20:45:37	I	Occ.	R.	-38,5	-19,4
23/05/2011	11:08:48	III	Ec.	D.	45,9	68,6
23/05/2011	13:31:07	III	Ec.	R.	21,4	53,2
23/05/2011	13:38:08	II	Ec.	D.	20,1	52,0
23/05/2011	14:21:21	III	Occ.	D.	12,1	44,4
23/05/2011	15:02:30	I	Sh.	I.	4,6	36,9
23/05/2011	15:49:34	I	Tr.	I.	-3,9	28,1
23/05/2011	16:42:45	III	Occ.	R.	-13,4	18,4
23/05/2011	17:13:31	I	Sh.	E.	-18,3	12,8
23/05/2011	17:45:25	II	Occ.	R.	-23,2	7,3
23/05/2011	18:00:37	I	Tr.	E.	-25,3	4,7
24/05/2011	12:15:01	I	Ec.	D.	34,7	64,6
24/05/2011	15:15:48	I	Occ.	R.	1,8	34,5
25/05/2011	08:12:35	II	Sh.	I.	56,8	47,5
25/05/2011	09:31:01	I	Sh.	I.	56,2	60,5
25/05/2011	09:53:21	II	Tr.	I.	54,5	63,6
25/05/2011	10:19:40	I	Tr.	I.	51,8	66,5
25/05/2011	10:48:28	II	Sh.	E.	48,0	68,5
25/05/2011	11:42:00	I	Sh.	E.	39,8	67,8
25/05/2011	12:28:25	II	Tr.	E.	31,8	63,1
25/05/2011	12:30:40	I	Tr.	E.	31,4	62,8
26/05/2011	06:43:44	I	Ec.	D.	48,4	31,3
26/05/2011	09:46:04	I	Occ.	R.	54,9	62,8
27/05/2011	01:22:32	III	Sh.	I.	-7,7	-19,7
27/05/2011	02:55:32	II	Ec.	D.	9,3	-8,1
27/05/2011	03:43:22	III	Sh.	E.	18,1	0,0
27/05/2011	03:59:31	I	Sh.	I.	21,1	2,3
27/05/2011	04:48:33	III	Tr.	I.	30,1	10,5
27/05/2011	04:49:43	I	Tr.	I.	30,3	10,7
27/05/2011	06:10:28	I	Sh.	E.	44,0	25,2
27/05/2011	07:00:39	I	Tr.	E.	51,1	34,5
27/05/2011	07:07:05	III	Tr.	E.	51,8	35,7
27/05/2011	07:08:42	II	Occ.	R.	52,0	36,0
28/05/2011	01:12:22	I	Ec.	D.	-8,9	-20,6
28/05/2011	04:16:13	I	Occ.	R.	24,8	5,1
28/05/2011	21:31:03	II	Sh.	I.	-36,6	-22,6
28/05/2011	22:28:00	I	Sh.	I.	-32,0	-25,8
28/05/2011	23:18:22	II	Tr.	I.	-26,1	-26,5

Date	Time	M	Phe	Pha	h	h S
28/05/2011	23:19:45	I	Tr.	I.	-25,9	-26,5
29/05/2011	00:06:44	II	Sh.	E.	-19,1	-25,1
29/05/2011	00:38:56	I	Sh.	E.	-14,0	-23,2
29/05/2011	01:30:37	I	Tr.	E.	-5,0	-18,6
29/05/2011	01:52:53	II	Tr.	E.	-0,4	-16,1
29/05/2011	19:41:05	I	Ec.	D.	-36,7	-10,3
29/05/2011	22:46:25	I	Occ.	R.	-29,6	-26,1

Date	Time	M	Phe	Pha	h	h S
12/06/2011	03:18:58	I	Tr.	I.	23,7	-3,1
12/06/2011	04:26:35	I	Sh.	E.	35,9	7,5
12/06/2011	04:57:57	I	Tr.	I.	41,3	12,9
12/06/2011	05:21:39	II	Sh.	E.	45,1	17,0
12/06/2011	05:29:22	I	Tr.	E.	46,3	18,4
12/06/2011	07:30:21	II	Tr.	E.	58,7	40,7
12/06/2011	23:30:15	I	Ec.	D.	-16,6	-24,7
13/06/2011	02:46:34	I	Occ.	R.	18,3	-8,2
13/06/2011	20:44:17	I	Sh.	I.	-35,3	-16,4
13/06/2011	21:22:11	II	Ec.	D.	-32,5	-20,0
13/06/2011	21:48:44	I	Tr.	I.	-29,9	-22,0
13/06/2011	22:55:02	I	Sh.	E.	-21,4	-24,7
13/06/2011	23:14:31	III	Ec.	D.	-18,5	-24,8
13/06/2011	23:59:04	I	Tr.	E.	-11,4	-23,9
14/06/2011	01:33:00	III	Ec.	R.	5,4	-17,1
14/06/2011	02:01:45	II	Occ.	R.	10,7	-14,0
14/06/2011	03:42:29	III	Occ.	D.	29,3	0,7
14/06/2011	05:51:30	III	Occ.	R.	50,5	22,4
14/06/2011	17:58:49	I	Ec.	D.	-31,9	7,4
14/06/2011	21:16:22	I	Occ.	R.	-32,6	-19,5
15/06/2011	15:12:45	I	Sh.	I.	-9,2	37,3
15/06/2011	16:05:57	II	Sh.	I.	-17,9	27,4
15/06/2011	16:18:28	I	Tr.	I.	-19,7	25,1
15/06/2011	17:23:29	I	Sh.	E.	-28,4	13,5
15/06/2011	18:22:35	II	Tr.	I.	-34,0	3,6
15/06/2011	18:28:45	I	Tr.	E.	-34,5	2,7
15/06/2011	18:40:46	II	Sh.	E.	-35,2	0,9
15/06/2011	20:54:26	II	Tr.	E.	-34,1	-17,3
16/06/2011	12:27:29	I	Ec.	D.	20,3	65,7
16/06/2011	15:46:14	I	Occ.	R.	-15,2	31,1
17/06/2011	09:41:11	I	Sh.	I.	48,6	63,4
17/06/2011	10:39:28	II	Ec.	D.	39,3	70,1
17/06/2011	10:48:08	I	Tr.	I.	37,8	70,7
17/06/2011	11:51:54	I	Sh.	E.	26,3	69,7
17/06/2011	12:58:22	I	Tr.	E.	14,0	61,3
17/06/2011	13:25:11	III	Sh.	I.	9,1	56,8
17/06/2011	15:23:38	II	Occ.	R.	-12,0	35,4
17/06/2011	15:42:12	III	Sh.	E.	-15,1	31,9
17/06/2011	18:03:29	III	Tr.	I.	-32,9	6,8
17/06/2011	20:09:32	III	Tr.	E.	-36,0	-12,2
18/06/2011	06:56:05	I	Ec.	D.	58,4	34,2
18/06/2011	10:15:59	I	Occ.	R.	42,7	67,9
19/06/2011	04:09:38	I	Sh.	I.	37,2	4,7
19/06/2011	05:17:47	I	Tr.	I.	48,3	16,3
19/06/2011	05:24:23	II	Sh.	I.	49,2	17,4
19/06/2011	06:20:20	I	Sh.	E.	56,0	27,6
19/06/2011	07:27:57	I	Tr.	E.	59,4	40,1
19/06/2011	07:46:06	II	Tr.	I.	59,1	43,5
19/06/2011	07:59:01	II	Sh.	E.	58,6	45,8
19/06/2011	10:17:23	II	Tr.	E.	42,0	68,1
20/06/2011	01:24:45	I	Ec.	D.	7,7	-17,9
20/06/2011	04:45:47	I	Occ.	R.	43,9	10,7
20/06/2011	22:38:04	I	Sh.	I.	-20,2	-24,1
20/06/2011	23:47:24	I	Tr.	I.	-9,2	-24,1
20/06/2011	23:56:45	II	Ec.	D.	-7,7	-23,8
21/06/2011	00:48:46	I	Sh.	E.	1,9	-21,0
21/06/2011	01:57:30	I	Tr.	E.	14,3	-14,5
21/06/2011	03:16:00	III	Ec.	D.	28,8	-3,7
21/06/2011	04:45:15	II	Occ.	R.	44,4	10,6
21/06/2011	05:33:15	III	Ec.	R.	51,5	19,0
21/06/2011	08:05:05	III	Occ.	D.	58,0	46,9
21/06/2011	10:09:50	III	Occ.	R.	42,3	67,2
21/06/2011	19:53:18	I	Ec.	D.	-35,9	-9,9
21/06/2011	23:15:25	I	Occ.	R.	-13,9	-24,6
22/06/2011	17:06:32	I	Sh.	I.	-28,7	16,8
22/06/2011	18:16:59	I	Tr.	I.	-34,7	4,8
22/06/2011	18:43:40	II	Sh.	I.	-35,9	0,8
22/06/2011	19:17:13	I	Sh.	E.	-36,4	-4,7
22/06/2011	20:27:03	I	Tr.	E.	-34,0	-14,1
22/06/2011	21:10:08	II	Tr.	I.	-30,4	-18,6
22/06/2011	21:18:06	II	Sh.	E.	-29,5	-19,3
22/06/2011	23:40:52	II	Tr.	E.	-9,2	-24,3
23/06/2011	14:21:57	I	Ec.	D.	-4,4	47,0
23/06/2011	17:45:08	I	Occ.	R.	-32,7	10,1
24/06/2011	11:34:58	I	Sh.	I.	25,6	70,9
24/06/2011	12:46:30	I	Tr.	I.	12,3	63,3
24/06/2011	13:14:01	II	Ec.	D.	7,3	59,0
24/06/2011	13:45:38	I	Sh.	E.	1,7	53,6
24/06/2011	14:56:30	I	Tr.	E.	-11,0	40,7
24/06/2011	17:26:19	III	Sh.	I.	-31,3	13,4
24/06/2011	18:06:34	II	Occ.	R.	-34,4	6,6
24/06/2011	19:42:03	III	Sh.	E.	-35,8	-8,3
24/06/2011	22:24:45	III	Tr.	I.	-20,1	-23,6
25/06/2011	00:26:23	III	Tr.	E.	0,5	-22,6
25/06/2011	08:50:31	I	Ec.	D.	52,4	54,8
25/06/2011	12:14:43	I	Occ.	R.	17,6	67,6
26/06/2011	06:03:24	I	Sh.	I.	57,0	24,2

Date	Time	M	Phe	Pha	h	h S
26/06/2011	07:16:00	I	Tr.	I.	59,7	37,6
26/06/2011	08:02:01	II	Sh.	I.	57,3	46,1
26/06/2011	08:14:03	I	Sh.	E.	56,2	48,3
26/06/2011	09:25:56	I	Tr.	E.	46,9	60,7
26/06/2011	10:32:58	II	Tr.	I.	35,7	69,4
26/06/2011	10:36:15	II	Sh.	E.	35,1	69,7
26/06/2011	13:03:09	II	Tr.	E.	8,1	60,8
27/06/2011	03:19:11	I	Ec.	D.	33,2	-3,5
27/06/2011	06:44:21	I	Occ.	R.	59,6	31,7
28/06/2011	00:31:50	I	Sh.	I.	3,2	-22,4
28/06/2011	01:45:27	I	Tr.	I.	16,6	-16,1
28/06/2011	02:31:19	II	Ec.	D.	25,1	-10,6
28/06/2011	02:42:28	I	Sh.	E.	27,1	-9,1
28/06/2011	03:55:20	I	Tr.	E.	40,1	2,1
28/06/2011	07:17:27	III	Ec.	D.	59,6	37,7
28/06/2011	07:27:38	II	Occ.	R.	59,2	39,6
28/06/2011	09:33:28	III	Ec.	R.	44,8	61,8
28/06/2011	12:25:13	III	Occ.	D.	14,0	66,3
28/06/2011	14:25:34	III	Occ.	R.	-7,8	46,5
28/06/2011	21:47:43	I	Ec.	D.	-23,3	-21,7
29/06/2011	01:13:49	I	Occ.	R.	11,4	-19,3
29/06/2011	19:00:18	I	Sh.	I.	-36,0	-1,4
29/06/2011	20:14:53	I	Tr.	I.	-32,9	-12,7
29/06/2011	21:10:54	I	Sh.	E.	-27,4	-18,8
29/06/2011	21:21:14	II	Sh.	I.	-26,2	-19,7
29/06/2011	22:24:43	I	Tr.	E.	-17,4	-23,8
29/06/2011	23:55:17	II	Sh.	E.	-1,7	-24,2
29/06/2011	23:56:17	II	Tr.	I.	-1,5	-24,2
30/06/2011	02:25:54	II	Tr.	E.	25,4	-11,4
30/06/2011	16:16:22	I	Ec.	D.	-25,4	26,0
30/06/2011	19:43:21	I	Occ.	R.	-34,6	-8,6
01/07/2011	13:28:43	I	Sh.	I.	1,0	56,6
01/07/2011	14:44:14	I	Tr.	I.	-12,5	43,1
01/07/2011	15:39:18	I	Sh.	E.	-20,9	32,9
01/07/2011	15:48:36	II	Ec.	D.	-22,2	31,1
01/07/2011	16:54:00	I	Tr.	E.	-30,0	19,2
01/07/2011	20:48:24	II	Occ.	R.	-29,1	-16,6
01/07/2011	21:27:23	III	Sh.	I.	-24,5	-20,3
01/07/2011	23:41:51	III	Sh.	E.	-3,1	-24,7
02/07/2011	02:43:20	III	Tr.	I.	29,8	-9,3
02/07/2011	04:40:27	III	Tr.	E.	49,6	9,1
02/07/2011	10:44:56	I	Ec.	D.	30,2	70,0
02/07/2011	14:12:46	I	Occ.	R.	-7,7	48,8
03/07/2011	07:57:08	I	Sh.	I.	56,0	44,7
03/07/2011	09:13:33	I	Tr.	I.	45,5	58,2
03/07/2011	10:07:43	I	Sh.	E.	36,4	66,2
03/07/2011	10:39:33	II	Sh.	I.	30,6	69,5
03/07/2011	11:23:16	I	Tr.	E.	22,6	70,9
03/07/2011	13:13:26	II	Sh.	E.	2,5	59,1
03/07/2011	13:18:23	II	Tr.	I.	1,7	58,3
03/07/2011	15:47:27	II	Tr.	E.	-22,8	31,3
04/07/2011	05:13:35	I	Ec.	D.	54,9	14,7
04/07/2011	08:42:13	I	Occ.	R.	49,9	52,7
05/07/2011	02:25:34	I	Sh.	I.	28,5	-11,9
05/07/2011	03:42:50	I	Tr.	I.	42,2	-0,1
05/07/2011	04:36:07	I	Sh.	E.	50,6	8,1
05/07/2011	05:05:51	II	Ec.	D.	54,5	13,2
05/07/2011	05:52:29	I	Tr.	E.	58,8	21,5
05/07/2011	07:38:04	II	Ec.	R.	57,3	41,0
05/07/2011	07:41:03	II	Occ.	D.	57,0	41,6
05/07/2011	10:08:46	II	Occ.	R.	35,1	66,2
05/07/2011	11:18:20	III	Ec.	D.	22,3	70,8
05/07/2011	13:33:08	III	Ec.	R.	-1,7	55,7
05/07/2011	16:42:13	III	Occ.	D.	-30,0	21,2
05/07/2011	18:38:01	III	Occ.	R.	-35,7	1,5
05/07/2011	23:42:06	I	Ec.	D.	-0,3	-25,0
06/07/2011	03:11:29	I	Occ.	R.	37,4	-5,6
06/07/2011	20:54:00	I	Sh.	I.	-26,4	-17,5
06/07/2011	22:12:05	I	Tr.	I.	-15,5	-23,7
06/07/2011	23:04:34	I	Sh.	E.	-7,0	-25,3
06/07/2011	23:58:45	II	Sh.	I.	2,9	-24,7
07/07/2011	00:21:41	I	Tr.	E.	6,9	-23,7
07/07/2011	02:32:25	II	Sh.	E.	31,0	-11,2
07/07/2011	02:40:55	II	Tr.	I.	32,6	-10,1
07/07/2011	05:09:25	II	Tr.	E.	55,7	13,7
07/07/2011	18:10:44	I	Ec.	D.	-35,5	5,7
07/07/2011	21:40:49	I	Occ.	R.	-19,7	-21,8
08/07/2011	15:22:25	I	Sh.	I.	-21,5	35,8
08/07/2011	16:41:15	I	Tr.	I.	-30,7	21,3
08/07/2011	17:32:58	I	Sh.	E.	-34,4	12,1
08/07/2011	18:23:10	II	Ec.	D.	-35,6	3,7
08/07/2011	18:50:48	I	Tr.	E.	-35,2	-0,4
08/07/2011	20:55:15	II	Ec.	R.	-25,3	-17,8
08/07/2011	21:01:36	II	Occ.	D.	-24,5	-18,4
08/07/2011	23:28:52	II	Occ.	R.	-0,7	-25,6
09/07/2011	01:29:13	III	Sh.	I.	20,7	-18,8
09/07/2011	03:42:27	III	Sh.	E.	44,5	-0,5

Date	Time	M	Phe	Pha	h	h S
09/07/2011	06:59:49	III	Tr.	I.	59,3	33,5
09/07/2011	08:52:19	III	Tr.	E.	45,9	54,0
09/07/2011	12:39:16	I	Ec.	D.	5,1	63,9
09/07/2011	16:10:02	I	Occ.	R.	-27,9	27,0
10/07/2011	09:50:50	I	Sh.	I.	35,4	63,2
10/07/2011	11:10:24	I	Tr.	I.	20,8	70,2
10/07/2011	12:01:23	I	Sh.	E.	11,4	

Date	Time	M	Phe	Pha	h	h S
22/07/2011	20:32:58	I	Tr.	I.	-21,5	-17,0
22/07/2011	21:20:15	I	Sh.	E.	-14,6	-22,1
22/07/2011	22:42:08	I	Tr.	E.	-0,2	-27,3
22/07/2011	23:32:29	II	Ec.	D.	8,3	-27,8
23/07/2011	02:04:02	II	Ec.	R.	36,2	-17,1
23/07/2011	02:20:00	II	Occ.	D.	39,0	-15,1
23/07/2011	04:45:29	I	Occ.	R.	59,2	7,6
23/07/2011	09:31:00	III	Sh.	I.	31,3	58,5
23/07/2011	11:41:50	III	Sh.	E.	7,2	67,5
23/07/2011	15:21:06	III	Tr.	I.	-27,2	34,9
23/07/2011	16:27:50	I	Ec.	D.	-33,0	22,5
23/07/2011	17:04:18	III	Tr.	E.	-34,6	15,9
23/07/2011	20:02:05	I	Occ.	R.	-25,1	-13,2
24/07/2011	13:38:13	I	Sh.	I.	-13,7	53,2
24/07/2011	15:01:42	I	Tr.	I.	-25,4	38,4
24/07/2011	15:48:40	I	Sh.	E.	-30,3	29,7
24/07/2011	17:10:49	I	Tr.	E.	-34,8	14,6
24/07/2011	18:31:40	II	Sh.	I.	-33,1	0,9
24/07/2011	21:04:19	II	Sh.	E.	-15,9	-20,9
24/07/2011	21:24:32	II	Tr.	I.	-12,8	-22,9
24/07/2011	23:50:20	II	Tr.	E.	12,9	-27,8
25/07/2011	10:56:27	I	Ec.	D.	14,3	67,2
25/07/2011	14:30:53	I	Occ.	R.	-21,9	43,8
26/07/2011	08:06:37	I	Sh.	I.	44,4	43,8
26/07/2011	09:30:21	I	Tr.	I.	29,6	57,9
26/07/2011	10:17:04	I	Sh.	E.	20,9	64,0
26/07/2011	11:39:24	I	Tr.	E.	5,8	67,0
26/07/2011	12:49:49	II	Ec.	D.	-6,8	60,3
26/07/2011	15:21:14	II	Ec.	R.	-28,3	34,5
26/07/2011	15:38:35	II	Occ.	D.	-30,0	31,3
26/07/2011	18:03:38	II	Occ.	R.	-34,1	5,1
26/07/2011	23:21:46	III	Ec.	D.	9,0	-28,7
27/07/2011	01:32:58	III	Ec.	R.	33,2	-21,3
27/07/2011	05:15:14	III	Occ.	D.	61,1	12,2
27/07/2011	05:24:57	I	Ec.	D.	61,1	14,0
27/07/2011	06:57:00	III	Occ.	R.	54,3	30,9
27/07/2011	08:59:31	I	Occ.	R.	34,6	52,9
28/07/2011	02:35:04	I	Sh.	I.	44,7	-14,0
28/07/2011	03:59:00	I	Tr.	I.	56,6	-0,5
28/07/2011	04:45:31	I	Sh.	E.	60,4	6,9
28/07/2011	06:08:00	I	Tr.	E.	59,1	21,7
28/07/2011	07:50:35	II	Sh.	I.	45,9	40,6
28/07/2011	10:23:01	II	Sh.	E.	18,5	64,2
28/07/2011	10:44:11	II	Tr.	I.	14,6	65,9
28/07/2011	13:09:28	II	Tr.	E.	-11,2	57,1
28/07/2011	23:53:32	I	Ec.	D.	16,2	-28,6
29/07/2011	03:28:10	I	Occ.	R.	53,3	-6,4
29/07/2011	21:03:29	I	Sh.	I.	-13,2	-21,8
29/07/2011	22:27:32	I	Tr.	I.	1,4	-28,2
29/07/2011	23:13:55	I	Sh.	E.	9,6	-29,4
30/07/2011	00:36:29	I	Tr.	E.	24,8	-26,8
30/07/2011	02:07:14	II	Ec.	D.	41,2	-18,0
30/07/2011	04:38:32	II	Ec.	R.	60,5	5,4
30/07/2011	04:56:44	II	Occ.	D.	61,1	8,5
30/07/2011	07:21:18	II	Occ.	R.	49,4	35,0
30/07/2011	13:31:27	III	Sh.	I.	-15,7	53,3
30/07/2011	15:41:04	III	Sh.	E.	-31,3	30,2
30/07/2011	18:22:03	I	Ec.	D.	-32,2	1,4
30/07/2011	19:26:02	III	Tr.	I.	-26,2	-9,3
30/07/2011	21:04:22	III	Tr.	E.	-12,5	-22,1
30/07/2011	21:56:42	I	Occ.	R.	-3,4	-26,7
31/07/2011	15:31:55	I	Sh.	I.	-30,8	31,8
31/07/2011	16:56:02	I	Tr.	I.	-34,7	16,2
31/07/2011	17:42:20	I	Sh.	E.	-34,0	7,9
31/07/2011	19:04:57	I	Tr.	E.	-28,1	-6,2
31/07/2011	21:08:47	II	Sh.	I.	-11,2	-22,8
31/07/2011	23:41:02	II	Sh.	E.	15,9	-29,6
01/08/2011	00:02:41	II	Tr.	I.	19,9	-29,0
01/08/2011	02:27:29	II	Tr.	E.	45,9	-15,8
01/08/2011	12:50:39	I	Ec.	D.	-10,4	59,0
01/08/2011	16:25:14	I	Occ.	R.	-34,1	21,7
02/08/2011	10:00:19	I	Sh.	I.	19,5	60,6
02/08/2011	11:24:27	I	Tr.	I.	4,2	65,8
02/08/2011	12:10:43	I	Sh.	E.	-4,0	63,3
02/08/2011	13:33:20	I	Tr.	E.	-17,6	52,4
02/08/2011	15:24:40	II	Ec.	D.	-30,8	32,8
02/08/2011	17:55:51	II	Ec.	R.	-33,0	5,2
02/08/2011	18:14:28	II	Occ.	D.	-31,9	2,1
02/08/2011	20:38:39	II	Occ.	R.	-14,8	-19,9
03/08/2011	03:23:41	III	Ec.	D.	55,1	-8,0
03/08/2011	05:33:43	III	Ec.	R.	60,1	14,5
03/08/2011	07:19:09	I	Ec.	D.	47,6	34,0
03/08/2011	09:19:29	III	Occ.	D.	26,5	54,8
03/08/2011	10:53:37	I	Occ.	R.	9,1	65,0
03/08/2011	10:56:34	III	Occ.	R.	8,5	65,1
04/08/2011	04:28:47	I	Sh.	I.	60,9	3,0
04/08/2011	05:52:52	I	Tr.	I.	58,4	17,9

Date	Time	M	Phe	Pha	h	h S
04/08/2011	06:39:11	I	Sh.	E.	53,0	26,4
04/08/2011	08:01:42	I	Tr.	E.	39,9	41,6
04/08/2011	10:27:38	II	Sh.	I.	13,2	63,0
04/08/2011	12:59:40	II	Sh.	E.	-13,5	57,1
04/08/2011	13:21:12	II	Tr.	I.	-16,8	53,9
04/08/2011	15:45:31	II	Tr.	E.	-32,7	28,5
05/08/2011	01:47:44	I	Ec.	D.	41,7	-21,6
05/08/2011	05:22:01	I	Occ.	R.	60,4	12,1
05/08/2011	22:57:11	I	Sh.	I.	11,2	-31,0
06/08/2011	00:21:09	I	Tr.	I.	26,8	-29,4
06/08/2011	01:07:34	I	Sh.	E.	35,3	-26,0
06/08/2011	02:29:57	I	Tr.	E.	49,2	-16,5
06/08/2011	04:42:07	II	Ec.	D.	61,4	4,9
06/08/2011	07:13:11	II	Ec.	R.	46,9	32,4
06/08/2011	07:31:38	II	Occ.	D.	43,9	35,8
06/08/2011	09:55:25	II	Occ.	R.	17,8	59,2
06/08/2011	17:31:55	III	Sh.	I.	-33,4	8,6
06/08/2011	19:40:21	III	Sh.	E.	-21,1	-13,0
06/08/2011	20:16:15	I	Ec.	D.	-15,9	-18,0
06/08/2011	23:26:58	III	Tr.	I.	17,4	-31,4
06/08/2011	23:50:17	I	Occ.	R.	21,7	-31,0
07/08/2011	01:00:30	III	Tr.	E.	34,7	-26,9
07/08/2011	17:25:37	I	Sh.	I.	-33,5	9,6
07/08/2011	18:49:24	I	Tr.	I.	-26,9	-5,1
07/08/2011	19:36:00	I	Sh.	E.	-21,2	-12,5
07/08/2011	20:58:10	I	Tr.	E.	-8,7	-23,4
07/08/2011	23:45:48	II	Sh.	I.	21,6	-31,4
08/08/2011	02:17:38	II	Sh.	E.	48,5	-18,6
08/08/2011	02:38:38	II	Tr.	I.	51,6	-16,7
08/08/2011	05:02:27	II	Tr.	E.	60,9	8,1
08/08/2011	14:44:51	I	Ec.	D.	-29,0	38,9
08/08/2011	18:18:35	I	Occ.	R.	-29,7	0,4
09/08/2011	11:54:02	I	Sh.	I.	-5,6	62,7
09/08/2011	13:17:34	I	Tr.	I.	-18,8	53,3
09/08/2011	14:04:25	I	Sh.	E.	-25,0	45,8
09/08/2011	15:26:16	I	Tr.	E.	-32,6	31,1
09/08/2011	17:59:36	II	Ec.	D.	-30,9	3,2
09/08/2011	20:30:33	II	Ec.	R.	-12,0	-20,6
09/08/2011	20:48:23	II	Occ.	D.	-9,1	-22,8
09/08/2011	23:11:47	II	Occ.	R.	16,7	-32,3
10/08/2011	07:24:48	III	Ec.	D.	42,6	33,9
10/08/2011	09:13:21	I	Ec.	D.	23,0	52,5
10/08/2011	09:33:42	III	Ec.	R.	19,2	55,5
10/08/2011	12:46:43	I	Occ.	R.	-14,8	57,3
10/08/2011	13:18:42	III	Occ.	D.	-19,5	52,9
10/08/2011	14:51:05	III	Occ.	R.	-30,2	37,3
11/08/2011	06:22:30	I	Sh.	I.	51,9	22,3
11/08/2011	07:45:45	I	Tr.	I.	38,3	37,6
11/08/2011	08:32:53	I	Sh.	E.	29,8	45,8
11/08/2011	09:54:23	I	Tr.	E.	14,7	57,9
11/08/2011	13:04:36	II	Sh.	I.	-18,0	54,7
11/08/2011	15:36:11	II	Sh.	E.	-33,4	28,8
11/08/2011	15:56:03	II	Tr.	I.	-34,1	25,2
11/08/2011	18:19:22	II	Tr.	E.	-28,5	-0,3
12/08/2011	03:41:55	I	Ec.	D.	60,2	-6,7
12/08/2011	07:14:51	I	Occ.	R.	43,1	31,8
13/08/2011	00:50:55	I	Sh.	I.	37,0	-29,2
13/08/2011	02:13:47	I	Tr.	I.	50,7	-20,2
13/08/2011	03:01:18	I	Sh.	E.	57,0	-13,4
13/08/2011	04:22:22	I	Tr.	E.	61,5	0,5
13/08/2011	07:17:06	II	Ec.	D.	42,0	32,0
13/08/2011	09:47:55	II	Ec.	R.	14,5	56,6
13/08/2011	10:04:33	II	Occ.	D.	11,5	58,6
13/08/2011	12:27:34	II	Occ.	R.	-13,5	58,7
13/08/2011	21:32:57	III	Sh.	I.	1,6	-28,6
13/08/2011	22:10:26	I	Ec.	D.	8,2	-31,4
13/08/2011	23:40:12	III	Sh.	E.	24,7	-33,2
14/08/2011	01:42:51	I	Occ.	R.	46,5	-24,3
14/08/2011	03:24:14	III	Tr.	I.	59,5	-10,0
14/08/2011	04:52:55	III	Tr.	E.	60,4	5,4
14/08/2011	19:19:22	I	Sh.	I.	-19,8	-11,7
14/08/2011	20:41:47	I	Tr.	I.	-7,0	-23,4
14/08/2011	21:29:45	I	Sh.	E.	1,7	-28,6
14/08/2011	22:50:20	I	Tr.	E.	16,2	-33,5
15/08/2011	02:22:42	II	Sh.	I.	53,1	-19,4
15/08/2011	04:54:06	II	Sh.	E.	60,1	5,5
15/08/2011	05:12:19	II	Tr.	I.	58,6	8,7
15/08/2011	07:35:11	II	Tr.	E.	37,6	35,0
15/08/2011	16:39:01	I	Ec.	D.	-34,0	16,3
15/08/2011	20:10:51	I	Occ.	R.	-11,5	-19,7
16/08/2011	13:47:48	I	Sh.	I.	-26,0	46,8
16/08/2011	15:09:41	I	Tr.	I.	-33,0	32,5
16/08/2011	15:58:09	I	Sh.	E.	-34,4	23,6
16/08/2011	17:18:13	I	Tr.	E.	-32,0	8,9
16/08/2011	20:34:41	II	Ec.	D.	-6,9	-23,1
16/08/2011	23:05:24	II	Ec.	R.	20,4	-34,4
16/08/2011	23:20:19	II	Occ.	D.	23,1	-34,4

Date	Time	M	Phe	Pha	h	h S
17/08/2011	01:42:59	II	Occ.	R.	48,3	-25,0
17/08/2011	11:07:30	I	Ec.	D.	-1,9	61,4
17/08/2011	11:25:53	III	Ec.	D.	-5,8	61,4
17/08/2011	13:33:40	III	Ec.	R.	-24,8	48,8
17/08/2011	14:38:42	I	Occ.	R.	-31,2	37,9
17/08/2011	17:13:20	III	Occ.	D.	-32,0	9,5
17/08/2011	18:41:13	III	Occ.	R.	-23,4	-6,3
18/08/2011	08:16:17	I	Sh.	I.	28,1	41,7
18/08/2011	09:37:34	I	Tr.	I.	13,0	54,1
18/08/2011	10:26:38	I	Sh.	E.	4,2	59,2
18/08/2011	11:46:05	I	Tr.	E.	-9,8	60,4
18/08/2011	15:41:24	II	Sh.	I.	-34,3	26,2
18/08/2011	18:12:35	II	Sh.	E.	-26,4	-0,8
18/08/2011	18:28:29	II	Tr.	I.	-24,5	-4,2
18/08/2011	20:50:54	II	Tr.	E.	-2,2	-25,7
19/08/2011	05:36:04	I	Ec.	D.	54,3	12,4
19/08/2011	09:06:32	I	Occ.	R.	18,1	49,6
20/08/2011	02:44:43	I	Sh.	I.	58,0	-17,4
20/08/2011	04:05:20	I	Tr.	I.	61,5	-4,1
20/08/2011	04:55:03	I	Sh.	E.	58,5	4,8
20/08/2011	06:13:48	I	Tr.	E.	48,2	19,2
20/08/2011	09:52:16	II	Ec.	D.	9,0	55,4
20/08/2011	12:22:51	II	Ec.	R.	-16,7	57,0
20/08/2011	12:35:26	II	Occ.	D.	-18,6	55,7
20/08/2011	14:57:45	II	Occ.	R.	-33,1	33,7
21/08/2011	00:04:35	I	Ec.	D.	34,1	-34,6
21/08/2011	01:33:57	III	Sh.	I.	49,3	-27,1
21/08/2011	03:34:16	I	Occ.	R.	61,4	-9,8
21/08/2011	03:40:02	III	Sh.	E.	61,6	-8,8
21/08/2011	07:16:46	III	Tr.	I.	36,9	30,6
21/08/2011	08:40:46	III	Tr.	E.	21,5	45,1
21/08/2011	21:13:10	I	Sh.	I.	3,4	-29,2
21/08/2011	22:33:05	I	Tr.	I.	17,9	-35,2
21/08/2011	23:23:30	I	Sh.	E.	27,3	-36,0
22/08/2011	00:41:30	I	Tr.	E.	41,3	-32,5
22/08/2011	04:59:29	II	Sh.	I.	57,3	5,2
22/08/2011	07:30:28	II	Sh.	E.	33,7	32,9
22/08/2011	07:43:34	II	Tr.	I.	31,3	35,2
22/08/2011	10:05:35	II	Tr.	E.	5,2	56,2
22/08/2011	18:33:11	I	Ec.	D.	-21,9	-6,3
22/08/2011	22:02:01	I	Occ.	R.	12,9	-33,8
23/08/2011	15:41:36	I	Sh.	I.	-34,4	24,9
23/08/2011	17:00:43	I	Tr.	I.	-31,3	10,3
23/08/2011	17:51:55	I	Sh.	E.	-26,5	1,2
23/08/2011	19:09:05	I	Tr.	E.	-16,3	-12,6
23/08/2011	23:09:56	II	Ec.	D.	26,2	-36,7
24/08/2011	01:40:25	II	Ec.	R.	52,0	-27,1
24/08/2011	01:50:07	II	Occ.	D.	53,4	-25,9
24/08/2011	04:12:07	II	Occ.	R.	60,6	-3,5
24/08/2011	13:01:40	I	Ec.	D.	-24,1	51,3
24/08/2011	15:26:29	III	Ec.	D.	-34,4	27,4
24/08/2011	16:29:35	I	Occ.	R.	-33,0	15,7
24/08/2011	17:33:11	III	Ec.	R.	-28,1	4,1
24/08/2011	21:02:54	III	Occ.	D.	3,6	-29,1
24/08/2011	22:26:24	III	Occ.	R.	18,8	-35,9
25/08/2011	10:10:06	I	Sh.	I.	2,5	55,8
25/08/2011	11:28:21	I	Tr.	I.	-11,3	58,6
25/08/2011	12:20:25	I	Sh.	E.	-19,2	55,6
25/08/2011	13:36:40	I	Tr.	E.	-28,5	45,9
25/08/2011	18:18:06	II	Sh.	I.	-22,4	-4,3
25/08/2011	20:48:51	II	Sh.	E.	1,9	-27,7
25/08/2011	20:58:29	II	Tr.	I.	3,5	-28,9
25/08/2011	23:20:06	II	Tr.	E.	29,5	-37,4
26/08/2011	07:30:15	I	Ec.	D.	31,0	32,1
26/08/2011	10:57:08	I	Occ.	R.	-6,7	58,2
27/08/2011	04:38:33	I	Sh.	I.	57,5	0,8
27/08/2011	05:55:50	I	Tr.	I.	46,8	14,6
27/08/2011	06:48:52	I	Sh.	E.	37,8	24,4
27/08/2011	08:04:08	I	Tr.	E.	24,0	37,8
27/08/2011	12:27:35	II	Ec.	D.	-21,2	54,2
27/08/2011	14:57:57	II	Ec.	R.	-34,1	31,7
27/08/2011	15:04:07	II	Occ.	D.	-34,2	30,6
27/08/2011	17:25:46	II	Occ.	R.	-27,7	4,6
28/08/2011	01:58:45	I	Ec.	D.	56,4	-25,8
28/08/2011	05:24:34	I	Occ.	R.	51,1	8,7
28/08/2011	05:35:46	III	Sh.	I.	49,4	10,8
28/08/2011	07:40:43	III	Sh.	E.	27,6	33,6
28/08/2011	11:05:06	III	Tr.	I.	-9,4	57,7
28/08/2011	12:24:46	III	Tr.	E.	-21,4	54,1
28/08/2011	23:07:01	I	Sh.	I.	29,2	-38,4
29/08/2011	00:23:17	I	Tr.	I.	42,9	-36,0
29/08/2011	01:17:21	I	Sh.	E.	51,5	-31,2
29/08/2011	02:31:35	I	Tr.	E.	59,9	-21,4
29/08/2011	07:36:09	II	Sh.	I.	27,7	32,6
29/08/2011	10:06:43	II	Sh.	E.	0,5	54,3
29/08/2011	10:12:21	II	Tr.	I.	-0,3	54,8
29/08/2011	12:33:38	II	Tr.	E.	-23,0	52,9

Date	Time	M	Phe	Pha	h	h S
29/08/2011	20:27:21	I	Ec.	D.	0,9	-26,3
29/08/2011	23:52:00	I	Occ.	R.	38,1	-38,0
30/08/2011	17:35:28	I	Sh.	I.	-25,3	2,1
30/08/2011	18:50:38	I	Tr.	I.	-15,0	-11,6
30/08/2011	19:45:48	I	Sh.	E.	-6,1	-20,6
30/08/2011	20:58:53	I	Tr.	E.	7,0	-30,6
31/08/2011	01:45:21	II	Ec.	D.	56,2	-28,4
31/08/2011	04:15:38	II	Ec.	R.	58,2	-4,4
31/08/2011	04:17:42	II	Occ.	D.	58,0	-4,0
31/08/2011	06:39:04	II	Occ.	R.	36,7	21,9
31/08/2011	14:55:50	I	Ec.	D.	-34,3	30,9
31/08/2011	18:19:17	I	Occ.	R.	-19,1	-6,5
31/08/2011	19:27:10	III	Ec.	D.	-8,6	-18,0
31/08/2011	21:32:46	III	Ec.	R.	13,9	-34,6
01/09/2011	00:47:34	III	Occ.	D.	48,8	-35,0
01/09/2011	02:07:00	III	Occ.	R.	58,9	-25,7
01/09/2011	12:04:00	I	Sh.	I.	-20,7	54,4
01/09/2011	13:17:59	I	Tr.	I.	-29,3	46,4
01/09/2011	14:14:19	I	Sh.	E.	-33,3	37,7
01/09/2011	15:26:12	I	Tr.	E.	-34,2	25,1
01/09/2011	20:54:41	II	Sh.	I.	7,7	-30,9
01/09/2011	23:25:01	II	Sh.	E.	35,4	-39,8
01/09/2011	23:25:57	II	Tr.	I.	35,5	-39,8
02/09/2011	01:46:53	II	Tr.	E.	57,3	-28,7
02/09/2011	09:24:25	I	Ec.	D.	4,9	48,6
02/09/2011	12:46:34	I	Occ.	R.	-26,5	50,0
03/09/2011	06:32:27	I	Sh.	I.	35,7	20,1
03/09/2011	07:45:12	I	Tr.	I.	22,4	33,2
03/09/2011	08:42:46	I	Sh.	E.	11,7	42,5
03/09/2011	09:53:22	I	Tr.	E.	-0,5	51,5
03/09/2011	15:03:06	II	Ec.	D.	-34,4	28,6
03/09/2011	19:51:39	II	Occ.	R.	-1,6	-22,8
04/09/2011	03:52:55	I	Ec.	D.	58,8	-9,4
04/09/2011	07:13:43	I	Occ.	R.	27,5	27,4
04/09/2011	09:36:46	III	Sh.	I.	1,5	49,5
04/09/2011	11:40:36	III	Sh.	E.	-19,1	54,6
04/09/2011	14:47:33	III	Tr.	I.	-34,4	31,1
04/09/2011	16:03:16	III	Tr.	E.	-32,0	17,4
05/09/2011	01:00:58	I	Sh.	I.	53,1	-35,0
05/09/2011	02:12:23	I	Tr.	I.	60,4	-25,9
05/09/2011	03:11:16	I	Sh.	E.	61,2	-16,7
05/09/2011	04:20:32	I	Tr.	E.	55,4	-4,5
05/09/2011	10:12:43	II	Sh.	I.	-5,9	52,6
05/09/2011	12:38:33	II	Tr.	I.	-27,0	49,8
05/09/2011	12:42:52	II	Sh.	E.	-27,4	49,4
05/09/2011	14:59:13	II	Tr.	E.	-34,4	28,7
05/09/2011	22:21:31	I	Ec.	D.	26,6	-40,1
06/09/2011	01:40:52	I	Occ.	R.	58,3	-30,6
06/09/2011	19:29:26	I	Sh.	I.	-3,9	-20,4
06/09/2011	20:39:26	I	Tr.	I.	8,5	-30,7
06/09/2011	21:39:43	I	Sh.	E.	19,6	-37,5
06/09/2011	22:47:35	I	Tr.	E.	32,2	-41,4
07/09/2011	04:20:59	II	Ec.	D.	54,3	-4,9
07/09/2011	09:03:57	II	Occ.	R.	5,0	44,5
07/09/2011	16:50:01	I	Ec.	D.	-26,9	7,9
07/09/2011	20:07:51	I	Occ.	R.	3,6	-26,7
07/09/2011	23:28:28	III	Ec.	D.	40,2	-41,9
08/09/2011	01:33:00	III	Ec.	R.	58,3	-32,1
08/09/2011	04:27:49	III	Occ.	D.	52,9	-3,6
08/09/2011	05:43:42	III	Occ.	R.	40,8	10,2
08/09/2011	13:57:59	I	Sh.	I.	-33,8	38,0
08/09/2011	15:06:31	I	Tr.	I.	-34,0	26,4
08/09/2011	16:08:16	I	Sh.	E.	-30,5	15,2
08/09/2011	17:14:38	I	Tr.	E.	-23,5	3,1
08/09/2011	23:31:09	II	Sh.	I.	41,4	-42,2
09/09/2011	01:50:51	II	Tr.	I.	60,1	-30,0
09/09/2011	02:01:05	II	Sh.	E.	60,7	-28,6
09/09/2011	04:11:14	II	Tr.	E.	54,5	-7,1
09/09/2011	11:18:36	I	Ec.	D.	-18,9	53,3
09/09/2011	14:34:50	I	Occ.	R.	-34,5	31,6
10/09/2011	08:26:28	I	Sh.	I.	9,5	38,3
10/09/2011	09:33:27	I	Tr.	I.	-2,0	47,3
10/09/2011	10:36:44	I	Sh.	E.	-13,2	52,3
10/09/2011	11:41:32	I	Tr.	E.	-22,6	52,3
10/09/2011	17:38:48	II	Ec.	D.	-19,2	-1,5
10/09/2011	22:15:25	II	Occ.	R.	29,2	-41,7
11/09/2011	05:47:07	I	Ec.	D.	38,0	10,3
11/09/2011	09:01:43	I	Occ.	R.	2,5	43,2
11/09/2011	13:37:46	III	Sh.	I.	-33,5	40,0
11/09/2011	15:40:31	III	Sh.	E.	-31,8	19,4
11/09/2011	18:24:42	III	Tr.	I.	-11,6	-11,0
11/09/2011	19:37:11	III	Tr.	E.	1,2	-23,3
12/09/2011	02:54:59	I	Sh.	I.	60,6	-21,0
12/09/2011	04:00:22	I	Tr.	I.	54,3	-9,7
12/09/2011	05:05:17	I	Sh.	E.	44,5	2,5
12/09/2011	06:08:25	I	Tr.	E.	33,5	14,0
12/09/2011	12:49:12	II	Sh.	I.	-30,8	46,0

Date	Time	M	Phe	Pha	h	h S
12/09/2011	15:02:17	II	Tr.	I.	-33,7	25,9
12/09/2011	15:18:56	II	Sh.	E.	-32,9	22,9
12/09/2011	17:22:25	II	Tr.	E.	-20,4	0,6
13/09/2011	00:15:44	I	Ec.	D.	51,1	-41,5
13/09/2011	03:28:36	I	Occ.	R.	57,6	-15,5
13/09/2011	21:23:28	I	Sh.	I.	21,8	-38,6
13/09/2011	22:27:09	I	Tr.	I.	33,6	-43,4
13/09/2011	23:33:46	I	Sh.	E.	45,2	-44,0
14/09/2011	00:35:11	I	Tr.	E.	54,4	-40,3
14/09/2011	06:56:50	II	Ec.	D.	23,0	22,4
14/09/2011	11:26:39	II	Occ.	R.	-22,8	51,2
14/09/2011	18:44:14	I	Ec.	D.	-6,4	-15,4
14/09/2011	21:55:18	I	Occ.	R.	28,5	-41,9
15/09/2011	03:29:39	III	Ec.	D.	56,5	-15,7
15/09/2011	05:33:07	III	Ec.	R.	37,5	7,0
15/09/2011	08:02:37	III	Occ.	D.	10,1	33,4
15/09/2011	09:15:45	III	Occ.	R.	-2,7	43,8
15/09/2011	15:52:03	I	Sh.	I.	-29,5	16,0
15/09/2011	16:53:58	I	Tr.	I.	-22,6	4,6
15/09/2011	18:02:21	I	Sh.	E.	-12,6	-8,3
15/09/2011	19:02:00	I	Tr.	E.	-1,9	-18,8
16/09/2011	02:07:33	II	Sh.	I.	61,4	-29,4
16/09/2011	04:13:21	II	Tr.	I.	50,1	-8,1
16/09/2011	04:37:03	II	Sh.	E.	46,4	-3,4
16/09/2011	06:33:17	II	Tr.	E.	25,8	17,8
16/09/2011	13:12:49	I	Ec.	D.	-33,4	41,6
16/09/2011	16:22:00	I	Occ.	R.	-26,0	10,2
17/09/2011	10:20:33	I	Sh.	I.	-15,3	49,0
17/09/2011	11:20:37	I	Tr.	I.	-23,7	50,2
17/09/2011	12:30:51	I	Sh.	E.	-31,0	46,0
17/09/2011	13:28:39	I	Tr.	E.	-34,2	39,1
17/09/2011	20:14:44	II	Ec.	D.	12,1	-31,3
18/09/2011	00:37:02	II	Occ.	R.	56,6	-41,4
18/09/2011	07:41:21	I	Ec.	D.	11,6	29,2
18/09/2011	10:48:37	I	Occ.	R.	-20,0	49,7
18/09/2011	17:38:28	III	Sh.	I.	-14,4	-4,7
18/09/2011	19:40:07	III	Sh.	E.	6,6	-26,2
18/09/2011	21:56:34	III	Tr.	I.	31,7	-43,5
18/09/2011	23:06:33	III	Tr.	E.	44,0	-46,3
19/09/2011	04:49:07	I	Sh.	I.	42,3	-1,3
19/09/2011	05:47:17	I	Tr.	I.	31,9	8,8
19/09/2011	06:59:25	I	Sh.	E.	18,6	21,8
19/09/2011	07:55:17	I	Tr.	E.	8,3	31,3
19/09/2011	15:25:33	II	Sh.	I.	-30,5	19,4
19/09/2011	17:23:34	II	Tr.	I.	-16,1	-1,6
19/09/2011	17:54:53	II	Sh.	E.	-11,2	-8,2
19/09/2011	19:43:22	II	Tr.	E.	7,9	-27,1
20/09/2011	02:09:58	I	Ec.	D.	61,0	-30,1
20/09/2011	05:15:15	I	Occ.	R.	37,0	2,8
20/09/2011	23:17:38	I	Sh.	I.	47,2	-47,0
21/09/2011	00:13:49	I	Tr.	I.	55,2	-44,4
21/09/2011	01:27:55	I	Sh.	E.	61,1	-36,4
21/09/2011	02:21:47	I	Tr.	E.	60,2	-28,5
21/09/2011	09:32:57	II	Ec.	D.	-10,5	43,9
21/09/2011	13:47:22	II	Occ.	R.	-34,7	35,0
21/09/2011	20:38:29	I	Ec.	D.	19,5	-36,1
21/09/2011	23:41:42	I	Occ.	R.	51,5	-46,7
22/09/2011	07:31:35	III	Ec.	D.	10,3	26,7
22/09/2011	09:34:02	III	Ec.	R.	-11,3	43,6
22/09/2011	11:33:00	III	Occ.	D.	-27,7	47,9
22/09/2011	12:44:24	III	Occ.	R.	-33,4	42,7
22/09/2011	17:46:15	I	Sh.	I.	-10,6	-7,6
22/09/2011	18:40:22	I	Tr.	I.	-0,6	-17,4
22/09/2011	19:56:31	I	Sh.	E.	12,5	-30,3
22/09/2011	20:48:21	I	Tr.	E.	22,1	-37,8
23/09/2011	04:43:51	II	Sh.	I.	40,2	-3,6
23/09/2011	06:33:26	II	Tr.	I.	20,2	16,4
23/09/2011	07:12:57	II	Sh.	E.	12,9	23,3
23/09/2011	08:53:05	II	Tr.	E.	-5,2	38,6
23/09/2011	15:07:04	I	Ec.	D.	-30,7	21,3
23/09/2011	18:08:09	I	Occ.	R.	-6,3	-11,9
24/09/2011	12:14:47	I	Sh.	I.	-32,2	44,7
24/09/2011	13:06:46	I	Tr.	I.	-34,6	39,4
24/09/2011	14:25:03	I	Sh.	E.	-33,3	28,0
24/09/2011	15:14:46	I	Tr.	E.	-29,7	19,6
24/09/2011	22:50:55	II	Ec.	D.	45,5	-48,5
25/09/2011	02:56:47	II	Occ.	R.	55,3	-23,6
25/09/2011	09:35:37	I	Ec.	D.	-13,7	42,8
25/09/2011	12:34:31	I	Occ.	R.	-33,6	42,5
25/09/2011	21:39:19	III	Sh.	I.	33,8	-44,8
25/09/2011	23:39:54	III	Sh.	E.	53,5	-48,2
26/09/2011	01:23:33	III	Tr.	I.	61,2	-38,4
26/09/2011	02:32:11	III	Tr.	E.	57,5	-28,0
26/09/2011	06:43:22	I	Sh.	I.	16,0	17,5
26/09/2011	07:33:12	I	Tr.	I.	6,8	26,0
26/09/2011	08:53:39	I	Sh.	E.	-7,6	37,8
26/09/2011	09:41:11	I	Tr.	E.	-15,2	43,0

Date	Time	M	Phe	Pha	h	h S
26/09/2011	18:01:50	II	Sh.	I.	-5,2	-11,8
26/09/2011	19:42:34	II	Tr.	I.	13,0	-29,5
26/09/2011	20:30:46	II	Sh.	E.	22,0	-36,9
26/09/2011	22:02:10	II	Tr.	E.	38,6	-47,1
27/09/2011	04:04:15	I	Ec.	D.	44,0	-12,0
27/09/2011	07:00:54	I	Occ.	R.	11,9	20,4
28/09/2011	01:11:55	I	Sh.	I.	61,1	-40,5
28/09/2011	01:59:29	I	Tr.	I.	59,5	-33,7
28/09/2011	03:22:10	I	Sh.	E.	50,0	-19,8
28/09/2011	04:07:27	I	Tr.	E.	42,7	-11,6
28/09/2011	12:09:16	II	Ec.	D.	-33,0	43,5
28/09/2011	16:06:08	II	Occ.	R.	-21,9	9,2
28/09/2011	22:32:47	I	Ec.	D.	45,3	-49,6
29/09/2011	01:27:08	I	Occ.	R.	60,9	-38,7
29/09/2011	11:32:47	III	Ec.	D.	-30,7	45,1
29/09/2011	13:34:16	III	Ec.	R.	-34,6	33,9
29/09/2011	14:57:46	III	Occ.	D.	-29,4	20,9
29/09/2011	16:08:37	III	Occ.	R.	-21,0	8,4
29/09/2011	19:40:33	I	Sh.	I.	15,0	-30,2
29/09/2011	20:25:49	I	Tr.	I.	23,4	-37,3
29/09/2011	21:50:49	I	Sh.	E.	38,8	-47,4
29/09/2011	22:33:48	I	Tr.	E.	46,1	-50,1
30/09/2011	07:20:05	II	Sh.	I.	6,0	22,9
30/09/2011	08:51:22	II	Tr.	I.	-10,1	36,4
30/09/2011	09:48:48	II	Sh.	E.	-19,0	42,3
30/09/2011	11:10:57	II	Tr.	E.	-29,1	45,2
30/09/2011	17:01:24	I	Ec.	D.	-12,5	-1,0
30/09/2011	19:53:21	I	Occ.	R.	18,1	-32,6
01/10/2011	14:09:07	I	Sh.	I.	-32,7	28,1
01/10/2011	14:52:01	I	Tr.	I.	-29,2	21,2
01/10/2011	16:19:24	I	Sh.	E.	-18,3	5,8
01/10/2011	17:00:01	I	Tr.	E.	-12,1	-1,1
02/10/2011	01:27:21	II	Ec.	D.	60,3	-39,5
02/10/2011	05:14:44	II	Occ.	R.	27,5	0,6
02/10/2011	11:29:58	I	Ec.	D.	-31,6	44,0
02/10/2011	14:19:30	I	Occ.	R.	-31,7	26,1
03/10/2011	01:40:51	III	Sh.	I.	59,1	-37,8
03/10/2011	03:40:21	III	Sh.	E.	43,5	-17,6
03/10/2011	04:46:36	III	Tr.	I.	31,9	-5,3
03/10/2011	05:55:04	III	Tr.	E.	19,2	7,5
03/10/2011	08:37:45	I	Sh.	I.	-10,1	33,8
03/10/2011	09:18:14	I	Tr.	I.	-16,5	38,5
03/10/2011	10:48:02	I	Sh.	E.	-28,2	44,0
03/10/2011	11:26:13	I	Tr.	E.	-31,7	43,7
03/10/2011	20:38:04	II	Sh.	I.	28,7	-40,5
03/10/2011	21:59:32	II	Tr.	I.	43,2	-49,7
03/10/2011	23:06:35	II	Sh.	E.	53,4	-52,1
04/10/2011	00:19:07	II	Tr.	E.	60,2	-48,3
04/10/2011	05:58:36	I	Ec.	D.	17,7	7,9
04/10/2011	08:45:41	I	Occ.	R.	-12,1	34,5
05/10/2011	03:06:19	I	Sh.	I.	47,6	-24,1
05/10/2011	03:44:19	I	Tr.	I.	41,3	-17,2
05/10/2011	05:16:36	I	Sh.	E.	24,7	0,4
05/10/2011	05:52:18	I	Tr.	E.	18,1	6,6
05/10/2011	14:45:52	II	Ec.	D.	-28,2	20,8
05/10/2011	18:23:21	II	Occ.	R.	5,5	-18,6
06/10/2011	00:27:10	I	Ec.	D.	60,7	-48,2
06/10/2011	03:11:44	I	Occ.	R.	46,0	-23,3
06/10/2011	15:34:00	III	Ec.	D.	-21,8	12,3
06/10/2011	17:34:33	III	Ec.	R.	-2,0	-9,9
06/10/2011	18:18:07	III	Occ.	D.	5,3	-18,0
06/10/2011	19:29:50	III	Occ.	R.	18,4	-30,7
06/10/2011	21:35:00	I	Sh.	I.	41,2	-48,7
06/10/2011	22:10:28	I	Tr.	I.	47,0	-51,6
06/10/2011	23:45:17	I	Sh.	E.	58,8	-51,9
07/10/2011	00:18:29	I	Tr.	E.	60,6	-49,4
07/10/2011	09:56:15	II	Sh.	I.	-24,3	40,4
07/10/2011	11:07:24	II	Tr.	I.	-31,7	42,5
07/10/2011	12:24:34	II	Sh.	E.	-35,2	38,8
07/10/2011	13:27:05	II	Tr.	E.	-33,9	31,9
07/10/2011	18:55:47	I	Ec.	D.	12,9	-25,1
07/10/2011	21:37:46	I	Occ.	R.	42,4	-49,3
08/10/2011	16:03:36	I	Sh.	I.	-16,3	6,4
08/10/2011	16:36:29	I	Tr.	I.	-11,2	0,7
08/10/2011	18:13:53	I	Sh.	E.	6,1	-17,8
08/10/2011	18:44:32	I	Tr.	E.	11,6	-23,4
09/10/2011	04:04:04	II	Ec.	D.	34,7	-14,4
09/10/2011	07:31:16	II	Occ.	R.	-2,9	22,5
09/10/2011	13:24:22	I	Ec.	D.	-33,6	31,5
09/10/2011	16:03:46	I	Occ.	R.	-15,7	6,1
10/10/2011	05:42:23	III	Sh.	I.	15,7	3,8
10/10/2011	07:40:52	III	Sh.	E.	-5,8	23,8
10/10/2011	08:05:22	III	Tr.	I.	-10,0	27,4
10/10/2011	09:15:14	III	Tr.	E.	-20,7	36,0
10/10/2011	10:32:17	I	Sh.	I.	-29,9	41,0
10/10/2011	11:02:32	I	Tr.	I.	-32,5	41,4
10/10/2011	12:42:33	I	Sh.	E.	-35,1	36,0

Date	Time	M	Phe	Pha	h	h S
10/10/2011	13:10:36	I	Tr.	E.	-34,1	32,9
10/10/2011	23:14:13	II	Sh.	I.	57,5	-54,6
11/10/2011	00:14:47	II	Tr.	I.	60,7	-51,0
11/10/2011	01:42:22	II	Sh.	E.	55,4	-39,6
11/10/2011	02:34:33	II	Tr.	E.	48,3	-31,0
11/10/2011	07:53:01	I	Ec.	D.	-8,7	25,3
11/10/2011	10:29:48	I	Occ.	R.	-30,2	40,6
12/10/2011	05:00:53	I	Sh.	I.	21,8	-4,4
12/10/2011	05:28:29	I	Tr.	I.	16,6	1,0
12/10/2011	07:11:09	I	Sh.	E.	-1,4	18,6
12/10/2011	07:36:32	I	Tr.	E.	-6,6	22,6
12/10/2011	17:22:43	II	Ec.	D.	0,3	-9,5
12/10/2011	20:39:19	II	Occ.	R.	35,9	-43,8
13/10/2011	02:21:36	I	Ec.	D.	48,8	-33,7
13/10/2011	04:55:42	I	Occ.	R.	21,9	-5,6
13/10/2011	19:34:54	III	Ec.	D.	24,9	-33,8
13/10/2011	21:34:30	III	Ec.	R.	46,0	-51,2
13/10/2011	21:34:35	III	Occ.	D.	46,0	-51,2
13/10/2011	22:48:22	III	Occ.	R.	56,1	-55,9
13/10/2011	23:29:36	I	Sh.	I.	59,6	-55,2
13/10/2011	23:54:29	I	Tr.	I.	60,5	-53,7
14/10/2011	01:39:52	I	Sh.	E.	54,0	-40,8
14/10/2011	02:02:36	I	Tr.	E.	51,0	-37,1
14/10/2011	12:32:22	II	Sh.	I.	-35,1	35,5
14/10/2011	13:21:57	II	Tr.	I.	-32,5	30,1
14/10/2011	15:00:19	II	Sh.	E.	-21,9	15,5
14/10/2011	15:41:54	II	Tr.	E.	-15,8	8,4
14/10/2011	20:50:14	I	Ec.	D.	39,3	-46,1
14/10/2011	23:21:37	I	Occ.	R.	59,3	-55,9
15/10/2011	17:58:15	I	Sh.	I.	8,6	-17,0
15/10/2011	18:20:23	I	Tr.	I.	12,7	-21,1
15/10/2011	20:08:30	I	Sh.	E.	32,6	-40,1
15/10/2011	20:28:32	I	Tr.	E.	36,2	-43,2
16/10/2011	06:41:02	II	Ec.	D.	0,4	12,7
16/10/2011	09:46:43	II	Occ.	R.	-28,2	36,7
16/10/2011	15:18:51	I	Ec.	D.	-18,0	11,8
16/10/2011	17:47:30	I	Occ.	R.	7,4	-15,3
17/10/2011	09:44:48	III	Sh.	I.	-28,5	36,2
17/10/2011	11:21:46	III	Tr.	I.	-35,3	38,5
17/10/2011	11:42:19	III	Sh.	E.	-35,6	37,8
17/10/2011	12:26:57	I	Sh.	I.	-34,9	34,8
17/10/2011	12:34:21	III	Tr.	E.	-34,7	34,2
17/10/2011	12:46:20	I	Tr.	I.	-34,1	33,0
17/10/2011	14:37:12	I	Sh.	E.	-23,3	18,3
17/10/2011	14:54:29	I	Tr.	E.	-21,0	15,5
18/10/2011	01:50:21	II	Sh.	I.	50,0	-40,1
18/10/2011	02:28:47	II	Tr.	I.	44,1	-33,6
18/10/2011	04:18:09	II	Sh.	E.	24,6	-13,6
18/10/2011	04:48:55	II	Tr.	E.	18,9	-8,0
18/10/2011	09:47:31	I	Ec.	D.	-29,3	36,0
18/10/2011	12:13:25	I	Occ.	R.	-35,3	35,6
19/10/2011	06:55:36	I	Sh.	I.	-6,3	14,4
19/10/2011	07:12:11	I	Tr.	I.	-8,0	17,0
19/10/2011	09:05:50	I	Sh.	E.	-25,1	32,2
19/10/2011	09:20:21	I	Tr.	E.	-26,8	33,6
19/10/2011	19:59:52	II	Ec.	D.	34,2	-39,9
19/10/2011	22:54:25	II	Occ.	R.	58,8	-58,1
20/10/2011	04:16:08	I	Ec.	D.	23,3	-14,4
20/10/2011	06:39:14	I	Occ.	R.	-2,5	11,4
20/10/2011	23:35:57	III	Ec.	D.	60,2	-57,3
21/10/2011	01:24:21	I	Sh.	I.	51,7	-45,0
21/10/2011	01:38:06	I	Tr.	I.	49,8	-42,8
21/10/2011	02:05:30	III	Occ.	R.	45,6	-38,2
21/10/2011	03:34:36	I	Sh.	E.	30,1	-22,3
21/10/2011	03:46:21	I	Tr.	E.	27,9	-20,1
21/10/2011	15:08:26	II	Sh.	I.	-16,4	12,1
21/10/2011	15:35:26	II	Tr.	I.	-12,1	7,5
21/10/2011	17:36:00	II	Sh.	E.	9,2	-14,5
21/10/2011	17:55:50	II	Tr.	E.	12,9	-18,2
21/10/2011	22:44:48	I	Ec.	D.	58,7	-58,7
22/10/2011	01:05:05	I	Occ.	R.	53,6	-48,1
22/10/2011	19:53:01	I	Sh.	I.	35,2	-39,6
22/10/2011	20:03:56	I	Tr.	I.	37,2	-41,4
22/10/2011	22:03:17	I	Sh.	E.	55,2	-57,1
22/10/2011	22:12:13	I	Tr.	E.	56,2	-57,7
23/10/2011	09:18:17	II	Ec.	D.	-28,8	32,1
23/10/2011	12:01:33	II	Occ.	R.	-35,2	34,6
23/10/2011	17:13:25	I	Ec.	D.	6,7	-10,9
23/10/2011	19:30:55	I	Occ.	R.	32,0	-36,0
24/10/2011	13:46:27	III	Sh.	I.	-26,1	23,6
24/10/2011	14:21:46	I	Sh.	I.	-21,4	18,6
24/10/2011	14:29:50	I	Tr.	I.	-20,3	17,4
24/10/2011	14:35:09	III	Tr.	I.	-19,5	16,5
24/10/2011	15:43:02	III	Sh.	E.	-8,8	5,4
24/10/2011	15:51:36	III	Tr.	E.	-7,3	4,0
24/10/2011	16:32:03	I	Sh.	E.	0,4	-3,1
24/10/2011	16:38:08	I	Tr.	E.	1,3	-4,5

Date	Time	M	Phe	Pha	h	h S
25/10/2011	04:26:27	II	Sh.	I.	17,1	-13,5
25/10/2011	04:41:55	II	Tr.	I.	14,2	-10,7
25/10/2011	06:53:51	II	Sh.	E.	-9,6	12,7
25/10/2011	07:02:36	II	Tr.	E.	-11,0	14,1
25/10/2011	11:42:07	I	Ec.	D.	-35,6	34,9
25/10/2011	13:56:47	I	Occ.	R.	-24,3	21,9
26/10/2011	08:50:27	I	Sh.	I.	-27,2	28,5
26/10/2011	08:55:38	I	Tr.	I.	-27,8	29,0
26/10/2011	11:00:44	I	Tr.	E.	-36,0	35,6
26/10/2011	11:04:00	I	Tr.	E.	-36,0	35,6
26/10/2011	12:37:17	II	Ec.	D.	59,3	-60,3
27/10/2011	01:09:10	II	Occ.	R.	49,9	-48,8
27/10/2011	06:10:45	I	Ec.	D.	-3,4	5,1
27/10/2011	08:22:35	I	Occ.	R.	-24,4	25,0
28/10/2011	03:19:15	I	Sh.	I.	27,0	-26,6
28/10/2011	03:21:33	I	Tr.	I.	26,6	-26,1
28/10/2011	03:37:47	III	Ec.	D.	23,6	-23,1
28/10/2011	05:29:31	I	Sh.	E.	3,1	-1,9
28/10/2011	05:29:58	I	Tr.	E.	3,0	-1,8
28/10/2011	05:35:31	III	Ec.	R.	2,1	-0,8
28/10/2011	17:44:30	II	Sh.	I.	16,3	-17,8
28/10/2011	17:48:20	II	Tr.	I.	17,1	-18,5
28/10/2011	20:09:21	II	Tr.	E.	42,5	-43,9
28/10/2011	20:11:43	II	Sh.	E.	42,9	-44,3
29/10/2011	00:39:26	I	Ec.	D.	52,7	-53,5
29/10/2011	02:49:25	I	Ec.	R.	31,6	-32,2
29/10/2011	21:47:23	I	Tr.	I.	56,5	-57,9
29/10/2011	21:47:58	I	Sh.	I.	56,6	-58,0
29/10/2011	23:55:51	I	Tr.	E.	56,9	-58,8
29/10/2011	23:58:14	I	Sh.	E.	56,7	-58,5
30/10/2011	11:53:54	II	Occ.	D.	-34,3	32,7
30/10/2011	14:24:17	II	Ec.	R.	-17,3	16,5
30/10/2011	19:06:03	I	Occ.	D.	33,0	-33,3
30/10/2011	21:18:03	I	Ec.	R.	53,8	-54,8
31/10/2011	16:13:18	I	Tr.	I.	2,2	-1,0
31/10/2011	16:16:46	I	Sh.	I.	2,7	-1,7
31/10/2011	17:47:29	III	Tr.	I.	19,3	-19,0
31/10/2011	17:48:07	III	Sh.	I.	19,4	-19,1
31/10/2011	18:21:48	I	Tr.	E.	25,7	-25,4
31/10/2011	18:27:02	I	Sh.	E.	26,6	-26,4
31/10/2011	19:08:47	III	Tr.	E.	34,2	-34,0
31/10/2011	19:43:50	III	Sh.	E.	40,3	-40,3
01/11/2011	06:54:47	II	Tr.	I.	-15,0	11,1
01/11/2011	07:02:31	II	Sh.	I.	-16,2	12,4
01/11/2011	09:16:10	II	Tr.	E.	-32,7	29,2
01/11/2011	09:29:36	II	Sh.	E.	-33,7	30,3
01/11/2011	13:31:56	I	Occ.	D.	-23,7	23,1
01/11/2011	15:46:45	I	Ec.	R.	-1,4	2,9
02/11/2011	10:39:08	I	Tr.	I.	-36,3	33,2
02/11/2011	10:45:29	I	Sh.	I.	-36,3	33,3
02/11/2011	12:47:42	I	Tr.	E.	-28,6	27,7
02/11/2011	12:55:44	I	Sh.	E.	-27,7	26,9
03/11/2011	01:01:15	II	Occ.	D.	46,2	-51,7
03/11/2011	03:43:23	II	Ec.	R.	17,4	-23,3
03/11/2011	07:57:45	I	Occ.	D.	-25,5	19,9
03/11/2011	10:15:24	I	Ec.	R.	-36,2	32,3
04/11/2011	05:05:06	I	Tr.	I.	1,8	-8,5
04/11/2011	05:14:19	I	Sh.	I.	0,3	-6,8
04/11/2011	07:13:44	I	Tr.	E.	-20,1	13,4
04/11/2011	07:13:59	III	Occ.	D.	-20,1	13,4
04/11/2011	07:24:34	I	Sh.	E.	-21,6	15,0
04/11/2011	09:36:21	III	Ec.	R.	-35,0	29,9
04/11/2011	20:01:17	II	Tr.	I.	46,0	-44,2
04/11/2011	20:20:32	II	Sh.	I.	48,9	-47,5
04/11/2011	22:23:02	II	Tr.	E.	59,6	-62,6
04/11/2011	22:47:27	II	Sh.	E.	59,3	-63,4
05/11/2011	02:23:37	I	Occ.	D.	30,4	-38,3
05/11/2011	04:44:04	I	Ec.	R.	4,6	-12,5
05/11/2011	23:31:01	I	Tr.	I.	56,1	-62,7
05/11/2011	23:43:05	I	Sh.	I.	54,8	-61,9
06/11/2011	01:39:41	I	Tr.	E.	37,4	-46,2
06/11/2011	01:53:19	I	Sh.	E.	35,0	-43,9
06/11/2011	14:08:07	II	Occ.	D.	-15,3	17,1
06/11/2011	17:01:52	II	Ec.	R.	15,6	-11,8
06/11/2011	20:49:28	I	Occ.	D.	53,9	-52,6
06/11/2011	23:12:44	I	Ec.	R.	57,3	-63,8
07/11/2011	17:57:01	I	Tr.	I.	26,6	-22,2
07/11/2011	18:11:55	I	Sh.	I.	29,4	-24,9
07/11/2011	20:05:44	I	Tr.	E.	48,6	-45,6
07/11/2011	20:22:09	I	Sh.	E.	50,9	-48,4
07/11/2011	20:59:53	III	Tr.	I.	55,4	-54,3
07/11/2011	21:49:36	III	Sh.	I.	59,0	-60,7
07/11/2011	22:26:30	III	Tr.	E.	59,3	-63,6
07/11/2011	23:44:26	III	Sh.	E.	53,6	-62,4
08/11/2011	09:07:53	II	Tr.	I.	-34,6	26,4
08/11/2011	09:38:33	II	Sh.	I.	-36,0	28,9
08/11/2011	11:30:06	II	Tr.	E.	-33,6	31,0

Date	Time	M	Phe	Pha	h	h S
08/11/2011	12:05:17	II	Sh.	E.	-30,5	29,3
08/11/2011	15:15:26	I	Occ.	D.	-1,7	6,5
08/11/2011	17:41:27	I	Ec.	R.	24,6	-19,5
09/11/2011	12:22:56	I	Tr.	I.	-28,2	27,8
09/11/2011	12:40:40	I	Sh.	I.	-26,0	26,4
09/11/2011	14:31:46	I	Tr.	E.	-9,3	13,0
09/11/2011	14:50:54	I	Sh.	E.	-6,0	10,1
10/11/2011	03:15:52	II	Occ.	D.	16,5	-29,8
10/11/2011	06:21:06	II	Ec.	R.	-16,3	3,8
10/11/2011	09:41:21	I	Occ.	D.	-36,4	28,5
10/11/2011	12:10:07	I	Ec.	R.	-29,1	28,5
11/11/2011	06:49:02	I	Tr.	I.	-21,2	8,0
11/11/2011	07:09:32	I	Sh.	I.	-24,1	11,1
11/11/2011	08:57:55	I	Tr.	E.	-34,9	24,7
11/11/2011	09:19:47	I	Sh.	E.	-36,0	26,6
11/11/2011	10:28:03	III	Occ.	D.	-36,3	30,3
11/11/2011	13:38:01	III	Ec.	R.	-16,7	19,9
11/11/2011	22:14:44	II	Tr.	I.	59,0	-64,0
11/11/2011	22:56:34	II	Sh.	I.	56,6	-65,5
12/11/2011	00:37:20	II	Tr.	E.	43,3	-57,4
12/11/2011	01:23:07	II	Sh.	E.	35,5	-50,3
12/11/2011	04:07:19	I	Occ.	D.	5,4	-20,6
12/11/2011	06:38:49	I	Ec.	R.	-20,4	6,1
13/11/2011	01:15:04	I	Tr.	I.	36,1	-51,9
13/11/2011	01:38:20	I	Sh.	I.	32,0	-48,0
13/11/2011	03:24:00	I	Tr.	E.	12,5	-28,8
13/11/2011	03:48:35	I	Sh.	E.	8,0	-24,3
13/11/2011	16:23:11	II	Occ.	D.	14,0	-6,1
13/11/2011	19:39:42	II	Ec.	R.	48,5	-42,0
13/11/2011	22:33:19	I	Occ.	D.	57,6	-65,6
14/11/2011	01:07:30	I	Ec.	R.	36,7	-53,3
14/11/2011	19:41:13	I	Tr.	I.	49,3	-42,4
14/11/2011	20:07:12	I	Sh.	I.	52,7	-47,1
14/11/2011	21:50:13	I	Tr.	E.	59,2	-62,4
14/11/2011	22:17:28	I	Sh.	E.	58,3	-64,9
15/11/2011	00:13:52	III	Tr.	I.	44,9	-61,2
15/11/2011	01:46:05	III	Tr.	E.	28,9	-47,0
15/11/2011	01:51:17	III	Sh.	I.	28,0	-46,1
15/11/2011	03:45:16	III	Sh.	E.	6,9	-25,3
15/11/2011	11:21:49	II	Tr.	I.	-32,0	29,3
15/11/2011	12:14:36	II	Sh.	I.	-26,2	26,9
15/11/2011	13:44:54	II	Tr.	E.	-12,9	18,2
15/11/2011	14:41:00	II	Sh.	E.	-2,7	10,5
15/11/2011	16:59:25	I	Occ.	D.	22,3	-12,8
15/11/2011	19:36:14	I	Ec.	R.	49,2	-41,7
16/11/2011	14:07:19	I	Tr.	I.	-8,4	15,1
16/11/2011	14:35:59	I	Sh.	I.	-2,9	11,1
16/11/2011	16:16:24	I	Tr.	E.	15,1	-5,3
16/11/2011	16:46:15	I	Sh.	E.	20,7	-10,6
17/11/2011	05:31:32	II	Occ.	D.	-13,5	-6,4
17/11/2011	08:59:05	II	Ec.	R.	-36,4	23,3
17/11/2011	11:25:30	I	Occ.	D.	-30,9	28,7
17/11/2011	14:04:57	I	Ec.	R.	-8,1	15,2
18/11/2011	08:33:35	I	Tr.	I.	-35,5	20,5
18/11/2011	09:04:54	I	Sh.	I.	-36,7	23,6
18/11/2011	10:42:44	I	Tr.	E.	-34,2	28,7
18/11/2011	11:15:10	I	Sh.	E.	-31,5	28,7
18/11/2011	13:43:26	III	Occ.	D.	-11,0	17,8
18/11/2011	15:20:32	III	Occ.	R.	6,4	4,0
18/11/2011	15:43:50	III	Ec.	D.	10,7	0,5
18/11/2011	17:39:01	III	Ec.	R.	31,9	-20,4
19/11/2011	00:29:16	II	Tr.	I.	39,3	-60,1
19/11/2011	01:32:37	II	Sh.	I.	28,1	-50,2
19/11/2011	02:52:47	II	Tr.	E.	13,3	-35,8
19/11/2011	03:58:53	II	Sh.	E.	1,4	-23,5
19/11/2011	05:51:39	I	Occ.	D.	-18,1	-2,9
19/11/2011	08:33:41	I	Ec.	R.	-35,8	20,3
20/11/2011	02:59:49	I	Tr.	I.	11,1	-34,6
20/11/2011	03:33:44	I	Sh.	I.	5,0	-28,4
20/11/2011	05:09:01	I	Tr.	E.	-12,1	-11,0
20/11/2011	05:44:00	I	Sh.	E.	-17,7	-4,8
20/11/2011	18:39:34	II	Occ.	D.	43,7	-31,8
20/11/2011	22:17:46	II	Ec.	R.	56,2	-66,2
21/11/2011	00:17:50	I	Occ.	D.	39,8	-62,1
21/11/2011	03:02:24	I	Ec.	R.	9,8	-34,4
21/11/2011	21:26:10	I	Tr.	I.	58,8	-60,7
21/11/2011	22:02:39	I	Sh.	I.	57,0	-65,1
21/11/2011	23:35:26	I	Tr.	E.	45,9	-66,6
22/11/2011	00:12:54	I	Sh.	E.	39,8	-62,9
22/11/2011	03:31:03	III	Tr.	I.	3,9	-29,2
22/11/2011	05:08:51	III	Tr.	E.	-13,5	-11,4
22/11/2011	05:53:44	III	Sh.	I.	-20,5	-3,2
22/11/2011	07:46:51	III	Sh.	E.	-33,7	13,9
22/11/2011	13:37:02	II	Tr.	I.	-9,3	17,9
22/11/2011	14:50:38	II	Sh.	I.	4,1	8,0
22/11/2011	16:01:03	II	Tr.	E.	17,0	-3,0
22/11/2011	17:16:45	II	Sh.	E.	30,9	-16,7



Date	Time	M	Phe	Pha	h	h S
22/11/2011	18:44:08	I	Occ.	D.	45,8	-32,8
22/11/2011	21:31:10	I	Ec.	R.	58,5	-61,5
23/11/2011	15:52:28	I	Tr.	I.	16,2	-1,3
23/11/2011	16:31:29	I	Sh.	I.	23,4	-8,8
23/11/2011	18:01:51	I	Tr.	E.	39,6	-25,1
23/11/2011	18:41:43	I	Sh.	E.	46,0	-32,5
24/11/2011	07:48:46	II	Occ.	D.	-34,6	13,7
24/11/2011	11:37:15	II	Ec.	R.	-26,2	26,9
24/11/2011	13:10:26	I	Occ.	D.	-12,3	20,5
24/11/2011	15:59:54	I	Ec.	R.	18,3	-3,0
25/11/2011	10:18:58	I	Tr.	I.	-33,9	26,6
25/11/2011	11:00:26	I	Sh.	I.	-30,1	27,3
25/11/2011	12:28:24	I	Tr.	E.	-18,4	24,0
25/11/2011	13:10:40	I	Sh.	E.	-11,6	20,3
25/11/2011	17:01:54	III	Occ.	D.	30,5	-14,3
25/11/2011	18:44:33	III	Occ.	R.	47,7	-33,1
25/11/2011	19:45:38	III	Ec.	D.	55,3	-44,4
25/11/2011	21:40:04	III	Ec.	R.	57,3	-63,1
26/11/2011	02:45:16	II	Tr.	I.	8,9	-38,4
26/11/2011	04:08:38	II	Sh.	I.	-6,3	-23,0
26/11/2011	05:09:43	II	Tr.	E.	-16,5	-12,0
26/11/2011	06:34:35	II	Sh.	E.	-28,4	2,7
26/11/2011	07:36:48	I	Occ.	D.	-34,4	11,7
26/11/2011	10:28:38	I	Ec.	R.	-32,8	26,7
27/11/2011	04:45:27	I	Tr.	I.	-13,3	-16,5
27/11/2011	05:29:18	I	Sh.	I.	-20,2	-8,7
27/11/2011	06:54:56	I	Tr.	E.	-31,1	5,6
27/11/2011	07:39:31	I	Sh.	E.	-34,9	11,9
27/11/2011	20:57:46	II	Occ.	D.	58,7	-57,0
28/11/2011	00:56:04	II	Ec.	R.	27,5	-58,0
28/11/2011	02:03:14	I	Occ.	D.	15,0	-46,4
28/11/2011	04:57:22	I	Ec.	R.	-16,0	-14,5
28/11/2011	23:12:03	I	Tr.	I.	44,7	-69,2
28/11/2011	23:58:14	I	Sh.	I.	37,0	-66,0
29/11/2011	01:21:37	I	Tr.	E.	22,0	-53,9
29/11/2011	02:08:28	I	Sh.	E.	13,3	-45,7
29/11/2011	06:51:39	III	Tr.	I.	-31,7	4,7
29/11/2011	08:34:58	III	Tr.	E.	-37,3	18,3
29/11/2011	09:56:08	III	Sh.	I.	-34,5	24,9
29/11/2011	11:48:26	III	Sh.	E.	-21,8	25,6
29/11/2011	15:53:57	II	Tr.	I.	21,1	-2,1
29/11/2011	17:26:40	II	Sh.	I.	37,9	-19,0
29/11/2011	18:18:53	II	Tr.	E.	46,4	-28,6
29/11/2011	19:52:28	II	Sh.	E.	57,2	-45,8
29/11/2011	20:29:47	I	Occ.	D.	58,7	-52,5
29/11/2011	23:26:09	I	Ec.	R.	41,7	-68,8
30/11/2011	17:38:38	I	Tr.	I.	40,6	-21,2
30/11/2011	18:27:06	I	Sh.	I.	48,2	-30,1
30/11/2011	19:48:17	I	Tr.	E.	57,1	-45,1
30/11/2011	20:37:19	I	Sh.	E.	58,7	-53,8
01/12/2011	10:07:59	II	Occ.	D.	-32,9	25,1
01/12/2011	14:15:41	II	Ec.	R.	4,6	12,0
01/12/2011	14:56:21	I	Occ.	D.	12,0	6,4
01/12/2011	17:54:54	I	Ec.	R.	43,9	-24,2
02/12/2011	12:05:24	I	Tr.	I.	-17,4	24,4
02/12/2011	12:56:04	I	Sh.	I.	-9,1	20,8
02/12/2011	14:15:08	I	Tr.	E.	5,2	12,0
02/12/2011	15:06:17	I	Sh.	E.	14,6	4,8
02/12/2011	20:23:56	III	Occ.	D.	58,6	-51,6
02/12/2011	22:11:49	III	Occ.	R.	50,9	-67,5
02/12/2011	23:47:10	III	Ec.	D.	35,9	-67,8
03/12/2011	01:40:50	III	Ec.	R.	15,2	-51,3
03/12/2011	05:03:11	II	Tr.	I.	-20,2	-14,3
03/12/2011	06:44:41	II	Sh.	I.	-32,7	3,0
03/12/2011	07:28:33	II	Tr.	E.	-35,9	9,3
03/12/2011	09:10:21	II	Sh.	E.	-36,3	21,0
03/12/2011	09:22:59	I	Occ.	D.	-35,6	22,0
03/12/2011	12:23:40	I	Ec.	R.	-13,8	23,2
04/12/2011	06:32:09	I	Tr.	I.	-32,0	1,0
04/12/2011	07:24:58	I	Sh.	I.	-36,0	8,7
04/12/2011	08:41:57	I	Tr.	E.	-37,2	18,1
04/12/2011	09:35:11	I	Sh.	E.	-34,6	22,8
04/12/2011	23:18:04	II	Occ.	D.	39,5	-70,0
05/12/2011	03:34:31	II	Ec.	R.	-7,2	-30,8
05/12/2011	03:49:41	I	Occ.	D.	-9,8	-28,0
05/12/2011	06:52:25	I	Ec.	R.	-34,1	3,8
06/12/2011	00:59:04	I	Tr.	I.	20,5	-58,8
06/12/2011	01:53:56	I	Sh.	I.	10,4	-49,4
06/12/2011	03:08:55	I	Tr.	E.	-3,0	-35,7
06/12/2011	04:04:10	I	Sh.	E.	-13,0	-25,5
06/12/2011	10:17:30	III	Tr.	I.	-29,9	24,7
06/12/2011	12:05:56	III	Tr.	E.	-14,7	23,9
06/12/2011	13:59:21	III	Sh.	I.	5,4	13,8

Date	Time	M	Phe	Pha	h	h S
06/12/2011	15:50:54	III	Sh.	E.	25,9	-1,8
06/12/2011	18:12:59	II	Tr.	I.	49,7	-27,6
06/12/2011	20:02:44	II	Sh.	I.	58,5	-47,8
06/12/2011	20:38:46	II	Tr.	E.	57,9	-54,2
06/12/2011	22:16:31	I	Occ.	D.	47,8	-68,2
06/12/2011	22:28:16	II	Sh.	E.	46,1	-69,2
07/12/2011	01:21:13	I	Ec.	R.	15,6	-55,3
07/12/2011	19:25:56	I	Tr.	I.	57,4	-41,1
07/12/2011	20:22:49	I	Sh.	I.	58,3	-51,4
07/12/2011	21:35:51	I	Tr.	E.	52,7	-63,4
07/12/2011	22:33:03	I	Sh.	E.	44,7	-69,6
08/12/2011	12:29:31	II	Occ.	D.	-9,4	22,4
08/12/2011	16:43:23	I	Occ.	D.	36,8	-11,5
08/12/2011	16:54:13	II	Ec.	R.	38,7	-13,3
08/12/2011	19:50:00	I	Ec.	R.	58,4	-45,5
09/12/2011	13:53:01	I	Tr.	I.	6,4	14,4
09/12/2011	14:51:49	I	Sh.	I.	17,3	6,7
09/12/2011	16:03:01	I	Tr.	E.	30,4	-4,4
09/12/2011	17:02:03	I	Sh.	E.	40,7	-14,7
09/12/2011	23:50:43	III	Occ.	D.	30,0	-68,6
10/12/2011	01:43:25	III	Occ.	R.	9,2	-51,9
10/12/2011	03:48:50	III	Ec.	D.	-13,2	-28,9
10/12/2011	05:41:47	III	Ec.	R.	-29,4	-8,7
10/12/2011	07:23:16	II	Tr.	I.	-37,1	7,5
10/12/2011	09:20:42	II	Sh.	I.	-33,8	20,8
10/12/2011	09:49:30	II	Tr.	E.	-31,2	22,9
10/12/2011	11:10:20	I	Occ.	D.	-20,8	25,1
10/12/2011	11:46:08	II	Sh.	E.	-15,3	24,4
10/12/2011	14:18:47	I	Ec.	R.	11,9	11,2
11/12/2011	08:20:04	I	Tr.	I.	-37,1	14,7
11/12/2011	09:20:44	I	Sh.	I.	-33,5	20,7
11/12/2011	10:30:09	I	Tr.	E.	-25,9	24,6
11/12/2011	11:30:58	I	Sh.	E.	-17,0	24,8
12/12/2011	01:40:51	II	Occ.	D.	8,1	-52,6
12/12/2011	05:37:19	I	Occ.	D.	-29,9	-9,7
12/12/2011	06:13:10	II	Ec.	R.	-33,4	-3,3
12/12/2011	08:47:34	I	Ec.	R.	-35,6	17,6
13/12/2011	02:47:18	I	Tr.	I.	-4,7	-40,7
13/12/2011	03:49:45	I	Sh.	I.	-15,4	-29,1
13/12/2011	04:57:27	I	Tr.	E.	-25,5	-16,8
13/12/2011	05:59:58	I	Sh.	E.	-32,6	-6,0
13/12/2011	13:47:23	III	Tr.	I.	8,4	15,0
13/12/2011	15:40:35	III	Tr.	E.	29,3	-0,2
13/12/2011	18:01:45	III	Sh.	I.	51,9	-25,3
13/12/2011	19:52:38	III	Sh.	E.	58,3	-45,8
13/12/2011	20:34:13	II	Tr.	I.	56,2	-53,3
13/12/2011	22:38:46	II	Sh.	I.	39,7	-70,3
13/12/2011	23:00:52	II	Tr.	E.	35,9	-71,1
14/12/2011	00:04:27	I	Occ.	D.	24,4	-67,6
14/12/2011	01:04:02	II	Sh.	E.	13,4	-59,1
14/12/2011	03:16:23	I	Ec.	R.	-10,6	-35,4
14/12/2011	21:14:30	I	Tr.	I.	51,7	-60,1
14/12/2011	22:18:39	I	Sh.	I.	42,3	-68,7
14/12/2011	23:24:42	I	Tr.	E.	30,9	-70,9
15/12/2011	00:28:52	I	Sh.	E.	19,2	-64,6
15/12/2011	14:53:36	II	Occ.	D.	22,1	6,5
15/12/2011	18:31:38	I	Occ.	D.	55,8	-30,7
15/12/2011	19:32:59	II	Ec.	R.	58,4	-42,1
15/12/2011	21:45:12	I	Ec.	R.	46,9	-64,7
16/12/2011	15:41:54	I	Tr.	I.	31,7	-0,3
16/12/2011	16:47:41	I	Sh.	I.	43,0	-11,9
16/12/2011	17:52:09	I	Tr.	E.	52,2	-23,4
16/12/2011	18:57:53	I	Sh.	E.	57,8	-35,5
17/12/2011	03:23:12	III	Occ.	D.	-13,8	-34,5
17/12/2011	05:20:10	III	Occ.	R.	-30,3	-13,3
17/12/2011	07:51:15	III	Ec.	D.	-37,3	10,5
17/12/2011	09:43:28	III	Ec.	R.	-28,7	21,8
17/12/2011	09:45:44	II	Tr.	I.	-28,4	22,0
17/12/2011	11:56:45	II	Sh.	I.	-8,8	23,7
17/12/2011	12:12:46	II	Tr.	E.	-6,0	23,0
17/12/2011	12:58:53	I	Occ.	D.	2,6	19,8
17/12/2011	14:21:53	II	Sh.	E.	17,8	10,9
17/12/2011	16:13:59	I	Ec.	R.	38,0	-6,1
18/12/2011	10:09:17	I	Tr.	I.	-24,9	23,2
18/12/2011	11:16:37	I	Sh.	I.	-14,8	24,6
18/12/2011	12:19:37	I	Tr.	E.	-3,8	22,6
18/12/2011	13:26:50	I	Sh.	E.	8,3	17,3
19/12/2011	04:06:11	II	Occ.	D.	-21,7	-26,8
19/12/2011	07:26:13	II	Occ.	D.	-37,6	7,0
19/12/2011	08:51:54	II	Ec.	R.	-33,2	17,4
19/12/2011	10:42:47	I	Ec.	R.	-19,5	24,4
20/12/2011	04:36:49	I	Tr.	I.	-26,5	-21,3
20/12/2011	05:45:39	I	Sh.	I.	-33,9	-9,2

Date	Time	M	Phe	Pha	h	h S
20/12/2011	06:47:14	I	Tr.	E.	-37,3	1,3
20/12/2011	07:55:51	I	Sh.	E.	-36,7	10,9
20/12/2011	17:22:28	III	Tr.	I.	50,5	-17,8
20/12/2011	19:19:53	III	Tr.	E.	58,4	-39,3
20/12/2011	22:04:05	III	Sh.	I.	40,7	-67,0
20/12/2011	22:57:56	II	Tr.	I.	31,4	-71,3
20/12/2011	23:54:22	III	Sh.	E.	21,0	-69,2
21/12/2011	01:14:50	II	Sh.	I.	6,2	-58,1
21/12/2011	01:25:19	II	Tr.	E.	4,3	-56,3
21/12/2011	01:53:39	I	Occ.	D.	-0,4	-51,4
21/12/2011	03:39:50	II	Sh.	E.	-19,0	-31,8
21/12/2011	05:11:36	I	Ec.	R.	-31,1	-15,2
21/12/2011	23:04:21	I	Tr.	I.	29,5	-71,4
22/12/2011	00:14:35	I	Sh.	I.	16,5	-67,1
22/12/2011	01:14:49	I	Tr.	E.	5,5	-58,2
22/12/2011	02:24:46	I	Sh.	E.	-7,3	-45,8
22/12/2011	17:20:17	II	Occ.	D.	51,2	-17,2
22/12/2011	20:21:08	I	Occ.	D.	54,1	-50,4
22/12/2011	22:11:48	II	Ec.	R.	38,1	-67,8
22/12/2011	23:40:25	I	Ec.	R.	22,1	-70,4
23/12/2011	17:32:05	I	Tr.	I.	53,1	-19,2
23/12/2011	18:43:37	I	Sh.	I.	58,2	-32,3
23/12/2011	19:42:36	I	Tr.	E.	57,0	-43,2
23/12/2011	20:53:48	I	Sh.	E.	49,6	-56,0
24/12/2011	07:00:50	III	Occ.	D.	-37,6	3,0
24/12/2011	09:01:39	III	Occ.	R.	-30,3	18,1
24/12/2011	11:53:29	III	Ec.	D.	-4,3	23,9
24/12/2011	12:10:42	II	Tr.	I.	-0,6	23,2
24/12/2011	13:45:01	III	Ec.	R.	16,1	15,6
24/12/2011	14:32:50	II	Sh.	I.	25,0	9,8
24/12/2011	14:38:25	II	Tr.	E.	26,0	9,1
24/12/2011	14:48:43	I	Occ.	D.	27,9	7,7
24/12/2011	16:57:46	II	Sh.	E.	49,3	-13,1
24/12/2011	18:09:14	I	Ec.	R.	56,9	-25,9
25/12/2011	11:59:48	I	Tr.	I.	-1,9	23,7
25/12/2011	13:12:35	I	Sh.	I.	10,8	19,0
25/12/2011	14:10:23	I	Tr.	E.	21,5	12,8
25/12/2011	15:22:45	I	Sh.	E.	34,7	3,0
26/12/2011	06:34:13	II	Occ.	D.	-37,5	-0,8
26/12/2011	09:16:22	I	Occ.	D.	-27,6	19,4
26/12/2011	11:30:48	II	Ec.	R.	-7,1	24,5
26/12/2011	12:38:02	I	Ec.	R.	5,2	21,7
27/12/2011	06:27:41	I	Tr.	I.	-37,4	-2,0
27/12/2011	07:41:38	I	Sh.	I.	-36,0	8,6
27/12/2011	08:38:19	I	Tr.	E.	-31,5	15,6
27/12/2011	09:51:47	I	Sh.	E.	-22,3	22,1
27/12/2011	21:02:39	III	Tr.	I.	46,1	-57,1
27/12/2011	23:03:44	III	Tr.	E.	25,3	-71,2
28/12/2011	01:24:07	II	Tr.	I.	-0,1	-57,0
28/12/2011	02:06:11	III	Sh.	I.	-8,2	-49,6
28/12/2011	03:44:08	I	Occ.	D.	-23,7	-31,6
28/12/2011	03:50:51	II	Sh.	I.	-24,6	-30,3
28/12/2011	03:52:09	II	Tr.	E.	-24,8	-30,1
28/12/2011	03:55:52	III	Sh.	E.	-25,3	-29,4
28/12/2011	06:15:41	II	Sh.	E.	-37,3	-4,6
28/12/2011	07:06:52	I	Ec.	R.	-37,3	3,6
29/12/2011	00:55:33	I	Tr.	I.	4,0	-61,7
29/12/2011	02:10:34	I	Sh.	I.	-9,6	-48,9
29/12/2011	03:06:13	I	Tr.	E.	-18,7	-38,7
29/12/2011	04:20:43	I	Sh.	E.	-28,9	-24,9
29/12/2011	19:49:43	II	Occ.	D.	54,5	-43,9
29/12/2011	22:11:57	I	Occ.	D.	33,3	-67,2
29/12/2011	22:19:59	II	Occ.	R.	31,8	-68,1
29/12/2011	22:24:02	II	Ec.	D.	31,1	-68,5
30/12/2011	00:50:43	II	Ec.	R.	4,2	-62,5
30/12/2011	01:35:42	I	Ec.	R.	-4,0	-55,1
30/12/2011	19:23:36	I	Tr.	I.	56,5	-38,9
30/12/2011	20:39:37	I	Sh.	I.	47,8	-52,8
30/12/2011	21:34:21	I	Tr.	E.	39,1	-61,9
30/12/2011	22:49:47	I	Sh.	E.	25,7	-70,4
31/12/2011	10:44:38	III	Occ.	D.	-11,6	24,6
31/12/2011	12:48:45	III	Occ.	R.	10,8	21,4
31/12/2011	14:38:08	II	Tr.	I.	30,9	9,9
31/12/2011	15:56:26	III	Ec.	D.	44,3	-1,1
31/12/2011	16:39:51	I	Occ.	D.	50,6	-9,2
31/12/2011	17:06:28	II	Tr.	E.	53,8	-13,8
31/12/2011	17:08:53	II	Sh.	I.	54,0	-14,2
31/12/2011	17:47:19	III	Ec.	R.	57,3	-21,0
31/12/2011	19:33:35	II	Sh.	E.	55,3	-40,6
31/12/2011	20:04:32	I	Ec.	R.	52,0	-46,3

Date = data  
Time = orario  
Phe = fenomeno  
Pha = fase  
H = altitudine di Giove sull'orizzonte  
H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
Phe = phenomenon  
Pha = phase  
H = altitude of Jupiter above the horizon  
H S = altitude of the Sun above the horizon

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# FENOMENI MULTIPLI DEI SATELLITI DI GIOVE

## MULTIPLA PHENOMENA OF THE SATELLITES OF JUPITER

### DOPPI TRANSITI DI SATELLITI - DOUBLE TRANSITS OF THE SATELLITES

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2011 1 10 3 48 17	2011 1 10 4 11 22	0101	2011 5 27 4 49 35	2011 5 27 7 1 39	1010
2011 1 17 21 50 33	2011 1 17 22 49 19	1010	2011 5 28 23 19 24	2011 5 29 1 31 37	1100
2011 1 25 0 3 57	2011 1 25 2 5 45	1010	2011 6 1 12 45 6	2011 6 1 14 31 31	1100
2011 5 7 17 18 40	2011 5 7 17 21 31	1100	2011 6 5 2 9 43	2011 6 5 3 31 14	1100
2011 5 11 6 19 17	2011 5 11 6 47 45	1100	2011 6 8 15 34 56	2011 6 8 16 30 53	1100
2011 5 14 19 19 45	2011 5 14 20 12 57	1100	2011 6 12 4 58 59	2011 6 12 5 30 22	1100
2011 5 18 8 20 11	2011 5 18 9 38 57	1100	2011 6 15 18 23 38	2011 6 15 18 29 45	1100
2011 5 21 21 20 28	2011 5 21 23 3 49	1100	2011 10 24 14 36 12	2011 10 24 15 52 34	1010
2011 5 25 10 20 42	2011 5 25 12 29 25	1100	2011 10 31 17 48 32	2011 10 31 18 22 48	1010

Esempio di lettura : il 1 gennaio dalle 3.48 alle 4.11 Europa e Callisto saranno contemporaneamente in transito

Example : on 1 January from 3.48 to 4.11 Europa and Callisto will be simultaneously in transit

### TRIPLI TRANSITI DI SATELLITI - TRIPLE TRANSITS OF THE SATELLITES

YYYY MM DD hh mm ss    YYYY MM DD hh mm ss    IEGC  
-----

### DOPPI TRANSITI DI OMBRE - DOUBLE TRANSITS OF SHADOWS

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2011 1 3 19 11 12	2011 1 3 19 25 25	1010	2011 6 8 13 29 15	2011 6 8 15 30 44	1100
2011 1 10 21 7 11	2011 1 10 23 20 34	1010	2011 6 10 9 25 33	2011 6 10 9 59 10	1010
2011 1 18 0 43 49	2011 1 18 1 16 20	1010	2011 6 12 2 47 41	2011 6 12 4 27 36	1100
2011 5 14 18 40 55	2011 5 14 18 52 40	1100	2011 6 15 16 6 59	2011 6 15 17 24 30	1100
2011 5 18 7 37 60	2011 5 18 8 11 56	1100	2011 6 19 5 25 25	2011 6 19 6 21 21	1100
2011 5 21 20 35 1	2011 5 21 21 30 15	1100	2011 6 22 18 44 41	2011 6 22 19 18 14	1100
2011 5 25 9 32 3	2011 5 25 10 49 28	1100	2011 6 26 8 3 2	2011 6 26 8 15 4	1100
2011 5 28 22 29 2	2011 5 29 0 7 45	1100	2011 10 24 14 22 49	2011 10 24 15 43 60	1010
2011 6 1 11 26 2	2011 6 1 13 26 58	1100	2011 10 31 17 49 10	2011 10 31 18 28 2	1010
2011 6 3 5 54 30	2011 6 3 7 44 21	1010	2011 12 28 3 51 54	2011 12 28 3 56 50	0110
2011 6 5 0 22 58	2011 6 5 2 33 48	1100			

### DOPPI-TRIPLI TRANSITI DI OMBRE E SATELLITI - DOUBLE-TRIPLE TRANSITS OF SHADOWS AND SATELLITES

YYYY MM DD hh mm ss    YYYY MM DD hh mm ss    IEGC    IEGC  
-----

Nell'ordine: tipo di fenomeno, anno/mese/giorno/ora/minuti/secondi di inizio e di fine  
Io, Europa, Ganimede, Callisto (1 = il satellite è coinvolto, 0 = non lo è)

Data nel formato aaaa/mm/gg - Tempi in T.D.T.

Io, Europa, Ganimede, Callisto (1 = the satellite is involved, 0 = it isn't)

Times in T.D.T.

# **DOPPIE ECLISSI - DOUBLE ECLIPSES**

YYYY MM DD	hh mm ss	YYYY MM DD	hh mm ss	IEGC	YYYY MM DD	hh mm ss	YYYY MM DD	hh mm ss	IEGC
2011 3 20	0 32 36	2011 3 20	1 26 25	1010	2011 8 10	9 14 23	2011 8 10	9 34 41	1010
2011 3 27	2 54 20	2011 3 27	4 40 21	1010	2011 8 17	11 26 53	2011 8 17	13 19 30	1010
2011 5 30	16 13 56	2011 5 30	17 32 36	0110	2011 12 19	8 34 19	2011 12 19	8 52 55	1100
2011 6 6	19 13 13	2011 6 6	21 21 58	0110	2011 12 22	21 31 59	2011 12 22	22 12 47	1100
2011 6 13	23 15 31	2011 6 13	23 56 18	0110	2011 12 26	10 29 37	2011 12 26	11 31 47	1100
					2011 12 29	23 27 19	2011 12 30	0 51 44	1100

Esempio di lettura : il 20 marzo dalle 0.32 alle 1.26 Io e Ganimede saranno contemporaneamente eclissati

Example : on 20 March from 0.32 to 1.26 Io and Ganimede will be simultaneously eclipsed

# **DOPPIE OCCULTAZIONI - DOUBLE OCCULTATIONS**

YYYY MM DD	hh mm ss	YYYY MM DD	hh mm ss	IEGC	YYYY MM DD	hh mm ss	YYYY MM DD	hh mm ss	IEGC
2011 3 20	0 13 22	2011 3 20	0 19 44	1010	2011 6 6	23 17 54	2011 6 6	23 18 12	0110
2011 3 27	2 16 5	2011 3 27	4 29 52	1010	2011 7 27	6 50 48	2011 7 27	6 57 57	1010
2011 5 23	15 12 59	2011 5 23	16 43 44	0110	2011 8 3	9 20 32	2011 8 3	10 54 38	1010
2011 5 30	18 51 3	2011 5 30	20 32 45	0110	2011 12 29	22 12 59	2011 12 29	22 21 0	1100

# **TRIPLE OCCULTAZIONI - TRIPLE OCCULTATIONS**

YYYY MM DD hh mm ss YYYY MM DD hh mm ss IEGC  
-----

# **2 TRANSITI DI SATELLITI + 2 TRANSITI DI OMBRE - 2 TRANSITS OF SATELLITES + 2 TRANSITS OF SHADOWS**

YYYY MM DD	hh mm ss	YYYY MM DD	hh mm ss	IEGC	IEGC
2011 5 21	21 20 28	2011 5 21	21 30 15	1100	1100
2011 5 25	10 20 42	2011 5 25	10 49 28	1100	1100
2011 5 28	23 19 24	2011 5 29	0 7 45	1100	1100
2011 6 1	12 45 6	2011 6 1	13 26 58	1100	1100
2011 6 5	2 9 43	2011 6 5	2 33 48	1100	1100
2011 10 24	14 36 12	2011 10 24	15 43 60	1010	1010
2011 10 31	17 49 10	2011 10 31	18 22 48	1010	1010

Nell'ordine: tipo di fenomeno, anno/mese/giorno/ora/minuti/secondi di inizio e di fine  
Io, Europa, Ganimede, Callisto (1 = il satellite è coinvolto, 0 = non lo è)

Data nel formato aaaa/mm/gg - Tempi in T.D.T.

Io, Europa, Ganimede, Callisto (1 = the satellite is involved, 0 = it isn't)

Times in T.D.T.

# **GIOVE SENZA SATELLITI - JUPITER WITHOUT SATELLITES**

YYYY MM GG hh mm ss YYYY MM GG hh mm ss  
-----

## GIOVE CON UN SOLO SATELLITE

-

## JUPITER WITH ONLY 1 SATELLITE

YYYY	MM	DD	hh	mm	ss	YYYY	MM	DD	hh	mm	ss	IEGC	YYYY	MM	DD	hh	mm	ss	YYYY	MM	DD	hh	mm	ss	IEGC
2011	5	23	15	50	36	2011	5	23	16	43	44	1110	2011	6	6	19	50	33	2011	6	6	21	32	57	1110
2011	5	27	4	49	35	2011	5	27	7	1	39	1110	2011	6	13	23	15	31	2011	6	14	0	0	5	1110
2011	5	30	18	51	3	2011	5	30	20	1	35	1110	2011	12	31	16	40	53	2011	12	31	17	7	29	1110

## OCCULTAZIONE DI UN'OMBRA DI UN SATELLITE

-

## OCCULTATION OF A SATELLITE'S SHADOW

YYYY MM DD hh mm ss    YYYY MM DD hh mm ss  
 -----

X → Y il satellite X occulta l'ombra del satellite Y  
 X → Y the satellite X occults the shadow of the satellite Y

OCCULTAZIONE DI UN'OMBRA DA PARTE DI UN'ALTRA OMBRA DI UN SATELLITE  
 OCCULTATION OF A SATELLITE'S SHADOW BY ANOTHER SATELLITE'S SHADOW

YYYY MM DD hh mm ss    YYYY MM DD hh mm ss  
 -----

X → Y l'ombra del satellite X occulta l'ombra del satellite Y  
 X → Y the shadow of the satellite X occults the shadow of the satellite Y

Nell'ordine: tipo di fenomeno, anno/mese/giorno/ora/minuti/secondi di inizio e di fine  
 Io, Europa, Ganimede, Callisto (1 = il satellite è coinvolto, 0 = non lo è)

Data nel formato aaaa/mm/gg - Tempi in T.D.T.

Io, Europa, Ganimede, Callisto (1 = the satellite is involved, 0 = it isn't)

Times in T.D.T.

# CONGIUNZ. TRIPLE TRA I SATELLITI DI GIOVE

## TRIPLE CONJUNCTIONS BETWEEN THE MOON OF JUPITER

DATA	ORA	CORPI	D12	D13	D23	CERCHIO	MAG1	MAG2	MAG3	MAGT
------	-----	-------	-----	-----	-----	---------	------	------	------	------

Questo anno non avvengono fenomeni - No phenomena this year

D12 = distanza tra il primo satellite indicato ed il secondo, in raggi gioviani  
 D13 = distanza tra il primo satellite indicato ed il terzo, in raggi gioviani  
 D23 = distanza tra il secondo satellite indicato ed il terzo, in raggi gioviani

Un Rj raggio gioviano è pari a circa 20"

CERCHIO = cerchio minimo, in raggi gioviani, comprendente i 3 satelliti

MAG1 = magnitudine del primo satellite indicato  
 MAG2 = magnitudine del secondo satellite indicato  
 MAG3 = magnitudine del terzo satellite indicato  
 MAGT = magnitudine totale del gruppo

Tempi in TDT                      Sono riportati solo gli eventi entro un cerchio minimo di 0.5 Rj

D12 = distance between the first and the second satellite, in jovian radii  
 D13 = distance between the first and the third satellite, in jovian radii  
 D23 = distance between the second and the third satellite, in jovian radii

Rj is almost 20"

GROUP = least grouping, in jovian radii

MAG1 = magnitude of the first satellite  
 MAG2 = magnitude of the second satellite  
 MAG3 = magnitude of the third satellite  
 MAGT = total magnitude of the group

Times in TDT                      Are listed only the events under 0.5 Rj

# CONGIUNZIONI TRA I SATELLITI DI GIOVE

## CONJUNCTIONS BETWEEN THE MOONS OF JUPITER

Date	time	Moons	Dist."	h	h S
01/01/2011	16:33:45	I/II	-6"	45,4	-8,0
01/01/2011	22:21:26	I/IV	-20"	-1,8	-67,9
02/01/2011	13:10:13	II/IV	-17"	29,1	20,0
02/01/2011	17:42:56	III/IV	-22"	41,2	-20,0
03/01/2011	03:55:50	I/III	11"	-50,2	-29,7
04/01/2011	05:35:35	II/III	9"	-45,9	-11,8
05/01/2011	05:46:55	I/II	-6"	44,3	-9,8
06/01/2011	20:36:42	II/III	-14"	13,9	-51,2
07/01/2011	05:53:42	I/III	-13"	-42,6	-8,6
08/01/2011	14:05:47	III/IV	18"	39,6	15,1
08/01/2011	18:59:41	I/II	-6"	29,2	-33,1
09/01/2011	04:49:49	II/IV	19"	-48,0	-19,9
10/01/2011	02:06:08	I/II	8"	-43,8	-49,9
10/01/2011	07:05:43	I/III	10"	-30,5	3,5
10/01/2011	07:36:51	II/IV	12"	-25,3	8,1
11/01/2011	03:08:11	II/IV	14"	-49,1	-38,6
11/01/2011	09:14:20	II/III	9"	-7,0	19,9
12/01/2011	08:12:46	I/II	-6"	-17,6	13,1
13/01/2011	15:15:38	I/II	8"	46,0	6,7
14/01/2011	00:01:45	II/III	-14"	-27,5	-67,7
14/01/2011	08:46:37	I/III	-13"	-10,1	17,4
15/01/2011	21:25:33	I/II	-7"	0,2	-57,9
17/01/2011	04:25:26	I/II	8"	-47,3	-24,1
17/01/2011	10:30:22	I/III	9"	11,2	26,1
17/01/2011	19:41:05	II/IV	-20"	17,7	-39,3
18/01/2011	02:02:49	I/III	6"	-45,7	-50,1
18/01/2011	03:51:27	I/IV	-19"	-48,9	-30,3
18/01/2011	04:13:03	III/IV	-25"	-47,9	-26,3
18/01/2011	08:01:36	I/III	8"	-15,7	12,2
18/01/2011	12:53:06	II/III	10"	35,3	24,1
19/01/2011	10:38:33	I/II	-7"	14,0	26,8
20/01/2011	17:35:33	I/II	8"	36,2	-15,6
21/01/2011	03:29:11	II/III	-13"	-49,0	-34,2
22/01/2011	23:51:19	I/II	-7"	-30,2	-66,8
24/01/2011	06:45:56	I/II	8"	-25,3	1,7
24/01/2011	14:26:41	I/III	8"	46,4	15,8
24/01/2011	23:52:22	I/III	5"	-31,3	-66,3
25/01/2011	12:31:52	I/III	9"	36,0	27,1
25/01/2011	16:32:11	II/III	10"	42,1	-3,0
26/01/2011	08:40:15	I/IV	17"	-2,9	18,4
26/01/2011	12:27:19	II/IV	21"	35,9	27,6
26/01/2011	13:04:17	I/II	-7"	40,5	25,1
26/01/2011	15:43:15	I/IV	13"	45,8	5,1
27/01/2011	10:36:34	I/IV	18"	18,7	28,5
27/01/2011	19:56:38	I/II	8"	9,6	-40,2
27/01/2011	21:52:45	III/IV	22"	-12,1	-59,3
28/01/2011	06:59:11	II/III	-13"	-20,5	4,3
30/01/2011	02:17:05	I/II	-7"	-48,1	-46,2
31/01/2011	09:07:35	I/II	8"	5,2	22,6
01/02/2011	16:09:59	I/III	10"	42,6	2,2
01/02/2011	20:11:21	II/III	11"	4,2	-41,8
02/02/2011	15:30:01	I/II	-7"	45,8	8,8
02/02/2011	19:36:51	III/IV	-17"	10,0	-35,3
03/02/2011	22:18:49	I/II	8"	-20,5	-60,7
04/02/2011	05:17:10	II/IV	-21"	-33,2	-12,5
04/02/2011	10:31:12	II/III	-13"	22,7	30,4
04/02/2011	13:50:56	I/IV	-19"	47,2	22,9
04/02/2011	17:31:08	I/III	-13"	30,7	-11,8
06/02/2011	04:42:48	I/II	-7"	-37,1	-18,4
07/02/2011	11:30:19	I/II	7"	34,0	32,7
08/02/2011	19:31:22	I/III	11"	7,8	-33,1
08/02/2011	23:51:01	II/III	11"	-37,2	-62,3
09/02/2011	17:55:42	I/II	-7"	24,4	-15,2
11/02/2011	00:42:03	I/II	7"	-43,6	-57,7
11/02/2011	14:05:21	II/III	-13"	48,5	23,1
11/02/2011	20:29:10	I/III	-12"	-4,6	-42,7
12/02/2011	08:41:36	III/IV	25"	8,1	22,6
12/02/2011	22:55:01	II/IV	21"	-30,7	-60,8
13/02/2011	07:08:28	I/II	-8"	-8,7	9,1
14/02/2011	13:54:03	I/II	7"	48,8	25,4
15/02/2011	22:43:38	I/III	12"	-30,2	-59,1
16/02/2011	03:30:14	II/III	11"	-41,4	-29,8
16/02/2011	20:21:20	I/II	-8"	-5,9	-40,2
18/02/2011	03:06:16	I/II	7"	-43,0	-33,6
18/02/2011	17:41:41	II/III	-13"	22,5	-10,7
18/02/2011	23:29:51	I/III	-12"	-37,9	-59,5
20/02/2011	09:34:04	I/II	-8"	22,6	31,2
20/02/2011	19:47:45	I/IV	-19"	-1,0	-33,4
21/02/2011	15:48:19	II/IV	-20"	39,1	10,4
21/02/2011	16:18:46	I/II	7"	34,7	5,2

Date	time	Moons	Dist."	h	h S
22/02/2011	02:51:24	II/IV	-22"	-42,8	-35,2
23/02/2011	01:50:53	I/III	12"	-46,2	-44,9
23/02/2011	07:09:21	II/III	12"	-1,4	11,9
23/02/2011	22:46:50	I/II	-8"	-33,8	-56,6
25/02/2011	05:31:27	I/II	7"	-18,7	-5,0
25/02/2011	21:20:06	II/III	-13"	-20,9	-47,1
26/02/2011	02:33:55	I/III	-12"	-42,9	-37,0
27/02/2011	11:59:32	I/II	-8"	46,7	39,0
28/02/2011	01:30:42	III/IV	16"	-45,8	-46,2
28/02/2011	18:44:25	I/II	7"	6,1	-20,1
01/03/2011	02:30:30	I/IV	16"	-42,2	-36,7
01/03/2011	04:47:35	I/IV	14"	-23,8	-12,1
02/03/2011	02:51:25	I/IV	19"	-39,7	-32,8
02/03/2011	04:54:48	I/III	13"	-22,0	-10,5
02/03/2011	09:08:21	II/IV	19"	24,1	31,8
02/03/2011	10:48:06	II/III	12"	39,9	40,1
03/03/2011	01:12:14	I/II	-8"	-45,7	-47,6
04/03/2011	07:57:33	I/II	7"	12,7	22,5
05/03/2011	01:00:55	II/III	-13"	-45,6	-48,3
05/03/2011	05:43:10	I/III	-11"	-11,7	0,0
06/03/2011	14:24:52	I/II	-8"	45,3	27,0
07/03/2011	21:11:00	I/II	7"	-23,9	-42,9
09/03/2011	03:26:23	II/IV	-16"	-32,0	-24,5
09/03/2011	07:56:46	I/III	13"	15,7	24,1
09/03/2011	14:00:18	III/IV	-26"	47,1	31,4
09/03/2011	14:26:37	II/III	13"	44,4	27,6
09/03/2011	16:32:54	II/IV	-12"	25,4	6,3
10/03/2011	03:37:28	I/II	-9"	-29,8	-22,2
10/03/2011	06:02:07	I/IV	-20"	-5,0	4,7
11/03/2011	00:26:53	II/IV	-16"	-45,0	-49,3
11/03/2011	10:24:37	I/II	7"	41,2	42,4
12/03/2011	04:43:24	II/III	-13"	-18,0	-9,6
12/03/2011	08:59:20	I/III	-11"	28,6	34,3
13/03/2011	16:50:01	I/II	-9"	20,5	4,1
14/03/2011	23:38:33	I/II	7"	-43,4	-50,2
16/03/2011	10:57:45	I/III	14"	47,3	45,9
16/03/2011	18:05:04	II/III	13"	5,3	-9,4
17/03/2011	06:02:30	I/II	-9"	0,0	6,9
17/03/2011	16:35:17	II/IV	20"	21,2	7,6
18/03/2011	08:58:02	I/IV	21"	31,9	36,4
18/03/2011	12:52:37	I/II	7"	50,8	42,3
19/03/2011	08:21:34	III/IV	24"	26,2	31,5
19/03/2011	08:28:01	II/III	-12"	27,4	32,5
19/03/2011	12:27:47	I/III	-10"	51,6	44,8
20/03/2011	06:37:35	I/III	-7"	8,0	14,2
20/03/2011	08:41:27	I/II	-7"	30,2	34,8
20/03/2011	19:14:57	I/II	-9"	-9,9	-21,1
22/03/2011	02:07:04	I/II	7"	-36,1	-33,2
23/03/2011	21:43:05	II/III	14"	-34,6	-41,8
24/03/2011	08:27:18	I/II	-9"	30,2	34,1
25/03/2011	08:57:05	III/IV	-15"	35,7	38,8
25/03/2011	15:21:38	I/II	7"	30,3	22,5
26/03/2011	08:30:30	II/IV	-22"	31,9	35,3
26/03/2011	12:14:22	II/III	-12"	52,1	48,2
26/03/2011	12:18:35	I/III	-20"	51,9	47,9
26/03/2011	16:21:15	I/III	-9"	19,3	12,1
27/03/2011	06:59:58	I/IV	-13"	16,5	20,5
27/03/2011	14:11:17	I/IV	-16"	40,6	34,7
27/03/2011	14:33:20	I/III	-10"	37,3	31,2
27/03/2011	16:14:39	III/IV	-7"	20,0	13,5
27/03/2011	21:39:37	I/II	-9"	-35,3	-40,1
28/03/2011	10:01:32	III/IV	-9"	46,2	47,4
29/03/2011	04:36:40	I/II	7"	-8,9	-5,3
31/03/2011	01:21:00	II/III	15"	-37,4	-36,1
31/03/2011	10:51:49	I/II	-10"	51,7	51,7
01/04/2011	17:51:46	I/II	7"	0,1	-3,2
02/04/2011	16:02:57	II/III	-12"	19,2	16,8
03/04/2011	18:26:01	I/III	-11"	-7,8	-9,4
03/04/2011	19:29:07	III/IV	27"	-18,8	-20,2
04/04/2011	00:03:59	I/II	-10"	-41,9	-41,3
04/04/2011	01:56:25	II/IV	24"	-31,4	-30,0
04/04/2011	19:29:14	I/IV	21"	-19,3	-20,0
05/04/2011	07:07:26	I/II	6"	23,4	24,8
06/04/2011	19:59:42	I/III	14"	-25,0	-24,3
07/04/2011	04:57:59	II/III	15"	1,1	1,8
07/04/2011	13:16:03	I/II	-10"	44,5	45,7
08/04/2011	20:23:10	I/II	6"	-29,2	-27,2
09/04/2011	19:54:20	II/III	-12"	-25,3	-22,7
10/04/2011	21:54:37	I/III	-12"	-39,7	-36,8
11/04/2011	02:28:03	I/II	-10"	-23,2	-23,0

Date	time	Moons	Dist."	h	h S
12/04/2011	09:39:37	I/II	6"	50,0	50,8
12/04/2011	18:58:29	II/IV	-24"	-17,6	-13,1
12/04/2011	22:27:20	I/IV	-22"	-41,5	-38,1
13/04/2011	13:46:42	III/IV	-26"	37,8	42,8
13/04/2011	23:01:30	I/III	14"	-41,8	-38,8
14/04/2011	08:34:17	II/III	16"	42,9	42,4
14/04/2011	15:39:55	I/II	-10"	17,5	23,5
15/04/2011	22:56:07	I/II	6"	-41,6	-38,0
16/04/2011	23:48:53	II/III	-12"	-39,4	-37,1
18/04/2011	01:11:12	I/III	-13"	-30,7	-30,7
18/04/2011	04:51:43	I/II	-10"	6,5	3,7
19/04/2011	12:13:26	I/II	6"	48,7	56,3
19/04/2011	17:13:12	III/IV	15"	-1,6	7,2
21/04/2011	01:31:47	I/IV	23"	-26,4	-27,3
21/04/2011	02:04:42	I/III	14"	-21,3	-23,2
21/04/2011	06:48:36	III/IV	8"	29,7	26,0
21/04/2011	12:09:42	II/III	17"	48,6	57,2
21/04/2011	12:50:36	II/IV	24"	43,2	52,8
21/04/2011	18:03:25	I/II	-11"	-12,3	-0,8
22/04/2011	22:20:07	III/IV	13"	-41,0	-34,5
23/04/2011	01:30:54	I/II	6"	-25,4	-26,8
24/04/2011	03:47:57	II/III	-11"	-9,9	-6,2
25/04/2011	04:21:00	I/III	-14"	5,2	0,4
25/04/2011	07:15:02	I/II	-11"	36,6	31,8
26/04/2011	14:49:26	I/II	6"	20,8	34,9
28/04/2011	05:10:22	I/III	14"	16,2	9,6
28/04/2011	15:44:21	II/III	17"	9,7	25,2
28/04/2011	20:26:30	I/II	-11"	-35,3	-22,4
29/04/2011	00:55:22	III/IV	-29"	-27,5	-28,7
29/04/2011	05:00:52	I/IV	-21"	15,0	8,1
29/04/2011	20:22:17	I/IV	-14"	-35,1	-21,7
30/04/2011	04:08:13	I/II	6"	5,9	-0,5
30/04/2011	05:37:59	II/IV	-23"	22,5	15,1
30/04/2011	07:35:48	I/IV	-19"	42,6	36,8
01/05/2011	07:51:48	II/III	-11"	45,5	39,9
02/05/2011	07:25:45	I/III	-15"	42,1	35,4
02/05/2011	09:37:53	I/II	-11"	55,5	56,9
03/05/2011	17:28:20	I/II	6"	-11,8	7,1
05/05/2011	08:20:05	I/III	14"	50,9	45,7
05/05/2011	22:49:08	I/II	-11"	-37,9	-31,5
07/05/2011	06:48:56	I/II	5"	39,1	29,7
08/05/2011	12:03:05	I/IV	23"	43,7	62,5
08/05/2011	12:03:12	II/III	-11"	43,7	62,5
08/05/2011	19:26:33	III/IV	29"	-31,4	-11,9
08/05/2011	22:54:58	II/IV	22"	-36,6	-30,7
09/05/2011	10:27:12	I/III	-16"	54,6	63,8
10/05/2011	20:11:25	I/II	5"	-36,3	-17,7
12/05/2011	11:36:02	I/III	13"	46,2	65,4
14/05/2011	09:34:50	I/II	5"	56,7	59,3
15/05/2011	03:26:02	III/IV	-13"	7,5	-4,5
15/05/2011	15:08:01	II/IV	-21"	7,7	34,7
15/05/2011	16:25:18	II/III	-10"	-6,6	20,4
15/05/2011	23:57:43	III/IV	-9"	-27,1	-28,0
16/05/2011	13:26:06	I/III	-17"	26,0	53,0
16/05/2011	14:45:23	I/IV	-25"	11,3	39,0
17/05/2011	13:21:51	II/IV	-18"	26,2	53,8
17/05/2011	23:01:10	I/II	5"	-32,9	-28,6
18/05/2011	05:15:14	III/IV	-15"	29,4	14,2
19/05/2011	15:03:22	I/III	13"	6,5	36,1
20/05/2011	08:56:34	I/III	8"	57,3	54,5
20/05/2011	11:25:52	I/III	9"	44,5	67,7
21/05/2011	12:29:28	I/II	5"	33,6	62,3
22/05/2011	00:56:43	I/II	3"	-15,0	-22,9
22/05/2011	06:03:30	I/II	5"	40,1	23,5
22/05/2011	21:06:54	II/III	-10"	-38,5	-21,5
23/05/2011	19:59:05	II/III	-5"	-37,1	-13,6
24/05/2011	05:55:29	II/IV	25"	39,9	22,2
24/05/2011	06:23:03	III/IV	31"	44,3	27,3
24/05/2011	08:41:20	II/III	-7"	57,6	52,5
24/05/2011	17:55:47	I/IV	25"	-25,0	5,7
25/05/2011	02:03:06	I/II	4"	-0,9	-15,4
25/05/2011	12:15:19	I/II	3"	34,1	64,7
25/05/2011	20:02:14	I/II	5"	-37,4	-13,7
26/05/2011	18:53:34	I/III	12"	-32,6	-3,4
27/05/2011	05:50:29	I/III	8"	40,8	21,6
27/05/2011	17:01:48	I/III	12"	-18,2	15,5
28/05/2011	15:42:22	I/II	4"	-5,3	30,1
28/05/2011	23:46:30	I/II	3"	-22,1	-25,9
29/05/2011	09:42:40	I/II	6"	54,6	62,7
30/05/2011	02:33:52	II/III	-9"	7,2	-10,0



Date	time	Moons	Dist."	h	h S
31/05/2011	14:20:41	I/III	-8"	8,1	45,5
01/06/2011	05:37:27	I/II	4"	41,5	19,5
01/06/2011	11:08:00	I/II	3"	42,2	70,0
01/06/2011	21:29:42	I/IV	-23"	-35,6	-21,9
01/06/2011	22:08:12	I/IV	-28"	-32,5	-24,4
01/06/2011	23:16:30	I/II	6"	-24,4	-25,9
03/06/2011	00:09:50	I/IV	-23"	-15,9	-24,3
03/06/2011	00:14:41	III/IV	-32"	-15,1	-24,1
03/06/2011	00:47:08	I/III	9"	-9,7	-22,0
03/06/2011	02:28:19	I/III	9"	8,7	-11,2
03/06/2011	20:49:00	I/III	14"	-37,1	-17,9
04/06/2011	20:42:34	I/II	3"	-37,2	-17,1
04/06/2011	21:25:11	I/II	3"	-35,1	-21,1
05/06/2011	12:44:24	I/II	7"	23,2	62,4
06/06/2011	22:15:10	I/III	-18"	-29,8	-24,1
07/06/2011	19:03:31	I/III	-9"	-35,6	-3,4
09/06/2011	02:09:50	I/II	7"	9,0	-13,2
10/06/2011	12:53:08	I/III	21"	18,9	61,6
10/06/2011	15:21:55	I/IV	31"	-8,3	35,2
11/06/2011	00:11:46	I/III	15"	-11,0	-23,5
11/06/2011	04:12:01	I/IV	27"	32,7	5,1
12/06/2011	12:45:57	III/IV	19"	19,1	62,8
12/06/2011	15:31:56	I/II	8"	-11,0	33,5
14/06/2011	23:22:39	I/III	-10"	-16,7	-24,7
16/06/2011	04:52:47	I/II	8"	42,7	12,0
17/06/2011	16:20:09	I/III	22"	-20,8	24,9
18/06/2011	03:22:23	I/III	17"	28,1	-2,4
18/06/2011	10:55:09	III/IV	-34"	36,0	71,0
19/06/2011	06:37:05	I/IV	-28"	57,5	30,7
19/06/2011	08:19:04	I/IV	-31"	57,4	49,5
19/06/2011	18:11:22	I/II	8"	-33,9	5,6
22/06/2011	03:26:29	I/III	-12"	31,4	-1,7
23/06/2011	07:29:13	I/II	9"	59,5	40,2
24/06/2011	19:45:57	I/III	23"	-35,7	-8,9
25/06/2011	06:25:34	I/III	18"	58,3	28,3
26/06/2011	20:45:18	I/II	9"	-31,3	-16,1
27/06/2011	09:46:29	I/IV	29"	43,2	63,8
28/06/2011	01:40:36	I/IV	32"	15,7	-16,6
28/06/2011	05:04:42	III/IV	37"	51,0	13,6
28/06/2011	07:02:41	I/III	-18"	59,9	35,0
29/06/2011	07:20:09	I/III	-13"	59,5	38,2
30/06/2011	10:00:53	I/II	10"	39,2	65,6
01/07/2011	23:10:07	I/III	23"	-9,0	-24,9
02/07/2011	09:23:09	I/III	19"	44,5	59,8
03/07/2011	23:15:03	I/II	10"	-7,0	-25,1
05/07/2011	10:00:36	I/III	-18"	36,5	65,1
05/07/2011	13:07:36	I/IV	-26"	2,4	59,9
06/07/2011	11:05:53	I/III	-14"	24,1	70,6
06/07/2011	15:44:27	I/IV	-27"	-23,6	31,8
06/07/2011	18:01:48	I/IV	-30"	-35,3	7,2
07/07/2011	12:28:48	I/II	11"	8,1	65,5
07/07/2011	17:00:42	III/IV	-22"	-32,1	17,8
09/07/2011	02:32:50	I/III	24"	32,4	-11,4
09/07/2011	12:16:48	I/III	21"	9,2	66,7
11/07/2011	01:41:23	I/II	11"	24,3	-17,8
12/07/2011	13:01:26	I/III	-18"	-0,1	60,5
13/07/2011	14:45:14	I/III	-16"	-18,4	42,5
13/07/2011	15:18:15	III/IV	38"	-23,0	36,3
14/07/2011	14:53:35	I/II	11"	-20,1	40,8
14/07/2011	19:34:23	I/IV	32"	-31,4	-8,2
15/07/2011	10:08:19	I/IV	27"	29,3	64,9
16/07/2011	05:53:14	I/III	25"	60,7	20,5
18/07/2011	04:04:46	I/II	12"	52,8	1,6
19/07/2011	16:07:38	I/III	-18"	-30,6	26,7
20/07/2011	18:19:23	I/III	-17"	-34,4	3,2
21/07/2011	17:15:34	I/II	12"	-34,8	14,1
22/07/2011	00:48:44	I/IV	-31"	21,7	-24,3
22/07/2011	21:40:34	I/IV	-33"	-11,4	-23,8
23/07/2011	08:15:21	III/IV	-42"	44,6	45,8
23/07/2011	09:11:32	I/III	25"	34,8	55,4
23/07/2011	14:37:51	I/IV	-18"	-21,9	42,8
23/07/2011	18:41:46	I/IV	-19"	-32,7	-0,4
25/07/2011	06:25:29	I/II	13"	58,4	25,3
26/07/2011	19:23:05	I/III	-17"	-28,2	-8,2
27/07/2011	11:15:20	I/III	-11"	9,5	67,2
27/07/2011	16:48:33	I/III	-14"	-34,4	18,2
27/07/2011	21:48:05	I/III	-18"	-7,1	-25,4
28/07/2011	19:35:02	I/II	13"	-26,1	-10,3
30/07/2011	12:27:23	I/III	26"	-5,3	62,3
30/07/2011	16:19:50	I/IV	36"	-33,7	23,0
31/07/2011	00:35:54	I/IV	34"	25,4	-27,0
01/08/2011	08:43:44	I/II	14"	34,3	49,4
01/08/2011	21:40:59	III/IV	26"	-5,1	-26,0
02/08/2011	22:59:32	I/III	-16"	9,6	-30,2
03/08/2011	21:07:59	I/III	-17"	-9,5	-23,5
04/08/2011	01:12:10	I/III	-20"	34,8	-25,1
04/08/2011	21:52:03	I/II	14"	-0,6	-27,6

Date	time	Moons	Dist."	h	h S
06/08/2011	15:40:48	II/III	27"	-32,8	29,0
07/08/2011	17:48:40	III/IV	-42"	-32,3	5,5
08/08/2011	03:14:50	I/IV	-32"	56,3	-10,3
08/08/2011	08:27:08	II/IV	-40"	32,8	45,4
08/08/2011	10:59:36	I/II	14"	4,8	63,9
08/08/2011	18:21:00	I/IV	-22"	-29,4	0,0
09/08/2011	05:44:59	I/IV	-30"	57,5	15,7
09/08/2011	17:47:49	I/II	-16"	-31,8	5,2
10/08/2011	04:11:30	I/III	-13"	61,2	-0,6
10/08/2011	06:34:58	I/III	-12"	50,6	24,7
11/08/2011	00:30:33	I/III	-19"	31,9	-30,2
11/08/2011	04:31:03	II/III	-21"	61,5	2,2
12/08/2011	00:06:46	I/II	15"	28,2	-31,8
13/08/2011	06:53:10	I/II	-16"	46,1	27,6
13/08/2011	18:51:50	II/III	27"	-24,0	-7,0
14/08/2011	01:59:55	I/III	25"	49,2	-22,2
15/08/2011	13:13:13	I/II	15"	-21,3	52,4
16/08/2011	19:58:12	I/II	-16"	-12,9	-18,2
17/08/2011	09:42:39	I/IV	36"	12,8	55,0
17/08/2011	11:03:25	III/IV	48"	-1,1	61,3
18/08/2011	03:33:07	I/III	-21"	61,0	-9,3
18/08/2011	07:45:17	II/III	-23"	33,8	36,3
19/08/2011	02:19:14	I/II	16"	54,7	-20,8
20/08/2011	09:02:52	I/II	-16"	18,1	48,8
20/08/2011	22:00:05	II/III	28"	11,1	-33,0
21/08/2011	04:38:06	I/III	25"	59,6	1,7
22/08/2011	15:24:35	I/II	16"	-34,3	28,3
23/08/2011	22:07:11	I/II	-17"	14,5	-34,5
25/08/2011	06:24:06	I/III	-23"	43,4	20,2
25/08/2011	10:54:56	II/III	-24"	-5,7	58,5
25/08/2011	11:30:03	I/IV	-39"	-11,5	58,6
25/08/2011	17:17:31	II/IV	-41"	-29,2	6,6
26/08/2011	04:29:31	I/II	17"	58,8	-0,4
26/08/2011	22:46:51	III/IV	-29"	24,0	-37,4
27/08/2011	11:11:09	I/II	-17"	-9,7	58,1
28/08/2011	01:05:48	II/III	28"	49,2	-32,1
28/08/2011	07:14:56	I/III	26"	32,3	29,0
29/08/2011	17:33:49	I/II	17"	-25,9	2,6
31/08/2011	00:14:46	I/II	-17"	42,7	-37,2
01/09/2011	09:07:13	I/III	-24"	8,7	46,5
01/09/2011	14:00:13	II/III	-25"	-32,5	40,0
01/09/2011	19:44:55	III/IV	47"	-4,8	-21,1
02/09/2011	06:37:39	I/II	17"	35,5	21,3
02/09/2011	13:59:41	I/IV	40"	-32,7	39,8
03/09/2011	09:20:40	II/IV	40"	4,9	47,8
03/09/2011	13:18:00	I/II	-17"	-30,0	45,7
04/09/2011	04:08:06	II/III	28"	57,3	-6,7
04/09/2011	09:50:00	I/III	26"	-0,6	50,9
05/09/2011	19:40:54	I/II	18"	-2,2	-21,8
07/09/2011	02:20:55	I/II	-17"	61,2	-25,2
08/09/2011	11:44:38	I/III	-26"	-21,9	52,9
08/09/2011	17:01:35	II/III	-27"	-25,1	5,4
09/09/2011	08:43:42	I/II	18"	7,1	41,2
10/09/2011	03:31:31	I/IV	-30"	58,5	-14,3
10/09/2011	13:24:33	II/IV	-23"	-32,6	42,3
10/09/2011	15:23:25	I/II	-17"	-33,0	22,8
10/09/2011	15:45:47	I/IV	-39"	-31,7	18,7
11/09/2011	07:07:26	II/III	29"	23,3	24,9
11/09/2011	11:29:23	III/IV	-52"	-21,5	52,3
11/09/2011	12:24:00	I/III	26"	-28,0	49,0
11/09/2011	23:29:14	II/IV	-34"	43,1	-43,4
12/09/2011	21:45:59	I/II	19"	25,3	-40,3
14/09/2011	04:25:39	I/II	-17"	49,5	-5,4
15/09/2011	14:17:05	I/III	-27"	-34,5	32,5
15/09/2011	19:58:41	II/III	-28"	7,7	-28,1
16/09/2011	10:47:49	I/II	19"	-18,7	50,5
17/09/2011	17:27:28	I/II	-17"	-16,7	-1,7
18/09/2011	10:03:41	II/III	29"	-13,3	47,5
18/09/2011	14:06:21	II/IV	42"	-34,6	33,2
18/09/2011	14:57:16	I/III	26"	-32,8	24,7
18/09/2011	20:12:04	I/IV	35"	12,4	-31,2
19/09/2011	03:14:21	I/IV	28"	56,3	-19,2
19/09/2011	21:58:00	I/IV	39"	32,7	-44,0
19/09/2011	23:49:09	I/II	19"	51,4	-45,6
20/09/2011	23:47:26	III/IV	33"	51,7	-46,1
21/09/2011	06:29:04	I/II	-17"	22,6	16,0
22/09/2011	16:45:50	I/III	-28"	-19,8	3,9
22/09/2011	22:52:12	II/III	-29"	44,4	-47,8
23/09/2011	12:50:06	I/II	20"	-33,9	41,7
24/09/2011	19:30:15	I/II	-17"	9,2	-26,7
25/09/2011	12:57:14	II/III	29"	-34,5	40,1
25/09/2011	17:30:37	I/III	25"	-11,2	-5,6
26/09/2011	19:12:37	III/IV	-51"	7,5	-24,4
27/09/2011	01:50:35	I/II	20"	60,3	-34,8
27/09/2011	04:37:31	II/IV	-47"	38,3	-5,8
27/09/2011	23:42:07	I/IV	-42"	54,8	-48,9
28/09/2011	08:31:15	I/II	-17"	-5,2	34,3

Date	time	Moons	Dist."	h	h S
29/09/2011	19:11:00	I/III	-29"	9,5	-25,2
30/09/2011	01:41:52	II/III	-30"	60,0	-36,9
30/09/2011	14:50:45	I/II	20"	-29,7	21,7
01/10/2011	21:31:53	I/II	-17"	37,0	-46,4
02/10/2011	15:48:39	II/III	29"	-22,1	11,0
02/10/2011	20:05:18	I/III	24"	21,9	-35,2
04/10/2011	03:50:31	I/II	20"	41,0	-15,9
05/10/2011	10:32:26	I/II	-17"	-27,5	42,9
05/10/2011	20:17:58	II/IV	50"	26,6	-38,2
06/10/2011	11:19:38	III/IV	56"	-32,3	42,7
06/10/2011	21:33:33	I/III	-30"	40,9	-48,5
07/10/2011	04:28:29	II/III	-31"	31,9	-9,5
07/10/2011	16:49:59	I/II	20"	-9,6	-1,1
08/10/2011	23:32:40	I/II	-17"	58,4	-53,3
09/10/2011	18:38:12	II/III	28"	11,2	-22,5
09/10/2011	22:42:36	I/III	24"	53,5	-54,2
11/10/2011	05:49:11	I/II	21"	13,6	4,8
12/10/2011	12:32:52	I/II	-16"	-35,2	36,1
13/10/2011	23:54:02	I/III	-30"	60,5	-53,8
14/10/2011	03:05:40	I/IV	-44"	41,0	-26,1
14/10/2011	07:12:38	II/III	-31"	-3,8	18,3
14/10/2011	11:52:49	II/IV	-49"	-35,5	38,4
14/10/2011	18:48:10	I/II	21"	17,0	-25,9
15/10/2011	21:14:24	III/IV	-31"	44,1	-49,6
16/10/2011	01:32:50	I/II	-16"	53,7	-42,4
16/10/2011	21:26:56	II/III	28"	46,8	-51,5
17/10/2011	01:25:40	I/III	22"	54,0	-43,7
17/10/2011	17:24:21	I/III	14"	4,1	-11,3
17/10/2011	22:33:50	I/III	18"	56,3	-57,0
18/10/2011	07:46:58	I/II	21"	-13,0	22,6
19/10/2011	14:32:55	I/II	-16"	-22,8	18,4
21/10/2011	02:13:17	I/III	-30"	44,3	-36,9
21/10/2011	09:55:06	II/III	-32"	-31,4	35,5
21/10/2011	18:17:35	III/IV	53"	16,9	-22,2
21/10/2011	20:45:35	I/II	21"	43,6	-47,7
22/10/2011	05:23:01	I/IV	43"	9,2	-1,8
23/10/2011	03:24:51	II/IV	46"	30,2	-24,5
23/10/2011	03:32:49	I/II	-16"	28,7	-23,0
24/10/2011	00:14:40	II/III	27"	57,9	-55,1
24/10/2011	04:18:30	I/III	21"	19,4	-14,8
24/10/2011	16:08:54	I/III	13"	-4,1	1,1
25/10/2011	02:17:24	I/III	20"	40,5	-37,1
25/10/2011	09:44:09	I/II	21"	-32,1	33,5
26/10/2011	16:32:56	I/II	-15"	1,9	-4,0
28/10/2011	12:36:56	II/III	-32"	-31,7	30,2
28/10/2011	22:42:38	I/II	21"	59,7	-61,1
30/10/2011	05:32:58	I/II	-15"	1,0	-1,7
30/10/2011	07:44:54	I/IV	-38"	-21,2	19,2
30/10/2011	18:52:38	I/IV	-27"	30,5	-30,9
31/10/2011	03:02:48	II/III	26"	27,5	-30,2
31/10/2011	07:35:21	I/III	18"	-20,5	17,5
31/10/2011	09:23:52	III/IV	-55"	-32,9	30,1
31/10/2011	10:03:20	I/IV	-39"	-35,3	32,7
31/10/2011	15:11:58	I/III	13"	-9,0	8,8
31/10/2011	17:41:43	II/IV	-38"	18,2	-18,0
01/11/2011	05:18:13	I/III	22"	1,9	-5,5
01/11/2011	11:41:10	I/II	21"	-34,6	32,7
02/11/2011	18:33:22	I/II	-15"	29,4	-28,0
04/11/2011	06:51:06	I/III	-30"	-16,6	9,9
04/11/2011	15:18:30	II/III	-32"	-4,8	6,8
05/11/2011	00:39:43	I/II	21"	48,0	-55,3
06/11/2011	07:33:47	I/II	-14"	-24,2	15,8
07/11/2011	05:51:58	II/III	25"	-9,3	-0,1
07/11/2011	07:53:12	II/IV	41"	-27,2	18,3
08/11/2011	08:04:18	I/III	23"	-29,1	19,5
08/11/2011	12:46:49	I/IV	42"	-25,8	26,1
08/11/2011	13:38:24	I/II	21"	-18,5	20,5
08/11/2011	18:11:42	II/IV	23"	30,1	-25,1
09/11/2011	03:44:29	II/IV	28"	12,1	-24,3
09/11/2011	19:41:24	III/IV	30"	46,2	-41,7
09/11/2011	20:34:44	I/II	-14"	53,6	-50,8
11/11/2011	09:11:11	I/III	-29"	-35,6	25,9
11/11/2011	18:01:02	II/III	-32"	30,5	-23,6
12/11/2011	02:37:13	I/II	21"	22,0	-37,3
13/11/2011	09:35:45	I/II	-14"	-36,7	27,3
14/11/2011	08:43:23	II/III	24"	-34,9	22,5
15/11/2011	10:43:20	I/III	23"	-34,9	29,5
15/11/2011	15:36:15	I/II	20"	6,9	2,0
15/11/2011	16:18:29	III/IV	-51"	14,7	-5,5
15/11/2011	21:37:02	II/IV	-45"	59,2	-61,1
16/11/2011	14:05:05	I/IV	-42"	-8,8	15,4
16/11/2011	22:37:27	I/II	-13"	56,1	-66,5
18/11/2011	11:32:30	I/III	-28"	-29,7	28,3
18/11/2011	20:44:39	II/III	-31"	57,8	-54,0
19/11/2011	04:35:30	I/II	20"	-5,5	-16,8
20/11/2011	11:39:19	I/II	-13"	-28,0	27,6
21/11/2011	11:38:17	II/III	23"	-27,6	27,4

Date	time	Moons	Dist."	h	h S
22/11/2011	13:18:59	I/III	24"	-12,3	19,9
22/11/2011	17:35:02	I/II	20"	34,2	-20,1
24/11/2011	00:42:03	I/II	-13"	33,2	-59,3
24/11/2011	13:10:58	II/IV	46"	-12,2	20,4
24/11/2011	16:06:11	I/IV	42"	19,5	-4,3
25/11/2011	08:23:42	III/IV	51"	-36,6	17,8
25/11/2011	13:56:05	I/III	-27"	-3,4	15,2
25/11/2011	23:30:16	II/III	-31"	43,9	-67,8
26/11/2011	06:34:52	I/II	20"	-28,4	2,7
27/11/2011	13:45:01	I/II	-12"	-4,0	16,3
28/11/2011	14:37:31	II/III	22"	6,2	9,3
29/11/2011	15:52:47	I/III	24"	20,9	-1,9
29/11/2011	19:35:03	I/II	20"	55,8	-42,7
01/12/2011	02:48:59	I/II	-12"	4,3	-38,6
02/12/2011	16:22:25	I/III	-26"	28,7	-7,8
02/12/2011	17:41:57	I/IV	-38"	42,5	-21,9
03/12/2011	02:18:23	II/III	-30"	8,2	-44,5
03/12/2011	04:52:12	II/IV	-44"	-18,6	-16,3
03/12/2011	08:35:35	I/II	19"	-37,3	17,6
04/12/2011	15:53:16	I/II	-11"	24,8	-2,3

Date	time	Moons	Dist."	h	h S
04/12/2011	16:52:01	III/IV	-25"	35,4	-12,9
05/12/2011	17:42:36	II/III	20"	44,6	-22,0
06/12/2011	18:26:30	I/III	24"	51,4	-30,1
06/12/2011	21:36:33	I/II	19"	53,1	-63,4
08/12/2011	04:58:45	I/II	-11"	-22,7	-15,9
09/12/2011	18:52:21	I/III	-24"	55,6	-34,8
10/12/2011	10:37:53	I/II	19"	-25,4	24,8
10/12/2011	15:50:17	III/IV	47"	28,8	-1,7
10/12/2011	21:10:06	I/IV	33"	54,1	-59,5
11/12/2011	07:51:43	I/IV	24"	-37,5	11,3
11/12/2011	18:04:38	I/II	-10"	51,2	-25,9
11/12/2011	20:52:52	II/IV	40"	55,4	-56,6
11/12/2011	23:36:58	I/IV	34"	31,0	-69,9
12/12/2011	20:53:29	II/III	19"	54,9	-56,7
13/12/2011	21:00:12	I/III	24"	53,8	-57,8
13/12/2011	23:39:40	I/II	18"	29,0	-69,9
15/12/2011	07:11:52	I/II	-10"	-37,4	5,3
16/12/2011	21:26:51	I/III	-23"	48,9	-61,9
17/12/2011	12:41:50	I/II	18"	-0,2	21,2
18/12/2011	20:19:36	I/II	-9"	55,7	-50,4

Date	time	Moons	Dist."	h	h S
20/12/2011	00:11:59	II/III	17"	18,5	-67,3
20/12/2011	01:50:59	I/IV	-35"	0,6	-51,7
20/12/2011	07:50:41	III/IV	-45"	-36,9	10,2
20/12/2011	12:07:21	II/IV	-33"	-4,7	23,3
20/12/2011	23:34:51	I/III	24"	24,6	-70,7
21/12/2011	01:44:30	I/II	18"	1,0	-53,0
22/12/2011	09:28:56	I/II	-9"	-28,1	20,5
24/12/2011	00:06:33	I/III	-21"	16,6	-68,1
24/12/2011	11:02:34	II/III	-27"	-13,2	24,6
24/12/2011	14:47:34	I/II	18"	27,7	7,9
25/12/2011	22:38:53	I/II	-9"	31,2	-70,1
27/12/2011	03:39:09	II/III	16"	-22,4	-32,4
27/12/2011	04:00:30	II/IV	31"	-25,4	-28,5
28/12/2011	01:42:23	II/IV	19"	-3,8	-53,9
28/12/2011	02:10:47	I/III	23"	-9,0	-48,8
29/12/2011	02:08:56	II/IV	27"	-9,3	-49,2
29/12/2011	11:50:48	I/II	-8"	-0,6	24,3
29/12/2011	17:54:37	III/IV	22"	57,2	-22,6
31/12/2011	02:53:11	I/III	-20"	-17,8	-41,2
31/12/2011	14:04:37	II/III	-27"	24,8	14,1

Date = data  
 Time = orario  
 Moons = lune coinvolte  
 Dist = distanza in secondi  
 H = altitudine di Giove sull'orizzonte  
 H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
 Dist = distance in seconds  
 H = altitude of Jupiter above the horizon  
 H S = altitude of the Sun above the horizon

I = Io  
 II = Europa  
 III = Ganimede  
 IV = Callisto

TEMPI IN T.U.

Valori negativi delle distanze indicano che il 2° satellite transita a nord dell'altro

TIMES IN U.T.

Negative values of the distances show that the 2nd satellite transits to north of the other

© (5)

# OCCULTAZIONI TRA I SATELLITI DI GIOVE

## OCCULTATIONS BETWEEN THE MOONS OF JUPITER

Year	M	D	h	m	s	Event Type	Ph	Dur	dMag	%Ill	Sep	PA	MinD	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s
------	---	---	---	---	---	------------	----	-----	------	------	-----	----	------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Questo anno non avvengono fenomeni - No phenomena this year

Ore in T.U.

Legenda :

Data nel formato mese/giorno, un asterisco indica che le lune si avvicinano ma non si occultano  
 Event type : tipo di evento, eclissi o occultazione  
 Ph : fenomeno, M=mancato, E=eclisse penombrale, P=eclisse/occultazione parziale, T=eclisse/occultazione totale, A=eclisse/occultazione anulare  
 Durn : durata in secondi  
 dMag : caduta di luce in magnitudini  
 %ill : cambio in illuminazione, rispetto alla illuminazione intera, della luna rimanente (occultazione) o di entrambe (eclissi)  
 Sep : distanza in " tra satellite occultato/eclissato e centro del pianeta  
 Pa : angolo di posizione tra satellite occultato/eclissato e pianeta  
 MinD : distanza minima tra i centri delle lune o tra la luna e l'ombra  
 T1-T7 : inizio/fine della fase di contatto con la penombra  
 T2-T6 : inizio/fine della fase di contatto con l'ombra o tra i lembi delle lune  
 T3-T5 : inizio/fine della fase di totalità  
 Tmax : tempo di metà evento

Times in U.T.

Date in the format month/day, an asterisk shows that the moons are near but they don't occult  
 Event type : eclipse or occultation  
 Ph : phenomenon, M=missed, E=penumbral eclipse, P=partial eclipse/occultation, T=total eclipse/occultation, A=annular eclipse/occultation  
 Durn : duration in seconds  
 dMag : difference magnitude  
 %ill : defect of illumination, respect to integer  
 Sep : distance in " between the satellite and the center of the planet  
 Pa : position angle between the satellite and the center of the planet  
 MinD : least distance between the satellies  
 T1-T7 : penumbral phase begins/ends  
 T2-T6 : umbra phase begins/ends  
 T3-T5 : totalità phase begins/ends  
 Tmax : middle time of the event

© (8)

# CONGIUNZIONI ED ELONGAZIONI DEI SATELLITI DI GIOVE

## CONJUNCTIONS AND ELONGATIONS OF THE SATELLITES OF JUPITER

I Congiunzione superiore - Superior conjunction

Date	Time	h	h S
01/01/2011	03:09:55	-47,6	-38,2
02/01/2011	21:39:20	4,9	-62,2
04/01/2011	16:08:51	45,7	-2,9
06/01/2011	10:38:22	5,5	24,9
08/01/2011	05:07:57	-46,9	-16,6
09/01/2011	23:37:35	-21,2	-69,7
11/01/2011	18:07:18	35,4	-23,0
13/01/2011	12:37:01	30,3	24,1
15/01/2011	07:06:48	-27,3	4,0
17/01/2011	01:36:36	-42,7	-54,7
18/01/2011	20:06:31	12,6	-43,7
20/01/2011	14:36:24	45,9	13,6
22/01/2011	09:06:21	-0,4	20,7
24/01/2011	03:36:19	-48,3	-32,6
25/01/2011	22:06:24	-13,5	-61,6
27/01/2011	16:36:26	41,1	-3,4
29/01/2011	11:06:33	25,1	29,9
31/01/2011	05:36:39	-32,5	-9,6
02/02/2011	00:06:52	-36,8	-63,5
03/02/2011	18:37:02	20,2	-24,1
05/02/2011	13:07:17	44,7	27,6
07/02/2011	07:37:31	-7,2	12,3
09/02/2011	02:07:51	-47,7	-45,9
10/02/2011	20:38:09	-5,8	-44,4
12/02/2011	15:08:31	45,8	14,6
14/02/2011	09:38:51	19,7	29,7
16/02/2011	04:09:17	-36,7	-22,6
17/02/2011	22:39:40	-30,4	-58,2
19/02/2011	17:10:08	27,4	-4,5
21/02/2011	11:40:33	42,3	37,3
23/02/2011	06:11:05	-12,9	2,0
25/02/2011	00:41:33	-45,4	-53,2
26/02/2011	19:12:05	2,1	-25,6
28/02/2011	13:42:34	49,4	31,0
02/03/2011	08:13:10	14,3	24,3
04/03/2011	02:43:42	-39,7	-33,5
05/03/2011	21:14:18	-23,6	-44,0
07/03/2011	15:44:51	34,3	14,3
09/03/2011	10:15:30	38,9	41,0
11/03/2011	04:46:05	-18,1	-9,4
12/03/2011	23:16:44	-41,8	-51,2
14/03/2011	17:47:19	9,5	-6,6
16/03/2011	12:18:00	51,5	44,4
18/03/2011	06:48:37	8,8	15,5
20/03/2011	01:19:18	-41,5	-40,4
21/03/2011	19:49:54	-16,5	-26,8
23/03/2011	14:20:37	40,7	32,2
25/03/2011	08:51:15	34,7	38,0
27/03/2011	03:21:57	-22,9	-19,4
28/03/2011	21:52:34	-37,1	-41,0
30/03/2011	16:23:17	17,0	12,5
01/04/2011	10:53:56	52,1	52,2

Date	Time	h	h S
03/04/2011	05:24:38	3,3	5,3
04/04/2011	23:55:14	-42,1	-41,3
06/04/2011	18:25:58	-9,2	-8,7
08/04/2011	12:56:35	46,7	48,5
10/04/2011	07:27:17	29,9	29,8
12/04/2011	01:57:52	-27,2	-27,0
13/04/2011	20:28:34	-31,6	-26,6
15/04/2011	14:59:10	24,4	31,0
17/04/2011	09:29:51	50,9	51,4
19/04/2011	04:00:24	-1,8	-5,4
20/04/2011	22:31:04	-41,2	-35,6
22/04/2011	17:01:38	-1,0	9,9
24/04/2011	11:32:16	51,8	60,5
26/04/2011	06:02:47	24,5	18,7
28/04/2011	00:33:24	-30,9	-30,8
29/04/2011	19:03:55	-25,5	-10,3
01/05/2011	13:34:30	31,8	48,8
03/05/2011	08:04:58	48,2	42,6
05/05/2011	02:35:31	-8,1	-14,9
06/05/2011	21:05:59	-39,1	-24,9
08/05/2011	15:36:30	6,0	28,4
10/05/2011	10:06:53	55,7	62,3
12/05/2011	04:37:22	18,8	6,6
13/05/2011	23:07:45	-33,8	-29,5
15/05/2011	17:38:11	-18,8	7,3
17/05/2011	12:08:29	39,1	64,0
19/05/2011	06:38:53	44,1	29,7
21/05/2011	01:09:10	-13,5	-22,0
22/05/2011	19:39:31	-35,8	-11,2
24/05/2011	14:09:44	13,8	46,6
26/05/2011	08:40:01	57,7	52,5
28/05/2011	03:10:12	12,6	-5,7
29/05/2011	21:40:27	-35,7	-23,1
31/05/2011	16:10:33	-11,7	25,2
02/06/2011	10:40:44	46,0	69,3
04/06/2011	05:10:48	38,8	14,9
05/06/2011	23:40:55	-18,8	-25,1
07/06/2011	18:10:53	-31,3	4,9
09/06/2011	12:40:56	21,7	63,3
11/06/2011	07:10:52	57,5	37,0
13/06/2011	01:40:51	6,2	-16,4
14/06/2011	20:10:41	-36,5	-12,5
16/06/2011	14:40:35	-4,0	43,3
18/06/2011	09:10:22	52,4	58,5
20/06/2011	03:40:12	32,6	0,3
21/06/2011	22:09:52	-23,7	-23,0
23/06/2011	16:39:37	-25,8	21,7
25/06/2011	11:09:14	29,7	71,4
27/06/2011	05:38:54	54,9	19,7
29/06/2011	00:08:25	-0,1	-23,6
30/06/2011	18:37:59	-35,9	1,7
02/07/2011	13:07:25	4,1	60,1

Date	Time	h	h S
04/07/2011	07:36:54	57,6	40,9
06/07/2011	02:06:13	25,6	-14,4
07/07/2011	20:35:35	-28,1	-15,5
09/07/2011	15:04:50	-19,4	39,1
11/07/2011	09:34:07	37,8	60,6
13/07/2011	04:03:14	50,0	2,0
14/07/2011	22:32:24	-7,6	-25,6
16/07/2011	17:01:26	-33,8	17,1
18/07/2011	11:30:30	12,3	68,9
20/07/2011	05:59:24	60,7	21,2
22/07/2011	00:28:20	18,0	-25,6
23/07/2011	18:57:08	-31,6	-3,2
25/07/2011	13:25:59	-12,2	55,0
27/07/2011	07:54:38	45,8	41,5
29/07/2011	02:23:20	43,4	-15,8
30/07/2011	20:51:54	-14,5	-20,8
01/08/2011	15:20:29	-30,1	33,7
03/08/2011	09:48:54	21,0	59,0
05/08/2011	04:17:20	60,6	1,0
06/08/2011	22:45:38	9,8	-31,0
08/08/2011	17:13:57	-33,9	11,4
10/08/2011	11:42:06	-4,0	63,1
12/08/2011	06:10:16	53,1	19,8
14/08/2011	00:38:18	35,4	-30,5
15/08/2011	19:06:21	-21,1	-9,9
17/08/2011	13:34:13	-24,9	48,7
19/08/2011	08:02:06	30,0	39,0
21/08/2011	02:29:51	56,9	-19,8
22/08/2011	20:57:37	1,4	-27,8
24/08/2011	15:25:13	-34,4	27,6
26/08/2011	09:52:48	4,8	53,8
28/08/2011	04:20:16	58,9	-2,6
29/08/2011	22:47:44	26,4	-38,5
31/08/2011	17:15:02	-27,1	5,4
02/09/2011	11:42:20	-18,2	55,3
04/09/2011	06:09:30	39,1	15,7
06/09/2011	00:36:40	50,1	-37,6
07/09/2011	19:03:41	-7,9	-16,4
09/09/2011	13:30:42	-32,7	41,8
11/09/2011	07:57:35	14,0	33,5
13/09/2011	02:24:29	61,4	-26,1
14/09/2011	20:51:13	16,6	-35,2
16/09/2011	15:17:57	-32,0	21,8
18/09/2011	09:44:34	-10,3	45,9
20/09/2011	04:11:11	47,8	-9,3
21/09/2011	22:37:40	41,2	-47,0
23/09/2011	17:04:08	-16,6	0,5
25/09/2011	11:30:30	-28,8	46,8
27/09/2011	05:56:53	23,8	9,0
29/09/2011	00:23:08	59,3	-46,3
30/09/2011	18:49:23	6,4	-21,7
02/10/2011	13:15:32	-34,9	35,2

Date	Time	h	h S
04/10/2011	07:41:42	-0,5	25,4
06/10/2011	02:07:45	55,1	-34,4
07/10/2011	20:33:49	31,1	-41,3
09/10/2011	14:59:47	-24,7	17,2
11/10/2011	09:25:48	-22,8	36,7
13/10/2011	03:51:43	33,6	-17,5
14/10/2011	22:17:38	53,0	-55,1
16/10/2011	16:43:30	-4,0	-3,0
18/10/2011	11:09:24	-35,1	38,4
20/10/2011	05:35:14	8,7	0,6
22/10/2011	00:01:04	59,4	-55,8
23/10/2011	18:26:52	20,2	-24,4
25/10/2011	12:52:44	-31,4	29,7
27/10/2011	07:18:32	-15,1	16,0
29/10/2011	01:44:22	43,0	-43,7
30/10/2011	20:10:10	44,0	-44,6
01/11/2011	14:36:03	-14,2	14,2
03/11/2011	09:01:54	-32,3	27,3
05/11/2011	03:27:47	18,6	-26,6
06/11/2011	21:53:40	59,0	-60,9
08/11/2011	16:19:38	9,4	-4,5
10/11/2011	10:45:35	-35,8	30,9
12/11/2011	05:11:36	-6,3	-9,0
13/11/2011	23:37:37	50,9	-64,5
15/11/2011	18:03:44	34,0	-24,6
17/11/2011	12:29:51	-23,0	25,4
19/11/2011	06:56:02	-27,1	7,3
21/11/2011	01:22:15	28,4	-52,3
22/11/2011	19:48:34	54,4	-44,7
24/11/2011	14:14:54	-0,4	12,8
26/11/2011	08:41:18	-37,2	19,5
28/11/2011	03:07:46	3,3	-34,6
29/11/2011	21:34:20	56,3	-62,7
01/12/2011	16:00:56	24,0	-3,8
03/12/2011	10:27:36	-30,1	25,5
05/12/2011	04:54:20	-20,2	-16,2
06/12/2011	23:21:11	37,5	-70,2
08/12/2011	17:48:05	47,3	-23,0
10/12/2011	12:15:03	-10,5	23,1
12/12/2011	06:42:05	-35,6	1,4
14/12/2011	01:09:14	12,4	-58,3
15/12/2011	19:36:26	58,4	-42,7
17/12/2011	14:03:43	14,4	13,1
19/12/2011	08:31:04	-34,9	15,2
21/12/2011	02:58:32	-12,4	-39,5
22/12/2011	21:26:03	45,5	-61,4
24/12/2011	15:53:39	39,3	-1,5
26/12/2011	10:21:20	-18,5	23,6
28/12/2011	04:49:07	-31,6	-19,7
29/12/2011	23:16:57	21,4	-71,2
31/12/2011	17:44:52	57,1	-20,6

I Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
02/01/2011	00:29:03	-25,8	-65,6
03/01/2011	18:58:36	31,6	-33,7
05/01/2011	13:28:17	33,4	18,7
07/01/2011	07:57:56	-23,5	10,8
09/01/2011	02:27:44	-45,8	-46,1
10/01/2011	20:57:28	7,9	-54,2
12/01/2011	15:27:20	46,1	4,8
14/01/2011	09:57:11	3,3	23,8
16/01/2011	04:27:09	-47,5	-23,8
17/01/2011	22:57:03	-18,3	-68,0
19/01/2011	17:27:05	37,7	-14,3
21/01/2011	11:57:05	28,6	27,6
23/01/2011	06:27:12	-29,0	-1,1
25/01/2011	00:57:15	-40,6	-59,8
26/01/2011	19:27:25	15,4	-35,0
28/01/2011	13:57:33	45,9	20,3

Date	Time	h	h S
30/01/2011	08:27:48	-2,5	17,7
01/02/2011	02:57:59	-48,1	-38,6
02/02/2011	21:28:16	-10,9	-54,4
04/02/2011	15:58:31	43,0	4,7
06/02/2011	10:28:53	23,5	30,9
08/02/2011	04:59:10	-33,8	-15,1
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11/02/2011	17:59:53	22,7	-15,5
13/02/2011	12:30:20	44,3	32,7
15/02/2011	07:00:42	-8,9	8,3
17/02/2011	01:31:10	-46,9	-49,6
18/02/2011	20:01:35	-2,8	-36,3
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25/02/2011	22:03:31	-28,1	-52,4

Date	Time	h	h S
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09/05/2011	12:53:44	35,1	56,7
11/05/2011	07:23:59	46,5	36,8
13/05/2011	01:54:12	-10,5	-18,7
14/05/2011	20:24:24	-37,7	-18,5
16/05/2011	14:54:36	9,6	37,3
18/05/2011	09:24:46	56,9	58,6
20/05/2011	03:54:54	15,9	0,8
21/05/2011	22:25:00	-34,8	-27,0
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27/05/2011	05:55:12	41,6	22,4
29/05/2011	00:25:11	-16,2	-24,1
30/05/2011	18:55:11	-33,6	-2,9
01/06/2011	13:25:09	17,8	55,4
03/06/2011	07:55:03	57,9	45,0
05/06/2011	02:24:56	9,3	-11,5
06/06/2011	20:54:48	-36,3	-18,1
08/06/2011	15:24:39	-7,8	34,5
10/06/2011	09:54:25	49,5	65,1
12/06/2011	04:24:11	35,5	7,1
13/06/2011	22:53:54	-21,5	-24,7
15/06/2011	17:23:37	-28,4	13,5
17/06/2011	11:53:15	26,1	69,6
19/06/2011	06:22:52	56,3	28,1
21/06/2011	00:52:27	2,5	-20,7
22/06/2011	19:22:01	-36,4	-5,5
24/06/2011	13:51:31	0,8	52,6
26/06/2011	08:20:59	55,5	49,5

Date	Time	h	h S
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17/07/2011	14:11:08	-15,2	48,3
19/07/2011	08:39:59	42,7	50,7
21/07/2011	03:08:49	46,1	-8,0
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24/07/2011	16:06:16	-31,8	26,4
26/07/2011	10:34:54	17,6	65,6
28/07/2011	05:03:31	61,0	10,0
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31/07/2011	18:00:31	-33,2	4,8
02/08/2011	12:28:54	-7,4	61,5
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11/08/2011	08:50:05	26,6	48,7
13/08/2011	03:18:06	58,7	-10,8
14/08/2011	21:46:05	4,5	-30,0
16/08/2011	16:13:57	-34,4	20,7
18/08/2011	10:41:51	1,6	60,2
20/08/2011	05:09:35	57,0	7,4
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23/08/2011	18:04:55	-25,0	-0,8
25/08/2011	12:32:32	-20,8	54,4
27/08/2011	07:00:00	35,8	26,5
29/08/2011	01:27:27	52,9	-30,0

Date	Time	h	h S
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12/09/2011	05:04:25	44,7	2,4
13/09/2011	23:31:11	44,8	-44,1
15/09/2011	17:57:59	-13,3	-7,5
17/09/2011	12:24:39	-30,5	46,6
19/09/2011	06:51:18	20,1	20,4
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22/09/2011	19:44:22	10,3	-28,3
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03/10/2011	10:22:14	-25,3	43,3
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06/10/2011	23:14:29	55,9	-53,1
08/10/2011	17:40:31	0,4	-11,6
10/10/2011	12:06:35	-35,3	39,0
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14/10/2011	00:58:33	58,3	-46,8
15/10/2011	19:24:28	24,6	-32,6
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22/10/2011	21:08:05	47,8	-51,1
24/10/2011	15:34:00	-10,3	7,0
26/10/2011	09:59:50	-33,7	34,1
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31/10/2011	17:17:34	13,7	-13,5

Date	Time	h	h S
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14/11/2011	20:45:44	56,7	-53,5
16/11/2011	15:11:52	3,4	5,7
18/11/2011	09:38:10	-36,9	26,2
20/11/2011	04:04:26	-0,2	-22,7
21/11/2011	22:30:49	54,5	-67,3
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30/12/2011	20:28:59	49,3	-50,9

# I Massima elongazione est - Maxima est elongation

Date	Time	h	h S
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19/01/2011	06:44:54	-28,5	1,1
21/01/2011	01:14:55	-41,4	-57,8
22/01/2011	19:45:03	14,3	-39,1
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26/01/2011	08:45:20	-1,7	19,0
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05/02/2011	23:47:04	-35,6	-63,4
07/02/2011	18:17:23	21,6	-19,6
09/02/2011	12:47:52	44,5	30,3
11/02/2011	07:18:16	-8,2	10,2
13/02/2011	01:48:47	-47,3	-48,1
14/02/2011	20:19:13	-4,3	-40,3
16/02/2011	14:49:46	46,6	18,4
18/02/2011	09:20:16	18,9	29,1
20/02/2011	03:50:52	-37,1	-25,0
21/02/2011	22:21:22	-29,2	-55,4
23/02/2011	16:52:01	28,6	0,1
25/02/2011	11:22:35	42,0	38,9
27/02/2011	05:53:15	-13,6	0,1
01/03/2011	00:23:49	-44,8	-53,4
02/03/2011	18:54:30	3,3	-21,5
04/03/2011	13:25:07	49,9	34,2
06/03/2011	07:55:50	13,6	22,9
08/03/2011	02:26:27	-39,9	-35,1
09/03/2011	20:57:11	-22,5	-40,4
11/03/2011	15:27:50	35,3	18,2
13/03/2011	09:58:35	38,6	41,3
15/03/2011	04:29:13	-18,6	-11,2
16/03/2011	22:59:58	-41,1	-49,3
18/03/2011	17:30:38	10,6	-1,9
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Date	Time	h	h S
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25/03/2011	19:33:27	-15,5	-23,1
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10/04/2011	18:09:41	-8,3	-4,9
12/04/2011	12:40:17	47,5	51,5
14/04/2011	07:10:57	29,4	28,1
16/04/2011	01:41:33	-27,5	-27,8
17/04/2011	20:12:13	-30,7	-23,3
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23/04/2011	03:43:55	-2,5	-7,2
24/04/2011	22:14:32	-40,9	-33,6
26/04/2011	16:45:01	-0,1	13,7
28/04/2011	11:15:34	52,5	62,1
30/04/2011	05:46:02	24,0	16,6
02/05/2011	00:16:35	-31,1	-30,7
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09/05/2011	02:18:19	-8,7	-16,4
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14/05/2011	09:49:20	56,2	61,2
16/05/2011	04:19:42	18,0	4,2
17/05/2011	22:49:56	-34,0	-28,5
19/05/2011	17:20:13	-17,7	11,1
21/05/2011	11:50:25	40,2	66,5
23/05/2011	06:20:40	43,4	26,7
25/05/2011	00:50:48	-14,3	-22,9
26/05/2011	19:20:58	-35,0	-7,9
28/05/2011	13:51:03	15,1	50,5
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02/06/2011	21:21:13	-35,9	-21,1
04/06/2011	15:51:10	-10,4	29,2
06/06/2011	10:21:10	47,3	68,1
08/06/2011	04:51:03	37,8	11,6
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11/06/2011	17:50:45	-30,3	8,5

Date	Time	h	h S
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15/06/2011	06:50:20	57,3	33,2
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20/06/2011	14:19:25	-1,8	47,4
22/06/2011	08:49:00	53,6	54,7
24/06/2011	03:18:34	31,2	-3,
25/06/2011	21:48:04	-24,7	-21,7
27/06/2011	16:17:35	-24,5	25,8
29/06/2011	10:46:59	31,5	70,3
01/07/2011	05:16:23	54,0	15,4
02/07/2011	23:45:41	-1,5	-24,7
04/07/2011	18:15:01	-35,5	5,1
06/07/2011	12:44:14	5,9	63,4
08/07/2011	07:13:26	58,6	36,2
10/07/2011	01:42:32	23,8	-17,5
11/07/2011	20:11:40	-29,0	-12,9
13/07/2011	14:40:41	-17,7	43,3
15/07/2011	09:09:40	39,8	56,3
17/07/2011	03:38:34	48,5	-2,2
18/07/2011	22:07:28	-9,4	-25,0
20/07/2011	16:36:17	-33,0	21,3
22/07/2011	11:05:02	14,5	68,1
24/07/2011	05:33:43	61,0	16,0
26/07/2011	00:02:24	15,8	-27,6
27/07/2011	18:30:58	-32,4	0,6
29/07/2011	12:59:29	-10,2	58,4
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05/08/2011	14:52:57	-28,8	38,0
07/08/2011	09:21:09	23,5	54,3
09/08/2011	03:49:19	59,9	-4,8
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12/08/2011	16:45:23	-34,2	15,8
14/08/2011	11:13:19	-0,9	62,4
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19/08/2011	18:36:45	-23,0	-6,0
21/08/2011	13:04:24	-23,0	51,8
23/08/2011	07:32:01	32,8	33,0
25/08/2011	01:59:32	55,1	-25,0
26/08/2011	20:26:59	-0,9	-25,3
28/08/2011	14:54:22	-34,1	32,0
30/08/2011	09:21:41	7,5	49,0
01/09/2011	03:48:56	60,1	-9,

Date	Time	h	h S
23/11/2011	06:20:23	-24,9	1,1
25/11/2011	00:46:47	31,6	-58,8
26/11/2011	19:13:12	52,2	-38,5
28/11/2011	13:39:42	-4,2	16,8
30/11/2011	08:06:15	-36,9	14,8
02/12/2011	02:32:55	6,4	-41,7

Date	Time	h	h S
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05/12/2011	15:26:24	20,6	1,8
07/12/2011	09:53:14	-32,0	23,4
09/12/2011	04:20:12	-17,6	-23,0
10/12/2011	22:47:12	40,4	-70,6
12/12/2011	17:14:18	44,6	-16,8

Date	Time	h	h S
14/12/2011	11:41:27	-13,4	24,3
16/12/2011	06:08:45	-34,4	-4,8
18/12/2011	00:36:03	15,5	-63,9
19/12/2011	19:03:29	58,3	-36,3
21/12/2011	13:30:58	11,3	17,0
23/12/2011	07:58:35	-36,0	11,0

Date	Time	h	h S
25/12/2011	02:26:13	-9,6	-45,8
26/12/2011	20:53:59	47,9	-55,7
28/12/2011	15:21:47	36,6	3,4
30/12/2011	09:49:45	-20,9	22,0

# I Massima elongazione ovest - Maxima west elongation

Date	Time	h	h S
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09/01/2011	13:04:57	32,2	21,4
11/01/2011	07:34:37	-25,0	7,8
13/01/2011	02:04:20	-44,5	-50,2
14/01/2011	20:34:04	9,9	-49,4
16/01/2011	15:03:53	46,2	9,0
18/01/2011	09:33:43	1,7	22,6
20/01/2011	04:03:35	-47,9	-27,9
21/01/2011	22:33:29	-16,3	-65,4
23/01/2011	17:03:27	39,2	-9,3
25/01/2011	11:33:26	27,1	29,0
27/01/2011	06:03:26	-30,6	-5,4
29/01/2011	00:33:28	-39,0	-62,0
30/01/2011	19:03:34	17,5	-29,8
01/02/2011	13:33:41	45,5	24,0
03/02/2011	08:03:49	-4,8	15,3
05/02/2011	02:33:58	-48,0	-42,3
06/02/2011	21:04:10	-8,6	-49,7
08/02/2011	15:34:23	44,4	9,5
10/02/2011	10:04:37	21,8	30,6
12/02/2011	04:34:52	-35,2	-18,7
13/02/2011	23:05:11	-32,6	-60,9
15/02/2011	17:35:29	25,0	-10,2
17/02/2011	12:05:48	43,4	35,3
19/02/2011	06:36:08	-10,8	5,2
21/02/2011	01:06:30	-46,3	-51,8
22/02/2011	19:36:54	-0,1	-31,0
24/02/2011	14:07:17	48,4	26,6
26/02/2011	08:37:41	16,2	26,5
28/02/2011	03:08:07	-38,7	-30,5
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19/03/2011	14:43:26	38,9	27,6
21/03/2011	09:13:57	36,1	39,6
23/03/2011	03:44:30	-21,5	-16,7
24/03/2011	22:15:00	-38,5	-44,2
26/03/2011	16:45:32	14,9	7,6
28/03/2011	11:16:03	52,1	51,0
30/03/2011	05:46:37	4,9	8,1
01/04/2011	00:17:07	-42,0	-41,7
02/04/2011	18:47:39	-11,2	-13,4

Date	Time	h	h S
04/04/2011	13:18:10	45,2	44,6
06/04/2011	07:48:43	31,2	32,3
08/04/2011	02:19:13	-26,1	-25,4
09/04/2011	20:49:44	-33,0	-30,5
11/04/2011	15:20:13	22,6	26,5
13/04/2011	09:50:45	51,3	52,4
15/04/2011	04:21:14	-0,5	-2,3
16/04/2011	22:51:43	-41,6	-37,6
18/04/2011	17:22:11	-3,1	5,4
20/04/2011	11:52:41	50,7	58,2
22/04/2011	06:23:08	25,8	21,5
24/04/2011	00:53:35	-30,2	-30,4
25/04/2011	19:24:00	-26,9	-14,3
27/04/2011	13:54:29	30,2	44,7
29/04/2011	08:24:52	48,8	45,1
01/05/2011	02:55:17	-7,0	-13,0
02/05/2011	21:25:39	-39,7	-27,8
04/05/2011	15:56:05	4,5	24,1
06/05/2011	10:26:25	54,9	62,9
08/05/2011	04:56:46	19,9	9,2
09/05/2011	23:27:04	-33,4	-30,4
11/05/2011	17:57:26	-20,2	3,4
13/05/2011	12:27:42	37,7	61,0
15/05/2011	06:57:59	44,8	32,7
17/05/2011	01:28:13	-12,6	-20,8
18/05/2011	19:58:30	-36,5	-14,4
20/05/2011	14:28:41	12,4	42,7
22/05/2011	08:58:54	57,4	55,2
24/05/2011	03:29:02	13,6	-2,8
25/05/2011	21:59:14	-35,6	-25,0
27/05/2011	16:29:19	-13,0	21,3
29/05/2011	10:59:27	44,8	69,5
31/05/2011	05:29:29	39,6	18,0
01/06/2011	23:59:35	-18,0	-24,9
03/06/2011	18:29:34	-32,1	1,5
05/06/2011	12:59:35	20,4	60,1
07/06/2011	07:29:30	57,6	40,4
09/06/2011	01:59:29	7,1	-14,4
10/06/2011	20:29:21	-36,6	-15,0
12/06/2011	14:59:15	-5,3	39,6
14/06/2011	09:29:02	51,4	61,5
16/06/2011	03:58:54	33,5	3,1
17/06/2011	22:28:38	-23,1	-23,8
19/06/2011	16:58:24	-26,7	18,1
21/06/2011	11:28:03	28,5	71,2
23/06/2011	05:57:45	55,3	23,3
25/06/2011	00:27:21	0,7	-22,5
26/06/2011	18:56:58	-36,2	-0,9
28/06/2011	13:26:27	2,9	57,0
30/06/2011	07:56:01	56,9	44,7
02/07/2011	02:25:26	26,6	-11,7
03/07/2011	20:54:53	-27,6	-17,4

Date	Time	h	h S
05/07/2011	15:24:12	-20,5	35,6
07/07/2011	09:53:35	36,6	63,9
09/07/2011	04:22:49	50,7	5,5
10/07/2011	22:52:05	-6,7	-25,6
12/07/2011	17:21:13	-34,3	13,9
14/07/2011	11:50:24	11,0	68,6
16/07/2011	06:19:27	60,4	25,3
18/07/2011	00:48:31	19,0	-23,6
19/07/2011	19:17:26	-31,2	-6,2
21/07/2011	13:46:25	-13,4	52,2
23/07/2011	08:15:15	44,6	45,8
25/07/2011	02:44:06	44,4	-12,2
26/07/2011	21:12:48	-13,5	-22,1
28/07/2011	15:41:33	-30,8	30,4
30/07/2011	10:10:09	19,7	62,4
01/08/2011	04:38:46	60,8	5,1
02/08/2011	23:07:13	11,0	-30,3
04/08/2011	17:35:43	-33,6	8,3
06/08/2011	12:04:05	-5,5	62,9
08/08/2011	06:32:27	52,0	24,6
10/08/2011	01:00:39	36,7	-27,6
11/08/2011	19:28:54	-20,1	-12,4
13/08/2011	13:56:59	-25,8	46,1
15/08/2011	08:25:06	28,5	43,7
17/08/2011	02:53:01	57,7	-15,5
18/08/2011	21:21:00	2,8	-29,0
20/08/2011	15:48:49	-34,4	24,3
22/08/2011	10:16:39	3,3	57,3
24/08/2011	04:44:18	58,1	2,2
25/08/2011	23:12:00	28,0	-37,4
27/08/2011	17:39:32	-26,2	2,2
29/08/2011	12:07:05	-19,5	55,3
31/08/2011	06:34:27	37,5	21,1
02/09/2011	01:01:52	51,5	-34,0
03/09/2011	19:29:07	-6,2	-19,3
05/09/2011	13:56:23	-33,2	39,3
07/09/2011	08:23:27	12,3	38,6
09/09/2011	02:50:35	61,3	-21,0
10/09/2011	21:17:33	18,5	-36,8
12/09/2011	15:44:33	-31,2	18,3
14/09/2011	10:11:21	-11,8	49,5
16/09/2011	04:38:12	46,2	-3,1
17/09/2011	23:04:54	43,1	-45,9
19/09/2011	17:31:38	-14,9	-3,6
21/09/2011	11:58:10	-29,7	47,1
23/09/2011	06:24:46	21,8	14,8
25/09/2011	00:51:13	60,2	-42,1
26/09/2011	19:17:42	8,5	-25,3
28/09/2011	13:44:00	-34,4	32,9
30/09/2011	08:10:22	-2,6	30,8
02/10/2011	02:36:36	53,8	-28,6
03/10/2011	21:02:53	33,3	-43,9

Date	Time	h	h S
05/10/2011	15:29:00	-23,0	13,5
07/10/2011	09:55:11	-24,2	40,3
09/10/2011	04:21:14	31,6	-11,3
10/10/2011	22:47:21	54,6	-54,7
12/10/2011	17:13:19	-1,2	-7,8
14/10/2011	11:39:22	-35,2	39,0
16/10/2011	06:05:18	6,5	6,5
18/10/2011	00:31:19	58,9	-51,4
19/10/2011	18:57:11	22,7	-28,9
21/10/2011	13:23:09	-30,0	27,5
23/10/2011	07:49:02	-16,9	21,6
25/10/2011	02:15:00	40,9	-37,5
26/10/2011	20:40:50	46,2	-48,4
28/10/2011	15:06:47	-12,0	10,4
30/10/2011	09:32:40	-33,2	31,1
01/11/2011	03:58:39	16,3	-20,1
02/11/2011	22:24:32	59,6	-62,1
04/11/2011	16:50:32	11,9	-9,4
06/11/2011	11:16:29	-35,0	31,9
08/11/2011	05:42:34	-8,5	-1,9
10/11/2011	00:08:33	49,2	-60,6
11/11/2011	18:34:40	36,5	-29,8
13/11/2011	13:00:45	-21,0	23,6
15/11/2011	07:26:59	-28,6	12,7
17/11/2011	01:53:07	26,0	-46,2
18/11/2011	20:19:25	55,8	-49,7
20/11/2011	14:45:42	1,8	9,0
22/11/2011	09:12:07	-37,1	23,3
24/11/2011	03:38:29	1,1	-28,2
25/11/2011	22:05:01	55,2	-66,0
27/11/2011	16:31:32	26,5	-9,1
29/11/2011	10:58:12	-28,5	26,6
01/12/2011	05:24:50	-22,1	-10,2
02/12/2011	23:51:37	35,1	-67,4
04/12/2011	18:18:25	49,3	-28,6
06/12/2011	12:45:22	-8,1	21,3
08/12/2011	07:12:17	-36,3	6,3
10/12/2011	01:39:23	9,9	-52,6
11/12/2011	20:06:28	58,2	-48,4
13/12/2011	14:33:44	16,9	9,2
15/12/2011	09:00:58	-33,8	18,6
17/12/2011	03:28:22	-14,6	-33,5
18/12/2011	21:55:46	43,4	-66,0
20/12/2011	16:23:21	41,6	-7,5
22/12/2011	10:50:54	-16,4	24,4
24/12/2011	05:18:37	-32,9	-14,2
25/12/2011	23:46:21	18,8	-70,1
27/12/2011	18:14:14	57,8	-26,5
29/12/2011	12:42:07	8,1	21,7
31/12/2011	07:10:08	-36,7	4,0

# II Congiunzione superiore - Superior conjunction

Date	Time	h	h S
01/01/2011	08:06:31	-25,8	11,8
04/01/2011	21:28:40	5,7	-60,3
08/01/2011	10:50:28	9,0	25,5
12/01/2011	00:13:24	-28,4	-66,9
15/01/2011	13:35:57	39,3	19,7
19/01/2011	02:59:28	-49,1	-39,9
22/01/2011	16:22:39	43,7	-1,7
26/01/2011	05:46:43	-33,7	-8,6
29/01/2011	19:10:30	16,8	-31,3
02/02/2011	08:35:00	0,7	19,2
05/02/2011	21:59:14	-18,0	-57,9
09/02/2011	11:24:06	34,2	33,3
13/02/2011	00:48:44	-44,6	-56,4
16/02/2011	14:13:54	48,5	23,4
20/02/2011	03:38:48	-38,6	-27,2
23/02/2011	17:04:09	26,5	-2,0
27/02/2011	06:29:18	-7,0	6,2
02/03/2011	19:54:49	-8,2	-32,3
06/03/2011	09:20:08	28,6	34,7

Date	Time	h	h S
28/09/2011	14:56:29	-29,9	21,4
02/10/2011	04:05:01	40,1	-12,8
05/10/2011	17:13:37	-7,1	-5,7
09/10/2011	06:21:27	9,4	10,9
12/10/2011	19:29:25	23,1	-32,6
16/10/2011	08:36:41	-19,2	29,8
19/10/2011	21:44:15	51,3	-54,3

Date	Time	h	h S
23/10/2011	10:51:13	-35,4	36,6
26/10/2011	23:58:40	58,0	-57,6
30/10/2011	13:05:32	-28,0	26,8
03/11/2011	02:13:06	34,0	-39,8
06/11/2011	15:20:11	-2,5	6,1
10/11/2011	04:28:11	3,3	-16,4
13/11/2011	17:35:45	27,4	-19,2

Date	Time	h	h S
17/11/2011	06:44:21	-24,4	5,9
20/11/2011	19:52:38	53,9	-45,2
24/11/2011	09:02:06	-37,2	22,0
27/11/2011	22:11:20	53,6	-66,8
01/12/2011	11:21:50	-24,4	26,1
05/12/2011	00:32:09	26,3	-62,8
08/12/2011	13:43:50	4,1	15,5

Date	Time	h	h S
12/12/2011	02:55:24	-5,5	-39,0
15/12/2011	16:08:23	35,7	-5,2
19/12/2011	05:21:10	-31,2	-13,3
22/12/2011	18:35:28	57,8	-30,9
26/12/2011	07:49:35	-35,8	9,7
29/12/2011	21:05:15	44,5	-57,3

## II Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
03/01/2011	02:28:17	-44,0	-45,9
06/01/2011	15:49:05	45,7	0,7
10/01/2011	05:10:17	-46,0	-16,2
13/01/2011	18:31:55	31,1	-27,2
17/01/2011	07:53:58	-17,8	11,1
20/01/2011	21:16:24	-0,7	-55,5
24/01/2011	10:39:11	17,3	27,9
28/01/2011	00:02:16	-34,2	-65,0
31/01/2011	13:25:44	44,6	24,5
04/02/2011	02:49:27	-47,8	-39,7
07/02/2011	16:13:35	40,5	2,9
11/02/2011	05:37:49	-26,0	-7,4
14/02/2011	19:02:29	10,0	-26,5
18/02/2011	08:27:11	9,3	22,5
21/02/2011	21:52:22	-24,5	-52,4
25/02/2011	11:17:28	41,3	38,9
01/03/2011	00:43:03	-45,6	-51,7
04/03/2011	14:08:30	47,3	28,8
08/03/2011	03:34:27	-31,3	-23,4
11/03/2011	17:00:12	19,6	1,9
15/03/2011	06:26:28	2,9	10,6
18/03/2011	19:52:22	-15,5	-27,9
22/03/2011	09:18:53	37,4	40,6
25/03/2011	22:44:57	-41,2	-45,4
29/03/2011	12:11:41	52,1	49,5
02/04/2011	01:37:50	-34,7	-33,2

Date	Time	h	h S
05/04/2011	15:04:40	28,2	28,0
09/04/2011	04:30:50	-2,6	-2,4
12/04/2011	17:57:45	-7,1	-1,7
16/04/2011	07:23:55	32,9	31,0
19/04/2011	20:50:48	-35,8	-27,8
23/04/2011	10:16:52	55,0	58,3
26/04/2011	23:43:41	-36,6	-33,8
30/04/2011	13:09:38	36,5	52,4
04/05/2011	02:36:20	-8,5	-15,1
07/05/2011	16:02:03	2,0	23,5
11/05/2011	05:28:32	27,5	15,5
14/05/2011	18:53:59	-29,3	-5,7
18/05/2011	08:20:14	55,5	48,0
21/05/2011	21:45:22	-37,5	-24,9
25/05/2011	11:11:14	44,7	68,9
29/05/2011	00:35:59	-14,4	-23,4
01/06/2011	14:01:26	11,1	49,1
05/06/2011	03:25:46	20,5	-2,1
08/06/2011	16:50:43	-21,6	18,8
12/06/2011	06:14:31	52,6	26,6
15/06/2011	19:38:53	-36,9	-8,2
19/06/2011	09:02:07	53,1	57,1
22/06/2011	22:25:53	-21,0	-23,7
26/06/2011	11:48:26	21,9	70,1
30/06/2011	01:11:28	11,6	-19,6
03/07/2011	14:33:18	-11,7	45,1

Date	Time	h	h S
07/07/2011	03:55:34	45,5	1,4
10/07/2011	17:16:36	-33,8	14,9
14/07/2011	06:37:58	59,8	29,0
17/07/2011	19:58:09	-28,1	-11,8
21/07/2011	09:18:33	34,8	56,9
24/07/2011	22:37:51	0,2	-27,5
28/07/2011	11:57:14	1,6	65,6
01/08/2011	01:15:29	33,4	-24,1
04/08/2011	14:33:46	-26,4	41,7
08/08/2011	03:50:57	59,8	-4,3
11/08/2011	17:08:07	-33,6	11,9
15/08/2011	06:24:10	49,5	21,9
18/08/2011	19:40:07	-14,5	-16,1
22/08/2011	08:54:59	18,1	47,2
25/08/2011	22:09:42	16,4	-35,4
29/08/2011	11:23:24	-12,9	57,3
02/09/2011	00:36:49	47,7	-36,3
05/09/2011	13:49:18	-32,8	40,4
09/09/2011	03:01:27	60,9	-19,2
12/09/2011	16:12:46	-28,7	13,1
16/09/2011	05:23:44	38,5	5,1
19/09/2011	18:33:52	-4,6	-15,3
23/09/2011	07:43:41	7,3	28,4
26/09/2011	20:52:46	26,0	-39,9
30/09/2011	10:01:35	-20,8	43,2
03/10/2011	23:09:44	53,8	-52,1

Date	Time	h	h S
07/10/2011	12:17:39	-35,1	39,3
11/10/2011	01:25:04	57,2	-42,3
14/10/2011	14:32:20	-25,5	20,0
18/10/2011	03:39:15	31,8	-20,8
21/10/2011	16:46:02	0,5	-5,2
25/10/2011	05:52:39	1,5	2,5
28/10/2011	18:59:15	30,2	-31,6
01/11/2011	08:05:52	-25,3	21,5
04/11/2011	21:12:33	55,5	-55,4
08/11/2011	10:19:23	-36,6	30,9
11/11/2011	23:26:26	53,5	-64,7
15/11/2011	12:33:45	-23,6	25,5
19/11/2011	01:41:25	26,5	-48,6
22/11/2011	14:49:26	3,9	8,2
26/11/2011	03:57:52	-4,3	-25,0
29/11/2011	17:06:48	34,4	-15,4
03/12/2011	06:16:14	-29,9	-1,0
06/12/2011	19:26:15	57,2	-41,2
10/12/2011	08:36:46	-36,6	16,7
13/12/2011	21:47:55	47,7	-65,1
17/12/2011	10:59:37	-18,2	24,7
21/12/2011	00:12:00	17,8	-67,4
24/12/2011	13:24:55	12,4	17,7
28/12/2011	02:38:31	-13,6	-43,7
31/12/2011	15:52:41	43,7	-0,6

## II Massima elongazione est - Maxima est elongation

Date	Time	h	h S
02/01/2011	05:28:18	-47,3	-13,0
05/01/2011	18:49:00	32,1	-31,6
09/01/2011	08:10:07	-20,0	12,5
12/01/2011	21:31:33	0,7	-59,4
16/01/2011	10:53:23	14,7	26,7
20/01/2011	00:15:28	-32,7	-65,6
23/01/2011	13:37:53	42,8	21,2
27/01/2011	03:00:32	-48,7	-38,9
30/01/2011	16:23:31	41,7	-0,2
03/02/2011	05:46:43	-29,2	-7,3
06/02/2011	19:10:08	12,7	-29,6
10/02/2011	08:33:45	5,4	21,1
13/02/2011	21:57:35	-21,7	-55,4
17/02/2011	11:21:36	38,0	36,0
21/02/2011	00:45:47	-45,4	-54,2
24/02/2011	14:10:05	48,3	26,2
28/02/2011	03:34:33	-35,4	-25,8
03/03/2011	16:59:08	23,7	0,5
07/03/2011	06:23:51	-2,4	7,6
10/03/2011	19:48:40	-11,1	-29,3
14/03/2011	09:13:33	32,1	36,9
17/03/2011	22:38:32	-39,3	-48,1
21/03/2011	12:03:33	52,0	47,1
25/03/2011	01:28:41	-39,0	-37,4
28/03/2011	14:53:48	33,7	28,0
01/04/2011	04:19:00	-10,2	-7,6

Date	Time	h	h S
04/04/2011	17:44:11	0,0	-0,8
08/04/2011	07:09:27	25,6	26,0
11/04/2011	20:34:41	-31,7	-28,0
15/04/2011	09:59:54	52,6	54,0
18/04/2011	23:25:07	-40,3	-37,0
22/04/2011	12:50:17	42,9	53,1
26/04/2011	02:15:28	-16,8	-20,2
29/04/2011	15:40:34	9,8	26,1
03/05/2011	05:05:39	18,4	9,8
06/05/2011	18:30:35	-23,2	-2,9
10/05/2011	07:55:33	50,2	42,4
13/05/2011	21:20:19	-39,3	-24,6
17/05/2011	10:45:06	51,1	66,8
21/05/2011	00:09:36	-22,9	-26,4
24/05/2011	13:34:11	20,4	52,9
28/05/2011	02:58:22	10,4	-7,5
31/05/2011	16:22:44	-13,7	23,0
04/06/2011	05:46:33	44,6	21,3
07/06/2011	19:10:33	-35,9	-4,7
11/06/2011	08:33:57	57,6	52,2
14/06/2011	21:57:35	-28,4	-22,5
18/06/2011	11:20:32	31,5	71,3
22/06/2011	00:43:42	1,7	-21,4
25/06/2011	14:06:05	-2,2	50,0
29/06/2011	03:28:43	36,1	-1,7
02/07/2011	16:50:31	-30,0	19,8

Date	Time	h	h S
06/07/2011	06:12:34	60,0	25,1
09/07/2011	19:33:37	-33,0	-7,6
13/07/2011	08:55:00	43,4	54,0
16/07/2011	22:15:17	-9,3	-25,1
20/07/2011	11:35:56	10,1	68,4
24/07/2011	00:55:23	24,3	-24,1
27/07/2011	14:15:09	-20,6	46,4
31/07/2011	03:33:40	55,0	-5,8
03/08/2011	16:52:31	-34,7	16,3
07/08/2011	06:10:04	55,4	20,6
10/08/2011	19:27:54	-20,7	-12,0
14/08/2011	08:44:21	25,7	47,1
17/08/2011	22:01:07	9,2	-32,1
21/08/2011	11:16:28	-6,8	60,1
25/08/2011	00:32:08	41,7	-34,2
28/08/2011	13:46:17	-30,4	43,5
01/09/2011	03:00:45	61,6	-17,6
04/09/2011	16:13:42	-31,3	15,5
08/09/2011	05:27:01	43,7	7,2
11/09/2011	18:38:49	-9,3	-13,5
15/09/2011	07:50:56	12,2	31,5
18/09/2011	21:01:35	21,5	-38,0
22/09/2011	10:12:35	-17,3	46,7
25/09/2011	23:22:12	51,0	-48,8
29/09/2011	12:32:11	-34,3	41,2
03/10/2011	01:40:50	59,1	-37,8

Date	Time	h	h S
06/10/2011	14:49:57	-27,3	19,8
10/10/2011	03:57:51	35,0	-15,8
13/10/2011	17:06:19	-1,7	-6,8
17/10/2011	06:13:39	4,2	7,8
20/10/2011	19:21:38	28,0	-33,6
24/10/2011	08:28:38	-23,3	26,6
27/10/2011	21:36:27	54,5	-56,2
31/10/2011	10:43:25	-36,2	33,9
03/11/2011	23:51:15	55,0	-60,6
07/11/2011	12:58:27	-24,8	25,3
11/11/2011	02:06:37	28,5	-42,6
14/11/2011	15:14:20	2,3	5,6
18/11/2011	04:23:04	-1,8	-18,9
21/11/2011	17:31:28	32,8	-19,3
25/11/2011	06:40:59	-28,6	3,8
28/11/2011	19:50:19	56,7	-45,4
02/12/2011	09:00:50	-36,8	20,3
05/12/2011	22:11:13	49,2	-67,7
09/12/2011	11:22:48	-19,6	25,1
13/12/2011	00:34:22	19,7	-63,6
16/12/2011	13:47:08	10,6	15,1
20/12/2011	02:59:56	-12,0	-39,1
23/12/2011	16:13:53	42,0	-5,6
27/12/2011	05:27:56	-34,7	-12,8
30/12/2011	18:43:05	58,4	-31,4



Date	Time	h	h S
23/06/2011	19:52:38	-35,6	-9,8
27/06/2011	09:14:20	48,2	58,8
30/06/2011	22:35:41	-15,2	-24,2
04/07/2011	11:56:38	15,8	69,1
08/07/2011	01:17:10	17,8	-19,8
11/07/2011	14:37:20	-16,3	44,0
15/07/2011	03:57:02	50,1	0,8
18/07/2011	17:16:18	-34,6	14,3
22/07/2011	06:35:05	58,4	27,5
25/07/2011	19:53:26	-25,2	-12,4
29/07/2011	09:11:17	31,2	54,4
01/08/2011	22:28:38	3,5	-29,0
05/08/2011	11:45:27	-0,9	64,3
09/08/2011	01:01:45	36,2	-27,3

Date	Time	h	h S
12/08/2011	14:17:30	-27,7	42,8
16/08/2011	03:32:44	60,6	-9,0
19/08/2011	16:47:22	-33,1	13,8
23/08/2011	06:01:28	48,4	16,4
26/08/2011	19:14:57	-13,7	-14,5
30/08/2011	08:27:55	17,4	41,1
02/09/2011	21:40:15	16,8	-36,0
06/09/2011	10:52:01	-13,0	54,3
10/09/2011	00:03:14	47,4	-41,3
13/09/2011	13:13:52	-32,8	42,6
17/09/2011	02:24:00	61,0	-27,1
20/09/2011	15:33:33	-29,4	17,7
24/09/2011	04:42:38	39,7	-4,1
27/09/2011	17:51:12	-6,3	-10,1

Date	Time	h	h S
01/10/2011	06:59:22	9,0	19,2
04/10/2011	20:07:06	23,8	-36,2
08/10/2011	09:14:30	-19,3	36,5
11/10/2011	22:21:33	51,8	-54,2
15/10/2011	11:28:23	-35,1	39,1
19/10/2011	00:35:01	58,2	-51,3
22/10/2011	13:41:31	-27,6	24,9
26/10/2011	02:47:54	34,4	-31,9
29/10/2011	15:54:19	-2,6	2,3
02/11/2011	05:00:45	4,1	-8,9
05/11/2011	18:07:24	27,0	-23,7
09/11/2011	07:14:09	-23,4	12,2
12/11/2011	20:21:13	53,4	-49,1
16/11/2011	09:28:33	-36,9	26,0

Date	Time	h	h S
19/11/2011	22:36:17	54,9	-67,1
23/11/2011	11:44:27	-25,8	26,8
27/11/2011	00:53:03	28,8	-58,2
30/11/2011	14:02:12	1,5	13,8
04/12/2011	03:11:52	-1,7	-34,8
07/12/2011	16:22:11	32,3	-7,8
11/12/2011	05:33:04	-28,9	-10,3
14/12/2011	18:44:36	56,5	-33,2
18/12/2011	07:56:43	-37,0	11,1
21/12/2011	21:09:34	48,5	-58,9
25/12/2011	10:23:01	-18,9	23,7
28/12/2011	23:37:13	18,4	-70,6

### III Congiunzione superiore - Superior conjunction

Date	Time	h	h S
07/01/2011	02:38:22	-46,3	-44,1
14/01/2011	06:54:35	-29,9	2,1
21/01/2011	11:13:12	21,3	28,1
28/01/2011	15:34:44	46,1	6,9
04/02/2011	19:57:58	5,1	-38,7
12/02/2011	00:23:11	-42,0	-59,3
19/02/2011	04:50:30	-29,0	-14,2
26/02/2011	09:19:20	23,6	31,7
05/03/2011	13:50:14	48,5	31,5
12/03/2011	18:21:22	4,3	-13,3
19/03/2011	22:53:17	-41,0	-48,0
27/03/2011	03:25:03	-22,4	-18,8
03/04/2011	07:57:01	30,9	32,7

Date	Time	h	h S
10/04/2011	12:29:30	49,2	52,0
17/04/2011	17:01:43	1,2	9,0
24/04/2011	21:34:19	-39,8	-30,8
02/05/2011	02:05:32	-15,0	-19,9
09/05/2011	06:35:55	38,1	27,6
16/05/2011	11:04:43	49,0	67,1
23/05/2011	15:32:17	-0,3	31,3
30/05/2011	19:58:57	-37,5	-12,6
07/06/2011	00:23:44	-11,3	-23,2
14/06/2011	04:47:14	40,7	11,0
21/06/2011	09:07:42	51,6	57,9
28/06/2011	13:25:38	3,0	57,1
05/07/2011	17:40:22	-34,4	10,9

Date	Time	h	h S
12/07/2011	21:52:06	-15,3	-23,1
20/07/2011	02:01:10	33,8	-16,9
27/07/2011	06:06:22	59,4	21,5
03/08/2011	10:08:17	17,4	61,3
10/08/2011	14:05:10	-25,5	45,4
17/08/2011	17:57:32	-28,4	1,7
24/08/2011	21:44:54	11,1	-33,2
01/09/2011	01:27:33	54,5	-30,8
08/09/2011	05:06:01	47,1	3,4
15/09/2011	08:39:26	3,5	39,0
22/09/2011	12:08:57	-31,1	45,9
29/09/2011	15:33:27	-25,6	14,7
06/10/2011	18:54:13	11,8	-24,5

Date	Time	h	h S
13/10/2011	22:11:44	51,6	-54,4
21/10/2011	01:27:16	51,3	-44,5
28/10/2011	04:42:22	11,6	-11,2
04/11/2011	07:57:17	-26,0	19,6
11/11/2011	11:14:04	-33,9	30,5
18/11/2011	14:32:13	-1,8	11,3
25/11/2011	17:53:26	39,6	-23,7
02/12/2011	21:18:06	56,6	-60,6
10/12/2011	00:47:17	19,6	-61,3
17/12/2011	04:21:55	-22,8	-23,7
24/12/2011	08:01:27	-35,6	11,3
31/12/2011	11:46:54	-0,1	24,5

### III Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
03/01/2011	12:44:35	25,6	22,1
10/01/2011	16:58:28	43,2	-10,8
17/01/2011	21:15:26	0,9	-55,9
25/01/2011	01:35:30	-44,8	-54,0
01/02/2011	05:58:15	-28,5	-5,6
08/02/2011	10:24:04	23,9	31,2
15/02/2011	14:50:57	46,7	18,0
22/02/2011	19:19:32	2,8	-27,8
01/03/2011	23:48:48	-42,6	-55,0
09/03/2011	04:19:01	-23,9	-15,0
16/03/2011	08:50:25	29,4	34,6
23/03/2011	13:22:24	47,8	40,5
30/03/2011	17:55:32	0,3	-4,6

Date	Time	h	h S
06/04/2011	22:27:53	-41,3	-40,3
14/04/2011	03:00:06	-16,2	-17,1
21/04/2011	07:31:25	37,0	33,8
28/04/2011	12:02:09	47,4	59,9
05/05/2011	16:32:39	-2,3	17,5
12/05/2011	21:02:09	-39,1	-23,1
20/05/2011	01:31:14	-10,4	-19,9
27/05/2011	05:58:02	42,0	22,9
03/06/2011	10:23:08	48,2	68,0
10/06/2011	14:45:57	-1,2	41,9
17/06/2011	19:06:44	-36,4	-3,0
24/06/2011	23:25:47	-10,5	-24,6
02/07/2011	03:42:07	40,3	0,0

Date	Time	h	h S
09/07/2011	07:56:18	54,0	44,0
16/07/2011	12:06:25	6,9	67,0
23/07/2011	16:12:57	-32,0	25,3
30/07/2011	20:15:27	-19,9	-16,3
07/08/2011	00:13:58	26,1	-30,0
14/08/2011	04:08:50	61,5	-1,8
21/08/2011	07:59:01	29,2	38,1
28/08/2011	11:45:12	-15,7	57,0
04/09/2011	15:25:39	-33,9	24,3
11/09/2011	19:01:12	-5,5	-17,3
18/09/2011	22:31:49	38,1	-45,6
26/09/2011	01:58:07	60,2	-33,4
03/10/2011	05:21:04	25,5	1,5

Date	Time	h	h S
10/10/2011	08:40:33	-15,6	32,1
17/10/2011	11:58:18	-35,6	36,9
24/10/2011	15:13:37	-13,6	10,4
31/10/2011	18:28:22	26,9	-26,6
07/11/2011	21:43:24	58,8	-60,1
15/11/2011	01:00:11	37,1	-54,7
22/11/2011	04:20:09	-5,2	-20,2
29/11/2011	07:43:32	-35,7	12,1
06/12/2011	11:11:56	-23,0	25,5
13/12/2011	14:44:11	18,9	7,8
20/12/2011	18:21:23	56,6	-28,5
27/12/2011	22:03:23	36,1	-66,3

### III Massima elongazione est - Maxima est elongation

Date	Time	h	h S
01/01/2011	17:30:15	42,6	-17,8
08/01/2011	21:43:43	0,8	-62,0
16/01/2011	02:00:44	-45,0	-50,6
23/01/2011	06:20:03	-30,2	-2,5
30/01/2011	10:41:56	21,5	29,5
06/02/2011	15:06:27	46,7	13,4
13/02/2011	19:33:02	4,9	-32,3
21/02/2011	00:02:09	-42,0	-57,8
28/02/2011	04:31:55	-26,9	-15,3
07/03/2011	09:02:55	26,2	32,9
14/03/2011	13:34:09	48,5	36,3
21/03/2011	18:05:58	2,7	-8,5
28/03/2011	22:38:35	-41,1	-44,0

Date	Time	h	h S
05/04/2011	03:11:20	-19,5	-18,2
12/04/2011	07:44:49	34,1	33,5
19/04/2011	12:17:10	48,3	56,0
26/04/2011	16:48:58	-0,7	12,9
03/05/2011	21:19:34	-39,5	-27,0
11/05/2011	01:49:16	-12,5	-19,7
18/05/2011	06:18:22	40,3	25,7
25/05/2011	10:45:58	48,4	68,4
01/06/2011	15:12:46	-1,3	36,0
08/06/2011	19:36:53	-37,0	-8,5
15/06/2011	23:58:48	-10,3	-23,8
23/06/2011	04:18:02	41,0	5,9
30/06/2011	08:34:49	52,5	51,7

Date	Time	h	h S
07/07/2011	12:49:21	4,5	62,6
14/07/2011	17:00:31	-33,5	17,5
21/07/2011	21:08:59	-16,9	-20,8
29/07/2011	01:12:54	30,9	-23,7
05/08/2011	05:12:38	60,9	10,4
12/08/2011	09:07:46	22,7	51,3
19/08/2011	12:58:35	-21,3	53,2
26/08/2011	16:45:20	-31,6	12,3
02/09/2011	20:26:58	3,5	-27,6
10/09/2011	00:04:28	47,6	-41,2
17/09/2011	03:36:24	54,7	-15,0
24/09/2011	07:03:43	13,8	21,5
01/10/2011	10:26:37	-24,7	44,2

Date	Time	h	h S
08/10/2011	13:46:10	-32,5	29,0
15/10/2011	17:03:38	-0,7	-6,9
22/10/2011	20:19:03	39,8	-43,9
29/10/2011	23:34:25	58,6	-60,4
06/11/2011	02:49:19	24,9	-33,9
13/11/2011	06:05:35	-16,0	0,7
20/11/2011	09:23:53	-37,0	24,7
27/11/2011	12:45:36	-14,3	22,3
04/12/2011	16:11:57	28,3	-6,0
11/12/2011	19:42:46	58,5	-44,1
18/12/2011	23:19:19	29,0	-71,3
26/12/2011	03:00:12	-15,9	-39,6

### III Massima elongazione ovest - Maxima west elongation

Date	Time	h	h S
05/01/2011	07:45:51	-26,8	9,1
12/01/2011	12:00:17	23,8	25,7
19/01/2011	16:17:58	44,6	-1,4
26/01/2011	20:39:12	2,4	-48,0
03/02/2011	01:02:09	-43,8	-57,3
10/02/2011	05:27:27	-28,3	-9,5
17/02/2011	09:53:50	24,2	32,0
24/02/2011	14:21:35	47,5	24,7
03/03/2011	18:51:00	3,4	-20,7

Date	Time	h	h S
10/03/2011	23:21:31	-41,8	-52,0
18/03/2011	03:53:33	-22,9	-16,8
25/03/2011	08:25:18	30,4	34,2
01/04/2011	12:57:27	48,4	46,3
08/04/2011	17:29:04	0,7	2,3
15/04/2011	22:00:25	-40,5	-35,6
23/04/2011	02:31:56	-15,8	-18,7
30/04/2011	07:02:53	37,4	30,8
07/05/2011	11:33:51	48,2	64,2

Date	Time	h	h S
20/09/2011	17:19:44	-16,1	-1,2
27/09/2011	20:45:39	25,5	-39,4
05/10/2011	00:08:26	59,9	-49,6
12/10/2011	03:27:17	38,8	-21,8
19/10/2011	06:43:50	-2,5	12,4

Date	Time	h	h S
26/10/2011	09:58:43	-33,6	34,1
02/11/2011	13:13:22	-25,6	25,0
09/11/2011	16:29:31	12,0	-6,6
16/11/2011	19:47:26	51,3	-43,8
23/11/2011	23:08:55	48,5	-68,3

Date	Time	h	h S
01/12/2011	02:33:15	7,1	-41,5
08/12/2011	06:01:56	-30,7	-4,9
15/12/2011	09:34:58	-30,6	21,4
22/12/2011	13:13:00	8,7	18,7
29/12/2011	16:56:46	51,7	-12,3

#### IV Congiunzione superiore - Superior conjunction

Date	Time	h	h S
01/01/2011	17:56:26	40,2	-22,5
18/01/2011	13:22:44	39,1	21,6
04/02/2011	09:24:51	10,9	25,4
21/02/2011	05:54:15	-17,1	-1,2
10/03/2011	02:41:28	-37,4	-32,0
26/03/2011	23:38:57	-43,5	-45,4

Date	Time	h	h S
12/04/2011	20:39:53	-32,7	-28,4
29/04/2011	17:37:32	-11,6	4,7
16/05/2011	14:25:43	15,0	42,6
02/06/2011	10:57:59	43,3	70,0
19/06/2011	07:07:21	59,1	36,3
06/07/2011	02:46:33	33,0	-9,2

Date	Time	h	h S
22/07/2011	21:46:59	-10,4	-24,3
08/08/2011	16:00:18	-34,0	25,0
25/08/2011	09:18:37	11,6	49,9
11/09/2011	01:36:33	59,6	-32,5
27/09/2011	16:55:51	-15,3	0,7
14/10/2011	07:27:50	-6,7	20,7

Date	Time	h	h S
30/10/2011	21:34:23	55,6	-56,8
16/11/2011	11:45:57	-29,1	28,3
03/12/2011	02:31:20	5,9	-42,2
19/12/2011	18:10:50	55,4	-26,6

#### IV Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
10/01/2011	03:28:13	-49,7	-34,9
26/01/2011	23:19:40	-26,9	-66,6
12/02/2011	19:42:58	3,6	-34,3
01/03/2011	16:29:27	29,6	5,2
18/03/2011	13:30:45	48,1	37,9
04/04/2011	10:38:13	52,0	52,7

Date	Time	h	h S
21/04/2011	07:46:06	39,3	36,4
08/05/2011	04:47:07	18,1	7,5
25/05/2011	01:34:38	-6,8	-18,7
10/06/2011	22:02:33	-29,6	-23,1
27/06/2011	18:02:54	-34,6	7,2
14/07/2011	13:27:23	-6,5	56,2

Date	Time	h	h S
31/07/2011	08:08:44	41,1	43,5
17/08/2011	01:56:42	50,5	-23,3
02/09/2011	18:45:03	-14,0	-11,6
19/09/2011	10:32:07	-18,3	48,8
06/10/2011	01:22:57	59,4	-41,3
22/10/2011	15:35:09	-11,5	7,3

Date	Time	h	h S
08/11/2011	05:36:53	-7,5	-3,3
24/11/2011	19:58:54	56,1	-46,7
11/12/2011	11:07:09	-20,7	25,0
28/12/2011	03:17:37	-19,8	-36,5

#### IV Massima elongazione est - Maxima est elongation

Date	Time	h	h S
05/01/2011	21:44:08	2,3	-62,5
22/01/2011	17:22:50	37,1	-12,9
08/02/2011	13:36:05	47,5	25,7
25/02/2011	10:14:10	32,2	36,4
14/03/2011	07:09:04	10,0	17,8
31/03/2011	04:12:48	-11,9	-9,1

Date	Time	h	h S
17/04/2011	01:18:17	-30,2	-30,2
03/05/2011	22:19:19	-39,7	-31,1
20/05/2011	19:09:04	-32,7	-7,0
06/06/2011	15:40:54	-9,6	31,3
23/06/2011	11:48:02	23,7	70,1
10/07/2011	07:21:44	57,4	37,5

Date	Time	h	h S
27/07/2011	02:14:08	40,5	-16,6
12/08/2011	20:16:24	-12,4	-19,6
29/08/2011	13:20:20	-28,4	47,1
15/09/2011	05:22:32	39,4	5,1
01/10/2011	20:26:57	25,1	-38,2
18/10/2011	10:47:13	-34,1	38,4

Date	Time	h	h S
04/11/2011	00:48:57	47,3	-53,8
20/11/2011	15:03:55	4,9	6,3
07/12/2011	05:59:11	-29,9	-5,2
23/12/2011	21:53:07	40,5	-65,3

#### IV Massima elongazione ovest - Maxima west elongation

Date	Time	h	h S
14/01/2011	09:22:19	-3,1	21,0
31/01/2011	05:19:22	-35,1	-12,7
17/02/2011	01:45:56	-47,0	-47,4
05/03/2011	22:32:55	-35,4	-52,2
22/03/2011	19:31:42	-13,8	-23,5
08/04/2011	16:35:10	10,3	12,1

Date	Time	h	h S
25/04/2011	13:36:55	34,2	47,1
12/05/2011	10:29:56	53,9	64,7
29/05/2011	07:08:33	52,9	36,1
15/06/2011	03:25:32	26,8	-1,7
01/07/2011	23:13:34	-8,4	-25,0
18/07/2011	18:25:03	-34,6	2,6

Date	Time	h	h S
04/08/2011	12:51:13	-12,2	58,3
21/08/2011	06:23:28	46,1	20,8
06/09/2011	22:56:45	33,8	-41,6
23/09/2011	14:29:46	-33,3	27,6
10/10/2011	05:11:06	21,5	-1,4
26/10/2011	19:21:01	32,6	-35,1

Date	Time	h	h S
12/11/2011	09:27:48	-36,4	27,0
29/11/2011	00:01:39	36,4	-65,7
15/12/2011	15:26:12	28,1	1,8

I = Io

II = Europa

III = Ganimede

IV = Callisto

TEMPI IN T.U.

TIMES IN U.T.

H = altitudine di Giove sull'orizzonte

H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy

H = altitude of Jupiter on the horizon

H S = altitude of the Sun on the horizon

© (5)

# MERIDIANO CENTRALE DI GIOVE – TRANSITI

## CENTRAL MERIDIAN OF JUPITER – TRANSITS

Date	Zero meridian	Zero meridian	Zero meridian
01/01/2011	02:32:29	12:23:07	22:13:46
02/01/2011	08:04:24	17:55:03	
03/01/2011	03:45:42	13:36:21	23:26:59
04/01/2011	09:17:38	19:08:17	
05/01/2011	04:58:57	14:49:35	
06/01/2011	00:40:14	10:30:53	20:21:32
07/01/2011	06:12:12	16:02:50	
08/01/2011	01:53:29	11:44:08	21:34:47
09/01/2011	07:25:27	17:16:07	
10/01/2011	03:06:46	12:57:25	22:48:05
11/01/2011	08:38:44	18:29:23	
12/01/2011	04:20:02	14:10:42	
13/01/2011	00:01:22	09:52:01	19:42:41
14/01/2011	05:33:20	15:23:59	
15/01/2011	01:14:40	11:05:19	20:55:59
16/01/2011	06:46:38	16:37:18	
17/01/2011	02:27:58	12:18:38	22:09:18
18/01/2011	07:59:57	17:50:37	
19/01/2011	03:41:18	13:31:57	23:22:37
20/01/2011	09:13:17	19:03:56	
21/01/2011	04:54:37	14:45:17	
22/01/2011	00:35:57	10:26:37	20:17:16
23/01/2011	06:07:57	15:58:37	
24/01/2011	01:49:17	11:39:57	21:30:37
25/01/2011	07:21:18	17:11:58	
26/01/2011	03:02:38	12:53:18	22:43:58
27/01/2011	08:34:39	18:25:19	
28/01/2011	04:15:59	14:06:39	23:57:19
29/01/2011	09:48:01	19:38:41	
30/01/2011	05:29:21	15:20:01	
31/01/2011	01:10:41	11:01:23	20:52:03
01/02/2011	06:42:43	16:33:23	
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03/02/2011	07:56:05	17:46:46	
04/02/2011	03:37:27	13:28:07	23:18:48
05/02/2011	09:09:28	19:00:08	
06/02/2011	04:50:50	14:41:30	
07/02/2011	00:32:11	10:22:51	20:13:31
08/02/2011	06:04:13	15:54:53	
09/02/2011	01:45:34	11:36:14	21:26:55
10/02/2011	07:17:36	17:08:17	
11/02/2011	02:58:57	12:49:38	22:40:18
12/02/2011	08:31:00	18:21:40	
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14/02/2011	09:44:23	19:35:04	
15/02/2011	05:25:44	15:16:25	
16/02/2011	01:07:05	10:57:47	20:48:28
17/02/2011	06:39:08	16:29:49	
18/02/2011	02:20:29	12:11:11	22:01:51
19/02/2011	07:52:32	17:43:12	
20/02/2011	03:33:53	13:24:35	23:15:15
21/02/2011	09:05:56	18:56:36	
22/02/2011	04:47:17	14:37:59	
23/02/2011	00:28:39	10:19:20	20:10:00
24/02/2011	06:00:42	15:51:23	
25/02/2011	01:42:03	11:32:44	21:23:24
26/02/2011	07:14:06	17:04:46	
27/02/2011	02:55:27	12:46:08	22:36:48
28/02/2011	08:27:30	18:18:10	
01/03/2011	04:08:51	13:59:31	23:50:12
02/03/2011	09:40:54	19:31:34	
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09/03/2011	09:02:25	18:53:06	
10/03/2011	04:43:46	14:34:28	
11/03/2011	00:25:08	10:15:49	20:06:29
12/03/2011	05:57:10	15:47:51	
13/03/2011	01:38:32	11:29:12	21:19:52
14/03/2011	07:10:33	17:01:14	
15/03/2011	02:51:54	12:42:35	22:33:15
16/03/2011	08:23:55	18:14:37	
17/03/2011	04:05:17	13:55:57	23:46:38
18/03/2011	09:37:19	19:27:59	

Date	Zero meridian	Zero meridian	Zero meridian
19/03/2011	05:18:40	15:09:20	
20/03/2011	01:00:00	10:50:41	20:41:22
21/03/2011	06:32:02	16:22:42	
22/03/2011	02:13:22	12:04:03	21:54:44
23/03/2011	07:45:24	17:36:04	
24/03/2011	03:26:44	13:17:25	23:08:05
25/03/2011	08:58:45	18:49:25	
26/03/2011	04:40:05	14:30:46	
27/03/2011	00:21:26	10:12:06	20:02:46
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05/06/2011	03:41:02	13:31:38	23:22:14
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11/07/2011	05:51:41	15:42:14	
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13/07/2011	07:04:24	16:54:57	
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15/07/2011	08:17:07	18:07:40	
16/07/2011	03:58:12	13:48:44	23:39:16
17/07/2011	09:29:48	19:20:21	
18/07/2011	05:10:53	15:01:25	
19/07/2011	00:51:57	10:42:29	20:33:01
20/07/2011	06:23:33	16:14:05	
21/07/2011	02:04:36	11:55:08	21:45:40
22/07/2011	07:36:12	17:26:43	
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11/08/2011	00:00:39	09:51:08	19:41:37
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13/08/2011	01:13:05	11:03:34	20:54:03
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17/08/2011	03:37:55	13:28:24	23:18:52
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05/11/2011	02:30:44	12:21:09	22:11:35
06/11/2011	08:02:00	17:52:25	
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20/11/2011	06:36:47	16:27:14	
21/11/2011	02:17:41	12:08:08	21:58:35
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22/12/2011	06:15:16	16:05:48	
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28/12/2011	00:02:55	09:53:28	19:44:02
29/12/2011	05:34:35	15:25:09	
30/12/2011	01:15:43	11:06:16	20:56:50
31/12/2011	06:47:24	16:37:57	

Zero meridian = Ore dei passaggi

Orari in T.U. in cui transita il Meridiano Centrale

Date in the format dd/mm/yyyy

TIMES IN U.T.

# MERIDIANO CENTRALE DI GIOVE I

(Valido per le regioni equatoriali)

# CENTRAL MERIDIAN OF JUPITER I

(For equatorial zones)

Data	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	°	°	°	°	°	°	°	°	°	°	°	°
1	266.3	113.8	207.6	54.4	104.4	313.5	6.7	219.8	75.6	135.9	355.2	54.8
2	64.0	271.4	5.2	212.0	262.1	111.3	164.5	17.7	233.6	294.0	153.2	212.7
3	221.7	69.1	162.8	9.7	59.8	269.0	322.3	175.6	31.6	92.0	311.3	10.7
4	19.3	226.7	320.5	167.4	217.5	66.7	120.1	333.5	189.6	250.0	109.3	168.6
5	177.0	24.3	118.1	325.0	15.2	224.5	277.9	131.4	347.6	48.1	267.3	326.5
6	334.7	182.0	275.7	122.7	172.9	22.2	75.7	289.3	145.6	206.1	65.3	124.4
7	132.4	339.6	73.4	280.3	330.6	180.0	233.5	87.2	303.5	4.2	223.3	282.3
8	290.0	137.2	231.0	78.0	128.3	337.7	31.4	245.1	101.5	162.2	21.4	80.2
9	87.7	294.9	28.6	235.6	286.0	135.5	189.2	43.0	259.5	320.3	179.4	238.1
10	245.4	92.5	186.3	33.3	83.7	293.3	347.0	200.9	57.5	118.3	337.4	36.0
11	43.1	250.2	343.9	191.0	241.4	91.0	144.8	358.8	215.5	276.3	135.4	193.9
12	200.7	47.8	141.5	348.6	39.1	248.8	302.7	156.7	13.5	74.4	293.4	351.8
13	358.4	205.4	299.2	146.3	196.8	46.5	100.5	314.7	171.5	232.4	91.4	149.7
14	156.1	3.1	96.8	303.9	354.5	204.3	258.3	112.6	329.5	30.5	249.4	307.6
15	313.7	160.7	254.4	101.6	152.2	2.1	56.2	270.5	127.5	188.5	47.4	105.4
16	111.4	318.3	52.1	259.3	309.9	159.8	214.0	68.4	285.5	346.6	205.4	263.3
17	269.0	116.0	209.7	56.9	107.6	317.6	11.9	226.4	83.6	144.6	3.4	61.2
18	66.7	273.6	7.4	214.6	265.3	115.4	169.7	24.3	241.6	302.7	161.3	219.0
19	224.3	71.2	165.0	12.3	63.1	273.2	327.5	182.2	39.6	100.7	319.3	16.9
20	22.0	228.9	322.6	170.0	220.8	70.9	125.4	340.2	197.6	258.8	117.3	174.8
21	179.7	26.5	120.3	327.6	18.5	228.7	283.3	138.1	355.6	56.8	275.3	332.6
22	337.3	184.1	277.9	125.3	176.2	26.5	81.1	296.1	153.6	214.8	73.2	130.4
23	135.0	341.8	75.6	283.0	333.9	184.3	239.0	94.0	311.7	12.9	231.2	288.3
24	292.6	139.4	233.2	80.7	131.7	342.1	36.8	251.9	109.7	170.9	29.2	86.1
25	90.3	297.0	30.9	238.3	289.4	139.9	194.7	49.9	267.7	329.0	187.1	244.0
26	247.9	94.7	188.5	36.0	87.1	297.7	352.6	207.9	65.8	127.0	345.1	41.8
27	45.6	252.3	346.2	193.7	244.8	95.5	150.4	5.8	223.8	285.0	143.0	199.6
28	203.2	49.9	143.8	351.4	42.6	253.3	308.3	163.8	21.8	83.1	301.0	357.4
29	0.8		301.4	149.1	200.3	51.1	106.2	321.7	179.9	241.1	98.9	155.2
30	158.5		99.1	306.7	358.0	208.9	264.1	119.7	337.9	39.1	256.9	313.1
31	316.1		256.7		155.8		61.9	277.7		197.2		110.9

Moto del meridiano centrale - Motion of the central meridian

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	°	°	°	°	°	°	°	°	°	°	°	°
00	0.0	36.6	73.2	109.7	146.3	182.9	219.5	256.1	292.6	329.2	5.8	42.4
10	6.1	42.7	79.3	115.8	152.4	189.0	225.6	262.2	298.7	335.3	11.9	48.5
20	12.2	48.8	85.4	121.9	158.5	195.1	231.7	268.2	304.8	341.4	18.0	54.6
30	18.3	54.9	91.4	128.0	164.6	201.2	237.8	274.3	310.9	347.5	24.1	60.7
40	24.4	61.0	97.5	134.1	170.7	207.3	243.9	280.4	317.0	353.6	30.2	66.8
50	30.5	67.1	103.6	140.2	176.8	213.4	250.0	286.5	323.1	359.7	36.3	72.9
60	36.6	73.2	109.7	146.3	182.9	219.5	256.1	292.6	329.2	5.8	42.4	79.0

Longitude del meridiano che transita alle ore 0 T.U. del giorno indicato e moto medio in gradi

Longitude of the meridian that transits at 0 U.T. and motion in °

# MERIDIANO CENTRALE DI GIOVE II

(Valido per le regioni a media latitudine)

# CENTRAL MERIDIAN OF JUPITER II

(For middle latitude zones)

Data	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	°	°	°	°	°	°	°	°	°	°	°	°
1	189.2	160.2	40.3	10.6	191.8	164.3	348.5	325.2	304.4	135.8	118.5	309.2
2	339.2	310.2	190.3	160.7	341.8	314.4	138.7	115.4	94.8	286.2	268.9	99.5
3	129.3	100.2	340.3	310.7	131.9	104.5	288.9	265.7	245.1	76.6	59.3	249.8
4	279.4	250.2	130.3	100.7	281.9	254.6	79.1	55.9	35.5	227.0	209.7	40.1
5	69.4	40.2	280.3	250.7	72.0	44.8	229.3	206.2	185.8	17.4	0.1	190.4
6	219.4	190.2	70.3	40.7	222.1	194.9	19.4	356.5	336.2	167.8	150.5	340.7
7	9.5	340.2	220.3	190.8	12.1	345.0	169.6	146.7	126.5	318.3	300.9	131.0
8	159.5	130.2	10.3	340.8	162.2	135.1	319.8	297.0	276.9	108.7	91.3	281.3
9	309.6	280.2	160.3	130.8	312.3	285.3	110.0	87.3	67.3	259.1	241.7	71.5
10	99.6	70.2	310.4	280.9	102.3	75.4	260.2	237.6	217.6	49.5	32.0	221.8
11	249.7	220.2	100.4	70.9	252.4	225.5	50.4	27.8	8.0	199.9	182.4	12.1
12	39.7	10.3	250.4	220.9	42.5	15.6	200.6	178.1	158.4	350.3	332.8	162.3
13	189.7	160.3	40.4	11.0	192.6	165.8	350.8	328.4	308.7	140.7	123.2	312.6
14	339.8	310.3	190.4	161.0	342.6	315.9	141.0	118.7	99.1	291.2	273.5	102.8
15	129.8	100.3	340.4	311.0	132.7	106.0	291.2	269.0	249.5	81.6	63.9	253.1
16	279.8	250.3	130.4	101.1	282.8	256.2	81.4	59.3	39.9	232.0	214.3	43.3
17	69.9	40.3	280.4	251.1	72.9	46.3	231.6	209.6	190.2	22.4	4.6	193.5
18	219.9	190.3	70.4	41.1	223.0	196.5	21.9	359.9	340.6	172.8	155.0	343.8
19	9.9	340.3	220.4	191.2	13.0	346.6	172.1	150.2	131.0	323.2	305.3	134.0
20	159.9	130.3	10.4	341.2	163.1	136.8	322.3	300.5	281.4	113.6	95.7	284.2
21	310.0	280.3	160.5	131.3	313.2	286.9	112.5	90.8	71.8	264.1	246.0	74.5
22	100.0	70.3	310.5	281.3	103.3	77.1	262.7	241.1	222.2	54.5	36.3	224.7
23	250.0	220.3	100.5	71.4	253.4	227.2	53.0	31.5	12.6	204.9	186.7	14.9
24	40.0	10.3	250.5	221.4	43.5	17.4	203.2	181.8	163.0	355.3	337.0	165.1
25	190.1	160.3	40.5	11.4	193.6	167.5	353.4	332.1	313.4	145.7	127.3	315.3
26	340.1	310.3	190.5	161.5	343.7	317.7	143.7	122.4	103.8	296.1	277.7	105.5
27	130.1	100.3	340.5	311.5	133.8	107.9	293.9	272.7	254.2	86.5	68.0	255.7
28	280.1	250.3	130.6	101.6	283.9	258.0	84.2	63.1	44.6	236.9	218.3	45.9
29	70.1		280.6	251.7	74.0	48.2	234.4	213.4	195.0	27.3	8.6	196.1
30	220.1		70.6	41.7	224.1	198.4	24.7	3.7	345.4	177.7	158.9	346.2
31	10.1		220.6		14.2		174.9	154.1		328.1		136.4

## Moto del meridiano centrale - Motion of the central meridian

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	°	°	°	°	°	°	°	°	°	°	°	°
0	0.0	36.3	72.5	108.8	145.0	181.3	217.6	253.8	290.1	326.4	2.6	38.9
10	6.0	42.3	78.6	114.8	151.1	187.3	223.6	259.9	296.1	332.4	8.7	44.9
20	12.1	48.3	84.6	120.9	157.1	193.4	229.7	265.9	302.2	338.4	14.7	51.0
30	18.1	54.4	90.7	126.9	163.2	199.4	235.7	272.0	308.2	344.5	20.7	57.0
40	24.2	60.4	96.7	133.0	169.2	205.5	241.7	278.0	314.3	350.5	26.8	63.0
50	30.2	66.5	102.7	139.0	175.3	211.5	247.8	284.0	320.3	356.6	32.8	69.1
60	36.3	72.5	108.8	145.0	181.3	217.6	253.8	290.1	326.4	2.6	38.9	75.1

Longitudine del meridiano che transita alle ore 0 T.U. del giorno indicato e moto medio in gradi

Longitude of the meridian that transits at 0 U.T. and motion in °

# TRANSITI MACCHIA ROSSA DI GIOVE

## TRANSITS OF THE RED SPOT OF JUPITER

Date	Time	Time	Time
01/01/2011	06:27:21	16:23:10	
02/01/2011	02:18:59	12:14:50	22:10:39
03/01/2011	08:06:28	18:02:18	
04/01/2011	03:58:08	13:53:57	23:49:46
05/01/2011	09:45:37	19:41:26	
06/01/2011	05:37:16	15:33:05	
07/01/2011	01:28:56	11:24:45	21:20:35
08/01/2011	07:16:26	17:12:15	
09/01/2011	03:08:05	13:03:55	22:59:46
10/01/2011	08:55:35	18:51:25	
11/01/2011	04:47:15	14:43:06	
12/01/2011	00:38:56	10:34:46	20:30:37
13/01/2011	06:26:27	16:22:17	
14/01/2011	02:18:07	12:13:58	22:09:48
15/01/2011	08:05:38	18:01:30	
16/01/2011	03:57:20	13:53:10	23:49:00
17/01/2011	09:44:51	19:40:42	
18/01/2011	05:36:32	15:32:22	
19/01/2011	01:28:14	11:24:04	21:19:54
20/01/2011	07:15:46	17:11:36	
21/01/2011	03:07:27	13:03:17	22:59:09
22/01/2011	08:54:59	18:50:50	
23/01/2011	04:46:40	14:42:32	
24/01/2011	00:38:23	10:34:13	20:30:05
25/01/2011	06:25:56	16:21:46	
26/01/2011	02:17:37	12:13:29	22:09:20
27/01/2011	08:05:10	18:01:02	
28/01/2011	03:56:53	13:52:44	23:48:35
29/01/2011	09:44:27	19:40:17	
30/01/2011	05:36:08	15:31:59	
31/01/2011	01:27:51	11:23:42	21:19:33
01/02/2011	07:15:25	17:11:16	
02/02/2011	03:07:07	13:02:58	22:58:50
03/02/2011	08:54:41	18:50:32	
04/02/2011	04:46:23	14:42:15	
05/02/2011	00:38:06	10:33:57	20:29:49
06/02/2011	06:25:41	16:21:32	
07/02/2011	02:17:23	12:13:15	22:09:06
08/02/2011	08:04:57	18:00:49	
09/02/2011	03:56:41	13:52:32	23:48:23
10/02/2011	09:44:15	19:40:06	
11/02/2011	05:35:57	15:31:49	
12/02/2011	01:27:41	11:23:32	21:19:23
13/02/2011	07:15:16	17:11:07	
14/02/2011	03:06:58	13:02:49	22:58:42
15/02/2011	08:54:33	18:50:24	
16/02/2011	04:46:15	14:42:08	
17/02/2011	00:37:59	10:33:50	20:29:43
18/02/2011	06:25:34	16:21:25	
19/02/2011	02:17:16	12:13:09	22:09:00
20/02/2011	08:04:51	18:00:44	
21/02/2011	03:56:35	13:52:26	23:48:18
22/02/2011	09:44:10	19:40:01	
23/02/2011	05:35:53	15:31:44	
24/02/2011	01:27:36	11:23:28	21:19:19
25/02/2011	07:15:11	17:11:03	
26/02/2011	03:06:54	13:02:45	22:58:38
27/02/2011	08:54:29	18:50:20	
28/02/2011	04:46:11	14:42:04	
01/03/2011	00:37:55	10:33:46	20:29:39
02/03/2011	06:25:30	16:21:21	
03/03/2011	02:17:12	12:13:05	22:08:56
04/03/2011	08:04:47	18:00:40	
05/03/2011	03:56:31	13:52:22	23:48:13
06/03/2011	09:44:06	19:39:57	
07/03/2011	05:35:48	15:31:39	
08/03/2011	01:27:32	11:23:23	21:19:14
09/03/2011	07:15:07	17:10:58	
10/03/2011	03:06:49	13:02:40	22:58:32
11/03/2011	08:54:23	18:50:14	
12/03/2011	04:46:06	14:41:58	
13/03/2011	00:37:49	10:33:40	20:29:32
14/03/2011	06:25:23	16:21:14	
15/03/2011	02:17:05	12:12:58	22:08:49
16/03/2011	08:04:40	18:00:32	
17/03/2011	03:56:23	13:52:14	23:48:05
18/03/2011	09:43:57	19:39:48	

Date	Time	Time	Time
19/03/2011	05:35:39	15:31:30	
20/03/2011	01:27:22	11:23:13	21:19:04
21/03/2011	07:14:56	17:10:47	
22/03/2011	03:06:38	13:02:29	22:58:21
23/03/2011	08:54:11	18:50:02	
24/03/2011	04:45:53	14:41:45	
25/03/2011	00:37:36	10:33:27	20:29:19
26/03/2011	06:25:09	16:21:00	
27/03/2011	02:16:51	12:12:43	22:08:33
28/03/2011	08:04:24	18:00:16	
29/03/2011	03:56:07	13:51:57	23:47:48
30/03/2011	09:43:40	19:39:30	
31/03/2011	05:35:21	15:31:11	
01/04/2011	01:27:03	11:22:54	21:18:44
02/04/2011	07:14:36	17:10:26	
03/04/2011	03:06:17	13:02:07	22:57:59
04/04/2011	08:53:49	18:49:40	
05/04/2011	04:45:30	14:41:21	
06/04/2011	00:37:12	10:33:02	20:28:54
07/04/2011	06:24:44	16:20:34	
08/04/2011	02:16:24	12:12:16	22:08:06
09/04/2011	08:03:56	17:59:46	
10/04/2011	03:55:38	13:51:28	23:47:18
11/04/2011	09:43:09	19:38:59	
12/04/2011	05:34:50	15:30:40	
13/04/2011	01:26:31	11:22:21	21:18:11
14/04/2011	07:14:02	17:09:52	
15/04/2011	03:05:42	13:01:32	22:57:23
16/04/2011	08:53:13	18:49:02	
17/04/2011	04:44:52	14:40:43	
18/04/2011	00:36:33	10:32:23	20:28:14
19/04/2011	06:24:03	16:19:53	
20/04/2011	02:15:43	12:11:34	22:07:23
21/04/2011	08:03:13	17:59:03	
22/04/2011	03:54:53	13:50:43	23:46:32
23/04/2011	09:42:23	19:38:12	
24/04/2011	05:34:02	15:29:51	
25/04/2011	01:25:42	11:21:31	21:17:21
26/04/2011	07:13:11	17:09:01	
27/04/2011	03:04:50	13:00:39	22:56:30
28/04/2011	08:52:19	18:48:08	
29/04/2011	04:43:57	14:39:47	
30/04/2011	00:35:37	10:31:26	20:27:16
01/05/2011	06:23:05	16:18:54	
02/05/2011	02:14:43	12:10:33	22:06:22
03/05/2011	08:02:11	17:58:00	
04/05/2011	03:53:50	13:49:39	23:45:28
05/05/2011	09:41:18	19:37:06	
06/05/2011	05:32:55	15:28:44	
07/05/2011	01:24:34	11:20:22	21:16:11
08/05/2011	07:12:01	17:07:49	
09/05/2011	03:03:38	12:59:27	22:55:16
10/05/2011	08:51:05	18:46:53	
11/05/2011	04:42:42	14:38:31	
12/05/2011	00:34:19	10:30:08	20:25:57
13/05/2011	06:21:46	16:17:34	
14/05/2011	02:13:22	12:09:11	22:05:00
15/05/2011	08:00:48	17:56:36	
16/05/2011	03:52:25	13:48:13	23:44:01
17/05/2011	09:39:50	19:35:38	
18/05/2011	05:31:26	15:27:14	
19/05/2011	01:23:03	11:18:51	21:14:39
20/05/2011	07:10:27	17:06:16	
21/05/2011	03:02:03	12:57:51	22:53:40
22/05/2011	08:49:28	18:45:15	
23/05/2011	04:41:03	14:36:51	
24/05/2011	00:32:39	10:28:27	20:24:15
25/05/2011	06:20:03	16:15:50	
26/05/2011	02:11:37	12:07:26	22:03:13
27/05/2011	07:59:00	17:54:48	
28/05/2011	03:50:36	13:46:23	23:42:10
29/05/2011	09:37:59	19:33:46	
30/05/2011	05:29:33	15:25:20	
31/05/2011	01:21:08	11:16:55	21:12:42
01/06/2011	07:08:29	17:04:17	
02/06/2011	03:00:04	12:55:50	22:51:38
03/06/2011	08:47:25	18:43:12	

Date	Time	Time	Time
04/06/2011	04:38:59	14:34:46	
05/06/2011	00:30:33	10:26:19	20:22:06
06/06/2011	06:17:53	16:13:40	
07/06/2011	02:09:26	12:05:14	22:01:00
08/06/2011	07:56:47	17:52:33	
09/06/2011	03:48:20	13:44:06	23:39:53
10/06/2011	09:35:39	19:31:26	
11/06/2011	05:27:12	15:22:58	
12/06/2011	01:18:45	11:14:31	21:10:17
13/06/2011	07:06:03	17:01:50	
14/06/2011	02:57:36	12:53:22	22:49:08
15/06/2011	08:44:54	18:40:40	
16/06/2011	04:36:26	14:32:12	
17/06/2011	00:27:58	10:23:44	20:19:29
18/06/2011	06:15:15	16:11:01	
19/06/2011	02:06:47	12:02:33	21:58:18
20/06/2011	07:54:04	17:49:49	
21/06/2011	03:45:35	13:41:20	23:37:05
22/06/2011	09:32:51	19:28:37	
23/06/2011	05:24:22	15:20:07	
24/06/2011	01:15:52	11:11:38	21:07:23
25/06/2011	07:03:08	16:58:53	
26/06/2011	02:54:38	12:50:23	22:46:08
27/06/2011	08:41:53	18:37:38	
28/06/2011	04:33:22	14:29:08	
29/06/2011	00:24:52	10:20:37	20:16:21
30/06/2011	06:12:06	16:07:51	
01/07/2011	02:03:35	11:59:20	21:55:05
02/07/2011	07:50:49	17:46:33	
03/07/2011	03:42:18	13:38:02	23:33:46
04/07/2011	09:29:30	19:25:15	
05/07/2011	05:20:59	15:16:43	
06/07/2011	01:12:27	11:08:11	21:03:55
07/07/2011	06:59:39	16:55:23	
08/07/2011	02:51:07	12:46:51	22:42:34
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12/07/2011	06:08:23	16:04:07	
13/07/2011	01:59:50	11:55:33	21:51:17
14/07/2011	07:47:00	17:42:43	
15/07/2011	03:38:26	13:34:09	23:29:52
16/07/2011	09:25:35	19:21:18	
17/07/2011	05:17:01	15:12:44	
18/07/2011	01:08:27	11:04:10	20:59:52
19/07/2011	06:55:35	16:51:18	
20/07/2011	02:47:00	12:42:43	22:38:25
21/07/2011	08:34:08	18:29:50	
22/07/2011	04:25:33	14:21:15	
23/07/2011	00:16:58	10:12:40	20:08:22
24/07/2011	06:04:04	15:59:46	
25/07/2011	01:55:28	11:51:10	21:46:52
26/07/2011	07:42:34	17:38:16	
27/07/2011	03:33:58	13:29:40	23:25:21
28/07/2011	09:21:03	19:16:45	
29/07/2011	05:12:26	15:08:08	
30/07/2011	01:03:49	10:59:31	20:55:12
31/07/2011	06:50:54	16:46:35	
01/08/2011	02:42:16	12:37:57	22:33:38
02/08/2011	08:29:20	18:25:01	
03/08/2011	04:20:42	14:16:23	
04/08/2011	00:12:04	10:07:44	20:03:25
05/08/2011	05:59:06	15:54:47	
06/08/2011	01:50:27	11:46:08	21:41:49
07/08/2011	07:37:29	17:33:10	
08/08/2011	03:28:50	13:24:31	23:20:11
09/08/2011	09:15:51	19:11:32	
10/08/2011	05:07:12	15:02:52	
11/08/2011	00:58:32	10:54:12	20:49:52
12/08/2011	06:45:32	16:41:12	
13/08/2011	02:36:52	12:32:32	22:28:11
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15/08/2011	04:15:10	14:10:50	
16/08/2011	00:06:29	10:02:09	19:57:48
17/08/2011	05:53:28	15:49:07	
18/08/2011	01:44:46	11:40:26	21:36:05
19/08/2011	07:31:44	17:27:23	



Date	Time	Time	Time
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21/08/2011	09:09:59	19:05:38	
22/08/2011	05:01:16	14:56:55	
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19/09/2011	08:03:27	17:59:03	
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03/10/2011	09:33:27	19:29:01	

Date	Time	Time	Time
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05/10/2011	01:15:46	11:11:21	21:06:56
06/10/2011	07:02:31	16:58:05	
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30/10/2011	06:46:08	16:41:44	
31/10/2011	02:37:18	12:32:54	22:28:29
01/11/2011	08:24:04	18:19:40	
02/11/2011	04:15:15	14:10:51	
03/11/2011	00:06:26	10:02:02	19:57:37
04/11/2011	05:53:13	15:48:48	
05/11/2011	01:44:24	11:40:00	21:35:36
06/11/2011	07:31:11	17:26:47	
07/11/2011	03:22:23	13:17:59	23:13:35
08/11/2011	09:09:11	19:04:47	
09/11/2011	05:00:23	14:55:59	
10/11/2011	00:51:36	10:47:12	20:42:48
11/11/2011	06:38:24	16:34:01	
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15/11/2011	09:54:30	19:50:07	
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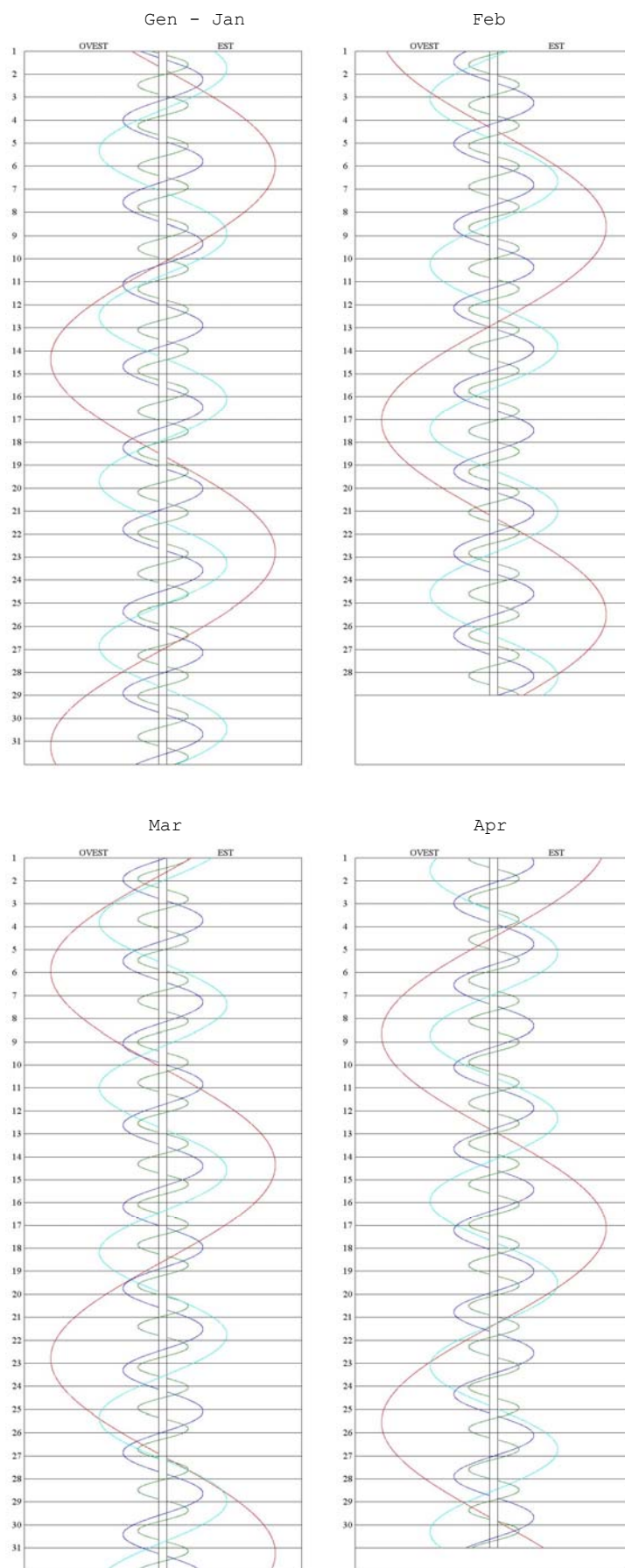
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23/11/2011	06:31:22	16:27:00	
24/11/2011	02:22:38	12:18:16	22:13:54
25/11/2011	08:09:33	18:05:11	
26/11/2011	04:00:49	13:56:28	23:52:06
27/11/2011	09:47:45	19:43:24	
28/11/2011	05:39:02	15:34:41	
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12/12/2011	07:11:43	17:07:24	
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14/12/2011	08:50:10	18:45:51	
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16/12/2011	00:32:57	10:28:39	20:24:21
17/12/2011	06:20:03	16:15:45	
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24/12/2011	07:07:09	17:02:52	
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26/12/2011	08:45:47	18:41:30	
27/12/2011	04:37:14	14:32:58	
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29/12/2011	06:15:54	16:11:38	
30/12/2011	02:07:22	12:03:07	21:58:51
31/12/2011	07:54:36	17:50:20	

Orari in T.U. in cui transita la grande macchia rossa

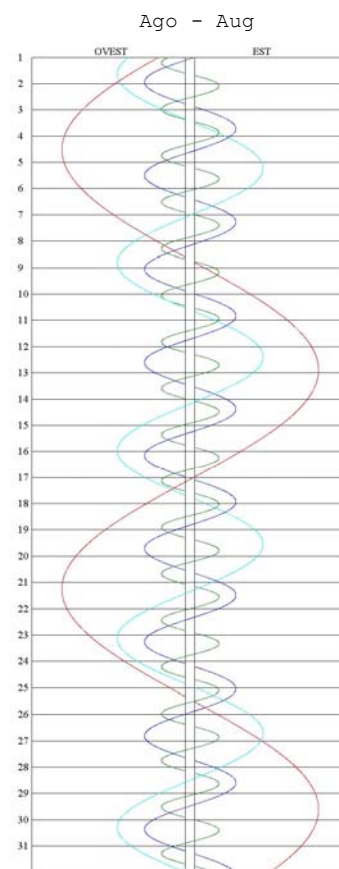
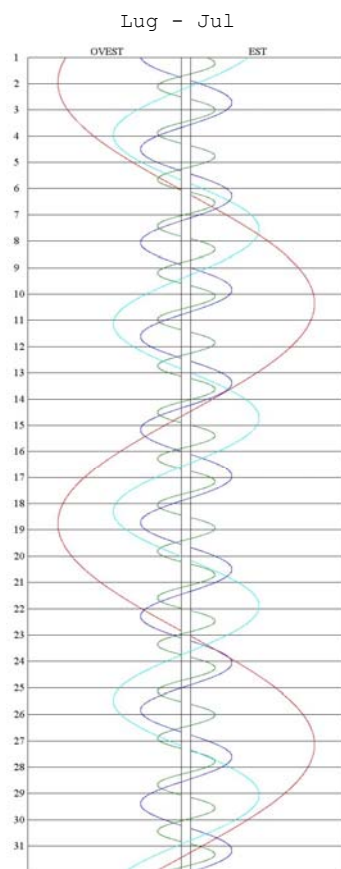
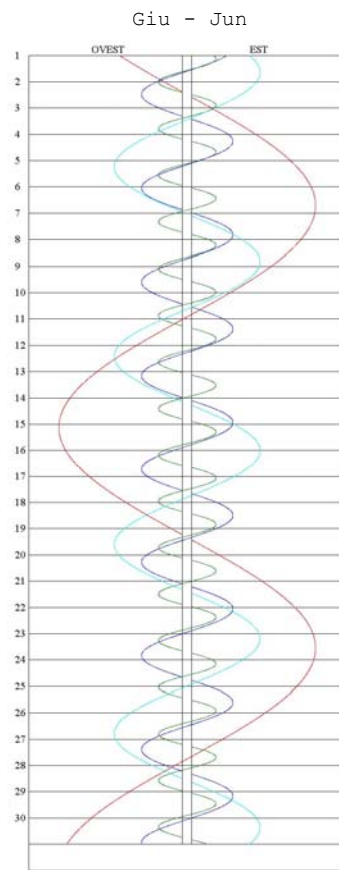
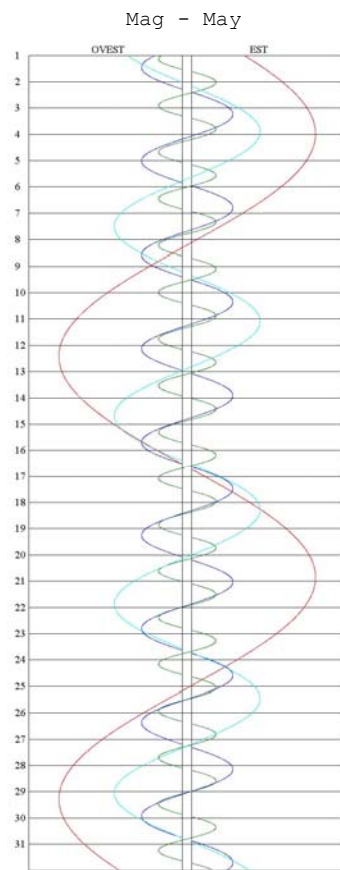
Date in the format dd/mm/yyyy

TIMES IN U.T.

# POSIZIONE DEI SATELLITI DI GIOVE POSITION OF THE SATELLITES OF JUPITER

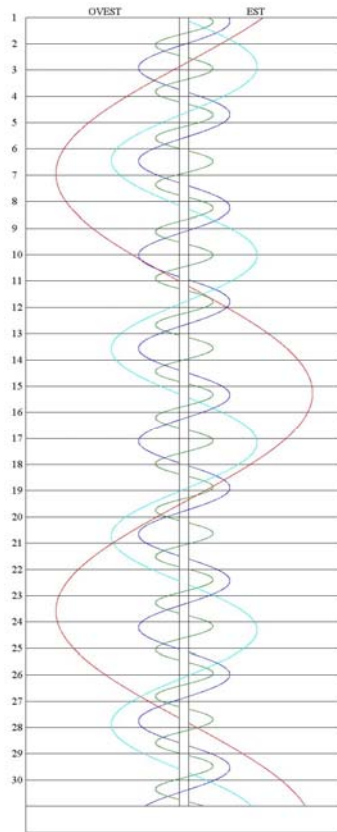


In verde Io, in blu Europa, in azzurro Ganimede, in rosso Callisto  
In green Io, in blue Europa, in blue light Ganimede, in red Callisto

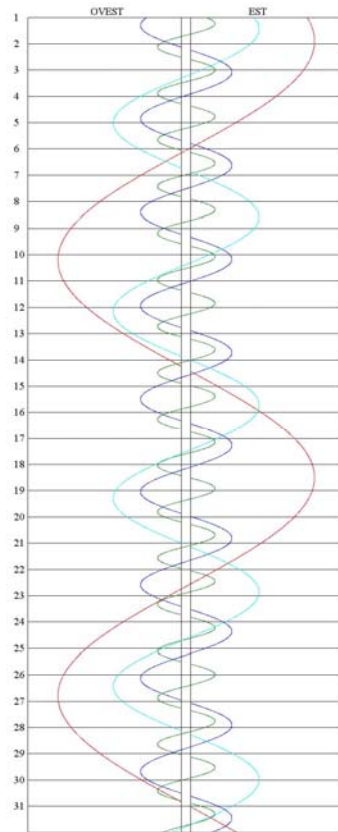


In verde Io, in blu Europa, in azzurro Ganimede, in rosso Callisto  
 In green Io, in blue Europa, in blue light Ganimede, in red Callisto

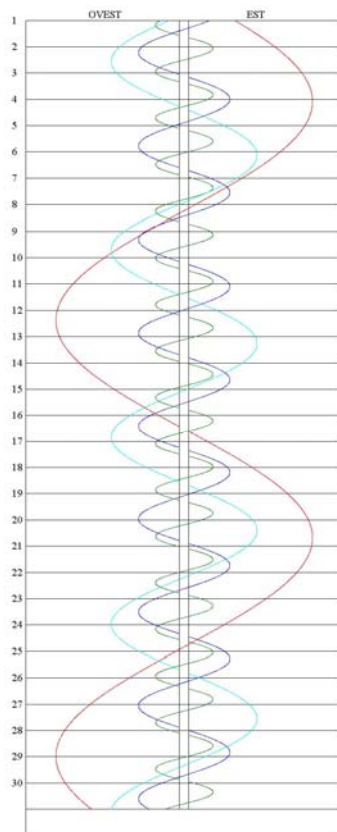
Set - Sep



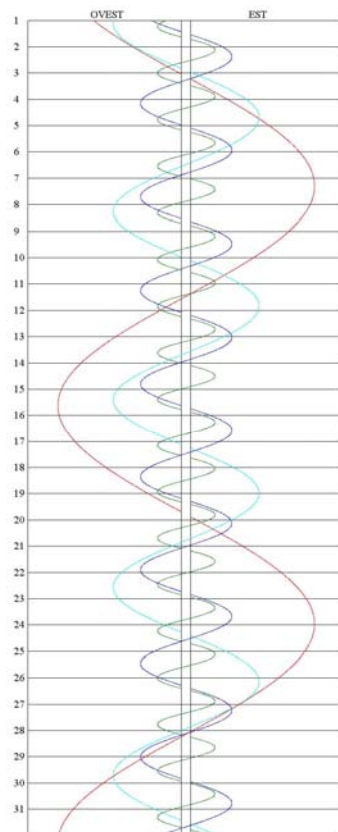
Ott - Oct



Nov



Dic - Dec



In verde Io, in blu Europa, in azzurro Ganimede, in rosso Callisto  
 In green Io, in blue Europa, in blue light Ganimede, in red Callisto

# EFFEMERIDI DI SATURNO - EPHEMERIDES OF SATURN

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq."	Diam. Pol."	Mag.	Phase angle°	Max °	Min °	B °	Rise	Trans.	Set.
01/01/2011	13h 05m 07.08s	-04° 19' 22.9"	9.585109	9.645607	80.22	83.6	17.2	15.3	0.8	5.9	38.9	6.9	10.2	0.46	6.33	12.19
02/01/2011	13h 05m 17.17s	-04° 20' 07.6"	9.585408	9.629082	80.08	84.5	17.2	15.3	0.8	5.9	39.0	6.9	10.2	0.42	6.29	12.15
03/01/2011	13h 05m 26.88s	-04° 20' 49.9"	9.585708	9.612529	79.94	85.5	17.2	15.4	0.8	5.9	39.0	6.9	10.2	0.38	6.25	12.11
04/01/2011	13h 05m 36.22s	-04° 21' 29.8"	9.586007	9.595952	79.81	86.5	17.2	15.4	0.8	5.9	39.1	6.9	10.2	0.35	6.21	12.08
05/01/2011	13h 05m 45.18s	-04° 22' 07.3"	9.586307	9.579359	79.67	87.5	17.3	15.4	0.7	5.9	39.2	6.9	10.2	0.31	6.17	12.04
06/01/2011	13h 05m 53.77s	-04° 22' 42.4"	9.586607	9.562752	79.53	88.4	17.3	15.4	0.7	5.9	39.3	7.0	10.2	0.27	6.14	12.00
07/01/2011	13h 06m 01.97s	-04° 23' 15.0"	9.586906	9.546139	79.39	89.4	17.3	15.5	0.7	5.9	39.3	7.0	10.2	0.23	6.10	11.56
08/01/2011	13h 06m 09.78s	-04° 23' 45.2"	9.587206	9.529523	79.25	90.4	17.4	15.5	0.7	5.9	39.4	7.0	10.2	0.20	6.06	11.52
09/01/2011	13h 06m 17.21s	-04° 24' 12.9"	9.587505	9.512910	79.12	91.4	17.4	15.5	0.7	5.9	39.5	7.0	10.3	0.16	6.02	11.49
10/01/2011	13h 06m 24.26s	-04° 24' 38.2"	9.587805	9.496306	78.98	92.4	17.4	15.6	0.7	5.9	39.5	7.0	10.3	0.12	5.98	11.45
11/01/2011	13h 06m 30.91s	-04° 25' 01.0"	9.588104	9.479715	78.84	93.4	17.5	15.6	0.7	5.9	39.6	7.1	10.3	0.08	5.95	11.41
12/01/2011	13h 06m 37.18s	-04° 25' 21.4"	9.588404	9.463142	78.70	94.4	17.5	15.6	0.7	5.9	39.7	7.1	10.3	0.05	5.91	11.37
13/01/2011	13h 06m 43.06s	-04° 25' 39.4"	9.588703	9.446593	78.56	95.4	17.5	15.6	0.7	5.9	39.7	7.1	10.3	0.01	5.87	11.33
14/01/2011	13h 06m 48.55s	-04° 25' 54.9"	9.589002	9.430073	78.43	96.4	17.6	15.7	0.7	5.9	39.8	7.1	10.3	23.53	5.83	11.29
15/01/2011	13h 06m 53.65s	-04° 26' 08.0"	9.589302	9.413586	78.29	97.4	17.6	15.7	0.7	5.9	39.9	7.1	10.3	23.49	5.79	11.25
16/01/2011	13h 06m 58.36s	-04° 26' 18.6"	9.589601	9.397137	78.15	98.4	17.6	15.7	0.7	5.8	39.9	7.1	10.3	23.45	5.75	11.22
17/01/2011	13h 07m 02.68s	-04° 26' 26.9"	9.589900	9.380732	78.02	99.4	17.6	15.7	0.7	5.8	40.0	7.2	10.3	23.42	5.72	11.18
18/01/2011	13h 07m 06.61s	-04° 26' 32.7"	9.590200	9.364375	77.88	100.4	17.7	15.8	0.7	5.8	40.1	7.2	10.3	23.38	5.68	11.14
19/01/2011	13h 07m 10.14s	-04° 26' 36.0"	9.590499	9.348071	77.75	101.4	17.7	15.8	0.7	5.8	40.2	7.2	10.3	23.34	5.64	11.10
20/01/2011	13h 07m 13.27s	-04° 26' 36.9"	9.590798	9.331824	77.61	102.4	17.7	15.8	0.7	5.8	40.2	7.2	10.3	23.30	5.60	11.06
21/01/2011	13h 07m 16.00s	-04° 26' 35.4"	9.591097	9.315640	77.48	103.4	17.8	15.9	0.7	5.7	40.3	7.2	10.3	23.26	5.56	11.02
22/01/2011	13h 07m 18.33s	-04° 26' 31.3"	9.591396	9.299523	77.34	104.4	17.8	15.9	0.7	5.7	40.4	7.2	10.3	23.22	5.52	10.58
23/01/2011	13h 07m 20.26s	-04° 26' 24.8"	9.591696	9.283477	77.21	105.4	17.8	15.9	0.7	5.7	40.4	7.2	10.3	23.18	5.48	10.54
24/01/2011	13h 07m 21.79s	-04° 26' 15.9"	9.591995	9.267508	77.08	106.4	17.9	15.9	0.7	5.6	40.5	7.2	10.3	23.14	5.44	10.50
25/01/2011	13h 07m 22.92s	-04° 26' 04.5"	9.592294	9.251620	76.94	107.4	17.9	16.0	0.7	5.6	40.6	7.3	10.3	23.10	5.40	10.47
26/01/2011	13h 07m 23.65s	-04° 25' 50.6"	9.592593	9.235818	76.81	108.4	17.9	16.0	0.7	5.6	40.6	7.3	10.3	23.06	5.36	10.43
27/01/2011	13h 07m 23.99s	-04° 25' 34.4"	9.592892	9.220109	76.68	109.4	18.0	16.0	0.7	5.6	40.7	7.3	10.3	23.02	5.32	10.39
28/01/2011	13h 07m 23.92s	-04° 25' 15.7"	9.593191	9.204496	76.55	110.5	18.0	16.0	0.6	5.5	40.8	7.3	10.3	22.58	5.28	10.35
29/01/2011	13h 07m 23.46s	-04° 24' 54.7"	9.593490	9.188985	76.42	111.5	18.0	16.1	0.6	5.5	40.8	7.3	10.3	22.54	5.24	10.31
30/01/2011	13h 07m 22.60s	-04° 24' 31.2"	9.593789	9.173582	76.29	112.5	18.0	16.1	0.6	5.4	40.9	7.3	10.3	22.50	5.20	10.27
31/01/2011	13h 07m 21.34s	-04° 24' 05.3"	9.594088	9.158292	76.17	113.5	18.1	16.1	0.6	5.4	41.0	7.3	10.3	22.47	5.17	10.23
01/02/2011	13h 07m 19.68s	-04° 23' 37.1"	9.594387	9.143121	76.04	114.5	18.1	16.2	0.6	5.4	41.1	7.3	10.3	22.43	5.13	10.19
02/02/2011	13h 07m 17.62s	-04° 23' 06.5"	9.594686	9.128073	75.92	115.6	18.1	16.2	0.6	5.3	41.1	7.3	10.2	22.39	5.09	10.15
03/02/2011	13h 07m 15.16s	-04° 22' 33.4"	9.594985	9.113155	75.79	116.6	18.2	16.2	0.6	5.3	41.2	7.3	10.2	22.34	5.05	10.11
04/02/2011	13h 07m 12.30s	-04° 21' 58.1"	9.595283	9.098371	75.67	117.6	18.2	16.2	0.6	5.2	41.3	7.3	10.2	22.30	5.01	10.07
05/02/2011	13h 07m 09.04s	-04° 21' 20.4"	9.595582	9.083726	75.55	118.7	18.2	16.3	0.6	5.2	41.3	7.3	10.2	22.26	4.97	10.03
06/02/2011	13h 07m 05.40s	-04° 20' 40.3"	9.595881	9.069227	75.43	119.7	18.2	16.3	0.6	5.1	41.4	7.3	10.2	22.22	4.93	9.59
07/02/2011	13h 07m 01.36s	-04° 19' 58.0"	9.596180	9.054877	75.31	120.7	18.3	16.3	0.6	5.1	41.5	7.3	10.2	22.18	4.89	9.55
08/02/2011	13h 06m 56.94s	-04° 19' 13.4"	9.596479	9.040682	75.19	121.8	18.3	16.3	0.6	5.0	41.5	7.3	10.2	22.14	4.85	9.51
09/02/2011	13h 06m 52.14s	-04° 18' 26.6"	9.596777	9.026647	75.07	122.8	18.3	16.4	0.6	5.0	41.6	7.3	10.2	22.10	4.81	9.48
10/02/2011	13h 06m 46.96s	-04° 17' 37.6"	9.597076	9.012777	74.96	123.8	18.4	16.4	0.6	4.9	41.6	7.3	10.1	22.06	4.77	9.44
11/02/2011	13h 06m 41.40s	-04° 16' 46.4"	9.597375	8.999076	74.84	124.9	18.4	16.4	0.6	4.8	41.7	7.3	10.1	22.02	4.73	9.40
12/02/2011	13h 06m 35.47s	-04° 15' 53.0"	9.597673	8.985548	74.73	125.9	18.4	16.4	0.6	4.8	41.8	7.3	10.1	21.58	4.69	9.36
13/02/2011	13h 06m 29.18s	-04° 14' 57.6"	9.597972	8.972200	74.62	126.9	18.4	16.5	0.6	4.7	41.8	7.3	10.1	21.54	4.65	9.32
14/02/2011	13h 06m 22.52s	-04° 14' 00.1"	9.598270	8.959034	74.51	128.0	18.5	16.5	0.6	4.7	41.9	7.3	10.1	21.50	4.61	9.28
15/02/2011	13h 06m 15.50s	-04° 13' 00.4"	9.598569	8.946055	74.40	129.0	18.5	16.5	0.6	4.6	42.0	7.3	10.1	21.46	4.57	9.24
16/02/2011	13h 06m 08.12s	-04° 11' 58.8"	9.598867	8.933268	74.30	130.1	18.5	16.5	0.6	4.5	42.0	7.3	10.0	21.42	4.53	9.20
17/02/2011	13h 06m 00.38s	-04° 10' 55.0"	9.599166	8.920676	74.19	131.1	18.6	16.6	0.6	4.4	42.1	7.3	10.0	21.37	4.49	9.16
18/02/2011	13h 05m 52.29s	-04° 09' 49.3"	9.599464	8.908283	74.09	132.2	18.6	16.6	0.5	4.4	42.1	7.3	10.0	21.33	4.45	9.12
19/02/2011	13h 05m 43.84s	-04° 08' 41.6"	9.599763	8.896093	73.99	133.2	18.6	16.6	0.5	4.3	42.2	7.3	10.0	21.29	4.41	9.08
20/02/2011	13h 05m 35.05s	-04° 07' 31.9"	9.600061	8.884111	73.89	134.2	18.6	16.6	0.5	4.2	42.2	7.3	10.0	21.25	4.37	9.04
21/02/2011	13h 05m 25.93s	-04° 06' 20.3"	9.600359	8.872339	73.79	135.3	18.7	16.6	0.5	4.2	42.3	7.3	9.9	21.21	4.33	9.00
22/02/2011	13h 05m 16.47s	-04° 05' 06.9"	9.600658	8.860783	73.69	136.3	18.7	16.7	0.5	4.1	42.4	7.3	9.9	21.17	4.29	8.56
23/02/2011	13h 05m 06.68s	-04° 03' 51.6"	9.600956	8.849446	73.60	137.4	18.7	16.7	0.5	4.0	42.4	7.3	9.9	21.12	4.25	8.52
24/02/2011	13h 04m 56.57s	-04° 02' 34.5"	9.601254	8.838333	73.51	138.4	18.7	16.7	0.5	3.9	42.5	7.3	9.9	21.08	4.21	8.48
25/02/2011	13h 04m 46.14s	-04° 01' 15.6"	9.601553	8.827447	73.42	139.5	18.7	16.7	0.5	3.8	42.5	7.3	9.9	21.04	4.17	8.44
26/02/2011	13h 04m 35.39s	-03° 59' 55.1"	9.601851	8.816794	73.33	140.6	18.8	16.8	0.5	3.8	42.6	7.3	9.8	21.00	4.13	8.39
27/02/2011	13h 04m 24.34s	-03° 58' 32.8"	9.602149	8.806377	73.24	141.6	18.8	16.8	0.5	3.7	42.6	7.3	9.8	20.56	4.08	8.35
28/02/2011	13h 04m 12.98s	-03° 57' 08.9"	9.602447	8.796199	73.16	142.7	18.8	16.8	0.5	3.6	42.7	7.2	9.8	20.51	4.04	8.31
01/03/2011	13h 04m 01.32s	-03° 55' 43.4"	9.602745	8.786266	73.07	143.7	18.8	16.8	0.5	3.5	42.7	7.2	9.8	20.47	4.00	8.27
02/03/2011	13h 03m 49.36s	-03° 54' 16.2"	9.603043	8.776582	72.99	144.8	18.9	16.8	0.5	3.4	42.8	7.2	9.7	20.43	3.96	8.23
03/03/2011	13h 03m 37.11s	-03° 52' 47.6"	9.603342	8.767149	72.91	145.8	18.9	16.8	0.5	3.3	42.8	7.2	9.7	20.39	3.92	8.19
04/03/2011	13h 03m 24.58s	-03° 51' 17.4"	9.603640	8.757972	72.84	146.9	18.9	16.9	0.5	3.2	42.9	7.2	9.7	20.35	3.88	8.15
05/03/2011	13h 03m 11.78s	-03° 49' 45.8"	9.603938	8.749053	72.76	147.9	18.9	16.9	0.5	3.1	42.9	7.2	9.6	20.30	3.84	8.11



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.°	Diam. Pol.°	Mag.	Phase angle°	Max °	Min °	B °	Rise	Trans.	Set.
09/04/2011	12h 53m 54.71s	-02° 48' 12.9"	9.614349	8.617879	71.67	174.0	19.2	17.1	0.4	0.6	43.6	6.4	8.5	18.00	23.52	5.48
10/04/2011	12h 53m 37.62s	-02° 46' 26.1"	9.614646	8.619589	71.69	173.1	19.2	17.1	0.4	0.7	43.5	6.4	8.5	17.55	23.48	5.44
11/04/2011	12h 53m 20.58s	-02° 44' 39.9"	9.614943	8.621605	71.70	172.1	19.2	17.1	0.4	0.8	43.5	6.4	8.4	17.51	23.43	5.40
12/04/2011	12h 53m 03.60s	-02° 42' 54.4"	9.615240	8.623925	71.72	171.1	19.2	17.1	0.4	0.9	43.5	6.4	8.4	17.47	23.39	5.36
13/04/2011	12h 52m 46.68s	-02° 41' 09.7"	9.615537	8.626548	71.74	170.1	19.2	17.1	0.4	1.0	43.5	6.3	8.4	17.43	23.35	5.32
14/04/2011	12h 52m 29.83s	-02° 39' 25.8"	9.615834	8.629472	71.77	169.0	19.2	17.1	0.4	1.1	43.5	6.3	8.3	17.38	23.31	5.27
15/04/2011	12h 52m 13.07s	-02° 37' 42.7"	9.616130	8.632695	71.80	168.0	19.2	17.1	0.4	1.2	43.5	6.3	8.3	17.34	23.27	5.23
16/04/2011	12h 51m 56.40s	-02° 36' 00.6"	9.616427	8.636216	71.83	167.0	19.2	17.1	0.4	1.3	43.5	6.3	8.3	17.30	23.22	5.19
17/04/2011	12h 51m 39.83s	-02° 34' 19.4"	9.616724	8.640033	71.86	166.0	19.2	17.1	0.4	1.5	43.4	6.2	8.2	17.25	23.18	5.15
18/04/2011	12h 51m 23.37s	-02° 32' 39.2"	9.617020	8.644145	71.89	164.9	19.1	17.1	0.4	1.6	43.4	6.2	8.2	17.21	23.14	5.11
19/04/2011	12h 51m 07.04s	-02° 31' 00.1"	9.617317	8.648550	71.93	163.9	19.1	17.1	0.4	1.7	43.4	6.2	8.2	17.17	23.10	5.07
20/04/2011	12h 50m 50.83s	-02° 29' 22.1"	9.617614	8.653246	71.97	162.9	19.1	17.1	0.4	1.8	43.4	6.1	8.1	17.12	23.06	5.03
21/04/2011	12h 50m 34.76s	-02° 27' 45.4"	9.617910	8.658231	72.01	161.8	19.1	17.1	0.4	1.9	43.4	6.1	8.1	17.08	23.01	4.99
22/04/2011	12h 50m 18.83s	-02° 26' 09.8"	9.618207	8.663504	72.05	160.8	19.1	17.0	0.5	2.0	43.3	6.1	8.1	17.04	22.97	4.95
23/04/2011	12h 50m 03.06s	-02° 24' 35.5"	9.618503	8.669064	72.10	159.8	19.1	17.0	0.5	2.1	43.3	6.1	8.1	17.00	22.93	4.91
24/04/2011	12h 49m 47.43s	-02° 23' 02.6"	9.618800	8.674908	72.15	158.7	19.1	17.0	0.5	2.2	43.3	6.0	8.0	16.55	22.89	4.86
25/04/2011	12h 49m 31.97s	-02° 21' 30.9"	9.619096	8.681035	72.20	157.7	19.1	17.0	0.5	2.3	43.2	6.0	8.0	16.51	22.85	4.82
26/04/2011	12h 49m 16.68s	-02° 20' 00.7"	9.619392	8.687442	72.25	156.7	19.1	17.0	0.5	2.4	43.2	6.0	8.0	16.47	22.80	4.78
27/04/2011	12h 49m 01.57s	-02° 18' 31.9"	9.619689	8.694127	72.31	155.6	19.0	17.0	0.5	2.5	43.2	6.0	7.9	16.42	22.76	4.74
28/04/2011	12h 48m 46.65s	-02° 17' 04.6"	9.619985	8.701089	72.36	154.6	19.0	17.0	0.5	2.6	43.1	5.9	7.9	16.38	22.72	4.70
29/04/2011	12h 48m 31.92s	-02° 15' 38.8"	9.620281	8.708323	72.42	153.6	19.0	17.0	0.5	2.7	43.1	5.9	7.9	16.34	22.68	4.66
30/04/2011	12h 48m 17.40s	-02° 14' 14.6"	9.620578	8.715829	72.49	152.5	19.0	16.9	0.5	2.8	43.1	5.9	7.9	16.30	22.64	4.62
01/05/2011	12h 48m 03.09s	-02° 12' 52.0"	9.620874	8.723602	72.55	151.5	19.0	16.9	0.5	2.9	43.0	5.9	7.8	16.25	22.60	4.58
02/05/2011	12h 47m 49.00s	-02° 11' 31.2"	9.621170	8.731641	72.62	150.5	19.0	16.9	0.5	3.0	43.0	5.8	7.8	16.21	22.55	4.54
03/05/2011	12h 47m 35.14s	-02° 10' 12.1"	9.621466	8.739942	72.69	149.4	18.9	16.9	0.5	3.1	42.9	5.8	7.8	16.17	22.51	4.50
04/05/2011	12h 47m 21.51s	-02° 08' 54.7"	9.621762	8.748502	72.76	148.4	18.9	16.9	0.5	3.1	42.9	5.8	7.8	16.13	22.47	4.46
05/05/2011	12h 47m 08.13s	-02° 07' 39.2"	9.622058	8.757317	72.83	147.4	18.9	16.9	0.5	3.2	42.9	5.8	7.7	16.08	22.43	4.41
06/05/2011	12h 46m 55.00s	-02° 06' 25.5"	9.622354	8.766385	72.91	146.4	18.9	16.8	0.6	3.3	42.8	5.7	7.7	16.04	22.39	4.37
07/05/2011	12h 46m 42.13s	-02° 05' 13.7"	9.622651	8.775701	72.99	145.3	18.9	16.8	0.6	3.4	42.8	5.7	7.7	16.00	22.35	4.33
08/05/2011	12h 46m 29.51s	-02° 04' 03.9"	9.622946	8.785262	73.06	144.3	18.8	16.8	0.6	3.5	42.7	5.7	7.7	15.56	22.31	4.29
09/05/2011	12h 46m 17.16s	-02° 02' 55.9"	9.623242	8.795064	73.15	143.3	18.8	16.8	0.6	3.6	42.7	5.7	7.6	15.52	22.26	4.25
10/05/2011	12h 46m 05.08s	-02° 01' 50.0"	9.623538	8.805103	73.23	142.3	18.8	16.8	0.6	3.7	42.6	5.7	7.6	15.47	22.22	4.21
11/05/2011	12h 45m 53.28s	-02° 00' 46.0"	9.623834	8.815375	73.32	141.3	18.8	16.8	0.6	3.8	42.6	5.6	7.6	15.43	22.18	4.17
12/05/2011	12h 45m 41.76s	-01° 59' 44.0"	9.624130	8.825876	73.40	140.2	18.8	16.7	0.6	3.8	42.5	5.6	7.6	15.39	22.14	4.13
13/05/2011	12h 45m 30.52s	-01° 58' 44.1"	9.624426	8.836603	73.49	139.2	18.7	16.7	0.6	3.9	42.5	5.6	7.6	15.35	22.10	4.09
14/05/2011	12h 45m 19.58s	-01° 57' 46.3"	9.624722	8.847551	73.58	138.2	18.7	16.7	0.6	4.0	42.4	5.6	7.5	15.31	22.06	4.05
15/05/2011	12h 45m 08.93s	-01° 56' 50.5"	9.625017	8.858716	73.68	137.2	18.7	16.7	0.6	4.1	42.4	5.5	7.5	15.27	22.02	4.01
16/05/2011	12h 44m 58.59s	-01° 55' 56.9"	9.625313	8.870094	73.77	136.2	18.7	16.6	0.6	4.2	42.3	5.5	7.5	15.22	21.98	3.97
17/05/2011	12h 44m 48.55s	-01° 55' 05.5"	9.625609	8.881682	73.87	135.2	18.6	16.6	0.6	4.2	42.3	5.5	7.5	15.18	21.93	3.93
18/05/2011	12h 44m 38.83s	-01° 54' 16.2"	9.625905	8.893476	73.96	134.2	18.6	16.6	0.6	4.3	42.2	5.5	7.5	15.14	21.89	3.89
19/05/2011	12h 44m 29.42s	-01° 53' 29.2"	9.626200	8.905473	74.06	133.2	18.6	16.6	0.6	4.4	42.1	5.5	7.5	15.10	21.85	3.85
20/05/2011	12h 44m 20.34s	-01° 52' 44.3"	9.626496	8.917667	74.17	132.2	18.6	16.6	0.6	4.5	42.1	5.5	7.4	15.06	21.81	3.81
21/05/2011	12h 44m 11.56s	-01° 52' 01.7"	9.626791	8.930057	74.27	131.2	18.5	16.5	0.7	4.5	42.0	5.4	7.4	15.02	21.77	3.77
22/05/2011	12h 44m 03.11s	-01° 51' 21.3"	9.627087	8.942638	74.37	130.2	18.5	16.5	0.7	4.6	42.0	5.4	7.4	14.58	21.73	3.73
23/05/2011	12h 43m 54.99s	-01° 50' 43.2"	9.627382	8.955406	74.48	129.2	18.5	16.5	0.7	4.7	41.9	5.4	7.4	14.54	21.69	3.69
24/05/2011	12h 43m 47.19s	-01° 50' 07.3"	9.627678	8.968357	74.59	128.2	18.5	16.5	0.7	4.7	41.9	5.4	7.4	14.49	21.65	3.65
25/05/2011	12h 43m 39.73s	-01° 49' 33.8"	9.627973	8.981488	74.70	127.2	18.4	16.4	0.7	4.8	41.8	5.4	7.4	14.45	21.61	3.61
26/05/2011	12h 43m 32.60s	-01° 49' 02.5"	9.628269	8.994795	74.81	126.2	18.4	16.4	0.7	4.9	41.7	5.4	7.4	14.41	21.57	3.57
27/05/2011	12h 43m 25.82s	-01° 48' 33.5"	9.628564	9.008272	74.92	125.2	18.4	16.4	0.7	4.9	41.7	5.3	7.4	14.37	21.53	3.53
28/05/2011	12h 43m 19.38s	-01° 48' 06.9"	9.628859	9.021917	75.03	124.3	18.3	16.4	0.7	5.0	41.6	5.3	7.4	14.33	21.49	3.49
29/05/2011	12h 43m 13.29s	-01° 47' 42.7"	9.629154	9.035723	75.15	123.3	18.3	16.3	0.7	5.0	41.5	5.3	7.3	14.29	21.45	3.45
30/05/2011	12h 43m 07.55s	-01° 47' 20.8"	9.629450	9.049688	75.26	122.3	18.3	16.3	0.7	5.1	41.5	5.3	7.3	14.25	21.41	3.41
31/05/2011	12h 43m 02.17s	-01° 47' 01.4"	9.629745	9.063807	75.38	121.3	18.3	16.3	0.7	5.2	41.4	5.3	7.3	14.21	21.37	3.37
01/06/2011	12h 42m 57.15s	-01° 46' 44.3"	9.630040	9.078075	75.50	120.3	18.2	16.3	0.7	5.2	41.3	5.3	7.3	14.17	21.33	3.33
02/06/2011	12h 42m 52.49s	-01° 46' 29.7"	9.630335	9.092487	75.62	119.4	18.2	16.2	0.7	5.3	41.3	5.3	7.3	14.13	21.29	3.29
03/06/2011	12h 42m 48.19s	-01° 46' 17.5"	9.630630	9.107039	75.74	118.4	18.2	16.2	0.7	5.3	41.2	5.2	7.3	14.09	21.25	3.25
04/06/2011	12h 42m 44.26s	-01° 46' 07.7"	9.630925	9.121725	75.86	117.4	18.1	16.2	0.7	5.4	41.1	5.2	7.3	14.05	21.21	3.21
05/06/2011	12h 42m 40.69s	-01° 46' 00.4"	9.631220	9.136542	75.99	116.4	18.1	16.2	0.7	5.4	41.1	5.2	7.3	14.01	21.17	3.17
06/06/2011	12h 42m 37.48s	-01° 45' 55.4"	9.631515	9.151483	76.11	115.5	18.1	16.1	0.8	5.5	41.0	5.2	7.3	13.57	21.53	3.13
07/06/2011	12h 42m 34.63s	-01° 45' 52.9"	9.631810	9.166545	76.24	114.5	18.1	16.1	0.8	5.5	40.9	5.2	7.3	13.53	21.49	3.09
08/06/2011	12h 42m 32.16s	-01° 45' 52.8"	9.632105	9.181722	76.36	113.5	18.0	16.1	0.8	5.5	40.9	5.2	7.3	13.49	21.45	3.05
09/06/2011	12h 42m 30.04s	-01° 45' 55.0"	9.632400	9.197010	76.49	112.6	18.0	16.1	0.8	5.6	40.8	5.2	7.3	13.45	21.41	3.01
10/06/2011	12h 42m 28.30s	-01° 45' 59.7"	9.632695	9.212403	76.62	111.6	18.0	16.0	0.8	5.6	40.7	5.2	7.3	13.41	21.37	2.97
11/06/2011	12h 42m 26.93s	-01° 46' 06.8"	9.632990	9.227897	76.75	110.7	17.9	16.0	0.8	5.7	40.7	5.2	7.3	13.37	21.33	2.93
12/06/2011	12h 42m 25.92s	-0														

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq."	Diam. Pol."	Mag.	Phase angle°	Max "	Min "	B "	Rise	Trans.	Set.
22/07/2011	12h 46m 41.64s	-02° 23' 48.3"	9.645045	9.896438	82.31	72.8	16.7	14.9	0.9	5.8	37.9	5.3	8.0	11.03	16.56	22.50
23/07/2011	12h 46m 54.98s	-02° 25' 27.1"	9.645338	9.912271	82.44	71.9	16.7	14.9	0.9	5.7	37.9	5.3	8.0	10.59	16.52	22.46
24/07/2011	12h 47m 08.63s	-02° 27' 07.8"	9.645631	9.928025	82.57	71.0	16.7	14.9	0.9	5.7	37.8	5.3	8.1	10.55	16.49	22.42
25/07/2011	12h 47m 22.59s	-02° 28' 50.3"	9.645924	9.943697	82.70	70.1	16.6	14.9	0.9	5.7	37.7	5.3	8.1	10.52	16.45	22.38
26/07/2011	12h 47m 36.85s	-02° 30' 34.5"	9.646217	9.959282	82.83	69.2	16.6	14.8	0.9	5.7	37.7	5.3	8.1	10.48	16.41	22.34
27/07/2011	12h 47m 51.42s	-02° 32' 20.5"	9.646510	9.974777	82.96	68.4	16.6	14.8	0.9	5.6	37.6	5.3	8.2	10.45	16.38	22.31
28/07/2011	12h 48m 06.28s	-02° 34' 08.3"	9.646803	9.990177	83.09	67.5	16.6	14.8	0.9	5.6	37.6	5.3	8.2	10.41	16.34	22.27
29/07/2011	12h 48m 21.44s	-02° 35' 57.8"	9.647096	10.005480	83.21	66.6	16.5	14.8	0.9	5.5	37.5	5.4	8.2	10.37	16.30	22.23
30/07/2011	12h 48m 36.89s	-02° 37' 48.9"	9.647389	10.020681	83.34	65.7	16.5	14.7	0.9	5.5	37.5	5.4	8.3	10.34	16.27	22.19
31/07/2011	12h 48m 52.63s	-02° 39' 41.7"	9.647682	10.035775	83.47	64.8	16.5	14.7	0.9	5.5	37.4	5.4	8.3	10.30	16.23	22.15
01/08/2011	12h 49m 08.65s	-02° 41' 36.1"	9.647975	10.050760	83.59	63.9	16.5	14.7	0.9	5.4	37.3	5.4	8.3	10.27	16.19	22.12
02/08/2011	12h 49m 24.95s	-02° 43' 32.1"	9.648267	10.065632	83.71	63.1	16.4	14.7	0.9	5.4	37.3	5.4	8.4	10.23	16.16	22.08
03/08/2011	12h 49m 41.53s	-02° 45' 29.7"	9.648560	10.080386	83.84	62.2	16.4	14.7	0.9	5.3	37.2	5.4	8.4	10.20	16.12	22.04
04/08/2011	12h 49m 58.38s	-02° 47' 28.8"	9.648853	10.095020	83.96	61.3	16.4	14.6	0.9	5.3	37.2	5.5	8.4	10.16	16.08	22.00
05/08/2011	12h 50m 15.50s	-02° 49' 29.5"	9.649145	10.109529	84.08	60.4	16.4	14.6	0.9	5.2	37.1	5.5	8.5	10.13	16.05	21.57
06/08/2011	12h 50m 32.90s	-02° 51' 31.6"	9.649438	10.123911	84.20	59.5	16.3	14.6	0.9	5.2	37.1	5.5	8.5	10.09	16.01	21.53
07/08/2011	12h 50m 50.56s	-02° 53' 35.3"	9.649731	10.138163	84.32	58.7	16.3	14.6	0.9	5.2	37.0	5.5	8.5	10.06	15.57	21.49
08/08/2011	12h 51m 08.49s	-02° 55' 40.4"	9.650023	10.152281	84.43	57.8	16.3	14.5	0.9	5.1	37.0	5.5	8.6	10.02	15.54	21.45
09/08/2011	12h 51m 26.67s	-02° 57' 47.0"	9.650316	10.166263	84.55	56.9	16.3	14.5	0.9	5.1	36.9	5.5	8.6	9.59	15.50	21.42
10/08/2011	12h 51m 45.11s	-02° 59' 55.0"	9.650608	10.180105	84.67	56.0	16.3	14.5	0.9	5.0	36.9	5.6	8.7	9.55	15.46	21.38
11/08/2011	12h 52m 03.80s	-03° 02' 04.3"	9.650900	10.193806	84.78	55.2	16.2	14.5	0.9	4.9	36.8	5.6	8.7	9.52	15.43	21.34
12/08/2011	12h 52m 22.73s	-03° 04' 15.0"	9.651193	10.207362	84.89	54.3	16.2	14.5	0.9	4.9	36.8	5.6	8.7	9.48	15.39	21.30
13/08/2011	12h 52m 41.90s	-03° 06' 27.0"	9.651485	10.220772	85.00	53.4	16.2	14.5	0.9	4.8	36.7	5.6	8.8	9.45	15.36	21.27
14/08/2011	12h 53m 01.31s	-03° 08' 40.2"	9.651777	10.234031	85.11	52.6	16.2	14.4	0.9	4.8	36.7	5.6	8.8	9.41	15.32	21.23
15/08/2011	12h 53m 20.95s	-03° 10' 54.8"	9.652070	10.247138	85.22	51.7	16.2	14.4	0.9	4.7	36.6	5.6	8.9	9.38	15.28	21.19
16/08/2011	12h 53m 40.83s	-03° 13' 10.6"	9.652362	10.260089	85.33	50.8	16.1	14.4	0.9	4.7	36.6	5.7	8.9	9.34	15.25	21.15
17/08/2011	12h 54m 00.94s	-03° 15' 27.6"	9.652654	10.272883	85.44	50.0	16.1	14.4	0.9	4.6	36.5	5.7	9.0	9.31	15.21	21.12
18/08/2011	12h 54m 21.27s	-03° 17' 45.8"	9.652946	10.285516	85.54	49.1	16.1	14.4	0.9	4.5	36.5	5.7	9.0	9.27	15.18	21.08
19/08/2011	12h 54m 41.83s	-03° 20' 05.2"	9.653238	10.297986	85.65	48.2	16.1	14.3	0.9	4.5	36.4	5.7	9.0	9.24	15.14	21.04
20/08/2011	12h 55m 02.61s	-03° 22' 25.8"	9.653530	10.310289	85.75	47.4	16.1	14.3	0.9	4.4	36.4	5.7	9.1	9.20	15.10	21.00
21/08/2011	12h 55m 23.62s	-03° 24' 47.5"	9.653822	10.322424	85.85	46.5	16.0	14.3	0.9	4.4	36.4	5.8	9.1	9.17	15.07	20.57
22/08/2011	12h 55m 44.84s	-03° 27' 10.4"	9.654114	10.334387	85.95	45.6	16.0	14.3	0.9	4.3	36.3	5.8	9.2	9.14	15.03	20.53
23/08/2011	12h 56m 06.27s	-03° 29' 34.3"	9.654406	10.346175	86.05	44.8	16.0	14.3	0.9	4.2	36.3	5.8	9.2	9.10	15.00	20.49
24/08/2011	12h 56m 27.92s	-03° 31' 59.4"	9.654698	10.357786	86.14	43.9	16.0	14.3	0.9	4.2	36.2	5.8	9.3	9.07	14.56	20.46
25/08/2011	12h 56m 49.77s	-03° 34' 25.5"	9.654989	10.369217	86.24	43.0	16.0	14.2	0.9	4.1	36.2	5.9	9.3	9.03	14.53	20.42
26/08/2011	12h 57m 11.83s	-03° 36' 52.6"	9.655281	10.380465	86.33	42.2	15.9	14.2	0.9	4.0	36.2	5.9	9.3	9.00	14.49	20.38
27/08/2011	12h 57m 34.08s	-03° 39' 20.7"	9.655573	10.391527	86.42	41.3	15.9	14.2	0.9	4.0	36.1	5.9	9.4	8.56	14.45	20.34
28/08/2011	12h 57m 56.52s	-03° 41' 49.7"	9.655864	10.402401	86.51	40.5	15.9	14.2	0.9	3.9	36.1	5.9	9.4	8.53	14.42	20.31
29/08/2011	12h 58m 19.15s	-03° 44' 19.7"	9.656156	10.413083	86.60	39.6	15.9	14.2	0.9	3.8	36.0	5.9	9.5	8.50	14.38	20.27
30/08/2011	12h 58m 41.96s	-03° 46' 50.5"	9.656448	10.423571	86.69	38.7	15.9	14.2	0.9	3.8	36.0	6.0	9.5	8.46	14.35	20.23
31/08/2011	12h 59m 04.96s	-03° 49' 22.3"	9.656739	10.433862	86.78	37.9	15.9	14.2	0.9	3.7	36.0	6.0	9.6	8.43	14.31	20.20
01/09/2011	12h 59m 28.14s	-03° 51' 54.8"	9.657031	10.443954	86.86	37.0	15.8	14.1	0.9	3.6	35.9	6.0	9.6	8.39	14.28	20.16
02/09/2011	12h 59m 51.50s	-03° 54' 28.2"	9.657322	10.453845	86.94	36.1	15.8	14.1	0.9	3.5	35.9	6.0	9.7	8.36	14.24	20.12
03/09/2011	13h 00m 15.03s	-03° 57' 02.4"	9.657613	10.463532	87.02	35.3	15.8	14.1	0.9	3.5	35.9	6.1	9.7	8.33	14.21	20.09
04/09/2011	13h 00m 38.73s	-03° 59' 37.4"	9.657905	10.473014	87.10	34.4	15.8	14.1	0.9	3.4	35.8	6.1	9.8	8.29	14.17	20.05
05/09/2011	13h 01m 02.59s	-04° 02' 13.2"	9.658196	10.482289	87.18	33.6	15.8	14.1	0.9	3.3	35.8	6.1	9.8	8.26	14.14	20.01
06/09/2011	13h 01m 26.62s	-04° 04' 49.6"	9.658487	10.491355	87.25	32.7	15.8	14.1	0.9	3.2	35.8	6.1	9.9	8.23	14.10	19.57
07/09/2011	13h 01m 50.80s	-04° 07' 26.8"	9.658778	10.500210	87.33	31.9	15.8	14.1	0.9	3.2	35.7	6.2	9.9	8.19	14.07	19.54
08/09/2011	13h 02m 15.12s	-04° 10' 04.6"	9.659070	10.508854	87.40	31.0	15.7	14.1	0.9	3.1	35.7	6.2	10.0	8.16	14.03	19.50
09/09/2011	13h 02m 39.60s	-04° 12' 43.0"	9.659361	10.517284	87.47	30.1	15.7	14.0	0.9	3.0	35.7	6.2	10.0	8.12	13.59	19.46
10/09/2011	13h 03m 04.21s	-04° 15' 22.0"	9.659652	10.525498	87.54	29.3	15.7	14.0	0.9	2.9	35.7	6.2	10.1	8.09	13.56	19.43
11/09/2011	13h 03m 28.96s	-04° 18' 01.6"	9.659943	10.533496	87.60	28.4	15.7	14.0	0.8	2.8	35.6	6.3	10.1	8.06	13.52	19.39
12/09/2011	13h 03m 53.85s	-04° 20' 41.7"	9.660234	10.541276	87.67	27.6	15.7	14.0	0.8	2.8	35.6	6.3	10.2	8.02	13.49	19.35
13/09/2011	13h 04m 18.87s	-04° 23' 22.4"	9.660525	10.548836	87.73	26.7	15.7	14.0	0.8	2.7	35.6	6.3	10.2	7.59	13.45	19.32
14/09/2011	13h 04m 44.02s	-04° 26' 03.5"	9.660816	10.556174	87.79	25.9	15.7	14.0	0.8	2.6	35.6	6.3	10.3	7.56	13.42	19.28
15/09/2011	13h 05m 09.30s	-04° 28' 45.2"	9.661106	10.563289	87.85	25.0	15.7	14.0	0.8	2.5	35.5	6.4	10.3	7.52	13.38	19.24
16/09/2011	13h 05m 34.70s	-04° 31' 27.3"	9.661397	10.570180	87.91	24.2	15.7	14.0	0.8	2.4	35.5	6.4	10.4	7.49	13.35	19.21
17/09/2011	13h 06m 00.23s	-04° 34' 09.9"	9.661688	10.576845	87.96	23.3	15.6	14.0	0.8	2.4	35.5	6.4	10.4	7.46	13.31	19.17
18/09/2011	13h 06m 25.88s	-04° 36' 52.9"	9.661979	10.583282	88.02	22.4	15.6	14.0	0.8	2.3	35.5	6.4	10.5	7.42	13.28	19.13
19/09/2011	13h 06m 51.64s	-04° 39' 36.3"	9.662269	10.589489	88.07	21.6	15.6	13.9	0.8	2.2	35.4	6.5	10.5	7.39	13.24	19.10
20/09/2011	13h 07m 17.51s	-04° 42' 20.1"	9.662560	10.595466	88.12	20.7	15.6	13.9	0.8	2.1	35.4	6.5	10.6	7.36	13.21	19.06
21/09/2011	13h 07m 43.49s	-04° 45' 04.3"	9.662850	10.601210	88.17	19.9	15.6	13.9	0.8	2.0	35.4	6.5	10.6	7.32	13.17	19.02
22/09/2011	13h 08m 09.57s	-04° 47' 48.7"	9.663141	10.606719	88.21	19.0	15.6	13.9	0.8	1.9	35.4	6.5	10.7	7.29	13.14	18.59
23/09/2011	13h 08m 35.75s	-04° 50' 33.5"	9.663431	10.611993	88.26	18.2	15.6	13.9	0.8	1.9	35.4	6.6	10.7	7.26	13.10	18.55
24/09/2011																



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq."	Diam. Pol."	Mag.	Phase angle°	Max "	Min "	B °	Rise	Trans.	Set.
03/11/2011	13h 27m 03.67s	-06° 41' 46.1"	9,675298	10,615590	88,29	17,7	15,6	13,9	0,7	1,8	35,4	7,8	12,8	5,09	10,47	16,25
04/11/2011	13h 27m 30.30s	-06° 44' 19.1"	9,675586	10,610440	88,24	18,6	15,6	13,9	0,7	1,9	35,4	7,8	12,8	5,06	10,44	16,22
05/11/2011	13h 27m 56.86s	-06° 46' 51.3"	9,675875	10,605047	88,20	19,5	15,6	13,9	0,7	2,0	35,4	7,9	12,9	5,03	10,41	16,18
06/11/2011	13h 28m 23.32s	-06° 49' 22.6"	9,676163	10,599413	88,15	20,4	15,6	13,9	0,7	2,0	35,4	7,9	12,9	4,59	10,37	16,15
07/11/2011	13h 28m 49.70s	-06° 51' 53.0"	9,676451	10,593539	88,10	21,3	15,6	13,9	0,7	2,1	35,4	7,9	12,9	4,56	10,34	16,11
08/11/2011	13h 29m 15.98s	-06° 54' 22.6"	9,676739	10,587427	88,05	22,1	15,6	13,9	0,7	2,2	35,5	8,0	13,0	4,53	10,30	16,07
09/11/2011	13h 29m 42.17s	-06° 56' 51.2"	9,677028	10,581077	88,00	23,0	15,6	14,0	0,7	2,3	35,5	8,0	13,0	4,49	10,27	16,04
10/11/2011	13h 30m 08.27s	-06° 59' 18.9"	9,677316	10,574491	87,95	23,9	15,7	14,0	0,7	2,4	35,5	8,0	13,1	4,46	10,23	16,00
11/11/2011	13h 30m 34.26s	-07° 01' 45.6"	9,677604	10,567671	87,89	24,8	15,7	14,0	0,7	2,5	35,5	8,1	13,1	4,43	10,20	15,56
12/11/2011	13h 31m 00.14s	-07° 04' 11.3"	9,677892	10,560617	87,83	25,7	15,7	14,0	0,7	2,5	35,5	8,1	13,2	4,39	10,16	15,53
13/11/2011	13h 31m 25.91s	-07° 06' 36.1"	9,678180	10,553330	87,77	26,6	15,7	14,0	0,7	2,6	35,6	8,1	13,2	4,36	10,13	15,49
14/11/2011	13h 31m 51.57s	-07° 08' 59.8"	9,678468	10,545813	87,71	27,5	15,7	14,0	0,7	2,7	35,6	8,2	13,3	4,33	10,09	15,45
15/11/2011	13h 32m 17.10s	-07° 11' 22.5"	9,678755	10,538066	87,64	28,3	15,7	14,0	0,7	2,8	35,6	8,2	13,3	4,29	10,06	15,42
16/11/2011	13h 32m 42.51s	-07° 13' 44.1"	9,679043	10,530091	87,58	29,2	15,7	14,0	0,7	2,9	35,6	8,2	13,3	4,26	10,02	15,38
17/11/2011	13h 33m 07.79s	-07° 16' 04.6"	9,679331	10,521888	87,51	30,1	15,7	14,0	0,7	2,9	35,7	8,3	13,4	4,22	9,58	15,34
18/11/2011	13h 33m 32.93s	-07° 18' 23.9"	9,679619	10,513461	87,44	31,0	15,7	14,0	0,7	3,0	35,7	8,3	13,4	4,19	9,55	15,31
19/11/2011	13h 33m 57.93s	-07° 20' 42.1"	9,679906	10,504809	87,37	31,9	15,8	14,1	0,7	3,1	35,7	8,3	13,5	4,16	9,51	15,27
20/11/2011	13h 34m 22.79s	-07° 22' 59.1"	9,680194	10,495934	87,29	32,8	15,8	14,1	0,7	3,2	35,8	8,4	13,5	4,12	9,48	15,23
21/11/2011	13h 34m 47.49s	-07° 25' 14.8"	9,680481	10,486838	87,22	33,7	15,8	14,1	0,7	3,2	35,8	8,4	13,6	4,09	9,44	15,20
22/11/2011	13h 35m 12.05s	-07° 27' 29.3"	9,680769	10,477523	87,14	34,6	15,8	14,1	0,7	3,3	35,8	8,4	13,6	4,06	9,41	15,16
23/11/2011	13h 35m 36.44s	-07° 29' 42.6"	9,681056	10,467990	87,06	35,5	15,8	14,1	0,7	3,4	35,9	8,5	13,6	4,02	9,37	15,12
24/11/2011	13h 36m 00.68s	-07° 31' 54.6"	9,681344	10,458242	86,98	36,4	15,8	14,1	0,7	3,5	35,9	8,5	13,7	3,59	9,34	15,09
25/11/2011	13h 36m 24.76s	-07° 34' 05.3"	9,681631	10,448281	86,90	37,3	15,8	14,1	0,7	3,5	35,9	8,5	13,7	3,55	9,30	15,05
26/11/2011	13h 36m 48.66s	-07° 36' 14.7"	9,681918	10,438109	86,81	38,2	15,9	14,1	0,7	3,6	36,0	8,5	13,8	3,52	9,27	15,01
27/11/2011	13h 37m 12.39s	-07° 38' 22.8"	9,682205	10,427729	86,72	39,1	15,9	14,2	0,7	3,7	36,0	8,6	13,8	3,49	9,23	14,58
28/11/2011	13h 37m 35.93s	-07° 40' 29.5"	9,682493	10,417143	86,64	40,0	15,9	14,2	0,7	3,8	36,0	8,6	13,8	3,45	9,20	14,54
29/11/2011	13h 37m 59.29s	-07° 42' 34.7"	9,682780	10,406354	86,55	40,9	15,9	14,2	0,7	3,8	36,1	8,6	13,9	3,42	9,16	14,50
30/11/2011	13h 38m 22.45s	-07° 44' 38.6"	9,683067	10,395366	86,46	41,9	15,9	14,2	0,7	3,9	36,1	8,7	13,9	3,38	9,13	14,47
01/12/2011	13h 38m 45.41s	-07° 46' 40.9"	9,683354	10,384181	86,36	42,8	15,9	14,2	0,7	4,0	36,1	8,7	13,9	3,35	9,09	14,43
02/12/2011	13h 39m 08.16s	-07° 48' 41.8"	9,683641	10,372801	86,27	43,7	16,0	14,2	0,7	4,0	36,2	8,7	14,0	3,31	9,05	14,39
03/12/2011	13h 39m 30.71s	-07° 50' 41.2"	9,683928	10,361231	86,17	44,6	16,0	14,3	0,7	4,1	36,2	8,8	14,0	3,28	9,02	14,36
04/12/2011	13h 39m 53.05s	-07° 52' 39.1"	9,684215	10,349472	86,07	45,5	16,0	14,3	0,7	4,2	36,3	8,8	14,1	3,25	8,58	14,32
05/12/2011	13h 40m 15.18s	-07° 54' 35.4"	9,684501	10,337527	85,97	46,4	16,0	14,3	0,7	4,2	36,3	8,8	14,1	3,21	8,55	14,28
06/12/2011	13h 40m 37.09s	-07° 56' 30.2"	9,684788	10,325401	85,87	47,3	16,0	14,3	0,7	4,3	36,4	8,9	14,1	3,18	8,51	14,25
07/12/2011	13h 40m 58.78s	-07° 58' 23.4"	9,685075	10,313094	85,77	48,3	16,0	14,3	0,7	4,4	36,4	8,9	14,2	3,14	8,48	14,21
08/12/2011	13h 41m 20.24s	-08° 00' 15.1"	9,685362	10,300611	85,67	49,2	16,1	14,3	0,7	4,4	36,4	8,9	14,2	3,11	8,44	14,17
09/12/2011	13h 41m 41.48s	-08° 02' 05.2"	9,685648	10,287954	85,56	50,1	16,1	14,4	0,7	4,5	36,5	9,0	14,2	3,07	8,40	14,14
10/12/2011	13h 42m 02.49s	-08° 03' 53.6"	9,685935	10,275126	85,46	51,0	16,1	14,4	0,7	4,5	36,5	9,0	14,3	3,04	8,37	14,10
11/12/2011	13h 42m 23.26s	-08° 05' 40.5"	9,686221	10,262130	85,35	51,9	16,1	14,4	0,7	4,6	36,6	9,0	14,3	3,00	8,33	14,06
12/12/2011	13h 42m 43.79s	-08° 07' 25.7"	9,686508	10,248970	85,24	52,9	16,1	14,4	0,7	4,6	36,6	9,1	14,3	2,57	8,30	14,03
13/12/2011	13h 43m 04.08s	-08° 09' 09.2"	9,686794	10,235647	85,13	53,8	16,2	14,4	0,7	4,7	36,7	9,1	14,4	2,53	8,26	13,59
14/12/2011	13h 43m 24.11s	-08° 10' 51.0"	9,687080	10,222165	85,01	54,7	16,2	14,4	0,7	4,8	36,7	9,1	14,4	2,50	8,23	13,55
15/12/2011	13h 43m 43.88s	-08° 12' 31.1"	9,687367	10,208526	84,90	55,7	16,2	14,5	0,7	4,8	36,8	9,2	14,4	2,46	8,19	13,51
16/12/2011	13h 44m 03.40s	-08° 14' 09.4"	9,687653	10,194735	84,79	56,6	16,2	14,5	0,7	4,9	36,8	9,2	14,4	2,43	8,15	13,48
17/12/2011	13h 44m 22.64s	-08° 15' 46.0"	9,687939	10,180793	84,67	57,5	16,3	14,5	0,7	4,9	36,9	9,2	14,5	2,39	8,12	13,44
18/12/2011	13h 44m 41.62s	-08° 17' 20.8"	9,688225	10,166704	84,55	58,5	16,3	14,5	0,7	5,0	36,9	9,2	14,5	2,36	8,08	13,40
19/12/2011	13h 45m 00.33s	-08° 18' 53.7"	9,688511	10,152472	84,44	59,4	16,3	14,5	0,7	5,0	37,0	9,3	14,5	2,32	8,04	13,37
20/12/2011	13h 45m 18.76s	-08° 20' 24.8"	9,688797	10,138099	84,32	60,3	16,3	14,6	0,7	5,1	37,0	9,3	14,6	2,29	8,01	13,33
21/12/2011	13h 45m 36.91s	-08° 21' 54.1"	9,689083	10,123589	84,19	61,3	16,3	14,6	0,7	5,1	37,1	9,3	14,6	2,25	7,57	13,29
22/12/2011	13h 45m 54.78s	-08° 23' 21.6"	9,689369	10,108947	84,07	62,2	16,4	14,6	0,7	5,2	37,1	9,4	14,6	2,22	7,54	13,25
23/12/2011	13h 46m 12.36s	-08° 24' 47.2"	9,689655	10,094175	83,95	63,1	16,4	14,6	0,7	5,2	37,2	9,4	14,6	2,18	7,50	13,22
24/12/2011	13h 46m 29.65s	-08° 26' 10.9"	9,689941	10,079278	83,83	64,1	16,4	14,7	0,7	5,2	37,2	9,4	14,7	2,15	7,46	13,18
25/12/2011	13h 46m 46.64s	-08° 27' 32.7"	9,690227	10,064260	83,70	65,0	16,4	14,7	0,7	5,3	37,3	9,5	14,7	2,11	7,43	13,14
26/12/2011	13h 47m 03.32s	-08° 28' 52.6"	9,690512	10,049125	83,58	66,0	16,5	14,7	0,7	5,3	37,4	9,5	14,7	2,07	7,39	13,10
27/12/2011	13h 47m 19.69s	-08° 30' 10.5"	9,690798	10,033878	83,45	66,9	16,5	14,7	0,7	5,4	37,4	9,5	14,7	2,04	7,35	13,07
28/12/2011	13h 47m 35.74s	-08° 31' 26.4"	9,691084	10,018523	83,32	67,9	16,5	14,7	0,7	5,4	37,5	9,5	14,8	2,00	7,32	13,03
29/12/2011	13h 47m 51.48s	-08° 32' 40.4"	9,691369	10,003065	83,19	68,8	16,5	14,8	0,7	5,4	37,5	9,6	14,8	1,57	7,28	12,59
30/12/2011	13h 48m 06.89s	-08° 33' 52.3"	9,691655	9,987508	83,06	69,8	16,6	14,8	0,7	5,5	37,6	9,6	14,8	1,53	7,24	12,55
31/12/2011	13h 48m 21.98s	-08° 35' 02.2"	9,691940	9,971856	82,93	70,7	16,6	14,8	0,7	5,5	37,6	9,6	14,8	1,49	7,21	12,52

A.R., Dec. = coordinate apparenti  
R. = distanza dal Sole in U.A.  
Distance = distanza dalla Terra in U.A.  
Light = distanza in minuti-luce  
El. = elongazione dal Sole in °  
Diam. = diametro equatoriale e polare in "  
Mag. = magnitudine  
Max = diametro dell'asse maggiore degli anelli in "  
Min = diametro dell'asse minore degli anelli in "  
B = latitudine saturnocentrica della Terra, in °

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

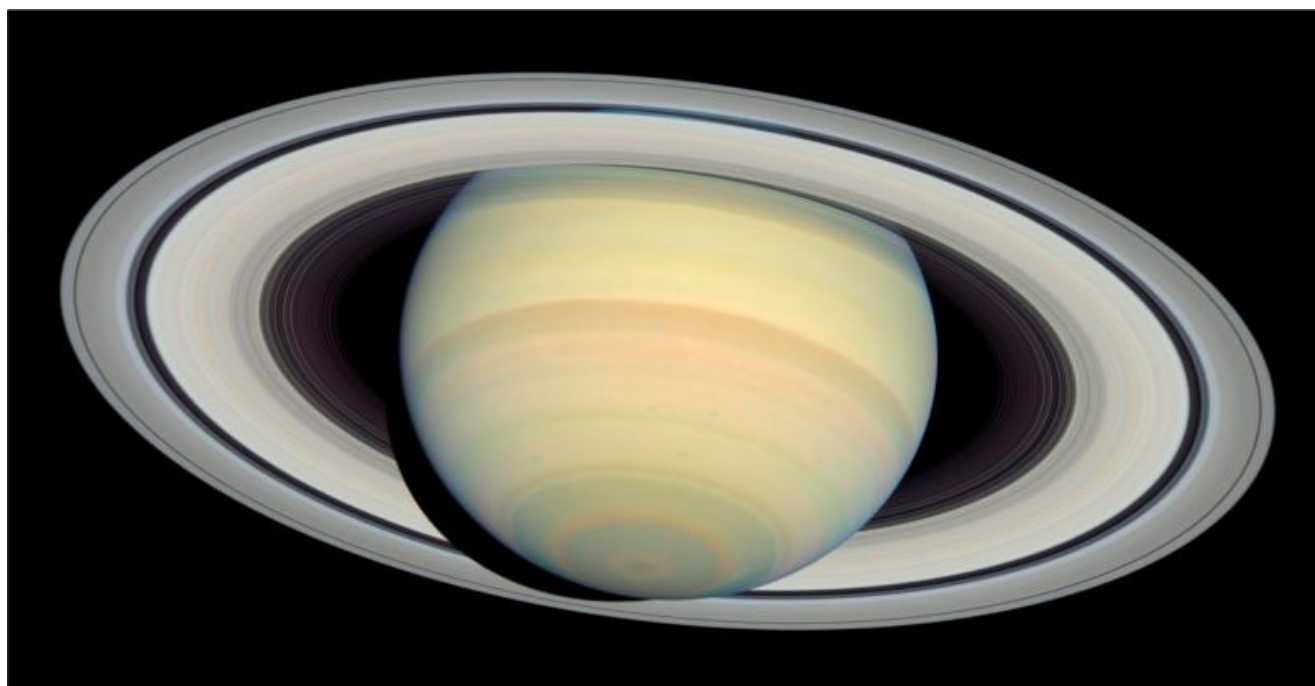
A.R., Dec. = apparent coordinates  
R. = distance from the Sun in A.U.  
Distance = distance from the Earth in A.U.  
Light = distance in minutes  
El. = elongation from the Sun in °  
Diam. = equatorial and polar diameter in "  
Mag. = magnitude  
Max = diameter of the major axis of the rings in "  
Min = diameter of the minor axis of the rings in "  
B = Saturnocentric latitude of the Earth, in °

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

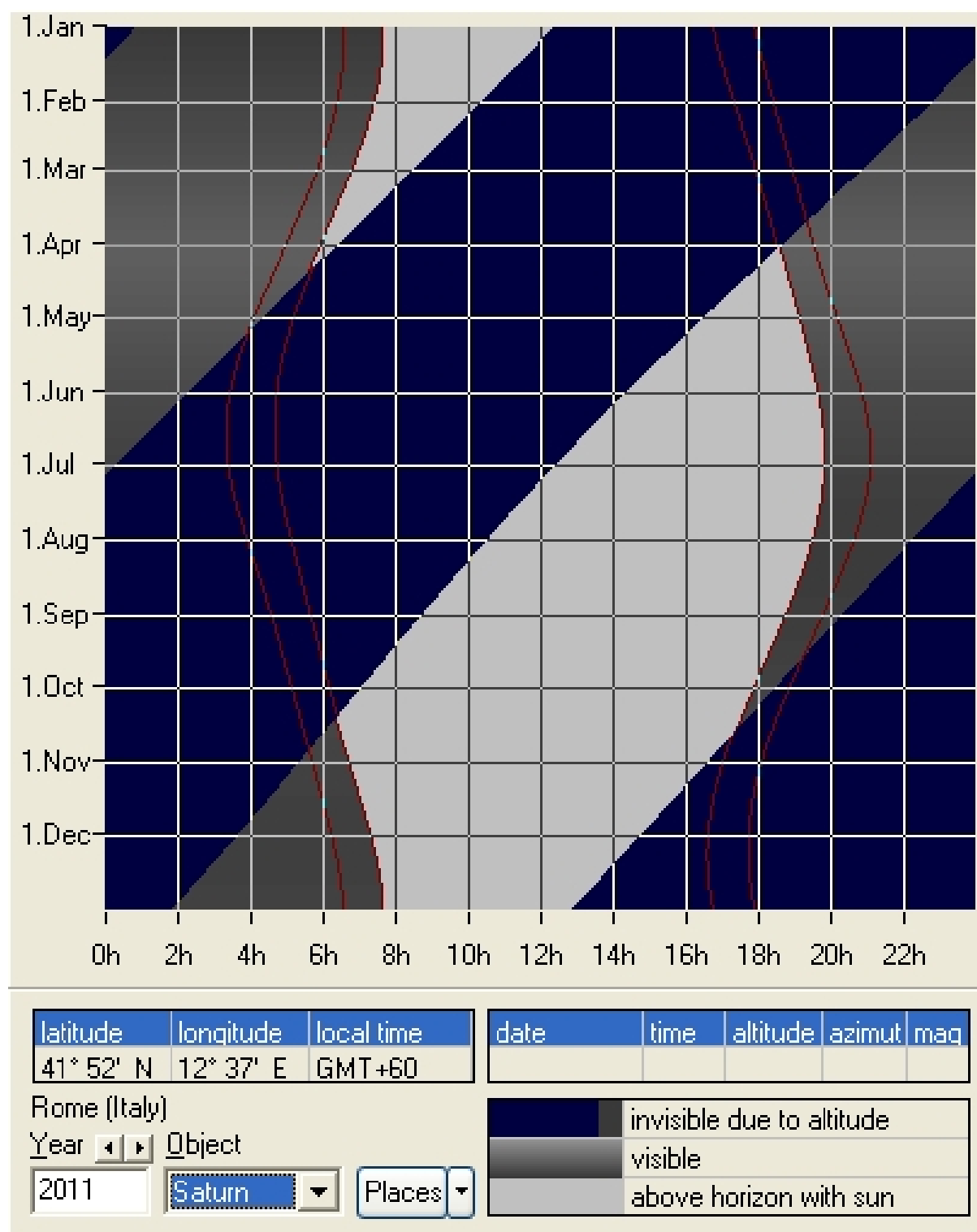
# FENOMENI DI SATURNO - PHENOMENA OF SATURN

Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	03/04/2011	22:53:41	8,61394	AU
Apogeo - Apogee	13/10/2011	21:51:40	10,66629	AU
Magnit. Max - Brightness maximum	05/04/2011	02:53:12	0,4	mag
Magnit. Max - Brightness maximum	15/10/2011	10:20:42	0,7	mag
Magnit. Min - Brightness minimum	04/08/2011	08:06:49	0,9	mag
Magnit. Min - Brightness minimum	20/11/2011	10:45:45	0,7	mag
Opposizione - Opposition	03/04/2011	23:56:28		
Congiunzione - Conjunction	13/10/2011	21:13:09		
Moto retrogr. - Retrograde motion	27/01/2011	08:12:55		
Moto diretto - Prograde motion	14/06/2011	04:37:15		
Max ang. Fase - Maximum phase angle	07/01/2011	13:53:26	5,9	°
Max ang. Fase - Maximum phase angle	02/07/2011	23:20:31	6,1	°
Min ang. Fase - Minimum phase angle	04/04/2011	01:58:46	0,3	°
Min ang. Fase - Minimum phase angle	13/10/2011	22:09:31	0,2	°
Estr. lat. Terra- Extremum lat. Earth	20/01/2011	12:54:21	10,28	°

© (5)



# VISIBILITA' DI SATURNO - VISIBILITY OF SATURN



Visibilità di Saturno nel corso dell'anno - Visibility of Saturn during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

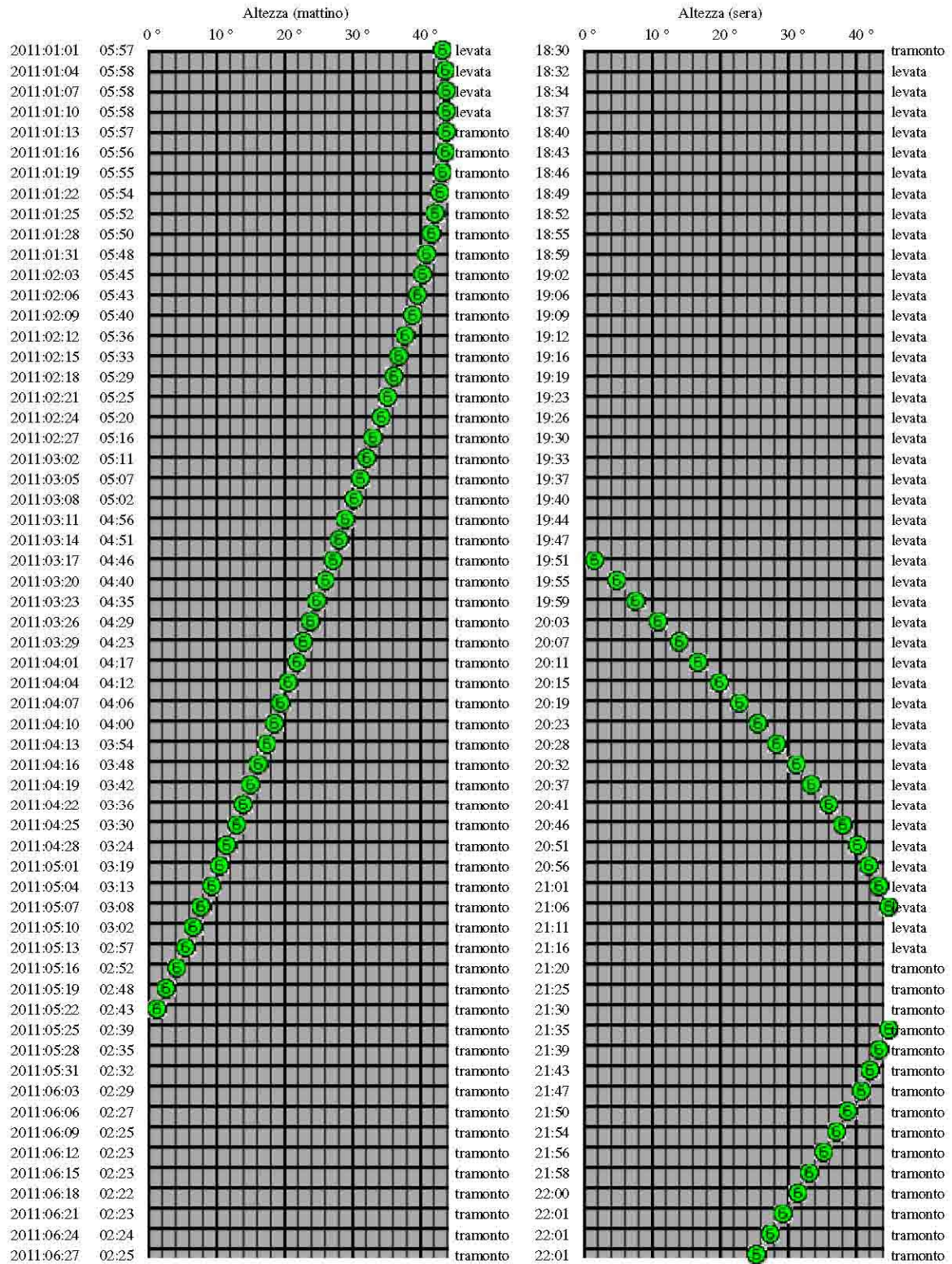
The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

# Altezza ai crepuscoli

## di Saturno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



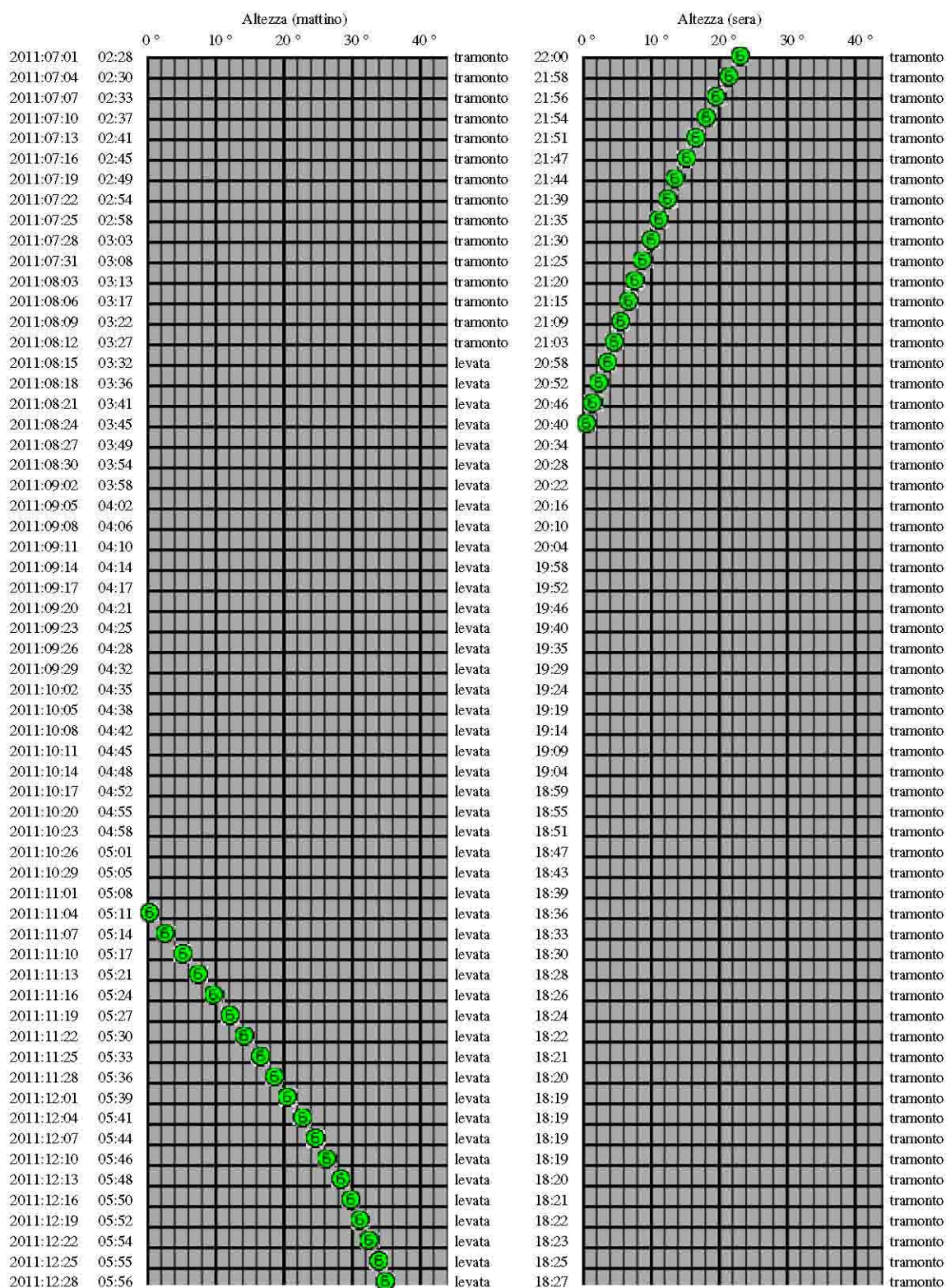


# Altezza ai crepuscoli

## di Saturno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	43.1	167.8	83.8	18:30	-52.4	359.3	84.3
2011:01:04	05:58	43.4	171.8	86.7	18:32	-52.4	5.0	87.2
2011:01:07	05:58	43.6	175.7	89.6	18:34	-52.1	10.6	90.2
2011:01:10	05:58	43.7	179.6	92.6	18:37	-51.5	16.2	93.1
2011:01:13	05:57	43.6	183.4	95.6	18:40	-50.6	21.8	96.1
2011:01:16	05:56	43.4	187.1	98.6	18:43	-49.5	27.1	99.1
2011:01:19	05:55	43.1	190.7	101.6	18:46	-48.1	32.3	102.1
2011:01:22	05:54	42.7	194.2	104.6	18:49	-46.6	37.3	105.1
2011:01:25	05:52	42.2	197.5	107.6	18:52	-44.8	41.9	108.2
2011:01:28	05:50	41.6	200.7	110.7	18:55	-42.8	46.4	111.2
2011:01:31	05:48	41.0	203.7	113.7	18:59	-40.7	50.6	114.3
2011:02:03	05:45	40.3	206.7	116.8	19:02	-38.4	54.5	117.4
2011:02:06	05:43	39.5	209.5	119.9	19:06	-36.0	58.3	120.5
2011:02:09	05:40	38.7	212.1	123.0	19:09	-33.5	61.8	123.6
2011:02:12	05:36	37.8	214.7	126.1	19:12	-30.8	65.2	126.7
2011:02:15	05:33	36.9	217.1	129.2	19:16	-28.1	68.4	129.8
2011:02:18	05:29	36.0	219.5	132.4	19:19	-25.3	71.5	133.0
2011:02:21	05:25	35.1	221.7	135.5	19:23	-22.5	74.5	136.1
2011:02:24	05:20	34.1	223.8	138.6	19:26	-19.6	77.3	139.3
2011:02:27	05:16	33.1	225.9	141.8	19:30	-16.7	80.1	142.4
2011:03:02	05:11	32.1	227.9	145.0	19:33	-13.7	82.8	145.6
2011:03:05	05:07	31.1	229.8	148.1	19:37	-10.7	85.5	148.8
2011:03:08	05:02	30.1	231.6	151.3	19:40	-7.6	88.2	151.9
2011:03:11	04:56	29.1	233.4	154.5	19:44	-4.6	90.8	155.1
2011:03:14	04:51	28.0	235.1	157.6	19:47	-1.5	93.4	158.3
2011:03:17	04:46	27.0	236.7	160.8	19:51	1.6	96.1	161.5
2011:03:20	04:40	26.0	238.3	164.0	19:55	4.7	98.8	164.6
2011:03:23	04:35	24.9	239.9	167.1	19:59	7.8	101.5	167.8
2011:03:26	04:29	23.8	241.4	170.2	20:03	10.8	104.3	170.9
2011:03:29	04:23	22.8	242.9	173.2	20:07	13.9	107.2	173.8
2011:04:01	04:17	21.7	244.3	175.9	20:11	16.9	110.2	176.4
2011:04:04	04:12	20.6	245.7	177.3	20:15	19.8	113.4	177.1
2011:04:07	04:06	19.5	247.1	175.7	20:19	22.8	116.6	175.1
2011:04:10	04:00	18.4	248.4	172.9	20:23	25.6	120.1	172.3
2011:04:13	03:54	17.3	249.8	169.9	20:28	28.4	123.7	169.2
2011:04:16	03:48	16.2	251.1	166.9	20:32	31.0	127.6	166.2
2011:04:19	03:42	15.1	252.4	163.8	20:37	33.6	131.7	163.1
2011:04:22	03:36	14.0	253.6	160.7	20:41	36.0	136.1	159.9
2011:04:25	03:30	12.8	254.9	157.6	20:46	38.2	140.8	156.8
2011:04:28	03:24	11.6	256.1	154.5	20:51	40.2	145.7	153.7
2011:05:01	03:19	10.5	257.4	151.4	20:56	41.9	151.0	150.6
2011:05:04	03:13	9.2	258.6	148.3	21:01	43.4	156.6	147.6
2011:05:07	03:08	8.0	259.9	145.3	21:06	44.6	162.4	144.5
2011:05:10	03:02	6.7	261.2	142.2	21:11	45.5	168.5	141.4
2011:05:13	02:57	5.4	262.4	139.2	21:16	46.0	174.7	138.4
2011:05:16	02:52	4.1	263.7	136.1	21:20	46.2	180.9	135.4
2011:05:19	02:48	2.7	265.0	133.1	21:25	46.0	187.1	132.4
2011:05:22	02:43	1.3	266.4	130.1	21:30	45.5	193.1	129.4
2011:05:25	02:39	-0.2	267.8	127.2	21:35	44.7	198.9	126.4
2011:05:28	02:35	-1.8	269.2	124.2	21:39	43.5	204.5	123.4
2011:05:31	02:32	-3.4	270.7	121.3	21:43	42.2	209.7	120.5
2011:06:03	02:29	-5.1	272.2	118.3	21:47	40.6	214.6	117.6
2011:06:06	02:27	-6.9	273.8	115.4	21:50	38.9	219.1	114.6
2011:06:09	02:25	-8.7	275.5	112.5	21:54	37.1	223.2	111.8
2011:06:12	02:23	-10.7	277.3	109.7	21:56	35.1	227.0	108.9
2011:06:15	02:23	-12.7	279.2	106.8	21:58	33.2	230.5	106.0
2011:06:18	02:22	-14.8	281.2	103.9	22:00	31.2	233.6	103.2
2011:06:21	02:23	-17.0	283.3	101.1	22:01	29.2	236.5	100.4
2011:06:24	02:24	-19.3	285.6	98.3	22:01	27.3	239.2	97.5
2011:06:27	02:25	-21.7	288.0	95.5	22:01	25.4	241.6	94.8
2011:06:30	02:27	-24.1	290.6	92.7	22:00	23.6	243.8	92.0

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	-24.9	291.5	91.8	22:00	23.0	244.5	91.1
2011:07:04	02:30	-27.4	294.3	89.0	21:58	21.3	246.4	88.3
2011:07:07	02:33	-29.8	297.3	86.3	21:56	19.7	248.2	85.6
2011:07:10	02:37	-32.3	300.6	83.6	21:54	18.1	249.8	82.8
2011:07:13	02:41	-34.7	304.0	80.8	21:51	16.6	251.3	80.1
2011:07:16	02:45	-37.1	307.8	78.1	21:47	15.1	252.7	77.4
2011:07:19	02:49	-39.4	311.8	75.4	21:44	13.8	254.0	74.7
2011:07:22	02:54	-41.6	316.1	72.7	21:39	12.5	255.2	72.0
2011:07:25	02:58	-43.6	320.6	70.1	21:35	11.2	256.3	69.4
2011:07:28	03:03	-45.4	325.6	67.4	21:30	10.0	257.3	66.7
2011:07:31	03:08	-47.1	330.8	64.7	21:25	8.8	258.3	64.1
2011:08:03	03:13	-48.5	336.3	62.1	21:20	7.7	259.2	61.4
2011:08:06	03:17	-49.6	342.0	59.5	21:15	6.6	260.1	58.8
2011:08:09	03:22	-50.5	348.0	56.8	21:09	5.6	260.9	56.2
2011:08:12	03:27	-51.1	354.1	54.2	21:03	4.5	261.7	53.6
2011:08:15	03:32	-51.3	0.3	51.6	20:58	3.5	262.5	51.0
2011:08:18	03:36	-51.3	6.5	49.0	20:52	2.5	263.2	48.4
2011:08:21	03:41	-50.9	12.5	46.4	20:46	1.6	264.0	45.8
2011:08:24	03:45	-50.3	18.4	43.8	20:40	0.6	264.7	43.2
2011:08:27	03:49	-49.4	24.1	41.2	20:34	-0.4	265.4	40.6
2011:08:30	03:54	-48.2	29.5	38.6	20:28	-1.3	266.0	38.0
2011:09:02	03:58	-46.9	34.6	36.0	20:22	-2.2	266.7	35.5
2011:09:05	04:02	-45.3	39.4	33.5	20:16	-3.2	267.4	32.9
2011:09:08	04:06	-43.6	44.0	30.9	20:10	-4.1	268.0	30.3
2011:09:11	04:10	-41.8	48.2	28.3	20:04	-5.1	268.7	27.8
2011:09:14	04:14	-39.9	52.2	25.7	19:58	-6.0	269.4	25.2
2011:09:17	04:17	-37.8	55.9	23.2	19:52	-7.0	270.1	22.6
2011:09:20	04:21	-35.7	59.5	20.6	19:46	-8.0	270.8	20.1
2011:09:23	04:25	-33.5	62.8	18.0	19:40	-8.9	271.5	17.5
2011:09:26	04:28	-31.2	66.0	15.5	19:35	-9.9	272.2	14.9
2011:09:29	04:32	-28.9	69.0	12.9	19:29	-11.0	272.9	12.4
2011:10:02	04:35	-26.6	71.9	10.4	19:24	-12.0	273.7	9.9
2011:10:05	04:38	-24.2	74.7	7.9	19:19	-13.1	274.4	7.4
2011:10:08	04:42	-21.8	77.3	5.4	19:14	-14.2	275.3	5.0
2011:10:11	04:45	-19.4	79.9	3.3	19:09	-15.3	276.1	2.9
2011:10:14	04:48	-17.0	82.5	2.3	19:04	-16.4	277.0	2.4
2011:10:17	04:52	-14.5	85.0	3.6	18:59	-17.6	277.9	4.0
2011:10:20	04:55	-12.0	87.4	5.9	18:55	-18.8	278.8	6.4
2011:10:23	04:58	-9.6	89.8	8.4	18:51	-20.0	279.8	8.9
2011:10:26	05:01	-7.1	92.2	10.9	18:47	-21.3	280.9	11.4
2011:10:29	05:05	-4.6	94.6	13.5	18:43	-22.6	282.0	14.0
2011:11:01	05:08	-2.2	96.9	16.1	18:39	-23.9	283.2	16.6
2011:11:04	05:11	0.3	99.3	18.8	18:36	-25.3	284.4	19.3
2011:11:07	05:14	2.7	101.7	21.4	18:33	-26.8	285.8	21.9
2011:11:10	05:17	5.1	104.1	24.1	18:30	-28.2	287.2	24.6
2011:11:13	05:21	7.5	106.6	26.7	18:28	-29.7	288.7	27.2
2011:11:16	05:24	9.8	109.1	29.4	18:26	-31.3	290.3	29.9
2011:11:19	05:27	12.1	111.6	32.1	18:24	-32.9	292.0	32.6
2011:11:22	05:30	14.4	114.2	34.8	18:22	-34.5	293.8	35.3
2011:11:25	05:33	16.6	116.8	37.5	18:21	-36.2	295.8	38.0
2011:11:28	05:36	18.7	119.6	40.2	18:20	-37.9	298.0	40.7
2011:12:01	05:39	20.8	122.3	42.9	18:19	-39.6	300.3	43.4
2011:12:04	05:41	22.8	125.2	45.7	18:19	-41.3	302.8	46.2
2011:12:07	05:44	24.7	128.1	48.4	18:19	-43.0	305.5	48.9
2011:12:10	05:46	26.5	131.1	51.2	18:19	-44.7	308.5	51.7
2011:12:13	05:48	28.2	134.2	54.0	18:20	-46.4	311.7	54.5
2011:12:16	05:50	29.8	137.4	56.8	18:21	-48.1	315.2	57.3
2011:12:19	05:52	31.3	140.6	59.6	18:22	-49.6	319.0	60.1
2011:12:22	05:54	32.7	143.9	62.4	18:23	-51.1	323.2	62.9
2011:12:25	05:55	33.9	147.2	65.2	18:25	-52.5	327.7	65.7
2011:12:28	05:56	35.0	150.6	68.1	18:27	-53.8	332.6	68.6
2011:12:31	05:57	36.0	154.0	70.9	18:29	-54.9	337.8	71.4

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



heliacal dates for Saturn in 2011  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Saturno  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E  
visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
last visibility	2011-09-22	18:58	18:07	0:50h	-21d 03h	1.0
first visibility	2011-10-29	05:26	06:37	-1:10h	15d 08h	1.0

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins : inizio visibilità mattutina  
Morning visibility ends : fine visibilità mattutina  
Evening visibility begins : inizio visibilità serale  
Evening visibility ends : fine visibilità serale  
Last visibility : ultimo giorno di visibilità  
Firs visibilità : primo giorno di visibilità

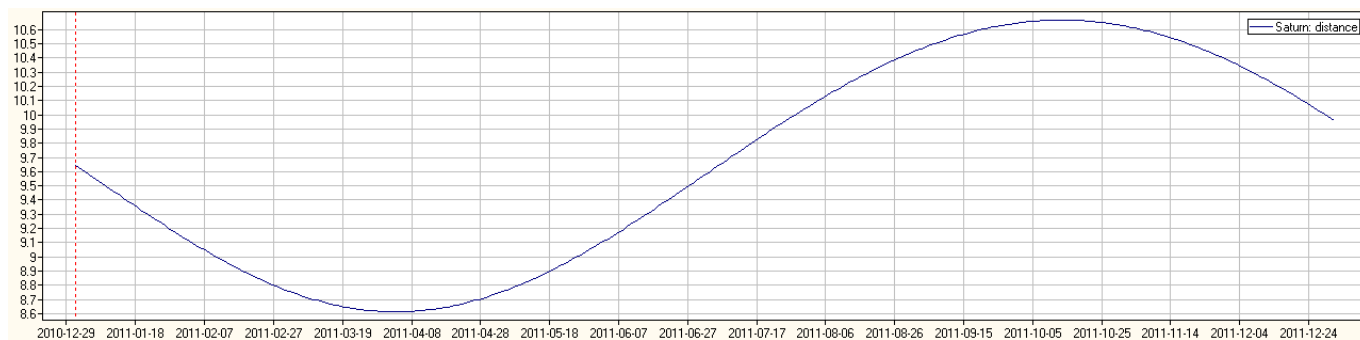
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
L	09-22	18:58	18:07	-10° 12'	179° 23'	197° 38'	2° 16'	1.0	-15° 41'	18° 15'
F	10-29	05:26	06:37	-13° 43'	215° 24'	202° 03'	2° 16'	1.0	2° 37'	-13° 21'

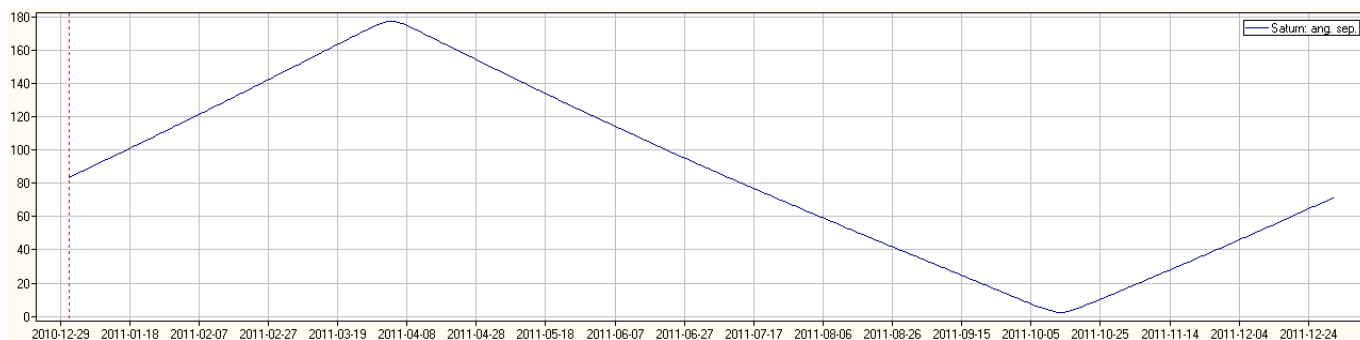
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità  
L = ultimo giorno di visibilità  
F = primo giorno di visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

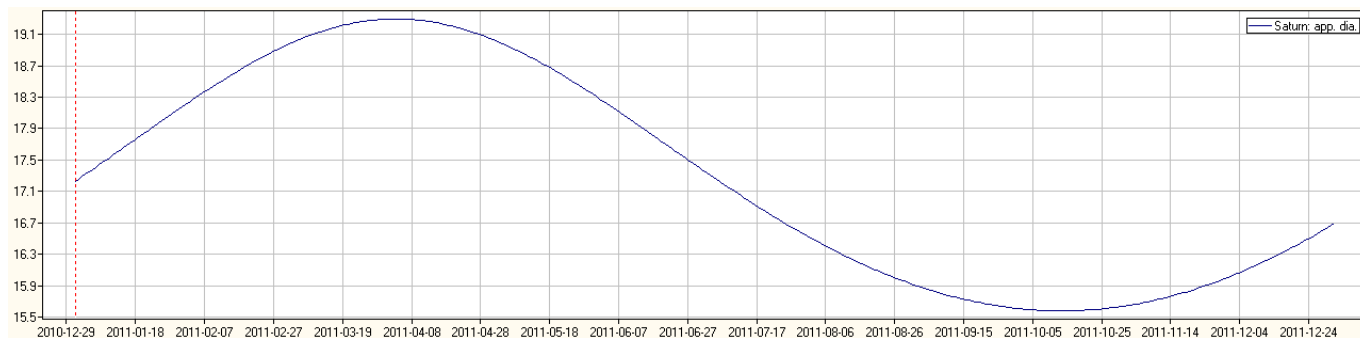
© (3)



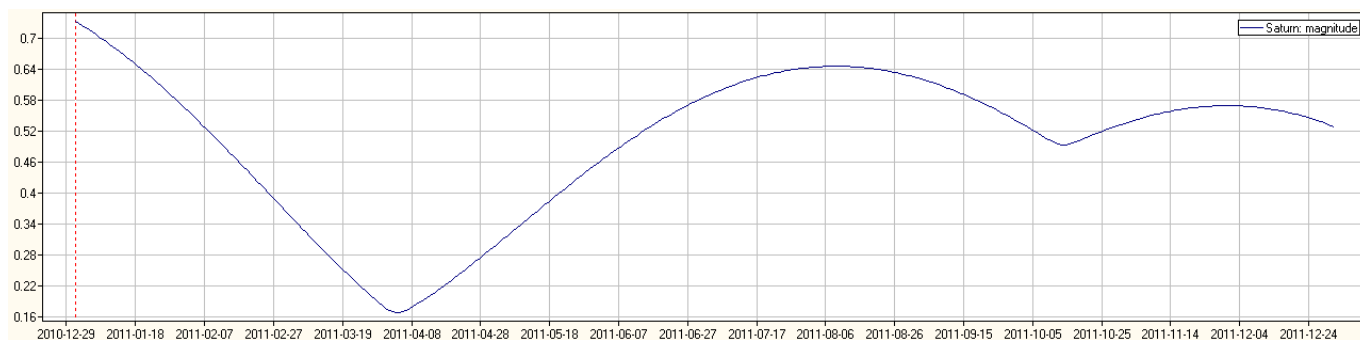
Distanza di Saturno in U.A. nel corso dell'anno - Distance of Saturn in A.U. during the year



Elongazione di Saturno in ° nel corso dell'anno - Elongation of Saturn in ° during the year



Diametro di Saturno in " nel corso dell'anno - Diameter of Saturn in " during the year



Magnitudine di Saturno nel corso dell'anno - Magnitude of Saturn during the year

# COORDINATE DEI SATELLITI DI SATURNO

## COORDINATES OF THE SATELLITES OF SATURN

	Tethys: x	Tethys: y	Tethys: z	Dione: x	Dione: y	Dione: z	Rhea: x	Rhea: y	Rhea: z	Titan: x	Titan: y	Titan: z	Hyperion: x	Hyperion: y	Hyperion: z
01/01/2011	-1,4935	-0,7595	-4,5845	-5,6960	0,4519	2,5150	-8,6523	-0,1958	-1,0876	19,8448	1,0230	5,6989	-11,7894	-4,2100	-23,4410
02/01/2011	0,6069	0,7828	4,7794	1,9089	-1,0513	-5,8505	-0,4494	-1,5382	-8,5712	16,4438	2,2436	12,5019	-5,4517	-4,5687	-25,4155
03/01/2011	0,3011	-0,7798	-4,8089	3,2231	0,9494	5,2835	8,4960	-0,3526	-1,9681	10,7293	3,1510	17,5455	1,2635	-4,6114	-25,6326
04/01/2011	-1,1979	0,7492	4,6719	-6,1341	-0,1997	-1,1143	3,5058	1,4158	7,8714	3,5120	3,6177	20,1266	7,8862	-4,3225	-24,0122
05/01/2011	2,0549	-0,6932	-4,3730	4,9497	-0,6784	-3,7579	-7,2248	0,8662	4,8155	-4,1993	3,5729	19,8580	13,9098	-3,7062	-20,5821
06/01/2011	-2,8387	0,6126	3,9226	-0,3733	1,1092	6,1469	-6,0998	-1,1067	-6,1330	-11,3019	3,0117	16,7226	18,8111	-2,7909	-15,5027
07/01/2011	3,5266	-0,5110	-3,3362	-4,3994	-0,7852	-4,3490	5,0535	-1,2628	-6,9978	-16,7240	2,0016	11,1056	22,0870	-1,6339	-9,0931
08/01/2011	-4,0901	0,3913	2,6341	6,2484	-0,0627	-0,3413	7,9097	0,6577	3,6359	-19,5765	0,6820	3,7880	23,3143	-0,3248	-1,8475
09/01/2011	4,5137	-0,2580	-1,8405	-3,8394	0,8788	4,8520	-2,1980	1,5028	8,3149	-19,3198	-0,7483	-4,1249	22,2302	1,0171	5,5748
10/01/2011	-4,7794	0,1155	0,9830	-1,1023	-1,0947	-6,0414	-8,6989	-0,1157	-0,6338	-15,9072	-2,0588	-11,3595	18,8183	2,2528	12,4075
11/01/2011	4,8801	0,0312	-0,0913	5,3527	0,5786	3,1965	-0,9093	-1,5461	-8,5331	-9,8485	-3,0289	-16,7044	13,3638	3,2441	17,8877
12/01/2011	-4,8113	-0,1770	-0,8037	-5,9529	0,3360	1,8466	8,3791	-0,4347	-2,4039	-2,1422	-3,4945	-19,2628	6,4408	3,8790	21,3982
13/01/2011	4,5748	0,3168	1,6709	2,5877	-1,0158	-5,5917	3,9186	1,3924	7,6784	5,9231	-3,3826	-18,6408	-1,1826	4,0937	22,5875
14/01/2011	-4,1806	-0,4458	-2,4802	2,5788	1,0190	5,6135	-6,9605	0,9385	5,1780	13,0362	-2,7234	-15,0074	-8,6885	3,8812	21,4189
15/01/2011	3,6396	0,5593	3,2034	-5,9588	-0,3285	-1,8128	-6,4150	-1,0561	-5,8123	18,1103	-1,6360	-9,0200	-15,3469	3,2854	18,1376
16/01/2011	-2,9736	-0,6537	-3,8154	5,3633	-0,5759	-3,1627	4,6798	-1,3152	-7,2433	20,4431	-0,2993	-1,6611	-20,6021	2,3857	13,1834
17/01/2011	2,2027	0,7251	4,2948	-1,1014	1,1017	6,0590	8,0886	0,5879	3,2315	19,7766	1,0824	5,9473	-24,1002	1,2797	7,0956
18/01/2011	-1,3561	-0,7719	-4,6249	-3,8469	-0,8779	-4,8287	-1,7644	1,5279	8,4133	16,2800	2,3097	12,7082	-25,6759	0,0692	0,4359
19/01/2011	0,4618	0,7913	4,7942	6,2467	0,0689	0,3840	-8,7205	-0,0370	-0,1979	10,4890	3,2114	17,6780	-25,3205	-1,1485	-6,2607
20/01/2011	0,4490	-0,7838	-4,7967	-4,3943	0,7955	4,3696	-1,3473	-1,5411	-8,4759	3,2255	3,6612	20,1608	-23,1482	-2,8522	-12,5117
21/01/2011	-1,3432	0,7485	4,6323	-0,3645	-1,1151	-6,1275	8,2455	-0,5107	-2,8151	-4,4928	3,5913	19,7802	-19,3683	-3,2643	-17,8978
22/01/2011	2,1925	-0,6877	-4,3066	4,9307	0,6899	3,7973	4,3035	1,3585	7,4755	-11,5576	3,0011	16,5335	-14,2662	-4,0213	-22,0666
23/01/2011	-2,9635	0,6026	3,8308	-6,1333	0,2072	1,1338	-6,6901	1,0006	5,5126	-16,8969	1,9638	10,8234	-8,1910	-4,5045	-24,7356
24/01/2011	3,6337	-0,4970	-3,2215	3,2494	-0,9551	-5,2482	-6,7003	-0,9986	-5,4920	-19,6293	0,6242	3,4489	-1,5491	-4,6760	-25,6966
25/01/2011	-4,1750	0,3739	2,4998	1,8796	1,0676	5,8755	4,3108	-1,3549	-7,4613	-19,2318	-0,8141	-4,4698	5,2019	-4,5135	-24,8265
26/01/2011	4,5729	-0,2381	-1,6909	-5,6931	-0,4545	-2,5055	8,2396	0,5160	2,8377	-15,6818	-2,1182	-11,6517	11,5606	-4,0138	-22,1038
27/01/2011	-4,8100	0,0941	0,8229	5,7119	-0,4562	-2,5062	-1,3458	1,5395	8,4885	-9,5157	-3,0684	-16,8907	16,9978	-3,1969	-17,6331
28/01/2011	4,8801	0,0530	0,0740	-1,8343	1,0682	5,8835	-8,7201	0,0387	0,2190	-1,7540	-3,5048	-19,3068	20,9878	-2,1106	-11,6719
29/01/2011	-4,7801	-0,1981	-0,9684	-3,2228	-0,9529	-5,2530	-1,7623	-1,5237	-8,4025	6,3030	-3,3609	-18,5311	23,0608	-0,8349	-4,6531
30/01/2011	4,5124	0,3360	1,8293	6,1544	0,2029	1,1244	8,0984	-0,5790	-3,2016	13,3458	-2,6736	-14,7594	22,8795	0,5189	2,8139
31/01/2011	-4,0885	-0,4620	-2,6264	-4,9006	0,6912	3,8111	4,6609	1,3152	7,2659	18,3002	-1,5679	-8,6708	20,3269	1,8150	9,9836
01/02/2011	3,5202	0,5715	3,3320	0,3994	-1,1097	-6,1274	-6,4166	1,0515	5,8201	20,4832	-0,2259	-1,2621	15,5781	2,9115	16,0692
02/02/2011	-2,8306	-0,6613	-3,9214	4,4244	0,7879	4,3603	-6,9571	-0,9360	-5,1749	19,6588	1,1472	6,3382	9,1135	3,6844	20,3803
03/02/2011	2,0405	0,7273	4,3738	-6,2275	0,0705	0,3846	3,9490	-1,3816	-7,6538	16,0177	2,3535	13,0346	1,6498	4,0524	22,4578
04/02/2011	-1,1800	-0,7683	-4,6735	3,8810	-0,8706	-4,8180	8,3652	0,4438	2,4563	10,1150	3,2248	17,8907	-5,9940	3,9899	22,1509
05/02/2011	0,2778	0,7818	4,8099	1,1330	1,0921	6,0588	-0,9438	1,5380	8,5430	2,7891	3,6399	20,2236	-13,0423	3,5257	19,6102
06/02/2011	0,6347	-0,7687	-4,7782	-5,3339	-0,5720	-3,1801	-8,7006	0,1098	0,6162	-4,9309	3,5361	19,6751	-18,8696	2,7293	15,2150
07/02/2011	-1,5239	0,7281	4,5793	5,9838	-0,3237	-1,7942	-2,1542	-1,4950	-8,3159	-11,9312	2,9191	16,2652	-23,0471	1,6939	9,4772
08/02/2011	2,3617	-0,6629	-4,2202	-2,5595	1,0090	5,6156	7,9409	-0,6387	-3,5638	-17,1429	1,8673	10,4219	-25,3412	0,5208	2,9567
09/02/2011	-3,1148	0,5742	3,7133	-2,5322	-1,0062	-5,6096	4,9916	1,2638	7,0520	-19,6990	0,5297	2,9693	-25,6873	-0,6909	-3,7969
10/02/2011	3,7613	-0,4661	-3,0763	5,9655	0,3337	1,8684	-6,1425	1,0908	6,1023	-19,1016	-0,8887	-4,9531	-24,1552	-1,8501	-10,2777
11/02/2011	-4,2740	0,3418	2,3315	-5,3448	0,5694	3,1796	-7,1874	-0,8697	-4,8626	-15,3623	-2,1571	-12,0574	-20,9207	-2,8770	-16,0387
12/02/2011	4,6390	-0,2062	-1,5049	1,1773	-1,0778	-6,0335	3,5960	-1,3954	-7,8230	-9,0529	-3,0617	-17,1461	-16,2429	-3,7034	-20,6985
13/02/2011	-4,8402	0,0638	0,6253	8,3663	0,8678	4,8722	-8,4679	0,3727	2,0881	-1,2223	-3,4513	-19,3641	-10,4509	-4,2742	-23,9436
14/02/2011	4,8725	0,0802	0,2763	-6,2263	-0,0685	-0,3904	-0,5588	1,5243	8,5795	6,8160	-3,2685	-18,3771	-3,9346	-4,5476	-25,5340
15/02/2011	-4,7342	-0,2209	-1,1684	4,4677	-0,7650	-4,3019	-8,6647	0,1753	0,9939	13,7564	-2,5580	-14,4166	2,8602	-4,4970	-25,3110
16/02/2011	4,4290	0,3532	2,0198	0,3495	1,0906	6,1533	-2,5235	-1,4562	-8,2183	18,5431	-1,4491	-8,1915	9,4394	-4,1135	-23,2136
17/02/2011	-3,9700	-0,4727	-2,8006	-4,8806	-0,6757	-3,8224	7,7751	-0,6891	-3,9031	20,5206	-0,1245	-0,7178	15,2733	-3,4099	-19,3005
18/02/2011	3,3700	0,5749	3,4833	6,1674	-0,1839	-1,0357	5,2974	1,2059	6,8356	19,4833	1,2134	6,8682	19,8233	-2,4251	-13,7776
19/02/2011	-2,6534	-0,6569	-4,0440	-3,2617	0,9259	5,2526	-5,8693	1,1186	6,3611	15,6515	2,3720	13,4735	22,5880	-1,2284	-7,0237
20/02/2011	1,8423	0,7151	4,4629	-1,7839	-1,0350	-5,8859	-7,3934	-0,8012	-4,5561	9,6061	3,1905	18,1734	23,1742	0,0794	0,4002
21/02/2011	-0,9672	-0,7485	-4,7253	5,6763	0,4555	2,6014	3,2523	-1,3970	-7,9714	2,2061	3,5553	20,3042	21,3846	1,3715	7,7772
22/02/2011	0,0580	0,7549	4,8219	-5,7128	0,4352	2,4817	8,5503	0,3039	1,7327	-5,5057	3,4118	19,5335	17,2985	2,5091	14,3137
23/02/2011	0,8540	-0,7354	-4,7492	1,9541	-1,0205	-5,8402	-0,1900	1,4995	8,6001	-12,4112	2,7722	15,9120	11,3069	3,3642	19,2685
24/02/2011	-1,7347	0,6897	4,5097	3,1724	0,9259	5,3185	-8,6146	0,2345	1,3535	-17,4493	1,7202	9,9011	4,0678	3,8445	22,0956
25/02/2011	2,5565	-0,6207	-4,1117	-6,1227	-0,2037	-1,1775	-8,2720	-1,4088	-8,1115	-19,7737	0,4065	2,3555	-3,6130	3,9096	22,5433
26/02/2011	-3,2863	0,5298	3,5692	4,9940	-0,6429	-3,7037	7,6027	-0,7302	-4,2216	-18,9213	-0,9657	-5,5632	-10,9304	3,5734	20,6729
27/02/2011	3,9031	-0,4212	-2,9012	-0,4568	1,0631	6,1501	5,5805	1,1430	6,6174	-14,9468	-2,1722	-12,5610	-17,2023	2,8941	16,8023
28/02/2011	-4,3806	0,2983	2,1310	-4,3363	-0,7610	-4,4162	-5,5977	1,1355	6,5990	-8,4656	-3,0097	-17,4545	-21,9345	1,9570	11,4128
01/03/2011	4,7060	-0,1658	-1,2858	6,2525	-0,0428	-2,2432	-7,5779	-0,7318	-4,2551	-0,5594	-3,3390	-19,4212	-24,8321	0,8593	5,0584
02/03/2011	-4,8648	0,0282	0,3951	-3,9240	0,8227	4,7950	2,9175	-1,3877	-8,1012	7,4448	-3,1142	-18,1707	-25,7790	-0,3015	-1,7005
03/03/2011	4,8530	0,1095	0,5096	-0,9905	-1,0381	-6,0701	8,6147	0,2382	1,3891	14,2489	-2,3875	-13,9789	-24,8056	-1,4352	-8,3385
04/03/2011	-4,6709	-0,2425	-1,3967	5,2865	0,5630	3,3071	0,1639	1,4651	8,6067	18,8220	-1,2910	-7,5905	-22,0570	-2,4613	-14,3850
05/03/2011	4,3235	0,3660	2,2348	-5,9915	0,2946	1,7278	-8,5522	0,2871	1,6969	20,5435	-0,0051	-0,0442	-17,7696	-3,3113	-19,4333
06/03/2011	-3,8255	-0,4761	-2,9945	2,7125	-0,9404	-5,5447	-3,2018	-1,3545	-7,9965	19,2460					

	Tethys: x	Tethys: y	Tethys: z	Dione: x	Dione: y	Dione: z	Rhea: x	Rhea: y	Rhea: z	Titan: x	Titan: y	Titan: z	Hyperion: x	Hyperion: y	Hyperion: z
19/03/2011	-4,8789	-0,0081	0,1421	-5,5956	-0,4405	-2,7196	-7,8924	-0,5948	-3,6644	14,7925	-2,1805	-13,4567	-9,0525	3,4669	21,4241
20/03/2011	4,8189	0,1369	0,7629	5,8045	-0,3721	-2,2962	2,2681	-1,3425	-8,3132	19,1133	-1,1109	-6,8911	-15,6633	2,9047	18,0319
21/03/2011	-4,5898	-0,2598	-1,6412	-2,0687	0,9389	5,8284	8,6977	0,1181	0,7280	20,5400	0,1192	0,7260	-20,8424	2,0791	12,9744
22/03/2011	4,1977	0,3725	2,4619	-3,0069	-0,8654	-5,3939	8,8371	1,3751	8,5826	18,9494	1,3230	8,2437	-24,2411	1,0802	6,7970
23/03/2011	-3,6594	-0,4713	-3,1960	6,1011	0,2196	1,3792	-8,3943	0,3736	2,3463	14,6389	2,3286	14,5822	-25,6973	0,0007	0,0668
24/03/2011	2,9904	0,5525	3,8175	-5,0601	0,5770	3,6183	-3,8175	-1,2324	-7,7422	8,2545	2,9976	18,8540	-25,2054	-1,0725	-6,6746
25/03/2011	-2,2177	-0,6140	-4,3047	0,6657	-0,9725	-6,1268	7,0505	-0,8041	-5,0781	0,7031	3,2380	20,4515	-22,8836	-2,0615	-12,9368
26/03/2011	1,3656	0,6529	4,6403	4,2239	0,7209	4,5658	6,3220	0,9394	5,9481	-6,9457	3,0139	19,1136	-18,9482	-2,8992	-18,2920
27/03/2011	-0,4659	-0,6692	-4,8124	-6,2396	0,0185	0,1114	-4,7847	1,1331	7,2118	-13,5725	2,3512	14,9716	-13,6951	-3,5305	-22,3804
28/03/2011	-0,4499	0,6612	4,8150	4,0996	-0,7311	-4,6563	-8,0274	-0,5289	-3,3699	-18,1452	1,3396	8,5687	-7,4879	-3,9125	-24,9141
29/03/2011	1,3509	-0,6307	-4,6479	0,8442	0,9571	6,1289	1,9480	-1,3107	-8,3988	-19,8792	0,1273	0,8309	-0,7507	-4,0152	-25,6842
30/03/2011	-2,2026	-0,5779	4,3170	-5,1767	-0,5342	-3,4368	8,7192	0,0638	0,4044	-18,4021	-1,0960	-7,0357	6,0382	-8,8237	-24,5736
31/03/2011	2,9789	-0,5056	-3,8339	6,0637	-0,2357	-1,5146	1,1631	1,3236	8,5527	-13,8753	-2,1292	-13,7337	12,3568	-3,3408	-21,5757
01/04/2011	-3,6478	0,4160	3,2156	-2,8356	0,8508	5,5091	-8,2991	0,4090	2,6590	-7,0148	-2,7981	-18,1247	17,6592	-2,5905	-16,8206
02/04/2011	4,1905	-0,3128	-2,4840	-2,2489	-0,8840	-5,7488	-4,1103	-1,1683	-7,6010	1,0284	-2,9936	-19,4730	21,4121	-1,6219	-10,6023
03/04/2011	-4,5836	0,1994	1,6647	5,8617	0,3316	2,1709	6,8519	-0,8164	-5,3405	8,9059	-2,6931	-17,5961	23,1544	-0,5112	-3,3979
04/04/2011	4,8167	-0,0802	-0,7867	-5,5026	0,4465	2,9214	6,5433	0,8712	5,7143	15,3484	-1,9611	-12,8743	22,5787	0,6398	4,1395
05/04/2011	-4,8794	-0,0409	-0,1192	1,4896	-0,9109	-5,9911	-4,5076	1,1206	7,3905	19,3919	-0,9287	-6,1326	19,6192	1,7126	11,2337
06/04/2011	4,7701	0,1593	1,0210	3,5720	0,7689	5,0852	-8,1501	-0,4653	-3,0719	20,5030	0,2358	1,5443	14,5138	2,5890	17,0933
07/04/2011	-4,4937	-0,2712	-1,8869	-6,1979	-0,1067	-0,7140	1,6265	-1,2757	-8,4720	18,6059	1,3568	9,0015	7,8003	3,1717	21,0541
08/04/2011	4,0577	0,3724	2,6865	4,6927	-0,6133	-4,0795	8,7282	0,0131	0,0806	14,0401	2,2750	15,1712	0,2311	3,4036	22,7070
09/04/2011	-3,4805	-0,4598	-3,3915	0,0123	0,9256	6,1908	1,4870	1,2706	8,5105	7,4859	2,8645	19,1904	-7,3681	3,2754	21,9585
10/04/2011	2,7790	0,5301	3,9772	-4,6650	-0,6092	-4,0936	-8,1922	0,4405	2,9683	-0,1268	3,0446	20,4861	-14,2387	2,8215	19,0092
11/04/2011	-1,9812	-0,5815	-4,4229	6,2147	-0,1055	-0,7049	-4,3976	-1,1044	-7,7176	2,7879	18,8384	-19,7848	2,1071	14,2734	
12/04/2011	1,1128	0,6117	4,7129	-3,5510	0,7527	5,0912	6,6431	-0,8253	-5,5963	-14,1716	2,1255	14,4232	-23,6098	1,2137	8,2837
13/04/2011	-0,2055	-0,6206	-4,8370	-1,4520	-0,8832	-6,0003	6,7563	0,8047	5,4708	-18,4771	1,1479	7,8268	-25,5101	0,2270	1,6104
14/04/2011	-0,7085	0,6073	4,7909	5,5190	0,4277	2,9235	-4,2225	1,1058	7,5596	-19,8871	-0,0009	0,0097	-25,4466	-0,7708	-5,1930
15/04/2011	1,5988	-0,5733	-4,5761	-5,8458	0,3182	2,1731	-8,2621	-0,4044	-2,7666	-18,0798	-1,1405	-7,8032	-23,5125	-1,7057	-11,6195
16/04/2011	-2,4308	0,5192	4,2003	2,2837	-0,8367	-5,7482	1,3000	-1,2398	-8,5333	-13,2737	-2,0830	-14,3191	-19,9050	-2,5134	-17,2238
17/04/2011	3,1796	-0,4478	-3,6767	2,8600	0,7982	5,5130	8,7249	-0,0347	-0,2471	-6,2347	-2,6698	-18,4292	-14,9053	-3,1406	-21,6281
18/04/2011	-3,8140	0,3610	3,0237	-6,0461	-0,2191	-1,5239	1,8125	1,2183	8,4549	1,8550	-2,8055	-19,4474	-8,8651	-3,5451	-24,5267
19/04/2011	4,3166	-0,2626	-2,2642	5,1994	-0,4943	-3,4321	-8,0720	0,4696	3,2776	9,6422	-2,4776	-17,2490	-2,1981	-3,6968	-25,6919
20/04/2011	-4,6654	0,1558	1,4251	-0,8145	0,8797	6,1428	-4,6826	-1,0424	-7,2819	15,8780	-1,7538	-12,2671	4,6262	-3,5787	-24,9854
21/04/2011	4,8514	-0,0446	-0,5359	-4,0739	-0,6665	-4,6739	6,4213	-0,8327	-5,8479	19,6372	-0,7624	-5,3647	11,0921	-3,1898	-22,3764
22/04/2011	-4,8664	-0,0672	-0,3723	6,2554	0,0151	0,1129	6,9631	0,7408	5,2142	20,4336	0,3366	2,3548	16,6553	-2,5478	-17,9653
23/04/2011	4,7100	0,1757	1,2674	-4,1982	0,6500	4,5860	-3,9260	1,0909	7,7203	18,2378	1,3784	9,7357	20,7757	-1,6929	-12,0118
24/04/2011	-4,3892	-0,2772	-2,1180	-0,6362	-0,8670	-6,1434	-8,3641	-0,3463	-2,4506	13,4304	2,2157	15,7252	22,9717	-0,6901	-4,9561
25/04/2011	3,9126	0,3680	2,8942	5,0832	0,5080	3,6193	0,9647	-1,2052	-8,5824	6,7229	2,7342	19,4872	22,8974	0,3715	2,5815
26/04/2011	-3,3004	-0,4454	-3,5688	-6,0832	0,1959	1,3925	8,7085	-0,0804	-0,5821	-0,9344	2,8627	20,4845	20,4313	1,3851	9,8427
27/04/2011	2,5707	0,5063	4,1180	3,0299	-0,7552	-5,4059	2,1427	1,1684	8,3844	-8,4539	2,5808	18,5380	15,7459	2,2401	16,0284
28/04/2011	-1,7521	-0,5495	-4,5225	2,1061	0,8118	5,8407	-7,9368	0,4975	3,5894	-14,7275	1,9231	13,8667	9,3199	2,8414	20,4362
29/04/2011	0,8713	0,5727	4,7683	-5,7903	-0,3179	-2,2993	-4,9677	-0,9834	-7,0990	-18,7664	0,9798	7,0969	1,8693	3,1272	22,5958
30/04/2011	0,0400	-0,5762	-4,8467	5,6100	-0,3781	-2,7311	6,1839	-0,8404	-6,0969	-19,8617	-0,1098	-0,7795	-5,7846	3,0792	22,3462
01/05/2011	-0,9490	0,5592	4,7550	-1,6172	0,8244	5,9885	7,1649	0,6799	4,9416	-17,7419	-1,1743	-8,5238	-12,8605	2,7207	19,8306
02/05/2011	1,8260	-0,5233	-4,4964	-3,4195	-0,7085	-5,1661	-3,6150	1,0778	7,8729	-12,6788	-2,0378	-14,8513	-18,7231	2,1064	15,4257
03/05/2011	-2,6369	0,4690	4,0801	6,1881	0,1248	0,9192	-8,4560	-0,2906	-2,1207	-5,4844	-2,5547	-18,6851	-22,9327	1,3090	9,6467
04/05/2011	3,3576	-0,3992	-3,5207	-4,7646	0,5469	4,0075	0,6177	-1,1735	-8,6185	2,6332	-2,6415	-19,3884	-25,2459	0,4074	3,0619
05/05/2011	-3,9581	0,3158	2,8379	0,1790	-0,8399	-6,1782	8,6778	-0,1248	-0,9271	10,3200	-2,2929	-16,8916	-25,5911	-0,5215	-3,7671
06/05/2011	4,4219	-0,2222	-2,0555	4,5675	0,5742	4,2439	2,4805	1,1223	8,2972	16,3504	-1,5787	-11,6763	-24,0355	-1,4072	-10,3205
07/05/2011	-4,7291	0,1215	1,2012	-6,2133	0,0818	0,5986	-7,7844	0,5258	3,9060	19,8378	-0,6235	-4,6383	-20,7566	-2,1880	-16,1378
08/05/2011	4,8715	-0,0173	-0,3047	3,7128	-0,6708	-4,9755	-5,2546	-0,9284	-6,8972	20,3408	0,4198	3,1045	-16,0196	-2,8117	-20,8254
09/05/2011	-4,8430	-0,0868	-0,6023	1,3290	0,8140	6,0644	5,9279	-0,8503	-6,3443	17,8732	1,3960	10,3995	-10,1629	-3,2366	-24,0610
10/05/2011	4,6445	0,1871	1,4883	-5,4408	-0,4042	-3,0236	7,3624	0,6225	4,6500	12,8521	2,1677	16,2106	-3,5888	-3,4314	-25,5995
11/05/2011	-4,2845	-0,2804	-2,3221	5,9193	-0,2673	-1,9948	-3,2863	1,0683	8,0172	6,0159	2,6294	19,7287	3,2429	-3,3771	-25,2830
12/05/2011	3,7731	0,3631	3,0745	-2,3788	0,7642	5,7359	-8,5373	-0,2369	-1,7740	-1,6690	2,7174	20,4504	9,8244	-3,0687	-23,0571
13/05/2011	-3,1314	-0,4330	-3,7194	-2,7195	-0,7388	-5,5624	0,2561	-1,1466	-8,6403	-9,1107	2,4161	18,2347	15,6146	-2,5181	-18,9944
14/05/2011	2,3787	0,4872	4,2340	6,0196	0,2239	1,6964	8,6312	-0,1690	-1,2845	-15,2100	1,7625	13,3393	20,0690	-1,7577	-13,3214
15/05/2011	-1,5441	-0,5245	-4,6006	-5,2414	0,4465	3,3723	2,8277	1,0812	8,1908	-19,0010	0,8458	6,4253	22,6892	-0,8427	-6,4420
16/05/2011	0,6550	0,5429	4,8063	0,9756	-0,8061	-6,1087	-7,6122	0,5559	4,2285	-19,8108	-0,1985	-1,4898	23,0964	0,1482	1,0572
17/05/2011	0,2570	-0,5430	-4,8439	3,9872	0,6293	4,7868	-5,5443	-0,8779	-6,6736	-17,4137	-1,2060	-9,1576	21,1182	1,1177	8,4401
18/05/2011	-1,1589	0,5238	4,7123	-6,2387	-0,0241	-0,1902	5,6506	-0,8637	-6,5902	-12,1295	-2,0097	-15,3041	16,8650	1,9616	14,9071
19/05/2011	2,0219	-0,4870	-4,4160	4,3211	-0,5867	-4,4712	7,5553	0,5682	4,3366	-4,8089	-2,4740	-18,8841	10,7552	2,5854	19,7266
20/05/2011	-2,8120	0,4331	3,9655	0,5466	0,8086	6,1844	-2,9375	1,0639	8,1524	3,3198	-2,5234	-19,3066	3,4635	2,9229	22,3743
21/05/2011	3,5062	-0,3649	-3,3766	-5,0100	-0,4803	-3,6836	-8,6066	-0,1846	-1,4083	10,9055	-2,1580	-16,5514	-4,2020	2,9471	22,6246
22/05/2011	-4,0756	0,2841	2,6699	6,1267	-0,1626	-1,2410	-0,1219	-1,1254	-8,6458	16,7461	-1,4486	-11,1410	-11,4449	2,6709	20,5618
23/05/2011	4,5														

	Tethys: x	Tethys: y	Tethys: z	Dione: x	Dione: y	Dione: z	Rhea: x	Rhea: y	Rhea: z	Titan: x	Titan: y	Titan: z	Hyperion: x	Hyperion: y	Hyperion: z
11/06/2011	4,8806	0,0148	0,0566	-0,9733	0,7872	6,1330	3,9303	0,9914	7,7343	11,9293	2,1668	16,9058	-2,5472	2,9211	22,8001
12/06/2011	-4,7855	-0,1121	-0,9553	-3,9608	-0,6131	-4,7775	-6,9537	0,6695	5,2297	4,9190	2,5670	20,0325	-9,9257	2,7180	21,2290
13/06/2011	4,5237	0,2057	1,8207	6,2500	0,0320	0,2561	-6,4236	-0,7513	-5,8506	-2,7825	2,6051	20,3286	-16,3502	2,2515	17,5988
14/06/2011	-4,1064	-0,2923	-2,6229	-4,2987	0,5793	4,5032	4,6702	-0,9375	-7,3074	-10,0820	2,2703	17,7109	-21,3009	1,5801	12,3706
15/06/2011	3,5453	0,3689	3,3341	-0,5118	-0,7931	-6,1645	8,0915	0,4181	3,2492	-15,8981	1,6019	12,4940	-24,4537	0,7734	6,0912
16/06/2011	-2,8631	-0,4331	-3,9296	5,0108	0,4783	3,7221	-1,7559	1,0896	8,4833	-19,3030	0,6902	5,3886	-25,6651	-0,0967	-0,6758
17/06/2011	2,0804	0,4822	4,3889	-6,1083	0,1667	1,2878	-8,7214	-0,0253	-0,1889	-19,6809	-0,3309	-2,5544	-24,9419	-0,9618	-7,3943
18/06/2011	-1,2268	-0,5153	-4,6962	3,1181	-0,6921	-5,3628	-1,3597	-1,1003	-8,5422	-16,8763	-1,3001	-10,0776	-22,4117	-1,7595	-13,5790
19/06/2011	0,3305	0,5304	4,8408	2,0140	0,7587	5,8805	8,2406	-0,3664	-2,8496	-11,2796	-2,0561	-15,9305	-18,2983	-2,4351	-18,8067
20/06/2011	0,5775	-0,5277	-4,8179	-5,7588	-0,3069	-2,3804	4,3152	0,9716	7,5287	-3,7958	-2,4700	-19,1211	-12,9054	-2,9424	-22,7217
21/06/2011	-1,4643	0,5065	4,6284	5,6432	-0,3455	-2,6633	-6,6798	0,7186	5,5696	4,3230	-2,4734	-19,1305	-6,6053	-3,2442	-25,0411
22/06/2011	2,3020	-0,4683	-4,2788	-1,6872	0,7745	5,9768	-6,7141	-0,7150	-5,5199	11,7380	-2,0717	-16,0111	0,1679	-3,3138	-25,5637
23/06/2011	-3,0579	0,4136	3,7813	-3,3695	-0,6749	-5,2033	4,2892	-0,9756	-7,5320	17,2878	-1,3387	-10,3422	6,9250	-3,1368	-24,1842
24/06/2011	3,7103	-0,3448	-3,1533	6,1788	0,1258	0,9741	8,2479	0,3688	2,8350	20,1784	-0,3971	-3,0773	13,1346	-2,7138	-20,9145
25/06/2011	-4,2322	0,2637	2,4164	-4,7951	0,5183	3,9768	-1,3157	1,1120	8,5600	20,0665	0,6067	4,6506	18,2454	-2,0643	-15,9104
26/06/2011	4,6097	-0,1735	-1,5961	0,2137	-0,8063	-6,1809	-8,7198	0,0325	0,2573	17,0535	1,5260	11,7095	21,7287	-1,2301	-9,4987
27/06/2011	-4,8267	0,0768	0,7209	4,5462	0,5570	4,2685	-1,8046	-1,1040	-8,4589	11,6251	2,2318	17,1097	23,1431	-0,2773	-2,1917
28/06/2011	4,8776	0,0228	0,1790	-6,2162	0,0768	0,5804	8,0798	-0,4265	-3,2699	4,5661	2,6262	20,1048	22,2185	0,7055	5,3294
29/06/2011	-4,7603	-0,1221	-1,0726	3,7204	-0,6527	-4,9709	4,7053	0,9554	7,2933	-3,1332	2,6514	20,2637	18,9408	1,6160	12,2794
30/06/2011	4,4780	0,2176	1,9290	1,3241	0,7973	6,0680	-6,3763	0,7744	5,9082	-10,3809	2,2969	17,5215	13,6004	2,3529	17,8858
01/07/2011	-4,0426	-0,3063	-2,7187	-5,4451	-0,3969	-3,0180	-6,9986	-0,6796	-5,1595	-16,1023	1,6035	12,2097	6,7713	2,8344	21,5292
02/07/2011	3,4663	0,3847	3,4144	5,9136	-0,2660	-2,0080	3,8804	-1,0208	-7,7443	-19,3824	0,6639	5,0535	-0,7865	3,0129	22,8568
03/07/2011	-2,7721	-0,4507	-3,9923	-2,3592	0,7606	5,7455	8,3881	0,3175	2,3955	-19,6243	-0,3839	-2,8872	-8,2676	2,8810	21,8248
04/07/2011	1,9812	0,5012	4,4325	-2,7501	-0,7360	-5,5477	-0,8534	1,1408	8,6148	-16,6948	-1,3744	-10,3545	-14,9495	2,4671	18,6635
05/07/2011	-1,1229	-0,5353	-4,7198	6,0293	0,2199	1,6590	-8,6934	0,0947	0,7208	-11,0064	-2,1424	-16,1076	-20,2741	1,8252	13,7962
06/07/2011	0,2259	0,5509	4,8445	-5,2157	0,4559	3,4130	-2,2624	-1,1122	-8,3470	-3,4801	-2,5562	-19,1738	-23,8750	1,0234	7,7493
07/07/2011	0,6793	-0,5481	-4,8024	0,9166	-0,8183	-6,1155	7,8894	-0,4929	-3,6971	4,6273	-2,5468	-19,0582	-25,5677	0,1345	1,0796
08/07/2011	-1,5598	0,5261	4,5949	4,0364	0,6357	4,7443	5,0975	0,9412	7,0265	11,9834	-2,1209	-15,8358	-25,3228	-0,7704	-5,6736
09/07/2011	2,3882	-0,4864	-4,2293	-6,2416	-0,0146	-0,1147	-6,0420	0,8374	6,2420	17,4423	-1,3554	-10,1013	-23,2364	-1,6249	-12,0152
10/07/2011	-3,1323	0,4295	3,7182	4,2589	-0,6113	-4,5256	-7,2737	-0,6434	-4,7692	20,2283	-0,3768	-2,8141	-19,5057	-2,3697	-17,5077
11/07/2011	3,7707	-0,3578	-3,0793	0,6365	0,8351	6,1727	3,4441	-1,0729	-7,9407	20,0156	0,6636	4,8947	-14,4111	-2,9534	-21,7778
12/07/2011	-4,2773	0,2731	2,3346	-5,0710	-0,4880	-3,5990	8,5086	0,2628	1,9318	16,9188	1,6144	11,9009	-8,3053	-3,3332	-24,5214
13/07/2011	4,6385	-0,1786	-1,5099	6,1029	-0,1840	-1,3454	-0,3709	1,1750	8,6446	11,4324	2,3422	17,2256	-1,6064	-3,4765	-25,5127
14/07/2011	-4,8390	0,0772	0,6334	-2,9839	0,7446	5,4481	-8,6396	0,1626	1,1992	4,3459	2,7453	20,1339	5,2089	-3,3627	-24,6171
15/07/2011	4,8737	0,0275	0,2647	-2,1128	-0,7968	-5,8123	-2,7303	-1,1237	-8,2044	-3,3490	2,7635	20,2063	11,6150	-2,9865	-21,8122
16/07/2011	-4,7411	-0,1322	-1,1534	5,8098	0,3162	2,3044	7,6674	-0,5662	-4,1278	-10,5619	2,3857	17,3885	17,0584	-2,3616	-17,2148
17/07/2011	4,4449	0,2331	2,0024	-5,5613	0,3902	2,8220	5,4881	0,9276	6,7275	-16,2228	1,6545	12,0221	20,9954	-1,5251	-11,1090
18/07/2011	-3,9974	-0,3269	-2,7824	1,5899	-0,8282	-5,9755	-5,6767	0,9075	6,5672	-19,4248	0,6672	4,8404	22,9533	-0,5402	-3,9653
19/07/2011	3,4111	0,4102	3,4666	3,4912	0,7153	5,1487	-7,5354	-0,6048	-4,3498	-19,5825	-0,4316	-3,0921	22,6127	0,5044	3,5681
20/07/2011	-2,7094	-0,4804	-4,0317	-6,1905	-0,1094	-0,7896	2,9815	-1,1310	-8,1175	-16,5772	-1,4683	-10,5183	19,8951	1,5019	10,7198
21/07/2011	1,9135	0,5344	4,4583	4,7323	-0,5661	-4,0367	8,6059	0,2032	1,4461	-10,8353	-2,2694	-16,2048	15,0220	2,3423	16,7040
22/07/2011	-1,0527	-0,5711	-4,7318	-0,0411	0,8715	6,1998	0,1293	1,2134	8,6465	-3,2869	-2,6973	-19,1929	8,5087	2,9316	20,8589
23/07/2011	0,1559	0,5881	4,8429	-4,6455	-0,5812	-4,1206	-8,5557	0,2370	1,6891	4,8090	-2,6801	-19,0038	1,0798	3,2090	22,7690
24/07/2011	0,7468	-0,5856	-4,7879	6,2150	-0,0977	-0,0977	-3,2048	-1,1367	-8,0292	12,1266	-2,2253	-15,7263	-6,4643	3,1554	22,3214
25/07/2011	-1,6225	0,5627	4,5687	-3,5578	0,7249	5,0932	7,4128	-0,6467	-4,5581	17,5308	-1,4139	-9,9630	-13,3811	2,7912	19,6859
26/07/2011	2,4443	-0,5207	-4,1930	-1,4663	-0,8571	-5,9999	5,8732	0,9126	6,3959	20,2585	-0,3791	-2,6743	-19,0760	2,1668	15,2411
27/07/2011	-3,1801	0,4602	3,6736	5,5281	0,4160	2,9055	-5,2807	0,9843	6,8796	19,9932	0,7202	5,0134	-23,1392	1,3501	9,4861
28/07/2011	3,8091	-0,3837	-3,0285	-5,8334	0,3194	2,2129	-7,7799	-0,5621	-3,9024	16,8561	1,7245	11,9832	-25,3427	0,4170	2,9657
29/07/2011	-4,3055	0,2932	2,2798	2,2282	-0,8347	-5,7681	2,4943	-1,1944	-8,2710	11,3442	2,4927	17,2636	-25,6171	-0,5565	-3,7815
30/07/2011	4,6560	-0,1919	-1,4532	2,9191	0,7957	5,4825	8,6769	0,1374	0,9409	4,2477	2,9171	20,1267	-24,0229	-1,4979	-10,2530
31/07/2011	-4,8459	0,0830	0,5770	-6,0691	-0,2090	-1,4380	0,6445	1,2546	8,6176	-3,4427	2,9333	20,1584	-20,7260	-2,3413	-15,9981
01/08/2011	4,8704	0,0298	0,3187	5,1400	-0,5153	-3,5130	-8,4396	0,3189	2,1871	-10,6382	2,5290	17,3089	-15,9800	-3,0279	-20,6256
02/08/2011	-4,7284	-0,1427	-1,2033	-0,7022	0,9054	6,1544	-3,6823	-1,1496	-7,8200	-16,2708	1,7491	11,9232	-10,1147	-3,5078	-23,8097
03/08/2011	4,4238	0,2519	2,0464	-4,1768	-0,6767	-4,5813	7,1246	-0,7347	-4,9838	-19,4373	0,6967	4,7373	-3,5288	-3,7409	-25,2980
04/08/2011	-3,9691	-0,3536	-2,8194	6,2543	-0,0054	-0,0314	6,2488	0,8945	6,0319	-19,5575	-0,4741	-3,1830	3,3151	-3,6994	-24,9249
05/08/2011	3,3771	0,4442	3,4956	-4,0785	0,6995	4,6888	-4,8545	1,0674	7,1753	-16,5197	-1,5783	-10,5824	9,8995	-3,3711	-22,6312
06/08/2011	-2,6712	-0,5207	-4,0521	-0,8178	-0,9159	-6,1138	-8,0034	-0,5137	-3,4286	-10,7569	-2,4308	-16,2329	15,6697	-2,7636	-18,4920
07/08/2011	1,8728	0,5799	4,4699	5,1912	0,5198	3,4591	1,9845	-1,2618	-8,3977	-3,2035	-2,8851	-19,1843	20,0678	-1,9095	-12,7457
08/08/2011	-1,0111	-0,6204	-4,7347	-6,0345	0,2415	1,5933	8,7184	0,0643	0,4192	4,8826	-2,8646	-18,9672	22,5905	-0,8701	-5,8177
09/08/2011	0,1149	0,6396	4,8375	2,8277	-0,8358	-5,5003	1,1712	1,2969	8,5557	12,1807	-2,3773	-15,6765	22,8687	0,2639	1,6806
10/08/2011	0,7858	-0,6377	-4,7750	2,3275	0,8763	5,7470	-8,2896	0,4087	2,6893	17,5633	-1,5093	-9,9162	20,7586	1,3792	8,9970
11/08/2011	-1,6583	0,6135	4,5493	-5,8832	-0,3143	-2,0550	-4,1585	-1,1603	-7,5759	20,2733	-0,4023	-2,6432	16,4094	2,3540	15,3370
12/08/2011	2,4759	-0,5685	-4,1682	5,4826	-0,4569	-2,9622	6,8026	-0,8299	-5,4007	19,9978	0,7746	5,0225	10,2721	3,0794	20,0007
13/08/2011	-3,2067	0,5033	3,6448	-1,3417	0,9348	6,0419	6,6107	0,8714	5,6363	16,8578	1,8507	11,9703	3,0297	3,4786	22,5111
14/08/2011	3,8301	-0,4205	-2,9970	-3,6720	-0,7741	-4,9803	-4,3996	1,1557	7,4501	11,3482	2,6752	17,2341	-4,5298	3,5192	22,6847
1															

	Tethys: x	Tethys: y	Tethys: z	Dione: x	Dione: y	Dione: z	Rhea: x	Rhea: y	Rhea: z	Titan: x	Titan: y	Titan: z	Hyperion: x	Hyperion: y	Hyperion: z
03/09/2011	-4,8506	0,1067	0,5328	5,9767	-0,3103	-1,8051	0,3501	-1,4718	-8,5879	-16,1954	2,0428	11,9380	5,0296	3,7815	22,0644
04/09/2011	4,8677	0,0288	0,3577	-2,5404	0,9718	5,6351	8,6419	-0,2070	-1,2077	-19,3946	0,8232	4,7939	-2,4908	3,9384	22,8837
05/09/2011	-4,7193	-0,1648	-1,2358	-2,5783	-0,9695	-5,5940	2,7815	1,4114	8,1562	-19,5515	-0,5378	-3,0939	-9,7700	3,7062	21,4425
06/09/2011	4,4093	0,2968	2,0715	5,9779	0,3167	1,8219	-7,6259	0,7255	8,1771	-16,5505	-1,8247	-10,4747	-16,1493	3,1262	18,0125
07/09/2011	-3,9504	-0,4202	-2,8363	-5,3107	0,5685	3,2453	-5,5374	-1,1608	-6,6357	-10,8218	-2,8222	-16,1258	-21,1339	2,2677	13,0198
08/09/2011	3,3556	0,5305	3,5043	1,0840	-1,0647	-6,0499	5,6405	-1,1513	-6,5554	-3,2955	-3,3590	-19,1016	-24,4049	1,2149	6,9684
09/09/2011	-2,6478	-0,6242	-4,0528	3,9106	0,8509	4,8155	7,5737	0,7558	4,2765	4,7769	-3,3453	-18,9343	-25,8046	0,0573	0,3824
10/09/2011	1,8489	0,6972	4,4631	-6,2366	-0,0470	-0,2679	-2,8843	1,4389	8,1133	12,0826	-2,7889	-15,7140	-25,3127	-1,1165	-6,2307
11/09/2011	-0,9876	-0,7478	-4,7212	4,3675	-0,7852	-4,3936	-8,6181	-0,2372	-1,3244	17,4991	-1,7880	-10,0327	-23,0223	-2,2227	-12,3999
12/09/2011	0,0928	0,7729	4,8185	0,4934	1,1023	6,1437	-0,2179	-1,5383	-8,5804	20,2682	-0,5050	-2,8305	-19,1229	-3,1841	-17,7018
13/09/2011	0,8059	-0,7724	-4,7517	-4,9895	-0,6640	-3,6835	8,5437	-0,3155	-1,7570	20,0688	0,8648	4,7888	-13,8878	-3,9317	-21,7677
14/09/2011	-1,6758	0,7450	4,5232	6,1302	-0,2198	-1,2095	3,3144	1,4389	7,9496	17,0079	2,1238	11,7260	-7,6683	-4,4066	-24,2914
15/09/2011	2,4904	-0,6924	-4,1407	-3,0936	0,9746	5,3496	-7,3331	0,8453	4,6523	11,5643	3,0956	17,0185	-0,8895	-4,5627	-25,0422
16/09/2011	-3,2182	0,6151	3,6174	-1,9996	-1,0636	-5,8096	-5,9663	-1,1447	-6,2561	4,5112	3,6428	19,9363	5,9549	-4,3703	-23,8836
17/09/2011	3,8385	-0,5162	-2,9711	5,7667	0,4394	2,3913	5,1926	-1,2665	-6,8949	-3,1718	3,6816	20,0542	12,3149	-3,8218	-20,8010
18/09/2011	-4,3262	0,3985	2,2239	-5,6097	0,5007	2,7060	7,8415	0,6975	3,7739	-10,3985	3,1921	17,3059	17,6109	-2,9382	-15,9341
19/09/2011	4,6682	-0,2659	-1,4012	1,6891	-1,0974	-5,9046	-2,3386	1,5337	8,2704	-16,0957	2,2273	12,0187	21,2827	-1,7758	-9,6082
20/09/2011	-4,8504	0,1228	0,5311	3,4102	0,9634	5,1626	-8,6879	-0,1433	-0,7635	-19,3485	0,9138	4,9137	22,8656	-0,4289	-2,3475
21/09/2011	4,8678	0,0261	0,3567	-6,1779	-0,1633	-0,8731	-0,7908	-1,5998	-8,5353	-19,5634	-0,5560	-2,9544	22,0837	0,9739	5,1493
22/09/2011	-4,7198	-0,1758	-1,2322	4,7885	-0,7435	-3,9407	8,4078	-0,4326	-2,3024	-16,6166	-1,9493	-10,3377	18,9346	2,2837	12,0888
23/09/2011	4,4105	0,3211	2,0654	-0,1225	1,1649	6,1502	3,8382	1,4581	7,7067	-10,9311	-3,0332	-16,0138	13,7271	3,3555	17,7096
24/09/2011	-3,9522	-0,4571	-2,8281	-4,5938	-0,7886	-4,1439	-7,0060	0,9705	5,1100	-3,4311	-3,6222	-19,0351	7,0411	4,0739	21,4204
25/09/2011	3,3581	0,5787	3,4943	6,2226	-0,1170	-0,6088	-6,3730	-1,1179	-5,8466	4,6368	-3,6185	-18,9287	-0,3812	4,3722	22,8964
26/09/2011	-2,6511	-0,6823	-4,0413	-3,6124	0,9640	5,0144	4,7183	-1,3830	-7,2059	11,9621	-3,0291	-15,7766	-7,7698	4,2380	22,1019
27/09/2011	1,8528	0,7632	4,4506	-1,4055	-1,1522	-5,9649	8,0775	0,6281	3,2519	17,4217	-1,9585	-10,1596	-14,4405	3,7059	19,2483
28/09/2011	-0,9921	-0,8194	-4,7084	5,5011	0,5683	2,9311	-1,7784	1,6256	8,3917	20,2521	-0,5804	-3,0065	-19,8588	2,8441	14,7175
29/09/2011	0,0976	0,8478	4,8058	-5,8521	0,4188	2,1456	-8,7204	-0,0393	-0,1965	20,1228	0,8957	4,5881	-23,6606	1,7404	8,9852
30/09/2011	0,8008	-0,8480	-4,7397	2,2739	-1,1176	-5,7022	-1,3643	-1,6543	-8,4520	17,1293	2,2572	11,5302	-26,6425	0,4910	2,5613
01/10/2011	-1,6708	0,8187	4,5123	2,8800	1,0735	5,4558	8,2341	-0,5573	-2,8397	11,7388	3,3132	16,8567	-25,7405	-0,8069	-4,0495
02/10/2011	2,4856	-0,7617	-4,1314	-6,0594	-0,2891	-1,4642	4,3486	1,4672	7,4287	4,7154	3,9149	19,8320	-24,0079	-2,0596	-10,3708
03/10/2011	-3,2138	0,6776	3,6101	5,1607	-0,6866	-3,4532	-6,6462	1,0996	5,5465	-2,9668	3,9699	20,0215	-20,5977	-3,1798	-15,9661
04/10/2011	3,8348	-0,5699	-2,9661	-0,7340	1,2168	6,0966	-6,7542	-1,0795	-5,4099	-10,2216	3,4551	17,3473	-15,7510	-4,0876	-20,4475
05/10/2011	-4,3233	0,4413	2,2214	-4,1551	-0,9143	-4,5595	4,2207	-1,4991	-7,4854	-15,9711	2,4257	12,1252	-9,7904	-4,7136	-23,4837
06/10/2011	4,6664	-0,2965	-1,4013	6,2546	-0,0018	-0,0069	8,2793	0,5470	2,7145	-19,2918	1,0171	5,0666	-3,1178	-5,0004	-24,8118
07/10/2011	-4,8496	0,1399	0,5339	-4,0944	0,9378	4,6328	-1,2078	1,7125	8,4758	-19,5796	-0,5643	-2,7801	3,7901	-4,9081	-24,2566
08/10/2011	4,8682	0,0229	0,3515	-0,7997	-1,2325	-6,0605	-8,7145	0,0746	0,3720	-16,7003	-2,0680	-10,1697	10,3904	-4,4193	-21,7573
09/10/2011	-4,7214	-0,1867	-1,2246	5,1835	0,7019	3,4388	-1,9341	-1,7000	-8,3308	-11,0676	-3,2426	-15,8793	16,0975	-3,5470	-17,4018
10/10/2011	4,4132	0,3457	2,0557	-6,0372	0,3221	1,5678	8,0236	-0,6886	-3,3645	-3,5982	-3,8880	-18,9575	20,3279	-2,3422	-11,4610
11/10/2011	-3,9559	-0,4946	-2,8166	2,8352	-1,1227	-5,4453	4,8415	1,4651	7,1175	4,4660	-3,8978	-18,9244	22,5725	-0,8990	-4,4093
12/10/2011	3,3627	0,6279	3,4813	2,3232	1,1784	5,6944	-6,2560	1,2308	5,9580	11,8166	-3,2781	-15,8515	22,4908	0,6481	3,0901
13/10/2011	-2,6563	-0,7414	-4,0274	-5,8822	-0,4233	-2,0377	-7,1063	-1,0288	-4,9494	17,3280	-2,1394	-10,3071	20,0028	2,1374	10,2536
14/10/2011	1,8585	0,8303	4,4362	5,4825	-0,6133	-2,9345	3,7034	-1,6126	-7,7311	20,2299	-0,6668	-3,2077	15,3403	3,4050	16,2983
15/10/2011	-0,9980	-0,8922	-4,6939	-1,3380	1,2551	5,9842	8,4449	0,5456	2,1657	20,1806	0,9161	4,3617	9,0228	4,3140	20,5824
16/10/2011	0,1036	0,9236	4,7917	-3,6762	-1,0384	-4,9287	-0,6310	1,7925	8,5220	17,2626	2,3813	11,3114	1,7596	4,7775	22,7120
17/10/2011	0,7951	-0,9244	-4,7263	6,2263	0,1250	0,5926	-8,6701	0,1972	0,9376	11,9309	3,5239	16,6771	-5,6826	4,7673	22,5799
18/10/2011	-1,6655	0,8930	4,5001	-4,5371	0,8943	4,2076	-2,4956	-1,7354	-8,1727	4,9396	4,1826	19,7169	-12,5984	4,3089	20,3340
19/10/2011	2,4809	-0,8313	-4,1208	-0,1859	-1,3014	-6,0964	7,7775	-0,8247	-3,8728	-2,7423	4,2567	19,9852	-18,4171	3,4677	16,3077
20/10/2011	-3,2099	0,7402	3,6013	4,8157	0,8380	3,9116	5,3130	1,4506	6,7758	-10,0285	3,7195	17,3917	-22,7307	2,3334	10,9444
21/10/2011	3,8317	-0,6233	-2,9594	-6,1642	0,2105	0,9763	-5,8383	1,3622	6,3415	-15,8353	2,6282	12,2397	-25,2903	1,0079	4,7356
22/10/2011	-4,3211	0,4837	2,2169	3,3699	-1,1105	-5,1358	-7,4267	-0,9656	-4,4686	-19,2298	1,1267	5,2304	-25,9878	-0,4038	-1,8209
23/10/2011	4,6650	-0,3264	-1,3992	1,7431	1,2753	5,8776	3,1703	-1,7215	-7,9414	-19,5963	-0,5647	-2,5941	-24,8352	-1,7987	-8,2459
24/10/2011	-4,8491	0,1565	0,5341	-5,6474	-0,5642	-2,5903	8,5730	0,3513	1,6099	-16,7888	-2,1777	-9,9912	-21,9476	-3,0792	-14,0932
25/10/2011	4,8684	0,0204	0,3490	5,7521	-0,5230	-2,3880	-0,0525	1,8636	8,5301	-11,2116	-3,4430	-15,7367	-17,5313	-4,1550	-18,9582
26/10/2011	-4,7222	-0,1981	-1,2198	-1,9310	1,2773	5,8141	-8,5875	0,3273	1,4960	-3,7738	-4,1458	-18,8749	-11,8784	-4,9452	-22,4860
27/10/2011	4,4143	0,3707	2,0488	-3,1598	-1,1581	-5,2494	-3,0448	-1,7589	-7,9793	4,2874	-4,1711	-18,9178	-5,3641	-5,3816	-24,3839
28/10/2011	-3,9573	-0,5322	-2,8077	6,1376	0,2624	1,1861	7,4978	-0,9640	-4,3608	11,6648	-3,5242	-15,9263	1,5546	-5,4125	-24,4387
29/10/2011	3,3641	0,6767	3,4708	-4,9375	0,8322	3,7417	5,7598	1,4231	6,4063	17,2300	-2,3213	-10,4557	8,3463	-5,0097	-22,5445
30/10/2011	-2,6576	-0,7998	-4,0154	0,4326	-1,3561	-6,0726	-5,3965	1,4917	6,6945	20,2047	-0,7583	-3,4105	14,4237	-4,1763	-18,7366
31/10/2011	1,8595	0,8961	4,4230	4,3997	0,9739	4,3469	-7,7132	-0,8900	-3,9715	20,2362	0,9276	4,1335	19,1842	-2,9561	-13,2299
01/11/2011	-0,9985	-0,9631	-4,6797	-6,2315	0,0846	0,3746	2,6255	-1,8238	-8,1151	17,3938	2,4935	11,0909	22,0782	-1,4402	-6,4451
02/11/2011	0,1035	0,9971	4,7769	3,8745	-1,0790	-4,7756	8,6630	0,2381	1,0515	12,1201	3,7205	16,4957	22,7032	0,2338	0,9951
03/11/2011	0,7957	-0,9980	-4,7112	1,1425	1,3609	6,0042	0,5233	1,9243	8,5008	5,1598	4,4357	19,5989	20,9021	1,8934	8,3239
04/11/2011	-1,6666	0,9641	4,4850	-5,3555	-0,7096	-3,1187	-8,4678	0,4634	2,0430	-2,5226	4,5300	19,9444	16,8270	3,3572	14,7435
05/11/2011	2,4824	-0,8975	-4,1060	5,9670	-0,4153	-1,8168	-3,5775	-1,7697	-7,7527	-9,8402	3,9730	17,4293	10,9318	4,4666	19,5664
06/11/2011	-3,2117	0,7991	3,5870	-2,5093	1,2808	5,5869	7,1873	-1,1043	-4,8252	-15,7032	2,8240	12,3449	3,8868	5,1130	22,3331
0															

	Tethys: x	Tethys: y	Tethys: z	Dione: x	Dione: y	Dione: z	Rhea: x	Rhea: y	Rhea: z	Titan: x	Titan: y	Titan: z	Hyperion: x	Hyperion: y	Hyperion: z
26/11/2011	4,6723	-0,3737	-1,3625	-4,6015	-1,0019	-4,0887	-3,9662	1,8474	7,5524	-11,4428	-3,7952	-15,4910	12,7251	4,5069	18,4019
27/11/2011	-4,8520	0,1787	0,4998	6,2219	-0,1506	-0,6118	-8,3557	-0,5967	-2,4270	-4,0544	-4,6002	-18,7242	5,9512	5,3444	21,7762
28/11/2011	4,8661	0,0237	0,3798	-3,6058	1,2228	4,9620	0,9669	-2,0723	-8,4160	4,0037	-4,6532	-18,8890	-1,4257	5,6472	22,9575
29/11/2011	-4,7140	-0,2266	-1,2463	-1,4097	-1,4578	-5,8968	8,7081	-0,1460	-0,5951	11,4252	-3,9585	-16,0289	-8,6728	5,4153	21,9633
30/11/2011	4,3998	0,4230	2,0698	5,5027	0,7175	2,8957	2,1907	2,0308	8,2050	17,0758	-2,6431	-10,6789	-15,1577	4,7008	19,0226
01/12/2011	-3,9362	-0,6062	-2,8224	-5,8519	0,5272	2,1208	-7,9068	0,8870	3,5772	20,1649	-0,9223	-3,7238	-20,3922	3,5913	14,5048
02/12/2011	3,3365	0,7695	3,4781	2,2776	-1,4053	-5,6371	-5,0399	-1,7199	-6,9051	20,3211	0,9422	3,7755	-24,0407	2,1943	8,8555
03/12/2011	-2,6238	-0,9078	-4,0146	2,8749	1,3484	5,3971	6,1042	-1,5097	-6,0499	17,5929	2,6818	10,7399	-25,9092	0,6259	2,5500
04/12/2011	1,8202	1,0151	4,4136	-6,0567	-0,3650	-1,4571	7,2440	1,1838	4,7280	12,4037	4,0535	16,2000	-25,9277	-0,9963	-3,9368
05/12/2011	-0,9547	-1,0890	-4,6612	5,1683	-0,8555	-3,4045	-3,4693	1,9483	7,7690	5,4850	4,8639	19,3953	-24,1341	-2,5576	-10,1470
06/12/2011	0,0565	1,1250	4,7492	-0,7495	1,5175	6,0266	-8,4963	-0,4813	-1,9093	-2,2041	4,9903	19,8522	-20,6634	-3,9490	-15,6512
07/12/2011	0,8445	-1,1235	-4,6744	-4,1398	-1,1419	-4,5219	0,4211	-2,1307	-8,4462	-9,5724	4,3966	17,4484	-15,7421	-5,0697	-20,0564
08/12/2011	-1,7153	1,0825	4,4394	6,2549	0,0038	0,0155	8,6527	-0,2824	-1,1206	-15,5181	3,1467	12,4586	-9,6869	-5,8299	-23,0176
09/12/2011	2,5291	-1,0048	-4,0523	-4,1144	1,1580	4,5642	2,7130	2,0386	8,0455	-19,0814	1,4074	5,5628	-2,9063	-6,1553	-24,2539
10/12/2011	-3,2543	0,8915	3,5263	-0,7683	-1,5258	-5,9976	-7,6623	1,0260	4,0425	-19,6181	-0,5633	-2,2080	4,1018	-5,9943	-23,5748
11/12/2011	3,8701	-0,7474	-2,8795	5,1643	0,8739	3,4286	-5,4724	-1,6763	-6,5790	-16,9581	-2,4510	-9,6128	10,7606	-5,3270	-20,9150
12/12/2011	-4,3513	0,5765	2,1341	-6,0468	0,3869	1,5138	5,7063	-1,6323	-6,3961	-11,4885	-3,9406	-15,4231	16,4451	-4,1766	-16,3762
13/12/2011	4,6848	-0,3851	-1,3156	2,8743	-1,3749	-5,3668	7,5308	1,0955	4,2798	-4,1084	-4,7816	-18,6742	20,5413	-2,6195	-10,2664
14/12/2011	-4,8566	0,1793	0,4520	2,2796	1,4497	5,6492	-2,9700	2,0376	7,9513	3,9507	-4,8402	-18,8644	22,5359	-0,7892	-3,1135
15/12/2011	4,8621	0,0337	0,4268	-5,8642	-0,5308	-2,0634	-8,6013	-0,3600	-1,3975	11,3822	-4,1217	-16,0342	22,1237	1,1314	4,3674
16/12/2011	-4,7010	-0,2466	-1,2909	5,5099	-0,7362	-2,8548	-0,1138	-2,1752	-8,4444	17,0505	-2,7584	-10,7144	19,2953	2,9348	11,3690
17/12/2011	4,3775	0,4520	2,1105	-1,3973	1,5257	5,9070	8,5659	-0,4193	-1,6284	20,1622	-0,9744	-3,7842	14,3629	4,4243	17,1303
18/12/2011	-3,9050	-0,6429	-2,8575	-3,6220	-1,2723	-4,9140	3,2127	2,0323	7,8609	20,3418	0,9589	3,6993	7,9026	5,4485	21,0716
19/12/2011	3,2967	0,8124	3,5061	6,2193	0,1697	0,6544	-7,3950	1,1600	4,4808	17,6329	2,7629	10,6590	0,6367	5,9230	22,8749
20/12/2011	-2,5766	-0,9551	-4,0342	-4,5887	1,0680	4,1094	-5,8739	-1,6205	-6,2381	12,4549	4,1853	16,1247	-6,6955	5,8327	22,4929
21/12/2011	1,7666	1,0649	4,4236	-0,1039	-1,5719	-6,0345	5,2972	-1,7453	-6,7100	5,5371	5,0259	19,3323	-13,4364	5,2200	20,1013
22/12/2011	-0,8965	-1,1393	-4,6608	4,7604	1,0264	3,9346	7,7827	0,9985	3,8290	-2,1601	5,1572	19,8039	-19,0620	4,1680	16,0307
23/12/2011	-0,0046	1,1739	4,7377	-6,1779	0,2296	0,8780	-2,4729	2,1140	8,1005	-9,5418	4,5426	17,4133	-23,1971	2,7838	10,7012
24/12/2011	0,9063	-1,1690	-4,6516	3,4521	-1,3179	-5,0316	-8,6723	-0,2352	-0,8956	-15,5008	3,2489	12,4331	-25,6077	1,1858	4,5741
25/12/2011	-1,7757	1,1230	4,4054	1,6443	1,5328	5,8444	-0,6339	-2,2052	-8,4133	-19,0718	1,4502	5,5438	-26,1852	-0,5037	-1,8806
26/12/2011	2,5858	-1,0388	-4,0077	-5,5998	-0,6988	-2,6593	8,4509	-0,5544	-2,1156	-19,6080	-0,5853	-2,2207	-24,9311	-2,1645	-8,2032
27/12/2011	-3,3050	0,9177	3,4720	5,7964	-0,5954	-2,2616	3,6871	2,0124	7,6551	-16,9403	-2,5316	-9,6169	-21,9457	-3,6809	-13,9555
28/12/2011	3,9126	-0,7651	-2,8169	-2,0450	1,5074	5,7189	-7,1092	1,2868	4,8905	-11,4599	-4,0636	-15,4153	-17,4231	-4,9442	-18,7302
29/12/2011	-4,3835	0,5851	2,0648	-3,0492	-1,3889	-5,2589	-6,2432	-1,5537	-5,8868	-4,0709	-4,9244	-18,6528	-11,6501	-5,8562	-22,1612
30/12/2011	4,7050	-0,3844	-1,2416	6,1107	0,3438	1,3002	4,8816	-1,8469	-6,9916	3,9917	-4,9782	-18,8312	-5,0084	-6,3332	-23,9394
31/12/2011	-4,8635	0,1696	0,3757	-5,0214	0,9528	3,5977	8,0001	0,8949	3,3799	11,4202	-4,2331	-15,9941	2,0247	-6,3127	-23,8373

Distanze in raggi di Saturno - Distance in saturnian radii



# FENOMENI MUTUI DEI SATELLITI DI SATURNO

## MUTUAL PHENOM. OF THE SATELLITES OF SATURN

Ec.D. : inizio dell'eclisse  
 Ec.R. : fine dell'eclisse  
 Oc.D. : inizio dell'occultazione  
 Oc.R. : fine dell'occultazione  
 Tr.I. : inizio del transito  
 Tr.E. : fine del transito  
 Sh.I. : ingresso dell'ombra  
 Sh.E. : uscita dell'ombra

TEMPI IN T.U.

Sono stati presi in considerazione solo i 4 satelliti principali

Ec.D. : beginning of the eclipse  
 Ec.R. : ending of the eclipse  
 Oc.D. : beginning of the occultation  
 Oc.R. : ending of the occultation  
 Tr.I. : beginning of the transit  
 Tr.E. : ending of the transit  
 Sh.I. : beginning of the umbra transit  
 Sh.E. : ending of the umbra transit

TIMES IN U.T.

Only the 4 main satellites

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
01/01/2011	00:25:33	Tethys	Sh.	I.	6,4	-66,0	12/01/2011	19:09:39	Dione	Sh.	E.	-41,4	-34,3	25/01/2011	13:29:19	Tethys	Sh.	I.	-39,5	22,6
01/01/2011	01:30:29	Tethys	Tr.	I.	17,8	-56,1	13/01/2011	06:57:23	Tethys	Ec.	D.	35,2	2,5	25/01/2011	14:32:04	Tethys	Tr.	I.	-47,5	15,3
01/01/2011	02:44:29	Tethys	Sh.	E.	29,6	-42,9	13/01/2011	09:30:04	Tethys	Occ.	R.	11,5	21,6	25/01/2011	15:44:09	Tethys	Sh.	E.	-52,3	4,8
01/01/2011	03:00:19	Tethys	Tr.	E.	31,8	-39,9	14/01/2011	02:54:02	Dione	Ec.	D.	37,1	-41,1	25/01/2011	15:59:25	Tethys	Tr.	E.	-52,4	2,4
01/01/2011	19:06:54	Dione	Sh.	I.	-46,9	-35,5	14/01/2011	04:02:53	Dione	Ec.	R.	42,6	-28,4	26/01/2011	10:33:55	Dione	Sh.	I.	-9,7	28,2
01/01/2011	20:27:36	Dione	Sh.	E.	-35,9	-50,3	14/01/2011	05:36:46	Tethys	Sh.	I.	42,1	-11,4	26/01/2011	11:31:01	Dione	Sh.	E.	-20,2	29,3
01/01/2011	23:04:55	Tethys	Ec.	D.	-8,1	-70,8	14/01/2011	06:42:17	Tethys	Tr.	I.	36,5	0,3	26/01/2011	12:08:41	Tethys	Ec.	D.	-26,9	28,5
02/01/2011	01:39:38	Tethys	Occ.	R.	20,0	-54,6	14/01/2011	07:53:33	Tethys	Sh.	E.	26,9	10,7	26/01/2011	14:38:43	Tethys	Occ.	R.	-48,6	14,6
02/01/2011	21:44:18	Tethys	Sh.	I.	-22,2	-63,0	14/01/2011	08:09:09	Tethys	Tr.	E.	24,5	12,8	27/01/2011	10:48:06	Tethys	Sh.	I.	-13,1	29,0
02/01/2011	22:49:33	Tethys	Tr.	I.	-10,2	-70,1	15/01/2011	04:16:08	Tethys	Ec.	D.	43,2	-25,9	27/01/2011	11:50:05	Tethys	Tr.	I.	-24,4	29,3
03/01/2011	00:02:56	Tethys	Sh.	E.	3,7	-68,5	15/01/2011	06:48:27	Tethys	Occ.	R.	35,3	1,3	27/01/2011	13:02:36	Tethys	Sh.	E.	-36,6	25,5
03/01/2011	00:18:44	Tethys	Tr.	E.	6,5	-66,8	15/01/2011	11:41:19	Dione	Sh.	I.	-14,3	26,7	27/01/2011	13:17:47	Tethys	Tr.	E.	-38,9	24,2
03/01/2011	04:02:25	Dione	Ec.	D.	39,8	-28,5	15/01/2011	12:50:03	Dione	Sh.	E.	-26,7	23,7	27/01/2011	19:30:02	Dione	Ec.	D.	-28,9	-35,3
03/01/2011	05:21:06	Dione	Ec.	R.	43,6	-14,3	16/01/2011	02:55:31	Tethys	Sh.	I.	38,1	-40,8	27/01/2011	20:23:45	Dione	Ec.	R.	-19,4	-45,0
03/01/2011	20:23:39	Tethys	Ec.	D.	-35,3	-49,3	16/01/2011	04:00:47	Tethys	Tr.	I.	42,8	-28,7	28/01/2011	09:27:28	Tethys	Ec.	D.	1,6	24,0
03/01/2011	22:58:03	Tethys	Occ.	R.	-8,0	-70,4	16/01/2011	05:11:59	Tethys	Sh.	E.	42,9	-15,7	28/01/2011	11:57:04	Tethys	Occ.	R.	-26,3	29,4
04/01/2011	12:49:42	Dione	Sh.	I.	-19,1	21,9	16/01/2011	05:27:32	Tethys	Tr.	E.	42,2	-12,9	29/01/2011	04:17:18	Dione	Sh.	I.	43,1	-24,4
04/01/2011	14:08:10	Dione	Sh.	E.	-32,8	14,2	16/01/2011	20:37:05	Dione	Ec.	D.	-24,7	-49,6	29/01/2011	05:11:04	Dione	Sh.	E.	39,8	-14,5
04/01/2011	19:03:02	Tethys	Sh.	I.	-46,1	-34,4	16/01/2011	21:43:12	Dione	Ec.	R.	-12,7	-60,4	29/01/2011	08:06:52	Tethys	Sh.	I.	15,2	14,7
04/01/2011	20:08:32	Tethys	Tr.	I.	-37,1	-46,5	17/01/2011	01:34:53	Tethys	Ec.	D.	28,3	-55,0	29/01/2011	09:08:01	Tethys	Tr.	I.	4,3	22,2
04/01/2011	21:21:22	Tethys	Sh.	E.	-24,9	-59,1	17/01/2011	04:06:50	Tethys	Occ.	R.	43,2	-27,5	29/01/2011	10:21:02	Tethys	Sh.	E.	-9,5	28,3
04/01/2011	21:37:09	Tethys	Tr.	E.	-22,1	-61,6	18/01/2011	00:14:17	Tethys	Sh.	I.	15,8	-66,0	29/01/2011	10:36:08	Tethys	Tr.	E.	-12,3	29,0
05/01/2011	17:42:24	Tethys	Ec.	D.	-52,0	-19,4	18/01/2011	01:19:12	Tethys	Tr.	I.	26,5	-57,4	30/01/2011	06:46:14	Tethys	Ec.	D.	27,7	2,6
05/01/2011	20:16:28	Tethys	Occ.	R.	-35,3	-47,7	18/01/2011	02:30:25	Tethys	Sh.	E.	36,2	-45,2	30/01/2011	09:15:26	Tethys	Occ.	R.	2,3	23,2
05/01/2011	21:45:15	Dione	Ec.	D.	-20,0	-62,7	18/01/2011	02:45:55	Tethys	Tr.	E.	37,9	-42,4	30/01/2011	13:13:33	Dione	Ec.	D.	-40,0	25,3
05/01/2011	23:01:37	Dione	Ec.	R.	-5,9	-70,3	18/01/2011	05:24:22	Dione	Sh.	I.	42,0	-13,3	30/01/2011	14:03:39	Dione	Ec.	R.	-46,6	20,1
06/01/2011	16:21:47	Tethys	Sh.	I.	-50,6	-5,1	18/01/2011	06:30:23	Dione	Sh.	E.	36,1	-1,1	31/01/2011	05:25:39	Tethys	Sh.	I.	37,7	-11,6
06/01/2011	17:27:27	Tethys	Tr.	I.	-52,3	-16,6	18/01/2011	22:53:38	Tethys	Ec.	D.	2,2	-67,6	31/01/2011	06:25:53	Tethys	Tr.	I.	30,1	-0,3
06/01/2011	18:39:48	Tethys	Sh.	E.	-47,8	-29,8	19/01/2011	01:25:13	Tethys	Occ.	R.	28,0	-56,4	31/01/2011	07:39:28	Tethys	Sh.	E.	18,5	11,1
06/01/2011	18:55:34	Tethys	Tr.	E.	-46,1	-32,7	19/01/2011	14:20:11	Dione	Ec.	D.	-43,3	15,5	31/01/2011	07:54:30	Tethys	Tr.	E.	15,9	13,3
07/01/2011	06:32:32	Dione	Sh.	I.	40,2	-1,3	19/01/2011	15:23:28	Dione	Ec.	R.	-50,1	6,7	31/01/2011	22:00:48	Dione	Sh.	I.	1,9	-59,4
07/01/2011	07:48:42	Dione	Sh.	E.	31,6	9,6	19/01/2011	21:33:02	Tethys	Sh.	I.	-12,4	-58,3	31/01/2011	22:51:00	Dione	Sh.	E.	10,8	-64,2
07/01/2011	15:01:08	Tethys	Ec.	D.	-42,6	7,7	19/01/2011	22:37:33	Tethys	Tr.	I.	0,2	-66,3	01/02/2011	04:05:01	Tethys	Ec.	D.	43,1	-26,3
07/01/2011	17:34:52	Tethys	Occ.	R.	-52,0	-17,8	19/01/2011	23:48:51	Tethys	Sh.	E.	12,7	-67,6	01/02/2011	06:33:47	Tethys	Occ.	R.	28,4	1,0
08/01/2011	13:40:32	Tethys	Sh.	I.	-30,8	17,9	20/01/2011	00:04:18	Tethys	Tr.	E.	15,4	-66,5	02/02/2011	02:44:26	Tethys	Sh.	I.	42,4	-40,9
08/01/2011	14:46:16	Tethys	Tr.	I.	-41,1	10,0	20/01/2011	20:12:24	Tethys	Ec.	D.	-26,3	-44,4	02/02/2011	03:43:40	Tethys	Tr.	I.	43,5	-30,1
08/01/2011	15:28:08	Dione	Ec.	D.	-46,4	4,0	20/01/2011	22:43:36	Tethys	Occ.	R.	1,8	-66,5	02/02/2011	04:57:55	Tethys	Sh.	E.	39,6	-16,3
08/01/2011	15:58:14	Tethys	Sh.	E.	-49,4	-0,3	20/01/2011	23:07:28	Dione	Sh.	I.	6,0	-67,8	02/02/2011	05:12:51	Tethys	Tr.	E.	38,2	-13,6
08/01/2011	16:13:58	Tethys	Tr.	E.	-50,6	-3,2	21/01/2011	00:10:40	Dione	Sh.	E.	17,2	-65,8	02/02/2011	06:57:13	Dione	Ec.	D.	24,2	4,9
08/01/2011	16:42:05	Dione	Ec.	R.	-52,0	-8,3	21/01/2011	18:51:48	Tethys	Sh.	I.	-38,9	-29,4	02/02/2011	07:43:24	Dione	Ec.	R.	16,5	12,1
09/01/2011	12:19:53	Tethys	Ec.	D.	-17,1	24,4	21/01/2011	19:55:48	Tethys	Tr.	I.	-28,5	-41,2	03/02/2011	01:23:48	Tethys	Ec.	D.	35,8	-54,3
09/01/2011	14:53:16	Tethys	Occ.	R.	-42,6	9,2	21/01/2011	21:07:17	Tethys	Sh.	E.	-15,7	-53,8	03/02/2011	03:52:08	Tethys	Occ.	R.	43,3	-28,4
10/01/2011	00:15:25	Dione	Sh.	I.	10,6	-66,8	21/01/2011	21:22:40	Tethys	Tr.	E.	-12,9	-56,2	03/02/2011	15:44:27	Dione	Sh.	I.	-52,1	6,7
10/01/2011	01:29:12	Dione	Sh.	E.	23,2	-56,3	22/01/2011	08:03:23	Dione	Ec.	D.	20,4	13,0	03/02/2011	16:30:47	Dione	Sh.	E.	-49,6	-0,5
10/01/2011	10:59:17	Tethys	Sh.	I.	-2,2	25,9	22/01/2011	09:03:39	Dione	Ec.	R.	10,0	20,4	04/02/2011	00:03:13	Tethys	Sh.	I.	25,1	-63,2
10/01/2011	12:05:01	Tethys	Tr.	I.	-15,1	25,2	22/01/2011	17:31:09	Tethys	Ec.	D.	-48,6	-14,4	04/02/2011	01:01:22	Tethys	Tr.	I.	33,5	-57,2
10/01/2011	13:16:40	Tethys	Sh.	E.	-28,0	20,6	22/01/2011	20:01:58	Tethys	Occ.	R.	-26,8	-42,1	04/02/2011	02:16:22	Tethys	Sh.	E.	41,2	-45,5
10/01/2011	13:32:22	Tethys	Tr.	E.	-30,7	19,1	23/01/2011	16:10:33	Tethys	Sh.	I.	-52,4	0,4	04/02/2011	02:31:12	Tethys	Tr.	E.	42,1	-42,9
11/01/2011	09:11:04	Dione	Ec.	D.	16,1	19,6	23/01/2011	16:50:39	Dione	Sh.	I.	-51,3	-7,0	04/02/2011	22:42:36	Tethys	Ec.	D.	12,2	-62,5
11/01/2011	09:38:38	Tethys	Ec.	D.	11,3	22,1	23/01/2011	17:13:59	Tethys	Tr.	I.	-49,7	-11,2	05/02/2011	00:41:05	Dione	Ec.	D.	31,3	-59,5
11/01/2011	10:22:31	Dione	Ec.	R.	3,5	24,9	23/01/2011	17:50:53	Dione	Sh.	E.	-46,1	-17,8	05/02/2011	01:10:29	Tethys	Occ.	R.	35,2	-55,7
11/01/2011	12:11:40	Tethys	Occ.	R.	-17,0	25,1	23/01/2011	18:25:43	Tethys	Sh.	E.	-41,6	-24,2	05/02/2011	01:22:58	Dione	Ec.	R.	36,6	-53,9
12/01/2011	08:18:01	Tethys	Sh.	I.	24,3	13,8	23/01/2011	18:41:02	Tethys	Tr.	E.	-39,4	-27,0	05/02/2011	21:22:01	Tethys	Sh.	I.	-1,1	-52,7
12/01/2011	09:23:41	Tethys	Tr.	I.	13,3	20,9	24/01/2011	14:49:55	Tethys	Ec.	D.	-48,9	12,6	05/02/2011	22:19:00	Tethys	Tr.	I.	8,7	-60,1
12/01/2011	10:35:07	Tethys	Sh.	E.	0,7	25,5	24/01/2011	17:20:20	Tethys	Occ.	R.	-48,8	-12,1	05/02/2011	23:34:49	Tethys	Sh.	E.	21,8	-63,7
12/01/2011	10:50:45	Tethys	Tr.	E.	-2,0	26,0	25/01/2011	01:46:39	Dione	Ec.	D.	34,2	-52,2	05/02/2011	23:49:32	Tethys	Tr.	E.	24,2	-63,3
12/01/2011	17:58:21	Dione	Sh.	I.	-49,6	-21,2	25/01/2011	02:43:45	Dione	Ec.	R.	40,2	-42,2	06/02/2011	09:28:18	Dione	Sh.	I.	-5,5	26,3

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
06/02/2011	10:10:24	Dione	Sh.	E.	-13,4	29,8	27/02/2011	16:49:48	Tethys	Occ.	R.	-34,4	1,2	26/03/2011	03:03:05	Tethys	Occ.	R.	28,3	-22,9
06/02/2011	20:01:24	Tethys	Ec.	D.	-16,1	-38,9	28/02/2011	13:08:04	Tethys	Sh.	I.	-51,1	34,7	26/03/2011	23:33:23	Tethys	Sh.	I.	44,6	-45,5
06/02/2011	22:28:49	Tethys	Occ.	R.	11,2	-60,8	28/02/2011	13:45:57	Tethys	Tr.	I.	-51,9	30,5	26/03/2011	23:41:30	Tethys	Tr.	I.	44,7	-45,3
07/02/2011	18:25:14	Dione	Ec.	D.	-32,4	-21,1	28/02/2011	15:16:30	Tethys	Sh.	E.	-46,7	17,4	27/03/2011	01:36:10	Tethys	Sh.	E.	39,1	-35,7
07/02/2011	18:40:49	Tethys	Sh.	I.	-29,8	-23,9	28/02/2011	15:28:48	Tethys	Tr.	E.	-45,3	15,4	27/03/2011	01:42:00	Tethys	Tr.	E.	38,5	-34,9
07/02/2011	19:02:16	Dione	Ec.	R.	-26,1	-27,9	01/03/2011	11:47:29	Tethys	Ec.	D.	-44,4	40,1	27/03/2011	22:12:53	Tethys	Ec.	D.	39,8	-43,0
07/02/2011	19:36:34	Tethys	Tr.	I.	-19,9	-34,2	01/03/2011	14:07:59	Tethys	Occ.	R.	-51,4	28,0	28/03/2011	00:21:05	Tethys	Occ.	R.	44,3	-43,0
07/02/2011	20:53:16	Tethys	Sh.	E.	-5,7	-47,7	02/03/2011	10:26:57	Tethys	Sh.	I.	-33,3	39,1	28/03/2011	20:52:25	Tethys	Sh.	I.	30,3	-34,3
07/02/2011	21:07:52	Tethys	Tr.	E.	-2,5	-50,0	02/03/2011	11:02:54	Tethys	Tr.	I.	-38,9	40,5	28/03/2011	20:58:18	Tethys	Tr.	I.	31,1	-35,0
08/02/2011	17:20:12	Tethys	Ec.	D.	-41,8	-8,9	02/03/2011	12:35:00	Tethys	Sh.	E.	-49,6	38,2	28/03/2011	22:54:46	Tethys	Sh.	E.	43,5	-44,6
08/02/2011	19:47:09	Tethys	Occ.	R.	-17,3	-35,9	02/03/2011	12:46:59	Tethys	Tr.	E.	-50,4	37,3	28/03/2011	22:59:59	Tethys	Tr.	E.	43,7	-44,7
09/02/2011	03:12:25	Dione	Sh.	I.	43,7	-34,6	03/03/2011	09:06:23	Tethys	Ec.	D.	-20,0	31,9	29/03/2011	19:31:55	Tethys	Ec.	D.	18,0	-21,9
09/02/2011	03:49:47	Dione	Sh.	E.	42,5	-27,7	03/03/2011	11:26:10	Tethys	Occ.	R.	-42,7	41,2	29/03/2011	21:39:04	Tethys	Occ.	R.	37,1	-39,4
09/02/2011	15:59:37	Tethys	Sh.	I.	-50,1	5,7	04/03/2011	07:45:51	Tethys	Sh.	I.	-5,9	20,7	30/03/2011	18:11:27	Tethys	Sh.	I.	4,4	-7,6
09/02/2011	16:54:04	Tethys	Tr.	I.	-44,7	-3,7	04/03/2011	08:19:49	Tethys	Tr.	I.	-12,2	25,9	30/03/2011	18:15:06	Tethys	Tr.	I.	5,1	-8,3
09/02/2011	18:11:43	Tethys	Sh.	E.	-33,3	-18,1	04/03/2011	09:53:31	Tethys	Sh.	E.	-29,0	37,3	30/03/2011	20:13:22	Tethys	Sh.	E.	25,6	-28,2
09/02/2011	18:26:12	Tethys	Tr.	E.	-30,9	-20,8	04/03/2011	10:05:09	Tethys	Tr.	E.	-31,0	38,3	30/03/2011	20:17:58	Tethys	Tr.	E.	26,4	-28,9
10/02/2011	12:09:46	Dione	Ec.	D.	-36,9	32,8	05/03/2011	06:25:17	Tethys	Ec.	D.	8,4	7,3	31/03/2011	16:50:57	Tethys	Ec.	D.	-10,0	7,6
10/02/2011	12:41:13	Dione	Ec.	R.	-41,6	31,1	05/03/2011	08:44:19	Tethys	Occ.	R.	-17,4	29,8	31/03/2011	18:57:03	Tethys	Occ.	R.	13,4	-15,5
10/02/2011	14:39:00	Tethys	Ec.	D.	-52,1	18,4	06/03/2011	05:04:45	Tethys	Sh.	I.	21,7	-7,4	01/04/2011	15:30:30	Tethys	Sh.	I.	-23,8	22,5
10/02/2011	17:05:28	Tethys	Occ.	R.	-42,7	-5,8	06/03/2011	05:36:42	Tethys	Tr.	I.	16,3	-0,7	01/04/2011	15:31:55	Tethys	Tr.	I.	-23,6	22,3
11/02/2011	13:18:26	Tethys	Sh.	I.	-46,7	28,3	06/03/2011	07:12:02	Tethys	Sh.	E.	-0,4	15,7	01/04/2011	17:31:59	Tethys	Sh.	E.	-0,8	0,6
11/02/2011	14:11:30	Tethys	Tr.	I.	-51,1	22,3	06/03/2011	07:23:18	Tethys	Tr.	E.	-2,6	17,6	01/04/2011	17:35:57	Tethys	Tr.	E.	-0,1	0,0
11/02/2011	15:30:11	Tethys	Sh.	E.	-51,4	10,9	07/03/2011	03:44:11	Tethys	Ec.	D.	33,3	-22,0	02/04/2011	14:10:01	Tethys	Ec.	D.	-36,5	36,5
11/02/2011	15:44:31	Tethys	Tr.	E.	-50,6	8,6	07/03/2011	06:02:28	Tethys	Occ.	R.	11,1	3,8	02/04/2011	16:15:02	Tethys	Occ.	R.	-15,0	14,6
11/02/2011	20:56:53	Dione	Sh.	I.	-1,3	-47,3	08/03/2011	02:23:40	Tethys	Sh.	I.	41,5	-35,5	03/04/2011	12:48:46	Tethys	Tr.	I.	-46,4	47,9
11/02/2011	21:28:48	Dione	Sh.	E.	4,1	-52,2	08/03/2011	02:53:33	Tethys	Tr.	I.	38,9	-30,6	03/04/2011	12:49:34	Tethys	Sh.	I.	-46,3	47,8
12/02/2011	11:57:49	Tethys	Ec.	D.	-36,3	33,8	08/03/2011	04:30:34	Tethys	Sh.	E.	26,0	-13,2	03/04/2011	14:50:36	Tethys	Sh.	E.	-29,2	30,0
12/02/2011	14:23:46	Tethys	Occ.	R.	-51,8	21,0	08/03/2011	04:41:26	Tethys	Tr.	E.	24,2	-11,1	03/04/2011	14:53:56	Tethys	Tr.	E.	-28,7	29,4
13/02/2011	05:54:56	Dione	Ec.	D.	27,1	-3,5	09/03/2011	01:03:07	Tethys	Ec.	D.	44,3	-46,5	04/04/2011	11:27:10	Tethys	Occ.	D.	-50,9	53,6
13/02/2011	06:19:32	Dione	Ec.	R.	23,3	1,0	09/03/2011	03:20:35	Tethys	Occ.	R.	35,3	-25,5	04/04/2011	13:33:00	Tethys	Occ.	R.	-40,5	42,5
13/02/2011	10:37:15	Tethys	Sh.	I.	-23,3	33,5	09/03/2011	23:42:36	Tethys	Sh.	I.	40,7	-52,1	05/04/2011	10:05:37	Tethys	Tr.	I.	-48,1	50,9
13/02/2011	11:28:52	Tethys	Tr.	I.	-32,3	34,6	10/03/2011	00:10:24	Tethys	Tr.	I.	42,7	-50,8	05/04/2011	10:08:39	Tethys	Sh.	I.	-48,3	51,1
13/02/2011	12:48:38	Tethys	Sh.	E.	-44,1	31,5	10/03/2011	01:49:06	Tethys	Sh.	E.	43,2	-40,2	05/04/2011	12:09:14	Tethys	Sh.	E.	-49,0	52,1
13/02/2011	13:02:49	Tethys	Tr.	E.	-45,9	30,4	10/03/2011	01:59:33	Tethys	Tr.	E.	42,6	-38,6	05/04/2011	12:11:54	Tethys	Tr.	E.	-48,8	51,9
14/02/2011	09:16:38	Tethys	Ec.	D.	-9,3	27,4	10/03/2011	22:22:03	Tethys	Ec.	D.	31,9	-49,7	06/04/2011	08:44:02	Tethys	Occ.	D.	-39,2	41,3
14/02/2011	11:42:04	Tethys	Occ.	R.	-35,1	34,9	11/03/2011	00:38:42	Tethys	Occ.	R.	44,1	-48,3	06/04/2011	10:50:58	Tethys	Occ.	R.	-50,7	54,0
14/02/2011	14:41:58	Dione	Sh.	I.	-52,2	19,0	11/03/2011	21:01:32	Tethys	Sh.	I.	20,0	-40,4	07/04/2011	07:22:30	Tethys	Tr.	I.	-26,8	28,1
14/02/2011	15:07:15	Dione	Sh.	E.	-51,8	15,3	11/03/2011	21:27:13	Tethys	Tr.	I.	24,2	-43,8	07/04/2011	07:27:44	Tethys	Sh.	I.	-27,7	29,0
15/02/2011	07:56:04	Tethys	Sh.	I.	5,1	17,1	11/03/2011	23:07:38	Tethys	Sh.	E.	38,1	-51,4	07/04/2011	09:27:52	Tethys	Sh.	E.	-45,2	47,6
15/02/2011	08:46:11	Tethys	Tr.	I.	-4,2	24,1	11/03/2011	23:17:39	Tethys	Tr.	E.	39,2	-51,6	07/04/2011	09:29:52	Tethys	Tr.	E.	-45,4	47,9
15/02/2011	10:07:06	Tethys	Sh.	E.	-19,3	32,4	12/03/2011	19:40:59	Tethys	Ec.	D.	6,6	-27,5	08/04/2011	06:00:56	Tethys	Occ.	D.	-13,0	13,5
15/02/2011	10:21:06	Tethys	Tr.	E.	-21,9	33,3	12/03/2011	21:56:48	Tethys	Occ.	R.	29,5	-46,8	08/04/2011	08:08:56	Tethys	Occ.	R.	-35,1	36,4
15/02/2011	23:41:36	Dione	Ec.	D.	29,3	-60,3	13/03/2011	18:20:29	Tethys	Sh.	I.	-7,8	-12,9	09/04/2011	04:39:25	Tethys	Tr.	I.	1,8	-0,6
15/02/2011	23:56:24	Dione	Ec.	R.	31,4	-59,8	13/03/2011	18:44:01	Tethys	Tr.	I.	-2,9	-17,2	09/04/2011	04:46:49	Tethys	Sh.	I.	0,6	0,5
16/02/2011	06:35:28	Tethys	Ec.	D.	18,6	4,3	13/03/2011	20:26:10	Tethys	Sh.	E.	15,4	-34,7	09/04/2011	06:46:31	Tethys	Sh.	E.	-22,0	22,2
16/02/2011	09:00:22	Tethys	Occ.	R.	-7,8	26,2	13/03/2011	20:35:44	Tethys	Tr.	E.	17,0	-36,1	09/04/2011	06:47:50	Tethys	Tr.	E.	-22,2	22,4
17/02/2011	05:14:54	Tethys	Sh.	I.	30,7	-10,2	14/03/2011	16:59:56	Tethys	Ec.	D.	-21,8	2,6	10/04/2011	03:17:51	Tethys	Occ.	D.	15,6	-15,4
17/02/2011	06:03:26	Tethys	Tr.	I.	23,3	-0,6	14/03/2011	19:14:53	Tethys	Occ.	R.	3,4	-22,5	10/04/2011	05:26:54	Tethys	Occ.	R.	-8,2	7,8
17/02/2011	07:25:35	Tethys	Sh.	E.	9,2	12,9	15/03/2011	15:39:26	Tethys	Sh.	I.	-34,7	17,1	11/04/2011	01:56:21	Tethys	Tr.	I.	28,5	-27,6
17/02/2011	07:39:23	Tethys	Tr.	E.	6,7	15,1	15/03/2011	16:00:49	Tethys	Tr.	I.	-31,3	13,4	11/04/2011	02:05:56	Tethys	Sh.	I.	27,0	-26,3
17/02/2011	08:28:21	Dione	Sh.	I.	-1,8	22,3	15/03/2011	17:44:43	Tethys	Sh.	E.	-12,8	-5,8	11/04/2011	04:05:09	Tethys	Sh.	E.	6,4	-7,0
17/02/2011	08:44:25	Dione	Sh.	E.	-5,5	24,5	15/03/2011	17:53:49	Tethys	Tr.	E.	-11,1	-7,6	11/04/2011	04:05:47	Tethys	Tr.	E.	6,3	-6,9
18/02/2011	03:54:18	Tethys	Ec.	D.	39,8	-24,9	16/03/2011	14:18:54	Tethys	Ec.	D.	-45,3	30,6	12/04/2011	00:34:48	Tethys	Occ.	D.	38,9	-36,2
18/02/2011	06:18:38	Tethys	Occ.	R.	20,1	2,0	16/03/2011	16:32:57	Tethys	Occ.	R.	-25,0	7,8	12/04/2011	02:44:52	Tethys	Occ.	R.	19,9	-20,1
19/02/2011	02:33:45	Tethys	Sh.	I.	43,8	-39,1	17/03/2011	12:58:24	Tethys	Sh.	I.	-51,1	41,3	12/04/2011	23:13:19	Tethys	Tr.	I.	44,8	-39,2
19/02/2011	03:20:38	Tethys	Tr.	I.	42,0	-30,8	17/03/2011	13:17:36	Tethys	Tr.	I.	-50,2	39,2	12/04/2011	23:25:03	Tethys	Sh.	I.	44,3	-39,1
19/02/2011	04:44:03	Tethys	Sh.	E.	33,8	-15,4	17/03/2011	15:03:17	Tethys	Sh.	E.	-38,9	23,8	13/04/2011	01:23:46	Tethys	Tr.	E.	32,2	-31,0
19/02/2011	04:57:40	Tethys	Tr.	E.	32,0	-12,9	17/03/2011	15:11:52	Tethys	Tr.	E.	-37,7	22,4	13/04/2011	01:23:49	Tethys	Sh.	E.	32,2	-31,0
20/02/2011	01:13:09	Tethys	Ec.	D.	41,5	-51,2	18/03/2011	11:37:52	Tethys	Ec.	D.	-49,8	46,8	13/04/2011	21:51:47	Tethys	Occ.	D.	44,2	-35,6
20/02/2011	03:36:54	Tethys	Occ.	R.	40,6	-27,6	18/03/2011	13:51:00	Tethys	Occ.	R.	-47,3	35,3	14/04/2011	00:03:14	Tethys	Ec.	R.	41,3	-37,5
20/02/2011	23:52:35	Tethys	Sh.	I.	33,7	-58,2	19/03/2011	10:17:22	Tethys	Sh.	I.	-42,0	45,1	14/04/2011	20:30:19	Tethys	Tr.	I.	37,4	-26,6
21/02/2011	00:37:47	Tethys	Tr.	I.	38,9	-55,0	19/03/2011	10												

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
19/04/2011	15:59:15	Tethys	Ec.	R.	-4,2	20,8	07/05/2011	14:26:54	Tethys	Sh.	E.	-7,3	40,9	25/05/2011	13:01:58	Dione	Occ.	R.	-9,2	58,3
19/04/2011	22:19:40	Dione	Occ.	D.	45,5	-35,4	07/05/2011	16:43:05	Dione	Tr.	I.	17,8	15,9	26/05/2011	08:55:45	Tethys	Tr.	I.	-46,5	55,1
19/04/2011	22:56:07	Dione	Occ.	R.	44,4	-36,6	07/05/2011	18:00:37	Dione	Tr.	E.	30,5	2,2	26/05/2011	09:47:36	Tethys	Sh.	I.	-40,8	63,0
20/04/2011	12:21:31	Tethys	Tr.	I.	-40,7	55,9	08/05/2011	10:36:14	Tethys	Occ.	D.	-44,1	64,1	26/05/2011	11:20:21	Tethys	Tr.	E.	-26,7	69,0
20/04/2011	12:41:38	Tethys	Sh.	I.	-37,9	53,7	08/05/2011	13:06:21	Tethys	Ec.	R.	-21,2	54,6	26/05/2011	11:34:26	Tethys	Sh.	E.	-24,2	68,4
20/04/2011	14:35:40	Tethys	Tr.	E.	-18,9	36,2	09/05/2011	01:35:35	Dione	Occ.	D.	12,8	-21,8	26/05/2011	20:16:49	Dione	Tr.	I.	45,4	-15,4
20/04/2011	14:38:30	Tethys	Sh.	E.	-18,4	35,7	09/05/2011	02:53:47	Dione	Occ.	R.	-1,0	-11,3	26/05/2011	21:50:14	Dione	Tr.	E.	37,1	-24,3
21/04/2011	07:02:20	Dione	Tr.	I.	-33,0	28,5	09/05/2011	09:15:03	Tethys	Tr.	I.	-49,7	55,4	27/05/2011	07:34:48	Tethys	Occ.	D.	-49,8	40,8
21/04/2011	07:46:32	Dione	Tr.	E.	-39,6	36,4	09/05/2011	09:53:49	Tethys	Sh.	I.	-47,6	60,6	27/05/2011	10:13:54	Tethys	Ec.	R.	-36,6	66,3
21/04/2011	11:00:04	Tethys	Occ.	D.	-48,6	59,7	09/05/2011	11:36:12	Tethys	Tr.	E.	-35,5	64,6	28/05/2011	05:09:56	Dione	Occ.	D.	-38,5	14,3
21/04/2011	13:17:56	Tethys	Ec.	R.	-31,6	49,1	09/05/2011	11:45:38	Tethys	Sh.	E.	-34,1	64,1	28/05/2011	06:13:54	Tethys	Tr.	I.	-46,0	25,9
22/04/2011	09:38:40	Tethys	Tr.	I.	-50,1	54,1	10/05/2011	07:53:50	Tethys	Occ.	D.	-48,3	42,1	28/05/2011	06:43:13	Dione	Occ.	R.	-48,3	31,4
22/04/2011	10:00:48	Tethys	Sh.	I.	-50,4	56,5	10/05/2011	10:21:19	Dione	Tr.	I.	-44,7	63,6	28/05/2011	07:06:57	Tethys	Sh.	I.	-49,4	35,8
22/04/2011	11:53:40	Tethys	Tr.	E.	-43,1	58,7	10/05/2011	10:25:06	Tethys	Ec.	R.	-44,3	63,9	28/05/2011	08:38:43	Tethys	Tr.	E.	-47,2	52,4
22/04/2011	11:57:11	Tethys	Sh.	E.	-42,7	58,5	10/05/2011	11:42:10	Dione	Tr.	E.	-33,9	64,6	28/05/2011	08:53:12	Tethys	Sh.	E.	-46,0	54,9
22/04/2011	15:54:07	Dione	Occ.	D.	-2,3	22,3	11/05/2011	06:32:40	Tethys	Tr.	I.	-40,5	27,3	29/05/2011	04:52:58	Tethys	Occ.	D.	-36,7	11,4
22/04/2011	16:40:16	Dione	Occ.	R.	5,9	13,8	11/05/2011	07:13:05	Tethys	Sh.	I.	-45,2	34,8	29/05/2011	07:32:40	Tethys	Ec.	R.	-49,8	40,6
23/04/2011	08:17:14	Tethys	Occ.	D.	-44,5	42,3	11/05/2011	08:54:21	Tethys	Tr.	E.	-49,9	52,6	29/05/2011	13:57:01	Dione	Tr.	I.	4,3	49,5
23/04/2011	10:36:37	Tethys	Ec.	R.	-49,4	59,6	11/05/2011	09:04:23	Tethys	Sh.	E.	-49,7	54,2	29/05/2011	15:31:29	Dione	Tr.	E.	21,2	32,2
24/04/2011	00:37:41	Dione	Tr.	I.	32,4	-31,8	11/05/2011	19:13:54	Dione	Occ.	D.	41,8	-9,4	30/05/2011	03:32:06	Tethys	Tr.	I.	-24,2	-1,4
24/04/2011	01:29:55	Dione	Tr.	E.	24,3	-26,6	11/05/2011	20:35:18	Dione	Occ.	R.	46,0	-20,4	30/05/2011	04:26:19	Tethys	Sh.	I.	-33,2	6,9
24/04/2011	06:55:51	Tethys	Tr.	I.	-33,9	28,1	12/05/2011	05:11:29	Tethys	Occ.	D.	-28,8	12,6	30/05/2011	05:57:06	Tethys	Tr.	E.	-45,2	23,0
24/04/2011	07:19:59	Tethys	Sh.	I.	-37,6	32,5	12/05/2011	07:43:50	Tethys	Ec.	R.	-48,2	40,6	30/05/2011	06:11:58	Tethys	Sh.	E.	-46,6	25,7
24/04/2011	09:11:40	Tethys	Tr.	E.	-49,3	51,1	13/05/2011	03:50:22	Tethys	Tr.	I.	-15,3	-0,8	30/05/2011	22:50:14	Dione	Occ.	D.	26,0	-26,1
24/04/2011	09:15:53	Tethys	Sh.	E.	-49,5	51,7	13/05/2011	03:59:52	Dione	Tr.	I.	-17,0	0,6	31/05/2011	00:24:27	Dione	Occ.	R.	9,6	-23,9
25/04/2011	05:34:27	Tethys	Occ.	D.	-20,8	13,3	13/05/2011	04:32:22	Tethys	Sh.	I.	-22,8	5,9	31/05/2011	02:11:12	Tethys	Occ.	D.	-10,4	-13,7
25/04/2011	07:55:19	Tethys	Ec.	R.	-42,8	39,0	13/05/2011	05:23:39	Dione	Tr.	E.	-31,5	15,0	31/05/2011	04:51:27	Tethys	Ec.	R.	-37,6	11,3
25/04/2011	09:29:39	Dione	Occ.	D.	-50,1	53,9	13/05/2011	06:12:31	Tethys	Tr.	E.	-38,9	23,9	01/06/2011	00:50:22	Tethys	Tr.	I.	4,2	-22,0
25/04/2011	10:23:28	Dione	Occ.	R.	-49,6	59,4	13/05/2011	06:23:07	Tethys	Sh.	E.	-40,3	25,9	01/06/2011	01:45:41	Tethys	Sh.	I.	-6,4	-16,6
26/04/2011	04:13:05	Tethys	Tr.	I.	-6,7	-0,6	14/05/2011	02:29:12	Tethys	Occ.	D.	-0,3	-13,9	01/06/2011	03:15:31	Tethys	Tr.	E.	-22,7	-4,4
26/04/2011	04:39:10	Tethys	Sh.	I.	-11,5	3,6	14/05/2011	05:02:35	Tethys	Ec.	R.	-28,7	11,3	01/06/2011	03:30:44	Tethys	Sh.	E.	-25,4	-1,4
26/04/2011	06:29:41	Tethys	Tr.	E.	-31,0	23,7	14/05/2011	12:52:32	Dione	Occ.	D.	-19,2	57,8	01/06/2011	07:37:28	Dione	Tr.	I.	-49,5	41,7
26/04/2011	06:34:35	Tethys	Sh.	E.	-31,8	24,6	14/05/2011	14:16:44	Dione	Occ.	R.	-3,4	43,9	01/06/2011	09:12:44	Dione	Tr.	E.	-42,1	58,4
26/04/2011	18:13:48	Dione	Tr.	I.	25,2	-1,7	15/05/2011	01:08:06	Tethys	Tr.	I.	13,3	-23,3	01/06/2011	23:29:30	Tethys	Occ.	D.	18,0	-25,8
26/04/2011	19:12:40	Dione	Tr.	E.	34,1	-12,3	15/05/2011	01:51:40	Tethys	Sh.	I.	5,5	-18,6	02/06/2011	02:10:13	Tethys	Ec.	R.	-11,7	-13,6
27/04/2011	02:51:42	Tethys	Occ.	D.	7,9	-14,6	15/05/2011	03:30:42	Tethys	Tr.	E.	-13,2	-4,2	02/06/2011	16:30:47	Dione	Occ.	D.	33,2	21,8
27/04/2011	05:14:02	Tethys	Ec.	R.	-18,6	10,0	15/05/2011	03:41:52	Tethys	Sh.	E.	-15,2	-1,9	02/06/2011	18:05:40	Dione	Occ.	R.	43,8	5,2
28/04/2011	01:30:22	Tethys	Tr.	I.	21,5	-25,3	15/05/2011	21:38:42	Dione	Tr.	I.	42,9	-25,7	02/06/2011	22:08:41	Tethys	Tr.	I.	30,6	-24,3
28/04/2011	01:58:23	Tethys	Sh.	I.	16,7	-21,9	15/05/2011	23:05:03	Dione	Tr.	E.	33,0	-29,1	02/06/2011	23:05:03	Tethys	Sh.	I.	21,5	-25,8
28/04/2011	03:05:54	Dione	Occ.	D.	4,5	-12,1	15/05/2011	23:46:59	Tethys	Occ.	D.	26,5	-28,4	03/06/2011	00:33:58	Tethys	Tr.	E.	5,7	-22,9
28/04/2011	03:47:43	Tethys	Tr.	E.	-3,0	-5,5	16/05/2011	02:21:20	Tethys	Ec.	R.	-0,3	-14,6	03/06/2011	00:49:30	Tethys	Sh.	E.	2,9	-21,8
28/04/2011	03:53:17	Tethys	Sh.	E.	-4,3	-4,1	16/05/2011	22:25:54	Tethys	Tr.	I.	37,6	-28,1	03/06/2011	20:47:51	Tethys	Occ.	D.	40,7	-17,8
28/04/2011	04:06:06	Dione	Occ.	R.	-6,9	-1,3	16/05/2011	23:10:58	Tethys	Sh.	I.	31,5	-28,8	03/06/2011	23:28:59	Tethys	Ec.	R.	16,7	-25,5
29/04/2011	00:09:00	Tethys	Occ.	D.	33,6	-32,1	17/05/2011	00:48:55	Tethys	Tr.	E.	15,3	-24,6	04/06/2011	01:18:11	Dione	Tr.	I.	-3,1	-19,2
29/04/2011	02:32:44	Tethys	Ec.	R.	9,8	-16,9	17/05/2011	01:00:37	Tethys	Sh.	E.	13,2	-23,6	04/06/2011	02:53:58	Dione	Tr.	E.	-21,0	-7,6
29/04/2011	11:50:29	Dione	Tr.	I.	-39,6	61,1	17/05/2011	06:31:27	Dione	Occ.	D.	-43,3	28,0	04/06/2011	19:27:04	Tethys	Tr.	I.	45,9	-7,6
29/04/2011	12:55:01	Dione	Tr.	E.	-29,7	54,3	17/05/2011	07:58:07	Dione	Occ.	R.	-49,7	44,0	04/06/2011	20:24:26	Tethys	Sh.	I.	42,5	-15,1
29/04/2011	22:47:41	Tethys	Tr.	I.	42,4	-33,2	17/05/2011	21:04:48	Tethys	Occ.	D.	44,7	-22,3	04/06/2011	21:52:26	Tethys	Tr.	E.	31,9	-23,1
29/04/2011	23:17:36	Tethys	Sh.	I.	39,5	-33,4	17/05/2011	23:40:06	Tethys	Ec.	R.	26,4	-28,2	04/06/2011	22:08:17	Tethys	Sh.	E.	29,5	-24,0
30/04/2011	01:05:45	Tethys	Tr.	E.	24,3	-27,4	18/05/2011	15:17:49	Dione	Tr.	I.	10,8	33,3	05/06/2011	10:11:36	Dione	Occ.	D.	-31,4	67,0
30/04/2011	01:12:00	Tethys	Sh.	E.	23,2	-26,8	18/05/2011	16:46:24	Dione	Tr.	E.	26,1	17,0	05/06/2011	11:46:53	Dione	Occ.	R.	-14,8	69,1
30/04/2011	20:42:42	Dione	Occ.	D.	44,7	-23,9	18/05/2011	19:43:45	Tethys	Tr.	I.	45,7	-12,4	05/06/2011	18:06:16	Tethys	Occ.	D.	44,6	5,4
30/04/2011	21:26:20	Tethys	Occ.	D.	45,8	-28,4	18/05/2011	20:30:16	Tethys	Sh.	I.	45,9	-18,4	05/06/2011	20:47:46	Tethys	Ec.	R.	39,8	-17,5
30/04/2011	21:48:22	Dione	Occ.	R.	45,5	-30,2	18/05/2011	22:07:09	Tethys	Tr.	E.	38,9	-26,8	06/06/2011	16:45:31	Tethys	Tr.	I.	37,3	19,5
30/04/2011	23:51:27	Tethys	Ec.	R.	34,9	-32,3	18/05/2011	22:19:23	Tethys	Sh.	E.	37,5	-27,4	06/06/2011	17:43:50	Tethys	Sh.	I.	43,4	9,3
01/05/2011	20:05:03	Tethys	Tr.	I.	42,5	-18,9	19/05/2011	18:22:41	Tethys	Occ.	D.	40,1	0,7	06/06/2011	18:59:09	Dione	Tr.	I.	46,2	-2,7
01/05/2011	20:36:49	Tethys	Sh.	I.	44,6	-23,0	19/05/2011	20:58:51	Tethys	Ec.	R.	44,6	-21,3	06/06/2011	19:10:56	Tethys	Tr.	E.	46,1	-4,9
01/05/2011	22:23:48	Tethys	Tr.	E.	43,6	-31,9	20/05/2011	00:10:40	Dione	Occ.	D.	19,9	-26,5	06/06/2011	19:27:03	Tethys	Sh.	E.	45,7	-7,3
01/05/2011	22:30:43	Tethys	Sh.	E.	43,2	-32,2	20/05/2011	01:39:26	Dione	Occ.	R.	4,0	-19,0	06/06/2011	20:35:13	Dione	Tr.	E.	40,7	-16,1
02/05/2011	05:27:38	Dione	Tr.	I.	-24,6	13,6	20/05/2011	17:01:40	Tethys	Tr.	I.	29,9	14,5	07/06/2011	15:24:45	Tethys	Occ.	D.	26,1	34,4
02/05/2011	06:37:05	Dione	Tr.	E.	-36,0	26,5	20/05/2011	17:49:36	Tethys	Sh.	I.	36,7	6,1	07/06/2011	18:06:32	Tethys	Ec.	R.	45,1	5,6
02/05/2011	18:43:44	Tethys	Occ.	D.	33,7	-6,3	20/05/2011	19:25:25	Tethys	Tr.	E.	45,3	-9,5	08/06/2011	03:52:41	Dione	Occ.	D.	-33,6	2,0
02/05/2011	21:10:10	Tethys	Ec.	R.	45,8	-26,4	20/05/2011	19:38:08	Tethys	Sh.	E.	45,8	-11,							

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
12/06/2011	11:23:22	Tethys	Sh.	E.	-14,1	71,0	01/07/2011	06:56:26	Tethys	Sh.	I.	-44,4	33,6	19/07/2011	05:43:02	Dione	Occ.	D.	-45,3	18,3
13/06/2011	07:20:32	Tethys	Occ.	D.	-48,2	38,8	01/07/2011	08:13:50	Tethys	Tr.	E.	-34,1	47,9	19/07/2011	06:42:28	Dione	Occ.	R.	-37,9	29,2
13/06/2011	10:02:51	Tethys	Ec.	R.	-27,6	66,3	01/07/2011	08:30:58	Tethys	Sh.	E.	-31,4	51,0	19/07/2011	06:58:55	Tethys	Ec.	R.	-35,4	32,3
13/06/2011	15:15:37	Dione	Occ.	D.	28,4	36,6	01/07/2011	10:19:39	Dione	Tr.	I.	-12,3	67,8	20/07/2011	03:05:54	Tethys	Tr.	I.	-48,0	-8,3
13/06/2011	16:50:33	Dione	Occ.	R.	41,0	19,2	01/07/2011	11:46:12	Dione	Tr.	E.	4,0	70,1	20/07/2011	04:11:19	Tethys	Sh.	I.	-50,4	2,4
14/06/2011	05:59:54	Tethys	Tr.	I.	-49,4	23,9	02/07/2011	04:30:19	Tethys	Occ.	D.	-48,7	7,4	20/07/2011	05:23:12	Tethys	Tr.	E.	-46,9	14,6
14/06/2011	07:01:27	Tethys	Sh.	I.	-49,0	35,3	02/07/2011	07:10:27	Tethys	Ec.	R.	-42,4	36,1	20/07/2011	05:38:09	Tethys	Sh.	E.	-45,5	17,3
14/06/2011	08:25:12	Tethys	Tr.	E.	-41,6	50,7	02/07/2011	19:14:22	Dione	Occ.	D.	38,3	-4,2	20/07/2011	14:32:48	Dione	Tr.	I.	40,9	44,1
14/06/2011	08:42:08	Tethys	Sh.	E.	-39,4	53,7	02/07/2011	20:38:43	Dione	Occ.	R.	26,2	-15,6	20/07/2011	15:30:58	Dione	Tr.	E.	44,9	33,4
15/06/2011	00:03:37	Dione	Tr.	I.	2,6	-23,7	03/07/2011	03:09:59	Tethys	Tr.	I.	-41,5	-5,6	21/07/2011	01:45:47	Tethys	Occ.	D.	-39,7	-18,8
15/06/2011	01:38:57	Dione	Tr.	E.	-15,4	-16,5	03/07/2011	04:15:55	Tethys	Sh.	I.	-48,1	5,0	21/07/2011	04:17:36	Tethys	Ec.	R.	-50,3	3,2
15/06/2011	04:39:15	Tethys	Occ.	D.	-43,7	9,7	03/07/2011	05:32:41	Tethys	Tr.	E.	-49,7	18,1	21/07/2011	23:29:33	Dione	Occ.	D.	-19,7	-27,6
15/06/2011	07:21:37	Tethys	Ec.	R.	-47,6	39,0	03/07/2011	05:49:43	Tethys	Sh.	E.	-49,1	21,2	22/07/2011	00:22:06	Dione	Occ.	R.	-27,2	-25,9
16/06/2011	03:18:39	Tethys	Tr.	I.	-33,2	-3,1	04/07/2011	01:49:37	Tethys	Occ.	D.	-30,2	-16,1	22/07/2011	00:25:43	Tethys	Tr.	I.	-27,8	-25,7
16/06/2011	04:20:52	Tethys	Sh.	I.	-42,0	6,6	04/07/2011	04:03:18	Dione	Tr.	I.	-47,4	2,9	22/07/2011	01:30:50	Tethys	Sh.	I.	-38,1	-20,6
16/06/2011	05:43:50	Tethys	Tr.	E.	-49,1	21,0	04/07/2011	04:29:11	Tethys	Ec.	R.	-49,1	7,0	22/07/2011	02:42:13	Tethys	Tr.	E.	-46,7	-12,0
16/06/2011	06:00:54	Tethys	Sh.	E.	-49,6	24,1	04/07/2011	05:27:17	Dione	Tr.	E.	-49,8	17,1	22/07/2011	02:56:49	Tethys	Sh.	E.	-47,9	-9,9
16/06/2011	08:57:29	Dione	Occ.	D.	-36,1	56,3	05/07/2011	00:29:18	Tethys	Tr.	I.	-16,9	-23,1	22/07/2011	23:05:38	Tethys	Occ.	D.	-14,3	-27,8
16/06/2011	10:31:46	Dione	Occ.	R.	-20,5	69,5	05/07/2011	01:35:23	Tethys	Sh.	I.	-28,5	-17,7	23/07/2011	01:36:16	Tethys	Ec.	R.	-39,4	-20,2
17/06/2011	01:58:01	Tethys	Occ.	D.	-20,2	-14,4	05/07/2011	02:51:33	Tethys	Tr.	E.	-40,1	-8,4	23/07/2011	08:19:32	Dione	Tr.	I.	-19,4	46,5
17/06/2011	04:40:23	Tethys	Ec.	R.	-44,7	9,8	05/07/2011	03:08:27	Tethys	Sh.	E.	-42,3	-6,0	23/07/2011	09:10:31	Dione	Tr.	E.	-10,1	55,3
17/06/2011	17:45:37	Dione	Tr.	I.	45,8	9,8	05/07/2011	12:58:13	Dione	Occ.	D.	19,6	61,4	23/07/2011	21:45:35	Tethys	Tr.	I.	0,4	-24,4
17/06/2011	19:20:12	Dione	Tr.	E.	43,6	-5,4	05/07/2011	14:19:42	Dione	Occ.	R.	32,6	47,5	23/07/2011	22:50:21	Tethys	Sh.	I.	-12,2	-27,7
18/06/2011	00:37:27	Tethys	Tr.	I.	-6,2	-21,8	05/07/2011	23:08:58	Tethys	Occ.	D.	-2,1	-25,3	24/07/2011	00:01:15	Tethys	Tr.	E.	-24,9	-27,3
18/06/2011	01:40:18	Tethys	Sh.	I.	-17,8	-16,3	06/07/2011	01:47:56	Tethys	Ec.	R.	-31,2	-16,5	24/07/2011	00:15:30	Tethys	Sh.	E.	-27,4	-26,7
18/06/2011	03:02:30	Tethys	Tr.	E.	-31,9	-5,9	06/07/2011	21:47:16	Dione	Tr.	I.	11,7	-22,2	24/07/2011	17:16:59	Dione	Occ.	D.	41,5	13,5
18/06/2011	03:19:41	Tethys	Sh.	E.	-34,6	-2,9	06/07/2011	21:48:41	Tethys	Tr.	I.	11,4	-22,3	24/07/2011	18:01:02	Dione	Occ.	R.	36,7	5,8
18/06/2011	23:16:51	Tethys	Occ.	D.	8,2	-24,6	06/07/2011	22:54:52	Tethys	Sh.	I.	-0,2	-25,2	24/07/2011	20:25:32	Tethys	Occ.	D.	14,0	-16,5
19/06/2011	01:59:09	Tethys	Ec.	R.	-21,8	-14,2	06/07/2011	23:08:17	Dione	Tr.	E.	-3,0	-25,4	24/07/2011	22:54:56	Tethys	Ec.	R.	-13,7	-28,0
19/06/2011	02:39:37	Dione	Occ.	D.	-28,8	-9,2	07/07/2011	00:10:27	Tethys	Tr.	E.	-14,9	-24,2	25/07/2011	19:05:30	Tethys	Tr.	I.	26,9	-5,2
19/06/2011	04:12:59	Dione	Occ.	R.	-42,5	5,2	07/07/2011	00:27:11	Tethys	Sh.	E.	-17,9	-23,4	25/07/2011	20:09:52	Tethys	Sh.	I.	16,1	-14,6
19/06/2011	21:56:18	Tethys	Tr.	I.	21,8	-22,2	07/07/2011	20:28:23	Tethys	Occ.	D.	24,7	-14,7	25/07/2011	21:20:18	Tethys	Tr.	E.	3,4	-22,7
19/06/2011	22:59:44	Tethys	Sh.	I.	10,6	-24,5	07/07/2011	23:06:39	Tethys	Ec.	R.	-3,5	-25,5	25/07/2011	21:34:09	Tethys	Sh.	E.	1,0	-23,9
20/06/2011	00:21:11	Tethys	Tr.	E.	-4,5	-22,8	08/07/2011	06:42:23	Dione	Occ.	D.	-43,1	30,4	26/07/2011	02:07:15	Dione	Tr.	I.	-44,8	-17,2
20/06/2011	00:38:26	Tethys	Sh.	E.	-7,9	-21,7	08/07/2011	08:00:36	Dione	Occ.	R.	-32,1	44,9	26/07/2011	02:49:17	Dione	Tr.	E.	-48,5	-11,7
20/06/2011	11:27:53	Dione	Tr.	I.	-7,5	71,2	08/07/2011	19:08:07	Tethys	Tr.	I.	36,1	-3,4	26/07/2011	17:45:29	Tethys	Occ.	D.	37,6	8,2
20/06/2011	13:01:26	Dione	Tr.	E.	10,0	60,9	08/07/2011	20:14:21	Tethys	Sh.	I.	26,4	-13,0	26/07/2011	20:13:36	Tethys	Ec.	R.	14,7	-15,3
20/06/2011	20:35:45	Tethys	Occ.	D.	33,8	-15,1	08/07/2011	21:29:22	Tethys	Tr.	E.	13,5	-21,0	27/07/2011	11:05:57	Dione	Occ.	D.	13,9	67,1
20/06/2011	23:17:55	Tethys	Ec.	R.	6,6	-24,6	08/07/2011	21:45:55	Tethys	Sh.	E.	10,5	-22,2	27/07/2011	11:38:38	Dione	Occ.	R.	19,6	66,8
21/06/2011	19:15:14	Tethys	Tr.	I.	42,7	-4,4	09/07/2011	15:31:34	Dione	Tr.	I.	42,7	34,1	27/07/2011	16:25:29	Tethys	Tr.	I.	44,3	22,4
21/06/2011	20:19:10	Tethys	Sh.	I.	35,5	-13,2	09/07/2011	16:49:12	Dione	Tr.	E.	45,9	19,8	27/07/2011	17:29:23	Tethys	Sh.	I.	39,0	10,8
21/06/2011	20:22:00	Dione	Occ.	D.	35,2	-13,5	09/07/2011	17:47:51	Tethys	Occ.	D.	43,8	9,5	27/07/2011	18:39:21	Tethys	Tr.	E.	29,8	-0,6
21/06/2011	21:39:54	Tethys	Tr.	E.	23,2	-21,1	09/07/2011	20:25:23	Tethys	Ec.	R.	23,9	-14,5	27/07/2011	18:52:48	Tethys	Sh.	E.	27,7	-3,2
21/06/2011	21:54:11	Dione	Occ.	R.	20,8	-22,1	10/07/2011	16:27:37	Tethys	Tr.	I.	45,7	23,7	28/07/2011	15:05:29	Tethys	Occ.	D.	44,9	37,1
21/06/2011	21:57:12	Tethys	Sh.	E.	20,3	-22,2	10/07/2011	17:33:50	Tethys	Sh.	I.	44,4	11,8	28/07/2011	17:32:14	Tethys	Ec.	R.	38,3	10,2
22/06/2011	17:54:42	Tethys	Occ.	D.	46,2	8,5	10/07/2011	18:48:18	Tethys	Tr.	E.	37,6	-0,1	28/07/2011	19:56:44	Dione	Tr.	I.	16,4	-13,4
22/06/2011	20:36:41	Tethys	Ec.	R.	32,5	-15,2	10/07/2011	19:04:38	Tethys	Sh.	E.	35,5	-2,9	28/07/2011	20:26:27	Dione	Tr.	E.	11,1	-17,3
23/06/2011	05:10:25	Dione	Tr.	I.	-48,9	14,8	11/07/2011	00:26:54	Dione	Occ.	D.	-20,7	-23,9	29/07/2011	13:45:31	Tethys	Tr.	I.	39,2	51,2
23/06/2011	06:42:40	Dione	Tr.	E.	-48,2	31,6	11/07/2011	01:41:23	Dione	Occ.	R.	-33,3	-17,8	29/07/2011	14:48:55	Tethys	Sh.	I.	44,3	40,0
23/06/2011	16:34:13	Tethys	Tr.	I.	43,0	22,7	11/07/2011	15:07:22	Tethys	Occ.	D.	41,2	38,5	29/07/2011	15:58:24	Tethys	Tr.	E.	45,0	27,1
23/06/2011	17:38:37	Tethys	Sh.	I.	46,1	11,2	11/07/2011	17:44:06	Tethys	Ec.	R.	43,5	10,0	29/07/2011	16:11:27	Tethys	Sh.	E.	44,5	24,7
23/06/2011	18:58:38	Tethys	Tr.	E.	43,4	-1,2	12/07/2011	09:16:13	Dione	Tr.	I.	-16,4	57,7	30/07/2011	04:59:39	Dione	Occ.	D.	-45,9	9,0
23/06/2011	19:15:58	Tethys	Sh.	E.	41,9	-4,5	12/07/2011	10:29:58	Dione	Tr.	E.	-2,1	67,6	30/07/2011	05:11:41	Dione	Occ.	R.	-44,6	11,2
24/06/2011	14:04:40	Dione	Occ.	D.	23,8	50,2	12/07/2011	13:47:10	Tethys	Tr.	I.	31,6	52,9	30/07/2011	12:25:32	Tethys	Occ.	D.	29,0	62,5
24/06/2011	15:13:42	Tethys	Occ.	D.	34,4	37,5	12/07/2011	14:53:19	Tethys	Sh.	I.	40,1	41,0	30/07/2011	14:50:53	Tethys	Ec.	R.	44,5	39,5
24/06/2011	15:35:22	Dione	Occ.	R.	37,3	33,5	12/07/2011	16:07:15	Tethys	Tr.	E.	45,4	27,3	31/07/2011	11:05:36	Tethys	Tr.	I.	16,4	66,1
24/06/2011	17:55:27	Tethys	Ec.	R.	46,1	8,4	12/07/2011	16:23:21	Tethys	Sh.	E.	45,8	24,4	31/07/2011	12:08:27	Tethys	Sh.	I.	26,9	64,0
25/06/2011	13:53:15	Tethys	Tr.	I.	22,5	52,3	13/07/2011	12:26:57	Tethys	Occ.	D.	19,3	65,2	31/07/2011	13:17:28	Tethys	Tr.	E.	36,7	55,3
25/06/2011	14:58:04	Tethys	Sh.	I.	32,7	40,4	13/07/2011	15:02:49	Tethys	Ec.	R.	41,4	39,2	31/07/2011	13:30:05	Tethys	Sh.	E.	38,2	53,3
25/06/2011	16:17:24	Tethys	Tr.	E.	42,2	25,8	13/07/2011	18:11:49	Dione	Occ.	D.	40,4	5,2	01/08/2011	09:45:38	Tethys	Occ.	D.	2,7	59,0
25/06/2011	16:34:43	Tethys	Sh.	E.	43,7	22,6	13/07/2011	19:22:00	Dione	Occ.	R.	31,5	-6,2	01/08/2011	12:09:31	Tethys	Ec.	R.	27,6	63,7
25/06/2011	22:53:12	Dione	Tr.	I.	7,5	-24,5	14/07/2011	11:06:46	Tethys	Tr.	I.	5,6	69,6	02/08/2011	08:25:44	Tethys	Tr.	I.	-11,8	46,1
26/06/2011	00:23:53	Dione	Tr.	E.	-9,5	-22,7	14/07/2011	12:12:49	Tethys	Sh.	I.	17,4	66,6							

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
09/08/2011	01:23:55	Tethys	Ec.	R.	-46,0	-25,1	01/09/2011	14:41:10	Tethys	Sh.	I.	41,4	33,1	24/09/2011	07:23:40	Tethys	Tr.	E.	10,3	24,9
09/08/2011	21:46:46	Tethys	Tr.	I.	-12,3	-28,6	01/09/2011	15:40:47	Tethys	Tr.	E.	35,4	22,5	25/09/2011	04:52:50	Tethys	Occ.	D.	-17,1	-1,9
09/08/2011	22:46:09	Tethys	Sh.	I.	-23,1	-31,8	01/09/2011	15:44:50	Tethys	Sh.	E.	34,9	21,7	25/09/2011	06:02:49	Tethys	Occ.	R.	-3,9	10,5
09/08/2011	23:52:48	Tethys	Tr.	E.	-34,3	-31,7	02/09/2011	12:35:20	Tethys	Occ.	D.	42,6	51,3	26/09/2011	03:33:55	Tethys	Tr.	I.	-30,6	-17,3
10/08/2011	00:03:05	Tethys	Sh.	E.	-35,9	-31,4	02/09/2011	14:24:09	Tethys	Ec.	R.	42,3	35,7	26/09/2011	03:57:34	Tethys	Sh.	I.	-26,4	-13,0
10/08/2011	20:26:56	Tethys	Occ.	D.	2,2	-20,4	03/09/2011	11:15:53	Tethys	Tr.	I.	35,7	55,6	26/09/2011	04:41:18	Tethys	Sh.	E.	-18,6	-4,8
10/08/2011	22:42:29	Tethys	Ec.	R.	-23,1	-32,0	03/09/2011	12:00:48	Tethys	Sh.	I.	40,4	53,9	26/09/2011	04:41:42	Tethys	Tr.	E.	-18,5	-4,8
11/08/2011	19:07:09	Tethys	Tr.	I.	15,8	-9,0	03/09/2011	12:59:38	Tethys	Tr.	E.	43,7	48,1	27/09/2011	02:14:57	Tethys	Occ.	D.	-44,2	-31,0
11/08/2011	20:05:42	Tethys	Sh.	I.	5,3	-17,9	03/09/2011	13:03:11	Tethys	Sh.	E.	43,8	47,6	27/09/2011	03:20:47	Tethys	Occ.	R.	-32,2	-19,8
11/08/2011	21:11:52	Tethys	Tr.	E.	-7,2	-26,0	04/09/2011	09:56:23	Tethys	Occ.	D.	24,9	51,5	28/09/2011	00:56:07	Tethys	Tr.	I.	-50,8	-42,5
11/08/2011	21:21:39	Tethys	Sh.	E.	-9,1	-27,0	04/09/2011	11:42:30	Tethys	Ec.	R.	39,0	54,5	28/09/2011	01:17:28	Tethys	Sh.	I.	-49,0	-39,8
12/08/2011	17:47:21	Tethys	Occ.	D.	28,4	4,6	05/09/2011	08:36:58	Tethys	Tr.	I.	12,0	41,1	28/09/2011	01:59:13	Tethys	Sh.	E.	-44,2	-33,7
12/08/2011	20:01:02	Tethys	Ec.	R.	5,5	-17,5	05/09/2011	09:20:26	Tethys	Sh.	I.	19,6	47,2	28/09/2011	01:59:34	Tethys	Tr.	E.	-44,1	-33,7
13/08/2011	16:27:36	Tethys	Tr.	I.	38,5	18,9	05/09/2011	10:18:28	Tethys	Tr.	E.	28,8	53,0	28/09/2011	23:37:14	Tethys	Occ.	D.	-52,9	-49,4
13/08/2011	17:25:16	Tethys	Sh.	I.	31,1	8,3	05/09/2011	10:21:31	Tethys	Sh.	E.	29,3	53,2	29/09/2011	00:38:34	Tethys	Occ.	R.	-51,8	-44,8
13/08/2011	18:30:56	Tethys	Tr.	E.	20,7	-3,1	06/09/2011	07:17:30	Tethys	Occ.	D.	-1,2	27,7	29/09/2011	02:18:32	Tethys	Tr.	I.	-47,9	-49,4
13/08/2011	18:40:12	Tethys	Sh.	E.	19,1	-5,0	06/09/2011	09:00:49	Tethys	Ec.	R.	16,8	44,4	29/09/2011	22:37:25	Tethys	Sh.	I.	-49,8	-50,2
14/08/2011	15:07:49	Tethys	Occ.	D.	44,2	33,4	07/09/2011	05:58:07	Tethys	Tr.	I.	-16,1	13,1	29/09/2011	23:17:05	Tethys	Sh.	E.	-52,4	-50,4
14/08/2011	17:19:35	Tethys	Ec.	R.	31,4	9,1	07/09/2011	06:40:05	Tethys	Sh.	I.	-8,4	20,8	29/09/2011	23:17:15	Tethys	Tr.	E.	-52,5	-50,4
15/08/2011	13:48:05	Tethys	Tr.	I.	43,8	47,0	07/09/2011	07:37:15	Tethys	Tr.	E.	2,6	31,0	30/09/2011	20:59:44	Tethys	Occ.	D.	-53,8	-42,3
15/08/2011	14:44:50	Tethys	Sh.	I.	44,7	37,3	07/09/2011	07:39:50	Tethys	Sh.	E.	3,0	31,4	30/09/2011	21:56:11	Tethys	Ec.	R.	-45,7	-48,3
15/08/2011	15:49:59	Tethys	Tr.	E.	41,4	25,4	08/09/2011	04:38:41	Tethys	Occ.	D.	-29,7	-1,1	01/10/2011	19:41:10	Tethys	Tr.	I.	-25,1	-31,0
15/08/2011	15:58:44	Tethys	Sh.	E.	40,6	23,8	08/09/2011	06:19:08	Tethys	Ec.	R.	-11,7	16,8	01/10/2011	19:57:25	Tethys	Sh.	I.	-28,0	-33,6
16/08/2011	12:28:20	Tethys	Occ.	D.	37,3	57,7	09/09/2011	03:19:20	Tethys	Tr.	I.	-41,6	-16,2	01/10/2011	20:34:42	Tethys	Tr.	E.	-34,3	-39,3
16/08/2011	14:38:07	Tethys	Ec.	R.	44,7	38,2	09/09/2011	03:59:45	Tethys	Sh.	I.	-35,6	-9,2	01/10/2011	20:34:52	Tethys	Sh.	E.	-34,4	-39,3
17/08/2011	11:08:37	Tethys	Tr.	I.	26,7	61,4	09/09/2011	04:56:00	Tethys	Tr.	E.	-26,1	1,5	02/10/2011	18:22:31	Tethys	Occ.	D.	-11,4	-17,5
17/08/2011	12:04:24	Tethys	Sh.	I.	34,8	59,6	09/09/2011	04:58:08	Tethys	Sh.	E.	-25,7	1,8	02/10/2011	19:13:56	Tethys	Ec.	R.	-20,9	-26,7
17/08/2011	13:09:01	Tethys	Tr.	E.	41,7	52,4	10/09/2011	01:59:56	Tethys	Occ.	D.	-50,0	-29,0	03/10/2011	17:04:07	Tethys	Tr.	I.	2,8	-2,8
17/08/2011	13:17:15	Tethys	Sh.	E.	42,3	51,2	10/09/2011	03:37:25	Tethys	Ec.	R.	-38,5	-13,3	03/10/2011	17:17:30	Tethys	Sh.	I.	0,5	-5,8
18/08/2011	09:48:54	Tethys	Occ.	D.	13,9	55,5	11/09/2011	00:40:36	Tethys	Tr.	I.	-52,1	-38,8	03/10/2011	17:51:49	Tethys	Tr.	E.	-6,4	-12,2
18/08/2011	11:56:38	Tethys	Ec.	R.	34,2	59,8	11/09/2011	01:19:26	Tethys	Sh.	I.	-52,0	-34,7	03/10/2011	17:52:34	Tethys	Sh.	E.	-6,5	-12,3
19/08/2011	08:29:13	Tethys	Tr.	I.	0,4	43,7	11/09/2011	02:14:41	Tethys	Tr.	E.	-48,5	-27,1	04/10/2011	15:45:39	Tethys	Occ.	D.	15,9	10,9
19/08/2011	09:23:58	Tethys	Sh.	I.	10,1	52,1	11/09/2011	02:16:23	Tethys	Sh.	E.	-48,3	-26,8	04/10/2011	16:31:36	Tethys	Ec.	R.	7,9	2,7
19/08/2011	10:28:03	Tethys	Tr.	E.	21,3	59,0	11/09/2011	23:21:14	Tethys	Occ.	D.	-47,1	-43,5	05/10/2011	14:27:31	Tethys	Tr.	I.	27,9	23,8
19/08/2011	10:35:45	Tethys	Sh.	E.	22,5	59,6	12/09/2011	00:55:40	Tethys	Ec.	R.	-52,4	-37,6	05/10/2011	14:37:39	Tethys	Sh.	I.	26,3	22,2
20/08/2011	07:09:31	Tethys	Occ.	D.	-14,3	29,5	12/09/2011	02:01:57	Tethys	Tr.	I.	-37,0	-41,6	05/10/2011	15:08:30	Tethys	Tr.	E.	21,5	17,0
20/08/2011	09:15:08	Tethys	Ec.	R.	9,1	50,6	12/09/2011	22:39:07	Tethys	Sh.	I.	-42,4	-43,5	05/10/2011	15:10:10	Tethys	Sh.	E.	21,3	16,8
21/08/2011	05:49:52	Tethys	Tr.	I.	-27,9	14,6	12/09/2011	23:33:20	Tethys	Tr.	E.	-48,7	-43,7	06/10/2011	13:09:20	Tethys	Occ.	D.	37,2	34,5
21/08/2011	06:43:33	Tethys	Sh.	I.	-18,4	24,5	12/09/2011	23:34:38	Tethys	Sh.	E.	-48,8	-43,6	06/10/2011	13:49:10	Tethys	Ec.	R.	32,6	29,3
21/08/2011	07:47:04	Tethys	Tr.	E.	-6,7	36,0	13/09/2011	20:42:38	Tethys	Occ.	D.	-24,3	-33,7	07/10/2011	11:51:38	Tethys	Tr.	I.	42,1	41,1
21/08/2011	07:54:15	Tethys	Sh.	E.	-5,3	37,3	13/09/2011	22:13:53	Tethys	Ec.	R.	-39,4	-42,7	07/10/2011	11:57:55	Tethys	Sh.	I.	41,9	40,7
22/08/2011	04:30:11	Tethys	Occ.	D.	-40,0	0,3	14/09/2011	19:23:23	Tethys	Tr.	I.	-10,5	-22,1	07/10/2011	12:24:27	Tethys	Tr.	E.	40,5	38,8
22/08/2011	06:33:37	Tethys	Ec.	R.	-19,6	22,5	14/09/2011	19:58:50	Tethys	Sh.	I.	-17,0	-27,8	07/10/2011	12:27:38	Tethys	Sh.	E.	40,3	38,5
23/08/2011	03:10:33	Tethys	Tr.	I.	-48,7	-14,0	14/09/2011	20:51:55	Tethys	Tr.	E.	-26,6	-35,3	08/10/2011	10:33:59	Tethys	Occ.	D.	41,3	41,8
23/08/2011	04:03:08	Tethys	Sh.	I.	-43,2	-5,2	14/09/2011	20:52:50	Tethys	Sh.	E.	-26,7	-35,4	08/10/2011	11:06:35	Tethys	Ec.	R.	42,4	42,1
23/08/2011	05:06:04	Tethys	Tr.	E.	-34,1	6,2	15/09/2011	18:04:05	Tethys	Occ.	D.	3,8	-8,6	09/10/2011	09:17:15	Tethys	Tr.	I.	35,1	36,5
23/08/2011	05:12:43	Tethys	Sh.	E.	-33,0	7,4	15/09/2011	19:32:05	Tethys	Ec.	R.	-12,8	-23,9	09/10/2011	09:18:20	Tethys	Sh.	I.	35,3	36,6
24/08/2011	01:50:54	Tethys	Occ.	D.	-51,5	-25,8	16/09/2011	16:44:53	Tethys	Tr.	I.	17,2	6,0	09/10/2011	09:38:55	Tethys	Tr.	E.	37,4	38,4
24/08/2011	03:52:05	Tethys	Ec.	R.	-44,2	-7,3	16/09/2011	17:18:34	Tethys	Sh.	I.	11,3	0,1	09/10/2011	09:44:58	Tethys	Sh.	E.	38,0	38,9
25/08/2011	00:31:18	Tethys	Tr.	I.	-47,1	-34,2	16/09/2011	18:10:26	Tethys	Tr.	E.	2,1	-10,1	10/10/2011	07:58:23	Tethys	Ec.	D.	24,9	26,4
25/08/2011	01:22:43	Tethys	Sh.	I.	-50,8	-29,5	16/09/2011	18:11:00	Tethys	Sh.	E.	2,0	-10,2	10/10/2011	08:23:50	Tethys	Ec.	R.	28,7	29,9
25/08/2011	02:25:04	Tethys	Tr.	E.	-51,1	-21,4	17/09/2011	15:25:38	Tethys	Occ.	D.	29,2	20,1	11/10/2011	06:38:57	Tethys	Sh.	I.	12,3	13,4
25/08/2011	02:31:11	Tethys	Sh.	E.	-50,8	-20,5	17/09/2011	16:50:15	Tethys	Ec.	R.	15,6	4,7	11/10/2011	07:02:03	Tethys	Sh.	E.	16,3	17,3
25/08/2011	23:11:41	Tethys	Occ.	D.	-37,3	-37,4	18/09/2011	14:06:29	Tethys	Tr.	I.	38,5	33,1	12/10/2011	05:19:06	Tethys	Ec.	D.	-0,9	-0,4
26/08/2011	01:10:32	Tethys	Ec.	R.	-50,5	-31,0	18/09/2011	14:38:18	Tethys	Sh.	I.	35,0	28,0	12/10/2011	05:40:50	Tethys	Ec.	R.	2,6	3,1
26/08/2011	21:52:07	Tethys	Tr.	I.	-24,8	-34,5	18/09/2011	15:28:53	Tethys	Tr.	E.	28,2	19,2	13/10/2011	03:59:54	Tethys	Sh.	I.	-15,8	-16,0
26/08/2011	22:42:19	Tethys	Sh.	I.	-33,3	-37,3	18/09/2011	15:29:09	Tethys	Sh.	E.	28,1	19,1	13/10/2011	04:18:49	Tethys	Sh.	E.	-12,3	-12,5
26/08/2011	23:44:02	Tethys	Tr.	E.	-42,5	-37,3	19/09/2011	12:47:16	Tethys	Occ.	D.	43,1	43,6	14/10/2011	02:40:13	Tethys	Ec.	D.	-29,6	-30,7
26/08/2011	23:49:37	Tethys	Sh.	E.	-43,2	-37,1	19/09/2011	14:08:22	Tethys	Ec.	R.	37,9	32,5	14/10/2011	02:57:25	Tethys	Ec.	R.	-26,6	-27,6
27/08/2011	20:32:31	Tethys	Occ.	D.	-11,0	-26,3	20/09/2011	11:28:10	Tethys	Tr.	I.	41,6	48,8	15/10/2011	01:21:28	Tethys	Sh.	I.	-41,8	-43,9
27/08/2011	22:28:58	Tethys	Ec.	R.	-31,7	-37,1	20/09/2011	11:58:05	Tethys	Sh.	I.	42,9	47,5	15/10/2011	01:34:56	Tethys	Sh.	E.	-39,8	-41,8
28/08/2011	19:12:58	Tethys	Tr.	I.	3,4	-14,8	20/09/2011	12:47:15	Tethys	Sh.	E.	43,0	43,2	16/10/2011	00:02:12	Tethys	Ec.	D.	-50,9	-53,8
28/08/2011	20:01:56	Tethys	Sh.	I.	-6,0	-22,4														

# CONGIUNZIONI TRA I SATELLITI DI SATURNO

## CONJUNCT. BETWEEN THE SATELLITES OF SATURN

Sono stati presi in considerazione solo i 4 satelliti principali - Only 4 main satellites

Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
01/01/2011	22:57:03	Tethys/Dione	16"	-9,5	-70,6	04/02/2011	12:00:25	Tethys/Rhea	-13"	-31,6	31,2	10/03/2011	21:36:22	Tethys/Rhea	20"	25,0	-45,2
02/01/2011	14:32:16	Dione/Rhea	11"	-35,5	10,9	05/02/2011	11:16:09	Tethys/Dione	-6"	-24,6	32,0	11/03/2011	02:59:13	Tethys/Dione	15"	37,0	-28,6
03/01/2011	02:26:19	Tethys/Dione	-15"	28,0	-46,3	05/02/2011	18:09:03	Tethys/Titan	-39"	-36,3	-18,5	12/03/2011	06:59:31	Tethys/Dione	-9"	-2,8	15,5
03/01/2011	07:42:57	Rhea/Titan	-26"	34,4	8,7	06/02/2011	10:37:46	Dione/Titan	-38"	31,4	-59,6	13/03/2011	10:39:16	Tethys/Rhea	-14"	-41,8	44,0
03/01/2011	23:57:23	Rhea/Titan	-19"	3,4	-69,0	06/02/2011	09:17:23	Rhea/Titan	-37"	-3,1	25,2	13/03/2011	12:53:02	Dione/Rhea	-15"	-51,6	40,5
04/01/2011	06:18:21	Tethys/Dione	9"	42,0	-4,3	06/02/2011	16:25:19	Tethys/Dione	14"	-49,1	0,9	14/03/2011	09:05:22	Tethys/Dione	9"	-27,7	35,8
04/01/2011	11:05:46	Dione/Rhea	-22"	0,7	25,3	07/02/2011	00:33:33	Tethys/Rhea	20"	31,4	-59,8	15/03/2011	00:03:03	Tethys/Rhea	17"	43,5	-49,3
04/01/2011	13:12:54	Dione/Titan	-41"	-23,3	20,0	07/02/2011	12:24:21	Dione/Rhea	21"	-37,4	31,2	15/03/2011	08:14:08	Dione/Rhea	23"	-19,3	28,9
04/01/2011	14:41:15	Tethys/Rhea	-17"	-38,1	10,0	07/02/2011	19:59:41	Tethys/Dione	-17"	-15,7	-38,4	15/03/2011	13:15:58	Tethys/Dione	-15"	-50,8	38,8
04/01/2011	17:34:42	Tethys/Titan	-38"	-52,3	-18,2	08/02/2011	23:27:33	Tethys/Dione	15"	22,6	-62,9	16/03/2011	16:41:32	Tethys/Dione	16"	-23,5	6,3
05/01/2011	14:04:43	Rhea/Titan	-32"	-32,9	14,8	09/02/2011	07:10:56	Dione/Rhea	-24"	17,3	8,5	16/03/2011	18:14:48	Tethys/Titan	37"	-6,4	-11,2
06/01/2011	03:59:51	Tethys/Rhea	-14"	40,5	-29,0	09/02/2011	14:34:04	Tethys/Rhea	-20"	-51,8	18,8	17/03/2011	03:10:39	Dione/Rhea	-17"	32,4	-20,6
06/01/2011	05:54:26	Dione/Rhea	20"	42,8	-8,5	10/02/2011	03:59:33	Tethys/Dione	-7"	41,7	-25,7	17/03/2011	07:39:53	Rhea/Titan	43"	-14,6	24,1
06/01/2011	08:26:58	Tethys/Dione	-8"	26,5	14,4	11/02/2011	03:22:08	Dione/Rhea	12"	43,3	-32,4	17/03/2011	13:51:00	Tethys/Rhea	-20"	-47,7	35,0
07/01/2011	12:42:36	Tethys/Dione	15"	-19,9	22,8	12/02/2011	02:52:13	Tethys/Rhea	13"	43,8	-37,6	17/03/2011	15:38:37	Dione/Titan	34"	-33,5	17,7
08/01/2011	17:15:07	Tethys/Rhea	-20"	-32,4	-14,1	12/02/2011	05:53:39	Tethys/Dione	11"	27,9	-4,1	17/03/2011	20:18:20	Tethys/Dione	-12"	17,0	-32,4
09/01/2011	09:21:46	Dione/Rhea	-9"	15,6	20,4	12/02/2011	18:31:23	Tethys/Titan	37"	-27,9	-21,1	19/03/2011	03:26:07	Tethys/Dione	4"	29,1	-21,3
09/01/2011	19:46:29	Tethys/Dione	13"	-37,6	-41,6	13/02/2011	05:42:28	Dione/Titan	42"	29,0	-6,1	19/03/2011	11:05:50	Tethys/Dione	3"	-47,6	47,3
11/01/2011	01:40:38	Tethys/Dione	-4"	25,6	-54,4	13/02/2011	09:44:38	Tethys/Dione	-17"	-13,8	29,9	19/03/2011	19:56:39	Tethys/Dione	4"	14,7	-28,4
11/01/2011	06:37:13	Dione/Rhea	22"	38,3	-0,5	13/02/2011	14:59:06	Rhea/Titan	44"	-52,1	16,2	20/03/2011	03:28:28	Tethys/Rhea	16"	28,1	-20,6
11/01/2011	07:13:28	Tethys/Rhea	19"	34,2	4,7	13/02/2011	16:56:05	Tethys/Rhea	-19"	-42,3	-3,0	20/03/2011	08:00:31	Dione/Rhea	14"	-20,6	28,5
11/01/2011	18:13:11	Dione/Titan	38"	-48,6	-24,1	14/02/2011	07:46:50	Dione/Rhea	-20"	7,5	15,4	21/03/2011	02:52:07	Tethys/Dione	-13"	32,8	-26,4
11/01/2011	18:25:14	Tethys/Titan	34"	-47,4	-26,3	14/02/2011	13:09:29	Tethys/Dione	17"	-47,0	30,1	21/03/2011	16:41:26	Tethys/Rhea	-14"	-19,7	7,3
12/01/2011	14:24:48	Tethys/Titan	25"	-40,2	13,5	15/02/2011	16:56:10	Tethys/Dione	-11"	-41,1	-2,4	22/03/2011	03:35:49	Dione/Rhea	-23"	25,7	-18,6
12/01/2011	20:44:59	Tethys/Titan	30"	-26,0	-51,7	16/02/2011	02:38:27	Dione/Rhea	24"	43,8	-39,0	23/03/2011	09:53:57	Tethys/Dione	-14"	-41,0	44,8
12/01/2011	21:21:35	Rhea/Titan	41"	-19,5	-57,8	17/02/2011	18:40:26	Tethys/Dione	7"	-22,7	-21,8	23/03/2011	22:30:01	Dione/Rhea	18"	39,7	-45,5
12/01/2011	21:48:24	Tethys/Rhea	-11"	-14,5	-61,9	17/02/2011	22:22:08	Dione/Rhea	-14"	17,9	-56,8	24/03/2011	06:03:36	Tethys/Rhea	20"	-1,2	9,3
13/01/2011	01:20:53	Dione/Rhea	-21"	23,7	-57,6	18/02/2011	20:14:55	Tethys/Rhea	-16"	-4,4	-38,6	24/03/2011	14:02:18	Tethys/Dione	8"	-43,1	35,3
13/01/2011	02:20:49	Tethys/Dione	13"	32,6	-47,2	18/02/2011	23:25:54	Tethys/Dione	-15"	28,8	-59,5	24/03/2011	15:04:47	Rhea/Titan	-43"	-34,0	25,2
13/01/2011	10:57:34	Tethys/Rhea	-7"	-4,6	26,3	20/02/2011	09:27:02	Tethys/Rhea	17"	-15,7	30,4	25/03/2011	00:02:26	Dione/Titan	-41"	44,8	-45,3
13/01/2011	17:38:50	Tethys/Rhea	-10"	-50,7	-17,5	20/02/2011	13:56:08	Dione/Titan	-38"	-51,8	26,9	25/03/2011	02:59:57	Tethys/Titan	-38"	29,3	-23,8
14/01/2011	06:01:36	Tethys/Dione	-17"	40,5	-7,0	20/02/2011	22:41:25	Rhea/Titan	-47"	23,2	-57,3	26/03/2011	16:12:17	Tethys/Dione	-9"	-21,0	13,7
15/01/2011	09:27:36	Tethys/Dione	15"	10,5	21,6	21/02/2011	03:06:57	Dione/Rhea	19"	42,4	-32,7	26/03/2011	19:58:34	Tethys/Rhea	-18"	20,3	-26,9
15/01/2011	09:37:26	Tethys/Rhea	19"	8,8	22,5	21/02/2011	03:11:24	Tethys/Titan	-40"	42,1	-31,9	27/03/2011	03:04:16	Dione/Rhea	-12"	27,4	-22,4
16/01/2011	03:43:44	Dione/Rhea	8"	42,0	-31,8	21/02/2011	06:26:17	Tethys/Dione	-14"	16,8	4,0	27/03/2011	20:07:12	Tethys/Dione	15"	22,5	-28,0
16/01/2011	13:31:19	Tethys/Dione	-9"	-34,3	20,3	21/02/2011	19:05:54	Dione/Titan	-25"	-15,0	-25,6	28/03/2011	09:57:17	Tethys/Rhea	11"	-44,0	47,0
17/01/2011	23:38:31	Tethys/Rhea	-20"	9,5	-68,4	22/02/2011	01:45:34	Dione/Titan	-29"	43,6	-46,0	28/03/2011	22:58:52	Dione/Rhea	22"	43,7	-44,7
18/01/2011	02:05:53	Dione/Rhea	-22"	33,1	-49,6	22/02/2011	11:19:38	Tethys/Dione	6"	-36,5	37,8	28/03/2011	23:35:35	Tethys/Dione	-15"	44,8	-44,7
18/01/2011	15:38:48	Tethys/Dione	9"	-50,9	4,2	22/02/2011	22:01:46	Dione/Rhea	-24"	18,0	-53,2	30/03/2011	03:13:24	Tethys/Dione	11"	24,0	-19,8
19/01/2011	19:47:20	Tethys/Dione	-16"	-31,3	-40,0	22/02/2011	23:06:48	Dione/Rhea	-21"	28,5	-57,8	30/03/2011	17:45:29	Dione/Rhea	-18"	0,0	-2,2
19/01/2011	20:51:36	Dione/Rhea	22"	-20,0	-51,5	24/02/2011	12:57:51	Tethys/Dione	-12"	-49,5	34,4	30/03/2011	22:18:49	Tethys/Rhea	-18"	41,6	-42,3
20/01/2011	02:52:39	Tethys/Titan	-39"	39,3	-41,0	24/02/2011	17:33:01	Dione/Rhea	15"	-29,4	-7,8	31/03/2011	21:28:08	Rhea/Titan	32"	36,9	-37,6
20/01/2011	05:32:21	Rhea/Titan	-47"	40,9	-11,7	25/02/2011	12:53:53	Tethys/Rhea	18"	-49,5	35,0	01/04/2011	04:21:27	Tethys/Dione	-5"	10,9	-7,2
20/01/2011	12:31:21	Tethys/Rhea	14"	-26,8	25,9	25/02/2011	16:38:06	Tethys/Dione	17"	-37,6	2,8	01/04/2011	05:28:28	Dione/Titan	33"	-0,8	5,4
20/01/2011	19:21:14	Dione/Titan	-41"	-35,0	-35,0	26/02/2011	20:06:20	Tethys/Dione	-16"	0,6	-35,2	01/04/2011	06:58:44	Tethys/Titan	26"	-18,3	21,9
20/01/2011	23:13:13	Tethys/Dione	17"	7,1	-67,9	27/02/2011	02:19:19	Tethys/Rhea	-14"	43,6	-39,2	01/04/2011	11:03:01	Tethys/Titan	24"	-50,6	52,4
21/01/2011	19:37:15	Dione/Rhea	-8"	-31,7	-37,8	27/02/2011	22:25:21	Dione/Rhea	-18"	25,3	-53,8	02/04/2011	08:30:26	Tethys/Titan	32"	-34,7	37,8
22/01/2011	02:05:54	Tethys/Rhea	-18"	35,1	-49,2	27/02/2011	23:56:21	Tethys/Dione	10"	37,7	-55,5	02/04/2011	09:44:43	Tethys/Dione	12"	-44,9	47,7
22/01/2011	02:51:49	Tethys/Dione	-12"	39,9	-41,0	28/02/2011	04:22:06	Rhea/Titan	38"	32,0	-17,1	02/04/2011	12:16:47	Tethys/Rhea	18"	-49,4	50,5
22/01/2011	13:05:44	Dione/Rhea	-4"	-34,0	24,0	01/03/2011	09:14:15	Tethys/Titan	38"	-19,9	32,2	02/04/2011	21:58:46	Dione/Rhea	11"	41,0	-39,8
22/01/2011	20:23:25	Dione/Rhea	-6"	-23,0	-46,0	01/03/2011	11:11:02	Dione/Titan	40"	-39,5	40,3	03/04/2011	13:19:11	Tethys/Dione	-15"	-42,9	44,2
23/01/2011	11:09:46	Tethys/Dione	3"	-14,2	28,5	01/03/2011	15:21:20	Tethys/Rhea	20"	-45,7	16,8	04/04/2011	16:46:29	Tethys/Dione	13"	-7,6	9,2
23/01/2011	15:00:16	Tethys/Dione	3"	-49,5	10,9	01/03/2011	17:27:33	Dione/Rhea	24"	-26,7	-5,6	04/04/2011	18:20:18	Dione/Rhea	-21"	9,9	-8,2
24/01/2011	03:03:22	Tethys/Dione	5"	41,4	-38,7	02/03/2011	02:01:20	Tethys/Dione	-8"	43,8	-41,1	05/04/2011	00:46:27	Tethys/Rhea	-12"	40,6	-37,8
24/01/2011	21:34:04	Dione/Rhea	22"	-8,6	-57,4	03/03/2011	06:19:26	Tethys/Dione	15"	10,9	5,6	05/04/2011	21:11:23	Tethys/Dione	-7"	37,5	-34,2
25/01/2011	09:27:17	Tethys/Dione	-14"	3,7	23,3	03/03/2011	12:41:31	Dione/Rhea	-16"	-50,3	38,1	06/04/2011	13:06:51	Dione/Rhea	19"	-42,8	46,6
26/01/2011	16:17:13	Dione/Rhea	-23"	-52,2	0,0	04/03/2011	05:19:52	Tethys/Rhea	-19"	20,6	-5,1	06/04/2011	14:38:15	Tethys/Rhea	16"	-29,1	32,8
27/01/2011	05:35:11	Tethys/Rhea	-17"	38,3	-10,5	04/03/2011	09:49:53	Tethys/Dione	-17"	-28,4	37,0	07/04/2011	23:09:36	Tethys/Dione	9"	45,2	-41,0
27/01/2011	10:48:43	Rhea/Titan	40"	-13,2	29,0	05/03/2011	13:21:28	Tethys/Dione	13"	-51,8	35,0	09/04/2011	03:02:15	Tethys/Dione	-14"	19,1	-18,3
27/01/2011	16:29:52	Tethys/Dione	-15"	-51,5	-1,8	05/03/2011	20:25:11	Tethys/Rhea	10"	9,1	-36,6	09/04/2011	04:32:13	Tethys/Rhea	-18"	3,1	-2,0
27/01/2011	23:54:42	Dione/Titan	41"	19,1	-65,5	06/03/2011	06:33:03	Tethys/Rhea	7"	6,3	9,0	09/04/2011	12:00:58	Tethys/Titan	-33"	-48,2	54,0
28/01/2011	09:09:57	Tethys/Titan	39"	4,7	22,2	06/03/2011	16:30:22	Tethys/Rhea	11"	-32,8	6,1	09/04/2011	16:42:11	Dione/Rhea	-9"	-4,2	11,0
28/01/2011	13:47:36	Dione/Rhea	9"	-43,7	21,4	06/03/2011	17:40:11	Dione/Rhea	16"	-20,7	-6,9	10/04/2011	05:32:07	Rhea/Titan	-38"	-9,2	8,8
28/01/2011	18:46:30	Tethys/Rhea	16"	-35,5	-27,1	06/03/2011	18:59:58	Tethys/Dione	-5"	-6,0	-21,6	10/04/2011	06:27:05	Tethys/Dione	14"	-19,2	18,9
28/01/2011	20:42:15	Tethys/Dione	8"	-15,3	-48,1	08/03/2011	07:39:15	Tethys/Rhea	-19"	-7,7	20,9						

Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
16/04/2011	11:00:45	Dione/Rhea	7"	-49,9	58,0	26/05/2011	22:41:16	Tethys/Rhea	10"	29,9	-26,5	06/07/2011	02:08:01	Tethys/Rhea	14"	-34,4	-14,2
16/04/2011	23:41:44	Tethys/Dione	-12"	42,1	-37,3	27/05/2011	00:04:43	Rhea/Titan	-32"	16,0	-25,5	06/07/2011	03:44:27	Tethys/Titan	27"	-46,5	0,0
17/04/2011	10:02:07	Dione/Titan	34"	-50,3	55,0	27/05/2011	03:08:31	Tethys/Dione	10"	-17,9	-6,1	06/07/2011	13:31:39	Tethys/Dione	3"	25,8	55,9
17/04/2011	23:56:56	Rhea/Titan	39"	40,4	-36,4	27/05/2011	04:22:12	Dione/Titan	-30"	-30,6	6,0	07/07/2011	11:56:16	Rhea/Titan	23"	9,9	68,9
18/04/2011	04:25:23	Tethys/Dione	5"	-2,2	-0,6	28/05/2011	02:29:28	Tethys/Titan	-28"	-11,5	-11,6	08/07/2011	14:03:06	Tethys/Dione	-9"	31,8	50,4
18/04/2011	09:04:07	Dione/Rhea	-19"	-47,2	48,2	28/05/2011	06:44:11	Tethys/Dione	-12"	-48,3	31,5	08/07/2011	16:08:48	Tethys/Rhea	-14"	44,9	27,2
18/04/2011	10:34:24	Tethys/Rhea	-15"	-50,4	57,8	28/05/2011	12:28:46	Tethys/Rhea	-13"	-13,1	63,5	09/07/2011	00:31:01	Dione/Rhea	-7"	-20,0	-23,4
20/04/2011	00:01:39	Tethys/Rhea	12"	39,1	-35,4	29/05/2011	05:13:47	Dione/Rhea	-13"	-39,6	15,1	09/07/2011	17:39:27	Tethys/Dione	12"	44,4	10,9
20/04/2011	03:47:48	Dione/Rhea	19"	2,9	-7,4	29/05/2011	10:11:57	Tethys/Dione	11"	-35,7	66,3	10/07/2011	06:47:21	Tethys/Rhea	8"	-41,6	31,1
20/04/2011	06:11:45	Tethys/Dione	-10"	-23,8	18,9	30/05/2011	14:31:39	Tethys/Dione	-6"	11,3	43,4	10/07/2011	19:33:56	Tethys/Rhea	5"	31,4	-7,7
21/04/2011	09:53:56	Tethys/Dione	14"	-50,4	55,5	01/06/2011	18:34:52	Tethys/Dione	7"	33,2	20,9	10/07/2011	21:08:46	Tethys/Dione	-11"	15,8	-19,3
22/04/2011	02:52:55	Dione/Rhea	-6"	11,3	-15,8	01/06/2011	19:32:26	Dione/Rhea	-11"	46,1	-8,7	10/07/2011	21:20:41	Dione/Rhea	16"	13,7	-20,4
22/04/2011	12:59:33	Tethys/Rhea	-17"	-33,9	51,9	02/06/2011	15:54:05	Tethys/Rhea	-11"	27,6	28,5	11/07/2011	02:39:31	Tethys/Rhea	7"	-41,6	-10,8
22/04/2011	13:21:46	Tethys/Dione	-13"	-30,3	48,8	02/06/2011	20:30:14	Tethys/Dione	-11"	42,7	-16,0	12/07/2011	01:13:08	Tethys/Dione	6"	-29,3	-20,7
22/04/2011	18:12:45	Dione/Rhea	-3"	22,2	-2,5	03/06/2011	10:03:06	Rhea/Titan	21"	-34,0	65,8	12/07/2011	16:06:36	Dione/Rhea	-15"	45,3	27,4
23/04/2011	04:04:07	Dione/Rhea	-5"	-2,0	-3,4	03/06/2011	23:56:05	Tethys/Dione	12"	11,8	-24,8	12/07/2011	18:33:56	Tethys/Rhea	-14"	38,4	1,7
23/04/2011	17:09:44	Tethys/Dione	9"	12,0	8,6	04/06/2011	03:08:25	Tethys/Titan	26"	-23,6	-5,4	14/07/2011	03:26:11	Tethys/Dione	-7"	-47,7	-4,2
25/04/2011	02:57:00	Tethys/Rhea	16"	8,4	-14,3	04/06/2011	05:05:18	Tethys/Rhea	12"	-41,6	14,0	14/07/2011	12:41:40	Tethys/Titan	-29"	22,4	63,2
25/04/2011	04:25:51	Dione/Rhea	18"	-8,3	1,1	04/06/2011	15:17:21	Rhea/Titan	13"	22,9	35,5	14/07/2011	22:34:24	Dione/Titan	-30"	-2,2	-25,6
25/04/2011	07:18:00	Rhea/Titan	-37"	-37,9	32,4	05/06/2011	00:32:56	Dione/Rhea	12"	4,4	-22,6	14/07/2011	23:13:19	Rhea/Titan	-33"	-10,1	-26,4
25/04/2011	19:10:05	Tethys/Dione	-6"	33,2	-12,1	05/06/2011	02:14:22	Dione/Titan	27"	-14,6	-12,8	15/07/2011	07:27:46	Tethys/Dione	11"	-33,2	38,1
26/04/2011	02:38:42	Tethys/Titan	-33"	10,9	-16,8	05/06/2011	03:39:14	Tethys/Dione	-8"	-29,5	0,0	15/07/2011	08:35:23	Tethys/Rhea	15"	-21,8	50,4
26/04/2011	10:39:55	Dione/Titan	-33"	-48,5	60,8	05/06/2011	14:52:46	Rhea/Titan	20"	19,4	40,2	15/07/2011	19:13:22	Dione/Rhea	7"	31,6	-5,1
26/04/2011	18:20:46	Tethys/Rhea	-8"	26,4	-3,3	06/06/2011	18:41:18	Tethys/Rhea	-15"	46,1	0,2	16/07/2011	10:57:25	Tethys/Dione	-12"	5,2	68,9
26/04/2011	23:07:55	Dione/Rhea	-19"	41,7	-34,4	06/06/2011	19:43:31	Dione/Rhea	-17"	44,9	-9,6	17/07/2011	14:35:20	Tethys/Dione	9"	40,1	43,9
26/04/2011	23:34:49	Tethys/Dione	12"	38,9	-34,1	07/06/2011	05:08:08	Tethys/Dione	4"	-43,3	14,6	17/07/2011	16:54:24	Dione/Rhea	-16"	44,9	18,3
27/04/2011	14:26:32	Tethys/Rhea	-9"	-15,2	39,2	08/06/2011	10:12:51	Tethys/Dione	-10"	-29,2	67,3	17/07/2011	21:34:50	Tethys/Rhea	-10"	6,3	-22,5
28/04/2011	03:05:34	Tethys/Dione	-14"	4,6	-12,2	08/06/2011	14:53:50	Dione/Rhea	12"	21,6	40,2	19/07/2011	11:06:43	Tethys/Rhea	13"	8,9	68,7
28/04/2011	20:44:47	Dione/Rhea	7"	44,3	-24,7	09/06/2011	08:33:08	Tethys/Rhea	13"	-43,0	52,1	19/07/2011	11:41:06	Dione/Rhea	16"	15,1	68,3
29/04/2011	05:17:17	Tethys/Rhea	16"	-20,7	11,1	10/06/2011	17:14:19	Tethys/Dione	-10"	42,2	14,7	19/07/2011	15:16:49	Tethys/Dione	-4"	44,1	36,1
29/04/2011	06:36:42	Tethys/Dione	11"	-34,1	25,7	10/06/2011	22:09:29	Tethys/Rhea	-9"	25,5	-23,4	20/07/2011	21:11:19	Tethys/Dione	9"	8,5	-20,9
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01/05/2011	19:15:22	Tethys/Rhea	-16"	37,3	-11,6	11/06/2011	21:52:07	Tethys/Dione	5"	27,7	-22,4	21/07/2011	22:06:16	Dione/Rhea	-3"	-1,8	-25,4
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02/05/2011	13:08:03	Tethys/Dione	10"	25,4	53,1	12/06/2011	11:40:33	Tethys/Titan	-28"	-10,9	70,2	22/07/2011	01:00:26	Tethys/Rhea	-15"	-33,5	-23,4
02/05/2011	14:55:05	Rhea/Titan	26"	-5,9	35,0	13/06/2011	05:07:28	Rhea/Titan	-32"	-45,8	14,5	22/07/2011	03:31:26	Dione/Titan	30"	-49,9	-4,6
03/05/2011	03:37:01	Tethys/Titan	27"	-5,2	-5,8	13/06/2011	11:00:57	Tethys/Rhea	14"	-17,4	71,1	22/07/2011	04:04:38	Rhea/Titan	33"	-50,4	1,1
03/05/2011	16:50:11	Tethys/Dione	-13"	16,1	13,8	13/06/2011	15:13:50	Dione/Rhea	17"	28,1	36,9	22/07/2011	13:17:47	Dione/Rhea	-5"	32,6	56,8
03/05/2011	18:32:51	Dione/Rhea	18"	32,8	-4,2	13/06/2011	23:45:27	Tethys/Dione	-8"	6,6	-24,4	22/07/2011	19:06:34	Tethys/Titan	27"	28,5	-4,9
03/05/2011	20:55:07	Tethys/Titan	20"	45,7	-24,6	15/06/2011	03:30:12	Tethys/Dione	11"	-34,4	-1,0	23/07/2011	04:16:41	Tethys/Dione	11"	-50,2	2,8
04/05/2011	06:37:16	Tethys/Titan	25"	-37,2	26,9	15/06/2011	10:13:38	Dione/Rhea	-13"	-24,4	67,7	24/07/2011	08:35:12	Tethys/Dione	-6"	-16,0	49,2
04/05/2011	08:20:01	Tethys/Rhea	11"	-48,5	45,5	16/06/2011	01:02:17	Tethys/Rhea	-14"	-9,4	-20,0	24/07/2011	12:28:07	Dione/Rhea	16"	26,1	63,4
04/05/2011	20:15:45	Tethys/Dione	12"	44,2	-19,6	16/06/2011	06:58:35	Tethys/Dione	-11"	-48,8	34,7	24/07/2011	14:40:00	Tethys/Rhea	12"	42,7	42,3
05/05/2011	15:14:23	Dione/Rhea	-8"	0,5	32,0	17/06/2011	10:46:00	Tethys/Dione	8"	-17,3	70,6	26/07/2011	03:54:47	Tethys/Rhea	-11"	-50,5	-0,8
05/05/2011	21:43:14	Tethys/Rhea	-14"	45,1	-28,4	17/06/2011	17:19:46	Tethys/Rhea	7"	44,7	14,3	26/07/2011	07:13:29	Dione/Rhea	-16"	-29,1	34,1
06/05/2011	00:12:39	Tethys/Dione	-8"	28,9	-29,8	17/06/2011	23:04:59	Tethys/Rhea	5"	11,0	-24,6	26/07/2011	10:41:14	Tethys/Dione	7"	8,9	66,1
08/05/2011	02:17:49	Tethys/Dione	7"	5,9	-16,7	18/06/2011	12:55:32	Tethys/Rhea	8"	7,5	61,7	27/07/2011	14:38:09	Tethys/Dione	-12"	43,3	62,7
08/05/2011	19:09:06	Dione/Rhea	16"	40,1	-9,2	18/06/2011	15:08:30	Dione/Rhea	10"	30,3	38,2	28/07/2011	05:27:44	Dione/Rhea	6"	-43,6	14,3
09/05/2011	06:33:04	Tethys/Dione	-12"	-39,5	27,1	19/06/2011	12:43:41	Tethys/Dione	-5"	6,1	63,6	28/07/2011	18:04:58	Tethys/Dione	12"	34,1	4,5
10/05/2011	13:55:25	Dione/Rhea	-18"	-10,8	47,0	19/06/2011	17:11:49	Dione/Titan	23"	44,6	15,8	29/07/2011	13:10:34	Rhea/Titan	-28"	35,0	56,8
11/05/2011	00:11:37	Dione/Titan	-27"	25,8	-28,5	20/06/2011	03:25:53	Tethys/Rhea	-13"	-36,7	-1,7	29/07/2011	21:48:22	Tethys/Dione	-9"	-4,8	-25,9
11/05/2011	01:11:51	Tethys/Rhea	-13"	15,5	-23,8	20/06/2011	09:51:11	Rhea/Titan	32"	-24,9	64,8	29/07/2011	23:15:31	Tethys/Titan	-26"	-20,9	-29,4
11/05/2011	11:25:26	Tethys/Titan	-30"	-35,9	65,6	20/06/2011	10:43:49	Dione/Rhea	-17"	-15,6	70,4	31/07/2011	03:31:03	Tethys/Titan	-26"	-50,7	-6,3
11/05/2011	13:35:14	Tethys/Dione	-10"	-13,7	50,6	20/06/2011	13:37:07	Dione/Titan	15"	16,4	54,9	31/07/2011	04:33:26	Dione/Titan	-29"	-48,0	4,4
11/05/2011	21:11:02	Dione/Titan	-18"	45,5	-24,2	20/06/2011	17:14:46	Tethys/Dione	10"	45,0	15,3	31/07/2011	07:23:08	Tethys/Rhea	-14"	-24,4	35,2
12/05/2011	10:08:28	Dione/Rhea	9"	-45,2	62,9	20/06/2011	18:09:31	Tethys/Titan	26"	46,1	6,0	31/07/2011	08:02:57	Dione/Rhea	-16"	-17,3	42,4
12/05/2011	11:52:16	Rhea/Titan	-33"	-31,0	64,4	21/06/2011	05:46:27	Dione/Titan	22"	-49,8	21,3	31/07/2011	23:16:01	Tethys/Dione	4"	-22,3	-29,9
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12/05/2011	14:25:17	Tethys/Rhea	12"	-3,3	42,1	22/06/2011	17:24:30	Tethys/Rhea	14"	45,7	13,7	02/08/2011	02:50:17	Dione/Rhea	17"	-50,2	-12,8
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13/05/2011	07:44:08	Tethys/Dione	3"	-48,4	40,8	24/06/2011	05:27:38	Tethys/Dione	-4"	-49,6	17,8	03/08/2011	23:59:05	Dione/Rhea	-7"	-31,7	-29,9
13/05/2011	11:55:29	Tethys/Dione	3"	-29,8	64,3	25/06/2011	06:42:07	Tethys/Rhea	-10"	-47,7	31,4	04/08/2011	09:51:10	Tethys/Rhea	-15"	5,6	59,1
14/05/2011	20:10:05	Tethys/Dione	-10"	45,9	-16,7	25/06/2011	10:23:18	Dione/Rhea	-9"	-15,8	68,6	04/08/2011	11:27:42	Tethys/Dione	-11"	22,6	65,2
15/05/2011	03:46:03	Tethys/Rhea	-16"	-15,9	-1,1	26/06/2011	06:51:27	Tethys/Dione	8"	-46,7	33,0	05/08/2011	16:04:53	Tethys/Dione	5"	43,3	24,7
15/05/2011	14:31:17	Dione/Rhea	-15"	0,3	41,4	26/06/2011	19:59:51	Tethys/Rhea	12"	35,5	-10,7	06/08/2011	23:53:59	Tethys/Rhea	15"	-32,7	-30,9
15/05/2011																	



Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
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15/08/2011	18:03:44	Rhea/Titan	-37"	24,0	1,2	24/09/2011	03:07:39	Tethys/Titan	23"	-36,0	-21,5	31/10/2011	16:46:17	Tethys/Dione	-10"	-13,2	-7,8
16/08/2011	05:52:37	Tethys/Rhea	12"	-30,3	15,9	24/09/2011	06:34:13	Dione/Titan	20"	1,5	16,3	01/11/2011	20:46:34	Tethys/Dione	17"	-51,5	-50,9
16/08/2011	08:53:53	Dione/Titan	-25"	2,8	48,3	24/09/2011	17:58:57	Tethys/Dione	5"	-0,8	-10,6	02/11/2011	11:34:42	Dione/Rhea	-9"	36,1	32,6
16/08/2011	18:39:42	Tethys/Dione	11"	17,3	-5,7	24/09/2011	22:19:28	Tethys/Titan	32"	-45,8	-47,4	02/11/2011	23:46:03	Tethys/Rhea	-23"	-46,5	-60,8
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17/08/2011	19:07:38	Tethys/Rhea	-13"	11,7	-10,7	25/09/2011	09:14:58	Tethys/Rhea	18"	29,1	40,7	03/11/2011	04:51:46	Tethys/Titan	-41"	6,8	-10,7
17/08/2011	23:48:51	Tethys/Dione	-5"	-38,3	-34,2	25/09/2011	15:58:30	Dione/Rhea	22"	19,4	11,5	03/11/2011	07:57:21	Dione/Rhea	-5"	34,9	19,8
20/08/2011	01:14:54	Tethys/Dione	9"	-49,1	-28,9	25/09/2011	23:04:44	Tethys/Dione	-13"	-50,7	-49,0	03/11/2011	11:06:30	Dione/Rhea	-6"	38,3	32,9
20/08/2011	18:45:23	Dione/Rhea	15"	13,7	-7,8	27/09/2011	10:55:28	Dione/Rhea	-17"	40,8	46,4	04/11/2011	03:41:53	Tethys/Titan	-30"	-5,6	-23,8
21/08/2011	04:59:23	Tethys/Dione	-13"	-36,2	5,4	27/09/2011	23:19:00	Tethys/Rhea	-19"	-52,1	-49,6	04/11/2011	03:55:40	Tethys/Dione	14"	-2,4	-21,2
22/08/2011	08:26:39	Tethys/Dione	13"	1,7	42,6	28/09/2011	06:08:30	Tethys/Dione	-14"	-0,5	10,9	04/11/2011	03:57:40	Dione/Titan	-44"	-2,0	-20,9
22/08/2011	13:40:34	Dione/Rhea	-19"	44,2	46,2	29/09/2011	10:48:16	Tethys/Dione	7"	40,7	45,5	04/11/2011	06:52:17	Tethys/Titan	-32"	27,1	10,1
22/08/2011	22:43:25	Tethys/Rhea	-14"	-31,0	-35,9	30/09/2011	12:23:57	Tethys/Rhea	13"	42,1	41,5	04/11/2011	14:45:26	Rhea/Titan	-42"	6,6	12,1
22/08/2011	23:06:29	Rhea/Titan	35"	-34,8	-36,3	30/09/2011	15:43:04	Dione/Rhea	12"	18,9	12,6	05/11/2011	13:42:48	Tethys/Rhea	20"	16,8	20,7
23/08/2011	12:22:55	Tethys/Dione	-8"	39,2	56,0	01/10/2011	12:42:55	Tethys/Dione	-10"	41,0	39,4	05/11/2011	13:54:28	Dione/Rhea	24"	14,9	19,2
23/08/2011	16:33:27	Dione/Titan	33"	33,0	15,3	01/10/2011	14:03:28	Rhea/Titan	-23"	33,2	28,9	06/11/2011	04:51:29	Tethys/Dione	-5"	8,5	-11,4
23/08/2011	20:33:01	Tethys/Titan	29"	-8,3	-25,1	01/10/2011	20:07:05	Rhea/Titan	-20"	-29,7	-35,1	07/11/2011	03:31:30	Tethys/Rhea	-15"	-5,6	-26,3
24/08/2011	09:27:53	Dione/Rhea	11"	13,8	51,4	02/10/2011	01:53:58	Tethys/Rhea	-17"	-43,1	-35,6	07/11/2011	08:41:35	Dione/Rhea	-25"	39,6	24,1
24/08/2011	12:19:14	Tethys/Rhea	11"	39,2	56,0	02/10/2011	02:43:15	Tethys/Titan	-35"	-35,7	-27,5	07/11/2011	10:32:40	Tethys/Dione	15"	39,4	31,5
25/08/2011	14:30:00	Tethys/Dione	6"	43,7	37,2	02/10/2011	11:38:25	Dione/Rhea	-22"	42,7	43,7	08/11/2011	14:09:17	Tethys/Dione	-19"	10,4	16,4
26/08/2011	18:49:27	Tethys/Dione	-12"	8,9	-10,2	02/10/2011	14:10:19	Dione/Titan	-41"	31,8	27,5	09/11/2011	06:05:58	Dione/Rhea	11"	22,6	1,6
27/08/2011	01:15:24	Tethys/Rhea	-17"	-50,9	-30,8	02/10/2011	16:28:35	Tethys/Dione	16"	9,7	3,8	09/11/2011	16:14:06	Tethys/Rhea	23"	-13,3	-3,5
27/08/2011	14:20:07	Dione/Rhea	-15"	43,8	38,3	02/10/2011	22:53:14	Tethys/Titan	-25"	-51,9	-51,7	09/11/2011	17:38:28	Tethys/Dione	17"	-28,7	-19,1
29/08/2011	01:54:16	Tethys/Dione	-11"	-51,7	-26,7	03/10/2011	06:03:11	Tethys/Titan	-30"	1,3	8,9	10/11/2011	22:00:52	Tethys/Dione	-9"	-54,1	-62,6
29/08/2011	09:20:10	Dione/Rhea	20"	15,5	49,1	03/10/2011	17:23:06	Rhea/Titan	-33"	-0,3	-6,9	11/11/2011	08:48:06	Dione/Titan	46"	40,4	23,7
29/08/2011	15:18:19	Tethys/Rhea	16"	39,2	27,4	03/10/2011	19:57:56	Tethys/Dione	-16"	-29,4	-34,4	11/11/2011	11:06:43	Tethys/Titan	44"	35,4	30,6
30/08/2011	08:02:30	Tethys/Dione	4"	2,3	36,9	04/10/2011	06:33:16	Dione/Rhea	19"	7,2	14,0	11/11/2011	20:18:52	Rhea/Titan	50"	-52,5	-48,6
30/08/2011	10:16:26	Rhea/Titan	-28"	25,4	54,8	04/10/2011	23:46:48	Tethys/Dione	11"	-53,3	-51,1	12/11/2011	06:18:54	Tethys/Rhea	-23"	26,1	3,0
31/08/2011	00:35:04	Dione/Titan	-33"	-49,5	-35,8	07/10/2011	01:47:21	Tethys/Dione	-7"	-41,8	-37,9	12/11/2011	09:32:35	Dione/Rhea	-23"	40,8	27,3
31/08/2011	00:43:32	Tethys/Titan	-30"	-50,1	-35,1	07/10/2011	05:32:42	Tethys/Rhea	-16"	-1,5	2,7	13/11/2011	00:05:27	Tethys/Dione	11"	-39,0	-61,7
31/08/2011	04:49:31	Dione/Rhea	-12"	-32,4	1,9	07/10/2011	11:02:15	Dione/Rhea	-12"	42,3	42,6	14/11/2011	04:01:01	Tethys/Dione	-18"	4,3	-22,2
31/08/2011	07:41:42	Tethys/Rhea	-8"	-0,6	33,2	08/10/2011	06:18:03	Tethys/Dione	14"	6,8	10,5	14/11/2011	04:21:29	Dione/Rhea	26"	7,9	-18,4
31/08/2011	13:14:31	Tethys/Rhea	-6"	44,0	47,2	08/10/2011	18:48:36	Tethys/Rhea	15"	-20,3	-24,1	14/11/2011	18:38:19	Tethys/Rhea	13"	-41,7	-30,9
31/08/2011	18:31:10	Tethys/Titan	-22"	8,9	-8,6	09/10/2011	07:18:25	Dione/Rhea	23"	17,9	20,5	15/11/2011	07:28:00	Tethys/Dione	19"	35,8	12,9
31/08/2011	23:28:37	Rhea/Titan	-16"	-43,0	-39,4	09/10/2011	09:50:34	Tethys/Dione	-17"	38,5	39,3	16/11/2011	01:00:48	Dione/Rhea	-12"	-27,8	-54,8
01/09/2011	03:18:56	Tethys/Rhea	-9"	-45,0	-14,6	09/10/2011	19:52:20	Dione/Titan	36"	-32,2	-35,5	16/11/2011	08:47:41	Tethys/Rhea	-22"	40,6	22,4
01/09/2011	04:41:02	Tethys/Titan	-28"	-33,2	0,4	10/10/2011	08:59:56	Tethys/Titan	38"	33,5	34,4	16/11/2011	11:12:48	Tethys/Dione	-14"	32,7	29,2
01/09/2011	08:33:19	Tethys/Dione	-10"	9,0	41,5	10/10/2011	13:23:23	Tethys/Dione	14"	33,9	31,3	18/11/2011	12:48:05	Tethys/Dione	7"	18,0	23,7
01/09/2011	17:06:38	Rhea/Titan	-23"	22,9	6,6	11/10/2011	00:29:54	Rhea/Titan	42"	-49,7	-49,5	18/11/2011	21:15:22	Dione/Titan	-35"	-55,1	-58,7
02/09/2011	12:10:10	Tethys/Dione	14"	40,9	53,6	11/10/2011	02:08:21	Dione/Rhea	-20"	-36,6	-35,4	18/11/2011	22:46:52	Tethys/Rhea	24"	-47,5	-67,2
02/09/2011	17:46:56	Tethys/Rhea	16"	15,4	-0,5	11/10/2011	08:15:15	Tethys/Rhea	-21"	27,9	28,5	19/11/2011	04:49:33	Rhea/Titan	-52"	15,7	-14,3
03/09/2011	09:51:45	Dione/Rhea	15"	23,6	51,4	11/10/2011	18:37:40	Tethys/Dione	-6"	-20,3	-23,1	19/11/2011	05:08:03	Dione/Rhea	23"	18,7	-11,0
03/09/2011	15:40:03	Tethys/Dione	-13"	34,5	22,0	13/10/2011	19:59:26	Tethys/Dione	12"	-35,8	-38,0	19/11/2011	06:33:35	Dione/Titan	-28"	31,1	3,9
04/09/2011	19:45:23	Tethys/Dione	8"	-7,7	-22,2	13/10/2011	22:15:10	Tethys/Rhea	19"	-52,4	-54,6	19/11/2011	17:48:51	Tethys/Dione	-16"	-36,8	-22,3
05/09/2011	04:58:33	Dione/Rhea	-20"	-28,0	2,6	14/10/2011	06:09:50	Dione/Rhea	11"	8,9	7,8	19/11/2011	20:49:49	Tethys/Titan	-46"	-55,4	-54,9
05/09/2011	07:48:57	Tethys/Rhea	-17"	3,4	33,4	14/10/2011	23:43:35	Tethys/Dione	-17"	-52,5	-54,8	20/11/2011	09:58:01	Dione/Titan	-42"	38,3	26,9
06/09/2011	21:59:24	Tethys/Dione	-8"	-33,0	-39,1	15/10/2011	12:29:34	Tethys/Rhea	-12"	37,6	35,3	20/11/2011	21:19:45	Tethys/Dione	20"	-54,7	-59,6
07/09/2011	00:19:27	Dione/Rhea	14"	-50,4	-39,2	16/10/2011	02:58:19	Dione/Rhea	-23"	-25,2	-27,9	20/11/2011	23:58:54	Dione/Rhea	-27"	-35,7	-64,3
07/09/2011	21:08:16	Tethys/Rhea	13"	-24,9	-34,6	16/10/2011	03:11:02	Tethys/Dione	16"	-23,0	-25,6	21/11/2011	12:15:45	Tethys/Rhea	-18"	21,4	25,6
08/09/2011	02:01:08	Tethys/Dione	13"	-50,3	-28,3	17/10/2011	07:08:33	Tethys/Dione	-10"	20,6	17,0	22/11/2011	00:52:11	Tethys/Dione	-17"	-25,7	-57,4
08/09/2011	06:54:39	Tethys/Titan	33"	-5,0	23,2	17/10/2011	21:47:42	Dione/Rhea	21"	-51,6	-54,0	22/11/2011	20:12:02	Dione/Rhea	14"	-54,9	-48,9
08/09/2011	22:52:52	Dione/Titan	33"	-42,3	-42,3	18/10/2011	00:44:52	Tethys/Rhea	20"	-45,5	-49,8	23/11/2011	01:30:20	Tethys/Rhea	20"	-18,1	-51,3
09/09/2011	04:26:25	Rhea/Titan	34"	-31,2	-4,2	18/10/2011	09:06:06	Rhea/Titan	-47"	36,9	32,5	23/11/2011	05:35:10	Tethys/Dione	8"	25,0	-7,0
09/09/2011	05:31:14	Tethys/Dione	-15"	-19,8	7,8	18/10/2011	18:38:05	Tethys/Titan	-41"	-25,0	-25,2	25/11/2011	07:26:31	Tethys/Dione	-13"	38,2	10,5
09/09/2011	10:28:26	Tethys/Rhea	-15"	32,1	52,3	18/10/2011	21:11:15	Dione/Titan	-43"	-48,6	-50,3	25/11/2011	15:14:08	Tethys/Rhea	-25"	-13,0	4,2
10/09/2011	05:24:33	Dione/Rhea	-14"	-20,4	6,4	19/10/2011	09:16:41	Tethys/Dione	8"	38,1	33,2	26/11/2011	00:44:06	Dione/Rhea	-23"	-24,7	-59,4
10/09/2011	09:09:50	Tethys/Dione	11"	20,6	44,5	20/10/2011	13:34:26	Tethys/Dione	-16"	27,4	26,5	26/11/2011	11:11:07	Tethys/Dione	20"	28,1	27,1
12/09/2011	00:38:46	Dione/Rhea	21"	-52,2	-39,3	20/10/2011	14:49:48	Tethys/Rhea	-21"	15,4	15,4	26/11/2011	11:47:39	Rhea/Titan	41"	22,8	26,1
12/09/2011	09:56:15	Tethys/Dione	-4"	28,9	49,0	21/10/2011	01:05:05	Dione/Rhea	-9"	-41,4	-47,8	26/11/2011	22:20:14	Tethys/Titan	40"	-47,6	-67,5
13/09/2011	15:47:09	Tethys/Dione	11"	28,3	17,5	21/10/2011	17:02:46	Tethys/Dione	18"	-9,5	-8,4	27/11/2011	12:08:51	Tethys/Titan	29"	18,9	24,9
13/09/2011	19:47:57	Dione/Rhea	-15"	-14,4	-25,7	22/10/2011	20:39:43	Tethys/Dione	-14"	-46,6	-47,1	27/11/2011	14:40:16	Tethys/Dione	-20"	-8,1	9,0
14/09/2011	14:07:25	Tethys/Rhea	-15"	39,8	34,4	22/10/2011	22:37:27	Dione/Rhea	23"	-54,2	-58,9	27/11/2011	15:33:48	Dione/Titan	50"	-18,0	1,1
14/09/2011	19:24:10	Tethys/Dione	-15"	-10,6	-22,2	23/10/2011	03:35:49	Tethys/Rhea	13"	-14,2	-22,5	27/11/2011	19:38:06	Dione/Rhea	28"	-54,2	-43,1
15/09/2011	22:53:19	Tethys/Dione	13"	-45,7	-45,0	24/10/2011	03:00:22	Tethys/Dione	5"	-20,1	-29,2	28/11/2011	01:50:40	Tethys/Titan	39"	-11	

Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
06/12/2011	21:29:01	Tethys/Rhea	8"	-49,8	-62,4	17/12/2011	21:48:47	Tethys/Dione	6"	-41,8	-65,1	27/12/2011	13:01:29	Tethys/Rhea	-25"	-10,3	20,1
07/12/2011	09:21:07	Tethys/Rhea	13"	35,9	21,3	18/12/2011	06:29:00	Dione/Rhea	-31"	38,8	-1,0	27/12/2011	18:47:58	Tethys/Dione	-23"	-56,4	-32,7
07/12/2011	14:39:30	Tethys/Dione	15"	-14,7	8,8	18/12/2011	06:36:57	Tethys/Rhea	-27"	39,1	0,1	28/12/2011	09:29:32	Rhea/Titan	39"	25,5	20,5
08/12/2011	18:22:45	Tethys/Dione	-21"	-51,5	-29,4	18/12/2011	08:33:41	Tethys/Dione	3"	36,2	15,5	28/12/2011	22:26:48	Tethys/Dione	17"	-28,7	-68,9
09/12/2011	00:10:27	Tethys/Rhea	-25"	-22,7	-66,3	18/12/2011	14:05:31	Tethys/Dione	4"	-16,0	13,0	28/12/2011	23:31:04	Tethys/Titan	46"	-17,0	-70,9
09/12/2011	15:49:16	Dione/Rhea	-22"	-28,9	-1,5	19/12/2011	21:54:20	Tethys/Dione	-16"	-39,8	-65,8	29/12/2011	03:31:22	Tethys/Rhea	16"	25,0	-34,0
09/12/2011	21:49:51	Tethys/Dione	20"	-45,8	-65,3	20/12/2011	01:41:49	Dione/Rhea	22"	1,7	-53,4	29/12/2011	17:06:53	Rhea/Titan	24"	-52,0	-14,1
11/12/2011	01:48:06	Tethys/Dione	-13"	-2,9	-51,2	20/12/2011	20:22:48	Tethys/Rhea	22"	-51,9	-50,8	29/12/2011	17:12:19	Tethys/Titan	33"	-52,6	-15,1
11/12/2011	10:52:59	Dione/Rhea	30"	22,6	25,0	21/12/2011	00:20:15	Rhea/Titan	-56"	-13,2	-66,3	29/12/2011	17:18:40	Tethys/Rhea	9"	-53,2	-16,2
11/12/2011	14:11:07	Tethys/Rhea	26"	-12,2	12,2	21/12/2011	01:29:52	Tethys/Dione	22"	0,3	-55,5	29/12/2011	23:09:09	Tethys/Rhea	12"	-20,4	-71,2
13/12/2011	03:56:05	Tethys/Dione	10"	20,2	-27,8	21/12/2011	06:24:29	Dione/Titan	-53"	39,0	-2,1	30/12/2011	02:05:55	Dione/Rhea	19"	12,0	-49,8
13/12/2011	06:13:19	Dione/Rhea	-20"	37,0	-3,4	21/12/2011	22:42:03	Tethys/Titan	-51"	-30,5	-70,5	30/12/2011	02:37:36	Tethys/Titan	42"	17,3	-44,0
13/12/2011	13:00:03	Tethys/Titan	49"	0,2	19,8	22/12/2011	04:59:34	Tethys/Dione	-21"	33,0	-17,4	30/12/2011	03:47:47	Dione/Titan	48"	27,7	-31,0
13/12/2011	15:40:57	Rhea/Titan	58"	-30,0	-0,2	22/12/2011	09:42:56	Tethys/Rhea	-20"	26,8	21,6	30/12/2011	14:33:14	Rhea/Titan	36"	-29,3	10,4
13/12/2011	22:04:01	Dione/Titan	50"	-41,6	-67,1	23/12/2011	06:44:54	Dione/Rhea	-20"	39,6	0,8	30/12/2011	23:26:44	Tethys/Dione	-6"	-16,4	-71,0
14/12/2011	03:26:38	Tethys/Rhea	-18"	16,0	-33,5	23/12/2011	09:07:06	Tethys/Dione	12"	30,9	18,6	31/12/2011	15:27:01	Tethys/Rhea	-27"	-39,2	3,0
14/12/2011	08:11:44	Tethys/Dione	-19"	38,7	13,4	24/12/2011	23:00:20	Tethys/Rhea	28"	-25,3	-71,3	31/12/2011	21:39:43	Dione/Rhea	-32"	-35,1	-62,6
15/12/2011	11:39:29	Tethys/Dione	22"	12,7	24,3	25/12/2011	02:05:08	Dione/Rhea	31"	8,8	-49,6						
15/12/2011	16:47:20	Tethys/Rhea	23"	-42,4	-11,8	25/12/2011	11:19:47	Tethys/Dione	-12"	9,7	24,6						
16/12/2011	11:17:06	Dione/Rhea	21"	15,8	24,7	26/12/2011	15:18:31	Tethys/Dione	21"	-34,6	3,7						
16/12/2011	15:16:23	Tethys/Dione	-17"	-27,6	3,3	26/12/2011	21:07:51	Dione/Rhea	-23"	-43,2	-58,1						

Date = data  
 Time = orario  
 Moons = lune coinvolte  
 Dist = distanza in secondi  
 H = altitudine di Saturno sull'orizzonte  
 H S = altitudine del Sole sull'orizzonte

TEMPI IN T.U.

Date in the format dd/mm/yyyy  
 Dist = distance in seconds  
 H = altitude of Saturn above the horizon  
 H S = altitude of the Sun above the horizon

TIMES IN U.T.

Valori negativi delle distanze indicano che il 2° satellite transita a nord dell'altro  
 Negative values of the distances show that the 2nd satellite transits to north of the other

# OCCULTAZIONI TRA I SATELLITI DI SATURNO

## OCCULTAT. BETWEEN THE SATELLITES OF SATURN

Year M D h m s Event Type Ph Dur dMag %Ill Sep PA MinD h m s h m s h m s h m s h m s h m s h m s

Questo anno non avvengono fenomeni - No phenomena this year

Ore in T.U.

Legenda :

Data nel formato mese/giorno, un asterisco indica che le lune si avvicinano ma non si occultano  
 Event type : tipo di evento, eclissi o occultazione  
 Ph : fenomeno, M=mancato, E=eclisse penombrale, P=eclisse/occultazione parziale, T=eclisse/occultazione totale, A=eclisse/occultazione anulare  
 Durn : durata in secondi  
 dMag : caduta di luce in magnitudini  
 %ill : cambio in illuminazione, rispetto alla illuminazione intera, della luna rimanente (occultazione) o di entrambe (eclissi)  
 Sep : distanza in " tra satellite occultato/eclissato e centro del pianeta  
 Pa : angolo di posizione tra satellite occultato/eclissato e pianeta  
 MinSep : distanza minima tra i centri delle lune o tra la luna e l'ombra  
 T1-T7 : inizio/fine della fase di contatto con la penombra  
 T2-T6 : inizio/fine della fase di contatto con l'ombra o tra i lembi delle lune  
 T3-T5 : inizio/fine della fase di totalità  
 Tmax : tempo di metà evento

Satelliti :

I = Mimas  
 II = Enceladus  
 III = Tethys  
 IV = Dione  
 V = Rhea  
 VI = Titan  
 VII = Hyperion

Times in T.U.

Date in the format month/day, an asterisk shows that the moons are near but they don't occult  
 Event type : eclipse or occultation  
 Ph : phenomenon, M=missed, E=penumbral eclipse, P=partial eclipse/occultation, T=total eclipse/occultation, A=annular eclipse/occultation  
 Durn : duration in seconds  
 dMag : difference magnitude  
 %ill : defect of illumination, respect to integer  
 Sep : distance in " between the satellite and the center of the planet  
 Pa : position angle between the satellite and the center of the planet  
 MinD : least distance between the satellies  
 T1-T7 : penumbral phase begins/ends  
 T2-T6 : umbra phase begins/ends  
 T3-T5 : totalità phase begins/ends  
 Tmax : middle time of the event

Satellites :

I = Mimas  
 II = Enceladus  
 III = Tethys  
 IV = Dione  
 V = Rhea  
 VI = Titan  
 VII = Hyperion

© (8)

# CONGIUNZIONI ED ELONGAZIONI DEI SATELLITI DI SATURNO

## CONJUNCTIONS AND ELONGATIONS OF THE SATELLITES OF SATURN

Tethys Congiunzione superiore - Tethys Superior conjunction

Date	Time	h	h S
02/01/2011	00:53:57	12,1	-62,1
03/01/2011	22:12:41	-16,3	-66,6
05/01/2011	19:31:22	-42,0	-39,5
07/01/2011	16:50:01	-52,1	-9,9
09/01/2011	14:08:37	-36,0	14,9
11/01/2011	11:27:11	-8,8	26,2
13/01/2011	08:45:42	19,2	17,2
15/01/2011	06:04:10	39,9	-6,5
17/01/2011	03:22:36	40,8	-35,7
19/01/2011	00:41:00	21,0	-62,8
20/01/2011	21:59:21	-6,8	-61,8
22/01/2011	19:17:39	-34,3	-34,0
24/01/2011	16:35:55	-51,8	-4,1
26/01/2011	13:54:08	-43,5	20,2
28/01/2011	11:12:19	-18,2	29,7
30/01/2011	08:30:28	10,3	18,0
01/02/2011	05:48:33	34,6	-7,3
03/02/2011	03:06:37	43,4	-36,7
05/02/2011	00:24:38	29,0	-61,2
06/02/2011	21:42:37	2,9	-55,4
08/02/2011	19:00:33	-25,7	-27,4
10/02/2011	16:18:27	-48,2	2,8
12/02/2011	13:36:19	-48,9	26,8
14/02/2011	10:54:09	-27,0	34,5
16/02/2011	08:11:57	1,6	19,7
18/02/2011	05:29:42	27,9	-7,2
20/02/2011	02:47:26	43,4	-36,4
22/02/2011	00:05:08	35,8	-57,2
23/02/2011	21:22:48	11,9	-48,0
25/02/2011	18:40:27	-16,6	-20,0
27/02/2011	15:58:03	-42,2	10,2
01/03/2011	13:15:39	-51,5	34,3
03/03/2011	10:33:12	-34,9	39,8
05/03/2011	07:50:45	-7,6	21,8
07/03/2011	05:08:16	20,5	-6,5
09/03/2011	02:25:45	41,0	-34,9
10/03/2011	23:43:14	41,1	-51,7
12/03/2011	21:00:42	20,6	-40,0
14/03/2011	18:18:09	-7,4	-12,3
16/03/2011	15:35:35	-34,7	18,0
18/03/2011	12:53:01	-51,1	42,2
20/03/2011	10:10:26	-41,6	45,0
22/03/2011	07:27:51	-16,1	23,8
24/03/2011	04:45:15	12,5	-5,3
26/03/2011	02:02:40	36,6	-32,4
27/03/2011	23:20:04	44,4	-45,3
29/03/2011	20:37:28	28,7	-32,0
31/03/2011	17:54:53	2,3	-4,2
02/04/2011	15:12:17	-26,3	26,0

Date	Time	h	h S
04/04/2011	12:29:42	-47,7	50,1
06/04/2011	09:47:08	-46,8	49,5
08/04/2011	07:04:34	-24,4	25,2
10/04/2011	04:22:02	4,1	-4,1
12/04/2011	01:39:30	30,5	-29,4
13/04/2011	22:56:59	45,1	-38,7
15/04/2011	20:14:29	36,0	-24,1
17/04/2011	17:32:00	11,3	3,5
19/04/2011	14:49:33	-17,2	33,6
21/04/2011	12:07:07	-42,0	57,4
23/04/2011	09:24:42	-49,7	52,6
25/04/2011	06:42:19	-32,4	25,8
27/04/2011	03:59:58	-4,9	-2,9
29/04/2011	01:17:38	23,0	-26,5
30/04/2011	22:35:20	43,1	-32,6
02/05/2011	19:53:05	41,8	-17,0
04/05/2011	17:10:51	20,4	10,4
06/05/2011	14:28:39	-7,7	40,5
08/05/2011	11:46:30	-34,6	63,8
10/05/2011	09:04:22	-49,8	54,0
12/05/2011	06:22:17	-39,7	25,6
14/05/2011	03:40:14	-14,2	-2,4
16/05/2011	00:58:14	14,4	-24,0
17/05/2011	22:16:16	38,3	-27,4
19/05/2011	19:34:20	45,5	-10,9
21/05/2011	16:52:27	29,1	16,3
23/05/2011	14:10:36	2,4	46,3
25/05/2011	11:28:48	-25,9	68,5
27/05/2011	08:47:03	-46,9	53,8
29/05/2011	06:05:20	-45,6	24,4
31/05/2011	03:23:39	-23,4	-3,0
02/06/2011	00:42:01	5,0	-22,5
03/06/2011	22:00:26	31,3	-23,7
05/06/2011	19:18:54	46,0	-6,2
07/06/2011	16:37:24	36,8	21,1
09/06/2011	13:55:57	12,1	50,9
11/06/2011	11:14:32	-16,4	71,1
13/06/2011	08:33:10	-41,1	52,1
15/06/2011	05:51:50	-49,2	22,5
17/06/2011	03:10:33	-32,5	-4,6
19/06/2011	00:29:19	-5,4	-22,3
20/06/2011	21:48:07	22,5	-21,7
22/06/2011	19:06:58	43,0	-2,8
24/06/2011	16:25:51	42,7	24,2
26/06/2011	13:44:47	21,7	53,8
28/06/2011	11:03:45	-6,3	71,1
30/06/2011	08:22:46	-33,3	49,6
02/07/2011	05:41:49	-49,6	19,9
04/07/2011	03:00:54	-40,9	-7,0

Date	Time	h	h S
06/07/2011	00:20:02	-16,0	-23,7
07/07/2011	21:39:12	12,4	-21,7
09/07/2011	18:58:24	36,8	-1,5
11/07/2011	16:17:39	45,6	25,5
13/07/2011	13:36:55	30,6	54,6
15/07/2011	10:56:14	4,4	69,0
17/07/2011	08:15:35	-24,0	46,6
19/07/2011	05:34:58	-46,1	16,9
21/07/2011	02:54:23	-47,4	-10,1
23/07/2011	00:13:49	-26,4	-26,6
24/07/2011	21:33:18	1,8	-23,6
26/07/2011	18:52:49	28,3	-2,9
28/07/2011	16:12:21	44,7	24,7
30/07/2011	13:31:55	38,0	53,2
01/08/2011	10:51:31	14,5	65,4
03/08/2011	08:11:09	-13,8	43,4
05/08/2011	05:30:48	-39,6	13,7
07/08/2011	02:50:29	-50,8	-13,8
09/08/2011	00:10:11	-36,4	-30,8
10/08/2011	21:29:55	-9,9	-27,5
12/08/2011	18:49:40	18,2	-6,4
14/08/2011	16:09:26	40,0	22,0
16/08/2011	13:29:14	42,9	49,7
18/08/2011	10:49:03	24,2	60,6
20/08/2011	08:08:53	-2,7	40,0
22/08/2011	05:28:45	-30,9	10,5
24/08/2011	02:48:38	-50,1	-17,7
26/08/2011	00:08:31	-45,0	-36,0
27/08/2011	21:28:26	-21,2	-32,8
29/08/2011	18:48:21	7,1	-11,0
31/08/2011	16:08:18	32,3	17,7
02/09/2011	13:28:15	44,1	44,6
04/09/2011	10:48:14	32,6	54,9
06/09/2011	08:08:13	7,5	36,4
08/09/2011	05:28:12	-21,0	7,4
10/09/2011	02:48:12	-45,2	-21,6
12/09/2011	00:08:13	-51,0	-41,7
13/09/2011	21:28:15	-32,2	-39,1
15/09/2011	18:48:16	-4,5	-16,5
17/09/2011	16:08:19	22,6	12,3
19/09/2011	13:28:21	41,3	38,4
21/09/2011	10:48:24	38,8	48,6
23/09/2011	08:08:28	17,5	32,3
25/09/2011	05:28:31	-10,5	4,3
27/09/2011	02:48:35	-37,5	-25,4
29/09/2011	00:08:39	-53,0	-47,5
30/09/2011	21:28:43	-42,1	-45,7
02/10/2011	18:48:47	-16,3	-22,2
04/10/2011	16:08:51	11,9	6,7

Date	Time	h	h S
06/10/2011	13:28:55	35,1	32,0
08/10/2011	10:48:58	41,9	42,1
10/10/2011	08:09:02	26,5	27,9
12/10/2011	05:29:05	0,6	1,1
14/10/2011	02:49:08	-28,0	-29,1
16/10/2011	00:09:11	-50,3	-53,2
17/10/2011	21:29:13	-50,0	-52,1
19/10/2011	18:49:15	-27,6	-27,5
21/10/2011	16:09:16	0,9	1,8
23/10/2011	13:29:17	26,5	26,1
25/10/2011	10:49:17	41,3	35,9
27/10/2011	08:09:17	33,8	23,3
29/10/2011	05:29:15	10,5	-2,2
31/10/2011	02:49:13	-17,8	-32,7
02/11/2011	00:09:11	-43,9	-58,3
03/11/2011	21:29:07	-54,5	-57,3
05/11/2011	18:49:02	-38,2	-31,4
07/11/2011	16:08:57	-11,0	-1,8
09/11/2011	13:28:50	16,7	21,4
11/11/2011	10:48:42	37,1	30,6
13/11/2011	08:08:33	38,6	18,7
15/11/2011	05:28:23	19,8	-6,6
17/11/2011	02:48:12	-7,5	-36,2
19/11/2011	00:08:00	-35,3	-62,8
20/11/2011	21:27:46	-54,4	-60,8
22/11/2011	18:47:31	-47,2	-33,5
24/11/2011	16:07:14	-22,1	-4,5
26/11/2011	13:26:56	6,3	18,5
28/11/2011	10:46:36	30,3	26,7
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02/12/2011	05:25:51	27,9	-10,2
04/12/2011	02:45:27	3,0	-39,7
06/12/2011	00:05:00	-25,6	-66,5
07/12/2011	21:24:32	-49,9	-61,7
09/12/2011	18:44:02	-53,8	-33,3
11/12/2011	16:03:30	-32,7	-4,5
13/12/2011	13:22:56	-4,5	17,6
15/12/2011	10:42:20	22,0	24,5
17/12/2011	08:01:42	38,6	11,9
19/12/2011	05:21:01	34,1	-13,3
21/12/2011	02:40:19	12,4	-42,8
22/12/2011	23:59:35	-15,7	-68,8
24/12/2011	21:18:48	-42,6	-60,1
26/12/2011	18:38:00	-56,5	-30,9
28/12/2011	15:57:08	-42,2	-1,7
30/12/2011	13:16:15	-15,2	19,1

Tethys Congiunzione inferiore - Tethys Inferior conjunction

Date	Time	h	h S
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02/01/2011	23:33:17	-1,3	-70,5
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08/01/2011	15:29:17	-46,6	3,8
10/01/2011	12:47:52	-22,9	22,9
12/01/2011	10:06:25	5,7	24,1
14/01/2011	07:24:55	31,1	6,6
16/01/2011	04:43:22	43,6	-20,8
18/01/2011	02:01:47	32,6	-50,3
19/01/2011	23:20:09	7,6	-68,2
21/01/2011	20:38:28	-21,0	-48,9
23/01/2011	17:56:45	-45,4	-18,9
25/01/2011	15:15:00	-51,1	9,2
27/01/2011	12:33:12	-31,8	27,5
29/01/2011	09:51:22	-3,7	26,3

Date	Time	h	h S
31/01/2011	07:09:29	23,5	6,5
02/02/2011	04:27:33	41,9	-21,9
04/02/2011	01:45:36	38,6	-50,6
05/02/2011	23:03:36	16,6	-63,4
07/02/2011	20:21:33	-11,7	-42,3
09/02/2011	17:39:28	-38,4	-12,2
11/02/2011	14:57:21	-52,3	16,0
13/02/2011	12:15:12	-39,6	33,5
15/02/2011	09:33:01	-13,1	29,4
17/02/2011	06:50:48	15,3	7,2
19/02/2011	04:08:33	38,0	-22,0
21/02/2011	01:26:15	42,6	-49,1
22/02/2011	22:43:57	24,9	-56,8
24/02/2011	20:01:36	-1,6	-34,9
26/02/2011	17:19:13	-30,3	-4,7
28/02/2011	14:36:49	-50,2	23,6

Date	Time	h	h S
02/03/2011	11:54:24	-45,7	40,3
04/03/2011	09:11:57	-21,7	33,0
06/03/2011	06:29:28	7,0	8,3
08/03/2011	03:46:59	32,4	-21,1
10/03/2011	01:04:28	44,3	-46,0
11/03/2011	22:21:56	32,5	-49,3
13/03/2011	19:39:24	7,0	-27,0
15/03/2011	16:56:50	-21,5	3,3
17/03/2011	14:14:16	-45,3	31,6
19/03/2011	11:31:42	-49,6	47,3
21/03/2011	08:49:07	-29,8	36,2
23/03/2011	06:06:31	-1,0	9,5
25/03/2011	03:23:56	25,6	-19,7
27/03/2011	00:41:20	43,5	-41,8
28/03/2011	21:58:44	38,8	-41,5
30/03/2011	19:16:08	16,0	-19,9

Date	Time	h	h S
01/05/2011	21:14:10	45,8	-27,0
03/05/2011	18:31:56	32,6	-4,0
05/05/2011	15:49:43	6,7	25,4
07/05/2011	13:07:32	-21,7	54,2
09/05/2011	10:25:24	-44,8	63,7
11/05/2011	07:43:17	-47,9	40,4
13/05/2011	05:01:13	-27,8	10,9
15/05/2011	02:19:12	0,6	-15,0
16/05/2011	23:37:13	27,5	-28,5
18/05/2011	20:55:16	45,0	-21,2
20/05/2011	18:13:21	39,5	2,2
22/05/2011	15:31:29	16,2	31,4
24/05/2011	12:49:40	-12,2	60,0
26/05/2011	10:07:53	-38,1	65,5
28/05/2011	07:26:09	-49,8	39,3
30/05/2011	04:44:27	-36,0	10,0
01/06/2011	02:02:48	-9,6	-14,6
02/06/2011	23:21:12	18,7	-25,7
04/06/2011	20:39:38	41,1	-16,8
06/06/2011	17:58:06	44,4	6,9
08/06/2011	15:16:38	25,4	36,0
10/06/2011	12:35:12	-1,4	64,2
12/06/2011	09:53:49	-29,8	65,1
14/06/2011	07:12:28	-48,4	37,3
16/06/2011	04:31:10	-43,2	8,3
18/06/2011	01:49:54	-19,5	-15,3
19/06/2011	23:08:41	9,0	-24,6
21/06/2011	20:27:30	34,4	-14,2
23/06/2011	17:46:22	46,2	9,9
25/06/2011	15:05:17	33,8	39,1
27/06/2011	12:24:14	8,1	66,4
29/06/2011	09:43:13	-20,3	63,2
01/07/2011	07:02:15	-43,8	34,7

Date	Time	h	h S
03/07/2011	04:21:19	-48,4	5,8
05/07/2011	01:40:26	-29,4	-17,2
06/07/2011	22:59:35	-1,0	-25,3
08/07/2011	20:18:46	25,6	-13,6
10/07/2011	17:37:59	44,2	11,1
12/07/2011	14:57:15	40,5	40,3
14/07/2011	12:16:32	18,1	66,3
16/07/2011	09:35:52	-10,1	60,3
18/07/2011	06:55:14	-36,5	31,7
20/07/2011	04:14:38	-50,3	2,9
22/07/2011	01:34:04	-38,6	-20,2
23/07/2011	22:53:32	-12,8	-27,8
25/07/2011	20:13:01	15,5	-15,0
27/07/2011	17:32:33	38,7	10,3
29/07/2011	14:52:06	44,5	39,4
31/07/2011	12:11:41	27,4	63,7
02/08/2011	09:31:18	0,9	56,8
04/08/2011	06:50:56	-27,5	28,6
06/08/2011	04:10:36	-48,2	-0,1
08/08/2011	01:30:18	-46,3	-24,2
09/08/2011	22:50:01	-23,7	-31,9
11/08/2011	20:09:45	4,6	-18,4
13/08/2011	17:29:31	30,5	7,5
15/08/2011	14:49:18	44,6	36,5
17/08/2011	12:09:07	35,4	59,2
19/08/2011	09:28:56	11,0	52,7
21/08/2011	06:48:47	-17,4	25,5
23/08/2011	04:08:39	-42,5	-4,1
25/08/2011	01:28:32	-51,1	-28,8
26/08/2011	22:48:26	-34,3	-37,4
28/08/2011	20:08:22	-7,2	-23,3
30/08/2011	17:28:18	20,5	3,3
01/09/2011	14:48:15	40,8	31,9

Date	Time	h	h S
03/09/2011	12:08:12	41,0	53,4
05/09/2011	09:28:11	20,9	48,2
07/09/2011	06:48:10	-6,9	22,3
09/09/2011	04:08:10	-34,2	-7,7
11/09/2011	01:28:11	-51,7	-33,6
12/09/2011	22:48:12	-43,7	-43,8
14/09/2011	20:08:14	-18,7	-29,2
16/09/2011	17:28:16	9,6	-1,5
18/09/2011	14:48:18	33,8	26,3
20/09/2011	12:08:21	43,2	46,8
22/09/2011	09:28:24	29,6	43,1
24/09/2011	06:48:28	4,0	18,9
26/09/2011	04:08:31	-24,5	-11,0
28/09/2011	01:28:35	-47,8	-38,3
29/09/2011	22:48:39	-50,7	-50,5
01/10/2011	20:08:43	-30,0	-35,4
03/10/2011	17:28:47	-1,3	-7,9
05/10/2011	14:48:51	24,6	20,3
07/10/2011	12:08:55	41,4	40,0
09/10/2011	09:28:58	36,4	37,6
11/10/2011	06:49:02	14,0	15,2
13/10/2011	04:09:05	-14,1	-14,3
15/10/2011	01:29:08	-40,7	-42,7
16/10/2011	22:49:10	-54,0	-57,0
18/10/2011	20:09:12	-40,3	-41,1
20/10/2011	17:29:14	-13,7	-13,0
22/10/2011	14:49:15	14,3	14,9
24/10/2011	12:09:15	36,2	33,7
26/10/2011	09:29:15	40,4	32,1
28/10/2011	06:49:14	23,3	11,2
30/10/2011	04:09:13	-3,2	-17,7
01/11/2011	01:29:10	-31,6	-46,9
02/11/2011	22:49:07	-52,5	-62,8

Date	Time	h	h S
04/11/2011	20:09:03	-48,9	-45,5
06/11/2011	17:28:58	-25,0	-16,8
08/11/2011	14:48:52	3,5	10,7
10/11/2011	12:08:44	28,4	28,6
12/11/2011	09:28:36	40,9	27,1
14/11/2011	06:48:27	31,0	7,2
16/11/2011	04:08:16	6,8	-21,2
18/11/2011	01:28:04	-21,7	-50,7
19/11/2011	22:47:51	-47,0	-67,5
21/11/2011	20:07:36	-54,5	-48,0
23/11/2011	17:27:20	-35,6	-18,8
25/11/2011	14:47:03	-8,0	8,2
27/11/2011	12:06:44	19,3	25,0
29/11/2011	09:26:23	37,9	23,0
01/12/2011	06:46:01	36,5	3,5
03/12/2011	04:05:37	16,2	-24,7
05/12/2011	01:25:12	-11,5	-54,3
06/12/2011	22:44:44	-38,9	-70,2
08/12/2011	20:04:15	-55,8	-48,1
10/12/2011	17:23:44	-45,0	-18,5
12/12/2011	14:43:11	-18,8	7,9
14/12/2011	12:02:36	9,4	23,6
16/12/2011	09:21:59	32,3	20,3
18/12/2011	06:41:20	39,3	0,7
20/12/2011	04:00:39	24,6	-27,9
22/12/2011	01:19:55	-0,7	-57,3
23/12/2011	22:39:10	-29,7	-70,3
25/12/2011	19:58:22	-52,6	-45,9
27/12/2011	17:17:32	-52,3	-16,2
29/12/2011	14:36:40	-29,2	9,8
31/12/2011	11:55:45	-0,3	24,3

Tethys Massima elongazione est - Tethys Maxima est elongation

Date	Time	h	h S
02/01/2011	11:47:18	-6,1	24,7
04/01/2011	09:06:25	21,5	18,6
06/01/2011	06:25:29	41,0	-2,8
08/01/2011	03:44:29	39,8	-31,9
10/01/2011	01:03:27	19,0	-60,5
11/01/2011	22:22:21	-9,0	-66,4
13/01/2011	19:41:12	-36,1	-40,0
15/01/2011	17:00:00	-52,2	-10,2
17/01/2011	14:18:44	-42,1	15,2
19/01/2011	11:37:26	-16,4	27,6
21/01/2011	08:56:04	12,0	19,4
23/01/2011	06:14:39	35,7	-3,8
25/01/2011	03:33:11	43,1	-33,1
27/01/2011	00:51:40	27,6	-60,2
28/01/2011	22:10:06	1,5	-61,3
30/01/2011	19:28:29	-27,1	-34,4
01/02/2011	16:46:49	-49,0	-4,3
03/02/2011	14:05:06	-48,3	21,0
05/02/2011	11:23:21	-25,9	32,1
07/02/2011	08:41:32	2,7	21,3
09/02/2011	05:59:40	28,8	-3,5
11/02/2011	03:17:46	43,5	-33,2
13/02/2011	00:35:49	34,9	-57,8
14/02/2011	21:53:50	10,8	-54,7
16/02/2011	19:11:48	-17,7	-27,8
18/02/2011	16:29:44	-43,0	2,7
20/02/2011	13:47:37	-51,6	27,9
22/02/2011	11:05:28	-34,3	37,6
24/02/2011	08:23:17	-6,8	23,8
26/02/2011	05:41:04	21,1	-2,4
28/02/2011	02:58:49	41,2	-32,2
02/03/2011	00:16:32	40,5	-53,5
03/03/2011	21:34:14	19,7	-47,2
05/03/2011	18:51:53	-8,3	-20,4
07/03/2011	16:09:31	-35,4	10,0
09/03/2011	13:27:08	-51,4	35,6
11/03/2011	10:44:43	-41,4	43,5
13/03/2011	08:02:18	-15,7	26,4
15/03/2011	05:19:51	12,9	-1,0
17/03/2011	02:37:23	36,7	-30,2
18/03/2011	23:54:55	44,0	-48,1
20/03/2011	21:12:26	28,0	-39,2
22/03/2011	18:29:57	1,6	-12,7
24/03/2011	15:47:27	-26,9	17,7
26/03/2011	13:04:58	-48,2	43,5

Date	Time	h	h S
28/03/2011	10:22:28	-46,8	49,1
30/03/2011	07:39:58	-24,2	28,5
01/04/2011	04:57:29	4,4	0,1
03/04/2011	02:15:00	30,6	-27,7
04/04/2011	23:32:31	44,9	-42,0
06/04/2011	20:50:03	35,4	-31,4
08/04/2011	18:07:37	10,7	-4,9
10/04/2011	15:25:11	-17,8	25,4
12/04/2011	12:42:47	-42,5	51,3
14/04/2011	10:00:23	-49,9	53,7
16/04/2011	07:18:02	-32,2	30,0
18/04/2011	04:35:42	-4,7	1,0
20/04/2011	01:53:23	23,1	-25,0
21/04/2011	23:11:07	43,0	-36,0
23/04/2011	20:28:53	41,5	-24,0
25/04/2011	17:46:40	20,0	2,5
27/04/2011	15:04:30	-8,2	32,4
29/04/2011	12:22:23	-35,0	58,3
01/05/2011	09:40:18	-50,1	56,9
03/05/2011	06:58:15	-39,6	30,6
05/05/2011	04:16:16	-14,1	1,7
07/05/2011	01:34:19	14,4	-22,4
08/05/2011	22:52:25	38,3	-30,7
10/05/2011	20:10:34	45,3	-17,6
12/05/2011	17:28:46	28,9	8,5
14/05/2011	14:47:01	2,3	38,4
16/05/2011	12:05:20	-26,0	64,1
18/05/2011	09:23:41	-46,9	58,4
20/05/2011	06:42:06	-45,7	30,4
22/05/2011	04:00:34	-23,6	1,9
24/05/2011	01:19:06	4,8	-20,5
25/05/2011	22:37:41	31,1	-26,6
27/05/2011	19:56:19	46,0	-12,6
29/05/2011	17:15:01	37,0	13,4
31/05/2011	14:33:46	12,4	43,1
02/06/2011	11:52:34	-16,0	68,3
04/06/2011	09:11:26	-40,8	58,4
06/06/2011	06:30:22	-49,3	29,5
08/06/2011	03:49:20	-33,0	1,5
10/06/2011	01:08:22	-6,1	-19,7
11/06/2011	22:27:27	21,8	-24,1
13/06/2011	19:46:35	42,7	-9,4
15/06/2011	17:05:47	43,1	16,6
17/06/2011	14:25:01	22,7	46,2
19/06/2011	11:44:19	-5,1	70,3

Date	Time	h	h S
21/06/2011	09:03:39	-32,2	57,3
23/06/2011	06:23:02	-49,2	27,9
25/06/2011	03:42:29	-41,6	0,4
27/06/2011	01:01:57	-17,2	-20,2
28/06/2011	22:21:29	11,1	-23,6
30/06/2011	19:41:03	35,9	-8,2
02/07/2011	17:00:40	45,9	18,0
04/07/2011	14:20:19	32,2	47,4
06/07/2011	11:40:00	6,3	70,1
08/07/2011	08:59:44	-22,0	55,4
10/07/2011	06:19:30	-44,9	26,0
12/07/2011	03:39:18	-48,0	-1,3
14/07/2011	00:59:08	-28,3	-22,1
15/07/2011	22:19:00	0,0	-25,1
17/07/2011	19:38:53	26,5	-9,2
19/07/2011	16:58:49	44,3	17,3
21/07/2011	14:18:46	39,8	46,5
23/07/2011	11:38:45	17,2	67,7
25/07/2011	08:58:45	-11,0	53,0
27/07/2011	06:18:47	-37,2	23,8
29/07/2011	03:38:51	-50,6	-4,5
31/07/2011	00:58:55	-38,5	-25,3
01/08/2011	22:19:01	-12,7	-28,6
03/08/2011	19:39:09	15,4	-12,1
05/08/2011	16:59:17	38,4	14,7
07/08/2011	14:19:26	44,2	43,6
09/08/2011	11:39:37	27,3	63,5
11/08/2011	08:59:48	0,9	50,2
13/08/2011	06:20:00	-27,4	21,5
15/08/2011	03:40:14	-48,4	-7,6
17/08/2011	01:00:27	-46,8	-29,5
18/08/2011	22:20:42	-24,5	-33,6
20/08/2011	19:40:57	3,7	-16,8
22/08/2011	17:01:13	29,6	10,4
24/08/2011	14:21:30	44,2	38,9
26/08/2011	11:41:47	35,7	57,9
28/08/2011	09:02:05	11,7	46,8
30/08/2011	06:22:23	-16,7	19,0
01/09/2011	03:42:41	-42,0	-10,6
03/09/2011	01:03:00	-51,7	-34,2
04/09/2011	22:23:19	-35,7	-39,8
06/09/2011	19:43:38	-8,8	-22,6
08/09/2011	17:03:57	19,0	5,0
10/09/2011	14:24:17	39,8	33,1
12/09/2011	11:44:36	41,2	51,4

Date	Time	h	h S
08/12/2011	09:08:58	36,6	20,1
10/12/2011	06:28:33	37,4	-0,2
12/12/2011	03:48:06	18,4	-29,3
14/12/2011	01:07:37	-8,9	-58,6

Date	Time	h	h S
15/12/2011	22:27:06	-36,7	-69,5
17/12/2011	19:46:33	-55,5	-44,5
19/12/2011	17:05:58	-47,3	-14,9
21/12/2011	14:25:21	-21,7	10,6

Date	Time	h	h S
23/12/2011	11:44:41	6,7	24,1
25/12/2011	09:04:00	30,4	18,3
27/12/2011	06:23:16	39,4	-3,0
29/12/2011	03:42:29	26,5	-32,0

Date	Time	h	h S
31/12/2011	01:01:40	1,5	-60,8

Tethys Massima elongazione ovest - Tethys Maxima west elongation

Date	Time	h	h S
01/01/2011	13:07:43	-20,3	20,1
03/01/2011	10:26:52	8,2	24,2
05/01/2011	07:45:57	33,0	9,1
07/01/2011	05:04:59	43,6	-17,2
09/01/2011	02:23:58	30,9	-46,7
10/01/2011	23:42:54	5,5	-69,3
12/01/2011	21:01:47	-23,0	-54,6
14/01/2011	18:20:36	-46,7	-24,9
16/01/2011	15:39:22	-50,4	3,7
18/01/2011	12:58:05	-30,1	23,7
20/01/2011	10:16:45	-1,4	26,0
22/01/2011	07:35:22	24,9	9,0
24/01/2011	04:53:56	42,4	-18,3
26/01/2011	02:12:26	37,6	-47,6
27/01/2011	23:30:54	15,1	-66,3
29/01/2011	20:49:18	-13,2	-49,0
31/01/2011	18:07:40	-39,6	-19,3
02/02/2011	15:25:58	-52,4	9,4
04/02/2011	12:44:14	-38,6	29,1
06/02/2011	10:02:27	-11,9	29,2
08/02/2011	07:20:37	16,3	9,9
10/02/2011	04:38:44	38,5	-18,4
12/02/2011	01:56:48	42,1	-47,0
13/02/2011	23:14:50	23,9	-61,1
15/02/2011	20:32:49	-3,1	-42,3
17/02/2011	17:50:46	-31,3	-12,6
19/02/2011	15:08:41	-50,7	16,3
21/02/2011	12:26:33	-45,3	35,6
23/02/2011	09:44:23	-21,0	33,2
25/02/2011	07:02:11	7,6	11,3
27/02/2011	04:19:57	32,8	-17,8
01/03/2011	01:37:41	44,1	-44,9
02/03/2011	22:55:23	31,7	-54,5
04/03/2011	20:13:04	6,2	-34,9
06/03/2011	17:30:42	-22,4	-5,1
08/03/2011	14:48:20	-46,0	24,0
10/03/2011	12:05:56	-49,7	42,8
12/03/2011	09:23:31	-29,4	37,3
14/03/2011	06:41:04	-0,6	12,9
16/03/2011	03:58:37	25,9	-16,5
18/03/2011	01:16:09	43,4	-41,6
19/03/2011	22:33:41	38,3	-47,1
21/03/2011	19:51:12	15,3	-27,0
23/03/2011	17:08:42	-13,1	2,8
25/03/2011	14:26:12	-39,2	31,9
27/03/2011	11:43:43	-51,2	50,1
29/03/2011	09:01:13	-36,9	40,9
31/03/2011	06:18:43	-10,2	14,3
02/04/2011	03:36:14	18,1	-14,9

Date	Time	h	h S
04/04/2011	00:53:45	40,2	-37,5
05/04/2011	22:11:17	43,1	-39,7
07/04/2011	19:28:50	24,1	-19,2
09/04/2011	16:46:24	-3,2	10,2
11/04/2011	14:03:59	-31,2	39,6
13/04/2011	11:21:35	-49,6	57,0
15/04/2011	08:39:12	-43,3	43,5
17/04/2011	05:56:52	-19,0	15,3
19/04/2011	03:14:32	9,6	-13,2
21/04/2011	00:32:15	34,8	-33,2
22/04/2011	21:50:00	45,6	-32,6
24/04/2011	19:07:46	32,2	-11,9
26/04/2011	16:25:35	6,3	17,2
28/04/2011	13:43:26	-22,2	46,7
30/04/2011	11:01:20	-45,1	62,7
02/05/2011	08:19:16	-47,9	44,9
04/05/2011	05:37:15	-27,7	15,8
06/05/2011	02:55:17	0,7	-11,8
08/05/2011	00:13:21	27,5	-29,2
09/05/2011	21:31:29	44,9	-26,5
11/05/2011	18:49:39	39,3	-5,5
13/05/2011	16:07:53	16,0	23,3
15/05/2011	13:26:10	-12,3	52,8
17/05/2011	10:44:30	-38,2	66,7
19/05/2011	08:02:53	-49,9	45,1
21/05/2011	05:21:20	-36,1	15,7
23/05/2011	02:39:50	-9,7	-10,8
24/05/2011	23:58:23	18,5	-26,2
26/05/2011	21:17:00	40,9	-21,8
28/05/2011	18:35:40	44,4	0,0
30/05/2011	15:54:23	25,7	28,1
01/06/2011	13:13:10	-1,0	57,4
03/06/2011	10:32:00	-29,4	68,7
05/06/2011	07:50:54	-48,3	44,3
07/06/2011	05:09:51	-43,5	14,9
09/06/2011	02:28:51	-20,1	-10,7
10/06/2011	23:47:54	8,3	-24,5
12/06/2011	21:07:01	33,8	-18,8
14/06/2011	18:26:11	46,2	3,0
16/06/2011	15:45:24	34,6	31,3
18/06/2011	13:04:40	9,2	60,3
20/06/2011	10:23:59	-19,2	68,8
22/06/2011	07:43:20	-43,0	42,8
24/06/2011	05:02:45	-48,7	13,5
26/06/2011	02:22:13	-30,5	-11,7
27/06/2011	23:41:43	-2,6	-24,4
29/06/2011	21:01:16	24,4	-17,8
01/07/2011	18:20:51	43,8	4,3
03/07/2011	15:40:29	41,6	32,6

Date	Time	h	h S
05/07/2011	13:00:09	19,9	61,1
07/07/2011	10:19:52	-8,1	67,2
09/07/2011	07:39:37	-34,8	40,9
11/07/2011	04:59:23	-49,9	11,5
13/07/2011	02:19:12	-40,0	-13,7
14/07/2011	23:39:03	-14,8	-26,2
16/07/2011	20:58:56	13,5	-19,0
18/07/2011	18:18:51	37,4	3,6
20/07/2011	15:38:47	45,2	31,9
22/07/2011	12:58:45	29,8	59,7
24/07/2011	10:18:45	3,5	64,5
26/07/2011	07:38:46	-24,8	38,7
28/07/2011	04:58:49	-46,6	9,2
30/07/2011	02:18:53	-47,5	-16,5
31/07/2011	23:38:58	-26,3	-29,7
02/08/2011	20:59:05	1,8	-22,3
04/08/2011	18:19:13	28,1	1,0
06/08/2011	15:39:22	44,4	29,3
08/08/2011	12:59:31	37,8	56,2
10/08/2011	10:19:42	14,5	60,8
12/08/2011	07:39:54	-13,8	36,3
14/08/2011	05:00:07	-39,6	6,7
16/08/2011	02:20:20	-51,2	-20,0
17/08/2011	23:40:35	-37,1	-34,5
19/08/2011	21:00:50	-10,7	-27,2
21/08/2011	18:21:05	17,2	-3,6
23/08/2011	15:41:22	39,2	24,9
25/08/2011	13:01:38	42,8	50,9
27/08/2011	10:21:56	24,7	56,2
29/08/2011	07:42:14	-1,7	33,7
31/08/2011	05:02:32	-30,2	4,2
02/09/2011	02:22:50	-50,0	-23,7
03/09/2011	23:43:09	-46,1	-40,1
05/09/2011	21:03:28	-22,7	-33,3
07/09/2011	18:23:48	5,6	-9,5
09/09/2011	15:44:07	30,9	19,4
11/09/2011	13:04:27	43,6	44,6
13/09/2011	10:24:46	33,3	50,6
15/09/2011	07:45:06	8,7	30,5
17/09/2011	05:05:26	-19,6	1,7
19/09/2011	02:25:45	-44,4	-27,3
20/09/2011	23:46:05	-51,9	-46,1
22/09/2011	21:06:24	-34,1	-40,1
24/09/2011	18:26:44	-6,8	-15,6
26/09/2011	15:47:03	20,7	13,3
28/09/2011	13:07:21	40,1	37,8
30/09/2011	10:27:40	39,4	44,6
02/10/2011	07:47:58	19,0	26,9
04/10/2011	05:08:16	-8,7	-0,7

Date	Time	h	h S
06/10/2011	02:28:33	-36,0	-30,9
07/10/2011	23:48:50	-53,1	-52,1
09/10/2011	21:09:06	-44,1	-46,8
11/10/2011	18:29:22	-18,7	-21,5
13/10/2011	15:49:37	9,5	7,4
15/10/2011	13:09:51	33,2	31,2
17/10/2011	10:30:05	41,9	38,4
19/10/2011	07:50:18	28,0	22,8
21/10/2011	05:10:30	2,5	-4,5
23/10/2011	02:30:41	-26,0	-34,3
24/10/2011	23:50:52	-49,3	-57,6
26/10/2011	21:11:01	-51,6	-52,8
28/10/2011	18:31:10	-30,2	-26,5
30/10/2011	15:51:18	-1,5	2,6
01/11/2011	13:11:24	24,2	25,5
03/11/2011	10:31:30	40,4	32,7
05/11/2011	07:51:34	35,0	18,5
07/11/2011	05:11:37	12,6	-7,9
09/11/2011	02:31:39	-15,5	-37,7
10/11/2011	23:51:39	-42,1	-62,6
12/11/2011	21:11:39	-55,1	-57,1
14/11/2011	18:31:37	-40,7	-29,7
16/11/2011	15:51:33	-13,8	-0,4
18/11/2011	13:11:28	14,1	21,4
20/11/2011	10:31:22	35,5	28,1
22/11/2011	07:51:14	39,1	14,5
24/11/2011	05:11:04	21,8	-11,4
26/11/2011	02:30:53	-4,9	-41,1
27/11/2011	23:50:40	-33,0	-66,6
29/11/2011	21:10:26	-53,8	-59,2
01/12/2011	18:30:10	-49,3	-30,7
03/12/2011	15:49:51	-25,0	-1,5
05/12/2011	13:09:31	3,5	19,3
07/12/2011	10:29:09	28,2	25,0
09/12/2011	07:48:46	40,0	11,1
11/12/2011	05:08:20	29,6	-14,6
13/12/2011	02:27:52	5,4	-43,2
14/12/2011	23:47:22	-23,1	-69,4
16/12/2011	21:06:50	-48,3	-58,7
18/12/2011	18:26:16	-55,0	-29,5
20/12/2011	15:45:40	-35,4	-0,6
22/12/2011	13:05:01	-7,5	19,5
24/12/2011	10:24:21	19,5	23,7
26/12/2011	07:43:38	37,6	8,9
28/12/2011	05:02:53	35,3	-17,2
30/12/2011	02:22:05	14,7	-46,9
31/12/2011	23:41:15	-13,1	-70,3

Dione Congiunzione superiore - Dione Superior conjunction

Date	Time	h	h S
03/01/2011	05:40:32	43,6	-10,9
05/01/2011	23:22:25	-1,2	-70,5
08/01/2011	17:04:11	-52,4	-12,2
11/01/2011	10:45:48	-0,4	25,7
14/01/2011	04:27:18	43,4	-23,9
16/01/2011	22:08:39	-8,0	-63,9
19/01/2011	15:49:53	-51,7	2,7
22/01/2011	09:30:59	5,1	23,1
25/01/2011	03:11:57	42,2	-37,0
27/01/2011	20:52:48	-14,0	-50,1
30/01/2011	14:33:30	-49,5	16,3
02/02/2011	08:14:05	11,1	16,5
05/02/2011	01:54:32	39,8	-49,0
07/02/2011	19:34:52	-20,2	-33,9
10/02/2011	13:15:04	-45,9	28,4
13/02/2011	06:55:10	17,3	6,9
16/02/2011	00:35:09	36,3	-56,9
18/02/2011	18:15:01	-26,4	-16,8

Date	Time	h	h S
21/02/2011	11:54:47	-41,2	37,0
24/02/2011	05:34:27	23,5	-4,7
26/02/2011	23:14:02	31,9	-56,5
01/03/2011	16:53:31	-32,5	1,0
04/03/2011	10:32:55	-35,5	40,2
07/03/2011	04:12:15	29,4	-16,8
09/03/2011	21:51:30	26,7	-47,3
12/03/2011	15:30:43	-38,1	18,0
15/03/2011	09:09:52	-29,2	36,8
18/03/2011	02:48:58	34,8	-28,0
20/03/2011	20:28:02	20,9	-33,1
23/03/2011	14:07:05	-43,0	34,3
26/03/2011	07:46:06	-22,4	28,3
29/03/2011	01:25:07	39,5	-36,3
31/03/2011	19:04:08	14,6	-16,7
03/04/2011	12:43:09	-46,9	48,4
06/04/2011	06:22:10	-15,4	16,8
09/04/2011	00:01:14	43,0	-39,5

Date	Time	h	h S
19/07/2011	06:12:46	-41,9	23,7
21/07/2011	23:55:51	-22,6	-27,1
24/07/2011	17:39:02	39,3	9,6
27/07/2011	11:22:19	16,8	67,2
30/07/2011	05:05:41	-45,3	10,1
01/08/2011	22:49:09	-18,2	-29,7
04/08/2011	16:32:43	41,5	19,8
07/08/2011	10:16:21	12,0	61,3
10/08/2011	04:00:04	-48,0	-2,8
12/08/2011	21:43:52	-13,8	-29,2
15/08/2011	15:27:44	43,0	29,5
18/08/2011	09:11:41	7,3	50,6
21/08/2011	02:55:41	-50,2	-15,9
23/08/2011	20:39:45	-9,6	-25,9
26/08/2011	14:23:53	43,8	37,9
29/08/2011	08:08:04	2,6	38,1

Date	Time	h	h S
01/09/2011	01:52:19	-51,6	-27,7
03/09/2011	19:36:36	-5,4	-20,5
06/09/2011	13:20:56	43,9	44,2
09/09/2011	07:05:18	-1,7	24,9
12/09/2011	00:49:43	-52,4	-38,3
14/09/2011	18:34:10	-0,6	-13,6
17/09/2011	12:18:38	43,3	47,1
20/09/2011	06:03:08	-7,2	11,5
22/09/2011	23:47:40	-52,4	-46,8
25/09/2011	17:32:12	3,0	-6,0
28/09/2011	11:16:46	42,1	45,9
01/10/2011	05:01:20	-11,8	-1,4
03/10/2011	22:45:55	-51,7	-52,0
06/10/2011	16:30:30	6,8	2,3
09/10/2011	10:15:04	40,4	40,8
12/10/2011	03:59:39	-16,5	-15,8

Date	Time	h	h S
14/10/2011	21:44:13	-50,3	-52,6
17/10/2011	15:28:47	10,6	9,8
20/10/2011	09:13:19	38,1	32,6
23/10/2011	02:57:51	-21,1	-29,4
25/10/2011	20:42:21	-48,3	-48,4
28/10/2011	14:26:49	14,4	16,7
31/10/2011	08:11:16	35,4	22,4
03/11/2011	01:55:40	-25,8	-42,8
05/11/2011	19:40:02	-45,7	-40,7
08/11/2011	13:24:22	18,1	22,2
11/11/2011	07:08:38	32,3	11,0
14/11/2011	00:52:52	-30,4	-55,6
16/11/2011	18:37:02	-42,6	-30,9
19/11/2011	12:21:09	21,7	25,6
22/11/2011	06:05:12	28,7	-0,9
24/11/2011	23:49:11	-35,0	-66,1

Date	Time	h	h S
27/11/2011	17:33:06	-39,0	-20,1
30/11/2011	11:16:56	25,2	26,3
03/12/2011	05:00:41	24,8	-14,8
05/12/2011	22:44:22	-39,6	-70,0
08/12/2011	16:27:57	-35,0	-8,8
11/12/2011	10:11:27	28,5	23,9
14/12/2011	03:54:51	20,6	-28,3
16/12/2011	21:38:09	-44,0	-63,6
19/12/2011	15:21:21	-30,5	2,7
22/12/2011	09:04:27	31,7	18,4
25/12/2011	02:47:27	16,0	-41,9
27/12/2011	20:30:20	-48,1	-51,5
30/12/2011	14:13:05	-25,6	12,9

# Dione Congiunzione inferiore - Dione Inferior conjunction

Date	Time	h	h S
01/01/2011	20:45:33	-33,0	-53,5
04/01/2011	14:27:31	-35,9	11,8
07/01/2011	08:09:20	28,6	12,3
10/01/2011	01:51:02	26,7	-52,6
12/01/2011	19:32:37	-38,0	-38,6
15/01/2011	13:14:03	-30,8	21,8
18/01/2011	06:55:21	33,0	2,5
21/01/2011	00:36:32	21,5	-63,1
23/01/2011	18:17:35	-42,7	-22,7
26/01/2011	11:58:30	-25,2	28,8
29/01/2011	05:39:17	37,0	-9,5
31/01/2011	23:19:57	15,9	-65,2
03/02/2011	17:00:29	-46,8	-6,4
06/02/2011	10:40:54	-19,0	31,4
09/02/2011	04:21:11	40,4	-21,9
11/02/2011	22:01:21	9,9	-56,4
14/02/2011	15:41:24	-49,9	9,8
17/02/2011	09:21:21	-12,4	28,9
20/02/2011	03:01:12	42,9	-34,0
22/02/2011	20:40:56	3,7	-41,9
25/02/2011	14:20:35	-51,6	25,1
28/02/2011	08:00:08	-5,5	21,6
03/03/2011	01:39:36	44,1	-44,0
05/03/2011	19:19:00	-2,7	-25,3
08/03/2011	12:58:19	-51,6	38,3
11/03/2011	06:37:35	1,9	11,3
14/03/2011	00:16:47	43,9	-48,9
16/03/2011	17:55:56	-10,0	-7,7
19/03/2011	11:35:03	-49,9	47,3
22/03/2011	05:14:09	8,8	0,0
24/03/2011	22:53:12	42,1	-46,1
27/03/2011	16:32:15	-16,6	10,2
30/03/2011	10:11:18	-46,5	49,0
02/04/2011	03:50:21	15,7	-12,4

Date	Time	h	h S
04/04/2011	21:29:24	39,0	-36,5
07/04/2011	15:08:28	-23,1	27,7
10/04/2011	08:47:34	-41,8	43,1
13/04/2011	02:26:43	22,3	-22,6
15/04/2011	20:05:54	34,8	-22,9
18/04/2011	13:45:08	-29,3	44,2
21/04/2011	07:24:26	-36,4	32,5
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26/04/2011	18:43:14	29,9	-7,5
29/04/2011	12:22:46	-34,9	58,2
02/05/2011	06:02:22	-30,5	20,0
04/05/2011	23:42:04	34,0	-31,4
07/05/2011	17:21:52	24,4	8,9
10/05/2011	11:01:46	-39,8	65,6
13/05/2011	04:41:46	-24,4	7,5
15/05/2011	22:21:53	38,6	-28,1
18/05/2011	16:02:07	18,7	25,1
21/05/2011	09:42:29	-43,9	61,6
24/05/2011	03:22:57	-18,3	-4,1
26/05/2011	21:03:33	42,2	-20,5
29/05/2011	14:44:16	12,9	41,0
01/06/2011	08:25:07	-47,0	50,3
04/06/2011	02:06:06	-12,4	-13,9
06/06/2011	19:47:13	44,7	-10,1
09/06/2011	13:28:27	7,1	55,7
12/06/2011	07:09:49	-49,0	36,9
15/06/2011	00:51:19	-6,6	-20,9
17/06/2011	18:32:56	46,0	2,1
20/06/2011	12:14:42	1,6	67,5
23/06/2011	05:56:34	-49,8	23,1
25/06/2011	23:38:35	-0,4	-24,4
28/06/2011	17:20:42	46,1	14,4
01/07/2011	11:02:57	-4,1	70,9
04/07/2011	04:45:20	-49,7	9,8

Date	Time	h	h S
06/07/2011	22:27:49	4,4	-24,4
09/07/2011	16:10:25	45,1	26,9
12/07/2011	09:53:08	-9,7	63,3
15/07/2011	03:35:58	-48,6	-2,4
17/07/2011	21:18:54	9,2	-21,1
20/07/2011	15:01:56	43,3	38,8
23/07/2011	08:45:05	-14,8	51,0
26/07/2011	02:28:19	-46,9	-14,5
28/07/2011	20:11:39	13,7	-15,4
31/07/2011	13:55:05	40,8	49,2
03/08/2011	07:38:36	-19,8	37,5
06/08/2011	01:22:12	-44,6	-24,6
08/08/2011	19:05:53	18,0	-8,1
11/08/2011	12:49:38	37,9	56,7
14/08/2011	06:33:28	-24,5	23,8
17/08/2011	00:17:23	-41,8	-32,7
19/08/2011	18:01:21	21,9	0,7
22/08/2011	11:45:23	34,5	59,1
25/08/2011	05:29:29	-29,1	10,1
27/08/2011	23:13:39	-38,8	-38,1
30/08/2011	16:57:51	25,5	8,8
02/09/2011	10:42:07	30,8	55,3
05/09/2011	04:26:26	-33,4	-3,2
07/09/2011	22:10:47	-35,5	-40,2
10/09/2011	15:55:10	28,7	17,0
13/09/2011	09:39:35	26,9	47,1
16/09/2011	03:24:03	-37,5	-16,9
18/09/2011	21:08:32	-32,0	-38,8
21/09/2011	14:53:02	31,7	24,4
24/09/2011	08:37:34	22,8	36,3
27/09/2011	02:22:07	-41,4	-29,9
29/09/2011	20:06:40	-28,3	-34,4
02/10/2011	13:51:14	34,2	30,4
05/10/2011	07:35:49	18,6	24,2

Date	Time	h	h S
08/10/2011	01:20:23	-45,1	-42,2
10/10/2011	19:04:58	-24,5	-27,7
13/10/2011	12:49:32	36,4	34,2
16/10/2011	06:34:05	14,3	11,5
19/10/2011	00:18:38	-48,3	-53,2
21/10/2011	18:03:09	-20,6	-19,5
24/10/2011	11:47:40	38,2	35,0
27/10/2011	05:32:09	9,8	-1,1
29/10/2011	23:16:36	-51,2	-61,2
01/11/2011	17:01:01	-16,6	-10,7
04/11/2011	10:45:24	39,4	32,6
07/11/2011	04:29:44	5,3	-15,5
09/11/2011	22:14:02	-53,5	-63,4
12/11/2011	15:58:17	-12,4	-0,8
15/11/2011	09:42:28	40,2	27,2
18/11/2011	03:26:36	0,8	-29,3
20/11/2011	21:10:41	-55,1	-58,3
23/11/2011	14:54:42	-8,0	7,3
26/11/2011	08:38:39	40,4	19,3
29/11/2011	02:22:31	-4,5	-43,1
01/12/2011	20:06:19	-55,8	-48,4
04/12/2011	13:50:01	-3,1	15,0
07/12/2011	07:33:39	39,9	9,4
10/12/2011	01:17:12	-9,8	-56,4
12/12/2011	19:00:39	-55,5	-36,3
15/12/2011	12:44:00	1,6	21,0
18/12/2011	06:27:15	38,8	-1,3
21/12/2011	00:10:24	-15,0	-67,5
23/12/2011	17:53:27	-54,1	-23,1
26/12/2011	11:36:24	6,1	24,4
29/12/2011	05:19:13	36,9	-14,4
31/12/2011	23:01:56	-20,4	-70,9

# Dione Massima elongazione est - Dione Maxima est elongation

Date	Time	h	h S
01/01/2011	04:24:28	41,0	-24,4
03/01/2011	22:06:27	-17,5	-65,9
06/01/2011	15:48:18	-47,8	0,8
09/01/2011	09:30:02	14,2	21,1
12/01/2011	03:11:37	38,1	-37,9
14/01/2011	20:53:05	-23,2	-52,7
17/01/2011	14:34:26	-44,2	13,2
20/01/2011	08:15:38	19,7	14,3
23/01/2011	01:56:43	34,5	-50,7
25/01/2011	19:37:40	-29,0	-37,1
28/01/2011	13:18:29	-39,6	24,4
31/01/2011	06:59:10	25,1	4,8
03/02/2011	00:39:44	30,0	-60,1
05/02/2011	18:20:11	-34,6	-20,5
08/02/2011	12:00:30	-34,2	32,5
11/02/2011	05:40:42	30,4	-6,8
13/02/2011	23:20:47	24,8	-61,2
16/02/2011	17:00:45	-39,9	-3,3
19/02/2011	10:40:37	-28,1	35,7
22/02/2011	04:20:23	35,3	-19,0
24/02/2011	22:00:03	19,1	-52,4
27/02/2011	15:39:38	-44,5	13,3
02/03/2011	09:19:07	-21,5	33,1

Date	Time	h	h S
05/03/2011	02:58:32	39,5	-30,7
07/03/2011	20:37:53	12,9	-38,1
10/03/2011	14:17:09	-48,2	29,3
13/03/2011	07:56:22	-14,6	25,4
16/03/2011	01:35:33	42,7	-39,9
18/03/2011	19:14:40	6,5	-21,5
21/03/2011	12:53:46	-50,5	43,1
24/03/2011	06:32:50	-7,5	14,7
27/03/2011	00:11:53	44,6	-44,0
29/03/2011	17:50:56	0,2	-3,8
01/04/2011	11:29:59	-51,0	52,4



Date	Time	h	h S
09/09/2011	23:33:00	-47,5	-42,6
12/09/2011	17:17:25	14,1	1,4
15/09/2011	11:01:51	38,3	51,1
18/09/2011	04:46:19	-22,5	-1,7
20/09/2011	22:30:48	-45,3	-46,4
23/09/2011	16:15:19	17,8	9,1
26/09/2011	09:59:51	35,4	44,5
29/09/2011	03:44:24	-27,0	-16,0
01/10/2011	21:28:58	-42,7	-46,1
04/10/2011	15:13:32	21,3	16,5
07/10/2011	08:58:06	32,0	35,1

Date	Time	h	h S
10/10/2011	02:42:40	-31,4	-29,4
12/10/2011	20:27:13	-39,6	-42,0
15/10/2011	14:11:46	24,6	22,9
18/10/2011	07:56:19	28,4	23,9
21/10/2011	01:40:50	-35,8	-42,4
23/10/2011	19:25:21	-36,3	-35,1
26/10/2011	13:09:50	27,7	27,5
29/10/2011	06:54:17	24,5	11,8
01/11/2011	00:38:42	-39,9	-54,4
03/11/2011	18:23:05	-32,6	-26,3
06/11/2011	12:07:26	30,6	29,7

Date	Time	h	h S
09/11/2011	05:51:44	20,4	-0,5
11/11/2011	23:35:59	-43,9	-64,1
14/11/2011	17:20:11	-28,7	-16,5
17/11/2011	11:04:20	33,2	29,1
20/11/2011	04:48:25	16,0	-14,7
22/11/2011	22:32:27	-47,7	-67,5
25/11/2011	16:16:24	-24,5	-6,3
28/11/2011	10:00:17	35,5	25,3
01/12/2011	03:44:06	11,4	-28,4
03/12/2011	21:27:50	-51,0	-62,1
06/12/2011	15:11:28	-20,0	3,9

Date	Time	h	h S
09/12/2011	08:55:02	37,3	18,7
12/12/2011	02:38:30	6,6	-42,1
14/12/2011	20:21:52	-53,8	-51,1
17/12/2011	14:05:09	-15,2	13,0
20/12/2011	07:48:19	38,6	9,9
23/12/2011	01:31:24	1,7	-55,4
25/12/2011	19:14:21	-55,8	-37,8
28/12/2011	12:57:12	-10,2	20,5
31/12/2011	06:39:56	39,3	-0,2

Dione Massima elongazione ovest - Dione Maxima west elongation

Date	Time	h	h S
02/01/2011	13:11:46	-21,7	19,8
05/01/2011	06:53:41	39,0	1,6
08/01/2011	00:35:28	12,8	-64,6
10/01/2011	18:17:07	-48,6	-24,9
13/01/2011	11:58:38	-16,1	25,9
16/01/2011	05:40:02	41,5	-10,7
18/01/2011	23:21:17	7,1	-68,5
21/01/2011	17:02:25	-51,1	-9,5
24/01/2011	10:43:25	-10,0	28,1
27/01/2011	04:24:17	43,1	-23,4
29/01/2011	22:05:01	1,3	-60,4
01/02/2011	15:45:38	-52,3	6,1
04/02/2011	09:26:07	-3,3	25,5
07/02/2011	03:06:29	43,7	-36,0
09/02/2011	20:46:43	-5,4	-46,1
12/02/2011	14:26:50	-51,9	20,6
15/02/2011	08:06:51	3,2	18,7
18/02/2011	01:46:45	43,0	-47,0
20/02/2011	19:26:33	-12,0	-29,6
23/02/2011	13:06:14	-49,9	33,3
26/02/2011	06:45:50	9,8	8,8
01/03/2011	00:25:21	40,9	-53,3
03/03/2011	18:04:47	-18,5	-12,2
06/03/2011	11:44:08	-46,3	42,1
09/03/2011	05:23:25	16,5	-2,4
11/03/2011	23:02:38	37,6	-51,3
14/03/2011	16:41:48	-25,0	5,8
17/03/2011	10:20:56	-41,4	44,6
20/03/2011	04:00:01	23,1	-14,9
22/03/2011	21:39:05	33,2	-41,7
25/03/2011	15:18:07	-31,2	23,2
28/03/2011	08:57:08	-35,7	39,9
31/03/2011	02:36:09	29,3	-25,5
02/04/2011	20:15:11	28,0	-27,7

Date	Time	h	h S
05/04/2011	13:54:13	-36,9	39,7
08/04/2011	07:33:17	-29,4	30,3
11/04/2011	01:12:22	34,8	-33,0
13/04/2011	18:51:30	22,2	-11,7
16/04/2011	12:30:40	-41,8	53,7
19/04/2011	06:09:54	-22,7	18,3
21/04/2011	23:49:12	39,6	-35,3
24/04/2011	17:28:34	16,1	5,4
27/04/2011	11:08:00	-45,7	61,8
30/04/2011	04:47:31	-16,0	5,9
02/05/2011	22:27:07	43,1	-31,7
05/05/2011	16:06:49	9,8	22,3
08/05/2011	09:46:38	-48,4	59,5
11/05/2011	03:26:32	-9,4	-5,8
13/05/2011	21:06:33	45,4	-23,3
16/05/2011	14:46:41	3,7	38,8
19/05/2011	08:26:55	-49,7	49,4
22/05/2011	02:07:17	-2,3	-15,3
24/05/2011	19:47:46	46,2	-12,0
27/05/2011	13:28:23	-2,1	54,3
30/05/2011	07:09:07	-49,6	36,3
02/06/2011	00:49:59	3,5	-21,9
04/06/2011	18:30:58	45,6	1,4
07/06/2011	12:12:05	-8,7	66,9
10/06/2011	05:53:21	-48,4	22,7
12/06/2011	23:34:43	9,2	-24,6
15/06/2011	17:16:14	43,9	14,8
18/06/2011	10:57:52	-14,4	71,1
21/06/2011	04:39:38	-46,1	9,6
23/06/2011	22:21:32	14,6	-23,5
26/06/2011	16:03:33	41,3	28,3
29/06/2011	09:45:41	-19,9	63,5
02/07/2011	03:27:57	-43,2	-2,2
04/07/2011	21:10:20	19,6	-18,9

Date	Time	h	h S
07/07/2011	14:52:50	38,0	41,4
10/07/2011	08:35:27	-25,0	51,0
13/07/2011	02:18:10	-39,9	-13,8
15/07/2011	20:01:00	24,1	-12,0
18/07/2011	13:43:57	34,2	53,0
21/07/2011	07:27:00	-29,8	37,2
24/07/2011	01:10:09	-36,2	-22,9
26/07/2011	18:53:23	28,2	-3,1
29/07/2011	12:36:44	30,2	61,4
01/08/2011	06:20:10	-34,3	23,4
04/08/2011	00:03:41	-32,4	-29,7
06/08/2011	17:47:17	31,8	5,9
09/08/2011	11:30:59	25,9	63,7
12/08/2011	05:14:45	-38,5	9,7
14/08/2011	22:58:35	-28,5	-33,6
17/08/2011	16:42:30	34,8	15,2
20/08/2011	10:26:28	21,6	58,6
23/08/2011	04:10:31	-42,2	-3,6
25/08/2011	21:54:37	-24,6	-34,3
28/08/2011	15:38:47	37,4	24,0
31/08/2011	09:22:59	17,1	48,9
03/09/2011	03:07:15	-45,6	-16,9
05/09/2011	20:51:34	-20,6	-31,9
08/09/2011	14:35:55	39,4	31,8
11/09/2011	08:20:18	12,6	37,1
14/09/2011	02:04:44	-48,5	-29,3
16/09/2011	19:49:11	-16,6	-27,0
19/09/2011	13:33:40	40,9	37,7
22/09/2011	07:18:10	8,1	24,4
25/09/2011	01:02:42	-51,0	-40,8
27/09/2011	18:47:15	-12,6	-20,3
30/09/2011	12:31:48	41,8	40,8
03/10/2011	06:16:22	3,6	11,3
06/10/2011	00:00:56	-52,8	-50,5

Date	Time	h	h S
08/10/2011	17:45:30	-8,6	-12,6
11/10/2011	11:30:04	42,1	40,5
14/10/2011	05:14:38	-0,6	-1,6
16/10/2011	22:59:11	-53,9	-57,0
19/10/2011	16:43:43	-4,4	-4,1
22/10/2011	10:28:14	41,8	36,6
25/10/2011	04:12:44	-6,0	-16,1
27/10/2011	21:57:12	-54,3	-58,2
30/10/2011	15:41:39	0,1	4,2
02/11/2011	09:26:03	40,9	29,7
05/11/2011	03:10:25	-10,8	-29,8
07/11/2011	20:54:45	-53,8	-53,6
10/11/2011	14:39:02	3,9	11,7
13/11/2011	08:23:16	39,5	20,5
16/11/2011	02:07:26	-15,7	-43,5
18/11/2011	19:51:33	-52,5	-44,8
21/11/2011	13:35:37	8,0	18,2
24/11/2011	07:19:37	37,5	9,7
27/11/2011	01:03:32	-20,6	-56,6
29/11/2011	18:47:23	-50,4	-33,9
02/12/2011	12:31:09	12,1	22,8
05/12/2011	06:14:50	34,9	-1,6
07/12/2011	23:58:27	-25,6	-67,5
10/12/2011	17:41:57	-47,6	-21,8
13/12/2011	11:25:23	16,3	24,7
16/12/2011	05:08:42	31,7	-15,2
18/12/2011	22:51:56	-30,6	-71,1
21/12/2011	16:35:03	-44,0	-9,4
24/12/2011	10:18:04	20,5	23,5
27/12/2011	04:00:58	28,1	-28,4
29/12/2011	21:43:46	-35,7	-63,4

Rhea Congiunzione superiore - Rhea Superior conjunction

Date	Time	h	h S
04/01/2011	07:08:39	37,9	3,8
08/01/2011	19:36:00	-39,8	-39,9
13/01/2011	08:02:46	26,1	11,9
17/01/2011	20:28:57	-25,5	-47,9
22/01/2011	08:54:31	11,6	19,4
26/01/2011	21:19:30	-9,8	-54,7
31/01/2011	09:43:54	-3,8	26,2
04/02/2011	22:07:42	6,0	-59,2
09/02/2011	10:30:56	-19,3	31,9
13/02/2011	22:53:36	20,4	-60,4
18/02/2011	11:15:46	-33,4	36,3
22/02/2011	23:37:26	32,8	-57,9
27/02/2011	11:58:39	-44,8	39,1
04/03/2011	00:19:27	41,5	-52,6
08/03/2011	12:39:52	-51,1	40,0
13/03/2011	00:59:59	44,4	-45,4
17/03/2011	13:19:50	-50,1	39,0
22/03/2011	01:39:29	40,7	-37,1
26/03/2011	13:59:00	-42,4	36,3
31/03/2011	02:18:26	31,9	-28,3
04/04/2011	14:37:52	-30,6	32,4

Date	Time	h	h S
09/04/2011	02:57:20	19,9	-19,1
13/04/2011	15:16:55	-16,9	27,5
18/04/2011	03:36:41	6,4	-9,8
22/04/2011	15:56:41	-1,7	21,9
27/04/2011	04:16:57	-8,2	0,2
01/05/2011	16:37:34	12,3	15,9
06/05/2011	04:58:34	-22,4	9,2
10/05/2011	17:19:59	26,2	9,7
15/05/2011	05:41:53	-35,6	18,6
19/05/2011	18:04:15	38,0	3,6
24/05/2011	06:27:09	-45,8	28,0
28/05/2011	18:50:35	45,3	-2,3
02/06/2011	07:14:34	-49,8	37,5
06/06/2011	19:39:08	45,1	-9,0
11/06/2011	08:04:16	-45,3	46,9
15/06/2011	20:29:58	37,2	-14,7
20/06/2011	08:56:14	-34,0	56,0
24/06/2011	21:23:04	24,0	-19,8
29/06/2011	09:50:28	-19,0	64,2
03/07/2011	22:18:25	8,2	-23,7
08/07/2011	10:46:54	-1,6	69,5

Date	Time	h	h S
12/07/2011	23:15:54	-9,1	-26,1
17/07/2011	11:45:23	14,5	68,4
22/07/2011	00:15:22	-26,1	-26,3
26/07/2011	12:45:48	30,0	60,9
31/07/2011	01:16:41	-41,0	-23,8
04/08/2011	13:47:59	41,4	49,6
09/08/2011	02:19:40	-50,2	-18,5
13/08/2011	14:51:43	44,8	36,5
18/08/2011	03:24:07	-48,9	-10,8
22/08/2011	15:56:50	38,0	22,3
27/08/2011	04:29:51	-37,6	-0,5

# Rhea Congiunzione inferiore - Rhea Inferior conjunction

Date	Time	h	h S
02/01/2011	00:53:18	12,0	-62,2
06/01/2011	13:20:56	-26,0	19,5
11/01/2011	01:47:59	26,8	-53,1
15/01/2011	14:14:27	-40,4	15,4
20/01/2011	02:40:20	38,1	-43,3
24/01/2011	15:05:36	-50,2	10,4
29/01/2011	03:30:17	43,4	-33,1
02/02/2011	15:54:23	-52,0	4,9
07/02/2011	04:17:54	41,3	-22,9
11/02/2011	16:40:51	-45,3	-0,5
16/02/2011	05:03:17	32,8	-12,6
20/02/2011	17:25:12	-33,5	-7,2
25/02/2011	05:46:38	20,8	-1,5
01/03/2011	18:07:39	-19,5	-13,1
06/03/2011	06:28:16	7,2	8,1
10/03/2011	18:48:32	-4,8	-18,7
15/03/2011	07:08:32	-7,3	18,1
19/03/2011	19:28:17	9,7	-23,6
24/03/2011	07:47:53	-21,2	27,8
28/03/2011	20:07:22	23,2	-27,8
02/04/2011	08:26:48	-34,1	37,2

Date	Time	h	h S
06/04/2011	20:46:15	34,9	-30,9
11/04/2011	09:05:47	-44,5	46,1
15/04/2011	21:25:28	43,1	-32,7
20/04/2011	09:45:22	-50,1	54,2
24/04/2011	22:05:30	45,5	-33,1
29/04/2011	10:25:57	-48,5	60,9
03/05/2011	22:46:46	41,1	-32,0
08/05/2011	11:07:59	-40,2	65,1
12/05/2011	23:29:39	31,1	-29,6
17/05/2011	11:51:47	-27,6	65,5
22/05/2011	00:14:26	17,8	-25,9
26/05/2011	12:37:36	-12,9	62,0
31/05/2011	01:01:19	2,9	-21,2
04/06/2011	13:25:35	3,0	55,7
09/06/2011	01:50:26	-13,1	-15,5
13/06/2011	14:15:51	18,4	47,6
18/06/2011	02:41:50	-28,5	-8,8
22/06/2011	15:08:23	32,6	38,4
27/06/2011	03:35:30	-41,8	-0,6
01/07/2011	16:03:10	42,9	28,4
06/07/2011	04:31:22	-49,5	7,2

Date	Time	h	h S
10/07/2011	17:00:06	45,7	17,8
15/07/2011	05:29:21	-47,8	16,3
19/07/2011	17:59:04	39,2	6,7
24/07/2011	06:29:16	-37,2	26,2
28/07/2011	18:59:55	25,9	-4,8
02/08/2011	07:30:59	-21,7	36,3
06/08/2011	20:02:28	9,3	-16,1
11/08/2011	08:34:19	-4,1	46,1
15/08/2011	21:06:32	-9,0	-26,6
20/08/2011	09:39:04	13,4	53,8
24/08/2011	22:11:55	-26,9	-35,1
29/08/2011	10:45:03	29,3	56,8
02/09/2011	23:18:26	-42,6	-40,2
07/09/2011	11:52:03	40,7	52,9
12/09/2011	00:25:51	-51,9	-40,4
16/09/2011	12:59:51	43,2	43,3
21/09/2011	01:33:59	-49,4	-35,6
25/09/2011	14:08:15	35,4	30,4
30/09/2011	02:42:36	-36,9	-27,1
04/10/2011	15:17:02	20,7	15,9
09/10/2011	03:51:30	-19,8	-16,7

Date	Time	h	h S
13/10/2011	16:25:58	3,1	1,1
18/10/2011	05:00:26	-0,7	-5,8
22/10/2011	17:34:51	-16,1	-14,6
27/10/2011	06:09:11	16,2	4,8
31/10/2011	18:43:26	-34,2	-29,4
05/11/2011	07:17:32	31,0	13,7
09/11/2011	19:51:28	-49,1	-43,5
14/11/2011	08:25:13	39,7	20,5
18/11/2011	20:58:45	-55,3	-56,2
23/11/2011	09:32:01	39,1	24,6
27/11/2011	22:05:00	-49,0	-66,2
02/12/2011	10:37:41	29,6	25,9
06/12/2011	23:10:00	-34,7	-70,5
11/12/2011	11:41:57	14,8	24,5
16/12/2011	00:13:30	-17,7	-66,8
20/12/2011	12:44:37	-1,6	21,0
25/12/2011	01:15:16	0,3	-58,3
29/12/2011	13:45:26	-19,9	16,0

# Rhea Massima elongazione est - Rhea Maxima est elongation

Date	Time	h	h S
05/01/2011	10:15:37	8,8	23,9
09/01/2011	22:42:50	-6,6	-68,6
14/01/2011	11:09:27	-7,7	26,7
18/01/2011	23:35:28	9,7	-68,3
23/01/2011	12:00:54	-23,5	28,0
28/01/2011	00:25:43	24,2	-63,0
01/02/2011	12:49:58	-37,7	27,8
06/02/2011	01:13:37	36,0	-55,1
10/02/2011	13:36:42	-48,2	26,2
15/02/2011	01:59:15	42,9	-45,9
19/02/2011	14:21:17	-52,1	23,3
24/02/2011	02:42:50	43,1	-36,1
28/02/2011	15:03:56	-48,0	19,4
05/03/2011	03:24:38	36,8	-26,1
09/03/2011	15:44:58	-37,9	14,8
14/03/2011	04:05:01	26,2	-16,0
18/03/2011	16:24:48	-24,9	9,7
23/03/2011	04:44:25	13,4	-5,8
27/03/2011	17:03:54	-10,8	4,5
01/04/2011	05:23:20	0,0	4,5

Date	Time	h	h S
05/04/2011	17:42:45	3,9	-0,4
10/04/2011	06:02:14	-14,7	14,3
14/04/2011	18:21:52	17,9	-6,3
19/04/2011	06:41:40	-28,2	24,2
23/04/2011	19:01:44	30,7	-11,2
28/04/2011	07:22:05	-40,1	33,8
02/05/2011	19:42:47	40,9	-15,5
07/05/2011	08:03:53	-48,2	43,3
11/05/2011	20:25:25	45,9	-19,3
16/05/2011	08:47:25	-49,5	52,4
20/05/2011	21:09:55	43,6	-22,2
25/05/2011	09:32:57	-43,1	60,8
29/05/2011	21:56:31	34,7	-24,2
03/06/2011	10:20:38	-31,2	67,7
07/06/2011	22:45:20	21,5	-25,0
12/06/2011	11:10:37	-16,4	71,1
16/06/2011	23:36:27	6,1	-24,4
21/06/2011	12:02:52	0,3	68,8
26/06/2011	00:29:51	-10,6	-22,4
30/06/2011	12:57:24	16,1	61,7

Date	Time	h	h S
05/07/2011	01:25:29	-26,8	-18,7
09/07/2011	13:54:06	31,0	51,9
14/07/2011	02:23:14	-41,0	-13,3
18/07/2011	14:52:51	42,1	40,6
23/07/2011	03:22:57	-49,7	-6,2
27/07/2011	15:53:30	45,4	28,4
01/08/2011	04:24:29	-48,4	2,7
05/08/2011	16:55:53	38,8	15,3
10/08/2011	05:27:41	-37,6	12,3
14/08/2011	17:59:49	25,2	2,1
19/08/2011	06:32:18	-21,7	22,8
23/08/2011	19:05:06	8,1	-12,0
28/08/2011	07:38:11	-3,6	33,1
01/09/2011	20:11:32	-10,5	-25,1
06/09/2011	08:45:06	14,0	42,1
10/09/2011	21:18:54	-28,7	-36,9
15/09/2011	09:52:52	29,8	47,7
19/09/2011	22:26:59	-44,4	-45,8
24/09/2011	11:01:14	40,6	47,6
28/09/2011	23:35:36	-52,9	-49,5

Date	Time	h	h S
03/10/2011	12:10:02	42,1	41,5
08/10/2011	00:44:30	-49,2	-46,9
12/10/2011	13:19:00	33,5	31,1
17/10/2011	01:53:29	-35,8	-39,3
21/10/2011	14:27:56	18,5	18,5
26/10/2011	03:02:18	-18,5	-29,3
30/10/2011	15:36:35	0,9	5,0
04/11/2011	04:10:45	0,3	-18,4
08/11/2011	16:44:44	-18,3	-9,1
13/11/2011	05:18:33	17,2	-7,9
17/11/2011	17:52:09	-36,1	-22,7
22/11/2011	06:25:30	31,4	2,0
26/11/2011	18:58:34	-50,4	-35,8
01/12/2011	07:31:20	39,4	10,1
05/12/2011	20:03:45	-55,9	-48,0
10/12/2011	08:35:48	38,3	16,6
14/12/2011	21:07:28	-49,1	-58,9
19/12/2011	09:38:42	28,9	21,4
23/12/2011	22:09:28	-34,9	-67,4
28/12/2011	10:39:46	14,6	24,3

# Rhea Massima elongazione ovest - Rhea Maxima west elongation

Date	Time	h	h S
03/01/2011	03:58:52	39,5	-29,2
07/01/2011	16:26:22	-51,1	-5,8
12/01/2011	04:53:17	43,6	-19,2
16/01/2011	17:19:36	-51,2	-13,5
21/01/2011	05:45:20	39,5	-9,4
25/01/2011	18:10:28	-42,6	-21,0
30/01/2011	06:35:00	29,4	0,9
03/02/2011	18:58:57	-29,5	-28,1
08/02/2011	07:22:19	16,1	10,1
12/02/2011	19:45:08	-14,6	-34,7
17/02/2011	08:07:25	1,7	19,4
21/02/2011	20:29:12	0,9	-40,3
26/02/2011	08:50:31	-13,4	28,2
02/03/2011	21:11:24	15,1	-44,4
07/03/2011	09:31:55	-27,4	36,3
11/03/2011	21:52:06	28,1	-46,7
16/03/2011	10:12:00	-39,6	43,5
20/03/2011	22:31:42	38,5	-46,7
25/03/2011	10:51:14	-48,3	49,3
29/03/2011	23:10:40	44,4	-44,5
03/04/2011	11:30:05	-50,9	53,1

Date	Time	h	h S
07/04/2011	23:49:31	43,9	-40,4
12/04/2011	12:09:04	-46,3	54,5
17/04/2011	00:28:46	37,3	-34,8
21/04/2011	12:48:42	-36,2	53,1
26/04/2011	01:08:53	26,4	-28,3
30/04/2011	13:29:24	-23,1	49,4
05/05/2011	01:50:17	13,0	-21,0
09/05/2011	14:11:36	-8,6	44,0
14/05/2011	02:33:21	-1,0	-13,3
18/05/2011	14:55:36	6,8	37,4
23/05/2011	03:18:22	-16,8	-5,2
27/05/2011	15:41:40	21,5	30,1
01/06/2011	04:05:30	-31,2	3,6
05/06/2011	16:29:55	34,7	22,2
10/06/2011	04:54:54	-43,2	12,3
14/06/2011	17:20:28	44,0	14,0
19/06/2011	05:46:36	-49,6	21,4
23/06/2011	18:13:18	45,8	5,4
28/06/2011	06:40:34	-47,0	30,9
02/07/2011	19:08:23	39,0	-3,1
07/07/2011	07:36:44	-36,3	40,6

Date	Time	h	h S
11/07/2011	20:05:37	25,9	-12,2
16/07/2011	08:35:00	-21,2	50,2
20/07/2011	21:04:52	9,6	-20,3
25/07/2011	09:35:13	-4,0	58,8
29/07/2011	22:05:59	-8,2	-27,1
03/08/2011	10:37:12	13,2	64,0
07/08/2011	23:08:48	-25,7	-31,7
12/08/2011	11:40:47	29,1	62,5
17/08/2011	00:13:06	-41,2	-32,9
21/08/2011	12:45:45	40,8	54,2
26/08/2011	01:18:43	-50,9	-30,2
30/08/2011	13:51:56	44,1	42,0
04/09/2011	02:25:25	-49,4	-23,8
08/09/2011	14:59:07	37,1	27,8
13/09/2011	03:33:01	-37,7	-14,7
17/09/2011	16:07:04	22,8	12,6
22/09/2011	04:41:17	-21,0	-3,9
26/09/2011	17:15:36	5,3	-2,7
01/10/2011	05:50:01	-2,1	7,0
05/10/2011	18:24:30	-13,8	-18,8
10/10/2011	06:59:00	15,2	17,1

Date	Time	h	h S
14/10/2011	19:33:30	-32,1	-33,9
19/10/2011	08:07:59	30,5	25,3
23/10/2011	20:42:25	-47,4	-47,8
28/10/2011	09:16:46	40,0	30,4
01/11/2011	21:51:01	-54,6	-59,2
06/11/2011	10:25:07	40,1	31,7
10/11/2011	22:59:02	-49,2	-65,2
15/11/2011	11:32:45	30,7	29,0
20/11/2011	00:06:15	-35,0	-63,3
24/11/2011	12:39:29	15,7	23,3
29/11/2011	01:12:25	-17,7	-55,5
03/12/2011	13:45:02	-1,1	15,7
08/12/2011	02:17:17	0,6	-45,5
12/12/2011	14:49:09	-20,0	7,1
17/12/2011	03:20:37	16,8	-35,0
21/12/2011	15:51:39	-37,0	-1,4
26/12/2011	04:22:12	30,3	-24,5
30/12/2011	16:52:15	-50,8	-11,4

Titano Congiunzione superiore - Titano Superior conjunction

Date	Time	h	h S
04/01/2011	10:55:03	2,5	25,1
20/01/2011	10:00:22	1,3	25,0
05/02/2011	08:37:58	4,7	20,3
21/02/2011	06:48:51	12,9	7,9
09/03/2011	04:37:08	24,3	-11,6
25/03/2011	02:09:57	36,2	-31,7

Date	Time	h	h S
09/04/2011	23:36:33	44,2	-40,0
25/04/2011	21:07:04	44,8	-27,9
11/05/2011	18:50:35	39,4	-5,7
27/05/2011	16:54:08	33,0	16,8
12/06/2011	15:21:56	28,8	35,4
28/06/2011	14:15:32	28,0	48,3

Date	Time	h	h S
14/07/2011	13:34:22	30,8	55,0
30/07/2011	13:16:14	36,1	55,7
15/08/2011	13:18:09	41,9	51,7
31/08/2011	13:36:23	44,2	44,0
16/09/2011	14:06:59	39,2	33,8
02/10/2011	14:45:45	26,8	21,9

Date	Time	h	h S
18/10/2011	15:28:13	10,0	9,6
03/11/2011	16:09:47	-8,4	-1,1
19/11/2011	16:45:28	-25,7	-10,8
05/12/2011	17:10:15	-40,1	-16,2
21/12/2011	17:18:59	-49,9	-17,1

Titano Congiunzione inferiore - Titano Inferior conjunction

Date	Time	h	h S
12/01/2011	06:18:48	39,7	-4,0
28/01/2011	05:09:38	40,3	-14,9
13/02/2011	03:35:22	42,5	-29,5
01/03/2011	01:38:24	44,1	-44,8
16/03/2011	23:23:49	41,7	-49,6
01/04/2011	20:59:17	33,7	-34,0

Date	Time	h	h S
17/04/2011	18:33:44	22,1	-7,8
03/05/2011	16:16:05	10,0	20,2
19/05/2011	14:13:44	0,2	45,2
04/06/2011	12:31:42	-7,3	64,1
20/06/2011	11:12:35	-10,3	71,4
06/07/2011	10:16:42	-9,4	67,0

Date	Time	h	h S
22/07/2011	09:42:47	-4,7	60,4
07/08/2011	09:28:28	3,4	55,4
23/08/2011	09:30:41	13,7	52,0
08/09/2011	09:46:05	25,4	49,3
24/09/2011	10:10:56	35,9	45,9
10/10/2011	10:41:27	41,8	41,3

Date	Time	h	h S
26/10/2011	11:13:30	40,0	35,5
11/11/2011	11:42:45	31,4	29,7
27/11/2011	12:04:37	19,6	25,2
13/12/2011	12:14:18	8,0	23,0
29/12/2011	12:07:12	-0,9	23,7

Titano Massima elongazione est - Titano Maxima est elongation

Date	Time	h	h S
08/01/2011	11:26:35	-6,5	25,8
24/01/2011	10:23:35	-6,3	27,2
09/02/2011	08:55:01	-0,8	23,5
25/02/2011	07:02:33	7,5	11,4
13/03/2011	04:50:37	19,4	-7,9
29/03/2011	02:26:28	31,9	-27,8

Date	Time	h	h S
13/04/2011	23:58:55	41,7	-37,7
29/04/2011	21:37:16	45,7	-29,6
15/05/2011	19:29:32	44,4	-11,0
31/05/2011	17:41:35	41,0	9,0
16/06/2011	16:16:43	38,6	25,5
02/07/2011	15:15:43	38,5	37,2

Date	Time	h	h S
18/07/2011	14:37:41	40,7	43,4
03/08/2011	14:20:16	43,6	44,3
19/08/2011	14:20:25	44,7	40,5
04/09/2011	14:34:41	40,9	33,3
20/09/2011	14:59:15	31,3	23,7
06/10/2011	15:30:15	17,3	13,0

Date	Time	h	h S
22/10/2011	16:03:30	1,3	2,5
07/11/2011	16:34:42	-15,7	-7,1
23/11/2011	16:59:18	-30,8	-13,7
09/12/2011	17:12:35	-42,8	-16,6
25/12/2011	17:09:57	-50,7	-15,1

Titano Massima elongazione ovest - Titano Maxima west elongation

Date	Time	h	h S
16/01/2011	05:08:32	43,1	-16,3
01/02/2011	03:53:24	43,4	-28,4
17/02/2011	02:11:18	43,6	-43,4
05/03/2011	00:05:36	40,7	-53,1
20/03/2011	21:42:33	32,4	-42,7
05/04/2011	19:10:57	19,6	-16,7

Date	Time	h	h S
21/04/2011	16:40:43	5,2	13,5
07/05/2011	14:21:09	-8,4	42,0
23/05/2011	12:19:49	-18,4	63,9
08/06/2011	10:41:28	-24,4	69,9
24/06/2011	09:28:17	-26,2	61,2
10/07/2011	08:40:10	-24,2	51,8

Date	Time	h	h S
26/07/2011	08:15:20	-18,3	45,4
11/08/2011	08:11:06	-8,7	42,1
27/08/2011	08:23:58	4,2	41,1
12/09/2011	08:50:15	18,4	41,3
28/09/2011	09:25:54	31,9	40,9
14/10/2011	10:06:40	40,7	38,6

Date	Time	h	h S
30/10/2011	10:48:03	40,4	34,3
15/11/2011	11:25:10	31,7	29,2
01/12/2011	11:53:04	19,1	25,1
17/12/2011	12:06:27	6,8	23,3

TEMPI IN T.U.      TIMES IN U.T.

H = altitudine di Saturno sull'orizzonte  
H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
H = altitude of Saturn on the horizon  
H S = altitude of the Sun on the horizon

# MERIDIANO CENTRALE DI SATURNO I

(Banda equatoriale nord NEB, zona equatoriale EZ, banda equatoriale sud SEB)

## CENTRAL MERIDIAN OF SATURN I

(North Equatorial Band, equatorial zone, Sud Equatorial Band)

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
01/01/2011	00:15:41	10:29:40	20:43:38	17/03/2011	01:09:28	11:23:24	21:37:20	31/05/2011	02:09:29	12:23:31	22:37:33	14/08/2011	03:27:22	13:41:28	23:55:34
02/01/2011	06:57:36	17:11:34		18/03/2011	07:51:16	18:05:12		01/06/2011	08:51:36	19:05:38		15/08/2011	10:09:41	20:23:47	
03/01/2011	03:25:33	13:39:31	23:53:29	19/03/2011	04:19:08	14:33:04		02/06/2011	05:19:40	15:33:42		16/08/2011	06:37:54	16:52:00	
04/01/2011	10:07:27	20:21:25		20/03/2011	00:47:01	11:00:56	21:14:53	03/06/2011	01:47:45	12:01:47	22:15:50	17/08/2011	03:06:06	13:20:13	23:34:19
05/01/2011	06:35:23	16:49:21		21/03/2011	07:28:49	17:42:45		04/06/2011	08:29:52	18:43:54		18/08/2011	09:48:25	20:02:31	
06/01/2011	03:03:19	13:17:17	23:31:15	22/03/2011	03:56:41	14:10:38		05/06/2011	04:57:57	15:12:00		19/08/2011	06:16:38	16:30:44	
07/01/2011	09:45:13	19:59:11		23/03/2011	00:24:34	10:38:30	20:52:26	06/06/2011	01:26:02	11:40:05	21:54:08	20/08/2011	02:44:51	12:58:57	23:13:03
08/01/2011	06:13:08	16:27:06		24/03/2011	07:06:23	17:20:19		07/06/2011	08:08:10	18:22:13		21/08/2011	09:27:09	19:41:16	
09/01/2011	02:41:04	12:55:02	23:09:00	25/03/2011	03:34:16	13:48:12		08/06/2011	04:36:16	14:50:19		22/08/2011	05:55:22	16:09:29	
10/01/2011	09:22:57	19:36:55		26/03/2011	00:02:08	10:16:05	20:30:01	09/06/2011	01:04:21	11:18:25	21:32:27	23/08/2011	02:23:34	12:37:41	22:51:48
11/01/2011	05:50:53	16:04:50		27/03/2011	06:43:57	16:57:54		10/06/2011	07:46:30	18:00:34		24/08/2011	09:05:54	19:20:01	
12/01/2011	02:18:48	12:32:45	22:46:43	28/03/2011	03:11:50	13:25:47	23:39:43	11/06/2011	04:14:37	14:28:40		25/08/2011	05:34:06	15:48:13	
13/01/2011	09:00:40	19:14:38		29/03/2011	09:53:40	20:07:37		12/06/2011	00:42:43	10:56:46	21:10:49	26/08/2011	02:02:19	12:16:26	22:30:32
14/01/2011	05:28:35	15:42:32		30/03/2011	06:21:33	16:35:30		13/06/2011	07:24:53	17:38:56		27/08/2011	08:44:38	18:58:44	
15/01/2011	01:56:30	12:10:27	22:24:25	31/03/2011	02:49:26	13:03:23	23:17:20	14/06/2011	03:52:59	14:07:02		28/08/2011	05:12:51	15:26:57	
16/01/2011	08:38:22	18:52:19		01/04/2011	09:31:17	19:45:13		15/06/2011	00:21:06	10:35:09	20:49:13	29/08/2011	01:41:04	11:55:10	22:09:16
17/01/2011	05:06:16	15:20:14		02/04/2011	05:59:10	16:13:07		16/06/2011	07:03:16	17:17:20		30/08/2011	08:37:29		
18/01/2011	01:34:11	11:48:08	22:02:05	03/04/2011	02:27:04	12:41:01	22:54:57	17/06/2011	03:31:23	13:45:27	23:59:30	31/08/2011	04:51:35	15:05:41	
19/01/2011	08:16:02	18:29:59		04/04/2011	09:08:54	19:22:51		18/06/2011	10:13:34	20:27:38		01/09/2011	01:19:48	11:33:54	21:48:01
20/01/2011	04:43:57	14:57:54		05/04/2011	05:36:48	15:50:45		19/06/2011	06:41:42	16:55:46		02/09/2011	08:02:06	18:16:13	
21/01/2011	01:11:51	12:25:48	21:39:44	06/04/2011	02:04:42	12:18:39	22:32:36	20/06/2011	03:09:49	13:23:53	23:37:57	03/09/2011	04:30:19	14:44:26	
22/01/2011	07:53:42	18:07:38		07/04/2011	08:46:33	19:00:31		21/06/2011	09:52:01	20:06:05		04/09/2011	00:58:31	11:12:38	21:26:44
23/01/2011	04:21:35	14:35:32		08/04/2011	05:14:28	15:28:25		22/06/2011	06:20:09	16:34:13		05/09/2011	07:40:50	17:54:56	
24/01/2011	00:49:29	11:03:26	21:17:23	09/04/2011	01:42:22	11:56:20	22:10:17	23/06/2011	02:48:17	13:02:21	23:16:25	06/09/2011	04:09:03	14:23:09	
25/01/2011	07:31:19	17:45:16		10/04/2011	08:24:14	18:38:12		24/06/2011	09:30:29	19:44:33		07/09/2011	00:37:15	10:51:22	21:05:28
26/01/2011	03:59:13	14:13:10		11/04/2011	04:52:09	15:06:06		25/06/2011	05:58:37	16:12:42		08/09/2011	07:19:34	17:33:40	
27/01/2011	00:27:06	10:41:03	20:55:00	12/04/2011	01:20:04	11:34:01	21:47:59	26/06/2011	02:26:46	12:40:50	22:54:55	09/09/2011	03:47:47	14:01:52	
28/01/2011	07:08:57	17:22:53		13/04/2011	08:01:56	18:15:54		27/06/2011	09:08:59	19:23:03		10/09/2011	00:15:59	10:30:05	20:44:11
29/01/2011	03:36:49	13:50:46		14/04/2011	04:29:52	14:43:49		28/06/2011	05:37:07	15:51:12		11/09/2011	06:58:17	17:12:23	
30/01/2011	00:04:42	10:18:39	20:32:35	15/04/2011	00:57:47	11:11:45	21:25:42	29/06/2011	02:05:16	12:19:21	22:33:25	12/09/2011	03:26:29	13:40:35	23:54:41
31/01/2011	06:46:32	17:00:28		16/04/2011	07:39:40	17:53:38		30/06/2011	08:47:30	19:01:34		13/09/2011	10:08:48	20:22:53	
01/02/2011	03:14:25	13:28:21	23:42:18	17/04/2011	04:07:36	14:21:34		01/07/2011	05:15:39	15:29:44		14/09/2011	06:37:00	16:51:06	
02/02/2011	09:56:14	20:10:11		18/04/2011	00:35:32	10:49:30	21:03:28	02/07/2011	01:43:49	11:57:53	22:11:58	15/09/2011	03:05:12	13:19:18	23:33:24
03/02/2011	06:24:07	16:38:03		19/04/2011	07:17:26	17:31:24		03/07/2011	08:26:03	18:40:07		16/09/2011	09:47:30	20:01:36	
04/02/2011	02:52:00	13:05:56	23:19:52	20/04/2011	03:45:22	13:59:20		04/07/2011	04:54:12	15:08:17		17/09/2011	06:15:42	16:29:48	
05/02/2011	09:33:49	19:47:45		21/04/2011	00:13:18	10:27:17	20:41:15	05/07/2011	01:22:22	11:36:27	21:50:32	18/09/2011	02:43:54	12:58:00	23:12:06
06/02/2011	06:01:41	16:15:37		22/04/2011	06:55:13	17:09:11		06/07/2011	08:04:36	18:18:42		19/09/2011	09:26:11	19:40:18	
07/02/2011	02:29:33	12:43:30	22:57:26	23/04/2011	03:23:10	13:37:08	23:51:07	07/07/2011	04:32:46	14:46:52		20/09/2011	05:54:23	16:08:30	
08/02/2011	09:11:22	19:25:18		24/04/2011	10:05:05	20:19:04		08/07/2011	01:00:56	11:15:02	21:29:06	21/09/2011	02:22:35	12:36:41	22:50:47
09/02/2011	05:39:14	15:53:10		25/04/2011	06:33:02	16:47:01		09/07/2011	07:43:12	17:57:17		22/09/2011	09:04:53	19:18:59	
10/02/2011	02:07:06	12:21:02	22:34:59	26/04/2011	03:00:59	13:14:58	23:28:57	10/07/2011	04:11:22	14:25:28		23/09/2011	05:33:05	15:47:11	
11/02/2011	08:48:54	19:02:51		27/04/2011	09:42:56	19:56:54		11/07/2011	00:39:32	10:53:38	21:07:43	24/09/2011	02:01:16	12:15:22	22:29:28
12/02/2011	05:16:47	15:30:43		28/04/2011	06:10:53	16:24:52		12/07/2011	07:21:48	17:35:53		25/09/2011	08:43:34	18:57:39	
13/02/2011	01:44:39	11:58:35	22:12:31	29/04/2011	02:38:51	12:52:50	23:06:49	13/07/2011	03:49:59	14:04:04		26/09/2011	05:11:45	15:25:50	
14/02/2011	08:26:26	18:40:23		30/04/2011	09:20:48	19:34:47		14/07/2011	00:18:10	10:32:15	20:46:20	27/09/2011	01:39:56	11:54:02	22:08:08
15/02/2011	04:54:18	15:08:14		01/05/2011	05:48:46	16:02:45		15/07/2011	07:00:25	17:14:31		28/09/2011	08:22:13	18:36:19	
16/02/2011	01:22:10	11:36:06	21:50:02	02/05/2011	02:16:45	12:30:44	22:44:43	16/07/2011	03:28:36	13:42:42	23:56:47	29/09/2011	04:50:25	15:04:30	
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19/02/2011	00:59:42	11:13:37	21:27:34	05/05/2011	01:54:40	12:08:40	22:22:39	19/07/2011	03:07:15	13:21:21	23:35:26	02/10/2011	04:29:03	14:43:09	
20/02/2011	07:41:29	17:55:25		06/05/2011	08:36:39	18:50:39		20/07/2011	09:49:32	20:03:38		03/10/2011	00:57:14	11:11:20	21:25:25
21/02/2011	04:09:21	14:23:17		07/05/2011	05:04:38	15:18:38		21/07/2011	06:17:44	16:31:49		04/10/2011	07:39:31	17:53:36	
22/02/2011	00:37:13	10:51:08	21:05:04	08/05/2011	01:32:38	11:46:38	22:00:38	22/07/2011	02:45:55	13:00:00	23:14:06	05/10/2011	04:07:41	14:21:46	
23/02/2011	07:19:00	17:32:56		09/05/2011	08:14:38	18:28:38		23/07/2011	09:28:12	19:42:18		06/10/2011	00:35:52	10:49:57	21:04:02
24/02/2011	03:46:51	14:00:47		10/05/2011	04:42:38	14:56:38		24/07/2011	05:56:23	16:10:29		07/10/2011	07:18:08	17:32:13	
25/02/2011	00:14:43	10:28:39	20:42:35	11/05/2011	01:10:38	11:24:38	21:38:38	25/07/2011	02:24:36	12:38:41	22:52:47	08/10/2011	03:46:18	14:00:23	
26/02/2011	06:56:31	17:10:26		12/05/2011	07:52:38	18:06:38		26/07/2011	09:06:53	19:20:59		09/10/2011	00:14:29	10:28:34	20:42:39
27/02/2011	03:24:22	13:38:18	23:52:14	13/05/2011	04:20:39	14:34:39		27/07/2011	05:35:04	15:49:11		10/10/2011	06:56:44	17:10:49	
28/02/2011	10:06:09	20:20:05		14/05/2011	00:48:39	11:02:40	21:16:40	28/07/2011	02:03:16	12:17:22	22:31:28	11/10/2011	03:24:54	13:38:59	23:53:04
01/03/2011	06:34:01	16:47:57		15/05/2011	07:30:41	17:44:41		29/07/2011	08:45:34	18:59:40		12/10/2011	10:07:09	20:21:14	
02/03/2011	03:01:52	13:15:48	23:29:44	16/05/2011	03:58:42	14:12:43		30/07/2011	05:13:46	15:27:52		13/10/2011	06:35:19	16:49:25	
03/03/2011	09:43:40	19:57:36		17											

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
28/10/2011	04:47:59	04:48:00	15:02:04	15/11/2011	02:38:29	12:52:32	23:06:35	03/12/2011	00:28:06	10:42:07	20:56:09	21/12/2011	08:30:44	18:44:44	
29/10/2011	01:16:08	11:30:12	21:44:16	16/11/2011	09:20:38	19:34:41		04/12/2011	07:10:10	17:24:12		22/12/2011	04:58:44	15:12:45	
30/10/2011	07:58:20	18:12:24		17/11/2011	05:48:43	16:02:46		05/12/2011	03:38:13	13:52:15		23/12/2011	01:26:45	11:40:45	21:54:45
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13/11/2011	09:42:17	19:56:20		01/12/2011	07:31:59	17:46:01		19/12/2011	05:20:43	15:34:43					
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Orari in T.U. in cui transita il Meridiano Centrale

Date in the format dd/mm/yyyy

TIMES IN U.T.

# MERIDIANO CENTRALE DI SATURNO III

(Origine delle radio emissioni)

## CENTRAL MERIDIAN OF SATURN III

(Radio emissions)

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
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03/01/2011	10:12:15	20:51:36		18/03/2011	02:57:57	13:37:15		31/05/2011	06:29:15	17:08:39		13/08/2011	10:18:29	20:57:59	
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Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
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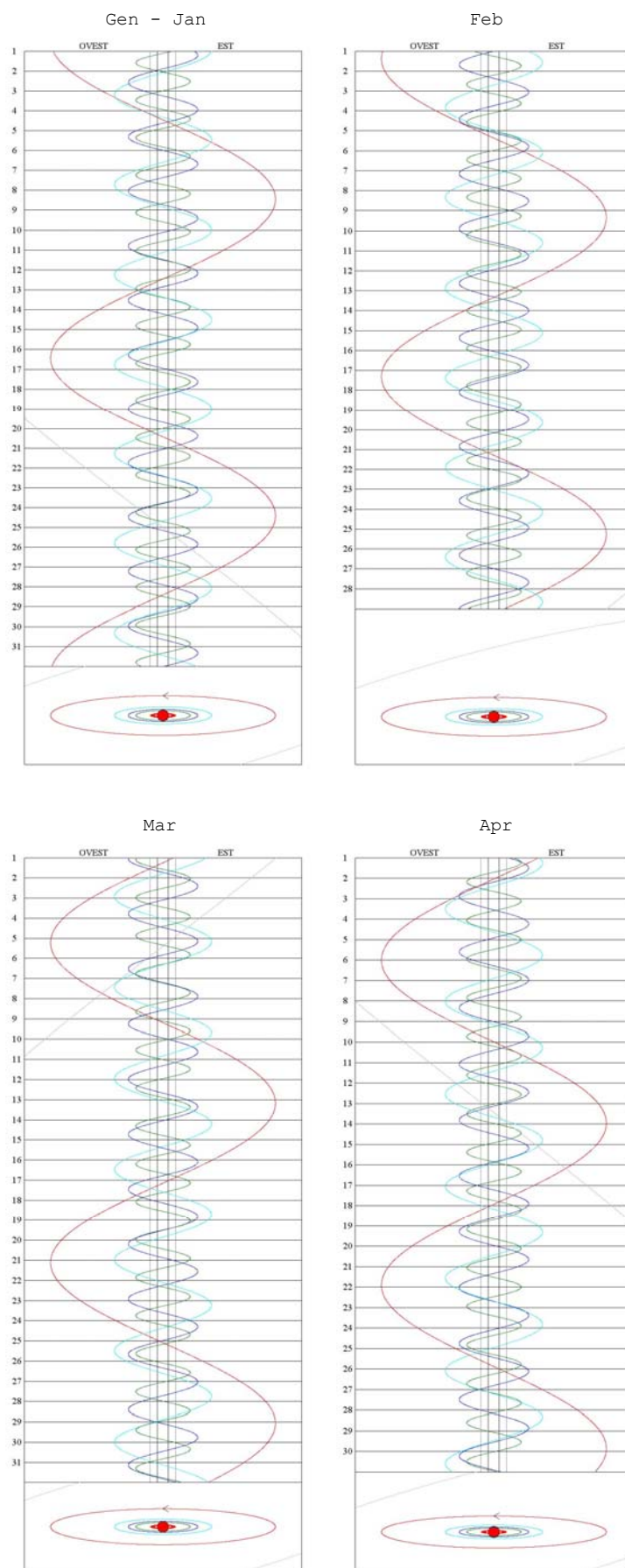
Orari in T.U. in cui transita il Meridiano Centrale

Date in the format dd/mm/yyyy

TIMES IN U.T.

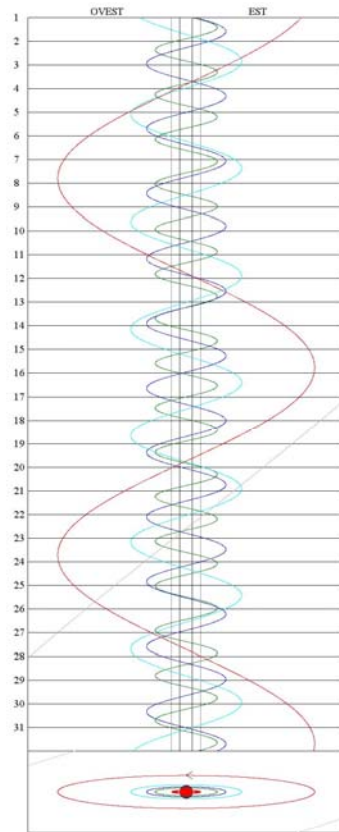


# POSIZIONE DEI SATELLITI DI SATURNO POSITION OF THE SATELLITES OF SATURN

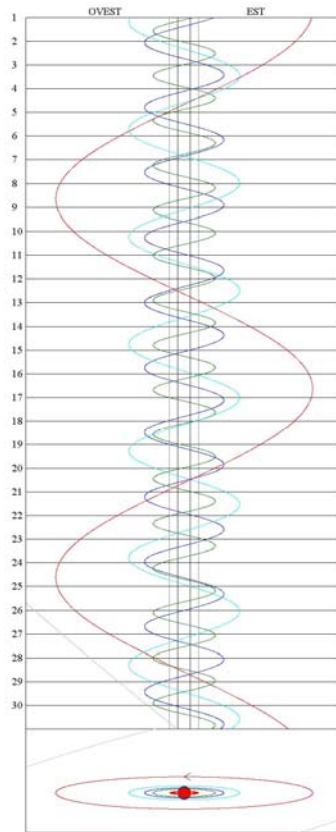


In verde Tethys, in blu Dione, in azzurro Rhea, in rosso Titano, in grigio Japetus  
In green Tethys, in blue Dione, in light blue Rhea, in red Titano, in black Japetus

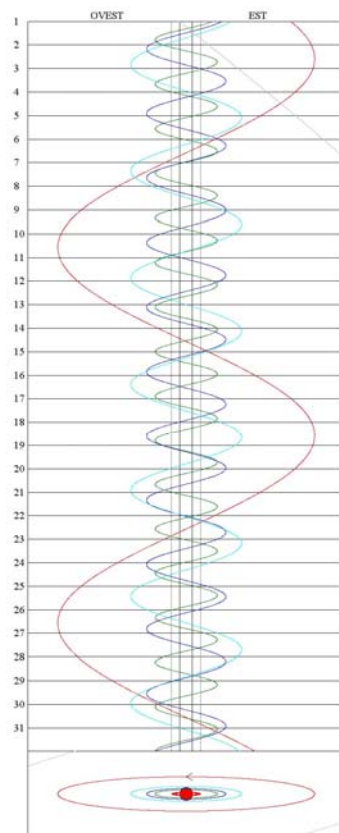
Mag - May



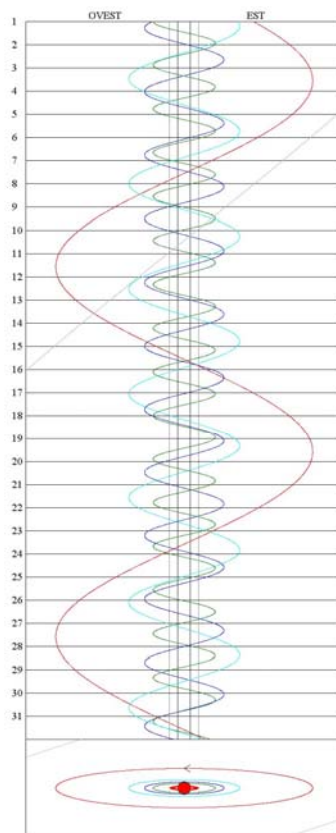
Giu - Jun



Lug - Jul



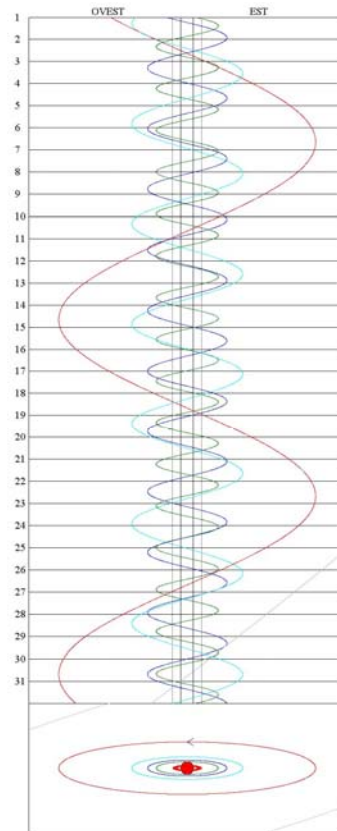
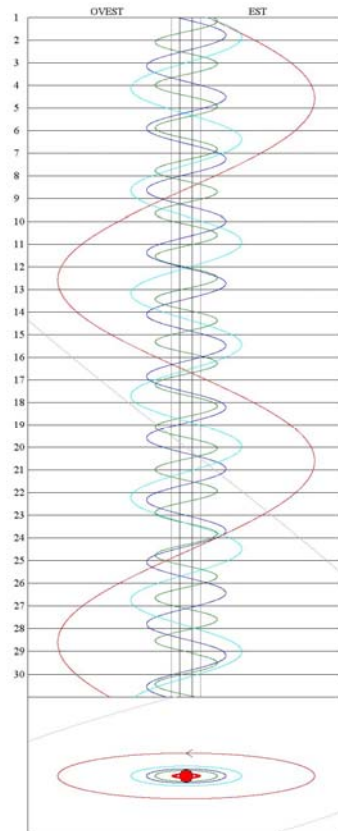
Ago - Aug



In verde Tethys, in blu Dione, in azzurro Rhea, in rosso Titano, in grigio Japetus  
In green Tethys, in blue Dione, in light blue Rhea, in red Titano, in black Japetus

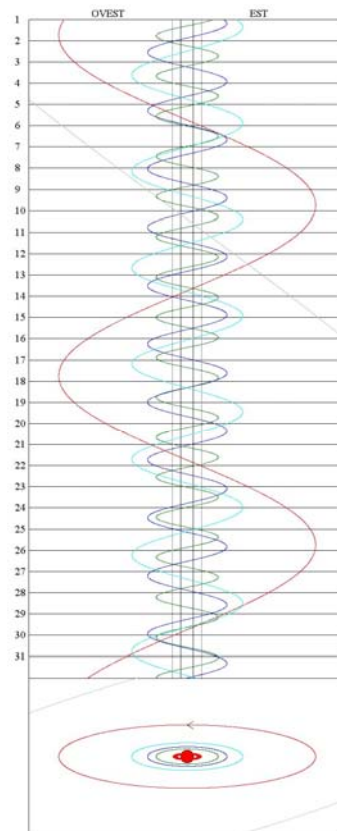
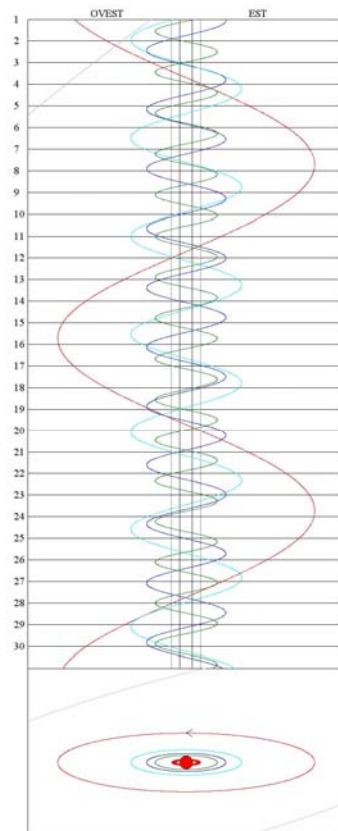
Set - Sep

Ott - Oct



Nov

Dic - Dec



In verde Tethys, in blu Dione, in azzurro Rhea, in rosso Titano, in grigio Japetus  
In green Tethys, in blue Dione, in light blue Rhea, in red Titano, in black Japetus

# EFFEMERIDI DI URANO - EPHEMERIDES OF URANUS

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
01/01/2011	23h 50m 00.45s	-01° 53' 05.9"	20,08943	20,291941	168,76	76,8	3,5	5,9	11.20	17.16	23.11
02/01/2011	23h 50m 05.31s	-01° 52' 31.9"	20,08940	20,308727	168,90	75,8	3,5	5,9	11.16	17.12	23.07
03/01/2011	23h 50m 10.34s	-01° 51' 56.6"	20,08937	20,325440	169,04	74,8	3,5	5,9	11.13	17.08	23.03
04/01/2011	23h 50m 15.56s	-01° 51' 20.3"	20,08934	20,342075	169,18	73,8	3,4	5,9	11.09	17.04	23.00
05/01/2011	23h 50m 20.94s	-01° 50' 42.8"	20,08931	20,358627	169,32	72,8	3,4	5,9	11.05	17.00	22.56
06/01/2011	23h 50m 26.50s	-01° 50' 04.2"	20,08929	20,375091	169,45	71,8	3,4	5,9	11.01	16.56	22.52
07/01/2011	23h 50m 32.22s	-01° 49' 24.6"	20,08926	20,391462	169,59	70,8	3,4	5,9	10.57	16.53	22.48
08/01/2011	23h 50m 38.11s	-01° 48' 43.9"	20,08923	20,407735	169,73	69,8	3,4	5,9	10.53	16.49	22.44
09/01/2011	23h 50m 44.17s	-01° 48' 02.1"	20,08920	20,423904	169,86	68,8	3,4	5,9	10.49	16.45	22.41
10/01/2011	23h 50m 50.40s	-01° 47' 19.2"	20,08917	20,439966	169,99	67,8	3,4	5,9	10.45	16.41	22.37
11/01/2011	23h 50m 56.79s	-01° 46' 35.3"	20,08914	20,455915	170,13	66,8	3,4	5,9	10.42	16.37	22.33
12/01/2011	23h 51m 03.35s	-01° 45' 50.4"	20,08911	20,471748	170,26	65,8	3,4	5,9	10.38	16.33	22.29
13/01/2011	23h 51m 10.07s	-01° 45' 04.4"	20,08908	20,487458	170,39	64,8	3,4	5,9	10.34	16.30	22.26
14/01/2011	23h 51m 16.95s	-01° 44' 17.4"	20,08906	20,503042	170,52	63,9	3,4	5,9	10.30	16.26	22.22
15/01/2011	23h 51m 23.99s	-01° 43' 29.3"	20,08903	20,518497	170,65	62,9	3,4	5,9	10.26	16.22	22.18
16/01/2011	23h 51m 31.20s	-01° 42' 40.3"	20,08900	20,533816	170,77	61,9	3,4	5,9	10.22	16.18	22.14
17/01/2011	23h 51m 38.56s	-01° 41' 50.2"	20,08897	20,548997	170,90	60,9	3,4	5,9	10.18	16.14	22.10
18/01/2011	23h 51m 46.07s	-01° 40' 59.1"	20,08894	20,564036	171,03	59,9	3,4	5,9	10.15	16.11	22.07
19/01/2011	23h 51m 53.73s	-01° 40' 07.2"	20,08891	20,578928	171,15	58,9	3,4	5,9	10.11	16.07	22.03
20/01/2011	23h 52m 01.54s	-01° 39' 14.2"	20,08888	20,593671	171,27	58,0	3,4	5,9	10.07	16.03	21.59
21/01/2011	23h 52m 09.50s	-01° 38' 20.4"	20,08885	20,608259	171,39	57,0	3,4	5,9	10.03	15.59	21.55
22/01/2011	23h 52m 17.60s	-01° 37' 25.7"	20,08882	20,622690	171,51	56,0	3,4	5,9	9.59	15.55	21.52
23/01/2011	23h 52m 25.83s	-01° 36' 30.0"	20,08879	20,636960	171,63	55,0	3,4	5,9	9.55	15.52	21.48
24/01/2011	23h 52m 34.21s	-01° 35' 33.5"	20,08876	20,651065	171,75	54,0	3,4	5,9	9.51	15.48	21.44
25/01/2011	23h 52m 42.73s	-01° 34' 36.1"	20,08873	20,665001	171,87	53,1	3,4	5,9	9.48	15.44	21.41
26/01/2011	23h 52m 51.39s	-01° 33' 37.8"	20,08870	20,678764	171,98	52,1	3,4	5,9	9.44	15.40	21.37
27/01/2011	23h 53m 00.18s	-01° 32' 38.6"	20,08868	20,692350	172,09	51,1	3,4	5,9	9.40	15.36	21.33
28/01/2011	23h 53m 09.12s	-01° 31' 38.5"	20,08865	20,705755	172,20	50,1	3,4	5,9	9.36	15.33	21.29
29/01/2011	23h 53m 18.19s	-01° 30' 37.6"	20,08862	20,718976	172,31	49,2	3,4	5,9	9.32	15.29	21.26
30/01/2011	23h 53m 27.39s	-01° 29' 35.9"	20,08859	20,732008	172,42	48,2	3,4	5,9	9.28	15.25	21.22
31/01/2011	23h 53m 36.73s	-01° 28' 33.4"	20,08856	20,744847	172,53	47,2	3,4	5,9	9.25	15.21	21.18
01/02/2011	23h 53m 46.18s	-01° 27' 30.0"	20,08853	20,757490	172,63	46,2	3,4	5,9	9.21	15.18	21.15
02/02/2011	23h 53m 55.76s	-01° 26' 25.9"	20,08850	20,769932	172,74	45,3	3,4	5,9	9.17	15.14	21.11
03/02/2011	23h 54m 05.46s	-01° 25' 21.1"	20,08847	20,782171	172,84	44,3	3,4	5,9	9.13	15.10	21.07
04/02/2011	23h 54m 15.27s	-01° 24' 15.5"	20,08844	20,794202	172,94	43,3	3,4	5,9	9.09	15.06	21.03
05/02/2011	23h 54m 25.20s	-01° 23' 09.2"	20,08841	20,806623	173,04	42,3	3,4	5,9	9.05	15.03	21.00
06/02/2011	23h 54m 35.24s	-01° 22' 02.2"	20,08838	20,817630	173,14	41,4	3,4	5,9	9.02	14.99	20.56
07/02/2011	23h 54m 45.39s	-01° 20' 54.6"	20,08835	20,829019	173,23	40,4	3,4	5,9	8.58	14.55	20.52
08/02/2011	23h 54m 55.65s	-01° 19' 46.2"	20,08832	20,840189	173,32	39,4	3,4	5,9	8.54	14.51	20.49
09/02/2011	23h 55m 06.02s	-01° 18' 37.2"	20,08829	20,851135	173,41	38,5	3,4	5,9	8.50	14.47	20.45
10/02/2011	23h 55m 16.50s	-01° 17' 27.5"	20,08826	20,861856	173,50	37,5	3,4	5,9	8.46	14.44	20.41
11/02/2011	23h 55m 27.08s	-01° 16' 17.1"	20,08823	20,872349	173,59	36,6	3,4	5,9	8.42	14.40	20.38
12/02/2011	23h 55m 37.76s	-01° 15' 06.2"	20,08820	20,882610	173,68	35,6	3,4	5,9	8.39	14.36	20.34
13/02/2011	23h 55m 48.54s	-01° 13' 54.6"	20,08817	20,892639	173,76	34,6	3,4	5,9	8.35	14.32	20.30
14/02/2011	23h 55m 59.42s	-01° 12' 42.4"	20,08814	20,902431	173,84	33,7	3,4	5,9	8.31	14.29	20.27
15/02/2011	23h 56m 10.39s	-01° 11' 29.7"	20,08811	20,911987	173,92	32,7	3,4	5,9	8.27	14.25	20.23
16/02/2011	23h 56m 21.44s	-01° 10' 16.4"	20,08808	20,921302	174,00	31,8	3,4	5,9	8.23	14.21	20.19
17/02/2011	23h 56m 32.58s	-01° 09' 02.6"	20,08805	20,930376	174,07	30,8	3,4	5,9	8.19	14.17	20.15
18/02/2011	23h 56m 43.80s	-01° 07' 48.4"	20,08802	20,939207	174,15	29,8	3,3	5,9	8.16	14.14	20.12
19/02/2011	23h 56m 55.10s	-01° 06' 33.6"	20,08799	20,947792	174,22	28,9	3,3	5,9	8.12	14.10	20.08
20/02/2011	23h 57m 06.47s	-01° 05' 18.4"	20,08796	20,956130	174,29	27,9	3,3	5,9	8.08	14.06	20.04
21/02/2011	23h 57m 17.93s	-01° 04' 02.7"	20,08793	20,964219	174,35	27,0	3,3	5,9	8.04	14.02	20.01
22/02/2011	23h 57m 29.45s	-01° 02' 46.5"	20,08789	20,972057	174,42	26,0	3,3	5,9	8.00	13.59	19.57
23/02/2011	23h 57m 41.06s	-01° 01' 29.9"	20,08786	20,979642	174,48	25,1	3,3	5,9	7.57	13.55	19.53
24/02/2011	23h 57m 52.74s	-01° 00' 12.8"	20,08783	20,986971	174,54	24,1	3,3	5,9	7.53	13.51	19.50
25/02/2011	23h 58m 04.49s	-00° 58' 55.4"	20,08780	20,994043	174,60	23,2	3,3	5,9	7.49	13.48	19.46
26/02/2011	23h 58m 16.30s	-00° 57' 37.5"	20,08777	21,000855	174,66	22,2	3,3	5,9	7.45	13.44	19.43
27/02/2011	23h 58m 28.18s	-00° 56' 19.2"	20,08774	21,007406	174,71	21,2	3,3	5,9	7.41	13.40	19.39
28/02/2011	23h 58m 40.12s	-00° 55' 00.6"	20,08771	21,013694	174,77	20,3	3,3	5,9	7.37	13.36	19.35
01/03/2011	23h 58m 52.11s	-00° 53' 41.6"	20,08768	21,019716	174,82	19,3	3,3	5,9	7.34	13.33	19.32
02/03/2011	23h 59m 04.16s	-00° 52' 22.3"	20,08765	21,025472	174,86	18,4	3,3	5,9	7.30	13.29	19.28
03/03/2011	23h 59m 16.25s	-00° 51' 02.8"	20,08762	21,030960	174,91	17,4	3,3	5,9	7.26	13.25	19.24
04/03/2011	23h 59m 28.40s	-00° 49' 43.0"	20,08759	21,036177	174,95	16,5	3,3	5,9	7.22	13.21	19.21
05/03/2011	23h 59m 40.59s	-00° 48' 22.9"	20,08756	21,041124	174,99	15,6	3,3	5,9	7.18	13.18	19.17
06/03/2011	23h 59m 52.82s	-00° 47' 02.6"	20,08753	21,045798	175,03	14,6	3,3	5,9	7.15	13.14	19.13
07/03/2011	00h 00m 05.09s	-00° 45' 42.0"	20,08749	21,050199	175,07	13,7	3,3	5,9	7.11	13.10	19.10
08/03/2011	00h 00m 17.41s	-00° 44' 21.2"	20,08746	21,054326	175,10	12,7	3,3	5,9	7.07	13.06	19.06
09/03/2011	00h 00m 29.76s	-00° 43' 00.3"	20,08743	21,058178	175,14	11,8	3,3	5,9	7.03	13.03	19.02
10/03/2011	00h 00m 42.14s	-00° 41' 39.1"	20,08740	21,061754	175,17	10,8	3,3	5,9	6.59	12.59	18.59
11/03/2011	00h 00m 54.56s	-00° 40' 17.7"	20,08737	21,065054	175,19	9,9	3,3	5,9	6.56	12.55	18.55
12/03/2011	00h 01m 07.01s	-00° 38' 56.2"	20,08734	21,068078	175,22	9,0	3,3	5,9	6.52	12.52	18.51
13/03/2011	00h 01m 19.49s	-00° 37' 34.6"	20,08731	21,070824	175,24	8,0	3,3	5,9	6.48	12.48	18.48
14/03/2011	00h 01m 31.99s	-00° 36' 12.8"	20,08728	21,073294	175,26	7,1	3,3	5,9	6.44	12.44	18.44
15/03/2011	00h 01m 44.50s	-00° 34' 51.0"	20,08724	21,075486	175,28	6,2	3,3	5,9	6.40	12.40	18.40
16/03/2011	00h 01m 57.04s	-00° 33' 29.1"	20,08721	21,077402	175,30	5,2	3,3	5,9	6.37	12.37	18.37
17/03/2011	00h 02m 09.58s	-00° 32' 07.1"	20,08718	21,079040	175,31	4,3	3,3	5,9	6.33	12.33	18.33
18/03/2011	00h 02m 22.13s	-00° 30' 45.2"	20,08715	21,080402	175,32	3,4	3,3	5,9	6.29	12.29	18.30
19/03/2011	00h 02m 34.70s	-00° 29' 23.2"	20,08712	21,081488	175,33	2,5	3,3	5,9	6.25	12.26	18.26
20/03/2011	00h 02m 47.27s	-00° 28' 01.3"	20,08709	21,082297	175,34	1,6	3,3	5,9	6.21	12.22	18.22
21/03/2011	00h 02m 59.85s	-00° 26' 39.6"	20,08705	21,082829	175,34	1,0	3,3	5,9	6.18	12.18	18.19
22/03/2011	00h 03m 12.39s	-00° 25' 17.9"	20,08702	21,083085	175,34	0,9	3,3	5,9	6.14	12.14	18.15
23/03/2011	00h 03m 24.96s	-00° 23' 55.6"	20,08699	21,083065	175,34	1,6	3,3	5,9	6.10	12.11	18.11
24/03/2011	00h 03m 37.54s	-00° 22' 33.6									



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
09/04/2011	00h 06m 56.38s	-00° 01' 03.8"	20,08644	21,040654	174,99	17.2	3,3	5,9	5.05	11.07	17.09
10/04/2011	00h 07m 08.52s	+00° 00' 14.7"	20,08641	21,035728	174,95	18.2	3,3	5,9	5.01	11.04	17.06
11/04/2011	00h 07m 20.62s	+00° 01' 32.8"	20,08638	21,030540	174,91	19.1	3,3	5,9	4.58	11.00	17.02
12/04/2011	00h 07m 32.67s	+00° 02' 50.5"	20,08635	21,025092	174,86	20.0	3,3	5,9	4.54	10.56	16.58
13/04/2011	00h 07m 44.66s	+00° 04' 07.9"	20,08631	21,019386	174,81	20.9	3,3	5,9	4.50	10.52	16.55
14/04/2011	00h 07m 56.59s	+00° 05' 24.8"	20,08628	21,013425	174,76	21.9	3,3	5,9	4.46	10.49	16.51
15/04/2011	00h 08m 08.46s	+00° 06' 41.3"	20,08625	21,007210	174,71	22.8	3,3	5,9	4.42	10.45	16.47
16/04/2011	00h 08m 20.27s	+00° 07' 57.3"	20,08622	21,000743	174,66	23.7	3,3	5,9	4.39	10.41	16.44
17/04/2011	00h 08m 32.01s	+00° 09' 12.9"	20,08618	20,994026	174,60	24.6	3,3	5,9	4.35	10.37	16.40
18/04/2011	00h 08m 43.70s	+00° 10' 28.1"	20,08615	20,987061	174,54	25.6	3,3	5,9	4.31	10.34	16.36
19/04/2011	00h 08m 55.32s	+00° 11' 42.8"	20,08612	20,979851	174,48	26.5	3,3	5,9	4.27	10.30	16.33
20/04/2011	00h 09m 06.87s	+00° 12' 57.0"	20,08609	20,972395	174,42	27.4	3,3	5,9	4.23	10.26	16.29
21/04/2011	00h 09m 18.36s	+00° 14' 10.8"	20,08605	20,964698	174,36	28.3	3,3	5,9	4.19	10.22	16.25
22/04/2011	00h 09m 29.77s	+00° 15' 24.1"	20,08602	20,956759	174,29	29.3	3,3	5,9	4.16	10.19	16.22
23/04/2011	00h 09m 41.11s	+00° 16' 36.8"	20,08599	20,948581	174,22	30.2	3,3	5,9	4.12	10.15	16.18
24/04/2011	00h 09m 52.37s	+00° 17' 49.0"	20,08595	20,940165	174,15	31.1	3,3	5,9	4.08	10.11	16.14
25/04/2011	00h 10m 03.55s	+00° 19' 00.7"	20,08592	20,931515	174,08	32.0	3,4	5,9	4.04	10.07	16.11
26/04/2011	00h 10m 14.64s	+00° 20' 11.7"	20,08589	20,922631	174,01	33.0	3,4	5,9	4.00	10.04	16.07
27/04/2011	00h 10m 25.64s	+00° 21' 22.1"	20,08585	20,913515	173,93	33.9	3,4	5,9	3.57	10.00	16.03
28/04/2011	00h 10m 36.56s	+00° 22' 32.0"	20,08582	20,904171	173,85	34.8	3,4	5,9	3.53	9.56	16.00
29/04/2011	00h 10m 47.39s	+00° 23' 41.2"	20,08579	20,894601	173,78	35.7	3,4	5,9	3.49	9.52	15.56
30/04/2011	00h 10m 58.12s	+00° 24' 49.8"	20,08575	20,884806	173,69	36.6	3,4	5,9	3.45	9.49	15.52
01/05/2011	00h 11m 08.76s	+00° 25' 57.7"	20,08572	20,874790	173,61	37.6	3,4	5,9	3.41	9.45	15.49
02/05/2011	00h 11m 19.31s	+00° 27' 05.0"	20,08569	20,864555	173,53	38.5	3,4	5,9	3.37	9.41	15.45
03/05/2011	00h 11m 29.76s	+00° 28' 11.6"	20,08565	20,854105	173,44	39.4	3,4	5,9	3.34	9.37	15.41
04/05/2011	00h 11m 40.11s	+00° 29' 17.5"	20,08562	20,843441	173,35	40.3	3,4	5,9	3.30	9.34	15.38
05/05/2011	00h 11m 50.36s	+00° 30' 22.8"	20,08559	20,832568	173,26	41.3	3,4	5,9	3.26	9.30	15.34
06/05/2011	00h 12m 00.51s	+00° 31' 27.4"	20,08555	20,821487	173,17	42.2	3,4	5,9	3.22	9.26	15.30
07/05/2011	00h 12m 10.55s	+00° 32' 31.2"	20,08552	20,810204	173,07	43.1	3,4	5,9	3.18	9.22	15.26
08/05/2011	00h 12m 20.48s	+00° 33' 34.3"	20,08549	20,798720	172,98	44.0	3,4	5,9	3.15	9.19	15.23
09/05/2011	00h 12m 30.30s	+00° 34' 36.6"	20,08545	20,787039	172,88	45.0	3,4	5,9	3.11	9.15	15.19
10/05/2011	00h 12m 40.01s	+00° 35' 38.2"	20,08542	20,775165	172,78	45.9	3,4	5,9	3.07	9.11	15.15
11/05/2011	00h 12m 49.59s	+00° 36' 38.9"	20,08538	20,763101	172,68	46.8	3,4	5,9	3.03	9.07	15.12
12/05/2011	00h 12m 59.06s	+00° 37' 38.9"	20,08535	20,750850	172,58	47.7	3,4	5,9	2.59	9.04	15.08
13/05/2011	00h 13m 08.40s	+00° 38' 38.0"	20,08532	20,738417	172,48	48.7	3,4	5,9	2.55	9.00	15.04
14/05/2011	00h 13m 17.62s	+00° 39' 36.3"	20,08528	20,725804	172,37	49.6	3,4	5,9	2.52	8.56	15.00
15/05/2011	00h 13m 26.73s	+00° 40' 33.8"	20,08525	20,713015	172,26	50.5	3,4	5,9	2.48	8.52	14.57
16/05/2011	00h 13m 35.71s	+00° 41' 30.5"	20,08521	20,700054	172,16	51.4	3,4	5,9	2.44	8.48	14.53
17/05/2011	00h 13m 44.57s	+00° 42' 26.4"	20,08518	20,686923	172,05	52.3	3,4	5,9	2.40	8.45	14.49
18/05/2011	00h 13m 53.30s	+00° 43' 21.5"	20,08515	20,673625	171,94	53.3	3,4	5,9	2.36	8.41	14.46
19/05/2011	00h 14m 01.91s	+00° 44' 15.7"	20,08511	20,660165	171,83	54.2	3,4	5,9	2.32	8.37	14.42
20/05/2011	00h 14m 10.39s	+00° 45' 09.0"	20,08508	20,646544	171,71	55.1	3,4	5,9	2.28	8.33	14.38
21/05/2011	00h 14m 18.74s	+00° 46' 01.5"	20,08504	20,632766	171,60	56.0	3,4	5,9	2.25	8.29	14.34
22/05/2011	00h 14m 26.95s	+00° 46' 53.0"	20,08501	20,618834	171,48	57.0	3,4	5,9	2.21	8.26	14.31
23/05/2011	00h 14m 35.02s	+00° 47' 43.6"	20,08497	20,604752	171,36	57.9	3,4	5,9	2.17	8.22	14.27
24/05/2011	00h 14m 42.96s	+00° 48' 33.3"	20,08494	20,590523	171,25	58.8	3,4	5,9	2.13	8.18	14.23
25/05/2011	00h 14m 50.75s	+00° 49' 22.0"	20,08491	20,576150	171,13	59.7	3,4	5,9	2.09	8.14	14.19
26/05/2011	00h 14m 58.40s	+00° 50' 09.8"	20,08487	20,561638	171,01	60.7	3,4	5,9	2.05	8.10	14.16
27/05/2011	00h 15m 05.90s	+00° 50' 56.7"	20,08484	20,546989	170,88	61.6	3,4	5,9	2.02	8.07	14.12
28/05/2011	00h 15m 13.26s	+00° 51' 42.5"	20,08480	20,532208	170,76	62.5	3,4	5,9	1.58	8.03	14.08
29/05/2011	00h 15m 20.48s	+00° 52' 27.5"	20,08477	20,517299	170,64	63.4	3,4	5,9	1.54	7.59	14.04
30/05/2011	00h 15m 27.55s	+00° 53' 11.4"	20,08473	20,502265	170,51	64.4	3,4	5,9	1.50	7.55	14.00
31/05/2011	00h 15m 34.48s	+00° 53' 54.4"	20,08470	20,487110	170,39	65.3	3,4	5,9	1.46	7.51	13.57
01/06/2011	00h 15m 41.25s	+00° 54' 36.4"	20,08466	20,471840	170,26	66.2	3,4	5,9	1.42	7.48	13.53
02/06/2011	00h 15m 47.88s	+00° 55' 17.4"	20,08463	20,456457	170,13	67.2	3,4	5,9	1.38	7.44	13.49
03/06/2011	00h 15m 54.35s	+00° 55' 57.3"	20,08459	20,440967	170,00	68.1	3,4	5,9	1.35	7.40	13.45
04/06/2011	00h 16m 00.67s	+00° 56' 36.3"	20,08456	20,425373	169,87	69.0	3,4	5,9	1.31	7.36	13.42
05/06/2011	00h 16m 06.83s	+00° 57' 14.2"	20,08452	20,409681	169,74	70.0	3,4	5,9	1.27	7.32	13.38
06/06/2011	00h 16m 12.83s	+00° 57' 51.1"	20,08449	20,393895	169,61	70.9	3,4	5,9	1.23	7.28	13.34
07/06/2011	00h 16m 18.67s	+00° 58' 26.9"	20,08445	20,378019	169,48	71.8	3,4	5,9	1.19	7.25	13.30
08/06/2011	00h 16m 24.34s	+00° 59' 01.6"	20,08442	20,362058	169,35	72.7	3,4	5,9	1.15	7.21	13.26
09/06/2011	00h 16m 29.85s	+00° 59' 35.2"	20,08438	20,346017	169,21	73.7	3,4	5,9	1.11	7.17	13.23
10/06/2011	00h 16m 35.20s	+01° 00' 07.8"	20,08435	20,329899	169,08	74.6	3,5	5,9	1.07	7.13	13.19
11/06/2011	00h 16m 40.38s	+01° 00' 39.3"	20,08431	20,313710	168,94	75.5	3,5	5,9	1.04	7.09	13.15
12/06/2011	00h 16m 45.40s	+01° 01' 09.7"	20,08428	20,297453	168,81	76.5	3,5	5,9	1.00	7.05	13.11
13/06/2011	00h 16m 50.26s	+01° 01' 39.1"	20,08424	20,281133	168,67	77.4	3,5	5,8	0.56	7.02	13.07
14/06/2011	00h 16m 54.96s	+01° 02' 07.4"	20,08421	20,264753	168,54	78.3	3,5	5,8	0.52	6.58	13.03
15/06/2011	00h 16m 59.50s	+01° 02' 34.6"	20,08417	20,248319	168,40	79.3	3,5	5,8	0.48	6.54	13.00
16/06/2011	00h 17m 03.86s	+01° 03' 00.8"	20,08414	20,231834	168,26	80.2	3,5	5,8	0.44	6.50	12.56
17/06/2011	00h 17m 08.06s	+01° 03' 25.9"	20,08410	20,215302	168,13	81.1	3,5	5,8	0.40	6.46	12.52
18/06/2011	00h 17m 12.09s	+01° 03' 49.8"	20,08407	20,198727	167,99	82.1	3,5	5,8	0.36	6.42	12.48
19/06/2011	00h 17m 15.95s	+01° 04' 12.6"	20,08403	20,182112	167,85	83.0	3,5	5,8	0.32	6.38	12.44
20/06/2011	00h 17m 19.63s	+01° 04' 34.3"	20,08400	20,165464	167,71	84.0	3,5	5,8	0.29	6.34	12.40
21/06/2011	00h 17m 23.14s	+01° 04' 54.8"	20,08396	20,148784	167,57	84.9	3,5	5,8	0.25	6.31	12.37
22/06/2011	00h 17m 26.48s	+01° 05' 14.2"	20,08392	20,132079	167,43	85.8	3,5	5,8	0.21	6.27	12.33
23/06/2011	00h 17m 29.64s	+01° 05' 32.5"	20,08389	20,115352	167,29	86.8	3,5	5,8	0.17	6.23	12.29
24/06/2011	00h 17m 32.62s	+01° 05' 49.6"	20,08385	20,098608	167,15	87.7	3,5	5,8	0.13	6.19	12.25
25/06/2011	00h 17m 35.43s	+01° 06' 05.6"	20,08382	20,081851	167,02	88.7	3,5	5,8	0.09	6.15	12.21
26/06/2011	00h 17m 38.07s	+01° 06' 20.4"	20,08378	20,065087	166,88	89.6	3,5	5,8	0.05	6.11	12.17
27/06/2011	00h 17m 40.54s	+01° 06' 34.1"	20,08375	20,048318	166,74	90.5	3,5	5,8	0.01	6.07	12.13
28/06/2011	00h 17m 42.83s	+01° 06' 46.7"	20,08371	20,031552	166,60	91.5	3,5	5,8	23.53	6.03	12.09
29/06/2011	00h 17m 44.94s	+01° 06' 58.2"	20,08367	20,014792	166,46	92.4	3,5	5,8	23.50	6.00	12.06
30/06/2011	00h 17m 46.88s	+01° 07' 08.5"	20,08364	19,998042	166,32	93.4	3,5	5,8	23.46	5.56	12.02
01/07/2011	00h 17m										

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
22/07/2011	00h 17m 44.42s	+01° 06' 04.0"	20,08283	19,642146	163,36	114,4	3,6	5,8	22,19	4,29	10,35
23/07/2011	00h 17m 42,29s	+01° 05' 48.1"	20,08280	19,626955	163,23	115,3	3,6	5,8	22,15	4,25	10,31
24/07/2011	00h 17m 39,99s	+01° 05' 31.1"	20,08276	19,611886	163,11	116,3	3,6	5,8	22,11	4,21	10,27
25/07/2011	00h 17m 37,52s	+01° 05' 13.0"	20,08272	19,596942	162,98	117,3	3,6	5,8	22,07	4,17	10,23
26/07/2011	00h 17m 34,89s	+01° 04' 53.9"	20,08269	19,582129	162,86	118,2	3,6	5,8	22,03	4,13	10,19
27/07/2011	00h 17m 32,09s	+01° 04' 33.7"	20,08265	19,567451	162,74	119,2	3,6	5,8	21,59	4,09	10,15
28/07/2011	00h 17m 29,12s	+01° 04' 12.5"	20,08261	19,552913	162,62	120,2	3,6	5,8	21,55	4,05	10,11
29/07/2011	00h 17m 25,99s	+01° 03' 50.2"	20,08258	19,538520	162,50	121,1	3,6	5,8	21,51	4,01	10,07
30/07/2011	00h 17m 22,69s	+01° 03' 26.8"	20,08254	19,524276	162,38	122,1	3,6	5,8	21,47	3,57	10,03
31/07/2011	00h 17m 19,23s	+01° 03' 02.4"	20,08250	19,510185	162,26	123,1	3,6	5,8	21,43	3,53	9,59
01/08/2011	00h 17m 15,59s	+01° 02' 36.9"	20,08246	19,496254	162,15	124,1	3,6	5,8	21,40	3,49	9,55
02/08/2011	00h 17m 11,80s	+01° 02' 10.4"	20,08243	19,482485	162,03	125,0	3,6	5,8	21,36	3,45	9,51
03/08/2011	00h 17m 07,84s	+01° 01' 42.9"	20,08239	19,468884	161,92	126,0	3,6	5,8	21,32	3,41	9,47
04/08/2011	00h 17m 03,73s	+01° 01' 14.4"	20,08235	19,455456	161,81	127,0	3,6	5,8	21,28	3,37	9,43
05/08/2011	00h 16m 59,46s	+01° 00' 44.8"	20,08231	19,442203	161,70	128,0	3,6	5,8	21,24	3,33	9,39
06/08/2011	00h 16m 55,04s	+01° 00' 14.4"	20,08228	19,429131	161,59	128,9	3,6	5,8	21,20	3,29	9,35
07/08/2011	00h 16m 50,47s	+00° 59' 43.0"	20,08224	19,416243	161,48	129,9	3,6	5,8	21,16	3,25	9,31
08/08/2011	00h 16m 45,76s	+00° 59' 10.7"	20,08220	19,403542	161,37	130,9	3,6	5,8	21,12	3,21	9,27
09/08/2011	00h 16m 40,89s	+00° 58' 37.4"	20,08216	19,391033	161,27	131,9	3,6	5,8	21,08	3,17	9,23
10/08/2011	00h 16m 35,89s	+00° 58' 03.3"	20,08213	19,378719	161,17	132,9	3,6	5,8	21,04	3,13	9,19
11/08/2011	00h 16m 30,74s	+00° 57' 28.2"	20,08209	19,366603	161,07	133,8	3,6	5,8	21,00	3,09	9,15
12/08/2011	00h 16m 25,44s	+00° 56' 52.2"	20,08205	19,354689	160,97	134,8	3,6	5,8	20,56	3,05	9,11
13/08/2011	00h 16m 20,01s	+00° 56' 15.4"	20,08201	19,342981	160,87	135,8	3,6	5,8	20,52	3,01	9,07
14/08/2011	00h 16m 14,43s	+00° 55' 37.6"	20,08197	19,331481	160,77	136,8	3,6	5,8	20,48	2,57	9,02
15/08/2011	00h 16m 08,71s	+00° 54' 59.0"	20,08194	19,320193	160,68	137,8	3,6	5,8	20,44	2,53	8,58
16/08/2011	00h 16m 02,86s	+00° 54' 19.5"	20,08190	19,309121	160,59	138,8	3,6	5,8	20,40	2,49	8,54
17/08/2011	00h 15m 56,88s	+00° 53' 39.2"	20,08186	19,298269	160,50	139,8	3,6	5,8	20,36	2,45	8,50
18/08/2011	00h 15m 50,76s	+00° 52' 58.1"	20,08182	19,287638	160,41	140,7	3,6	5,8	20,32	2,41	8,46
19/08/2011	00h 15m 44,52s	+00° 52' 16.2"	20,08178	19,277234	160,32	141,7	3,6	5,7	20,28	2,37	8,42
20/08/2011	00h 15m 38,16s	+00° 51' 33.6"	20,08175	19,267059	160,24	142,7	3,6	5,7	20,24	2,33	8,38
21/08/2011	00h 15m 31,68s	+00° 50' 50.1"	20,08171	19,257118	160,16	143,7	3,6	5,7	20,20	2,29	8,34
22/08/2011	00h 15m 25,07s	+00° 50' 06.0"	20,08167	19,247413	160,08	144,7	3,6	5,7	20,16	2,25	8,30
23/08/2011	00h 15m 18,35s	+00° 49' 21.1"	20,08163	19,237947	160,00	145,7	3,6	5,7	20,12	2,21	8,26
24/08/2011	00h 15m 11,52s	+00° 48' 35.6"	20,08159	19,228725	159,92	146,7	3,6	5,7	20,08	2,17	8,22
25/08/2011	00h 15m 04,58s	+00° 47' 49.3"	20,08155	19,219750	159,85	147,7	3,6	5,7	20,04	2,13	8,18
26/08/2011	00h 14m 57,52s	+00° 47' 02.3"	20,08152	19,211024	159,77	148,7	3,7	5,7	20,00	2,09	8,13
27/08/2011	00h 14m 50,36s	+00° 46' 14.7"	20,08148	19,202553	159,70	149,7	3,7	5,7	19,56	2,05	8,09
28/08/2011	00h 14m 43,08s	+00° 45' 26.4"	20,08144	19,194337	159,63	150,7	3,7	5,7	19,52	2,01	8,05
29/08/2011	00h 14m 35,70s	+00° 44' 37.5"	20,08140	19,186382	159,57	151,7	3,7	5,7	19,48	1,57	8,01
30/08/2011	00h 14m 28,22s	+00° 43' 48.0"	20,08136	19,178689	159,50	152,7	3,7	5,7	19,44	1,52	7,57
31/08/2011	00h 14m 20,65s	+00° 42' 57.8"	20,08132	19,171263	159,44	153,7	3,7	5,7	19,40	1,48	7,53
01/09/2011	00h 14m 12,98s	+00° 42' 07.2"	20,08129	19,164104	159,38	154,7	3,7	5,7	19,36	1,44	7,49
02/09/2011	00h 14m 05,23s	+00° 41' 16.0"	20,08125	19,157217	159,33	155,7	3,7	5,7	19,32	1,40	7,45
03/09/2011	00h 13m 57,40s	+00° 40' 24.3"	20,08121	19,150602	159,27	156,7	3,7	5,7	19,28	1,36	7,41
04/09/2011	00h 13m 49,49s	+00° 39' 32.1"	20,08117	19,144263	159,22	157,7	3,7	5,7	19,24	1,32	7,37
05/09/2011	00h 13m 41,50s	+00° 38' 39.5"	20,08113	19,138200	159,17	158,7	3,7	5,7	19,20	1,28	7,32
06/09/2011	00h 13m 33,43s	+00° 37' 46.5"	20,08109	19,132416	159,12	159,7	3,7	5,7	19,16	1,24	7,28
07/09/2011	00h 13m 25,30s	+00° 36' 53.0"	20,08105	19,126913	159,07	160,7	3,7	5,7	19,12	1,20	7,24
08/09/2011	00h 13m 17,09s	+00° 35' 59.2"	20,08101	19,121691	159,03	161,7	3,7	5,7	19,08	1,16	7,20
09/09/2011	00h 13m 08,82s	+00° 35' 04.9"	20,08097	19,116753	158,99	162,7	3,7	5,7	19,04	1,12	7,16
10/09/2011	00h 13m 00,48s	+00° 34' 10.2"	20,08094	19,112101	158,95	163,7	3,7	5,7	19,00	1,08	7,12
11/09/2011	00h 12m 52,08s	+00° 33' 15.2"	20,08090	19,107734	158,91	164,7	3,7	5,7	18,56	1,04	7,08
12/09/2011	00h 12m 43,63s	+00° 32' 19.9"	20,08086	19,103656	158,88	165,8	3,7	5,7	18,52	1,00	7,04
13/09/2011	00h 12m 35,12s	+00° 31' 24.2"	20,08082	19,099868	158,85	166,8	3,7	5,7	18,48	0,56	6,59
14/09/2011	00h 12m 26,56s	+00° 30' 28.3"	20,08078	19,096371	158,82	167,8	3,7	5,7	18,44	0,51	6,55
15/09/2011	00h 12m 17,96s	+00° 29' 32.2"	20,08074	19,093165	158,79	168,8	3,7	5,7	18,40	0,47	6,51
16/09/2011	00h 12m 09,32s	+00° 28' 35.8"	20,08070	19,090254	158,77	169,8	3,7	5,7	18,36	0,43	6,47
17/09/2011	00h 12m 00,64s	+00° 27' 39.2"	20,08066	19,087638	158,75	170,8	3,7	5,7	18,32	0,39	6,43
18/09/2011	00h 11m 51,93s	+00° 26' 42.5"	20,08062	19,085318	158,73	171,8	3,7	5,7	18,28	0,35	6,39
19/09/2011	00h 11m 43,19s	+00° 25' 45.6"	20,08058	19,083295	158,71	172,8	3,7	5,7	18,23	0,31	6,35
20/09/2011	00h 11m 34,42s	+00° 24' 48.6"	20,08054	19,081571	158,70	173,8	3,7	5,7	18,19	0,27	6,30
21/09/2011	00h 11m 25,63s	+00° 23' 51.4"	20,08050	19,080147	158,68	174,8	3,7	5,7	18,15	0,23	6,26
22/09/2011	00h 11m 16,82s	+00° 22' 54.2"	20,08046	19,079023	158,68	175,9	3,7	5,7	18,11	0,19	6,22
23/09/2011	00h 11m 07,99s	+00° 21' 56.9"	20,08043	19,078201	158,67	176,9	3,7	5,7	18,07	0,15	6,18
24/09/2011	00h 10m 59,15s	+00° 20' 59.6"	20,08039	19,077682	158,66	177,9	3,7	5,7	18,03	0,11	6,14
25/09/2011	00h 10m 50,29s	+00° 20' 02.2"	20,08035	19,077467	158,66	178,8	3,7	5,7	17,59	0,07	6,10
26/09/2011	00h 10m 41,42s	+00° 19' 04.8"	20,08031	19,077556	158,66	179,4	3,7	5,7	17,55	0,03	6,06
27/09/2011	00h 10m 32,55s	+00° 18' 07.4"	20,08027	19,077949	158,67	178,8	3,7	5,7	17,51	23,54	6,02
28/09/2011	00h 10m 23,68s	+00° 17' 10.1"	20,08023	19,078647	158,67	177,9	3,7	5,7	17,47	23,50	5,57
29/09/2011	00h 10m 14,82s	+00° 16' 12.9"	20,08019	19,079650	158,68	176,9	3,7	5,7	17,43	23,46	5,53
30/09/2011	00h 10m 05,97s	+00° 15' 15.9"	20,08015	19,080957	158,69	175,9	3,7	5,7	17,39	23,42	5,49
01/10/2011	00h 09m 57,14s	+00° 14' 19.0"	20,08011	19,082569	158,70	174,8	3,7	5,7	17,35	23,38	5,45
02/10/2011	00h 09m 48,33s	+00° 13' 22.3"	20,08007	19,084484	158,72	173,8	3,7	5,7	17,31	23,34	5,41
03/10/2011	00h 09m 39,55s	+00° 12' 25.7"	20,08003	19,086702	158,74	172,8	3,7	5,7	17,27	23,30	5,37
04/10/2011	00h 09m 30,79s	+00° 11' 29.4"	20,07999	19,089222	158,76	171,8	3,7	5,7	17,23	23,26	5,33
05/10/2011	00h 09m 22,06s	+00° 10' 33.4"	20,07995	19,092042	158,78	170,8	3,7	5,7	17,19	23,22	5,28
06/10/2011	00h 09m 13,36s	+00° 09' 37.5"	20,07991	19,095162	158,81	169,7	3,7	5,7	17,15	23,18	5,24
07/10/2011	00h 09m 04,70s	+00° 08' 42.0"	20,07987	19,098581	158,84	168,7	3,7	5,7	17,11	23,14	5,20
08/10/2011	00h 08m 56,07s	+00° 07' 46.7"	20,07983	19,102298	158,87	167,7	3,7	5,7	17,07	23,10	5,16
09/10/2011	00h 08m 47,49s	+00° 06' 51.8"	20,07979	19,106310	158,90	166,7	3,7	5,7	17,03	23,05	5,12
10/10/2011	00h 08m 38,95s	+00° 05' 57.2"	20,07975	19,110618	158,94	165,6	3,7	5,7	16,59	23,01	5,08
11/10/2011	00h 08m 30,46s	+00° 05' 02.9"	20,07971	19,115219	158,98	164,6	3,7	5,7	16,55	22,57	5,04
12/10/2011	00h 08m 22,03s	+00° 04' 09.1"	20,07967	19,120113	159,02</						

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
03/11/2011	00h 05m 37.44s	-00° 13' 08.6"	20,07877	19,298281	160,50	141,0	3,6	5,8	15.23	21.24	3.29
04/11/2011	00h 05m 31.21s	-00° 13' 47.2"	20,07873	19,309358	160,59	139,9	3,6	5,8	15.19	21.20	3.25
05/11/2011	00h 05m 25.11s	-00° 14' 25.0"	20,07869	19,320667	160,69	138,9	3,6	5,8	15.15	21.16	3.21
06/11/2011	00h 05m 19.14s	-00° 15' 01.8"	20,07864	19,332206	160,78	137,9	3,6	5,8	15.11	21.12	3.17
07/11/2011	00h 05m 13.31s	-00° 15' 37.7"	20,07860	19,343970	160,88	136,9	3,6	5,8	15.07	21.08	3.13
08/11/2011	00h 05m 07.63s	-00° 16' 12.6"	20,07856	19,355956	160,98	135,8	3,6	5,8	15.03	21.04	3.09
09/11/2011	00h 05m 02.08s	-00° 16' 46.6"	20,07852	19,368159	161,08	134,8	3,6	5,8	14.59	21.00	3.05
10/11/2011	00h 04m 56.68s	-00° 17' 19.6"	20,07848	19,380576	161,18	133,8	3,6	5,8	14.55	20.56	3.01
11/11/2011	00h 04m 51.43s	-00° 17' 51.6"	20,07844	19,393203	161,29	132,7	3,6	5,8	14.51	20.52	2.57
12/11/2011	00h 04m 46.34s	-00° 18' 22.6"	20,07840	19,406036	161,40	131,7	3,6	5,8	14.47	20.48	2.53
13/11/2011	00h 04m 41.39s	-00° 18' 52.6"	20,07835	19,419072	161,50	130,7	3,6	5,8	14.43	20.44	2.49
14/11/2011	00h 04m 36.61s	-00° 19' 21.5"	20,07831	19,432307	161,61	129,7	3,6	5,8	14.39	20.40	2.45
15/11/2011	00h 04m 31.97s	-00° 19' 49.4"	20,07827	19,445736	161,73	128,6	3,6	5,8	14.35	20.36	2.41
16/11/2011	00h 04m 27.50s	-00° 20' 16.2"	20,07823	19,459356	161,84	127,6	3,6	5,8	14.31	20.32	2.37
17/11/2011	00h 04m 23.18s	-00° 20' 42.0"	20,07819	19,473163	161,95	126,6	3,6	5,8	14.27	20.28	2.33
18/11/2011	00h 04m 19.02s	-00° 21' 06.8"	20,07815	19,487152	162,07	125,6	3,6	5,8	14.23	20.24	2.29
19/11/2011	00h 04m 15.02s	-00° 21' 30.4"	20,07810	19,501320	162,19	124,5	3,6	5,8	14.19	20.20	2.25
20/11/2011	00h 04m 11.18s	-00° 21' 53.0"	20,07806	19,515662	162,31	123,5	3,6	5,8	14.15	20.16	2.21
21/11/2011	00h 04m 07.52s	-00° 22' 14.5"	20,07802	19,530173	162,43	122,5	3,6	5,8	14.11	20.12	2.17
22/11/2011	00h 04m 04.02s	-00° 22' 34.8"	20,07798	19,544851	162,55	121,5	3,6	5,8	14.07	20.08	2.13
23/11/2011	00h 04m 00.69s	-00° 22' 54.0"	20,07794	19,559688	162,67	120,4	3,6	5,8	14.03	20.04	2.09
24/11/2011	00h 03m 57.55s	-00° 23' 12.0"	20,07789	19,574682	162,80	119,4	3,6	5,8	13.59	20.00	2.05
25/11/2011	00h 03m 54.58s	-00° 23' 28.8"	20,07785	19,589826	162,92	118,4	3,6	5,8	13.55	19.56	2.01
26/11/2011	00h 03m 51.79s	-00° 23' 44.5"	20,07781	19,605116	163,05	117,4	3,6	5,8	13.51	19.52	1.57
27/11/2011	00h 03m 49.18s	-00° 23' 58.9"	20,07777	19,620546	163,18	116,3	3,6	5,8	13.47	19.48	1.53
28/11/2011	00h 03m 46.75s	-00° 24' 12.2"	20,07772	19,636111	163,31	115,3	3,6	5,8	13.43	19.44	1.49
29/11/2011	00h 03m 44.50s	-00° 24' 24.3"	20,07768	19,651805	163,44	114,3	3,6	5,8	13.39	19.40	1.45
30/11/2011	00h 03m 42.43s	-00° 24' 35.2"	20,07764	19,667623	163,57	113,3	3,6	5,8	13.35	19.36	1.41
01/12/2011	00h 03m 40.53s	-00° 24' 45.0"	20,07760	19,683560	163,70	112,2	3,6	5,8	13.32	19.32	1.37
02/12/2011	00h 03m 38.82s	-00° 24' 53.5"	20,07756	19,699611	163,84	111,2	3,6	5,8	13.28	19.28	1.33
03/12/2011	00h 03m 37.29s	-00° 25' 00.9"	20,07751	19,715770	163,97	110,2	3,6	5,8	13.24	19.24	1.29
04/12/2011	00h 03m 35.95s	-00° 25' 07.0"	20,07747	19,732032	164,11	109,2	3,6	5,8	13.20	19.20	1.25
05/12/2011	00h 03m 34.79s	-00° 25' 12.0"	20,07743	19,748392	164,24	108,2	3,6	5,8	13.16	19.16	1.21
06/12/2011	00h 03m 33.81s	-00° 25' 15.7"	20,07738	19,764845	164,38	107,1	3,5	5,8	13.12	19.12	1.17
07/12/2011	00h 03m 33.03s	-00° 25' 18.1"	20,07734	19,781386	164,52	106,1	3,5	5,8	13.08	19.08	1.13
08/12/2011	00h 03m 32.44s	-00° 25' 19.4"	20,07730	19,798010	164,66	105,1	3,5	5,8	13.04	19.04	1.09
09/12/2011	00h 03m 32.03s	-00° 25' 19.4"	20,07726	19,814711	164,79	104,1	3,5	5,8	13.00	19.01	1.05
10/12/2011	00h 03m 31.82s	-00° 25' 18.1"	20,07721	19,831485	164,93	103,1	3,5	5,8	12.56	18.57	1.01
11/12/2011	00h 03m 31.79s	-00° 25' 15.7"	20,07717	19,848327	165,07	102,1	3,5	5,8	12.52	18.53	0.97
12/12/2011	00h 03m 31.96s	-00° 25' 11.9"	20,07713	19,865231	165,21	101,0	3,5	5,8	12.48	18.49	0.93
13/12/2011	00h 03m 32.31s	-00° 25' 07.0"	20,07709	19,882194	165,36	100,0	3,5	5,8	12.44	18.45	0.89
14/12/2011	00h 03m 32.84s	-00° 25' 00.9"	20,07704	19,899209	165,50	99,0	3,5	5,8	12.40	18.41	0.85
15/12/2011	00h 03m 33.57s	-00° 24' 53.5"	20,07700	19,916272	165,64	98,0	3,5	5,8	12.36	18.37	0.81
16/12/2011	00h 03m 34.48s	-00° 24' 44.9"	20,07696	19,933379	165,78	97,0	3,5	5,8	12.32	18.33	0.77
17/12/2011	00h 03m 35.58s	-00° 24' 35.1"	20,07691	19,950523	165,92	96,0	3,5	5,8	12.29	18.29	0.73
18/12/2011	00h 03m 36.86s	-00° 24' 24.1"	20,07687	19,967700	166,07	95,0	3,5	5,8	12.25	18.25	0.69
19/12/2011	00h 03m 38.34s	-00° 24' 11.8"	20,07683	19,984905	166,21	94,0	3,5	5,8	12.21	18.21	0.65
20/12/2011	00h 03m 40.01s	-00° 23' 58.3"	20,07678	20,002133	166,35	92,9	3,5	5,8	12.17	18.17	0.61
21/12/2011	00h 03m 41.87s	-00° 23' 43.5"	20,07674	20,019377	166,50	91,9	3,5	5,8	12.13	18.14	0.57
22/12/2011	00h 03m 43.92s	-00° 23' 27.5"	20,07670	20,036633	166,64	90,9	3,5	5,8	12.09	18.10	0.53
23/12/2011	00h 03m 46.17s	-00° 23' 10.2"	20,07665	20,053895	166,78	89,9	3,5	5,8	12.05	18.06	0.49
24/12/2011	00h 03m 48.61s	-00° 22' 51.7"	20,07661	20,071158	166,93	88,9	3,5	5,8	12.01	18.02	0.45
25/12/2011	00h 03m 51.23s	-00° 22' 31.9"	20,07657	20,088415	167,07	87,9	3,5	5,8	11.57	17.58	0.41
26/12/2011	00h 03m 54.05s	-00° 22' 11.0"	20,07652	20,105660	167,21	86,9	3,5	5,8	11.53	17.54	0.37
27/12/2011	00h 03m 57.04s	-00° 21' 48.9"	20,07648	20,122889	167,36	85,9	3,5	5,8	11.49	17.50	0.33
28/12/2011	00h 04m 00.23s	-00° 21' 25.5"	20,07644	20,140096	167,50	84,9	3,5	5,8	11.46	17.46	0.29
29/12/2011	00h 04m 03.59s	-00° 21' 01.0"	20,07639	20,157275	167,64	83,9	3,5	5,8	11.42	17.42	0.25
30/12/2011	00h 04m 07.14s	-00° 20' 35.3"	20,07635	20,174421	167,79	82,9	3,5	5,8	11.38	17.39	0.21
31/12/2011	00h 04m 10.87s	-00° 20' 08.5"	20,07631	20,191529	167,93	81,9	3,5	5,8	11.34	17.35	0.17

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

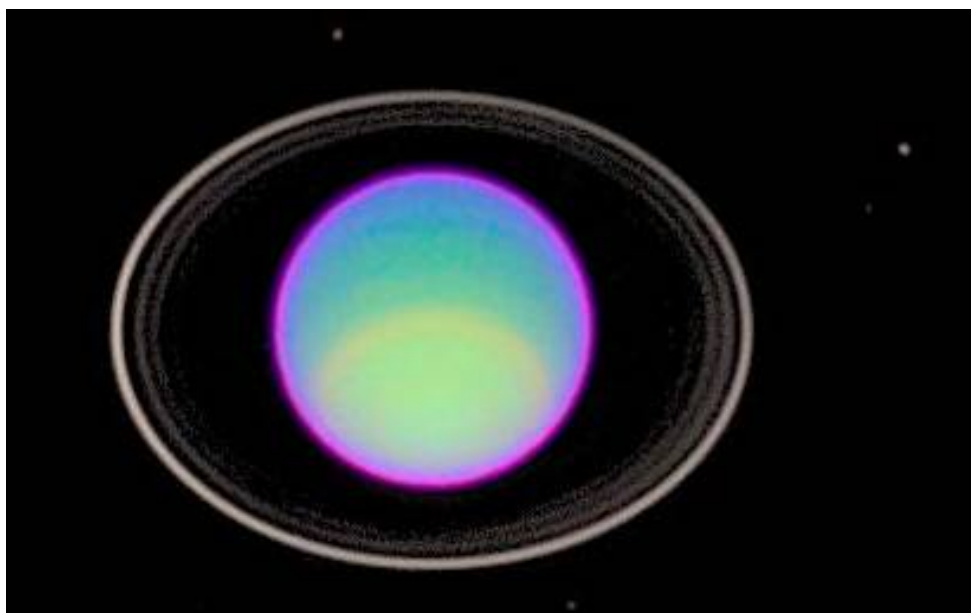
Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1



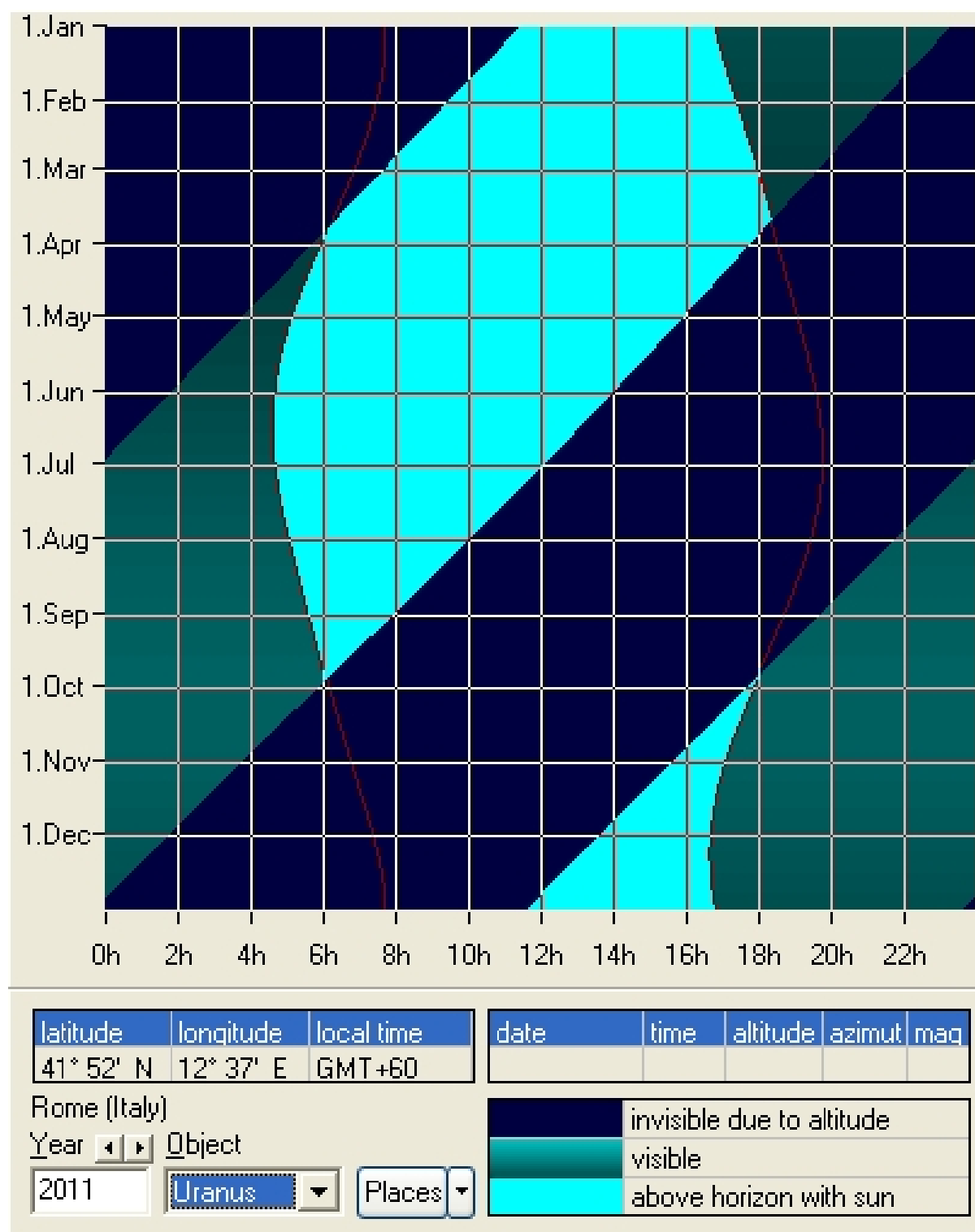
# FENOMENI DI URANO - PHENOMENA OF URANUS

Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	25/09/2011	05:00:54	19,07750 AU	
Apogeo - Apogee	22/03/2011	10:15:39	21,08315 AU	
Magnit. Max - Brightness maximum	25/09/2011	07:59:06	5,7	mag
Magnit. Min - Brightness minimum	22/03/2011	07:22:10	5,9	mag
Opposizione - Opposition	26/09/2011	00:14:45		
Congiunzione - Conjunction	21/03/2011	12:24:02		
Moto retrogr. - Retrograde motion	10/07/2011	08:02:14		
Moto diretto - Prograde motion	10/12/2011	15:14:22		
Max ang. Fase - Maximum phase angle	26/06/2011	17:30:08	2,9	°
Max ang. Fase - Maximum phase angle	22/12/2011	19:13:38	2,8	°
Min ang. Fase - Minimum phase angle	21/03/2011	14:41:24	0,0	°
Min ang. Fase - Minimum phase angle	26/09/2011	04:22:58	0,0	°

© (5)



# VISIBILITA' DI URANO - VISIBILITY OF URANUS



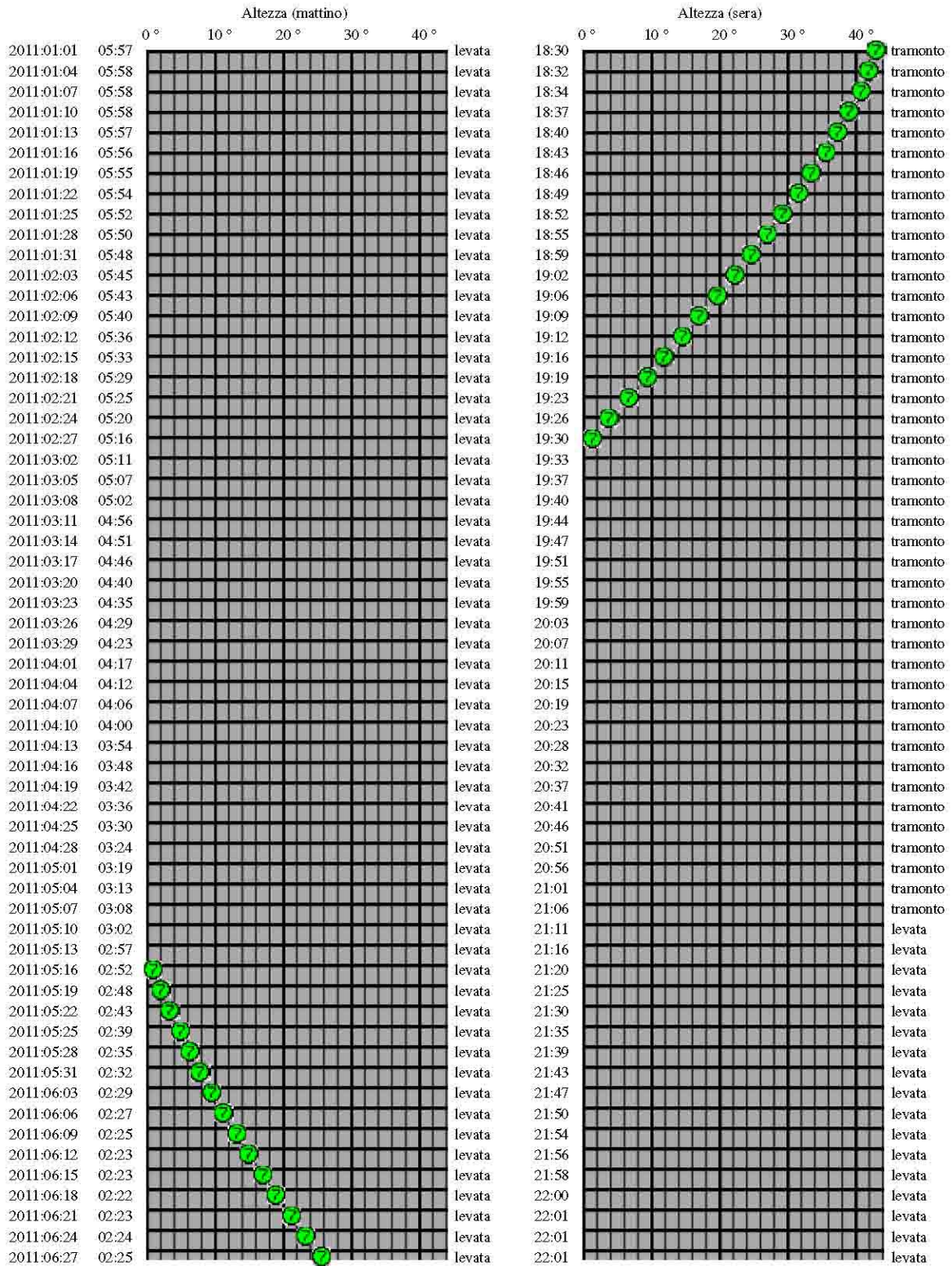
Visibilità di Urano nel corso dell'anno - Visibility of Uranus during the year

# Altezza ai crepuscoli

## di Urano

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

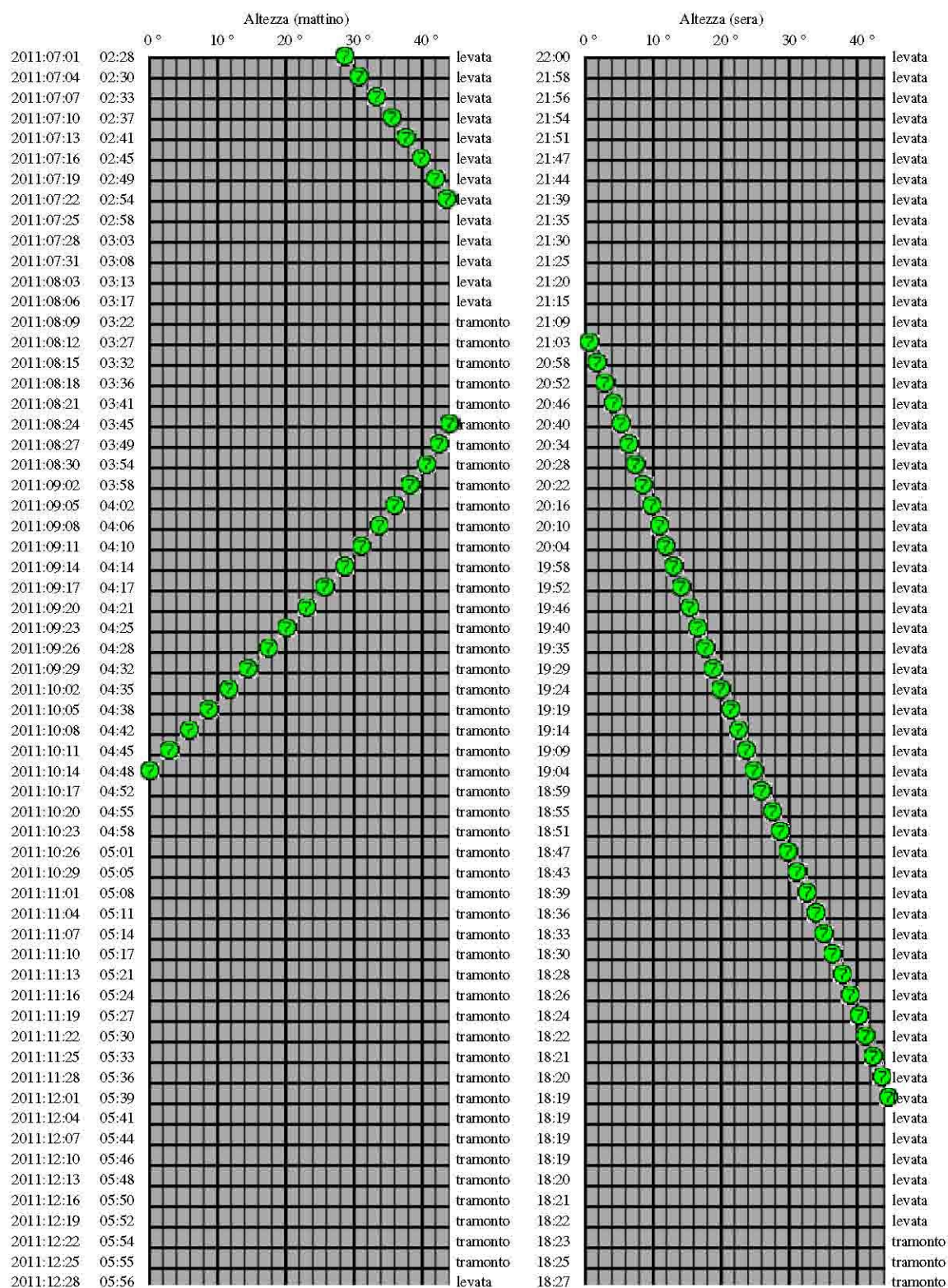


# Altezza ai crepuscoli

## di Urano

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)





Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	-49.0	15.1	76.6	18:30	43.2	205.6	76.0
2011:01:04	05:58	-48.3	19.5	73.6	18:32	42.0	210.0	73.0
2011:01:07	05:58	-47.5	23.7	70.6	18:34	40.6	214.4	70.1
2011:01:10	05:58	-46.6	27.6	67.6	18:37	39.1	218.5	67.1
2011:01:13	05:57	-45.5	31.3	64.6	18:40	37.4	222.5	64.1
2011:01:16	05:56	-44.4	34.7	61.7	18:43	35.5	226.4	61.2
2011:01:19	05:55	-43.2	37.9	58.7	18:46	33.6	230.1	58.2
2011:01:22	05:54	-42.0	40.9	55.8	18:49	31.5	233.6	55.3
2011:01:25	05:52	-40.7	43.6	52.9	18:52	29.3	237.0	52.3
2011:01:28	05:50	-39.5	46.2	49.9	18:55	27.0	240.2	49.4
2011:01:31	05:48	-38.2	48.6	47.0	18:59	24.6	243.3	46.5
2011:02:03	05:45	-36.9	50.8	44.1	19:02	22.2	246.3	43.6
2011:02:06	05:43	-35.6	52.9	41.2	19:06	19.7	249.2	40.7
2011:02:09	05:40	-34.3	54.9	38.3	19:09	17.1	252.0	37.8
2011:02:12	05:36	-33.1	56.7	35.4	19:12	14.6	254.8	34.9
2011:02:15	05:33	-31.8	58.4	32.5	19:16	11.9	257.4	32.0
2011:02:18	05:29	-30.6	60.1	29.7	19:19	9.3	260.0	29.1
2011:02:21	05:25	-29.3	61.6	26.8	19:23	6.6	262.6	26.2
2011:02:24	05:20	-28.1	63.0	23.9	19:26	4.0	265.1	23.4
2011:02:27	05:16	-27.0	64.4	21.1	19:30	1.3	267.6	20.5
2011:03:02	05:11	-25.8	65.7	18.2	19:33	-1.4	270.1	17.7
2011:03:05	05:07	-24.7	67.0	15.4	19:37	-4.1	272.7	14.8
2011:03:08	05:02	-23.6	68.2	12.6	19:40	-6.8	275.2	12.0
2011:03:11	04:56	-22.4	69.3	9.8	19:44	-9.5	277.8	9.2
2011:03:14	04:51	-21.4	70.4	6.9	19:47	-12.2	280.4	6.4
2011:03:17	04:46	-20.3	71.4	4.2	19:51	-14.9	283.1	3.6
2011:03:20	04:40	-19.2	72.5	1.5	19:55	-17.5	285.8	1.0
2011:03:23	04:35	-18.2	73.4	1.7	19:59	-20.2	288.6	2.2
2011:03:26	04:29	-17.2	74.4	4.4	20:03	-22.7	291.6	5.0
2011:03:29	04:23	-16.1	75.3	7.1	20:07	-25.3	294.7	7.8
2011:04:01	04:17	-15.1	76.2	9.9	20:11	-27.8	297.9	10.5
2011:04:04	04:12	-14.1	77.1	12.7	20:15	-30.2	301.3	13.3
2011:04:07	04:06	-13.1	78.0	15.5	20:19	-32.6	304.9	16.1
2011:04:10	04:00	-12.1	78.9	18.3	20:23	-34.8	308.6	18.9
2011:04:13	03:54	-11.1	79.8	21.0	20:28	-37.0	312.7	21.7
2011:04:16	03:48	-10.1	80.6	23.8	20:32	-39.0	317.0	24.5
2011:04:19	03:42	-9.1	81.5	26.6	20:37	-40.9	321.5	27.2
2011:04:22	03:36	-8.1	82.3	29.3	20:41	-42.6	326.3	30.0
2011:04:25	03:30	-7.0	83.2	32.1	20:46	-44.0	331.4	32.8
2011:04:28	03:24	-6.0	84.1	34.9	20:51	-45.3	336.8	35.6
2011:05:01	03:19	-4.9	85.0	37.6	20:56	-46.3	342.5	38.3
2011:05:04	03:13	-3.8	85.9	40.4	21:01	-47.0	348.3	41.1
2011:05:07	03:08	-2.7	86.9	43.2	21:06	-47.4	354.3	43.9
2011:05:10	03:02	-1.5	87.8	45.9	21:11	-47.5	0.3	46.6
2011:05:13	02:57	-0.3	88.8	48.7	21:16	-47.3	6.3	49.4
2011:05:16	02:52	0.9	89.9	51.5	21:20	-46.7	12.3	52.2
2011:05:19	02:48	2.2	91.0	54.2	21:25	-45.9	18.0	55.0
2011:05:22	02:43	3.5	92.1	57.0	21:30	-44.8	23.6	57.7
2011:05:25	02:39	4.9	93.3	59.8	21:35	-43.4	28.8	60.5
2011:05:28	02:35	6.4	94.6	62.6	21:39	-41.9	33.8	63.3
2011:05:31	02:32	7.9	95.9	65.3	21:43	-40.1	38.4	66.1
2011:06:03	02:29	9.5	97.4	68.1	21:47	-38.2	42.7	68.9
2011:06:06	02:27	11.2	98.9	70.9	21:50	-36.2	46.7	71.7
2011:06:09	02:25	13.0	100.5	73.7	21:54	-34.2	50.4	74.5
2011:06:12	02:23	14.9	102.3	76.5	21:56	-32.1	53.8	77.3
2011:06:15	02:23	16.8	104.2	79.3	21:58	-30.0	56.9	80.1
2011:06:18	02:22	18.9	106.3	82.1	22:00	-27.9	59.8	82.9
2011:06:21	02:23	21.0	108.5	84.9	22:01	-25.8	62.5	85.7
2011:06:24	02:24	23.2	110.9	87.8	22:01	-23.8	65.0	88.5
2011:06:27	02:25	25.5	113.5	90.6	22:01	-21.8	67.3	91.4
2011:06:30	02:27	27.8	116.3	93.4	22:00	-19.9	69.4	94.2

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

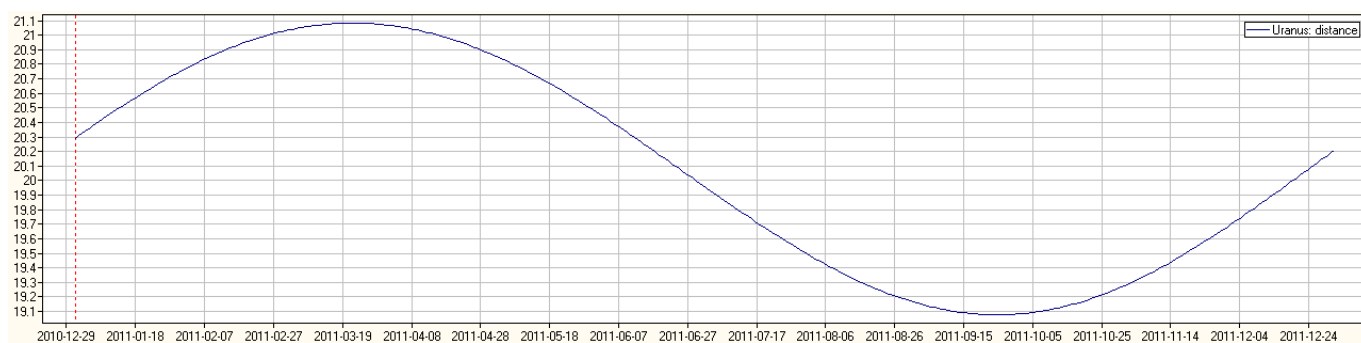
Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

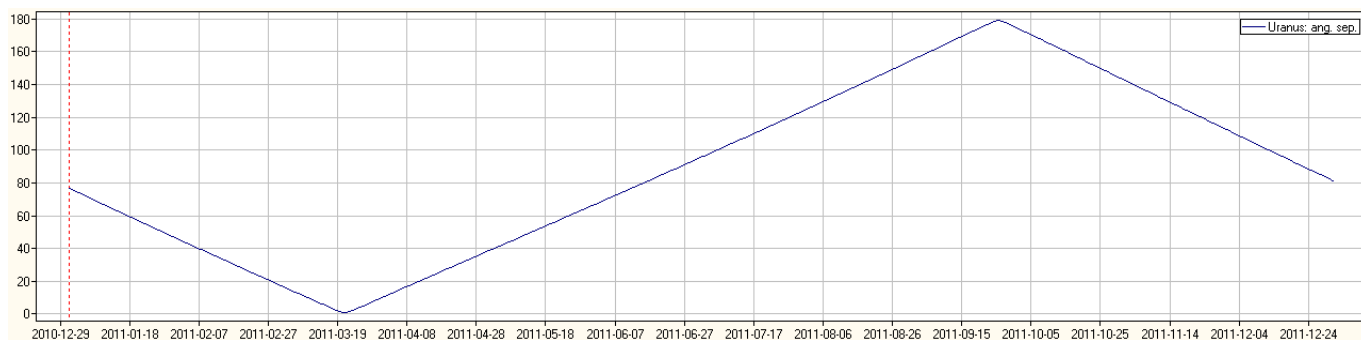
Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	28.6	117.3	94.4	22:00	-19.3	70.0	95.1
2011:07:04	02:30	31.0	120.5	97.2	21:58	-17.5	72.0	98.0
2011:07:07	02:33	33.3	123.9	100.1	21:56	-15.7	73.7	100.8
2011:07:10	02:37	35.6	127.6	102.9	21:54	-14.1	75.4	103.7
2011:07:13	02:41	37.9	131.6	105.8	21:51	-12.5	77.0	106.6
2011:07:16	02:45	40.0	135.9	108.7	21:47	-10.9	78.5	109.4
2011:07:19	02:49	42.0	140.6	111.5	21:44	-9.5	79.9	112.3
2011:07:22	02:54	43.8	145.6	114.4	21:39	-8.0	81.2	115.2
2011:07:25	02:58	45.4	150.9	117.3	21:35	-6.7	82.5	118.1
2011:07:28	03:03	46.8	156.6	120.2	21:30	-5.4	83.7	121.0
2011:07:31	03:08	47.9	162.6	123.2	21:25	-4.1	84.9	123.9
2011:08:03	03:13	48.6	168.9	126.1	21:20	-2.8	86.1	126.8
2011:08:06	03:17	49.0	175.2	129.0	21:15	-1.6	87.2	129.8
2011:08:09	03:22	49.1	181.7	132.0	21:09	-0.4	88.3	132.7
2011:08:12	03:27	48.8	188.1	134.9	21:03	0.8	89.4	135.6
2011:08:15	03:32	48.1	194.3	137.9	20:58	1.9	90.5	138.6
2011:08:18	03:36	47.2	200.4	140.8	20:52	3.1	91.6	141.6
2011:08:21	03:41	45.9	206.2	143.8	20:46	4.2	92.6	144.5
2011:08:24	03:45	44.4	211.6	146.8	20:40	5.3	93.7	147.5
2011:08:27	03:49	42.6	216.8	149.8	20:34	6.4	94.8	150.5
2011:08:30	03:54	40.6	221.6	152.8	20:28	7.5	95.8	153.5
2011:09:02	03:58	38.5	226.2	155.8	20:22	8.6	96.9	156.5
2011:09:05	04:02	36.2	230.4	158.8	20:16	9.8	98.0	159.5
2011:09:08	04:06	33.8	234.4	161.8	20:10	10.9	99.1	162.5
2011:09:11	04:10	31.2	238.1	164.9	20:04	12.0	100.2	165.5
2011:09:14	04:14	28.6	241.6	167.9	19:58	13.1	101.4	168.6
2011:09:17	04:17	25.9	244.9	170.9	19:52	14.2	102.5	171.6
2011:09:20	04:21	23.2	248.1	174.0	19:46	15.4	103.7	174.6
2011:09:23	04:25	20.4	251.1	177.0	19:40	16.5	104.9	177.6
2011:09:26	04:28	17.5	254.0	179.2	19:35	17.7	106.2	179.9
2011:09:29	04:32	14.7	256.8	176.7	19:29	18.9	107.5	176.1
2011:10:02	04:35	11.8	259.5	173.7	19:24	20.0	108.8	173.1
2011:10:05	04:38	8.9	262.2	170.6	19:19	21.2	110.1	170.0
2011:10:08	04:42	5.9	264.8	167.6	19:14	22.4	111.6	166.9
2011:10:11	04:45	3.0	267.4	164.5	19:09	23.7	113.0	163.9
2011:10:14	04:48	0.1	270.0	161.4	19:04	24.9	114.6	160.8
2011:10:17	04:52	-2.8	272.5	158.3	18:59	26.2	116.2	157.7
2011:10:20	04:55	-5.7	275.1	155.2	18:55	27.4	117.8	154.6
2011:10:23	04:58	-8.6	277.7	152.1	18:51	28.7	119.6	151.5
2011:10:26	05:01	-11.5	280.3	149.0	18:47	30.0	121.4	148.5
2011:10:29	05:05	-14.3	283.0	146.0	18:43	31.3	123.3	145.4
2011:11:01	05:08	-17.1	285.8	142.9	18:39	32.6	125.3	142.3
2011:11:04	05:11	-19.9	288.6	139.8	18:36	33.9	127.5	139.2
2011:11:07	05:14	-22.6	291.5	136.7	18:33	35.2	129.7	136.1
2011:11:10	05:17	-25.2	294.5	133.6	18:30	36.5	132.1	133.0
2011:11:13	05:21	-27.8	297.7	130.5	18:28	37.7	134.7	130.0
2011:11:16	05:24	-30.3	301.0	127.4	18:26	39.0	137.4	126.9
2011:11:19	05:27	-32.7	304.4	124.3	18:24	40.2	140.3	123.8
2011:11:22	05:30	-34.9	308.0	121.3	18:22	41.4	143.3	120.7
2011:11:25	05:33	-37.1	311.8	118.2	18:21	42.5	146.6	117.6
2011:11:28	05:36	-39.1	315.8	115.1	18:20	43.6	150.0	114.6
2011:12:01	05:39	-41.0	319.9	112.1	18:19	44.6	153.7	111.5
2011:12:04	05:41	-42.6	324.3	109.0	18:19	45.4	157.6	108.5
2011:12:07	05:44	-44.1	328.8	105.9	18:19	46.2	161.7	105.4
2011:12:10	05:46	-45.4	333.5	102.9	18:19	46.8	166.0	102.4
2011:12:13	05:48	-46.4	338.3	99.8	18:20	47.3	170.5	99.3
2011:12:16	05:50	-47.3	343.2	96.8	18:21	47.6	175.1	96.3
2011:12:19	05:52	-47.9	348.1	93.8	18:22	47.7	179.9	93.2
2011:12:22	05:54	-48.3	353.1	90.7	18:23	47.6	184.8	90.2
2011:12:25	05:55	-48.5	358.0	87.7	18:25	47.3	189.7	87.2
2011:12:28	05:56	-48.4	2.8	84.7	18:27	46.8	194.6	84.2
2011:12:31	05:57	-48.2	7.5	81.7	18:29	46.1	199.5	81.2

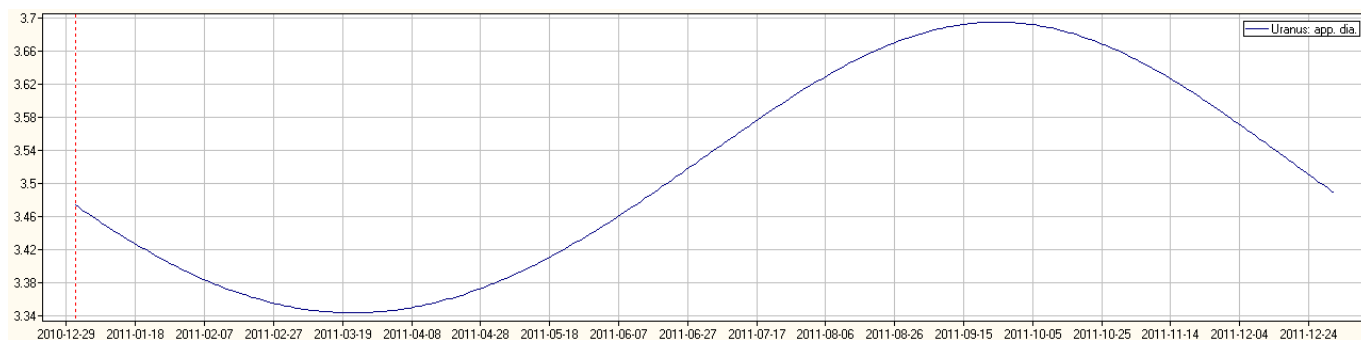
Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza del pianeta sull'orizzonte, in °  
 Az = azimut del pianeta, in °  
 Elong = elongazione del pianeta, in °  
  
 Alt = altitude of the planet above the horizon, in °  
 Az = azimuth of the planet, in °  
 Elong = elongation of the planet, in °



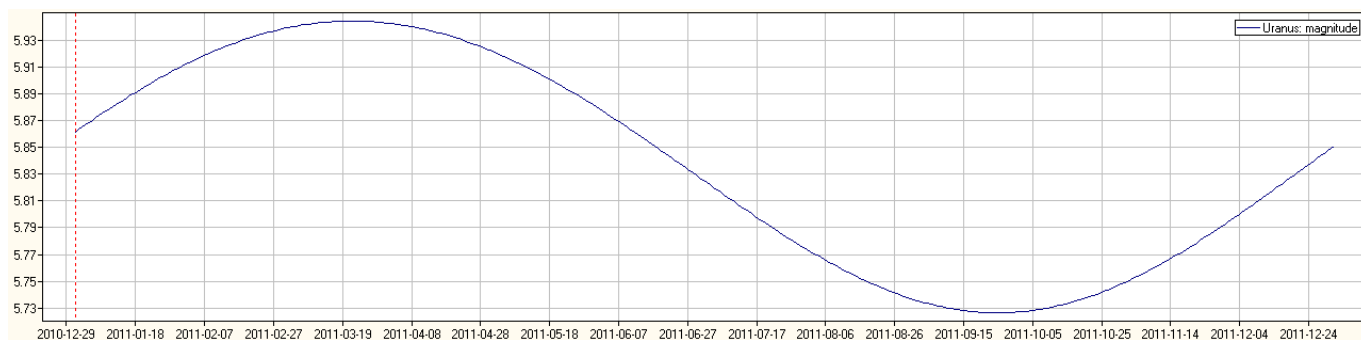
Distanza di Urano in U.A. nel corso dell'anno - Distance of Uranus in A.U. during the year



Elongazione di Urano in ° nel corso dell'anno - Elongation of Uranus in ° during the year



Diametro di Urano in " nel corso dell'anno - Diameter of Uranus in " during the year



Magnitudine di Urano nel corso dell'anno - Magnitude of Uranus during the year



# OCCULTAZIONI TRA I SATELLITI DI URANO

## OCCULTATIONS BETWEEN THE SATELLITES OF URANUS

Year	M	D	h	m	s	Event Type	Ph	Dur	dMag	%Ill	Sep	PA	MinD	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s				
														T1				T2				T3				Tmax				T5				T6				T7
2011	9	20	2	29	15*	(V) occ (I)	A	0	2.1	14.2	3.7	240	5.071																									
2011	10	24	22	0	9*	(V) ecl (I)	A	0	9.9	0.0	13.5	167	0.596																									
2011	11	17	0	30	55*	(V) occ (I)	A	0	2.1	14.2	3.2	272	4.854																									

Ore in T.U.

Legenda :

Data nel formato mese/giorno, un asterisco indica che le lune si avvicinano ma non si occultano  
 Event type : tipo di evento, eclissi o occultazione  
 Ph : fenomeno, M=mancato, E=eclisse penombrale, P=eclisse/occultazione parziale, T=eclisse/occultazione totale, A=eclisse/occultazione anulare  
 Durn : durata in secondi  
 dMag : caduta di luce in magnitudini  
 %ill : cambio in illuminazione, rispetto alla illuminazione intera, della luna rimanente (occultazione) o di entrambe (eclissi)  
 Sep : distanza in " tra satellite occultato/eclissato e centro del pianeta  
 Pa : angolo di posizione tra satellite occultato/eclissato e pianeta  
 MinD : distanza minima tra i centri delle lune o tra la luna e l'ombra  
 T1-T7 : inizio/fine della fase di contatto con la penombra  
 T2-T6 : inizio/fine della fase di contatto con l'ombra o tra i lembi delle lune  
 T3-T5 : inizio/fine della fase di totalità  
 Tmax : tempo di metà evento

Satelliti :

I = Miranda  
 II = Ariel  
 III = Umbriel  
 IV = Titania  
 V = Oberon

Times in T.U.

Date in the format month/day, an asterisk shows that the moons are near but they don't occult  
 Event type : eclipse or occultation  
 Ph : phenomenon, M=missed, E=penumbral eclipse, P=partial eclipse/occultation, T=total eclipse/occultation, A=annular eclipse/occultation  
 Durn : duration in seconds  
 dMag : difference magnitude  
 %ill : defect of illumination, respect to integer  
 Sep : distance in " between the satellite and the center of the planet  
 Pa : position angle between the satellite and the center of the planet  
 MinD : least distance between the satellies  
 T1-T7 : penumbral phase begins/ends  
 T2-T6 : umbra phase begins/ends  
 T3-T5 : totalità phase begins/ends  
 Tmax : middle time of the event

Satellites :

I = Miranda  
 II = Ariel  
 III = Umbriel  
 IV = Titania  
 V = Oberon

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# EFFEMERIDI DI NETTUNO - EPHEMERIDES OF NEPTUNE

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
01/01/2011	21h 56m 30.13s	-13° 03' 20.1"	30,01390	30,681911	255,17	46,5	2,2	8,0	10.08	15.23	20.37
02/01/2011	21h 56m 36.74s	-13° 02' 44.9"	30,01387	30,694394	255,28	45,5	2,2	8,0	10.04	15.19	20.33
03/01/2011	21h 56m 43.45s	-13° 02' 09.2"	30,01384	30,706669	255,38	44,5	2,2	8,0	10.00	15.15	20.29
04/01/2011	21h 56m 50.24s	-13° 01' 33.1"	30,01381	30,718733	255,48	43,6	2,2	8,0	9.57	15.11	20.26
05/01/2011	21h 56m 57.12s	-13° 00' 56.5"	30,01378	30,730581	255,58	42,6	2,2	8,0	9.53	15.07	20.22
06/01/2011	21h 57m 04.08s	-13° 00' 19.5"	30,01375	30,742212	255,68	41,6	2,2	8,0	9.49	15.03	20.18
07/01/2011	21h 57m 11.11s	-12° 59' 42.0"	30,01372	30,753620	255,77	40,6	2,2	8,0	9.45	15.00	20.14
08/01/2011	21h 57m 18.23s	-12° 59' 04.2"	30,01369	30,764802	255,86	39,6	2,2	8,0	9.41	14.56	20.10
09/01/2011	21h 57m 25.42s	-12° 58' 25.9"	30,01366	30,775756	255,95	38,6	2,2	8,0	9.37	14.52	20.07
10/01/2011	21h 57m 32.69s	-12° 57' 47.2"	30,01363	30,786479	256,04	37,6	2,2	8,0	9.33	14.48	20.03
11/01/2011	21h 57m 40.04s	-12° 57' 08.1"	30,01360	30,796966	256,13	36,6	2,2	8,0	9.30	14.44	19.59
12/01/2011	21h 57m 47.46s	-12° 56' 28.6"	30,01357	30,807217	256,22	35,7	2,2	8,0	9.26	14.41	19.55
13/01/2011	21h 57m 54.95s	-12° 55' 48.8"	30,01354	30,817227	256,30	34,7	2,2	8,0	9.22	14.37	19.52
14/01/2011	21h 58m 02.51s	-12° 55' 08.5"	30,01351	30,826994	256,38	33,7	2,2	8,0	9.18	14.33	19.48
15/01/2011	21h 58m 10.14s	-12° 54' 27.8"	30,01348	30,836517	256,46	32,7	2,2	8,0	9.14	14.29	19.44
16/01/2011	21h 58m 17.84s	-12° 53' 46.8"	30,01345	30,845791	256,54	31,7	2,2	8,0	9.10	14.25	19.40
17/01/2011	21h 58m 25.61s	-12° 53' 05.4"	30,01342	30,854816	256,61	30,7	2,2	8,0	9.06	14.22	19.37
18/01/2011	21h 58m 33.44s	-12° 52' 23.8"	30,01339	30,863589	256,68	29,7	2,2	8,0	9.03	14.18	19.33
19/01/2011	21h 58m 41.33s	-12° 51' 41.8"	30,01335	30,872108	256,76	28,8	2,2	8,0	8.59	14.14	19.29
20/01/2011	21h 58m 49.28s	-12° 50' 59.5"	30,01332	30,880372	256,82	27,8	2,2	8,0	8.55	14.10	19.25
21/01/2011	21h 58m 57.28s	-12° 50' 16.9"	30,01329	30,888377	256,89	26,8	2,2	8,0	8.51	14.06	19.22
22/01/2011	21h 59m 05.33s	-12° 49' 34.0"	30,01326	30,896122	256,96	25,8	2,2	8,0	8.47	14.03	19.18
23/01/2011	21h 59m 13.43s	-12° 48' 50.9"	30,01323	30,903605	257,02	24,8	2,2	8,0	8.43	13.59	19.14
24/01/2011	21h 59m 21.58s	-12° 48' 07.5"	30,01320	30,910824	257,08	23,9	2,2	8,0	8.40	13.55	19.10
25/01/2011	21h 59m 29.78s	-12° 47' 23.8"	30,01317	30,917776	257,14	22,9	2,2	8,0	8.36	13.51	19.07
26/01/2011	21h 59m 38.02s	-12° 46' 39.8"	30,01314	30,924460	257,19	21,9	2,2	8,0	8.32	13.47	19.03
27/01/2011	21h 59m 46.32s	-12° 45' 55.5"	30,01311	30,930874	257,24	20,9	2,2	8,0	8.28	13.44	18.59
28/01/2011	21h 59m 54.67s	-12° 45' 11.0"	30,01308	30,937014	257,30	19,9	2,2	8,0	8.24	13.40	18.55
29/01/2011	22h 00m 03.06s	-12° 44' 26.3"	30,01305	30,942880	257,34	18,9	2,2	8,0	8.20	13.36	18.52
30/01/2011	22h 00m 11.49s	-12° 43' 41.3"	30,01302	30,948469	257,39	18,0	2,2	8,0	8.17	13.32	18.48
31/01/2011	22h 00m 19.95s	-12° 42' 56.2"	30,01299	30,953779	257,43	17,0	2,2	8,0	8.13	13.28	18.44
01/02/2011	22h 00m 28.46s	-12° 42' 10.9"	30,01296	30,958809	257,48	16,0	2,2	8,0	8.09	13.25	18.40
02/02/2011	22h 00m 36.99s	-12° 41' 25.4"	30,01293	30,963558	257,52	15,0	2,2	8,0	8.05	13.21	18.37
03/02/2011	22h 00m 45.55s	-12° 40' 39.7"	30,01290	30,968023	257,55	14,0	2,2	8,0	8.01	13.17	18.33
04/02/2011	22h 00m 54.14s	-12° 39' 53.9"	30,01287	30,972204	257,59	13,1	2,2	8,0	7.57	13.13	18.29
05/02/2011	22h 01m 02.76s	-12° 39' 08.0"	30,01283	30,976099	257,62	12,1	2,2	8,0	7.54	13.09	18.25
06/02/2011	22h 01m 11.39s	-12° 38' 21.9"	30,01280	30,979709	257,65	11,1	2,2	8,0	7.50	13.06	18.22
07/02/2011	22h 01m 20.05s	-12° 37' 35.6"	30,01277	30,983031	257,68	10,1	2,2	8,0	7.46	13.02	18.18
08/02/2011	22h 01m 28.73s	-12° 36' 49.3"	30,01274	30,986065	257,70	9,2	2,2	8,0	7.42	12.58	18.14
09/02/2011	22h 01m 37.43s	-12° 36' 02.9"	30,01271	30,988811	257,73	8,2	2,2	8,0	7.38	12.54	18.10
10/02/2011	22h 01m 46.15s	-12° 35' 16.3"	30,01268	30,991269	257,75	7,2	2,2	8,0	7.34	12.50	18.07
11/02/2011	22h 01m 54.89s	-12° 34' 29.6"	30,01265	30,993437	257,76	6,3	2,2	8,0	7.30	12.47	18.03
12/02/2011	22h 02m 03.64s	-12° 33' 42.9"	30,01262	30,995316	257,78	5,3	2,2	8,0	7.27	12.43	17.59
13/02/2011	22h 02m 12.40s	-12° 32' 56.1"	30,01259	30,996906	257,79	4,3	2,2	8,0	7.23	12.39	17.55
14/02/2011	22h 02m 21.18s	-12° 32' 09.3"	30,01256	30,998207	257,80	3,4	2,2	8,0	7.19	12.35	17.52
15/02/2011	22h 02m 29.96s	-12° 31' 22.4"	30,01253	30,999220	257,81	2,4	2,2	8,0	7.15	12.32	17.48
16/02/2011	22h 02m 38.75s	-12° 30' 35.5"	30,01250	30,999943	257,82	1,5	2,2	8,0	7.11	12.28	17.44
17/02/2011	22h 02m 47.55s	-12° 29' 49.0"	30,01247	31,000378	257,82	0,8	2,2	8,0	7.07	12.24	17.41
18/02/2011	22h 02m 56.27s	-12° 29' 02.3"	30,01244	31,000525	257,82	0,9	2,2	8,0	7.04	12.20	17.37
19/02/2011	22h 03m 05.05s	-12° 28' 15.1"	30,01241	31,000384	257,82	1,7	2,2	8,0	7.00	12.16	17.33
20/02/2011	22h 03m 13.82s	-12° 27' 28.2"	30,01237	30,999955	257,82	2,6	2,2	8,0	6.56	12.13	17.29
21/02/2011	22h 03m 22.58s	-12° 26' 41.3"	30,01234	30,999239	257,81	3,5	2,2	8,0	6.52	12.09	17.26
22/02/2011	22h 03m 31.34s	-12° 25' 54.5"	30,01231	30,998236	257,80	4,5	2,2	8,0	6.48	12.05	17.22
23/02/2011	22h 03m 40.09s	-12° 25' 07.7"	30,01228	30,996945	257,79	5,4	2,2	8,0	6.44	12.01	17.18
24/02/2011	22h 03m 48.83s	-12° 24' 20.9"	30,01225	30,995367	257,78	6,4	2,2	8,0	6.41	11.57	17.14
25/02/2011	22h 03m 57.56s	-12° 23' 34.2"	30,01222	30,993502	257,77	7,4	2,2	8,0	6.37	11.54	17.11
26/02/2011	22h 04m 06.28s	-12° 22' 47.5"	30,01219	30,991350	257,75	8,3	2,2	8,0	6.33	11.50	17.07
27/02/2011	22h 04m 14.99s	-12° 22' 01.0"	30,01216	30,988912	257,73	9,3	2,2	8,0	6.29	11.46	17.03
28/02/2011	22h 04m 23.67s	-12° 21' 14.6"	30,01213	30,986188	257,70	10,3	2,2	8,0	6.25	11.42	16.59
01/03/2011	22h 04m 32.33s	-12° 20' 28.3"	30,01210	30,983179	257,68	11,2	2,2	8,0	6.21	11.39	16.56
02/03/2011	22h 04m 40.96s	-12° 19' 42.1"	30,01207	30,979886	257,65	12,2	2,2	8,0	6.18	11.35	16.52
03/03/2011	22h 04m 49.57s	-12° 18' 56.1"	30,01204	30,976310	257,62	13,2	2,2	8,0	6.14	11.31	16.48
04/03/2011	22h 04m 58.15s	-12° 18' 10.3"	30,01201	30,972452	257,59	14,1	2,2	8,0	6.10	11.27	16.44
05/03/2011	22h 05m 06.70s	-12° 17' 24.6"	30,01197	30,968313	257,56	15,1	2,2	8,0	6.06	11.23	16.41
06/03/2011	22h 05m 15.21s	-12° 16' 39.0"	30,01194	30,963895	257,52	16,1	2,2	8,0	6.02	11.20	16.37
07/03/2011	22h 05m 23.69s	-12° 15' 53.7"	30,01191	30,959199	257,48	17,0	2,2	8,0	5.58	11.16	16.33
08/03/2011	22h 05m 32.14s	-12° 15' 08.5"	30,01188	30,954227	257,44	18,0	2,2	8,0	5.55	11.12	16.29
09/03/2011	22h 05m 40.55s	-12° 14' 23.5"	30,01185	30,948980	257,39	19,0	2,2	8,0	5.51	11.08	16.26
10/03/2011	22h 05m 48.92s	-12° 13' 38.7"	30,01182	30,943461	257,35	19,9	2,2	8,0	5.47	11.04	16.22
11/03/2011	22h 05m 57.26s	-12° 12' 54.1"	30,01179	30,937671	257,30	20,9	2,2	8,0	5.43	11.01	16.18
12/03/2011	22h 06m 05.55s	-12° 12' 09.8"	30,01176	30,931613	257,25	21,8	2,2	8,0	5.39	10.57	16.14
13/03/2011	22h 06m 13.80s	-12° 11' 25.6"	30,01173	30,925288	257,20	22,8	2,2	8,0	5.35	10.53	16.11
14/03/2011	22h 06m 22.01s	-12° 10' 41.8"	30,01170	30,918700	257,14	23,8	2,2	8,0	5.32	10.49	16.07
15/03/2011	22h 06m 30.17s	-12° 09' 58.2"	30,01167	30,911849	257,09	24,7	2,2	8,0	5.28	10.45	16.03
16/03/2011	22h 06m 38.27s	-12° 09' 14.9"	30,01164	30,904740	257,03	25,7	2,2	8,0	5.24	10.42	15.59
17/03/2011	22h 06m 46.32s	-12° 08' 31.9"	30,01161	30,897374	256,97	26,7	2,2	8,0	5.20	10.38	15.56
18/03/2011	22h 06m 54.32s	-12° 07' 49.2"	30,01157	30,889753	256,90	27,6	2,2	8,0	5.16	10.34	15.52
19/03/2011	22h 07m 02.25s	-12° 07' 06.8"	30,01154	30,881880	256,84	28,6	2,2	8,0	5.12	10.30	15.48
20/03/2011	22h 07m 10.13s	-12° 06' 24.8"	30,01151	30,873757	256,77	29,5	2,2	8,0	5.08	10.26	15.44
21/03/2011	22h 07m 17.95s	-12° 05' 43.0"	30,01148	30,865387	256,70	30,5	2,2	8,0	5.05	10.23	15.41
22/03/2011	22h 07m 25.71s	-12° 05' 01.5"	30,01145	30,856771	256,63	31,5	2,2	8,0	5.01	10.19	15.37
23/03/2011	22h 07m 33.41s	-12° 04' 20.4"	30,01142	30,847912	256,55	32,4	2,2	8,0	4.57	10.15	15.33
24/03/2011	22h 07m 41.06s	-12° 03' 39.5"	30,01139	30,838							

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
09/04/2011	22h 09m 33.37s	-11° 53' 41.8"	30,01089	30,662592	255,01	48,7	2,2	7,9	3,51	9,10	14,29
10/04/2011	22h 09m 39.69s	-11° 53' 08.3"	30,01086	30,649830	254,91	49,6	2,2	7,9	3,48	9,06	14,25
11/04/2011	22h 09m 45.92s	-11° 52' 35.3"	30,01083	30,636884	254,80	50,6	2,2	7,9	3,44	9,03	14,21
12/04/2011	22h 09m 52.06s	-11° 52' 02.8"	30,01080	30,623758	254,69	51,5	2,2	7,9	3,40	8,59	14,18
13/04/2011	22h 09m 58.10s	-11° 51' 30.9"	30,01077	30,610456	254,58	52,5	2,2	7,9	3,36	8,55	14,14
14/04/2011	22h 10m 04.04s	-11° 50' 59.6"	30,01074	30,596983	254,47	53,5	2,2	7,9	3,32	8,51	14,10
15/04/2011	22h 10m 09.88s	-11° 50' 28.8"	30,01071	30,583342	254,35	54,4	2,2	7,9	3,28	8,47	14,06
16/04/2011	22h 10m 15.62s	-11° 49' 58.5"	30,01068	30,569537	254,24	55,4	2,2	7,9	3,24	8,43	14,02
17/04/2011	22h 10m 21.26s	-11° 49' 28.8"	30,01065	30,555572	254,12	56,3	2,2	7,9	3,20	8,40	13,59
18/04/2011	22h 10m 26.81s	-11° 48' 59.5"	30,01062	30,541451	254,01	57,3	2,2	7,9	3,17	8,36	13,55
19/04/2011	22h 10m 32.25s	-11° 48' 30.9"	30,01058	30,527177	253,89	58,2	2,2	7,9	3,13	8,32	13,51
20/04/2011	22h 10m 37.61s	-11° 48' 02.8"	30,01055	30,512754	253,77	59,2	2,2	7,9	3,09	8,28	13,47
21/04/2011	22h 10m 42.86s	-11° 47' 35.2"	30,01052	30,498185	253,65	60,1	2,2	7,9	3,05	8,24	13,43
22/04/2011	22h 10m 48.01s	-11° 47' 08.2"	30,01049	30,483474	253,52	61,1	2,2	7,9	3,01	8,20	13,39
23/04/2011	22h 10m 53.05s	-11° 46' 41.8"	30,01046	30,468625	253,40	62,0	2,2	7,9	2,57	8,16	13,36
24/04/2011	22h 10m 57.99s	-11° 46' 16.0"	30,01043	30,453642	253,28	63,0	2,2	7,9	2,53	8,13	13,32
25/04/2011	22h 11m 02.82s	-11° 45' 50.9"	30,01040	30,438528	253,15	63,9	2,2	7,9	2,49	8,09	13,28
26/04/2011	22h 11m 07.53s	-11° 45' 26.3"	30,01037	30,423288	253,02	64,9	2,2	7,9	2,46	8,05	13,24
27/04/2011	22h 11m 12.14s	-11° 45' 02.4"	30,01034	30,407926	252,89	65,9	2,2	7,9	2,42	8,01	13,20
28/04/2011	22h 11m 16.63s	-11° 44' 39.1"	30,01030	30,392446	252,77	66,8	2,2	7,9	2,38	7,57	13,17
29/04/2011	22h 11m 21.01s	-11° 44' 16.4"	30,01027	30,376853	252,64	67,8	2,2	7,9	2,34	7,53	13,13
30/04/2011	22h 11m 25.27s	-11° 43' 54.4"	30,01024	30,361150	252,51	68,7	2,2	7,9	2,30	7,49	13,09
01/05/2011	22h 11m 29.43s	-11° 43' 33.0"	30,01021	30,345344	252,37	69,7	2,2	7,9	2,26	7,46	13,05
02/05/2011	22h 11m 33.47s	-11° 43' 12.2"	30,01018	30,329437	252,24	70,6	2,2	7,9	2,22	7,42	13,01
03/05/2011	22h 11m 37.40s	-11° 42' 52.0"	30,01015	30,313435	252,11	71,6	2,2	7,9	2,18	7,38	12,57
04/05/2011	22h 11m 41.21s	-11° 42' 32.5"	30,01012	30,297343	251,98	72,5	2,2	7,9	2,15	7,34	12,53
05/05/2011	22h 11m 44.91s	-11° 42' 13.6"	30,01009	30,281165	251,84	73,5	2,2	7,9	2,11	7,30	12,50
06/05/2011	22h 11m 48.49s	-11° 41' 55.4"	30,01006	30,264907	251,71	74,4	2,2	7,9	2,07	7,26	12,46
07/05/2011	22h 11m 51.96s	-11° 41' 37.8"	30,01002	30,248573	251,57	75,4	2,2	7,9	2,03	7,22	12,42
08/05/2011	22h 11m 55.31s	-11° 41' 20.9"	30,00999	30,232168	251,43	76,3	2,2	7,9	1,59	7,18	12,38
09/05/2011	22h 11m 58.54s	-11° 41' 04.7"	30,00996	30,215696	251,30	77,3	2,2	7,9	1,55	7,15	12,34
10/05/2011	22h 12m 01.64s	-11° 40' 49.2"	30,00993	30,199164	251,16	78,3	2,2	7,9	1,51	7,11	12,30
11/05/2011	22h 12m 04.62s	-11° 40' 34.4"	30,00990	30,182575	251,02	79,2	2,2	7,9	1,47	7,07	12,26
12/05/2011	22h 12m 07.48s	-11° 40' 20.2"	30,00987	30,165935	250,88	80,2	2,2	7,9	1,43	7,03	12,23
13/05/2011	22h 12m 10.22s	-11° 40' 06.8"	30,00984	30,149248	250,74	81,1	2,2	7,9	1,39	6,59	12,19
14/05/2011	22h 12m 12.83s	-11° 39' 54.0"	30,00981	30,132519	250,60	82,1	2,2	7,9	1,36	6,55	12,15
15/05/2011	22h 12m 15.32s	-11° 39' 41.8"	30,00978	30,115752	250,46	83,0	2,2	7,9	1,32	6,51	12,11
16/05/2011	22h 12m 17.69s	-11° 39' 30.4"	30,00974	30,098951	250,33	84,0	2,2	7,9	1,28	6,47	12,07
17/05/2011	22h 12m 19.95s	-11° 39' 19.5"	30,00971	30,082122	250,19	84,9	2,2	7,9	1,24	6,44	12,03
18/05/2011	22h 12m 22.08s	-11° 39' 09.4"	30,00968	30,065268	250,05	85,9	2,2	7,9	1,20	6,40	11,59
19/05/2011	22h 12m 24.10s	-11° 38' 59.9"	30,00965	30,048394	249,90	86,8	2,2	7,9	1,16	6,36	11,55
20/05/2011	22h 12m 25.99s	-11° 38' 51.2"	30,00962	30,031503	249,76	87,8	2,2	7,9	1,12	6,32	11,51
21/05/2011	22h 12m 27.76s	-11° 38' 43.1"	30,00959	30,014600	249,62	88,8	2,2	7,9	1,08	6,28	11,48
22/05/2011	22h 12m 29.40s	-11° 38' 35.8"	30,00956	29,997690	249,48	89,7	2,2	7,9	1,04	6,24	11,44
23/05/2011	22h 12m 30.91s	-11° 38' 29.1"	30,00953	29,980778	249,34	90,7	2,2	7,9	1,00	6,20	11,40
24/05/2011	22h 12m 32.30s	-11° 38' 23.2"	30,00949	29,963867	249,20	91,6	2,2	7,9	0,56	6,16	11,36
25/05/2011	22h 12m 33.56s	-11° 38' 18.0"	30,00946	29,946963	249,06	92,6	2,2	7,9	0,53	6,12	11,32
26/05/2011	22h 12m 34.69s	-11° 38' 13.5"	30,00943	29,930070	248,92	93,5	2,2	7,9	0,49	6,08	11,28
27/05/2011	22h 12m 35.70s	-11° 38' 09.7"	30,00940	29,913193	248,78	94,5	2,2	7,9	0,45	6,04	11,24
28/05/2011	22h 12m 36.58s	-11° 38' 06.6"	30,00937	29,896337	248,64	95,4	2,2	7,9	0,41	6,01	11,20
29/05/2011	22h 12m 37.34s	-11° 38' 04.1"	30,00934	29,879508	248,50	96,4	2,2	7,9	0,37	5,57	11,16
30/05/2011	22h 12m 37.97s	-11° 38' 02.4"	30,00931	29,862709	248,36	97,4	2,2	7,9	0,33	5,53	11,12
31/05/2011	22h 12m 38.49s	-11° 38' 01.3"	30,00928	29,845946	248,22	98,3	2,2	7,9	0,29	5,49	11,08
01/06/2011	22h 12m 38.87s	-11° 38' 00.9"	30,00924	29,829224	248,08	99,3	2,3	7,9	0,25	5,45	11,05
02/06/2011	22h 12m 39.14s	-11° 38' 01.3"	30,00921	29,812548	247,94	100,2	2,3	7,9	0,21	5,41	11,01
03/06/2011	22h 12m 39.28s	-11° 38' 02.3"	30,00918	29,795923	247,81	101,2	2,3	7,9	0,17	5,37	10,57
04/06/2011	22h 12m 39.30s	-11° 38' 04.0"	30,00915	29,779355	247,67	102,1	2,3	7,9	0,13	5,33	10,53
05/06/2011	22h 12m 39.19s	-11° 38' 06.4"	30,00912	29,762847	247,53	103,1	2,3	7,9	0,09	5,29	10,49
06/06/2011	22h 12m 38.95s	-11° 38' 09.5"	30,00909	29,746406	247,39	104,1	2,3	7,9	0,05	5,25	10,45
07/06/2011	22h 12m 38.59s	-11° 38' 13.4"	30,00906	29,730035	247,26	105,0	2,3	7,9	0,02	5,21	10,41
08/06/2011	22h 12m 38.10s	-11° 38' 17.9"	30,00902	29,713741	247,12	106,0	2,3	7,9	23,54	5,17	10,37
09/06/2011	22h 12m 37.49s	-11° 38' 23.1"	30,00899	29,697527	246,99	106,9	2,3	7,9	23,50	5,13	10,33
10/06/2011	22h 12m 36.75s	-11° 38' 29.0"	30,00896	29,681398	246,85	107,9	2,3	7,9	23,46	5,09	10,29
11/06/2011	22h 12m 35.89s	-11° 38' 35.6"	30,00893	29,665359	246,72	108,9	2,3	7,9	23,42	5,05	10,25
12/06/2011	22h 12m 34.92s	-11° 38' 42.8"	30,00890	29,649414	246,59	109,8	2,3	7,9	23,38	5,02	10,21
13/06/2011	22h 12m 33.82s	-11° 38' 50.6"	30,00887	29,633567	246,45	110,8	2,3	7,9	23,34	4,58	10,17
14/06/2011	22h 12m 32.61s	-11° 38' 59.1"	30,00884	29,617822	246,32	111,7	2,3	7,9	23,30	4,54	10,13
15/06/2011	22h 12m 31.29s	-11° 39' 08.2"	30,00880	29,602183	246,19	112,7	2,3	7,9	23,26	4,50	10,09
16/06/2011	22h 12m 29.84s	-11° 39' 18.0"	30,00877	29,586655	246,06	113,7	2,3	7,9	23,22	4,46	10,05
17/06/2011	22h 12m 28.28s	-11° 39' 28.5"	30,00874	29,571242	245,94	114,6	2,3	7,9	23,18	4,42	10,01
18/06/2011	22h 12m 26.60s	-11° 39' 39.6"	30,00871	29,555946	245,81	115,6	2,3	7,9	23,14	4,38	9,57
19/06/2011	22h 12m 24.80s	-11° 39' 51.4"	30,00868	29,540774	245,68	116,5	2,3	7,9	23,10	4,34	9,53
20/06/2011	22h 12m 22.89s	-11° 40' 03.8"	30,00865	29,525729	245,56	117,5	2,3	7,9	23,06	4,30	9,49
21/06/2011	22h 12m 20.85s	-11° 40' 16.9"	30,00862	29,510814	245,43	118,5	2,3	7,9	23,02	4,26	9,45
22/06/2011	22h 12m 18.70s	-11° 40' 30.6"	30,00858	29,496036	245,31	119,4	2,3	7,9	22,58	4,22	9,41
23/06/2011	22h 12m 16.43s	-11° 40' 45.0"	30,00855	29,481397	245,19	120,4	2,3	7,9	22,54	4,18	9,37
24/06/2011	22h 12m 14.05s	-11° 40' 59.9"	30,00852	29,466903	245,07	121,4	2,3	7,9	22,50	4,14	9,34
25/06/2011	22h 12m 11.55s	-11° 41' 15.5"	30,00849	29,452557	244,95	122,3	2,3	7,9	22,47	4,10	9,30
26/06/2011	22h 12m 08.95s	-11° 41' 31.7"	30,00846	29,438364	244,83	123,3	2,3	7,9	22,43	4,06	9,26
27/06/2011	22h 12m 06.24s	-11° 41' 48.4"	30,00843	29,424329	244,71	124,3	2,3	7,8	22,39	4,02	9,22
28/06/2011	22h 12m 03.42s	-11° 42' 05.8"	30,00840	29,410455	244,60	125,2	2,3	7,8	22,35	3,58	9,18
29/06/2011	22h 12m 00.50s	-11° 42' 23.7"	30,00836	29,396748	244,49	126,2	2,3	7,8	22,31	3,54	9,14
30/06/2011	22h 11m 57.47s	-11° 42' 42.2"	30,00833	29,383211	244,37	127,2	2,3	7,8	22,27	3,50	9,10
01/07											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
22/07/2011	22h 10m 26.48s	-11° 51' 40.6"	30.00764	29,136208	242,32	148,5	2,3	7,8	20.59	2.22	7.41
23/07/2011	22h 10m 21.38s	-11° 52' 10.2"	30.00761	29,127586	242,25	149,5	2,3	7,8	20.55	2.18	7.37
24/07/2011	22h 10m 16.21s	-11° 52' 40.1"	30.00758	29,119215	242,18	150,5	2,3	7,8	20.51	2.14	7.33
25/07/2011	22h 10m 10.98s	-11° 53' 10.4"	30.00754	29,111096	242,11	151,5	2,3	7,8	20.47	2.10	7.29
26/07/2011	22h 10m 05.68s	-11° 53' 40.9"	30.00751	29,103234	242,04	152,5	2,3	7,8	20.43	2.06	7.25
27/07/2011	22h 10m 00.32s	-11° 54' 11.9"	30.00748	29,095631	241,98	153,4	2,3	7,8	20.39	2.02	7.21
28/07/2011	22h 09m 54.90s	-11° 54' 43.1"	30.00745	29,088290	241,92	154,4	2,3	7,8	20.35	1.58	7.17
29/07/2011	22h 09m 49.41s	-11° 55' 14.7"	30.00742	29,081213	241,86	155,4	2,3	7,8	20.31	1.54	7.13
30/07/2011	22h 09m 43.87s	-11° 55' 46.5"	30.00739	29,074403	241,80	156,4	2,3	7,8	20.27	1.50	7.09
31/07/2011	22h 09m 38.27s	-11° 56' 18.7"	30.00736	29,067862	241,75	157,4	2,3	7,8	20.23	1.46	7.04
01/08/2011	22h 09m 32.62s	-11° 56' 51.2"	30.00732	29,061593	241,70	158,3	2,3	7,8	20.19	1.42	7.00
02/08/2011	22h 09m 26.90s	-11° 57' 23.9"	30.00729	29,055598	241,65	159,3	2,3	7,8	20.15	1.38	6.56
03/08/2011	22h 09m 21.14s	-11° 57' 56.9"	30.00726	29,049878	241,60	160,3	2,3	7,8	20.11	1.34	6.52
04/08/2011	22h 09m 15.33s	-11° 58' 30.1"	30.00723	29,044436	241,56	161,3	2,3	7,8	20.07	1.30	6.48
05/08/2011	22h 09m 09.47s	-11° 59' 03.5"	30.00720	29,039273	241,51	162,3	2,3	7,8	20.03	1.26	6.44
06/08/2011	22h 09m 03.58s	-11° 59' 37.1"	30.00717	29,034391	241,47	163,2	2,3	7,8	19.59	1.22	6.40
07/08/2011	22h 08m 57.65s	-12° 00' 10.8"	30.00713	29,029790	241,43	164,2	2,3	7,8	19.55	1.18	6.36
08/08/2011	22h 08m 51.68s	-12° 00' 44.7"	30.00710	29,025472	241,40	165,2	2,3	7,8	19.51	1.14	6.32
09/08/2011	22h 08m 45.68s	-12° 01' 18.8"	30.00707	29,021438	241,36	166,2	2,3	7,8	19.47	1.10	6.28
10/08/2011	22h 08m 39.65s	-12° 01' 53.0"	30.00704	29,017688	241,33	167,2	2,3	7,8	19.43	1.06	6.24
11/08/2011	22h 08m 33.58s	-12° 02' 27.4"	30.00701	29,014225	241,30	168,2	2,3	7,8	19.39	1.02	6.20
12/08/2011	22h 08m 27.49s	-12° 03' 02.0"	30.00698	29,011048	241,28	169,1	2,3	7,8	19.35	0.58	6.16
13/08/2011	22h 08m 21.36s	-12° 03' 36.6"	30.00694	29,008158	241,25	170,1	2,3	7,8	19.31	0.54	6.12
14/08/2011	22h 08m 15.21s	-12° 04' 11.4"	30.00691	29,005557	241,23	171,1	2,3	7,8	19.27	0.49	6.08
15/08/2011	22h 08m 09.03s	-12° 04' 46.3"	30.00688	29,003246	241,21	172,1	2,3	7,8	19.23	0.45	6.03
16/08/2011	22h 08m 02.83s	-12° 05' 21.3"	30.00685	29,001224	241,20	173,1	2,3	7,8	19.19	0.41	5.59
17/08/2011	22h 07m 56.62s	-12° 05' 56.4"	30.00682	28,999494	241,18	174,1	2,3	7,8	19.15	0.37	5.55
18/08/2011	22h 07m 50.38s	-12° 06' 31.5"	30.00679	28,998056	241,17	175,0	2,3	7,8	19.11	0.33	5.51
19/08/2011	22h 07m 44.14s	-12° 07' 06.6"	30.00675	28,996911	241,16	176,0	2,3	7,8	19.07	0.29	5.47
20/08/2011	22h 07m 37.88s	-12° 07' 41.7"	30.00672	28,996059	241,15	177,0	2,3	7,8	19.03	0.25	5.43
21/08/2011	22h 07m 31.62s	-12° 08' 16.9"	30.00669	28,995501	241,15	178,0	2,3	7,8	18.59	0.21	5.39
22/08/2011	22h 07m 25.35s	-12° 08' 52.0"	30.00666	28,995238	241,15	178,9	2,3	7,8	18.55	0.17	5.35
23/08/2011	22h 07m 19.08s	-12° 09' 27.1"	30.00663	28,995271	241,15	179,5	2,3	7,8	18.51	0.13	5.31
24/08/2011	22h 07m 12.81s	-12° 10' 02.2"	30.00660	28,995599	241,15	178,9	2,3	7,8	18.47	0.09	5.27
25/08/2011	22h 07m 06.55s	-12° 10' 37.3"	30.00656	28,996224	241,15	177,9	2,3	7,8	18.43	0.05	5.23
26/08/2011	22h 07m 00.28s	-12° 11' 12.3"	30.00653	28,997145	241,16	177,0	2,3	7,8	18.39	0.01	5.19
27/08/2011	22h 06m 54.02s	-12° 11' 47.3"	30.00650	28,998363	241,17	176,0	2,3	7,8	18.35	23.53	5.15
28/08/2011	22h 06m 47.76s	-12° 12' 22.2"	30.00647	28,999879	241,18	175,0	2,3	7,8	18.31	23.49	5.11
29/08/2011	22h 06m 41.51s	-12° 12' 57.1"	30.00644	29,001690	241,20	174,0	2,3	7,8	18.27	23.45	5.06
30/08/2011	22h 06m 35.27s	-12° 13' 31.9"	30.00641	29,003799	241,22	173,0	2,3	7,8	18.23	23.41	5.02
31/08/2011	22h 06m 29.05s	-12° 14' 06.5"	30.00637	29,006203	241,24	172,0	2,3	7,8	18.19	23.37	4.58
01/09/2011	22h 06m 22.84s	-12° 14' 40.9"	30.00634	29,008902	241,26	171,0	2,3	7,8	18.15	23.33	4.54
02/09/2011	22h 06m 16.66s	-12° 15' 15.2"	30.00631	29,011896	241,28	170,0	2,3	7,8	18.11	23.29	4.50
03/09/2011	22h 06m 10.50s	-12° 15' 49.4"	30.00628	29,015182	241,31	169,0	2,3	7,8	18.07	23.25	4.46
04/09/2011	22h 06m 04.38s	-12° 16' 23.3"	30.00625	29,018760	241,34	168,0	2,3	7,8	18.03	23.21	4.42
05/09/2011	22h 05m 58.28s	-12° 16' 57.0"	30.00622	29,022629	241,37	167,0	2,3	7,8	17.59	23.17	4.38
06/09/2011	22h 05m 52.22s	-12° 17' 30.6"	30.00618	29,026786	241,41	166,0	2,3	7,8	17.55	23.13	4.34
07/09/2011	22h 05m 46.19s	-12° 18' 03.9"	30.00615	29,031231	241,45	165,0	2,3	7,8	17.51	23.09	4.30
08/09/2011	22h 05m 40.19s	-12° 18' 37.0"	30.00612	29,035962	241,48	164,0	2,3	7,8	17.47	23.05	4.26
09/09/2011	22h 05m 34.23s	-12° 19' 09.9"	30.00609	29,040978	241,53	163,1	2,3	7,8	17.43	23.01	4.22
10/09/2011	22h 05m 28.30s	-12° 19' 42.6"	30.00606	29,046277	241,57	162,1	2,3	7,8	17.39	22.57	4.18
11/09/2011	22h 05m 22.42s	-12° 20' 15.1"	30.00602	29,051857	241,62	161,1	2,3	7,8	17.35	22.53	4.14
12/09/2011	22h 05m 16.57s	-12° 20' 47.3"	30.00599	29,057717	241,67	160,1	2,3	7,8	17.31	22.48	4.10
13/09/2011	22h 05m 10.77s	-12° 21' 19.1"	30.00596	29,063855	241,72	159,1	2,3	7,8	17.27	22.44	4.05
14/09/2011	22h 05m 05.02s	-12° 21' 50.7"	30.00593	29,070271	241,77	158,1	2,3	7,8	17.24	22.40	4.01
15/09/2011	22h 04m 59.32s	-12° 22' 22.0"	30.00590	29,076961	241,83	157,1	2,3	7,8	17.20	22.36	3.57
16/09/2011	22h 04m 53.68s	-12° 22' 53.0"	30.00587	29,083925	241,88	156,1	2,3	7,8	17.16	22.32	3.53
17/09/2011	22h 04m 48.09s	-12° 23' 23.6"	30.00583	29,091161	241,94	155,1	2,3	7,8	17.12	22.28	3.49
18/09/2011	22h 04m 42.56s	-12° 23' 53.8"	30.00580	29,098667	242,01	154,1	2,3	7,8	17.08	22.24	3.45
19/09/2011	22h 04m 37.09s	-12° 24' 23.7"	30.00577	29,106441	242,07	153,1	2,3	7,8	17.04	22.20	3.41
20/09/2011	22h 04m 31.69s	-12° 24' 53.2"	30.00574	29,114481	242,14	152,1	2,3	7,8	17.00	22.16	3.37
21/09/2011	22h 04m 26.35s	-12° 25' 22.4"	30.00571	29,122786	242,21	151,1	2,3	7,8	16.56	22.12	3.33
22/09/2011	22h 04m 21.07s	-12° 25' 51.2"	30.00568	29,131352	242,28	150,1	2,3	7,8	16.52	22.08	3.29
23/09/2011	22h 04m 15.87s	-12° 26' 19.6"	30.00564	29,140178	242,35	149,1	2,3	7,8	16.48	22.04	3.25
24/09/2011	22h 04m 10.73s	-12° 26' 47.6"	30.00561	29,149262	242,43	148,1	2,3	7,8	16.44	22.00	3.21
25/09/2011	22h 04m 05.66s	-12° 27' 15.2"	30.00558	29,158602	242,50	147,1	2,3	7,8	16.40	21.56	3.17
26/09/2011	22h 04m 00.66s	-12° 27' 42.4"	30.00555	29,168193	242,58	146,1	2,3	7,8	16.36	21.52	3.13
27/09/2011	22h 03m 55.73s	-12° 28' 09.1"	30.00552	29,178035	242,67	145,1	2,3	7,8	16.32	21.48	3.09
28/09/2011	22h 03m 50.88s	-12° 28' 35.4"	30.00548	29,188123	242,75	144,1	2,3	7,8	16.28	21.44	3.05
29/09/2011	22h 03m 46.12s	-12° 29' 01.2"	30.00545	29,198454	242,84	143,1	2,3	7,8	16.24	21.40	3.01
30/09/2011	22h 03m 41.44s	-12° 29' 26.5"	30.00542	29,209026	242,92	142,1	2,3	7,8	16.20	21.36	2.57
01/10/2011	22h 03m 36.86s	-12° 29' 51.2"	30.00539	29,219834	243,01	141,1	2,3	7,8	16.16	21.32	2.53
02/10/2011	22h 03m 32.36s	-12° 30' 15.5"	30.00536	29,230874	243,11	140,1	2,3	7,8	16.12	21.28	2.49
03/10/2011	22h 03m 27.95s	-12° 30' 39.3"	30.00533	29,242144	243,20	139,1	2,3	7,8	16.08	21.24	2.45
04/10/2011	22h 03m 23.63s	-12° 31' 02.5"	30.00529	29,253639	243,30	138,1	2,3	7,8	16.04	21.20	2.41
05/10/2011	22h 03m 19.41s	-12° 31' 25.3"	30.00526	29,265355	243,39	137,1	2,3	7,8	16.00	21.16	2.36
06/10/2011	22h 03m 15.27s	-12° 31' 47.6"	30.00523	29,277289	243,49	136,1	2,3	7,8	15.56	21.12	2.32
07/10/2011	22h 03m 11.23s	-12° 32' 09.3"	30.00520	29,289437	243,59	135,0	2,3	7,8	15.52	21.08	2.28
08/10/2011	22h 03m 07.28s	-12° 32' 30.5"	30.00517	29,301795	243,70	134,0	2,3	7,8	15.48	21.04	2.24
09/10/2011	22h 03m 03.43s	-12° 32' 51.2"	30.00513	29,314361	243,80	133,0	2,3	7,8	15.44	21.00	2.20
10/10/2011	22h 02m 59.68s	-12° 33' 11.3"	30.00510	29,327129	243,91	132,0	2,3	7,8	15.40	20.56	2.16
11/10/2011	22h 02m 56.03s	-12° 33' 30.8"	30.00507	29,340096	244,01	131,0	2,3	7,8	15.36	20.52	2.12
12/10/2011	22h 02m 52.48s	-12° 33' 49.7"	30.00504								

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
03/11/2011	22h 02m 03.32s	-12° 38' 06.5"	30,00434	29,684082	246,88	107,9	2,3	7,9	14.05	19.21	0.41
04/11/2011	22h 02m 02.49s	-12° 38' 10.5"	30,00430	29,700569	247,01	106,9	2,3	7,9	14.01	19.17	0.37
05/11/2011	22h 02m 01.79s	-12° 38' 13.8"	30,00427	29,717142	247,15	105,9	2,3	7,9	13.57	19.13	0.33
06/11/2011	22h 02m 01.21s	-12° 38' 16.4"	30,00424	29,733796	247,29	104,9	2,3	7,9	13.53	19.09	0.29
07/11/2011	22h 02m 00.77s	-12° 38' 18.3"	30,00421	29,750525	247,43	103,9	2,3	7,9	13.49	19.05	0.25
08/11/2011	22h 02m 00.45s	-12° 38' 19.4"	30,00418	29,767326	247,57	102,9	2,3	7,9	13.45	19.01	0.21
09/11/2011	22h 02m 00.27s	-12° 38' 19.9"	30,00415	29,784192	247,71	101,9	2,3	7,9	13.41	18.57	0.17
10/11/2011	22h 02m 00.22s	-12° 38' 19.6"	30,00411	29,801120	247,85	100,9	2,3	7,9	13.37	18.53	0.13
11/11/2011	22h 02m 00.30s	-12° 38' 18.6"	30,00408	29,818103	247,99	99,9	2,3	7,9	13.33	18.49	0.09
12/11/2011	22h 02m 00.52s	-12° 38' 16.9"	30,00405	29,835138	248,13	98,9	2,3	7,9	13.30	18.45	0.05
13/11/2011	22h 02m 00.87s	-12° 38' 14.4"	30,00402	29,852220	248,27	97,9	2,2	7,9	13.26	18.42	0.01
14/11/2011	22h 02m 01.35s	-12° 38' 11.3"	30,00399	29,869342	248,42	96,9	2,2	7,9	13.22	18.38	23.54
15/11/2011	22h 02m 01.96s	-12° 38' 07.4"	30,00395	29,886502	248,56	95,9	2,2	7,9	13.18	18.34	23.50
16/11/2011	22h 02m 02.71s	-12° 38' 02.8"	30,00392	29,903693	248,70	94,9	2,2	7,9	13.14	18.30	23.46
17/11/2011	22h 02m 03.58s	-12° 37' 57.6"	30,00389	29,920911	248,84	93,9	2,2	7,9	13.10	18.26	23.42
18/11/2011	22h 02m 04.58s	-12° 37' 51.6"	30,00386	29,938151	248,99	92,9	2,2	7,9	13.06	18.22	23.38
19/11/2011	22h 02m 05.72s	-12° 37' 45.0"	30,00383	29,955408	249,13	91,9	2,2	7,9	13.02	18.18	23.34
20/11/2011	22h 02m 06.98s	-12° 37' 37.6"	30,00379	29,972676	249,28	90,9	2,2	7,9	12.58	18.14	23.30
21/11/2011	22h 02m 08.37s	-12° 37' 29.5"	30,00376	29,989950	249,42	89,9	2,2	7,9	12.54	18.10	23.26
22/11/2011	22h 02m 09.90s	-12° 37' 20.7"	30,00373	30,007225	249,56	88,9	2,2	7,9	12.50	18.06	23.22
23/11/2011	22h 02m 11.56s	-12° 37' 11.1"	30,00370	30,024495	249,71	87,9	2,2	7,9	12.46	18.02	23.18
24/11/2011	22h 02m 13.36s	-12° 37' 00.8"	30,00367	30,041755	249,85	86,8	2,2	7,9	12.43	17.59	23.15
25/11/2011	22h 02m 15.29s	-12° 36' 49.8"	30,00363	30,058999	249,99	85,8	2,2	7,9	12.39	17.55	23.11
26/11/2011	22h 02m 17.36s	-12° 36' 38.0"	30,00360	30,076222	250,14	84,8	2,2	7,9	12.35	17.51	23.07
27/11/2011	22h 02m 19.56s	-12° 36' 25.6"	30,00357	30,093417	250,28	83,8	2,2	7,9	12.31	17.47	23.03
28/11/2011	22h 02m 21.89s	-12° 36' 12.4"	30,00354	30,110579	250,42	82,8	2,2	7,9	12.27	17.43	22.59
29/11/2011	22h 02m 24.35s	-12° 35' 58.6"	30,00350	30,127703	250,56	81,8	2,2	7,9	12.23	17.39	22.55
30/11/2011	22h 02m 26.93s	-12° 35' 44.1"	30,00347	30,144783	250,71	80,8	2,2	7,9	12.19	17.35	22.51
01/12/2011	22h 02m 29.65s	-12° 35' 28.9"	30,00344	30,161814	250,85	79,8	2,2	7,9	12.15	17.31	22.47
02/12/2011	22h 02m 32.48s	-12° 35' 13.1"	30,00341	30,178790	250,99	78,8	2,2	7,9	12.11	17.27	22.44
03/12/2011	22h 02m 35.45s	-12° 34' 56.5"	30,00338	30,195708	251,13	77,8	2,2	7,9	12.07	17.24	22.40
04/12/2011	22h 02m 38.53s	-12° 34' 39.3"	30,00334	30,212561	251,27	76,8	2,2	7,9	12.03	17.20	22.36
05/12/2011	22h 02m 41.75s	-12° 34' 21.4"	30,00331	30,229344	251,41	75,8	2,2	7,9	12.00	17.16	22.32
06/12/2011	22h 02m 45.09s	-12° 34' 02.8"	30,00328	30,246054	251,55	74,8	2,2	7,9	11.56	17.12	22.28
07/12/2011	22h 02m 48.56s	-12° 33' 43.5"	30,00325	30,262685	251,69	73,8	2,2	7,9	11.52	17.08	22.24
08/12/2011	22h 02m 52.15s	-12° 33' 23.5"	30,00322	30,279232	251,82	72,8	2,2	7,9	11.48	17.04	22.20
09/12/2011	22h 02m 55.87s	-12° 33' 02.9"	30,00318	30,295690	251,96	71,8	2,2	7,9	11.44	17.00	22.17
10/12/2011	22h 02m 59.71s	-12° 32' 41.6"	30,00315	30,312056	252,10	70,8	2,2	7,9	11.40	16.56	22.13
11/12/2011	22h 03m 03.68s	-12° 32' 19.6"	30,00312	30,328324	252,23	69,8	2,2	7,9	11.36	16.53	22.09
12/12/2011	22h 03m 07.76s	-12° 31' 57.0"	30,00309	30,344491	252,37	68,8	2,2	7,9	11.32	16.49	22.05
13/12/2011	22h 03m 11.96s	-12° 31' 33.8"	30,00306	30,360550	252,50	67,8	2,2	7,9	11.28	16.45	22.01
14/12/2011	22h 03m 16.28s	-12° 31' 09.9"	30,00302	30,376499	252,63	66,8	2,2	7,9	11.25	16.41	21.57
15/12/2011	22h 03m 20.72s	-12° 30' 45.5"	30,00299	30,392332	252,77	65,8	2,2	7,9	11.21	16.37	21.54
16/12/2011	22h 03m 25.27s	-12° 30' 20.4"	30,00296	30,408045	252,90	64,8	2,2	7,9	11.17	16.33	21.50
17/12/2011	22h 03m 29.93s	-12° 29' 54.7"	30,00293	30,423633	253,03	63,9	2,2	7,9	11.13	16.29	21.46
18/12/2011	22h 03m 34.70s	-12° 29' 28.4"	30,00290	30,439092	253,15	62,9	2,2	7,9	11.09	16.26	21.42
19/12/2011	22h 03m 39.59s	-12° 29' 01.4"	30,00286	30,454416	253,28	61,9	2,2	7,9	11.05	16.22	21.38
20/12/2011	22h 03m 44.59s	-12° 28' 33.9"	30,00283	30,469602	253,41	60,9	2,2	7,9	11.01	16.18	21.34
21/12/2011	22h 03m 49.71s	-12° 28' 05.7"	30,00280	30,484644	253,53	59,9	2,2	7,9	10.57	16.14	21.31
22/12/2011	22h 03m 54.94s	-12° 27' 36.8"	30,00277	30,499538	253,66	58,9	2,2	7,9	10.54	16.10	21.27
23/12/2011	22h 04m 00.28s	-12° 27' 07.4"	30,00273	30,514278	253,78	57,9	2,2	7,9	10.50	16.06	21.23
24/12/2011	22h 04m 05.73s	-12° 26' 37.4"	30,00270	30,528861	253,90	56,9	2,2	7,9	10.46	16.02	21.19
25/12/2011	22h 04m 11.29s	-12° 26' 06.8"	30,00267	30,543280	254,02	55,9	2,2	7,9	10.42	15.59	21.15
26/12/2011	22h 04m 16.96s	-12° 25' 35.7"	30,00264	30,557532	254,14	54,9	2,2	7,9	10.38	15.55	21.12
27/12/2011	22h 04m 22.72s	-12° 25' 04.1"	30,00261	30,571612	254,26	53,9	2,2	7,9	10.34	15.51	21.08
28/12/2011	22h 04m 28.58s	-12° 24' 31.9"	30,00257	30,585516	254,37	52,9	2,2	7,9	10.30	15.47	21.04
29/12/2011	22h 04m 34.54s	-12° 23' 59.2"	30,00254	30,599240	254,49	51,9	2,2	7,9	10.26	15.43	21.00
30/12/2011	22h 04m 40.60s	-12° 23' 26.0"	30,00251	30,612779	254,60	50,9	2,2	7,9	10.23	15.39	20.56
31/12/2011	22h 04m 46.75s	-12° 22' 52.2"	30,00248	30,626131	254,71	49,9	2,2	7,9	10.19	15.36	20.53

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

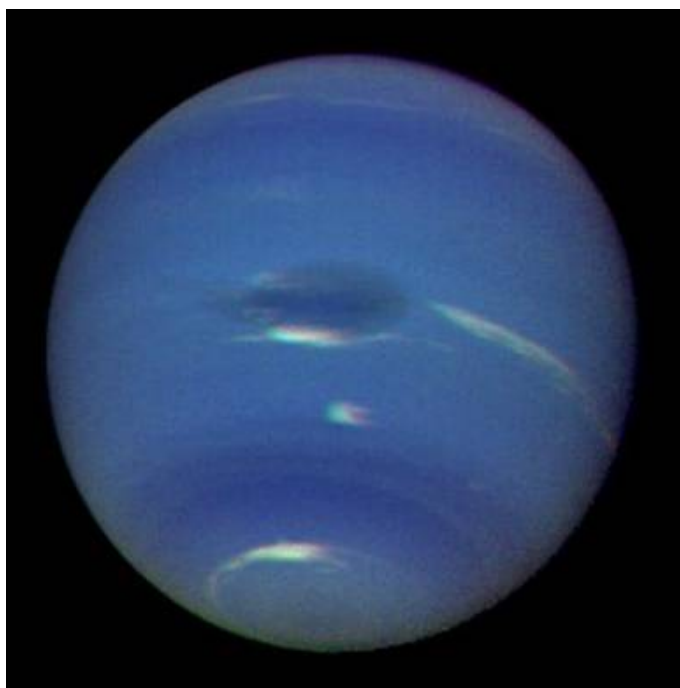
R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

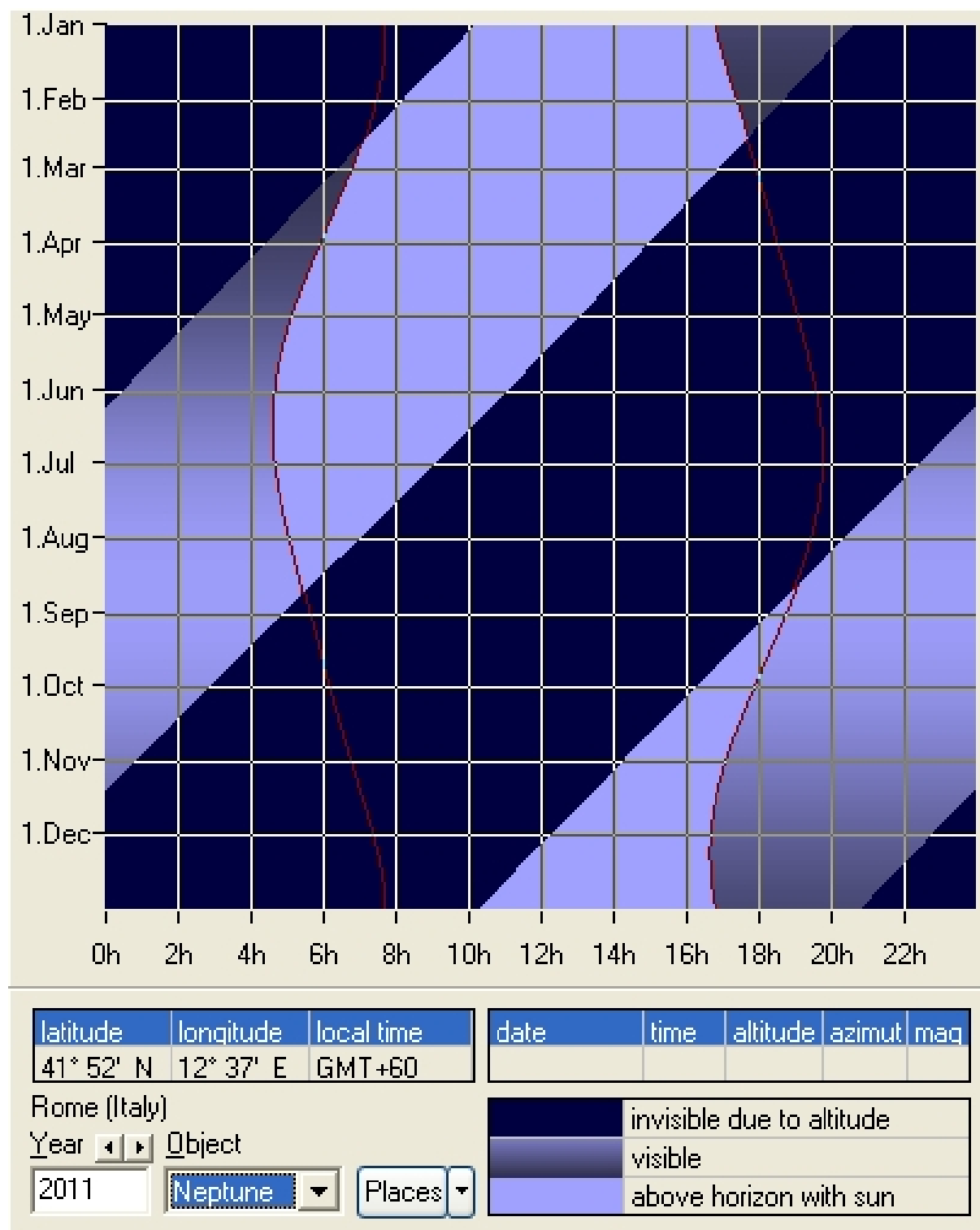
# FENOMENI DI NETTUNO - PHENOMENA OF NEPTUNE

Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	22/08/2011	09:22:19	28,99512 AU	
Apogeo - Apogee	18/02/2011	00:15:27	31,00043 AU	
Magnit. Max - Brightness maximum	22/08/2011	11:51:32	7,8	mag
Magnit. Min - Brightness minimum	17/02/2011	21:36:53	8,0	mag
Opposizione - Opposition	22/08/2011	23:26:28		
Congiunzione - Conjunction	17/02/2011	09:56:25		
Moto retrogr. - Retrograde motion	03/06/2011	15:18:43		
Moto diretto - Prograde motion	09/11/2011	21:08:55		
Max ang. Fase - Maximum phase angle	23/05/2011	04:30:54	1,9	°
Max ang. Fase - Maximum phase angle	20/11/2011	10:05:45	1,9	°
Min ang. Fase - Minimum phase angle	17/02/2011	13:35:39	0,0	°
Min ang. Fase - Minimum phase angle	23/08/2011	04:39:58	0,0	°

© (5)



# VISIBILITA' DI NETTUNO - VISIBILITY OF NEPTUNE



Visibilità di Nettuno nel corso dell'anno - Visibility of Neptune during the year

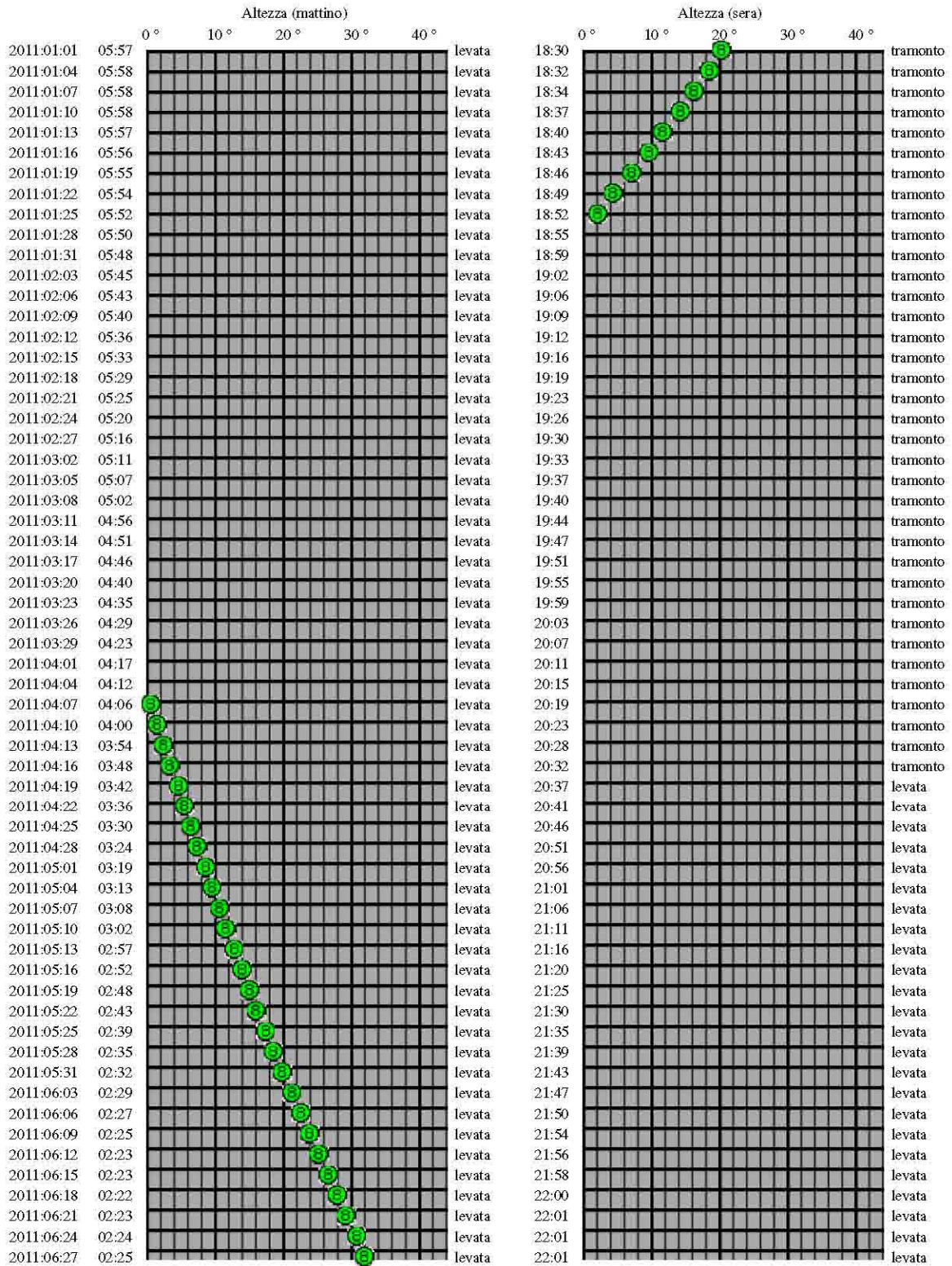


# Altezza ai crepuscoli

## di Nettuno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

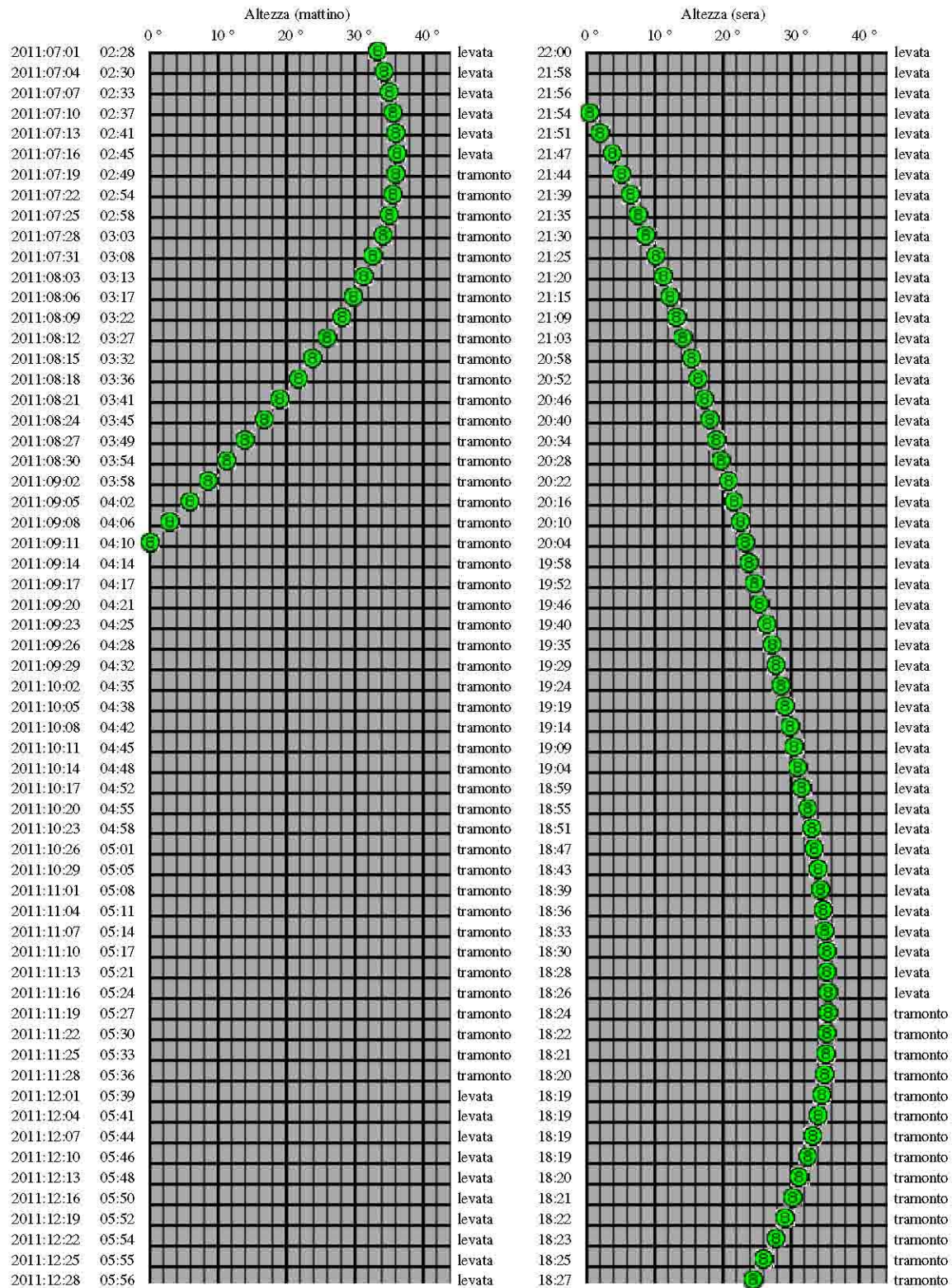


# Altezza ai crepuscoli

## di Nettuno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	-46.1	60.4	46.3	18:30	20.3	229.1	45.8
2011:01:04	05:58	-44.1	63.4	43.4	18:32	18.3	232.0	42.8
2011:01:07	05:58	-42.2	66.1	40.4	18:34	16.2	234.9	39.9
2011:01:10	05:58	-40.2	68.7	37.4	18:37	14.0	237.7	36.9
2011:01:13	05:57	-38.3	71.1	34.5	18:40	11.8	240.4	33.9
2011:01:16	05:56	-36.3	73.3	31.5	18:43	9.5	243.1	31.0
2011:01:19	05:55	-34.5	75.4	28.6	18:46	7.1	245.7	28.0
2011:01:22	05:54	-32.6	77.3	25.6	18:49	4.6	248.2	25.1
2011:01:25	05:52	-30.8	79.1	22.7	18:52	2.1	250.8	22.1
2011:01:28	05:50	-29.1	80.8	19.7	18:55	-0.5	253.2	19.2
2011:01:31	05:48	-27.4	82.4	16.8	18:59	-3.1	255.7	16.3
2011:02:03	05:45	-25.7	84.0	13.9	19:02	-5.8	258.1	13.3
2011:02:06	05:43	-24.1	85.4	10.9	19:06	-8.4	260.6	10.4
2011:02:09	05:40	-22.5	86.8	8.0	19:09	-11.1	263.0	7.5
2011:02:12	05:36	-21.0	88.2	5.1	19:12	-13.9	265.5	4.6
2011:02:15	05:33	-19.6	89.5	2.2	19:16	-16.6	267.9	1.7
2011:02:18	05:29	-18.1	90.7	0.9	19:19	-19.3	270.4	1.4
2011:02:21	05:25	-16.7	91.9	3.7	19:23	-22.1	273.0	4.3
2011:02:24	05:20	-15.4	93.0	6.6	19:26	-24.8	275.6	7.1
2011:02:27	05:16	-14.1	94.1	9.5	19:30	-27.5	278.2	10.0
2011:03:02	05:11	-12.8	95.2	12.4	19:33	-30.2	281.0	12.9
2011:03:05	05:07	-11.6	96.2	15.3	19:37	-32.9	283.9	15.8
2011:03:08	05:02	-10.3	97.2	18.2	19:40	-35.6	287.0	18.7
2011:03:11	04:56	-9.2	98.2	21.0	19:44	-38.2	290.2	21.6
2011:03:14	04:51	-8.0	99.2	23.9	19:47	-40.8	293.6	24.5
2011:03:17	04:46	-6.9	100.2	26.8	19:51	-43.3	297.2	27.4
2011:03:20	04:40	-5.8	101.1	29.7	19:55	-45.8	301.1	30.3
2011:03:23	04:35	-4.7	102.0	32.6	19:59	-48.1	305.4	33.2
2011:03:26	04:29	-3.6	102.9	35.4	20:03	-50.3	310.0	36.0
2011:03:29	04:23	-2.6	103.9	38.3	20:07	-52.4	315.0	38.9
2011:04:01	04:17	-1.5	104.8	41.2	20:11	-54.3	320.5	41.8
2011:04:04	04:12	-0.5	105.7	44.0	20:15	-56.0	326.5	44.7
2011:04:07	04:06	0.5	106.6	46.9	20:19	-57.5	333.0	47.5
2011:04:10	04:00	1.5	107.5	49.8	20:23	-58.6	340.0	50.4
2011:04:13	03:54	2.5	108.4	52.6	20:28	-59.4	347.4	53.3
2011:04:16	03:48	3.5	109.3	55.5	20:32	-59.9	355.1	56.1
2011:04:19	03:42	4.5	110.3	58.3	20:37	-59.9	3.0	59.0
2011:04:22	03:36	5.5	111.2	61.2	20:41	-59.5	10.9	61.9
2011:04:25	03:30	6.5	112.2	64.0	20:46	-58.7	18.5	64.7
2011:04:28	03:24	7.5	113.2	66.9	20:51	-57.5	25.8	67.6
2011:05:01	03:19	8.5	114.3	69.8	20:56	-56.0	32.6	70.5
2011:05:04	03:13	9.6	115.3	72.6	21:01	-54.2	39.0	73.3
2011:05:07	03:08	10.6	116.4	75.5	21:06	-52.1	44.8	76.2
2011:05:10	03:02	11.7	117.6	78.3	21:11	-49.8	50.2	79.1
2011:05:13	02:57	12.8	118.8	81.2	21:16	-47.3	55.1	81.9
2011:05:16	02:52	13.9	120.1	84.0	21:20	-44.7	59.6	84.8
2011:05:19	02:48	15.0	121.4	86.9	21:25	-42.0	63.7	87.6
2011:05:22	02:43	16.2	122.8	89.8	21:30	-39.2	67.6	90.5
2011:05:25	02:39	17.4	124.4	92.6	21:35	-36.3	71.1	93.4
2011:05:28	02:35	18.6	126.0	95.5	21:39	-33.5	74.5	96.3
2011:05:31	02:32	19.9	127.7	98.4	21:43	-30.6	77.6	99.1
2011:06:03	02:29	21.2	129.6	101.2	21:47	-27.7	80.5	102.0
2011:06:06	02:27	22.5	131.6	104.1	21:50	-24.9	83.2	104.9
2011:06:09	02:25	23.8	133.8	107.0	21:54	-22.1	85.9	107.8
2011:06:12	02:23	25.2	136.2	109.9	21:56	-19.5	88.3	110.7
2011:06:15	02:23	26.6	138.8	112.8	21:58	-16.9	90.7	113.5
2011:06:18	02:22	28.0	141.6	115.6	22:00	-14.4	92.9	116.4
2011:06:21	02:23	29.3	144.6	118.5	22:01	-12.0	95.0	119.3
2011:06:24	02:24	30.6	147.9	121.4	22:01	-9.7	97.1	122.2
2011:06:27	02:25	31.9	151.5	124.3	22:01	-7.5	99.0	125.1
2011:06:30	02:27	33.0	155.3	127.2	22:00	-5.5	100.8	128.0

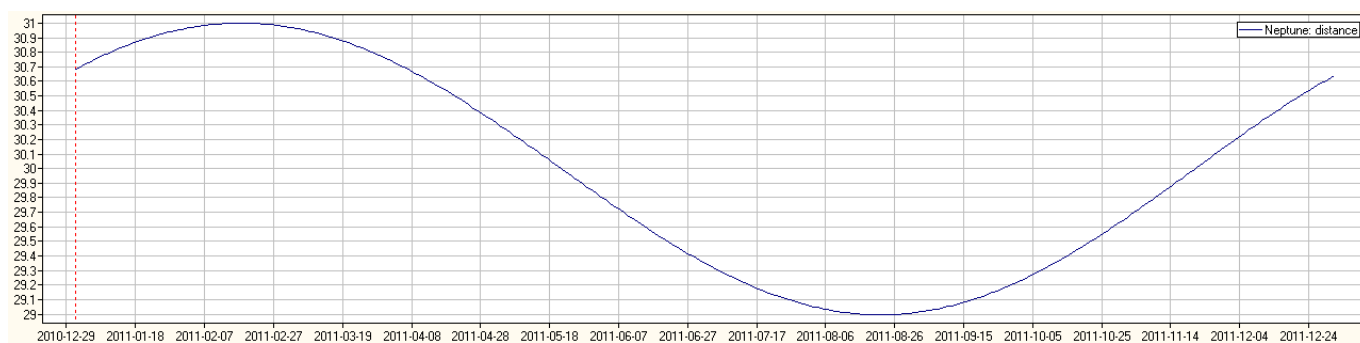
Morning twilights = crepuscolo mattutino  
Evening twilight = crepuscolo serale

Date = data nel formato aaaa/mm/gg  
Times = ore

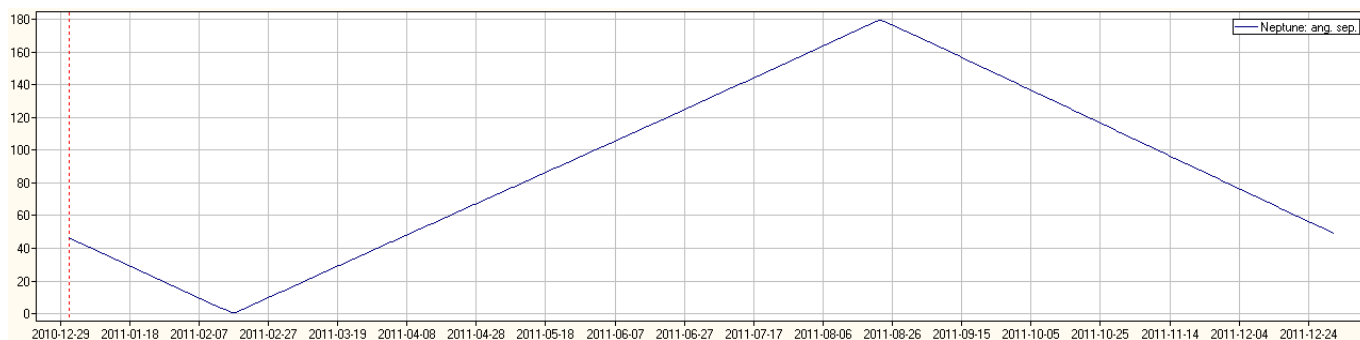
Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:01	02:28	33.4	156.6	128.2	22:00	-4.8	101.4	129.0
2011:07:04	02:30	34.4	160.8	131.1	21:58	-2.9	103.2	131.9
2011:07:07	02:33	35.2	165.2	134.0	21:56	-1.1	104.8	134.8
2011:07:10	02:37	35.8	169.8	136.9	21:54	0.6	106.4	137.7
2011:07:13	02:41	36.2	174.5	139.8	21:51	2.1	108.0	140.6
2011:07:16	02:45	36.3	179.4	142.8	21:47	3.7	109.5	143.5
2011:07:19	02:49	36.2	184.4	145.7	21:44	5.1	110.9	146.5
2011:07:22	02:54	35.8	189.4	148.6	21:39	6.4	112.3	149.4
2011:07:25	02:58	35.1	194.3	151.6	21:35	7.7	113.6	152.3
2011:07:28	03:03	34.2	199.2	154.5	21:30	8.9	115.0	155.2
2011:07:31	03:08	33.0	204.0	157.4	21:25	10.1	116.3	158.2
2011:08:03	03:13	31.6	208.6	160.4	21:20	11.2	117.5	161.1
2011:08:06	03:17	29.9	213.0	163.3	21:15	12.3	118.8	164.1
2011:08:09	03:22	28.1	217.3	166.3	21:09	13.4	120.1	167.0
2011:08:12	03:27	26.1	221.3	169.2	21:03	14.4	121.3	170.0
2011:08:15	03:32	23.9	225.2	172.2	20:58	15.4	122.5	172.9
2011:08:18	03:36	21.6	228.8	175.2	20:52	16.3	123.8	175.9
2011:08:21	03:41	19.2	232.3	178.1	20:46	17.2	125.0	178.7
2011:08:24	03:45	16.7	235.7	178.7	20:40	18.1	126.3	178.1
2011:08:27	03:49	14.1	238.9	175.8	20:34	19.0	127.6	175.2
2011:08:30	03:54	11.4	241.9	172.9	20:28	19.9	128.8	172.2
2011:09:02	03:58	8.6	244.9	169.9	20:22	20.7	130.1	169.2
2011:09:05	04:02	5.9	247.7	166.9	20:16	21.6	131.5	166.2
2011:09:08	04:06	3.0	250.5	163.9	20:10	22.4	132.8	163.3
2011:09:11	04:10	0.2	253.1	160.9	20:04	23.2	134.2	160.3
2011:09:14	04:14	-2.7	255.8	157.9	19:58	24.0	135.6	157.3
2011:09:17	04:17	-5.6	258.3	154.9	19:52	24.8	137.0	154.3
2011:09:20	04:21	-8.5	260.9	151.9	19:46	25.5	138.5	151.3
2011:09:23	04:25	-11.4	263.4	148.9	19:40	26.3	140.0	148.3
2011:09:26	04:28	-14.3	265.9	145.9	19:35	27.0	141.6	145.3
2011:09:29	04:32	-17.2	268.5	142.9	19:29	27.8	143.2	142.3
2011:10:02	04:35	-20.1	271.0	139.9	19:24	28.5	144.8	139.3
2011:10:05	04:38	-23.0	273.6	136.9	19:19	29.2	146.5	136.3
2011:10:08	04:42	-25.8	276.3	133.9	19:14	29.8	148.3	133.3
2011:10:11	04:45	-28.7	279.1	130.9	19:09	30.5	150.2	130.3
2011:10:14	04:48	-31.5	281.9	127.9	19:04	31.1	152.1	127.3
2011:10:17	04:52	-34.3	284.9	124.8	18:59	31.7	154.0	124.3
2011:10:20	04:55	-37.0	288.0	121.8	18:55	32.3	156.1	121.2
2011:10:23	04:58	-39.7	291.3	118.8	18:51	32.9	158.2	118.2
2011:10:26	05:01	-42.3	294.7	115.8	18:47	33.4	160.5	115.2
2011:10:29	05:05	-44.8	298.5	112.8	18:43	33.9	162.8	112.2
2011:11:01	05:08	-47.2	302.5	109.8	18:39	34.3	165.2	109.2
2011:11:04	05:11	-49.6	306.8	106.7	18:36	34.6	167.7	106.2
2011:11:07	05:14	-51.7	311.5	103.7	18:33	35.0	170.3	103.2
2011:11:10	05:17	-53.7	316.5	100.7	18:30	35.2	173.0	100.2
2011:11:13	05:21	-55.6	322.0	97.7	18:28	35.4	175.7	97.2
2011:11:16	05:24	-57.2	327.9	94.7	18:26	35.5	178.6	94.1
2011:11:19	05:27	-58.5	334.3	91.7	18:24	35.5	181.6	91.1
2011:11:22	05:30	-59.5	341.0	88.7	18:22	35.4	184.6	88.1
2011:11:25	05:33	-60.3	348.0	85.7	18:21	35.2	187.7	85.1
2011:11:28	05:36	-60.6	355.2	82.6	18:20	34.9	190.9	82.1
2011:12:01	05:39	-60.7	2.4	79.6	18:19	34.4	194.1	79.1
2011:12:04	05:41	-60.4	9.5	76.6	18:19	33.9	197.4	76.1
2011:12:07	05:44	-59.8	16.4	73.6	18:19	33.2	200.7	73.1
2011:12:10	05:46	-58.9	22.9	70.6	18:19	32.4	204.0	70.1
2011:12:13	05:48	-57.8	28.9	67.6	18:20	31.4	207.3	67.1
2011:12:16	05:50	-56.4	34.5	64.6	18:21	30.3	210.6	64.1
2011:12:19	05:52	-54.9	39.6	61.7	18:22	29.1	213.9	61.1
2011:12:22	05:54	-53.2	44.3	58.7	18:23	27.7	217.1	58.1
2011:12:25	05:55	-51.4	48.6	55.7	18:25	26.2	220.3	55.2
2011:12:28	05:56	-49.6	52.5	52.7	18:27	24.5	223.4	52.2
2011:12:31	05:57	-47.7	56.1	49.7	18:29	22.8	226.5	49.2

Morning twilights = crepuscolo mattutino  
Evening twilight = crepuscolo serale

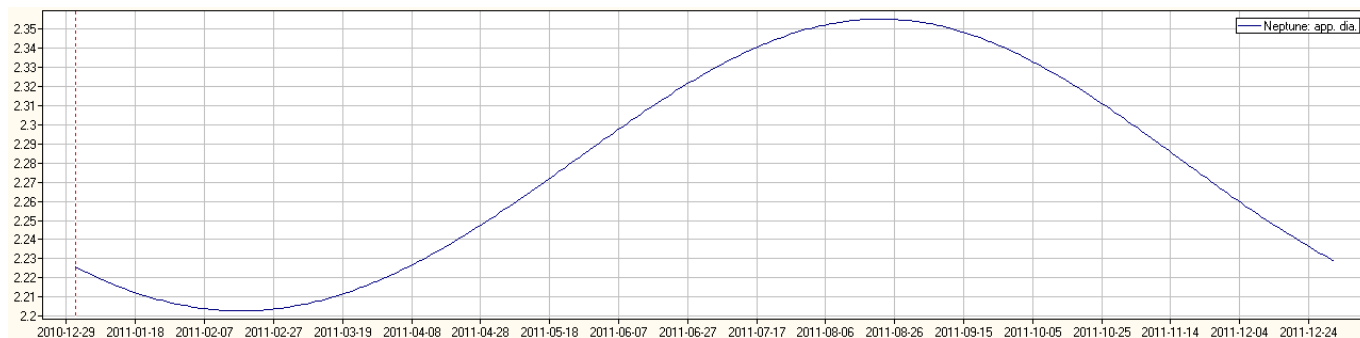
Date = data nel formato aaaa/mm/gg  
Times = ore



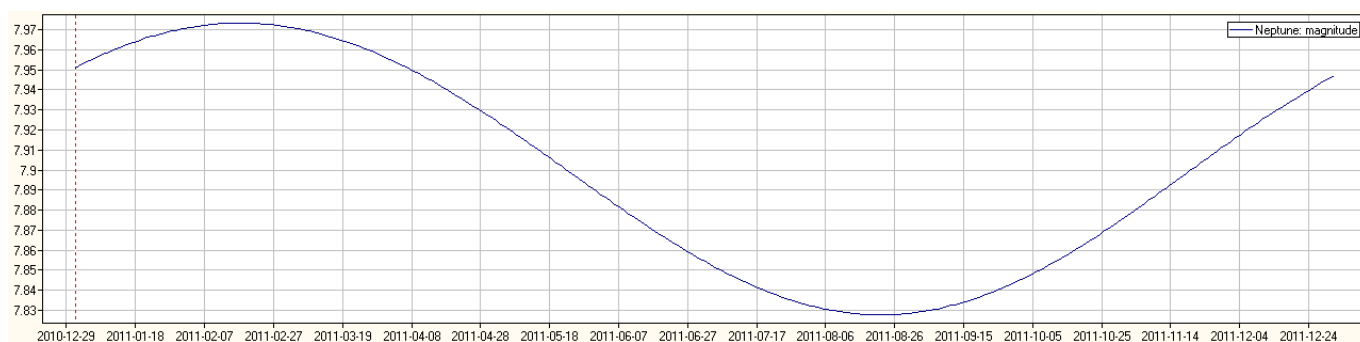
Distanza di Nettuno in U.A. nel corso dell'anno - Distance of Neptune in A.U. during the year



Elongazione di Nettuno in ° nel corso dell'anno - Elongation of Neptune in ° during the year



Diametro di Nettuno in " nel corso dell'anno - Diameter of Neptune in " during the year



Magnitudine di Nettuno nel corso dell'anno - Magnitude of Neptune during the year

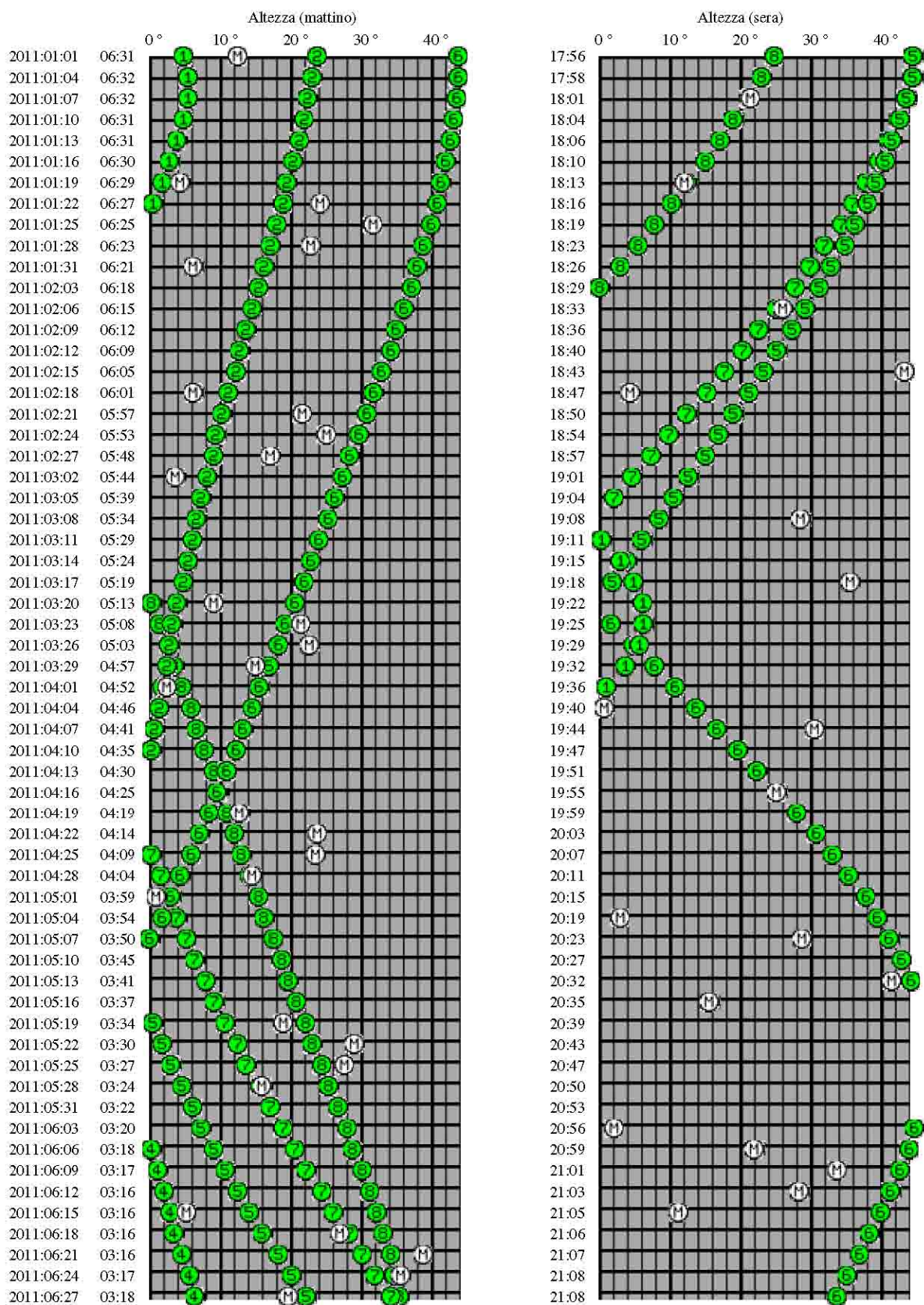


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna  
 1 = Mercury , 2 = Venus , 4 = Mars , 5 = Jupiter, 6 = Saturn , 7 = Uranus, 8 = Neptune, M = Moon

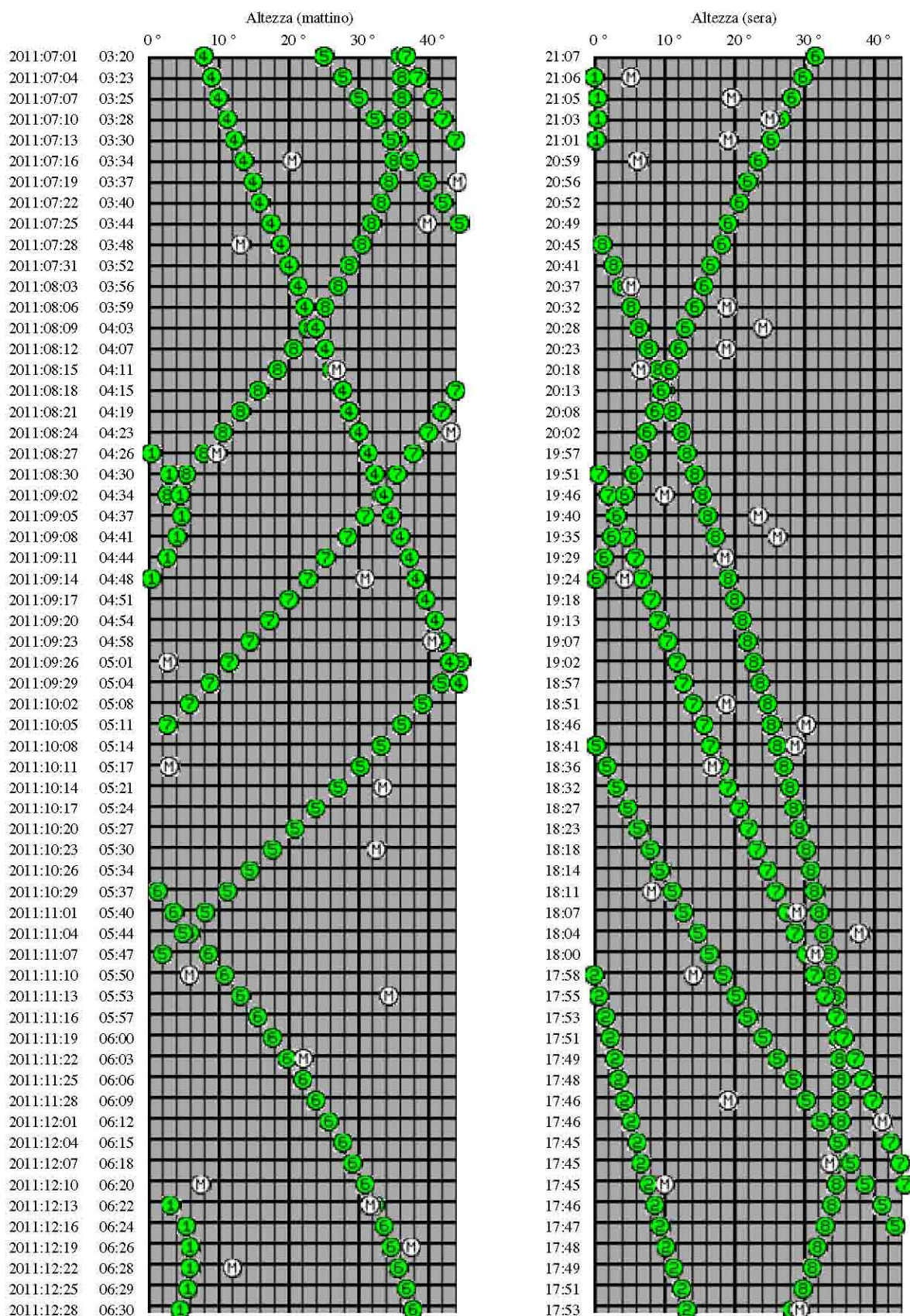


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



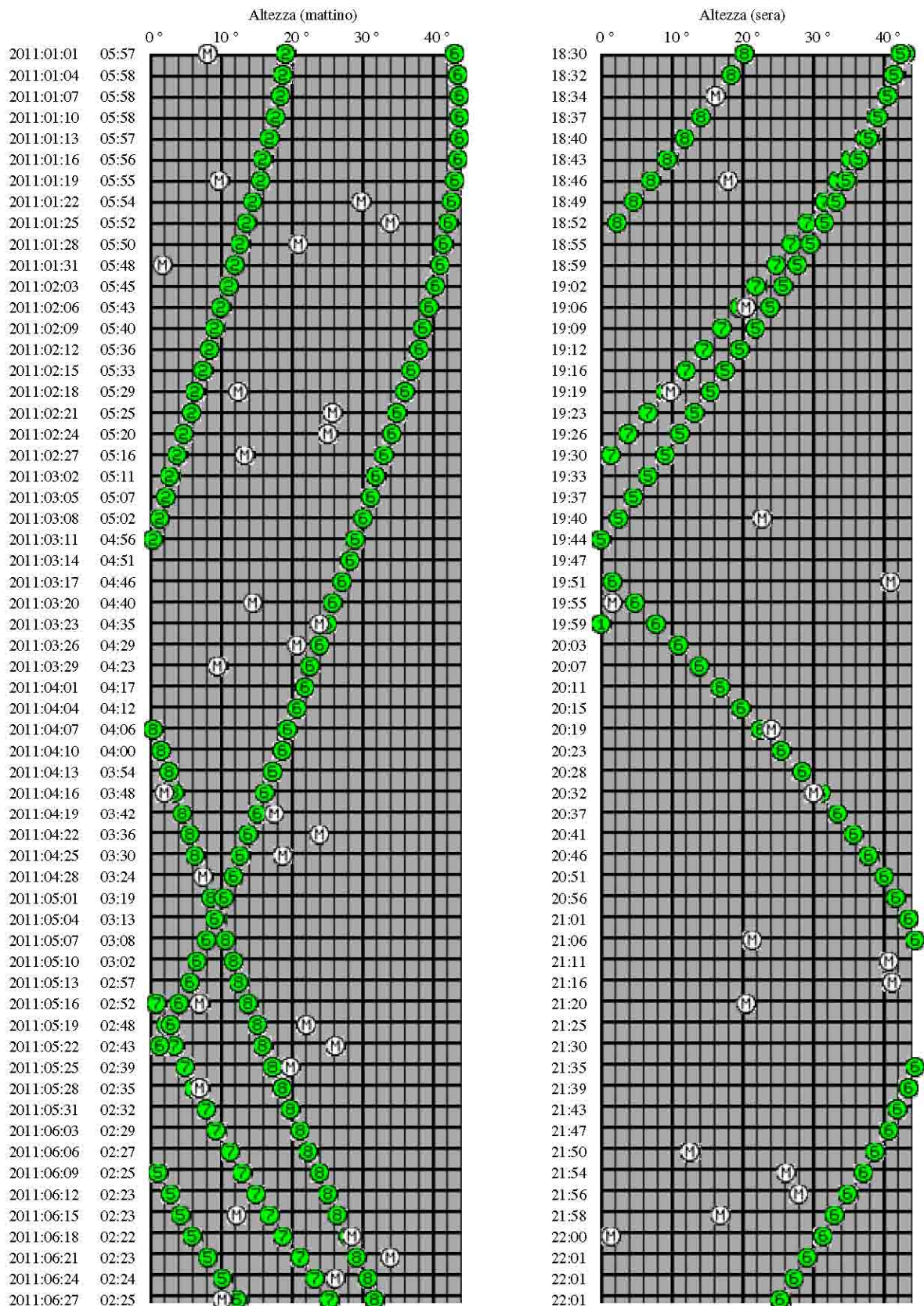


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



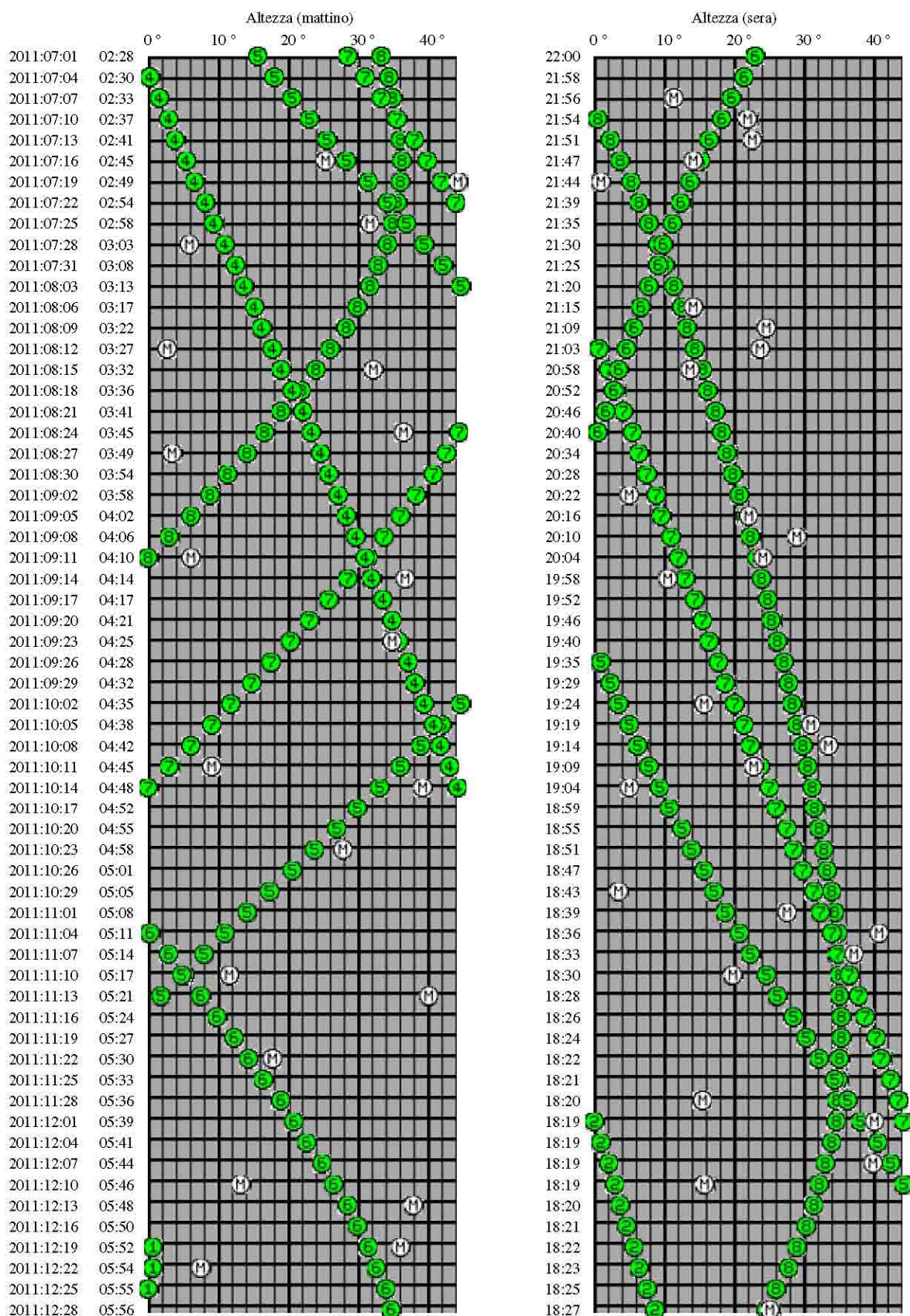
1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna  
 1 = Mercury, 2 = Venus, 4 = Mars, 5 = Jupiter, 6 = Saturn, 7 = Uranus, 8 = Neptune, M = Moon

# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna  
 1 = Mercury , 2 = Venus , 4 = Mars , 5 = Jupiter, 6 = Saturn , 7 = Uranus, 8 = Neptune, M = Moon



# EVENTI GEOCENTRICI <5° TRA PIANETI

## GEOCENTRIC EVENTS <5° BETWEEN PLANETS

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)	tw(h)		
2011/01/04	15:33:58	0.51897	0.00599	5.144	20.351	335	73	-2.2	5.9		1009.5	Jupiter	Uranus
2011/02/20	23:19:12	0.98852	0.00194	1.390	2.369	338	-4	-1.2	1.1		117.9	Mercury	Mars
2011/02/21	04:20:44	0.58737	0.00178	2.368	30.999	340	-4	1.1	8.0		158.5	Mars	Neptune
2011/02/21	01:27:29	1.57378	0.00263	1.390	30.999	339	-4	-1.2	8.0		65.1	Mercury	Neptune
2011/03/09	15:41:41	0.32611	0.00305	1.232	21.060	151	11	-1.4	5.9		64.8	Mercury	Uranus
2011/03/15	20:19:49	1.97439	0.00720	1.094	5.895	148	16	-0.8	-2.0		77.8	Mercury	Jupiter
2011/03/27	01:32:48	0.14735	0.00408	1.228	30.811	342	-36	-3.9	8.0		102.6	Venus	Neptune
2011/04/03	20:56:13	0.21410	0.00190	2.345	21.062	336	-12	1.1	5.9		165.9	Mars	Uranus
2011/04/12	21:40:15	2.83638	0.00991	0.579	5.947	143	-6	3.3	-2.0		97.4	Mercury	Jupiter
2011/04/19	18:21:12	0.61983	0.00509	0.605	2.333	143	-16	1.3	1.1		107.1	Mercury	Mars
2011/04/23	02:13:59	0.85186	0.00374	1.390	20.949	337	-30	-3.8	5.9		102.1	Venus	Uranus
2011/05/01	04:09:48	0.36231	0.00573	2.323	5.896	157	-18	1.1	-2.0		227.6	Mars	Jupiter
2011/05/08	05:37:04	1.43131	0.00394	0.838	1.471	328	-27	0.4	-3.8		516.4	Mercury	Venus
2011/05/11	20:10:50	2.05207	0.00793	0.896	5.837	338	-26	0.3	-2.0		117.2	Mercury	Jupiter
2011/05/11	14:49:14	0.56794	0.00736	1.488	5.839	338	-26	-3.8	-2.0		121.2	Venus	Jupiter
2011/05/18	06:46:14	1.35804	0.00328	1.003	1.519	326	-24	0.1	-3.8		523.0	Mercury	Venus
2011/05/21	08:15:56	2.13099	0.00270	1.055	2.299	335	-22	-0.0	1.1		134.7	Mercury	Mars
2011/05/23	09:25:43	0.99296	0.00259	1.543	2.296	340	-23	-3.8	1.1		249.2	Venus	Mars
2011/09/29	23:06:59	1.27930	0.00471	1.672	10.642	24	12	-3.9	0.8		103.3	Venus	Saturn
2011/10/06	20:12:59	1.68191	0.00425	1.416	10.660	26	6	-1.0	0.8		72.6	Mercury	Saturn
2011/11/01	22:47:10	1.96713	0.00266	1.231	1.571	27	20	-0.2	-3.9		838.1	Mercury	Venus
2011/11/13	08:27:23	1.96234	0.00317	1.039	1.526	21	23	-0.1	-3.9		583.8	Mercury	Venus

## OCCULTAZIONI TRA PIANETI

## OCCULTATION BETWEEN PLANETS

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)	tw(h)
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Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei pianeti

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i pianeti

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

P = angolo di posizione tra i pianeti, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo pianeta

m2 = magnitudine del secondo pianeta

tm = se presente, uno dei pianeti viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due pianeti distano meno di 5° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the planets

Dl = parameter limit, if Dm < Dl there is an occultation between the planets

R1 = distance in A.U. of the body 1 from the Earth

R2 = distance in A.U. of the body 2 from the Earth

P = angle of position between the planets, in °

e = elongation, in °

m1 = magnitude of the first planet

m2 = magnitude of the second planet

tm = if present, one of the planets is occulted maximum for x seconds

tw = semiperiod in hours in which the two planets are near less than 5°

# CONGIUNZIONI MULTIPLE PLANETARIE

(eventi con 3 o più pianeti entro 5°)

## MULTIPLE PLANETARY CONJUNCTIONS

(events with 3 or more planets within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax			
2011/02/21 01:21:07		1.128	1.574	-4	1.1	8.0	Mercury	Mars	Neptune
2011/05/11 17:03:56		1.506	2.055	-26	-2.0	0.3	Mercury	Venus	Jupiter
2011/05/21 11:47:06		1.736	2.134	-23	-0.1	1.1	Mercury	Venus	Mars

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri dei pianeti, in gradi

Dmax = diametro del cerchio comprendente i pianeti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo pianeta più debole

mmax = magnitudine del pianeta più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the center of the planets, in gradi

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest planet

mmax = least magnitude

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Per le congiunzioni multiple stellari o lunari consultare più avanti

# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI TOPOCENTRICI TRA PIANETI

### MULTIPLE CONJUNCTIONS

### LEAST TOPOCENTRIC GROUPING BETWEEN PLANETS

42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
18 02 2011 07		MERCURY MARS NEPTUNE	2.7	5.0	2.2	5.0	3	-1.1	1.1	8.0	-1.2	9	120	-4	104
18 02 2011 08		MERCURY MARS NEPTUNE	2.7	4.9	2.2	5.0	3	-1.1	1.1	8.0	-1.2	18	132	4	116
18 02 2011 09		MERCURY MARS NEPTUNE	2.7	4.9	2.1	4.9	3	-1.1	1.1	8.0	-1.2	26	145	11	129
18 02 2011 10		MERCURY MARS NEPTUNE	2.6	4.8	2.1	4.8	3	-1.1	1.1	8.0	-1.2	31	161	17	142
18 02 2011 11		MERCURY MARS NEPTUNE	2.6	4.7	2.1	4.8	3	-1.1	1.1	8.0	-1.2	34	177	22	157
18 02 2011 12		MERCURY MARS NEPTUNE	2.6	4.7	2.1	4.7	3	-1.1	1.1	8.0	-1.2	33	194	24	173
18 02 2011 13		MERCURY MARS NEPTUNE	2.5	4.6	2.0	4.6	3	-1.1	1.1	8.0	-1.2	29	210	24	189
18 02 2011 14		MERCURY MARS NEPTUNE	2.5	4.5	2.0	4.6	3	-1.1	1.1	8.0	-1.2	23	224	21	205
18 02 2011 15		MERCURY MARS NEPTUNE	2.5	4.5	2.0	4.5	3	-1.1	1.1	8.0	-1.2	14	236	16	220
18 02 2011 16		MERCURY MARS NEPTUNE	2.4	4.4	1.9	4.4	3	-1.1	1.1	8.0	-1.2	4	247	10	233
18 02 2011 17		MERCURY MARS NEPTUNE	2.4	4.3	1.9	4.4	3	-1.1	1.1	8.0	-1.2	-6	257	2	246
18 02 2011 18		MERCURY MARS NEPTUNE	2.3	4.3	1.9	4.3	3	-1.1	1.1	8.0	-1.2	-17	266	-5	258
18 02 2011 19		MERCURY MARS NEPTUNE	2.3	4.2	1.8	4.2	3	-1.1	1.1	8.0	-1.2	-29	277	-14	270
18 02 2011 20		MERCURY MARS NEPTUNE	2.3	4.1	1.8	4.2	3	-1.1	1.1	8.0	-1.2	-39	288	-23	282
18 02 2011 21		MERCURY MARS NEPTUNE	2.2	4.1	1.8	4.1	3	-1.1	1.1	8.0	-1.2	-49	304	-31	296
18 02 2011 22		MERCURY MARS NEPTUNE	2.2	4.0	1.8	4.0	3	-1.1	1.1	8.0	-1.2	-57	325	-39	311
18 02 2011 23		MERCURY MARS NEPTUNE	2.2	3.9	1.7	4.0	4	-1.1	1.1	8.0	-1.2	-62	355	-44	330
19 02 2011 00		MERCURY MARS NEPTUNE	2.1	3.9	1.7	3.9	4	-1.1	1.1	8.0	-1.2	-60	25	-47	351
19 02 2011 01		MERCURY MARS NEPTUNE	2.1	3.8	1.7	3.8	4	-1.1	1.1	8.0	-1.2	-54	49	-47	13
19 02 2011 02		MERCURY MARS NEPTUNE	2.1	3.7	1.6	3.8	4	-1.1	1.1	8.0	-1.2	-45	66	-43	33
19 02 2011 03		MERCURY MARS NEPTUNE	2.0	3.7	1.6	3.7	4	-1.1	1.1	8.0	-1.2	-34	79	-37	51
19 02 2011 04		MERCURY MARS NEPTUNE	2.0	3.6	1.6	3.6	4	-1.1	1.1	8.0	-1.2	-23	90	-30	66
19 02 2011 05		MERCURY MARS NEPTUNE	1.9	3.5	1.5	3.6	4	-1.1	1.1	8.0	-1.2	-12	99	-21	79
19 02 2011 06		MERCURY MARS NEPTUNE	1.9	3.5	1.5	3.5	4	-1.1	1.1	8.0	-1.2	-1	109	-12	92
19 02 2011 07		MERCURY MARS NEPTUNE	1.9	3.4	1.5	3.4	4	-1.1	1.1	8.0	-1.2	9	119	-3	104
19 02 2011 08		MERCURY MARS NEPTUNE	1.8	3.3	1.5	3.4	4	-1.1	1.1	8.0	-1.2	19	131	4	116
19 02 2011 09		MERCURY MARS NEPTUNE	1.8	3.3	1.4	3.3	4	-1.1	1.1	8.0	-1.2	26	144	12	128
19 02 2011 10		MERCURY MARS NEPTUNE	1.8	3.2	1.4	3.3	4	-1.2	1.1	8.0	-1.3	32	160	18	142
19 02 2011 11		MERCURY MARS NEPTUNE	1.7	3.2	1.4	3.2	4	-1.2	1.1	8.0	-1.3	34	176	22	157
19 02 2011 12		MERCURY MARS NEPTUNE	1.7	3.1	1.3	3.1	4	-1.2	1.1	8.0	-1.3	33	194	24	173
19 02 2011 13		MERCURY MARS NEPTUNE	1.7	3.0	1.3	3.1	4	-1.2	1.1	8.0	-1.3	29	210	24	189
19 02 2011 14		MERCURY MARS NEPTUNE	1.6	3.0	1.3	3.0	4	-1.2	1.1	8.0	-1.3	23	224	22	205
19 02 2011 15		MERCURY MARS NEPTUNE	1.6	2.9	1.3	2.9	4	-1.2	1.1	8.0	-1.3	14	236	17	220
19 02 2011 16		MERCURY MARS NEPTUNE	1.6	2.8	1.2	2.9	4	-1.2	1.1	8.0	-1.3	4	247	10	233
19 02 2011 17		MERCURY MARS NEPTUNE	1.5	2.8	1.2	2.8	4	-1.2	1.1	8.0	-1.3	-6	257	3	246
19 02 2011 18		MERCURY MARS NEPTUNE	1.5	2.7	1.2	2.8	4	-1.2	1.1	8.0	-1.3	-17	266	-5	258
19 02 2011 19		MERCURY MARS NEPTUNE	1.5	2.7	1.2	2.7	4	-1.2	1.1	8.0	-1.3	-29	277	-14	270
19 02 2011 20		MERCURY MARS NEPTUNE	1.5	2.6	1.1	2.7	4	-1.2	1.1	8.0	-1.3	-39	288	-23	282
19 02 2011 21		MERCURY MARS NEPTUNE	1.4	2.5	1.1	2.6	4	-1.2	1.1	8.0	-1.3	-49	304	-31	296
19 02 2011 22		MERCURY MARS NEPTUNE	1.4	2.5	1.1	2.5	4	-1.2	1.1	8.0	-1.3	-57	325	-39	312
19 02 2011 23		MERCURY MARS NEPTUNE	1.4	2.4	1.0	2.5	4	-1.2	1.1	8.0	-1.3	-61	353	-44	330
20 02 2011 00		MERCURY MARS NEPTUNE	1.3	2.4	1.0	2.4	4	-1.2	1.1	8.0	-1.3	-60	24	-47	351
20 02 2011 01		MERCURY MARS NEPTUNE	1.3	2.3	1.0	2.4	4	-1.2	1.1	8.0	-1.3	-53	48	-47	13
20 02 2011 02		MERCURY MARS NEPTUNE	1.3	2.3	1.0	2.3	4	-1.2	1.1	8.0	-1.3	-44	65	-43	33
20 02 2011 03		MERCURY MARS NEPTUNE	1.2	2.2	0.9	2.3	4	-1.2	1.1	8.0	-1.3	-34	78	-37	51
20 02 2011 04		MERCURY MARS NEPTUNE	1.2	2.2	0.9	2.2	4	-1.2	1.1	8.0	-1.3	-23	89	-29	66
20 02 2011 05		MERCURY MARS NEPTUNE	1.2	2.1	0.9	2.2	4	-1.2	1.1	8.0	-1.3	-12	98	-21	79
20 02 2011 06		MERCURY MARS NEPTUNE	1.2	2.1	0.9	2.1	4	-1.2	1.1	8.0	-1.3	0	108	-12	91
20 02 2011 07		MERCURY MARS NEPTUNE	1.2	2.0	0.8	2.1	4	-1.2	1.1	8.0	-1.3	10	118	-3	103
20 02 2011 08		MERCURY MARS NEPTUNE	1.1	2.0	0.8	2.0	4	-1.2	1.1	8.0	-1.3	19	130	4	115
20 02 2011 09		MERCURY MARS NEPTUNE	1.1	1.9	0.8	2.0	4	-1.2	1.1	8.0	-1.3	27	143	12	128
20 02 2011 10		MERCURY MARS NEPTUNE	1.1	1.9	0.8	1.9	4	-1.2	1.1	8.0	-1.3	32	159	18	142
20 02 2011 11		MERCURY MARS NEPTUNE	1.1	1.8	0.8	1.9	4	-1.2	1.1	8.0	-1.3	35	176	23	157
20 02 2011 12		MERCURY MARS NEPTUNE	1.0	1.8	0.7	1.9	4	-1.2	1.1	8.0	-1.3	34	193	25	173
20 02 2011 13		MERCURY MARS NEPTUNE	1.0	1.8	0.7	1.8	4	-1.2	1.1	8.0	-1.3	30	209	25	189
20 02 2011 14		MERCURY MARS NEPTUNE	1.0	1.7	0.7	1.8	4	-1.3	1.1	8.0	-1.4	23	223	22	205
20 02 2011 15		MERCURY MARS NEPTUNE	1.0	1.7	0.7	1.7	4	-1.3	1.1	8.0	-1.4	14	236	17	220
20 02 2011 16		MERCURY MARS NEPTUNE	1.0	1.7	0.7	1.7	4	-1.3	1.1	8.0	-1.4	5	247	11	234
20 02 2011 17		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.7	4	-1.3	1.1	8.0	-1.4	-6	257	3	246
20 02 2011 18		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.7	4	-1.3	1.1	8.0	-1.4	-17	266	-5	258
20 02 2011 19		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-28	277	-14	270
20 02 2011 20		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-39	288	-22	283
20 02 2011 21		MERCURY MARS NEPTUNE	0.9	1.6	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-49	303	-31	296
20 02 2011 22		MERCURY MARS NEPTUNE	0.9	1.5	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-57	324	-38	312
20 02 2011 23		MERCURY MARS NEPTUNE	0.9	1.5	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-61	352	-44	330
21 02 2011 00		MERCURY MARS NEPTUNE	0.9	1.5	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-59	22	-47	351
21 02 2011 01		MERCURY MARS NEPTUNE	0.9	1.5	0.6	1.6	4	-1.3	1.1	8.0	-1.4	-53	46	-46	13
21 02 2011 02		MERCURY MARS NEPTUNE	1.0	1.5	0.5	1.6	4	-1.3	1.1	8.0	-1.4	-44	64	-43	33
21 02 2011 03		MERCURY MARS NEPTUNE	1.0	1.5	0.5	1.6	4	-1.3	1.1	8.0	-1.4	-33	77	-37	51
21 02 2011 04		MERCURY MARS NEPTUNE	1.0	1.5	0.5	1.6	4	-1.3	1.1	8.0	-1.4	-22	87	-29	66
21 02 2011 05		MERCURY MARS NEPTUNE	1.0	1.6	0.5	1.6	4	-1.3	1.1	8.0	-1.4	-11	97	-21	79
21 02 2011 06		MERCURY MARS NEPTUNE	1.0	1.6	0.5	1.6	4	-1.3	1.1	8.0	-1.4	0	107	-12	91
21 02 2011 07		MERCURY MARS NEPTUNE	1.0	1.6	0.5	1.6	4	-1.3	1.1	8.0	-1.4	10	117	-3	103
21 02 2011 08		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.6	4	-1.3	1.1	8.0	-1.4	19	129	5	115
21 02 2011 09		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.7	4	-1.3	1.1	8.0	-1.4	27	142	12	128
21 02 2011 10		MERCURY MARS NEPTUNE	1.0	1.6	0.6	1.7	4	-1.3	1.1	8.0	-1.4	32	158	18	142
21 02 2011 11		MERCURY MARS NEPTUNE	1.1	1.7	0.6	1.7	4	-1.3	1.1	8.0	-1.4	35	175	23	157
21 02 2011 12		MERCURY MARS NEPTUNE	1.1	1.7	0.6	1.8	4	-1.3	1.1	8.0	-1.4	34	192	25	173
21 02 2011 13		MERCURY MARS NEPTUNE	1.1	1.7	0.6	1.8	4	-1.3	1.1	8.0	-1.4	30	209	25	189
21 02 2011 14		MERCURY MARS NEPTUNE	1.1	1.8	0.6	1.8	4	-1.3	1.1	8.0	-1.4	23	223	22	205
21 02 2011 15		MERCURY MARS NEPTUNE	1.1	1.8	0.6	1.9	4	-1.3	1.1	8.0	-1.4	14	236	17	220

DATE	TIME	BODIES		D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
21 02 2011 16		MERCURY MARS	NEPTUNE	1.2	1.9	0.6	1.9	4	-1.3	1.1	8.0	-1.4	5	247	11	234
21 02 2011 17		MERCURY MARS	NEPTUNE	1.2	1.9	0.7	1.9	4	-1.3	1.1	8.0	-1.4	-6	257	3	246
21 02 2011 18		MERCURY MARS	NEPTUNE	1.2	1.9	0.7	2.0	4	-1.3	1.1	8.0	-1.4	-17	266	-5	258
21 02 2011 19		MERCURY MARS	NEPTUNE	1.2	2.0	0.7	2.0	4	-1.4	1.1	8.0	-1.5	-28	277	-13	270
21 02 2011 20		MERCURY MARS	NEPTUNE	1.3	2.0	0.7	2.1	4	-1.4	1.1	8.0	-1.5	-39	288	-22	283
21 02 2011 21		MERCURY MARS	NEPTUNE	1.3	2.1	0.7	2.1	4	-1.4	1.1	8.0	-1.5	-49	303	-31	296
21 02 2011 22		MERCURY MARS	NEPTUNE	1.3	2.1	0.8	2.2	4	-1.4	1.1	8.0	-1.5	-57	323	-38	312
21 02 2011 23		MERCURY MARS	NEPTUNE	1.4	2.2	0.8	2.2	4	-1.4	1.1	8.0	-1.5	-61	351	-43	330
22 02 2011 00		MERCURY MARS	NEPTUNE	1.4	2.2	0.8	2.3	4	-1.4	1.1	8.0	-1.5	-59	20	-46	351
22 02 2011 01		MERCURY MARS	NEPTUNE	1.4	2.3	0.8	2.3	4	-1.4	1.1	8.0	-1.5	-53	45	-46	13
22 02 2011 02		MERCURY MARS	NEPTUNE	1.4	2.3	0.9	2.4	4	-1.4	1.1	8.0	-1.5	-44	62	-42	33
22 02 2011 03		MERCURY MARS	NEPTUNE	1.5	2.4	0.9	2.4	4	-1.4	1.1	8.0	-1.5	-33	75	-36	50
22 02 2011 04		MERCURY MARS	NEPTUNE	1.5	2.5	0.9	2.5	4	-1.4	1.1	8.0	-1.5	-22	86	-29	65
22 02 2011 05		MERCURY MARS	NEPTUNE	1.5	2.5	0.9	2.6	4	-1.4	1.1	8.0	-1.5	-11	96	-20	79
22 02 2011 06		MERCURY MARS	NEPTUNE	1.6	2.6	1.0	2.6	4	-1.4	1.1	8.0	-1.5	0	106	-11	91
22 02 2011 07		MERCURY MARS	NEPTUNE	1.6	2.6	1.0	2.7	4	-1.4	1.1	8.0	-1.5	10	116	-3	103
22 02 2011 08		MERCURY MARS	NEPTUNE	1.6	2.7	1.0	2.7	4	-1.4	1.1	8.0	-1.5	20	128	5	115
22 02 2011 09		MERCURY MARS	NEPTUNE	1.7	2.8	1.0	2.8	4	-1.4	1.1	8.0	-1.5	27	141	13	128
22 02 2011 10		MERCURY MARS	NEPTUNE	1.7	2.8	1.1	2.9	4	-1.4	1.1	8.0	-1.5	33	157	19	142
22 02 2011 11		MERCURY MARS	NEPTUNE	1.7	2.9	1.1	2.9	4	-1.4	1.1	8.0	-1.5	35	174	23	157
22 02 2011 12		MERCURY MARS	NEPTUNE	1.8	2.9	1.1	3.0	4	-1.4	1.1	8.0	-1.5	34	191	26	173
22 02 2011 13		MERCURY MARS	NEPTUNE	1.8	3.0	1.1	3.0	4	-1.4	1.1	8.0	-1.5	30	208	25	189
22 02 2011 14		MERCURY MARS	NEPTUNE	1.9	3.1	1.2	3.1	4	-1.4	1.1	8.0	-1.5	23	223	23	205
22 02 2011 15		MERCURY MARS	NEPTUNE	1.9	3.1	1.2	3.2	4	-1.4	1.1	8.0	-1.5	15	235	18	220
22 02 2011 16		MERCURY MARS	NEPTUNE	1.9	3.2	1.2	3.2	4	-1.4	1.1	8.0	-1.5	5	247	11	234
22 02 2011 17		MERCURY MARS	NEPTUNE	2.0	3.3	1.2	3.3	4	-1.4	1.1	8.0	-1.5	-6	257	3	247
22 02 2011 18		MERCURY MARS	NEPTUNE	2.0	3.3	1.3	3.4	4	-1.4	1.1	8.0	-1.5	-17	266	-4	259
22 02 2011 19		MERCURY MARS	NEPTUNE	2.0	3.4	1.3	3.4	4	-1.4	1.1	8.0	-1.5	-28	277	-13	271
22 02 2011 20		MERCURY MARS	NEPTUNE	2.1	3.5	1.3	3.5	4	-1.4	1.1	8.0	-1.5	-39	288	-22	283
22 02 2011 21		MERCURY MARS	NEPTUNE	2.1	3.5	1.4	3.6	4	-1.4	1.1	8.0	-1.5	-49	303	-30	297
22 02 2011 22		MERCURY MARS	NEPTUNE	2.2	3.6	1.4	3.6	4	-1.4	1.1	8.0	-1.5	-57	323	-38	312
22 02 2011 23		MERCURY MARS	NEPTUNE	2.2	3.7	1.4	3.7	4	-1.5	1.1	8.0	-1.6	-60	349	-43	331
23 02 2011 00		MERCURY MARS	NEPTUNE	2.2	3.7	1.4	3.8	4	-1.5	1.1	8.0	-1.6	-59	18	-46	351
23 02 2011 01		MERCURY MARS	NEPTUNE	2.3	3.8	1.5	3.8	4	-1.5	1.1	8.0	-1.6	-52	43	-46	12
23 02 2011 02		MERCURY MARS	NEPTUNE	2.3	3.9	1.5	3.9	4	-1.5	1.1	8.0	-1.6	-43	61	-42	33
23 02 2011 03		MERCURY MARS	NEPTUNE	2.3	3.9	1.5	4.0	4	-1.5	1.1	8.0	-1.6	-33	74	-36	50
23 02 2011 04		MERCURY MARS	NEPTUNE	2.4	4.0	1.6	4.0	4	-1.5	1.1	8.0	-1.6	-22	85	-28	65
23 02 2011 05		MERCURY MARS	NEPTUNE	2.4	4.1	1.6	4.1	4	-1.5	1.1	8.0	-1.6	-11	95	-20	79
23 02 2011 06		MERCURY MARS	NEPTUNE	2.5	4.1	1.6	4.2	4	-1.5	1.1	8.0	-1.6	1	105	-11	91
23 02 2011 07		MERCURY MARS	NEPTUNE	2.5	4.2	1.6	4.2	4	-1.5	1.1	8.0	-1.6	11	115	-2	103
23 02 2011 08		MERCURY MARS	NEPTUNE	2.5	4.3	1.7	4.3	4	-1.5	1.1	8.0	-1.6	20	127	5	115
23 02 2011 09		MERCURY MARS	NEPTUNE	2.6	4.3	1.7	4.4	4	-1.5	1.1	8.0	-1.6	28	140	13	128
23 02 2011 10		MERCURY MARS	NEPTUNE	2.6	4.4	1.7	4.5	4	-1.5	1.1	8.0	-1.6	33	156	19	142
23 02 2011 11		MERCURY MARS	NEPTUNE	2.7	4.5	1.8	4.5	4	-1.5	1.1	8.0	-1.6	36	173	24	157
23 02 2011 12		MERCURY MARS	NEPTUNE	2.7	4.5	1.8	4.6	4	-1.5	1.1	8.0	-1.6	35	191	26	173
23 02 2011 13		MERCURY MARS	NEPTUNE	2.7	4.6	1.8	4.7	4	-1.5	1.1	8.0	-1.6	30	208	26	190
23 02 2011 14		MERCURY MARS	NEPTUNE	2.8	4.7	1.9	4.7	4	-1.5	1.1	8.0	-1.6	23	223	23	206
23 02 2011 15		MERCURY MARS	NEPTUNE	2.8	4.8	1.9	4.8	4	-1.5	1.1	8.0	-1.6	15	235	18	220
23 02 2011 16		MERCURY MARS	NEPTUNE	2.9	4.8	1.9	4.9	4	-1.5	1.1	8.0	-1.6	5	247	11	234
23 02 2011 17		MERCURY MARS	NEPTUNE	2.9	4.9	1.9	4.9	4	-1.5	1.1	8.0	-1.6	-6	257	4	247
23 02 2011 18		MERCURY MARS	NEPTUNE	2.9	5.0	2.0	5.0	4	-1.5	1.1	8.0	-1.6	-17	266	-4	259
06 05 2011 13		MERCURY VENUS	JUPITER	1.5	4.6	5.0	5.0	25	0.6	-3.9	-2.1	-4.1	32	246	51	200
06 05 2011 14		MERCURY VENUS	JUPITER	1.4	4.6	4.9	5.0	25	0.6	-3.9	-2.1	-4.1	22	257	47	221
06 05 2011 15		MERCURY VENUS	JUPITER	1.4	4.6	4.9	4.9	25	0.6	-3.9	-2.1	-4.1	11	268	40	239
06 05 2011 16		MERCURY VENUS	JUPITER	1.4	4.6	4.8	4.9	25	0.6	-3.9	-2.1	-4.1	0	278	32	254
06 05 2011 17		MERCURY VENUS	JUPITER	1.4	4.5	4.8	4.9	25	0.6	-3.9	-2.1	-4.1	-11	288	23	266
06 05 2011 18		MERCURY VENUS	JUPITER	1.4	4.5	4.8	4.8	25	0.6	-3.9	-2.1	-4.1	-21	300	14	278
06 05 2011 19		MERCURY VENUS	JUPITER	1.4	4.5	4.7	4.8	25	0.6	-3.9	-2.1	-4.1	-30	313	5	290
06 05 2011 20		MERCURY VENUS	JUPITER	1.4	4.5	4.7	4.7	25	0.6	-3.9	-2.1	-4.1	-37	330	-2	302
06 05 2011 21		MERCURY VENUS	JUPITER	1.4	4.4	4.6	4.7	25	0.6	-3.9	-2.1	-4.1	-41	349	-9	315
06 05 2011 22		MERCURY VENUS	JUPITER	1.4	4.4	4.6	4.7	25	0.6	-3.9	-2.1	-4.1	-41	9	-14	328
06 05 2011 23		MERCURY VENUS	JUPITER	1.4	4.4	4.6	4.6	25	0.5	-3.9	-2.1	-4.1	-38	28	-18	343
07 05 2011 00		MERCURY VENUS	JUPITER	1.4	4.4	4.5	4.6	25	0.5	-3.9	-2.1	-4.1	-31	45	-19	358
07 05 2011 01		MERCURY VENUS	JUPITER	1.4	4.3	4.5	4.5	25	0.5	-3.9	-2.1	-4.1	-23	58	-18	13
07 05 2011 02		MERCURY VENUS	JUPITER	1.4	4.3	4.4	4.5	25	0.5	-3.9	-2.1	-4.1	-13	70	-15	28
07 05 2011 03		MERCURY VENUS	JUPITER	1.4	4.3	4.4	4.5	25	0.5	-3.9	-2.1	-4.1	-2	81	-10	41
07 05 2011 04		MERCURY VENUS	JUPITER	1.4	4.3	4.4	4.4	25	0.5	-3.9	-2.1	-4.1	9	91	-3	54
07 05 2011 05		MERCURY VENUS	JUPITER	1.4	4.2	4.3	4.4	25	0.5	-3.9	-2.1	-4.1	20	101	4	66
07 05 2011 06		MERCURY VENUS	JUPITER	1.4	4.2	4.3	4.4	25	0.5	-3.9	-2.1	-4.1	31	113	12	78
07 05 2011 07		MERCURY VENUS	JUPITER	1.4	4.2	4.2	4.3	25	0.5	-3.9	-2.1	-4.1	41	127	21	90
07 05 2011 08		MERCURY VENUS	JUPITER	1.4	4.2	4.2	4.3	25	0.5	-3.9	-2.1	-4.1	49	144	30	102
07 05 2011 09		MERCURY VENUS	JUPITER	1.4	4.1	4.2	4.3	25	0.5	-3.9	-2.1	-4.1	54	167	38	116
07 05 2011 10		MERCURY VENUS	JUPITER	1.4	4.1	4.1	4.2	25	0.5	-3.9	-2.1	-4.1	54	191	46	133
07 05 2011 11		MERCURY VENUS	JUPITER	1.4	4.1	4.1	4.2	25	0.5	-3.9	-2.1	-4.1	50	214	51	154
07 05 2011 12		MERCURY VENUS	JUPITER	1.4	4.1	4.0	4.2	25	0.5	-3.9	-2.1	-4.1	42	232	53	177
07 05 2011 13		MERCURY VENUS	JUPITER	1.4	4.0	4.0	4.1	25	0.5	-3.9	-2.1	-4.1	32	246	52	201
07 05 2011 14		MERCURY VENUS	JUPITER	1.4	4.0	4.0	4.1	25	0.5	-3.9	-2.1	-4.1	22	258	47	222
07 05 2011 15		MERCURY VENUS	JUPITER	1.4	4.0	3.9	4.1	25	0.5	-3.9	-2.1	-4.1	11	268	40	239
07 05 2011 16		MERCURY VENUS	JUPITER	1.4	4.0	3.9	4.0	25	0.5	-3.9	-2.1	-4.1	0	278	32	254
07 05 2011 17		MERCURY VENUS	JUPITER	1.4	3.9	3.8	4.0	25	0.5	-3.9	-2.1	-4.1	-11	289	23	267
07 05 2011 18		MERCURY VENUS	JUPITER	1.4	3.9	3.8	4.0	25	0.5	-3.9	-2.1	-4.1	-21	300	14	279
07 05 2011 19		MERCURY VENUS	JUPITER	1.4	3.9	3.8	3.9	25	0.5	-3.9	-2.1	-4.1	-30	314	6	290
07 05 2011 20		MERCURY VENUS	JUPITER	1.4	3.9	3.7	3.9	25	0.5	-3.9	-2.1	-4.1	-37	330	-1	302
07 05 2011 21		MERCURY VENUS	JUPITER	1.4	3.8	3.7	3.9	26	0.5	-3.9	-2.1	-4.1	-41	349	-8	315
07 05 2011 22		MERCURY VENUS	JUPITER	1.4	3.8	3.6										

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
08 05 2011 09		MERCURY VENUS JUPITER	1.4	3.5	3.2	3.6	26	0.5	-3.9	-2.1	-4.1	54	167	38	116
08 05 2011 10		MERCURY VENUS JUPITER	1.4	3.5	3.1	3.5	26	0.5	-3.9	-2.1	-4.1	54	191	46	133
08 05 2011 11		MERCURY VENUS JUPITER	1.4	3.5	3.1	3.5	26	0.5	-3.9	-2.1	-4.1	50	214	51	153
08 05 2011 12		MERCURY VENUS JUPITER	1.4	3.4	3.1	3.5	26	0.5	-3.9	-2.1	-4.1	42	232	53	177
08 05 2011 13		MERCURY VENUS JUPITER	1.4	3.4	3.0	3.5	26	0.5	-3.9	-2.1	-4.1	32	246	52	201
08 05 2011 14		MERCURY VENUS JUPITER	1.4	3.4	3.0	3.4	26	0.5	-3.9	-2.1	-4.1	22	258	47	222
08 05 2011 15		MERCURY VENUS JUPITER	1.4	3.4	2.9	3.4	26	0.5	-3.9	-2.1	-4.1	11	268	40	239
08 05 2011 16		MERCURY VENUS JUPITER	1.4	3.3	2.9	3.4	26	0.5	-3.9	-2.1	-4.1	0	278	32	254
08 05 2011 17		MERCURY VENUS JUPITER	1.4	3.3	2.9	3.4	26	0.5	-3.9	-2.1	-4.1	-11	289	23	267
08 05 2011 18		MERCURY VENUS JUPITER	1.4	3.3	2.8	3.3	26	0.5	-3.9	-2.1	-4.1	-21	300	14	279
08 05 2011 19		MERCURY VENUS JUPITER	1.4	3.3	2.8	3.3	26	0.5	-3.9	-2.1	-4.1	-30	314	6	290
08 05 2011 20		MERCURY VENUS JUPITER	1.4	3.2	2.7	3.3	26	0.5	-3.9	-2.1	-4.1	-37	330	-1	302
08 05 2011 21		MERCURY VENUS JUPITER	1.4	3.2	2.7	3.3	26	0.4	-3.9	-2.1	-4.1	-41	349	-8	315
08 05 2011 22		MERCURY VENUS JUPITER	1.4	3.2	2.7	3.2	26	0.4	-3.9	-2.1	-4.1	-41	9	-14	328
08 05 2011 23		MERCURY VENUS JUPITER	1.4	3.2	2.6	3.2	26	0.4	-3.9	-2.1	-4.1	-37	28	-17	343
09 05 2011 00		MERCURY VENUS JUPITER	1.4	3.1	2.6	3.2	26	0.4	-3.9	-2.1	-4.1	-31	44	-19	358
09 05 2011 01		MERCURY VENUS JUPITER	1.4	3.1	2.5	3.2	26	0.4	-3.9	-2.1	-4.1	-22	58	-18	13
09 05 2011 02		MERCURY VENUS JUPITER	1.4	3.1	2.5	3.1	26	0.4	-3.9	-2.1	-4.1	-12	70	-15	27
09 05 2011 03		MERCURY VENUS JUPITER	1.4	3.1	2.5	3.1	26	0.4	-3.9	-2.1	-4.1	-1	80	-9	41
09 05 2011 04		MERCURY VENUS JUPITER	1.4	3.0	2.4	3.1	26	0.4	-3.9	-2.1	-4.1	10	90	-3	54
09 05 2011 05		MERCURY VENUS JUPITER	1.4	3.0	2.4	3.1	26	0.4	-3.9	-2.1	-4.1	21	100	4	66
09 05 2011 06		MERCURY VENUS JUPITER	1.4	3.0	2.3	3.0	26	0.4	-3.9	-2.1	-4.1	32	112	13	78
09 05 2011 07		MERCURY VENUS JUPITER	1.4	3.0	2.3	3.0	26	0.4	-3.9	-2.1	-4.1	42	126	21	89
09 05 2011 08		MERCURY VENUS JUPITER	1.4	2.9	2.3	3.0	26	0.4	-3.9	-2.1	-4.1	50	144	30	102
09 05 2011 09		MERCURY VENUS JUPITER	1.4	2.9	2.2	3.0	26	0.4	-3.9	-2.1	-4.1	54	167	39	116
09 05 2011 10		MERCURY VENUS JUPITER	1.4	2.9	2.2	2.9	26	0.4	-3.9	-2.1	-4.1	55	192	46	133
09 05 2011 11		MERCURY VENUS JUPITER	1.4	2.9	2.2	2.9	26	0.4	-3.9	-2.1	-4.1	50	214	51	153
09 05 2011 12		MERCURY VENUS JUPITER	1.4	2.8	2.1	2.9	26	0.4	-3.9	-2.1	-4.1	42	232	54	177
09 05 2011 13		MERCURY VENUS JUPITER	1.4	2.8	2.1	2.9	26	0.4	-3.9	-2.1	-4.1	32	247	52	201
09 05 2011 14		MERCURY VENUS JUPITER	1.4	2.8	2.0	2.8	26	0.4	-3.9	-2.1	-4.1	22	258	47	222
09 05 2011 15		MERCURY VENUS JUPITER	1.4	2.8	2.0	2.8	26	0.4	-3.9	-2.1	-4.1	11	269	40	240
09 05 2011 16		MERCURY VENUS JUPITER	1.4	2.7	2.0	2.8	26	0.4	-3.9	-2.1	-4.1	0	279	32	254
09 05 2011 17		MERCURY VENUS JUPITER	1.4	2.7	1.9	2.8	26	0.4	-3.9	-2.1	-4.1	-11	289	23	267
09 05 2011 18		MERCURY VENUS JUPITER	1.4	2.7	1.9	2.7	26	0.4	-3.9	-2.1	-4.1	-21	301	15	279
09 05 2011 19		MERCURY VENUS JUPITER	1.4	2.7	1.8	2.7	26	0.4	-3.9	-2.1	-4.1	-30	314	6	291
09 05 2011 20		MERCURY VENUS JUPITER	1.4	2.7	1.8	2.7	26	0.4	-3.9	-2.1	-4.1	-37	330	-1	302
09 05 2011 21		MERCURY VENUS JUPITER	1.4	2.6	1.8	2.7	26	0.4	-3.9	-2.1	-4.1	-40	349	-8	315
09 05 2011 22		MERCURY VENUS JUPITER	1.4	2.6	1.7	2.7	26	0.4	-3.9	-2.1	-4.1	-40	9	-13	329
09 05 2011 23		MERCURY VENUS JUPITER	1.4	2.6	1.7	2.6	26	0.4	-3.9	-2.1	-4.1	-37	28	-17	343
10 05 2011 00		MERCURY VENUS JUPITER	1.4	2.6	1.6	2.6	26	0.4	-3.9	-2.1	-4.1	-30	44	-18	358
10 05 2011 01		MERCURY VENUS JUPITER	1.4	2.5	1.6	2.6	26	0.4	-3.9	-2.1	-4.1	-22	58	-17	13
10 05 2011 02		MERCURY VENUS JUPITER	1.4	2.5	1.6	2.6	26	0.4	-3.9	-2.1	-4.1	-12	69	-14	27
10 05 2011 03		MERCURY VENUS JUPITER	1.4	2.5	1.5	2.6	26	0.4	-3.9	-2.1	-4.1	-1	80	-9	41
10 05 2011 04		MERCURY VENUS JUPITER	1.4	2.5	1.5	2.5	26	0.4	-3.9	-2.1	-4.1	10	90	-3	54
10 05 2011 05		MERCURY VENUS JUPITER	1.4	2.5	1.5	2.5	26	0.4	-3.9	-2.1	-4.1	21	100	4	66
10 05 2011 06		MERCURY VENUS JUPITER	1.4	2.4	1.4	2.5	26	0.4	-3.9	-2.1	-4.1	32	112	13	77
10 05 2011 07		MERCURY VENUS JUPITER	1.4	2.4	1.4	2.5	26	0.4	-3.9	-2.1	-4.1	42	126	22	89
10 05 2011 08		MERCURY VENUS JUPITER	1.4	2.4	1.3	2.5	26	0.4	-3.9	-2.1	-4.1	50	144	30	102
10 05 2011 09		MERCURY VENUS JUPITER	1.4	2.4	1.3	2.4	26	0.4	-3.9	-2.1	-4.1	55	166	39	116
10 05 2011 10		MERCURY VENUS JUPITER	1.4	2.4	1.3	2.4	26	0.4	-3.9	-2.1	-4.1	55	192	46	133
10 05 2011 11		MERCURY VENUS JUPITER	1.4	2.3	1.2	2.4	26	0.4	-3.9	-2.1	-4.1	50	215	52	153
10 05 2011 12		MERCURY VENUS JUPITER	1.4	2.3	1.2	2.4	26	0.4	-3.9	-2.1	-4.1	42	233	54	177
10 05 2011 13		MERCURY VENUS JUPITER	1.4	2.3	1.2	2.4	26	0.4	-3.9	-2.1	-4.1	33	247	52	201
10 05 2011 14		MERCURY VENUS JUPITER	1.4	2.3	1.1	2.3	26	0.4	-3.9	-2.1	-4.1	22	259	48	222
10 05 2011 15		MERCURY VENUS JUPITER	1.4	2.3	1.1	2.3	26	0.4	-3.9	-2.1	-4.1	11	269	41	240
10 05 2011 16		MERCURY VENUS JUPITER	1.4	2.3	1.0	2.3	26	0.4	-3.9	-2.1	-4.1	0	279	32	254
10 05 2011 17		MERCURY VENUS JUPITER	1.4	2.2	1.0	2.3	26	0.3	-3.9	-2.1	-4.1	-11	289	24	267
10 05 2011 18		MERCURY VENUS JUPITER	1.4	2.2	1.0	2.3	26	0.3	-3.9	-2.1	-4.1	-21	301	15	279
10 05 2011 19		MERCURY VENUS JUPITER	1.4	2.2	0.9	2.3	26	0.3	-3.9	-2.1	-4.1	-30	314	6	291
10 05 2011 20		MERCURY VENUS JUPITER	1.4	2.2	0.9	2.2	26	0.3	-3.9	-2.1	-4.1	-36	330	-1	303
10 05 2011 21		MERCURY VENUS JUPITER	1.4	2.2	0.9	2.2	26	0.3	-3.9	-2.1	-4.1	-40	349	-8	315
10 05 2011 22		MERCURY VENUS JUPITER	1.4	2.2	0.8	2.2	26	0.3	-3.9	-2.1	-4.1	-40	9	-13	329
10 05 2011 23		MERCURY VENUS JUPITER	1.4	2.2	0.8	2.2	26	0.3	-3.9	-2.1	-4.1	-36	28	-17	343
11 05 2011 00		MERCURY VENUS JUPITER	1.4	2.1	0.8	2.2	26	0.3	-3.9	-2.1	-4.1	-30	44	-18	358
11 05 2011 01		MERCURY VENUS JUPITER	1.4	2.1	0.8	2.2	26	0.3	-3.9	-2.1	-4.1	-21	58	-17	13
11 05 2011 02		MERCURY VENUS JUPITER	1.4	2.1	0.7	2.2	26	0.3	-3.9	-2.1	-4.1	-11	69	-14	27
11 05 2011 03		MERCURY VENUS JUPITER	1.4	2.1	0.7	2.2	26	0.3	-3.9	-2.1	-4.1	0	80	-9	41
11 05 2011 04		MERCURY VENUS JUPITER	1.4	2.1	0.7	2.1	26	0.3	-3.9	-2.1	-4.1	11	90	-2	54
11 05 2011 05		MERCURY VENUS JUPITER	1.4	2.1	0.7	2.1	26	0.3	-3.9	-2.1	-4.1	22	100	5	66
11 05 2011 06		MERCURY VENUS JUPITER	1.4	2.1	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	32	111	13	77
11 05 2011 07		MERCURY VENUS JUPITER	1.4	2.1	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	42	125	22	89
11 05 2011 08		MERCURY VENUS JUPITER	1.4	2.1	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	50	143	31	102
11 05 2011 09		MERCURY VENUS JUPITER	1.5	2.1	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	55	166	39	116
11 05 2011 10		MERCURY VENUS JUPITER	1.5	2.0	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	55	192	46	133
11 05 2011 11		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	50	215	52	153
11 05 2011 12		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	42	233	54	177
11 05 2011 13		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	33	247	53	201
11 05 2011 14		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	22	259	48	222
11 05 2011 15		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	11	269	41	240
11 05 2011 16		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	0	279	33	255
11 05 2011 17		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	-11	290	24	267
11 05 2011 18		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	-21	301	15	279
11 05 2011 19		MERCURY VENUS JUPITER	1.5	2.0	0.5	2.1	26	0.3	-3.9	-2.1	-4.1	-30	315	6	291
11 05 2011 20		MERCURY VENUS JUPITER	1.5	2.0	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	-36	331	-1	303
11 05 2011 21		MERCURY VENUS JUPITER	1.5	2.0	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	-40	349	-7	315
11 05 2011 22		MERCURY VENUS JUPITER	1.5	2.0	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	-40	9	-13	329
11 05 2011 23		MERCURY VENUS JUPITER	1.5	2.0	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	-36	27	-16	343
12 05 2011 00		MERCURY VENUS JUPITER	1.5	2.0	0.6	2.1	26	0.3	-3.9	-2.1	-4.1	-30	44	-18	358



DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
12 05 2011 09		MERCURY VENUS JUPITER	1.5	2.1	0.9	2.1	26	0.3	-3.9	-2.1	-4.1	55	166	39	116
12 05 2011 10		MERCURY VENUS JUPITER	1.5	2.1	0.9	2.1	26	0.3	-3.9	-2.1	-4.1	55	192	47	132
12 05 2011 11		MERCURY VENUS JUPITER	1.5	2.1	1.0	2.1	26	0.3	-3.9	-2.1	-4.1	51	215	52	153
12 05 2011 12		MERCURY VENUS JUPITER	1.5	2.1	1.0	2.1	26	0.3	-3.9	-2.1	-4.1	43	233	54	177
12 05 2011 13		MERCURY VENUS JUPITER	1.5	2.1	1.0	2.2	26	0.3	-3.9	-2.1	-4.1	33	247	53	201
12 05 2011 14		MERCURY VENUS JUPITER	1.5	2.1	1.1	2.2	26	0.3	-3.9	-2.1	-4.1	22	259	48	223
12 05 2011 15		MERCURY VENUS JUPITER	1.5	2.1	1.1	2.2	26	0.3	-3.9	-2.1	-4.1	11	269	41	240
12 05 2011 16		MERCURY VENUS JUPITER	1.5	2.1	1.1	2.2	26	0.3	-3.9	-2.1	-4.1	0	279	33	255
12 05 2011 17		MERCURY VENUS JUPITER	1.5	2.2	1.2	2.2	26	0.3	-3.9	-2.1	-4.1	-11	290	24	268
12 05 2011 18		MERCURY VENUS JUPITER	1.5	2.2	1.2	2.2	26	0.3	-3.9	-2.1	-4.1	-21	301	15	279
12 05 2011 19		MERCURY VENUS JUPITER	1.5	2.2	1.2	2.2	26	0.3	-3.9	-2.1	-4.1	-29	315	7	291
12 05 2011 20		MERCURY VENUS JUPITER	1.5	2.2	1.3	2.3	26	0.3	-3.9	-2.1	-4.1	-36	331	-0	303
12 05 2011 21		MERCURY VENUS JUPITER	1.5	2.2	1.3	2.3	26	0.3	-3.9	-2.1	-4.1	-39	349	-7	315
12 05 2011 22		MERCURY VENUS JUPITER	1.5	2.2	1.4	2.3	26	0.3	-3.9	-2.1	-4.1	-39	9	-13	329
12 05 2011 23		MERCURY VENUS JUPITER	1.5	2.3	1.4	2.3	26	0.2	-3.9	-2.1	-4.1	-36	27	-16	343
13 05 2011 00		MERCURY VENUS JUPITER	1.5	2.3	1.4	2.3	26	0.2	-3.9	-2.1	-4.1	-29	43	-18	358
13 05 2011 01		MERCURY VENUS JUPITER	1.5	2.3	1.5	2.4	26	0.2	-3.9	-2.1	-4.1	-21	57	-17	13
13 05 2011 02		MERCURY VENUS JUPITER	1.5	2.3	1.5	2.4	26	0.2	-3.9	-2.1	-4.1	-11	68	-14	27
13 05 2011 03		MERCURY VENUS JUPITER	1.5	2.3	1.5	2.4	26	0.2	-3.9	-2.1	-4.1	0	79	-8	41
13 05 2011 04		MERCURY VENUS JUPITER	1.5	2.4	1.6	2.4	26	0.2	-3.9	-2.1	-4.1	11	89	-2	53
13 05 2011 05		MERCURY VENUS JUPITER	1.5	2.4	1.6	2.4	26	0.2	-3.9	-2.1	-4.1	22	99	5	65
13 05 2011 06		MERCURY VENUS JUPITER	1.5	2.4	1.7	2.5	26	0.2	-3.9	-2.1	-4.1	33	110	13	77
13 05 2011 07		MERCURY VENUS JUPITER	1.5	2.4	1.7	2.5	26	0.2	-3.9	-2.1	-4.1	43	124	22	89
13 05 2011 08		MERCURY VENUS JUPITER	1.5	2.5	1.7	2.5	26	0.2	-3.9	-2.1	-4.1	51	142	31	101
13 05 2011 09		MERCURY VENUS JUPITER	1.5	2.5	1.8	2.5	26	0.2	-3.9	-2.1	-4.1	56	166	40	115
13 05 2011 10		MERCURY VENUS JUPITER	1.5	2.5	1.8	2.5	26	0.2	-3.9	-2.1	-4.1	56	191	47	132
13 05 2011 11		MERCURY VENUS JUPITER	1.5	2.5	1.9	2.6	26	0.2	-3.9	-2.1	-4.1	51	215	52	153
13 05 2011 12		MERCURY VENUS JUPITER	1.5	2.6	1.9	2.6	26	0.2	-3.9	-2.1	-4.1	43	233	55	177
13 05 2011 13		MERCURY VENUS JUPITER	1.5	2.6	1.9	2.6	26	0.2	-3.9	-2.1	-4.1	33	248	53	201
13 05 2011 14		MERCURY VENUS JUPITER	1.5	2.6	2.0	2.6	26	0.2	-3.9	-2.1	-4.1	22	259	48	223
13 05 2011 15		MERCURY VENUS JUPITER	1.5	2.6	2.0	2.7	26	0.2	-3.9	-2.1	-4.1	11	270	41	240
13 05 2011 16		MERCURY VENUS JUPITER	1.5	2.7	2.1	2.7	26	0.2	-3.9	-2.1	-4.1	0	280	33	255
13 05 2011 17		MERCURY VENUS JUPITER	1.4	2.7	2.1	2.7	26	0.2	-3.9	-2.1	-4.1	-11	290	24	268
13 05 2011 18		MERCURY VENUS JUPITER	1.4	2.7	2.1	2.8	26	0.2	-3.9	-2.1	-4.1	-21	301	15	280
13 05 2011 19		MERCURY VENUS JUPITER	1.4	2.7	2.2	2.8	26	0.2	-3.9	-2.1	-4.1	-29	315	7	291
13 05 2011 20		MERCURY VENUS JUPITER	1.4	2.8	2.2	2.8	26	0.2	-3.9	-2.1	-4.1	-36	331	-0	303
13 05 2011 21		MERCURY VENUS JUPITER	1.4	2.8	2.2	2.8	26	0.2	-3.9	-2.1	-4.1	-39	349	-7	316
13 05 2011 22		MERCURY VENUS JUPITER	1.4	2.8	2.3	2.9	26	0.2	-3.9	-2.1	-4.1	-39	8	-12	329
13 05 2011 23		MERCURY VENUS JUPITER	1.4	2.9	2.3	2.9	26	0.2	-3.9	-2.1	-4.1	-35	27	-16	343
14 05 2011 00		MERCURY VENUS JUPITER	1.4	2.9	2.4	2.9	26	0.2	-3.9	-2.1	-4.1	-29	43	-17	358
14 05 2011 01		MERCURY VENUS JUPITER	1.4	2.9	2.4	3.0	26	0.2	-3.9	-2.1	-4.1	-20	56	-16	13
14 05 2011 02		MERCURY VENUS JUPITER	1.4	3.0	2.5	3.0	26	0.2	-3.9	-2.1	-4.1	-10	68	-13	27
14 05 2011 03		MERCURY VENUS JUPITER	1.4	3.0	2.5	3.0	26	0.2	-3.9	-2.1	-4.1	1	78	-8	41
14 05 2011 04		MERCURY VENUS JUPITER	1.4	3.0	2.5	3.1	26	0.2	-3.9	-2.1	-4.1	12	88	-2	53
14 05 2011 05		MERCURY VENUS JUPITER	1.4	3.0	2.6	3.1	26	0.2	-3.9	-2.1	-4.1	23	98	5	65
14 05 2011 06		MERCURY VENUS JUPITER	1.4	3.1	2.6	3.1	26	0.2	-3.9	-2.1	-4.1	33	110	14	77
14 05 2011 07		MERCURY VENUS JUPITER	1.4	3.1	2.7	3.2	26	0.2	-3.9	-2.1	-4.1	43	124	22	89
14 05 2011 08		MERCURY VENUS JUPITER	1.4	3.1	2.7	3.2	26	0.2	-3.9	-2.1	-4.1	51	142	31	101
14 05 2011 09		MERCURY VENUS JUPITER	1.4	3.2	2.7	3.2	26	0.2	-3.9	-2.1	-4.1	56	165	40	115
14 05 2011 10		MERCURY VENUS JUPITER	1.4	3.2	2.8	3.3	26	0.2	-3.9	-2.1	-4.1	56	191	47	132
14 05 2011 11		MERCURY VENUS JUPITER	1.4	3.2	2.8	3.3	26	0.2	-3.9	-2.1	-4.1	51	215	53	153
14 05 2011 12		MERCURY VENUS JUPITER	1.4	3.3	2.9	3.3	26	0.2	-3.9	-2.1	-4.1	43	234	55	177
14 05 2011 13		MERCURY VENUS JUPITER	1.4	3.3	2.9	3.4	26	0.2	-3.9	-2.1	-4.1	33	248	53	201
14 05 2011 14		MERCURY VENUS JUPITER	1.4	3.3	2.9	3.4	26	0.2	-3.9	-2.1	-4.1	22	260	49	223
14 05 2011 15		MERCURY VENUS JUPITER	1.4	3.4	3.0	3.4	26	0.2	-3.9	-2.1	-4.1	11	270	41	241
14 05 2011 16		MERCURY VENUS JUPITER	1.4	3.4	3.0	3.5	26	0.2	-3.9	-2.1	-4.1	0	280	33	255
14 05 2011 17		MERCURY VENUS JUPITER	1.4	3.4	3.1	3.5	26	0.2	-3.9	-2.1	-4.1	-11	290	24	268
14 05 2011 18		MERCURY VENUS JUPITER	1.4	3.5	3.1	3.5	26	0.2	-3.9	-2.1	-4.1	-20	302	16	280
14 05 2011 19		MERCURY VENUS JUPITER	1.4	3.5	3.1	3.6	26	0.2	-3.9	-2.1	-4.1	-29	315	7	291
14 05 2011 20		MERCURY VENUS JUPITER	1.4	3.6	3.2	3.6	26	0.1	-3.9	-2.1	-4.1	-35	331	0	303
14 05 2011 21		MERCURY VENUS JUPITER	1.4	3.6	3.2	3.6	26	0.1	-3.9	-2.1	-4.1	-39	349	-7	316
14 05 2011 22		MERCURY VENUS JUPITER	1.4	3.6	3.3	3.7	26	0.1	-3.9	-2.1	-4.1	-39	8	-12	329
14 05 2011 23		MERCURY VENUS JUPITER	1.4	3.7	3.3	3.7	26	0.1	-3.9	-2.1	-4.1	-35	26	-16	343
15 05 2011 00		MERCURY VENUS JUPITER	1.4	3.7	3.3	3.8	26	0.1	-3.9	-2.1	-4.1	-28	42	-17	358
15 05 2011 01		MERCURY VENUS JUPITER	1.4	3.7	3.4	3.8	26	0.1	-3.9	-2.1	-4.1	-20	56	-16	13
15 05 2011 02		MERCURY VENUS JUPITER	1.4	3.8	3.4	3.8	26	0.1	-3.9	-2.1	-4.1	-10	67	-13	27
15 05 2011 03		MERCURY VENUS JUPITER	1.4	3.8	3.5	3.9	26	0.1	-3.9	-2.1	-4.1	1	78	-8	41
15 05 2011 04		MERCURY VENUS JUPITER	1.4	3.9	3.5	3.9	26	0.1	-3.9	-2.1	-4.1	12	88	-1	53
15 05 2011 05		MERCURY VENUS JUPITER	1.4	3.9	3.5	3.9	26	0.1	-3.9	-2.1	-4.1	23	98	5	65
15 05 2011 06		MERCURY VENUS JUPITER	1.4	3.9	3.6	4.0	26	0.1	-3.9	-2.1	-4.1	34	109	14	77
15 05 2011 07		MERCURY VENUS JUPITER	1.4	4.0	3.6	4.0	26	0.1	-3.9	-2.1	-4.1	44	123	23	88
15 05 2011 08		MERCURY VENUS JUPITER	1.4	4.0	3.7	4.1	26	0.1	-3.9	-2.1	-4.1	52	141	31	101
15 05 2011 09		MERCURY VENUS JUPITER	1.4	4.0	3.7	4.1	26	0.1	-3.9	-2.1	-4.1	56	165	40	115
15 05 2011 10		MERCURY VENUS JUPITER	1.4	4.1	3.7	4.1	26	0.1	-3.9	-2.1	-4.1	56	191	47	132
15 05 2011 11		MERCURY VENUS JUPITER	1.4	4.1	3.8	4.2	26	0.1	-3.9	-2.1	-4.1	51	215	53	153
15 05 2011 12		MERCURY VENUS JUPITER	1.4	4.2	3.8	4.2	26	0.1	-3.9	-2.1	-4.1	43	234	55	177
15 05 2011 13		MERCURY VENUS JUPITER	1.4	4.2	3.9	4.2	26	0.1	-3.9	-2.1	-4.1	33	248	54	201
15 05 2011 14		MERCURY VENUS JUPITER	1.4	4.2	3.9	4.3	26	0.1	-3.9	-2.1	-4.1	22	260	49	223
15 05 2011 15		MERCURY VENUS JUPITER	1.4	4.3	3.9	4.3	26	0.1	-3.9	-2.1	-4.1	11	270	42	241
15 05 2011 16		MERCURY VENUS JUPITER	1.4	4.3	4.0	4.4	26	0.1	-3.9	-2.1	-4.1	0	280	33	255
15 05 2011 17		MERCURY VENUS JUPITER	1.4	4.4	4.0	4.4	26	0.1	-3.9	-2.1	-4.1	-10	290	25	268
15 05 2011 18		MERCURY VENUS JUPITER	1.4	4.4	4.1	4.4	26	0.1	-3.9	-2.1	-4.1	-20	302	16	280
15 05 2011 19		MERCURY VENUS JUPITER	1.4	4.4	4.1	4.5	26	0.1	-3.9	-2.1	-4.1	-29	315	7	291
15 05 2011 20		MERCURY VENUS JUPITER	1.4	4.5	4.1	4.5	26	0.1	-3.9	-2.1	-4.1	-35	331	0	303
15 05 2011 21		MERCURY VENUS JUPITER	1.4	4.5	4.2	4.6	26	0.1	-3.9	-2.1	-4.1	-38	349	-7	316
15 05 2011 22		MERCURY VENUS JUPITER	1.4	4.6	4.2	4.6	26	0.1	-3.9	-2.1	-4.1	-38	8	-12	329
15 05 2011 23		MERCURY VENUS JUPITER	1.4	4.6	4.3	4.7	26	0.1	-3.9	-2.1	-4.1	-35	26	-16	343
16 05 2011 00		MERCURY VENUS JUPITER	1.4	4.6	4.3	4.7	26	0.1	-3.9	-2.1	-4.1	-28	42	-17	358

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
14 05 2011	10	MERCURY VENUS MARS	1.4	5.0	4.3	5.0	24	0.2	-3.9	1.3	-3.9	57	191	47	132
14 05 2011	11	MERCURY VENUS MARS	1.4	5.0	4.2	5.0	24	0.2	-3.9	1.3	-3.9	53	215	53	153
14 05 2011	12	MERCURY VENUS MARS	1.4	5.0	4.2	5.0	24	0.2	-3.9	1.3	-3.9	45	234	55	177
14 05 2011	13	MERCURY VENUS MARS	1.4	4.9	4.2	5.0	24	0.2	-3.9	1.3	-3.9	35	248	53	201
14 05 2011	14	MERCURY VENUS MARS	1.4	4.9	4.2	5.0	24	0.2	-3.9	1.3	-3.9	24	260	49	223
14 05 2011	15	MERCURY VENUS MARS	1.4	4.9	4.2	4.9	24	0.2	-3.9	1.3	-3.9	13	270	41	241
14 05 2011	16	MERCURY VENUS MARS	1.4	4.9	4.1	4.9	24	0.2	-3.9	1.3	-3.9	3	280	33	255
14 05 2011	17	MERCURY VENUS MARS	1.4	4.9	4.1	4.9	24	0.2	-3.9	1.3	-3.9	-8	290	24	268
14 05 2011	18	MERCURY VENUS MARS	1.4	4.8	4.1	4.9	24	0.2	-3.9	1.3	-3.9	-18	302	16	280
14 05 2011	19	MERCURY VENUS MARS	1.4	4.8	4.1	4.9	24	0.2	-3.9	1.3	-3.9	-27	315	7	291
14 05 2011	20	MERCURY VENUS MARS	1.4	4.8	4.1	4.8	24	0.1	-3.9	1.3	-3.9	-34	331	0	303
14 05 2011	21	MERCURY VENUS MARS	1.4	4.8	4.1	4.8	24	0.1	-3.9	1.3	-3.9	-37	349	-7	316
14 05 2011	22	MERCURY VENUS MARS	1.4	4.8	4.0	4.8	24	0.1	-3.9	1.3	-3.9	-38	8	-12	329
14 05 2011	23	MERCURY VENUS MARS	1.4	4.7	4.0	4.8	24	0.1	-3.9	1.3	-3.9	-35	26	-16	343
15 05 2011	00	MERCURY VENUS MARS	1.4	4.7	4.0	4.8	24	0.1	-3.9	1.3	-3.9	-29	42	-17	358
15 05 2011	01	MERCURY VENUS MARS	1.4	4.7	4.0	4.7	24	0.1	-3.9	1.3	-3.9	-20	56	-16	13
15 05 2011	02	MERCURY VENUS MARS	1.4	4.7	4.0	4.7	24	0.1	-3.9	1.3	-3.9	-11	67	-13	27
15 05 2011	03	MERCURY VENUS MARS	1.4	4.7	3.9	4.7	24	0.1	-3.9	1.3	-3.9	0	78	-8	41
15 05 2011	04	MERCURY VENUS MARS	1.4	4.6	3.9	4.7	24	0.1	-3.9	1.3	-3.9	11	88	-1	53
15 05 2011	05	MERCURY VENUS MARS	1.4	4.6	3.9	4.7	24	0.1	-3.9	1.3	-3.9	22	98	5	65
15 05 2011	06	MERCURY VENUS MARS	1.4	4.6	3.9	4.6	24	0.1	-3.9	1.3	-3.9	33	109	14	77
15 05 2011	07	MERCURY VENUS MARS	1.4	4.6	3.9	4.6	24	0.1	-3.9	1.3	-3.9	43	123	23	88
15 05 2011	08	MERCURY VENUS MARS	1.4	4.6	3.8	4.6	24	0.1	-3.9	1.3	-3.9	52	141	31	101
15 05 2011	09	MERCURY VENUS MARS	1.4	4.5	3.8	4.6	24	0.1	-3.9	1.3	-3.9	57	165	40	115
15 05 2011	10	MERCURY VENUS MARS	1.4	4.5	3.8	4.6	24	0.1	-3.9	1.3	-3.9	58	191	47	132
15 05 2011	11	MERCURY VENUS MARS	1.4	4.5	3.8	4.5	24	0.1	-3.9	1.3	-3.9	53	215	53	153
15 05 2011	12	MERCURY VENUS MARS	1.4	4.5	3.8	4.5	24	0.1	-3.9	1.3	-3.9	45	234	55	177
15 05 2011	13	MERCURY VENUS MARS	1.4	4.5	3.8	4.5	24	0.1	-3.9	1.3	-3.9	36	248	54	201
15 05 2011	14	MERCURY VENUS MARS	1.4	4.4	3.7	4.5	24	0.1	-3.9	1.3	-3.9	25	260	49	223
15 05 2011	15	MERCURY VENUS MARS	1.4	4.4	3.7	4.5	24	0.1	-3.9	1.3	-3.9	14	270	42	241
15 05 2011	16	MERCURY VENUS MARS	1.4	4.4	3.7	4.4	24	0.1	-3.9	1.3	-3.9	3	280	33	255
15 05 2011	17	MERCURY VENUS MARS	1.4	4.4	3.7	4.4	24	0.1	-3.9	1.3	-3.9	-8	290	25	268
15 05 2011	18	MERCURY VENUS MARS	1.4	4.4	3.7	4.4	24	0.1	-3.9	1.3	-3.9	-18	302	16	280
15 05 2011	19	MERCURY VENUS MARS	1.4	4.3	3.6	4.4	24	0.1	-3.9	1.3	-3.9	-27	315	7	291
15 05 2011	20	MERCURY VENUS MARS	1.4	4.3	3.6	4.4	24	0.1	-3.9	1.3	-3.9	-33	331	0	303
15 05 2011	21	MERCURY VENUS MARS	1.4	4.3	3.6	4.3	24	0.1	-3.9	1.3	-3.9	-37	349	-7	316
15 05 2011	22	MERCURY VENUS MARS	1.4	4.3	3.6	4.3	24	0.1	-3.9	1.3	-3.9	-38	8	-12	329
15 05 2011	23	MERCURY VENUS MARS	1.4	4.2	3.6	4.3	24	0.1	-3.9	1.3	-3.9	-34	26	-16	343
16 05 2011	00	MERCURY VENUS MARS	1.4	4.2	3.5	4.3	24	0.1	-3.9	1.3	-3.9	-28	42	-17	358
16 05 2011	01	MERCURY VENUS MARS	1.4	4.2	3.5	4.2	24	0.1	-3.9	1.3	-3.9	-20	55	-16	13
16 05 2011	02	MERCURY VENUS MARS	1.4	4.2	3.5	4.2	24	0.1	-3.9	1.3	-3.9	-10	67	-13	27
16 05 2011	03	MERCURY VENUS MARS	1.4	4.2	3.5	4.2	24	0.1	-3.9	1.3	-3.9	1	77	-8	40
16 05 2011	04	MERCURY VENUS MARS	1.4	4.1	3.5	4.2	24	0.1	-3.9	1.3	-3.9	11	87	-1	53
16 05 2011	05	MERCURY VENUS MARS	1.4	4.1	3.5	4.2	24	0.1	-3.9	1.3	-3.9	22	97	6	65
16 05 2011	06	MERCURY VENUS MARS	1.4	4.1	3.4	4.1	24	0.1	-3.9	1.3	-3.9	33	109	14	77
16 05 2011	07	MERCURY VENUS MARS	1.4	4.1	3.4	4.1	24	0.1	-3.9	1.3	-3.9	43	123	23	88
16 05 2011	08	MERCURY VENUS MARS	1.4	4.1	3.4	4.1	24	0.1	-3.9	1.3	-3.9	52	140	32	101
16 05 2011	09	MERCURY VENUS MARS	1.4	4.0	3.4	4.1	24	0.1	-3.9	1.3	-3.9	57	164	40	115
16 05 2011	10	MERCURY VENUS MARS	1.4	4.0	3.4	4.1	24	0.1	-3.9	1.3	-3.9	58	191	48	132
16 05 2011	11	MERCURY VENUS MARS	1.4	4.0	3.3	4.0	24	0.1	-3.9	1.3	-3.9	54	215	53	153
16 05 2011	12	MERCURY VENUS MARS	1.4	4.0	3.3	4.0	24	0.1	-3.9	1.3	-3.9	46	234	55	177
16 05 2011	13	MERCURY VENUS MARS	1.4	3.9	3.3	4.0	24	0.1	-3.9	1.3	-3.9	36	248	54	201
16 05 2011	14	MERCURY VENUS MARS	1.4	3.9	3.3	4.0	24	0.1	-3.9	1.3	-3.9	25	260	49	223
16 05 2011	15	MERCURY VENUS MARS	1.4	3.9	3.3	4.0	24	0.1	-3.9	1.3	-3.9	14	270	42	241
16 05 2011	16	MERCURY VENUS MARS	1.3	3.9	3.3	3.9	24	0.1	-3.9	1.3	-3.9	3	280	34	255
16 05 2011	17	MERCURY VENUS MARS	1.3	3.9	3.2	3.9	24	0.1	-3.9	1.3	-3.9	-8	291	25	268
16 05 2011	18	MERCURY VENUS MARS	1.3	3.8	3.2	3.9	24	0.1	-3.9	1.3	-3.9	-18	302	16	280
16 05 2011	19	MERCURY VENUS MARS	1.3	3.8	3.2	3.9	24	0.1	-3.9	1.3	-3.9	-26	315	7	292
16 05 2011	20	MERCURY VENUS MARS	1.3	3.8	3.2	3.8	24	0.1	-3.9	1.3	-3.9	-33	330	0	303
16 05 2011	21	MERCURY VENUS MARS	1.3	3.8	3.2	3.8	24	0.1	-3.9	1.3	-3.9	-37	348	-6	316
16 05 2011	22	MERCURY VENUS MARS	1.3	3.8	3.1	3.8	24	0.1	-3.9	1.3	-3.9	-37	7	-12	329
16 05 2011	23	MERCURY VENUS MARS	1.3	3.7	3.1	3.8	24	0.1	-3.9	1.3	-3.9	-34	25	-15	343
17 05 2011	00	MERCURY VENUS MARS	1.3	3.7	3.1	3.8	24	0.0	-3.9	1.3	-3.9	-28	41	-17	358
17 05 2011	01	MERCURY VENUS MARS	1.3	3.7	3.1	3.7	24	0.0	-3.9	1.3	-3.9	-20	55	-16	13
17 05 2011	02	MERCURY VENUS MARS	1.3	3.7	3.1	3.7	24	0.0	-3.9	1.3	-3.9	-10	66	-13	27
17 05 2011	03	MERCURY VENUS MARS	1.3	3.6	3.1	3.7	24	0.0	-3.9	1.3	-3.9	1	77	-8	40
17 05 2011	04	MERCURY VENUS MARS	1.3	3.6	3.0	3.7	24	0.0	-3.9	1.3	-3.9	11	87	-1	53
17 05 2011	05	MERCURY VENUS MARS	1.3	3.6	3.0	3.7	24	0.0	-3.9	1.3	-3.9	22	97	6	65
17 05 2011	06	MERCURY VENUS MARS	1.3	3.6	3.0	3.6	24	0.0	-3.9	1.3	-3.9	33	108	14	76
17 05 2011	07	MERCURY VENUS MARS	1.3	3.6	3.0	3.6	23	0.0	-3.9	1.3	-3.9	44	122	23	88
17 05 2011	08	MERCURY VENUS MARS	1.3	3.5	3.0	3.6	23	0.0	-3.9	1.3	-3.9	52	140	32	101
17 05 2011	09	MERCURY VENUS MARS	1.3	3.5	2.9	3.6	23	0.0	-3.9	1.3	-3.9	58	163	40	115
17 05 2011	10	MERCURY VENUS MARS	1.3	3.5	2.9	3.5	23	0.0	-3.9	1.3	-3.9	58	190	48	132
17 05 2011	11	MERCURY VENUS MARS	1.3	3.5	2.9	3.5	23	0.0	-3.9	1.3	-3.9	54	215	53	152
17 05 2011	12	MERCURY VENUS MARS	1.3	3.5	2.9	3.5	23	0.0	-3.9	1.3	-3.9	46	234	56	177
17 05 2011	13	MERCURY VENUS MARS	1.3	3.4	2.9	3.5	23	0.0	-3.9	1.3	-3.9	36	248	54	202
17 05 2011	14	MERCURY VENUS MARS	1.3	3.4	2.9	3.5	23	0.0	-3.9	1.3	-3.9	25	260	49	223
17 05 2011	15	MERCURY VENUS MARS	1.3	3.4	2.8	3.4	23	0.0	-3.9	1.3	-3.9	14	271	42	241
17 05 2011	16	MERCURY VENUS MARS	1.3	3.4	2.8	3.4	23	0.0	-3.9	1.3	-3.9	3	280	34	256
17 05 2011	17	MERCURY VENUS MARS	1.3	3.4	2.8	3.4	23	0.0	-3.9	1.3	-3.9	-7	291	25	268
17 05 2011	18	MERCURY VENUS MARS	1.3	3.3	2.8	3.4	23	0.0	-3.9	1.3	-3.9	-17	302	16	280
17 05 2011	19	MERCURY VENUS MARS	1.3	3.3	2.8	3.4	23	0.0	-3.9	1.3	-3.9	-26	315	8	292
17 05 2011	20	MERCURY VENUS MARS	1.3	3.3	2.7	3.3	23	0.0	-3.9	1.3	-3.9	-32	330	0	303
17 05 2011	21	MERCURY VENUS MARS	1.3	3.3	2.7	3.3	23	0.0	-3.9	1.3	-3.9	-36	348	-6	316
17 05 2011	22	MERCURY VENUS MARS	1.3	3.2	2.7	3.3	23	0.0	-3.9	1.3	-3.9	-37	7	-12	329
17 05 2011	23	MERCURY VENUS MARS	1.3	3.2	2.7	3.3	23	0.0	-3.9	1.3	-3.9	-34	25	-15	343
18 05 2011	00	MERCURY VENUS MARS	1.3	3.2	2.7	3.2	23	0.0	-3.9	1.3	-3.9	-28	41	-16	358
18 05 2011	01	MERCURY VENUS MARS	1.3	3.2	2.7	3.2	23	0.0	-3.9	1.3	-3.9	-20	54	-16	13
18 05 2011	02	MERCURY VENUS MARS	1.3	3.2	2.6	3.2	23	0.0	-3.9	1.3					

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
18 05 2011 10		MERCURY VENUS MARS	1.3	3.0	2.5	3.0	23	-0.0	-3.9	1.3	-3.9	59	190	48	131
18 05 2011 11		MERCURY VENUS MARS	1.3	3.0	2.5	3.0	23	-0.0	-3.9	1.3	-3.9	54	215	53	152
18 05 2011 12		MERCURY VENUS MARS	1.3	3.0	2.5	3.0	23	-0.0	-3.9	1.3	-3.9	46	234	56	177
18 05 2011 13		MERCURY VENUS MARS	1.3	2.9	2.4	3.0	23	-0.0	-3.9	1.3	-3.9	37	249	54	202
18 05 2011 14		MERCURY VENUS MARS	1.3	2.9	2.4	3.0	23	-0.0	-3.9	1.3	-3.9	26	260	49	223
18 05 2011 15		MERCURY VENUS MARS	1.3	2.9	2.4	2.9	23	-0.0	-3.9	1.3	-3.9	15	271	42	241
18 05 2011 16		MERCURY VENUS MARS	1.3	2.9	2.4	2.9	23	-0.0	-3.9	1.3	-3.9	4	281	34	256
18 05 2011 17		MERCURY VENUS MARS	1.3	2.9	2.4	2.9	23	-0.0	-3.9	1.3	-3.9	-7	291	25	269
18 05 2011 18		MERCURY VENUS MARS	1.3	2.8	2.3	2.9	23	-0.0	-3.9	1.3	-3.9	-17	302	16	280
18 05 2011 19		MERCURY VENUS MARS	1.3	2.8	2.3	2.9	23	-0.0	-3.9	1.3	-3.9	-25	315	8	292
18 05 2011 20		MERCURY VENUS MARS	1.3	2.8	2.3	2.8	23	-0.0	-3.9	1.3	-3.9	-32	330	0	304
18 05 2011 21		MERCURY VENUS MARS	1.3	2.8	2.3	2.8	23	-0.0	-3.9	1.3	-3.9	-36	348	-6	316
18 05 2011 22		MERCURY VENUS MARS	1.3	2.8	2.3	2.8	23	-0.1	-3.9	1.3	-3.9	-36	6	-11	329
18 05 2011 23		MERCURY VENUS MARS	1.3	2.7	2.3	2.8	23	-0.1	-3.9	1.3	-3.9	-33	24	-15	343
19 05 2011 00		MERCURY VENUS MARS	1.3	2.7	2.2	2.8	23	-0.1	-3.9	1.3	-3.9	-27	40	-16	358
19 05 2011 01		MERCURY VENUS MARS	1.3	2.7	2.2	2.7	23	-0.1	-3.9	1.3	-3.9	-19	53	-15	13
19 05 2011 02		MERCURY VENUS MARS	1.3	2.7	2.2	2.7	23	-0.1	-3.9	1.3	-3.9	-10	65	-12	27
19 05 2011 03		MERCURY VENUS MARS	1.3	2.7	2.2	2.7	23	-0.1	-3.9	1.3	-3.9	1	75	-7	40
19 05 2011 04		MERCURY VENUS MARS	1.3	2.6	2.2	2.7	23	-0.1	-3.9	1.3	-3.9	12	85	-1	53
19 05 2011 05		MERCURY VENUS MARS	1.3	2.6	2.2	2.7	23	-0.1	-3.9	1.3	-3.9	23	95	6	64
19 05 2011 06		MERCURY VENUS MARS	1.3	2.6	2.1	2.7	23	-0.1	-3.9	1.3	-3.9	34	107	14	76
19 05 2011 07		MERCURY VENUS MARS	1.3	2.6	2.1	2.6	23	-0.1	-3.9	1.3	-3.9	44	120	23	88
19 05 2011 08		MERCURY VENUS MARS	1.3	2.6	2.1	2.6	23	-0.1	-3.9	1.3	-3.9	53	138	32	100
19 05 2011 09		MERCURY VENUS MARS	1.3	2.6	2.1	2.6	23	-0.1	-3.9	1.3	-3.9	58	161	41	114
19 05 2011 10		MERCURY VENUS MARS	1.3	2.5	2.1	2.6	23	-0.1	-3.9	1.3	-3.9	59	189	48	131
19 05 2011 11		MERCURY VENUS MARS	1.3	2.5	2.1	2.6	23	-0.1	-3.9	1.3	-3.9	55	215	54	152
19 05 2011 12		MERCURY VENUS MARS	1.3	2.5	2.0	2.6	23	-0.1	-3.9	1.3	-3.9	47	234	56	177
19 05 2011 13		MERCURY VENUS MARS	1.3	2.5	2.0	2.5	23	-0.1	-3.9	1.3	-3.9	37	249	54	202
19 05 2011 14		MERCURY VENUS MARS	1.4	2.5	2.0	2.5	23	-0.1	-3.9	1.3	-3.9	26	261	50	224
19 05 2011 15		MERCURY VENUS MARS	1.4	2.5	2.0	2.5	23	-0.1	-3.9	1.3	-3.9	15	271	42	241
19 05 2011 16		MERCURY VENUS MARS	1.4	2.4	2.0	2.5	23	-0.1	-3.9	1.3	-3.9	4	281	34	256
19 05 2011 17		MERCURY VENUS MARS	1.4	2.4	1.9	2.5	23	-0.1	-3.9	1.3	-3.9	-7	291	25	269
19 05 2011 18		MERCURY VENUS MARS	1.4	2.4	1.9	2.5	23	-0.1	-3.9	1.3	-3.9	-17	302	16	280
19 05 2011 19		MERCURY VENUS MARS	1.4	2.4	1.9	2.4	23	-0.1	-3.9	1.3	-3.9	-25	315	8	292
19 05 2011 20		MERCURY VENUS MARS	1.4	2.4	1.9	2.4	23	-0.1	-3.9	1.3	-3.9	-32	330	0	304
19 05 2011 21		MERCURY VENUS MARS	1.4	2.4	1.9	2.4	23	-0.1	-3.9	1.3	-3.9	-35	347	-6	316
19 05 2011 22		MERCURY VENUS MARS	1.4	2.4	1.9	2.4	23	-0.1	-3.9	1.3	-3.9	-36	6	-11	329
19 05 2011 23		MERCURY VENUS MARS	1.4	2.3	1.8	2.4	23	-0.1	-3.9	1.3	-3.9	-33	23	-15	343
20 05 2011 00		MERCURY VENUS MARS	1.4	2.3	1.8	2.4	23	-0.1	-3.9	1.3	-3.9	-27	39	-16	358
20 05 2011 01		MERCURY VENUS MARS	1.4	2.3	1.8	2.4	23	-0.1	-3.9	1.3	-3.9	-19	53	-15	13
20 05 2011 02		MERCURY VENUS MARS	1.4	2.3	1.8	2.3	23	-0.1	-3.9	1.3	-3.9	-10	64	-12	27
20 05 2011 03		MERCURY VENUS MARS	1.4	2.3	1.8	2.3	23	-0.1	-3.9	1.3	-3.9	1	75	-7	40
20 05 2011 04		MERCURY VENUS MARS	1.4	2.3	1.8	2.3	23	-0.1	-3.9	1.3	-3.9	12	85	-1	53
20 05 2011 05		MERCURY VENUS MARS	1.4	2.3	1.7	2.3	23	-0.1	-3.9	1.3	-3.9	23	95	6	64
20 05 2011 06		MERCURY VENUS MARS	1.4	2.3	1.7	2.3	23	-0.1	-3.9	1.3	-3.9	34	106	15	76
20 05 2011 07		MERCURY VENUS MARS	1.4	2.2	1.7	2.3	23	-0.1	-3.9	1.3	-3.9	44	119	23	88
20 05 2011 08		MERCURY VENUS MARS	1.4	2.2	1.7	2.3	23	-0.1	-3.9	1.3	-3.9	53	137	32	100
20 05 2011 09		MERCURY VENUS MARS	1.4	2.2	1.7	2.3	23	-0.1	-3.9	1.3	-3.9	59	160	41	114
20 05 2011 10		MERCURY VENUS MARS	1.4	2.2	1.7	2.3	23	-0.1	-3.9	1.3	-3.9	60	189	48	131
20 05 2011 11		MERCURY VENUS MARS	1.4	2.2	1.7	2.2	23	-0.1	-3.9	1.3	-3.9	55	214	54	152
20 05 2011 12		MERCURY VENUS MARS	1.4	2.2	1.6	2.2	23	-0.1	-3.9	1.3	-3.9	47	234	56	177
20 05 2011 13		MERCURY VENUS MARS	1.4	2.2	1.6	2.2	23	-0.1	-3.9	1.3	-3.9	37	249	55	202
20 05 2011 14		MERCURY VENUS MARS	1.4	2.2	1.6	2.2	23	-0.1	-3.9	1.3	-3.9	26	261	50	224
20 05 2011 15		MERCURY VENUS MARS	1.5	2.2	1.6	2.2	23	-0.1	-3.9	1.3	-3.9	15	271	43	241
20 05 2011 16		MERCURY VENUS MARS	1.5	2.2	1.6	2.2	23	-0.1	-3.9	1.3	-3.9	4	281	34	256
20 05 2011 17		MERCURY VENUS MARS	1.5	2.1	1.6	2.2	23	-0.1	-3.9	1.3	-3.9	-6	291	25	269
20 05 2011 18		MERCURY VENUS MARS	1.5	2.1	1.5	2.2	23	-0.1	-3.9	1.3	-3.9	-16	302	17	281
20 05 2011 19		MERCURY VENUS MARS	1.5	2.1	1.5	2.2	23	-0.1	-3.9	1.3	-3.9	-25	315	8	292
20 05 2011 20		MERCURY VENUS MARS	1.5	2.1	1.5	2.2	23	-0.1	-3.9	1.3	-3.9	-31	330	1	304
20 05 2011 21		MERCURY VENUS MARS	1.5	2.1	1.5	2.2	23	-0.1	-3.9	1.3	-3.9	-35	347	-6	316
20 05 2011 22		MERCURY VENUS MARS	1.5	2.1	1.5	2.2	23	-0.2	-3.9	1.3	-3.9	-36	5	-11	329
20 05 2011 23		MERCURY VENUS MARS	1.5	2.1	1.5	2.2	23	-0.2	-3.9	1.3	-3.9	-33	23	-14	343
21 05 2011 00		MERCURY VENUS MARS	1.5	2.1	1.5	2.1	23	-0.2	-3.9	1.3	-3.9	-27	38	-16	358
21 05 2011 01		MERCURY VENUS MARS	1.5	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	-19	52	-15	12
21 05 2011 02		MERCURY VENUS MARS	1.5	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	-9	64	-12	27
21 05 2011 03		MERCURY VENUS MARS	1.5	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	1	74	-7	40
21 05 2011 04		MERCURY VENUS MARS	1.5	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	12	84	-0	52
21 05 2011 05		MERCURY VENUS MARS	1.5	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	23	94	6	64
21 05 2011 06		MERCURY VENUS MARS	1.6	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	34	105	15	76
21 05 2011 07		MERCURY VENUS MARS	1.6	2.1	1.4	2.1	23	-0.2	-3.9	1.3	-3.9	45	118	24	87
21 05 2011 08		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	53	136	32	100
21 05 2011 09		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	59	159	41	114
21 05 2011 10		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	60	188	48	131
21 05 2011 11		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	56	214	54	152
21 05 2011 12		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	48	234	56	177
21 05 2011 13		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	38	249	55	202
21 05 2011 14		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	27	261	50	224
21 05 2011 15		MERCURY VENUS MARS	1.6	2.1	1.3	2.1	23	-0.2	-3.9	1.3	-3.9	16	271	43	242
21 05 2011 16		MERCURY VENUS MARS	1.6	2.1	1.2	2.1	23	-0.2	-3.9	1.3	-3.9	5	281	34	256
21 05 2011 17		MERCURY VENUS MARS	1.6	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-6	291	26	269
21 05 2011 18		MERCURY VENUS MARS	1.7	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-16	302	17	281
21 05 2011 19		MERCURY VENUS MARS	1.7	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-24	315	8	292
21 05 2011 20		MERCURY VENUS MARS	1.7	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-31	330	1	304
21 05 2011 21		MERCURY VENUS MARS	1.7	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-35	346	-5	316
21 05 2011 22		MERCURY VENUS MARS	1.7	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-35	4	-11	329
21 05 2011 23		MERCURY VENUS MARS	1.7	2.1	1.2	2.2	23	-0.2	-3.9	1.3	-3.9	-32	22	-14	343
22 05 2011 00		MERCURY VENUS MARS	1.7	2.2	1.1	2.2	23	-0.2	-3.9	1.3	-3.9	-26	38	-16	358
22 05 2011 01		MERCURY VENUS MARS	1.7	2.2	1.1	2.2	23	-0.2	-3.9	1.3	-3.9	-19	51	-15	12
22 05 2011 02		MERCURY VENUS MARS	1.7	2.2	1.1	2.2	23	-0.2	-3.9	1.3					

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
22 05 2011 10		MERCURY VENUS MARS	1.8	2.3	1.0	2.3	22	-0.3	-3.9	1.3	-3.9	61	187	49	131
22 05 2011 11		MERCURY VENUS MARS	1.8	2.3	1.0	2.3	22	-0.3	-3.9	1.3	-3.9	56	214	54	152
22 05 2011 12		MERCURY VENUS MARS	1.8	2.3	1.0	2.3	22	-0.3	-3.9	1.3	-3.9	48	234	57	177
22 05 2011 13		MERCURY VENUS MARS	1.8	2.3	1.0	2.3	22	-0.3	-3.9	1.3	-3.9	38	249	55	202
22 05 2011 14		MERCURY VENUS MARS	1.9	2.3	1.0	2.4	22	-0.3	-3.9	1.3	-3.9	27	261	50	224
22 05 2011 15		MERCURY VENUS MARS	1.9	2.3	1.0	2.4	22	-0.3	-3.9	1.3	-3.9	16	271	43	242
22 05 2011 16		MERCURY VENUS MARS	1.9	2.4	1.0	2.4	22	-0.3	-3.9	1.3	-3.9	5	281	35	256
22 05 2011 17		MERCURY VENUS MARS	1.9	2.4	1.0	2.4	22	-0.3	-3.9	1.3	-3.9	-6	291	26	269
22 05 2011 18		MERCURY VENUS MARS	1.9	2.4	1.0	2.4	22	-0.3	-3.9	1.3	-3.9	-15	302	17	281
22 05 2011 19		MERCURY VENUS MARS	1.9	2.4	1.0	2.4	22	-0.3	-3.9	1.3	-3.9	-24	315	8	292
22 05 2011 20		MERCURY VENUS MARS	1.9	2.4	1.0	2.5	22	-0.3	-3.9	1.3	-3.9	-30	329	1	304
22 05 2011 21		MERCURY VENUS MARS	1.9	2.4	1.0	2.5	22	-0.3	-3.9	1.3	-3.9	-34	346	-5	316
22 05 2011 22		MERCURY VENUS MARS	2.0	2.5	1.0	2.5	22	-0.3	-3.9	1.3	-3.9	-35	4	-11	329
22 05 2011 23		MERCURY VENUS MARS	2.0	2.5	1.0	2.5	22	-0.3	-3.9	1.3	-3.9	-32	21	-14	343
23 05 2011 00		MERCURY VENUS MARS	2.0	2.5	1.0	2.5	22	-0.3	-3.9	1.3	-3.9	-26	37	-15	358
23 05 2011 01		MERCURY VENUS MARS	2.0	2.5	1.0	2.6	22	-0.3	-3.9	1.3	-3.9	-18	50	-15	12
23 05 2011 02		MERCURY VENUS MARS	2.0	2.5	1.0	2.6	22	-0.3	-3.9	1.3	-3.9	-9	62	-11	26
23 05 2011 03		MERCURY VENUS MARS	2.0	2.6	1.0	2.6	22	-0.3	-3.9	1.3	-3.9	2	72	-7	40
23 05 2011 04		MERCURY VENUS MARS	2.0	2.6	1.0	2.6	22	-0.3	-3.9	1.3	-3.9	12	82	0	52
23 05 2011 05		MERCURY VENUS MARS	2.0	2.6	1.0	2.6	22	-0.3	-3.9	1.3	-3.9	24	92	7	64
23 05 2011 06		MERCURY VENUS MARS	2.1	2.6	1.0	2.7	22	-0.3	-3.9	1.3	-3.9	35	103	15	76
23 05 2011 07		MERCURY VENUS MARS	2.1	2.6	0.9	2.7	22	-0.3	-3.9	1.3	-3.9	45	116	24	87
23 05 2011 08		MERCURY VENUS MARS	2.1	2.7	0.9	2.7	22	-0.3	-3.9	1.3	-3.9	54	133	33	100
23 05 2011 09		MERCURY VENUS MARS	2.1	2.7	0.9	2.7	22	-0.3	-3.9	1.3	-3.9	60	157	41	114
23 05 2011 10		MERCURY VENUS MARS	2.1	2.7	0.9	2.8	22	-0.3	-3.9	1.3	-3.9	61	186	49	131
23 05 2011 11		MERCURY VENUS MARS	2.1	2.7	0.9	2.8	22	-0.3	-3.9	1.3	-3.9	57	213	54	152
23 05 2011 12		MERCURY VENUS MARS	2.1	2.8	0.9	2.8	22	-0.3	-3.9	1.3	-3.9	48	234	57	177
23 05 2011 13		MERCURY VENUS MARS	2.2	2.8	1.0	2.8	22	-0.3	-3.9	1.3	-3.9	38	249	55	202
23 05 2011 14		MERCURY VENUS MARS	2.2	2.8	1.0	2.9	22	-0.3	-3.9	1.3	-3.9	28	261	50	224
23 05 2011 15		MERCURY VENUS MARS	2.2	2.8	1.0	2.9	22	-0.3	-3.9	1.3	-3.9	16	271	43	242
23 05 2011 16		MERCURY VENUS MARS	2.2	2.9	1.0	2.9	22	-0.3	-3.9	1.3	-3.9	6	281	35	256
23 05 2011 17		MERCURY VENUS MARS	2.2	2.9	1.0	2.9	22	-0.3	-3.9	1.3	-3.9	-5	291	26	269
23 05 2011 18		MERCURY VENUS MARS	2.2	2.9	1.0	3.0	22	-0.3	-3.9	1.3	-3.9	-15	302	17	281
23 05 2011 19		MERCURY VENUS MARS	2.2	2.9	1.0	3.0	22	-0.3	-3.9	1.3	-3.9	-23	315	9	292
23 05 2011 20		MERCURY VENUS MARS	2.3	3.0	1.0	3.0	22	-0.3	-3.9	1.3	-3.9	-30	329	1	304
23 05 2011 21		MERCURY VENUS MARS	2.3	3.0	1.0	3.0	22	-0.3	-3.9	1.3	-3.9	-34	345	-5	316
23 05 2011 22		MERCURY VENUS MARS	2.3	3.0	1.0	3.1	22	-0.3	-3.9	1.3	-3.9	-34	3	-10	329
23 05 2011 23		MERCURY VENUS MARS	2.3	3.0	1.0	3.1	22	-0.3	-3.9	1.3	-3.9	-32	20	-14	343
24 05 2011 00		MERCURY VENUS MARS	2.3	3.1	1.0	3.1	22	-0.3	-3.9	1.3	-3.9	-26	36	-15	358
24 05 2011 01		MERCURY VENUS MARS	2.3	3.1	1.0	3.1	22	-0.3	-3.9	1.3	-3.9	-18	50	-14	12
24 05 2011 02		MERCURY VENUS MARS	2.3	3.1	1.0	3.2	22	-0.3	-3.9	1.3	-3.9	-9	61	-11	26
24 05 2011 03		MERCURY VENUS MARS	2.4	3.2	1.0	3.2	22	-0.3	-3.9	1.3	-3.9	2	72	-6	40
24 05 2011 04		MERCURY VENUS MARS	2.4	3.2	1.0	3.2	22	-0.4	-3.9	1.3	-4.0	13	81	0	52
24 05 2011 05		MERCURY VENUS MARS	2.4	3.2	1.0	3.3	22	-0.4	-3.9	1.3	-4.0	24	91	7	64
24 05 2011 06		MERCURY VENUS MARS	2.4	3.2	1.0	3.3	22	-0.4	-3.9	1.3	-4.0	35	102	15	75
24 05 2011 07		MERCURY VENUS MARS	2.4	3.3	1.0	3.3	22	-0.4	-3.9	1.3	-4.0	45	115	24	87
24 05 2011 08		MERCURY VENUS MARS	2.4	3.3	1.0	3.3	22	-0.4	-3.9	1.3	-4.0	54	132	33	99
24 05 2011 09		MERCURY VENUS MARS	2.5	3.3	1.1	3.4	22	-0.4	-3.9	1.3	-4.0	60	155	41	113
24 05 2011 10		MERCURY VENUS MARS	2.5	3.4	1.1	3.4	22	-0.4	-3.9	1.3	-4.0	61	185	49	130
24 05 2011 11		MERCURY VENUS MARS	2.5	3.4	1.1	3.4	22	-0.4	-3.9	1.3	-4.0	57	213	55	152
24 05 2011 12		MERCURY VENUS MARS	2.5	3.4	1.1	3.5	22	-0.4	-3.9	1.3	-4.0	49	234	57	176
24 05 2011 13		MERCURY VENUS MARS	2.5	3.4	1.1	3.5	22	-0.4	-3.9	1.3	-4.0	39	249	55	202
24 05 2011 14		MERCURY VENUS MARS	2.5	3.5	1.1	3.5	22	-0.4	-3.9	1.3	-4.0	28	261	50	224
24 05 2011 15		MERCURY VENUS MARS	2.6	3.5	1.1	3.6	22	-0.4	-3.9	1.3	-4.0	17	272	43	242
24 05 2011 16		MERCURY VENUS MARS	2.6	3.5	1.1	3.6	22	-0.4	-3.9	1.3	-4.0	6	281	35	257
24 05 2011 17		MERCURY VENUS MARS	2.6	3.6	1.1	3.6	22	-0.4	-3.9	1.3	-4.0	-5	291	26	269
24 05 2011 18		MERCURY VENUS MARS	2.6	3.6	1.1	3.6	22	-0.4	-3.9	1.3	-4.0	-14	302	17	281
24 05 2011 19		MERCURY VENUS MARS	2.6	3.6	1.1	3.7	22	-0.4	-3.9	1.3	-4.0	-23	314	9	292
24 05 2011 20		MERCURY VENUS MARS	2.6	3.7	1.2	3.7	22	-0.4	-3.9	1.3	-4.0	-29	329	1	304
24 05 2011 21		MERCURY VENUS MARS	2.7	3.7	1.2	3.7	22	-0.4	-3.9	1.3	-4.0	-33	345	-5	316
24 05 2011 22		MERCURY VENUS MARS	2.7	3.7	1.2	3.8	22	-0.4	-3.9	1.3	-4.0	-34	2	-10	330
24 05 2011 23		MERCURY VENUS MARS	2.7	3.8	1.2	3.8	22	-0.4	-3.9	1.3	-4.0	-31	19	-14	343
25 05 2011 00		MERCURY VENUS MARS	2.7	3.8	1.2	3.8	22	-0.4	-3.9	1.3	-4.0	-26	35	-15	358
25 05 2011 01		MERCURY VENUS MARS	2.7	3.8	1.2	3.9	22	-0.4	-3.9	1.3	-4.0	-18	49	-14	12
25 05 2011 02		MERCURY VENUS MARS	2.7	3.9	1.2	3.9	22	-0.4	-3.9	1.3	-4.0	-8	60	-11	26
25 05 2011 03		MERCURY VENUS MARS	2.8	3.9	1.2	3.9	22	-0.4	-3.9	1.3	-4.0	2	71	-6	40
25 05 2011 04		MERCURY VENUS MARS	2.8	3.9	1.3	4.0	22	-0.4	-3.9	1.3	-4.0	13	81	0	52
25 05 2011 05		MERCURY VENUS MARS	2.8	4.0	1.3	4.0	22	-0.4	-3.9	1.3	-4.0	24	90	7	64
25 05 2011 06		MERCURY VENUS MARS	2.8	4.0	1.3	4.0	22	-0.4	-3.9	1.3	-4.0	35	101	15	75
25 05 2011 07		MERCURY VENUS MARS	2.8	4.0	1.3	4.1	22	-0.4	-3.9	1.3	-4.0	45	114	24	87
25 05 2011 08		MERCURY VENUS MARS	2.8	4.1	1.3	4.1	22	-0.4	-3.9	1.3	-4.0	54	130	33	99
25 05 2011 09		MERCURY VENUS MARS	2.9	4.1	1.3	4.1	22	-0.4	-3.9	1.3	-4.0	61	154	42	113
25 05 2011 10		MERCURY VENUS MARS	2.9	4.1	1.3	4.2	22	-0.4	-3.9	1.3	-4.0	62	184	49	130
25 05 2011 11		MERCURY VENUS MARS	2.9	4.2	1.3	4.2	22	-0.4	-3.9	1.3	-4.0	57	212	55	151
25 05 2011 12		MERCURY VENUS MARS	2.9	4.2	1.4	4.2	22	-0.4	-3.9	1.3	-4.0	49	234	57	176
25 05 2011 13		MERCURY VENUS MARS	2.9	4.2	1.4	4.3	22	-0.5	-3.9	1.3	-4.0	39	249	56	202
25 05 2011 14		MERCURY VENUS MARS	3.0	4.3	1.4	4.3	22	-0.5	-3.9	1.3	-4.0	28	261	51	224
25 05 2011 15		MERCURY VENUS MARS	3.0	4.3	1.4	4.4	22	-0.5	-3.9	1.3	-4.0	17	272	43	242
25 05 2011 16		MERCURY VENUS MARS	3.0	4.3	1.4	4.4	22	-0.5	-3.9	1.3	-4.0	6	281	35	257
25 05 2011 17		MERCURY VENUS MARS	3.0	4.4	1.4	4.4	22	-0.5	-3.9	1.3	-4.0	-4	291	26	269
25 05 2011 18		MERCURY VENUS MARS	3.0	4.4	1.4	4.5	22	-0.5	-3.9	1.3	-4.0	-14	302	17	281
25 05 2011 19		MERCURY VENUS MARS	3.1	4.4	1.5	4.5	22	-0.5	-3.9	1.3	-4.0	-22	314	9	293
25 05 2011 20		MERCURY VENUS MARS	3.1	4.5	1.5	4.5	22	-0.5	-3.9	1.3	-4.0	-29	328	1	304
25 05 2011 21		MERCURY VENUS MARS	3.1	4.5	1.5	4.6	22	-0.5	-3.9	1.3	-4.0	-33	344	-5	316
25 05 2011 22		MERCURY VENUS MARS	3.1	4.6	1.5	4.6	22	-0.5	-3.9	1.3	-4.0	-33	2	-10	330
25 05 2011 23		MERCURY VENUS MARS	3.1	4.6	1.5	4.6	22	-0.5	-3.9	1.3	-4.0	-31	19	-14	343
26 05 2011 00		MERCURY VENUS MARS	3.2	4.6	1.5	4.7	22	-0.5	-3.9	1.3	-4.0	-25	34	-15	358
26 05 2011 01		MERCURY VENUS MARS	3.2	4.7	1.6	4.7	22	-0.5	-3.9	1.3	-4.0	-18	48	-14	12
26 05 2011 02		MERCURY VENUS MARS	3.2	4.7	1.6	4.7	22	-0.5	-3.9	1.3	-4.0				

Date, Time = data ed ora  
 Bodies = corpi  
 Dxy = distanza tra il corpo x e quello y, in gradi  
 Group = cerchio minimo comprendente tutto il gruppo, in gradi  
 EL = elongazione dal Sole, in gradi  
 MAGx = magnitudine del corpo x  
 MAGT = magnitudine totale del gruppo  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi      AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

Date in the format day/month/year  
 Dxy = distance between the body x and y, in °  
 GROUP = least group, in °  
 EL = elongation from the Sun, in °  
 MAGx = magnitude of body x  
 MAGT = total magnitude  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °      AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# 3 PIANETI IN LINEA RETTA

## 3 PLANETS IN STRAIGHT LINE

DATE	TIMES	BODIES			C	ALT	AZ	ALT.S.	AZ.S
18 02 2011 07		MERCURY	MARS	NEPTUNE	0.232	9	120	-4	104
18 02 2011 08		MERCURY	MARS	NEPTUNE	0.229	18	132	4	116
18 02 2011 09		MERCURY	MARS	NEPTUNE	0.226	26	145	11	129
18 02 2011 10		MERCURY	MARS	NEPTUNE	0.223	31	161	17	142
18 02 2011 11		MERCURY	MARS	NEPTUNE	0.220	34	177	22	157
18 02 2011 12		MERCURY	MARS	NEPTUNE	0.217	33	194	24	173
18 02 2011 13		MERCURY	MARS	NEPTUNE	0.214	29	210	24	189
18 02 2011 14		MERCURY	MARS	NEPTUNE	0.211	23	224	21	205
18 02 2011 15		MERCURY	MARS	NEPTUNE	0.208	14	236	16	220
18 02 2011 16		MERCURY	MARS	NEPTUNE	0.205	4	247	10	233
18 02 2011 17		MERCURY	MARS	NEPTUNE	0.202	-6	257	2	246
18 02 2011 18		MERCURY	MARS	NEPTUNE	0.199	-17	266	-5	258
18 02 2011 19		MERCURY	MARS	NEPTUNE	0.196	-29	277	-14	270
18 02 2011 20		MERCURY	MARS	NEPTUNE	0.193	-39	288	-23	282
18 02 2011 21		MERCURY	MARS	NEPTUNE	0.190	-49	304	-31	296
18 02 2011 22		MERCURY	MARS	NEPTUNE	0.187	-57	325	-39	311
18 02 2011 23		MERCURY	MARS	NEPTUNE	0.184	-62	355	-44	330
19 02 2011 00		MERCURY	MARS	NEPTUNE	0.181	-60	25	-47	351
19 02 2011 01		MERCURY	MARS	NEPTUNE	0.178	-54	49	-47	13
19 02 2011 02		MERCURY	MARS	NEPTUNE	0.175	-45	66	-43	33
19 02 2011 03		MERCURY	MARS	NEPTUNE	0.172	-34	79	-37	51
19 02 2011 04		MERCURY	MARS	NEPTUNE	0.169	-23	90	-30	66
19 02 2011 05		MERCURY	MARS	NEPTUNE	0.166	-12	99	-21	79
19 02 2011 06		MERCURY	MARS	NEPTUNE	0.163	-1	109	-12	92
19 02 2011 07		MERCURY	MARS	NEPTUNE	0.160	9	119	-3	104
19 02 2011 08		MERCURY	MARS	NEPTUNE	0.157	19	131	4	116
19 02 2011 09		MERCURY	MARS	NEPTUNE	0.154	26	144	12	128
19 02 2011 10		MERCURY	MARS	NEPTUNE	0.151	32	160	18	142
19 02 2011 11		MERCURY	MARS	NEPTUNE	0.149	34	176	22	157
19 02 2011 12		MERCURY	MARS	NEPTUNE	0.146	33	194	24	173
19 02 2011 13		MERCURY	MARS	NEPTUNE	0.143	29	210	24	189
19 02 2011 14		MERCURY	MARS	NEPTUNE	0.140	23	224	22	205
19 02 2011 15		MERCURY	MARS	NEPTUNE	0.137	14	236	17	220
19 02 2011 16		MERCURY	MARS	NEPTUNE	0.134	4	247	10	233
19 02 2011 17		MERCURY	MARS	NEPTUNE	0.132	-6	257	3	246
19 02 2011 18		MERCURY	MARS	NEPTUNE	0.129	-17	266	-5	258
19 02 2011 19		MERCURY	MARS	NEPTUNE	0.126	-29	277	-14	270
19 02 2011 20		MERCURY	MARS	NEPTUNE	0.123	-39	288	-23	282
19 02 2011 21		MERCURY	MARS	NEPTUNE	0.121	-49	304	-31	296
19 02 2011 22		MERCURY	MARS	NEPTUNE	0.118	-57	325	-39	312
19 02 2011 23		MERCURY	MARS	NEPTUNE	0.115	-61	353	-44	330
20 02 2011 00		MERCURY	MARS	NEPTUNE	0.113	-60	24	-47	351
20 02 2011 01		MERCURY	MARS	NEPTUNE	0.110	-53	48	-47	13
20 02 2011 02		MERCURY	MARS	NEPTUNE	0.107	-44	65	-43	33
20 02 2011 03		MERCURY	MARS	NEPTUNE	0.105	-34	78	-37	51
20 02 2011 04		MERCURY	MARS	NEPTUNE	0.102	-23	89	-29	66
20 02 2011 05		MERCURY	MARS	NEPTUNE	0.099	-12	98	-21	79
20 02 2011 06		MERCURY	MARS	NEPTUNE	0.097	0	108	-12	91
20 02 2011 07		MERCURY	MARS	NEPTUNE	0.094	10	118	-3	103
20 02 2011 08		MERCURY	MARS	NEPTUNE	0.092	19	130	4	115
20 02 2011 09		MERCURY	MARS	NEPTUNE	0.089	27	143	12	128
20 02 2011 10		MERCURY	MARS	NEPTUNE	0.087	32	159	18	142
20 02 2011 11		MERCURY	MARS	NEPTUNE	0.084	35	176	23	157
20 02 2011 12		MERCURY	MARS	NEPTUNE	0.082	34	193	25	173
20 02 2011 13		MERCURY	MARS	NEPTUNE	0.079	30	209	25	189
20 02 2011 14		MERCURY	MARS	NEPTUNE	0.077	23	223	22	205
20 02 2011 15		MERCURY	MARS	NEPTUNE	0.074	14	236	17	220
20 02 2011 16		MERCURY	MARS	NEPTUNE	0.072	5	247	11	234
20 02 2011 17		MERCURY	MARS	NEPTUNE	0.070	-6	257	3	246
20 02 2011 18		MERCURY	MARS	NEPTUNE	0.067	-17	266	-5	258
20 02 2011 19		MERCURY	MARS	NEPTUNE	0.065	-28	277	-14	270
20 02 2011 20		MERCURY	MARS	NEPTUNE	0.063	-39	288	-22	283
20 02 2011 21		MERCURY	MARS	NEPTUNE	0.060	-49	303	-31	296
20 02 2011 22		MERCURY	MARS	NEPTUNE	0.058	-57	324	-38	312
20 02 2011 23		MERCURY	MARS	NEPTUNE	0.056	-61	352	-44	330
21 02 2011 00		MERCURY	MARS	NEPTUNE	0.054	-59	22	-47	351
21 02 2011 01		MERCURY	MARS	NEPTUNE	0.051	-53	46	-46	13
21 02 2011 02		MERCURY	MARS	NEPTUNE	0.049	-44	64	-43	33
21 02 2011 03		MERCURY	MARS	NEPTUNE	0.047	-33	77	-37	51
21 02 2011 04		MERCURY	MARS	NEPTUNE	0.045	-22	87	-29	66
21 02 2011 05		MERCURY	MARS	NEPTUNE	0.043	-11	97	-21	79
21 02 2011 06		MERCURY	MARS	NEPTUNE	0.041	0	107	-12	91
21 02 2011 07		MERCURY	MARS	NEPTUNE	0.039	10	117	-3	103
21 02 2011 08		MERCURY	MARS	NEPTUNE	0.037	19	129	5	115
21 02 2011 09		MERCURY	MARS	NEPTUNE	0.035	27	142	12	128
21 02 2011 10		MERCURY	MARS	NEPTUNE	0.033	32	158	18	142

DATE	TIMES		BODIES			C	ALT	AZ	ALT.S.	AZ.S
21 02 2011 11			MERCURY	MARS	NEPTUNE	0.031	35	175	23	157
21 02 2011 12			MERCURY	MARS	NEPTUNE	0.029	34	192	25	173
21 02 2011 13			MERCURY	MARS	NEPTUNE	0.027	30	209	25	189
21 02 2011 14			MERCURY	MARS	NEPTUNE	0.025	23	223	22	205
21 02 2011 15			MERCURY	MARS	NEPTUNE	0.024	14	236	17	220
21 02 2011 16			MERCURY	MARS	NEPTUNE	0.022	5	247	11	234
21 02 2011 17			MERCURY	MARS	NEPTUNE	0.020	-6	257	3	246
21 02 2011 18			MERCURY	MARS	NEPTUNE	0.018	-17	266	-5	258
21 02 2011 19			MERCURY	MARS	NEPTUNE	0.017	-28	277	-13	270
21 02 2011 20			MERCURY	MARS	NEPTUNE	0.015	-39	288	-22	283
21 02 2011 21			MERCURY	MARS	NEPTUNE	0.013	-49	303	-31	296
21 02 2011 22			MERCURY	MARS	NEPTUNE	0.012	-57	323	-38	312
21 02 2011 23			MERCURY	MARS	NEPTUNE	0.010	-61	351	-43	330
22 02 2011 00			MERCURY	MARS	NEPTUNE	0.009	-59	20	-46	351
22 02 2011 01			MERCURY	MARS	NEPTUNE	0.007	-53	45	-46	13
22 02 2011 02			MERCURY	MARS	NEPTUNE	0.006	-44	62	-42	33
22 02 2011 03			MERCURY	MARS	NEPTUNE	0.004	-33	75	-36	50
22 02 2011 04			MERCURY	MARS	NEPTUNE	0.003	-22	86	-29	65
22 02 2011 05			MERCURY	MARS	NEPTUNE	0.002	-11	96	-20	79
22 02 2011 06			MERCURY	MARS	NEPTUNE	0.000	0	106	-11	91
22 02 2011 07			MERCURY	MARS	NEPTUNE	-0.000	10	116	-3	103
22 02 2011 08			MERCURY	MARS	NEPTUNE	-0.001	20	128	5	115
22 02 2011 09			MERCURY	MARS	NEPTUNE	-0.002	27	141	13	128
22 02 2011 10			MERCURY	MARS	NEPTUNE	-0.004	33	157	19	142
22 02 2011 11			MERCURY	MARS	NEPTUNE	-0.005	35	174	23	157
22 02 2011 12			MERCURY	MARS	NEPTUNE	-0.006	34	191	26	173
22 02 2011 13			MERCURY	MARS	NEPTUNE	-0.007	30	208	25	189
22 02 2011 14			MERCURY	MARS	NEPTUNE	-0.008	23	223	23	205
22 02 2011 15			MERCURY	MARS	NEPTUNE	-0.009	15	235	18	220
22 02 2011 16			MERCURY	MARS	NEPTUNE	-0.010	5	247	11	234
22 02 2011 17			MERCURY	MARS	NEPTUNE	-0.011	-6	257	3	247
22 02 2011 18			MERCURY	MARS	NEPTUNE	-0.011	-17	266	-4	259
22 02 2011 19			MERCURY	MARS	NEPTUNE	-0.012	-28	277	-13	271
22 02 2011 20			MERCURY	MARS	NEPTUNE	-0.013	-39	288	-22	283
22 02 2011 21			MERCURY	MARS	NEPTUNE	-0.014	-49	303	-30	297
22 02 2011 22			MERCURY	MARS	NEPTUNE	-0.015	-57	323	-38	312
22 02 2011 23			MERCURY	MARS	NEPTUNE	-0.015	-60	349	-43	331
23 02 2011 00			MERCURY	MARS	NEPTUNE	-0.016	-59	18	-46	351
23 02 2011 01			MERCURY	MARS	NEPTUNE	-0.016	-52	43	-46	12
23 02 2011 02			MERCURY	MARS	NEPTUNE	-0.017	-43	61	-42	33
23 02 2011 03			MERCURY	MARS	NEPTUNE	-0.017	-33	74	-36	50
23 02 2011 04			MERCURY	MARS	NEPTUNE	-0.018	-22	85	-28	65
23 02 2011 05			MERCURY	MARS	NEPTUNE	-0.018	-11	95	-20	79
23 02 2011 06			MERCURY	MARS	NEPTUNE	-0.019	1	105	-11	91
23 02 2011 07			MERCURY	MARS	NEPTUNE	-0.019	11	115	-2	103
23 02 2011 08			MERCURY	MARS	NEPTUNE	-0.019	20	127	5	115
23 02 2011 09			MERCURY	MARS	NEPTUNE	-0.019	28	140	13	128
23 02 2011 10			MERCURY	MARS	NEPTUNE	-0.019	33	156	19	142
23 02 2011 11			MERCURY	MARS	NEPTUNE	-0.020	36	173	24	157
23 02 2011 12			MERCURY	MARS	NEPTUNE	-0.020	35	191	26	173
23 02 2011 13			MERCURY	MARS	NEPTUNE	-0.020	30	208	26	190
23 02 2011 14			MERCURY	MARS	NEPTUNE	-0.020	23	223	23	206
23 02 2011 15			MERCURY	MARS	NEPTUNE	-0.020	15	235	18	220
23 02 2011 16			MERCURY	MARS	NEPTUNE	-0.019	5	247	11	234
23 02 2011 17			MERCURY	MARS	NEPTUNE	-0.019	-6	257	4	247
23 02 2011 18			MERCURY	MARS	NEPTUNE	-0.019	-17	266	-4	259
10 05 2011 12			MERCURY	VENUS	JUPITER	0.483	42	233	54	177
10 05 2011 13			MERCURY	VENUS	JUPITER	0.464	33	247	52	201
10 05 2011 14			MERCURY	VENUS	JUPITER	0.444	22	259	48	222
10 05 2011 15			MERCURY	VENUS	JUPITER	0.425	11	269	41	240
10 05 2011 16			MERCURY	VENUS	JUPITER	0.406	0	279	32	254
10 05 2011 17			MERCURY	VENUS	JUPITER	0.386	-11	289	24	267
10 05 2011 18			MERCURY	VENUS	JUPITER	0.367	-21	301	15	279
10 05 2011 19			MERCURY	VENUS	JUPITER	0.347	-30	314	6	291
10 05 2011 20			MERCURY	VENUS	JUPITER	0.328	-36	330	-1	303
10 05 2011 21			MERCURY	VENUS	JUPITER	0.308	-40	349	-8	315
10 05 2011 22			MERCURY	VENUS	JUPITER	0.289	-40	9	-13	329
10 05 2011 23			MERCURY	VENUS	JUPITER	0.269	-36	28	-17	343
11 05 2011 00			MERCURY	VENUS	JUPITER	0.250	-30	44	-18	358
11 05 2011 01			MERCURY	VENUS	JUPITER	0.230	-21	58	-17	13
11 05 2011 02			MERCURY	VENUS	JUPITER	0.211	-11	69	-14	27
11 05 2011 03			MERCURY	VENUS	JUPITER	0.192	0	80	-9	41
11 05 2011 04			MERCURY	VENUS	JUPITER	0.172	11	90	-2	54
11 05 2011 05			MERCURY	VENUS	JUPITER	0.153	22	100	5	66
11 05 2011 06			MERCURY	VENUS	JUPITER	0.133	32	111	13	77
11 05 2011 07			MERCURY	VENUS	JUPITER	0.114	42	125	22	89
11 05 2011 08			MERCURY	VENUS	JUPITER	0.094	50	143	31	102
11 05 2011 09			MERCURY	VENUS	JUPITER	0.075	55	166	39	116
11 05 2011 10			MERCURY	VENUS	JUPITER	0.055	55	192	46	133
11 05 2011 11			MERCURY	VENUS	JUPITER	0.036	50	215	52	153
11 05 2011 12			MERCURY	VENUS	JUPITER	0.016	42	233	54	177
11 05 2011 13			MERCURY	VENUS	JUPITER	-0.003	33	247	53	201
11 05 2011 14			MERCURY	VENUS	JUPITER	-0.022	22	259	48	222



DATE	TIMES	BODIES			C	ALT	AZ	ALT.S.	AZ.S
11 05 2011 15		MERCURY	VENUS	JUPITER	-0.042	11	269	41	240
11 05 2011 16		MERCURY	VENUS	JUPITER	-0.061	0	279	33	255
11 05 2011 17		MERCURY	VENUS	JUPITER	-0.080	-11	290	24	267
11 05 2011 18		MERCURY	VENUS	JUPITER	-0.100	-21	301	15	279
11 05 2011 19		MERCURY	VENUS	JUPITER	-0.119	-30	315	6	291
11 05 2011 20		MERCURY	VENUS	JUPITER	-0.139	-36	331	-1	303
11 05 2011 21		MERCURY	VENUS	JUPITER	-0.158	-40	349	-7	315
11 05 2011 22		MERCURY	VENUS	JUPITER	-0.178	-40	9	-13	329
11 05 2011 23		MERCURY	VENUS	JUPITER	-0.197	-36	27	-16	343
12 05 2011 00		MERCURY	VENUS	JUPITER	-0.217	-30	44	-18	358
12 05 2011 01		MERCURY	VENUS	JUPITER	-0.236	-21	57	-17	13
12 05 2011 02		MERCURY	VENUS	JUPITER	-0.255	-11	69	-14	27
12 05 2011 03		MERCURY	VENUS	JUPITER	-0.275	0	79	-9	41
12 05 2011 04		MERCURY	VENUS	JUPITER	-0.294	11	89	-2	54
12 05 2011 05		MERCURY	VENUS	JUPITER	-0.314	22	99	5	66
12 05 2011 06		MERCURY	VENUS	JUPITER	-0.333	33	111	13	77
12 05 2011 07		MERCURY	VENUS	JUPITER	-0.352	43	125	22	89
12 05 2011 08		MERCURY	VENUS	JUPITER	-0.372	51	143	31	101
12 05 2011 09		MERCURY	VENUS	JUPITER	-0.391	55	166	39	116
12 05 2011 10		MERCURY	VENUS	JUPITER	-0.410	55	192	47	132
12 05 2011 11		MERCURY	VENUS	JUPITER	-0.430	51	215	52	153
12 05 2011 12		MERCURY	VENUS	JUPITER	-0.449	43	233	54	177
12 05 2011 13		MERCURY	VENUS	JUPITER	-0.468	33	247	53	201
12 05 2011 14		MERCURY	VENUS	JUPITER	-0.487	22	259	48	223

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# GEOMETRIE SPAZIALI PLANETARIE TRIANGOLI EQUILATERI PLANETARY SPATIAL GEOMETRIES EQUILATERAL TRIANGLES

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

# GEOMETRIE SPAZIALI PLANETARIE - QUADRATI PLANETARY SPATIAL GEOMETRIES - SQUARES

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

Date, Time = data ed ora  
 Bodies = corpi  
 Dxy = distanza tra il corpo x e quello y, in gradi  
 DQM = distanza media tra i 4 corpi, in gradi  
 MAX = distanza massima tra i 4 corpi, in gradi  
 Group = cerchio minimo comprendente tutto il gruppo, in gradi  
 EL = elongazione dal Sole, in gradi  
 MAGx = magnitudine del corpo x  
 MAGT = magnitudine totale del gruppo  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi  
 AZ.S. = azimut del Sole, in gradi da nord  
 Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .  
 Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del 15%.

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Dxy = distance between the body x and y, in °  
 DQM = middle distance between the 4 bodies, in °  
 MAX = maxima distance between the 4 bodies, in °  
 GROUP = least group, in °  
 EL = elongation from the Sun, in °  
 MAGx = magnitude of body x  
 MAGT = total magnitude  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °  
 AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .  
 I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than 15%.

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# CONGIUNZIONI GEOCENTRICHE <0,2°

## PIANETI-STELLE m<6

# GEOCENTRIC CONJUNCTIONS <0,2°

## PLANETS-STARS m<6

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2011/01/07	13:11:24	0.02772	0.00715	0.666	192	-47	-4.4	4.1		Venus	Theta	LIB
2011/01/10	03:07:36	0.10194	0.00329	1.024	10	-23	-0.1	4.9		Mercury		OPH
2011/01/15	09:08:05	0.13314	0.00657	0.725	190	-47	-4.3	4.3		Venus	Chi	OPH
2011/01/23	10:56:20	0.03856	0.00274	1.234	180	-20	-0.2	5.9		Mercury		
2011/02/07	05:02:54	0.03072	0.00531	0.897	2	-45	-4.1	3.8		Venus	Mu	SGR Polis
2011/02/12	07:38:08	0.08364	0.00510	0.934	359	-44	-4.1	5.9		Venus		
2011/02/14	03:14:48	0.08787	0.00243	1.390	163	-9	-0.8	5.4		Mercury		CAP
2011/02/14	18:34:02	0.01887	0.00158	2.371	341	-2	1.1	6.0		Mars		CAP
2011/02/16	02:44:30	0.09381	0.00495	0.962	177	-43	-4.1	3.5		Venus	Xi2	SGR
2011/02/18	12:41:14	0.16076	0.00486	0.979	176	-43	-4.0	2.9		Venus	Pi	SGR Albaldah
2011/02/21	05:52:51	0.02675	0.00243	1.390	159	-4	-1.2	4.3		Mercury	Iota	AQR
2011/02/22	18:09:27	0.00028	0.00244	1.386	338	-3	-1.3	5.4	63.6	Mercury		AQR
2011/03/01	16:44:18	0.17248	0.00251	1.343	154	4	-1.5	5.5		Mercury		AQR
2011/03/02	01:32:54	0.17102	0.00158	2.364	158	-6	1.1	4.8		Mars	Sigma	AQR
2011/03/06	15:53:08	0.14590	0.00436	1.093	169	-40	-4.0	5.9		Venus	Omicron	CAP
2011/03/08	17:21:19	0.18340	0.00430	1.107	168	-40	-3.9	5.2		Venus	Upsilon	CAP
2011/03/16	23:26:20	0.04316	0.00159	2.356	157	-9	1.1	4.3		Mars	Phi	AQR
2011/03/21	13:18:18	0.15379	0.00399	1.192	343	-37	-3.9	5.2		Venus		CAP
2011/04/10	15:35:11	0.19451	0.00361	1.318	339	-33	-3.8	4.3		Venus	Phi	AQR
2011/04/10	21:27:05	0.13539	0.00160	2.340	336	-14	1.1	5.8		Mars		PSC
2011/04/18	02:30:49	0.12323	0.00350	1.362	338	-31	-3.8	5.5		Venus		PSC
2011/05/06	02:14:07	0.18423	0.00326	1.460	338	-27	-3.8	5.5		Venus		PSC
2011/05/10	11:41:03	0.07346	0.00386	0.873	339	-26	0.3	4.9		Mercury	Mu	PSC
2011/05/14	04:43:12	0.01967	0.00317	1.500	339	-25	-3.8	4.3		Venus	Omicron	PSC
2011/05/28	08:38:28	0.10564	0.00304	1.564	342	-22	-3.8	5.5		Venus	Sigma	ARI
2011/05/29	12:01:23	0.12717	0.00163	2.288	162	-24	1.2	5.8		Mars	Omicron	ARI
2011/06/06	03:28:40	0.00827	0.00262	1.288	165	-8	-1.5	5.5		Mercury		TAU
2011/06/07	02:38:50	0.03537	0.00260	1.296	166	-7	-1.6	5.7		Mercury		
2011/06/14	16:58:46	0.11366	0.00292	1.629	348	-17	-3.9	4.9		Venus	Omega2	TAU
2011/06/15	17:01:28	0.11485	0.00292	1.633	349	-17	-3.9	6.0		Venus		
2011/06/15	17:15:59	0.12047	0.00256	1.318	176	4	-1.9	5.0		Mercury		TAU
2011/06/30	16:52:54	0.18987	0.00168	2.225	169	-32	1.2	5.5		Mars		TAU
2011/07/03	14:43:27	0.07702	0.00169	2.217	170	-32	1.2	5.7		Mars		
2011/07/05	01:55:26	0.11517	0.00282	1.687	179	-12	-3.9	4.2		Venus		GEM
2011/07/05	16:13:29	0.12953	0.00312	1.080	18	22	-0.0	5.3		Mercury	Eta	CNC
2011/08/21	16:10:07	0.13895	0.00183	2.043	4	-46	1.3	5.7		Mars		
2011/09/02	17:45:03	0.07086	0.00237	10.461	24	36	0.7	5.8		Saturn		VIR
2011/09/02	18:17:17	0.07442	0.00277	1.720	203	5	-3.9	4.6		Venus	Chi	LEO
2011/09/04	13:34:02	0.12695	0.00351	0.962	7	-18	-0.4	5.4		Mercury	Psi	LEO
2011/09/18	22:40:04	0.10964	0.00281	1.695	204	9	-3.9	5.9		Venus		VIR
2011/09/19	03:08:29	0.12664	0.00281	1.695	24	9	-3.9	3.9		Venus	Eta	VIR Zaniah
2011/09/19	21:10:18	0.12512	0.00258	1.310	203	-8	-1.4	4.1		Mercury	Sigma	LEO
2011/09/23	11:58:39	0.17258	0.00201	1.863	12	-57	1.2	5.8		Mars		
2011/09/28	15:24:19	0.00892	0.00242	1.395	206	1	-1.3	3.9		Mercury	Eta	VIR Zaniah
2011/10/14	23:10:03	0.03368	0.00292	1.631	21	16	-3.9	4.5		Venus	Lambda	VIR Khambalia
2011/10/21	10:54:06	0.16766	0.00296	1.611	19	17	-3.9	5.2		Venus	Alpha1	LIB
2011/10/21	12:01:29	0.14051	0.00296	1.610	19	18	-3.9	2.7		Venus	Alpha2	LIB Zubenelgenubi
2011/10/27	10:03:40	0.13962	0.00260	1.299	199	18	-0.3	4.6		Mercury	Iota1	LIB
2011/11/03	19:45:17	0.12493	0.00304	1.564	194	21	-3.9	5.9		Venus		
2011/11/06	08:30:06	0.16665	0.00289	1.166	193	21	-0.2	5.9		Mercury		
2011/11/08	12:54:09	0.05884	0.00299	1.129	191	22	-0.2	4.6		Mercury	Omicron	SCO
2011/11/18	23:02:37	0.18636	0.00317	1.503	186	24	-3.8	5.1		Venus	Omicron	OPH
2011/11/20	11:30:00	0.10739	0.00318	1.497	5	25	-3.8	4.2		Venus		OPH
2011/12/15	02:52:05	0.19899	0.00345	1.382	171	30	-3.9	6.0		Venus		

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri degli oggetti

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

A.R. e DEC. = coordinate apparenti geocentriche

R1 = distanza in U.A. del pianeta

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

A.R. e DEC. = apparent geocentric coordinates

R1 = distance in A.U. of the planet

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the planet

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

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# CONGIUNZIONI GEOCENTRICHE <5°

## PIANETI-STELLE m<2

# GEOCENTRIC CONJUNCTIONS <5°

## PLANETS-STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)			
2011/06/13	14:36:12	4.40924	0.00255	1.323	353	1	-1.9	1.7		25.7	Mercury	Beta	TAU Elnath
2011/06/17	15:28:43	4.71428	0.00290	1.639	170	-16	-3.9	1.0		32.8	Venus	Alpha	TAU Aldebaran
2011/06/28	09:42:43	4.77614	0.00283	1.191	11	17	-0.6	1.2		19.6	Mercury	Beta	GEM Pollux
2011/07/26	17:41:31	2.81773	0.00444	0.760	41	26	0.5	1.4		162.5	Mercury	Alpha	LEO Regulus
2011/08/21	21:51:34	0.89948	0.00275	1.729	200	2	-3.9	1.4		95.4	Venus	Alpha	LEO Regulus
2011/09/09	04:49:38	0.66965	0.00310	1.089	195	-16	-0.7	1.4		76.5	Mercury	Alpha	LEO Regulus
2011/10/04	11:35:47	2.89082	0.00287	1.660	203	13	-3.9	1.1		78.7	Venus	Alpha	VIR Spica
2011/10/09	20:04:22	2.29931	0.00239	1.412	206	8	-0.8	1.1		65.0	Mercury	Alpha	VIR Spica
2011/11/10	11:09:33	3.90810	0.00310	1.538	191	22	-3.9	1.1		60.2	Venus	Alpha	SCO Antares
2011/11/10	11:50:21	1.91167	0.00308	1.094	190	22	-0.1	1.1		94.3	Mercury	Alpha	SCO Antares
2011/11/11	01:50:22	1.32724	0.00249	1.498	199	-78	0.9	1.4		229.3	Mars	Alpha	LEO Regulus
2011/11/14	09:33:13	4.33666	0.00235	10.543	201	-28	0.7	1.1		529.9	Saturn	Alpha	VIR Spica

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 5° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the planet from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the planet

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 5°

# CONGIUNZIONI MULTIPLE PIANETI - STELLE

(eventi con 2 o più pianeti ed una stella di mag<2 entro 5°)

# MULTIPLE CONJUNCTIONS PLANETS - STARS

(events with 2 or more planets and a Messier object within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2011/11/10	11:48:52	2.762	3.905	22	-0.1	1.1	Mercury	Alpha	SCO Antares	Venus

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the center of the planets, in gradi

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest planet

mmax = least magnitude

# CONGIUNZIONI MULTIPLE MISTE CERCHI MINIMI PIANETI-STELLE

(eventi con 2 o più pianeti ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS

# LEAST GROUPING PLANETS-STARS

(events with 2 or more planets and a star with mag<2 within 5°)

DATE	TIME	BODIES		D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
07 11 2011	21	MERCURY VENUS	α SCO	2.0	3.7	5.0	5.0	22	-0.3	-3.9	0.9	-4.0	-44	276	-40	300
07 11 2011	22	MERCURY VENUS	α SCO	2.0	3.6	5.0	5.0	22	-0.3	-3.9	0.9	-4.0	-55	289	-46	317
07 11 2011	23	MERCURY VENUS	α SCO	2.0	3.6	4.9	5.0	22	-0.3	-3.9	0.9	-4.0	-64	309	-51	338
08 11 2011	00	MERCURY VENUS	α SCO	2.0	3.5	4.9	4.9	22	-0.3	-3.9	0.9	-4.0	-70	343	-53	2
08 11 2011	01	MERCURY VENUS	α SCO	2.0	3.5	4.9	4.9	22	-0.3	-3.9	0.9	-4.0	-70	25	-50	25
08 11 2011	02	MERCURY VENUS	α SCO	2.0	3.4	4.8	4.9	22	-0.3	-3.9	0.9	-4.0	-62	55	-45	45
08 11 2011	03	MERCURY VENUS	α SCO	2.0	3.4	4.8	4.8	22	-0.3	-3.9	0.9	-4.0	-53	73	-38	62
08 11 2011	04	MERCURY VENUS	α SCO	2.0	3.3	4.8	4.8	22	-0.3	-3.9	0.9	-4.0	-42	85	-30	76
08 11 2011	05	MERCURY VENUS	α SCO	2.0	3.3	4.7	4.8	22	-0.3	-3.9	0.9	-4.0	-31	95	-21	89
08 11 2011	06	MERCURY VENUS	α SCO	2.0	3.3	4.7	4.8	22	-0.3	-3.9	0.9	-4.0	-20	104	-12	101
08 11 2011	07	MERCURY VENUS	α SCO	2.0	3.2	4.7	4.7	22	-0.3	-3.9	0.9	-4.0	-9	113	-3	113
08 11 2011	08	MERCURY VENUS	α SCO	2.0	3.2	4.7	4.7	22	-0.3	-3.9	0.9	-4.0	1	123	4	125
08 11 2011	09	MERCURY VENUS	α SCO	2.0	3.1	4.6	4.7	22	-0.3	-3.9	0.9	-4.0	10	134	10	137
08 11 2011	10	MERCURY VENUS	α SCO	2.0	3.1	4.6	4.6	22	-0.3	-3.9	0.9	-4.0	17	146	15	151
08 11 2011	11	MERCURY VENUS	α SCO	2.0	3.0	4.6	4.6	22	-0.3	-3.9	0.9	-4.0	22	159	18	166
08 11 2011	12	MERCURY VENUS	α SCO	2.0	3.0	4.5	4.6	22	-0.3	-3.9	0.9	-4.0	25	174	19	181
08 11 2011	13	MERCURY VENUS	α SCO	2.0	3.0	4.5	4.6	22	-0.3	-3.9	0.9	-4.0	24	188	18	196
08 11 2011	14	MERCURY VENUS	α SCO	2.0	2.9	4.5	4.5	22	-0.3	-3.9	0.9	-4.0	21	203	14	211
08 11 2011	15	MERCURY VENUS	α SCO	2.0	2.9	4.5	4.5	22	-0.3	-3.9	0.9	-4.0	16	216	9	224
08 11 2011	16	MERCURY VENUS	α SCO	2.0	2.9	4.4	4.5	22	-0.3	-3.9	0.9	-4.0	8	228	2	237
08 11 2011	17	MERCURY VENUS	α SCO	2.0	2.8	4.4	4.5	22	-0.3	-3.9	0.9	-4.0	-1	238	-5	249
08 11 2011	18	MERCURY VENUS	α SCO	2.0	2.8	4.4	4.4	22	-0.3	-3.9	0.9	-4.0	-11	247	-14	260
08 11 2011	19	MERCURY VENUS	α SCO	2.0	2.7	4.4	4.4	22	-0.3	-3.9	0.9	-4.0	-22	256	-23	272
08 11 2011	20	MERCURY VENUS	α SCO	2.0	2.7	4.3	4.4	22	-0.3	-3.9	0.9	-4.0	-33	266	-32	285
08 11 2011	21	MERCURY VENUS	α SCO	2.0	2.7	4.3	4.4	22	-0.3	-3.9	0.9	-4.0	-44	276	-40	300
08 11 2011	22	MERCURY VENUS	α SCO	2.0	2.6	4.3	4.3	22	-0.3	-3.9	0.9	-4.0	-55	289	-47	317
08 11 2011	23	MERCURY VENUS	α SCO	2.0	2.6	4.3	4.3	22	-0.3	-3.9	0.9	-4.0	-64	308	-51	338
09 11 2011	00	MERCURY VENUS	α SCO	2.0	2.6	4.3	4.3	22	-0.3	-3.9	0.9	-4.0	-71	342	-53	2
09 11 2011	01	MERCURY VENUS	α SCO	2.0	2.5	4.2	4.3	22	-0.3	-3.9	0.9	-4.0	-70	25	-51	25
09 11 2011	02	MERCURY VENUS	α SCO	2.0	2.5	4.2	4.3	22	-0.3	-3.9	0.9	-4.0	-63	55	-46	46
09 11 2011	03	MERCURY VENUS	α SCO	2.0	2.5	4.2	4.2	22	-0.3	-3.9	0.9	-4.0	-53	73	-38	62
09 11 2011	04	MERCURY VENUS	α SCO	2.0	2.4	4.2	4.2	22	-0.3	-3.9	0.9	-4.0	-42	85	-30	77
09 11 2011	05	MERCURY VENUS	α SCO	2.0	2.4	4.1	4.2	22	-0.3	-3.9	0.9	-4.0	-31	95	-21	89
09 11 2011	06	MERCURY VENUS	α SCO	2.0	2.4	4.1	4.2	22	-0.3	-3.9	0.9	-4.0	-20	104	-12	101
09 11 2011	07	MERCURY VENUS	α SCO	2.0	2.3	4.1	4.2	22	-0.3	-3.9	0.9	-4.0	-9	113	-4	113
09 11 2011	08	MERCURY VENUS	α SCO	2.0	2.3	4.1	4.1	22	-0.3	-3.9	0.9	-4.0	1	123	3	125
09 11 2011	09	MERCURY VENUS	α SCO	2.0	2.3	4.1	4.1	22	-0.3	-3.9	0.9	-4.0	9	134	10	138
09 11 2011	10	MERCURY VENUS	α SCO	2.0	2.2	4.1	4.1	22	-0.3	-3.9	0.9	-4.0	17	145	15	151
09 11 2011	11	MERCURY VENUS	α SCO	2.0	2.2	4.0	4.1	22	-0.3	-3.9	0.9	-4.0	22	159	18	166
09 11 2011	12	MERCURY VENUS	α SCO	2.0	2.2	4.0	4.1	22	-0.3	-3.9	0.9	-4.0	24	173	19	181
09 11 2011	13	MERCURY VENUS	α SCO	2.0	2.2	4.0	4.1	22	-0.3	-3.9	0.9	-4.0	24	188	18	196
09 11 2011	14	MERCURY VENUS	α SCO	2.0	2.1	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	21	202	14	211
09 11 2011	15	MERCURY VENUS	α SCO	2.0	2.1	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	16	216	9	224
09 11 2011	16	MERCURY VENUS	α SCO	2.0	2.1	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	8	227	2	237
09 11 2011	17	MERCURY VENUS	α SCO	2.0	2.1	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	-1	238	-5	249
09 11 2011	18	MERCURY VENUS	α SCO	2.0	2.0	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	-11	247	-14	260
09 11 2011	19	MERCURY VENUS	α SCO	2.0	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-21	256	-23	272
09 11 2011	20	MERCURY VENUS	α SCO	2.0	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-32	265	-32	285
09 11 2011	21	MERCURY VENUS	α SCO	2.0	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-44	275	-40	300
09 11 2011	22	MERCURY VENUS	α SCO	2.0	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-54	288	-47	317
09 11 2011	23	MERCURY VENUS	α SCO	2.0	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-64	307	-52	338
10 11 2011	00	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-71	341	-53	2
10 11 2011	01	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-70	24	-51	25
10 11 2011	02	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-63	55	-46	46
10 11 2011	03	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-53	73	-39	63
10 11 2011	04	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-42	85	-30	77
10 11 2011	05	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-31	95	-21	89
10 11 2011	06	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-20	104	-12	101
10 11 2011	07	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-10	113	-4	113
10 11 2011	08	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	1	123	3	125
10 11 2011	09	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	9	133	10	138
10 11 2011	10	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	16	145	15	151
10 11 2011	11	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	21	159	18	166
10 11 2011	12	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	24	173	19	181
10 11 2011	13	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	24	188	17	196
10 11 2011	14	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	21	202	14	210
10 11 2011	15	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	16	215	8	224
10 11 2011	16	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	8	227	2	237
10 11 2011	17	MERCURY VENUS	α SCO	2.0	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-1	237	-6	248
10 11 2011	18	MERCURY VENUS	α SCO	1.9	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-11	247	-14	260
10 11 2011	19	MERCURY VENUS	α SCO	1.9	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-21	256	-23	272
10 11 2011	20	MERCURY VENUS	α SCO	1.9	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-32	265	-32	285
10 11 2011	21	MERCURY VENUS	α SCO	1.9	1.9	3.9	3.9	22	-0.3	-3.9	0.9	-4.0	-43	275	-40	299
10 11 2011	22	MERCURY VENUS	α SCO	1.9	1.9	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-54	288	-47	317
10 11 2011	23	MERCURY VENUS	α SCO	1.9	1.9	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-64	307	-52	338
11 11 2011	00	MERCURY VENUS	α SCO	1.9	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-71	340	-53	2
11 11 2011	01	MERCURY VENUS	α SCO	1.9	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-71	24	-51	25
11 11 2011	02	MERCURY VENUS	α SCO	1.9	2.0	3.9	4.0	22	-0.3	-3.9	0.9	-4.0	-64	55	-46	46
11 11 2011	03	MERCURY VENUS	α SCO	1.9	2.0	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	-54	73	-39	63

DATE	TIME	BODIES		D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
11 11 2011 04		MERCURY VENUS	α SCO	1.9	2.0	4.0	4.0	22	-0.3	-3.9	0.9	-4.0	-43	85	-30	77
11 11 2011 05		MERCURY VENUS	α SCO	1.9	2.1	4.0	4.0	23	-0.3	-3.9	0.9	-4.0	-32	95	-22	90
11 11 2011 06		MERCURY VENUS	α SCO	1.9	2.1	4.0	4.0	23	-0.3	-3.9	0.9	-4.0	-21	104	-13	101
11 11 2011 07		MERCURY VENUS	α SCO	1.9	2.1	4.0	4.0	23	-0.3	-3.9	0.9	-4.0	-10	113	-4	113
11 11 2011 08		MERCURY VENUS	α SCO	1.9	2.1	4.0	4.1	23	-0.3	-3.9	0.9	-4.0	0	123	3	125
11 11 2011 09		MERCURY VENUS	α SCO	1.9	2.1	4.0	4.1	23	-0.3	-3.9	0.9	-4.0	9	133	9	138
11 11 2011 10		MERCURY VENUS	α SCO	1.9	2.2	4.0	4.1	23	-0.3	-3.9	0.9	-4.0	16	145	14	151
11 11 2011 11		MERCURY VENUS	α SCO	1.9	2.2	4.1	4.1	23	-0.3	-3.9	0.9	-4.0	21	158	18	166
11 11 2011 12		MERCURY VENUS	α SCO	1.9	2.2	4.1	4.1	23	-0.3	-3.9	0.9	-4.0	24	173	18	181
11 11 2011 13		MERCURY VENUS	α SCO	1.9	2.2	4.1	4.1	23	-0.3	-3.9	0.9	-4.0	24	187	17	196
11 11 2011 14		MERCURY VENUS	α SCO	1.9	2.3	4.1	4.2	23	-0.3	-3.9	0.9	-4.0	21	202	14	210
11 11 2011 15		MERCURY VENUS	α SCO	1.9	2.3	4.1	4.2	23	-0.3	-3.9	0.9	-4.0	16	215	8	224
11 11 2011 16		MERCURY VENUS	α SCO	1.9	2.3	4.1	4.2	23	-0.3	-3.9	0.9	-4.0	8	227	1	236
11 11 2011 17		MERCURY VENUS	α SCO	1.9	2.3	4.2	4.2	23	-0.3	-3.9	0.9	-4.0	-1	237	-6	248
11 11 2011 18		MERCURY VENUS	α SCO	1.9	2.4	4.2	4.2	23	-0.3	-3.9	0.9	-4.0	-11	246	-14	260
11 11 2011 19		MERCURY VENUS	α SCO	1.9	2.4	4.2	4.3	23	-0.3	-3.9	0.9	-4.0	-21	255	-23	272
11 11 2011 20		MERCURY VENUS	α SCO	1.9	2.4	4.2	4.3	23	-0.3	-3.9	0.9	-4.0	-32	264	-32	285
11 11 2011 21		MERCURY VENUS	α SCO	1.9	2.5	4.2	4.3	23	-0.3	-3.9	0.9	-4.0	-43	274	-40	299
11 11 2011 22		MERCURY VENUS	α SCO	1.9	2.5	4.3	4.3	23	-0.3	-3.9	0.9	-4.0	-54	287	-47	317
11 11 2011 23		MERCURY VENUS	α SCO	1.9	2.5	4.3	4.3	23	-0.3	-3.9	0.9	-4.0	-64	306	-52	338
12 11 2011 00		MERCURY VENUS	α SCO	1.9	2.6	4.3	4.4	23	-0.3	-3.9	0.9	-4.0	-71	339	-54	2
12 11 2011 01		MERCURY VENUS	α SCO	1.9	2.6	4.3	4.4	23	-0.3	-3.9	0.9	-4.0	-71	23	-52	26
12 11 2011 02		MERCURY VENUS	α SCO	1.9	2.6	4.4	4.4	23	-0.3	-3.9	0.9	-4.0	-64	55	-46	46
12 11 2011 03		MERCURY VENUS	α SCO	1.9	2.7	4.4	4.4	23	-0.3	-3.9	0.9	-4.0	-54	73	-39	63
12 11 2011 04		MERCURY VENUS	α SCO	1.9	2.7	4.4	4.5	23	-0.3	-3.9	0.9	-4.0	-43	85	-31	77
12 11 2011 05		MERCURY VENUS	α SCO	1.9	2.7	4.4	4.5	23	-0.3	-3.9	0.9	-4.0	-32	95	-22	90
12 11 2011 06		MERCURY VENUS	α SCO	1.9	2.8	4.5	4.5	23	-0.3	-3.9	0.9	-4.0	-21	104	-13	101
12 11 2011 07		MERCURY VENUS	α SCO	1.9	2.8	4.5	4.5	23	-0.3	-3.9	0.9	-4.0	-10	113	-4	113
12 11 2011 08		MERCURY VENUS	α SCO	1.9	2.8	4.5	4.6	23	-0.3	-3.9	0.9	-4.0	0	123	3	125
12 11 2011 09		MERCURY VENUS	α SCO	1.9	2.9	4.5	4.6	23	-0.3	-3.9	0.9	-4.0	8	133	9	138
12 11 2011 10		MERCURY VENUS	α SCO	1.9	2.9	4.6	4.6	23	-0.3	-3.9	0.9	-4.0	16	145	14	151
12 11 2011 11		MERCURY VENUS	α SCO	1.9	2.9	4.6	4.6	23	-0.3	-3.9	0.9	-4.0	21	158	17	166
12 11 2011 12		MERCURY VENUS	α SCO	1.9	3.0	4.6	4.7	23	-0.3	-3.9	0.9	-4.0	24	173	18	181
12 11 2011 13		MERCURY VENUS	α SCO	1.9	3.0	4.7	4.7	23	-0.3	-3.9	0.9	-4.0	24	187	17	196
12 11 2011 14		MERCURY VENUS	α SCO	1.9	3.0	4.7	4.7	23	-0.3	-3.9	0.9	-4.0	21	202	13	210
12 11 2011 15		MERCURY VENUS	α SCO	1.9	3.1	4.7	4.8	23	-0.3	-3.9	0.9	-4.0	15	215	8	224
12 11 2011 16		MERCURY VENUS	α SCO	1.9	3.1	4.7	4.8	23	-0.3	-3.9	0.9	-4.0	8	226	1	236
12 11 2011 17		MERCURY VENUS	α SCO	1.9	3.1	4.8	4.8	23	-0.3	-3.9	0.9	-4.0	-1	237	-6	248
12 11 2011 18		MERCURY VENUS	α SCO	1.9	3.2	4.8	4.8	23	-0.3	-3.9	0.9	-4.0	-11	246	-15	260
12 11 2011 19		MERCURY VENUS	α SCO	1.9	3.2	4.8	4.9	23	-0.3	-3.9	0.9	-4.0	-21	255	-24	272
12 11 2011 20		MERCURY VENUS	α SCO	1.9	3.3	4.9	4.9	23	-0.3	-3.9	0.9	-4.0	-32	264	-32	284
12 11 2011 21		MERCURY VENUS	α SCO	1.9	3.3	4.9	4.9	23	-0.3	-3.9	0.9	-4.0	-43	274	-41	299
12 11 2011 22		MERCURY VENUS	α SCO	1.9	3.3	4.9	5.0	23	-0.3	-3.9	0.9	-4.0	-54	287	-48	316
12 11 2011 23		MERCURY VENUS	α SCO	1.9	3.4	5.0	5.0	23	-0.3	-3.9	0.9	-4.0	-64	305	-53	338
13 11 2011 00		MERCURY VENUS	α SCO	1.9	3.4	5.0	5.0	23	-0.3	-3.9	0.9	-4.0	-71	338	-54	2

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# PIANETI-STELLE IN LINEA RETTA

## PLANETS-STARS IN STRAIGHT LINE

DATE	TIMES	BODIES			C	ALT	AZ	ALT.S.	AZ.S
10	11	2011	00	MERCURY VENUS $\alpha$ SCO	0.492	-71	341	-53	2
10	11	2011	01	MERCURY VENUS $\alpha$ SCO	0.454	-70	24	-51	25
10	11	2011	02	MERCURY VENUS $\alpha$ SCO	0.415	-63	55	-46	46
10	11	2011	03	MERCURY VENUS $\alpha$ SCO	0.377	-53	73	-39	63
10	11	2011	04	MERCURY VENUS $\alpha$ SCO	0.339	-42	85	-30	77
10	11	2011	05	MERCURY VENUS $\alpha$ SCO	0.301	-31	95	-21	89
10	11	2011	06	MERCURY VENUS $\alpha$ SCO	0.263	-20	104	-12	101
10	11	2011	07	MERCURY VENUS $\alpha$ SCO	0.225	-10	113	-4	113
10	11	2011	08	MERCURY VENUS $\alpha$ SCO	0.187	1	123	3	125
10	11	2011	09	MERCURY VENUS $\alpha$ SCO	0.149	9	133	10	138
10	11	2011	10	MERCURY VENUS $\alpha$ SCO	0.111	16	145	15	151
10	11	2011	11	MERCURY VENUS $\alpha$ SCO	0.074	21	159	18	166
10	11	2011	12	MERCURY VENUS $\alpha$ SCO	0.037	24	173	19	181
10	11	2011	13	MERCURY VENUS $\alpha$ SCO	-0.000	24	188	17	196
10	11	2011	14	MERCURY VENUS $\alpha$ SCO	-0.037	21	202	14	210
10	11	2011	15	MERCURY VENUS $\alpha$ SCO	-0.074	16	215	8	224
10	11	2011	16	MERCURY VENUS $\alpha$ SCO	-0.111	8	227	2	237
10	11	2011	17	MERCURY VENUS $\alpha$ SCO	-0.148	-1	237	-6	248
10	11	2011	18	MERCURY VENUS $\alpha$ SCO	-0.185	-11	247	-14	260
10	11	2011	19	MERCURY VENUS $\alpha$ SCO	-0.221	-21	256	-23	272
10	11	2011	20	MERCURY VENUS $\alpha$ SCO	-0.258	-32	265	-32	285
10	11	2011	21	MERCURY VENUS $\alpha$ SCO	-0.294	-43	275	-40	299
10	11	2011	22	MERCURY VENUS $\alpha$ SCO	-0.330	-54	288	-47	317
10	11	2011	23	MERCURY VENUS $\alpha$ SCO	-0.366	-64	307	-52	338
11	11	2011	00	MERCURY VENUS $\alpha$ SCO	-0.402	-71	340	-53	2
11	11	2011	01	MERCURY VENUS $\alpha$ SCO	-0.438	-71	24	-51	25
11	11	2011	02	MERCURY VENUS $\alpha$ SCO	-0.474	-64	55	-46	46

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.



# OCCULTAZIONI GEOCENTRICHE PIANETI-STELLE m<9

## GEOCENTRIC OCCULTATIONS PLANETS-STARS m<9

Date			U.T.		Diameter		Durn	Star	Elon	% Ill	Star	Planet	Min.D	R.A. (J2000)			Dec.			
y	m	d	h	m	km	"								sec/m	mag	o	h	m	s	o
2011	01	14	10	29.9	4878	6.11	121s	8.7	23	73	TYC 6263-00525-1s	Mercury	1.10	18	4	17.418	-22	29	40.10	
2011	01	16	3	27.9	4878	5.95	113s	8.6	23	75	TYC 6843-02182-1	Mercury	1.66	18	13	25.258	-22	43	3.42	
2011	01	27	8	51.2	12244	20.69	448s	8.6	46	59	TYC 6242-00636-1	Venus	0.23	17	21	39.131	-20	14	27.22	
2011	02	15	7	1.6	12244	17.68	366s	8.1	44	67	HIP 92721	Venus	0.17	18	53	38.388	-21	3	5.59	
2011	02	17	17	38.7	12244	17.35	358s	8.7	43	68	TYC 6295-00518-1	Venus	0.52	19	5	46.207	-20	55	2.50	
2011	02	21	3	2.9	12244	16.93	347s	6.7	43	69	HIP 95244	Venus	1.57	19	22	40.306	-20	38	35.64	
2011	02	21	13	24.8	12244	16.88	346s	8.4	43	69	TYC 6305-01681-1	Venus	1.67	19	24	48.301	-20	35	31.79	
2011	02	22	18	9.6	4878	4.85	64.2s	5.3	3	100	HIP 110000	Mercury	0.16	22	16	48.046	-12	49	53.11	
2011	04	12	12	11.5	4878	11.62	352s	7.5	5	1	HIP 4778	Mercury	1.14	1	1	23.090	8	27	2.22	
2011	04	12	22	47.7	12244	12.67	252s	8.8	33	83	HIP 115599	Venus	0.94	23	24	59.659	-	5	12	42.41
2011	05	23	1	8.7	12244	10.95	217s	8.2	23	92	HIP 11369	Venus	0.47	2	26	26.972	12	53	55.71	
2011	07	8	21	55.1	12244	9.96	195s	8.8	11	98	TYC 1878-00981-1	Venus	1.98	6	24	34.646	23	25	12.72	
2011	07	11	10	59.3	4878	6.79	122s	8.1	25	58	HIP 44637	Mercury	0.89	9	5	45.500	17	23	24.38	
2011	08	18	0	21.8	4878	10.88	316s	8.6	5	1	HIP 47012	Mercury	0.98	9	34	52.660	9	40	36.96	
2011	09	2	13	30.9	4878	7.43	193s	7.9	18	41	HIP 47035	Mercury	0.46	9	35	9.487	14	4	32.18	
2011	09	7	13	21.3	6794	4.79	183s	8.9	52	93	HIP 37203	Mars	1.72	7	38	32.683	22	18	29.08	
2011	09	29	17	8.3	6794	5.14	207s	7.5	60	92	HIP 42164	Mars	0.78	8	35	45.043	19	46	16.02	
2011	10	1	10	12.7	6794	5.17	209s	7.5	61	92	TYC 1395-01993-1	Mars	1.61	8	39	57.744	19	32	29.16	
2011	11	1	14	8.0	4878	5.44	94.8s	8.1	20	84	HIP 76903	Mercury	0.51	15	42	10.385	-21	53	59.00	
2011	11	5	5	45.3	4878	5.68	104s	8.0	21	79	HIP 78586	Mercury	1.68	16	2	45.487	-23	10	52.18	
2011	11	20	23	18.8	12244	11.29	218s	8.4	25	91	HIP 85548	Venus	0.68	17	29	0.197	-24	20	11.43	
2011	11	25	9	2.6	12244	11.44	221s	8.5	26	90	TYC 6845-00056-1	Venus	2.15	17	53	0.346	-24	40	41.30	

Date = data nel formato anno/mese/giorno  
 U.T. = ora dell'evento  
 Diameter = diametro in km ed in " del pianeta  
 Durn = durata dell'evento, in minuti o secondi  
 Star mag = magnitudine della stella coinvolta  
 Elon = elongazione, in gradi  
 % ill = percentuale illuminata del pianeta  
 Star = stella coinvolta  
 Planet = pianeta  
 Min.D. = distanza del centro dell'occultazione dal centro della Terra  
 Dist = distanza del percorso  
 Alt = altezza sull'orizzonte del pianeta, in gradi  
 Sole alt = altezza sull'orizzonte del Sole, in gradi

Date = date in the format year/month/day  
 U.T. = times  
 Diameter = diameter in km and in " of the planet  
 Durn = duration of the event, in minutes or seconds  
 Stella Mag = magnitude of the star  
 Elon = elongation, in °  
 % ill = illumination of the planet  
 Alt = height on the horizon of the planet, in °  
 Sun alt = height on the horizon of the Sun, in °

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# OCCULTAZIONI TOPOCENTRICHE PIANETI-STELLE $m < 9$

## TOPOCENTRIC OCCULTATIONS PLANETS-STARS $m < 9$

Date	U.T.	Diameter	Durn	Star	Elon	%	Star	Planet	Alt	Dist	Sun	Proba-	Moon	R.A. (J2000)	Dec.
y m d	h m	km "	sec/m	mag	o	Ill	No.		o	km	Alt	bilty	ill	h m s	o ' "

Questo anno non avvengono fenomeni - No phenomena this year

Date = data nel formato anno/mese/giorno  
 U.T. = ora dell'evento  
 Diameter = diametro in km ed in " del pianeta  
 Durn = durata dell'evento, in minuti o secondi  
 Star mag = magnitudine della stella coinvolta  
 Elon = elongazione, in gradi  
 % ill = percentuale illuminata del pianeta  
 Star = stella coinvolta  
 Planet = pianeta  
 Alt = altezza sull'orizzonte del pianeta, in gradi  
 Dist. = distanza del centro dell'occultazione dal centro della Terra  
 Sun alt = altezza sull'orizzonte del Sole, in gradi  
 Probabilità = probabilità che l'evento accada  
 Moon ill = percentuale di Luna illuminata  
 Moon elon = elongazione lunare

Date = date in the format year/month/day  
 U.T. = times  
 Diameter = diameter in km and in " of the planet  
 Durn = duration of the event, in minutes or seconds  
 Star mag = magnitude of the star  
 Elon = elongation, in °  
 % ill = illumination of the planet  
 Alt = height on the horizon of the planet, in °  
 Sun alt = height on the horizon of the Sun, in °

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# CONGIUNZIONI <1° PIANETI - OGGETTI MESSIER m<9

## CONJUNCTIONS <1° PLANETS - OBJECTS MESSIER m<9

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)		
2011/01/14	03:43:32	0.52530	0.00308	1.097	187	-23	-0.1	9.0		98.9	Mercury	NGC6514 M20
2011/01/14	11:55:45	0.00036	0.00306	1.103	7	-23	-0.1	6.5	119.1	98.6	Mercury	NGC6531 M21
2011/01/14	21:32:04	0.56139	0.00157	2.379	168	5	1.1	8.5		152.7	Mars	NGC6864 M75
2011/01/20	05:10:47	0.84003	0.00283	1.191	182	-21	-0.2	5.1		87.4	Mercury	NGC6656 M22
2011/02/03	09:43:32	0.12402	0.00252	1.340	171	-15	-0.5	8.5		77.5	Mercury	NGC6864 M75
2011/06/17	19:11:20	0.60053	0.00258	1.308	178	6	-1.7	5.3		55.5	Mercury	NGC2168 M35
2011/07/05	23:48:23	0.93081	0.00282	1.689	359	-11	-3.9	5.3		96.3	Venus	NGC2168 M35
2011/07/06	20:11:44	0.24410	0.00318	1.062	19	23	0.0	3.7		79.2	Mercury	NGC2632 M44
2011/08/03	14:39:49	0.55663	0.00275	1.728	14	-4	-3.9	3.7		96.7	Venus	NGC2632 M44
2011/08/06	16:25:04	0.54622	0.00177	2.107	360	-42	1.3	5.3		179.0	Mars	NGC2168 M35
2011/10/01	07:20:36	0.43955	0.00206	1.812	13	-60	1.2	3.7		201.4	Mars	NGC2632 M44
2011/11/07	16:40:47	0.94268	0.00295	1.144	12	22	-0.2	7.3		93.6	Mercury	NGC6093 M80
2011/11/17	16:45:12	0.91795	0.00356	0.948	181	22	-0.1	7.0		149.8	Mercury	NGC6273 M19
2011/11/27	07:55:18	0.37114	0.00325	1.467	1	26	-3.8	6.0		96.5	Venus	NGC6523 M8
2011/12/01	03:37:25	0.11708	0.00329	1.449	179	27	-3.8	6.8		96.8	Venus	NGC6626 M28
2011/12/03	08:25:19	0.76970	0.00331	1.439	358	28	-3.8	5.1		95.7	Venus	NGC6656 M22
2011/12/20	02:41:27	0.21521	0.00351	1.356	348	31	-3.9	8.5		97.2	Venus	NGC6864 M75

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine dell'oggetto

tm = se presente, l'oggetto viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the planet from the Earth

p = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the planet

m\* = magnitude of the object

tm = if present, the object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

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## CONGIUNZIONI MULTIPLE PIANETI-OGGETTI

(eventi con 2 o più pianeti ed un oggetto Messier entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-OBJECTS

(events with 2 or more planets and a Messier object within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2011/11/09	10:56	3.006	4.250	22	-0.1	7.1	Mercury	NGC6121 M4		Venus
2011/11/16	15:21	2.085	2.583	23	-0.1	7.0	Mercury	NGC6273 M19		Venus

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the center of the planets, in gradi

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest planet

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI PIANETI - OGGETTI

(eventi con 2 o più pianeti ed un oggetto Messier di mag<2 entro 5°)

## LEAST GROUPING PLANETS - OBJECTS

(events with 2 or more planets and a Messier object with mag<2 within 5°)

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------	-----	----	--------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# EFFEMERIDI DELLA LUNA - EPHEMERIDES OF THE MOON

Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	EI *	Diam. "	Mag	Phase	Phase. angle*	Par.	L1	L2	L3	L4	L5	L6
01/01/2011	15h 42m 57.47s	-22° 45' 24.5"	15h 45m 01.40s	-23° 08' 05.0"	379225	41.6	1891	-7.7	0.126	138.3	3469	4.8	3.8	4.8	3.8	4.2	4.2
02/01/2011	16h 41m 19.47s	-24° 05' 36.0"	16h 42m 47.61s	-24° 24' 43.0"	382200	29.1	1876	-6.7	0.064	150.8	3442	5.0	2.3	5.0	2.3	4.5	2.7
03/01/2011	17h 39m 24.74s	-24° 02' 35.1"	17h 40m 11.83s	-24° 20' 06.3"	385469	16.9	1860	-5.7	0.022	163.0	3413	5.0	0.8	5.0	0.8	4.7	1.1
04/01/2011	18h 35m 55.52s	-22° 40' 22.4"	18h 36m 00.97s	-22° 58' 26.4"	388972	5.0	1843	-4.4	0.002	175.0	3382	4.8	-0.7	4.8	-0.7	4.6	-0.4
05/01/2011	19h 29m 53.34s	-20° 09' 11.7"	19h 29m 20.60s	-20° 29' 44.4"	392587	7.0	1826	-4.7	0.004	173.0	3351	4.3	-2.2	4.3	-2.2	4.3	-1.9
06/01/2011	20h 20m 52.64s	-16° 43' 28.0"	20h 19m 47.35s	-17° 07' 21.7"	396137	18.5	1810	-5.8	0.026	161.4	3321	3.6	-3.6	3.6	-3.6	3.5	-3.2
07/01/2011	21h 08m 59.93s	-12° 37' 37.8"	21h 07m 28.07s	-13° 05' 24.0"	399394	29.8	1795	-6.8	0.066	150.1	3294	2.7	-4.7	2.7	-4.7	2.5	-4.3
08/01/2011	21h 54m 44.84s	-08° 05' 30.9"	21h 52m 51.64s	-08° 36' 55.4"	402108	40.9	1783	-7.6	0.123	139.0	3272	1.7	-5.6	1.7	-5.7	1.4	-5.1
09/01/2011	22h 38m 50.42s	-03° 18' 54.9"	22h 36m 40.05s	-03° 53' 15.1"	404027	51.9	1775	-8.3	0.192	128.0	3256	0.5	-6.3	0.5	-6.3	0.1	-5.8
10/01/2011	23h 22m 06.34s	+01° 32' 11.7"	23h 19m 42.01s	+00° 55' 56.8"	404930	62.7	1771	-8.9	0.272	117.2	3249	-0.7	-6.7	-0.7	-6.7	-1.2	-6.1
11/01/2011	00h 05m 25.08s	+06° 19' 00.8"	00h 02m 49.50s	+05° 42' 03.6"	404649	73.5	1772	-9.4	0.359	106.4	3251	-2.0	-6.8	-2.0	-6.8	-2.6	-6.2
12/01/2011	00h 49m 39.84s	+10° 53' 03.0"	00h 46m 55.81s	+10° 16' 40.9"	403094	84.3	1779	-9.9	0.452	95.5	3264	-3.3	-6.6	-3.3	-6.6	-3.9	-6.0
13/01/2011	01h 35m 42.47s	+15° 05' 08.1"	01h 32m 53.59s	+14° 30' 37.6"	400268	95.3	1791	-10.3	0.547	84.6	3287	-4.4	-6.1	-4.4	-6.1	-5.1	-5.5
14/01/2011	02h 24m 19.45s	+18° 44' 34.0"	02h 21m 30.96s	+18° 13' 02.1"	396278	106.4	1809	-10.7	0.643	73.4	3320	-5.3	-5.4	-5.3	-5.4	-6.0	-4.8
15/01/2011	03h 16m 04.52s	+21° 38' 37.0"	03h 13m 24.02s	+21° 10' 48.2"	391345	117.9	1832	-11.1	0.735	62.0	3362	-6.0	-4.3	-6.0	-4.3	-6.7	-3.8
16/01/2011	04h 11m 07.56s	+23° 32' 55.2"	04h 08m 45.16s	+23° 08' 54.6"	385788	129.7	1858	-11.4	0.820	50.2	3410	-6.4	-3.1	-6.4	-3.1	-7.0	-2.6
17/01/2011	05h 09m 03.62s	+24° 13' 15.6"	05h 07m 10.75s	+23° 52' 12.9"	380016	141.9	1887	-11.7	0.894	38.0	3462	-6.3	-1.6	-6.3	-1.6	-6.9	-1.2
18/01/2011	06h 08m 50.60s	+23° 28' 49.1"	06h 07m 37.39s	+23° 08' 55.6"	374488	154.5	1914	-12.1	0.952	25.4	3513	-5.9	0.0	-5.9	0.0	-6.3	0.4
19/01/2011	07h 09m 03.66s	+21° 15' 51.8"	07h 08m 36.08s	+20° 54' 41.3"	369664	167.5	1939	-12.4	0.988	12.5	3559	-5.1	1.7	-5.1	1.7	-5.4	2.0
20/01/2011	08h 08m 23.18s	+17° 40' 00.0"	08h 08m 41.76s	+17° 15' 11.2"	365945	177.4	1959	-12.9	0.999	2.6	3595	-3.9	3.3	-3.9	3.2	-4.0	3.7
21/01/2011	09h 06m 00.07s	+12° 55' 40.8"	09h 07m 00.99s	+12° 25' 42.9"	363614	165.0	1972	-12.3	0.983	14.9	3618	-2.4	4.7	-2.4	4.6	-2.5	5.1
22/01/2011	10h 01m 44.87s	+07° 23' 27.1"	10h 03m 22.22s	+06° 48' 06.9"	362793	151.3	1976	-12	0.939	28.6	3626	-0.8	5.7	-0.8	5.7	-1.0	6.3
23/01/2011	10h 56m 01.15s	+01° 26' 31.8"	10h 58m 08.64s	+00° 46' 54.1"	363429	137.6	1973	-11.6	0.870	42.3	3620	0.9	6.5	0.9	6.5	0.5	7.1
24/01/2011	11h 49m 31.98s	-04° 31' 57.1"	11h 52m 03.58s	-05° 13' 51.1"	365325	124.0	1962	-11.2	0.781	55.9	3601	2.4	6.7	2.4	6.7	1.9	7.5
25/01/2011	12h 43m 06.35s	-10° 10' 34.2"	12h 45m 56.00s	-10° 52' 18.8"	368187	110.6	1947	-10.8	0.677	69.2	3573	3.8	6.6	3.8	6.6	3.2	7.3
26/01/2011	13h 37m 27.29s	-15° 10' 16.9"	13h 40m 28.13s	-15° 49' 34.4"	371693	97.5	1929	-10.4	0.567	82.4	3540	4.8	6.0	4.8	6.0	4.1	6.7
27/01/2011	14h 33m 01.13s	-19° 14' 44.7"	14h 36m 04.70s	-19° 49' 52.1"	375542	84.7	1909	-9.9	0.455	95.2	3503	5.5	5.1	5.5	5.1	4.8	5.8
28/01/2011	15h 29m 48.16s	-22° 10' 50.2"	15h 32m 44.32s	-22° 40' 59.0"	379496	72.1	1889	-9.4	0.347	107.8	3467	5.9	4.0	5.9	3.9	5.2	4.5
29/01/2011	16h 27m 18.36s	-23° 49' 40.9"	16h 29m 56.29s	-24° 15' 04.9"	383390	59.8	1870	-8.8	0.250	120.1	3432	6.0	2.6	6.0	2.6	5.4	3.1
30/01/2011	17h 24m 36.82s	-24° 07' 52.3"	17h 26m 46.91s	-24° 29' 42.1"	387129	47.8	1852	-8.1	0.165	132.1	3398	5.9	1.1	5.9	1.1	5.3	1.5
31/01/2011	18h 20m 39.69s	-23° 08' 05.6"	18h 22m 15.53s	-23° 28' 08.6"	390670	36.0	1835	-7.3	0.096	144.0	3368	5.5	-0.4	5.5	-0.4	5.0	0.0
01/02/2011	19h 14m 34.20s	-20° 58' 29.9"	19h 15m 33.16s	-21° 18' 43.0"	393989	24.4	1820	-6.3	0.045	155.6	3339	4.9	-1.8	4.9	-1.9	4.5	-1.5
02/02/2011	20h 05m 51.27s	-17° 50' 56.5"	20h 06m 14.58s	-18° 13' 01.3"	397065	13.1	1806	-5.3	0.013	166.8	3313	4.1	-3.2	4.1	-3.2	3.9	-2.8
03/02/2011	20h 54m 29.89s	-13° 58' 52.4"	20h 54m 20.20s	-14° 23' 59.7"	399505	3.7	1793	-4.3	0.001	176.3	3290	3.2	-4.4	3.2	-4.4	3.1	-4.0
04/02/2011	21h 40m 05.08s	-09° 35' 38.4"	21h 40m 10.84s	-10° 04' 22.7"	402263	10.3	1782	-5	0.008	169.6	3271	2.2	-5.3	2.2	-5.4	2.2	-4.9
05/02/2011	22h 25m 26.07s	-04° 53' 31.5"	22h 24m 20.47s	-05° 25' 53.5"	404182	21.0	1774	-6	0.033	158.9	3255	1.1	-6.1	1.0	-6.1	0.9	-5.5
06/02/2011	23h 08m 59.77s	-00° 03' 28.3"	23h 07m 30.43s	-00° 39' 00.2"	405457	31.8	1768	-7	0.075	148.1	3245	-0.2	-6.5	-0.2	-6.5	-0.4	-5.9
07/02/2011	23h 52m 16.69s	+04° 44' 44.4"	23h 50m 25.67s	+04° 06' 52.0"	405923	42.6	1766	-7.7	0.132	137.3	3241	-1.4	-6.7	-1.4	-6.7	-1.8	-6.0
08/02/2011	00h 36m 03.66s	+09° 22' 00.3"	00h 33m 52.65s	+08° 42' 52.3"	405424	53.3	1768	-8.4	0.202	126.6	3245	-2.7	-6.5	-2.7	-6.6	-3.2	-5.9
09/02/2011	01h 21m 06.90s	+13° 39' 16.2"	01h 18m 37.81s	+13° 00' 06.6"	403832	64.1	1775	-9	0.283	115.8	3258	-4.0	-6.1	-4.0	-6.1	-4.5	-5.5
10/02/2011	02h 08m 09.52s	+17° 26' 51.5"	02h 05m 25.08s	+16° 48' 57.3"	401080	75.0	1788	-9.5	0.372	104.8	3280	-5.2	-5.5	-5.2	-5.5	-5.8	-4.8
11/02/2011	02h 57m 46.74s	+20° 33' 56.9"	02h 54m 51.40s	+19° 58' 29.2"	397177	86.1	1805	-10	0.467	93.7	3312	-6.2	-4.5	-6.2	-4.5	-6.9	-3.9
12/02/2011	03h 50m 18.62s	+22° 48' 28.4"	03h 47m 19.36s	+22° 16' 19.8"	392234	97.5	1828	-10.4	0.566	82.4	3354	-7.0	-3.4	-7.0	-3.4	-7.7	-2.8
13/02/2011	04h 45m 41.35s	+23° 57' 49.8"	04h 42m 47.95s	+23° 29' 17.6"	386474	109.2	1855	-10.8	0.665	70.7	3404	-7.4	-2.0	-7.5	-2.0	-8.2	-1.5
14/02/2011	05h 43m 21.59s	+23° 50' 41.0"	05h 40m 45.80s	+23° 25' 11.6"	380235	121.3	1886	-11.2	0.761	58.6	3460	-7.5	-0.5	-7.5	-0.5	-8.2	0.0
15/02/2011	06h 42m 20.57s	+22° 19' 40.1"	06h 40m 13.92s	+21° 55' 43.2"	373956	133.9	1917	-11.5	0.847	46.0	3518	-7.1	1.1	-7.1	1.1	-7.8	1.5
16/02/2011	07h 41m 30.40s	+19° 24' 06.9"	07h 40m 01.70s	+18° 59' 29.2"	368148	146.9	1947	-11.9	0.919	33.0	3574	-6.2	2.6	-6.3	2.6	-6.8	3.1
17/02/2011	08h 39m 56.03s	+15° 11' 33.2"	08h 39m 09.97s	+14° 43' 53.2"	363332	160.2	1973	-12.2	0.971	19.7	3621	-4.9	4.1	-4.9	4.1	-5.3	4.6
18/02/2011	09h 37m 10.83s	+09° 57' 24.6"	09h 37m 08.29s	+09° 24' 56.0"	359965	173.1	1992	-12.6	0.996	6.9	3655	-3.1	5.3	-3.1	5.3	-3.4	5.8
19/02/2011	10h 33m 19.32s	+04° 03' 09.4"	10h 33m 58.72s	+03° 25' 15.6"	358363	170.3	2001	-12.5	0.993	9.7	3671	-1.1	6.1	-1.1	6.1	-1.2	6.8
20/02/2011	11h 28m 49.29s	-02° 06' 18.9"	11h 30m 07.81s	-02° 48' 53.5"	358640	156.8	1999	-12.1	0.960	23.2	3668	1.0	6.6	0.9	6.6	0.8	7.3
21/02/2011	12h 24m 19.28s	-08° 05' 26.8"	12h 26m 13.35s	-08° 50' 48.6"	360690	142.9	1988	-11.8	0.899	37.0	3648	2.9	6.5	2.9	6.5	2.6	7.3
22/02/2011	13h 20m 25.45s	-13° 30' 20.4"	13h 22m 50.36s	-14° 15' 59.4"	364221	129.2	1968	-11.4	0.817	50.7	3612	4.6	6.0	4.6	6.0	4.2	6.8
23/02/2011	14h 17m 29.24s	-18° 00' 36.3"	14h 20m 18.33s	-18° 44' 04.5"	368817	115.8	1944	-11	0.719	64.1	3567	5.9	5.2	5.9	5.2	5.3	6.0
24/02/2011	15h 15m 27.52s	-21° 20' 44.9"	15h 18m 31.58s	-22° 00' 10.6"	374026	102.8	1917	-10.6	0.612	77.0	3518	6.8	4.0	6.7	4.0	6.1	4.8
25/02/2011	16h 13m 48.94s	-23° 21' 14.5"	16h 16m 56.54s	-23° 55' 45.0"	379425	90.2	1890	-10.1	0.503	89.6	3467	7.2	2.7	7.1	2.7	6.5	3.3
26/02/2011	17h 11m 40.27s	-23° 59' 09.0"	17h 14m 39.41s	-24° 28' 56.6"	384670	78.0	1864	-9.7	0.397	101.8	3420	7.2	1.2	7.1	1.2	6.4	1.8
27/02/2011	18h 08m 02.35s	-23° 17' 53.2"	18h 10m 42.64s	-23° 44' 04.3"	389514	66.1	1841	-9.1	0.299	113.7	3378	6.8	-0.3	6.8	-0.3	6.1	0.3
28/02/2011	19h 02m 08.22s	-21° 25' 54.6"	19h 04m 22.53s	-21° 50' 07.5"	393807	54.6	1821	-8.5	0.211	125.3	3341	6.2	-1.7	6.2	-1.7	5.6	-1.2

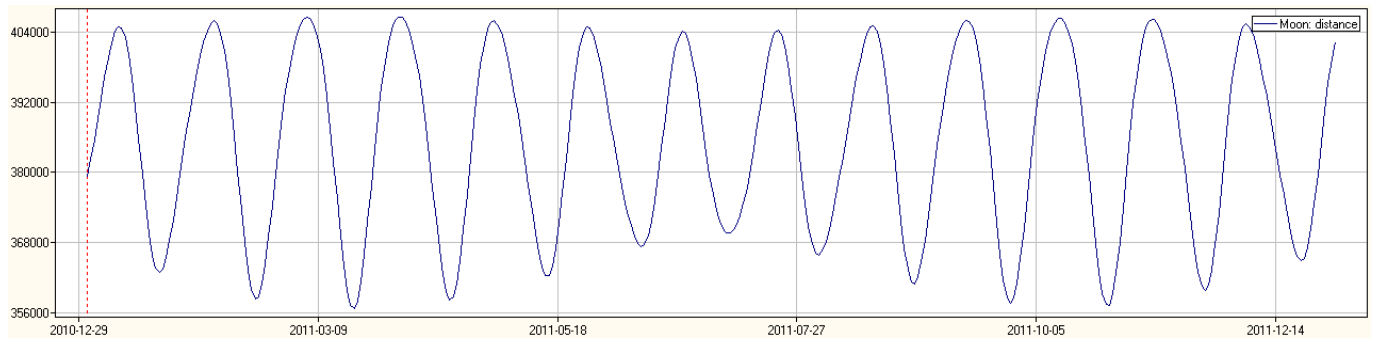
Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	EI *	Diam. "	Mag	Phase	Phase. angle*	Par.	L1	L2	L3	L4	L5	L6
09/04/2011	05h 09m 14.30s	+23° 34' 08.5"	05h 06m 33.41s	+22° 52' 31.3"	392591	59.6	1826	-8.8	0.248	120.3	3351	-6.9	-0.8	-6.9	-0.8	-7.5	-0.1
10/04/2011	06h 04m 34.67s	+22° 57' 09.2"	06h 01m 37.81s	+22° 18' 24.7"	388017	71.3	1848	-9.3	0.341	108.6	3391	-7.4	0.6	-7.4	0.6	-8.1	1.3
11/04/2011	07h 00m 14.39s	+21° 05' 59.5"	06h 57m 11.44s	+20° 29' 56.6"	382926	83.3	1872	-9.9	0.443	96.5	3436	-7.6	2.1	-7.7	2.1	-8.4	2.8
12/04/2011	07h 55m 35.88s	+18° 03' 13.7"	07h 52m 36.92s	+17° 28' 58.1"	377512	95.7	1899	-10.3	0.551	84.2	3485	-7.5	3.5	-7.5	3.5	-8.2	4.1
13/04/2011	08h 50m 21.01s	+13° 55' 58.4"	08h 47m 35.05s	+13° 22' 01.1"	372066	108.4	1927	-10.8	0.659	71.4	3536	-6.8	4.8	-6.9	4.7	-7.6	5.3
14/04/2011	09h 44m 35.18s	+08° 55' 33.2"	09h 42m 09.71s	+08° 20' 08.4"	366971	121.6	1954	-11.2	0.763	58.3	3585	-5.8	5.7	-5.8	5.7	-6.5	6.3
15/04/2011	10h 38m 44.64s	+03° 17' 20.3"	10h 36m 45.95s	+02° 38' 48.3"	362671	135.1	1977	-11.5	0.855	44.8	3628	-4.3	6.4	-4.3	6.4	-4.9	7.0
16/04/2011	11h 33m 29.39s	-02° 39' 19.9"	11h 32m 03.24s	-03° 22' 06.7"	359612	149.0	1994	-11.9	0.929	31.0	3659	-2.4	6.6	-2.5	6.6	-3.0	7.3
17/04/2011	12h 29m 33.13s	-08° 31' 27.4"	12h 28m 45.19s	-09° 18' 42.8"	358169	162.8	2002	-12.3	0.978	17.1	3673	-0.4	6.4	-0.4	6.4	-0.8	7.2
18/04/2011	13h 27m 30.33s	-13° 53' 37.5"	13h 27m 25.84s	-14° 44' 30.0"	358564	175.1	1999	-12.6	0.998	4.9	3669	1.7	5.7	1.7	5.7	1.5	6.5
19/04/2011	14h 27m 30.63s	-18° 20' 37.5"	14h 28m 13.07s	-19° 13' 17.0"	360818	167.6	1987	-12.4	0.988	12.4	3646	3.6	4.6	3.6	4.6	3.6	5.5
20/04/2011	15h 29m 05.09s	-21° 31' 21.3"	15h 30m 33.92s	-22° 23' 27.0"	364733	154.2	1966	-12.1	0.950	25.8	3607	5.2	3.3	5.2	3.3	5.0	4.2
21/04/2011	16h 31m 04.05s	-23° 12' 57.7"	16h 33m 13.07s	-24° 02' 19.3"	369934	140.9	1938	-11.7	0.888	39.1	3556	6.4	1.7	6.3	1.7	6.0	2.6
22/04/2011	17h 31m 54.89s	-23° 23' 15.3"	17h 34m 32.88s	-24° 08' 30.8"	375953	127.9	1907	-11.4	0.808	52.0	3500	7.0	0.1	7.0	0.1	6.5	0.9
23/04/2011	18h 30m 13.45s	-22° 09' 54.9"	18h 33m 07.20s	-22° 50' 46.1"	382220	115.5	1876	-11	0.716	64.4	3442	7.2	-1.4	7.2	-1.4	6.6	-0.7
24/04/2011	19h 25m 09.75s	-19° 46' 54.7"	19h 28m 07.36s	-20° 23' 57.5"	388310	103.4	1846	-10.6	0.617	76.4	3388	7.0	-2.9	7.0	-2.9	6.4	-2.2
25/04/2011	20h 16m 34.67s	-16° 30' 12.5"	20h 19m 27.29s	-17° 04' 37.4"	393808	91.8	1821	-10.2	0.517	88.0	3341	6.4	-4.1	6.4	-4.1	5.7	-3.5
26/04/2011	21h 04m 51.10s	-12° 34' 52.5"	21h 07m 32.95s	-13° 07' 59.1"	398426	80.5	1799	-9.8	0.419	99.4	3302	5.6	-5.1	5.5	-5.2	4.9	-4.5
27/04/2011	21h 50m 40.54s	-08° 13' 45.3"	21h 53m 08.05s	-08° 46' 50.6"	401986	69.4	1784	-9.3	0.325	110.4	3273	4.5	-5.9	4.5	-5.9	3.8	-5.3
28/04/2011	22h 34m 52.46s	-03° 37' 34.6"	22h 37m 03.25s	-04° 11' 45.0"	404417	58.5	1773	-8.7	0.240	121.4	3253	3.3	-6.4	3.2	-6.4	2.6	-5.8
29/04/2011	23h 18m 18.03s	+01° 04' 22.3"	23h 20m 10.08s	+00° 28' 14.8"	405734	47.7	1767	-8.1	0.164	132.2	3243	2.0	-6.7	2.0	-6.7	1.4	-6.1
30/04/2011	00h 01m 46.95s	+05° 43' 23.1"	00h 03m 18.01s	+05° 04' 43.2"	406019	36.9	1766	-7.3	0.101	143.0	3240	0.7	-6.6	0.7	-6.6	0.2	-6.0
01/05/2011	00h 46m 05.50s	+10° 10' 33.6"	00h 47m 12.78s	+09° 29' 04.7"	405397	26.1	1769	-6.5	0.051	153.8	3245	-0.6	-6.3	-0.6	-6.3	-1.0	-5.6
02/05/2011	01h 31m 54.37s	+14° 16' 13.1"	01h 32m 34.45s	+13° 31' 59.2"	404012	15.3	1775	-5.5	0.018	164.6	3256	-1.8	-5.6	-1.8	-5.7	-2.1	-4.9
03/05/2011	02h 19m 45.10s	+17° 49' 39.4"	02h 19m 54.15s	+17° 03' 07.0"	402010	5.2	1783	-4.4	0.002	174.8	3273	-2.9	-4.8	-2.9	-4.8	-3.1	-4.0
04/05/2011	03h 09m 54.72s	+20° 39' 23.9"	03h 09m 29.24s	+19° 51' 21.9"	399512	8.1	1795	-4.8	0.005	171.9	3293	-3.9	-3.7	-3.9	-3.7	-4.0	-2.9
05/05/2011	04h 02m 19.98s	+22° 34' 03.0"	04h 01m 17.91s	+21° 45' 38.0"	396613	19.0	1808	-5.8	0.027	161.0	3317	-4.8	-2.4	-4.8	-2.4	-4.9	-1.6
06/05/2011	04h 56m 34.24s	+23° 23' 47.3"	04h 54m 56.20s	+22° 36' 12.8"	393376	30.4	1823	-6.8	0.069	149.5	3344	-5.5	-1.0	-5.6	-1.0	-5.8	-0.2
07/05/2011	05h 51m 51.24s	+23° 02' 05.9"	05h 49m 41.29s	+22° 16' 26.2"	398939	42.1	1839	-7.7	0.129	137.8	3375	-6.1	0.5	-6.1	0.5	-6.5	1.3
08/05/2011	06h 47m 17.24s	+21° 27' 07.2"	06h 44m 42.47s	+20° 44' 01.3"	386034	54.0	1857	-8.4	0.207	125.9	3408	-6.4	2.0	-6.5	2.0	-7.0	2.7
09/05/2011	07h 42m 07.30s	+18° 42' 01.7"	07h 39m 16.51s	+18° 01' 31.4"	382006	66.1	1877	-9.1	0.299	113.7	3444	-6.5	3.4	-6.5	3.4	-7.1	4.1
10/05/2011	08h 35m 58.22s	+14° 54' 24.1"	08h 33m 00.31s	+14° 15' 53.0"	377841	78.6	1897	-9.7	0.402	101.3	3482	-6.3	4.7	-6.3	4.7	-7.0	5.3
11/05/2011	09h 28m 53.22s	+10° 15' 10.7"	09h 25m 56.21s	+09° 37' 31.1"	373685	91.3	1919	-10.2	0.513	88.5	3521	-5.7	5.7	-5.7	5.7	-6.4	6.3
12/05/2011	10h 21m 19.03s	+04° 57' 51.3"	10h 18m 29.94s	+04° 19' 38.0"	369755	104.4	1939	-10.6	0.625	75.5	3558	-4.8	6.4	-4.8	6.4	-5.5	7.0
13/05/2011	11h 13m 58.93s	-00° 41' 38.8"	11h 11m 24.29s	-01° 21' 55.3"	366338	117.7	1957	-11.1	0.733	62.2	3591	-3.5	6.7	-3.5	6.7	-4.3	7.4
14/05/2011	12h 07m 44.04s	-06° 24' 51.5"	12h 05m 30.70s	-07° 08' 22.5"	363757	131.3	1971	-11.4	0.831	48.6	3617	-2.0	6.6	-2.0	6.6	-2.7	7.3
15/05/2011	13h 03m 22.77s	-11° 50' 32.2"	13h 01m 38.50s	-12° 37' 54.8"	362332	145.1	1979	-11.8	0.910	34.9	3631	-0.3	6.1	-0.4	6.1	-0.9	6.8
16/05/2011	14h 01m 26.94s	-16° 35' 28.3"	14h 00m 20.25s	-17° 26' 28.6"	362312	158.9	1979	-12.2	0.967	21.1	3631	1.4	5.1	1.4	5.1	0.9	6.0
17/05/2011	15h 01m 55.11s	-20° 16' 50.2"	15h 01m 33.68s	-21° 10' 17.4"	363823	172.5	1971	-12.5	0.996	7.5	3616	3.0	3.8	3.0	3.8	2.7	4.7
18/05/2011	16h 03m 59.89s	-22° 36' 12.7"	16h 04m 27.84s	-23° 30' 12.3"	366825	173.1	1954	-12.6	0.996	6.9	3587	4.4	2.3	4.3	2.3	4.3	3.2
19/05/2011	17h 06m 12.07s	-23° 23' 59.6"	17h 07m 27.36s	-24° 16' 26.6"	371110	160.0	1932	-12.2	0.970	20.0	3545	5.4	0.7	5.4	0.7	5.3	1.6
20/05/2011	18h 06m 47.52s	-22° 41' 43.2"	18h 08m 41.95s	-23° 31' 00.9"	376328	147.0	1905	-11.9	0.920	32.9	3496	6.1	-1.0	6.1	-1.0	5.8	-0.1
21/05/2011	19h 04m 23.51s	-20° 40' 34.2"	19h 06m 45.58s	-21° 25' 58.0"	382042	134.5	1877	-11.5	0.851	45.4	3444	6.3	-2.5	6.3	-2.5	5.9	-1.7
22/05/2011	19h 58m 21.01s	-17° 37' 01.5"	20h 00m 59.37s	-18° 18' 39.0"	387792	122.4	1849	-11.2	0.769	57.5	3393	6.2	-3.9	6.2	-3.9	5.7	-3.1
23/05/2011	20h 48m 44.27s	-13° 48' 23.1"	20h 51m 29.85s	-14° 26' 58.3"	393147	110.6	1824	-10.8	0.677	69.2	3346	5.7	-5.0	5.7	-5.0	5.1	-4.3
24/05/2011	21h 36m 07.20s	-09° 30' 00.5"	21h 38m 53.51s	-10° 06' 35.7"	397746	99.2	1803	-10.5	0.582	80.6	3308	4.9	-5.9	4.9	-5.9	4.2	-5.2
25/05/2011	22h 21m 18.84s	-04° 54' 28.7"	22h 24m 01.41s	-05° 30' 11.2"	401326	88.1	1786	-10.1	0.485	91.8	3278	3.9	-6.5	3.9	-6.5	3.2	-5.9
26/05/2011	23h 05m 13.57s	-00° 11' 59.7"	23h 07m 49.07s	-00° 47' 54.3"	403723	77.1	1776	-9.6	0.390	102.7	3259	2.7	-6.8	2.7	-6.8	2.0	-6.2
27/05/2011	23h 48m 45.91s	+04° 28' 41.7"	23h 51m 11.37s	+03° 51' 37.6"	404880	66.2	1771	-9.1	0.300	113.6	3249	1.4	-6.8	1.4	-6.8	0.8	-6.2
28/05/2011	00h 32m 47.97s	+08° 59' 17.1"	00h 35m 00.12s	+08° 20' 16.1"	404834	55.4	1771	-8.5	0.217	124.5	3250	0.2	-6.5	0.2	-6.5	-0.5	-5.9
29/05/2011	01h 18m 07.39s	+13° 10' 59.5"	01h 20m 02.19s	+12° 29' 27.6"	403702	44.5	1776	-7.9	0.144	135.4	3259	-1.1	-5.9	-1.1	-5.9	-1.7	-5.3
30/05/2011	02h 05m 24.10s	+16° 53' 55.0"	02h 06m 56.50s	+16° 09' 36.1"	401657	33.4	1785	-7.1	0.083	146.5	3276	-2.2	-5.1	-2.2	-5.1	-2.7	-4.4
31/05/2011	02h 55m 05.02s	+19° 56' 52.7"	02h 56m 09.14s	+19° 09' 53.8"	398915	22.2	1797	-6.2	0.037	157.7	3298	-3.2	-4.0	-3.2	-4.0	-3.6	-3.3
01/06/2011	03h 47m 16.90s	+22° 07' 57.5"	03h 47m 46.81s	+21° 18' 52.3"	395699	10.8	1812	-5	0.009	169.1	3325	-4.1	-2.7	-4.1	-2.7	-4.4	-1.9
02/06/2011	04h 41m 40.28s	+23° 15' 54.7"	04h 41m 31.41s	+22° 25' 42.5"	392223	1.4	1828	-4	0.000	178.6	3354	-4.7	-1.3	-4.7	-1.3	-4.9	-0.5
03/06/2011	05h 37m 29.48s	+23° 12' 17.8"	05h 36m 40.24s	+22° 22' 14.3"	388671	12.8	1845	-5.3	0.012	167.2	3385	-5.1	0.2	-5.2	0.2	-5.2	1.0
04/06/2011	06h 33m 43.06s	+21° 53' 33.9"	06h 32m 15.71s	+21° 04' 53.8"	385180	24.8	1861	-6.4	0.046	155.1	3416	-5.4	1.7	-5.4	1.7	-5.6	2.6
05/06/2011	07h 29m 22.30s	+19° 22' 08.5"	07h 27m 22.46s	+18° 35' 46.8"	381840	37.1	1878	-7.3	0.102	142.8	3446	-5.3	3.2	-5.4	3.2	-5.7	4.0
06/06/2011	08h 23m 48.95s	+15° 45' 59.3"	08h 21m 24.10s	+15° 02' 17.4"	378705	49.6	1893	-8.2	0.177	130.3	3474	-5.1	4.5	-5.1	4.5	-5.6	5.3
07/06/2011	09h 16m 54.04s	+11° 17' 05.3"	09h 14m														

Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km.	EI *	Diam. "	Mag	Phase	Phase. angle*	Par.	L1	L2	L3	L4	L5	L6
22/07/2011	00h 48m 21.60s	+10° 24' 03.5"	00h 51m 01.08s	+09° 50' 18.0"	404354	103.6	1773	-10.6	0.619	76.2	3254	-0.4	-6.2	-0.4	-6.2	-1.0	-5.7
23/07/2011	01h 34m 00.68s	+14° 25' 15.5"	01h 36m 47.61s	+13° 50' 54.8"	403706	92.7	1776	-10.2	0.525	87.1	3259	-1.7	-5.5	-1.7	-5.5	-2.4	-5.0
24/07/2011	02h 21m 30.55s	+17° 53' 39.9"	02h 24m 20.23s	+17° 17' 36.5"	401793	81.8	1784	-9.8	0.430	98.1	3274	-2.9	-4.6	-2.9	-4.6	-3.6	-4.1
25/07/2011	03h 11m 20.66s	+20° 39' 16.9"	03h 14m 06.69s	+20° 00' 32.6"	398700	70.7	1798	-9.3	0.336	109.2	3300	-4.1	-3.5	-4.1	-3.5	-4.8	-2.9
26/07/2011	04h 03m 42.84s	+22° 31' 16.8"	04h 06m 17.00s	+21° 49' 13.1"	394612	59.4	1817	-8.8	0.246	120.5	3334	-5.0	-2.2	-5.0	-2.2	-5.6	-1.5
27/07/2011	04h 58m 24.82s	+23° 18' 58.8"	05h 00m 37.64s	+22° 33' 29.4"	389806	47.7	1839	-8.1	0.164	132.2	3375	-5.6	-0.7	-5.6	-0.7	-6.2	0.0
28/07/2011	05h 54m 48.48s	+22° 53' 44.5"	05h 56m 30.75s	+22° 05' 23.3"	384632	35.8	1864	-7.3	0.095	144.1	3421	-5.9	0.8	-5.9	0.8	-6.4	1.5
29/07/2011	06h 51m 57.48s	+21° 11' 16.8"	06h 53m 02.22s	+20° 21' 16.8"	379485	23.5	1889	-6.3	0.042	156.5	3467	-5.8	2.3	-5.8	2.3	-6.2	3.1
30/07/2011	07h 14m 53.80s	+18° 13' 31.0"	07h 16m 17.55s	+17° 23' 30.4"	374765	11.1	1913	-5.1	0.009	168.9	3511	-5.3	3.7	-5.3	3.7	-5.5	4.5
31/07/2011	08h 44m 55.63s	+14° 09' 05.2"	08h 46m 38.44s	+13° 20' 44.9"	370828	4.5	1933	-4.4	0.002	175.5	3548	-4.4	5.0	-4.4	5.0	-4.5	5.8
01/08/2011	09h 39m 47.95s	+09° 12' 24.8"	09h 38m 52.32s	+08° 27' 03.6"	367942	16.4	1949	-5.6	0.020	163.6	3576	-3.2	5.9	-3.2	5.9	-3.3	6.7
02/08/2011	10h 33m 42.69s	+03° 41' 52.8"	10h 32m 12.29s	+03° 00' 09.7"	366250	29.7	1958	-6.8	0.066	150.2	3592	-1.8	6.5	-1.8	6.5	-2.0	7.2
03/08/2011	11h 27m 11.66s	-02° 02' 05.1"	11h 25m 10.55s	-02° 40' 19.5"	365764	43.2	1960	-7.8	0.136	136.7	3597	-0.4	6.7	-0.4	6.7	-0.7	7.3
04/08/2011	12h 20m 56.70s	-07° 38' 35.3"	12h 18m 29.26s	-08° 14' 16.7"	366377	56.7	1957	-8.6	0.226	123.2	3591	1.0	6.4	1.1	6.4	0.6	7.0
05/08/2011	13h 15m 38.98s	-12° 47' 22.4"	13h 12m 50.50s	-13° 22' 00.9"	367902	70.1	1949	-9.3	0.331	109.7	3576	2.3	5.7	2.3	5.7	1.8	6.3
06/08/2011	14h 11m 47.95s	-17° 09' 40.3"	14h 08m 45.53s	-17° 45' 01.0"	370118	83.4	1937	-9.9	0.443	96.5	3555	3.4	4.7	3.4	4.7	2.8	5.2
07/08/2011	15h 09m 30.22s	-20° 29' 11.8"	15h 06m 23.40s	-21° 06' 49.9"	372818	96.4	1923	-10.4	0.557	83.4	3529	4.3	3.4	4.3	3.4	3.6	4.0
08/08/2011	16h 08m 21.67s	-22° 33' 35.4"	16h 05m 22.18s	-23° 14' 31.4"	375832	109.3	1908	-10.8	0.666	70.6	3501	4.8	1.9	4.9	1.9	4.2	2.6
09/08/2011	17h 10m 28.65s	-23° 16' 09.5"	17h 04m 48.68s	-24° 00' 32.1"	379041	121.9	1891	-11.2	0.765	58.0	3471	5.2	0.4	5.2	0.4	4.6	1.1
10/08/2011	18h 05m 41.73s	-22° 37' 05.7"	18h 03m 31.38s	-23° 24' 10.3"	382372	134.3	1875	-11.5	0.850	45.6	3441	5.3	-1.2	5.4	-1.2	4.8	-0.4
11/08/2011	19h 01m 57.29s	-20° 43' 18.9"	19h 00m 22.64s	-21° 31' 43.1"	385780	146.4	1858	-11.9	0.917	33.5	3410	5.3	-2.6	5.3	-2.6	4.8	-1.8
12/08/2011	19h 55m 35.31s	-17° 46' 43.8"	19h 54m 38.14s	-18° 34' 51.9"	389223	158.3	1842	-12.2	0.965	21.6	3380	5.0	-3.9	5.1	-3.9	4.7	-3.1
13/08/2011	20h 46m 25.41s	-14° 01' 47.8"	20h 46m 04.40s	-14° 48' 12.7"	392642	169.6	1826	-12.5	0.992	10.4	3351	4.6	-5.0	4.7	-5.0	4.4	-4.2
14/08/2011	21h 34m 42.51s	-09° 43' 19.1"	21h 34m 54.77s	-10° 26' 57.3"	395945	175.2	1811	-12.6	0.998	4.8	3323	4.1	-5.8	4.1	-5.8	4.0	-5.1
15/08/2011	22h 20m 58.10s	-05° 05' 05.3"	22h 21m 40.41s	-05° 45' 22.4"	398999	165.8	1797	-12.4	0.985	14.2	3297	3.3	-6.4	3.3	-6.4	3.3	-5.7
16/08/2011	23h 05m 52.42s	-00° 19' 20.0"	23h 07m 01.89s	-00° 56' 11.2"	401635	154.9	1785	-12.1	0.953	25.1	3276	2.4	-6.6	2.4	-6.6	2.3	-6.0
17/08/2011	23h 50m 09.09s	+04° 23' 15.7"	23h 51m 43.31s	+03° 49' 28.5"	403662	143.9	1776	-11.8	0.905	36.0	3259	1.3	-6.5	1.3	-6.5	1.0	-6.0
18/08/2011	00h 34m 31.90s	+08° 53' 10.0"	00h 36m 28.80s	+08° 21' 42.4"	404883	133.1	1771	-11.5	0.842	46.8	3249	0.1	-6.2	0.1	-6.2	-0.3	-5.7
19/08/2011	01h 19m 42.64s	+13° 01' 56.0"	01h 22m 00.07s	+12° 31' 19.9"	405118	122.3	1770	-11.2	0.768	57.6	3248	-1.2	-5.5	-1.2	-5.6	-1.7	-5.1
20/08/2011	02h 06m 18.74s	+16° 39' 27.6"	02h 08m 53.94s	+16° 09' 21.3"	402430	111.4	1774	-10.9	0.684	68.4	3255	-2.6	-4.7	-2.5	-4.7	-3.1	-4.2
21/08/2011	02h 46m 49.90s	+19° 37' 56.3"	02h 57m 38.78s	+19° 06' 34.6"	402140	100.5	1783	-10.5	0.593	79.3	3272	-3.8	-3.6	-3.8	-3.6	-4.5	-3.2
22/08/2011	03h 45m 33.31s	+21° 47' 23.2"	03h 48m 29.89s	+21° 13' 31.7"	398865	89.5	1797	-10.1	0.497	90.4	3298	-5.0	-2.4	-5.0	-2.4	-5.7	-1.9
23/08/2011	04h 38m 28.65s	+22° 58' 13.7"	04h 41m 24.81s	+22° 20' 55.5"	394502	78.2	1817	-9.7	0.399	101.6	3335	-6.0	-1.0	-5.9	-1.0	-6.6	-0.5
24/08/2011	05h 33m 15.18s	+23° 01' 54.1"	05h 36m 01.15s	+22° 20' 44.3"	398265	66.6	1842	-9.1	0.303	113.2	3380	-6.6	0.4	-6.6	0.4	-7.3	0.1
25/08/2011	06h 29m 14.59s	+21° 52' 27.9"	06h 31m 40.30s	+21° 07' 44.6"	383471	54.7	1870	-8.5	0.212	125.2	3431	-6.9	1.9	-6.8	1.9	-7.5	2.6
26/08/2011	07h 25m 40.88s	+19° 28' 18.6"	07h 27m 37.64s	+18° 41' 05.8"	377527	42.3	1899	-7.7	0.131	137.6	3485	-6.7	3.3	-6.7	3.3	-7.2	4.0
27/08/2011	08h 21m 54.36s	+15° 53' 25.6"	08h 23m 16.03s	+15° 05' 23.9"	371902	29.5	1928	-6.8	0.065	150.4	3538	-6.0	4.6	-6.0	4.6	-6.5	5.3
28/08/2011	09h 17m 33.29s	+11° 17' 48.5"	09h 18m 16.51s	+10° 30' 54.7"	367700	16.6	1953	-5.6	0.021	163.4	3584	-4.9	5.6	-4.8	5.6	-5.2	6.4
29/08/2011	10h 12m 38.53s	+05° 56' 59.0"	10h 12m 42.13s	+05° 12' 59.7"	363454	5.3	1973	-4.5	0.002	174.7	3620	-3.3	6.3	-3.3	6.3	-3.5	7.0
30/08/2011	11h 07m 30.76s	+00° 10' 52.3"	11h 06m 54.91s	-00° 29' 02.9"	361353	12.6	1984	-5.2	0.012	167.3	3641	-1.6	6.6	-1.5	6.6	-1.6	7.2
31/08/2011	12h 02m 42.67s	-05° 37' 49.8"	12h 01m 28.38s	-06° 13' 27.6"	360898	26.1	1987	-6.5	0.051	153.9	3645	0.3	6.4	0.3	6.4	0.2	7.0
01/09/2011	12h 58m 48.49s	-11° 05' 33.9"	12h 56m 57.80s	-11° 37' 42.6"	362031	39.8	1980	-7.5	0.117	140.1	3634	2.1	5.8	2.1	5.8	1.8	6.3
02/09/2011	13h 56m 12.31s	-15° 49' 57.7"	13h 53m 49.05s	-16° 20' 16.1"	364531	53.5	1967	-8.4	0.203	126.4	3609	3.7	4.8	3.7	4.8	3.3	5.3
03/09/2011	14h 54m 56.46s	-19° 31' 56.0"	14h 52m 07.32s	-20° 02' 27.6"	368070	66.9	1948	-9.1	0.305	113.0	3574	5.0	3.5	5.0	3.5	4.4	5.0
04/09/2011	15h 54m 34.11s	-21° 57' 40.5"	15h 51m 29.08s	-22° 30' 19.4"	372279	80.0	1926	-9.7	0.415	99.8	3534	5.8	2.0	5.9	2.0	5.2	2.5
05/09/2011	16h 54m 11.35s	-23° 00' 16.7"	16h 51m 02.85s	-23° 36' 16.6"	376809	92.8	1903	-10.2	0.526	87.0	3492	6.4	0.5	6.4	0.5	5.7	1.0
06/09/2011	17h 52m 41.46s	-22° 40' 18.9"	17h 49m 42.13s	-23° 19' 56.4"	381374	105.3	1880	-10.7	0.633	74.6	3450	6.6	-1.1	6.6	-1.1	5.9	-0.5
07/09/2011	18h 49m 05.53s	-21° 04' 56.4"	18h 46m 25.73s	-21° 47' 33.5"	385764	117.4	1859	-11.1	0.731	62.4	3410	6.5	-2.5	6.5	-2.5	5.9	-1.8
08/09/2011	19h 42m 48.34s	-18° 25' 46.3"	19h 40m 34.83s	-19° 10' 08.0"	389848	129.3	1839	-11.4	0.817	50.6	3375	6.2	-3.8	6.2	-3.8	5.6	-3.1
09/09/2011	20h 33m 42.89s	-14° 56' 28.2"	20h 31m 58.99s	-15° 41' 04.1"	393557	140.9	1822	-11.7	0.889	39.0	3343	5.7	-4.9	5.7	-4.9	5.2	-4.2
10/09/2011	21h 22m 05.52s	-10° 50' 52.2"	21h 20m 52.16s	-11° 34' 15.5"	396856	152.3	1807	-12.2	0.943	27.7	3315	5.0	-5.7	5.0	-5.7	4.6	-5.0
11/09/2011	22h 08m 27.52s	-06° 21' 58.1"	22h 07m 44.36s	-07° 02' 58.1"	399729	163.3	1794	-12.3	0.979	16.7	3291	4.1	-6.3	4.2	-6.3	3.8	-5.6
12/09/2011	22h 53m 27.64s	-01° 41' 36.0"	22h 53m 14.01s	-02° 19' 25.4"	402146	173.1	1783	-12.6	0.996	6.9	3272	3.2	-6.5	3.2	-6.5	3.0	-5.9
13/09/2011	23h 37m 47.12s	+02° 59' 28.6"	23h 38m 02.39s	+02° 25' 10.3"	404058	172.0	1774	-12.5	0.995	8.0	3256	2.1	-6.5	2.1	-6.5	2.0	-5.9
14/09/2011	00h 22m 06.53s	+07° 31' 19.1"	00h 22m 50.35s	+07° 00' 24.4"	405386	162.1	1769	-12.3	0.976	17.8	3245	0.9	-6.1	1.0	-6.2	0.9	-5.6
15/09/2011	01h 07m 03.79s	+11° 44' 28.9"	01h 08m 15.89s	+11° 16' 23.7"	406025	151.5	1766	-12	0.940	28.4	3240	-0.3	-5.6	-0.3	-5.6	-0.5	-5.1
16/09/2011	01h 53m 12.00s	+15° 29' 45.8"	01h 54m 51.84s	+15° 03' 32.2"	405855	140.8	1767	-11.7	0.888	39.1	3242	-1.7	-4.7	-1.7	-4.7	-1.9	-4.3
17/09/2011	02h 40m 56.85s	+18° 38' 01.3"	02h 43m 03.00s	+18° 12' 22.8"	404758	130.1	1771	-11.4	0.823	49.8	3250	-3.0	-3.7	-3.0	-3.7	-3.4	-3.3
18/09/2011	03h 30m 33.13s	+21° 00' 12.7"	03h 33m 02.62s	+20° 33' 42.8"	402638	119.2	1781	-11.1	0.745	60.6	3268	-4.4	-2.5	-4.3	-2.5	-4.8	-2.1
19/09/2011	04h 22m 01.47s	+22°															



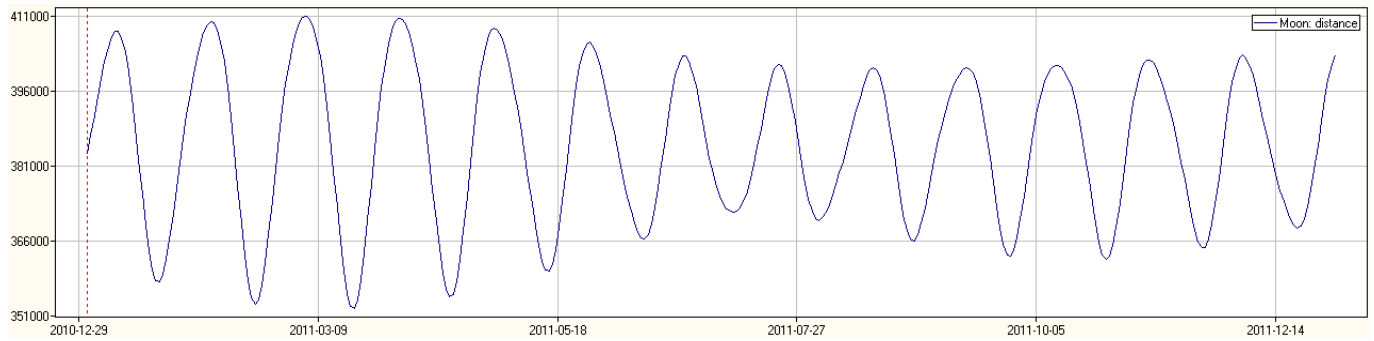
Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	El °	Diam. "	Mag	Phase	Phase. angle°	Par.	L1	L2	L3	L4	L5	L6
03/11/2011	20h 57m 46.04s	-12° 34' 42.7"	20h 54m 55.46s	-13° 11' 41.4"	391680	93.1	1830	-10.2	0.528	86.8	3359	7.2	-5.8	7.3	-5.8	6.6	-5.2
04/11/2011	21h 45m 19.43s	-08° 18' 01.5"	21h 42m 38.67s	-08° 56' 01.8"	396525	104.5	1808	-10.6	0.627	75.3	3318	6.5	-6.4	6.6	-6.4	5.9	-5.8
05/11/2011	22h 30m 51.53s	-03° 46' 40.8"	22h 28m 24.11s	-04° 24' 19.0"	400410	115.7	1791	-11	0.718	64.2	3286	5.6	-6.7	5.6	-6.7	5.0	-6.1
06/11/2011	23h 15m 14.29s	+00° 49' 10.0"	23h 13m 02.96s	+00° 13' 09.0"	403270	126.7	1778	-11.3	0.800	53.2	3262	4.5	-6.7	4.5	-6.7	3.9	-6.1
07/11/2011	23h 59m 17.58s	+05° 20' 30.5"	23h 57m 25.03s	+04° 47' 07.4"	405122	137.5	1770	-11.6	0.870	42.3	3248	3.3	-6.4	3.3	-6.4	2.8	-5.9
08/11/2011	00h 43m 46.75s	+09° 38' 41.1"	00h 42m 16.02s	+09° 08' 36.7"	406036	148.4	1766	-11.9	0.926	31.6	3240	2.0	-5.9	2.0	-5.9	1.5	-5.4
09/11/2011	01h 29m 20.51s	+13° 34' 47.0"	01h 28m 15.19s	+13° 08' 17.1"	406115	159.1	1765	-12.2	0.967	20.8	3240	0.7	-5.1	0.7	-5.1	0.3	-4.6
10/11/2011	02h 16m 28.08s	+16° 59' 23.1"	02h 15m 52.15s	+16° 36' 13.9"	405470	169.9	1768	-12.5	0.992	10.1	3245	-0.6	-4.0	-0.6	-4.1	-0.9	-3.7
11/11/2011	03h 05m 25.36s	+19° 42' 14.6"	03h 05m 22.63s	+19° 22' 10.2"	404198	177.5	1774	-12.7	1.000	2.5	3255	-1.9	-2.8	-1.9	-2.8	-2.1	-2.5
12/11/2011	03h 56m 11.03s	+21° 35' 26.1"	03h 56m 44.22s	+21° 16' 11.3"	402370	167.7	1782	-12.4	0.989	12.2	3270	-3.1	-1.5	-3.1	-1.5	-3.2	-1.2
13/11/2011	04h 48m 25.05s	+22° 29' 28.0"	04h 49m 34.67s	+22° 09' 56.9"	400025	156.7	1792	-12.1	0.959	23.2	3289	-4.2	-0.1	-4.2	-0.1	-4.3	0.2
14/11/2011	05h 41m 32.03s	+22° 19' 29.6"	05h 43m 15.66s	+21° 58' 02.9"	397176	145.5	1805	-11.8	0.912	34.4	3312	-5.2	1.4	-5.2	1.4	-5.5	1.7
15/11/2011	06h 34m 50.40s	+21° 03' 46.6"	06h 37m 02.78s	+20° 39' 00.8"	393820	134.1	1820	-11.5	0.848	45.8	3341	-6.0	2.8	-6.0	2.8	-6.4	3.1
16/11/2011	07h 27m 14.65s	+18° 44' 24.3"	07h 30m 18.63s	+18° 15' 30.9"	389959	122.4	1839	-11.2	0.769	57.5	3374	-6.6	4.1	-6.6	4.1	-7.1	4.5
17/11/2011	08h 19m 55.67s	+15° 26' 56.9"	08h 22m 43.49s	+14° 53' 47.7"	385627	110.5	1859	-10.8	0.677	69.3	3412	-6.9	5.2	-6.9	5.2	-7.5	5.7
18/11/2011	09h 11m 25.57s	+11° 19' 31.8"	09h 14m 19.84s	+10° 42' 47.6"	380915	98.4	1882	-10.4	0.574	81.5	3454	-6.8	6.1	-6.8	6.1	-7.5	6.6
19/11/2011	10h 02m 36.97s	+06° 32' 27.2"	10h 05m 31.01s	+05° 53' 28.4"	375993	85.9	1907	-10	0.465	94.0	3499	-6.4	6.6	-6.4	6.6	-7.1	7.3
20/11/2011	10h 54m 08.83s	+01° 18' 06.1"	10h 56m 56.37s	+00° 38' 43.0"	371127	73.0	1932	-9.4	0.355	106.9	3545	-5.6	6.8	-5.6	6.8	-6.3	7.5
21/11/2011	11h 40m 50.35s	-04° 08' 32.3"	11h 49m 24.85s	-04° 46' 15.9"	366663	59.8	1955	-8.8	0.249	120.1	3588	-4.4	6.6	-4.4	6.6	-5.1	7.2
22/11/2011	12h 41m 32.96s	-09° 29' 11.5"	12h 43m 46.88s	-10° 03' 22.1"	363009	46.2	1975	-8	0.155	133.7	3624	-2.9	5.9	-2.9	5.9	-3.5	6.5
23/11/2011	13h 38m 58.48s	-14° 22' 07.8"	13h 40m 42.92s	-14° 51' 32.3"	360573	32.3	1988	-7	0.078	147.6	3649	-1.2	4.9	-1.2	4.9	-1.7	5.4
24/11/2011	14h 39m 22.21s	-18° 23' 28.8"	14h 40m 27.60s	-18° 48' 02.7"	359691	18.3	1993	-5.8	0.026	161.6	3658	0.7	3.5	0.7	3.5	0.3	3.9
25/11/2011	15h 42m 14.76s	-21° 10' 45.9"	15h 42m 33.12s	-21° 31' 46.1"	360556	4.4	1988	-4.4	0.001	175.6	3649	2.5	1.8	2.5	1.8	2.2	2.2
26/11/2011	16h 46m 15.10s	-22° 28' 15.7"	16h 45m 43.31s	-22° 48' 00.9"	363164	9.7	1974	-4.9	0.007	170.3	3623	4.1	0.1	4.1	0.1	4.0	4.0
27/11/2011	17h 49m 29.17s	-22° 11' 38.9"	17h 48m 10.90s	-22° 32' 41.6"	367309	23.3	1952	-6.2	0.041	156.7	3582	5.4	-1.6	5.4	-1.6	5.3	-1.3
28/11/2011	18h 50m 09.70s	-20° 28' 50.0"	18h 48m 14.23s	-20° 53' 04.1"	372613	36.5	1924	-7.3	0.098	143.4	3531	6.4	-3.2	6.4	-3.2	6.1	-2.8
29/11/2011	19h 47m 11.30s	-17° 36' 13.3"	19h 44m 50.04s	-18° 04' 26.8"	378593	49.2	1894	-8.2	0.174	130.7	3475	6.9	-4.5	6.9	-4.6	6.5	-4.1
30/11/2011	20h 40m 19.88s	-13° 53' 10.2"	20h 37m 43.25s	-14° 25' 08.9"	384742	61.5	1863	-8.9	0.263	118.3	3420	7.0	-5.6	7.0	-5.6	6.5	-5.1
01/12/2011	21h 30m 00.69s	-09° 37' 44.0"	21h 27m 16.76s	-10° 12' 31.7"	390586	73.4	1836	-9.4	0.358	106.5	3368	6.8	-6.3	6.8	-6.3	6.2	-5.8
02/12/2011	22h 17m 00.53s	-05° 04' 49.8"	22h 14m 15.11s	-05° 41' 09.3"	363009	84.9	1812	-9.9	0.457	94.9	3325	6.2	-6.7	6.2	-6.7	5.5	-6.1
03/12/2011	23h 02m 14.27s	-00° 26' 14.0"	22h 59m 31.61s	-01° 02' 43.3"	399908	96.1	1793	-10.4	0.554	83.7	3290	5.3	-6.8	5.3	-6.8	4.6	-6.2
04/12/2011	23h 46m 37.19s	+04° 08' 33.1"	23h 44m 00.82s	+03° 33' 11.5"	402935	107.1	1779	-10.7	0.648	72.8	3265	4.2	-6.6	4.2	-6.6	3.5	-6.0
05/12/2011	00h 31m 01.22s	+08° 31' 11.8"	00h 28m 34.67s	+07° 58' 04.2"	404757	117.9	1771	-11.1	0.735	61.9	3250	2.9	-6.1	2.9	-6.1	2.2	-5.5
06/12/2011	01h 16m 12.67s	+12° 33' 35.4"	01h 13m 59.99s	+12° 03' 31.3"	405409	128.7	1768	-11.4	0.814	51.1	3245	1.6	-5.4	1.6	-5.4	1.0	-4.8
07/12/2011	02h 02m 49.57s	+16° 07' 09.1"	02h 00m 55.69s	+15° 40' 35.3"	404999	139.6	1770	-11.7	0.881	40.3	3249	0.2	-4.4	0.3	-4.4	-0.3	-3.9
08/12/2011	02h 51m 17.81s	+19° 02' 35.8"	02h 49m 48.48s	+18° 39' 30.1"	403688	150.5	1776	-12	0.935	29.5	3259	-1.0	-3.2	-1.0	-3.2	-1.5	-2.8
09/12/2011	03h 41m 46.17s	+21° 10' 15.5"	03h 40m 47.44s	+20° 50' 01.2"	401664	161.5	1785	-12.2	0.974	18.5	3275	-2.2	-1.9	-2.2	-1.9	-2.6	-1.5
10/12/2011	04h 34m 02.36s	+22° 21' 05.0"	04h 33m 39.46s	+22° 02' 30.8"	399115	172.7	1796	-12.5	0.996	7.3	3296	-3.3	-0.4	-3.3	-0.4	-3.6	-0.1
11/12/2011	05h 27m 33.24s	+22° 28' 07.4"	05h 27m 49.21s	+22° 09' 35.4"	396211	176.0	1810	-12.6	0.999	4.0	3321	-4.2	1.0	-4.2	1.0	-4.3	1.4
12/12/2011	06h 21m 32.15s	+21° 28' 03.6"	06h 22m 26.80s	+21° 07' 47.5"	393087	164.4	1824	-12.3	0.982	15.5	3347	-4.9	2.5	-4.9	2.5	-4.9	2.8
13/12/2011	07h 15m 12.16s	+19° 22' 06.8"	07h 16m 42.09s	+18° 58' 34.8"	389833	152.7	1839	-12	0.945	27.2	3375	-5.4	3.8	-5.4	3.8	-5.6	4.2
14/12/2011	08h 07m 59.98s	+16° 15' 55.3"	08h 09m 59.55s	+15° 48' 10.2"	386501	140.8	1855	-11.7	0.888	39.1	3404	-5.6	5.0	-5.6	5.0	-6.0	5.4
15/12/2011	08h 59m 44.49s	+12° 18' 34.9"	09h 02m 07.19s	+11° 46' 26.1"	383116	128.6	1871	-11.4	0.813	51.2	3434	-5.6	5.9	-5.6	5.9	-6.1	6.4
16/12/2011	09h 50m 38.11s	+07° 41' 28.1"	09h 53m 17.58s	+07° 05' 33.3"	379700	116.3	1888	-11	0.723	63.6	3465	-5.4	6.5	-5.4	6.5	-5.9	7.1
17/12/2011	10h 41m 12.94s	+02° 37' 24.7"	10h 44m 03.29s	+01° 59' 03.2"	376298	103.8	1905	-10.6	0.620	76.1	3496	-4.9	6.8	-4.9	6.8	-5.5	7.5
18/12/2011	11h 32m 14.69s	-02° 39' 30.4"	11h 35m 10.21s	-03° 18' 29.6"	373002	91.0	1922	-10.2	0.510	88.9	3527	-4.1	6.7	-4.1	6.7	-4.8	7.4
19/12/2011	12h 24m 35.68s	-07° 53' 37.5"	12h 27m 30.14s	-08° 31' 12.6"	369969	77.9	1938	-9.6	0.397	101.9	3556	-3.2	6.2	-3.2	6.2	-3.9	6.8
20/12/2011	13h 19m 06.14s	-12° 47' 12.7"	13h 21m 51.88s	-13° 21' 31.2"	367417	64.7	1951	-9	0.287	115.2	3581	-2.0	5.3	-2.0	5.3	-2.8	5.9
21/12/2011	14h 16m 21.80s	-17° 00' 28.8"	14h 18m 49.15s	-17° 30' 14.1"	365610	51.3	1961	-8.3	0.188	128.6	3599	-0.8	4.0	-0.8	4.0	-1.4	4.6
22/12/2011	15h 16m 27.47s	-20° 12' 55.7"	15h 18m 25.24s	-20° 37' 53.5"	364817	37.7	1965	-7.4	0.105	142.2	3606	0.6	2.5	0.6	2.5	0.0	3.0
23/12/2011	16h 18m 42.41s	-22° 06' 36.1"	16h 19m 59.95s	-22° 27' 47.8"	365253	24.1	1963	-6.3	0.044	155.8	3602	2.0	0.8	2.0	0.8	1.5	1.2
24/12/2011	17h 21m 40.03s	-22° 30' 40.7"	17h 22m 10.51s	-22° 50' 10.4"	367033	10.6	1953	-5	0.009	169.3	3585	3.2	-0.9	3.2	-0.9	3.0	-0.6
25/12/2011	18h 23m 31.59s	-21° 25' 00.9"	18h 23m 14.43s	-21° 45' 15.1"	370123	3.3	1937	-4.2	0.001	176.7	3555	4.3	-2.6	4.3	-2.6	4.2	-2.2
26/12/2011	19h 22m 43.96s	-19° 00' 07.3"	19h 21m 44.34s	-19° 23' 06.2"	374339	16.0	1915	-5.6	0.020	163.9	3515	5.2	-4.0	5.2	-4.0	5.1	-3.6
27/12/2011	20h 18m 26.78s	-15° 33' 26.3"	20h 16m 52.95s	-16° 00' 14.3"	379363	28.7	1890	-6.7	0.062	151.2	3468	5.7	-5.2	5.7	-5.2	5.5	-4.8
28/12/2011	21h 10m 35.83s	-11° 24' 24.7"	21h 08m 36.32s	-11° 55' 06.4"	384788	41.0	1863	-7.6	0.123	138.9	3419	5.9	-6.1	5.9	-6.1	5.6	-5.6
29/12/2011	21h 59m 40.08s	-06° 50' 52.7"	21h 57m 22.17s	-07° 24' 47.5"	390176	52.9	1838	-8.4	0.199	127.0	3372	5.7	-6.6	5.7	-6.6	5.3	-6.0
30/12/2011	22h 46m 26.13s	-02° 07' 32.5"	22h 43m 55.49s	-02° 43' 32.7"	395108	64.5	1815	-9	0.286	115.4	3330	5.2	-6.8	5.2	-6.8	4.7	-6.2
31/12/2011	23h 31m 46.86s	+02° 33' 59.4"	23h 29m 07.93s	+01° 57' 12.1"	399228	75.7	1796	-9.6	0.378	104.1	3295	4.4	-6.7	4.4	-6.7	3.8	-6.0

A.R. e DEC. = coordinate apparenti geocentriche e topocentriche per Roma



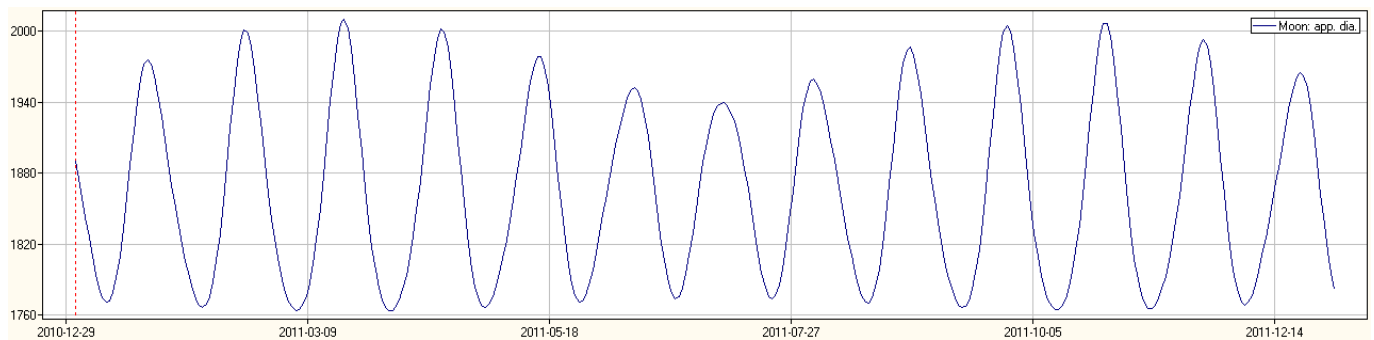
Distanza geocentrica della Luna in km nel corso dell'anno

Geocentric distance of the Moon in km during the year



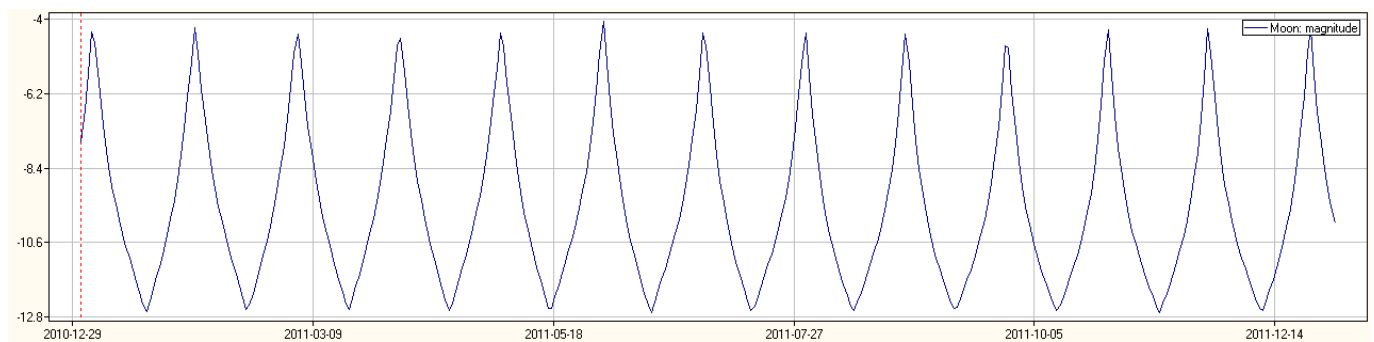
Distanza topocentrica della Luna in km nel corso dell'anno

Topocentric distance of the Moon in km during the year



Diametro geocentrico della Luna in " nel corso dell'anno

Geocentric diameter of the Moon in " during the year



Magnitudine della Luna nel corso dell'anno

Magnitude of the Moon during the year

# EFFEMERIDI FISICHE DELLA LUNA

## PHYSICAL EPHEMERIDES OF THE MOON

Date	l	b	Axis	Coln	Lat	%ill	Date	l	b	Axis	Coln	Lat	%ill
	o	o	o	o	o			o	o	o	o	o	
Jan 1	4,8	3,7	14,0	224,2	0,2	12	Apr 3	-0,6	-6,4	336,3	263,8	1,5	0
Gen 3	5,1	0,8	3,3	248,6	0,3	2	5	-3,0	-5,5	338,2	288,2	1,5	2
5	4,4	-2,2	352,5	272,9	0,3	0	7	-5,2	-3,6	344,2	312,7	1,4	10
7	2,9	-4,7	343,9	297,3	0,4	7	9	-6,9	-0,9	353,7	337,1	1,4	25
9	0,6	-6,3	338,5	321,7	0,4	19	11	-7,7	2,1	4,7	1,5	1,4	45
11	-1,9	-6,8	336,4	346,0	0,5	36	13	-6,8	4,8	14,7	25,9	1,4	66
13	-4,3	-6,1	338,0	10,3	0,5	55	15	-4,1	6,4	21,7	50,2	1,4	86
15	-6,0	-4,3	343,8	34,6	0,6	74	17	-0,2	6,4	23,7	74,6	1,3	98
17	-6,4	-1,5	353,7	58,9	0,6	90	19	3,7	4,6	19,5	98,9	1,3	99
19	-5,1	1,7	5,5	83,2	0,7	99	21	6,4	1,8	9,9	123,2	1,3	88
21	-2,5	4,6	15,8	107,4	0,8	98	23	7,3	-1,4	358,3	147,6	1,2	71
23	0,8	6,4	22,2	131,7	0,8	87	25	6,4	-4,1	348,1	172,0	1,2	51
25	3,7	6,6	23,4	156,0	0,9	67	27	4,4	-5,9	340,9	196,4	1,2	32
27	5,5	5,1	19,1	180,3	0,9	45	29	1,9	-6,6	337,0	220,8	1,1	16
29	6,0	2,6	10,2	204,6	0,9	25	May 1	-0,6	-6,2	336,5	245,3	1,1	5
31	5,4	-0,4	359,3	229,0	1,0	9	May 3	-2,9	-4,8	340,0	269,8	1,1	0
Feb 2	4,1	-3,2	349,2	253,4	1,0	1	5	-4,9	-2,4	347,5	294,2	1,0	3
4	2,2	-5,3	341,7	277,7	1,1	1	7	-6,2	0,5	357,8	318,7	1,0	13
6	-0,1	-6,5	337,3	302,1	1,1	8	9	-6,6	3,4	8,7	343,1	0,9	30
8	-2,6	-6,6	336,5	326,5	1,1	20	11	-5,7	5,7	17,6	7,6	0,9	52
10	-5,0	-5,5	339,5	350,8	1,2	38	13	-3,5	6,7	22,9	32,0	0,8	74
12	-6,9	-3,4	346,6	15,2	1,2	57	15	-0,3	6,0	23,1	56,4	0,8	91
14	-7,4	-0,4	357,1	39,5	1,3	76	17	3,0	3,8	17,3	80,7	0,8	100
16	-6,1	2,7	8,7	63,7	1,3	92	19	5,4	0,7	6,6	105,1	0,7	97
18	-3,0	5,3	18,2	88,0	1,3	100	21	6,3	-2,5	354,9	129,5	0,7	85
20	1,0	6,6	23,2	112,3	1,3	96	23	5,7	-5,0	345,4	153,9	0,6	67
22	4,6	6,1	22,6	136,6	1,4	81	25	3,9	-6,5	339,1	178,3	0,6	48
24	6,7	4,1	16,3	160,9	1,4	61	27	1,5	-6,7	336,3	202,7	0,5	29
26	7,1	1,2	6,1	185,2	1,4	39	29	-1,0	-5,9	337,2	227,2	0,5	14
28	6,1	-1,7	355,2	209,6	1,4	21	31	-3,1	-4,0	342,2	251,7	0,4	3
Mar 2	4,2	-4,2	346,1	234,0	1,5	7	Jun 2	-4,7	-1,3	351,1	276,2	0,3	0
4	2,0	-5,9	339,7	258,4	1,5	1	Giu 4	-5,3	1,7	2,1	300,7	0,3	5
6	-0,5	-6,5	336,6	282,8	1,5	1	6	-5,0	4,5	12,6	325,1	0,2	18
8	-2,9	-6,1	337,1	307,2	1,5	9	8	-3,8	6,4	20,2	349,6	0,2	38
10	-5,3	-4,6	341,5	331,5	1,5	22	10	-1,9	6,7	23,7	14,1	0,1	60
12	-7,2	-2,2	349,8	355,9	1,5	40	12	0,6	5,5	21,9	38,5	0,1	81
14	-7,9	0,8	0,8	20,3	1,5	61	14	3,0	2,9	14,4	62,9	0,0	96
16	-6,8	3,8	11,7	44,6	1,5	81	16	4,7	-0,4	3,1	87,2	0,0	100
18	-3,8	5,9	20,1	68,9	1,5	95	18	5,3	-3,4	351,7	111,6	-0,1	95
20	0,4	6,5	23,7	93,2	1,5	100	20	4,6	-5,6	343,0	136,0	-0,1	82
22	4,5	5,4	21,2	117,5	1,5	92	22	2,9	-6,7	337,8	160,4	-0,2	64
24	7,0	2,9	13,1	141,8	1,5	76	24	0,6	-6,6	336,2	184,9	-0,2	45
26	7,6	-0,1	2,0	166,2	1,5	55	26	-1,8	-5,3	338,4	209,3	-0,3	27
28	6,5	-3,0	351,4	190,6	1,5	35	28	-3,8	-3,1	344,8	233,8	-0,4	12
30	4,5	-5,2	343,3	215,0	1,5	18	30	-4,9	-0,2	354,7	258,3	-0,4	2
Apr 1	2,0	-6,3	338,1	239,4	1,5	6	Jul 2	-4,9	2,8	6,0	282,8	-0,5	0

Legenda:

l = librazione in longitudine, in °  
b = librazione in latitudine, in °  
axis = angolo di posizione del polo nord lunare, in °  
coln = colongitudine del Sole, ossia longitudine del terminatore lunare, in °  
lat = latitudine del Sole, riferita all'equatore lunare, in °  
ill = percentuale di Luna illuminata

l = libration in longitude, in °  
b = libration in latitude, in °  
axis = angle of position from the lunar north pole, in °  
coln = solar colongitude, alias longitude of the lunar limb, in °  
lat = latitude of the Sun, referred to the lunar equator, in °  
ill = lunar lightning

Date	l	b	Axis	Coln	Lat	%ill	Date	l	b	Axis	Coln	Lat	%ill
	o	o	o	o	o			o	o	o	o	o	
Jul 1	-5,1	1,3	0,4	270,6	-0,4	0	Oct 1	5,5	2,4	14,9	314,3	-1,4	18
Lug 3	-4,4	4,2	11,3	295,1	-0,5	3	Ott 3	7,3	-0,9	3,5	338,7	-1,4	38
5	-2,8	6,2	19,6	319,6	-0,5	16	5	7,5	-3,8	352,3	3,1	-1,4	59
7	-0,7	6,7	23,6	344,1	-0,6	36	7	6,4	-5,8	343,5	27,4	-1,4	78
9	1,4	5,7	22,5	8,5	-0,6	58	9	4,5	-6,6	338,0	51,8	-1,4	92
11	3,2	3,2	15,8	32,9	-0,7	79	11	2,3	-6,2	336,0	76,1	-1,3	99
13	4,3	0,1	5,0	57,3	-0,7	94	13	-0,3	-4,8	338,0	100,4	-1,3	99
15	4,8	-2,9	353,6	81,7	-0,8	100	15	-3,0	-2,7	343,8	124,7	-1,3	93
17	4,3	-5,3	344,3	106,1	-0,8	97	17	-5,5	0,1	352,9	149,1	-1,2	80
19	2,9	-6,5	338,4	130,5	-0,9	86	19	-7,3	2,9	3,5	173,4	-1,2	62
21	0,7	-6,6	336,1	154,9	-0,9	71	21	-7,6	5,3	13,5	197,8	-1,2	41
23	-1,7	-5,5	337,7	179,4	-1,0	52	23	-6,1	6,6	21,0	222,2	-1,1	20
25	-4,0	-3,5	343,3	203,8	-1,0	33	25	-2,8	6,3	24,0	246,6	-1,1	5
27	-5,5	-0,7	352,7	228,3	-1,0	16	27	1,3	4,3	20,9	271,0	-1,1	0
29	-5,7	2,4	4,0	252,8	-1,1	4	29	5,0	1,2	11,8	295,4	-1,0	7
31	-4,3	5,0	14,4	277,3	-1,1	0	31	7,2	-2,1	359,7	319,8	-1,0	23
Aug 2	-1,7	6,5	21,6	301,8	-1,1	7	Nov 2	7,6	-4,8	348,8	344,2	-0,9	43
Ago 4	1,2	6,4	23,9	326,3	-1,2	23	4	6,5	-6,4	341,0	8,5	-0,9	63
6	3,6	4,7	20,5	350,7	-1,2	45	6	4,5	-6,7	336,8	32,9	-0,8	80
8	5,0	1,9	12,0	15,1	-1,2	67	8	2,1	-5,8	336,2	57,2	-0,8	93
10	5,4	-1,2	0,7	39,5	-1,3	85	10	-0,5	-4,0	339,7	81,5	-0,7	99
12	5,1	-4,0	349,9	63,9	-1,3	97	12	-3,0	-1,5	346,9	105,8	-0,7	99
14	4,0	-5,8	341,8	88,3	-1,3	100	14	-5,2	1,3	356,9	130,1	-0,6	91
16	2,3	-6,6	337,2	112,7	-1,4	95	16	-6,5	4,0	7,5	154,4	-0,6	76
18	0,0	-6,2	336,2	137,1	-1,4	84	18	-6,8	6,1	16,6	178,7	-0,5	57
20	-2,6	-4,7	339,1	161,5	-1,4	68	20	-5,5	6,8	22,6	203,0	-0,5	35
22	-5,1	-2,4	346,0	185,9	-1,4	49	22	-2,9	5,9	23,8	227,4	-0,4	15
24	-6,7	0,5	356,0	210,3	-1,4	30	24	0,7	3,5	18,9	251,8	-0,4	2
26	-6,7	3,4	7,2	234,8	-1,5	13	26	4,0	0,2	8,5	276,2	-0,3	1
28	-4,9	5,6	17,0	259,3	-1,5	2	28	6,3	-3,1	356,2	300,6	-0,3	10
30	-1,6	6,5	22,9	283,7	-1,5	1	30	7,0	-5,6	345,9	324,9	-0,2	26
Sep 1	2,1	5,8	23,4	308,2	-1,5	12	Dec 2	6,1	-6,7	339,1	349,3	-0,1	46
Set 3	5,0	3,5	17,8	332,7	-1,5	31	Dic 4	4,1	-6,6	336,1	13,6	-0,1	65
5	6,5	0,5	7,7	357,1	-1,5	53	6	1,5	-5,3	337,0	37,9	0,0	82
7	6,6	-2,6	356,3	21,5	-1,5	74	8	-1,1	-3,2	341,8	62,2	0,0	94
9	5,8	-4,9	346,5	45,9	-1,5	89	10	-3,4	-0,4	350,3	86,5	0,1	100
11	4,3	-6,3	339,7	70,2	-1,5	98	12	-4,9	2,4	0,9	110,7	0,1	98
13	2,2	-6,5	336,4	94,6	-1,5	100	14	-5,6	5,0	11,3	135,0	0,2	89
15	-0,3	-5,6	336,8	118,9	-1,5	94	16	-5,3	6,5	19,4	159,3	0,3	72
17	-3,0	-3,7	341,2	143,3	-1,5	82	18	-4,1	6,7	23,7	183,6	0,3	50
19	-5,6	-1,2	349,2	167,7	-1,5	65	20	-2,0	5,2	22,9	207,9	0,4	28
21	-7,4	1,7	359,6	192,1	-1,5	46	22	0,7	2,4	16,3	232,3	0,4	10
23	-7,6	4,4	10,4	216,5	-1,5	26	24	3,4	-0,9	5,0	256,7	0,5	1
25	-5,7	6,2	19,1	240,9	-1,5	9	26	5,3	-4,0	352,9	281,0	0,5	2
27	-2,2	6,5	23,7	265,4	-1,5	0	28	6,0	-6,0	343,3	305,4	0,6	12
29	2,0	5,1	22,4	289,8	-1,5	4	30	5,3	-6,8	337,7	329,8	0,6	29

Legenda:

l = librazione in longitudine, in °  
b = librazione in latitudine, in °  
axis = angolo di posizione del polo nord lunare, in °  
coln = colongitudine del Sole, ossia longitudine del terminatore lunare, in °  
lat = latitudine del Sole, riferita all'equatore lunare, in °  
ill = percentuale di Luna illuminata

l = libration in longitude, in °  
b = libration in latitude, in °  
axis = angle of position from the lunar north pole, in °  
coln = solar colongitude, alias longitude of the lunar limb, in °  
lat = latitude of the Sun, referred to the lunar equator, in °  
ill = lunar lightning

# FENOMENI LUNARI - LUNAR PHENOMENA

Perigei - Perigea				Apogei - Apogea			
-----				-----			
Jan 22	0:11	362792 km	F+2d 2h	Jan 10	5:39	404975 km	N+5d20h
Feb 19	7:28	358246 km	F+ 22h	Feb 6	23:14	405923 km	N+3d20h
Mar 19	19:10	356577 km	++ F+ 0h	Mar 6	7:51	406582 km	- N+1d11h
Apr 17	6:01	358087 km	F- 20h	Apr 2	9:01	406655 km	-- N-1d 5h
May 15	11:19	362132 km	F-1d23h	Apr 29	18:03	406042 km	N-3d12h
Jun 12	1:43	367187 km	F-3d18h	May 27	9:59	405004 km	N-5d11h
Jul 7	14:05	369565 km	N+6d 5h	Jun 24	4:14	404274 km	N-7d 4h
Aug 2	21:00	365755 km	N+3d 2h	Jul 21	22:48	404356 km	F+6d16h
Aug 30	17:36	360857 km	N+1d14h	Aug 18	16:24	405159 km	F+4d21h
Sep 28	1:02	357555 km	N+ 13h	Sep 15	6:24	406067 km	F+2d20h
Oct 26	12:27	357050 km	- N- 7h	Oct 12	11:44	406434 km	+ F+ 9h
Nov 23	23:25	359691 km	N-1d 6h	Nov 8	13:21	406176 km	+ F-2d 6h
Dec 22	2:58	364800 km	N-2d15h	Dec 6	1:14	405412 km	F-4d13h

Tutti gli orari sono in T.U., le distanze sono calcolate da centro Luna a centro Terra; F indica che il fenomeno avviene in prossimità della luna piena, N che avviene in prossimità della luna nuova, "-" o "+" indicano di quanti giorni ed ore il perigeo o l'apogeo precedono la fase lunare.

Jan=gennaio, May=maggio, Jun=giugno, Jul=luglio, Aug=agosto, Sep=settembre, Oct=ottobre, Dec=dicembre

All the scheduled times are in U.T., the distances are calculated from the center of the Moon to the center of the Earth; F means that the phenomenon happens in proximity of the full moon, N that happens in proximity of the new moon, "-" or "+" shows how many days and hour the lunar phase precedes or follows the perigeum or the apogeeum.

## Passage through node

03/01/2011	12:47:10	09/04/2011	12:47:42	13/07/2011	02:26:57	16/10/2011	21:00:31
18/01/2011	00:06:05	22/04/2011	01:05:58	27/07/2011	12:03:15	29/10/2011	14:59:23
30/01/2011	18:28:42	06/05/2011	14:53:59	09/08/2011	06:34:46	13/11/2011	00:34:10
14/02/2011	08:13:18	19/05/2011	09:03:07	23/08/2011	17:23:31	26/11/2011	01:01:59
26/02/2011	20:18:33	02/06/2011	20:20:38	05/09/2011	07:35:03	10/12/2011	07:02:43
13/03/2011	11:54:57	15/06/2011	18:34:47	19/09/2011	19:37:38	23/12/2011	11:36:41
25/03/2011	21:09:07	30/06/2011	04:13:21	02/10/2011	09:09:00		

## Maximal libration

02/01/2011	10:26:31	5,1 °	17/06/2011	22:23:46	5,4 °	20/10/2011	08:49:10	-7,6 °
28/01/2011	19:52:46	6,1 °	30/06/2011	21:59:45	-5,2 °	01/11/2011	11:00:21	7,7 °
13/02/2011	15:12:22	-7,5 °	15/07/2011	00:24:20	4,9 °	17/11/2011	08:03:05	-6,9 °
25/02/2011	12:01:10	7,2 °	28/07/2011	05:22:07	-5,9 °	29/11/2011	19:30:31	7,1 °
13/03/2011	22:32:58	-8,0 °	10/08/2011	05:12:21	5,4 °	14/12/2011	12:06:05	-5,6 °
11/04/2011	02:04:21	-7,6 °	25/08/2011	01:41:39	-6,8 °	27/12/2011	23:45:32	5,9 °
22/04/2011	23:30:32	7,2 °	22/09/2011	04:57:05	-7,5 °			
08/05/2011	17:08:03	-6,5 °	04/10/2011	03:35:10	7,6 °			

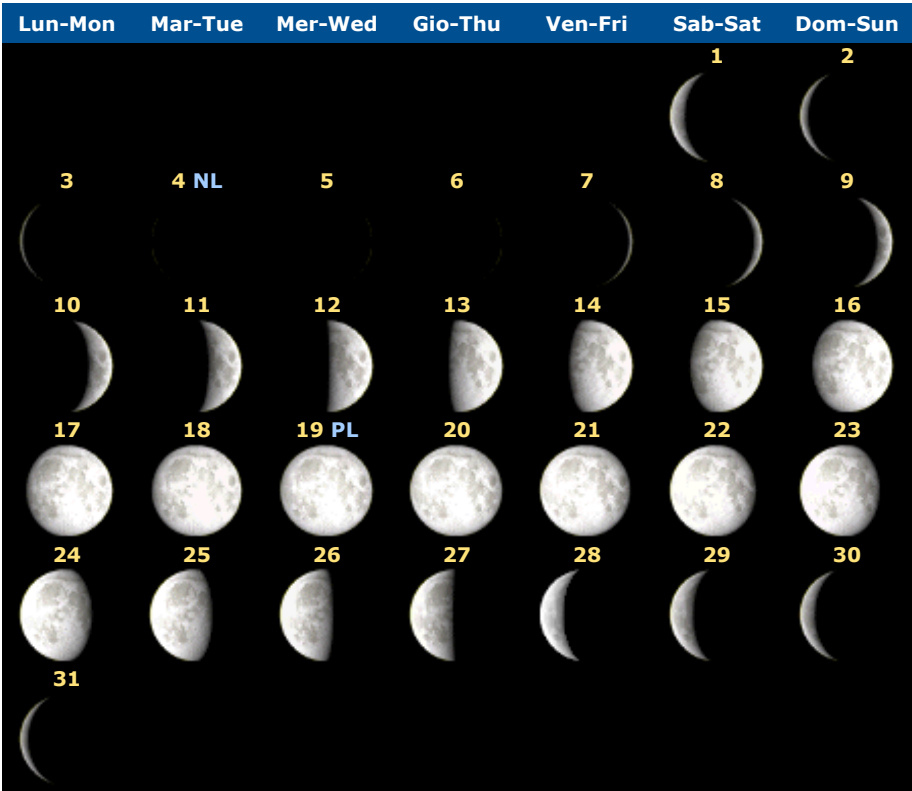
Passage through node = passaggio al nodo, tempi in T.U.  
Maximal libration = librazione massima, times in U.T.

# FASI LUNARI - LUNAR PHASES

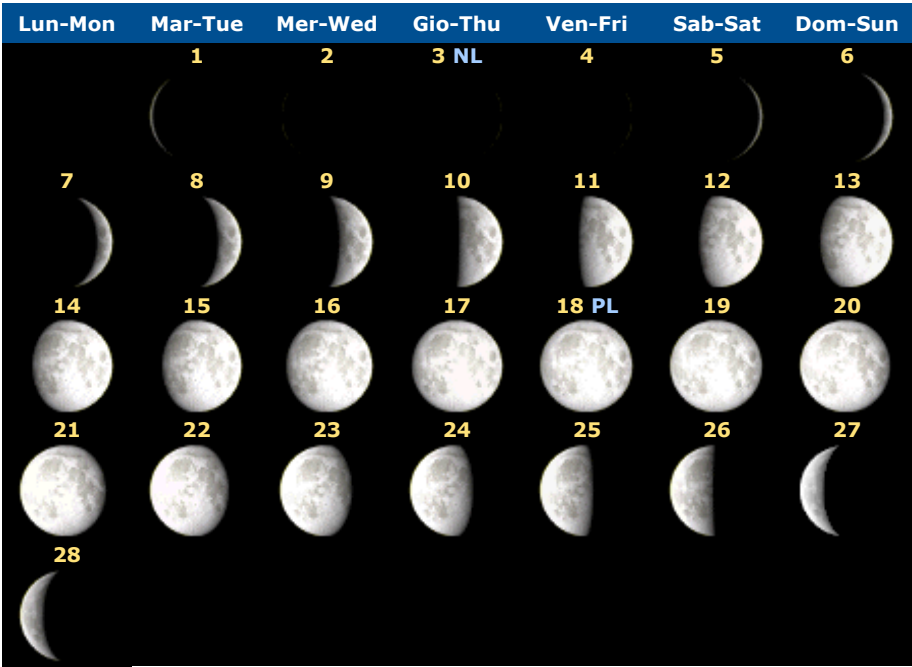
Luna nuova	d h m	Primo quarto	d h m	Luna piena	d h m	Ultimo quarto	d h m
New Moon		First quarter		Full Moon		Last quarter	
04/01/2011	09:02:46	12/01/2011	11:31:34	19/01/2011	21:21:29	26/01/2011	12:57:22
03/02/2011	02:30:48	11/02/2011	07:18:25	18/02/2011	08:35:44	24/02/2011	23:26:29
04/03/2011	20:46:00	12/03/2011	23:45:05	19/03/2011	18:10:06	26/03/2011	12:07:23
03/04/2011	14:32:24	11/04/2011	12:05:26	18/04/2011	02:44:02	25/04/2011	02:46:53
03/05/2011	06:50:46	10/05/2011	20:33:00	17/05/2011	11:08:41	24/05/2011	18:52:12
01/06/2011	21:02:40	09/06/2011	02:10:45	15/06/2011	20:13:35	23/06/2011	11:48:18
01/07/2011	08:53:58	08/07/2011	06:29:32	15/07/2011	06:39:37	23/07/2011	05:02:01
30/07/2011	18:39:53	06/08/2011	11:08:25	13/08/2011	18:57:37	21/08/2011	21:54:36
29/08/2011	03:04:10	04/09/2011	17:39:26	12/09/2011	09:26:48	20/09/2011	13:38:45
27/09/2011	11:08:41	04/10/2011	03:15:09	12/10/2011	02:05:55	20/10/2011	03:30:34
26/10/2011	19:55:52	02/11/2011	16:38:12	10/11/2011	20:16:22	18/11/2011	15:09:13
25/11/2011	06:09:48	02/12/2011	09:52:21	10/12/2011	14:36:32	18/12/2011	00:47:50
24/12/2011	18:06:28						

Jan=Gen, May=Mag, Jun=Giu, Jul=Lug, Aug=Ago, Sept=Set, Oct=Ott, Dec=Dic

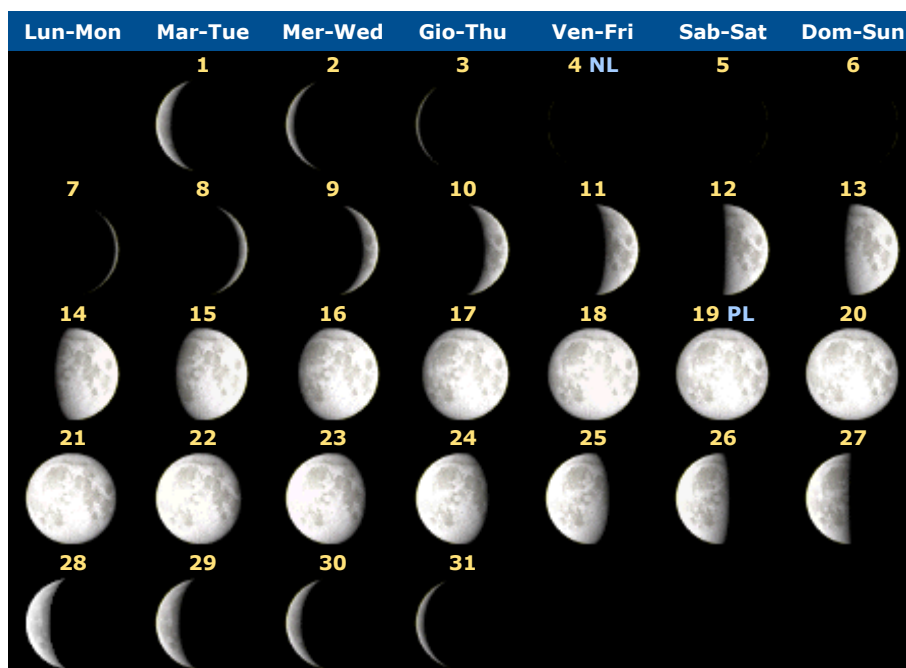
Gennaio - January



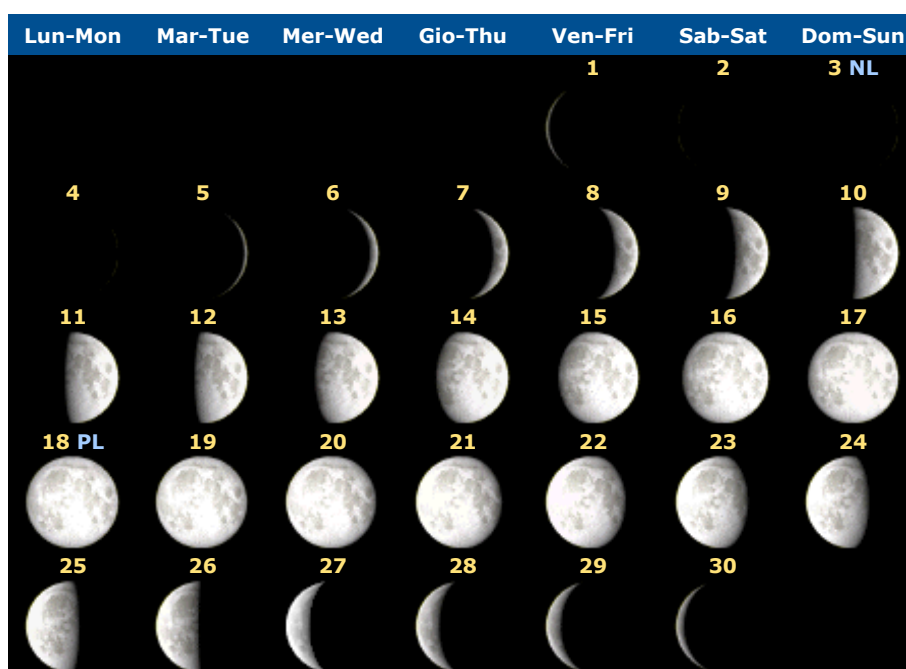
Febbraio - February



## Marzo – March

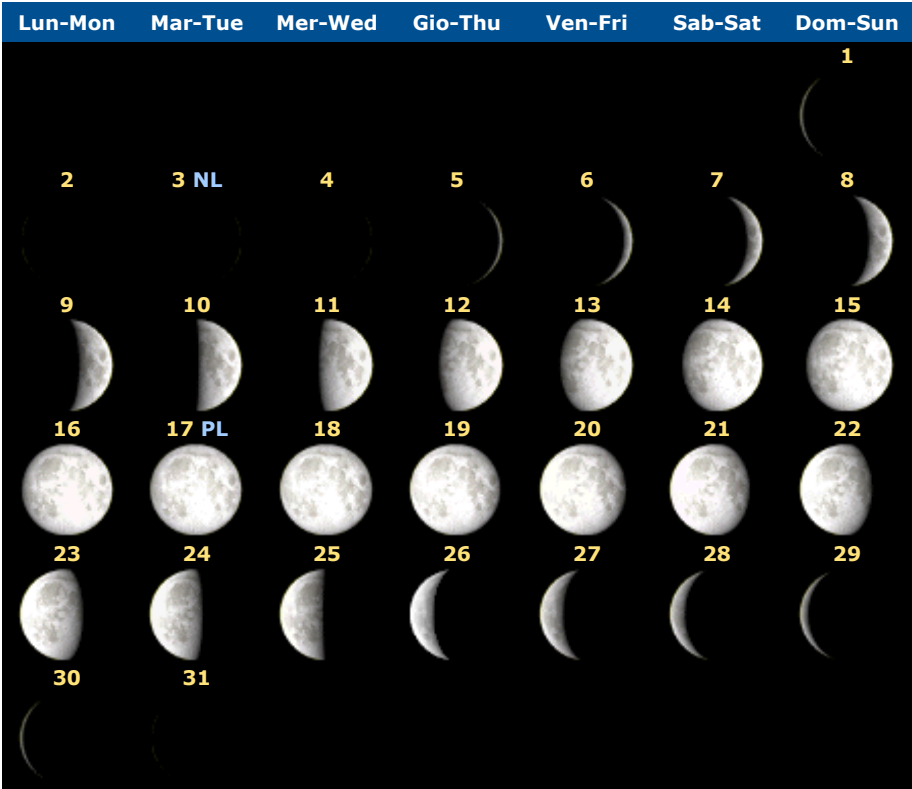


## Aprile – April

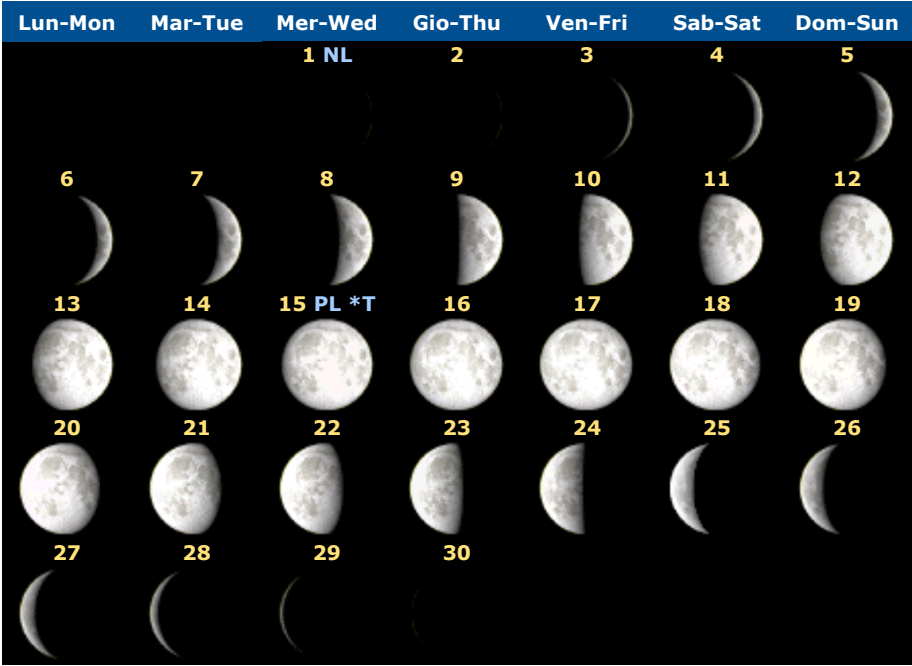




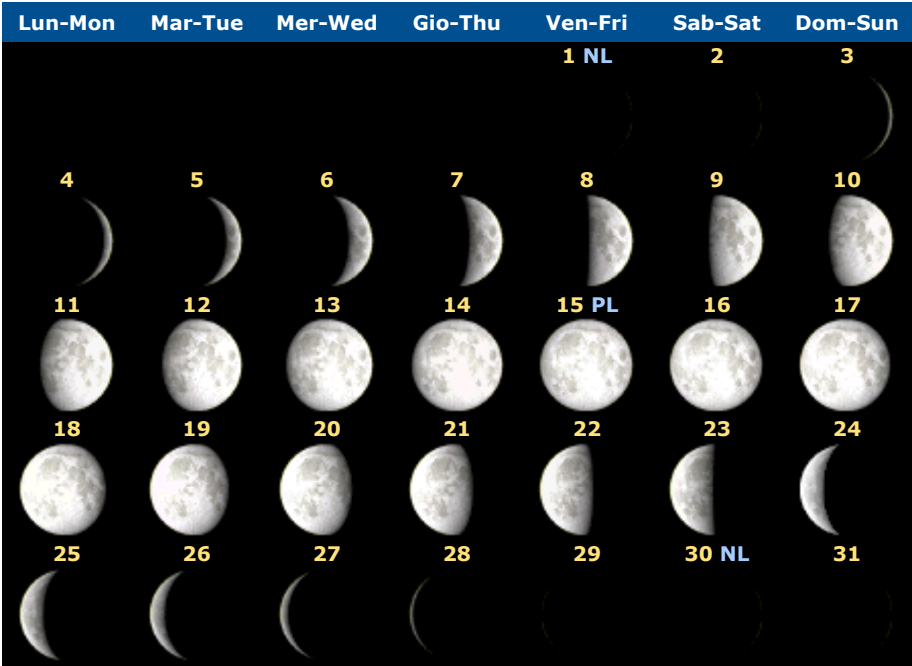
Maggio – May



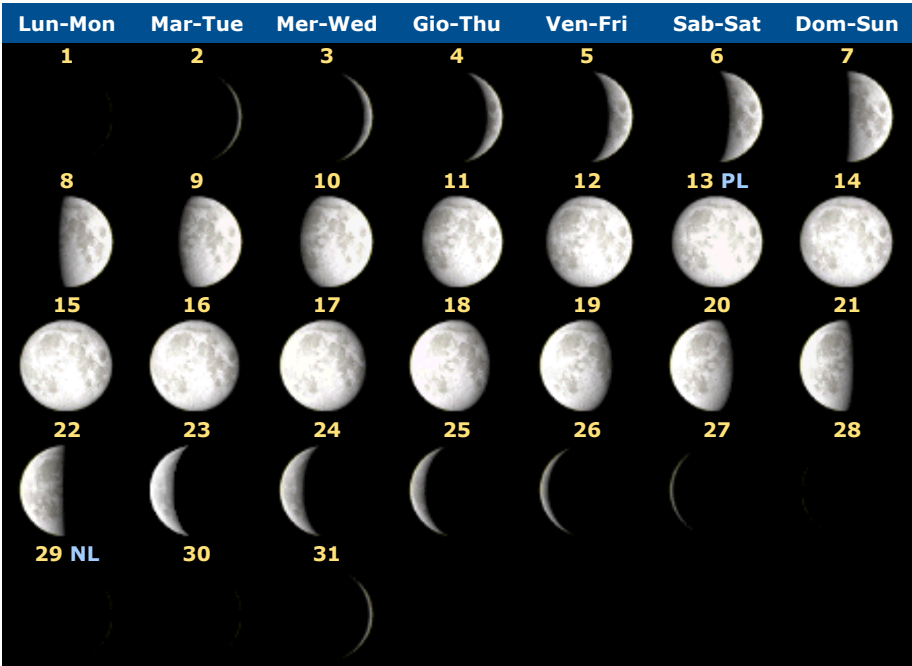
Giugno - June



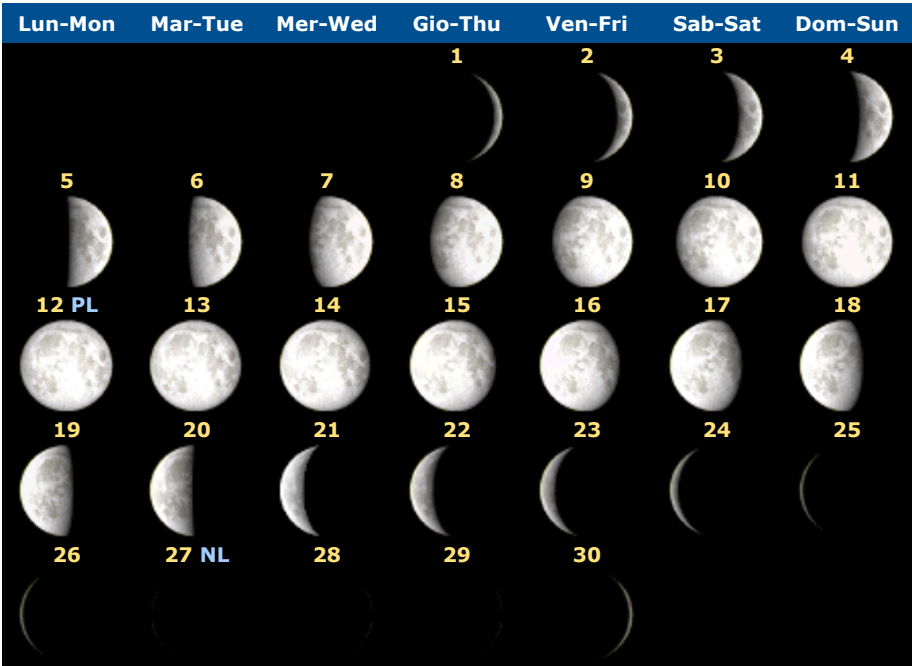
# Luglio – July



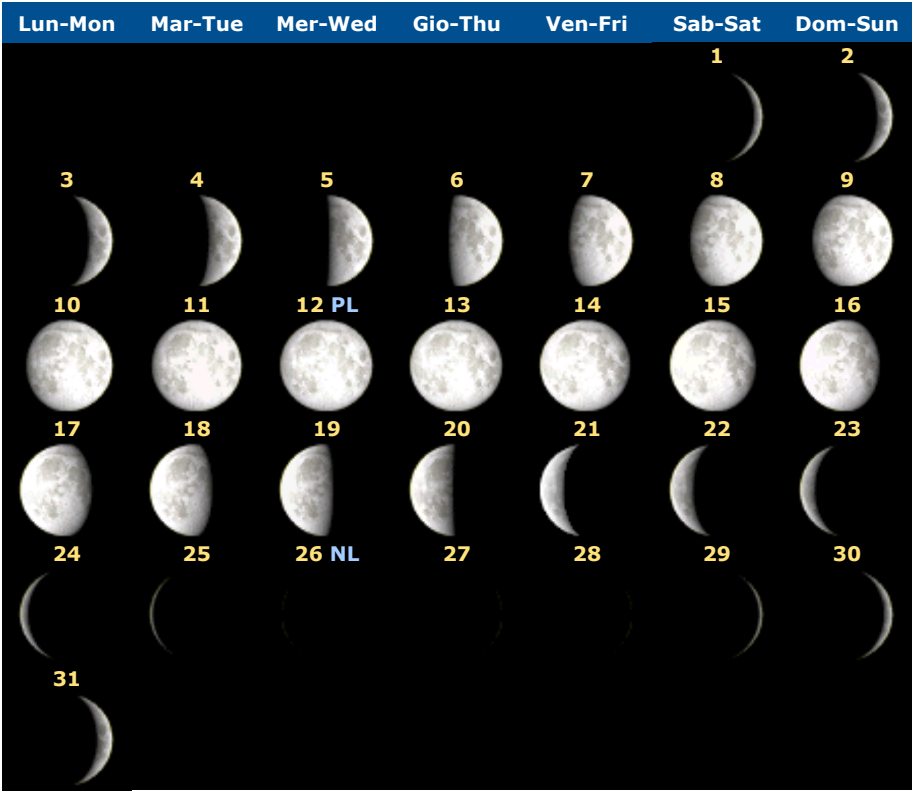
# Agosto – August



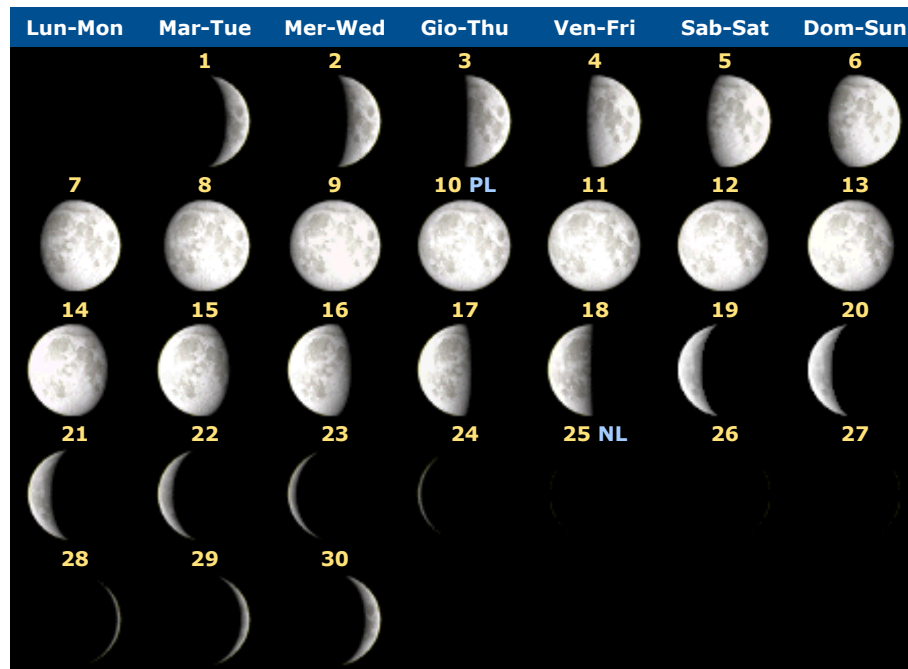
Settembre- September



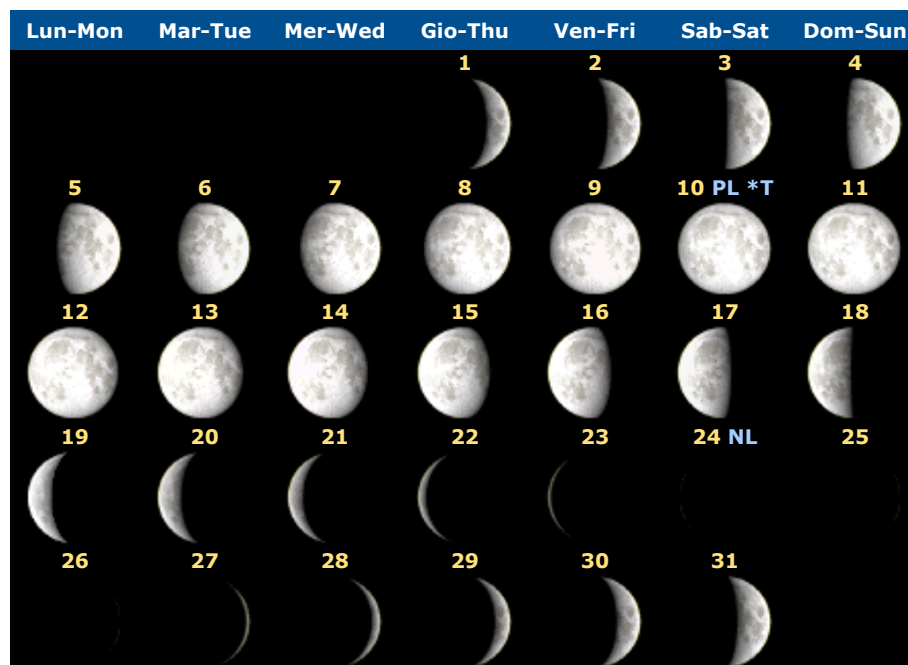
Ottobre - October



## Novembre – November



## Dicembre – December



# LEVATA E TRAMONTO DELLA LUNA

## RISING AND SETTING OF THE MOON

for Greenwich Meridian      for Rome :      Longitude E 12 00.0  
 Latitude N 42 00.0  
 Time Zone UT +1

		Ephemeris	Transit									
Date		TDT JD	TDT Time			Rise	(Azm)	Trans	(Alt)	Set	(Azm)	
			h	m	s	h	m	h	m	h	m	
2011-01- 1	1	2455562.892669	9	25	26.6	4	56	(122)	9	36	(237)	
2011-01- 2	2	2455563.931974	10	22	02.6	5	58	(124)	10	32	(236)	
2011-01- 3	3	2455564.970573	11	17	37.5	6	52	(123)	11	28	(238)	
2011-01- 4	4	2455566.007518	12	10	49.6	7	37	(120)	12	21	(241)	
2011-01- 5	5	2455567.042264	13	00	51.6	8	15	(116)	13	11	(246)	
2011-01- 6	6	2455568.074734	13	47	37.0	8	46	(111)	13	58	(252)	
2011-01- 7	7	2455569.105226	14	31	31.5	9	13	(105)	14	42	(258)	
2011-01- 8	8	2455570.134257	15	13	19.8	9	37	( 98)	15	24	(265)	
2011-01- 9	9	2455571.162454	15	53	56.0	10	00	( 92)	16	05	(272)	
2011-01-10	10	2455572.190488	16	34	18.2	10	22	( 85)	16	45	(278)	
2011-01-11	11	2455573.219048	17	15	25.8	10	45	( 79)	17	26	(285)	
2011-01-12	12	2455574.248816	17	58	17.7	11	10	( 73)	18	09	(291)	
2011-01-13	13	2455575.280424	18	43	48.7	11	38	( 67)	18	54	(296)	
2011-01-14	14	2455576.314371	19	32	41.6	12	11	( 62)	19	43	(300)	
2011-01-15	15	2455577.350863	20	25	14.6	12	51	( 59)	20	35	(303)	
2011-01-16	16	2455578.389648	21	21	05.6	13	39	( 57)	21	31	(303)	
2011-01-17	17	2455579.429942	22	19	07.0	14	37	( 57)	22	29	(302)	
2011-01-18	18	2455580.470610	23	17	40.7	15	44	( 60)	23	28	(298)	
2011-01-20	20	2455581.510572	0	15	13.5	p16	58	( 64)	0	25	(292)	
2011-01-21	21	2455582.549187	1	10	49.8	p18	14	( 71)	1	21	(285)	
2011-01-22	22	2455583.586366	2	04	22.0	p19	30	( 79)	2	15	(277)	
2011-01-23	23	2455584.622465	2	56	21.0	p20	46	( 87)	3	07	(269)	
2011-01-24	24	2455585.658082	3	47	38.3	p22	01	( 96)	3	58	(261)	
2011-01-25	25	2455586.693865	4	39	09.9	p23	15	(104)	4	49	(253)	
2011-01-26	26	2455587.730349	5	31	42.2	0	29	(111)	5	42	(246)	
2011-01-27	27	2455588.767810	6	25	38.8	1	40	(117)	6	36	(241)	
2011-01-28	28	2455589.806137	7	20	50.3	2	49	(121)	7	31	(238)	
2011-01-29	29	2455590.844804	8	16	31.0	3	52	(123)	8	27	(236)	
2011-01-30	30	2455591.882998	9	11	31.0	4	47	(123)	9	22	(237)	
2011-01-31	31	2455592.919897	10	04	39.1	5	34	(121)	10	15	(240)	
2011-02- 1	1	2455593.954931	10	55	06.0	6	14	(118)	11	05	(244)	
2011-02- 2	2	2455594.987906	11	42	35.1	6	47	(113)	11	53	(249)	
2011-02- 3	3	2455596.018972	12	27	19.2	7	16	(107)	12	38	(255)	
2011-02- 4	4	2455597.048513	13	09	51.5	7	41	(101)	13	20	(262)	
2011-02- 5	5	2455598.077043	13	50	56.5	8	04	( 95)	14	02	(269)	
2011-02- 6	6	2455599.105140	14	31	24.1	8	26	( 88)	14	42	(276)	
2011-02- 7	7	2455600.133406	15	12	06.3	8	49	( 81)	15	23	(282)	
2011-02- 8	8	2455601.162446	15	53	55.3	9	13	( 75)	16	05	(288)	
2011-02- 9	9	2455602.192839	16	37	41.3	9	39	( 69)	16	48	(294)	
2011-02-10	10	2455603.225090	17	24	07.8	10	09	( 64)	17	35	(298)	
2011-02-11	11	2455604.259534	18	13	43.7	10	45	( 60)	18	24	(302)	
2011-02-12	12	2455605.296209	19	06	32.5	11	28	( 58)	19	17	(303)	
2011-02-13	13	2455606.334757	20	02	03.0	12	20	( 57)	20	12	(303)	
2011-02-14	14	2455607.374432	20	59	10.9	13	22	( 58)	21	09	(300)	
2011-02-15	15	2455608.414322	21	56	37.4	14	31	( 62)	22	07	(295)	
2011-02-16	16	2455609.453665	22	53	16.7	15	45	( 67)	23	03	(289)	
2011-02-17	17	2455610.492092	23	48	36.8	17	02	( 75)	23	59	(281)	
2011-02-19	19	2455611.529671	0	42	43.6	p18	20	( 83)	0	53	(273)	
2011-02-20	20	2455612.566786	1	36	10.3	p19	38	( 92)	1	46	(264)	
2011-02-21	21	2455613.603955	2	29	41.7	p20	55	(100)	2	40	(256)	
2011-02-22	22	2455614.641645	3	23	58.2	p22	12	(108)	3	34	(249)	
2011-02-23	23	2455615.680099	4	19	20.5	p23	27	(115)	4	29	(243)	
2011-02-24	24	2455616.719198	5	15	38.7	0	39	(120)	5	26	(239)	
2011-02-25	25	2455617.758436	6	12	08.9	1	45	(123)	6	22	(237)	
2011-02-26	26	2455618.797052	7	07	45.3	2	43	(123)	7	18	(237)	
2011-02-27	27	2455619.834281	8	01	21.9	3	33	(122)	8	12	(239)	
2011-02-28	28	2455620.869606	8	52	14.0	4	14	(119)	9	03	(243)	
2011-03- 1	1	2455621.902862	9	40	07.2	4	49	(115)	9	51	(248)	
2011-03- 2	2	2455622.934200	10	25	14.9	5	19	(109)	10	36	(253)	
2011-03- 3	3	2455623.963988	11	08	08.6	5	45	(103)	11	19	(260)	
2011-03- 4	4	2455624.992712	11	49	30.3	6	09	( 97)	12	00	(266)	
2011-03- 5	5	2455626.020906	12	30	06.3	6	32	( 90)	12	41	(273)	
2011-03- 6	6	2455627.049121	13	10	44.1	6	54	( 84)	13	21	(280)	
2011-03- 7	7	2455628.077895	13	52	10.2	7	18	( 77)	14	03	(286)	
2011-03- 8	8	2455629.107736	14	35	08.4	7	43	( 72)	14	46	(292)	
2011-03- 9	9	2455630.139077	15	20	16.3	8	12	( 66)	15	31	(296)	
2011-03-10	10	2455631.172222	16	08	00.0	8	45	( 62)	16	18	(300)	
2011-03-11	11	2455632.207252	16	58	26.5	9	25	( 59)	17	09	(302)	
2011-03-12	12	2455633.243962	17	51	18.3	10	12	( 57)	18	02	(303)	
2011-03-13	13	2455634.281861	18	45	52.8	11	07	( 58)	18	56	(301)	
2011-03-14	14	2455635.320291	19	41	13.1	12	11	( 60)	19	51	(297)	
2011-03-15	15	2455636.358645	20	36	26.9	13	20	( 65)	20	47	(292)	

Ephemeris		Transit											
Date	TDT JD	TDT Time			Rise	(Azm)	Trans	(Alt)	Set	(Azm)			
		h	m	s	h	m	h	m	h	m			
2011-03-16	2455637.396571	21	31	03.7	14	34 ( 71)	21	41 (61)	f	4 37 (285)			
2011-03-17	2455638.434057	22	25	02.5	15	50 ( 78)	22	35 (55)	f	5 09 (277)			
2011-03-18	2455639.471395	23	18	48.5	17	07 ( 87)	23	29 (49)	f	5 39 (269)			
2011-03-20	2455640.509050	0	13	01.9	p18	25 ( 95)	0	23 (43)		6 10 (261)			
2011-03-21	2455641.547490	1	08	23.1	p19	44 (104)	1	19 (37)		6 43 (253)			
2011-03-22	2455642.586985	2	05	15.5	p21	03 (111)	2	15 (31)		7 20 (246)			
2011-03-23	2455643.627426	3	03	29.6	p22	19 (117)	3	14 (28)		8 03 (241)			
2011-03-24	2455644.668230	4	02	15.1	p23	30 (121)	4	12 (25)		8 52 (238)			
2011-03-25	2455645.708471	5	00	11.9	0	34 (123)	5	10 (24)		9 47 (237)			
2011-03-26	2455646.747193	5	55	57.5	1	28 (122)	6	06 (25)		10 47 (238)			
2011-03-27	2455647.783739	6	48	35.0	2	13 (120)	6	59 (27)		11 49 (242)			
2011-03-28	2455648.817895	7	37	46.1	2	50 (116)	7	48 (30)		12 52 (246)			
2011-03-29	2455649.849835	8	23	45.7	3	22 (111)	8	34 (34)		13 54 (252)			
2011-03-30	2455650.879984	9	07	10.6	3	49 (105)	9	18 (38)		14 54 (258)			
2011-03-31	2455651.908887	9	48	47.8	4	14 ( 99)	9	59 (43)		15 54 (264)			
2011-04- 1	2455652.937126	10	29	27.7	4	37 ( 92)	10	40 (48)		16 53 (271)			
2011-04- 2	2455653.965281	11	10	00.3	4	59 ( 86)	11	21 (52)		17 51 (278)			
2011-04- 3	2455654.993904	11	51	13.3	5	23 ( 80)	12	02 (57)		18 51 (284)			
2011-04- 4	2455656.023497	12	33	50.1	5	48 ( 74)	12	44 (61)		19 51 (290)			
2011-04- 5	2455657.054474	13	18	26.6	6	16 ( 68)	13	29 (65)		20 51 (295)			
2011-04- 6	2455658.087106	14	05	26.0	6	48 ( 63)	14	16 (68)		21 51 (299)			
2011-04- 7	2455659.121445	14	54	52.9	7	25 ( 60)	15	05 (70)		22 50 (302)			
2011-04- 8	2455660.157272	15	46	28.3	8	10 ( 58)	15	57 (72)		23 45 (302)			
2011-04- 9	2455661.194112	16	39	31.2	9	02 ( 58)	16	50 (71)	f	0 35 (301)			
2011-04-10	2455662.231355	17	33	09.1	10	01 ( 59)	17	43 (70)	f	1 20 (299)			
2011-04-11	2455663.268457	18	26	34.7	11	06 ( 63)	18	37 (67)	f	1 59 (294)			
2011-04-12	2455664.305114	19	19	21.8	12	15 ( 68)	19	30 (63)	f	2 33 (288)			
2011-04-13	2455665.341343	20	11	32.0	13	27 ( 75)	20	22 (58)	f	3 05 (281)			
2011-04-14	2455666.377461	21	03	32.7	14	41 ( 83)	21	14 (52)	f	3 35 (273)			
2011-04-15	2455667.413989	21	56	08.7	15	57 ( 91)	22	06 (46)	f	4 05 (265)			
2011-04-16	2455668.451512	22	50	10.6	17	14 ( 99)	23	00 (40)	f	4 37 (257)			
2011-04-17	2455669.490499	23	46	19.1	18	32 (107)	23	56 (34)	f	5 12 (250)			
2011-04-19	2455670.531082	0	44	45.5	p19	50 (114)	0	55 (30)		5 52 (243)			
2011-04-20	2455671.572841	1	44	53.5	p21	06 (119)	1	55 (26)		6 39 (239)			
2011-04-21	2455672.614790	2	45	17.8	p22	16 (122)	2	55 (25)		7 34 (237)			
2011-04-22	2455673.655660	3	44	09.0	p23	16 (122)	3	54 (25)		8 34 (238)			
2011-04-23	2455674.694384	4	39	54.8	0	07 (121)	4	50 (26)		9 37 (241)			
2011-04-24	2455675.730425	5	31	48.7	0	48 (117)	5	42 (29)		10 42 (245)			
2011-04-25	2455676.763804	6	19	52.7	1	22 (112)	6	30 (33)		11 45 (250)			
2011-04-26	2455677.794927	7	04	41.7	1	51 (107)	7	15 (37)		12 47 (256)			
2011-04-27	2455678.824394	7	47	07.6	2	17 (101)	7	58 (41)		13 47 (262)			
2011-04-28	2455679.852866	8	28	07.6	2	41 ( 94)	8	39 (46)		14 46 (269)			
2011-04-29	2455680.881005	9	08	38.8	3	04 ( 88)	9	19 (51)		15 44 (275)			
2011-04-30	2455681.909438	9	49	35.4	3	27 ( 82)	10	00 (56)		16 43 (282)			
2011-05- 1	2455682.938738	10	31	47.0	3	51 ( 75)	10	42 (60)		17 43 (288)			
2011-05- 2	2455683.969389	11	15	55.2	4	18 ( 70)	11	26 (64)		18 44 (293)			
2011-05- 3	2455685.001725	12	02	29.1	4	49 ( 65)	12	13 (67)		19 44 (298)			
2011-05- 4	2455686.035847	12	51	37.2	5	26 ( 61)	13	02 (70)		20 44 (301)			
2011-05- 5	2455687.071545	13	43	01.5	6	08 ( 59)	13	53 (71)		21 41 (302)			
2011-05- 6	2455688.108303	14	35	57.4	6	58 ( 58)	14	46 (71)		22 32 (302)			
2011-05- 7	2455689.145419	15	29	24.2	7	56 ( 59)	15	40 (70)		23 18 (299)			
2011-05- 8	2455690.182230	16	22	24.7	8	58 ( 62)	16	33 (68)		23 59 (295)			
2011-05- 9	2455691.218331	17	14	23.8	10	05 ( 67)	17	25 (64)	f	0 34 (290)			
2011-05-10	2455692.253674	18	05	17.4	11	15 ( 73)	18	16 (59)	f	1 05 (283)			
2011-05-11	2455693.288553	18	55	31.0	12	26 ( 80)	19	06 (54)	f	1 35 (276)			
2011-05-12	2455694.323508	19	45	51.1	13	38 ( 88)	19	56 (48)	f	2 04 (268)			
2011-05-13	2455695.359210	20	37	15.8	14	51 ( 96)	20	48 (42)	f	2 33 (260)			
2011-05-14	2455696.396319	21	30	42.0	16	07 (104)	21	41 (37)	f	3 06 (253)			
2011-05-15	2455697.435293	22	26	49.4	17	23 (111)	22	37 (32)	f	3 43 (246)			
2011-05-16	2455698.476144	23	25	38.9	18	40 (117)	23	36 (28)	f	4 26 (241)			
2011-05-18	2455699.518238	0	26	15.8	p19	52 (121)	0	36 (25)		5 17 (238)			
2011-05-19	2455700.560348	1	26	54.1	p20	58 (122)	1	37 (25)		6 16 (238)			
2011-05-20	2455701.601067	2	25	32.2	p21	55 (122)	2	36 (25)		7 19 (239)			
2011-05-21	2455702.639348	3	20	39.7	p22	41 (119)	3	31 (28)		8 25 (243)			
2011-05-22	2455703.674787	4	11	41.6	p23	20 (114)	4	22 (31)		9 31 (248)			
2011-05-23	2455704.707553	4	58	52.6	p23	51 (109)	5	09 (35)		10 35 (254)			
2011-05-24	2455705.738171	5	42	58.0	0	19 (103)	5	53 (40)		11 36 (260)			
2011-05-25	2455706.767317	6	24	56.2	0	43 ( 97)	6	36 (44)		12 36 (267)			
2011-05-26	2455707.795708	7	05	49.2	1	07 ( 90)	7	16 (49)		13 35 (273)			
2011-05-27	2455708.824042	7	46	37.2	1	30 ( 84)	7	57 (54)		14 34 (280)			
2011-05-28	2455709.852977	8	28	17.2	1	54 ( 78)	8	39 (59)		15 33 (286)			
2011-05-29	2455710.883101	9	11	40.0	2	20 ( 72)	9	22 (63)		16 34 (291)			
2011-05-30	2455711.914883	9	57	25.9	2	50 ( 67)	10	08 (66)		17 35 (296)			
2011-05-31	2455712.948578	10	45	57.1	3	24 ( 62)	10	56 (69)		18 35 (300)			
2011-06- 1	2455713.984128	11	37	08.7	4	05 ( 59)	11	47 (71)		19 34 (302)			
2011-06- 2	2455715.021098	12	30	22.8	4	53 ( 58)	12	41 (71)		20 28 (302)			
2011-06- 3	2455716.058741	13	24	35.2	5	49 ( 58)	13	35 (71)		21 17 (300)			
2011-06- 4	2455717.096224	14	18	33.8	6	51 ( 61)	14	29 (69)		21 59 (297)			
2011-06- 5	2455718.132911	15	11	23.5	7	58 ( 65)	15	22 (65)		22 36 (292)			
2011-06- 6	2455719.168546	16	02	42.4	9	07 ( 71)	16	13 (61)		23 08 (285)			
2011-06- 7	2455720.203275	16	52	42.9	10	17 ( 78)	17	03 (56)		23 38 (278)			
2011-06- 8	2455721.237560	17	42	05.1	11	28 ( 85)	17	52 (50)	f	0 06 (271)			

Ephemeris Transit										
Date	TDT JD	TDT Time			Rise	(Azm)	Trans	(Alt)	Set	(Azm)
		h	m	s	h	m	h	m	h	m
2011-06- 9	2455722.272051	18	31	45.2	12	39	( 93)	18	42	(44) f 0 35 (263)
2011-06-10	2455723.307464	19	22	44.9	13	52	(101)	19	33	(39) f 1 05 (256)
2011-06-11	2455724.344428	20	15	58.6	15	05	(108)	20	26	(34) f 1 39 (249)
2011-06-12	2455725.383295	21	11	56.7	16	19	(115)	21	22	(29) f 2 18 (243)
2011-06-13	2455726.423912	22	10	26.0	17	32	(119)	22	20	(26) f 3 05 (239)
2011-06-14	2455727.465487	23	10	18.1	18	40	(122)	23	20	(25) f 3 59 (238)
2011-06-16	2455728.506750	0	09	43.2	p19	41	(122)	0	20	(25) 5 00 (238)
2011-06-17	2455729.546404	1	06	49.3	p20	32	(120)	1	17	(27) 6 06 (241)
2011-06-18	2455730.583596	2	00	22.7	p21	14	(116)	2	11	(29) 7 13 (245)
2011-06-19	2455731.618092	2	50	03.2	p21	49	(111)	3	00	(33) 8 18 (251)
2011-06-20	2455732.650157	3	36	13.6	p22	19	(106)	3	47	(38) 9 22 (257)
2011-06-21	2455733.680347	4	19	42.0	p22	45	( 99)	4	30	(42) 10 24 (264)
2011-06-22	2455734.709336	5	01	26.7	p23	09	( 93)	5	12	(47) 11 24 (271)
2011-06-23	2455735.737831	5	42	28.6	p23	33	( 86)	5	53	(52) 12 23 (277)
2011-06-24	2455736.766520	6	23	47.3	p23	56	( 80)	6	34	(57) 13 22 (283)
2011-06-25	2455737.796051	7	06	18.8	0	21	( 74)	7	17	(61) 14 22 (289)
2011-06-26	2455738.826997	7	50	52.6	0	49	( 69)	8	01	(65) 15 22 (294)
2011-06-27	2455739.859782	8	38	05.2	1	22	( 64)	8	49	(68) 16 23 (298)
2011-06-28	2455740.894580	9	28	11.7	2	00	( 60)	9	39	(70) 17 23 (301)
2011-06-29	2455741.931203	10	20	56.0	2	45	( 58)	10	31	(71) 18 19 (302)
2011-06-30	2455742.969069	11	15	27.6	3	38	( 58)	11	26	(71) 19 11 (301)
2011-07- 1	2455744.007328	12	10	33.1	4	39	( 60)	12	21	(69) 19 56 (298)
2011-07- 2	2455745.045145	13	05	00.6	5	45	( 63)	13	15	(67) 20 36 (294)
2011-07- 3	2455746.081978	13	58	02.9	6	55	( 69)	14	08	(62) 21 10 (288)
2011-07- 4	2455747.117707	14	49	29.9	8	07	( 75)	15	00	(57) 21 42 (281)
2011-07- 5	2455748.152601	15	39	44.7	9	18	( 83)	15	50	(52) 22 11 (273)
2011-07- 6	2455749.187192	16	29	33.4	10	30	( 91)	16	40	(46) 22 39 (265)
2011-07- 7	2455750.222138	17	19	52.7	11	42	( 99)	17	30	(40) 23 09 (258)
2011-07- 8	2455751.258084	18	11	38.5	12	55	(106)	18	22	(35) 23 41 (251)
2011-07- 9	2455752.295506	19	05	31.7	14	07	(113)	19	16	(31) f 0 17 (245)
2011-07-10	2455753.334525	20	01	42.9	15	19	(118)	20	12	(27) f 1 00 (241)
2011-07-11	2455754.374750	20	59	38.4	16	28	(121)	21	10	(25) f 1 50 (238)
2011-07-12	2455755.415284	21	58	00.6	17	30	(122)	22	08	(25) f 2 47 (238)
2011-07-13	2455756.454983	22	55	10.5	18	24	(121)	23	05	(26) f 3 50 (240)
2011-07-14	2455757.492865	23	49	43.5	19	09	(118)	24	00	(28) f 4 56 (243)
2011-07-16	2455758.528411	0	40	54.7	p19	47	(114)	0	51	(31) 6 02 (248)
2011-07-17	2455759.561599	1	28	42.2	p20	19	(108)	1	39	(36) 7 07 (254)
2011-07-18	2455760.592776	2	13	35.9	p20	47	(102)	2	24	(40) 8 10 (261)
2011-07-19	2455761.622487	2	56	22.8	p21	12	( 96)	3	07	(45) 9 11 (268)
2011-07-20	2455762.651359	3	37	57.4	p21	36	( 89)	3	49	(50) 10 11 (274)
2011-07-21	2455763.680039	4	19	15.4	p21	59	( 83)	4	30	(55) 11 10 (281)
2011-07-22	2455764.709159	5	01	11.3	p22	24	( 76)	5	12	(59) 12 09 (287)
2011-07-23	2455765.739305	5	44	35.9	p22	50	( 71)	5	55	(63) 13 09 (292)
2011-07-24	2455766.770977	6	30	12.4	p23	20	( 66)	6	41	(67) 14 09 (297)
2011-07-25	2455767.804510	7	18	29.7	p23	55	( 62)	7	29	(69) 15 09 (300)
2011-07-26	2455768.839974	8	09	33.8	0	37	( 59)	8	20	(71) 16 06 (302)
2011-07-27	2455769.877086	9	03	00.3	1	26	( 58)	9	13	(71) 17 00 (302)
2011-07-28	2455770.915226	9	57	55.5	2	23	( 59)	10	08	(70) 17 49 (300)
2011-07-29	2455771.953598	10	53	10.9	3	27	( 62)	11	03	(68) 18 31 (296)
2011-07-30	2455772.991503	11	47	45.8	4	37	( 66)	11	58	(64) 19 09 (290)
2011-07-31	2455774.028556	12	41	07.2	5	49	( 73)	12	51	(60) 19 42 (284)
2011-08- 1	2455775.064764	13	33	15.6	7	03	( 80)	13	44	(54) 20 13 (276)
2011-08- 2	2455776.100458	14	24	39.6	8	17	( 88)	14	35	(48) 20 42 (268)
2011-08- 3	2455777.136159	15	16	04.1	9	30	( 96)	15	26	(42) 21 12 (260)
2011-08- 4	2455778.172435	16	08	18.4	10	44	(104)	16	19	(37) 21 44 (253)
2011-08- 5	2455779.209742	17	02	01.7	11	58	(111)	17	12	(32) 22 19 (247)
2011-08- 6	2455780.248268	17	57	30.3	13	10	(116)	18	08	(28) 23 00 (242)
2011-08- 7	2455781.287790	18	54	25.0	14	19	(120)	19	05	(26) 23 47 (239)
2011-08- 8	2455782.327653	19	51	49.2	15	23	(122)	20	02	(25) f 0 41 (238)
2011-08- 9	2455783.366936	20	48	23.3	16	19	(122)	20	59	(25) f 1 40 (239)
2011-08-10	2455784.404764	21	42	51.6	17	06	(120)	21	53	(27) f 2 44 (242)
2011-08-11	2455785.440580	22	34	26.1	17	46	(116)	22	45	(30) f 3 49 (246)
2011-08-12	2455786.474245	23	22	54.8	18	20	(110)	23	33	(34) f 4 54 (252)
2011-08-14	2455787.505965	0	08	35.4	p18	49	(105)	0	19	(38) 5 57 (258)
2011-08-15	2455788.536166	0	52	04.8	p19	15	( 98)	1	03	(43) 6 59 (265)
2011-08-16	2455789.565382	1	34	09.0	p19	39	( 92)	1	45	(48) 7 59 (272)
2011-08-17	2455790.594182	2	15	37.3	p20	03	( 85)	2	26	(53) 8 59 (278)
2011-08-18	2455791.623133	2	57	18.7	p20	27	( 79)	3	08	(57) 9 58 (284)
2011-08-19	2455792.652770	3	39	59.3	p20	53	( 73)	3	51	(62) 10 57 (290)
2011-08-20	2455793.683569	4	24	20.4	p21	21	( 68)	4	35	(65) 11 57 (295)
2011-08-21	2455794.715895	5	10	53.3	p21	54	( 64)	5	21	(68) 12 56 (299)
2011-08-22	2455795.749930	5	59	53.9	p22	32	( 60)	6	10	(70) 13 53 (301)
2011-08-23	2455796.785605	6	51	16.2	p23	16	( 58)	7	02	(71) 14 48 (302)
2011-08-24	2455797.822570	7	44	30.0	0	09	( 58)	7	55	(71) 15 38 (301)
2011-08-25	2455798.860263	8	38	46.7	1	09	( 60)	8	49	(69) 16 23 (298)
2011-08-26	2455799.898079	9	33	14.0	2	15	( 64)	9	43	(66) 17 03 (293)
2011-08-27	2455800.935573	10	27	13.5	3	26	( 69)	10	37	(62) 17 38 (287)
2011-08-28	2455801.972592	11	20	31.9	4	39	( 76)	11	31	(57) 18 10 (280)
2011-08-29	2455803.009288	12	13	22.5	5	54	( 84)	12	24	(51) 18 41 (272)
2011-08-30	2455804.046038	13	06	17.7	7	10	( 92)	13	17	(45) 19 12 (264)
2011-08-31	2455805.083307	13	59	57.7	8	26	(100)	14	10	(39) 19 44 (256)
2011-09- 1	2455806.121492	14	54	56.9	9	43	(108)	15	05	(34) 20 19 (249)



		Ephemeris Transit									
Date	TDJ	JD	TDT Time			Rise	(Azm)	Trans	(Alt)	Set	(Azm)
			h	m	s	h	m	h	m	h	m
2011-09- 2	2455807.160746		15	51	28.5	10	58 (114)	16	02 (30)	20	59 (244)
2011-09- 3	2455808.200839		16	49	12.5	12	10 (119)	16	59 (27)	21	45 (240)
2011-09- 4	2455809.241131		17	47	13.7	13	16 (121)	17	57 (25)	22	37 (238)
2011-09- 5	2455810.280741		18	44	16.0	14	14 (122)	18	54 (25)	23	36 (239)
2011-09- 6	2455811.318835		19	39	07.4	15	04 (120)	19	49 (27)	f 0	38 (241)
2011-09- 7	2455812.354892		20	31	02.7	15	46 (117)	20	41 (29)	f 1	42 (245)
2011-09- 8	2455813.388785		21	19	51.0	16	21 (112)	21	30 (33)	f 2	46 (250)
2011-09- 9	2455814.420719		22	05	50.2	16	52 (107)	22	16 (37)	f 3	49 (256)
2011-09-10	2455815.451105		22	49	35.5	17	19 (100)	23	00 (41)	f 4	50 (263)
2011-09-11	2455816.480452		23	31	51.1	17	43 ( 94)	23	42 (46)	f 5	50 (269)
2011-09-13	2455817.509297		0	13	23.3	p18	07 ( 88)	0	24 (51)	6	50 (276)
2011-09-14	2455818.538166		0	54	57.6	p18	31 ( 81)	1	06 (56)	7	49 (282)
2011-09-15	2455819.567548		1	37	16.2	p18	57 ( 75)	1	48 (60)	8	48 (288)
2011-09-16	2455820.597867		2	20	55.7	p19	24 ( 70)	2	31 (64)	9	47 (293)
2011-09-17	2455821.629446		3	06	24.1	p19	55 ( 65)	3	17 (67)	10	46 (297)
2011-09-18	2455822.662457		3	53	56.3	p20	31 ( 62)	4	04 (69)	11	43 (300)
2011-09-19	2455823.696878		4	43	30.2	p21	12 ( 59)	4	54 (71)	12	38 (301)
2011-09-20	2455824.732468		5	34	45.2	p22	00 ( 59)	5	45 (71)	13	29 (301)
2011-09-21	2455825.768826		6	27	06.6	p22	55 ( 60)	6	37 (70)	14	15 (299)
2011-09-22	2455826.805501		7	19	55.3	p23	57 ( 62)	7	30 (67)	14	55 (295)
2011-09-23	2455827.842146		8	12	41.5	1	04 ( 67)	8	23 (64)	15	32 (290)
2011-09-24	2455828.878631		9	05	13.7	2	14 ( 73)	9	15 (59)	16	05 (283)
2011-09-25	2455829.915082		9	57	43.1	3	28 ( 80)	10	08 (54)	16	37 (276)
2011-09-26	2455830.951843		10	50	39.2	4	43 ( 88)	11	01 (48)	17	08 (268)
2011-09-27	2455831.989373		11	44	41.9	5	59 ( 96)	11	55 (42)	17	40 (260)
2011-09-28	2455833.028102		12	40	28.0	7	17 (104)	12	51 (36)	18	15 (253)
2011-09-29	2455834.068230		13	38	15.0	8	35 (111)	13	48 (32)	18	54 (246)
2011-09-30	2455835.109539		14	37	44.2	9	51 (117)	14	48 (28)	19	39 (241)
2011-10- 1	2455836.151309		15	37	53.1	11	03 (120)	15	48 (26)	20	31 (239)
2011-10- 2	2455837.192473		16	37	09.6	12	06 (122)	16	47 (25)	21	29 (239)
2011-10- 3	2455838.231987		17	34	03.7	13	00 (121)	17	44 (26)	22	31 (240)
2011-10- 4	2455839.269183		18	27	37.4	13	45 (118)	18	38 (28)	23	35 (244)
2011-10- 5	2455840.303885		19	17	35.7	14	23 (113)	19	28 (32)	f 0	39 (249)
2011-10- 6	2455841.336326		20	04	18.6	14	54 (108)	20	15 (36)	f 1	42 (254)
2011-10- 7	2455842.366977		20	48	26.8	15	22 (102)	20	59 (40)	f 2	44 (261)
2011-10- 8	2455843.396409		21	30	49.8	15	48 ( 96)	21	41 (45)	f 3	44 (267)
2011-10- 9	2455844.425211		22	12	18.2	16	12 ( 90)	22	23 (50)	f 4	43 (274)
2011-10-10	2455845.453944		22	53	40.8	16	36 ( 83)	23	04 (54)	f 5	42 (280)
2011-10-11	2455846.483117		23	35	41.3	17	01 ( 77)	23	46 (59)	f 6	41 (286)
2011-10-13	2455847.513157		0	18	56.7	p17	28 ( 72)	0	30 (63)	7	40 (291)
2011-10-14	2455848.544377		1	03	54.2	p17	58 ( 67)	1	14 (66)	8	39 (296)
2011-10-15	2455849.576928		1	50	46.6	p18	32 ( 63)	2	01 (68)	9	37 (299)
2011-10-16	2455850.610758		2	39	29.5	p19	11 ( 60)	2	50 (70)	10	32 (301)
2011-10-17	2455851.645606		3	29	40.3	p19	57 ( 59)	3	40 (71)	11	23 (301)
2011-10-18	2455852.681061		4	20	43.7	p20	49 ( 59)	4	31 (70)	12	10 (300)
2011-10-19	2455853.716685		5	12	01.6	p21	47 ( 61)	5	22 (68)	12	51 (297)
2011-10-20	2455854.752155		6	03	06.2	p22	50 ( 65)	6	13 (65)	13	28 (292)
2011-10-21	2455855.787371		6	53	48.9	p23	56 ( 70)	7	04 (61)	14	02 (286)
2011-10-22	2455856.822492		7	44	23.3	1	06 ( 77)	7	55 (56)	14	33 (279)
2011-10-23	2455857.857904		8	35	22.9	2	17 ( 84)	8	46 (51)	15	03 (272)
2011-10-24	2455858.894152		9	27	34.7	3	31 ( 92)	9	38 (45)	15	34 (264)
2011-10-25	2455859.931815		10	21	48.9	4	47 (100)	10	32 (39)	16	07 (256)
2011-10-26	2455860.971339		11	18	43.7	6	05 (108)	11	29 (34)	16	44 (249)
2011-10-27	2455862.012787		12	18	24.8	7	23 (114)	12	28 (30)	17	27 (244)
2011-10-28	2455863.055617		13	20	05.3	8	39 (119)	13	30 (27)	18	17 (240)
2011-10-29	2455864.098669		14	22	05.0	9	49 (121)	14	32 (25)	19	14 (239)
2011-10-30	2455865.140522		15	22	21.1	10	49 (121)	15	32 (26)	20	18 (240)
2011-10-31	2455866.180037		16	19	15.2	11	39 (119)	16	29 (28)	21	23 (243)
2011-11- 1	2455867.216698		17	12	02.7	12	21 (115)	17	22 (31)	22	30 (247)
2011-11- 2	2455868.250590		18	00	51.0	12	55 (110)	18	11 (34)	23	34 (253)
2011-11- 3	2455869.282186		18	46	20.9	13	25 (104)	18	57 (39)	f 0	36 (259)
2011-11- 4	2455870.312128		19	29	27.9	13	51 ( 98)	19	40 (43)	f 1	37 (265)
2011-11- 5	2455871.341099		20	11	10.9	14	16 ( 92)	20	22 (48)	f 2	36 (272)
2011-11- 6	2455872.369752		20	52	26.6	14	40 ( 85)	21	03 (53)	f 3	35 (278)
2011-11- 7	2455873.398683		21	34	06.2	15	05 ( 79)	21	45 (57)	f 4	34 (284)
2011-11- 8	2455874.428402		22	16	53.9	15	31 ( 74)	22	27 (61)	f 5	33 (289)
2011-11- 9	2455875.459298		23	01	23.4	16	00 ( 68)	23	12 (65)	f 6	32 (294)
2011-11-10	2455876.491588		23	47	53.2	16	33 ( 64)	23	58 (68)	f 7	31 (298)
2011-11-12	2455877.525254		0	36	21.9	p17	11 ( 61)	0	47 (70)	8	27 (300)
2011-11-13	2455878.560025		1	26	26.2	p17	55 ( 59)	1	37 (71)	9	20 (301)
2011-11-14	2455879.595423		2	17	24.5	p18	45 ( 59)	2	28 (70)	10	08 (300)
2011-11-15	2455880.630897		3	08	29.5	p19	41 ( 61)	3	19 (69)	10	51 (297)
2011-11-16	2455881.666004		3	59	02.7	p20	42 ( 64)	4	09 (66)	11	28 (293)
2011-11-17	2455882.700540		4	48	46.6	p21	46 ( 69)	4	59 (63)	12	02 (288)
2011-11-18	2455883.734598		5	37	49.3	p22	53 ( 75)	5	48 (58)	12	33 (282)
2011-11-19	2455884.768540		6	26	41.9	0	01 ( 81)	6	37 (53)	13	02 (275)
2011-11-20	2455885.802930		7	16	13.2	1	11 ( 89)	7	27 (48)	13	32 (267)
2011-11-21	2455886.838444		8	07	21.6	2	23 ( 96)	8	18 (42)	14	02 (260)
2011-11-22	2455887.875746		9	01	04.5	3	38 (104)	9	11 (37)	14	36 (253)
2011-11-23	2455888.915296		9	58	01.6	4	54 (111)	10	08 (32)	15	15 (247)
2011-11-24	2455889.957074		10	58	11.2	6	10 (116)	11	08 (28)	16	01 (242)
2011-11-25	2455891.000348		12	00	30.1	7	24 (120)	12	10 (26)	16	55 (239)

Date	Ephemeris TDT JD	Transit			Rise (Azm)	Trans (Alt)	Set (Azm)
		TDT Time					
		h m s	h m	°	h m	°	h m
2011-11-26	2455892.043724	13 02 57.8	8 30	(121)	13 13	(26)	17 56 (239)
2011-11-27	2455893.085628	14 03 18.3	9 27	(120)	14 13	(27)	19 03 (241)
2011-11-28	2455894.124921	14 59 53.2	10 14	(117)	15 10	(29)	20 11 (245)
2011-11-29	2455895.161197	15 52 07.5	10 53	(112)	16 02	(33)	21 19 (250)
2011-11-30	2455896.194674	16 40 19.9	11 25	(106)	16 51	(37)	22 24 (256)
2011-12- 1	2455897.225929	17 25 20.2	11 53	(100)	17 36	(42)	23 27 (263)
2011-12- 2	2455898.255674	18 08 10.2	12 19	( 94)	18 19	(46)	f 0 27 (269)
2011-12- 3	2455899.284637	18 49 52.6	12 43	( 87)	19 00	(51)	f 1 27 (276)
2011-12- 4	2455900.313504	19 31 26.7	13 08	( 81)	19 42	(56)	f 2 25 (282)
2011-12- 5	2455901.342889	20 13 45.6	13 33	( 75)	20 24	(60)	f 3 24 (288)
2011-12- 6	2455902.373305	20 57 33.5	14 01	( 70)	21 08	(64)	f 4 23 (293)
2011-12- 7	2455903.405112	21 43 21.6	14 33	( 66)	21 54	(67)	f 5 22 (297)
2011-12- 8	2455904.438448	22 31 21.9	15 09	( 62)	22 42	(69)	f 6 20 (300)
2011-12- 9	2455905.473169	23 21 21.8	15 51	( 60)	23 32	(70)	f 7 14 (301)
2011-12-11	2455906.508840	0 12 43.8	p16 40	( 59)	0 23	(70)	8 05 (301)
2011-12-12	2455907.544840	1 04 34.2	p17 35	( 60)	1 15	(69)	8 50 (298)
2011-12-13	2455908.580552	1 55 59.7	p18 35	( 63)	2 06	(67)	9 30 (295)
2011-12-14	2455909.615562	2 46 24.6	p19 39	( 67)	2 57	(64)	10 05 (290)
2011-12-15	2455910.649769	3 35 40.0	p20 45	( 73)	3 46	(60)	10 36 (284)
2011-12-16	2455911.683386	4 24 04.6	p21 53	( 79)	4 34	(55)	11 06 (277)
2011-12-17	2455912.716883	5 12 18.7	p23 01	( 86)	5 23	(49)	11 34 (270)
2011-12-18	2455913.750893	6 01 17.2	0 10	( 94)	6 12	(44)	12 03 (263)
2011-12-19	2455914.786115	6 52 00.4	1 21	(101)	7 02	(39)	12 35 (256)
2011-12-20	2455915.823184	7 45 23.1	2 34	(108)	7 56	(34)	13 10 (249)
2011-12-21	2455916.862469	8 41 57.3	3 48	(114)	8 52	(30)	13 50 (244)
2011-12-22	2455917.903829	9 41 30.8	5 00	(119)	9 52	(27)	14 39 (240)
2011-12-23	2455918.946436	10 42 52.1	6 09	(121)	10 53	(26)	15 36 (239)
2011-12-24	2455919.988914	11 44 02.2	7 10	(121)	11 54	(26)	16 40 (240)
2011-12-25	2455921.029831	12 42 57.4	8 02	(119)	12 53	(28)	17 48 (243)
2011-12-26	2455922.068232	13 38 15.2	8 46	(115)	13 48	(31)	18 57 (248)
2011-12-27	2455923.103835	14 29 31.3	9 22	(109)	14 40	(35)	20 05 (253)
2011-12-28	2455924.136905	15 17 08.6	9 53	(103)	15 28	(39)	21 11 (260)
2011-12-29	2455925.168012	16 01 56.2	10 20	( 97)	16 12	(44)	22 13 (267)
2011-12-30	2455926.197841	16 44 53.4	10 45	( 90)	16 55	(49)	23 14 (273)
2011-12-31	2455927.227087	17 27 00.3	11 10	( 84)	17 38	(54)	f 0 14 (279)
2012-01- 1	2455928.256410	18 09 13.8	11 35	( 78)	18 20	(58)	f 1 13 (285)

for Greenwich Meridian = per il meridiano di Greenwich  
for Rome : per Roma  
Longitude = longitudine  
Latitude = latitudine  
Time Zone = fuso orario  
UT = tempo universale  
Ephemeris Transit = transito  
Date = data nel formato anno/mese/giorno  
Time = ora  
Rise, trans, set = orari di levata, altezza in gradi durante il transito a sud e tramonto.  
p = l'evento accade il giorno precedente  
F = l'evento accade il giorno seguente

Per località differenti da quella calcolata (42°N, 12°E) fare riferimento alla tabella correttiva posta in fondo all'almanacco.

Tempi in T.U.+1, aggiungere un'ora quando si adotta l'ora legale

#### Legenda:

Rise, transits, set = times of rising, transit and setting, altitude in ° during the south transit.  
P = the event happens in the past day  
F = the event happens in the forward day

For different places (42°N, 12°E) to refer to the corrective table in the last pages of the almanac.

Times in local time, to add an hour when it is in use daylight saving time

# VISIBILITA' DELLA LUNA - VISIBILITY OF THE MOON

First and last visibility of the Moon in 2011

prima ed ultima visibilità della Luna nel 2011

location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
visibility arc: 8°  
factor : 0.33

posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine : 12° 37' 12'' E

	date	sun r/s	moon r/s	d r/s	moon phs	moon age	period
last visibility	2011-01-03	07:37	06:49	-0:48h	1.3%	-26:26h	
first visibility	2011-01-05	16:52	18:11	1:19h	1.7%	30:48h	30
last visibility	2011-02-02	07:21	06:44	-0:37h	0.7%	-20:10h	
first visibility	2011-02-04	17:27	19:06	1:38h	2.5%	37:56h	30
last visibility	2011-03-03	06:42	05:42	-0:59h	2.5%	-39:04h	
first visibility	2011-03-05	18:03	18:56	0:52h	0.8%	20:16h	29
last visibility	2011-04-02	05:51	04:57	-0:54h	2.0%	-33:41h	
first visibility	2011-04-04	18:37	19:47	1:09h	1.3%	27:04h	30
last visibility	2011-05-02	05:05	04:16	-0:48h	1.3%	-26:46h	
first visibility	2011-05-04	19:10	20:41	1:30h	2.1%	35:19h	30
last visibility	2011-05-31	04:37	03:22	-1:15h	3.0%	-41:26h	
first visibility	2011-06-02	19:38	20:24	0:45h	0.9%	21:35h	29
last visibility	2011-06-30	04:37	03:36	-1:01h	1.7%	-29:17h	
first visibility	2011-07-02	19:48	20:32	0:44h	2.5%	33:53h	30
last visibility	2011-07-29	04:59	03:25	-1:34h	3.3%	-38:41h	
first visibility	2011-08-01	19:28	20:10	0:41h	5.5%	47:47h	30
last visibility	2011-08-28	05:30	04:36	-0:53h	1.4%	-22:34h	
first visibility	2011-08-30	18:47	19:09	0:22h	4.0%	38:41h	29
last visibility	2011-09-26	06:00	04:40	-1:20h	2.6%	-30:09h	
first visibility	2011-09-29	17:55	18:51	0:56h	7.6%	53:45h	30
last visibility	2011-10-25	06:32	04:43	-1:48h	4.1%	-38:24h	
first visibility	2011-10-28	17:09	18:15	1:05h	5.1%	44:12h	29
last visibility	2011-11-24	07:09	06:07	-1:01h	1.5%	-24:01h	
first visibility	2011-11-26	16:41	17:54	1:13h	2.8%	33:30h	29
last visibility	2011-12-23	07:34	06:06	-1:28h	3.0%	-35:33h	
first visibility	2011-12-25	16:43	17:45	1:02h	1.1%	21:36h	29

Date = data nel formato anno/mese/giorno

Sun r/s = ora della levata o del tramonto del Sole

Moon r/s = ora della levata o del tramonto della Luna

D r/s = differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due corpi

Moon phs = fase delle Luna

Moon age = età della Luna

period = giorni tra due eventi

Last visibility = ultimo giorno di visibilità mattutina prima della congiunzione con il Sole

First visibility = primo giorno di visibilità serale dopo la congiunzione con il Sole

Sun r/s = sunrise and sunset

Moon r/s = rise and set of the Moon

D r/s = difference in hours and minutes between the instants of the rising or the setting of the two objects

Moon phs = phase of the Moon

Moon age : age of the Moon

Period = days between two events

	date	sun r/s	moon r/s	sun lon	moon lon	moon lat	moon alt	moon phs	d az	d lon
L vis	2011-01-03	07:37	06:49	282° 31'	269° 27'	-0° 18'	6° 17'	1.3%	10° 27'	-13° 05'
F vis	2011-01-05	16:52	18:11	284° 57'	299° 52'	2° 24'	11° 22'	1.7%	-7° 42'	14° 55'
L vis	2011-02-02	07:21	06:44	313° 03'	303° 36'	2° 41'	5° 25'	0.7%	6° 53'	-9° 27'
F vis	2011-02-04	17:27	19:06	315° 30'	333° 02'	4° 30'	16° 03'	2.5%	-3° 50'	17° 32'
L vis	2011-03-03	06:42	05:42	342° 18'	324° 28'	4° 05'	9° 41'	2.5%	14° 26'	-17° 50'
F vis	2011-03-05	18:03	18:56	344° 46'	353° 59'	4° 59'	8° 45'	0.8%	1° 42'	9° 13'
L vis	2011-04-02	05:51	04:57	12° 07'	356° 50'	5° 00'	9° 20'	2.0%	11° 48'	-15° 16'
F vis	2011-04-04	18:37	19:47	14° 36'	26° 57'	4° 19'	11° 25'	1.3%	-0° 01'	12° 20'
L vis	2011-05-02	05:05	04:16	41° 26'	29° 03'	4° 13'	7° 54'	1.3%	8° 59'	-12° 23'
F vis	2011-05-04	19:10	20:41	43° 56'	60° 32'	2° 03'	14° 02'	2.1%	-5° 47'	16° 35'
L vis	2011-05-31	04:37	03:22	69° 23'	49° 32'	2° 56'	12° 01'	3.0%	14° 47'	-19° 50'
F vis	2011-06-02	19:38	20:24	71° 54'	82° 30'	0° 05'	6° 36'	0.9%	-6° 38'	10° 36'
L vis	2011-06-30	04:37	03:36	98° 03'	83° 09'	0° 02'	9° 06'	1.7%	10° 21'	-14° 54'
F vis	2011-07-02	19:48	20:32	100° 33'	118° 20'	-3° 01'	6° 54'	2.5%	-15° 54'	17° 47'
L vis	2011-07-29	04:59	03:25	125° 43'	104° 55'	-1° 57'	14° 59'	3.3%	12° 44'	-20° 48'
F vis	2011-08-01	19:28	20:10	129° 10'	155° 55'	-4° 55'	6° 55'	5.5%	-25° 50'	26° 45'
L vis	2011-08-28	05:30	04:36	154° 33'	141° 37'	-4° 24'	8° 38'	1.4%	8° 55'	-12° 56'
F vis	2011-08-30	18:47	19:09	157° 01'	179° 36'	-4° 57'	3° 27'	4.0%	-22° 33'	22° 35'
L vis	2011-09-26	06:00	04:40	182° 46'	164° 58'	-5° 01'	13° 25'	2.6%	10° 40'	-17° 49'
F vis	2011-09-29	17:55	18:51	186° 12'	218° 04'	-3° 10'	8° 14'	7.6%	-30° 32'	31° 51'
L vis	2011-10-25	06:32	04:43	211° 27'	188° 39'	-4° 43'	17° 16'	4.1%	13° 38'	-22° 49'
F vis	2011-10-28	17:09	18:15	214° 53'	240° 52'	-1° 15'	8° 51'	5.1%	-23° 52'	25° 59'
L vis	2011-11-24	07:09	06:07	241° 36'	227° 38'	-2° 22'	8° 34'	1.5%	9° 45'	-13° 58'
F vis	2011-11-26	16:41	17:54	244° 02'	263° 10'	0° 49'	9° 35'	2.8%	-15° 33'	19° 08'
L vis	2011-12-23	07:34	06:06	271° 04'	251° 14'	-0° 17'	11° 34'	3.0%	14° 50'	-19° 49'
F vis	2011-12-25	16:43	17:45	273° 29'	285° 18'	2° 43'	8° 35'	1.1%	-6° 24'	11° 49'

Sun lon = longitudine celeste del Sole

Moon lon = longitudine celeste della Luna

Moon lat = latitudine celeste della Luna

Luna alt = altezza della Luna sull'orizzonte quando il Sole è sull'orizzonte

D az = differenza in azimut tra i centri del Sole e della Luna nell'istante della sua visibilità

D lon = differenza in longitudine tra i centri del Sole e della Luna nell'istante della sua visibilità

Sun lon = celestial longitude of the Sun

Moon lon = celestial longitude of the Moon

Moon lat = celestial latitude of the Moon

Moon alt = altitude of the Moon above the horizon when the Sun is above the horizon

D az : difference in azimuth between the center of the Sun and of the Moon

D lon : difference in longitude between the center of the Sun and the Moon

## First and last visibility of the Moon in 2011

## prima ed ultima visibilità della Luna nel 2011

location : Rome (Italy)  
 latitude : 41° 52' 12'' N  
 longitude: 12° 37' 12'' E  
 visibility arc: 4°  
 factor : 0.33

posizione : Roma  
 latitudine : 41° 52' 12'' N  
 longitudine : 12° 37' 12'' E

	date	sun r/s	moon r/s	d r/s	moon phs	moon age	period
last visibility	2011-01-03	07:37	06:49	-0:48h	1.3%	-26:26h	
first visibility	2011-01-05	16:52	18:11	1:19h	1.7%	30:48h	30
last visibility	2011-02-02	07:21	06:44	-0:37h	0.7%	-20:10h	
first visibility	2011-02-03	17:26	18:04	0:38h	0.4%	13:54h	29
last visibility	2011-03-04	06:40	06:06	-0:34h	0.5%	-15:06h	
first visibility	2011-03-05	18:03	18:56	0:52h	0.8%	20:16h	30
last visibility	2011-04-03	05:49	05:20	-0:29h	0.3%	-9:43h	
first visibility	2011-04-04	18:37	19:47	1:09h	1.3%	27:04h	30
last visibility	2011-05-02	05:05	04:16	-0:48h	1.3%	-26:46h	
first visibility	2011-05-03	19:09	19:40	0:31h	0.3%	11:18h	29
last visibility	2011-06-01	04:37	04:02	-0:34h	0.6%	-17:26h	
first visibility	2011-06-02	19:38	20:24	0:45h	0.9%	21:35h	30
last visibility	2011-06-30	04:37	03:36	-1:01h	1.7%	-29:17h	
first visibility	2011-07-02	19:48	20:32	0:44h	2.5%	33:53h	30
last visibility	2011-07-30	05:00	04:34	-0:26h	0.6%	-14:40h	
first visibility	2011-07-31	19:29	19:39	0:09h	1.5%	23:48h	29
last visibility	2011-08-28	05:30	04:36	-0:53h	1.4%	-22:34h	
first visibility	2011-08-30	18:47	19:09	0:22h	4.0%	38:41h	30
last visibility	2011-09-26	06:00	04:40	-1:20h	2.6%	-30:09h	
first visibility	2011-09-28	17:57	18:12	0:15h	2.5%	29:47h	29
last visibility	2011-10-26	06:34	06:01	-0:32h	0.7%	-14:22h	
first visibility	2011-10-27	17:10	17:25	0:14h	1.1%	20:13h	29
last visibility	2011-11-24	07:09	06:07	-1:01h	1.5%	-24:01h	
first visibility	2011-11-26	16:41	17:54	1:13h	2.8%	33:30h	30
last visibility	2011-12-24	07:34	07:07	-0:27h	0.3%	-11:32h	
first visibility	2011-12-25	16:43	17:45	1:02h	1.1%	21:36h	29

Date = data nel formato anno/mese/giorno

Sun r/s = ora della levata o del tramonto del Sole

Moon r/s = ora della levata o del tramonto della Luna

D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due corpi

Moon phs = fase delle Luna

Moon age = età della Luna

Period = giorni tra due eventi

last visibility = ultimo giorno di visibilità mattutina prima della congiunzione con il Sole

first visibility = primo giorno di visibilità serale dopo la congiunzione con il Sole

Sun r/s = sunrise and sunset

Moon r/s = rise and set of the Moon

D r/s = difference in hours and minutes between the instants of the rising or the setting of the two objects

Moon phs = phase of the Moon

Moon age = age of the Moon

Period = days between two events

	date	sun r/s	moon r/s	sun lon	moon lon	moon lat	moon alt	moon phs	d az	d lon
L vis	2011-01-03	07:37	06:49	282° 31'	269° 27'	-0° 18'	6° 17'	1.3%	10° 27'	-13° 05'
F vis	2011-01-05	16:52	18:11	284° 57'	299° 52'	2° 24'	11° 22'	1.7%	-7° 42'	14° 55'
L vis	2011-02-02	07:21	06:44	313° 03'	303° 36'	2° 41'	5° 25'	0.7%	6° 53'	-9° 27'
F vis	2011-02-03	17:26	18:04	314° 29'	320° 58'	3° 53'	5° 55'	0.4%	0° 33'	6° 28'
L vis	2011-03-04	06:40	06:06	343° 18'	336° 26'	4° 36'	5° 31'	0.5%	4° 14'	-6° 52'
F vis	2011-03-05	18:03	18:56	344° 46'	353° 59'	4° 59'	8° 45'	0.8%	1° 42'	9° 13'
L vis	2011-04-03	05:49	05:20	13° 06'	8° 41'	4° 54'	4° 45'	0.3%	1° 55'	-4° 24'
F vis	2011-04-04	18:37	19:47	14° 36'	26° 57'	4° 19'	11° 25'	1.3%	-0° 01'	12° 20'
L vis	2011-05-02	05:05	04:16	41° 26'	29° 03'	4° 13'	7° 54'	1.3%	8° 59'	-12° 23'
F vis	2011-05-03	19:09	19:40	42° 58'	48° 15'	3° 01'	4° 28'	0.3%	0° 20'	5° 17'
L vis	2011-06-01	04:37	04:02	70° 20'	61° 55'	1° 56'	4° 51'	0.6%	5° 46'	-8° 25'
F vis	2011-06-02	19:38	20:24	71° 54'	82° 30'	0° 05'	6° 36'	0.9%	-6° 38'	10° 36'
L vis	2011-06-30	04:37	03:36	98° 03'	83° 09'	0° 02'	9° 06'	1.7%	10° 21'	-14° 54'
F vis	2011-07-02	19:48	20:32	100° 33'	118° 20'	-3° 01'	6° 54'	2.5%	-15° 54'	17° 47'
L vis	2011-07-30	05:00	04:34	126° 41'	118° 41'	-3° 01'	3° 43'	0.6%	6° 41'	-7° 59'
F vis	2011-07-31	19:29	19:39	128° 13'	141° 27'	-4° 24'	1° 16'	1.5%	-13° 39'	13° 14'
L vis	2011-08-28	05:30	04:36	154° 33'	141° 37'	-4° 24'	8° 38'	1.4%	8° 55'	-12° 56'
F vis	2011-08-30	18:47	19:09	157° 01'	179° 36'	-4° 57'	3° 27'	4.0%	-22° 33'	22° 35'
L vis	2011-09-26	06:00	04:40	182° 46'	164° 58'	-5° 01'	13° 25'	2.6%	10° 40'	-17° 49'
F vis	2011-09-28	17:57	18:12	185° 13'	202° 58'	-4° 05'	2° 05'	2.5%	-17° 50'	17° 44'
L vis	2011-10-26	06:34	06:01	212° 27'	203° 54'	-4° 01'	4° 38'	0.7%	7° 02'	-8° 33'
F vis	2011-10-27	17:10	17:25	213° 53'	225° 53'	-2° 31'	1° 45'	1.1%	-11° 49'	12° 00'
L vis	2011-11-24	07:09	06:07	241° 36'	227° 38'	-2° 22'	8° 34'	1.5%	9° 45'	-13° 58'
F vis	2011-11-26	16:41	17:54	244° 02'	263° 10'	0° 49'	9° 35'	2.8%	-15° 33'	19° 08'
L vis	2011-12-24	07:34	07:07	272° 05'	265° 42'	1° 03'	3° 30'	0.3%	3° 58'	-6° 23'
F vis	2011-12-25	16:43	17:45	273° 29'	285° 18'	2° 43'	8° 35'	1.1%	-6° 24'	11° 49'

Sun lon = longitudine celeste del Sole

Moon lon = longitudine celeste della Luna

Moon lat = latitudine celeste della Luna

Luna alt = altezza della Luna sull'orizzonte quando il Sole è sull'orizzonte

D az = differenza in azimut tra i centri del Sole e della Luna nell'istante della sua visibilità

D lon = differenza in longitudine tra i centri del Sole e della Luna nell'istante della sua visibilità

Sun lon = celestial longitude of the Sun

Moon lon = celestial longitude of the Moon

Moon lat = celestial latitude of the Moon

Moon alt = altitude of the Moon above the horizon when the Sun is above the horizon

D az = difference in azimuth between the center of the Sun and of the Moon

D lon = difference in longitude between the center of the Sun and the Moon

# First and last visibility of the Moon in 2011

# prima ed ultima visibilità della Luna nel 2011

location : Rome (Italy)  
 latitude : 41° 52' 12'' N  
 longitude: 12° 37' 12'' E  
 visibility arc: 0°  
 factor : 0.33

posizione : Roma  
 latitudine : 41° 52' 12'' N  
 longitudine : 12° 37' 12'' E

	date	sun r/s	moon r/s	d r/s	moon phs	moon age	period
last visibility	2011-01-04	07:37	07:34	-0:03h	0.0%	-2:26h	
first visibility	2011-01-04	16:51	17:07	0:15h	0.1%	6:47h	29
last visibility	2011-02-03	07:20	07:13	-0:07h	0.1%	3:48h	
first visibility	2011-02-03	17:26	18:04	0:38h	0.4%	13:54h	30
last visibility	2011-03-05	06:38	06:29	-0:09h	0.3%	8:51h	
first visibility	2011-03-05	18:03	18:56	0:52h	0.8%	20:16h	30
last visibility	2011-04-04	05:47	05:45	-0:02h	0.5%	14:14h	
first visibility	2011-04-03	18:36	18:47	0:10h	0.2%	3:03h	29
last visibility	2011-05-03	05:03	04:47	-0:16h	0.1%	-2:47h	
first visibility	2011-05-03	19:09	19:40	0:31h	0.3%	11:18h	30
last visibility	2011-06-01	04:37	04:02	-0:34h	0.6%	-17:26h	
first visibility	2011-06-02	19:38	20:24	0:45h	0.9%	21:35h	30
last visibility	2011-06-30	04:37	03:36	-1:01h	1.7%	-29:17h	
first visibility	2011-07-01	19:48	19:53	0:04h	0.2%	9:53h	29
last visibility	2011-07-30	05:00	04:34	-0:26h	0.6%	-14:40h	
first visibility	2011-07-31	19:29	19:39	0:09h	1.5%	23:48h	30
last visibility	2011-08-28	05:30	04:36	-0:53h	1.4%	-22:34h	
first visibility	2011-08-30	18:47	19:09	0:22h	4.0%	38:41h	30
last visibility	2011-09-27	06:01	05:56	-0:05h	0.3%	-6:08h	
first visibility	2011-09-28	17:57	18:12	0:15h	2.5%	29:47h	29
last visibility	2011-10-26	06:34	06:01	-0:32h	0.7%	-14:22h	
first visibility	2011-10-27	17:10	17:25	0:14h	1.1%	20:13h	29
last visibility	2011-11-24	07:09	06:07	-1:01h	1.5%	-24:01h	
first visibility	2011-11-25	16:42	16:52	0:10h	0.2%	9:31h	29
last visibility	2011-12-24	07:34	07:07	-0:27h	0.3%	-11:32h	
first visibility	2011-12-25	16:43	17:45	1:02h	1.1%	21:36h	30

Sun r/s = ora della levata o del tramonto del Sole

Moon r/s = ora della levata o del tramonto della Luna

D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due corpi

Moon phs = fase delle Luna

Moon age = età della Luna

Period = giorni tra due eventi

Last visibilità = ultimo giorno di visibilità mattutina prima della congiunzione con il Sole

First visibilità = primo giorno di visibilità serale dopo la congiunzione con il Sole

Sun r/s = sunrise and sunset

Moon r/s = rise and set of the Moon

D r/s = difference in hours and minutes between the instants of the rising or the setting of the two objects

Moon phs = phase of the Moon

Moon age = age of the Moon

Period = days between two events

	date	sun r/s	moon r/s	sun lon	moon lon	moon lat	moon alt	moon phs	d az	d lon
L vis	2011-01-04	07:37	07:34	283° 33'	282° 21'	0° 53'	0° 06'	0.0%	0° 23'	-1° 11'
F vis	2011-01-04	16:51	17:07	283° 56'	287° 16'	1° 19'	1° 58'	0.1%	-1° 07'	3° 20'
L vis	2011-02-03	07:20	07:13	314° 04'	315° 51'	3° 34'	0° 56'	0.1%	-3° 18'	1° 47'
F vis	2011-02-03	17:26	18:04	314° 29'	320° 58'	3° 53'	5° 55'	0.4%	0° 33'	6° 28'
L vis	2011-03-05	06:38	06:29	344° 18'	348° 20'	4° 54'	1° 20'	0.3%	-5° 44'	4° 02'
F vis	2011-03-05	18:03	18:56	344° 46'	353° 59'	4° 59'	8° 45'	0.8%	1° 42'	9° 13'
L vis	2011-04-04	05:47	05:45	14° 05'	20° 34'	4° 34'	0° 05'	0.5%	-7° 48'	6° 29'
F vis	2011-04-03	18:36	18:47	13° 37'	15° 01'	4° 45'	1° 30'	0.2%	4° 01'	1° 24'
L vis	2011-05-03	05:03	04:47	42° 24'	41° 06'	3° 30'	2° 15'	0.1%	-0° 31'	-1° 18'
F vis	2011-05-03	19:09	19:40	42° 58'	48° 15'	3° 01'	4° 28'	0.3%	0° 20'	5° 17'
L vis	2011-06-01	04:37	04:02	70° 20'	61° 55'	1° 56'	4° 51'	0.6%	5° 46'	-8° 25'
F vis	2011-06-02	19:38	20:24	71° 54'	82° 30'	0° 05'	6° 36'	0.9%	-6° 38'	10° 36'
L vis	2011-06-30	04:37	03:36	98° 03'	83° 09'	0° 02'	9° 06'	1.7%	10° 21'	-14° 54'
F vis	2011-07-01	19:48	19:53	99° 36'	104° 45'	-1° 55'	0° 23'	0.2%	-5° 12'	5° 09'
L vis	2011-07-30	05:00	04:34	126° 41'	118° 41'	-3° 01'	3° 43'	0.6%	6° 41'	-7° 59'
F vis	2011-07-31	19:29	19:39	128° 13'	141° 27'	-4° 24'	1° 16'	1.5%	-13° 39'	13° 14'
L vis	2011-08-28	05:30	04:36	154° 33'	141° 37'	-4° 24'	8° 38'	1.4%	8° 55'	-12° 56'
F vis	2011-08-30	18:47	19:09	157° 01'	179° 36'	-4° 57'	3° 27'	4.0%	-22° 33'	22° 35'
L vis	2011-09-27	06:01	05:56	183° 45'	180° 07'	-4° 54'	0° 31'	0.3%	5° 48'	-3° 38'
F vis	2011-09-28	17:57	18:12	185° 13'	202° 58'	-4° 05'	2° 05'	2.5%	-17° 50'	17° 44'
L vis	2011-10-26	06:34	06:01	212° 27'	203° 54'	-4° 01'	4° 38'	0.7%	7° 02'	-8° 33'
F vis	2011-10-27	17:10	17:25	213° 53'	225° 53'	-2° 31'	1° 45'	1.1%	-11° 49'	12° 00'
L vis	2011-11-24	07:09	06:07	241° 36'	227° 38'	-2° 22'	8° 34'	1.5%	9° 45'	-13° 58'
F vis	2011-11-25	16:42	16:52	243° 01'	248° 31'	-0° 32'	1° 08'	0.2%	-4° 52'	5° 30'
L vis	2011-12-24	07:34	07:07	272° 05'	265° 42'	1° 03'	3° 30'	0.3%	3° 58'	-6° 23'
F vis	2011-12-25	16:43	17:45	273° 29'	285° 18'	2° 43'	8° 35'	1.1%	-6° 24'	11° 49'

Sun lon = longitudine celeste del Sole

Moon lon = longitudine celeste della Luna

Moon lat = latitudine celeste della Luna

Luna alt = altezza della Luna sull'orizzonte quando il Sole è sull'orizzonte

D az = differenza in azimut tra i centri del Sole e della Luna nell'istante della sua visibilità

D lon = differenza in longitudine tra i centri del Sole e della Luna nell'istante della sua visibilità

Sun lon = celestial longitude of the Sun

Moon lon = celestial longitude of the Moon

Moon lat = celestial latitude of the Moon

Moon alt = altitude of the Moon above the horizon when the Sun is above the horizon

D az = difference in azimuth between the center of the Sun and of the Moon

D lon = difference in longitude between the center of the Sun and the Moon

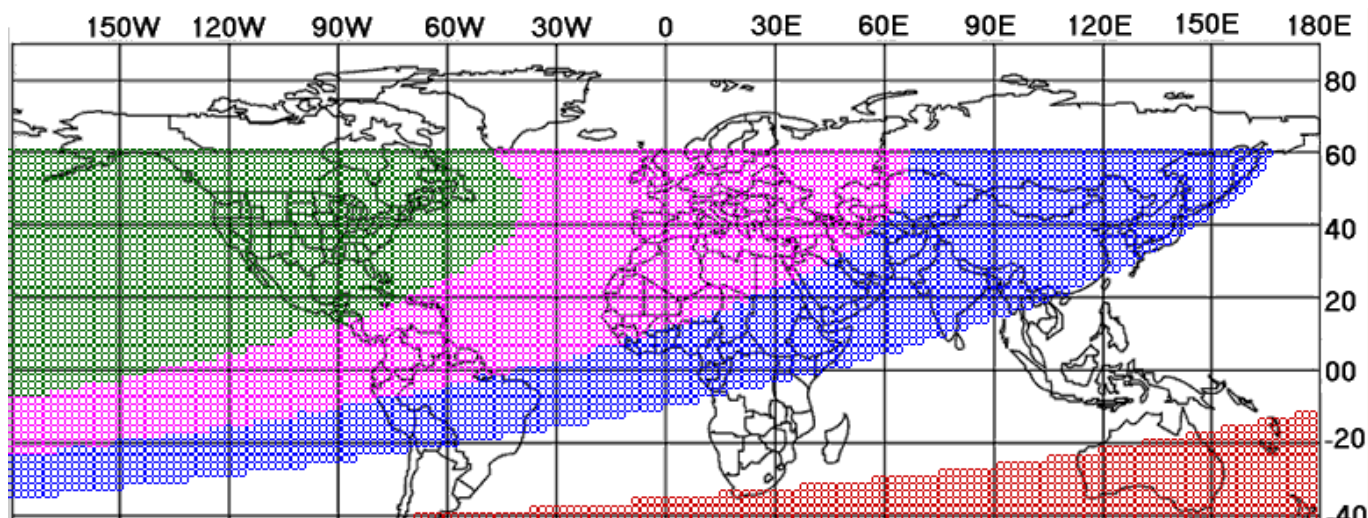
- Crescent Visibility on: Saturday 05/03/2011 CE  
 - Calculations are Done at Sunset Time at: 18:06 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 04/03/2011 CE, 22:46 LT  
 - Julian Date at Time of Calculations: 2455626,21219

- Sunset: 18:06 LT	T. Moon Age: +19H 19M
- Moonset: 18:58 LT	Moon Lag Time: +00H 53M
- T. Moon Right Ascension: +23H 27M 26S	T. Moon Declination: +01°:35':46"
- T. Sun Right Ascension: +23H 03M 54S	T. Sun Declination: -05°:59':51"
- T. Moon Longitude: +353°:09':11"	T. Moon Latitude: +04°:41':45"
- T. Sun Longitude: +344°:46':19"	T. Sun Latitude: -00°:00':02"
- T. Moon Altitude: +08°:36':37"	T. Moon Azimuth: +264°:23':57"
- T. Sun Altitude: -00°:50':17"	T. Sun Azimuth: +262°:41':54"
- T. Relative Altitude: +09°:26':54"	T. Elongation: +09°:35':57"
- T. Relative Azimuth: +01°:42':04"	T. Phase Angle: +170°:22':29"
- T. Crescent Width: +00°:00':12"	T. Moon Semi-Diameter: +00°:14':44"
- T. Illumination: 00,70 %	G. Horizontal Parallax: +00°:53':57"
- T. Magnitude: -04,93	G. Distance: 406452,97 Km

#### Note

- formato data : gg/mm/aaaa
- Il prefisso "G" sta per geocentrico, "T" per topocentrico
- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



Rosso : non visibile  
 Bianco : impossibile da vedere  
 Blu : visibile con strumenti  
 Rosa : potrebbe essere vista ad occhio nudo  
 Verde : facilmente visibile ad occhio nudo



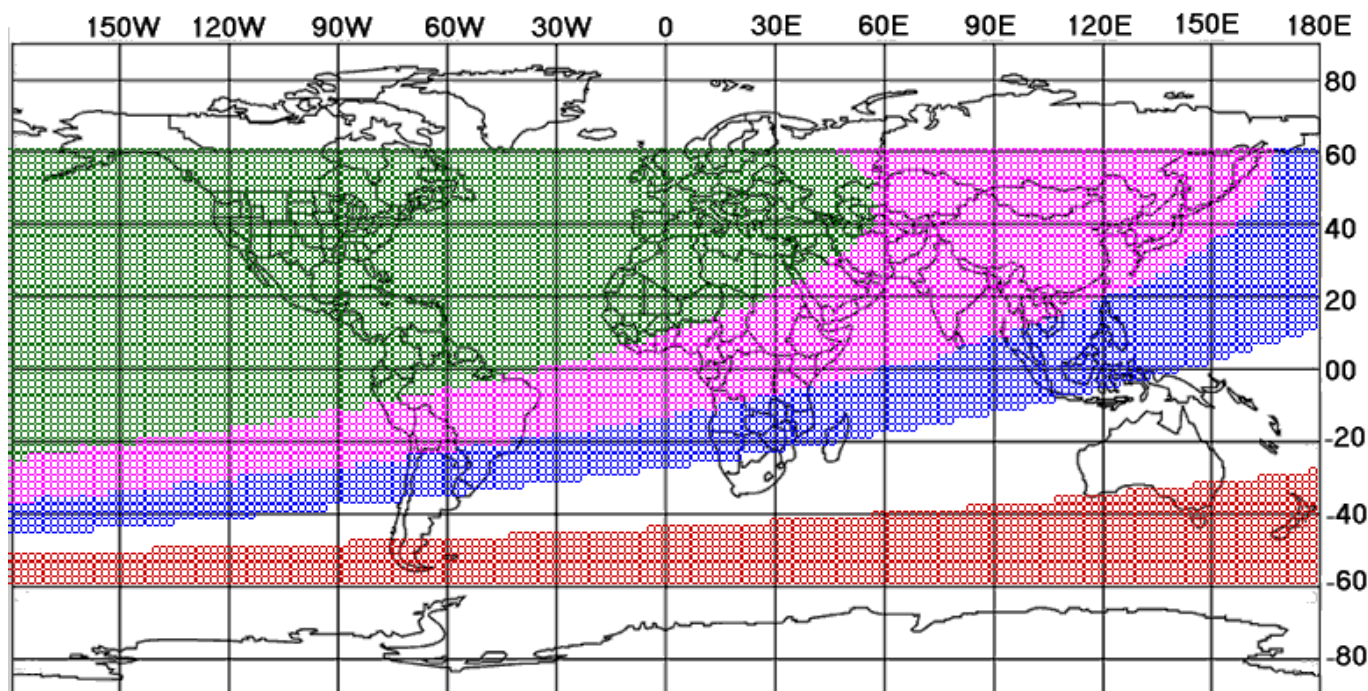
- Crescent Visibility on: Monday 04/04/2011 CE  
- Calculations are Done at Sunset Time at: 18:39 LT  
- Calculations are Topocentric.  
- ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
- Summer time is: Off  
- Height above mean sea-level affects rise and set events.  
- Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
- Delta T: 65.20 Second(s)

- T. Conjunction Time: 03/04/2011 CE, 17:22 LT  
- Julian Date at Time of Calculations: 2455656,23562

- Sunset: 18:39 LT	T. Moon Age: +25H 18M
- Moonset: 19:49 LT	Moon Lag Time: +01H 10M
- T. Moon Right Ascension: +01H 30M 52S	T. Moon Declination: +13°:49':52"
- T. Sun Right Ascension: +00H 53M 47S	T. Sun Declination: +05°:45':21"
- T. Moon Longitude: +26°:07':04"	T. Moon Latitude: +04°:01':29"
- T. Sun Longitude: +14°:36':21"	T. Sun Latitude: -00°:00':03"
- T. Moon Altitude: +11°:21':03"	T. Moon Azimuth: +278°:29':16"
- T. Sun Altitude: -00°:50':09"	T. Sun Azimuth: +278°:29':14"
- T. Relative Altitude: +12°:11':12"	T. Elongation: +12°:11':12"
- T. Relative Azimuth: +00°:00':02"	T. Phase Angle: +167°:46':50"
- T. Crescent Width: +00°:00':20"	T. Moon Semi-Diameter: +00°:14':48"
- T. Illumination: 01,13 %	G. Horizontal Parallax: +00°:54':10"
- T. Magnitude: -05,20	G. Distance: 404807,71 Km

#### Note

- formato data : gg/mm/yyyy
- Il prefisso "G" sta per geocentrico, "T" per topocentrico
- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



Rosso : non visibile  
Bianco : impossibile da vedere  
Blu : visibile con strumenti  
Rosa : potrebbe essere vista ad occhio nudo  
Verde : facilmente visibile ad occhio nudo



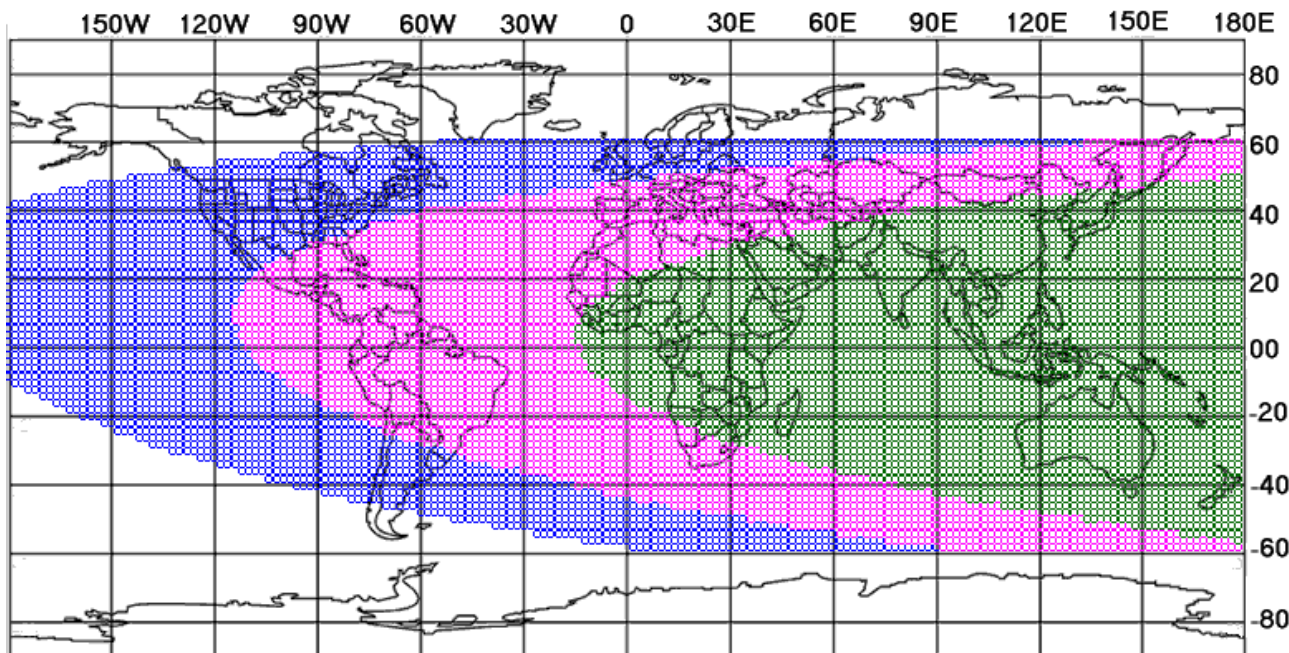
- Crescent Visibility on: Monday 02/05/2011 CE  
 - Calculations are Done at Sunrise Time at: 05:07 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)  
 =====

- T. Conjunction Time: 03/05/2011 CE, 06:50 LT  
 - Julian Date at Time of Calculations: 2455683,67144

- Moonrise: 04:18 LT	T. Moon Age: -25H 43M
- Sunrise: 05:07 LT	Moon Lag Time: +00H 49M
- T. Moon Right Ascension: +01H 44M 43S	T. Moon Declination: +14°:29':30"
- T. Sun Right Ascension: +02H 36M 01S	T. Sun Declination: +15°:15':31"
- T. Moon Longitude: +29°:29':27"	T. Moon Latitude: +03°:25':23"
- T. Sun Longitude: +41°:26':00"	T. Sun Latitude: -00°:00':07"
- T. Moon Altitude: +07°:46':59"	T. Moon Azimuth: +77°:29':29"
- T. Sun Altitude: -00°:50':02"	T. Sun Azimuth: +68°:31':32"
- T. Relative Altitude: +08°:37':01"	T. Elongation: +12°:25':02"
- T. Relative Azimuth: +08°:57':56"	T. Phase Angle: +167°:32':59"
- T. Crescent Width: +00°:00':21"	T. Moon Semi-Diameter: +00°:14':50"
- T. Illumination: 01,18 %	G. Horizontal Parallax: +00°:54':19"
- T. Magnitude: -05,22	G. Distance: 403633,74 Km

#### Note

- formato data : gg/mm/aaaa
- Il prefisso "G" stà per geocentrico, "T" per topocentrico
- LT = local time, ora locale
- 
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



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 Blu : visibile con strumenti  
 Rosa : potrebbe essere vista ad occhio nudo  
 Verde : facilmente visibile ad occhio nudo

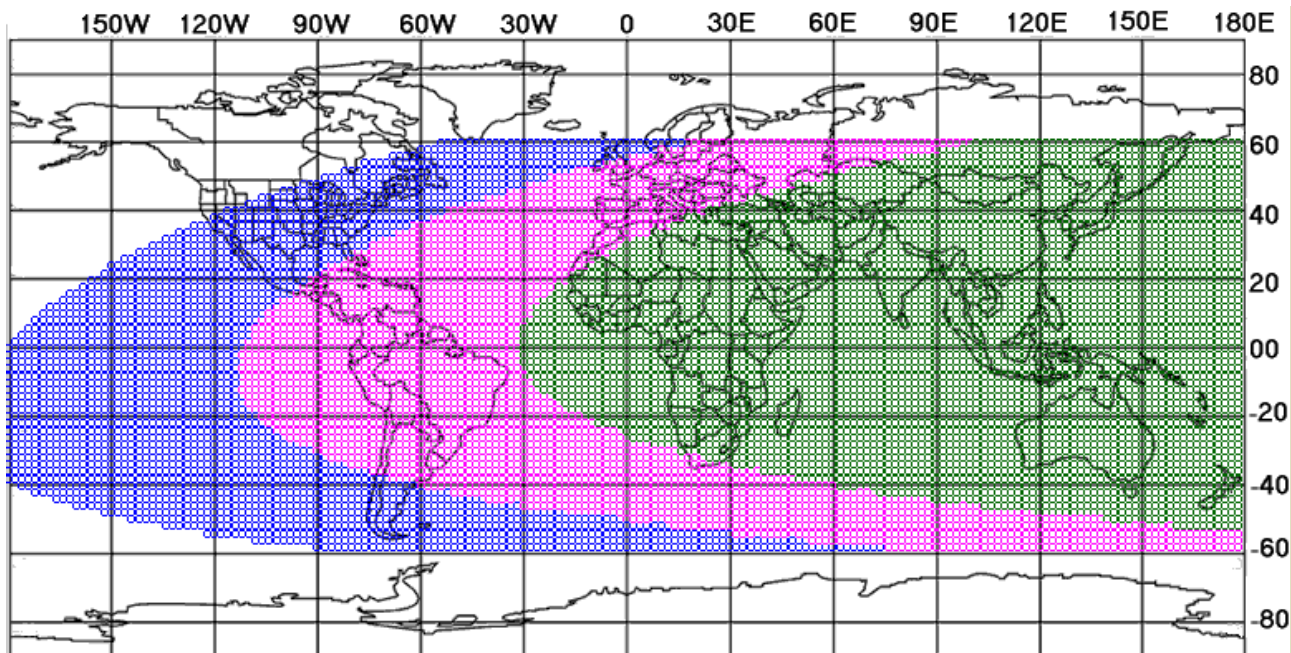
- Crescent Visibility on: Sunday 28/08/2011 CE  
 - Calculations are Done at Sunrise Time at: 05:32 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 29/08/2011 CE, 02:49 LT  
 - Julian Date at Time of Calculations: 2455801,68903

- Moonrise: 04:39 LT	T. Moon Age: -21H 17M
- Sunrise: 05:32 LT	Moon Lag Time: +00H 54M
- T. Moon Right Ascension: +09H 33M 19S	T. Moon Declination: +09°:28':27"
- T. Sun Right Ascension: +10H 25M 39S	T. Sun Declination: +09°:50':22"
- T. Moon Longitude: +142°:33':07"	T. Moon Latitude: -04°:46':36"
- T. Sun Longitude: +154°:33':10"	T. Sun Latitude: -00°:00':04"
- T. Moon Altitude: +08°:31':56"	T. Moon Azimuth: +84°:53':10"
- T. Sun Altitude: -00°:49':59"	T. Sun Azimuth: +75°:58':48"
- T. Relative Altitude: +09°:21':56"	T. Elongation: +12°:54':11"
- T. Relative Azimuth: +08°:54':22"	T. Phase Angle: +167°:03':57"
- T. Crescent Width: +00°:00':25"	T. Moon Semi-Diameter: +00°:16':22"
- T. Illumination: 01,27 %	G. Horizontal Parallax: +00°:59':54"
- T. Magnitude: -05,27	G. Distance: 366115,52 Km

#### Note

- formato data : gg/mm/aaaa
- Il prefisso "G" sta per geocentrico, "T" per topocentrico
- LT = local time, ora locale
- 
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



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 Blu : visibile con strumenti  
 Rosa : potrebbe essere vista ad occhio nudo  
 Verde : facilmente visibile ad occhio nudo

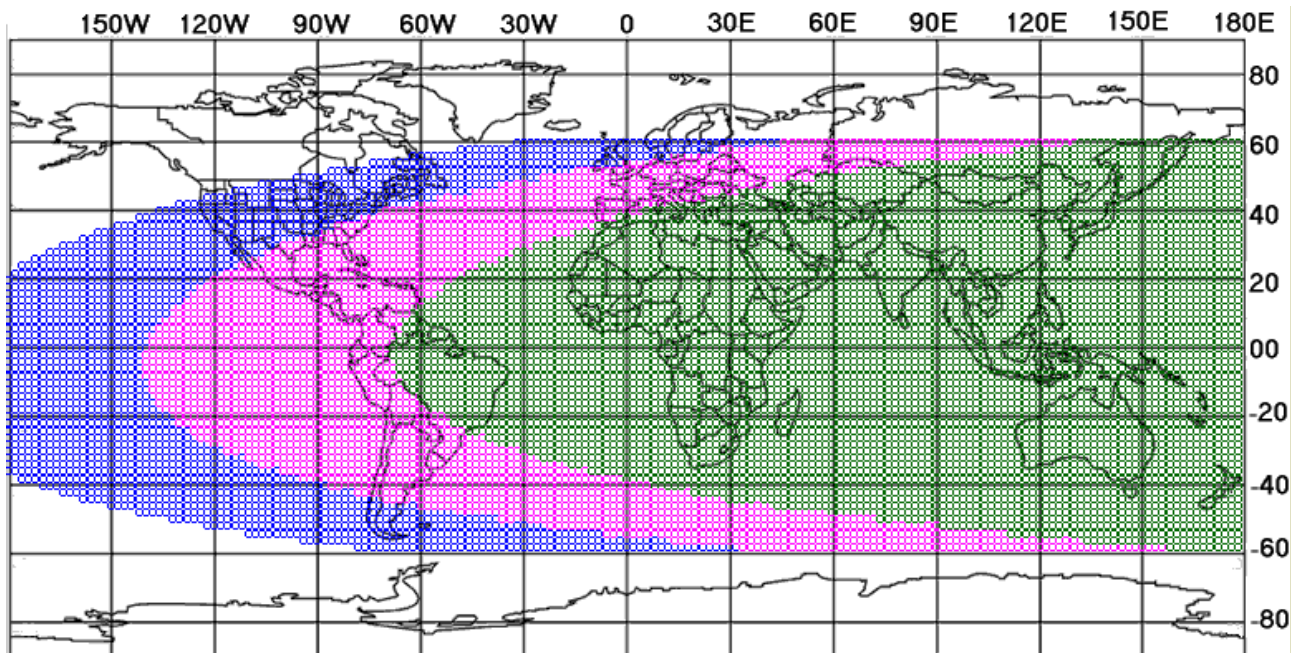
- Crescent Visibility on: Thursday 24/11/2011 CE
- Calculations are Done at Sunrise Time at: 07:11 LT
- Calculations are Topocentric.
- ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00
- Summer time is: Off
- Height above mean sea-level affects rise and set events.
- Refraction Settings: Temperature: 10 °C Pressure: 1010 mb
- Delta T: 65.20 Second(s)

- T. Conjunction Time: 25/11/2011 CE, 05:41 LT
- Julian Date at Time of Calculations: 2455889,75732

- Moonrise: 06:09 LT	T. Moon Age: -22H 30M
- Sunrise: 07:11 LT	Moon Lag Time: +01H 02M
- T. Moon Right Ascension: +15H 00M 39S	T. Moon Declination: -20°:08':35"
- T. Sun Right Ascension: +15H 57M 58S	T. Sun Declination: -20°:28':54"
- T. Moon Longitude: +228°:29':03"	T. Moon Latitude: -02°:55':56"
- T. Sun Longitude: +241°:36':17"	T. Sun Latitude: -00°:00':05"
- T. Moon Altitude: +08°:27':58"	T. Moon Azimuth: +126°:52':40"
- T. Sun Altitude: -00°:50':22"	T. Sun Azimuth: +117°:09':01"
- T. Relative Altitude: +09°:18':19"	T. Elongation: +13°:26':17"
- T. Relative Azimuth: +09°:43':39"	T. Phase Angle: +166°:31':46"
- T. Crescent Width: +00°:00':27"	T. Moon Semi-Diameter: +00°:16':39"
- T. Illumination: 01,38 %	G. Horizontal Parallax: +01°:00':57"
- T. Magnitude: -05,32	G. Distance: 359762,75 Km

#### Note

- formato data : gg/mm/aaaa
- Il prefisso "G" sta per geocentrico, "T" per topocentrico
- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



Rosso : non visibile  
 Bianco : impossibile da vedere  
 Blu : visibile con strumenti  
 Rosa : potrebbe essere vista ad occhio nudo  
 Verde : facilmente visibile ad occhio nudo

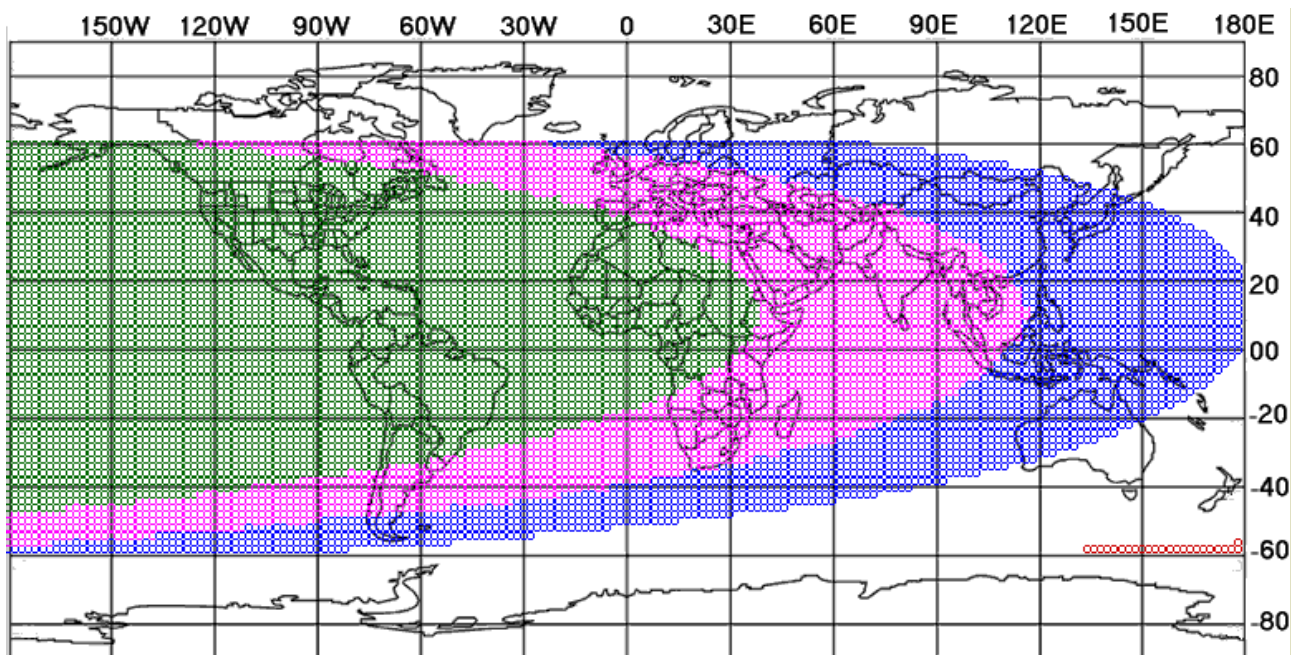
- Crescent Visibility on: Sunday 25/12/2011 CE  
 - Calculations are Done at Sunset Time at: 16:45 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 24/12/2011 CE, 20:16 LT  
 - Julian Date at Time of Calculations: 2455921,15647

- Sunset: 16:45 LT	T. Moon Age: +20H 29M
- Moonset: 17:48 LT	Moon Lag Time: +01H 02M
- T. Moon Right Ascension: +19H 02M 36S	T. Moon Declination: -20°:36':19"
- T. Sun Right Ascension: +18H 15M 13S	T. Sun Declination: -23°:23':32"
- T. Moon Longitude: +284°:38':03"	T. Moon Latitude: +02°:02':25"
- T. Sun Longitude: +273°:29':27"	T. Sun Latitude: -00°:00':06"
- T. Moon Altitude: +08°:31':34"	T. Moon Azimuth: +232°:18':33"
- T. Sun Altitude: -00°:50':25"	T. Sun Azimuth: +238°:41':59"
- T. Relative Altitude: +09°:21':59"	T. Elongation: +11°:19':36"
- T. Relative Azimuth: -06°:23':26"	T. Phase Angle: +168°:38':41"
- T. Crescent Width: +00°:00':19"	T. Moon Semi-Diameter: +00°:16':04"
- T. Illumination: 00,98 %	G. Horizontal Parallax: +00°:58':48"
- T. Magnitude: -05,11	G. Distance: 372964,54 Km

#### Note

- formato data : gg/mm/aaaa
- Il prefisso "G." stà per geocentrico, "T" per topocentrico
- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



Rosso : non visibile  
 Bianco : impossibile da vedere  
 Blu : visibile con strumenti  
 Rosa : potrebbe essere vista ad occhio nudo  
 Verde : facilmente visibile ad occhio nudo



Altezza ai crepuscoli. Il Sole è 12° sotto l'orizzonte

Altitude in the twilights. The Sun is 12° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	06:31	12.3	139.2	38.2	17:56	-39.0	270.8	32.3
2011:01:02	06:31	4.3	129.5	25.8	17:56	-29.3	262.0	20.0
2011:01:03	06:31	-3.6	120.1	13.6	17:57	-19.2	255.0	8.0
2011:01:04	06:32	-11.1	110.6	1.9	17:58	-8.9	249.1	4.1
2011:01:05	06:32	-18.1	100.8	10.1	17:59	1.3	243.7	15.6
2011:01:06	06:32	-24.3	90.4	21.6	18:00	11.4	238.6	27.0
2011:01:07	06:32	-29.6	79.1	32.8	18:01	21.3	233.2	38.1
2011:01:08	06:32	-33.7	67.0	43.9	18:02	30.9	227.3	49.1
2011:01:09	06:31	-36.4	54.1	54.8	18:03	40.1	220.1	60.0
2011:01:10	06:31	-37.8	40.5	65.6	18:04	48.7	210.8	70.8
2011:01:11	06:31	-37.5	26.8	76.4	18:04	56.3	197.9	81.6
2011:01:12	06:31	-35.8	13.3	87.3	18:05	61.8	179.3	92.5
2011:01:13	06:31	-32.8	0.4	98.3	18:06	63.8	155.1	103.6
2011:01:14	06:30	-28.5	348.3	109.5	18:07	61.3	130.7	115.0
2011:01:15	06:30	-23.2	336.7	121.0	18:08	55.0	111.8	126.8
2011:01:16	06:30	-17.1	325.6	132.9	18:10	46.1	98.6	138.9
2011:01:17	06:29	-10.3	314.8	145.3	18:11	35.6	89.3	151.4
2011:01:18	06:29	-3.1	304.0	158.0	18:12	24.1	82.2	164.3
2011:01:19	06:29	4.3	292.8	171.0	18:13	12.0	76.4	176.8
2011:01:20	06:28	11.6	281.0	174.7	18:14	-0.5	71.3	168.3
2011:01:21	06:28	18.3	268.3	161.4	18:15	-13.2	66.2	154.7
2011:01:22	06:27	24.1	254.5	147.7	18:16	-25.7	60.7	140.9
2011:01:23	06:27	28.4	239.6	134.0	18:17	-37.9	54.0	127.3
2011:01:24	06:26	30.9	223.7	120.4	18:18	-49.4	45.0	113.8
2011:01:25	06:25	31.4	207.7	107.1	18:19	-59.5	31.0	100.6
2011:01:26	06:25	30.1	192.1	94.1	18:20	-66.7	7.9	87.7
2011:01:27	06:24	27.1	177.5	81.3	18:21	-68.6	335.5	75.1
2011:01:28	06:23	22.8	164.1	68.8	18:23	-64.2	307.1	62.7
2011:01:29	06:22	17.8	151.8	56.6	18:24	-56.1	289.5	50.6
2011:01:30	06:22	12.2	140.3	44.6	18:25	-46.5	278.9	38.7
2011:01:31	06:21	6.4	129.6	32.9	18:26	-36.3	271.9	27.1
2011:02:01	06:20	0.5	119.1	21.4	18:27	-25.9	266.8	15.7
2011:02:02	06:19	-5.2	108.9	10.3	18:28	-15.4	262.8	5.3
2011:02:03	06:18	-10.7	98.6	3.8	18:29	-4.9	259.3	8.0
2011:02:04	06:17	-15.6	88.1	13.1	18:31	5.5	256.0	18.5
2011:02:05	06:16	-20.0	77.2	23.8	18:32	15.8	252.7	29.3
2011:02:06	06:15	-23.7	65.9	34.6	18:33	26.0	249.1	40.1
2011:02:07	06:14	-26.6	54.0	45.3	18:34	36.1	244.7	50.9
2011:02:08	06:13	-28.4	41.7	56.1	18:35	45.9	238.9	61.7
2011:02:09	06:12	-29.3	29.1	66.9	18:36	55.4	230.3	72.5
2011:02:10	06:11	-29.0	16.2	77.8	18:38	63.9	216.1	83.6
2011:02:11	06:10	-27.6	3.3	89.0	18:39	69.9	191.2	94.9
2011:02:12	06:09	-25.2	350.4	100.4	18:40	70.3	156.4	106.5
2011:02:13	06:07	-21.7	337.8	112.2	18:41	64.4	128.5	118.5
2011:02:14	06:06	-17.2	325.3	124.4	18:42	54.7	112.4	131.0
2011:02:15	06:05	-12.0	312.9	137.1	18:43	43.3	102.8	144.0
2011:02:16	06:04	-6.1	300.5	150.2	18:45	30.8	96.4	157.3
2011:02:17	06:02	0.1	287.9	163.6	18:46	17.7	91.6	170.5
2011:02:18	06:01	6.3	274.9	175.3	18:47	4.3	87.5	172.9
2011:02:19	06:00	12.3	261.4	167.1	18:48	-9.2	83.6	159.8
2011:02:20	05:58	17.4	247.2	153.3	18:49	-22.5	79.5	145.9
2011:02:21	05:57	21.5	232.5	139.5	18:50	-35.4	74.5	132.1
2011:02:22	05:56	24.2	217.3	125.9	18:52	-47.6	67.7	118.7
2011:02:23	05:54	25.3	202.1	112.6	18:53	-58.7	57.1	105.6
2011:02:24	05:53	24.9	187.2	99.7	18:54	-67.8	38.0	92.9
2011:02:25	05:51	23.3	173.0	87.2	18:55	-72.3	4.9	80.6
2011:02:26	05:50	20.6	159.7	75.1	18:56	-69.7	329.4	68.7
2011:02:27	05:48	17.0	147.2	63.4	18:57	-62.3	307.8	57.0
2011:02:28	05:47	12.9	135.4	51.8	18:58	-53.0	296.1	45.6
2011:03:01	05:45	8.4	124.3	40.6	19:00	-43.1	289.0	34.4
2011:03:02	05:44	3.7	113.5	29.5	19:01	-32.9	284.1	23.5
2011:03:03	05:42	-1.0	103.0	18.7	19:02	-22.7	280.3	12.9
2011:03:04	05:41	-5.6	92.6	8.6	19:03	-12.4	277.2	4.9
2011:03:05	05:39	-10.1	82.1	6.1	19:04	-2.1	274.3	10.9
2011:03:06	05:37	-14.2	71.4	15.3	19:05	8.2	271.4	21.1
2011:03:07	05:36	-17.8	60.3	25.7	19:07	18.5	268.3	31.7
2011:03:08	05:34	-20.9	48.9	36.4	19:08	28.7	264.6	42.5
2011:03:09	05:32	-23.4	37.0	47.2	19:09	38.9	259.9	53.4
2011:03:10	05:31	-25.0	24.6	58.1	19:10	48.9	253.2	64.4
2011:03:11	05:29	-25.6	11.8	69.2	19:11	58.4	242.8	75.7
2011:03:12	05:27	-25.3	358.7	80.6	19:12	66.4	224.5	87.3
2011:03:13	05:26	-23.9	345.4	92.3	19:14	70.5	193.4	99.2
2011:03:14	05:24	-21.5	332.1	104.4	19:15	67.7	158.8	111.5
2011:03:15	05:22	-18.0	318.8	116.9	19:16	59.3	136.5	124.4
2011:03:16	05:21	-13.6	305.5	129.9	19:17	48.2	123.7	137.6
2011:03:17	05:19	-8.4	292.3	143.3	19:18	35.7	115.7	151.3
2011:03:18	05:17	-2.7	279.0	157.0	19:19	22.6	109.8	165.0
2011:03:19	05:15	3.1	265.5	170.3	19:21	9.1	105.0	175.0
2011:03:20	05:13	8.8	251.8	172.2	19:22	-4.3	100.5	164.8
2011:03:21	05:12	14.0	237.6	159.2	19:23	-17.4	95.9	151.1
2011:03:22	05:10	18.2	223.1	145.5	19:24	-30.1	90.6	137.4
2011:03:23	05:08	21.3	208.4	132.0	19:25	-41.9	83.7	124.1
2011:03:24	05:06	23.1	193.6	118.9	19:26	-52.7	74.0	111.3
2011:03:25	05:05	23.5	179.1	106.2	19:28	-61.6	58.8	98.9
2011:03:26	05:03	22.7	165.2	94.0	19:29	-67.4	35.0	86.9
2011:03:27	05:01	20.9	151.9	82.2	19:30	-68.1	4.9	75.3
2011:03:28	04:59	18.2	139.4	70.8	19:31	-63.7	339.9	64.0
2011:03:29	04:57	14.8	127.6	59.6	19:32	-56.4	323.8	52.9
2011:03:30	04:56	10.9	116.4	48.6	19:34	-47.7	313.5	41.9

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:03:31	04:54	6.8	105.6	37.7	19:35	-38.5	306.4	31.1
2011:04:01	04:52	2.4	95.1	27.0	19:36	-28.9	300.9	20.5
2011:04:02	04:50	-2.1	84.7	16.5	19:37	-19.2	296.4	10.3
2011:04:03	04:48	-6.6	74.3	6.9	19:39	-9.3	292.3	5.1
2011:04:04	04:46	-10.9	63.7	7.5	19:40	0.6	288.3	13.5
2011:04:05	04:45	-14.9	52.7	17.4	19:41	10.6	284.1	24.1
2011:04:06	04:43	-18.5	41.4	28.1	19:42	20.6	279.4	35.0
2011:04:07	04:41	-21.6	29.5	39.2	19:44	30.4	273.7	46.2
2011:04:08	04:39	-23.9	17.0	50.4	19:45	40.1	266.3	57.6
2011:04:09	04:37	-25.3	4.0	61.8	19:46	49.1	256.0	69.2
2011:04:10	04:35	-25.7	350.5	73.6	19:47	56.9	240.9	81.1
2011:04:11	04:34	-24.9	336.7	85.6	19:49	61.8	218.6	93.5
2011:04:12	04:32	-23.0	322.7	98.0	19:50	62.0	191.4	106.2
2011:04:13	04:30	-19.8	308.9	110.8	19:51	56.9	167.4	119.3
2011:04:14	04:28	-15.6	295.2	124.1	19:53	48.0	150.3	132.8
2011:04:15	04:26	-10.5	281.7	137.7	19:54	37.2	138.5	146.6
2011:04:16	04:25	-4.8	268.3	151.5	19:55	25.3	129.7	160.5
2011:04:17	04:23	1.3	255.0	165.3	19:56	13.0	122.4	173.6
2011:04:18	04:21	7.3	241.6	175.7	19:58	0.7	115.8	169.8
2011:04:19	04:19	12.8	227.9	165.2	19:59	-11.2	109.2	156.4
2011:04:20	04:18	17.6	213.9	151.8	20:00	-22.6	102.1	143.1
2011:04:21	04:16	21.3	199.7	138.5	20:02	-33.0	93.8	130.1
2011:04:22	04:14	23.8	185.3	125.7	20:03	-42.3	83.7	117.5
2011:04:23	04:12	24.9	171.1	113.3	20:04	-49.9	70.7	105.4
2011:04:24	04:11	24.8	157.3	101.4	20:06	-55.3	54.2	93.7
2011:04:25	04:09	23.5	144.1	89.8	20:07	-57.7	34.6	82.3
2011:04:26	04:07	21.3	131.6	78.6	20:08	-56.8	14.7	71.2
2011:04:27	04:06	18.2	119.7	67.6	20:10	-53.0	357.4	60.3
2011:04:28	04:04	14.5	108.4	56.7	20:11	-47.2	343.7	49.4
2011:04:29	04:02	10.3	97.7	45.9	20:13	-40.2	332.9	38.6
2011:04:30	04:01	5.7	87.2	35.1	20:14	-32.3	324.2	27.8
2011:05:01	03:59	0.9	77.0	24.3	20:15	-24.0	316.7	17.0
2011:05:02	03:57	-4.0	66.7	13.6	20:17	-15.3	310.0	6.6
2011:05:03	03:56	-9.0	56.3	4.0	20:18	-6.4	303.6	6.5
2011:05:04	03:54	-13.8	45.5	9.7	20:19	2.7	297.1	17.2
2011:05:05	03:53	-18.3	34.2	20.8	20:21	11.7	290.2	28.6
2011:05:06	03:51	-22.3	22.3	32.2	20:22	20.5	282.5	40.3
2011:05:07	03:50	-25.5	9.5	43.9	20:23	28.9	273.5	52.1
2011:05:08	03:48	-27.8	356.0	55.9	20:25	36.7	262.5	64.3
2011:05:09	03:47	-28.8	341.8	68.1	20:26	43.1	248.8	76.7
2011:05:10	03:45	-28.4	327.3	80.5	20:27	47.5	231.9	89.4
2011:05:11	03:44	-26.6	312.6	93.3	20:29	48.9	212.5	102.4
2011:05:12	03:43	-23.3	298.3	106.4	20:30	46.9	192.9	115.7
2011:05:13	03:41	-18.8	284.5	119.8	20:32	41.7	175.4	129.3
2011:05:14	03:40	-13.2	271.2	133.4	20:33	34.2	160.8	143.1
2011:05:15	03:39	-6.9	258.4	147.1	20:34	25.4	148.7	156.9
2011:05:16	03:37	-0.2	245.8	160.9	20:35	15.8	138.2	170.6
2011:05:17	03:36	6.5	233.3	174.4	20:37	6.0	128.7	174.8
2011:05:18	03:35	12.9	220.7	171.2	20:38	-3.5	119.6	161.8
2011:05:19	03:34	18.7	207.7	158.1	20:39	-12.6	110.4	148.9
2011:05:20	03:32	23.4	194.4	145.2	20:41	-20.8	100.8	136.2
2011:05:21	03:31	27.0	180.7	132.7	20:42	-28.1	90.4	124.0
2011:05:22	03:30	29.2	166.7	120.7	20:43	-34.1	79.0	112.3
2011:05:23	03:29	29.9	152.8	109.0	20:44	-38.7	66.4	100.8
2011:05:24	03:28	29.3	139.3	97.6	20:45	-41.6	52.7	89.6
2011:05:25	03:27	27.4	126.5	86.5	20:47	-42.8	38.3	78.6
2011:05:26	03:26	24.5	114.3	75.6	20:48	-42.2	24.0	67.7
2011:05:27	03:25	20.6	102.9	64.7	20:49	-39.9	10.3	56.8
2011:05:28	03:24	16.0	92.2	53.9	20:50	-36.2	357.6	45.9
2011:05:29	03:24	10.8	82.0	42.9	20:51	-31.3	346.1	34.9
2011:05:30	03:23	5.1	72.1	31.9	20:52	-25.6	335.5	23.7
2011:05:31	03:22	-0.9	62.3	20.7	20:53	-19.2	325.6	12.4
2011:06:01	03:21	-7.1	52.4	9.3	20:54	-12.4	316.2	1.3
2011:06:02	03:21	-13.3	42.1	2.7	20:55	-5.2	306.9	11.2
2011:06:03	03:20	-19.3	31.3	14.4	20:56	2.0	297.4	23.2
2011:06:04	03:19	-24.9	19.5	26.5	20:57	9.1	287.6	35.5
2011:06:05	03:19	-29.8	6.7	38.8	20:58	16.0	277.0	48.0
2011:06:06	03:18	-33.4	352.5	51.3	20:59	22.2	265.3	60.7
2011:06:07	03:18	-35.5	337.2	64.1	21:00	27.5	252.4	73.6
2011:06:08	03:17	-35.7	321.3	77.0	21:01	31.4	238.2	86.6
2011:06:09	03:17	-33.9	305.5	90.1	21:01	33.6	222.7	99.8
2011:06:10	03:17	-30.1	290.5	103.3	21:02	33.8	206.6	113.2
2011:06:11	03:16	-24.8	276.7	116.6	21:03	32.0	190.7	126.6
2011:06:12	03:16	-18.2	264.1	130.1	21:03	28.4	175.7	140.1
2011:06:13	03:16	-10.8	252.4	143.5	21:04	23.5	161.8	153.5
2011:06:14	03:16	-2.9	241.4	156.9	21:05	17.6	149.0	166.8
2011:06:15	03:16	5.2	230.8	170.2	21:05	11.1	137.2	179.9
2011:06:16	03:16	13.1	220.1	176.8	21:06	4.6	126.1	167.3
2011:06:17	03:16	20.4	209.1	164.0	21:06	-1.8	115.5	154.8
2011:06:18	03:16	27.0	197.4	151.6	21:06	-7.9	105.0	142.6
2011:06:19	03:16	32.4	184.9	139.6	21:07	-13.4	94.5	130.9
2011:06:20	03:16	36.5	171.4	127.9	21:07	-18.3	83.8	119.4
2011:06:21	03:16	38.9	157.2	116.5	21:07	-22.5	72.7	108.2
2011:06:22	03:16	39.6	142.6	105.3	21:07	-25.8	61.3	97.2
2011:06:23	03:17	38.5	128.4	94.3	21:08	-28.2	49.4	86.2
2011:06:24	03:17	35.7	115.1	83.4	21:08	-29.7	37.1	75.3
2011:06:25	03:17	31.4	102.9	72.5	21:08	-30.1	24.6	64.4
2011:06:26	03:18	26.1	91.9	61.6	21:08	-29.4	11.8	53.3
2011:06:27	03:18	19.7	81.9	50.4	21:08	-27.7	359.2	42.0
2011:06:28	03:19	12.6	72.7	39.1	21:08	-24.9	346.7	30.5
2011:06:29	03:19	4.9	63.9	27.4	21:08	-21.3	334.4	18.7
2011:06:30	03:20	-3.3	55.3	15.6	21:07	-16.8	322.5	6.6
2011:07:01	03:20	-11.7	46.6	3.6	21:07	-11.8	310.7	6.1
2011:07:02	03:21	-20.2	37.2	9.3	21:07	-6.3	299.0	18.7

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:07:03	03:22	-28.4	26.7	22.0	21:07	-0.5	287.3	31.6
2011:07:04	03:23	-35.9	14.6	35.0	21:06	5.2	275.4	44.6
2011:07:05	03:23	-42.1	0.1	48.1	21:06	10.6	263.1	57.8
2011:07:06	03:24	-46.3	343.0	61.3	21:05	15.5	250.3	71.0
2011:07:07	03:25	-47.7	324.1	74.5	21:05	19.7	236.8	84.2
2011:07:08	03:26	-45.9	305.3	87.8	21:04	22.8	222.7	97.5
2011:07:09	03:27	-41.2	288.6	101.0	21:04	24.7	208.1	110.6
2011:07:10	03:28	-34.5	274.7	114.1	21:03	25.2	193.4	123.7
2011:07:11	03:28	-26.4	263.1	127.2	21:02	24.4	178.7	136.7
2011:07:12	03:29	-17.4	253.4	140.2	21:02	22.3	164.6	149.5
2011:07:13	03:30	-7.9	244.9	153.0	21:01	19.2	151.1	162.1
2011:07:14	03:31	1.7	236.9	165.5	21:00	15.3	138.4	174.2
2011:07:15	03:33	11.2	229.2	176.8	20:59	10.9	126.4	172.6
2011:07:16	03:34	20.5	221.2	169.5	20:59	6.2	115.0	161.0
2011:07:17	03:35	29.2	212.6	157.8	20:58	1.5	104.1	149.4
2011:07:18	03:36	37.2	202.7	146.2	20:57	-3.2	93.4	138.0
2011:07:19	03:37	44.2	191.0	134.9	20:56	-7.8	82.9	126.9
2011:07:20	03:38	49.5	176.8	123.8	20:55	-12.0	72.3	115.9
2011:07:21	03:39	52.7	160.2	112.9	20:54	-15.8	61.5	105.0
2011:07:22	03:40	53.3	142.1	102.0	20:52	-19.2	50.4	94.2
2011:07:23	03:42	51.0	124.8	91.1	20:51	-22.0	38.8	83.2
2011:07:24	03:43	46.3	109.9	80.1	20:50	-24.1	26.7	72.2
2011:07:25	03:44	39.8	97.6	69.0	20:49	-25.4	14.0	60.9
2011:07:26	03:45	31.9	87.7	57.6	20:48	-25.7	0.9	49.3
2011:07:27	03:47	23.0	79.3	45.9	20:47	-24.9	347.4	37.4
2011:07:28	03:48	13.3	72.0	33.9	20:45	-23.1	333.7	25.2
2011:07:29	03:49	2.9	65.4	21.5	20:44	-20.1	320.2	12.7
2011:07:30	03:50	-7.8	58.8	9.1	20:43	-16.1	306.8	3.7
2011:07:31	03:52	-18.8	51.9	6.0	20:41	-11.4	293.6	14.6
2011:08:01	03:53	-29.8	44.1	18.5	20:40	-6.1	280.7	27.8
2011:08:02	03:54	-40.3	34.4	31.9	20:38	-0.5	267.9	41.3
2011:08:03	03:56	-49.8	21.3	45.4	20:37	5.1	255.1	54.8
2011:08:04	03:57	-57.1	2.9	58.9	20:35	10.4	242.2	68.2
2011:08:05	03:58	-60.7	338.5	72.3	20:34	15.1	228.9	81.5
2011:08:06	03:59	-59.1	312.9	85.5	20:32	19.0	215.3	94.5
2011:08:07	04:01	-53.3	292.6	98.6	20:31	21.9	201.4	107.4
2011:08:08	04:02	-44.9	278.4	111.4	20:29	23.7	187.2	120.0
2011:08:09	04:03	-35.3	268.4	124.0	20:28	24.1	173.0	132.5
2011:08:10	04:05	-25.1	260.9	136.4	20:26	23.4	159.1	144.6
2011:08:11	04:06	-14.6	254.9	148.5	20:25	21.5	145.6	156.5
2011:08:12	04:07	-4.1	249.6	160.3	20:23	18.7	132.8	168.0
2011:08:13	04:09	6.4	244.7	171.4	20:21	15.2	120.7	175.6
2011:08:14	04:10	16.7	239.8	174.0	20:20	11.1	109.2	167.4
2011:08:15	04:11	26.8	234.4	163.9	20:18	6.6	98.3	156.6
2011:08:16	04:12	36.5	228.2	153.0	20:16	2.0	87.7	145.6
2011:08:17	04:14	45.7	220.3	142.0	20:15	-2.7	77.3	134.8
2011:08:18	04:15	54.0	209.4	131.2	20:13	-7.4	66.9	124.0
2011:08:19	04:16	60.8	193.7	120.3	20:11	-11.8	56.4	113.2
2011:08:20	04:18	64.8	171.6	109.5	20:09	-16.0	45.6	102.3
2011:08:21	04:19	64.6	146.0	98.6	20:08	-19.7	34.2	91.3
2011:08:22	04:20	60.1	124.1	87.5	20:06	-22.9	22.1	80.1
2011:08:23	04:21	52.6	108.6	76.1	20:04	-25.3	9.3	68.6
2011:08:24	04:23	43.4	98.0	64.5	20:02	-26.7	355.7	56.7
2011:08:25	04:24	33.0	90.4	52.4	20:01	-26.9	341.4	44.4
2011:08:26	04:25	21.7	84.4	40.0	19:59	-25.7	326.8	31.7
2011:08:27	04:26	9.8	79.3	27.2	19:57	-23.1	312.1	18.8
2011:08:28	04:28	-2.5	74.6	14.2	19:55	-19.2	297.7	6.7
2011:08:29	04:29	-15.1	69.8	4.9	19:53	-14.1	283.8	10.4
2011:08:30	04:30	-27.8	64.4	15.1	19:51	-8.3	270.4	23.7
2011:08:31	04:31	-40.3	57.6	28.6	19:50	-2.1	257.3	37.4
2011:09:01	04:32	-52.0	47.8	42.4	19:48	4.1	244.5	51.1
2011:09:02	04:34	-62.1	31.6	56.0	19:46	10.1	231.6	64.6
2011:09:03	04:35	-68.5	4.0	69.4	19:44	15.5	218.6	77.7
2011:09:04	04:36	-68.3	329.0	82.5	19:42	20.1	205.3	90.6
2011:09:05	04:37	-62.0	303.4	95.2	19:40	23.5	191.7	103.0
2011:09:06	04:38	-52.8	288.6	107.6	19:39	25.8	177.8	115.2
2011:09:07	04:40	-42.6	279.7	119.7	19:37	26.7	163.9	127.1
2011:09:08	04:41	-32.1	273.6	131.5	19:35	26.3	150.1	138.8
2011:09:09	04:42	-21.4	269.1	143.1	19:33	24.7	136.8	150.2
2011:09:10	04:43	-10.7	265.3	154.4	19:31	22.0	124.1	161.2
2011:09:11	04:44	-0.1	262.0	165.3	19:29	18.4	112.2	171.5
2011:09:12	04:45	10.4	258.7	174.4	19:27	14.2	101.0	173.5
2011:09:13	04:47	20.7	255.2	170.2	19:26	9.4	90.3	164.1
2011:09:14	04:48	30.9	251.1	160.1	19:24	4.4	80.0	153.6
2011:09:15	04:49	40.9	246.0	149.4	19:22	-0.9	69.9	142.9
2011:09:16	04:50	50.5	239.0	138.7	19:20	-6.2	59.9	132.2
2011:09:17	04:51	59.4	228.2	127.9	19:18	-11.4	49.7	121.4
2011:09:18	04:52	66.8	210.1	117.0	19:16	-16.4	39.0	110.4
2011:09:19	04:53	70.4	181.0	106.0	19:15	-21.0	27.7	99.2
2011:09:20	04:54	68.2	149.2	94.7	19:13	-25.0	15.6	87.8
2011:09:21	04:56	61.2	127.3	83.1	19:11	-28.1	2.3	76.0
2011:09:22	04:57	51.5	114.3	71.1	19:09	-30.1	348.0	63.8
2011:09:23	04:58	40.5	106.1	58.7	19:07	-30.6	332.9	51.2
2011:09:24	04:59	28.5	100.2	45.9	19:05	-29.3	317.3	38.1
2011:09:25	05:00	15.9	95.5	32.6	19:04	-26.3	301.8	24.7
2011:09:26	05:01	2.8	91.4	19.1	19:02	-21.6	287.0	11.3
2011:09:27	05:02	-10.5	87.3	6.5	19:00	-15.7	272.9	6.2
2011:09:28	05:03	-23.8	82.7	11.0	18:58	-8.8	259.6	18.7
2011:09:29	05:04	-36.9	77.0	24.5	18:57	-1.6	246.9	32.6
2011:09:30	05:05	-49.3	69.0	38.4	18:55	5.6	234.5	46.3
2011:10:01	05:07	-60.3	55.9	52.0	18:53	12.5	222.2	59.7
2011:10:02	05:08	-68.6	32.4	65.3	18:51	18.6	209.6	72.6
2011:10:03	05:09	-70.9	356.4	78.1	18:50	23.8	196.6	85.2
2011:10:04	05:10	-66.1	325.6	90.5	18:48	27.7	183.1	97.3



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:10:05	05:11	-57.7	308.0	102.5	18:46	30.3	169.2	109.1
2011:10:06	05:12	-48.1	297.9	114.1	18:45	31.3	155.2	120.6
2011:10:07	05:13	-37.9	291.4	125.5	18:43	30.8	141.3	131.9
2011:10:08	05:14	-27.7	286.7	136.7	18:41	29.0	128.0	142.9
2011:10:09	05:15	-17.4	282.9	147.8	18:40	25.9	115.4	153.8
2011:10:10	05:16	-7.1	279.5	158.6	18:38	21.8	103.7	164.5
2011:10:11	05:17	3.2	276.2	169.0	18:36	16.9	92.9	174.1
2011:10:12	05:18	13.3	272.9	175.7	18:35	11.5	82.6	172.0
2011:10:13	05:20	23.5	269.0	167.6	18:33	5.6	72.8	161.9
2011:10:14	05:21	33.5	264.4	157.1	18:32	-0.5	63.3	151.2
2011:10:15	05:22	43.2	258.4	146.4	18:30	-6.8	53.8	140.4
2011:10:16	05:23	52.5	249.6	135.4	18:29	-13.0	44.0	129.4
2011:10:17	05:24	60.8	236.0	124.3	18:27	-19.0	33.6	118.2
2011:10:18	05:25	66.8	213.9	113.0	18:26	-24.6	22.4	106.8
2011:10:19	05:26	68.0	183.5	101.4	18:24	-29.5	10.0	95.1
2011:10:20	05:27	63.5	156.3	89.6	18:23	-33.3	356.1	83.0
2011:10:21	05:28	55.0	138.5	77.3	18:21	-35.7	340.8	70.5
2011:10:22	05:29	44.5	127.2	64.5	18:20	-36.1	324.4	57.5
2011:10:23	05:30	32.8	119.4	51.4	18:18	-34.2	307.8	44.2
2011:10:24	05:31	20.3	113.3	37.8	18:17	-30.2	291.8	30.4
2011:10:25	05:33	7.4	108.1	23.9	18:16	-24.3	277.1	16.5
2011:10:26	05:34	-5.7	103.0	10.0	18:14	-17.0	263.6	3.9
2011:10:27	05:35	-18.8	97.5	6.0	18:13	-8.8	251.2	12.8
2011:10:28	05:36	-31.4	91.0	19.3	18:12	-0.3	239.6	26.6
2011:10:29	05:37	-43.2	82.6	33.1	18:11	8.1	228.2	40.2
2011:10:30	05:38	-53.6	70.4	46.5	18:09	16.0	216.8	53.4
2011:10:31	05:39	-61.7	51.8	59.5	18:08	23.1	205.0	66.1
2011:11:01	05:40	-65.6	25.6	72.1	18:07	29.1	192.4	78.4
2011:11:02	05:41	-64.1	358.0	84.1	18:06	33.8	179.0	90.2
2011:11:03	05:42	-58.4	337.3	95.8	18:05	36.8	164.8	101.7
2011:11:04	05:44	-50.6	323.7	107.2	18:04	38.0	150.2	112.9
2011:11:05	05:45	-41.8	314.4	118.3	18:03	37.5	135.6	123.9
2011:11:06	05:46	-32.6	307.5	129.3	18:01	35.2	121.8	134.8
2011:11:07	05:47	-23.1	301.9	140.1	18:00	31.4	109.1	145.6
2011:11:08	05:48	-13.5	297.1	150.9	17:59	26.5	97.6	156.4
2011:11:09	05:49	-3.9	292.5	161.7	17:59	20.6	87.1	167.2
2011:11:10	05:50	5.8	287.8	172.4	17:58	14.1	77.5	177.1
2011:11:11	05:51	15.4	282.8	175.6	17:57	7.0	68.5	170.5
2011:11:12	05:52	25.0	277.1	165.1	17:56	-0.4	59.8	159.5
2011:11:13	05:53	34.2	270.1	154.0	17:55	-7.9	51.1	148.4
2011:11:14	05:55	43.0	261.0	142.7	17:54	-15.5	42.1	137.0
2011:11:15	05:56	50.8	248.6	131.2	17:53	-22.9	32.3	125.4
2011:11:16	05:57	56.7	231.4	119.5	17:53	-29.9	21.4	113.6
2011:11:17	05:58	59.3	209.2	107.6	17:52	-36.0	8.8	101.5
2011:11:18	05:59	57.7	185.8	95.3	17:51	-40.9	354.0	89.1
2011:11:19	06:00	52.0	166.0	82.7	17:51	-43.7	337.0	76.4
2011:11:20	06:01	43.6	151.2	69.7	17:50	-43.8	318.6	63.2
2011:11:21	06:02	33.4	140.1	56.4	17:50	-41.0	300.6	49.7
2011:11:22	06:03	22.3	131.1	42.7	17:49	-35.5	284.4	36.0
2011:11:23	06:04	10.6	123.4	28.8	17:48	-28.0	270.4	22.0
2011:11:24	06:05	-1.3	116.0	14.8	17:48	-19.2	258.3	8.0
2011:11:25	06:06	-12.9	108.5	1.3	17:48	-9.6	247.6	6.1
2011:11:26	06:07	-24.1	100.2	13.1	17:47	0.3	237.8	19.7
2011:11:27	06:08	-34.3	90.4	26.7	17:47	10.0	228.3	33.1
2011:11:28	06:09	-43.1	78.4	39.8	17:46	19.2	218.6	46.0
2011:11:29	06:10	-49.9	63.3	52.4	17:46	27.7	208.3	58.4
2011:11:30	06:11	-53.9	45.1	64.6	17:46	35.1	196.9	70.3
2011:12:01	06:12	-54.7	25.3	76.4	17:46	41.1	183.8	81.9
2011:12:02	06:13	-52.4	6.9	87.8	17:46	45.3	169.1	93.2
2011:12:03	06:14	-47.7	351.6	98.9	17:45	47.3	153.0	104.2
2011:12:04	06:15	-41.4	339.3	109.9	17:45	47.0	136.6	115.1
2011:12:05	06:16	-34.2	329.4	120.7	17:45	44.4	121.1	125.9
2011:12:06	06:17	-26.4	321.0	131.5	17:45	39.8	107.5	136.7
2011:12:07	06:18	-18.2	313.6	142.4	17:45	33.8	95.9	147.6
2011:12:08	06:18	-9.7	306.6	153.3	17:45	26.6	86.0	158.6
2011:12:09	06:19	-1.1	299.8	164.4	17:45	18.6	77.3	169.7
2011:12:10	06:20	7.5	292.7	175.6	17:45	10.1	69.5	178.9
2011:12:11	06:21	16.1	285.1	173.0	17:45	1.1	62.1	167.5
2011:12:12	06:22	24.3	276.4	161.4	17:46	-8.1	54.8	155.8
2011:12:13	06:22	32.0	266.2	149.6	17:46	-17.4	47.2	143.9
2011:12:14	06:23	38.7	253.9	137.6	17:46	-26.7	38.8	131.8
2011:12:15	06:24	43.7	239.0	125.4	17:46	-35.5	28.9	119.5
2011:12:16	06:24	46.5	221.7	113.0	17:47	-43.6	16.6	107.0
2011:12:17	06:25	46.3	203.2	100.4	17:47	-50.0	0.7	94.3
2011:12:18	06:26	43.2	185.4	87.5	17:47	-53.8	340.8	81.4
2011:12:19	06:26	37.5	169.7	74.4	17:48	-53.8	318.6	68.2
2011:12:20	06:27	30.0	156.2	61.1	17:48	-49.8	298.1	54.8
2011:12:21	06:27	21.3	144.6	47.6	17:49	-42.7	281.7	41.2
2011:12:22	06:28	12.0	134.2	34.0	17:49	-33.5	269.1	27.6
2011:12:23	06:28	2.4	124.4	20.5	17:50	-23.3	259.1	14.1
2011:12:24	06:29	-7.0	114.8	7.1	17:50	-12.5	250.9	1.7
2011:12:25	06:29	-16.0	104.8	6.6	17:51	-1.5	243.6	12.7
2011:12:26	06:30	-24.1	94.1	19.5	17:51	9.3	236.7	25.5
2011:12:27	06:30	-31.1	82.3	32.1	17:52	19.7	229.6	37.9
2011:12:28	06:30	-36.6	69.2	44.3	17:53	29.6	222.0	49.9
2011:12:29	06:30	-40.4	55.0	56.1	17:53	38.7	213.0	61.5
2011:12:30	06:31	-42.2	40.0	67.5	17:54	46.8	202.0	72.9
2011:12:31	06:31	-42.0	25.0	78.7	17:55	53.3	187.9	83.9
2012:01:01	06:31	-40.0	10.8	89.7	17:55	57.5	169.9	94.8

Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza della Luna sull'orizzonte, in °  
 Az = azimut della Luna, in °  
 Elong = elongazione della Luna, in °

Alt = altitude of the Moon above the horizon, in °  
 Az = azimuth of the Moon, in °  
 Elong = elongation of the Moon, in °

Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:01:01	05:57	8.1	132.8	38.5	18:30	-45.0	276.6	32.0
2011:01:02	05:58	-0.6	123.9	26.1	18:30	-35.3	267.1	19.7
2011:01:03	05:58	-9.0	114.9	13.9	18:31	-25.1	259.9	7.7
2011:01:04	05:58	-16.9	105.6	2.2	18:32	-14.6	254.2	4.4
2011:01:05	05:58	-24.1	95.7	9.9	18:33	-4.2	249.2	15.9
2011:01:06	05:58	-30.4	84.9	21.3	18:34	6.1	244.6	27.2
2011:01:07	05:58	-35.5	72.8	32.6	18:34	16.3	240.0	38.4
2011:01:08	05:58	-39.1	59.7	43.6	18:35	26.2	235.0	49.4
2011:01:09	05:58	-41.1	45.6	54.5	18:36	35.9	229.2	60.2
2011:01:10	05:58	-41.4	31.1	65.4	18:37	45.2	221.7	71.0
2011:01:11	05:58	-39.9	17.0	76.1	18:38	53.8	211.4	81.9
2011:01:12	05:57	-36.8	3.6	87.0	18:39	61.1	196.0	92.8
2011:01:13	05:57	-32.4	351.3	98.0	18:40	65.6	173.1	103.9
2011:01:14	05:57	-26.9	339.9	109.2	18:41	65.5	145.1	115.3
2011:01:15	05:57	-20.5	329.2	120.8	18:42	60.4	121.4	127.0
2011:01:16	05:56	-13.5	319.1	132.7	18:43	52.0	105.4	139.2
2011:01:17	05:56	-5.9	309.0	145.0	18:44	41.6	94.8	151.7
2011:01:18	05:56	2.0	298.7	157.7	18:45	30.1	87.3	164.6
2011:01:19	05:55	9.9	287.8	170.7	18:46	17.8	81.5	177.0
2011:01:20	05:55	17.5	276.0	175.0	18:47	5.1	76.6	168.0
2011:01:21	05:54	24.4	262.9	161.7	18:48	-7.7	72.0	154.4
2011:01:22	05:54	29.8	248.3	148.0	18:49	-20.5	67.2	140.6
2011:01:23	05:53	33.5	232.2	134.3	18:50	-33.0	61.7	127.0
2011:01:24	05:53	34.9	215.4	120.8	18:51	-45.0	54.5	113.5
2011:01:25	05:52	33.9	198.8	107.4	18:52	-56.0	43.7	100.3
2011:01:26	05:52	31.0	183.2	94.4	18:53	-65.1	25.7	87.4
2011:01:27	05:51	26.4	169.1	81.6	18:54	-70.1	355.6	74.8
2011:01:28	05:50	20.9	156.4	69.1	18:55	-68.3	321.6	62.4
2011:01:29	05:50	14.7	144.9	56.9	18:57	-61.4	298.7	50.3
2011:01:30	05:49	8.2	134.2	44.9	18:58	-52.2	285.7	38.4
2011:01:31	05:48	1.6	124.0	33.2	18:59	-42.1	277.7	26.8
2011:02:01	05:47	-4.8	114.0	21.7	19:00	-31.7	272.2	15.5
2011:02:02	05:46	-10.9	103.9	10.5	19:01	-21.2	268.0	5.1
2011:02:03	05:45	-16.6	93.5	3.7	19:02	-10.7	264.6	8.2
2011:02:04	05:45	-21.6	82.7	12.8	19:03	-0.2	261.5	18.8
2011:02:05	05:44	-25.7	71.3	23.6	19:04	10.1	258.5	29.6
2011:02:06	05:43	-29.0	59.4	34.4	19:06	20.4	255.3	40.3
2011:02:07	05:42	-31.1	46.8	45.1	19:07	30.6	251.5	51.1
2011:02:08	05:41	-32.1	33.9	55.8	19:08	40.7	246.8	61.9
2011:02:09	05:40	-31.8	20.8	66.7	19:09	50.6	240.2	72.8
2011:02:10	05:38	-30.3	7.8	77.6	19:10	59.9	229.6	83.8
2011:02:11	05:37	-27.6	355.1	88.7	19:11	67.8	210.8	95.1
2011:02:12	05:36	-23.9	342.7	100.1	19:12	71.6	178.4	106.8
2011:02:13	05:35	-19.2	330.7	111.9	19:13	68.5	143.5	118.8
2011:02:14	05:34	-13.6	318.9	124.1	19:15	59.9	121.8	131.3
2011:02:15	05:33	-7.5	307.1	136.8	19:16	48.8	109.8	144.3
2011:02:16	05:31	-0.9	295.2	149.9	19:17	36.5	102.4	157.6
2011:02:17	05:30	5.8	282.8	163.3	19:18	23.4	97.1	170.8

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:02:18	05:29	12.2	269.8	175.2	19:19	10.0	92.8	172.7
2011:02:19	05:27	18.0	255.9	167.3	19:20	-3.5	89.0	159.5
2011:02:20	05:26	22.8	241.1	153.6	19:21	-16.9	85.0	145.6
2011:02:21	05:25	26.0	225.6	139.8	19:23	-29.9	80.6	131.8
2011:02:22	05:23	27.5	209.7	126.2	19:24	-42.2	74.8	118.4
2011:02:23	05:22	27.2	194.1	112.9	19:25	-53.8	66.3	105.3
2011:02:24	05:20	25.3	179.2	100.0	19:26	-63.8	52.2	92.6
2011:02:25	05:19	22.2	165.3	87.5	19:27	-70.8	26.5	80.3
2011:02:26	05:17	18.2	152.5	75.4	19:28	-71.7	349.9	68.4
2011:02:27	05:16	13.6	140.6	63.6	19:30	-66.3	321.4	56.8
2011:02:28	05:14	8.6	129.4	52.1	19:31	-57.9	305.7	45.4
2011:03:01	05:13	3.4	118.7	40.8	19:32	-48.4	296.6	34.2
2011:03:02	05:11	-1.8	108.3	29.8	19:33	-38.4	290.6	23.2
2011:03:03	05:10	-6.8	97.9	19.0	19:34	-28.3	286.3	12.7
2011:03:04	05:08	-11.5	87.4	8.8	19:35	-18.1	282.8	4.9
2011:03:05	05:07	-15.9	76.7	5.9	19:37	-7.8	279.7	11.1
2011:03:06	05:05	-19.7	65.6	15.0	19:38	2.4	276.7	21.3
2011:03:07	05:03	-22.8	54.0	25.5	19:39	12.6	273.6	31.9
2011:03:08	05:02	-25.2	42.0	36.1	19:40	22.9	270.1	42.7
2011:03:09	05:00	-26.6	29.5	46.9	19:41	33.1	265.8	53.6
2011:03:10	04:58	-27.1	16.7	57.9	19:43	43.1	260.0	64.7
2011:03:11	04:56	-26.5	3.8	69.0	19:44	52.9	251.5	75.9
2011:03:12	04:55	-24.8	350.8	80.3	19:45	61.8	237.5	87.5
2011:03:13	04:53	-22.1	337.9	92.0	19:46	68.1	213.2	99.5
2011:03:14	04:51	-18.4	325.1	104.1	19:47	68.8	178.9	111.8
2011:03:15	04:49	-13.8	312.4	116.6	19:49	62.8	150.6	124.7
2011:03:16	04:48	-8.5	299.7	129.6	19:50	52.7	133.7	138.0
2011:03:17	04:46	-2.8	286.9	143.0	19:51	40.8	123.4	151.6
2011:03:18	04:44	3.2	273.8	156.7	19:52	28.0	116.4	165.3
2011:03:19	04:42	9.1	260.2	170.0	19:54	14.7	110.9	175.0
2011:03:20	04:40	14.5	246.0	172.5	19:55	1.4	106.0	164.5
2011:03:21	04:38	19.0	231.3	159.5	19:56	-11.7	101.1	150.8
2011:03:22	04:37	22.2	216.0	145.8	19:57	-24.2	95.8	137.1
2011:03:23	04:35	23.9	200.6	132.3	19:59	-36.1	89.4	123.8
2011:03:24	04:33	24.1	185.5	119.2	20:00	-46.9	80.9	111.0
2011:03:25	04:31	23.0	171.0	106.5	20:01	-56.3	68.6	98.6
2011:03:26	04:29	20.7	157.4	94.3	20:03	-63.3	50.0	86.6
2011:03:27	04:27	17.6	144.6	82.5	20:04	-66.5	24.2	75.0
2011:03:28	04:25	13.8	132.7	71.0	20:05	-64.8	357.7	63.7
2011:03:29	04:23	9.6	121.4	59.8	20:07	-59.3	337.8	52.6
2011:03:30	04:21	5.2	110.5	48.8	20:08	-51.6	324.5	41.7
2011:03:31	04:19	0.6	100.0	38.0	20:09	-43.0	315.5	30.9
2011:04:01	04:17	-3.9	89.6	27.3	20:11	-33.9	308.7	20.3
2011:04:02	04:15	-8.4	79.1	16.7	20:12	-24.5	303.3	10.1
2011:04:03	04:14	-12.6	68.4	7.1	20:13	-14.9	298.5	5.2
2011:04:04	04:12	-16.4	57.4	7.3	20:15	-5.2	294.1	13.7
2011:04:05	04:10	-19.8	45.9	17.2	20:16	4.6	289.5	24.3
2011:04:06	04:08	-22.5	33.9	27.9	20:17	14.4	284.7	35.3
2011:04:07	04:06	-24.4	21.5	38.9	20:19	24.1	279.0	46.5
2011:04:08	04:04	-25.3	8.5	50.1	20:20	33.7	272.1	57.8
2011:04:09	04:02	-25.3	355.3	61.5	20:22	42.8	263.0	69.5
2011:04:10	04:00	-24.1	341.9	73.3	20:23	50.9	250.3	81.5
2011:04:11	03:58	-21.9	328.5	85.3	20:25	57.1	232.1	93.8
2011:04:12	03:56	-18.6	315.2	97.7	20:26	59.6	208.3	106.5
2011:04:13	03:54	-14.4	302.0	110.5	20:28	57.3	183.5	119.6
2011:04:14	03:52	-9.5	288.9	123.7	20:29	50.5	163.5	133.1
2011:04:15	03:50	-3.9	275.8	137.3	20:31	41.0	149.0	146.9
2011:04:16	03:48	1.9	262.5	151.2	20:32	30.0	138.2	160.9
2011:04:17	03:46	7.7	248.9	165.0	20:34	18.3	129.6	173.8
2011:04:18	03:44	13.0	235.0	175.7	20:35	6.5	122.1	169.5
2011:04:19	03:42	17.6	220.5	165.6	20:37	-5.1	115.0	156.1
2011:04:20	03:40	21.0	205.7	152.1	20:38	-16.1	107.6	142.7
2011:04:21	03:38	23.1	190.8	138.9	20:40	-26.4	99.5	129.7
2011:04:22	03:36	23.8	176.1	126.1	20:41	-35.5	90.1	117.2
2011:04:23	03:34	23.3	161.8	113.7	20:43	-43.3	78.7	105.1
2011:04:24	03:32	21.5	148.4	101.7	20:44	-49.3	64.8	93.4
2011:04:25	03:30	18.9	135.7	90.2	20:46	-53.0	48.3	82.0
2011:04:26	03:28	15.6	123.8	78.9	20:48	-54.0	30.3	70.9
2011:04:27	03:26	11.7	112.5	67.9	20:49	-52.3	12.9	60.0
2011:04:28	03:24	7.5	101.7	57.0	20:51	-48.3	357.8	49.1
2011:04:29	03:22	3.0	91.2	46.2	20:52	-42.6	345.2	38.3
2011:04:30	03:21	-1.6	80.8	35.4	20:54	-35.9	334.9	27.5
2011:05:01	03:19	-6.2	70.4	24.6	20:56	-28.4	326.0	16.7
2011:05:02	03:17	-10.7	59.8	13.9	20:57	-20.4	318.2	6.3
2011:05:03	03:15	-14.9	48.9	4.2	20:59	-12.2	310.9	6.8
2011:05:04	03:13	-18.8	37.4	9.4	21:01	-3.7	303.8	17.5
2011:05:05	03:11	-22.0	25.3	20.4	21:02	4.8	296.5	28.9
2011:05:06	03:09	-24.5	12.5	31.9	21:04	13.2	288.6	40.6
2011:05:07	03:08	-26.1	359.2	43.6	21:06	21.3	279.8	52.5
2011:05:08	03:06	-26.5	345.4	55.5	21:07	28.9	269.6	64.6
2011:05:09	03:04	-25.7	331.4	67.7	21:09	35.6	257.5	77.1
2011:05:10	03:02	-23.6	317.5	80.2	21:11	40.8	242.9	89.8
2011:05:11	03:01	-20.4	303.7	92.9	21:12	43.7	225.9	102.8
2011:05:12	02:59	-16.1	290.3	106.0	21:14	43.9	207.6	116.1
2011:05:13	02:57	-10.9	277.1	119.4	21:16	41.2	189.7	129.7
2011:05:14	02:56	-5.2	264.2	133.0	21:17	35.8	173.6	143.5
2011:05:15	02:54	0.9	251.3	146.7	21:19	28.7	159.7	157.3
2011:05:16	02:52	7.0	238.4	160.5	21:20	20.6	147.7	171.0
2011:05:17	02:51	12.7	225.1	174.0	21:22	11.9	136.9	174.5
2011:05:18	02:49	17.8	211.4	171.6	21:24	3.3	127.0	161.4
2011:05:19	02:48	21.8	197.4	158.5	21:25	-5.0	117.3	148.4
2011:05:20	02:46	24.7	183.1	145.6	21:27	-12.8	107.6	135.8
2011:05:21	02:45	26.1	168.8	133.1	21:29	-19.7	97.6	123.7
2011:05:22	02:43	26.2	154.8	121.1	21:30	-25.7	87.1	111.9

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:05:23	02:42	25.1	141.4	109.4	21:32	-30.6	75.8	100.4
2011:05:24	02:40	22.9	128.7	98.0	21:33	-34.3	63.8	89.2
2011:05:25	02:39	19.9	116.7	86.9	21:35	-36.6	51.0	78.2
2011:05:26	02:38	16.1	105.4	76.0	21:36	-37.6	37.9	67.4
2011:05:27	02:37	11.8	94.7	65.1	21:38	-37.1	24.7	56.5
2011:05:28	02:35	7.0	84.4	54.2	21:39	-35.3	11.8	45.6
2011:05:29	02:34	2.0	74.3	43.3	21:40	-32.3	359.4	34.5
2011:05:30	02:33	-3.2	64.2	32.3	21:42	-28.3	347.7	23.3
2011:05:31	02:32	-8.5	53.9	21.1	21:43	-23.5	336.6	12.0
2011:06:01	02:31	-13.8	43.3	9.7	21:44	-18.0	326.1	1.2
2011:06:02	02:30	-18.7	32.1	2.3	21:46	-12.0	315.8	11.6
2011:06:03	02:29	-23.2	20.1	14.0	21:47	-5.8	305.6	23.7
2011:06:04	02:28	-27.0	7.1	26.1	21:48	0.5	295.4	36.0
2011:06:05	02:28	-29.6	353.3	38.4	21:49	6.8	284.8	48.5
2011:06:06	02:27	-31.0	338.7	50.9	21:50	12.8	273.6	61.2
2011:06:07	02:26	-30.8	323.8	63.6	21:52	18.2	261.6	74.0
2011:06:08	02:25	-29.0	308.9	76.5	21:53	22.8	248.7	87.1
2011:06:09	02:25	-25.6	294.6	89.6	21:54	26.3	234.7	100.3
2011:06:10	02:24	-21.0	281.0	102.8	21:54	28.4	219.9	113.7
2011:06:11	02:24	-15.3	268.2	116.2	21:55	29.0	204.6	127.1
2011:06:12	02:23	-8.8	256.0	129.6	21:56	27.9	189.4	140.6
2011:06:13	02:23	-1.9	244.3	143.1	21:57	25.3	174.7	154.0
2011:06:14	02:23	5.2	232.8	156.5	21:58	21.6	160.8	167.3
2011:06:15	02:23	12.1	221.1	169.7	21:58	17.0	147.8	179.6
2011:06:16	02:22	18.5	209.2	177.2	21:59	11.9	135.7	166.8
2011:06:17	02:22	24.1	196.7	164.5	21:59	6.6	124.3	154.3
2011:06:18	02:22	28.6	183.6	152.1	22:00	1.3	113.4	142.2
2011:06:19	02:22	31.9	170.0	140.0	22:00	-3.8	102.8	130.4
2011:06:20	02:23	33.6	156.1	128.3	22:00	-8.6	92.4	119.0
2011:06:21	02:23	33.8	142.2	116.9	22:01	-13.0	81.9	107.8
2011:06:22	02:23	32.6	128.8	105.7	22:01	-16.9	71.3	96.7
2011:06:23	02:23	30.1	116.2	94.8	22:01	-20.2	60.4	85.8
2011:06:24	02:24	26.4	104.5	83.8	22:01	-23.0	49.1	74.9
2011:06:25	02:24	21.7	93.6	72.9	22:01	-25.0	37.3	64.0
2011:06:26	02:24	16.3	83.5	62.0	22:01	-26.3	25.1	52.9
2011:06:27	02:25	10.2	74.0	50.8	22:01	-26.6	12.5	41.6
2011:06:28	02:26	3.6	64.7	39.5	22:01	-26.0	359.6	30.0
2011:06:29	02:26	-3.4	55.6	27.9	22:01	-24.4	346.6	18.2
2011:06:30	02:27	-10.6	46.2	16.0	22:00	-21.9	333.6	6.2
2011:07:01	02:28	-17.9	36.3	4.0	22:00	-18.4	320.8	6.6
2011:07:02	02:29	-25.0	25.5	8.9	21:59	-14.2	308.3	19.2
2011:07:03	02:29	-31.4	13.4	21.6	21:59	-9.4	295.9	32.1
2011:07:04	02:30	-36.9	359.5	34.5	21:58	-4.2	283.6	45.1
2011:07:05	02:31	-40.7	343.8	47.6	21:58	1.1	271.4	58.3
2011:07:06	02:32	-42.2	326.7	60.8	21:57	6.4	259.0	71.5
2011:07:07	02:33	-41.2	309.4	74.0	21:56	11.4	246.3	84.7
2011:07:08	02:35	-37.8	293.3	87.3	21:56	15.8	233.1	97.9
2011:07:09	02:36	-32.4	279.0	100.5	21:55	19.5	219.5	111.1
2011:07:10	02:37	-25.4	266.6	113.7	21:54	22.1	205.4	124.2
2011:07:11	02:38	-17.5	255.7	126.8	21:53	23.6	191.0	137.2
2011:07:12	02:39	-9.0	246.1	139.7	21:52	23.8	176.6	150.0
2011:07:13	02:41	-0.2	237.1	152.5	21:51	22.8	162.4	162.6
2011:07:14	02:42	8.7	228.3	165.1	21:50	20.7	148.8	174.5
2011:07:15	02:43	17.3	219.5	176.6	21:49	17.7	135.9	172.2
2011:07:16	02:45	25.5	210.1	169.9	21:47	14.1	123.7	160.6
2011:07:17	02:46	33.0	199.8	158.2	21:46	9.9	112.1	149.0
2011:07:18	02:48	39.4	188.0	146.6	21:45	5.5	101.2	137.7
2011:07:19	02:49	44.4	174.6	135.3	21:44	1.0	90.6	126.5
2011:07:20	02:51	47.6	159.4	124.2	21:42	-3.5	80.1	115.6
2011:07:21	02:52	48.5	143.2	113.2	21:41	-8.0	69.7	104.7
2011:07:22	02:54	47.0	127.3	102.3	21:39	-12.2	59.2	93.8
2011:07:23	02:55	43.5	112.9	91.4	21:38	-16.2	48.3	82.9
2011:07:24	02:57	38.1	100.5	80.5	21:36	-19.7	36.8	71.8
2011:07:25	02:58	31.4	89.9	69.3	21:35	-22.6	24.7	60.5
2011:07:26	03:00	23.7	80.8	57.9	21:33	-24.8	11.9	48.9
2011:07:27	03:01	15.1	72.7	46.3	21:32	-26.0	358.4	37.0
2011:07:28	03:03	5.8	65.3	34.2	21:30	-26.0	344.3	24.8
2011:07:29	03:05	-4.1	58.1	21.9	21:29	-24.8	329.9	12.3
2011:07:30	03:06	-14.2	50.8	9.5	21:27	-22.2	315.5	3.8
2011:07:31	03:08	-24.5	42.7	5.7	21:25	-18.5	301.5	15.0
2011:08:01	03:09	-34.5	33.2	18.1	21:23	-13.8	287.9	28.2
2011:08:02	03:11	-43.8	21.2	31.5	21:22	-8.4	274.8	41.7
2011:08:03	03:13	-51.4	5.4	45.0	21:20	-2.6	262.0	55.2
2011:08:04	03:14	-56.2	344.6	58.5	21:18	3.3	249.4	68.6
2011:08:05	03:16	-56.7	321.1	71.9	21:16	8.9	236.7	81.9
2011:08:06	03:17	-53.0	299.7	85.2	21:15	14.1	223.9	94.9
2011:08:07	03:19	-46.2	283.3	98.2	21:13	18.6	210.7	107.8
2011:08:08	03:21	-37.6	271.3	111.0	21:11	22.1	197.1	120.4
2011:08:09	03:22	-28.0	262.2	123.6	21:09	24.4	183.1	132.8
2011:08:10	03:24	-18.0	254.9	136.0	21:07	25.5	169.0	145.0
2011:08:11	03:25	-7.7	248.7	148.1	21:05	25.3	155.0	156.9
2011:08:12	03:27	2.5	243.0	160.0	21:03	23.8	141.5	168.3
2011:08:13	03:28	12.7	237.5	171.1	21:01	21.3	128.5	175.6
2011:08:14	03:30	22.6	231.7	174.2	21:00	17.8	116.4	167.1
2011:08:15	03:32	32.2	225.2	164.2	20:58	13.7	104.9	156.3
2011:08:16	03:33	41.3	217.4	153.3	20:56	9.2	94.0	145.3
2011:08:17	03:35	49.6	207.2	142.3	20:54	4.3	83.5	134.5
2011:08:18	03:36	56.5	193.4	131.5	20:52	-0.7	73.3	123.7
2011:08:19	03:38	61.2	174.6	120.6	20:50	-5.7	63.1	112.9
2011:08:20	03:39	62.5	151.9	109.8	20:48	-10.7	52.7	102.0
2011:08:21	03:41	59.8	130.0	98.9	20:46	-15.5	42.0	91.0
2011:08:22	03:42	53.9	112.9	87.8	20:44	-19.9	30.6	79.8
2011:08:23	03:44	46.0	100.5	76.4	20:42	-23.7	18.3	68.3
2011:08:24	03:45	36.6	91.5	64.8	20:40	-26.7	5.0	56.4

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:08:25	03:47	26.3	84.5	52.8	20:38	-28.6	350.7	44.1
2011:08:26	03:48	15.2	78.7	40.3	20:36	-29.0	335.6	31.4
2011:08:27	03:49	3.5	73.5	27.5	20:34	-27.8	320.1	18.4
2011:08:28	03:51	-8.7	68.4	14.5	20:32	-24.9	304.8	6.4
2011:08:29	03:52	-21.0	63.0	4.8	20:30	-20.5	290.1	10.8
2011:08:30	03:54	-33.3	56.6	14.7	20:28	-14.9	276.2	24.0
2011:08:31	03:55	-45.3	48.1	28.3	20:26	-8.6	262.9	37.8
2011:09:01	03:57	-56.1	35.3	42.1	20:24	-1.9	250.3	51.4
2011:09:02	03:58	-64.5	14.3	55.7	20:22	4.8	237.9	64.9
2011:09:03	03:59	-67.7	342.8	69.1	20:20	11.2	225.5	78.0
2011:09:04	04:01	-64.3	312.4	82.2	20:18	16.9	213.0	90.9
2011:09:05	04:02	-56.5	292.8	94.9	20:16	21.8	200.0	103.3
2011:09:06	04:03	-46.8	281.1	107.3	20:14	25.6	186.6	115.5
2011:09:07	04:05	-36.5	273.4	119.4	20:12	28.1	172.8	127.4
2011:09:08	04:06	-25.9	267.9	131.3	20:10	29.1	158.8	139.0
2011:09:09	04:07	-15.2	263.5	142.8	20:08	28.8	144.9	150.4
2011:09:10	04:09	-4.6	259.7	154.2	20:06	27.1	131.5	161.5
2011:09:11	04:10	5.9	256.2	165.1	20:04	24.2	118.8	171.7
2011:09:12	04:11	16.3	252.6	174.2	20:02	20.3	106.9	173.4
2011:09:13	04:12	26.6	248.6	170.5	20:00	15.7	95.8	163.9
2011:09:14	04:14	36.6	243.9	160.3	19:58	10.6	85.3	153.4
2011:09:15	04:15	46.3	237.6	149.7	19:56	5.0	75.3	142.7
2011:09:16	04:16	55.5	228.5	139.0	19:54	-0.7	65.5	131.9
2011:09:17	04:17	63.5	214.1	128.2	19:52	-6.5	55.6	121.1
2011:09:18	04:19	68.9	190.4	117.3	19:50	-12.3	45.5	110.1
2011:09:19	04:20	69.4	159.0	106.2	19:48	-17.9	34.9	99.0
2011:09:20	04:21	64.4	132.9	94.9	19:46	-23.0	23.4	87.5
2011:09:21	04:22	56.0	116.6	83.4	19:44	-27.5	10.8	75.8
2011:09:22	04:23	45.9	106.5	71.4	19:42	-31.0	356.8	63.6
2011:09:23	04:25	34.6	99.6	59.0	19:40	-33.0	341.5	50.9
2011:09:24	04:26	22.6	94.4	46.2	19:39	-33.1	325.3	37.8
2011:09:25	04:27	10.0	90.0	32.9	19:37	-31.2	308.9	24.4
2011:09:26	04:28	-3.0	85.9	19.4	19:35	-27.2	293.0	11.0
2011:09:27	04:29	-16.3	81.7	6.7	19:33	-21.6	278.3	6.4
2011:09:28	04:30	-29.5	76.8	10.7	19:31	-14.7	264.7	19.1
2011:09:29	04:32	-42.4	70.3	24.2	19:29	-7.1	252.0	32.9
2011:09:30	04:33	-54.4	60.5	38.1	19:28	0.7	240.0	46.6
2011:10:01	04:34	-64.7	43.5	51.7	19:26	8.3	228.2	60.0
2011:10:02	04:35	-70.8	12.8	65.0	19:24	15.4	216.4	72.9
2011:10:03	04:36	-69.5	335.6	77.8	19:22	21.8	204.3	85.5
2011:10:04	04:37	-62.4	311.4	90.2	19:20	27.0	191.5	97.6
2011:10:05	04:38	-53.0	298.2	102.2	19:19	31.0	178.1	109.4
2011:10:06	04:39	-42.8	290.2	113.9	19:17	33.5	164.0	120.9
2011:10:07	04:41	-32.5	284.8	125.3	19:15	34.3	149.7	132.1
2011:10:08	04:42	-22.1	280.7	136.5	19:14	33.5	135.6	143.2
2011:10:09	04:43	-11.7	277.3	147.5	19:12	31.2	122.2	154.1
2011:10:10	04:44	-1.4	274.1	158.3	19:10	27.5	109.7	164.7
2011:10:11	04:45	8.9	271.0	168.8	19:09	22.8	98.2	174.3
2011:10:12	04:46	19.2	267.5	175.7	19:07	17.4	87.7	171.8
2011:10:13	04:47	29.3	263.6	167.9	19:05	11.3	77.8	161.7
2011:10:14	04:48	39.2	258.5	157.4	19:04	4.8	68.4	151.0
2011:10:15	04:49	48.9	251.5	146.6	19:02	-1.9	59.1	140.2
2011:10:16	04:50	57.9	240.8	135.7	19:01	-8.8	49.9	129.1
2011:10:17	04:52	65.3	223.2	124.6	18:59	-15.5	40.2	118.0
2011:10:18	04:53	69.3	195.4	113.3	18:58	-22.1	29.8	106.5
2011:10:19	04:54	67.4	164.0	101.7	18:56	-28.2	18.2	94.8
2011:10:20	04:55	60.5	141.5	89.8	18:55	-33.4	5.0	82.7
2011:10:21	04:56	50.8	127.8	77.5	18:53	-37.2	350.0	70.2
2011:10:22	04:57	39.7	119.0	64.8	18:52	-39.2	333.3	57.3
2011:10:23	04:58	27.6	112.6	51.7	18:51	-38.6	315.7	43.9
2011:10:24	04:59	14.9	107.4	38.1	18:49	-35.5	298.5	30.1
2011:10:25	05:00	1.9	102.6	24.2	18:48	-30.0	282.6	16.2
2011:10:26	05:01	-11.3	97.8	10.3	18:47	-22.8	268.6	3.8
2011:10:27	05:02	-24.4	92.4	5.7	18:45	-14.4	256.0	13.1
2011:10:28	05:04	-37.1	85.7	19.0	18:44	-5.4	244.6	26.9
2011:10:29	05:05	-48.8	76.3	32.8	18:43	3.6	233.8	40.5
2011:10:30	05:06	-58.9	61.8	46.2	18:42	12.3	223.2	53.7
2011:10:31	05:07	-65.8	38.6	59.3	18:41	20.4	212.3	66.4
2011:11:01	05:08	-67.3	7.8	71.8	18:39	27.5	200.8	78.6
2011:11:02	05:09	-63.1	341.3	83.9	18:38	33.5	188.3	90.5
2011:11:03	05:10	-55.7	324.2	95.6	18:37	38.0	174.6	102.0
2011:11:04	05:11	-46.8	313.4	106.9	18:36	40.7	159.9	113.2
2011:11:05	05:12	-37.4	305.9	118.1	18:35	41.4	144.7	124.2
2011:11:06	05:13	-27.8	300.3	129.0	18:34	40.1	129.8	135.1
2011:11:07	05:14	-18.0	295.6	139.9	18:33	37.0	115.9	145.9
2011:11:08	05:15	-8.2	291.3	150.7	18:32	32.4	103.4	156.7
2011:11:09	05:16	1.6	287.1	161.5	18:31	26.6	92.4	167.4
2011:11:10	05:17	11.4	282.8	172.1	18:30	19.9	82.5	177.2
2011:11:11	05:19	21.2	277.9	175.9	18:29	12.6	73.4	170.2
2011:11:12	05:20	30.9	272.0	165.3	18:29	4.9	65.0	159.3
2011:11:13	05:21	40.2	264.5	154.2	18:28	-3.2	56.7	148.1
2011:11:14	05:22	48.9	254.4	143.0	18:27	-11.4	48.3	136.7
2011:11:15	05:23	56.2	239.7	131.5	18:26	-19.5	39.5	125.2
2011:11:16	05:24	61.0	219.1	119.8	18:26	-27.4	29.6	113.3
2011:11:17	05:25	61.7	194.0	107.8	18:25	-34.8	18.1	101.3
2011:11:18	05:26	57.6	170.8	95.6	18:24	-41.0	4.4	88.8
2011:11:19	05:27	50.1	153.6	83.0	18:24	-45.6	347.8	76.1
2011:11:20	05:28	40.3	141.2	70.0	18:23	-47.4	328.7	62.9
2011:11:21	05:29	29.4	131.9	56.7	18:23	-45.9	309.0	49.4
2011:11:22	05:30	17.6	124.3	43.1	18:22	-41.2	291.0	35.6
2011:11:23	05:31	5.5	117.5	29.2	18:22	-33.9	275.8	21.7
2011:11:24	05:32	-6.7	110.7	15.1	18:21	-25.0	263.2	7.7
2011:11:25	05:33	-18.6	103.6	1.5	18:21	-15.1	252.6	6.4
2011:11:26	05:34	-29.9	95.2	12.8	18:21	-4.9	243.1	20.1

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2011:11:27	05:35	-40.2	84.9	26.3	18:20	5.3	234.3	33.4
2011:11:28	05:36	-48.9	71.5	39.5	18:20	15.2	225.5	46.2
2011:11:29	05:37	-55.0	54.0	52.1	18:20	24.5	216.3	58.7
2011:11:30	05:38	-57.8	33.0	64.3	18:19	32.9	206.2	70.6
2011:12:01	05:39	-56.7	11.7	76.1	18:19	40.2	194.6	82.2
2011:12:02	05:39	-52.5	353.7	87.5	18:19	45.9	180.9	93.4
2011:12:03	05:40	-46.3	339.9	98.7	18:19	49.7	164.9	104.5
2011:12:04	05:41	-38.9	329.3	109.6	18:19	50.9	147.6	115.3
2011:12:05	05:42	-30.8	320.8	120.5	18:19	49.5	130.4	126.2
2011:12:06	05:43	-22.3	313.5	131.3	18:19	45.6	115.0	137.0
2011:12:07	05:44	-13.6	307.0	142.1	18:19	39.9	102.1	147.9
2011:12:08	05:45	-4.7	300.8	153.1	18:19	32.8	91.3	158.8
2011:12:09	05:45	4.3	294.5	164.1	18:19	24.7	82.3	170.0
2011:12:10	05:46	13.2	287.7	175.4	18:19	15.9	74.5	178.7
2011:12:11	05:47	22.0	280.1	173.2	18:19	6.6	67.3	167.2
2011:12:12	05:48	30.5	271.2	161.6	18:19	-3.0	60.5	155.5
2011:12:13	05:48	38.1	260.3	149.8	18:20	-12.8	53.7	143.6
2011:12:14	05:49	44.5	246.6	137.9	18:20	-22.6	46.3	131.5
2011:12:15	05:50	48.8	229.8	125.7	18:20	-32.3	37.8	119.3
2011:12:16	05:50	50.2	210.6	113.3	18:21	-41.4	27.2	106.7
2011:12:17	05:51	48.3	191.2	100.7	18:21	-49.4	13.2	94.0
2011:12:18	05:52	43.3	174.0	87.8	18:21	-55.3	354.4	81.0
2011:12:19	05:52	36.0	159.6	74.7	18:22	-57.4	331.1	67.8
2011:12:20	05:53	27.2	147.7	61.4	18:22	-54.9	307.7	54.4
2011:12:21	05:53	17.6	137.4	48.0	18:23	-48.5	288.7	40.9
2011:12:22	05:54	7.4	128.0	34.4	18:23	-39.6	274.6	27.3
2011:12:23	05:54	-2.7	118.9	20.8	18:24	-29.2	264.2	13.8
2011:12:24	05:55	-12.7	109.7	7.4	18:24	-18.2	255.9	1.7
2011:12:25	05:55	-21.9	99.8	6.3	18:25	-7.1	249.0	13.0
2011:12:26	05:56	-30.2	88.7	19.2	18:25	4.1	242.6	25.8
2011:12:27	05:56	-37.1	76.1	31.8	18:26	14.9	236.4	38.2
2011:12:28	05:56	-42.2	61.8	44.0	18:27	25.2	229.8	50.2
2011:12:29	05:57	-45.1	46.1	55.8	18:27	35.0	222.3	61.8
2011:12:30	05:57	-45.7	29.8	67.3	18:28	44.0	213.2	73.1
2011:12:31	05:57	-44.1	14.3	78.4	18:29	51.8	201.3	84.2
2012:01:01	05:57	-40.7	0.2	89.4	18:29	57.9	185.3	95.1

Date = data nel formato aaaa/mm/gg  
 Times = ore  
 Morning twilights = crepuscolo mattutino  
 Evening twilight = crepuscolo serale  
 Alt = altezza della Luna sull'orizzonte, in °  
 Az = azimut della Luna, in °  
 Elong = elongazione della Luna, in °

Alt = altitude of the Moon above the horizon, in °  
 Az = azimuth of the Moon, in °  
 Elong = elongation of the Moon, in °

# EVENTI GEOCENTRICI <5° LUNA-PIANETI

## GEOCENTRIC EVENTS <5° MOON-PLANETS

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2011/01/02	14:46:50	3.78339	1.20805	0.871	0.003	178	-22	-0.0	-7.9		Mercury	Moon
2011/01/04	23:19:46	2.68930	1.18367	2.379	0.003	346	7	1.1	-5.5		Mars	Moon
2011/01/07	20:21:12	4.74917	1.15722	30.761	0.003	337	40	8.0	-9.2		Neptune	Moon
2011/01/30	04:02:38	3.47497	1.19849	0.837	0.003	176	-46	-4.2	-9.5		Venus	Moon
2011/02/01	15:56:12	3.44032	1.17240	1.327	0.003	343	-16	-0.4	-7.3		Mercury	Moon
2011/02/03	02:36:22	4.52259	1.16118	2.375	0.003	339	1	1.1	-3.9		Mars	Moon
2011/02/04	05:43:35	4.73142	1.15431	30.972	0.003	337	13	8.0	-6.8		Neptune	Moon
2011/03/01	02:40:33	1.51026	1.16812	1.054	0.003	343	-41	-4.0	-9.3		Venus	Moon
2011/03/03	14:11:23	4.78284	1.15063	30.975	0.003	337	-14	8.0	-7.0		Neptune	Moon
2011/03/30	21:58:04	4.95373	1.15006	30.771	0.003	337	-40	8.0	-9.2		Neptune	Moon
2011/04/04	10:10:03	1.25276	1.14489	0.636	0.003	340	9	1.9	-6.2		Mercury	Moon
2011/05/30	18:20:27	3.73978	1.16332	2.286	0.003	347	-25	1.2	-8.1		Mars	Moon
2011/05/31	16:35:06	3.67631	1.17109	1.222	0.003	353	-14	-0.9	-6.9		Mercury	Moon
2011/05/31	02:12:30	4.34102	1.16661	1.575	0.003	349	-21	-3.8	-7.7		Venus	Moon
2011/06/28	18:42:52	1.74090	1.18293	2.229	0.003	355	-31	1.2	-8.6		Mars	Moon
2011/06/30	07:34:48	0.08499	1.20356	1.675	0.003	4	-13	-3.9	-6.8	3760	Venus	Moon
2011/07/02	23:12:04	4.88946	1.23431	1.123	0.003	197	21	-0.2	-7.8		Mercury	Moon
2011/07/23	21:58:48	4.89040	1.16172	4.981	0.003	345	-83	-2.3	-10.6		Jupiter	Moon
2011/07/27	16:50:56	0.47400	1.20404	2.145	0.003	184	-39	1.3	-9.1	3314	Mars	Moon
2011/07/30	09:27:32	4.14559	1.24662	1.725	0.002	197	-5	-3.9	-5.2		Venus	Moon
2011/08/01	10:26:37	1.38775	1.26472	0.688	0.002	202	22	0.7	-8.1		Mercury	Moon
2011/08/20	09:52:44	4.64519	1.15776	4.567	0.003	345	-107	-2.5	-11.1		Jupiter	Moon
2011/08/25	12:39:52	2.63955	1.22269	2.025	0.003	191	-47	1.3	-9.6		Mars	Moon
2011/08/27	23:33:22	2.37686	1.26498	0.766	0.002	202	-16	0.5	-7.4		Mercury	Moon
2011/09/16	16:04:53	4.53613	1.15326	4.212	0.003	345	-134	-2.7	-11.8		Jupiter	Moon
2011/09/23	05:52:14	4.54718	1.23543	1.864	0.003	197	-57	1.2	-10.0		Mars	Moon
2011/10/13	17:04:35	4.63292	1.15142	4.000	0.003	345	-163	-2.8	-12.4		Jupiter	Moon
2011/10/28	02:11:29	0.22289	1.29221	1.292	0.002	189	18	-0.3	-7.7	3460	Mercury	Moon
2011/10/28	04:41:58	1.78092	1.29213	1.588	0.002	189	19	-3.9	-7.9		Venus	Moon
2011/11/09	16:01:05	4.85522	1.15201	3.995	0.003	344	167	-2.8	-12.5		Jupiter	Moon
2011/11/26	09:51:35	1.74704	1.27229	0.762	0.002	0	16	0.3	-7.4		Mercury	Moon
2011/11/27	03:57:21	2.80536	1.26224	1.467	0.002	354	26	-3.8	-8.5		Venus	Moon
2011/12/06	17:18:10	4.98167	1.15325	4.205	0.003	343	137	-2.7	-11.9		Jupiter	Moon
2011/12/23	03:40:28	2.57288	1.27060	1.016	0.002	183	-22	-0.2	-8.1		Mercury	Moon

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione del pianeta

R1 = distanza in U.A. del pianeta dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m2 = magnitudine della Luna

tm = se presente, il pianeta viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation of the planet

R1 = distance in A.U. of the planet from the Earth

R2 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

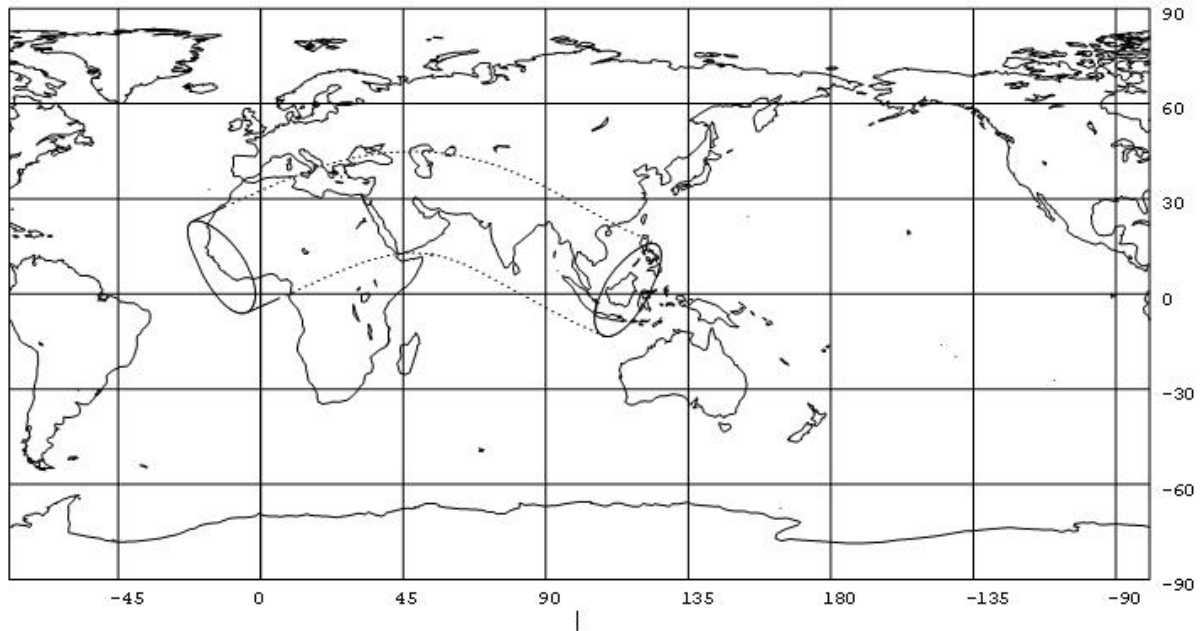
m1 = magnitude of the planet

m2 = magnitude of the Moon

tm = if present, the planet is occulted maximum for x seconds



# Occultation of Venus, Magnitude -3.8, on 2011 Jun 30



Occult 4.0.7.0

UT of conjunction = 7h 33.0m

Luna: % illuminazione 1-, elongazione solare 13°

Moon: % illumination 1-, solar elongation 13°

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az					
DZ Adrar	5	34	30	4	16	72	-38N	34	38	-0.7	+3.1
DZ Biskra	6	0	19	17	28	80	-11N	6	10	+9.9	+9.9
DZ Djanet	5	23	18	9	21	73	-66N	63	66	+0.1	+1.8
DZ El Golea	5	41	23	9	21	75	-32N	28	31	-0.8	+3.8
DZ Ghardaia	5	48	11	12	23	77	-24N	20	23	-1.2	+4.9
DZ Hassi-Messaoud	5	43	5	13	24	77	-34N	30	33	-0.7	+3.8
DZ Illizi	5	27	51	10	22	74	-58N	54	57	-0.1	+2.2
DZ In Salah	5	31	10	6	17	72	-46N	41	45	-0.5	+2.7
DZ Laghouat	5	59	26	14	25	78	-7N	3	7	+9.9	+9.9
DZ Ouargla	5	44	30	13	24	77	-31N	27	30	-0.8	+4.0
DZ Reggan	5	30	56	4	15	71	-44N	40	43	-0.6	+2.7
DZ Tamanrasset	5	20	46	4	16	71	-65N	61	65	-0.1	+1.7
DZ Tebessa	5	59	58	19	30	82	-15N	10	14	-2.1	+7.8
DZ Tilrempt	5	51	47	13	24	77	-19N	14	18	-1.7	+6.0
DZ Timimoun	5	38	44	6	18	73	-33N	29	32	-0.9	+3.6
DZ Tindouf	5	43	24	0	11	70	-19N	14	18	-1.9	+5.2
DZ Touggourt	5	48	56	14	26	78	-26N	22	26	-1.0	+4.7
BJ Cotonou	5	9	41	-8	5	67	-67S	110	114	+0.4	-0.5
BJ Parakou	5	9	0	-6	6	68	-77S	100	104	+0.3	+0.0
BF Bobo-Dioulasso	5	9	20	-12	1	67	-88N	84	88	-0.2	+0.5
BF Ouagadougou	5	9	35	-8	4	67	-88N	85	88	-0.1	+0.6
CM Bafoussam	5	16	49	1	14	68	-49S	128	132	+1.3	-1.6
CM Bamenda	5	15	47	1	14	68	-52S	126	129	+1.2	-1.4
CM Batouri	5	26	47	7	19	67	-33S	145	149	+2.6	-3.7
CM Douala	5	19	1	0	13	67	-43S	135	138	+1.6	-2.2
CM Foumban	5	17	13	2	14	68	-49S	129	132	+1.4	-1.7
CM Garoua	5	16	7	5	18	69	-59S	118	122	+1.2	-0.8
CM Maroua	5	16	19	6	19	69	-62S	115	119	+1.1	-0.6
CM N'Gaoundere	5	18	30	5	18	68	-51S	127	130	+1.5	-1.5
CM Tiko	5	18	15	0	13	67	-44S	133	137	+1.5	-2.1
CM Yaounde	5	22	32	3	16	67	-37S	140	144	+2.0	-2.9
CF Bambari	5	42	26	16	29	67	-19S	159	163	+5.6	-9.6
CF Berberati	5	32	10	9	22	67	-25S	152	156	+3.6	-5.8
CF Birao	5	30	46	17	30	69	-45S	133	137	+2.4	-2.1
CF Bouar	5	25	7	8	21	67	-39S	139	143	+2.2	-2.8
CF Bria	5	43	28	18	31	67	-20S	158	161	+5.3	-8.8
CF N'Dele	5	30	10	15	27	68	-40S	138	141	+2.5	-2.7
TD Abeche	5	22	58	15	28	71	-64S	113	117	+1.5	-0.5
TD Faya-Largeau	5	20	54	14	27	73	-80S	96	100	+1.0	+0.4
TD Moundou	5	20	31	8	21	68	-51S	126	130	+1.6	-1.4
TD N'Djamena	5	16	26	8	20	70	-67S	110	114	+1.0	-0.3
TD Pala	5	17	57	7	20	69	-57S	121	124	+1.3	-1.0
TD Sarh	5	23	41	11	24	69	-49S	129	132	+1.8	-1.7
EG Abu Simbel	5	40	37	31	44	79	-78S	99	103	+1.8	+0.4
EG Alexandria	5	49	10	34	45	88	-71N	68	71	+1.2	+2.1
EG Aswan	5	43	39	34	46	81	-82S	95	99	+1.8	+0.6
EG Asyut	5	43	36	33	45	83	-86N	83	86	+1.5	+1.3
EG Cairo	5	49	0	35	47	87	-76N	73	77	+1.4	+1.8
EG El Arish	5	54	15	38	50	90	-76N	72	76	+1.5	+1.9

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
EG El-Gora	5	54	41	38	50	90	-76N	73	76	+1.5	+1.8
EG El-Tor	5	49	20	36	49	86	-85N	82	85	+1.7	+1.4
EG Embaba	5	48	37	34	46	87	-76N	73	77	+1.4	+1.8
EG Hurghada	5	48	18	36	48	85	-89N	85	89	+1.7	+1.2
EG Luxor	5	44	47	34	47	83	-88S	89	93	+1.7	+1.0
EG Mersa-Matruh	5	46	28	31	43	86	-68N	64	68	+1.0	+2.2
EG Port Said	5	52	19	36	48	89	-74N	70	74	+1.4	+2.0
EG St. Catherine	5	50	36	37	49	87	-84N	81	84	+1.7	+1.4
GQ Bata	5	25	20	1	14	67	-29S	149	152	+2.6	-4.4
GQ Malabo	5	18	0	-1	12	67	-44S	134	137	+1.4	-2.1
ET Bahar Dar	6	26	31	44	57	65	-7S	171	174	+9.9	+9.9
ET Gondar	6	14	49	42	55	67	-21S	156	160	+5.2	-8.4
ET Makale	6	18	18	45	58	68	-25S	153	157	+4.7	-6.9
GA Bitam	5	29	22	4	17	66	-23S	154	158	+3.6	-6.3
GA Libreville	5	34	11	2	15	66	-13S	165	168	+9.9	+9.9
GA Oyem	5	34	28	5	18	66	-15S	162	166	+9.9	+9.9
GH Accra	5	9	10	-10	2	67	-68S	109	113	+0.3	-0.5
GH Sunyani	5	8	17	-12	1	67	-77S	100	103	+0.1	-0.1
GH Takoradi	5	9	4		1	67	-68S	109	113	+0.2	-0.5
GH Tamale	5	8	29	-9	3	67	-82S	94	98	+0.0	+0.2
GH Wa	5	8	36	-11	2	67	-86S	90	94	-0.1	+0.3
LY Benghazi	5	43	21	24	36	83	-56N	52	56	+0.4	+2.7
LY Buattifel	5	36	43	24	36	81	-70N	66	70	+0.7	+2.0
LY Dahra	5	35	50	20	32	80	-62N	58	62	+0.4	+2.3
LY El Beida	5	46	2	27	38	85	-56N	52	56	+0.5	+2.8
LY Ghadames	5	36	41	14	25	77	-47N	43	46	-0.2	+2.9
LY Ghat	5	24	56	10	22	74	-65N	61	65	+0.1	+1.9
LY Giallo	5	35	57	23	35	81	-69N	65	69	+0.7	+2.0
LY Hon	5	34	20	18	30	79	-60N	56	60	+0.3	+2.3
LY Kufra	5	30	18	22	35	78	-86N	82	86	+1.0	+1.2
LY Marsa Brega	5	38	42	22	34	81	-61N	57	61	+0.5	+2.4
LY Ras Lanouf V 40	5	38	32	22	33	81	-59N	55	59	+0.4	+2.5
LY Sebha	5	29	19	15	27	76	-65N	61	65	+0.3	+2.0
LY Tripoli	5	43	51	19	30	80	-43N	39	42	-0.1	+3.3
LY Zella 74	5	33	37	19	31	79	-64N	60	64	+0.4	+2.2
ML Gao	5	12	32	-5	7	68	-78N	74	78	-0.2	+1.0
ML Mopti	5	11	46	-9	3	67	-78N	74	78	-0.3	+0.9
ML Tessalit	5	17	25	-1	11	69	-67N	63	67	-0.2	+1.5
ML Tombouctou	5	13	48	-7	5	67	-72N	69	72	-0.3	+1.2
MR Atar	5	26	10	-11	1	66	-45N	40	44	-0.9	+2.2
MR Bir Moghreïn	5	38	7	-5	6	67	-25N	21	24	-1.5	+3.9
MR Nema	5	15	28	-10	2	66	-67N	63	67	-0.5	+1.3
MR Tidjikja	5	21	3	-12	0	66	-54N	50	54	-0.8	+1.8
NE Agadez	5	13	28	3	15	70	-87N	83	87	+0.3	+0.8
NE Diffa	5	14	7	6	18	70	-75S	102	106	+0.7	+0.1
NE Dirkou	5	17	0	8	21	72	-88N	84	88	+0.5	+0.9
NE Maradi	5	11	8	0	13	69	-84S	93	97	+0.3	+0.4
NE Niamey	5	10	9	-5	8	68	-89N	86	90	+0.0	+0.6
NE Tahoua	5	11	21	-1	11	69	-89N	86	90	+0.2	+0.7
NE Tanout	5	12	19	2	15	70	-86S	91	94	+0.4	+0.5
NE Zinder	5	11	57	2	15	69	-82S	95	99	+0.5	+0.3
NG Abuja	5	11	7	-2	11	68	-68S	109	112	+0.6	-0.4
NG Akure	5	10	38	-4	8	68	-65S	112	116	+0.6	-0.5
NG Benin	5	11	23	-4	9	68	-61S	116	120	+0.7	-0.8
NG Calabar	5	15	19	-1	11	67	-51S	127	131	+1.1	-1.5
NG Enugu	5	12	48	-2	11	68	-58S	119	123	+0.9	-0.9
NG Gusau	5	10	34	-1	12	69	-80S	97	101	+0.4	+0.2
NG Ibadan	5	9	57	-6	7	68	-68S	109	113	+0.5	-0.4
NG Ilorin	5	9	50	-5	8	68	-71S	106	110	+0.4	-0.3
NG Jos	5	11	53	0	13	68	-68S	109	113	+0.7	-0.3
NG Kaduna	5	10	47	-1	12	68	-74S	103	106	+0.5	-0.1
NG Kano	5	11	22	1	13	69	-77S	100	104	+0.5	+0.1
NG Lagos	5	9	59	-7	6	67	-66S	111	115	+0.5	-0.5
NG Maiduguri	5	14	39	5	18	69	-69S	108	112	+0.9	-0.2
NG Makurdi	5	12	40	-1	12	68	-61S	116	120	+0.8	-0.7
NG Minna	5	10	31	-2	10	68	-72S	105	109	+0.5	-0.2
NG Port Hartcourt	5	13	45	-3	10	67	-54S	124	128	+1.0	-1.3
NG Sokoto	5	10	20	-2	10	68	-85S	92	96	+0.2	+0.4
NG Yola	5	15	5	4	17	69	-61S	116	120	+1.1	-0.7
NG Zaria	5	10	56	-1	12	68	-75S	102	106	+0.5	+0.0
ST Principe	5	21	10	-2	11	67	-35S	142	146	+1.9	-3.2
ST Sao Tome	5	24	15	-3	10	67	-28S	150	153	+2.5	-4.6
SD Damazin	6	4	48	36	49	68	-24S	154	158	+4.9	-7.2
SD Dongola	5	38	4	29	42	76	-68S	109	112	+2.0	-0.2
SD El Fasher	5	30	58	21	34	71	-55S	122	126	+2.1	-1.2
SD El Obeid	5	44	13	28	41	71	-43S	134	138	+3.0	-2.5
SD Kassala	5	57	52	38	51	72	-43S	134	138	+3.3	-2.6
SD Khartoum	5	45	48	32	44	73	-51S	127	130	+2.8	-1.6
SD Nyala	5	32	26	20	33	70	-49S	129	132	+2.3	-1.7
SD Port Sudan	5	53	36	39	52	77	-61S	116	120	+2.7	-0.8
SY Palmyra	6	8	37	45	56	100	-68N	64	68	+1.7	+2.3
TG Lome	5	9	22	-9	4	67	-68S	109	113	+0.4	-0.5
TG Niatougou	5	8	42	-7	5	67	-80S	97	100	+0.1	+0.1
TN Bordj El Amri	6	7	42	22	33	84	-8N	3	7	+9.9	+9.9
TN Djerba	5	49	0	18	30	81	-33N	29	32	-0.5	+4.1
TN El Borma	5	41	38	15	26	78	-40N	36	39	-0.4	+3.4
TN Gabes	5	49	20	18	29	80	-31N	27	31	-0.6	+4.3
TN Gafsa	5	52	51	18	29	80	-25N	21	24	-1.0	+5.1
TN Monastir	5	58	8	21	32	83	-21N	17	21	-1.1	+6.0
TN Remada	5	43	17	16	28	79	-39N	35	39	-0.3	+3.5
TN Sfax	5	52	44	19	30	82	-28N	24	27	-0.7	+4.7
TN Tozeur	5	51	9	17	28	80	-26N	22	26	-0.9	+4.8
TN Tunis	6	8	18	22	33	85	-7N	3	7	+9.9	+9.9

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
DZ Adrar	6	19	4	14	25	76	43N	313	317	+1.5	-1.0
DZ Biskra	6	15	4	20	31	82	13N	343	346	+4.4	-7.5
DZ Djanet	6	33	30	24	36	78	73N	284	287	+1.5	+0.3
DZ El Golea	6	20	48	17	29	79	36N	320	324	+1.9	-1.5
DZ Ghardaia	6	19	5	18	30	80	27N	328	332	+2.3	-2.6
DZ Hassi-Messaoud	6	25	31	21	33	81	37N	319	322	+2.0	-1.4
DZ Illizi	6	32	31	23	36	80	63N	293	297	+1.6	+0.0
DZ In Salah	6	23	26	17	29	77	51N	306	309	+1.5	-0.5
DZ Laghouat	6	10	16	16	28	79	10N	346	349	+9.9	+9.9
DZ Ouargla	6	23	33	20	32	81	34N	321	325	+2.0	-1.7
DZ Reggan	6	20	37	14	26	76	49N	307	311	+1.4	-0.6
DZ Tamanrasset	6	27	35	19	31	76	72N	285	288	+1.2	+0.3
DZ Tebessa	6	20	15	23	34	84	17N	339	342	+3.5	-5.4
DZ Tilrempt	6	16	27	18	29	80	22N	334	338	+2.8	-3.7
DZ Timimoun	6	18	7	14	26	77	37N	319	323	+1.7	-1.4
DZ Tindouf	6	6	2	4	16	72	23N	333	337	+2.1	-3.2
DZ Touggourt	6	22	45	21	33	82	29N	327	330	+2.3	-2.3
BJ Cotonou	6	9	51	6	19	68	57S	234	238	+0.1	+1.7
BJ Parakou	6	14	18	9	21	69	67S	245	248	+0.3	+1.3
BF Bobo-Dioulasso	6	13	41	3	16	69	84S	261	264	+0.3	+0.7
BF Ouagadougou	6	15	42	6	19	70	84S	261	264	+0.5	+0.8
CM Bafoussam	6	8	2	13	26	67	38S	216	219	-0.1	+3.0
CM Bamenda	6	9	33	13	26	67	41S	219	222	+0.0	+2.8
CM Batouri	6	2	21	15	28	66	21S	199	203	-1.0	+5.2
CM Douala	6	3	30	11	23	67	32S	209	213	-0.5	+3.4
CM Foumban	6	8	16	13	26	67	38S	215	219	-0.1	+3.0
CM Garoua	6	18	49	19	32	68	49S	227	230	+0.5	+2.5
CM Maroua	6	21	59	21	34	69	52S	230	233	+0.6	+2.4
CM N'Gaoundere	6	13	30	18	31	67	40S	218	221	+0.1	+3.0
CM Tiko	6	3	59	10	23	67	33S	211	214	-0.4	+3.3
CM Yaounde	6	1	44	12	25	66	26S	204	207	-0.7	+4.2
CF Bambari	6	1	59	21	34	66	8S	186	189	+9.9	+9.9
CF Berberati	5	59	0	15	28	66	14S	192	195	-1.9	+7.2
CF Birao	6	26	52	30	43	68	35S	213	216	+0.6	+4.1
CF Bouar	6	8	21	18	31	67	28S	205	209	-0.4	+4.3
CF Bria	6	5	38	23	36	66	9S	187	191	+9.9	+9.9
CF N'Dele	6	18	20	26	39	67	30S	207	211	+0.1	+4.5
TD Abeche	6	36	21	32	45	71	55S	233	236	+1.3	+2.5
TD Faya-Largeau	6	42	17	33	46	75	73S	250	253	+1.6	+1.6
TD Moundou	6	18	1	21	34	68	41S	218	222	+0.3	+3.1
TD N'Djamena	6	26	21	24	37	70	57S	235	238	+0.9	+2.1
TD Pala	6	19	41	21	34	68	46S	224	227	+0.5	+2.7
TD Sarh	6	20	33	24	37	68	39S	216	220	+0.4	+3.4
CI Abidjan	6	8	7	0	12	67	63S	241	244	+0.0	+1.3
CI Bouake	6	10	45	0	13	68	74S	251	254	+0.1	+1.0
CI Daloa	6	9	48	-2	11	68	73S	250	253	+0.0	+0.9
CI Korhogo	6	12	8	1	13	68	80S	257	261	+0.2	+0.8
CI Man	6	10	7	-3	10	68	76S	253	257	+0.0	+0.8
CI San Pedro	6	7	42	-3	10	67	66S	243	247	-0.1	+1.1
CI Yamoussoukro	6	9	57	-1	12	68	71S	249	252	+0.1	+1.0
EG Abu Simbel	7	16	1	53	66	83	76S	253	257	+2.7	+1.6
EG Alexandria	7	17	40	52	64	101	70N	286	290	+2.6	-0.1
EG Aswan	7	21	33	55	68	87	81S	258	262	+2.8	+1.3
EG Asyut	7	19	26	54	66	93	86N	271	274	+2.7	+0.6
EG Cairo	7	21	31	54	67	101	75N	281	285	+2.7	+0.0
EG El Arish	7	28	6	58	70	108	73N	284	287	+2.8	-0.2
EG El-Gora	7	28	55	58	70	108	73N	284	287	+2.8	-0.2
EG El-Tor	7	27	20	58	70	100	83N	273	277	+2.8	+0.4
EG Embaba	7	20	56	54	66	101	75N	281	285	+2.7	+0.1
EG Hurghada	7	27	13	58	70	97	87N	270	273	+2.8	+0.6
EG Luxor	7	22	58	56	69	92	88S	265	268	+2.8	+0.9
EG Mersa-Matruh	7	10	43	49	61	98	68N	289	292	+2.5	-0.2
EG Port Said	7	23	44	56	68	105	71N	285	289	+2.7	-0.2
EG St. Catherine	7	28	35	58	71	102	82N	275	278	+2.8	+0.3
GQ Bata	5	54	36	8	21	66	17S	195	199	-1.6	+5.5
GQ Malabo	6	3	10	9	22	67	33S	210	214	-0.5	+3.3
ET Bahar Dar	6	39	12	47	59	64	5S	183	187	+9.9	+9.9
ET Gondar	6	53	12	50	63	63	20S	198	201	+9.9	+9.9
ET Makale	7	5	23	56	68	61	25S	203	207	+2.2	+8.7
GA Bitam	5	52	33	9	22	66	12S	190	193	-2.4	+7.5
GA Libreville	5	44	22	4	17	66	2S	179	183	+9.9	+9.9
GA Oyem	5	46	57	8	20	66	4S	182	185	+9.9	+9.9
GM Banjul	6	11	15	-8	5	67	70N	286	290	+0.2	-0.1
GH Accra	6	8	31	3	16	68	58S	236	239	+0.0	+1.5
GH Sunyani	6	10	40	2	15	68	68S	245	249	+0.1	+1.2
GH Takoradi	6	7	31	1	14	67	58S	236	239	-0.1	+1.5
GH Tamale	6	13	27	5	18	69	73S	251	254	+0.3	+1.1
GH Wa	6	13	29	4	17	69	78S	255	258	+0.3	+0.9
GN Faranah	6	11	30	-4	9	68	90S	267	270	+0.1	+0.5
GN Fira	6	11	22	-6	6	68	85N	272	275	+0.1	+0.3
GN Labe	6	11	48	-5	8	68	84N	273	277	+0.2	+0.3
GN MacEnta	6	10	49	-4	9	68	83S	260	263	+0.1	+0.6
GN N'Zerekore	6	10	31	-3	10	68	79S	257	260	+0.1	+0.7
GW Bissau	6	11	22	-8	5	67	77N	280	283	+0.2	+0.1
GW Cufar	6	11	22	-7	5	67	80N	277	281	+0.1	+0.2
LR Monrovia	6	9	24	-6	7	67	77S	255	258	+0.0	+0.7
LY Benghazi	6	54	5	39	51	92	58N	298	302	+2.2	-0.4
LY Buattifel	6	58	20	41	54	89	73N	284	288	+2.2	+0.2
LY Dahra	6	49	36	36	48	87	65N	291	295	+2.1	+0.0
LY El Beida	6	57	35	41	53	94	57N	299	303	+2.3	-0.5
LY Ghadames	6	33	40	26	38	83	51N	305	309	+1.8	-0.6
LY Ghat	6	34	50	25	37	79	71N	286	289	+1.5	+0.3
LY Giallo	6	56	53	40	53	89	72N	284	288	+2.2	+0.2

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
LY Hon	6	45	40	33	45	86	64N	292	296	+2.0	+0.0
LY Kufra	6	58	14	42	54	83	90S	267	270	+2.2	+1.0
LY Marsa Brega	6	53	2	38	50	89	64N	293	296	+2.2	-0.1
LY Ras Lanouf V 40	6	50	46	37	49	89	62N	294	298	+2.1	-0.2
LY Sebha	6	42	36	31	43	83	70N	287	290	+1.8	+0.2
LY Tripoli	6	38	34	30	42	87	46N	310	314	+2.1	-0.9
LY Zella 74	6	48	16	35	47	86	68N	289	292	+2.0	+0.1
ML Bamako	6	13	21	0	13	69	86N	271	274	+0.3	+0.4
ML Gao	6	19	21	10	22	71	86N	271	275	+0.7	+0.6
ML Kayes	6	12	43	-2	10	69	75N	282	286	+0.4	+0.1
ML Mopti	6	15	54	5	17	70	85N	271	275	+0.5	+0.5
ML Nioro	6	13	32	0	12	69	75N	282	285	+0.4	+0.2
ML Tessalit	6	21	57	13	25	73	74N	283	286	+1.0	+0.3
ML Tombouctou	6	17	31	7	20	71	80N	277	280	+0.7	+0.4
MR Aioun El Atrouss	6	13	42	0	13	69	70N	287	290	+0.5	+0.0
MR Atar	6	10	37	-2	10	69	50N	307	310	+0.7	-0.7
MR Bir Moghreïn	6	6	14	1	12	70	29N	327	330	+1.5	-2.1
MR Kaedi	6	11	58	-4	9	68	65N	291	295	+0.4	-0.1
MR Kiffa	6	12	51	-2	11	69	67N	289	293	+0.5	-0.1
MR Nema	6	14	52	3	15	70	73N	283	287	+0.6	+0.2
MR Nouadhibou	6	7	15	-6	6	68	39N	317	320	+0.8	-1.2
MR Nouakchott	6	10	17	-5	7	68	54N	302	306	+0.5	-0.5
MR Selibabi	6	12	30	-3	10	68	71N	286	289	+0.4	+0.0
MR Tidjikja	6	12	32	-1	11	69	60N	296	300	+0.6	-0.3
NE Agadez	6	26	43	19	32	73	85S	262	265	+1.0	+1.0
NE Diffa	6	26	35	22	35	71	66S	243	247	+0.9	+1.7
NE Dirkou	6	34	31	26	38	75	85S	262	265	+1.3	+1.1
NE Maradi	6	22	8	16	29	71	74S	252	255	+0.8	+1.3
NE Niamey	6	18	44	11	23	70	82S	259	262	+0.6	+0.9
NE Tahoua	6	22	15	15	28	71	82S	259	262	+0.8	+1.0
NE Tanout	6	25	24	19	31	72	77S	254	258	+0.9	+1.2
NE Zinder	6	24	3	18	31	71	73S	250	253	+0.8	+1.4
NG Abuja	6	15	30	13	26	69	58S	236	239	+0.4	+1.8
NG Akure	6	11	43	10	22	68	55S	233	236	+0.2	+1.8
NG Benin	6	9	59	9	22	68	51S	228	232	+0.1	+2.0
NG Calabar	6	6	51	10	23	67	40S	217	221	-0.2	+2.7
NG Enugu	6	10	31	11	24	68	48S	225	229	+0.1	+2.2
NG Gusau	6	20	9	15	27	70	71S	248	251	+0.6	+1.4
NG Ibadan	6	11	42	8	21	68	58S	235	239	+0.2	+1.7
NG Ilorin	6	13	38	10	23	68	61S	238	242	+0.3	+1.6
NG Jos	6	17	15	15	28	69	58S	236	239	+0.5	+1.9
NG Kaduna	6	18	19	14	27	69	64S	242	245	+0.5	+1.6
NG Kano	6	21	8	16	29	70	67S	245	248	+0.7	+1.5
NG Lagos	6	10	15	7	20	68	56S	233	237	+0.1	+1.7
NG Maiduguri	6	24	13	21	34	70	59S	237	240	+0.8	+2.0
NG Makurdi	6	13	21	13	26	68	51S	229	232	+0.2	+2.1
NG Minna	6	16	16	13	25	69	62S	239	243	+0.4	+1.6
NG Port Hartcourt	6	7	9	9	22	67	43S	220	224	-0.1	+2.5
NG Sokoto	6	20	4	13	26	70	75S	253	256	+0.7	+1.2
NG Yola	6	18	11	18	31	68	50S	228	231	+0.5	+2.3
NG Zaria	6	19	13	15	28	70	65S	243	246	+0.6	+1.6
ST Principe	5	56	25	6	19	66	24S	202	205	-1.1	+4.2
ST Sao Tome	5	51	26	4	16	66	16S	194	198	-1.8	+5.5
SN Bakel	6	12	25	-3	9	68	72N	285	288	+0.4	+0.0
SN Cap Skiring	6	11	14	-8	4	67	73N	283	287	+0.2	+0.0
SN Dakar	6	10	54	-8	4	67	64N	292	296	+0.3	-0.2
SN Kaolack	6	11	21	-7	5	68	68N	288	292	+0.3	-0.1
SN Kedougou	6	12	10	-4	8	68	80N	277	281	+0.2	+0.2
SN Kolda	6	11	35	-6	6	68	75N	282	286	+0.2	+0.1
SN St. Louis	6	10	52	-7	6	68	61N	295	299	+0.4	-0.3
SN Tambacounda	6	11	57	-5	8	68	74N	283	287	+0.3	+0.1
SN Ziguinchor	6	11	19	-8	5	67	74N	283	286	+0.2	+0.0
SL Freetown	6	10	40	-7	6	67	89S	266	269	+0.0	+0.4
SL Hastings	6	10	35	-7	6	67	88S	265	268	+0.0	+0.5
SD Damazin	6	43	24	45	58	65	19S	197	201	+0.6	+9.3
SD Dongola	7	6	51	49	62	76	65S	242	245	+2.4	+2.3
SD El Fasher	6	41	38	37	50	70	47S	225	228	+1.4	+3.3
SD El Obeid	6	46	54	43	56	68	37S	215	218	+1.5	+4.6
SD Kassala	7	9	29	54	67	67	42S	220	223	+2.5	+4.6
SD Khartoum	7	1	23	49	62	70	47S	225	228	+2.2	+3.7
SD Nyala	6	35	45	35	48	69	40S	218	222	+1.1	+3.8
SD Port Sudan	7	26	25	60	73	75	62S	239	243	+3.0	+2.6
SY Palmyra	7	38	24	63	73	129	61N	296	299	+2.7	-1.1
TG Lome	6	9	26	5	18	68	58S	235	239	+0.1	+1.6
TG Niatougou	6	14	20	7	20	69	71S	248	252	+0.3	+1.2
TN Bordj El Amri	6	18	45	24	35	86	9N	347	350	+9.9	+9.9
TN Djerba	6	31	50	27	38	86	35N	321	324	+2.2	-1.7
TN El Borma	6	31	38	25	37	83	43N	313	316	+2.0	-1.0
TN Gabes	6	30	11	26	38	85	34N	322	325	+2.3	-1.9
TN Gafsa	6	26	0	24	36	85	28N	328	332	+2.5	-2.7
TN Monastir	6	27	17	26	38	87	23N	332	336	+2.9	-3.5
TN Remada	6	33	14	27	38	85	43N	313	317	+2.0	-1.1
TN Sfax	6	29	50	27	38	86	30N	326	329	+2.4	-2.3
TN Tozeur	6	25	28	24	35	84	29N	327	330	+2.4	-2.4
TN Tunis	6	18	54	24	36	86	9N	347	350	+9.9	+9.9

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
AF Herat	7	6	33	75	79	190	-76N	72	76	+3.0	+1.1
AF Jalalabad	7	31	41	79	72	237	-69N	65	69	+3.0	+1.1
AF Kabul	7	28	0	79	73	232	-69N	66	69	+3.0	+1.1
AF Kandahar	7	15	36	80	79	223	-84N	80	84	+3.0	+0.3
AF Kunduz	7	30	1	76	72	227	-61N	57	60	+3.1	+1.8
AF Maimama	7	16	14	76	76	208	-67N	64	67	+3.0	+1.5
AF Mazar-I-Sharif	7	24	51	76	73	220	-62N	58	62	+3.0	+1.8
AF Sheberghan	7	20	59	76	74	214	-63N	59	63	+3.0	+1.8
AF Shindand	7	5	51	75	80	190	-79N	75	79	+3.0	+0.9
AF Taluqan	7	32	14	77	71	230	-59N	55	59	+3.1	+1.9
BD Chittagong	8	25	27	56	43	282	-81N	77	81	+1.9	-0.2
BD Cox'S Bazar	8	25	57	55	42	282	-83N	80	83	+1.9	-0.3
BD Dhaka	8	22	16	58	45	280	-78N	74	78	+2.1	-0.1
BD Dhaka	8	22	18	58	45	280	-78N	74	78	+2.1	-0.1
BD Ishurdi	8	19	20	60	47	279	-79N	76	79	+2.2	-0.2
BD Jessore	8	19	49	60	47	280	-82N	79	82	+2.1	-0.3
BD Rajshahi	8	18	21	60	48	278	-79N	75	79	+2.2	-0.2
BD Saidpur	8	18	58	60	47	277	-74N	70	74	+2.3	+0.1
BD Sylhet Osmani	8	25	29	56	43	279	-71N	67	71	+2.2	+0.2
BT Paro	8	20	49	59	47	276	-66N	63	66	+2.5	+0.5
BN Brunei	8	54	57	22	9	293	-83S	94	97	+0.2	-0.3
MM Bagan	8	31	28	51	38	283	-78N	75	79	+1.8	-0.1
MM Banmaw	8	36	33	49	36	282	-62N	58	62	+2.1	+0.7
MM Coco Island	8	33	16	50	38	289	-77S	100	104	+1.3	-1.0
MM Dawei	8	39	17	45	32	289	-85S	92	96	+1.2	-0.6
MM Heho	8	34	51	49	36	284	-76N	73	77	+1.7	+0.0
MM Hpa-An	8	37	4	46	34	287	-88N	84	88	+1.4	-0.4
MM Kalay	8	29	45	53	40	281	-73N	70	73	+2.0	+0.1
MM Kawthoung	8	42	58	42	29	291	-73S	104	108	+0.9	-0.9
MM Kengtung	8	39	44	45	32	285	-69N	65	69	+1.7	+0.3
MM Kyaukpyu	8	29	34	53	40	284	-87N	83	87	+1.7	-0.5
MM Lanywa	8	31	18	51	38	284	-79N	76	80	+1.8	-0.2
MM Lashio	8	36	56	48	35	283	-66N	63	66	+1.9	+0.4
MM Loikaw	8	35	36	48	35	285	-79N	76	79	+1.6	-0.1
MM Mandalay	8	33	18	50	37	283	-75N	71	75	+1.8	+0.0
MM Mawlamyine	8	37	14	46	33	287	-89N	86	89	+1.4	-0.5
MM Momeik	8	34	49	49	37	282	-68N	65	68	+1.9	+0.3
MM Mong Hsat	8	38	53	46	33	285	-72N	69	73	+1.6	+0.1
MM Myeik	8	40	54	43	30	290	-80S	97	100	+1.0	-0.8
MM Myitkyina	8	37	44	48	36	281	-57N	53	57	+2.3	+1.0
MM Nampong	8	37	36	48	36	281	-57N	53	57	+2.2	+1.0
MM Namsang	8	36	25	48	35	284	-74N	71	74	+1.7	+0.1
MM Pathein	8	32	58	50	37	287	-87S	90	93	+1.5	-0.6
MM Putao	8	40	52	48	35	280	-47N	43	46	+2.8	+2.2
MM Pyay	8	32	41	50	37	285	-86N	82	86	+1.6	-0.4
MM Shante	8	33	15	50	37	284	-77N	74	78	+1.7	-0.1
MM Sittwe	8	28	7	54	41	284	-86N	82	86	+1.8	-0.4
MM Tachilek	8	39	59	45	32	285	-71N	68	71	+1.6	+0.2
MM Taungoo	8	34	24	49	36	285	-83N	80	83	+1.6	-0.3
MM Thandwe	8	31	18	51	38	285	-88N	85	89	+1.6	-0.5
MM Yangon	8	34	51	48	35	287	-90S	87	91	+1.4	-0.5
KH Battambang	8	45	8	38	25	290	-90N	87	90	+1.0	-0.4
KH Kompong Chnang	8	46	41	37	24	290	-90S	87	91	+0.9	-0.4
KH Phnom-Penh	8	47	12	36	23	290	-88S	89	93	+0.8	-0.4
KH Siem-Reap	8	45	38	38	25	290	-88N	85	88	+1.0	-0.3
KH Stung Treng	8	47	42	35	22	290	-84N	80	84	+0.9	-0.2
CN Hotan	8	8	3	67	57	255	-38N	34	38	+4.2	+4.7
CN Jinghonggasa	8	41	57	44	31	285	-64N	60	64	+1.8	+0.6
CN Kashi	8	6	36	68	59	247	-26N	22	26	+9.9	+9.9
CN Kunming	8	50	17	41	28	284	-43N	39	42	+2.8	+2.7
GE Sukhumi	6	42	38	52	61	125	-32N	28	32	+1.3	+6.2
GE Tbilisi	6	42	28	55	64	129	-42N	38	42	+1.8	+4.5
IN Agartala	8	24	4	57	44	280	-76N	72	76	+2.1	+0.0
IN Agatti Island	8	10	1	72	61	299	-28S	150	154	+1.3	-4.2
IN Agra	7	51	24	76	63	268	-86N	83	87	+2.7	-0.3
IN Ahmedabad	7	40	20	84	71	275	-73S	104	107	+2.8	-1.3
IN Aizwal	8	27	18	55	42	281	-73N	70	74	+2.0	+0.1
IN Akola	7	55	4	76	63	281	-71S	106	110	+2.4	-1.4
IN Allahabad	8	1	55	70	58	274	-87N	83	87	+2.5	-0.4
IN Along	8	35	4	51	39	278	-50N	46	50	+2.8	+1.8
IN Amritsar	7	42	34	78	67	254	-74N	71	74	+3.0	+0.5
IN Aurangabad	7	52	14	78	65	283	-66S	111	115	+2.4	-1.7
IN Baghdogra	8	17	45	61	48	276	-71N	68	71	+2.4	+0.2
IN Bakshi Ka Talab	7	59	13	72	59	271	-83N	79	83	+2.6	-0.2
IN Balurghat	8	18	43	60	48	277	-76N	72	76	+2.3	+0.0
IN Bangalore	8	11	39	69	56	293	-46S	131	135	+1.7	-2.6
IN Bareilly	7	55	10	73	61	267	-80N	76	80	+2.7	+0.0
IN Baroda	7	42	57	82	70	277	-72S	106	109	+2.7	-1.4
IN Belgaum	7	58	28	75	63	290	-51S	126	130	+2.1	-2.4
IN Bhatinda	7	42	0	79	68	257	-80N	76	80	+2.9	+0.1
IN Bhaunagar	7	40	59	84	71	278	-68S	109	113	+2.7	-1.5
IN Bhiwani	7	46	4	78	66	263	-83N	80	83	+2.8	-0.1
IN Bhopal	7	52	27	77	64	276	-80S	97	101	+2.6	-1.0
IN Bhubaneswar	8	14	47	63	50	282	-83S	94	98	+2.0	-0.9
IN Bhuj	7	31	42	88	76	273	-71S	106	110	+2.9	-1.3
IN Bidar	8	0	27	74	61	286	-63S	115	118	+2.2	-1.8
IN Bikaner	7	37	43	82	71	260	-89N	86	90	+2.9	-0.3
IN Bilaspur	8	5	14	69	56	279	-83S	94	98	+2.3	-0.9
IN Bokaro	8	13	9	64	51	278	-86N	82	86	+2.2	-0.4
IN Bombay	7	47	6	81	68	285	-60S	117	121	+2.5	-2.0
IN Bombay	7	47	12	81	68	285	-60S	117	121	+2.5	-2.0
IN Calcutta	8	18	32	60	48	280	-85N	82	85	+2.1	-0.4
IN Calicut	8	14	16	69	57	295	-36S	141	145	+1.4	-3.3

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
IN Carnicobar	8	38	37	48	35	292	-60S	117	121	+0.9	-1.5
IN Chandigarh	7	48	0	76	65	259	-75N	72	76	+2.9	+0.3
IN Coimbatore	8	16	9	67	55	295	-38S	140	143	+1.4	-3.1
IN Cooch-Behar	8	20	23	59	47	277	-70N	67	70	+2.3	+0.3
IN Cuddapah	8	9	46	69	56	290	-53S	124	128	+1.8	-2.2
IN Daman	7	44	45	82	69	282	-65S	113	116	+2.6	-1.7
IN Deesa	7	37	38	84	72	271	-77S	100	104	+2.8	-1.1
IN Dehra Dun	7	51	52	75	63	262	-75N	72	75	+2.8	+0.3
IN Delhi	7	48	59	77	65	264	-82N	79	83	+2.8	-0.1
IN Delhi	7	48	41	77	65	264	-83N	79	83	+2.8	-0.1
IN Deharizo	8	33	18	52	40	278	-53N	49	52	+2.7	+1.5
IN Dhanbad	8	13	42	63	51	278	-85N	81	85	+2.2	-0.4
IN Dundigul	8	2	55	72	59	286	-63S	114	118	+2.1	-1.8
IN Gauhati	8	25	13	56	44	278	-67N	63	67	+2.3	+0.4
IN Gaya	8	9	56	66	53	276	-84N	81	84	+2.3	-0.4
IN Goa	7	58	1	76	64	291	-49S	129	133	+2.1	-2.6
IN Gorakhpur	8	5	48	68	55	273	-80N	76	80	+2.5	-0.1
IN Guna	7	51	14	77	64	273	-84S	92	96	+2.6	-0.8
IN Gwalior	7	52	27	76	63	270	-89N	86	89	+2.7	-0.5
IN Hirkud	8	9	51	66	53	280	-84S	93	96	+2.2	-0.9
IN Hissar	7	44	50	78	67	261	-82N	79	83	+2.9	-0.1
IN Hyderabad	8	3	22	72	59	286	-63S	115	118	+2.1	-1.8
IN Imphal	8	29	51	53	40	280	-67N	64	67	+2.1	+0.4
IN Indore	7	49	11	79	66	276	-76S	101	105	+2.6	-1.2
IN Jabalpur	7	59	19	73	60	277	-83S	94	97	+2.4	-0.9
IN Jaipur	7	45	37	79	67	267	-90S	87	91	+2.8	-0.5
IN Jaisalmer	7	31	31	85	74	260	-84S	93	96	+2.9	-0.6
IN Jammu	7	43	18	77	67	252	-70N	67	70	+3.0	+0.7
IN Jamnagar	7	33	51	87	75	276	-68S	109	113	+2.9	-1.5
IN Jamshedpur	8	13	37	64	51	279	-88N	85	89	+2.2	-0.6
IN Jeypore	8	9	48	67	54	284	-73S	104	107	+2.1	-1.3
IN Jhansi	7	53	46	75	62	272	-89S	88	92	+2.6	-0.6
IN Jharsuguda	8	9	38	66	53	280	-85S	92	95	+2.2	-0.8
IN Jodhpur	7	38	16	83	71	265	-84S	92	96	+2.9	-0.7
IN Jorhat	8	31	42	53	40	279	-59N	55	59	+2.4	+0.9
IN Kailashahar	8	25	40	56	43	280	-73N	69	73	+2.1	+0.1
IN Kamalpur	8	25	15	56	43	280	-74N	70	74	+2.1	+0.1
IN Kandla	7	33	11	87	75	274	-71S	107	110	+2.9	-1.4
IN Kanpur	7	58	10	72	60	271	-85N	82	86	+2.6	-0.4
IN Keshod	7	36	17	86	74	280	-65S	113	116	+2.8	-1.7
IN Khajuraho	7	57	41	73	60	274	-88S	88	92	+2.5	-0.6
IN Kolhapur	7	55	50	77	64	289	-54S	124	127	+2.2	-2.3
IN Kota	7	46	51	79	66	271	-84S	93	96	+2.7	-0.8
IN Kulu	7	49	45	75	64	258	-70N	67	70	+2.9	+0.6
IN Leh	7	53	7	73	62	254	-60N	56	60	+3.1	+1.4
IN Lilabari	8	32	3	53	40	278	-56N	53	56	+2.5	+1.1
IN Lucknow	7	59	16	72	59	271	-84N	80	84	+2.6	-0.3
IN Ludhiana	7	45	38	77	66	258	-76N	72	76	+2.9	+0.3
IN Madras	8	15	37	66	53	291	-51S	127	130	+1.6	-2.3
IN Madurai	8	21	13	65	53	295	-35S	142	146	+1.2	-3.2
IN Mangalore	8	6	58	72	60	294	-41S	136	140	+1.7	-3.0
IN Mazuffarpur	8	10	29	65	53	275	-79N	75	79	+2.4	-0.1
IN Mohanbari	8	34	38	51	39	279	-53N	49	53	+2.6	+1.4
IN Nagarjunsagar	8	6	41	70	57	287	-61S	116	120	+2.0	-1.9
IN Nagpur	7	59	12	73	60	280	-75S	102	106	+2.4	-1.2
IN Nainital	7	55	16	73	61	266	-78N	74	78	+2.7	+0.1
IN Nasik Road	7	48	4	80	67	283	-64S	113	117	+2.5	-1.8
IN Nawapara	8	7	14	68	55	281	-80S	97	101	+2.2	-1.0
IN Panagarh	8	16	1	62	49	279	-84N	81	84	+2.2	-0.4
IN Pasighat	8	36	21	51	38	278	-49N	45	49	+2.8	+1.9
IN Pathankot	7	45	21	77	66	254	-71N	67	71	+3.0	+0.6
IN Patiala	7	46	41	77	66	260	-77N	74	78	+2.9	+0.2
IN Patina	8	10	2	66	53	275	-81N	78	81	+2.4	-0.2
IN Porbandar	7	34	0	87	75	279	-65S	112	116	+2.8	-1.7
IN Port Blair	8	35	20	50	37	290	-68S	109	113	+1.1	-1.2
IN Pune	7	50	50	79	66	286	-60S	117	121	+2.4	-2.0
IN Purnea	8	15	31	62	50	276	-76N	73	76	+2.3	+0.0
IN Raibarelli	8	0	42	71	58	272	-85N	81	85	+2.5	-0.3
IN Raipur	8	5	10	69	56	280	-79S	98	101	+2.2	-1.1
IN Rajahmundry	8	10	49	67	54	286	-67S	110	114	+1.9	-1.6
IN Rajkot	7	36	16	86	73	277	-69S	109	112	+2.8	-1.5
IN Ranchi	8	11	31	65	52	278	-88N	85	89	+2.2	-0.5
IN Rourkela	8	11	0	65	52	280	-88S	89	93	+2.2	-0.7
IN Saharanpur	7	49	40	76	64	262	-77N	74	77	+2.8	+0.2
IN Salem	8	15	29	67	55	294	-43S	135	139	+1.5	-2.8
IN Shimla	7	48	58	76	64	259	-74N	70	74	+2.9	+0.4
IN Sholapur	7	57	28	75	63	287	-59S	118	122	+2.2	-2.0
IN Silchar	8	27	53	54	42	280	-69N	65	69	+2.2	+0.3
IN Srinagar	7	44	19	76	66	249	-65N	61	65	+3.1	+1.1
IN Surat	7	43	26	82	70	280	-67S	110	114	+2.7	-1.6
IN Tambaram	8	15	43	66	53	292	-50S	127	131	+1.6	-2.3
IN Tanjore	8	19	55	65	52	294	-41S	137	140	+1.3	-2.8
IN Tiruchchirappalli	8	19	16	65	53	294	-40S	137	141	+1.3	-2.9
IN Tirupeti	8	13	5	67	55	291	-52S	126	129	+1.7	-2.3
IN Trivandrum	8	24	31	64	52	297	-27S	150	154	+0.9	-3.8
IN Udaipur	7	42	1	82	69	271	-80S	97	101	+2.8	-0.9
IN Utkela	8	9	31	67	54	282	-78S	99	102	+2.1	-1.1
IN Varanasi	8	4	42	69	56	274	-85N	82	85	+2.5	-0.4
IN Vijayawada	8	9	42	68	55	287	-63S	114	118	+1.9	-1.7
IN Warangal	8	5	0	71	58	285	-66S	111	115	+2.1	-1.6
IN Zero	8	31	52	53	41	278	-56N	52	55	+2.6	+1.2
ID Balikpapan	8	58	0	17	5	293	-67S	111	114	-0.1	-0.6
ID Banda Aceh	8	46	4	42	30	293	-53S	124	128	+0.6	-1.6

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
ID Bandung	9	6	55	21	9	295	-31S	146	150	-0.6	-1.9
ID Banjarmasin	8	59	53	18	5	294	-56S	121	125	-0.2	-0.9
ID Batam	8	55	21	31	18	294	-54S	123	127	+0.2	-1.2
ID Batu Licin	8	59	36	17	4	293	-58S	119	123	-0.2	-0.8
ID Bengkulu	9	3	21	28	16	295	-33S	145	148	-0.3	-2.0
ID Cilacap	9	7	26	20	7	295	-31S	147	150	-0.6	-1.9
ID Cirebon	9	6	9	21	8	295	-34S	144	148	-0.5	-1.8
ID Dumai	8	54	13	33	21	294	-51S	126	130	+0.2	-1.4
ID Gunung Sitoli	8	54	19	37	24	295	-43S	135	138	+0.2	-1.8
ID Jakarta	9	6	6	22	10	295	-33S	145	149	-0.5	-1.9
ID Jambi	8	59	13	29	16	295	-44S	134	137	-0.1	-1.6
ID Ketapang	8	58	57	23	10	294	-54S	123	127	-0.1	-1.1
ID Lhok Sukon	8	47	46	40	27	293	-55S	122	126	+0.5	-1.4
ID Madiun	9	6	9	18	5	294	-36S	142	146	-0.5	-1.6
ID Medan	8	50	35	38	25	294	-53S	125	128	+0.4	-1.5
ID Muko Muko	9	1	6	30	18	295	-36S	142	145	-0.2	-2.0
ID Nangapinoh	8	57	33	23	10	294	-62S	115	119	+0.0	-0.8
ID Natuna	8	53	49	28	15	293	-70S	107	111	+0.3	-0.7
ID Padang	8	58	9	32	20	295	-41S	137	141	+0.0	-1.8
ID Padang Sidempuan	8	54	9	35	22	294	-47S	131	134	+0.2	-1.6
ID Palangkaraya	8	58	58	19	7	294	-59S	118	122	-0.1	-0.9
ID Palembang	9	1	6	27	14	295	-41S	136	140	-0.2	-1.6
ID Pangkal Pinang	8	59	43	26	14	294	-47S	131	135	-0.1	-1.4
ID Pangkalan Bun	8	59	41	21	8	294	-54S	123	127	-0.1	-1.0
ID Pekanbaru	8	55	55	33	20	294	-47S	130	134	+0.1	-1.5
ID Pendoro	9	1	53	27	15	295	-38S	139	143	-0.2	-1.7
ID Pontianak	8	57	18	25	12	294	-59S	119	122	+0.0	-1.0
ID Putusibau	8	56	46	22	9	293	-67S	110	113	+0.1	-0.7
ID Rengat	8	57	13	31	18	295	-46S	131	135	+0.0	-1.5
ID Sabang	8	45	29	43	30	293	-54S	123	127	+0.6	-1.5
ID Samarinda	8	57	35	18	5	293	-69S	108	111	-0.1	-0.6
ID Sampit	8	59	20	20	7	294	-57S	121	124	-0.1	-0.9
ID Semarang	9	5	39	19	6	294	-36S	141	145	-0.5	-1.6
ID Sibolga	8	53	47	36	23	295	-47S	131	135	+0.2	-1.6
ID Singkep	8	57	28	29	16	294	-50S	128	131	+0.0	-1.4
ID Sintang	8	57	12	23	10	293	-63S	115	118	+0.0	-0.8
ID Solo City	9	6	21	18	6	294	-35S	143	146	-0.5	-1.7
ID Surabaya	9	5	7	17	4	294	-39S	139	142	-0.5	-1.5
ID Tangerang	9	6	18	23	10	295	-32S	146	150	-0.5	-1.9
ID Tanjung Karang	9	4	57	25	12	295	-33S	144	148	-0.4	-1.9
ID Tanjung Pandan	9	0	19	25	12	294	-47S	130	134	-0.1	-1.3
ID Tanjung Pinang	8	55	40	30	17	294	-54S	123	127	+0.1	-1.2
ID Tanjung Redep	8	56	16	19	6	293	-78S	99	102	+0.1	-0.4
ID Tanjung Santan	8	57	22	18	5	293	-71S	106	110	+0.0	-0.5
ID Taraken	8	55	54	19	6	293	-82S	95	98	+0.1	-0.3
ID Tasikmalaya	9	7	21	20	8	295	-31S	147	151	-0.6	-1.9
ID Whok Seumawe	8	47	23	41	28	293	-55S	122	126	+0.5	-1.5
ID Yogyakarta	9	6	58	18	6	294	-33S	145	148	-0.6	-1.8
KY Georgetown	8	6	45	69	56	283	-73S	104	108	+2.1	-1.3
LA Bane Houei Say	8	40	45	44	31	285	-71N	67	71	+1.6	+0.2
LA Luang Prabang	8	43	20	42	29	286	-69N	65	69	+1.5	+0.3
LA Pakse	8	47	20	36	23	289	-79N	75	79	+1.1	+0.0
LA Phong Savanh	8	44	51	40	27	287	-68N	65	68	+1.5	+0.4
LA Savannakhet	8	46	15	38	25	288	-76N	72	76	+1.2	+0.1
LA Vientiane	8	43	33	41	28	287	-75N	71	75	+1.4	+0.1
MY Alor Setar	8	48	10	38	25	293	-64S	113	117	+0.6	-1.1
MY Bintulu	8	55	22	23	10	293	-75S	102	106	+0.2	-0.5
MY Butterworth	8	48	58	37	24	293	-62S	115	119	+0.5	-1.2
MY Ipoh	8	50	18	36	23	293	-60S	117	121	+0.4	-1.2
MY Johor Bahru	8	54	38	31	19	294	-55S	122	126	+0.2	-1.2
MY Kerteh	8	51	24	34	21	293	-64S	113	117	+0.4	-1.0
MY Kluang	8	54	6	32	19	294	-56S	122	125	+0.2	-1.2
MY Kota Bahru	8	49	20	36	23	293	-67S	110	114	+0.5	-1.0
MY Kota Kinabalu	8	54	59	22	9	293	-88S	89	92	+0.3	-0.2
MY Kuala Lumpur	8	52	46	34	21	294	-55S	122	126	+0.3	-1.3
MY Kuala Terengganu	8	50	27	34	22	293	-66S	111	115	+0.5	-1.0
MY Kuantan	8	52	4	33	20	293	-61S	116	120	+0.4	-1.1
MY Kuching	8	55	59	25	12	293	-65S	112	115	+0.1	-0.8
MY Labuan	8	54	57	22	9	293	-85S	92	96	+0.3	-0.3
MY Lahad Datu	8	55	40	19	6	293	-89S	88	92	+0.2	-0.1
MY Malacca	8	53	32	33	20	294	-55S	123	126	+0.3	-1.3
MY Marudi	8	55	5	23	10	293	-80S	97	101	+0.2	-0.4
MY Miri	8	54	57	23	10	293	-80S	97	101	+0.2	-0.4
MY Penang	8	49	3	37	24	293	-61S	116	120	+0.5	-1.2
MY Pulau	8	47	37	39	26	293	-63S	114	118	+0.6	-1.1
MY Pulau Pioman	8	53	24	32	19	293	-60S	118	121	+0.3	-1.1
MY Sibul	8	55	44	24	11	293	-70S	107	110	+0.2	-0.6
MY Simpang	8	52	20	34	21	294	-57S	121	124	+0.3	-1.3
MY Tawau	8	55	41	19	6	293	-86S	91	94	+0.2	-0.2
NP Bhairawa	8	5	42	68	55	272	-77N	73	77	+2.6	+0.0
NP Biratnagar	8	15	10	62	50	275	-74N	70	74	+2.4	+0.1
NP Chandragarhi	8	17	8	61	49	276	-72N	69	72	+2.4	+0.2
NP Janakpur	8	11	58	64	52	274	-76N	72	76	+2.4	+0.0
NP Kathmandu	8	10	43	65	53	273	-73N	69	73	+2.5	+0.2
NP Nepalgunj	8	1	8	70	58	269	-78N	74	78	+2.6	+0.0
NP Pokhara	8	7	14	67	55	271	-73N	70	74	+2.6	+0.2
NP Simara	8	9	39	66	53	273	-76N	72	76	+2.5	+0.0
PK Bahawalpure	7	33	4	83	73	254	-86N	83	87	+3.0	-0.1
PK Bannu	7	30	29	80	73	240	-74N	71	74	+3.0	+0.7
PK Chitral	7	37	43	77	69	238	-61N	57	61	+3.1	+1.6
PK Dalbandin	7	10	54	80	83	222	-86S	91	95	+3.1	-0.2
PK Dera Ghazi Khan	7	29	23	83	74	249	-85N	82	86	+3.0	+0.0
PK Dera Ismail Khan	7	31	2	81	73	244	-78N	74	78	+3.0	+0.4



## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
PK Faisalabad	7	37	6	80	70	251	-78N	74	78	+3.0	+0.3
PK Gilgit	7	45	40	75	66	245	-57N	53	57	+3.2	+1.8
PK Gwadar	7	6	54	79	87	226	-72S	105	109	+3.2	-1.0
PK Hyderabad	7	25	23	87	78	263	-76S	101	104	+3.0	-1.0
PK Islamabad	7	38	48	78	69	246	-69N	65	69	+3.0	+0.9
PK Jacobsbad	7	23	33	84	78	249	-87S	90	94	+3.0	-0.4
PK Jiwani	7	5	24	78	88	213	-71S	106	110	+3.2	-1.0
PK Karachi	7	21	36	86	80	262	-74S	103	107	+3.0	-1.1
PK Karachi	7	22	15	86	80	263	-74S	103	107	+3.0	-1.1
PK Kharan	7	14	10	82	82	232	-86S	91	95	+3.1	-0.3
PK Khuzdhar	7	18	19	84	80	244	-84S	93	97	+3.1	-0.5
PK Lahore	7	41	20	78	68	254	-75N	72	76	+3.0	+0.4
PK Lahore	7	41	10	79	68	254	-76N	72	76	+3.0	+0.4
PK Mangla	7	39	58	78	68	249	-70N	67	71	+3.0	+0.8
PK Mianwali	7	33	23	80	72	244	-75N	71	75	+3.0	+0.6
PK Mir Pur Khas	7	27	4	87	77	262	-78S	99	102	+3.0	-0.9
PK Miranshah	7	29	8	80	73	239	-75N	71	75	+3.0	+0.7
PK Moenjodaro	7	23	6	85	78	252	-83S	94	97	+3.0	-0.6
PK Multan	7	32	11	82	73	250	-84N	80	84	+3.0	+0.1
PK Muzaffarabad	7	40	49	77	68	246	-65N	62	65	+3.1	+1.1
PK Naushki	7	15	52	82	80	231	-89S	87	91	+3.1	-0.1
PK Nawabshah	7	24	34	86	78	258	-80S	97	101	+3.0	-0.8
PK Okara	7	37	59	80	70	253	-80N	76	80	+2.9	+0.2
PK Ormara	7	13	57	82	84	252	-73S	104	107	+3.1	-1.0
PK Panjgur	7	10	54	81	84	232	-79S	98	102	+3.1	-0.6
PK Parachinar	7	29	56	79	73	236	-71N	67	71	+3.0	+0.9
PK Pasni	7	9	59	80	86	242	-73S	104	108	+3.2	-1.0
PK Peshawar	7	34	21	79	71	241	-69N	66	69	+3.0	+1.0
PK Qasim	7	38	34	78	69	246	-69N	66	69	+3.0	+0.9
PK Quetta	7	18	40	82	79	234	-87N	84	88	+3.1	+0.1
PK Rahim Yar Khan	7	29	1	84	75	254	-89S	88	92	+3.0	-0.3
PK Rawala Kot	7	41	12	77	68	247	-67N	63	67	+3.0	+1.0
PK Risalpur	7	35	50	78	70	242	-68N	65	68	+3.0	+1.0
PK Sahiwal	7	35	16	80	71	248	-77N	73	77	+3.0	+0.4
PK Saidu Sharif	7	37	49	77	69	242	-65N	61	65	+3.1	+1.3
PK Sargodha	7	36	25	80	70	249	-76N	72	76	+3.0	+0.5
PK Shorekote	7	34	49	81	71	251	-81N	77	81	+3.0	+0.2
PK Skardu	7	48	33	74	65	249	-58N	54	58	+3.2	+1.7
PK Sui	7	25	38	84	76	250	-89S	88	92	+3.0	-0.3
PK Sukkur	7	24	52	85	77	252	-85S	92	95	+3.0	-0.5
PK Talhar	7	27	17	88	77	266	-75S	102	105	+3.0	-1.1
PK Terbela	7	37	40	78	69	244	-68N	64	68	+3.0	+1.0
PK Wana	7	27	15	81	74	239	-78N	74	78	+3.0	+0.5
PK Zhob	7	26	33	82	75	241	-81N	78	82	+3.0	+0.3
PH Bagabag	9	7	31	18	5	293	-34N	30	33	+2.3	+4.5
PH Baguio	9	5	29	19	6	292	-39N	35	38	+1.7	+3.2
PH Cauayan	9	10	55	17	4	293	-26N	22	26	+4.5	+9.6
PH Floridablanca	9	1	54	19	7	292	-48N	45	48	+1.1	+1.8
PH Iba	9	1	56	20	7	292	-48N	44	48	+1.2	+1.8
PH Jose Panganiban	9	2	58	17	4	293	-47N	43	46	+1.1	+2.0
PH Kalibo	8	59	16	17	4	293	-61N	57	60	+0.6	+0.9
PH Lingayen	9	3	46	20	7	292	-43N	39	42	+1.4	+2.5
PH Lipa	9	0	58	19	6	292	-52N	49	52	+0.9	+1.4
PH Mamburao	8	59	35	19	6	292	-57N	54	57	+0.8	+1.1
PH Manila	9	1	37	19	6	292	-50N	46	50	+1.0	+1.7
PH Marinduque	9	0	44	18	5	293	-54N	50	54	+0.8	+1.3
PH Puerto Princesa	8	56	13	20	7	292	-75N	71	75	+0.5	+0.3
PH San Fernando	9	5	26	19	7	292	-38N	34	38	+1.8	+3.3
PH San Jose	8	58	15	17	4	293	-65N	62	65	+0.5	+0.7
PH Vigan	9	10	24	18	6	292	-27N	23	26	+4.5	+9.3
RU Ashkhabad	7	1	38	69	75	169	-62N	58	62	+2.7	+2.3
RU Baku	6	47	51	60	69	140	-50N	47	50	+2.2	+3.5
RU Bukhara	7	23	48	73	72	206	-49N	46	49	+3.1	+3.2
RU Chardzhou	7	19	17	73	73	202	-54N	50	54	+3.0	+2.7
RU Dushanbe	7	33	52	75	70	225	-51N	47	51	+3.2	+2.7
RU Krasnovodsk	6	53	15	63	71	149	-53N	49	53	+2.4	+3.2
RU Makhachkala	6	53	8	58	66	141	-36N	32	36	+1.9	+5.5
RU Mineralnye Vody	6	55	52	55	63	136	-21N	17	21	+9.9	+9.9
RU Nukus	7	20	41	69	71	188	-36N	32	36	+3.0	+5.8
RU Osh	7	58	47	70	62	239	-27N	22	26	+9.9	+9.9
RU Samarkand	7	31	28	73	70	218	-47N	43	47	+3.2	+3.4
RU Shevchenko	7	7	3	62	68	157	-29N	24	28	+2.3	+8.0
RU Sochi	6	45	13	52	61	125	-26N	22	26	+1.1	+7.8
RU Termez	7	26	16	76	73	220	-59N	56	59	+3.1	+2.0
RU Yerevan	6	35	17	54	64	123	-50N	46	49	+1.8	+3.6
SG Paya Lebar	8	55	2	31	18	294	-55S	123	126	+0.2	-1.2
SG Sembawang	8	54	56	31	18	294	-55S	123	126	+0.2	-1.2
SG Singapore	8	55	3	31	18	294	-55S	123	126	+0.2	-1.2
SG Tengah	8	54	57	31	18	294	-54S	123	127	+0.2	-1.2
LK Anuradhapura	8	28	25	60	48	296	-34S	143	147	+0.9	-3.1
LK Batticaloa	8	31	21	59	46	296	-35S	143	147	+0.8	-3.0
LK Colombo	8	31	30	60	48	297	-29S	149	153	+0.7	-3.5
LK Galoya	8	32	23	58	46	296	-33S	145	148	+0.8	-3.1
LK Jaffna	8	23	42	63	50	295	-39S	138	142	+1.2	-2.9
LK Trincomalee	8	28	27	60	48	295	-37S	141	145	+1.0	-2.9
LK Wirawila	8	35	31	57	45	297	-28S	150	154	+0.5	-3.5
TH Bangkok	8	42	3	42	29	289	-88S	89	92	+1.1	-0.5
TH Chiang Rai	8	40	23	44	31	286	-74N	71	74	+1.5	+0.1
TH Krbi	8	45	16	40	28	292	-68S	110	113	+0.7	-1.1
TH Lampang	8	39	15	45	32	286	-80N	76	80	+1.4	-0.1
TH Loei	8	42	25	42	29	287	-78N	75	79	+1.3	-0.1
TH Lop Buri	8	41	42	42	29	289	-89N	85	89	+1.2	-0.4
TH Nakhon Pathom	8	41	12	43	30	289	-88S	89	93	+1.1	-0.5

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
TH Nakhon Ratchasima	8	43	20	40	27	289	-86N	83	86	+1.1	-0.3
TH Nakhon Sawan	8	40	46	43	30	288	-87N	84	88	+1.2	-0.4
TH Nakhon Si Thammarat	8	45	38	40	27	292	-70S	107	110	+0.7	-1.0
TH Narathiwat	8	48	41	37	24	292	-67S	110	114	+0.6	-1.0
TH Pattani	8	48	4	37	24	292	-67S	110	114	+0.6	-1.0
TH Phetchabun	8	41	52	42	29	288	-81N	78	82	+1.3	-0.2
TH Phitsanulok	8	40	35	43	30	287	-83N	80	84	+1.3	-0.2
TH Phrae	8	40	12	44	31	287	-79N	76	79	+1.4	-0.1
TH Phuket	8	44	43	41	28	292	-67S	111	114	+0.8	-1.1
TH Prachin Buri	8	43	57	40	27	289	-89N	86	90	+1.0	-0.4
TH Prachuap Khiri Khan	8	42	8	42	29	290	-83S	94	98	+1.0	-0.6
TH Ranong	8	43	17	42	29	291	-72S	105	109	+0.9	-1.0
TH Rayong	8	43	12	41	28	290	-85S	92	96	+1.0	-0.6
TH Sakon Nakhon	8	45	30	39	26	288	-75N	71	75	+1.3	+0.1
TH Songkhla	8	47	20	38	25	292	-68S	110	113	+0.6	-1.0
TH Songkhla	8	47	25	38	25	292	-66S	111	114	+0.6	-1.0
TH Surat Thani	8	44	42	40	27	291	-74S	103	107	+0.8	-0.9
TH Surin	8	44	53	39	26	289	-84N	80	84	+1.1	-0.2
TH Tak	8	38	20	45	32	287	-87N	83	87	+1.3	-0.4
TH Trang	8	46	19	39	26	292	-67S	110	114	+0.7	-1.1
TH Udon Thani	8	43	49	40	27	288	-77N	73	77	+1.3	+0.0
TH Uttaradit	8	40	22	44	31	287	-80N	77	81	+1.4	-0.2
TH Ya La	8	48	21	37	24	292	-67S	111	114	+0.6	-1.0
TR Adana	6	10	45	43	54	101	-56N	52	56	+1.3	+3.1
TR Adana	6	10	30	43	54	101	-56N	52	56	+1.3	+3.1
TR Afyon	6	11	28	39	50	100	-43N	39	43	+0.8	+4.0
TR Akhisar	6	9	54	37	48	98	-39N	35	39	+0.6	+4.3
TR Ankara	6	18	52	42	53	105	-39N	35	39	+0.9	+4.5
TR Ankara Acc/fir/fic	6	18	4	42	52	104	-39N	35	39	+0.8	+4.5
TR Antalya	6	5	5	38	49	97	-52N	48	51	+1.0	+3.3
TR Aydin	6	5	54	36	47	96	-44N	40	44	+0.7	+3.8
TR Balikesir	6	13	37	38	48	99	-35N	31	35	+0.5	+4.8
TR Bandirma	6	17	9	38	49	101	-31N	27	31	+0.3	+5.5
TR Batman	6	22	14	50	60	111	-57N	54	57	+1.7	+3.0
TR Bursa	6	17	11	39	50	101	-33N	29	33	+0.5	+5.2
TR Canakkale	6	15	47	37	48	99	-30N	25	29	+0.2	+5.6
TR Corlu	6	22	8	39	50	103	-26N	21	25	+0.1	+6.7
TR Dalaman	6	2	37	36	47	95	-50N	46	50	+0.8	+3.4
TR Denizli	6	7	9	38	49	97	-47N	43	46	+0.8	+3.7
TR Diyarbakir	6	20	33	49	59	109	-57N	53	57	+1.6	+3.0
TR Elazig	6	21	25	48	59	110	-53N	49	53	+1.5	+3.3
TR Eregli	6	23	54	42	52	106	-31N	27	30	+0.6	+5.8
TR Erzincan	6	25	37	49	59	113	-48N	44	48	+1.5	+3.7
TR Erzurum	6	29	4	51	61	116	-49N	45	48	+1.6	+3.8
TR Eskisehir	6	15	59	40	51	102	-38N	34	38	+0.7	+4.6
TR Eskisehir	6	16	3	40	51	102	-38N	34	38	+0.7	+4.6
TR Gaziantep	6	13	31	45	56	104	-58N	55	58	+1.5	+2.9
TR Iskenderun	6	10	31	43	55	101	-59N	55	59	+1.4	+2.9
TR Isparta	6	7	54	39	50	98	-48N	44	47	+0.9	+3.6
TR Istanbul	6	21	14	40	50	103	-28N	24	28	+0.3	+6.1
TR Istanbul	6	21	26	40	50	103	-29N	25	28	+0.3	+6.0
TR Izmir	6	8	11	36	47	96	-40N	35	39	+0.5	+4.3
TR Kars	6	34	37	53	63	122	-47N	43	47	+1.7	+3.9
TR Kastamonu	6	25	59	44	55	109	-34N	30	33	+0.8	+5.4
TR Kayseri	6	16	40	44	55	105	-49N	45	49	+1.2	+3.6
TR Konya	6	10	29	41	52	100	-49N	45	49	+1.0	+3.5
TR Kutahya	6	13	58	39	50	101	-39N	35	39	+0.7	+4.4
TR Malatya	6	19	3	47	57	108	-53N	49	53	+1.5	+3.3
TR Merzifon	6	25	12	45	56	110	-39N	35	38	+1.1	+4.7
TR Mus	6	25	46	51	61	114	-54N	50	54	+1.7	+3.2
TR Nevsehir	6	15	33	43	54	104	-48N	44	48	+1.2	+3.7
TR Niniop	6	30	55	46	56	113	-31N	27	31	+0.8	+6.0
TR Samsun	6	28	8	47	57	112	-37N	33	37	+1.1	+5.0
TR Sanliurfa	6	16	3	47	58	106	-59N	55	59	+1.6	+2.9
TR Siirt	6	23	38	50	61	112	-58N	54	58	+1.8	+3.0
TR Sivas	6	22	23	46	57	109	-45N	41	45	+1.3	+4.0
TR Sivrihisar	6	15	6	41	51	102	-41N	37	41	+0.8	+4.3
TR Tokat	6	23	46	46	56	110	-43N	39	42	+1.2	+4.3
TR Topel	6	20	24	40	51	104	-32N	28	32	+0.5	+5.4
TR Trabzon	6	31	12	50	60	117	-42N	38	42	+1.4	+4.4
TR Usak	6	10	26	38	49	99	-42N	38	42	+0.7	+4.1
TR Van	6	27	45	52	63	116	-57N	53	56	+1.8	+3.1
TR Yalova	6	19	42	40	50	103	-31N	27	31	+0.4	+5.5
TR Yenisehir	6	17	35	40	50	102	-34N	30	34	+0.5	+5.1
TR Zonguldak	6	25	50	43	53	108	-30N	26	30	+0.6	+6.0
UZ Tashkent	7	47	6	71	66	228	-31N	27	31	+4.4	+7.8
VN Danang	8	50	5	34	21	289	-71N	67	71	+1.1	+0.3
VN Hanoi	8	50	10	37	24	287	-55N	51	55	+1.8	+1.2
VN Ho Chi Minh City	8	48	57	34	21	291	-89S	88	92	+0.7	-0.4
VN Nhatrang	8	50	36	31	18	291	-83N	79	83	+0.8	-0.1

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
AF Herat	8	37	28	76	66	250	48N	308	312	+1.8	-2.7
AF Jalalabad	8	48	27	68	57	260	36N	320	324	+1.0	-3.4
AF Kabul	8	46	32	69	58	258	37N	319	322	+1.1	-3.3
AF Kandahar	8	50	36	72	61	262	53N	303	307	+1.7	-2.4
AF Kunduz	8	38	34	70	60	253	29N	327	330	+1.0	-3.9
AF Maimama	8	36	15	73	63	249	38N	318	321	+1.4	-3.3
AF Mazar-I-Sharif	8	36	33	71	61	250	32N	324	328	+1.1	-3.7
AF Sheberghan	8	34	50	72	62	248	33N	323	326	+1.2	-3.6
AF Shindand	8	39	38	76	66	252	51N	305	309	+1.8	-2.5
AF Taluqan	8	38	45	69	59	253	28N	328	332	+0.9	-4.0
BD Chittagong	9	33	36	40	27	285	40N	316	319	+0.0	-2.4
BD Cox'S Bazar	9	35	31	40	27	286	43N	314	317	+0.0	-2.3
BD Dhaka	9	29	50	43	30	284	38N	318	322	+0.0	-2.6
BD Dhaka	9	29	41	43	30	284	38N	318	322	+0.0	-2.6
BD Ishurdi	9	28	47	44	31	283	39N	317	321	+0.1	-2.6
BD Jessore	9	31	14	43	31	284	42N	314	318	+0.1	-2.4
BD Rajshahi	9	28	1	45	32	283	39N	317	321	+0.1	-2.6
BD Saidpur	9	24	22	46	33	282	34N	322	326	+0.0	-2.9
BD Sylhet Osmani	9	26	24	42	30	284	31N	325	329	-0.2	-2.9
BT Paro	9	19	32	46	34	281	27N	329	333	-0.2	-3.3
MM Bagan	9	35	51	37	24	287	38N	318	321	-0.2	-2.4
MM Banmaw	9	26	34	37	25	285	22N	334	337	-0.6	-3.2
MM Coco Island	9	48	32	33	20	290	63N	293	297	+0.2	-1.3
MM Dawei	9	49	0	29	16	290	55N	301	304	-0.1	-1.5
MM Heho	9	36	31	35	22	287	36N	320	323	-0.3	-2.4
MM Hpa-An	9	44	27	31	18	289	47N	309	312	-0.1	-1.8
MM Kalay	9	30	51	39	26	285	33N	323	327	-0.2	-2.7
MM Kawthoung	9	53	57	26	13	292	67N	289	293	+0.1	-1.0
MM Kengtung	9	33	56	33	20	288	29N	327	331	-0.5	-2.7
MM Kyaukpyu	9	39	52	37	24	287	46N	310	313	+0.0	-2.0
MM Lanywa	9	36	24	37	24	287	39N	317	320	-0.2	-2.3
MM Lashio	9	30	17	36	23	286	26N	330	333	-0.5	-2.9
MM Loikaw	9	38	49	34	21	288	39N	317	320	-0.2	-2.3
MM Mandalay	9	34	16	36	23	287	35N	322	325	-0.3	-2.5
MM Mawlamyine	9	45	17	31	18	290	49N	307	311	-0.1	-1.8
MM Momeik	9	30	22	37	24	286	28N	328	331	-0.4	-2.9
MM Mong Hsat	9	36	4	33	20	288	33N	324	327	-0.4	-2.5
MM Myeik	9	51	15	27	14	291	60N	297	300	+0.0	-1.3
MM Myitkyina	9	22	39	38	26	285	17N	339	342	-0.8	-3.6
MM Nampong	9	22	47	38	26	285	18N	338	342	-0.8	-3.6
MM Namsang	9	35	45	34	21	288	34N	322	325	-0.4	-2.5
MM Pathein	9	44	45	34	21	289	53N	304	307	+0.0	-1.7
MM Putao	9	14	30	40	28	283	7N	349	352	-1.3	-4.8
MM Pyay	9	41	1	35	22	288	45N	311	314	-0.1	-2.0
MM Shante	9	36	15	36	23	287	37N	319	322	-0.2	-2.4
MM Sittwe	9	38	24	38	25	287	45N	311	314	+0.0	-2.1
MM Tachilek	9	35	53	32	19	288	31N	325	328	-0.5	-2.6
MM Taungoo	9	40	28	34	21	288	43N	313	317	-0.2	-2.1
MM Thandwe	9	41	46	35	22	288	48N	308	312	+0.0	-1.9
MM Yangon	9	44	34	32	20	289	50N	306	310	+0.0	-1.8
KH Battambang	9	49	38	24	11	291	51N	306	309	-0.3	-1.5
KH Kompong Chnang	9	50	29	22	9	292	51N	305	308	-0.3	-1.5
KH Phnom-Penh	9	51	25	21	8	292	53N	303	307	-0.3	-1.4
KH Siem-Reap	9	48	58	23	10	291	49N	308	311	-0.3	-1.6
KH Stung Treng	9	47	54	22	9	292	45N	311	315	-0.5	-1.7
CN Hotan	8	38	57	62	51	262	3N	353	357	-1.1	-7.3
CN Jinghonggasa	9	31	27	33	20	288	24N	332	335	-0.7	-3.0
CN Kashi	8	21	34	66	57	251	-7N	3	7	+9.9	+9.9
CN Kunming	9	17	56	35	22	286	3N	352	356	-1.7	-5.2
GE Sukhumi	7	24	48	59	67	144	20N	336	339	+2.4	-5.3
GE Tbilisi	7	38	58	64	71	160	28N	328	331	+2.3	-4.0
IN Agartala	9	29	31	42	29	284	36N	320	324	-0.1	-2.6
IN Agatti Island	9	21	53	57	45	292	66S	244	247	+3.0	+1.2
IN Agra	9	16	21	57	45	277	49N	308	311	+0.8	-2.5
IN Ahmedabad	9	18	5	61	48	279	70N	287	290	+1.6	-1.5
IN Aizwal	9	29	37	41	28	285	33N	323	326	-0.2	-2.7
IN Akola	9	27	51	55	42	283	70N	287	290	+1.3	-1.4
IN Allahabad	9	23	11	52	40	280	48N	308	312	+0.6	-2.4
IN Along	9	13	40	43	31	282	10N	345	349	-1.0	-4.5
IN Amritsar	9	1	6	63	51	269	39N	317	321	+0.8	-3.1
IN Aurangabad	9	26	39	56	43	284	75N	281	285	+1.5	-1.2
IN Baghdogra	9	21	42	47	34	281	32N	324	328	+0.0	-3.0
IN Bakshi Ka Talab	9	18	53	54	41	278	44N	312	315	+0.6	-2.6
IN Balurghat	9	25	51	45	33	282	36N	320	324	+0.0	-2.7
IN Bangalore	9	35	17	50	37	289	86S	263	267	+1.7	-0.2
IN Bareilly	9	14	8	56	44	276	42N	314	318	+0.6	-2.8
IN Baroda	9	20	4	60	47	281	71N	285	289	+1.5	-1.5
IN Belgaum	9	28	48	56	43	287	90N	267	271	+1.9	-0.5
IN Bhatinda	9	5	23	62	50	271	44N	312	316	+0.9	-2.8
IN Bhaunagar	9	19	10	61	48	281	75N	282	285	+1.7	-1.3
IN Bhiwani	9	10	33	60	48	274	46N	310	313	+0.9	-2.6
IN Bhopal	9	23	57	56	43	281	62N	295	298	+1.1	-1.8
IN Bhubaneswar	9	36	15	45	32	285	57N	299	303	+0.5	-1.8
IN Bhuj	9	12	42	65	52	278	74N	283	286	+1.8	-1.4
IN Bidar	9	31	51	53	40	286	78N	279	282	+1.4	-1.0
IN Bikaner	9	9	19	63	50	273	53N	303	306	+1.2	-2.3
IN Bilaspur	9	30	43	50	37	283	58N	299	302	+0.7	-1.9
IN Bokaro	9	29	28	47	34	283	46N	310	314	+0.3	-2.3
IN Bombay	9	23	17	59	46	284	82N	275	278	+1.8	-0.9
IN Bombay	9	23	21	59	46	284	82N	275	278	+1.8	-0.9
IN Calcutta	9	32	23	44	31	284	45N	311	315	+0.2	-2.3
IN Calicut	9	31	49	52	39	291	76S	253	257	+2.2	+0.4
IN Carnicobar	9	53	5	31	18	291	79N	277	281	+0.5	-0.6

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
IN Chandigarh	9	5	48	60	48	271	39N	317	321	+0.7	-3.0
IN Coimbatore	9	34	8	50	38	291	78S	255	259	+2.0	+0.3
IN Cooch-Behar	9	22	42	45	33	282	31N	325	329	-0.1	-3.0
IN Cuddapah	9	36	28	50	37	288	87N	270	274	+1.5	-0.6
IN Daman	9	21	53	60	47	283	78N	279	282	+1.7	-1.1
IN Deesa	9	15	32	62	50	278	67N	290	293	+1.5	-1.7
IN Dehra Dun	9	8	14	59	46	273	38N	318	321	+0.6	-3.0
IN Delhi	9	12	6	59	46	275	45N	311	314	+0.8	-2.6
IN Delhi	9	12	3	59	46	274	46N	311	314	+0.8	-2.6
IN Deparizo	9	14	59	43	31	282	13N	343	346	-0.9	-4.2
IN Dhanbad	9	29	8	46	34	283	45N	311	315	+0.3	-2.4
IN Dundigul	9	33	22	52	38	286	77N	279	283	+1.3	-1.1
IN Gauhati	9	23	6	43	31	283	27N	329	332	-0.3	-3.1
IN Gaya	9	26	26	49	36	282	44N	312	315	+0.4	-2.4
IN Goa	9	27	25	56	43	288	87S	264	268	+2.0	-0.3
IN Gorakhpur	9	20	42	51	39	279	41N	316	319	+0.4	-2.7
IN Guna	9	21	18	56	44	279	57N	299	302	+1.0	-2.0
IN Gwalior	9	18	37	56	44	278	51N	305	309	+0.9	-2.3
IN Hirakud	9	32	46	47	35	284	56N	301	304	+0.6	-1.9
IN Hissar	9	9	15	61	48	273	46N	310	314	+0.9	-2.7
IN Hyderabad	9	33	38	51	38	286	78N	279	282	+1.3	-1.0
IN Imphal	9	26	32	40	28	284	28N	328	332	-0.3	-3.0
IN Indore	9	23	9	57	44	281	66N	291	294	+1.3	-1.7
IN Jabalpur	9	26	48	53	40	282	58N	299	302	+0.9	-2.0
IN Jaipur	9	15	8	59	47	276	53N	303	307	+1.0	-2.3
IN Jaisalmer	9	8	38	65	53	274	61N	296	299	+1.5	-2.0
IN Jammu	8	57	57	63	51	267	35N	321	324	+0.8	-3.3
IN Jamnagar	9	14	22	65	52	279	76N	281	284	+1.9	-1.3
IN Jamshedpur	9	31	22	46	33	284	48N	308	311	+0.4	-2.2
IN Jeypore	9	36	16	47	34	286	66N	290	294	+0.9	-1.5
IN Jhansi	9	20	45	56	43	279	53N	303	307	+0.9	-2.2
IN Jharsuguda	9	32	10	48	35	284	55N	302	305	+0.6	-2.0
IN Jodhpur	9	13	2	62	50	276	59N	297	300	+1.3	-2.0
IN Jorhat	9	19	59	42	30	283	19N	337	340	-0.6	-3.6
IN Kailashahar	9	28	11	42	29	284	33N	323	327	-0.2	-2.8
IN Kamalpur	9	28	42	42	29	284	34N	322	326	-0.1	-2.7
IN Kandla	9	13	43	65	52	279	74N	283	286	+1.8	-1.4
IN Kanpur	9	20	1	54	42	278	47N	309	313	+0.7	-2.5
IN Keshod	9	16	15	64	51	281	79N	277	281	+1.9	-1.1
IN Khajuraho	9	23	20	54	41	280	53N	304	307	+0.8	-2.2
IN Kolhapur	9	27	47	56	43	286	88N	269	273	+1.8	-0.6
IN Kota	9	18	41	58	46	278	58N	298	301	+1.1	-2.0
IN Kulu	9	2	11	61	49	270	34N	322	326	+0.6	-3.3
IN Leh	8	54	22	62	50	266	24N	332	335	+0.3	-4.0
IN Lilabari	9	17	52	43	30	282	17N	339	343	-0.7	-3.9
IN Lucknow	9	19	27	54	41	278	45N	311	315	+0.6	-2.5
IN Ludhiana	9	4	39	61	49	271	40N	316	320	+0.8	-3.0
IN Madras	9	39	15	47	34	289	89N	268	271	+1.4	-0.4
IN Madurai	9	35	47	49	36	292	76S	253	256	+2.0	+0.5
IN Mangalore	9	30	1	54	41	290	81S	258	261	+2.1	+0.1
IN Mazuffarpur	9	22	57	49	36	281	39N	317	320	+0.3	-2.7
IN Mohanbari	9	16	24	42	30	282	13N	342	346	-0.9	-4.1
IN Nagarjunsagar	9	35	39	50	37	287	79N	278	281	+1.3	-1.0
IN Nagpur	9	29	33	53	40	283	66N	291	294	+1.1	-1.6
IN Nainital	9	12	24	57	44	275	40N	316	320	+0.6	-2.9
IN Nasik Road	9	24	4	58	45	283	78N	279	282	+1.6	-1.1
IN Nawapara	9	33	2	49	36	284	60N	296	299	+0.8	-1.7
IN Panagarh	9	30	16	45	32	283	44N	312	316	+0.3	-2.4
IN Pasighat	9	13	36	43	30	282	9N	346	350	-1.1	-4.6
IN Pathankot	9	0	4	62	50	268	35N	321	324	+0.7	-3.3
IN Patiala	9	6	33	61	48	272	41N	315	319	+0.8	-2.9
IN Patina	9	24	20	49	36	281	41N	315	318	+0.3	-2.6
IN Porbandar	9	14	41	65	52	280	79N	277	281	+2.0	-1.1
IN Port Blair	9	51	6	32	19	291	72N	285	288	+0.4	-0.9
IN Pune	9	25	42	58	45	285	82N	275	278	+1.7	-0.9
IN Purnea	9	24	24	47	34	282	37N	319	323	+0.1	-2.8
IN Raibarelli	9	21	0	53	40	279	46N	310	314	+0.6	-2.5
IN Raipur	9	31	53	50	37	284	61N	296	299	+0.8	-1.8
IN Rajahmundry	9	37	51	47	34	287	73N	284	287	+1.0	-1.2
IN Rajkot	9	16	0	63	50	280	75N	281	285	+1.8	-1.3
IN Ranchi	9	29	56	47	34	283	48N	308	311	+0.4	-2.2
IN Rourkela	9	31	55	47	34	284	52N	304	307	+0.5	-2.0
IN Saharanpur	9	8	17	59	47	273	40N	316	319	+0.7	-2.9
IN Salem	9	36	9	49	36	290	83S	260	263	+1.8	+0.0
IN Shimla	9	4	50	60	48	271	37N	319	323	+0.7	-3.1
IN Sholapur	9	29	51	55	42	286	82N	275	279	+1.6	-0.9
IN Silchar	9	26	19	41	29	284	29N	327	331	-0.3	-3.0
IN Srinagar	8	53	24	64	52	265	30N	326	329	+0.6	-3.7
IN Surat	9	20	54	60	47	282	76N	281	284	+1.7	-1.2
IN Tambaram	9	39	11	47	34	289	89N	268	271	+1.4	-0.4
IN Tanjore	9	38	0	48	35	291	81S	258	262	+1.8	+0.1
IN Tiruchchirappalli	9	37	19	48	35	291	80S	258	261	+1.8	+0.2
IN Tirupeti	9	38	3	48	35	289	88N	269	272	+1.5	-0.5
IN Trivandrum	9	32	7	50	37	293	67S	245	248	+2.5	+1.1
IN Udaipur	9	17	22	61	48	278	63N	293	297	+1.3	-1.8
IN Utkela	9	34	51	47	34	285	62N	295	298	+0.7	-1.7
IN Varanasi	9	23	47	51	38	280	46N	310	314	+0.5	-2.4
IN Vijayawada	9	37	24	48	35	287	77N	280	284	+1.1	-1.0
IN Warangal	9	34	32	50	37	286	74N	282	286	+1.2	-1.2
IN Zero	9	16	54	43	31	282	16N	340	344	-0.7	-4.0
ID Banda Aceh	9	55	51	27	14	292	87N	270	274	+0.5	-0.2
ID Batam	9	58	53	16	3	293	88N	269	273	+0.1	+0.0
ID Bengkulu	9	56	4	16	4	293	71S	248	251	+0.6	+1.0

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
ID Dumai	9	58	20	19	6	293	90S	267	270	+0.3	+0.1
ID Gunung Sitoli	9	56	48	23	10	293	82S	259	262	+0.6	+0.4
ID Lhok Sukon	9	56	45	25	12	293	85N	272	275	+0.4	-0.2
ID Medan	9	57	29	23	9	293	88N	269	272	+0.3	-0.1
ID Muko Muko	9	56	33	18	5	293	74S	251	255	+0.6	+0.8
ID Padang	9	57	17	19	6	293	79S	256	260	+0.5	+0.6
ID Padang Sidempuan	9	57	37	21	8	293	86S	263	266	+0.4	+0.2
ID Pekanbaru	9	58	10	19	6	293	86S	263	266	+0.3	+0.2
ID Rengat	9	58	15	17	4	293	84S	261	265	+0.3	+0.3
ID Sabang	9	55	45	27	14	292	86N	271	275	+0.5	-0.3
ID Sibolga	9	57	25	22	9	293	85S	262	266	+0.5	+0.2
ID Whok Seumawe	9	56	36	25	12	293	85N	272	275	+0.4	-0.3
KY Georgetown	9	34	35	49	36	285	67N	289	293	+0.9	-1.5
LA Bane Houei Say	9	36	13	31	19	288	31N	325	328	-0.5	-2.6
LA Luang Prabang	9	36	14	30	17	289	29N	327	330	-0.6	-2.6
LA Pakse	9	45	3	23	10	291	40N	316	320	-0.5	-1.9
LA Phong Savanh	9	36	46	29	16	289	29N	327	331	-0.6	-2.6
LA Savannakhet	9	42	42	25	12	291	37N	320	323	-0.5	-2.1
LA Vientiane	9	40	39	28	15	290	35N	321	324	-0.5	-2.3
MY Alor Setar	9	57	0	22	9	292	77N	280	283	+0.1	-0.5
MY Butterworth	9	57	23	22	9	293	79N	278	281	+0.1	-0.4
MY Ipoh	9	57	51	21	8	293	81N	276	279	+0.1	-0.4
MY Johor Bahru	9	58	49	17	4	293	87N	270	274	+0.1	-0.1
MY Kerteh	9	58	1	18	5	293	77N	279	283	+0.0	-0.5
MY Kluang	9	58	45	17	4	293	86N	271	274	+0.1	-0.1
MY Kota Bahru	9	57	8	20	7	293	74N	283	286	+0.0	-0.6
MY Kuala Lumpur	9	58	25	19	6	293	86N	271	274	+0.2	-0.1
MY Kuala Terengganu	9	57	35	19	6	293	75N	281	285	+0.0	-0.6
MY Kuantan	9	58	20	18	5	293	80N	277	280	+0.1	-0.3
MY Malacca	9	58	34	18	5	293	87N	270	274	+0.2	-0.1
MY Penang	9	57	26	22	9	293	80N	277	280	+0.2	-0.4
MY Pulau	9	56	50	23	10	292	77N	279	283	+0.1	-0.5
MY Pulau Pioman	9	58	40	17	4	293	82N	275	278	+0.0	-0.3
MY Simpang	9	58	22	19	6	293	85N	272	276	+0.2	-0.2
NP Bhairawa	9	18	36	52	39	278	38N	318	321	+0.3	-2.8
NP Biratnagar	9	22	14	48	35	281	34N	322	325	+0.1	-2.9
NP Chandragarhi	9	22	0	47	34	281	33N	323	327	+0.0	-3.0
NP Janakpur	9	21	31	49	36	280	36N	320	323	+0.2	-2.8
NP Kathmandu	9	18	27	50	38	279	34N	322	326	+0.2	-3.0
NP Nepalgunj	9	16	10	54	42	277	39N	317	320	+0.5	-2.8
NP Pokhara	9	16	40	52	39	278	35N	321	325	+0.2	-3.0
NP Simara	9	20	3	50	38	279	36N	320	323	+0.2	-2.9
PK Bahawalpure	9	4	25	65	53	270	52N	305	308	+1.3	-2.4
PK Bannu	8	53	3	68	56	263	41N	315	318	+1.1	-3.0
PK Chitral	8	44	10	67	56	258	28N	328	332	+0.8	-4.0
PK Dalbandin	8	53	37	74	62	266	64N	293	296	+2.0	-1.9
PK Dera Ghazi Khan	9	1	19	67	55	269	51N	305	308	+1.3	-2.5
PK Dera Ismail Khan	8	56	41	67	55	265	44N	312	315	+1.2	-2.9
PK Faisalabad	9	0	32	65	53	268	43N	313	317	+1.0	-2.9
PK Gilgit	8	45	41	65	54	260	23N	333	337	+0.5	-4.3
PK Gwadar	8	54	27	76	63	272	79N	278	282	+2.4	-1.1
PK Hyderabad	9	7	20	68	55	275	70N	287	290	+1.8	-1.6
PK Islamabad	8	53	25	65	54	264	35N	321	325	+0.8	-3.4
PK Jacobsbad	9	2	1	69	56	270	60N	296	300	+1.6	-2.1
PK Jiواني	8	53	20	77	64	272	80N	277	280	+2.5	-1.0
PK Karachi	9	5	9	70	57	275	73N	284	287	+2.0	-1.4
PK Karachi	9	5	35	69	56	275	73N	284	287	+2.0	-1.4
PK Kharan	8	56	6	72	60	267	63N	293	297	+1.9	-1.9
PK Khuzdhar	8	59	56	71	58	270	64N	292	296	+1.8	-1.9
PK Lahore	9	1	21	63	51	269	40N	316	320	+0.9	-3.0
PK Lahore	9	1	22	63	51	269	40N	316	319	+0.9	-3.0
PK Mangla	8	55	53	65	53	265	36N	320	324	+0.8	-3.3
PK Mianwali	8	55	25	66	55	265	41N	315	319	+1.1	-3.0
PK Mir Pur Khas	9	8	0	67	54	275	67N	289	293	+1.7	-1.7
PK Miranshah	8	52	26	68	57	262	42N	314	318	+1.2	-3.0
PK Moenjodaro	9	3	25	69	56	271	63N	293	296	+1.7	-1.9
PK Multan	9	1	54	66	54	269	49N	307	310	+1.2	-2.6
PK Muzaffarabad	8	51	13	65	54	263	31N	325	328	+0.7	-3.6
PK Naushki	8	55	20	72	60	266	59N	297	301	+1.8	-2.1
PK Nawabshah	9	5	53	68	55	273	67N	290	293	+1.8	-1.7
PK Okara	9	2	41	64	52	269	44N	312	315	+1.0	-2.8
PK Ormara	8	59	40	73	60	273	75N	281	285	+2.2	-1.3
PK Panjgur	8	56	21	74	61	270	70N	286	290	+2.1	-1.6
PK Parachinar	8	49	37	68	57	261	38N	318	321	+1.1	-3.2
PK Pasni	8	56	47	75	62	272	77N	280	283	+2.3	-1.2
PK Peshawar	8	50	49	67	56	262	36N	320	324	+1.0	-3.4
PK Qasim	8	53	35	65	54	264	35N	321	325	+0.9	-3.4
PK Quetta	8	55	19	71	59	265	56N	301	304	+1.6	-2.3
PK Rahim Yar Khan	9	4	39	66	54	271	57N	299	303	+1.5	-2.2
PK Rawala Kot	8	53	9	65	53	264	32N	324	327	+0.8	-3.5
PK Risalpur	8	50	50	67	55	262	35N	321	325	+0.9	-3.4
PK Sahiwal	8	58	16	65	54	266	42N	314	317	+1.1	-2.9
PK Saidu Sharif	8	48	35	66	55	261	31N	325	328	+0.8	-3.7
PK Sargodha	8	58	7	65	53	266	41N	315	319	+1.0	-3.0
PK Shorekote	9	1	28	65	53	268	46N	310	314	+1.1	-2.7
PK Skardu	8	48	41	64	53	262	23N	333	336	+0.4	-4.2
PK Sui	9	2	26	68	56	270	58N	299	302	+1.5	-2.2
PK Sukkur	9	3	43	68	56	271	61N	295	299	+1.6	-2.0
PK Talhar	9	8	55	67	54	276	70N	286	290	+1.8	-1.6
PK Terbela	8	51	43	66	55	263	34N	322	326	+0.9	-3.5
PK Wana	8	53	57	69	57	263	45N	311	315	+1.3	-2.8
PK Zhob	8	56	25	68	57	265	48N	308	311	+1.3	-2.7
PH Vigan	9	19	11	16	4	293	-10N	6	9	+9.9	+9.9

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
RU Ashkhabad	8	19	14	75	70	228	38N	318	322	+1.8	-3.3
RU Baku	7	54	24	70	73	186	33N	323	327	+2.1	-3.6
RU Bukhara	8	20	56	72	65	236	22N	334	338	+1.0	-4.8
RU Chardzhou	8	23	5	72	65	237	26N	330	333	+1.2	-4.3
RU Dushanbe	8	30	32	70	60	247	21N	335	339	+0.7	-4.8
RU Krasnovodsk	8	1	56	72	72	201	33N	323	326	+2.0	-3.6
RU Makhachkala	7	39	40	65	70	168	20N	336	339	+2.1	-5.3
RU Mineralnye Vody	7	19	55	59	66	147	8N	348	351	+9.9	+9.9
RU Nukus	8	0	35	71	68	213	12N	344	347	+1.0	-6.9
RU Osh	8	15	39	68	59	245	-6N	1	5	+9.9	+9.9
RU Samarkand	8	23	26	71	63	241	18N	338	342	+0.7	-5.3
RU Shevchenko	7	39	26	66	69	178	10N	346	349	+1.6	-8.1
RU Sochi	7	18	23	57	65	139	15N	341	344	+2.6	-6.8
RU Termez	8	34	30	71	61	249	29N	327	330	+1.1	-4.0
RU Yerevan	7	43	2	66	72	160	36N	320	323	+2.4	-3.1
SG Paya Lebar	9	58	52	17	4	293	87N	270	273	+0.1	+0.0
SG Sembawang	9	58	51	17	4	293	87N	270	273	+0.1	+0.0
SG Singapore	9	58	52	16	3	293	87N	270	273	+0.1	+0.0
SG Tengah	9	58	50	17	4	293	87N	269	273	+0.1	+0.0
LK Anuradhapura	9	39	36	45	32	292	75S	252	255	+1.9	+0.6
LK Batticaloa	9	41	34	43	30	292	75S	252	256	+1.8	+0.5
LK Colombo	9	37	41	45	33	293	69S	246	250	+2.2	+1.0
LK Galoya	9	41	17	43	30	293	74S	251	254	+1.8	+0.6
LK Jaffna	9	39	34	46	33	291	80S	257	260	+1.7	+0.2
LK Trincomalee	9	41	5	44	31	292	77S	255	258	+1.7	+0.4
LK Wirawila	9	39	36	43	31	293	68S	246	249	+2.1	+1.0
TH Bangkok	9	49	1	26	14	291	52N	304	308	-0.2	-1.6
TH Chiang Rai	9	38	8	31	18	289	34N	322	325	-0.4	-2.4
TH Krbi	9	55	36	24	11	292	73N	284	287	+0.1	-0.7
TH Lampang	9	41	17	31	18	289	40N	316	320	-0.3	-2.1
TH Loei	9	42	14	28	15	290	39N	317	321	-0.4	-2.1
TH Lop Buri	9	47	27	27	14	291	49N	307	311	-0.2	-1.7
TH Nakhon Pathom	9	48	50	27	14	291	53N	304	307	-0.2	-1.5
TH Nakhon Ratchasima	9	46	59	26	13	291	47N	310	313	-0.3	-1.8
TH Nakhon Sawan	9	46	11	28	15	290	47N	309	312	-0.2	-1.8
TH Nakhon Si Thammarat	9	55	26	24	11	292	70N	286	290	+0.0	-0.8
TH Narathiwat	9	56	54	21	8	293	74N	283	286	+0.0	-0.6
TH Pattani	9	56	42	22	9	292	74N	283	286	+0.0	-0.7
TH Phetchabun	9	43	43	28	15	290	42N	314	318	-0.3	-2.0
TH Phitsanulok	9	44	7	29	16	290	43N	313	316	-0.3	-1.9
TH Phrae	9	41	20	30	17	289	39N	317	320	-0.3	-2.2
TH Phuket	9	55	31	25	12	292	74N	283	286	+0.2	-0.7
TH Prachin Buri	9	48	50	25	12	291	50N	306	310	-0.3	-1.6
TH Prachuap Khiri Khan	9	50	55	26	13	291	57N	299	303	-0.1	-1.4
TH Ranong	9	54	13	26	13	292	68N	288	292	+0.1	-0.9
TH Rayong	9	50	44	25	12	291	55N	301	304	-0.2	-1.4
TH Sakon Nakhon	9	41	37	26	13	290	35N	321	324	-0.5	-2.2
TH Songkhla	9	56	24	22	9	292	73N	283	287	+0.1	-0.7
TH Songkhla	9	56	35	22	9	292	74N	282	286	+0.1	-0.6
TH Surat Thani	9	54	30	24	11	292	67N	290	293	+0.0	-1.0
TH Surin	9	46	37	25	12	291	44N	312	315	-0.4	-1.8
TH Tak	9	44	41	30	17	290	47N	310	313	-0.2	-1.9
TH Trang	9	56	6	23	10	292	74N	283	286	+0.1	-0.7
TH Udorn Thani	9	41	55	27	14	290	37N	319	322	-0.5	-2.2
TH Uttaradit	9	42	17	29	17	290	41N	316	319	-0.3	-2.1
TH Ya La	9	56	53	21	8	292	74N	282	286	+0.1	-0.6
TR Adana	7	27	33	58	68	124	50N	306	310	+2.6	-1.6
TR Adana	7	27	12	58	68	123	50N	306	310	+2.6	-1.6
TR Afyon	7	11	43	51	61	114	39N	317	321	+2.6	-2.2
TR Akhisar	7	4	27	47	58	109	36N	320	324	+2.6	-2.3
TR Ankara	7	13	19	52	62	120	33N	323	326	+2.6	-2.9
TR Ankara Acc/fir/fic	7	12	7	52	62	118	33N	323	326	+2.6	-2.8
TR Antalya	7	15	40	52	63	113	48N	308	312	+2.6	-1.5
TR Aydin	7	6	39	48	59	108	41N	315	318	+2.6	-1.8
TR Balikesir	7	2	26	47	57	110	32N	324	328	+2.7	-2.9
TR Bandirma	7	0	32	46	57	111	27N	329	332	+2.8	-3.5
TR Batman	7	40	39	64	73	145	47N	309	313	+2.6	-2.1
TR Bursa	7	3	33	48	58	113	29N	327	330	+2.7	-3.2
TR Canakkale	6	56	58	45	55	108	26N	330	333	+2.8	-3.6
TR Corlu	6	57	9	46	56	111	21N	335	338	+3.0	-4.7
TR Dalaman	7	10	47	50	61	109	47N	309	312	+2.6	-1.4
TR Denizli	7	11	23	50	61	112	43N	313	317	+2.6	-1.8
TR Diyarbakir	7	38	23	63	72	141	47N	309	313	+2.6	-2.0
TR Elazig	7	34	34	62	71	138	44N	312	316	+2.6	-2.2
TR Eregli	7	6	37	50	60	118	25N	331	334	+2.8	-4.0
TR Erzincan	7	32	18	61	70	140	39N	318	321	+2.5	-2.7
TR Erzurum	7	35	45	63	71	146	37N	319	322	+2.5	-2.8
TR Eskisehir	7	8	56	50	60	115	33N	323	326	+2.6	-2.8
TR Eskissehir	7	8	41	50	60	115	33N	323	326	+2.6	-2.8
TR Gaziantep	7	33	1	61	71	130	51N	305	309	+2.6	-1.6
TR Iskenderun	7	30	8	59	69	125	52N	304	308	+2.6	-1.5
TR Isparta	7	13	39	51	62	113	44N	313	316	+2.6	-1.8
TR Istanbul	7	0	30	47	57	113	24N	332	336	+2.9	-4.2
TR Istanbul	7	1	34	47	58	113	24N	332	335	+2.8	-4.1
TR Izmir	7	3	0	46	57	108	37N	319	323	+2.6	-2.2
TR Kars	7	38	29	64	71	153	34N	322	325	+2.4	-3.2
TR Kastamonu	7	12	45	53	62	123	27N	329	333	+2.7	-3.8
TR Kayseri	7	24	24	57	67	126	42N	314	318	+2.6	-2.2
TR Konya	7	18	26	54	64	118	44N	312	316	+2.6	-1.9
TR Kutahya	7	8	28	50	60	114	35N	321	325	+2.6	-2.6
TR Malatya	7	31	52	60	70	134	44N	312	315	+2.6	-2.1
TR Merzifon	7	18	48	55	65	127	31N	325	328	+2.6	-3.3
TR Mus	7	40	12	64	72	148	43N	313	316	+2.5	-2.4

# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
TR Nevsehir	7	21	54	56	66	123	41N	315	318	+2.6	-2.2
TR Niniop	7	13	21	54	63	126	23N	333	336	+2.7	-4.5
TR Samsun	7	19	22	56	65	130	29N	327	331	+2.6	-3.6
TR Sanliurfa	7	36	22	62	72	135	50N	306	309	+2.6	-1.7
TR Siirt	7	42	24	65	73	149	47N	309	313	+2.5	-2.1
TR Sivas	7	25	26	58	67	131	37N	319	322	+2.6	-2.7
TR Sivrihisar	7	12	4	51	62	117	36N	320	324	+2.6	-2.5
TR Tokat	7	22	35	57	66	130	34N	322	325	+2.6	-2.9
TR Topel	7	4	53	49	59	115	27N	329	332	+2.7	-3.6
TR Trabzon	7	29	3	60	68	141	32N	324	328	+2.5	-3.4
TR Usak	7	8	54	49	60	112	38N	318	321	+2.6	-2.2
TR Van	7	45	3	66	74	156	44N	312	315	+2.5	-2.4
TR Yalova	7	3	13	48	58	114	27N	329	333	+2.8	-3.7
TR Yenisehir	7	4	57	49	59	114	30N	326	330	+2.7	-3.2
TR Zonguldak	7	7	29	51	60	119	24N	332	336	+2.8	-4.3
UZ Tashkent	8	13	19	69	62	238	1N	355	358	-0.7	-9.8
VN Danang	9	41	36	22	9	292	32N	324	327	-0.7	-2.2
VN Hanoi	9	29	28	28	16	289	16N	340	344	-1.1	-3.4
VN Ho Chi Minh City	9	51	46	19	6	292	53N	304	307	-0.4	-1.4
VN Nhatrang	9	48	31	18	5	293	44N	312	315	-0.5	-1.7

# Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
CY Akrotiri	6	0	50	39	50	95	-63N	59	63	+1.3	+2.6
CY Larnaca	6	2	24	40	51	96	-63N	59	62	+1.3	+2.6
CY Paphos	6	0	32	38	50	95	-62N	58	62	+1.2	+2.6
GE Sukhumi	6	42	38	52	61	125	-32N	28	32	+1.3	+6.2
GE Tbilisi	6	42	28	55	64	129	-42N	38	42	+1.8	+4.5
GR Agrinion	6	7	22	31	42	92	-29N	25	29	-0.1	+5.3
GR Alexandria	6	20	50	35	45	98	-16N	11	15	-1.3	+9.9
GR Alexandroupolis	6	20	17	37	48	100	-23N	19	23	-0.2	+7.0
GR Andravida	6	4	0	30	41	91	-33N	29	33	+0.0	+4.7
GR Athens	6	4	12	32	43	93	-38N	33	37	+0.3	+4.3
GR Chania	5	55	30	31	42	90	-49N	45	48	+0.5	+3.3
GR Chios	6	7	4	35	46	95	-39N	35	39	+0.5	+4.3
GR Dekelia	6	5	12	33	44	93	-36N	32	36	+0.2	+4.4
GR Elefsis	6	4	56	32	43	93	-36N	32	36	+0.2	+4.4
GR Heraklion	5	55	29	32	43	90	-51N	47	50	+0.6	+3.2
GR Ioannina	6	14	24	32	43	94	-20N	16	19	-0.8	+7.6
GR Kalamata	6	0	22	30	41	90	-39N	35	38	+0.2	+4.1
GR Karpathos	5	57	10	33	45	91	-53N	49	53	+0.8	+3.1
GR Kasos	5	57	0	33	45	91	-53N	49	52	+0.8	+3.1
GR Kasteli	5	55	6	32	43	90	-52N	48	51	+0.7	+3.2
GR Kastoria	6	20	43	34	44	96	-13N	9	13	+9.9	+9.9
GR Kavala	6	21	58	36	47	100	-18N	14	18	-0.8	+8.8
GR Keffallinia	6	4	58	30	41	91	-30N	26	30	-0.1	+5.1
GR Kerkyra/corfu	6	14	31	32	42	94	-18N	14	17	-1.1	+8.2
GR Kithira	5	57	35	30	42	90	-44N	40	43	+0.4	+3.7
GR Kos	6	1	37	34	46	94	-47N	43	47	+0.7	+3.5
GR Kozani	6	18	14	34	44	96	-17N	13	17	-1.1	+8.8
GR Larissa	6	13	11	33	44	95	-25N	20	24	-0.3	+6.3
GR Leros	6	2	49	34	46	94	-45N	41	45	+0.6	+3.7
GR Limnos	6	14	24	36	46	98	-29N	25	28	+0.1	+5.7
GR Marathon	6	5	24	33	44	93	-37N	33	36	+0.3	+4.4
GR Megara	6	4	32	32	43	93	-36N	32	36	+0.2	+4.4
GR Mykonos	6	2	59	33	44	93	-42N	38	42	+0.5	+3.9
GR Mytilini	6	10	24	36	47	97	-36N	32	36	+0.4	+4.6
GR Nea Anghialos	6	10	33	33	44	95	-28N	24	28	-0.1	+5.6
GR Patras	6	5	6	31	42	92	-32N	28	31	+0.0	+4.9
GR Preveza	6	9	21	31	42	93	-26N	22	25	-0.4	+5.9
GR Rhodes	6	1	1	35	46	94	-50N	46	50	+0.8	+3.3
GR Rhodes	6	0	58	35	46	94	-50N	46	50	+0.8	+3.3
GR Samos	6	4	48	35	46	95	-43N	39	43	+0.6	+3.9
GR Santorini	5	59	13	33	44	92	-47N	43	47	+0.6	+3.5
GR Sitia	5	55	45	32	44	90	-52N	49	52	+0.7	+3.1
GR Skiathos	6	10	16	33	44	95	-30N	26	29	+0.0	+5.3
GR Skiros	6	9	20	34	45	95	-33N	29	33	+0.2	+4.9
GR Sparti	6	0	6	31	42	91	-40N	36	39	+0.3	+4.0
GR Stefanovikion	6	12	3	33	44	95	-27N	22	26	-0.2	+5.9
GR Syros	6	2	44	33	44	93	-42N	38	41	+0.4	+3.9
GR Tanagra	6	6	11	33	44	93	-35N	31	34	+0.2	+4.6
GR Thessaloniki	6	19	11	35	45	97	-19N	14	18	-0.8	+8.4
GR Tripolis	6	2	21	31	42	91	-37N	33	37	+0.2	+4.3
GR Zakynthos	6	3	12	30	41	91	-33N	29	33	+0.0	+4.7
IT Catania	6	4	5	25	37	87	-21N	17	21	-1.0	+6.4
IT Palermo	6	13	51	26	37	88	-6N	2	5	+9.9	+9.9
IT Reggio Calabria	6	7	37	27	38	88	-18N	14	18	-1.3	+7.4
MT Malta	5	55	50	23	34	85	-30N	26	30	-0.4	+4.7
MT Malta Acc	5	56	9	23	34	85	-30N	26	29	-0.5	+4.7



# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
CY Akrotiri	7	24	2	56	67	114	59N	297	301	+2.7	-0.9
CY Larnaca	7	25	27	57	68	116	58N	298	302	+2.7	-1.0
CY Paphos	7	22	35	55	66	113	58N	298	302	+2.6	-0.9
GE Sukhumi	7	24	48	59	67	144	20N	336	339	+2.4	-5.3
GE Tbilisi	7	38	58	64	71	160	28N	328	331	+2.3	-4.0
GR Agrinion	6	47	41	39	50	100	28N	328	331	+2.8	-3.0
GR Alexandria	6	41	51	39	49	102	13N	342	346	+3.9	-7.6
GR Alexandroupolis	6	52	34	43	54	107	20N	336	339	+3.1	-5.0
GR Andravida	6	49	13	39	50	99	32N	324	327	+2.6	-2.5
GR Athens	6	55	51	43	54	102	36N	320	323	+2.6	-2.1
GR Chania	7	0	41	44	55	100	48N	308	312	+2.4	-1.2
GR Chios	7	1	6	45	56	106	37N	319	323	+2.6	-2.2
GR Dekelia	6	55	22	42	53	102	35N	321	325	+2.6	-2.3
GR Elefsis	6	54	53	42	53	102	35N	321	325	+2.6	-2.3
GR Heraklion	7	3	24	45	57	101	50N	306	310	+2.5	-1.1
GR Ioannina	6	41	55	38	48	99	18N	337	341	+3.3	-5.2
GR Kalamata	6	53	6	41	52	99	38N	318	321	+2.5	-1.9
GR Karpathos	7	8	13	48	59	104	51N	305	308	+2.5	-1.1
GR Kasos	7	7	37	48	59	104	51N	305	308	+2.5	-1.1
GR Kasteli	7	3	54	45	57	101	51N	305	309	+2.5	-1.0
GR Kastoria	6	38	21	37	48	100	11N	344	348	+4.4	-9.0
GR Kavala	6	46	30	41	52	105	15N	341	344	+3.6	-6.7
GR Keffallinia	6	46	40	38	49	98	30N	326	330	+2.7	-2.8
GR Kerkyra/corfu	6	39	17	36	47	98	17N	339	343	+3.5	-5.8
GR Kithira	6	56	56	42	53	100	43N	313	316	+2.5	-1.5
GR Kos	7	6	22	47	58	106	45N	311	314	+2.5	-1.5
GR Kozani	6	41	53	38	49	101	15N	340	344	+3.6	-6.5
GR Larissa	6	47	19	40	51	102	23N	333	337	+3.0	-4.1
GR Leros	7	5	2	47	58	106	43N	313	316	+2.5	-1.6
GR Limnos	6	54	20	43	54	106	26N	330	334	+2.8	-3.6
GR Marathon	6	55	55	43	54	103	35N	321	324	+2.6	-2.3
GR Megara	6	54	36	42	53	102	35N	321	324	+2.6	-2.2
GR Mykonos	7	0	48	45	56	104	40N	316	319	+2.5	-1.8
GR Mytilini	7	0	23	46	56	108	33N	323	326	+2.6	-2.6
GR Nea Anghialos	6	49	53	41	51	102	27N	329	333	+2.8	-3.4
GR Patras	6	49	3	39	50	99	31N	325	328	+2.7	-2.6
GR Preveza	6	45	7	38	49	99	25N	331	335	+2.9	-3.6
GR Rhodes	7	9	26	49	60	107	48N	308	312	+2.5	-1.3
GR Rhodes	7	9	32	49	60	107	48N	308	312	+2.5	-1.3
GR Samos	7	4	21	47	58	107	41N	315	319	+2.6	-1.8
GR Santorini	7	2	52	45	57	103	46N	311	314	+2.5	-1.4
GR Sitia	7	5	48	46	58	103	51N	305	308	+2.5	-1.0
GR Skiathos	6	51	52	42	52	103	28N	328	331	+2.8	-3.1
GR Skiros	6	55	3	43	54	104	31N	325	329	+2.7	-2.8
GR Sparti	6	54	29	41	53	100	39N	317	320	+2.5	-1.8
GR Stefanovikion	6	48	54	40	51	102	25N	331	335	+2.9	-3.7
GR Syros	6	59	50	44	55	104	40N	316	320	+2.5	-1.8
GR Tanagra	6	54	10	42	53	102	33N	323	326	+2.6	-2.4
GR Thessaloniki	6	44	27	40	50	103	16N	340	343	+3.5	-6.2
GR Tripolis	6	53	8	41	52	100	36N	320	323	+2.6	-2.1
GR Zakynthos	6	48	34	39	50	98	33N	323	327	+2.6	-2.4
IT Catania	6	33	46	31	42	92	22N	334	337	+3.0	-4.0
IT Palermo	6	22	2	28	39	89	7N	349	353	+9.9	+9.9
IT Reggio Calabria	6	32	54	32	43	92	19N	337	341	+3.4	-5.0
MT Malta	6	36	34	31	43	90	32N	324	328	+2.5	-2.2
MT Malta Acc	6	36	18	31	42	90	31N	325	328	+2.5	-2.3

# Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
BH Bahrain	6	28	59	60	72	95	-74S	103	107	+3.1	-0.3
IR Abadan	6	23	23	56	69	104	-90N	86	90	+2.6	+0.9
IR Abdanan	6	24	27	56	67	109	-80N	77	80	+2.4	+1.5
IR Abumusa I.	6	42	54	67	80	102	-73S	104	108	+3.2	-0.6
IR Aghajari	6	27	33	59	70	108	-89N	85	89	+2.7	+0.9
IR Ahwaz	6	25	41	57	69	107	-86N	83	87	+2.6	+1.0
IR Arak	6	32	6	59	70	118	-77N	73	77	+2.5	+1.6
IR Ardabil	6	37	44	58	68	127	-60N	56	60	+2.2	+2.7
IR Bakhtaran	6	25	56	56	67	113	-75N	71	75	+2.3	+1.8
IR Bam	6	52	31	72	83	140	-84S	92	96	+3.1	+0.0
IR Bandar Abbas	6	45	47	69	81	113	-77S	100	103	+3.1	-0.3
IR Bandar Lengeh	6	41	51	66	79	105	-75S	102	106	+3.1	-0.4
IR Bandar Mahshahr	6	25	58	58	70	106	-89N	86	90	+2.7	+0.8
IR Bastak	6	39	58	66	78	107	-78S	99	103	+3.1	-0.2
IR Birjand	6	56	34	72	80	162	-82N	78	82	+3.0	+0.8
IR Bojnord	6	57	39	68	75	161	-64N	60	64	+2.7	+2.1
IR Bushehr	6	29	41	60	72	105	-84S	92	96	+2.9	+0.4
IR Chah Bahar	7	0	28	76	87	150	-72S	105	109	+3.2	-0.9
IR Darab	6	40	12	66	78	113	-83S	94	98	+3.0	+0.1
IR Daran	6	34	48	61	73	119	-82N	78	82	+2.7	+1.2
IR Dasht-E-Naz	6	45	3	64	73	138	-68N	64	68	+2.6	+2.0
IR Dezful	6	26	2	57	69	110	-82N	79	83	+2.5	+1.3
IR Emam Shahr	6	49	38	66	75	146	-69N	65	69	+2.7	+1.9
IR Esfahan	6	34	43	62	73	119	-83N	79	83	+2.7	+1.1
IR Esfahan	6	35	24	62	73	120	-82N	79	83	+2.7	+1.2
IR Fasa	6	38	5	65	77	112	-84S	93	97	+3.0	+0.2
IR Gachsaran	6	30	21	60	72	109	-89S	87	91	+2.8	+0.7
IR Ghazvin	6	36	27	60	70	125	-69N	65	69	+2.4	+2.1
IR Gheshm I.	6	45	8	68	81	110	-76S	101	105	+3.2	-0.4
IR Golbandi	6	34	36	63	75	103	-79S	98	102	+3.0	-0.1

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
IR Gorgan	6	48	43	65	74	144	-67N	63	67	+2.6	+2.0
IR Hamadan	6	30	10	58	69	117	-73N	70	74	+2.4	+1.8
IR Ilam	6	22	54	55	66	109	-77N	74	77	+2.3	+1.7
IR Iran Shahr	7	0	2	76	86	166	-78S	99	102	+3.2	-0.5
IR Jahrom	6	37	35	64	76	110	-83S	94	98	+3.0	+0.1
IR Jask	6	51	58	71	84	112	-72S	105	109	+3.2	-0.8
IR Jiroft	6	50	6	71	82	131	-83S	94	98	+3.1	+0.0
IR Kalaleh	6	52	28	66	74	151	-65N	61	65	+2.6	+2.1
IR Kerman	6	48	6	69	80	133	-88S	88	92	+3.0	+0.3
IR Khark Island	6	28	16	59	72	105	-86S	91	95	+2.8	+0.5
IR Kish Island	6	39	13	65	78	103	-75S	102	106	+3.1	-0.4
IR Lamerd	6	36	25	64	76	104	-78S	99	102	+3.1	-0.1
IR Lar	6	39	58	66	78	109	-79S	98	101	+3.1	-0.1
IR Lavan Island	6	37	9	64	77	102	-76S	101	104	+3.1	-0.3
IR Mahmood Abad	6	35	54	61	72	123	-77N	73	77	+2.6	+1.5
IR Maragheh	6	30	11	55	66	119	-63N	59	63	+2.1	+2.6
IR Masjed Soleiman	6	27	43	58	70	110	-84N	81	84	+2.6	+1.1
IR Noshahr	6	40	46	61	71	131	-67N	64	67	+2.5	+2.1
IR Omidyeh	6	27	15	58	70	108	-88N	85	89	+2.7	+0.9
IR Parsabad	6	40	22	58	67	130	-54N	50	54	+2.1	+3.2
IR Rafsanjan	6	45	24	68	79	128	-88S	88	92	+3.0	+0.4
IR Ramsar	6	39	24	60	70	130	-66N	63	66	+2.4	+2.2
IR Rasht	6	37	49	59	69	128	-64N	61	64	+2.3	+2.4
IR Sanandaj	6	27	18	56	67	115	-71N	68	71	+2.3	+2.0
IR Sarakhs	7	6	18	72	77	183	-67N	63	67	+2.9	+1.7
IR Semnan	6	43	50	64	74	136	-72N	68	72	+2.6	+1.7
IR Sepah	6	34	48	62	73	119	-83N	79	83	+2.7	+1.1
IR Shahr Abad	6	54	54	67	74	156	-64N	60	64	+2.7	+2.2
IR Shiraz	6	34	49	63	75	111	-86S	91	94	+2.9	+0.4
IR Siri Island	6	41	18	66	79	101	-73S	104	108	+3.2	-0.6
IR Sirjan	6	43	57	68	79	122	-86S	91	95	+3.0	+0.2
IR Tabas	6	50	23	69	78	146	-79N	76	79	+2.8	+1.1
IR Tabriz	6	32	31	56	66	121	-60N	56	60	+2.1	+2.8
IR Teheran	6	38	32	61	72	128	-71N	68	71	+2.5	+1.9
IR Yazd	6	41	13	65	76	126	-86N	82	86	+2.8	+0.8
IR Zabol	7	2	18	75	82	182	-88N	84	88	+3.0	+0.3
IR Zahedan	7	0	0	75	84	173	-86S	90	94	+3.1	+0.0
IR Zanjan	6	33	40	58	68	122	-66N	62	66	+2.3	+2.3
IR Zarghan	6	35	17	63	75	112	-87S	90	94	+2.9	+0.5
IQ Baghdad	6	17	30	52	63	105	-77N	74	77	+2.2	+1.7
IQ Basrah	6	22	4	56	68	103	-89N	85	89	+2.6	+0.9
IL Beer-Sheba	5	56	0	39	51	91	-76N	73	76	+1.6	+1.8
IL Elat	5	53	29	39	51	89	-82N	79	82	+1.7	+1.5
IL Eyn-Shemer	5	58	41	40	52	93	-72N	69	73	+1.5	+2.0
IL Eyn-Yahav	5	55	35	39	51	90	-79N	75	79	+1.7	+1.7
IL Haifa	5	59	32	40	52	94	-71N	68	71	+1.5	+2.1
IL Haztor	5	56	53	39	51	92	-75N	71	75	+1.6	+1.9
IL Jerusalem	5	57	51	40	52	92	-75N	71	75	+1.6	+1.9
IL Megido Airstrip	5	59	21	40	52	93	-72N	69	72	+1.6	+2.1
IL Metzada	5	57	10	40	52	92	-77N	73	77	+1.6	+1.8
IL Nevatim	5	56	19	39	51	91	-77N	73	77	+1.6	+1.8
IL Ovda	5	54	1	39	51	89	-81N	77	81	+1.7	+1.6
IL Ramat David	5	59	24	40	52	94	-72N	68	72	+1.5	+2.1
IL Ramon	5	54	57	39	51	90	-78N	74	78	+1.6	+1.8
IL Rosh Pina	6	0	42	41	53	94	-71N	68	71	+1.6	+2.1
IL Tel-Aviv	5	57	41	40	51	92	-73N	70	73	+1.5	+2.0
IL Tel-Nof	5	57	11	39	51	92	-74N	71	74	+1.6	+1.9
JO Amman	5	58	51	41	53	93	-76N	72	76	+1.7	+1.9
JO Aqaba	5	53	39	39	51	89	-82N	79	82	+1.7	+1.5
JO Jerusalem	5	57	50	40	52	92	-75N	71	75	+1.6	+1.9
JO Mafrq	6	0	29	41	53	94	-74N	70	74	+1.6	+2.0
KW Kuwait	6	21	49	56	68	100	-87S	90	94	+2.7	+0.6
LB Beirut	6	2	24	41	53	96	-68N	64	68	+1.5	+2.3
LB Kleiat	6	5	3	42	54	98	-66N	62	66	+1.5	+2.4
OM Khasab	6	46	35	69	81	108	-74S	103	107	+3.2	-0.6
OM Masirah	7	2	47	75	87	38	-53S	124	128	+3.3	-2.3
OM Muscat	6	55	36	73	86	94	-64S	113	116	+3.3	-1.4
OM Saiq	6	54	15	72	85	87	-62S	115	119	+3.3	-1.5
OM Salalah	6	57	54	68	80	50	-36S	142	146	+3.5	-4.2
OM Thumrait	6	55	14	68	80	55	-39S	139	142	+3.5	-3.8
QA Doha	6	32	18	61	74	94	-71S	106	110	+3.1	-0.6
SA Abha	6	12	10	48	61	75	-48S	129	133	+3.4	-2.2
SA Abqaiq	6	25	57	58	71	94	-74S	103	107	+3.0	-0.3
SA Al-Ahsa	6	25	51	58	71	92	-72S	105	109	+3.0	-0.4
SA Al-Jouf	6	3	27	45	57	93	-86N	83	86	+2.1	+1.3
SA Arar	6	7	8	47	59	96	-83N	80	83	+2.1	+1.4
SA Bisha	6	8	58	47	60	78	-56S	121	125	+3.2	-1.4
SA Dammam	6	26	24	59	71	95	-76S	101	105	+3.0	-0.1
SA Dhahran	6	27	31	59	72	95	-75S	102	106	+3.0	-0.2
SA El-Baha	6	5	33	46	59	78	-59S	119	123	+3.0	-1.2
SA Gassim	6	9	17	49	62	90	-79S	98	102	+2.6	+0.3
SA Gizan	6	15	40	48	61	73	-42S	136	139	+3.7	-3.1
SA Guriat	6	0	29	42	54	93	-78N	75	78	+1.8	+1.7
SA Hafr Al-Batin	6	16	25	53	66	96	-84S	92	96	+2.6	+0.6
SA Hail	6	4	42	47	59	90	-85S	92	96	+2.4	+0.7
SA Jeddah	5	57	38	42	55	80	-67S	111	114	+2.6	-0.4
SA Jubail	6	25	8	58	71	97	-78S	99	102	+2.9	+0.0
SA King Khalid Mil.City	6	14	36	52	65	94	-83S	93	97	+2.6	+0.5
SA Madinah	5	58	42	43	56	84	-76S	101	104	+2.4	+0.2
SA Nejran	6	20	9	51	64	73	-44S	134	138	+3.6	-2.9
SA Petroline 10	6	2	2	45	58	84	-74S	103	107	+2.6	+0.0
SA Petroline 3	6	19	52	55	68	90	-72S	105	108	+3.0	-0.3
SA Petroline 6	6	12	39	51	64	87	-72S	105	108	+2.8	-0.2

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
SA Rabigh	5	57	11	42	55	81	-70S	107	110	+2.5	-0.2
SA Rafha	6	10	50	50	62	96	-89N	86	90	+2.4	+1.0
SA Ras Tanajib	6	23	26	57	69	98	-81S	95	99	+2.8	+0.3
SA Ras Tanura	6	27	1	59	72	96	-77S	100	104	+3.0	-0.1
SA Rash Mishab	6	23	1	57	69	98	-82S	95	98	+2.8	+0.3
SA Riyadh	6	17	36	54	66	89	-72S	105	109	+2.9	-0.3
SA Sharurah	6	30	41	56	69	71	-40S	137	141	+3.7	-3.4
SA Sulayel	6	17	55	52	65	79	-55S	122	126	+3.3	-1.6
SA Tabuk	5	54	46	40	52	88	-88N	84	88	+1.9	+1.2
SA Taif	6	1	22	44	57	80	-64S	113	117	+2.8	-0.6
SA Thumamah	6	17	21	54	66	89	-73S	104	108	+2.9	-0.2
SA Turaif	6	3	36	44	56	95	-78N	75	79	+1.9	+1.7
SA Wadi-Al-Dawasir	6	16	31	51	64	79	-56S	121	125	+3.3	-1.5
SA Wejh	5	52	21	39	52	85	-85S	92	95	+2.0	+0.8
SA Yenbo	5	54	44	41	53	83	-77S	100	104	+2.3	+0.3
SY Aleppo	6	10	58	44	56	102	-61N	57	61	+1.5	+2.7
SY Damascus	6	3	7	42	54	96	-71N	67	71	+1.6	+2.2
SY Deire Zor	6	13	33	47	59	104	-67N	63	67	+1.8	+2.4
SY Kamishli	6	19	48	49	60	109	-61N	57	61	+1.8	+2.7
SY Latakia	6	7	0	43	54	99	-63N	59	63	+1.5	+2.6
SY Palmyra	6	8	37	45	56	100	-68N	64	68	+1.7	+2.3
AE Abu Dhabi	6	42	36	66	79	93	-67S	111	114	+3.3	-1.0
AE Al Ain	6	46	4	68	81	95	-67S	111	114	+3.3	-1.1
AE Al Hamra	6	35	59	63	76	90	-66S	111	115	+3.2	-1.0
AE Arzana	6	35	47	63	76	93	-69S	108	112	+3.2	-0.8
AE Das Island	6	36	32	64	76	95	-70S	107	111	+3.2	-0.7
AE Dubai	6	44	26	68	80	100	-70S	107	110	+3.2	-0.8
AE Fujeirah	6	47	40	69	82	102	-70S	107	111	+3.2	-0.9
AE Jebel Dhana	6	36	23	63	76	91	-67S	110	114	+3.2	-0.9
AE Ras Al Khaimah	6	46	0	68	81	103	-72S	105	109	+3.2	-0.7
AE Sharjah	6	44	52	68	81	101	-71S	106	110	+3.2	-0.8
AE Zirku	6	37	22	64	77	94	-69S	108	112	+3.2	-0.8

## Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
BH Bahrain	8	19	48	84	82	253	89N	268	271	+3.2	-0.1
IR Abadan	8	10	29	78	82	208	75N	282	285	+2.9	-0.8
IR Abdanan	8	5	41	76	80	191	66N	291	294	+2.8	-1.3
IR Abumusa I.	8	33	53	86	75	264	85N	272	275	+3.0	-0.5
IR Aghajari	8	14	17	80	81	219	72N	284	288	+2.8	-1.0
IR Ahwaz	8	11	6	78	81	209	71N	286	289	+2.8	-1.1
IR Arak	8	10	8	77	78	206	60N	297	300	+2.6	-1.7
IR Ardabil	7	57	43	71	75	184	44N	312	316	+2.3	-2.7
IR Bakhtaran	8	2	44	74	79	185	60N	296	300	+2.7	-1.6
IR Bam	8	40	0	81	70	258	70N	286	290	+2.5	-1.5
IR Bandar Abbas	8	36	15	84	73	261	80N	277	281	+2.8	-0.9
IR Bandar Lengeh	8	32	52	86	75	261	83N	274	277	+3.0	-0.6
IR Bandar Mahshahr	8	12	58	79	81	216	73N	283	287	+2.9	-1.0
IR Bastak	8	30	53	86	76	257	81N	275	279	+2.9	-0.7
IR Birjand	8	34	55	79	69	248	56N	300	304	+2.1	-2.2
IR Bojnord	8	18	52	76	71	227	41N	315	319	+1.9	-3.1
IR Bushehr	8	19	17	82	80	236	78N	279	282	+3.0	-0.8
IR Chah Bahar	8	49	18	79	66	270	81N	276	280	+2.6	-1.0
IR Darab	8	29	52	84	75	252	76N	281	284	+2.8	-1.1
IR Daran	8	16	38	79	78	221	63N	293	297	+2.6	-1.6
IR Dasht-E-Naz	8	12	54	76	74	214	48N	308	312	+2.2	-2.5
IR Dezful	8	8	51	77	80	201	67N	290	293	+2.8	-1.3
IR Emam Shahr	8	17	37	77	73	223	47N	309	313	+2.1	-2.7
IR Esfahan	8	17	33	80	78	224	64N	292	296	+2.6	-1.6
IR Esfahan	8	17	41	80	77	224	64N	293	296	+2.6	-1.6
IR Fasa	8	27	41	84	76	249	76N	281	284	+2.8	-1.0
IR Gachsaran	8	18	0	81	80	229	73N	284	287	+2.8	-1.1
IR Ghazvin	8	6	35	75	76	199	52N	305	308	+2.4	-2.2
IR Ghesm I.	8	35	50	85	73	262	81N	275	279	+2.9	-0.8
IR Golbandi	8	25	40	85	78	252	82N	275	278	+3.0	-0.6
IR Gorgan	8	14	50	76	73	219	46N	310	314	+2.1	-2.7
IR Hamadan	8	5	32	75	78	194	58N	299	302	+2.6	-1.8
IR Ilam	8	1	52	74	80	180	64N	293	296	+2.7	-1.4
IR Iran Shahr	8	48	7	79	66	266	74N	283	286	+2.4	-1.3
IR Jahrom	8	27	35	85	77	250	77N	280	283	+2.8	-0.9
IR Jask	8	42	7	83	70	268	83N	274	277	+2.8	-0.8
IR Jiroft	8	38	30	82	71	258	73N	284	288	+2.6	-1.3
IR Kalaleh	8	15	41	76	72	221	43N	313	317	+2.0	-2.9
IR Kerman	8	34	36	82	72	252	68N	289	292	+2.5	-1.6
IR Khark Island	8	17	31	82	81	232	77N	279	283	+2.9	-0.8
IR Kish Island	8	30	23	86	76	259	84N	273	276	+3.0	-0.6
IR Lamerd	8	27	27	86	77	254	82N	275	278	+3.0	-0.7
IR Lar	8	30	43	85	76	256	80N	277	281	+2.9	-0.8
IR Lavan Island	8	28	20	86	77	257	84N	273	277	+3.0	-0.6
IR Mahmood Abad	8	13	51	78	77	215	59N	298	301	+2.5	-1.9
IR Maragheh	7	54	33	70	76	172	49N	307	311	+2.5	-2.2
IR Masjed Soleiman	8	11	48	78	80	210	68N	288	292	+2.8	-1.3
IR Noshahr	8	8	57	75	75	206	49N	307	311	+2.3	-2.4
IR Omidyeh	8	13	48	79	81	217	72N	284	288	+2.8	-1.0
IR Parsabad	7	52	46	69	74	178	38N	318	321	+2.3	-3.1
IR Rafsanjan	8	32	15	83	73	250	69N	288	291	+2.5	-1.5
IR Ramsar	8	6	33	74	76	201	49N	308	311	+2.3	-2.4
IR Rasht	8	3	1	73	76	193	47N	309	312	+2.3	-2.5
IR Sanandaj	8	0	51	73	78	182	57N	299	303	+2.6	-1.8
IR Sarakhs	8	28	41	75	67	240	41N	315	319	+1.7	-3.1

Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
IR Semnan	8	16	9	77	75	220	52N	305	308	+2.3	-2.3
IR Sepah	8	17	28	80	78	223	64N	292	296	+2.6	-1.6
IR Shahr Abad	8	16	21	76	72	223	41N	315	318	+2.0	-3.1
IR Shiraz	8	23	50	83	78	242	75N	282	286	+2.8	-1.0
IR Siri Island	8	32	22	86	75	263	86N	271	275	+3.0	-0.5
IR Sirjan	8	32	17	83	74	251	72N	285	288	+2.6	-1.3
IR Tabas	8	28	3	79	72	240	56N	300	304	+2.2	-2.2
IR Tabriz	7	52	59	70	75	172	45N	311	314	+2.4	-2.5
IR Teheran	8	11	6	76	76	209	53N	303	307	+2.4	-2.2
IR Yazd	8	25	15	81	75	238	65N	292	295	+2.5	-1.6
IR Zabol	8	43	26	77	66	257	60N	296	300	+2.1	-2.1
IR Zahedan	8	45	12	78	66	261	66N	290	294	+2.2	-1.7
IR Zanjan	8	1	17	73	76	187	50N	306	309	+2.4	-2.2
IR Zarghan	8	23	54	83	78	241	74N	283	286	+2.8	-1.1
IQ Baghdad	7	56	16	71	80	162	66N	291	294	+2.8	-1.1
IQ Basrah	8	8	41	78	82	201	74N	282	286	+2.9	-0.8
IL Beer-Sheba	7	30	31	59	71	110	72N	284	288	+2.8	-0.3
IL Elat	7	31	20	60	72	106	79N	278	281	+2.8	+0.1
IL Eyn-Shemer	7	30	58	59	71	114	68N	288	292	+2.8	-0.5
IL Eyn-Yahav	7	31	59	60	72	109	75N	282	285	+2.8	-0.1
IL Haifa	7	30	53	59	71	115	67N	290	293	+2.8	-0.6
IL Haztor	7	30	25	59	71	111	71N	286	289	+2.8	-0.3
IL Jerusalem	7	31	45	60	71	113	70N	286	290	+2.8	-0.4
IL Megido Airstrip	7	31	30	60	71	115	68N	289	292	+2.8	-0.5
IL Metzada	7	32	23	60	72	112	73N	284	288	+2.8	-0.3
IL Nevatim	7	31	20	60	71	111	73N	284	287	+2.8	-0.2
IL Ovda	7	31	15	60	72	107	78N	279	283	+2.8	+0.0
IL Ramat David	7	31	20	59	71	115	67N	289	293	+2.8	-0.5
IL Ramon	7	30	28	59	71	109	74N	282	286	+2.8	-0.1
IL Rosh Pina	7	32	13	60	71	117	66N	290	294	+2.8	-0.6
IL Tel-Aviv	7	30	29	59	71	112	69N	287	291	+2.8	-0.4
IL Tel-Nof	7	30	40	59	71	112	70N	286	290	+2.8	-0.4
JO Amman	7	33	57	61	72	115	71N	285	289	+2.8	-0.4
JO Aqaba	7	31	30	60	72	106	79N	278	281	+2.8	+0.1
JO Jerusalem	7	31	44	60	71	113	70N	286	290	+2.8	-0.4
JO Mafraq	7	34	28	61	72	117	69N	288	291	+2.8	-0.5
KW Kuwait	8	10	33	79	83	211	79N	278	281	+3.0	-0.6
LB Beirut	7	31	25	60	71	118	63N	293	297	+2.7	-0.8
LB Kleiat	7	32	7	60	71	121	60N	296	300	+2.7	-1.0
OM Khasab	8	37	16	85	73	264	83N	274	277	+2.9	-0.7
OM Masirah	8	46	52	81	68	281	80S	258	261	+3.3	+0.3
OM Muscat	8	44	36	82	69	274	90N	267	271	+3.0	-0.4
OM Saiq	8	42	48	83	70	275	88S	265	268	+3.1	-0.2
OM Salalah	8	23	30	84	76	299	57S	235	238	+4.4	+2.8
OM Thumrait	8	24	54	84	76	296	60S	238	241	+4.2	+2.4
QA Doha	8	23	0	86	80	260	89S	266	269	+3.3	+0.0
SA Abha	7	40	21	68	80	58	54S	232	235	+3.6	+3.3
SA Abqaiq	8	16	32	83	83	249	90S	267	270	+3.3	+0.0
SA Al-Ahsa	8	16	8	83	84	253	87S	265	268	+3.3	+0.2
SA Al-Jouf	7	46	23	67	79	123	79N	278	281	+3.0	-0.2
SA Arar	7	49	7	69	79	134	75N	282	285	+3.0	-0.5
SA Bisha	7	45	18	69	82	65	63S	240	244	+3.6	+2.4
SA Dammam	8	17	13	83	83	246	88N	269	273	+3.2	-0.1
SA Dhahran	8	18	23	83	82	249	88N	269	272	+3.2	-0.1
SA El-Baha	7	42	31	68	81	70	64S	241	245	+3.5	+2.3
SA Gassim	7	57	26	74	85	132	88S	265	269	+3.3	+0.4
SA Gizan	7	35	13	66	78	56	47S	225	229	+3.5	+4.2
SA Guriat	7	37	41	63	74	118	73N	284	287	+2.9	-0.4
SA Hafr Al-Batin	8	5	14	77	85	186	83N	274	277	+3.1	-0.2
SA Hail	7	51	9	70	82	121	88N	269	273	+3.2	+0.3
SA Jeddah	7	37	11	65	78	80	70S	247	251	+3.2	+1.9
SA Jubail	8	15	54	82	83	239	86N	271	274	+3.2	-0.2
SA King Khalid Mil.City	8	3	28	76	85	175	85N	272	275	+3.2	-0.1
SA Madinah	7	43	1	67	80	95	81S	259	262	+3.2	+1.0
SA Nejran	7	44	46	70	82	45	51S	229	233	+3.8	+3.7
SA Petroline 10	7	46	57	69	82	94	80S	257	260	+3.3	+1.1
SA Petroline 3	8	9	22	80	87	236	86S	263	266	+3.4	+0.4
SA Petroline 6	8	0	37	75	88	133	83S	260	263	+3.4	+0.7
SA Rabigh	7	38	36	65	78	85	74S	251	255	+3.2	+1.6
SA Rafha	7	56	42	72	83	149	79N	278	281	+3.0	-0.3
SA Ras Tanajib	8	13	40	81	83	228	83N	273	277	+3.1	-0.4
SA Ras Tanura	8	17	57	83	82	245	87N	270	274	+3.2	-0.2
SA Rash Mishab	8	13	4	80	83	225	83N	274	278	+3.1	-0.4
SA Riyadh	8	6	37	78	88	220	84S	262	265	+3.4	+0.5
SA Sharurah	7	54	53	75	84	9	52S	230	233	+4.1	+3.7
SA Sulayel	7	57	22	75	87	32	66S	243	247	+3.7	+2.1
SA Tabuk	7	35	58	62	75	106	84N	273	276	+3.0	+0.3
SA Taif	7	41	19	67	80	78	69S	246	250	+3.4	+1.9
SA Thumamah	8	6	32	78	88	215	85S	263	266	+3.4	+0.4
SA Turaif	7	41	46	65	76	124	72N	285	288	+2.9	-0.5
SA Wadi-Al-Dawasir	7	55	53	74	86	42	66S	243	247	+3.7	+2.1
SA Wejh	7	34	19	62	74	97	88S	265	269	+3.0	+0.7
SA Yenbo	7	37	25	64	77	91	80S	257	261	+3.1	+1.2
SY Aleppo	7	33	31	61	71	128	54N	302	306	+2.7	-1.4
SY Damascus	7	34	31	61	72	120	65N	292	295	+2.8	-0.8
SY Deire Zor	7	42	37	65	75	138	58N	298	302	+2.7	-1.3
SY Kamishli	7	42	37	65	74	145	51N	305	309	+2.6	-1.8
SY Latakia	7	31	5	59	70	123	57N	299	303	+2.7	-1.2
SY Palmyra	7	38	24	63	73	129	61N	296	299	+2.7	-1.1
AE Abu Dhabi	8	32	47	87	75	269	88S	265	269	+3.2	-0.1
AE Al Ain	8	36	10	86	74	270	89S	266	270	+3.1	-0.2
AE Al Hamra	8	25	55	87	79	268	85S	262	266	+3.4	+0.2
AE Arzana	8	26	17	87	79	265	88S	265	269	+3.3	+0.0

# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
AE Das Island	8	27	16	87	78	264	90S	267	270	+3.2	-0.1
AE Dubai	8	35	10	86	74	266	87N	270	273	+3.1	-0.4
AE Fujeirah	8	38	8	85	73	268	87N	270	274	+3.0	-0.5
AE Jebel Dhana	8	26	25	87	79	268	86S	263	266	+3.3	+0.1
AE Ras Al Khaimah	8	36	45	85	73	266	85N	272	275	+3.0	-0.6
AE Sharjah	8	35	35	86	74	266	87N	270	274	+3.0	-0.5
AE Zirku	8	27	57	87	78	265	89S	266	269	+3.2	-0.1

# Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
CO Turbo	7	8	21	80	86	228	-75S	102	106	+3.2	-0.8

# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
CO Turbo	8	55	12	75	63	271	75N	282	285	+2.3	-1.3

Sun alt : altezza del Sole sull'orizzonte, in gradi

Moon alt : altezza della Luna sull'orizzonte, in gradi

Moon az : azimut della Luna, in gradi

CA : angolo di cuspid, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspid più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso

PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °

Moon alt : height of the Moon above the horizon, in °

Moon az : azimuth of the Moon, in °

CA : angle of cuspid, angle of the event along the limb of the Moon, measured by the nearest cuspid;  
a negative value means that the phenomenon happens along the bright limb

PA : angle of position , angle of the event along the limb of the Moon, measured from north

I parametri "a" e "b" servono per il calcolo dei fenomeni nelle città non in tabella.

Si utilizza la seguente formula:

$$U.T.n = U.T.o + a \times (Long.n - Long.o) + b \times (Lat.n - Lat.o)$$

Ove "n" è l'indice relativo alla città ignota ed "o" quello relativo alla città più vicina in tabella.

U.T. deve essere espresso in minuti e decimali, mentre la longitudine e la latitudine in gradi e decimali.

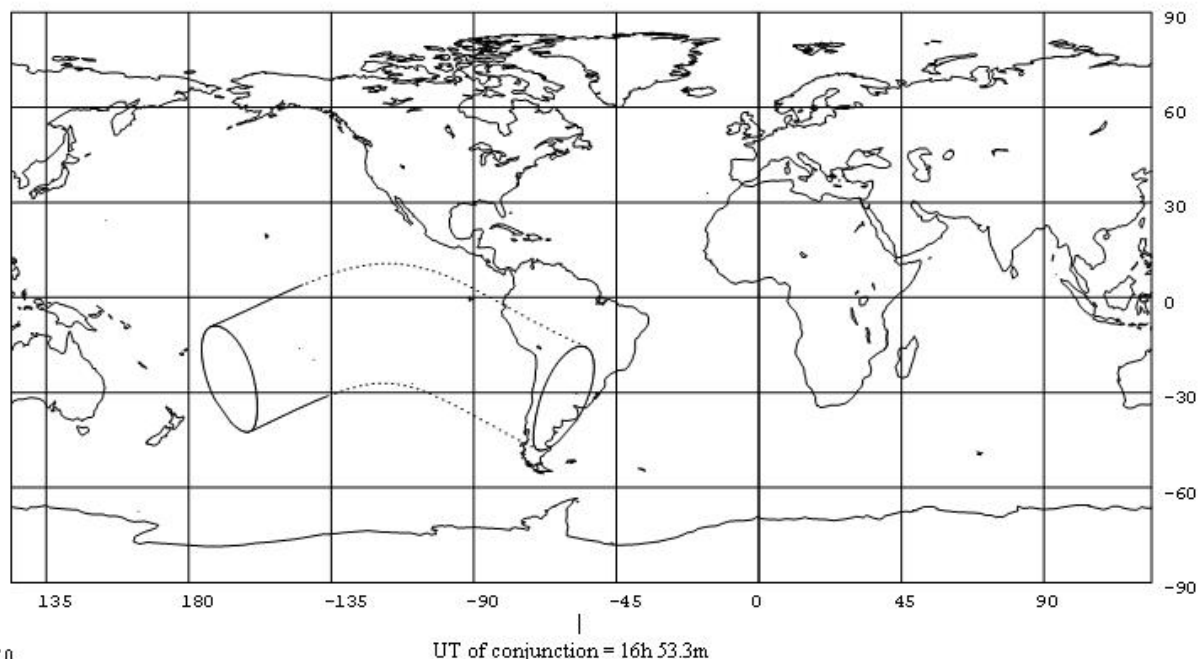
Le longitudini sono positive ad est di Greenwich.

A coefficient for correcting the prediction for changes in site location. The units are minutes of time per degree (or seconds of time per minute of arc). The correction to the prediction for a change in site, in seconds of time, is found by multiplying A by the change in site longitude (+ve for changes towards the East) from the prediction site.

B same as for A, but for changes in latitude (+ve to the north).

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# Occultation of Mars, Magnitude 1.4, on 2011 Jul 27



Luna: % illuminazione 11-, elongazione solare 39°

Moon: % illumination 11-, solar elongation 39°

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun		Moon		CA	PA	WA	a	b
	h	m	s	Alt	Az	Alt	Az					
AR Catamarca	17	49	27	39	11	305	-73S	105	109	+0.8	+0.5	
AR Chilecito	17	47	55	39	12	306	-69S	109	113	+0.8	+0.4	
AR Chosmadal	17	45	41	32	9	309	-41S	137	141	+0.3	-0.3	
AR Cordoba	17	49	8	36	9	304	-68S	111	114	+0.6	+0.4	
AR Cutralco	17	46	16	30	8	309	-38S	140	144	+0.2	-0.3	
AR El Bolson	17	47	41	28	7	311	-24S	154	158	-0.1	-0.9	
AR El Maiten	17	47	45	28	7	310	-24S	154	158	-0.1	-0.9	
AR Fuerte Gral Roca	17	46	37	30	7	308	-41S	138	141	+0.2	-0.2	
AR Gobernador Gordillo	17	48	11	37	11	306	-68S	111	114	+0.7	+0.4	
AR Jujuy	17	52	40	42	12	303	-87S	91	95	+1.0	+0.8	
AR La Cumbre	17	49	9	36	9	304	-68S	110	114	+0.6	+0.4	
AR La Quiaca	17	54	23	44	14	303	-87N	85	89	+1.1	+1.0	
AR La Rioja	17	48	18	38	12	306	-70S	109	112	+0.7	+0.4	
AR Laboulaye	17	48	21	33	6	304	-61S	117	121	+0.4	+0.3	
AR Las Lomitas	17	56	29	39	8	301	-87N	85	89	+0.8	+1.1	
AR Malargue	17	45	33	34	10	309	-48S	130	134	+0.4	-0.1	
AR Mendoza	17	45	57	36	11	308	-57S	122	125	+0.6	+0.1	
AR Neuquen	17	46	29	30	7	308	-40S	139	142	+0.2	-0.2	
AR Oran	17	54	32	42	12	302	-88N	86	90	+1.0	+1.0	
AR Presidencia R.S.Pena	17	54	31	37	7	301	-87S	91	95	+0.7	+0.9	
AR Rio Cuarto	17	48	20	34	8	305	-63S	116	119	+0.5	+0.3	
AR Salta	17	52	0	42	13	304	-85S	93	97	+1.0	+0.8	
AR San Carlos De Bariloche	17	47	6	28	7	310	-28S	151	154	+0.0	-0.7	
AR San Luis	17	47	13	35	9	306	-59S	119	123	+0.5	+0.2	
AR San Martin Des Andes	17	46	23	30	8	310	-31S	147	151	+0.1	-0.6	
AR San Rafael	17	45	58	34	10	308	-52S	126	130	+0.5	+0.0	
AR Santiago Del Estero	17	50	55	39	10	304	-78S	100	104	+0.8	+0.6	
AR Tartagal	17	55	39	42	12	302	-85N	83	87	+1.0	+1.1	
AR Tinogasta	17	48	19	40	13	306	-72S	106	110	+0.8	+0.4	
AR Tucuman	17	50	51	40	11	304	-80S	99	102	+0.8	+0.7	
AR Villa Dolores	17	48	18	35	9	305	-65S	114	117	+0.6	+0.4	
AR Villa Reynolds	17	47	34	34	8	306	-59S	119	123	+0.5	+0.2	
BO Apolo	18	0	17	51	19	302	-65N	63	67	+1.8	+1.9	
BO Ascension De Guarayos	18	7	37	46	12	299	-57N	55	58	+1.7	+2.4	
BO Bermejo	17	54	58	43	12	302	-87N	85	88	+1.0	+1.0	
BO Camiri	17	59	11	44	12	301	-76N	74	77	+1.2	+1.4	
BO Chapacura	18	1	38	47	15	301	-67N	65	69	+1.5	+1.8	
BO Charana	17	54	22	50	19	304	-78N	76	80	+1.5	+1.2	
BO Cobija	18	8	46	53	19	300	-47N	45	48	+2.8	+3.6	
BO Cochabamba	17	59	28	48	16	302	-71N	69	73	+1.5	+1.6	
BO Concepcion	18	8	24	45	11	299	-56N	54	58	+1.7	+2.5	
BO Guayaramerin	18	22	54	49	13	298	-26N	24	27	+9.9	+9.9	
BO La Paz	17	57	48	50	18	302	-72N	70	73	+1.6	+1.5	
BO Magdalena	18	12	57	48	13	298	-45N	43	47	+2.4	+3.8	
BO Oruro	17	57	25	48	16	302	-75N	73	77	+1.5	+1.4	
BO Potosi	17	57	11	46	15	302	-78N	76	80	+1.3	+1.3	
BO Reyes	18	3	2	50	17	301	-60N	59	62	+1.9	+2.2	
BO Riberalta	18	17	32	50	15	298	-34N	32	36	+4.0	+6.6	

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
BO Robore	18	6	48	42	8	298	-61N	59	63	+1.4	+2.1
BO Rurrenabaque	18	2	29	50	18	301	-61N	59	63	+1.9	+2.1
BO San Borja	18	3	1	50	17	301	-61N	60	63	+1.8	+2.1
BO San Ignacio De Moxos	18	4	50	49	15	300	-59N	57	61	+1.8	+2.3
BO San Ignacio De Velasco	18	9	34	44	10	298	-55N	53	56	+1.7	+2.6
BO San Joaquin	18	12	13	48	14	299	-46N	44	47	+2.4	+3.7
BO San Mathias	18	14	5	42	7	297	-47N	45	49	+1.8	+3.4
BO San Ramon	18	11	32	48	14	299	-47N	45	49	+2.4	+3.5
BO Santa Ana	18	8	13	49	15	299	-53N	51	54	+2.1	+2.8
BO Santa Cruz	18	3	27	45	12	300	-66N	64	67	+1.4	+1.9
BO Sucre	17	58	25	46	14	302	-75N	74	77	+1.3	+1.4
BO Tarija	17	55	54	44	13	302	-83N	81	85	+1.1	+1.1
BO Trinidad	18	6	31	48	14	300	-57N	55	58	+1.9	+2.4
BR Cruzeiro Do Sul	18	11	0	58	24	300	-36N	34	37	+4.6	+6.5
BR Guajara-Mirim	18	23	59	49	13	297	-24N	22	26	+9.9	+9.9
BR Rio Branco	18	17	49	52	17	299	-32N	30	34	+4.9	+8.0
BR Tarauaca	18	17	0	55	20	299	-29N	27	31	+9.9	+9.9
CL Ancud	17	48	21	28	8	312	-20S	159	163	-0.3	-1.3
CL Antofagasta	17	47	41	45	18	307	-81S	97	101	+1.2	+0.6
CL Arica	17	51	53	49	20	305	-82N	81	84	+1.5	+1.1
CL Calama	17	50	13	45	17	305	-87S	92	95	+1.2	+0.8
CL Castro	17	49	4	28	8	312	-17S	161	165	-0.4	-1.5
CL Chaiten	17	49	16	27	7	311	-18S	161	164	-0.4	-1.4
CL Chillan	17	44	45	33	11	311	-41S	137	141	+0.4	-0.3
CL Concepcion	17	44	23	33	12	312	-39S	140	143	+0.4	-0.4
CL Copiapo	17	46	5	42	16	308	-70S	108	112	+0.9	+0.3
CL Curico	17	44	39	35	12	310	-47S	131	135	+0.5	-0.2
CL Easter Island	16	55	1	31	39	355	-9S	169	173	+1.5	-6.7
CL Iquique	17	50	0	48	19	305	-89N	87	91	+1.3	+0.8
CL La Serena	17	44	36	39	15	309	-62S	117	120	+0.8	+0.1
CL Los Angeles	17	44	52	32	11	311	-38S	141	144	+0.3	-0.4
CL Osorno	17	46	42	29	9	312	-26S	152	156	+0.0	-0.9
CL Puerto Montt	17	47	23	29	8	312	-23S	156	159	-0.1	-1.1
CL Rancagua	17	44	46	35	12	310	-50S	128	132	+0.5	-0.1
CL Santiago	17	44	51	36	12	309	-52S	126	130	+0.6	+0.0
CL Santo Domingo	17	44	14	36	13	310	-50S	128	132	+0.6	-0.1
CL Temuco	17	45	28	31	10	311	-33S	145	149	+0.2	-0.6
CL Valdivia	17	45	52	30	10	312	-29S	149	153	+0.1	-0.7
CL Vallenar	17	45	17	41	15	308	-66S	112	116	+0.9	+0.2
EC Galapagos	17	27	54	68	51	310	-52N	50	54	+4.3	+3.2
EC MacAra	17	57	2	65	34	303	-42N	40	44	+4.4	+4.8
EC MacHala	18	4	17	66	34	301	-31N	29	32	+9.9	+9.9
EC San Cristobal	17	29	15	68	50	310	-53N	51	55	+4.2	+3.1
EC Santa Rosa	18	2	37	66	34	301	-33N	31	35	+6.3	+8.4
PY Filadelfia	17	59	45	40	8	300	-78N	76	80	+1.0	+1.3
PY Mariscal Estigarribia	17	59	36	41	9	300	-78N	76	80	+1.0	+1.3
PE Anta	17	50	9	61	31	305	-63N	61	65	+2.7	+2.0
PE Arequipa	17	52	19	52	22	305	-78N	76	80	+1.7	+1.2
PE Atalaya	17	56	57	57	26	303	-60N	58	61	+2.5	+2.2
PE Ayacucho	17	51	40	56	26	305	-71N	69	73	+2.1	+1.5
PE Cajamarca	17	52	41	63	33	304	-55N	53	56	+3.1	+2.7
PE Chachapoyas	17	57	40	63	32	303	-47N	45	49	+3.6	+3.8
PE Chiclayo	17	49	19	63	35	305	-57N	55	58	+3.2	+2.5
PE Chimbote	17	47	56	61	32	306	-64N	63	66	+2.7	+1.9
PE Ciro Alegria	18	5	27	64	31	301	-34N	32	35	+5.8	+7.8
PE Collique	17	47	4	58	30	306	-72N	71	74	+2.3	+1.4
PE Cuzco	17	55	45	54	23	303	-68N	66	70	+2.0	+1.7
PE Huanuco	17	52	41	59	29	304	-62N	60	64	+2.6	+2.1
PE Iberia	18	5	44	54	20	301	-51N	49	53	+2.5	+3.0
PE Ilo	17	51	1	50	21	305	-82N	80	84	+1.6	+1.1
PE Jauja	17	51	5	58	28	305	-69N	67	70	+2.3	+1.6
PE Juanjui	17	58	8	62	30	303	-49N	47	51	+3.3	+3.4
PE Juliaca	17	56	3	52	21	303	-72N	70	73	+1.8	+1.5
PE Las Palmas	17	46	53	58	30	306	-73N	71	75	+2.3	+1.4
PE Lima	17	46	48	58	30	306	-73N	71	75	+2.3	+1.4
PE Moquegua	17	52	21	51	21	304	-79N	78	81	+1.6	+1.2
PE Moyobamba	18	1	42	62	30	302	-42N	40	44	+4.0	+4.7
PE Nazca	17	47	50	55	26	306	-79N	77	81	+1.9	+1.1
PE Pisco	17	46	33	56	28	307	-77N	76	79	+2.1	+1.2
PE Piura	17	51	10	65	36	304	-50N	49	52	+3.6	+3.3
PE Pucallpa	18	1	1	59	27	302	-50N	48	51	+3.1	+3.3
PE Puerto Esperanza	18	8	0	55	22	300	-45N	43	46	+3.1	+4.0
PE Puerto Maldonado	18	3	9	53	20	301	-57N	55	59	+2.2	+2.4
PE San Juan	17	46	55	54	26	307	-81N	79	83	+1.9	+1.0
PE San Ramon	17	52	21	58	28	304	-65N	64	67	+2.4	+1.8
PE Tacna	17	52	19	50	20	304	-81N	79	83	+1.5	+1.1
PE Talara	17	50	50	66	37	304	-49N	47	50	+3.8	+3.6
PE Tarapoto	18	1	56	62	29	302	-44N	42	45	+3.8	+4.4
PE Tingo Maria	17	54	29	60	29	304	-59N	57	60	+2.7	+2.3
PE Trujillo	17	48	23	62	33	305	-61N	59	63	+2.9	+2.1
PE Tumbes	17	59	29	66	35	302	-37N	35	39	+5.3	+6.5
PE Yurimaguas	18	6	9	62	28	301	-37N	35	39	+4.8	+6.2



# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
BO Apolo	18	51	33	43	8	297	29N	329	332	-0.5	-1.8
BO Charana	18	55	50	41	7	297	43N	315	318	-0.2	-1.0
BO Cobiya	18	42	28	48	12	297	11N	348	351	-1.4	-3.7
BO Guayaramerin	18	32	26	47	11	297	-10N	8	11	+9.9	+9.9
BO La Paz	18	54	13	41	6	297	37N	322	325	-0.4	-1.3
BO Magdalena	18	43	51	43	6	296	10N	348	352	-1.5	-3.7
BO Reyes	18	50	3	43	7	297	25N	333	336	-0.7	-2.1
BO Riberalta	18	37	5	47	11	297	-1N	359	3	-2.8	-6.6
BO Rurrenabaque	18	50	23	43	7	297	26N	332	336	-0.7	-2.0
BO San Borja	18	50	43	42	7	297	26N	332	335	-0.7	-2.0
BO San Ignacio De Moxos	18	50	13	41	6	296	24N	334	337	-0.8	-2.1
BO San Joaquin	18	44	1	43	7	296	11N	348	351	-1.4	-3.6
BO San Ramon	18	44	39	43	7	296	12N	346	350	-1.3	-3.4
BO Santa Ana	18	47	8	43	7	296	17N	341	344	-1.0	-2.7
BO Trinidad	18	49	18	41	5	296	22N	336	340	-0.9	-2.3
BR Cruiziro Do Sul	18	32	58	54	19	298	-1N	359	3	-2.8	-6.9
BR Guajara-Mirim	18	31	33	47	11	297	-11N	9	13	+9.9	+9.9
BR Rio Branco	18	34	33	49	13	297	-4N	2	6	-3.5	-8.2
BR Tarauaca	18	30	32	53	18	298	-8N	6	9	+9.9	+9.9
CL Arica	18	56	23	41	7	298	47N	311	314	-0.1	-0.8
CL Easter Island	17	28	50	36	38	345	29S	208	211	+5.0	+6.4
CL Iquique	18	57	36	39	5	298	55N	303	307	+0.0	-0.4
EC Galapagos	18	20	6	70	40	302	16N	342	345	-0.2	-4.2
EC MacAra	18	29	7	62	28	300	5N	353	357	-1.7	-5.5
EC MacHala	18	21	10	64	30	300	-7N	5	8	+9.9	+9.9
EC San Cristobal	18	21	52	70	39	302	17N	341	345	-0.2	-4.1
EC Santa Rosa	18	22	50	64	29	300	-4N	2	6	-3.6	-9.1
PE Anta	18	44	51	54	20	299	26N	332	335	-0.4	-2.4
PE Arequipa	18	54	51	44	9	298	42N	316	319	-0.1	-1.1
PE Atalaya	18	46	12	51	15	298	23N	335	338	-0.6	-2.5
PE Ayacucho	18	51	6	48	14	299	35N	323	327	-0.2	-1.6
PE Cajamarca	18	39	13	58	23	299	17N	341	344	-0.7	-3.3
PE Chachapoyas	18	35	10	58	24	299	10N	348	352	-1.2	-4.3
PE Chiclayo	18	38	46	59	24	300	19N	339	342	-0.5	-3.1
PE Chimbote	18	44	29	55	21	300	27N	331	334	-0.3	-2.3
PE Ciro Alegria	18	26	0	61	26	299	-4N	2	5	-3.4	-8.5
PE Collique	18	49	25	51	17	299	36N	322	326	-0.1	-1.6
PE Cuzco	18	51	9	47	12	298	32N	326	330	-0.4	-1.7
PE Huanuco	18	45	29	53	18	299	25N	333	336	-0.4	-2.4
PE Iberia	18	44	32	48	12	297	15N	343	346	-1.1	-3.1
PE Ilo	18	55	58	42	8	298	47N	311	315	-0.1	-0.8
PE Jauja	18	49	10	51	16	299	32N	326	330	-0.3	-1.8
PE Juanjui	18	37	37	57	22	299	12N	346	349	-1.1	-3.9
PE Juliaca	18	53	29	44	9	298	36N	322	325	-0.3	-1.4
PE Las Palmas	18	49	48	51	17	299	37N	321	325	-0.1	-1.6
PE Lima	18	49	35	51	17	299	36N	322	325	-0.1	-1.6
PE Moquegua	18	55	33	43	8	298	44N	314	317	-0.1	-0.9
PE Moyobamba	18	32	49	58	23	299	5N	353	357	-1.7	-5.2
PE Nazca	18	53	23	47	13	299	43N	315	319	+0.0	-1.1
PE Pisco	18	52	3	49	15	299	41N	317	320	+0.0	-1.3
PE Piura	18	33	46	61	27	300	13N	345	349	-0.9	-4.0
PE Pucallpa	18	39	49	54	19	298	13N	346	349	-1.1	-3.7
PE Puerto Esperanza	18	40	11	50	15	298	8N	350	353	-1.5	-4.2
PE Puerto Maldonado	18	47	40	46	10	297	21N	337	340	-0.8	-2.5
PE San Juan	18	53	56	47	13	299	45N	313	316	+0.0	-1.0
PE San Ramon	18	47	50	51	16	299	29N	329	333	-0.3	-2.0
PE Tacna	18	56	12	41	7	298	46N	312	315	-0.1	-0.8
PE Talara	18	31	51	62	28	300	11N	347	350	-1.0	-4.3
PE Tarapoto	18	34	18	57	22	299	6N	352	355	-1.6	-4.9
PE Tingo Maria	18	43	52	54	19	299	22N	336	340	-0.6	-2.7
PE Trujillo	18	42	11	57	22	300	24N	334	338	-0.4	-2.6
PE Tumbes	18	24	56	63	29	300	-1N	359	2	-2.5	-7.2
PE Yurimaguas	18	30	19	58	23	299	0N	358	2	-2.6	-6.8

Sun alt : altezza del Sole sull'orizzonte, in gradi

Moon alt : altezza della Luna sull'orizzonte, in gradi

Moon az : azimut della Luna, in gradi

CA : angolo di cuspidi, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspidi più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso

PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °

Moon alt : height of the Moon above the horizon, in °

Moon az : azimuth of the Moon, in °

CA : angle of cuspidi, angle of the event along the limb of the Moon, measured by the nearest cuspidi;  
a negative value means that the phenomenon happens along the bright limb

PA : angle of position , angle of the event along the limb of the Moon, measured from north

I parametri "a" e "b" servono per il calcolo dei fenomeni nelle città non in tabella.  
Si utilizza la seguente formula:

$$U.T.n = U.T.o + a \times (Long.n - Long.o) + b \times (Lat.n - Lat.o)$$

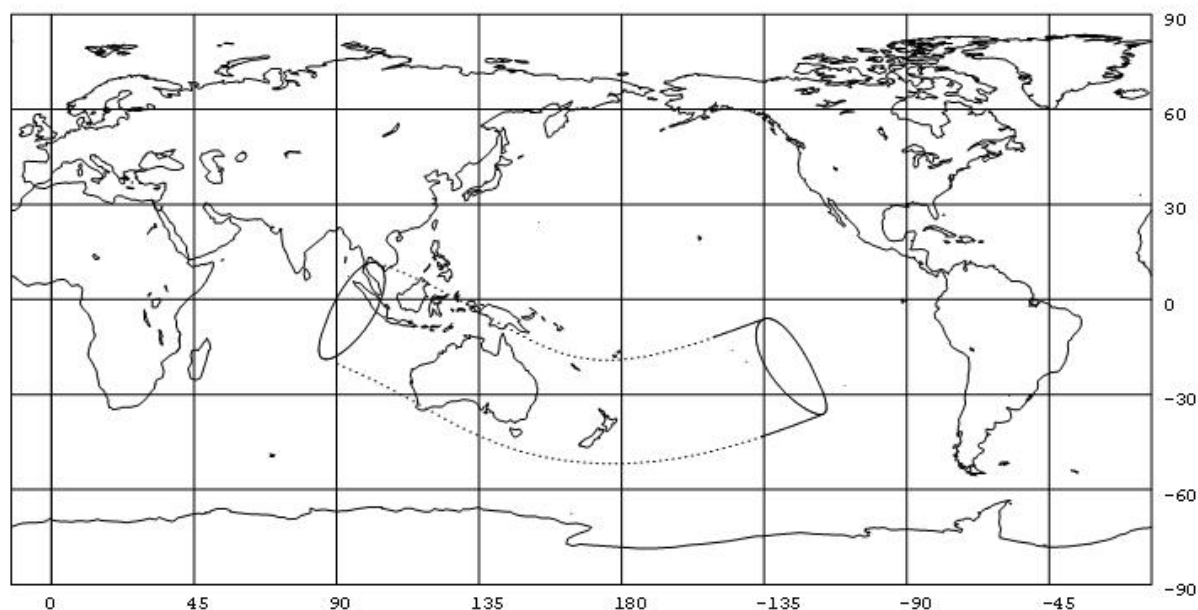
Ove "n" è l'indice relativo alla città ignota ed "o" quello relativo alla città più vicina in tabella.  
U.T. deve essere espresso in minuti e decimali, mentre la longitudine e la latitudine in gradi e decimali.  
Le longitudini sono positive ad est di Greenwich.

A coefficient for correcting the prediction for changes in site location. The units are minutes of time per degree (or seconds of time per minute of arc). The correction to the prediction for a change in site, in seconds of time, is found by multiplying A by the change in site longitude (+ve for changes towards the East) from the prediction site.

B same as for A, but for changes in latitude (+ve to the north).

© (8)

# Occultation of Mercury, Magnitude -0.3, on 2011 Oct 28



UT of conjunction = 2h 14.3m

Occult 4.0.7.0

Luna: % illuminazione 2+, elongazione solare 18° Moon: % illumination 2+, solar elongation 18°

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az					
BN Brunei	0	8	18	29	11	112	24N	45	29	+1.9	+3.3
ID Ambon	0	13	35	45	28	111	38N	59	43	+2.1	+1.6
ID Balikpapan	0	0	44	31	14	110	52N	73	56	+0.8	+0.6
ID Bandung	23	58	21	22	6	110	85N	106	89	+0.0	-0.7
ID Banjarmasin	23	58	40	29	12	110	64N	85	68	+0.5	+0.1
ID Batu Licin	23	59	19	30	13	110	61N	83	66	+0.6	+0.1
ID Bima	0	1	43	34	18	108	75N	95	79	+0.5	-0.5
ID Cilacap	23	58	51	24	8	109	85N	106	90	+0.0	-0.7
ID Cirebon	23	58	16	23	7	109	83N	104	87	+0.0	-0.6
ID Denpasar	0	0	27	30	14	109	80N	101	85	+0.3	-0.7
ID Ende	0	3	37	38	21	108	71N	92	75	+0.7	-0.4
ID Gorontalo	0	11	36	38	21	112	28N	50	33	+2.2	+2.8
ID Jakarta	23	58	0	21	5	110	84N	105	88	-0.1	-0.6
ID Kaimana	0	32	1	55	37	113	15N	36	20	+6.0	+7.6
ID Kendari	0	4	27	38	21	110	53N	74	57	+1.1	+0.5
ID Ketapang	23	56	57	23	6	110	65N	86	69	+0.3	+0.1
ID Kupang	0	5	42	40	24	108	72N	93	76	+0.8	-0.5
ID Labuhan Bajo	0	2	21	35	19	108	73N	93	77	+0.6	-0.4
ID Lenggur	0	21	7	52	35	110	35N	56	40	+2.7	+2.0
ID Luwuk	0	7	56	38	21	111	38N	60	43	+1.6	+1.6
ID Madiun	23	58	58	26	10	109	82N	103	86	+0.1	-0.6
ID Makale	0	2	16	34	17	110	54N	75	58	+0.9	+0.5
ID Malang	23	59	21	28	12	109	81N	102	86	+0.2	-0.6
ID Manado	0	23	39	43	25	113	8N	30	13	+9.9	+9.9
ID Masamba	0	3	7	35	18	110	51N	72	55	+1.1	+0.7
ID Mataram	0	0	39	31	15	109	79N	99	83	+0.3	-0.6
ID Maumere	0	3	59	38	22	108	69N	90	74	+0.8	-0.3
ID Merauke	0	40	12	65	47	110	25N	46	30	+4.6	+4.0
ID Nangapinoh	23	57	57	25	8	110	57N	78	62	+0.5	+0.4
ID Palangkaraya	23	58	26	27	11	110	60N	82	65	+0.5	+0.2
ID Palu	0	4	5	34	17	111	44N	66	49	+1.2	+1.1
ID Pangkalan Bun	23	57	25	25	8	110	66N	87	70	+0.3	+0.0
ID Ponggaluku	0	4	23	38	21	110	53N	75	58	+1.1	+0.5
ID Pontianak	23	57	8	22	5	110	60N	81	64	+0.3	+0.3
ID Poso	0	4	29	35	18	111	45N	66	50	+1.2	+1.0
ID Putusibau	23	59	18	26	9	110	50N	71	55	+0.7	+0.8
ID Ruteng	0	2	41	36	20	108	72N	93	76	+0.6	-0.4
ID Samarinda	0	1	34	31	14	111	48N	69	53	+0.9	+0.9
ID Sampit	23	57	56	26	10	110	63N	84	67	+0.4	+0.1
ID Semarang	23	58	29	25	9	109	82N	102	86	+0.1	-0.6
ID Sintang	23	58	0	24	7	110	56N	77	60	+0.5	+0.5
ID Solo City	23	58	51	26	9	109	83N	104	87	+0.1	-0.7
ID Soroako	0	4	16	36	19	110	48N	70	53	+1.2	+0.8
ID Sumbawa	0	1	7	33	16	108	76N	97	81	+0.4	-0.5
ID Surabaya	23	59	4	28	11	109	80N	100	84	+0.2	-0.6
ID Tangerang	23	58	3	21	5	110	84N	105	89	-0.1	-0.6
ID Tanjung Redep	0	5	19	31	14	111	35N	56	40	+1.4	+1.9
ID Tanjung Santan	0	2	13	31	14	111	46N	67	50	+1.0	+1.0
ID Taraken	0	8	15	32	14	112	27N	49	32	+1.9	+2.9
ID Tasikmalaya	23	58	38	23	7	109	86N	106	90	+0.0	-0.7

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
ID Ujung Pandang	0	1	30	34	18	109	61N	83	66	+0.8	+0.1
ID Waikabubak	0	2	29	35	19	108	76N	97	81	+0.5	-0.6
ID Waingapu	0	3	12	36	20	108	76N	97	80	+0.6	-0.6
ID Yogyakarta	23	59	1	25	9	109	84N	105	88	+0.1	-0.7
MY Bintulu	0	1	54	26	9	111	39N	61	44	+1.0	+1.5
MY Kota Kinabalu	0	17	24	32	14	112	7N	28	12	+9.9	+9.9
MY Kuching	23	58	16	23	6	110	52N	73	57	+0.5	+0.7
MY Labuan	0	10	16	30	12	112	20N	41	25	+2.3	+4.2
MY Marudi	0	5	15	28	10	111	31N	52	36	+1.4	+2.3
MY Miri	0	5	7	27	10	111	31N	52	36	+1.4	+2.3
MY Sibul	23	59	56	25	8	111	46N	67	51	+0.7	+1.0
MY Tawau	0	13	17	33	16	112	17N	38	22	+3.1	+5.3

## Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
BN Brunei	0	35	26	35	18	113	-26N	356	339	-1.4	-4.5
ID Ambon	0	58	20	56	38	113	-36N	345	329	-0.4	-3.8
ID Balikpapan	0	52	59	43	26	112	-52N	329	312	-0.1	-2.3
ID Bandung	0	59	41	37	21	109	-87N	294	277	+0.4	-1.0
ID Banjarmasin	0	57	13	43	25	111	-64N	317	300	+0.2	-1.8
ID Batam	0	49	52	30	12	111	-66N	315	298	-0.1	-1.4
ID Batu Licin	0	57	24	44	27	111	-62N	319	303	+0.2	-1.9
ID Bengkulu	0	55	32	30	14	110	-85N	295	279	+0.1	-0.9
ID Bima	1	7	21	50	33	108	-74N	307	290	+0.6	-1.6
ID Cilacap	1	1	4	39	22	109	-87N	294	277	+0.4	-1.0
ID Cirebon	0	59	55	38	21	109	-85N	296	279	+0.4	-1.1
ID Denpasar	1	5	29	46	30	108	-81N	300	284	+0.6	-1.4
ID Dumai	0	49	39	27	9	111	-69N	312	296	-0.2	-1.3
ID Ende	1	9	48	54	37	108	-70N	311	295	+0.7	-1.8
ID Gorontalo	0	44	27	46	29	113	-28N	353	337	-1.1	-4.5
ID Gunung Sitoli	0	50	49	24	6	110	-75N	305	289	-0.2	-1.0
ID Jakarta	0	58	51	36	19	109	-86N	295	278	+0.3	-1.0
ID Jambi	0	53	21	31	14	110	-76N	304	288	+0.0	-1.1
ID Kaimana	0	50	44	59	42	114	-13N	9	352	+9.9	+9.9
ID Kendari	0	59	55	51	33	111	-52N	329	313	+0.1	-2.5
ID Ketapang	0	53	55	37	20	111	-67N	314	297	+0.1	-1.6
ID Kupang	1	13	43	57	40	108	-70N	310	294	+0.8	-1.9
ID Labuhan Bajo	1	8	2	51	35	109	-72N	309	293	+0.6	-1.7
ID Langgur	1	4	33	62	45	113	-32N	349	333	-0.5	-4.5
ID Luwuk	0	51	1	48	31	113	-38N	344	327	-0.5	-3.4
ID Madiun	1	2	6	42	25	109	-83N	297	281	+0.5	-1.2
ID Makale	0	57	4	48	30	111	-53N	328	311	+0.1	-2.4
ID Malang	1	3	4	43	26	108	-82N	299	282	+0.5	-1.3
ID Manado	0	32	49	45	28	114	-8N	14	357	+9.9	+9.9
ID Masamba	0	56	1	48	30	112	-50N	331	314	+0.0	-2.5
ID Mataram	1	5	49	47	30	108	-78N	302	286	+0.6	-1.4
ID Maumere	1	9	47	54	37	109	-68N	313	296	+0.6	-1.9
ID Merauke	1	14	16	73	55	113	-22N	359	343	-1.3	-7.0
ID Muko Muko	0	54	13	29	12	110	-83N	298	281	+0.0	-0.9
ID Nangapinoh	0	51	27	38	20	111	-59N	322	306	-0.1	-1.9
ID Natuna	0	43	47	31	14	112	-48N	333	317	-0.5	-2.2
ID Padang	0	52	35	27	10	110	-79N	302	286	-0.1	-1.0
ID Padang Sidempuan	0	50	15	25	8	110	-72N	308	292	-0.2	-1.2
ID Palangkaraya	0	54	55	41	24	111	-62N	319	303	+0.1	-1.8
ID Palembang	0	54	50	32	15	110	-79N	302	286	+0.1	-1.1
ID Palu	0	51	43	46	28	112	-44N	337	320	-0.3	-2.8
ID Pangkal Pinang	0	54	6	33	16	110	-74N	306	290	+0.1	-1.3
ID Pangkalan Bun	0	55	29	39	22	111	-67N	314	297	+0.1	-1.6
ID Pekanbaru	0	51	2	27	10	110	-73N	308	292	-0.1	-1.2
ID Pendoro	0	55	8	32	15	110	-81N	299	283	+0.1	-1.0
ID Ponggaluku	1	0	30	51	34	111	-53N	329	312	+0.2	-2.5
ID Pontianak	0	51	15	35	18	111	-62N	319	302	-0.1	-1.7
ID Poso	0	52	56	47	29	112	-45N	336	320	-0.2	-2.8
ID Putusibau	0	48	54	38	20	112	-52N	329	313	-0.2	-2.2
ID Rengat	0	51	54	29	12	110	-74N	307	290	-0.1	-1.2
ID Ruteng	1	8	33	52	35	109	-71N	310	293	+0.6	-1.8
ID Samarinda	0	51	9	43	25	112	-49N	332	316	-0.2	-2.5
ID Sampit	0	55	18	40	23	111	-64N	317	300	+0.1	-1.7
ID Semarang	1	0	54	40	23	109	-83N	298	281	+0.4	-1.2
ID Sibolga	0	50	11	24	7	110	-73N	308	292	-0.2	-1.1
ID Singkep	0	51	58	31	14	111	-71N	310	293	+0.0	-1.3
ID Sintang	0	50	42	37	20	111	-58N	323	307	-0.1	-1.9
ID Solo City	1	1	40	41	24	109	-84N	297	280	+0.4	-1.2
ID Soroako	0	55	51	49	31	112	-48N	333	317	-0.1	-2.7
ID Sumbawa	1	6	30	49	32	108	-76N	305	288	+0.6	-1.5
ID Surabaya	1	2	26	43	26	109	-80N	300	284	+0.5	-1.3
ID Tangerang	0	58	47	36	19	109	-87N	294	278	+0.3	-1.0
ID Tanjung Karang	0	57	21	34	17	109	-85N	295	279	+0.2	-1.0
ID Tanjung Pandan	0	55	0	35	18	110	-74N	307	291	+0.1	-1.3
ID Tanjung Pinang	0	50	5	30	13	111	-66N	315	298	-0.1	-1.4
ID Tanjung Redep	0	43	29	40	23	113	-36N	346	329	-0.7	-3.4
ID Tanjung Santan	0	50	7	43	25	112	-46N	335	318	-0.3	-2.6
ID Tarakan	0	38	57	39	21	113	-28N	353	337	-1.2	-4.3
ID Tasikmalaya	1	0	25	38	21	109	-87N	293	277	+0.4	-1.0
ID Ujung Pandang	1	1	29	49	32	110	-61N	320	303	+0.3	-2.0
ID Waikabubak	1	9	6	51	34	108	-76N	305	289	+0.7	-1.6
ID Waingapu	1	10	16	53	36	108	-75N	306	290	+0.7	-1.7
ID Yogyakarta	1	1	50	41	24	109	-85N	295	279	+0.5	-1.1
MY Bintulu	0	43	14	36	18	112	-42N	340	323	-0.6	-2.8
MY Ipoh	0	45	33	25	7	111	-58N	323	306	-0.4	-1.6

# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
MY Johor Bahru	0	49	12	29	11	111	-65N	316	299	-0.2	-1.4
MY Kerteh	0	44	38	27	9	111	-55N	326	310	-0.4	-1.8
MY Kluang	0	48	42	28	11	111	-64N	317	300	-0.2	-1.5
MY Kota Bahru	0	42	12	25	7	111	-50N	331	315	-0.6	-2.0
MY Kota Kinabalu	0	25	14	34	16	113	-9N	13	356	+9.9	+9.9
MY Kuala Lumpur	0	48	4	26	9	111	-64N	317	300	-0.3	-1.4
MY Kuala Terengganu	0	43	15	26	8	111	-52N	329	313	-0.5	-1.9
MY Kuantan	0	46	3	27	10	111	-58N	323	307	-0.3	-1.7
MY Kuching	0	48	7	35	18	112	-54N	327	310	-0.2	-2.0
MY Labuan	0	33	5	35	17	113	-22N	360	343	-1.9	-5.4
MY Malacca	0	48	37	27	10	111	-65N	316	299	-0.2	-1.4
MY Marudi	0	39	7	36	18	113	-33N	348	332	-1.0	-3.6
MY Miri	0	38	55	35	18	113	-33N	348	332	-1.0	-3.5
MY Pulau Pioman	0	47	19	29	11	111	-60N	321	304	-0.3	-1.6
MY Sibul	0	46	1	36	18	112	-48N	333	317	-0.4	-2.3
MY Simpang	0	47	33	26	9	111	-63N	318	302	-0.3	-1.5
MY Tawau	0	32	51	38	20	113	-18N	4	347	-2.4	-6.7
SG Paya Lebar	0	49	34	29	12	111	-66N	315	299	-0.2	-1.4
SG Sembawang	0	49	29	29	12	111	-66N	315	299	-0.2	-1.4
SG Singapore	0	49	34	29	12	111	-66N	315	299	-0.2	-1.4
SG Tengah	0	49	34	29	12	111	-66N	315	298	-0.2	-1.4

# Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
AU Adelaide	0	58	35	60	52	78	59S	141	125	+0.8	-2.8
AU Adelaide	0	58	14	60	52	78	59S	141	124	+0.8	-2.8
AU Albury	1	10	14	65	60	65	68S	132	115	+1.3	-2.4
AU Alice Springs	0	29	44	56	42	96	84S	116	100	+1.0	-1.7
AU Amberley	0	41	8	67	50	108	33N	54	38	+3.8	+2.4
AU Argyle	0	51	29	60	50	83	65S	135	119	+0.8	-2.5
AU Avalon	1	12	35	62	58	65	58S	142	126	+1.0	-2.9
AU Brisbane	1	6	43	74	67	76	76N	97	80	+2.4	-0.9
AU Cairns	0	44	32	71	56	101	52N	73	57	+2.8	+0.4
AU Camden	1	11	17	68	64	64	80S	121	104	+1.7	-1.9
AU Canberra	1	11	32	66	63	64	74S	127	110	+1.5	-2.2
AU Charlieville	0	51	4	69	58	86	83N	104	88	+1.9	-1.3
AU Coff'S Harbour	1	9	52	72	67	69	85N	106	89	+2.1	-1.3
AU Coolangatta	1	8	19	74	68	74	78N	99	82	+2.3	-1.0
AU Dubbo	1	4	18	68	62	72	83S	118	101	+1.6	-1.9
AU East Sale	1	15	41	63	60	60	62S	138	122	+1.2	-2.7
AU Edinburgh	0	57	59	60	52	78	60S	140	124	+0.8	-2.8
AU Hobart	1	30	51	60	60	48	45S	155	139	+0.8	-3.7
AU Kalgoorlie	0	42	0	46	34	94	41S	159	143	-0.3	-3.4
AU Karratha	0	16	27	37	23	104	66S	134	118	+0.0	-2.0
AU Kununurra	0	14	5	48	32	104	81N	102	85	+0.9	-1.0
AU Launceston	1	26	2	61	60	52	50S	151	134	+0.9	-3.4
AU Learmonth	0	19	59	35	22	104	57S	143	127	-0.2	-2.3
AU MacKay	0	53	27	75	61	93	61N	82	66	+2.7	-0.2
AU Maroochydore	1	6	1	75	67	78	73N	94	78	+2.4	-0.7
AU Melbourne	1	12	8	63	58	65	60S	140	124	+1.0	-2.8
AU Mount Isa	0	32	35	62	47	98	77N	98	82	+1.6	-1.0
AU Norfolk Island	1	47	40	66	81	350	63N	84	68	+2.9	+0.4
AU Oakey	1	3	31	74	66	78	78N	99	82	+2.3	-1.0
AU Perth	0	51	10	43	32	95	20S	180	164	-1.7	-5.7
AU Point Cook	1	12	32	62	58	64	59S	141	125	+1.0	-2.9
AU Port Hedland	0	15	51	39	24	103	70S	131	114	+0.1	-1.9
AU Prosserpine	0	51	44	74	60	95	60N	81	65	+2.7	-0.1
AU Richmond	1	10	38	68	64	65	81S	119	103	+1.7	-1.9
AU Rockhampton	0	57	30	75	64	88	67N	88	71	+2.5	-0.5
AU Sydney	1	11	57	68	65	63	81S	120	103	+1.7	-1.9
AU Tamworth	1	6	24	70	64	71	89S	111	95	+1.9	-1.6
AU Townsville	0	46	55	72	57	97	59N	80	64	+2.6	-0.1
AU Wagga Wagga	1	8	46	66	61	67	72S	128	112	+1.4	-2.3
AU Weipa	0	36	37	66	49	106	44N	65	48	+3.0	+1.1
AU Woomera	0	47	22	59	49	86	68S	133	116	+0.8	-2.4
CK Aitutaki	3	20	7	19	36	259	22N	43	27	+0.6	+3.3
CK Avarua	3	13	14	21	38	261	34N	55	38	+0.9	+2.5
NZ Alexandra	2	6	10	51	64	343	59S	142	125	+1.6	-2.3
NZ Alofi	2	26	2	60	77	263	2N	23	7	+9.9	+9.9
NZ Ardmore	2	6	17	54	69	322	88N	108	92	+2.2	-0.5
NZ Auckland	2	5	52	54	70	322	88N	108	92	+2.2	-0.5
NZ Chatham Island	2	15	50	47	62	323	67S	133	116	+1.8	-1.5
NZ Christchurch	2	8	14	51	65	334	67S	133	116	+1.8	-1.7
NZ Dunedin	2	9	10	50	63	340	56S	144	128	+1.6	-2.4
NZ Gisborne	2	13	36	49	66	314	87S	113	97	+2.1	-0.6
NZ Glentanner	2	4	47	52	65	341	64S	136	119	+1.7	-2.0
NZ Hamilton	2	7	31	53	69	321	89S	111	95	+2.2	-0.6
NZ Hastings	2	11	46	50	66	319	83S	117	101	+2.1	-0.8
NZ Hokitika	2	4	9	53	66	339	70S	131	114	+1.8	-1.7
NZ Invercargill	2	7	24	51	63	345	53S	148	131	+1.5	-2.7
NZ Kaitaia	2	1	37	57	72	325	81N	102	86	+2.4	-0.3
NZ Kerikeri	2	3	9	56	72	323	82N	103	86	+2.4	-0.3
NZ Manapouri	2	4	12	52	64	348	56S	144	128	+1.6	-2.5
NZ Masterton	2	10	40	50	66	324	78S	122	106	+2.0	-1.1
NZ Mount Cook	2	4	31	52	65	341	65S	135	119	+1.8	-1.9
NZ Nelson	2	6	19	52	67	331	76S	124	108	+2.0	-1.3
NZ New Plymouth	2	5	54	53	68	327	85S	116	99	+2.1	-0.9
NZ Oamaru	2	8	28	50	64	338	61S	140	123	+1.7	-2.1
NZ Ohakea	2	9	26	51	66	324	81S	120	103	+2.0	-1.0

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
NZ Palmerston North	2	10	0	51	66	323	81S	120	103	+2.0	-1.0
NZ Paraparaumu	2	9	18	51	66	325	78S	122	106	+2.0	-1.1
NZ Pukaki	2	5	25	52	65	341	63S	137	121	+1.7	-2.0
NZ Queenstown International	2	4	41	52	65	345	59S	141	125	+1.6	-2.3
NZ Rotorua	2	9	47	52	68	318	89S	112	95	+2.1	-0.6
NZ Taupo	2	9	42	51	67	320	86S	114	98	+2.1	-0.7
NZ Tauranga	2	9	18	52	68	318	90N	110	94	+2.2	-0.5
NZ Timaru	2	7	26	51	65	338	63S	137	120	+1.7	-2.0
NZ Waiouru	2	9	21	51	67	322	84S	117	100	+2.1	-0.8
NZ Wairoa	2	12	41	50	66	316	86S	115	98	+2.1	-0.6
NZ Wanaka	2	4	53	52	65	344	61S	140	123	+1.7	-2.2
NZ Wanganui	2	8	28	52	67	325	82S	119	102	+2.0	-0.9
NZ Wellington	2	9	28	51	66	326	77S	124	107	+2.0	-1.2
NZ Westport	2	3	44	53	67	337	74S	127	110	+1.9	-1.5
NZ Whakatane	2	10	58	51	67	316	90S	111	94	+2.2	-0.5
NZ Whangarei	2	4	21	55	71	322	83N	104	88	+2.3	-0.3
NZ Whenuapai	2	5	25	54	70	322	87N	108	91	+2.3	-0.5
NZ Wigram	2	8	20	51	65	334	67S	133	117	+1.8	-1.7
NZ Woodbourne	2	7	52	51	66	329	75S	125	108	+1.9	-1.3
TO Ha'Apai	3	1	39	37	54	263	10N	31	15	+1.5	+6.5
TO Tongatapu	2	52	27	40	57	266	20N	41	25	+1.9	+4.5
TO Vava'U	3	12	14	34	51	261	-3N	19	2	+9.9	+9.9

## Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
AU Adelaide	2	9	20	68	65	59	-57S	257	241	+2.5	+0.0
AU Adelaide	2	9	35	68	66	59	-58S	258	242	+2.5	+0.0
AU Albury	2	30	36	66	72	28	-64S	264	248	+2.5	+0.0
AU Alice Springs	1	50	36	73	60	89	-86S	286	270	+2.0	-1.3
AU Amberley	1	27	52	79	61	112	-31N	351	334	-0.1	-5.5
AU Argyle	2	6	50	70	65	66	-64S	264	248	+2.4	-0.4
AU Avalon	2	23	47	65	69	35	-54S	254	238	+2.6	+0.4
AU Brisbane	2	39	34	69	83	1	-81N	300	284	+2.5	-1.6
AU Cairns	1	56	40	86	72	103	-51N	330	313	+1.5	-3.6
AU Camden	2	39	44	65	76	10	-74S	275	258	+2.5	-0.3
AU Canberra	2	36	14	65	74	17	-69S	269	253	+2.5	-0.1
AU Charlieville	2	21	21	76	78	62	-85N	296	279	+2.4	-1.6
AU Coff'S Harbour	2	43	24	66	80	356	-89S	290	273	+2.5	-1.0
AU Coolangatta	2	41	43	67	82	355	-83N	298	281	+2.5	-1.4
AU Dubbo	2	33	33	68	77	26	-79S	279	263	+2.5	-0.6
AU East Sale	2	30	37	64	71	24	-57S	257	240	+2.5	+0.4
AU Edinburgh	2	9	33	68	66	59	-58S	258	242	+2.5	+0.0
AU Hobart	2	27	1	59	66	21	-38S	238	221	+2.6	+1.6
AU Kalgoorlie	1	29	21	55	44	89	-41S	241	225	+2.2	+0.4
AU Karratha	1	19	3	52	37	100	-67S	267	250	+1.4	-0.6
AU Kununurra	1	29	17	66	50	103	-79N	302	286	+1.3	-1.8
AU Launceston	2	28	1	61	67	22	-43S	243	227	+2.6	+1.2
AU Learmonth	1	16	1	48	34	100	-57S	257	241	+1.4	-0.3
AU MacKay	2	16	40	79	81	85	-63N	318	302	+2.1	-2.9
AU Maroochydore	2	38	15	69	84	4	-78N	303	286	+2.5	-1.8
AU Melbourne	2	25	2	65	70	34	-56S	256	239	+2.6	+0.4
AU Mount Isa	1	56	6	80	67	93	-76N	305	289	+1.9	-2.1
AU Norfolk Island	3	18	53	48	66	286	-80N	301	285	+2.4	-1.1
AU Oakey	2	36	10	70	82	17	-82N	299	282	+2.5	-1.6
AU Perth	1	14	19	48	37	92	-19S	219	203	+3.2	+2.8
AU Point Cook	2	24	34	65	69	34	-55S	255	238	+2.6	+0.4
AU Port Hedland	1	21	23	54	39	100	-71S	271	255	+1.4	-0.8
AU Proserpine	2	13	25	81	79	90	-61N	320	304	+2.0	-3.0
AU Richmond	2	39	52	65	76	10	-76S	276	260	+2.5	-0.4
AU Rockhampton	2	25	15	75	83	63	-69N	312	295	+2.3	-2.4
AU Sydney	2	40	57	65	76	7	-75S	275	259	+2.5	-0.3
AU Tamworth	2	38	27	68	79	13	-85S	285	269	+2.5	-0.8
AU Townsville	2	6	14	83	76	96	-59N	322	306	+1.8	-3.1
AU Wagga Wagga	2	31	53	66	74	27	-68S	268	251	+2.5	-0.1
AU Weipa	1	35	59	80	63	109	-41N	340	324	+0.7	-4.3
AU Woomera	2	4	4	70	65	70	-68S	268	251	+2.4	-0.5
CK Aitutaki	4	9	12	7	25	256	-60N	321	304	+1.5	-1.8
CK Avarua	4	12	14	7	25	257	-71N	309	293	+1.2	-0.9
NZ Alexandra	3	11	13	43	58	314	-41S	241	224	+1.8	+2.4
NZ Alofi	2	45	13	56	73	263	-20N	1	345	+9.9	+9.9
NZ Ardmore	3	33	55	38	55	289	-71S	271	255	+1.8	+0.9
NZ Auckland	3	33	37	38	55	289	-71S	271	255	+1.8	+0.9
NZ Chatham Island	3	25	54	36	53	298	-46S	246	229	+1.5	+2.2
NZ Christchurch	3	20	21	40	56	304	-48S	248	231	+1.7	+2.0
NZ Dunedin	3	10	54	42	57	313	-38S	238	221	+1.7	+2.6
NZ Gisborne	3	37	8	34	52	287	-64S	264	248	+1.6	+1.3
NZ Glentanner	3	15	22	42	58	309	-46S	246	230	+1.8	+2.0
NZ Hamilton	3	33	43	37	54	290	-68S	268	252	+1.7	+1.1
NZ Hastings	3	33	53	36	53	291	-61S	261	245	+1.6	+1.4
NZ Hokitika	3	19	10	41	58	305	-51S	251	235	+1.8	+1.8
NZ Invercargill	3	6	18	43	58	318	-35S	235	219	+1.8	+2.7
NZ Kaitaia	3	32	8	40	57	288	-78S	278	262	+1.9	+0.5
NZ Kerikeri	3	33	16	39	56	288	-77S	277	261	+1.9	+0.5
NZ Manapouri	3	7	21	44	59	318	-39S	239	223	+1.8	+2.4
NZ Masterton	3	30	1	37	54	294	-57S	257	240	+1.6	+1.6
NZ Mount Cook	3	15	40	42	58	309	-47S	247	230	+1.8	+2.0
NZ Nelson	3	25	28	39	56	299	-56S	256	240	+1.7	+1.6
NZ New Plymouth	3	30	21	38	55	293	-64S	264	248	+1.8	+1.2
NZ Oamaru	3	14	43	41	57	310	-42S	242	225	+1.7	+2.3
NZ Ohakea	3	30	49	37	54	293	-60S	260	243	+1.7	+1.5

# Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az	o	o	o	m/o	m/o
NZ Palmerston North	3	31	0	37	54	293	-59S	259	243	+1.6	+1.5
NZ Paraparaumu	3	29	5	37	54	295	-57S	257	241	+1.6	+1.6
NZ Pukaki	3	14	40	42	58	310	-45S	245	229	+1.8	+2.1
NZ Queenstown International	3	10	29	43	59	315	-42S	242	225	+1.8	+2.3
NZ Rotorua	3	35	9	36	53	289	-67S	267	250	+1.7	+1.1
NZ Taupo	3	33	58	36	54	290	-65S	265	248	+1.7	+1.2
NZ Tauranga	3	35	24	36	54	288	-68S	268	252	+1.7	+1.1
NZ Timaru	3	16	26	41	57	308	-45S	245	228	+1.7	+2.2
NZ Waiouru	3	32	23	37	54	292	-62S	262	246	+1.7	+1.3
NZ Wairoa	3	35	46	35	52	289	-63S	263	247	+1.6	+1.3
NZ Wanaka	3	12	4	43	58	313	-43S	243	226	+1.8	+2.2
NZ Wanganui	3	30	36	37	54	294	-61S	261	244	+1.7	+1.4
NZ Wellington	3	28	5	38	54	296	-56S	256	239	+1.6	+1.7
NZ Westport	3	21	54	41	57	302	-55S	255	238	+1.8	+1.6
NZ Whakatane	3	36	21	35	53	288	-67S	267	251	+1.7	+1.1
NZ Whangarei	3	33	47	38	56	288	-75S	276	259	+1.9	+0.7
NZ Whenuapai	3	33	29	38	55	289	-72S	272	256	+1.8	+0.8
NZ Wigram	3	20	16	40	56	304	-48S	248	231	+1.7	+2.0
NZ Woodbourne	3	26	12	39	55	298	-55S	255	239	+1.7	+1.7
TO Ha'Apai	3	39	55	28	45	261	-42N	339	323	+2.9	-5.2
TO Tongatapu	3	43	54	28	46	263	-51N	330	314	+2.5	-3.3
TO Vava'U	3	32	30	29	47	260	-30N	351	335	+9.9	+9.9

Sun alt : altezza del Sole sull'orizzonte, in gradi

Moon alt : altezza della Luna sull'orizzonte, in gradi

Moon az : azimuth della Luna, in gradi

CA : angolo di cuspid, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspid più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso

PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °

Moon alt : height of the Moon above the horizon, in °

Moon az : azimuth of the Moon, in °

CA : angle of cuspid, angle of the event along the limb of the Moon, measured by the nearest cuspid;  
a negative value means that the phenomenon happens along the bright limb

PA : angle of position , angle of the event along the limb of the Moon, measured from north

I parametri "a" e "b" servono per il calcolo dei fenomeni nelle città non in tabella.

Si utilizza la seguente formula:

$$U.T.n = U.T.o + a \times (Long.n - Long.o) + b \times (Lat.n - Lat.o)$$

Ove "n" è l'indice relativo alla città ignota ed "o" quello relativo alla città più vicina in tabella.

U.T. deve essere espresso in minuti e decimali, mentre la longitudine e la latitudine in gradi e decimali.

Le longitudini sono positive ad est di Greenwich.

A coefficient for correcting the prediction for changes in site location. The units are minutes of time per degree (or seconds of time per minute of arc). The correction to the prediction for a change in site, in seconds of time, is found by multiplying A by the change in site longitude (+ve for changes towards the East) from the prediction site.

B same as for A, but for changes in latitude (+ve to the north).



# EVENTI TOPOCENTRICI <5° LUNA-PIANETI

## TOPOCENTRIC EVENT <5° MOON-PLANETS

42°N - 12°E

Date	UT	Dm	Alt.	r1	r2	p	e	m1	m2	tm (s)		
2011/01/02	17:00:29	4.26785	-27.64	0.873	0.003	171	-22	-0.0	-7.9		Mercury	Moon
2011/01/30	01:29:04	4.07409	-21.25	0.836	0.003	185	-46	-4.2	-9.5		Venus	Moon
2011/02/01	17:02:49	3.13230	-22.10	1.327	0.003	338	-16	-0.4	-7.3		Mercury	Moon
2011/02/04	05:29:52	3.95148	-17.10	30.972	0.003	341	13	8.0	-6.8		Neptune	Moon
2011/03/01	01:50:53	0.81558	-22.01	1.054	0.003	351	-41	-4.0	-9.3		Venus	Moon
2011/03/03	14:47:58	4.46096	10.25	30.975	0.003	331	-14	8.0	-7.1		Neptune	Moon
2011/03/04	06:06:14	4.85736	4.92	2.363	0.003	335	-6	1.1	-5.5		Mars	Moon
2011/03/06	04:21:20	4.90963	-21.74	21.046	0.003	339	14	5.9	-7.1		Uranus	Moon
2011/03/31	06:15:29	4.75363	24.44	1.255	0.003	329	-35	-3.9	-9.0		Venus	Moon
2011/04/04	09:33:44	0.71049	48.80	0.636	0.003	329	9	1.9	-6.1		Mercury	Moon
2011/04/27	04:26:47	4.43586	25.27	30.408	0.003	331	-66	7.9	-10.2		Neptune	Moon
2011/05/01	18:35:12	4.78345	-21.43	2.322	0.003	347	-18	1.1	-7.4		Mars	Moon
2011/05/30	19:50:47	3.05809	-27.94	2.286	0.003	353	-25	1.2	-8.1		Mars	Moon
2011/05/31	18:47:37	3.04224	-13.67	1.223	0.003	360	-14	-0.9	-6.8		Mercury	Moon
2011/05/31	01:04:12	3.53644	-15.97	1.575	0.003	346	-21	-3.8	-7.8		Venus	Moon
2011/06/20	21:34:05	4.58200	-6.92	29.515	0.003	340	-118	7.9	-11.4		Neptune	Moon
2011/06/26	03:24:27	4.62227	33.47	5.379	0.003	334	-60	-2.1	-10.0		Jupiter	Moon
2011/06/28	19:29:14	0.95502	-23.49	2.229	0.003	359	-31	1.2	-8.6		Mars	Moon
2011/06/30	06:22:05	0.31603	37.70	1.675	0.003	176	-13	-3.9	-6.8		Venus	Moon
2011/07/18	06:33:59	5.01910	3.95	29.172	0.003	333	-145	7.8	-12.1		Neptune	Moon
2011/07/23	21:04:42	4.07741	-16.39	4.982	0.003	343	-83	-2.3	-10.6		Jupiter	Moon
2011/07/27	17:32:20	1.27781	-12.35	2.145	0.003	187	-39	1.3	-9.1		Mars	Moon
2011/07/30	08:08:20	4.45578	48.14	1.725	0.002	198	-5	-3.9	-5.3		Venus	Moon
2011/08/01	08:57:34	1.73414	30.34	0.689	0.002	204	23	0.7	-8.1		Mercury	Moon
2011/08/20	12:14:47	4.13451	-15.48	4.565	0.003	352	-107	-2.5	-11.1		Jupiter	Moon
2011/08/25	12:49:35	3.32128	28.40	2.025	0.003	199	-47	1.3	-9.7		Mars	Moon
2011/09/10	16:38:29	4.41909	-1.23	29.049	0.003	339	161	7.8	-12.4		Neptune	Moon
2011/09/16	15:57:27	3.73293	-28.62	4.212	0.003	347	-134	-2.7	-11.8		Jupiter	Moon
2011/09/23	04:35:25	4.86502	48.44	1.865	0.002	198	-57	1.2	-10.1		Mars	Moon
2011/10/07	20:42:31	4.85337	34.97	29.298	0.003	327	134	7.8	-11.9		Neptune	Moon
2011/10/10	16:07:38	4.83498	0.57	19.113	0.003	336	165	5.7	-12.4		Uranus	Moon
2011/10/13	16:02:55	3.83767	-13.11	4.000	0.003	343	-163	-2.8	-12.4		Jupiter	Moon
2011/11/09	14:45:21	4.07365	-6.89	3.995	0.003	341	167	-2.8	-12.5		Jupiter	Moon
2011/11/26	09:10:07	0.93388	12.10	0.762	0.002	7	16	0.3	-7.5		Mercury	Moon
2011/12/01	10:42:52	4.81137	-6.90	30.166	0.003	341	79	7.9	-10.6		Neptune	Moon
2011/12/06	15:17:18	4.32690	19.66	4.204	0.003	336	137	-2.7	-11.9		Jupiter	Moon
2011/12/31	10:39:46	4.93192	0.08	20.197	0.003	336	81	5.8	-10.6		Uranus	Moon

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. del pianeta dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m2 = magnitudine della Luna

tm = se presente, il pianeta viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the planet from the Earth

R2 = distance in A.U. of the Moon from the Earth

p = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the planet

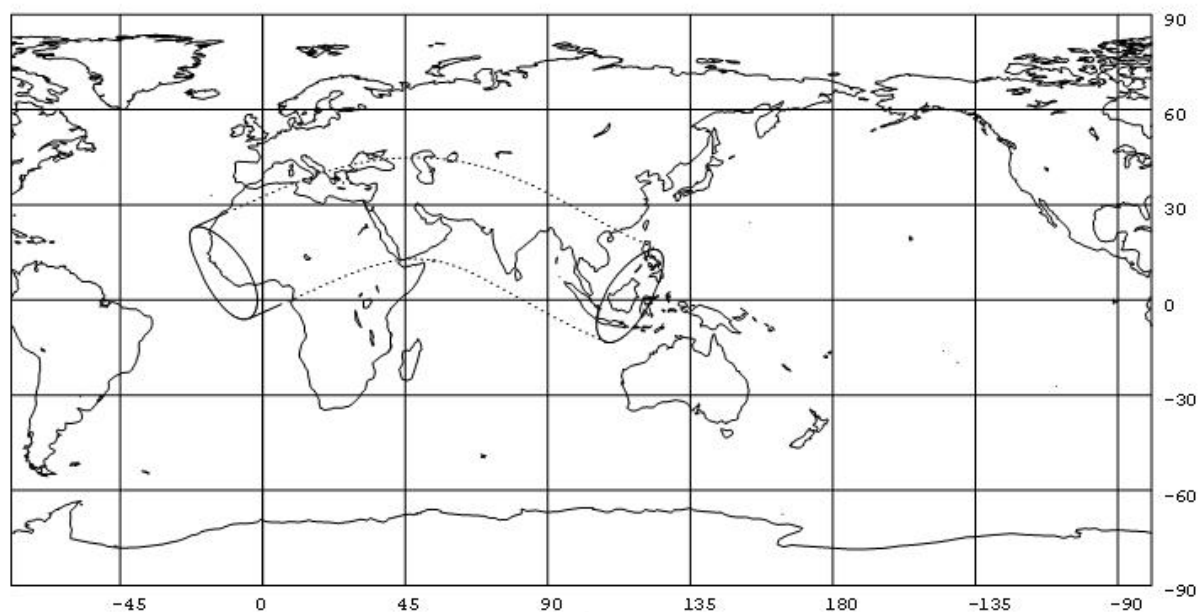
m2 = magnitude of the Moon

tm = if present, the planet is occulted maximum for x seconds

NB : i presenti dati, con una variazione di pochi centesimi di grado del valore Dm e di pochi minuti del valore U.T., sono altresì validi per il resto di Italia

Questo anno avviene solamente una occultazione radente visibile dal sud Italia

# Occultation of Venus, Magnitude -3.8, on 2011 Jun 30



Occult 4.0.7.0

UT of conjunction = 7h 33.0m

## Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az					
AGRIGENTO	6	4	33	24	35	86	-18N	14	18	-1.3	+7.2
CALTANISSETTA	6	5	17	25	36	87	-18N	14	18	-1.3	+7.2
CATANIA	6	4	18	26	37	87	-21N	17	21	-1.0	+6.4
CATANZARO	6	13	19	29	40	91	-13N	9	12	+9.9	+9.9
ENNA	6	5	27	25	36	87	-18N	14	18	-1.3	+7.2
MESSINA	6	8	34	27	38	89	-17N	13	16	-1.4	+8.0
PALERMO	6	13	57	26	37	88	-6N	2	5	+9.9	+9.9
RAGUSA	6	1	11	25	36	86	-24N	20	24	-0.7	+5.7
REGGIO CALABRIA	6	7	51	27	38	89	-18N	14	17	-1.3	+7.6
SIRACUSA	6	1	27	25	36	87	-25N	21	24	-0.7	+5.6

## Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA	WA	a	b
	h	m	s	Alt	Alt	Az					
AGRIGENTO	6	29	53	29	40	90	19N	337	340	+3.3	-4.7
CALTANISSETTA	6	30	30	30	41	90	19N	337	340	+3.3	-4.8
CATANIA	6	33	44	31	42	92	22N	334	337	+3.0	-4.0
CATANZARO	6	31	9	32	43	94	13N	343	347	+4.3	-7.9
ENNA	6	30	55	30	41	91	19N	337	340	+3.3	-4.8
MESSINA	6	31	55	31	42	92	17N	339	342	+3.5	-5.5
PALERMO	6	22	6	28	39	89	7N	349	353	+9.9	+9.9
RAGUSA	6	34	33	31	42	91	25N	330	334	+2.8	-3.2
REGGIO CALABRIA	6	32	41	32	43	92	18N	338	341	+3.4	-5.1
SIRACUSA	6	35	48	32	43	92	26N	330	333	+2.8	-3.2

Sun alt : altezza del Sole sull'orizzonte, in gradi

Moon alt : altezza della Luna sull'orizzonte, in gradi

Moon az : azimut della Luna, in gradi

CA : angolo di cuspid, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspid più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso

PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °

Moon alt : height of the Moon above the horizon, in °

Moon az : azimuth of the Moon, in °

CA : angle of cuspid, angle of the event along the limb of the Moon, measured by the nearest cuspid;  
a negative value means that the phenomenon happens along the bright limb

PA : angle of position , angle of the event along the limb of the Moon, measured from north

I parametri "a" e "b" servono per il calcolo dei fenomeni nelle città non in tabella.  
Si utilizza la seguente formula:

$$U.T.n = U.T.o + a \times (Long.n - Long.o) + b \times (Lat.n - Lat.o)$$

Ove "n" è l'indice relativo alla città ignota ed "o" quello relativo alla città più vicina in tabella.  
U.T. deve essere espresso in minuti e decimali, mentre la longitudine e la latitudine in gradi e decimali.  
Le longitudini sono positive ad est di Greenwich.

A coefficient for correcting the prediction for changes in site location. The units are minutes of time per degree (or seconds of time per minute of arc). The correction to the prediction for a change in site, in seconds of time, is found by multiplying A by the change in site longitude (+ve for changes towards the East) from the prediction site.

B same as for A, but for changes in latitude (+ve to the north).

© (8)

# CONGIUNZIONI MULTIPLE PIANETI-LUNA

(eventi con 2 o più pianeti e la Luna entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON

(events with 2 or more planets and the Moon within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax			
2011/05/30	21:56:53	4.217	4.758	-25	-3.8	1.2	Venus	Mars	Moon
2011/10/28	03:28:15	1.707	2.121	18	-3.9	-0.3	Mercury	Venus	Moon

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax			
2011/05/30	22:20:13	3.729	3.967	-25	-3.8	1.2	Venus	Mars	Moon

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest body

mmax = least magnitude

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Per le congiunzioni multiple stellari consultare più avanti

# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI GEOCENTRICI PIANETI-LUNA

(eventi con 2 pianeti e la Luna entro 5°)

## MULTIPLE CONJUNCTIONS

## LEAST GEOCENTRIC GROUPING PLANETS-MOON

(events with 2 planets and the Moon within 5°)

DATE	TIME	BODIES			D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
30 05 2011	21	VENUS	MARS	MOON	3.6	4.9	3.9	5.0	23	-3.9	1.3	-6.2	-6.3	-31	347	-4	317
30 05 2011	22	VENUS	MARS	MOON	3.7	4.7	4.1	4.9	23	-3.9	1.3	-6.2	-6.3	-31	4	-9	330
30 05 2011	23	VENUS	MARS	MOON	3.7	4.5	4.3	4.9	23	-3.9	1.3	-6.2	-6.3	-28	20	-13	343
31 05 2011	00	VENUS	MARS	MOON	3.7	4.4	4.6	5.0	22	-3.9	1.3	-6.1	-6.2	-22	35	-14	358
27 10 2011	21	MERCURY	VENUS	MOON	2.1	2.9	4.7	4.8	17	-0.3	-3.9	-5.5	-5.7	-46	285	-37	302
27 10 2011	22	MERCURY	VENUS	MOON	2.1	2.3	4.2	4.2	18	-0.3	-3.9	-5.5	-5.7	-56	300	-43	319
27 10 2011	23	MERCURY	VENUS	MOON	2.1	1.8	3.7	3.7	18	-0.3	-3.9	-5.6	-5.8	-64	323	-48	340
28 10 2011	00	MERCURY	VENUS	MOON	2.1	1.2	3.2	3.2	18	-0.3	-3.9	-5.6	-5.8	-68	357	-49	2
28 10 2011	01	MERCURY	VENUS	MOON	2.1	0.7	2.7	2.8	18	-0.3	-3.9	-5.7	-5.9	-65	32	-47	24
28 10 2011	02	MERCURY	VENUS	MOON	2.1	0.2	2.3	2.4	18	-0.3	-3.9	-5.8	-6.0	-57	56	-42	43
28 10 2011	03	MERCURY	VENUS	MOON	2.1	0.5	2.0	2.1	18	-0.3	-3.9	-5.8	-6.0	-48	72	-35	60
28 10 2011	04	MERCURY	VENUS	MOON	2.1	1.0	1.8	2.1	19	-0.3	-3.9	-5.9	-6.1	-37	84	-27	74
28 10 2011	05	MERCURY	VENUS	MOON	2.1	1.6	1.7	2.2	19	-0.3	-3.9	-5.9	-6.1	-26	95	-18	87
28 10 2011	06	MERCURY	VENUS	MOON	2.1	2.1	1.9	2.4	19	-0.3	-3.9	-6.0	-6.2	-15	104	-9	99
28 10 2011	07	MERCURY	VENUS	MOON	2.1	2.7	2.2	2.8	19	-0.3	-3.9	-6.0	-6.2	-5	113	-1	111
28 10 2011	08	MERCURY	VENUS	MOON	2.1	3.3	2.6	3.3	20	-0.3	-3.9	-6.1	-6.2	5	124	6	123
28 10 2011	09	MERCURY	VENUS	MOON	2.1	3.8	3.0	3.9	20	-0.3	-3.9	-6.1	-6.2	13	135	13	136
28 10 2011	10	MERCURY	VENUS	MOON	2.1	4.4	3.5	4.4	20	-0.3	-3.9	-6.2	-6.3	20	148	18	150
28 10 2011	11	MERCURY	VENUS	MOON	2.1	5.0	4.0	5.0	20	-0.3	-3.9	-6.2	-6.3	25	162	22	165

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI TOPOCENTRICI PIANETI-LUNA

(eventi con 2 pianeti e la Luna entro 5°)

## MULTIPLE CONJUNCTIONS

## LEAST TOPOCENTRIC GROUPING PLANETS-MOON

(events with 2 planets and the Moon within 5°)

42°N - 12°E

DATE	TIME		BODIES		D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
30 05 2011	20	VENUS	MARS	MOON	3.6	4.8	3.0	4.9	23	-3.9	1.3	-6.3	-6.4	-27	331	2	304
30 05 2011	21	VENUS	MARS	MOON	3.6	4.4	3.1	4.5	23	-3.9	1.3	-6.2	-6.3	-31	347	-4	317
30 05 2011	22	VENUS	MARS	MOON	3.7	4.0	3.3	4.3	23	-3.9	1.3	-6.2	-6.3	-31	4	-9	330
30 05 2011	23	VENUS	MARS	MOON	3.7	3.7	3.7	4.3	23	-3.9	1.3	-6.2	-6.3	-28	20	-13	343
31 05 2011	00	VENUS	MARS	MOON	3.7	3.6	4.1	4.5	22	-3.9	1.3	-6.1	-6.2	-22	35	-14	358
31 05 2011	01	VENUS	MARS	MOON	3.7	3.5	4.6	4.7	22	-3.9	1.3	-6.1	-6.2	-15	49	-13	12
27 10 2011	22	MERCURY	VENUS	MOON	2.1	2.7	4.7	4.7	18	-0.3	-3.9	-5.5	-5.7	-56	300	-43	319
27 10 2011	23	MERCURY	VENUS	MOON	2.1	2.0	4.0	4.0	18	-0.3	-3.9	-5.6	-5.8	-64	323	-48	340
28 10 2011	00	MERCURY	VENUS	MOON	2.1	1.3	3.3	3.4	18	-0.3	-3.9	-5.6	-5.8	-68	357	-49	2
28 10 2011	01	MERCURY	VENUS	MOON	2.1	0.7	2.8	2.8	18	-0.3	-3.9	-5.7	-5.9	-65	32	-47	24
28 10 2011	02	MERCURY	VENUS	MOON	2.1	0.6	2.3	2.4	18	-0.3	-3.9	-5.8	-6.0	-57	56	-42	43
28 10 2011	03	MERCURY	VENUS	MOON	2.1	1.1	2.1	2.2	18	-0.3	-3.9	-5.8	-6.0	-48	72	-35	60
28 10 2011	04	MERCURY	VENUS	MOON	2.1	1.8	2.1	2.4	19	-0.3	-3.9	-5.9	-6.1	-37	84	-27	74
28 10 2011	05	MERCURY	VENUS	MOON	2.1	2.4	2.4	2.7	19	-0.3	-3.9	-5.9	-6.1	-26	95	-18	87
28 10 2011	06	MERCURY	VENUS	MOON	2.1	3.0	2.7	3.2	19	-0.3	-3.9	-6.0	-6.2	-15	104	-9	99
28 10 2011	07	MERCURY	VENUS	MOON	2.1	3.6	3.1	3.7	19	-0.3	-3.9	-6.0	-6.2	-5	113	-1	111
28 10 2011	08	MERCURY	VENUS	MOON	2.1	4.1	3.6	4.2	20	-0.3	-3.9	-6.1	-6.2	5	124	6	123
28 10 2011	09	MERCURY	VENUS	MOON	2.1	4.6	4.0	4.7	20	-0.3	-3.9	-6.1	-6.2	13	135	13	136

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

**CONGIUNZIONI MULTIPLE MISTE**  
**QUARTETTI GEOCENTRICI PIANETI-LUNA**  
(eventi con 3 pianeti e la Luna entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**GEOCENTRIC QUARTETS PLANETS-MOON**  
(events with 3 planets and the Moon within 5°)

DATE	TIMES	BODIES	D12 D13 D14 D23 D24 D34 DQM MAX EL. MAG1 MAG2 MAG3 MAG4 MAGT
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Questo anno non avvengono fenomeni - No phenomena this year

**CONGIUNZIONI MULTIPLE MISTE**  
**QUARTETTI TOPOCENTRICI PIANETI-LUNA**  
(eventi con 3 pianeti e la Luna entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**TOPOCENTRIC QUARTETS PLANETS-MOON**  
(events with 3 planets and the Moon within 5°)  
42°N - 12°E

DATE	TIMES	BODIES	D12 D13 D14 D23 D24 D34 DQM MAX EL. MAG1 MAG2 MAG3 MAG4 MAGT ALT AZ
------	-------	--------	---

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora  
Dxy = distanza tra il corpo x e quello y, in gradi  
Group = cerchio minimo comprendente tutto il gruppo, in gradi  
EL = elongazione dal Sole, in gradi  
MAGx = magnitudine del corpo x  
MAGT = magnitudine totale del gruppo  
ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
ALT.S. = altezza sull'orizzonte del Sole, in gradi  
AZ.S. = azimut del Sole, in gradi da nord  
ALT.S. = height on the horizon of the Sun, in °  
AZ.S. = azimuth of the Sun, in ° from north  
Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Date in the format day/month/year  
Dxy = distance between the body x and y, in °  
GROUP = least group, in °  
EL = elongation from the Sun, in °  
MAGx = magnitude of body x  
MAGT = total magnitude  
ALT = height on the horizon of the baricenter of the group, in °  
AZ = azimuth of the baricenter of the group, in ° from north

Times in U.T.

# PIANETI-LUNA IN LINEA RETTA - GEOCENTRICI PLANETS-MOON IN STRAIGHT LINE - GEOCENTRIC

DATE	TIMES	BODIES			C	ALT	AZ	ALT.S.	AZ.S
28 10 2011	01	MERCURY	VENUS	MOON	-0.256	-65	32	-47	24
28 10 2011	02	MERCURY	VENUS	MOON	0.063	-57	56	-42	43
28 10 2011	03	MERCURY	VENUS	MOON	0.385	-48	72	-35	60

# PIANETI-LUNA IN LINEA RETTA - TOPOCENTRICI PLANETS-MOON IN STRAIGHT LINE-TOPOCENTRIC 42°N - 12°E

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.



# PIANETI-LUNA IN LINEA RETTA (4) - GEOCENTRICI PLANETS-MOON IN STRAIGHT LINE (4) - GEOCENTRIC

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

# PIANETI-LUNA IN LINEA RETTA (4) - TOPOCENTRICI PLANETS-MOON IN STRAIGHT LINE (4) - TOPOCENTRIC 42°N - 12°E

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# GEOMETRIE SPAZIALI LUNARI-TRIANGOLI EQUILATERI LUNAR SPATIAL GEOMETRIES-EQUILATERAL TRIANGLES

Geocentrici - geocentric

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
28 10 2011	06	MERCURY VENUS MOON	2.1	2.1	1.9	2.4	19	-0.3	-3.9	-6.0	-6.2	-15	104	-9	99

# GEOMETRIE SPAZIALI LUNARI-TRIANGOLI EQUILATERI LUNAR SPATIAL GEOMETRIES-EQUILATERAL TRIANGLES

42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
30 05 2011	22	VENUS MARS MOON	3.7	4.0	3.3	4.3	23	-3.9	1.3	-6.2	-6.3	-31	4	-9	330
30 05 2011	23	VENUS MARS MOON	3.7	3.7	3.7	4.3	23	-3.9	1.3	-6.2	-6.3	-28	20	-13	343
31 05 2011	00	VENUS MARS MOON	3.7	3.6	4.1	4.5	22	-3.9	1.3	-6.1	-6.2	-22	35	-14	358

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

DQM = distanza media tra i 4 corpi, in gradi

MAX = distanza massima tra i 4 corpi, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .

Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del 15%.

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Date in the format day/month/year

Dxy = distance between the body x and y, in °

DQM = middle distance between the 4 bodies, in °

MAX = maxima distance between the 4 bodies, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .

I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than 15%.

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# GEOMETRIE SPAZIALI LUNARI – QUADRATI

## LUNAR SPATIAL GEOMETRIES – SQUARES

Geocentrici – geocentric

DATA ORA CORPI D12 D13 D14 D23 D24 D34 DQM MAX EL. MAG1 MAG2 MAG3 MAG4 MAGT

Questo anno non avvengono fenomeni – No phenomena this year

# GEOMETRIE SPAZIALI LUNARI – QUADRATI

## LUNAR SPATIAL GEOMETRIES – SQUARES

42°N – 12°E

DATA ORA CORPI D12 D13 D14 D23 D24 D34 DQM MAX EL. MAG1 MAG2 MAG3 MAG4 MAGT ALT AZ

Questo anno non avvengono fenomeni – No phenomena this year

Date, Time = data ed ora  
 Bodies = corpi  
 Dxy = distanza tra il corpo x e quello y, in gradi  
 DQM = distanza media tra i 4 corpi, in gradi  
 MAX = distanza massima tra i 4 corpi, in gradi  
 Group = cerchio minimo comprendente tutto il gruppo, in gradi  
 EL = elongazione dal Sole, in gradi  
 MAGx = magnitudine del corpo x  
 MAGT = magnitudine totale del gruppo  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi  
 AZ.S. = azimut del Sole, in gradi da nord  
 Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .  
 Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del 15%.

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Date in the format day/month/year  
 Dxy = distance between the body x and y, in °  
 DQM = middle distance between the 4 bodies, in °  
 MAX = maxima distance between the 4 bodies, in °  
 GROUP = least group, in °  
 EL = elongation from the Sun, in °  
 MAGx = magnitude of body x  
 MAGT = total magnitude  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °  
 AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .  
 I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than 15%.

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# EVENTI GEOCENTRICI <5° LUNA-STELLE m<2

## GEOCENTRIC EVENTS <5° MOON-STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)				
2011/01/01	18:42:50	2.50559	1.21832	0.003	184	-31	-8.8	1.1		Moon	Alpha	SCO	Antares
2011/01/17	06:01:52	4.46253	1.22877	0.003	2	146	-12.3	1.7		Moon	Beta	TAU	Elnath
2011/01/21	22:47:28	4.85689	1.28161	0.002	23	-151	-12.5	1.4		Moon	Alpha	LEO	Regulus
2011/01/25	16:12:35	2.78196	1.25451	0.002	20	-101	-11.3	1.1		Moon	Alpha	VIR	Spica
2011/01/29	00:30:36	2.57595	1.21206	0.003	184	-59	-10.1	1.1		Moon	Alpha	SCO	Antares
2011/02/13	16:02:27	4.59880	1.21677	0.003	2	118	-11.6	1.7		Moon	Beta	TAU	Elnath
2011/02/18	09:18:32	4.80839	1.29492	0.002	23	176	-12.8	1.4		Moon	Alpha	LEO	Regulus
2011/02/21	23:46:46	2.59499	1.27617	0.002	20	-129	-12.0	1.1		Moon	Alpha	VIR	Spica
2011/02/25	06:05:40	2.78054	1.22044	0.003	184	-87	-10.8	1.1		Moon	Alpha	SCO	Antares
2011/03/13	00:15:08	4.85124	1.19966	0.003	2	90	-10.9	1.7		Moon	Beta	TAU	Elnath
2011/03/17	20:34:13	4.87083	1.29052	0.002	23	153	-12.5	1.4		Moon	Alpha	LEO	Regulus
2011/03/21	09:53:49	2.43229	1.29463	0.002	20	-156	-12.6	1.1		Moon	Alpha	VIR	Spica
2011/03/24	13:28:34	3.04595	1.23971	0.003	184	-114	-11.5	1.1		Moon	Alpha	SCO	Antares
2011/04/14	06:21:44	5.04150	1.27179	0.002	23	126	-11.8	1.4		Moon	Alpha	LEO	Regulus
2011/04/17	21:01:05	2.38640	1.29704	0.002	19	174	-12.8	1.1		Moon	Alpha	VIR	Spica
2011/04/20	23:01:42	3.24820	1.25689	0.002	184	-141	-12.2	1.1		Moon	Alpha	SCO	Antares
2011/05/15	07:03:32	2.43950	1.28373	0.002	19	150	-12.4	1.1		Moon	Alpha	VIR	Spica
2011/05/18	09:26:12	3.32488	1.26158	0.002	184	-167	-12.7	1.1		Moon	Alpha	SCO	Antares
2011/06/11	14:48:17	2.49190	1.26578	0.002	19	124	-11.8	1.1		Moon	Alpha	VIR	Spica
2011/06/14	18:56:46	3.32128	1.25324	0.002	184	166	-12.6	1.1		Moon	Alpha	SCO	Antares
2011/07/08	20:35:17	2.45162	1.25647	0.002	19	98	-11.1	1.1		Moon	Alpha	VIR	Spica
2011/07/12	02:29:01	3.34231	1.24000	0.003	184	140	-12.1	1.1		Moon	Alpha	SCO	Antares
2011/08/05	02:05:10	2.30101	1.26279	0.002	19	72	-10.5	1.1		Moon	Alpha	VIR	Spica
2011/08/08	08:15:25	3.46819	1.23299	0.003	184	114	-11.5	1.1		Moon	Alpha	SCO	Antares
2011/09/01	09:12:43	2.10584	1.28094	0.002	19	46	-9.6	1.1		Moon	Alpha	VIR	Spica
2011/09/04	13:44:29	3.69776	1.23958	0.003	184	88	-10.9	1.1		Moon	Alpha	SCO	Antares
2011/09/28	18:46:46	1.96933	1.29838	0.002	19	19	-7.8	1.1		Moon	Alpha	VIR	Spica
2011/10/01	20:48:36	3.94788	1.25797	0.002	184	61	-10.2	1.1		Moon	Alpha	SCO	Antares
2011/10/26	05:55:15	1.95061	1.30191	0.002	18	-9	-6.3	1.1		Moon	Alpha	VIR	Spica
2011/10/29	06:20:04	4.11245	1.27683	0.002	184	34	-9.0	1.1		Moon	Alpha	SCO	Antares
2011/11/22	16:33:46	2.00305	1.28768	0.002	18	-36	-9.2	1.1		Moon	Alpha	VIR	Spica
2011/11/25	17:23:22	4.15448	1.28292	0.002	183	6	-5.5	1.1		Moon	Alpha	SCO	Antares
2011/12/20	00:47:50	2.00562	1.26610	0.002	18	-64	-10.3	1.1		Moon	Alpha	VIR	Spica
2011/12/23	03:47:53	4.15248	1.27211	0.002	183	-21	-8.1	1.1		Moon	Alpha	SCO	Antares

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

© (6)

# EVENTI TOPOCENTRICI <5° LUNA-STELLE m<2

## TOPOCENTRIC EVENTS <5° MOON-STARS m<2

42°N - 12°E

Date	UT	Dm	Alt.	r1	p	e	m1	m*	tm(s)			
2011/02/13	16:07:18	4.99554	48.54	0.003	355	118	-11.6	1.7		Moon	Beta	TAU Elnath
2011/02/21	21:43:01	3.03726	4.32	0.002	26	-129	-12.0	1.1		Moon	Alpha	VIR Spica
2011/02/25	06:11:53	1.90152	22.51	0.003	183	-87	-10.9	1.1		Moon	Alpha	SCO Antares
2011/04/17	19:01:39	2.91296	13.42	0.002	27	174	-12.8	1.1		Moon	Alpha	VIR Spica
2011/04/20	22:35:24	2.51033	10.19	0.002	192	-140	-12.2	1.1		Moon	Alpha	SCO Antares
2011/06/11	12:58:52	2.84818	-12.22	0.002	23	124	-11.7	1.1		Moon	Alpha	VIR Spica
2011/06/14	18:27:19	2.62284	5.92	0.002	192	167	-12.6	1.1		Moon	Alpha	SCO Antares
2011/07/08	21:07:16	3.35057	14.30	0.002	19	98	-11.1	1.1		Moon	Alpha	VIR Spica
2011/07/12	23:01:40	2.77458	-22.58	0.003	176	140	-12.1	1.1		Moon	Alpha	SCO Antares
2011/09/01	07:29:14	2.46390	-13.46	0.002	22	46	-9.6	1.1		Moon	Alpha	VIR Spica
2011/09/04	13:23:35	2.99210	8.76	0.002	192	88	-10.9	1.1		Moon	Alpha	SCO Antares
2011/09/28	19:54:21	2.74685	-29.23	0.002	13	20	-7.9	1.1		Moon	Alpha	VIR Spica
2011/10/01	21:14:44	3.34066	-17.82	0.002	176	61	-10.2	1.1		Moon	Alpha	SCO Antares
2011/10/26	04:12:04	2.33526	-9.89	0.002	22	-9	-6.3	1.1		Moon	Alpha	VIR Spica
2011/11/12	15:29:28	5.09048	-12.87	0.003	173	-160	-12.4	1.0		Moon	Alpha	TAU Aldebaran
2011/11/25	17:49:06	3.54923	-19.61	0.002	177	6	-5.4	1.1		Moon	Alpha	SCO Antares
2011/12/19	23:16:39	2.33864	-24.69	0.002	20	-64	-10.3	1.1		Moon	Alpha	VIR Spica
2011/12/23	03:12:16	3.64042	-19.98	0.002	190	-21	-8.0	1.1		Moon	Alpha	SCO Antares

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

# OCCULTAZIONI LUNARI TOPOCENTRICHE m<6

## LUNAR TOPOCENTRIC OCCULTATIONS m<6

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s			No D	V	ill		Alt	Alt	Az
Occultazioni per ANCONA									
11 01 14 23 33 40 D			472cA1	4,9	73+	117		27 274	
11 01 16 17 30 38 D			742SG8	5,8	88+	140		50 105	
11 01 17 20 44 7 D			916SG7	4,3s	95+	153		68 155	
11 01 17 23 56 46 d			929SB2	5,8v	95+	155		53 249	
11 01 18 2 33 31 D			946DM3	3,5V	96+	156		26 277	
11 01 23 3 15 46 r			1605 K3	6,0	85-	135		43 206	
11 01 23 23 26 1 r			1713cK0	5,6	77-	123		24 124	
11 01 26 1 42 0 R			1967 G1	5,6	55-	95		19 137	
11 02 12 19 25 20 D			693 F5	6,0v	65+	107		65 222	
11 02 14 13 44 1 d			976SM3	2,9v	82+	130	25 14	72	
11 02 16 1 54 13 D			1175cK5	4,9	92+	148		26 271	
11 02 20 0 13 55 R			1670 K4	4,8	96-	156		43 172	
11 02 22 5 42 12 r			1944SK1	5,5	79-	126	-3 17	228	
11 02 25 1 32 33 R			2347 A4	4,6s	48-	88		6 132	
11 03 10 17 10 8 D			486DB5	5,3e	28+	64	-2 57	236	
11 03 11 23 16 2 D			660wA8	4,3v	39+	77		5 297	
11 03 13 21 37 8 D			946DM3	3,5V	59+	100		40 264	
11 03 13 22 36 25 r			946DM3	3,5V	59+	101		30 274	
11 03 14 17 14 27 D			1077SG3	4,0V	68+	111	-2 60	134	
11 03 14 17 27 45 r			1077SG3	4,0V	68+	111	-4 62	139	
11 03 15 23 6 51 d			1238cG8	6,0	80+	127		40 254	
11 03 18 23 29 4 d			1605 K3	6,0	99+	168		44 202	
11 03 20 22 23 40 r			1852cA2	6,0	97-	162		30 150	
11 03 24 4 28 29 r			2305 B8	5,9v	74-	119	-7 20	200	
11 03 26 1 31 3 r			2589 B9	4,7	54-	95		8 134	
11 03 27 7 31 21 r			2779wK0	3,8s	42-	81	26 21	204	
11 03 28 3 47 43 r			2902cK0	5,9	33-	71		16 138	
11 04 07 19 33 57 D			599SK0	4,4	15+	46		21 281	
11 04 07 20 1 10 D			601SG5	5,9	15+	46		16 285	
11 04 15 21 35 55 D			1670 K4	4,8	93+	148		43 192	
11 04 29 3 16 1 R			3453wA0	5,0v	15-	45	-8 13	101	
11 05 05 17 55 7 d			709MB3	4,3	6+	27	2 26	278	
11 05 05 18 34 59 R			709MB3	4,3	6+	28	-5 19	284	
11 05 20 1 23 25 R			2630wK0	5,0	91-	146		23 179	
11 05 20 22 32 27 R			2779wK0	3,8s	85-	134		7 129	
11 05 21 1 26 31 M			2797SF2	2,9s	84-	133		24 165	
11 06 04 11 32 43 d			1077SG3	4,0V	7+	32	68 58	127	
11 06 11 19 1 16 d			1944SK1	5,5	80+	126	-3 31	175	
11 06 17 2 8 54 r			2725wK5	5,4s	98-	165	-11 19	208	
11 06 29 7 16 50 r			709MB3	4,3	5-	25	38 57	119	
11 07 09 21 19 37 d			2051 A*	5,9v	68+	111		15 225	
11 07 12 21 4 42 D			2490WK*	5,2	93+	150		22 180	
11 07 19 0 5 14 R			3320SK2	5,0	86-	136		36 144	
11 07 20 3 21 41 R			3453wA0	5,0v	78-	124	-4 47	194	
11 07 26 10 35 58 r			660wA8	4,3v	21-	54	65 44	260	
11 08 09 20 55 25 D			2589 B9	4,7	84+	133		21 195	
11 08 11 21 15 8 d			2902cK0	5,9	96+	157		27 174	
11 09 12 22 46 9 r			3482cF6	5,7	100-	173		48 168	
11 09 18 21 24 26 r			634 A0	5,3v	66-	108		13 72	
11 09 19 0 16 17 R			657SA7	5,3s	65-	107		43 100	
11 10 10 0 1 21 D			3453wA0	5,0v	96+	156		35 232	
11 10 16 5 0 37 R			631SF0	5,6	86-	136	-4 45	257	
11 10 17 21 24 7 r	Ber	21 C		6,0	72-	116		16 75	
11 10 29 17 1 23 D			2434DA0	5,6	11+	40	-11 8	227	
11 10 30 18 14 24 D			2595SB0	5,7s	20+	53		7 230	
11 10 31 16 27 22 D			2759 G8	3,5	29+	65	-6 24	196	
11 10 31 17 41 55 r			2759 G8	3,5	30+	66		18 213	
11 11 04 20 6 8 D			3287SA0	5,8	70+	114		38 209	
11 11 14 5 25 9 r	Ber	21 C		6,0	90-	143	-6 37	266	
11 11 16 5 50 53 R			1158cM0	5,0s	75-	119	-2 47	246	
11 11 17 3 49 54 R			1271cA5	5,9	65-	108		61 179	
11 11 20 2 58 26 R			1605 K3	6,0	33-	70		28 121	
11 12 14 21 57 42 R			1341SA5	4,3s	81-	128		24 96	
11 12 19 3 1 1 R			1800 A0	5,5	37-	75		24 133	
11 12 28 16 9 30 D			3185 G8	5,1	17+	49	-6 32	211	

### Occultazioni per AOSTA

11 01 14 23 26 50 D			472cA1	4,9	73+	117		33 267	
11 01 16 17 33 36 D			742SG8	5,8	88+	140		46 102	
11 01 17 20 34 14 D			916SG7	4,3s	95+	153		63 140	
11 01 17 23 45 45 D			929SB2	5,8v	95+	155		58 235	
11 01 18 2 29 20 D			946DM3	3,5V	96+	156		31 271	
11 01 23 3 6 41 r			1605 K3	6,0	85-	135		43 194	
11 01 23 23 22 43 r			1713cK0	5,6	77-	123		18 118	
11 01 26 1 38 53 r			1967 G1	5,6	55-	95		14 131	
11 02 12 19 9 8 D			693 F5	6,0v	65+	107		67 199	
11 02 16 1 47 9 D			1175cK5	4,9	92+	148		32 264	
11 02 20 0 3 47 R			1670 K4	4,8	96-	156		40 161	
11 02 22 5 31 8 r			1944SK1	5,5	79-	126	-10 20	220	
11 03 11 23 15 2 D			660wA8	4,3v	39+	77		10 292	
11 03 11 23 50 2 d			664cB7	5,5s	39+	78		5 298	

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s			No D	V	ill		Alt	Alt	Az
11 03 13 21 27 52 D			946DM3	3,5V	59+	100		46 255	
11 03 13 22 30 51 r			946DM3	3,5V	59+	101		35 267	
11 03 14 16 51 18 d			1077SG3	4,0V	68+	111	7 52	120	
11 03 15 22 56 56 d			1238cG8	6,0	80+	127		45 244	
11 03 18 23 17 14 d			1605 K3	6,0	99+	168		44 189	
11 03 20 22 16 42 r			1852cA2	6,0	97-	162		25 143	
11 03 24 4 14 12 r			2305 B8	5,9v	74-	119		20 190	
11 03 26 1 28 48 r			2589 B9	4,7	54-	95		3 129	
11 03 27 7 16 39 r			2779wK0	3,8s	42-	81	19 21	195	
11 04 07 19 29 19 D			599SK0	4,4	15+	46		27 275	
11 04 07 19 58 6 D			601SG5	5,9	15+	46		22 280	
11 04 15 21 24 3 D			1670 K4	4,8	93+	148		41 179	
11 04 29 3 16 16 R			3453wA0	5,0v	15-	45	-11 9	97	
11 05 05 17 48 32 d			709MB3	4,3	6+	27	8 32	271	
11 05 20 1 18 42 R			2630wK0	5,0	91-	146		20 171	
11 06 17 2 3 55 r			2725wK5	5,4s	98-	164		19 201	
11 06 29 7 6 35 r			709MB3	4,3	5-	25	32 51	111	
11 07 09 19 40 54 g			2039 A0	5,5	68+	111	-4 25	197	
11 07 09 21 8 48 d			2051 A*	5,9v	68+	111		17 217	
11 07 12 20 53 20 D			2490WK*	5,2	93+	150		20 172	
11 07 19 0 5 47 R			3320SK2	5,0	86-	136		32 139	
11 07 20 3 27 58 R			3453wA0	5,0v	78-	124	-6 45	187	
11 07 26 10 24 17 r			660wA8	4,3v	21-	54	60 50	249	
11 08 09 20 35 44 D			2589 B9	4,7	84+	133		21 184	
11 08 11 20 58 37 d			2902cK0	5,9	96+	157		24 163	
11 08 22 9 36 4 r			599SK0	4,4	46-	85	48 36	265	
11 09 12 22 40 39 r			3482cF6	5,7	100-	173		45 158	
11 09 18 21 27 33 r			634 A0	5,3v	66-	108		10 69	
11 09 19 0 3 8 R			657SA7	5,3s	65-	107		36 94	
11 09 20 0 10 33 R			792 G8	5,0	55-	96		28 86	
11 10 08 20 14 25 D			3320SK2	5,0	90+	144		39 165	
11 10 09 23 42 54 D			3453wA0	5,0v	96+	156		39 219	
11 10 16 4 53 4 R			631SF0	5,6	86-	136	-10 49	247	
11 10 16 5 54 36 r			634 A0	5,3v	86-	135	0 39	261	
11 10 17 21 25 22 r	Ber	21 C		6,0	72-	116		13 72	
11 10 30 18 6 12 D			2595SB0	5,7s	20+	53		9 223	
11 10 31 16 15 59 D			2759 G8	3,5	29+	65	0 23	186	
11 10 31 17 34 4 r			2759 G8	3,5	30+	66		19 206	
11 11 04 20 8 53 D			3287SA0	5,8	70+	114		37 202	
11 11 14 5 17 13 r	Ber	21 C		6,0	90-	143		42 258	
11 11 16 5 41 16 R			1158cM0	5,0s	75-	119	-9 51	235	
11 11 17 3 37 35 R			1271cA5	5,9	65-	108		57 162	
11 11 20 2 53 35 R			1605 K3	6,0	33-	70		23 115	
11 12 07 21 49 51 d			415cK1	5,8	93+	150		62 198	
11 12 09 19 9 51 d			665WA*	5,7	99+	171		40 100	
11 12 14 21 59 31 R			1341SA5	4,3s	81-	128		19 93	
11 12 19 2 56 8 R			1800 A0	5,5	37-	75		19 127	

### Occultazioni per BARI

11	01	14	23	39	37	D	472cA1	4,9	73+	117		23	278
11	01	15	15	55	4	d	582 F2	5,6	80+	127	-2	45	99
11	01	16	17	27	56	D	742SG8	5,8	88+	139		53	104
11	01	17	20	50	48	D	916SG7	4,3s	95+	153		72	166
11	01	18	0	3	16	d	929SB2	5,8v	95+	155		50	256
11	01	18	2	38	16	D	946DM3	3,5V	96+	156		22	281
11	01	23	3	23	40	r	1605 K3	6,0	85-	135		44	214
11	01	23	23	26	22	R	1713cK0	5,6	77-	123		27	126
11	01	26	1	45	19	R	1967 G1	5,6	55-	95		23	140
11	01	28	1	57	4	r	2227SK0	5,8	33-	70		4	126
11	02	12	19	38	44	D	693 F5	6,0v	65+	107		63	237
11	02	14	13	40	29	d	976SM3	2,9v	82+	130	25	15	73
11	02	16	1	58	38	D	1175cK5	4,9	92+	148		23	275
11	02	20	0	20	43	R	1670 K4	4,8	96-	156		46	178
11	02	25	1	33	11	R	2347 A4	4,6s	48-	88		10	134
11	03	10	17	17	10	D	486DB5	5,3e	28+	64	-5	55	246
11	03	11	23	17	31	d	660wA8	4,3v	39+	77		2	299
11	03	13	21	43	6	D	946DM3	3,5V	59+	100		37	269
11	03	13	22	41	44	r	946DM3	3,5V	59+	101		26	278
11	03	15	23	13	22	d	1238cG8	6,0	80+	127		37	259
11	03	18	23	36	56	d	1605 K3	6,0	99+	168		45	211
11	03	20	22	28	3	r	1852cA2	6,0	97-	162		34	154
11	03	24	4	39	33	r	2305 B8	5,9v	74-	119	-3	21	206
11	03	26	1	32	57	R	2589 B9	4,7	54-	95		12	137
11	03	27	7	39	37	r	2779wK0	3,8s	42-	81	31	21	210
11	03	28	4	0	25	r	2902cK0	5,9	33-	70	-9	21	143
11	04	07	19	38	57	D	599SK0	4,4	15+	46		17	285
11	04	07	20	6	38	D	601SG5	5,9	15+	46		12	289
11	04	15	21	43	38	D	1670 K4	4,8	93+	148		44	199
11	04	29	3	14	19	R	3453wA0	5,0v	15-	45	-8	16	103
11	05	05	17	58	10	D	709MB3	4,3	6+	27	-2	23	281
11	05	05	18	39	41	r	709MB3	4,3	6+	28	-9	15	287
11	05	14	18	19	55	d	1852cA2	6,0	90+	143	-4	31	146
11	05	20	22	29	29	R	2779wK0	3,8s	85-	134		10	130
11	05	21	1	16	0	d	2797SF2	2,9S	84-	133		27	161

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna
a m g h m s	No D	V	ill	Alt	Alt	Az		
11 05 21 1 48 3 R	2797SF2	2,9s	84-	133		28 174		
11 06 04 11 25 39 d	1077SG3	4,0V	7+	32	70	60 126		
11 06 11 19 8 4 D	1944SK1	5,5	80+	126	-8	34 180		
11 06 17 2 8 33 r	2725wK5	5,4s	98-	165	-11	20 212		
11 06 29 7 21 34 r	709MB3	4,3	5-	25	42	61 121		
11 07 09 19 53 6 D	2039 A0	5,5	67+	110		25 210		
11 07 09 21 27 23 d	2051 A*	5,9v	68+	111		14 230		
11 07 12 21 12 9 D	2490WK*	5,2	93+	150		25 186		
11 07 18 23 59 11 R	3320SK2	5,0	86-	136		39 145		
11 08 09 21 16 32 M	2589 B9	4,7	84+	133		22 203		
11 09 12 22 45 48 r	3482cF6	5,7	100-	173		51 173		
11 09 18 21 20 50 r	634 A0	5,3v	66-	108		14 73		
11 09 19 0 5 51 R	656SA7	4,2s	65-	107		44 98		
11 09 19 0 21 21 R	657SA7	5,3s	65-	107		47 101		
11 10 10 0 25 56 m	3453wA0	5,0v	96+	156		30 242		
11 10 16 4 57 12 r	631SF0	5,6	86-	136	-2	43 262		
11 10 17 21 21 45 r	Ber 21 C	6,0	72-	116		18 76		
11 10 29 17 1 39 D	2434DA0	5,6	11+	40		8 230		
11 10 30 18 21 10 D	2595SB0	5,7s	20+	53		5 234		
11 10 31 16 35 12 D	2759 G8	3,5	29+	65	-9	25 201		
11 10 31 17 45 3 r	2759 G8	3,5	30+	66		19 218		
11 11 04 20 5 20 D	3287SA0	5,8	70+	114		39 214		
11 11 14 5 31 51 r	Ber 21 C	6,0	90-	143	-2	33 271		
11 11 17 3 56 40 R	1271cA5	5,9	65-	108		63 190		
11 11 20 3 2 17 R	1605 K3	6,0	33-	70		32 123		
11 12 14 21 52 25 R	1341SA5	4,3s	81-	128		25 96		
11 12 19 3 2 51 R	1800 A0	5,5	37-	75		28 136		
11 12 28 16 33 33 M	3185 G8	5,1	17+	49	-11	30 222		

# Occultazioni per BOLOGNA

11 01 14 23 31 11 D	472cA1	4,9	73+	117		29 272		
11 01 16 17 31 30 D	742SG8	5,8	88+	140		48 104		
11 01 17 20 40 29 D	916SG7	4,3s	95+	153		66 149		
11 01 17 23 52 55 d	929SB2	5,8v	95+	155		55 244		
11 01 18 2 31 54 D	946DM3	3,5V	96+	156		28 275		
11 01 23 3 12 24 r	1605 K3	6,0	85-	135		43 202		
11 01 23 23 24 53 r	1713cK0	5,6	77-	123		22 122		
11 01 26 1 40 43 r	1967 G1	5,6	55-	95		17 135		
11 02 12 19 19 19 D	693 F5	6,0v	65+	107		66 214		
11 02 14 13 45 40 d	976SM3	2,9v	82+	130	25	13 71		
11 02 16 1 51 43 D	1175cK5	4,9	92+	148		28 269		
11 02 20 0 10 12 R	1670 K4	4,8	96-	156		42 168		
11 02 22 5 38 4 r	1944SK1	5,5	79-	126	-5	18 225		
11 02 25 1 31 47 R	2347 A4	4,6s	48-	88		4 130		
11 03 10 17 6 16 d	486DB5	5,3e	28+	64	0	59 231		
11 03 11 23 15 40 D	660wA8	4,3v	39+	77		7 295		
11 03 13 21 33 52 D	946DM3	3,5V	59+	100		42 260		
11 03 13 22 34 21 r	946DM3	3,5V	59+	101		31 272		
11 03 14 17 3 43 d	1077SG3	4,0V	68+	111	2	57 128		
11 03 14 17 30 34 r	1077SG3	4,0V	68+	111	-3	61 138		
11 03 15 23 3 19 d	1238cG8	6,0	80+	127		42 250		
11 03 18 23 24 45 d	1605 K3	6,0	99+	168		44 198		
11 03 20 22 21 4 r	1852cA2	6,0	97-	162		28 147		
11 03 24 4 23 5 r	2305 B8	5,9v	74-	119	-9	20 196		
11 03 26 1 30 7 r	2589 B9	4,7	54-	95		6 133		
11 03 27 7 26 19 r	2779wK0	3,8s	42-	81	24	21 201		
11 04 07 19 32 12 D	599SK0	4,4	15+	46		23 279		
11 04 07 19 59 51 D	601SG5	5,9	15+	46		18 283		
11 04 15 21 31 35 D	1670 K4	4,8	93+	148		42 187		
11 04 29 3 16 11 R	3453wA0	5,0v	15-	45	-9	12 100		
11 05 05 17 52 57 d	709MB3	4,3	6+	27	4	28 275		
11 05 05 18 33 42 r	709MB3	4,3	6+	28	-3	21 282		
11 05 20 1 22 22 R	2630wK0	5,0	91-	146		22 176		
11 05 20 22 31 48 r	2779wK0	3,8s	85-	134	5	127		
11 05 21 1 22 47 M	2797SF2	2,9s	84-	133		23 163		
11 06 04 11 40 36 m	1077SG3	4,0V	7+	32	67	57 128		
11 06 11 18 57 48 d	1944SK1	5,5	80+	126	-1	30 171		
11 06 17 2 7 36 r	2725wK5	5,4s	98-	165	-12	19 206		
11 06 29 7 13 17 r	709MB3	4,3	5-	25	36	55 116		
11 07 09 21 15 44 d	2051 A*	5,9v	68+	111		16 222		
11 07 12 21 0 34 D	2490WK*	5,2	93+	150		21 177		
11 07 19 0 5 59 R	3320SK2	5,0	86-	136		34 142		
11 07 20 3 25 52 R	3453wA0	5,0v	78-	124	-4	46 192		
11 07 26 10 31 40 r	660wA8	4,3v	21-	54	63	47 256		
11 08 09 20 47 20 D	2589 B9	4,7	84+	133		21 191		
11 08 11 21 8 29 d	2902cK0	5,9	96+	157		26 170		
11 08 22 9 40 44 r	599SK0	4,4	46-	85	51	32 270		
11 09 12 22 44 33 r	3482cF6	5,7	100-	173		47 165		
11 09 18 21 25 40 r	634 A0	5,3v	66-	108		12 71		
11 09 19 0 12 17 R	657SA7	5,3s	65-	107		40 98		
11 10 09 23 53 47 D	3453wA0	5,0v	96+	156		36 227		
11 10 16 4 58 21 R	631SF0	5,6	86-	136	-6	46 254		
11 10 17 21 24 41 r	Ber 21 C	6,0	72-	116		15 74		
11 10 29 17 1 45 D	2434DA0	5,6	12+	40	-10	8 226		
11 10 30 18 11 19 D	2595SB0	5,7s	20+	53		8 227		
11 10 31 16 23 12 D	2759 G8	3,5	29+	65	-4	24 192		
11 10 31 17 39 24 r	2759 G8	3,5	30+	66		19 211		
11 11 04 20 6 36 D	3287SA0	5,8	70+	114		38 206		
11 11 14 5 22 15 r	Ber 21 C	6,0	90-	143	-9	38 263		
11 11 16 5 47 21 R	1158cM0	5,0s	75-	119	-5	48 242		
11 11 17 3 45 29 R	1271cA5	5,9	65-	108		60 173		
11 11 20 2 56 34 R	1605 K3	6,0	33-	70		26 119		

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna
a m g h m s	No D	V	ill	Alt	Alt	Az		
11 12 07 22 8 41 d	415cK1	5,8	93+	150		60 215		
11 12 09 19 16 22 d	665WA*	5,7	99+	171		44 103		
11 12 14 21 58 38 R	1341SA5	4,3s	81-	128		22 95		
11 12 19 2 59 16 R	1800 A0	5,5	37-	75		22 131		
11 12 28 16 1 50 D	3185 G8	5,1	17+	49	-4	33 206		

# Occultazioni per CAGLIARI

11	01	02	6	19	17	r	2442 M1	5,9s	5-	25	-5	11	135
11	01	02	6	31	1	r	2443cF3	5,7	5-	25	-3	12	137
11	01	14	23	43	46	D	472cA1	4,9	73+	117		28	275
11	01	16	17	17	1	D	742SG8	5,8	88+	140	-10	45	94
11	01	17	20	36	15	D	916SG7	4,3s	95+	153		69	134
11	01	17	23	52	8	D	929SB2	5,8v	95+	155		59	249
11	01	18	2	45	31	D	946DM3	3,5V	96+	156		26	279
11	01	23	3	20	8	r	1605 K3	6,0	85-	135		48	203
11	01	23	23	8	14	r	1713cK0	5,6	77-	123		20	115
11	01	26	1	41	50	R	1967 G1	5,6	55-	95		20	132
11	02	12	19	38	20	D	693 F5	6,0v	65+	107		69	227
11	02	16	1	55	25	D	1175cK5	4,9	92+	148		29	271
11	02	20	0	5	46	R	1670 K4	4,8	96-	156		46	162
11	02	22	5	46	33	r	1944SK1	5,5	79-	126	-5	22	226
11	02	25	1	24	8	R	2347 A4	4,6s	48-	88		5	127
11	03	11	23	22	50	D	660wA8	4,3v	39+	77		5	295
11	03	13	21	37	44	D	946DM3	3,5V	59+	100		44	264
11	03	13	22	44	13	r	946DM3	3,5V	59+	101		31	275
11	03	15	23	7	17	d	1238cG8	6,0	80+	127		44	254
11	03	18	23	25	19	d	1605 K3	6,0	99+	168		50	197
11	03	20	22	14	42	r	1852cA2	6,0	97-	162		31	142
11	03	24	4	27	23	r	2305 B8	5,9v	74-	119	-11	26	196
11	03	26	1	27	13	r	2589 B9	4,7	54-	95		8	130
11	03	27	7	25	52	r	2779wK0	3,8s	42-	81	24	27	199
11	03	28	3	50	32	r	2902cK0	5,9	33-	70		18	134
11	04	07	19	48	7	D	599SK0	4,4	15+	46		21	282
11	04	15	21	30	35	D	1670 K4	4,8	93+	148		48	184
11	04	29	3	7	50	R	3453wA0	5,0v	15-	45		9	96
11	05	05	17	52	10	d	709MB3	4,3	6+	27	4	30	277
11	05	05	18	47	14	R	709MB3	4,3	6+	28	-6	19	285
11	05	21	0	58	13	d	2797SF2	2,9s	84-	133		25	153
11	05	21	1	28	46	R	2797SF2	2,9s	84-	133		28	161
11	06	04	11	6	35	d	1077SG3	4,0V	7+	32	73	53	108
11	06	11	18	59	33	d	1944SK1	5,5	80+	126	-3	35	169
11	06	17	2	1	50	r	2725wK5	5,4s	98-	165		25	203
11	06	29	7	6	39	r	709MB3	4,3	5-	25	33	54	105
11	07	09	19	28	54	D	2039 A0	5,5	67+	110	-7	31	196
11	07	09	21	20	14	d	2051 A*	5,9v	68+	111		20	222
11	07	12	20	56	40	D	2490WK*	5,2	93+	150		26	174
11	07	18	23	49	55	R	3320SK2	5,0	86-	136		35	133
11	07	20	3	1	17	R	3453wA0	5,0v	78-	124		52	180
11	07	25	4	20	45	r	487cK3	5,2	31-	68	0	56	112
11	07	26	10	46	18	r	660wA8	4,3v	21-	54	68	46	263
11	08	09	20	58	46	D	2589 B9	4,7	84+	133		26	192
11	08	09	21	8	51	r	2589 B9	4,7	84+	133		26	194
11	08	11	21	7	55	d	2902cK0	5,9	96+	157		31	167
11	08	22	9	52	7	r	599SK0	4,4	46-	85	56	32	274
11	09	12	22	31	54	r	3482cF6	5,7	100-	173		50	155
11	09	18	23	43	1	M	656SA7	4,2s	65-	107		34	87
11	09	19	0	8	47	R	657SA7	5,3s	65-	107		38	91
11	10	10	0	15	15	M	3453wA0	5,0v	96+	156		38	233
11	10	29	16	58	1	d	2434DA0	5,6	11+	40	-7	14	224
11	10	30	18	15	26	D	2595SB0	5,7s	20+	53		12	227
11	10	31	16	20	9	D	2759 G8	3,5	29+	65	0	29	190
11	10	31	17	36	54	r	2759 G8	3,5	30+	66		24	209
11	11	04	19	54	37	D	3287SA0	5,8	70+	114		44	201
11	11	14	5	31	36	r	21 C	6,0	90-	143	-7	39	268
11	11	16	5	57	51	R	1158cM0	5,0s	75-	119	-2	50	248
11	11	17	3	29	18	R	1271cA5	5,9	66-	108		63	158
11	11	20	2	55	50	R	1605 K3	6,0	33-	70		27	114
11	12	14	21	42	46	R	1341SA5	4,3s	81-	128		18	89
11	12	19	2	44	52	R	1800 A0	5,5	37-	75		22	124
11	12	28	16	8	49	d	3185 G8	5,1	17+	49	-1	38	200

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna
a m g h m s			No D	V	ill	Alt	Alt	Az
11 03 13 22 40 50	r		946DM3	3,5V	59+	101	28	276
11 03 15 23 10 31	d		1238cG8	6,0	80+	127	39	257
11 03 18 23 32 39	d		1605 K3	6,0	99+	168	45	206
11 03 20 22 24 51	r		1852cA2	6,0	97-	162	32	151
11 03 24 4 34 25	r		2305 B8	5,9v	74-	119	-5	22 203
11 03 26 1 31 25	R		2589 B9	4,7	54-	95	10	135
11 03 27 7 35 21	r		2779wK0	3,8s	42-	81	29	22 207
11 03 28 3 55 59	r		2902cK0	5,9	33-	70	-11	19 140
11 04 07 19 38 38	D		599SK0	4,4	15+	46	19	283
11 04 07 20 7 44	D		601SG5	5,9	15+	46	14	287
11 04 15 21 39 10	D		1670 K4	4,8	93+	148	44	195
11 04 29 3 13 38	R		3453wA0	5,0v	15-	45	-9	14 101
11 05 05 17 56 13	d		709MB3	4,3	6+	27	0	25 279
11 05 05 18 39 48	R		709MB3	4,3	6+	28	-7	17 286
11 05 14 18 17 10	d		1852cA2	6,0	90+	143	-2	29 143
11 05 20 22 26 42	R		2779wK0	3,8s	85-	134	8	128
11 05 21 1 15 38	d		2797SF2	2,9S	84-	133	26	164
11 05 21 1 39 17	R		2797SF2	2,9S	84-	133	27	170
11 06 04 11 23 14	d		1077SG3	4,0V	7+	32	70	58 122
11 06 11 19 4 26	D		1944SK1	5,5	80+	126	-5	33 177
11 06 17 2 8 9	r		2725wK5	5,4s	98-	165	20	210
11 06 29 7 17 50	r		709MB3	4,3	5-	25	40	59 117
11 07 09 19 48 13	D		2039 A0	5,5	67+	110	-11	26 207
11 07 09 21 24 5	d		2051 A*	5,9v	68+	111	15	227
11 07 12 21 7 25	D		2490WK*	5,2	93+	150	24	182
11 07 18 23 59 55	R		3320SK2	5,0	86-	136	38	143
11 08 09 21 12 57	G		2589 B9	4,7	84+	133	22	201
11 08 11 21 22 37	d		2902cK0	5,9	96+	157	30	177
11 09 12 22 43 57	r		3482cF6	5,7	100-	173	50	169
11 09 18 21 21 40	r		634 A0	5,3v	66-	108	12	72
11 09 18 23 55 38	R		656SA7	4,2s	65-	107	40	95
11 09 19 0 17 55	R		657SA7	5,3s	65-	107	44	99
11 10 10 0 17 39	D		3453wA0	5,0v	96+	156	33	238
11 10 16 4 47 47	G		631SF0	5,6	86-	136	-6	47 257
11 10 17 21 21 59	r	Ber	21 C	6,0	72-	116	16	75
11 10 29 17 1 1	D		2434DA0	5,6	11+	40	-12	9 228
11 10 30 18 18 18	D		2595SB0	5,7s	20+	53	7	231
11 10 31 16 30 32	D		2759 G8	3,5	29+	65	-7	25 198
11 10 31 17 43 7	r		2759 G8	3,5	30+	66	19	215
11 11 04 20 3 45	D		3287SA0	5,8	70+	114	39	210
11 11 14 5 30 8	r	Ber	21 C	6,0	90-	143	-4	35 269
11 11 16 5 56 49	r		1158cM0	5,0s	75-	119	0	46 251
11 11 17 3 51 16	R		1271cA5	5,9	65-	108	63	182
11 11 20 3 0 11	R		1605 K3	6,0	33-	70	30	121
11 12 14 21 52 39	R		1341SA5	4,3s	81-	128	24	95
11 12 19 2 59 46	R		1800 A0	5,5	37-	75	26	133
11 12 28 16 22 3	D		3185 G8	5,1	17+	49	-8	32 217

#### Occultazioni per CATANZARO

11 01 14 23 44 40	D		472cA1	4,9	73+	117	22	280
11 01 15 16 3 59	m		582 F2	5,6	80+	127	-2	47 98
11 01 16 17 23 20	D		742SG8	5,8	88+	139	52	100
11 01 17 20 51 33	D		916SG7	4,3s	95+	153	74	164
11 01 18 0 4 11	d		929SB2	5,8v	95+	155	51	259
11 01 18 2 43 13	D		946DM3	3,5V	96+	156	21	283
11 01 23 3 28 19	r		1605 K3	6,0	85-	135	45	216
11 01 23 23 21 6	R		1713cK0	5,6	77-	123	27	123
11 01 26 1 46 46	R		1967 G1	5,6	55-	95	25	139
11 01 28 1 53 39	r		2227SK0	5,8	33-	70	5	125
11 02 12 19 49 10	D		693 F5	6,0v	65+	107	62	244
11 02 14 13 38 1	d		976SM3	2,9v	82+	130	27	13 72
11 02 16 2 0 26	D		1175cK5	4,9	92+	148	22	276
11 02 20 0 21 16	R		1670 K4	4,8	96-	156	48	178
11 02 25 1 30 52	R		2347 A4	4,6s	48-	88	11	133
11 03 10 17 18 30	D		486DB5	5,3e	28+	64	-5	56 249
11 03 13 21 45 18	D		946DM3	3,5V	59+	100	37	271
11 03 13 22 46 3	r		946DM3	3,5V	59+	101	25	280
11 03 15 23 15 42	d		1238cG8	6,0	80+	127	37	261
11 03 18 23 38 26	d		1605 K3	6,0	99+	168	46	212
11 03 20 22 27 12	r		1852cA2	6,0	97-	162	35	153
11 03 24 4 42 54	r		2305 B8	5,9v	74-	119	-3	23 207
11 03 26 1 32 37	R		2589 B9	4,7	54-	95	13	136
11 03 27 7 40 42	r		2779wK0	3,8s	42-	81	32	23 210
11 03 28 4 2 24	R		2902cK0	5,9	33-	70	-9	23 143
11 04 07 19 44 32	D		599SK0	4,4	15+	46	16	286
11 04 15 21 44 33	D		1670 K4	4,8	93+	148	46	200
11 04 29 3 10 49	R		3453wA0	5,0v	15-	45	-10	16 101
11 05 05 17 58 16	D		709MB3	4,3	6+	27	-2	23 282
11 05 05 18 45 10	r		709MB3	4,3	6+	28	-11	14 289
11 05 14 18 19 28	d		1852cA2	6,0	90+	143	-5	32 144
11 05 21 1 8 29	d		2797SF2	2,9S	84-	133	28	163
11 05 21 1 51 48	R		2797SF2	2,9S	84-	133	30	175
11 06 04 11 18 14	d		1077SG3	4,0V	7+	31	73	60 120
11 06 11 19 9 48	D		1944SK1	5,5	80+	126	-9	36 181
11 06 29 7 19 21	r		709MB3	4,3	5-	25	42	62 116
11 07 09 19 48 10	D		2039 A0	5,5	67+	110	28	209
11 07 09 21 30 35	d		2051 A*	5,9v	68+	111	15	230
11 07 12 21 12 36	D		2490WK*	5,2	93+	150	27	186
11 07 18 23 50 59	R		3320SK2	5,0	86-	136	39	141
11 09 12 22 40 37	r		3482cF6	5,7	100-	173	53	170
11 09 18 21 17 45	r		634 A0	5,3v	66-	108	12	72
11 09 19 0 8 41	R		656SA7	4,2s	65-	107	44	96

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna
a m g h m s			No D	V	ill	Alt	Alt	Az
11 09 19 0 19 42	R		657SA7	5,3s	65-	107	46	98
11 10 17 21 18 50	r	Ber	21 C	6,0	72-	116	17	75
11 10 29 17 1 37	D		2434DA0	5,6	11+	40	9	230
11 10 30 18 24 33	D		2595SB0	5,7s	20+	53	6	234
11 10 31 16 36 25	D		2759 G8	3,5	29+	65	-9	27 202
11 10 31 17 44 10	r		2759 G8	3,5	30+	66	21	218
11 11 04 20 2 27	D		3287SA0	5,8	70+	114	41	213
11 11 17 3 53 39	R		1271cA5	5,9	65-	108	65	188
11 11 20 3 2 41	R		1605 K3	6,0	33-	70	33	122
11 12 14 21 42 39	R		1341SA5	4,3s	81-	128	23	94
11 12 19 2 58 41	R		1800 A0	5,5	37-	75	29	133

#### Occultazioni per FIRENZE

11	01	14	23	32	41	D	472cA1	4,9	73+	117	29	272
11	01	16	17	29	27	D	742SG8	5,8	88+	140	48	103
11	01	17	20	40	1	D	916SG7	4,3s	95+	153	67	148
11	01	17	23	52	58	d	929SB2	5,8v	95+	155	55	245
11	01	18	2	33	35	D	946DM3	3,5V	96+	156	27	276
11	01	23	3	13	42	r	1605 K3	6,0	85-	135	44	202
11	01	23	23	23	32	r	1713cK0	5,6	77-	123	22	121
11	01	26	1	41	8	R	1967 G1	5,6	55-	95	18	135
11	02	12	19	21	3	D	693 F5	6,0v	65+	107	66	216
11	02	14	13	44	36	d	976SM3	2,9v	82+	130	26	12 71
11	02	16	1	52	22	D	1175cK5	4,9	92+	148	28	269
11	02	20	0	10	14	R	1670 K4	4,8	96-	156	43	167
11	02	22	5	39	29	r	1944SK1	5,5	79-	126	-5	18 225
11	02	25	1	31	0	R	2347 A4	4,6s	48-	88	5	130
11	03	11	23	16	32	D	660wA8	4,3v	39+	77	7	295
11	03	13	21	34	31	D	946DM3	3,5V	59+	100	42	261
11	03	13	22	35	55	r	946DM3	3,5V	59+	101	31	272
11	03	14	17	10	17	d	1077SG3	4,0V	68+	111	1	59 129
11	03	14	17	23	32	r	1077SG3	4,0V	68+	111	-2	60 134
11	03	15	23	4	3	d	1238cG8	6,0	80+	127	42	251
11	03	18	23	25	5	d	1605 K3	6,0	99+	168	45	198
11	03	20	22	20	44	r	1852cA2	6,0	97-	162	29	147
11	03	24	4	24	7	r	2305 B8	5,9v	74-	119	-9	21 197
11	03	26	1	29	53	r	2589 B9	4,7	54-	95	7	132
11	03	27	7	26	47	r	2779wK0	3,8s	42-	81	24	22 201
11	03	28	3	45	2	r	2902cK0	5,9	33-	71	15	136
11	04	07	19	33	59	D	599SK0	4,4	15+	46	23	279
11	04	07	20	2	29	D	601SG5	5,9	15+	46	18	284
11	04	15	21	31	43	D	1670 K4	4,8	93+	148	43	187
11	04	29	3	15	5	R	3453wA0	5,0v	15-	45	-10	12 99
11	05	05	17	52	49	d	709MB3	4,3	6+	27	4	28 276
11	05	05	18	35	44	r	709MB3	4,3	6+	28	-3	21 283
11	05	20	1	20	37	R	2630wK0	5,0	91-	146	23	176
11	05	20	22	29	4	r	2779wK0	3,8s	85-	134	5	126
11	05	21	1	22	0	M	2797SF2	2,9S	84-	133	23	162
11	06	04	11	29	59	d	1077SG3	4,0V	7+	32	68	56 123
11	06	11	18	58	7	d	1944SK1	5,5	80+	126	-1	31 171
11	06	17	2	7	11	r	2725wK5	5,4s	98-	165	20	206
11	06	29	7	12	56	r	709MB3	4,3	5-	25	36	55 115
11	07	09	19	46	7	D	2039 A0	5,5	68+	111	-8	25 202
11	07	09	21	16	37	d	2051 A*	5,9v	68+	111	16	222
11	07	12	21	0	24	D	2490WK*	5,2	93+	150	22	177
11	07	19	0	4	4	R	3320SK2	5,0	86-	136	35	141
11	07	20	3	23	10	R	3453wA0	5,0v	78-	124	-5	47 191
11	07	26	10	34	29	r	660wA8	4,3v	21-	54	64	46 257
11	08	09	20	48	38	D	2589 B9	4,7	84+	133	22	191
11	08	11	21	8	42	d	2902cK0	5,9	96+	157	27	170
11	08	22	9	42	39	r	599SK0	4,4	46-	85	52	32 271
11	09	12	22	43	15	r	3482cF6	5,7	100-	173	47	164
11	09	18	21	24	46	r	634 A0	5,3v	66-	108	11	71
11	09	19	0	12	19	R	657SA7	5,3s	65-	107	40	97
11	10	09	23	55	43	D	3453wA0	5,0v	96+	156	37	228
11	10	16	4	55	55	R	631SF0	5,6	86-	136	-7	47 254
11	10	17	21	23	57	r Ber	21 C	6,0	72-	116	15	74
11	10	29	17	1	12	D	2434DA0	5,6	11+	40	-10	9 225
11	10	30	18	12	5	D	2595SB0	5,7s	20+	53	8	228
11	10	31	16	23	11	D	2759 G8	3,5	29+	65	-3	24 192
11	10	31	17	39	27	r	2759 G8	3,5	30+	66	19	211
11	11	04	20	5	0	D	3287SA0	5,8	70+	114	38	206
11	11	14	5	23	52	r Ber	21 C	6,0	90-	143	-8	38 264
11	11	16	5	49	7	R	1158cM0	5,0s	75-	119	-4	48 244
11	11	17	3	44	38	R	1271cA5	5,9	65-	108	60	172
11	11	20	2	56	48	R	1605 K3	6,0	33-	70	27	118
11	12	14	21	56	56	R	1341SA5	4,3s	81-	128	22	94
11	12	19	2	58	7	R	1800 A0	5,5	37-	75	23	130
11	12	28	16	2	58	D	3185 G8	5,1	17+	49	-4	34 204



Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s	No D	V	ill	Alt	Alt	Az			
11 01 26 1 40 2 r	1967 G1	5,6	55-	95	16	133			
11 02 12 19 15 4 D	693 F5	6,0v	65+	107	67	207			
11 02 14 13 46 9 d	976SM3	2,9v	82+	130	26	11 69			
11 02 16 1 49 50 D	1175cK5	4,9	92+	148	30	267			
11 02 20 0 6 21 R	1670 K4	4,8	96-	156	41	163			
11 02 22 5 35 32 r	1944SK1	5,5	79-	126	-8	19 222			
11 02 25 1 30 3 r	2347 A4	4,6s	48-	88	3	128			
11 03 11 23 16 19 D	660wA8	4,3v	39+	77	9	294			
11 03 11 23 50 14 d	664cB7	5,5s	39+	78	3	299			
11 03 13 21 31 8 D	946DM3	3,5V	59+	100	44	258			
11 03 13 22 34 3 r	946DM3	3,5V	59+	101	33	270			
11 03 14 17 0 30 d	1077SG3	4,0V	68+	111	4	55 124			
11 03 15 23 0 26 d	1238cG8	6,0	80+	127	44	247			
11 03 18 23 20 41 d	1605 K3	6,0	99+	168	45	193			
11 03 20 22 18 2 r	1852cA2	6,0	97-	162	27	144			
11 03 24 4 18 54 r	2305 B8	5,9v	74-	119	-12	21 193			
11 03 26 1 29 0 r	2589 B9	4,7	54-	95	5	131			
11 03 27 7 21 19 r	2779wK0	3,8s	42-	81	21	22 197			
11 04 07 19 32 35 D	599SK0	4,4	15+	46	25	277			
11 04 07 20 1 53 D	601SG5	5,9	15+	46	20	282			
11 04 15 21 27 16 D	1670 K4	4,8	93+	148	43	182			
11 04 29 3 15 2 R	3453wA0	5,0v	15-	45	-11	10 98			
11 05 05 17 50 20 d	709MB3	4,3	6+	27	6	31 273			
11 05 05 18 34 51 r	709MB3	4,3	6+	28	-1	23 281			
11 05 20 1 18 42 R	2630wK0	5,0	91-	146	22	173			
11 06 04 11 37 3 m	1077SG3	4,0V	7+	32	68	55 123			
11 06 17 2 5 13 r	2725wK5	5,4s	98-	164	20	203			
11 06 29 7 9 7 r	709MB3	4,3	5-	25	34	53 112			
11 07 09 19 38 49 d	2039 A0	5,5	68+	110	-5	26 198			
11 07 09 21 12 40 d	2051 A*	5,9v	68+	111	17	219			
11 07 12 20 56 4 D	2490WK*	5,2	93+	150	21	174			
11 07 19 0 3 56 R	3320SK2	5,0	86-	136	33	139			
11 07 20 3 25 9 R	3453wA0	5,0v	78-	124	-6	47 189			
11 07 26 10 30 38 r	660wA8	4,3v	21-	54	62	48 254			
11 08 09 20 41 20 D	2589 B9	4,7	84+	133	22	187			
11 08 11 21 2 25 d	2902cK0	5,9	96+	157	25	166			
11 08 22 9 40 14 r	599SK0	4,4	46-	85	50	34 268			
11 09 12 22 40 57 r	3482cF6	5,7	100-	173	46	160			
11 09 18 21 25 49 r	634 A0	5,3v	66-	108	10	69			
11 09 19 0 7 42 R	657SA7	5,3s	65-	107	38	95			
11 09 20 0 1 59 R	792 G8	5,0	55-	96	28	85			
11 10 08 20 25 1 M	3320SK2	5,0	91+	144	41	170			
11 10 09 23 48 39 D	3453wA0	5,0v	96+	156	38	223			
11 10 16 4 52 50 R	631SF0	5,6	86-	136	-9	49 250			
11 10 17 21 24 21 r	Ber 21 C	6,0	72-	116	14	73			
11 10 29 17 1 53 d	2434DA0	5,6	12+	40	-8	10 224			
11 10 30 18 9 4 D	2595SB0	5,7s	20+	53	9	225			
11 10 31 16 18 50 D	2759 G8	3,5	29+	65	-1	24 189			
11 10 31 17 36 30 r	2759 G8	3,5	30+	66	20	208			
11 11 04 20 5 26 D	3287SA0	5,8	70+	114	38	203			
11 11 14 5 21 6 r	Ber 21 C	6,0	90-	143	-10	40 261			
11 11 16 5 45 48 R	1158cM0	5,0s	75-	119	-7	50 239			
11 11 17 3 39 49 R	1271cA5	5,9	65-	108	59	165			
11 11 20 2 55 3 R	1605 K3	6,0	33-	70	24	116			
11 12 07 22 1 48 d	415cK1	5,8	93+	150	62	208			
11 12 09 19 12 7 d	665WA*	5,7	99+	171	42	100			
11 12 14 21 57 28 R	1341SA5	4,3s	81-	128	20	93			
11 12 19 2 56 3 R	1800 A0	5,5	37-	75	21	128			
11 12 28 15 56 3 d	3185 G8	5,1	17+	49	-1	34 202			

#### Occultazioni per L'AQUILA

11 01 14 23 36 24 D	472cA1	4,9	73+	117	27	275			
11 01 16 17 27 25 D	742SG8	5,8	88+	140	50	103			
11 01 17 20 43 53 D	916SG7	4,3s	95+	153	69	153			
11 01 17 23 57 8 d	929SB2	5,8v	95+	155	54	250			
11 01 18 2 36 23 D	946DM3	3,5V	96+	156	25	278			
11 01 23 3 18 18 r	1605 K3	6,0	85-	135	44	207			
11 01 23 23 39 r	1713cK0	5,6	77-	123	24	123			
11 01 26 1 42 51 R	1967 G1	5,6	55-	95	20	137			
11 02 12 19 29 0 D	693 F5	6,0v	65+	107	65	226			
11 02 14 13 42 15 d	976SM3	2,9v	82+	130	26	13 71			
11 02 16 1 55 17 D	1175cK5	4,9	92+	148	26	272			
11 02 20 0 14 13 R	1670 K4	4,8	96-	156	44	171			
11 02 22 5 44 54 r	1944SK1	5,5	79-	126	-2	17 229			
11 02 25 1 31 17 R	2347 A4	4,6s	48-	88	7	132			
11 03 10 17 10 16 D	486DB5	5,3e	28+	64	-2	58 238			
11 03 11 23 17 27 D	660wA8	4,3v	39+	77	5	297			
11 03 13 21 38 20 D	946DM3	3,5V	59+	100	40	265			
11 03 13 22 39 5 r	946DM3	3,5V	59+	101	29	275			
11 03 15 23 8 11 d	1238cG8	6,0	80+	127	40	255			
11 03 18 23 29 51 d	1605 K3	6,0	99+	168	45	203			
11 03 20 22 23 15 r	1852cA2	6,0	97-	162	31	149			
11 03 24 4 30 32 r	2305 B8	5,9v	74-	119	-7	21 200			
11 03 26 1 30 45 r	2589 B9	4,7	54-	95	9	134			
11 03 27 7 32 17 r	2779wK0	3,8s	42-	81	27	22 205			
11 03 28 3 52 27 r	2902cK0	5,9	33-	70	18	139			
11 04 07 19 37 0 D	599SK0	4,4	15+	46	20	282			
11 04 07 20 5 47 D	601SG5	5,9	15+	46	15	286			
11 04 15 21 36 21 D	1670 K4	4,8	93+	148	44	192			
11 04 29 3 14 8 R	3453wA0	5,0v	15-	45	-9	13 100			
11 05 05 17 55 1 d	709MB3	4,3	6+	27	2	26 278			
11 05 05 18 38 24 R	709MB3	4,3	6+	28	-6	18 285			

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s	No D	V	ill	Alt	Alt	Az			
11 05 20 1 19 42 r	2630wK0	5,0	91-	146	24	178			
11 05 20 22 27 37 R	2779wK0	3,8s	85-	134	7	128			
11 05 21 1 20 3 d	2797SF2	2,9S	84-	133	25	164			
11 05 21 1 30 41 R	2797SF2	2,9S	84-	133	26	166			
11 06 04 11 24 34 d	1077SG3	4,0V	7+	32	70	57 122			
11 06 11 19 2 1 D	1944SK1	5,5	80+	126	-4	32 175			
11 06 17 2 8 3 r	2725wK5	5,4s	98-	165	20	208			
11 06 29 7 16 4 r	709MB3	4,3	5-	25	38	58 116			
11 07 09 19 47 5 D	2039 A0	5,5	67+	110	-10	26 205			
11 07 09 21 21 21 d	2051 A*	5,9v	68+	111	16	225			
11 07 12 21 4 43 D	2490WK*	5,2	93+	150	24	180			
11 07 19 0 1 40 R	3320SK2	5,0	86-	136	37	142			
11 07 20 3 13 52 R	3453wA0	5,0v	78-	124	-6	49 192			
11 07 26 10 40 22 r	660wA8	4,3v	21-	54	66	44 262			
11 08 09 20 59 13 D	2589 B9	4,7	84+	133	22	196			
11 08 11 21 16 39 d	2902cK0	5,9	96+	157	29	174			
11 09 12 22 43 48 r	3482cF6	5,7	100-	173	49	167			
11 09 18 21 22 49 r	634 A0	5,3v	66-	108	12	71			
11 09 18 23 50 49 M	656SA7	4,2s	65-	107	38	94			
11 09 19 0 16 3 R	657SA7	5,3s	65-	107	43	98			
11 10 10 6 22 2 D	3453wA0	5,0v	96+	156	35	234			
11 10 16 4 54 45 R	631SF0	5,6	86-	136	-5	46 257			
11 10 17 21 22 43 r	Ber 21 C	6,0	72-	116	16	75			
11 10 29 17 0 52 D	2434DA0	5,6	11+	40	-11	9 227			
11 10 30 18 15 57 D	2595SB0	5,7s	20+	53	7	230			
11 10 31 16 27 42 D	2759 G8	3,5	29+	65	-5	25 196			
11 10 31 17 41 56 r	2759 G8	3,5	30+	66	19	214			
11 11 04 20 3 58 D	3287SA0	5,8	70+	114	39	209			
11 11 14 5 27 55 r	Ber 21 C	6,0	90-	143	-5	36 268			
11 11 16 5 54 3 R	1158cM0	5,0s	75-	119	-1	47 248			
11 11 17 3 48 44 R	1271cA5	5,9	65-	108	62	178			
11 11 20 2 58 52 R	1605 K3	6,0	33-	70	29	120			
11 12 14 21 54 22 R	1341SA5	4,3s	81-	128	23	95			
11 12 19 2 59 4 R	1800 A0	5,5	37-	75	25	132			
11 12 28 16 13 10 D	3185 G8	5,1	17+	49	-6	33 212			

#### Occultazioni per MILANO

11	01	02	6	37	54	r	2443cF3	5,7	5-	25	-5	9	140
11	01	14	23	28	20	D	472cA1	4,9	73+	117		31	269
11	01	16	17	33	18	D	742SG8	5,8	88+	140		47	104
11	01	17	20	37	12	D	916SG7	4,3s	95+	153		64	144
11	01	17	23	49	1	d	929SB2	5,8v	95+	155		56	239
11	01	18	2	29	53	D	946DM3	3,5V	96+	156		30	273
11	01	23	3	8	45	r	1605 K3	6,0	85-	135		43	197
11	01	23	23	24	5	r	1713cK0	5,6	77-	123		20	120
11	01	26	1	39	32	r	1967 G1	5,6	55-	95		15	133
11	02	12	19	13	10	D	693 F5	6,0v	65+	107		66	205
11	02	14	13	47	44	d	976SM3	2,9v	82+	130	25	12	70
11	02	16	1	49	1	D	1175cK5	4,9	92+	148		30	266
11	02	20	0	6	39	R	1670 K4	4,8	96-	156		40	164
11	02	22	5	33	42	r	1944SK1	5,5	79-	126	-8	19	222
11	02	25	1	31	18	r	2347 A4	4,6s	48-	88		2	129
11	03	11	23	15	2	D	660wA8	4,3v	39+	77		9	293
11	03	11	23	50	28	d	664cB7	5,5s	39+	78		4	299
11	03	13	21	30	23	D	946DM3	3,5V	59+	100		44	257
11	03	13	22	31	54	r	946DM3	3,5V	59+	101		33	269
11	03	14	16	55	13	d	1077SG3	4,0V	68+	111	5	54	124
11	03	14	17	31	33	r	1077SG3	4,0V	68+	111	-2	59	136
11	03	15	22	59	36	d	1238cG8	6,0	80+	127		43	246
11	03	18	23	20	29	d	1605 K3	6,0	99+	168		44	193
11	03	20	22	18	45	r	1852cA2	6,0	97-	162		26	145
11	03	24	4	17	44	r	2305 B8	5,9v	74-	119	-12	20	193
11	03	26	1	29	26	r	2589 B9	4,7	54-	95		4	131
11	03	27	7	20	53	r	2779wK0	3,8s	42-	81	21	21	197
11	04	07	19	30	0	D	599SK0	4,4	15+	46		25	277
11	04	07	19	58	1	D	601SG5	5,9	15+	46		20	281
11	04	15	21	27	24	D	1670 K4	4,8	93+	148		42	183
11	04	29	3	16	36	R	3453wA0	5,0v	15-	45	-10	10	99
11	05	05	17	50	40	d	709MB3	4,3	6+	27	6	30	273
11	05	05	18	31	55	r	709MB3	4,3	6+	28	-1	23	280
11	05	20	1	21	5	R	2630wK0	5,0	91+	146		21	174
11	06	17	2	5	50	r	2725wK5	5,4s	98-	164		19	203
11	06	29	7	9	42	r	709MB3	4,3	5-	25	34	52	114
11	07	09	19	44	27	m	2039 A0	5,5	68+	111	-5	24	200
11	07	09	21	11	38	d	2051 A*	5,9v	68+	111		16	219
11	07	12	20	56	37	D	2490WK*	5,2	93+	150		20	174
11	07	19	0	6	38	R	3320SK2	5,0	86-	136		33	141
11	07	20	3	28	12	R	3453wA0	5,0v	78-	124	-5	46	190
11	07	26	10	26	33	r	660wA8	4,3v	21-	54	61	49	252
11	08	09	20	40	22	D	2589 B9	4,7	84+	133		21	187
11	08	11	21	2	48	d	2902cK0	5,9	96+	157		25	166
11	08	22	9	37	30	r	599SK0	4,4	46-	85	49	35	267
11	09	12	22	42	54	r	3482cF6	5,7	100-	173		45	162
11	09	18	21	27	2	r	634 A0	5,3v	66-	108		11	70
11	09	19	0	7	25	R	657SA7	5,3s	65-	107		38	96
11	09	20	0	7	44	R	792 G8	5,0	55-	96		29	87
11	10	08	20	26	48	M	3320SK2	5,0	91+	144		40	171
11	10	09	23	47	1	D	3453wA0	5,0v	96+	156		38	223
11	10	16	4	56	13	R	631SF0	5,6	86-	136	-8	48	250
11	10	17	21	25	21	r Ber	21 C	6,0	72-	116		14	73
11	10	29	17	3	21	d	2434DA0	5,6	12+	40	-9	9	224
11	10	30	18	8	15	D	2595SB0	5,7s	20+	53		9	22

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s	No D	V	ill	Alt	Alt	Az			
11 10 31 16 19 12 D	2759 G8	3,5	29+	65	-2	23	189		
11 10 31 17 36 33 r	2759 G8	3,5	30+	66		19	208		
11 11 04 20 8 10 D	3287SA0	5,8	70+	114		37	204		
11 11 14 5 18 57 r	Ber 21 C	6,0	90-	143	-11	40	260		
11 11 16 5 43 23 R	1158cM0	5,0s	75-	119	-7	50	238		
11 11 17 3 41 22 R	1271cA5	5,9	65-	108		58	167		
11 11 20 2 54 46 R	1605 K3	6,0	33-	70		24	117		
11 12 07 21 56 13 d	415cK1	5,8	93+	150		61	205		
11 12 09 19 12 31 d	665WA*	5,7	99+	171		42	102		
11 12 14 21 59 43 R	1341SA5	4,3s	81-	128		21	94		
11 12 19 2 57 53 R	1800 A0	5,5	37-	75		21	129		
11 12 28 15 55 26 d	3185 G8	5,1	17+	49	-2	33	202		

#### Occultazioni per NAPOLI

11 01 14 23 39 56 D	472cA1	4,9	73+	117		25	277		
11 01 16 17 24 45 D	742SG8	5,8	88+	139		50	101		
11 01 17 20 45 48 D	916SG7	4,3s	95+	153		71	155		
11 01 17 23 59 16 d	929SB2	5,8v	95+	155		53	253		
11 01 18 2 39 33 D	946DM3	3,5V	96+	156		24	280		
11 01 23 3 22 9 r	1605 K3	6,0	85-	135		45	210		
11 01 23 23 21 51 r	1713cK0	5,6	77-	123		25	122		
11 01 26 1 44 14 R	1967 G1	5,6	55-	95		22	137		
11 02 12 19 36 1 D	693 F5	6,0v	65+	107		65	233		
11 02 14 13 40 16 d	976SM3	2,9v	82+	130	27	13	71		
11 02 16 1 57 15 D	1175cK5	4,9	92+	148		25	273		
11 02 20 0 16 12 R	1670 K4	4,8	96-	156		46	173		
11 02 25 1 30 32 R	2347 A4	4,6s	48-	88		8	132		
11 03 10 17 12 35 D	486DB5	5,3e	28+	64	-2	58	242		
11 03 11 23 18 51 D	660wA8	4,3v	39+	77		3	298		
11 03 13 21 40 51 D	946DM3	3,5V	59+	100		39	267		
11 03 13 22 42 11 r	946DM3	3,5V	59+	101		28	277		
11 03 15 23 10 53 d	1238cG8	6,0	80+	127		39	257		
11 03 18 23 32 34 d	1605 K3	6,0	99+	168		46	206		
11 03 20 22 24 2 r	1852cA2	6,0	97-	162		33	150		
11 03 24 4 34 56 r	2305 B8	5,9v	74-	119	-6	22	202		
11 03 26 1 31 4 R	2589 B9	4,7	54-	95		11	135		
11 03 27 7 35 10 r	2779wK0	3,8s	42-	81	29	23	206		
11 03 28 3 56 15 r	2902cK0	5,9	33-	70	-12	20	140		
11 04 07 19 40 31 D	599SK0	4,4	15+	46		19	283		
11 04 07 20 11 31 d	601SG5	5,9	15+	46		13	288		
11 04 15 21 38 47 D	1670 K4	4,8	93+	148		45	194		
11 04 29 3 12 25 R	3453wA0	5,0v	15-	45	-10	14	100		
11 05 05 17 55 56 d	709MB3	4,3	6+	27	0	25	279		
11 05 05 18 41 42 R	709MB3	4,3	6+	28	-7	17	286		
11 05 14 18 16 38 d	1852cA2	6,0	90+	143	-2	29	142		
11 05 20 22 22 36 R	2779wK0	3,8s	85-	134		7	127		
11 05 21 1 12 6 d	2797SF2	2,9S	84-	133		26	162		
11 05 21 1 39 58 R	2797SF2	2,9S	84-	133		28	169		
11 06 04 11 19 53 d	1077SG3	4,0V	7+	32	71	58	120		
11 06 11 19 4 31 D	1944SK1	5,5	80+	126	-6	34	176		
11 06 17 2 7 8 r	2725wK5	5,4s	98-	165		21	209		
11 06 29 7 16 39 r	709MB3	4,3	5-	25	39	59	116		
11 07 09 19 45 24 D	2039 A0	5,5	67+	110	-11	27	206		
11 07 09 21 24 39 d	2051 A*	5,9v	68+	111		16	227		
11 07 12 21 6 52 D	2490WK*	5,2	93+	150		25	182		
11 07 18 23 57 35 R	3320SK2	5,0	86-	136		38	142		
11 08 09 21 12 29 M	2589 B9	4,7	84+	133		23	200		
11 08 11 21 22 59 d	2902cK0	5,9	96+	157		30	177		
11 09 12 22 42 1 r	3482cF6	5,7	100-	173		51	167		
11 09 18 21 20 48 r	634 A0	5,3v	66-	108		12	71		
11 09 18 23 58 13 R	656SA7	4,2s	65-	107		40	94		
11 09 19 0 17 1 R	657SA7	5,3s	65-	107		44	98		
11 10 10 0 22 40 M	3453wA0	5,0v	96+	156		33	239		
11 10 16 4 48 9 M	631SF0	5,6	86-	136	-6	47	258		
11 10 17 21 21 9 r	Ber 21 C	6,0	72-	116		16	75		
11 10 29 17 0 42 D	2434DA0	5,6	11+	40	-11	10	228		
11 10 30 18 18 55 D	2595SB0	5,7s	20+	53		7	231		
11 10 31 16 30 7 D	2759 G8	3,5	29+	65	-6	26	198		
11 10 31 17 42 41 r	2759 G8	3,5	30+	66		20	215		
11 11 04 20 2 23 D	3287SA0	5,8	70+	114		40	210		
11 11 14 5 31 26 r	Ber 21 C	6,0	90-	143	-4	35	270		
11 11 16 5 58 17 r	1158cM0	5,0s	75-	119	1	46	252		
11 11 17 3 49 26 R	1271cA5	5,9	65-	108		63	180		
11 11 20 3 0 1 R	1605 K3	6,0	33-	70		30	120		
11 12 14 21 50 10 R	1341SA5	4,3s	81-	128		23	94		
11 12 19 2 58 1 R	1800 A0	5,5	37-	75		26	132		
11 12 28 16 30 5 G	3185 G8	5,1	17+	49	-9	32	218		

#### Occultazioni per PALERMO

11 01 14 23 46 54 D	472cA1	4,9	73+	117		24	279		
11 01 16 17 18 28 D	742SG8	5,8	88+	139		49	96		
11 01 17 20 45 29 D	916SG7	4,3s	95+	153		73	148		
11 01 17 23 59 52 d	929SB2	5,8v	95+	155		54	256		
11 01 18 2 46 20 D	946DM3	3,5V	96+	156		23	282		
11 01 23 3 26 52 r	1605 K3	6,0	85-	135		47	212		
11 01 23 23 11 59 r	1713cK0	5,6	77-	123		24	119		
11 01 26 1 44 59 R	1967 G1	5,6	55-	95		23	136		
11 02 16 1 59 19 D	1175cK5	4,9	92+	148		25	275		
11 02 20 0 14 50 R	1670 K4	4,8	96-	156		49	171		

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s	No D	V	ill	Alt	Alt	Az			
11 02 25 1 26 48 R	2347 A4	4,6s	48-	88		9	130		
11 03 10 17 13 12 D	486DB5	5,3e	28+	64	-2	60	245		
11 03 11 23 22 22 d	660wA8	4,3v	39+	77		2	298		
11 03 13 21 43 21 D	946DM3	3,5V	59+	100		40	269		
11 03 13 22 47 9 r	946DM3	3,5V	59+	101		27	278		
11 03 15 23 13 22 d	1238cG8	6,0	80+	127		40	259		
11 03 18 23 33 39 d	1605 K3	6,0	99+	168		49	206		
11 03 20 22 21 17 r	1852cA2	6,0	97-	162		34	147		
11 03 24 4 37 42 r	2305 B8	5,9v	74-	119	-6	25	203		
11 03 26 1 29 50 R	2589 B9	4,7	54-	95		12	133		
11 03 27 7 35 17 r	2779wK0	3,8s	42-	81	29	26	206		
11 03 28 3 57 12 R	2902cK0	5,9	33-	70		22	139		
11 04 07 19 48 42 D	599SK0	4,4	15+	46		17	285		
11 04 15 21 39 4 D	1670 K4	4,8	93+	148		48	194		
11 04 29 3 7 59 R	3453wA0	5,0v	15-	45		13	98		
11 05 05 17 56 9 D	709MB3	4,3	6+	27	0	25	280		
11 05 05 18 48 14 r	709MB3	4,3	6+	28	-9	15	287		
11 05 14 18 15 55 d	1852cA2	6,0	90+	143	-2	31	140		
11 05 21 1 1 10 d	2797SF2	2,9S	84-	133		28	158		
11 05 21 1 43 16 R	2797SF2	2,9S	84-	133		30	169		
11 05 24 3 55 33 m	3185 G8	5,1	56-	97		0	41	163	
11 06 04 11 10 32 d	1077SG3	4,0V	7+	31	74	57	112		
11 06 11 19 6 6 D	1944SK1	5,5	80+	126	-7	36	176		
11 06 17 2 3 1 r	2725wK5	5,4s	98-	165		24	208		
11 06 29 7 12 53 r	709MB3	4,3	5-	25	38	59	109		
11 07 09 19 39 11 D	2039 A0	5,5	67+	110	-12	30	204		
11 07 09 21 27 47 d	2051 A*	5,9v	68+	111		18	228		
11 07 12 21 6 1 D	2490WK*	5,2	93+	150		28	181		
11 07 18 23 47 57 R	3320SK2	5,0	86-	136		38	137		
11 07 26 10 52 24 r	660wA8	4,3v	21-	54	71	42	268		
11 08 11 21 32 0 m	2902cK0	5,9	96+	158		33	178		
11 09 12 22 35 3 r	3482cF6	5,7	100-	173		53	162		
11 09 18 21 17 18 r	634 A0	5,3v	66-	108		10	70		
11 09 19 0 2 5 R	656SA7	4,2s	65-	107		41	92		
11 09 19 0 14 21 R	657SA7	5,3s	65-	107		43	94		
11 10 17 21 17 46 r	Ber 21 C	6,0	72-	116		14	73		
11 10 29 16 59 59 D	2434DA0	5,6	11+	40	-10	12	228		
11 10 30 18 22 8 D	2595SB0	5,7s	20+	53		9	232		
11 10 31 16 29 58 D	2759 G8	3,5	29+	65	-5	29	197		
11 10 31 17 41 8 r	2759 G8	3,5	30+	66		23	214		
11 11 04 19 57 36 D	3287SA0	5,8	70+	114		43	208		
11 11 14 5 36 17 r	Ber 21 C	6,0	90-	143	-3	35	272		
11 11 17 3 40 55 R	1271cA5	5,9	66-	108		66	173		
11 11 20 2 59 39 R	1605 K3	6,0	33-	70		31	118		
11 12 14 21 37 16 R	1341SA5	4,3s	81-	128		20	90		
11 12 19 2 50 22 R	1800 A0	5,5	37-	75		26	128		

#### Occultazioni per PERUGIA

10	11	01	14	23	34	29	D	472cA1	4,9	73+	117	28
274												
11	01	16	17	28	29	D		742SG8	5,8	88+	140	49 103
11	01	17	20	42	3	D		916SG7	4,3s	95+	153	68 151
11	01	17	23	55	7	d		929SB2	5,8v	95+	155	54 248
11	01	18	2	34	53	D		946DM3	3,5V	96+	156	26 277
11	01	23	3	15	57	r		1605 K3	6,0	85-	135	44 205
11	01	23	23	23	44	r		1713cK0	5,6	77-	123	23 12
11	01	26	1	41	56	R		1967 G1	5,6	55-	95	19 136
11	02	12	19	24	52	D		693 F5	6,0v	65+	107	66 221
11	02	14	13	43	26	d		976SM3	2,9v	82+	130	26 13 71
11	02	16	1	53	50	D		1175cK5	4,9	92+	148	27 271
11	02	20	0	12	16	R		1670 K4	4,8	96-	156	43 169
11	02	22	5	42	7	r		1944SK1	5,5	79-	126	-4 18 227
11	02	25	1	31	13	R		2347 A4	4,6s	48-	88	6 131
11	03	10	17	8	15	d		486DB5	5,3e	28+	64	0 59 235
11	03	11	23	16	58	D		660wA8	4,3v	39+	77	6 296
11	03	13	21	36	27	D		946DM3	3,5V	59+	100	41 263
11	03	13	22	37	26	r		946DM3	3,5V	59+	101	30 274
11	03	14	17	18	47	m		1077SG3	4,0V	68+	111	-2 61 133
11	03	15	23	6	9	d		1238cG8	6,0	80+	127	41 253
11	03	18	23	27	31	d		1605 K3	6,0	99+	168	45 20
11	03	20	22	22	3	r		1852cA2	6,0	97-	162	30 148
11	03	24	4	27	23	r		2305 B8	5,9v	74-	119	-8 21 199
11	03	26	1	30	19	r		2589 B9	4,7	54-	95	8 133
11	03	27	7	29	39	r		2779wK0	3,8s	42-	81	26 22 203
11	03	28	3	49	2	r		2902cK0	5,9	33-	71	16 137
11	04	07	19	35	24	D		5995SK0	4,4	15+	46	21 281
11	04	07	20	3	45	D		601SG5	5,9	15+	46	16 285
11	04	15	21	34	6	D		1670 K4	4,8	93+	148	44 190
11	04	29	3	14	41	R		3453wA0	5,0v	15-	45	-10 12 100
11	05	05	17	53	59	d		709MB3	4,3	6+	27	3 27 277
11	05	05	18	36	56	R		709MB3	4,3	6+	28	-4 19 284
11	05	20	1	20	48	R		2630wK0	5,0	91-	146	23 177
11	05	20	22	28	41	r		2779wK0	3,8s	85-	134	6 127
11	05	21	1	23	50	M		2797SF2	2,9S	84-	133	24 164
11	06	04	11	26	57	d		1077SG3	4,0V	7+	32	69 57 123
11	06	11	19	0	5	d		1944SK1	5,5	80+	126	-3 31 173
11	06	17	2	7	46	r		2725wK5	5,4s	98-	165	20 207
11	06	29	7	14	40	r		709MB3	4,3	5-	25	37 56 116
11	07	09	19	46	41	D		2039 A0	5,5	68+	110	-9 25 204
11	07	09	21	18	58	d		2051 A* <sup>*</sup>	5,9v	68+	111	16 224
11	07	12	21	2	37	D		2490WK*	5,2	93+	150	23 179
11	07	19	0	3	9	R		3230SK2	5,0	86-	136	36 142

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna
a m g h m s	No D	V	ill	Alt	Alt	Az		
11 07 20 3 20 6 R	3453wA0	5,0v	78-	124	-5	48 192		
11 07 26 10 37 20 r	660wA8	4,3v	21-	54	65	45 259		
11 08 09 20 53 31 D	2589 B9	4,7	84+	133	22	193		
11 08 11 21 12 28 d	2902cK0	5,9	96+	157	28	172		
11 08 22 9 44 38 r	599SK0	4,4	46-	85	53	31 272		
11 09 12 22 43 43 r	3482cF6	5,7	100-	173	48	166		
11 09 18 21 23 52 r	634 A0	5,3v	66-	108	12	71		
11 09 19 0 14 25 R	657SA7	5,3s	65-	107	42	98		
11 10 10 0 0 33 D	3453wA0	5,0v	96+	156	36	231		
11 10 16 4 56 6 R	631SF0	5,6	86-	136	-6	46 256		
11 10 17 21 23 24 r	Ber 21 C	6,0	72-	116	15	74		
11 10 29 17 0 56 D	2434DA0	5,6	11+	40	-10	9 226		
11 10 30 18 14 0 D	2595SB0	5,7s	20+	53	8	229		
11 10 31 16 25 30 D	2759 G8	3,5	29+	65	-4	25 194		
11 10 31 17 40 49 r	2759 G8	3,5	30+	66	19	212		
11 11 04 20 4 25 D	3287SA0	5,8	70+	114	39	207		
11 11 14 5 25 50 r	Ber 21 C	6,0	90-	143	-7	37 266		
11 11 16 5 51 30 R	1158cM0	5,0s	75-	119	-3	48 246		
11 11 17 3 46 48 R	1271cA5	5,9	65-	108	61	175		
11 11 20 2 57 49 R	1605 K3	6,0	33-	70	28	119		
11 12 14 21 55 51 R	1341SA5	4,3s	81-	128	22	95		
11 12 19 2 58 44 R	1800 A0	5,5	37-	75	24	131		
11 12 28 16 7 33 D	3185 G8	5,1	17+	49	-5	33 210		

#### Occultazioni per POTENZA

11 01 14 23 40 35 D	472cA1	4,9	73+	117	24	278		
11 01 15 15 52 55 d	582 F2	5,6	80+	127	-1	44 97		
11 01 16 17 25 49 D	742SG8	5,8	88+	139	52	102		
11 01 17 20 48 57 D	916SG7	4,3s	95+	153	72	161		
11 01 18 0 1 52 d	929SB2	5,8v	95+	155	52	256		
11 01 18 2 39 38 D	946DM3	3,5v	96+	156	22	281		
11 01 23 3 23 55 r	1605 K3	6,0	85-	135	44	213		
11 01 23 23 23 46 R	1713cK0	5,6	77-	123	26	124		
11 01 26 1 45 9 R	1967 G1	5,6	55-	95	23	139		
11 01 28 1 55 30 r	2227SK0	5,8	33-	70	4	125		
11 02 12 19 39 13 D	693 F5	6,0v	65+	107	64	237		
11 02 14 13 39 55 d	976SM3	2,9v	82+	130	26	14 72		
11 02 16 1 58 26 D	1175cK5	4,9	92+	148	24	275		
11 02 20 0 19 5 R	1670 K4	4,8	96-	156	46	176		
11 02 25 1 31 44 R	2347 A4	4,6s	48-	88	9	133		
11 03 10 17 15 32 D	486DB5	5,3e	28+	64	-4	56 245		
11 03 11 23 18 26 d	660wA8	4,3v	39+	77	2	299		
11 03 13 21 42 37 D	946DM3	3,5v	59+	100	38	269		
11 03 13 22 42 42 r	946DM3	3,5v	59+	101	26	278		
11 03 15 23 12 50 d	1238cG8	6,0	80+	127	38	259		
11 03 18 23 35 28 d	1605 K3	6,0	99+	168	46	209		
11 03 20 22 26 24 r	1852cA2	6,0	97-	162	34	152		
11 03 24 4 38 20 r	2305 B8	5,9v	74-	119	-4	22 205		
11 03 26 1 32 8 R	2589 B9	4,7	54-	95	12	136		
11 03 27 7 38 7 r	2779wK0	3,8s	42-	81	30	22 209		
11 03 28 3 59 3 r	2902cK0	5,9	33-	70	-10	21 142		
11 04 07 19 40 31 D	599SK0	4,4	15+	46	18	284		
11 04 07 20 10 5 D	601SG5	5,9	15+	46	12	289		
11 04 15 21 41 54 D	1670 K4	4,8	93+	148	45	197		
11 04 29 3 12 56 R	3453wA0	5,0v	15-	45	-9	15 101		
11 05 05 17 57 18 D	709MB3	4,3	6+	27	-1	24 281		
11 05 05 18 41 27 r	709MB3	4,3	6+	28	-9	16 287		
11 05 14 18 18 29 d	1852cA2	6,0	90+	143	-3	30 144		
11 05 20 22 25 0 R	2779wK0	3,8s	85-	134	9	129		
11 05 21 1 13 7 d	2797SF2	2,9s	84-	133	27	164		
11 05 21 1 45 41 R	2797SF2	2,9s	84-	133	28	173		
11 06 04 11 21 55 d	1077SG3	4,0V	7+	32	71	59 122		
11 06 11 19 6 53 D	1944SK1	5,5	80+	126	-7	34 179		
11 06 17 2 7 37 r	2725wK5	5,4s	98-	165	21	211		
11 06 29 7 19 18 r	709MB3	4,3	5-	25	41	60 118		
11 07 09 19 49 7 D	2039 A0	5,5	67+	110	26	208		
11 07 09 21 26 53 d	2051 A*	5,9v	68+	111	15	229		
11 07 12 21 10 10 D	2490WK*	5,2	93+	150	25	184		
11 07 18 23 57 21 R	3320SK2	5,0	86-	136	38	143		
11 08 09 21 15 1 M	2589 B9	4,7	84+	133	22	202		
11 08 11 21 32 4 d	2902cK0	5,9	96+	158	30	181		
11 09 12 22 43 30 r	3482cF6	5,7	100-	173	51	170		
11 09 18 21 20 16 r	634 A0	5,3v	66-	108	13	72		
11 09 19 0 3 59 R	656SA7	4,2s	65-	107	43	96		
11 09 19 0 19 24 R	657SA7	5,3s	65-	107	45	99		
11 10 10 0 24 40 m	3453wA0	5,0v	96+	156	31	241		
11 10 16 4 50 38 m	631SF0	5,6	86-	136	-4	45 260		
11 10 17 21 21 0 r	Ber 21 C	6,0	72-	116	17	75		
11 10 29 17 1 16 D	2434DA0	5,6	11+	40	9	229		
11 10 30 18 20 52 D	2595SB0	5,7s	20+	53	6	233		
11 10 31 16 33 25 D	2759 G8	3,5	29+	65	-8	26 200		
11 10 31 17 44 5 r	2759 G8	3,5	30+	66	20	217		
11 11 04 20 3 39 D	3287SA0	5,8	70+	114	40	212		
11 11 14 5 32 30 r	Ber 21 C	6,0	90-	143	-2	34 271		
11 11 17 3 53 29 R	1271cA5	5,9	65-	108	63	186		
11 11 20 3 1 28 R	1605 K3	6,0	33-	70	32	122		
11 12 14 21 50 6 R	1341SA5	4,3s	81-	128	24	95		
11 12 19 3 0 16 R	1800 A0	5,5	37-	75	28	134		
11 12 28 16 32 6 M	3185 G8	5,1	17+	49	-10	31 221		

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna
a m g h m s	No D	V	ill	Alt	Alt	Az		
Occultazioni per ROMA								
11 01 14 23 37 10 D	472cA1	4,9	73+	117	27	275		
11 01 16 17 25 38 D	742SG8	5,8	88+	140	49	101		
11 01 17 20 42 5 D	916SG7	4,3s	95+	153	69	149		
11 01 17 23 55 45 d	929SB2	5,8v	95+	155	55	249		
11 01 18 2 37 34 D	946DM3	3,5v	96+	156	26	278		
11 01 23 3 18 23 r	1605 K3	6,0	85-	135	45	206		
11 01 23 23 21 31 r	1713cK0	5,6	77-	123	23	121		
11 01 26 1 42 44 R	1967 G1	5,6	55-	95	20	136		
11 02 12 19 28 54 D	693 F5	6,0v	65+	107	66	225		
11 02 14 13 41 49 d	976SM3	2,9v	82+	130	27	12 71		
11 02 16 1 55 0 D	1175cK5	4,9	92+	148	27	271		
11 02 20 0 12 40 R	1670 K4	4,8	96-	156	45	169		
11 02 22 5 44 49 r	1944SK1	5,5	79-	126	-3	18 228		
11 02 25 1 30 3 R	2347 A4	4,6s	48-	88	6	131		
11 03 10 17 8 45 d	486DB5	5,3e	28+	64	0	59 237		
11 03 11 23 18 17 D	660wA8	4,3v	39+	77	5	296		
11 03 13 21 37 49 D	946DM3	3,5v	59+	100	41	264		
11 03 13 22 39 52 r	946DM3	3,5v	59+	101	30	275		
11 03 15 23 7 36 d	1238cG8	6,0	80+	127	41	254		
11 03 18 23 28 33 d	1605 K3	6,0	99+	168	46	202		
11 03 20 22 21 42 r	1852cA2	6,0	97-	162	31	148		
11 03 24 4 29 28 r	2305 B8	5,9v	74-	119	-8	22 199		
11 03 26 1 30 7 r	2589 B9	4,7	54-	95	9	133		
11 03 27 7 30 47 r	2779wK0	3,8s	42-	81	26	23 203		
11 03 28 3 52 12 r	2902cK0	5,9	33-	70	18	138		
11 04 07 19 38 21 D	599SK0	4,4	15+	46	21	282		
11 04 07 20 8 55 D	601SG5	5,9	15+	46	15	286		
11 04 15 21 34 48 D	1670 K4	4,8	93+	148	45	190		
11 04 29 3 13 2 R	3453wA0	5,0v	15-	45	-10	12 99		
11 05 05 17 54 8 d	709MB3	4,3	6+	27	2	27 278		
11 05 05 18 39 55 R	709MB3	4,3	6+	28	-6	19 285		
11 05 20 1 16 55 r	2630wK0	5,0	91-	146	24	176		
11 05 20 22 23 37 r	2779wK0	3,8s	85-	134	6	126		
11 05 21 1 16 21 d	2797SF2	2,9s	84-	133	25	162		
11 05 21 1 29 53 R	2797SF2	2,9s	84-	133	26	165		
11 06 04 11 20 59 d	1077SG3	4,0V	7+	32	70	56 119		
11 06 11 19 1 7 d	1944SK1	5,5	80+	126	-3	33 173		
11 06 17 2 7 0 r	2725wK5	5,4s	98-	165	21	207		
11 06 29 7 14 11 r	709MB3	4,3	5-	25	37	57 114		
11 07 09 19 42 40 D	2039 A0	5,5	67+	110	-9	27 203		
11 07 09 21 20 47 d	2051 A*	5,9v	68+	111	16	225		
11 07 12 21 2 55 D	2490WK*	5,2	93+	150	24	179		
11 07 18 23 59 53 R	3320SK2	5,0	86-	136	36	141		
11 07 20 3 12 53 R	3453wA0	5,0v	78-	124	-7	49 190		
11 07 26 10 41 14 r	660wA8	4,3v	21-	54	66	45 261		
11 08 09 20 57 34 D	2589 B9	4,7	84+	133	23	195		
11 08 11 21 14 17 d	2902cK0	5,9	96+	157	29	172		
11 08 22 9 47 36 r	599SK0	4,4	46-	85	55	30 274		
11 09 12 22 41 43 r	3482cF6	5,7	100-	173	49	165		
11 09 18 21 22 23 r	634 A0	5,3v	66-	108	11	71		
11 09 18 23 49 27 M	656SA7	4,2s	65-	107	37	92		
11 09 19 0 14 28 R	657SA7	5,3s	65-	107	42	97		
11 10 10 0 5 55 D	3453wA0	5,0v	96+	156	36	233		
11 10 16 4 44 4 M	631SF0	5,6	86-	136	-8	49 254		
11 10 17 21 22 9 r	Ber 21 C	6,0	72-	116	15	74		
11 10 29 17 0 25 D	2434DA0	5,6	11+	40	-10	10 226		
11 10 30 18 15 34 D	2595SB0	5,7s	20+	53	8	229		
11 10 31 16 26 3 D	2759 G8	3,5	29+	65	-4	26 195		
11 10 31 17 40 56 r	2759 G8	3,5	30+	66	20	213		
11 11 04 20 2 26 D	3287SA0	5,8	70+	114	40	207		
11 11 14 5 28 24 r	Ber 21 C	6,0	90-	143	-6	37 267		
11 11 16 5 54 29 R	1158cM0	5,0s	75-	119	-2	48 248		
11 11 17 3 45 50 R	1271cA5	5,9	65-	108	62	175		
11 11 20 2 58 17 R	1605 K3	6,0	33-	70	28	119		
11 12 14 21 52 42 R	1341SA5	4,3s	81-	128	22	94		
11 12 19 2 56 54 R	1800 A0	5,5	37-	75	24	130		
11 12 28 16 11 26 D	3185 G8	5,1	17+	49	-5	34 211		

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s	No D	V	ill	Alt	Alt	Az			
11 03 20 22 16 49 r	1852cA2	6,0	97-	162		26 143			
11 03 24 4 15 48 r	2305 B8	5,9v	74-	119		21 191			
11 03 26 1 28 43 r	2589 B9	4,7	54-	95		4 130			
11 03 27 7 18 3 r	2779wK0	3,8s	42-	81	20	22 195			
11 04 07 19 31 0 D	599SK0	4,4	15+	46		26 276			
11 04 07 20 0 22 D	601SG5	5,9	15+	46		21 281			
11 04 15 21 24 54 D	1670 K4	4,8	93+	148		42 180			
11 04 29 3 15 29 R	3453wA0	5,0v	15-	45	-11	9 97			
11 05 05 17 48 57 d	709MB3	4,3	6+	27	7	32 272			
11 05 20 1 18 5 R	2630wK0	5,0	91-	146		21 172			
11 06 04 11 35 38 m	1077SG3	4,0v	7+	32	67	54 122			
11 06 17 2 4 9 r	2725wK5	5,4s	98-	164		20 202			
11 06 29 7 7 7 r	709MB3	4,3	5-	25	33	51 111			
11 07 09 19 36 40 d	2039 A0	5,5	68+	110	-4	25 196			
11 07 09 21 10 8 d	2051 A*	5,9v	68+	111		18 218			
11 07 12 20 53 53 D	2490WK*	5,2	93+	150		20 172			
11 07 19 0 4 28 R	3320SK2	5,0	86-	136		32 138			
11 07 20 3 26 31 R	3453wA0	5,0v	78-	124	-6	46 187			
11 07 26 10 27 14 r	660wA8	4,3v	21-	54	61	50 251			
11 08 09 20 37 27 D	2589 B9	4,7	84+	133		21 185			
11 08 11 20 59 28 d	2902cK0	5,9	96+	157		24 164			
11 08 22 9 38 3 r	599SK0	4,4	46-	85	49	36 267			
11 09 12 22 40 8 r	3482cF6	5,7	100-	173		45 158			
11 09 18 21 26 44 r	634 A0	5,3v	66-	108		10 69			
11 09 19 0 4 56 R	657SA7	5,3s	65-	107		36 94			
11 09 20 0 7 17 R	792 G8	5,0	55-	96		28 86			
11 10 08 20 24 0 G	3320SK2	5,0	91+	144		40 168			
11 10 09 23 44 38 D	3453wA0	5,0v	96+	156		39 220			
11 10 16 4 52 0 R	631SF0	5,6	86-	136	-10	50 248			
11 10 17 21 24 50 r	Ber 21 C	6,0	72-	116		13 72			
11 10 29 17 3 19 d	2434DA0	5,6	12+	40	-8	10 223			
11 10 30 18 7 12 D	2595SB0	5,7s	20+	53		10 224			
11 10 31 16 16 35 D	2759 G8	3,5	29+	65	0	24 187			
11 10 31 17 34 44 r	2759 G8	3,5	30+	66		20 206			
11 11 04 20 6 52 D	3287SA0	5,8	70+	114		38 202			
11 11 14 5 18 55 r	Ber 21 C	6,0	90-	143	-12	42 259			
11 11 16 5 43 14 R	1158cM0	5,0s	75-	119	-8	51 237			
11 11 17 3 37 41 R	1271cA5	5,9	65-	108		58 163			
11 11 20 2 54 5 R	1605 K3	6,0	33-	70		23 115			
11 12 07 21 53 53 d	415cK1	5,8	93+	150		62 201			
11 12 09 19 10 13 d	665WA*	5,7	99+	171		40 100			
11 12 14 21 58 23 R	1341SA5	4,3s	81-	128		19 93			
11 12 19 2 55 34 R	1800 A0	5,5	37-	75		20 127			

#### Occultazioni per TRENTO

11 01 14 23 28 2 D	472cA1	4,9	73+	117		30 270			
11 01 16 17 36 3 D	742SG8	5,8	88+	140		49 107			
11 01 17 20 40 55 D	916SG7	4,3s	95+	153		65 151			
11 01 17 23 52 18 d	929SB2	5,8v	95+	155		54 242			
11 01 18 2 28 24 D	946DM3	3,5v	96+	156		29 274			
11 01 22 22 30 1 r	1587DF2	5,9	87-	137		25 117			
11 01 23 3 9 4 r	1605 K3	6,0	85-	135		42 200			
11 01 23 23 26 57 r	1713cK0	5,6	77-	123		21 123			
11 01 26 1 39 34 r	1967 G1	5,6	55-	95		16 135			
11 02 12 19 15 24 D	693 F5	6,0v	65+	107		65 210			
11 02 14 13 48 12 d	976SM3	2,9v	82+	130	23	14 72			
11 02 16 1 50 12 D	1175cK5	4,9	92+	148		29 268			
11 02 20 0 9 26 R	1670 K4	4,8	96-	156		40 167			
11 02 22 5 34 26 r	1944SK1	5,5	79-	126	-6	17 224			
11 02 25 1 33 8 r	2347 A4	4,6s	48-	88		3 130			
11 02 26 2 43 12 m	2500cB2	3,3v	38-	76		4 133			
11 03 11 23 13 55 D	660wA8	4,3v	39+	77		8 294			
11 03 13 21 32 6 D	946DM3	3,5v	59+	100		42 259			
11 03 13 22 30 50 r	946DM3	3,5v	59+	101		32 270			
11 03 14 16 56 8 d	1077SG3	4,0v	68+	111	3	55 127			
11 03 14 17 37 54 r	1077SG3	4,0v	68+	112	-4	60 143			
11 03 15 23 1 18 d	1238cG8	6,0	80+	127		42 248			
11 03 18 23 23 22 d	1605 K3	6,0	99+	168		43 197			
11 03 20 22 21 18 r	1852cA2	6,0	97-	162		27 148			
11 03 24 4 20 4 r	2305 B8	5,9v	74-	119	-10	19 195			
11 03 26 1 30 12 r	2589 B9	4,7	54-	95		5 133			
11 03 27 7 24 18 r	2779wK0	3,8s	42-	81	23	20 200			
11 03 28 3 44 1 m	2902cK0	5,9	33-	71		13 136			
11 04 07 19 28 31 D	599SK0	4,4	15+	46		24 278			
11 04 07 19 54 46 D	601SG5	5,9	15+	46		20 282			
11 04 15 21 30 38 D	1670 K4	4,8	93+	148		41 186			
11 04 29 3 18 18 R	3453wA0	5,0v	15-	45	-8	12 100			
11 05 05 17 53 2 d	709MB3	4,3	6+	27	5	29 274			
11 05 05 18 29 6 r	709MB3	4,3	6+	27	-1	22 280			
11 05 20 1 24 55 R	2630wK0	5,0	91-	146		20 177			
11 05 20 22 36 22 r	2779wK0	3,8s	85-	134		4 128			
11 06 17 2 7 50 r	2725wK5	5,4s	98-	165	-11	18 206			
11 06 29 7 13 4 r	709MB3	4,3	5-	25	36	54 118			
11 07 09 21 13 19 d	2051 A*	5,9v	68+	111		15 221			
11 07 12 21 0 6 D	2490WK*	5,2	93+	150		20 177			
11 07 19 0 9 35 R	3320SK2	5,0	86-	136		33 144			
11 07 20 3 30 38 R	3453wA0	5,0v	78-	124	-3	45 193			
11 07 26 10 24 23 r	660wA8	4,3v	21-	54	61	47 252			
11 08 09 20 43 57 D	2589 B9	4,7	84+	133		20 190			
11 08 11 21 7 1 d	2902cK0	5,9	96+	157		24 169			
11 08 22 9 36 0 r	599SK0	4,4	46-	85	50	33 268			
11 09 12 22 46 36 r	3482cF6	5,7	100-	173		45 166			

Data	Ora	P	StellaSp	Mag	%	Elon	Sole	Luna	
a m g h m s	No D	V	ill	Alt	Alt	Az			
11 09 18 21 27 37 r	634 A0	5,3v	66-	108		12 71			
11 09 19 0 10 36 R	657SA7	5,3s	65-	107		40 99			
11 09 20 0 8 52 R	792 G8	5,0	55-	96		31 89			
11 10 08 20 30 31 M	3320SK2	5,0	90+	144		40 175			
11 10 09 23 49 42 D	3453wA0	5,0v	96+	156		36 225			
11 10 16 5 0 54 R	631SF0	5,6	86-	136	-6	46 253			
11 10 17 21 26 13 r	Ber 21 C	6,0	72-	116		16 75			
11 10 29 17 3 33 d	2434DA0	5,6	12+	40	-10	7 226			
11 10 30 18 9 21 D	2595SB0	5,7s	20+	53		7 227			
11 10 31 16 22 26 D	2759 G8	3,5	29+	65	-4	22 192			
11 10 31 17 38 40 r	2759 G8	3,5	30+	66		17 210			
11 11 04 20 10 6 D	3287SA0	5,8	70+	114		36 206			
11 11 14 5 18 29 r	Ber 21 C	6,0	90-	143	-10	39 261			
11 11 16 5 43 0 R	1158cM0	5,0s	75-	119	-6	48 239			
11 11 17 3 45 49 R	1271cA5	5,9	65-	108		58 173			
11 11 20 2 55 34 R	1605 K3	6,0	33-	70		25 119			
11 12 07 21 58 29 d	415cK1	5,8	93+	150		60 209			
11 12 09 19 15 35 d	665WA*	5,7	99+	171		43 104			
11 12 14 22 1 43 R	1341SA5	4,3s	81-	128		22 96			
11 12 19 3 0 57 R	1800 A0	5,5	37-	75		22 131			
11 12 28 15 59 3 D	3185 G8	5,1	17+	49	-4	32 205			

#### Occultazioni per TRIESTE

11	01	14	23	29	49	D	472cA1	4,9	73+	117		28	273
11	01	15	15	46	54	d	582 F2	5,6	80+	127	-1	41	99
11	01	16	17	36	18	D	742SG8	5,8	88+	140		51	109
11	01	17	20	45	17	D	916SG7	4,3s	95+	153		66	158
11	01	17	23	56	50	d	929SB2	5,8v	95+	155		52	246
11	01	18	2	29	9	D	946DM3	3,5v	96+	156		27	276
11	01	22	22	32	53	r	1587DF2	5,9	87-	137		27	120
11	01	23	3	11	38	r	1605 K3	6,0	85-	135		42	204
11	01	23	23	29	11	r	1713cK0	5,6	77-	123		23	125
11	01	26	1	40	21	r	1967 G1	5,6	55-	95		17	137
11	02	12	19	20	49	D	693 F5	6,0v	65+	107		64	218
11	02	14	13	47	1	d	976SM3	2,9v	82+	130	23	15	73
11	02	16	1	52	46	D	1175cK5	4,9	92+	148		26	270
11	02	20	0	13	28	R	1670 K4	4,8	96-	156		41	172
11	02	22	5	38	2	r	1944SK1	5,5	79-	126	-4	16	227
11	02	25	1	34	33	R	2347 A4	4,6s	48-	88		5	133
11	02	26	2	49	57	R	2500cB2	3,3v	38-	76		7	137
11	03	10	17	10	30	D	486DB5	5,3e	28+	64	-2	56	234
11	03	11	23	13	43	D	660wA8	4,3v	39+	77		6	296
11	03	13	21	35	29	D	946DM3	3,5v	59+	100		40	262
11	03	13	22	31	57	r	946DM3	3,5v	59+	101		30	272
11	03	14	17	1	28	D	1077SG3	4,0v	68+	111	0	58	132
11	03	14	17	41	44	r	1077SG3	4,0v	68+	112	-7	62	149
11	03	15	23	4	57	d	1238cG8	6,0	80+	127		39	252
11	03	18	23	28	7	d	1605 K3	6,0	99+	168		42	202
11	03	20	22	24	23	r	1852cA2	6,0	97-	162		28	151
11	03	24	4	25	23	r	2305 B8	5,9v	74-	119	-7	19	199
11	03	26	1	31	10	r	2589 B9	4,7	54-	95		7	135
11	03	27	7	29	51	r	2779wK0	3,8s	42-	81	26	19	204
11	03	28	3	47	15	m	2902cK0	5,9	33-	71		15	139
11	04	07	19	29	20	D	599SK0	4,4	15+	46		22	280
11	04	07	19	54	32	D	601SG5	5,9	15+	46		18	284
11	04	15	21	35	36	D	1670 K4	4,8	93+	148		41	191
11	04	29	3	19	5	R	3453wA0	5,0v	15-	45	-7	14	102
11	05	05	17	56	1	d	709MB3	4,3	6+	27		2	267
11	05	05	18	28	42	r	709MB3	4,3	6+	27	-3	21	282
11	05	20	1	27	45	R	2630wK0	5,0	91-	146		21	180
11	05	20	22	39	4	R	2779wK0	3,8s	85-	134		7	130
11	06	11	19	0	18	d	1944SK1	5,5	80+	126	-2	29	175
11	06	17	2	10	1	r	2725wK5	5,4s	98-	165	-9	17	208
11	06	29	7	17	39	r	709MB3	4,3	5-	25	39	56	122
11	07	09	21	17	2	d	2051 A*	5,9v	68+	111		14	224
11	07	12	21	4	53	D	2490WK*	5,2	93+	150		20	181
11	07	19	0	10	36	R	3320SK2	5,0	86-	136		35	147
11	07	20	3	29	53	R	3453wK0	5,0v	78-	124	-2	45	197
11	07	26	10	26	56	r	660wA8	4,3v	21-	54	62	45	256
11	08	09	20	51	10	D	2589 B9	4,7	84+	133		19	194
11	08	11	21	13	49	d	2902cK0	5,9	96+	157		25	174
11	08	22	9	37	34	r	599SK0	4,4	46-	85	51	31	271
11	09	12	22	49	43	r	3482cF6	5,7	100-	173		46	171
11	09	18	21	26	59	r	634 A0	5,3v	66-	108		14	73
11	09	19	0	16	7	R	657SA7	5,3s	65-	107		42	102
11	10	09	23	55	46	D	3453wK0	5,0v	96+	156		34	230
11	10	16	5	5	1	R	631SF0	5,6	86-	136	-4	43	256
11	10	17	21	26	18	r	Ber 21 C	6,0	72-	116		18	77
11	10	19	21	54	16	r	1158cM0	5,0s	52-	92		3	67
11	10	29	17	2	36	D	2434DA0	5,6	12+	40	-12	6	227
11	10	30	18	12	6	D	2595SB0	5,7s	20+	53		6	229
11	10	31	16	27	1	D	2759 G8	3,5	29+	65	-6	22	196
11	10	31	16	41	42	r	2759 G8	3,5	30+	66		17	213
11	11	04	20	10	7	D	3287SA0	5,8	70+	114		35	210
11	11	14	5	20	28	r	Ber 21 C	6,0	90-	143	-8	37	264
11	11	16	5	45	26	R	1158cM0	5,0s	75-	119	-4	47	243
11	11	17	3	51	11	R	1271cA5	5,9	65-	108		59	180
11	11	20	2	57	24	R	1605 K3	6,0	33-	70		27	122
11	12	07	22	7	1	d	415cK1	5,8	93+	150		58	217
11	12	09	19	20	17	d	665WA*	5,7	99+	171		46	107
11	12	14	22	2	19	R	1341SA0	4,3s	81-	128		24	98
11	12	19	3	3	41	R	1800 A0	5,5	37-	75		24	138

Data	Ora	P	StellaSp	Mag	% Elon	Sole	Luna
a m g h m s			No D	V	ill	Alt	Alt Az
11 12 28 16 5 34 D			3185 G8	5,1	17+	49	-6 31 210

Occultazioni per VENEZIA

11 01 14 23 29 42 D	472cA1	4,9	73+	117		29	272
11 01 16 17 34 48 D	742SG8	5,8	88+	140		49	107
11 01 17 20 42 41 D	916SG7	4,3s	95+	153		66	154
11 01 17 23 54 26 d	929SB2	5,8v	95+	155		54	244
11 01 18 2 29 41 D	946DM3	3,5v	96+	156		27	275
11 01 22 22 28 53 r	1587DF2	5,9	87-	137		26	118
11 01 23 3 11 9 r	1605 K3	6,0	85-	135		42	202
11 01 23 23 27 23 r	1713cK0	5,6	77-	123		22	124
11 01 26 1 40 18 r	1967 G1	5,6	55-	95		17	136
11 02 12 19 18 49 D	693 F5	6,0v	65+	107		65	215
11 02 14 13 46 57 d	976SM3	2,9v	82+	130	23 14	72	
11 02 16 1 51 45 D	1175cK5	4,9	92+	148		27	269
11 02 20 0 11 26 R	1670 K4	4,8	96-	156		41	169
11 02 22 5 37 1 r	1944SK1	5,5	79-	126	-5 17	225	
11 02 25 1 33 23 R	2347 A4	4,6s	48-	88		4	131
11 02 26 2 43 35 M	2500cB2	3,3v	38-	76		5	134
11 03 10 17 8 4 d	486DB5	5,3e	28+	64	-1 57	232	
11 03 11 23 14 20 D	660wA8	4,3v	39+	77		7	295
11 03 13 21 34 4 D	946DM3	3,5v	59+	100		41	260
11 03 13 22 32 20 r	946DM3	3,5v	59+	101		31	271
11 03 14 17 0 8 d	1077SG3	4,0v	68+	111	2 57	129	
11 03 14 17 37 49 r	1077SG3	4,0v	68+	111	-5 61	144	
11 03 15 23 3 26 d	1238cG8	6,0	80+	127		41	250
11 03 18 23 25 50 d	1605 K3	6,0	99+	168		43	199
11 03 20 22 22 37 r	1852cA2	6,0	97-	162		28	149
11 03 24 4 23 12 r	2305 B8	5,9v	74-	119	-9 19	197	
11 03 26 1 30 37 r	2589 B9	4,7	54-	95		6	133
11 03 27 7 27 20 r	2779wK0	3,8s	42-	81	24 20	202	
11 03 28 3 44 48 m	2902cK0	5,9	33-	71		14	137
11 04 07 19 29 52 D	599SK0	4,4	15+	46		23	279
11 04 07 19 56 1 D	601SG5	5,9	15+	46		18	283
11 04 15 21 33 4 D	1670 K4	4,8	93+	148		41	189
11 04 29 3 18 1 R	3453wA0	5,0v	15-	45	-8 13	101	

Data nel formato anno/mese/giorno, ore in T.U.

P : tipo di fenomeno

D = sparizione  
R = riapparizione  
G = radente

d = sparizione visibile con difficoltà  
r = riapparizione visibile con difficoltà  
g = radente visibile con difficoltà  
m = missing

Stella : nnnn = ZC catalogue no.  
nnnnn or nnnnnn = SAO catalogue number  
Xnnnnn = XZ80 catalogue no.  
Pppnnnnn = Hubble catalogue

D : stella doppia (vedere codice XZ catalogue)  
Sp : tipo spettrale  
Mag : magnitudine  
V : stella variabile ad eclisse (e), varia (v), sospetta (s)  
% : percentuale di Luna illuminata  
Elon : elongazione della Luna, in gradi  
Sole alt : altezza del Sole, in gradi  
Luna alt : altezza della Luna sull'orizzonte, in gradi  
Luna az : azimuth della Luna, in gradi

Date in the format year/month/day, times in T.U.

P : type of phenomenon

D = disappearing  
R = reappearing  
G = radent

d = disappearing, visibile with difficulty  
r = reappearing, visibile with difficulty  
g = radent, visibile with difficulty  
m = missing

Stella : nnnn = ZC catalogue no.  
nnnnn or nnnnnn = SAO catalogue number  
Xnnnnn = XZ80 catalogue no.  
Pppnnnnn = Hubble catalogue

D : double star (XZ catalogue)  
Sp : spectral type  
Mag : magnitude  
V : variable star : eclipse (e), variable (v), suspect (s)  
% : percentage of Moon illumination  
Elon : elongation of the Moon, in °  
Sun alt : height of the Sun, in °  
Moon alt : height of the Moon, in °  
Moon az : azimuth of the Moon, in °  
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Data	Ora	P	StellaSp	Mag	% Elon	Sole	Luna
a m g h m s			No D	V	ill	Alt	Alt Az
11 05 05 17 54 13 d	709MB3	4,3	6+	27	4 27	276	
11 05 05 18 30 19 r	709MB3	4,3	6+	27	-2 21	282	
11 05 20 1 25 34 R	2630wK0	5,0	91-	146	21 178		
11 05 20 22 36 21 r	2779wK0	3,8s	85-	134	6 129		
11 06 11 18 58 30 d	1944SK1	5,5	80+	126	-1 29	173	
11 06 17 2 8 47 r	2725wK5	5,4s	98-	165	-10 18	207	
11 06 29 7 15 10 r	709MB3	4,3	5-	25	37 55	119	
11 07 09 21 15 37 d	2051 A*	5,9v	68+	111	15 223		
11 07 12 21 2 19 D	2490WK*	5,2	93+	150	20 179		
11 07 19 0 9 3 R	3320SK2	5,0	86-	136	34 145		
11 07 20 3 29 11 R	3453wA0	5,0v	78-	124	-3 45	195	
11 07 26 10 27 47 r	660wA8	4,3v	21-	54	62 46	255	
11 08 09 20 48 1 D	2589 B9	4,7	84+	133	20 192		
11 08 11 21 10 19 d	2902cK0	5,9	96+	157	25 171		
11 08 22 9 38 2 r	599SK0	4,4	46-	85	51 32	270	
11 09 12 22 47 25 r	3482cF6	5,7	100-	173	46 168		
11 09 18 21 26 48 r	634 A0	5,3v	66-	108	13 72		
11 09 19 0 13 27 R	657SA7	5,3s	65-	107	41 100		
11 09 20 0 2 39 R	792 G8	5,0	55-	96	30 88		
11 10 09 23 53 30 D	3453wA0	5,0v	96+	156	35 228		
11 10 16 5 2 14 R	631SF0	5,6	86-	136	-5 45	255	
11 10 17 21 25 50 r Ber	21 C	6,0	72-	116	16 75		
11 10 29 17 2 36 D	2434DA0	5,6	12+	40	-11 7	226	
11 10 30 18 11 7 D	2595SB0	5,7s	20+	53	7 228		
11 10 31 16 24 40 D	2759 G8	3,5	29+	65	-5 22	194	
11 10 31 17 40 13 r	2759 G8	3,5	30+	66	17 212		
11 11 04 20 9 4 D	3287SA0	5,8	70+	114	36 208		
11 11 14 5 20 28 r Ber	21 C	6,0	90-	143	-8 38	263	
11 11 16 5 45 20 R	1158cM0	5,0s	75-	119	-5 48	242	
11 11 17 3 48 7 R	1271cA5	5,9	65-	108	59 176		
11 11 20 2 56 39 R	1605 K3	6,0	33-	70	26 120		
11 12 07 22 4 34 d	415cK1	5,8	93+	150	59 214		
11 12 09 19 17 48 d	665WA*	5,7	99+	171	45 105		
11 12 14 22 1 9 R	1341SA5	4,3s	81-	128	23 97		
11 12 19 3 1 42 R	1800 A0	5,5	37-	75	23 133		
11 12 28 16 2 37 D	3185 G8	5,1	17+	49	-5 32	207	

# CONGIUNZIONI MULTIPLE PIANETI-LUNA-STELLE

(eventi con 1 o più pianeti, la Luna ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON-STARS

(events with 1 or more planets, the Moon and a star with mag<2 within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest body

mmax = least magnitude

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## CONGIUNZIONI MULTIPLE MISTE

### CERCHI MINIMI GEOCENTRICI PIANETI-LUNA-STELLE

(eventi con 1 o più pianeti, la Luna ed una stella di mag<2 entro 5°)

### MULTIPLE CONJUNCTIONS

### LEAST GEOCENTRIC GROUPINGS PLANETS-MOON-STARS

(events with 1 or more planets, the Moon and a star with mag<2 within 5°)

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI TOPOCENTRICI PIANETI-LUNA-STELLE

(eventi con 1 o più pianeti, la Luna ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS

## LEAST TOPOCENTRIC GROUPINGS PLANETS-MOON-STARS

(events with 1 or more planets, the Moon and a star with mag<2 within 5°)

42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------	-----	----	--------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora  
 Bodies = corpi  
 Dxy = distanza tra il corpo x e quello y, in gradi  
 Group = cerchio minimo comprendente tutto il gruppo, in gradi  
 EL = elongazione dal Sole, in gradi  
 MAGx = magnitudine del corpo x  
 MAGT = magnitudine totale del gruppo  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi  
 AZ.S. = azimut del Sole, in gradi da nord  
 Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

Dxy = distance between the body x and y, in °  
 GROUP = least group, in °  
 EL = elongation from the Sun, in °  
 MAGx = magnitude of body x  
 MAGT = total magnitude  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °  
 AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.



# EVENTI GEOCENTRICI <5° LUNA-OGGETTI m<4

## GEOCENTRIC EVENTS <5° MOON-OBJECTS m<4

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)		
2011/01/15	13:18:35	1.25134	1.19793	0.003	352	125	-11.7	1.6		Moon	M45
2011/01/20	09:50:32	4.53356	1.27483	0.002	19	-172	-12.8	3.7		Moon	M44
2011/02/11	22:14:37	1.41525	1.18471	0.003	352	97	-11.0	1.6		Moon	M45
2011/02/16	20:49:20	4.55693	1.27825	0.002	19	159	-12.6	3.7		Moon	M44
2011/03/11	05:22:28	1.67003	1.17230	0.003	352	70	-10.3	1.6		Moon	M45
2011/03/16	07:26:51	4.70802	1.26489	0.002	19	132	-12.0	3.7		Moon	M44
2011/04/07	11:10:10	1.89012	1.16738	0.003	352	43	-9.3	1.6		Moon	M45
2011/04/12	15:55:20	4.94019	1.24417	0.002	19	105	-11.3	3.7		Moon	M44
2011/05/04	16:56:10	1.98964	1.16997	0.003	352	16	-7.2	1.6		Moon	M45
2011/05/31	23:43:06	1.98753	1.17529	0.003	352	-11	-6.3	1.6		Moon	M45
2011/06/28	07:43:12	1.98123	1.17789	0.003	352	-36	-9.0	1.6		Moon	M45
2011/07/25	16:21:08	2.06784	1.17468	0.003	352	-63	-10.1	1.6		Moon	M45
2011/08/22	00:38:10	2.27191	1.16653	0.003	352	-89	-10.8	1.6		Moon	M45
2011/09/18	07:48:47	2.52557	1.15783	0.003	352	-115	-11.4	1.6		Moon	M45
2011/10/15	13:55:02	2.71751	1.15346	0.003	352	-142	-12.0	1.6		Moon	M45
2011/11/11	19:48:56	2.78387	1.15473	0.003	353	-169	-12.5	1.6		Moon	M45
2011/12/09	02:31:25	2.77177	1.15849	0.003	353	163	-12.5	1.6		Moon	M45

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine dell'oggetto

tm = se presente, l'oggetto viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the Moon

m\* = magnitude of the object

tm = if present, the star is occulted maximum for x seconds

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# EVENTI TOPOCENTRICI <5° LUNA-OGGETTI m<4

## TOPOCENTRIC EVENTS <5° MOON-OBJECTS m<4

42°N - 12°E

Date	UT	Dm	Alt.	r1	p	e	m1	m*	tm(s)		
2011/01/15	12:34:44	1.98658	6.22	0.003	346	125	-11.7	1.6		Moon	M45
2011/02/11	23:12:30	1.87814	18.38	0.003	359	97	-11.0	1.6		Moon	M45
2011/02/16	19:30:30	4.87984	48.40	0.002	21	159	-12.6	3.7		Moon	M44
2011/03/11	05:06:48	2.50275	-23.71	0.003	352	70	-10.3	1.6		Moon	M45
2011/04/07	11:04:11	2.36564	48.02	0.003	343	43	-9.3	1.6		Moon	M45
2011/05/04	17:45:29	2.45323	18.87	0.003	360	16	-7.2	1.6		Moon	M45
2011/05/31	23:30:00	2.81893	-24.87	0.003	353	-10	-6.3	1.6		Moon	M45
2011/06/28	08:00:21	2.32270	68.42	0.003	347	-36	-9.0	1.6		Moon	M45
2011/07/25	16:45:58	2.81114	-20.64	0.003	357	-63	-10.1	1.6		Moon	M45
2011/08/22	00:19:19	2.87089	27.99	0.003	344	-88	-10.8	1.6		Moon	M45
2011/09/18	08:30:13	2.97522	21.58	0.003	359	-116	-11.4	1.6		Moon	M45
2011/10/15	13:48:01	3.52178	-27.15	0.003	354	-142	-12.0	1.6		Moon	M45
2011/11/11	19:47:19	3.32957	37.01	0.003	344	-169	-12.5	1.6		Moon	M45
2011/12/09	03:09:23	3.23001	21.13	0.003	360	163	-12.5	1.6		Moon	M45

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine dell'oggetto

tm = se presente, l'oggetto viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the Moon

m\* = magnitude of the object

tm = if present, the star is occulted maximum for x seconds

Vedere i dettagli sul mio sito : [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

See details on my site : [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm)

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# CONGIUNZIONI MULTIPLE PIANETI-LUNA-OGGETTI (eventi con 1 pianeta, la Luna ed un oggetto di mag<4 entro 5°) MULTIPLE CONJUNCTIONS PLANETS-MOON-OBJECTS (events with 1 planet, the Moon and an object with mag<4 within 5°)

## Geocentriche - Geocentric

Date      TT      Dmed      Dmax      emin      m2d      mmax

Questo anno non avvengono fenomeni - No phenomena this year

## Topocentriche - Topocentric      42°N - 12°E

Date      TT      Dmed      Dmax      emin      m2d      mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest body

mmax = least magnitude

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**CONGIUNZIONI MULTIPLE MISTE**  
**CERCHI MINIMI GEOCENTRICI**  
**PIANETI - LUNA - OGGETTI MESSIER**  
 (eventi con 1 pianeta, la Luna ed un oggetto di mag<4 entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**LEAST GEOCENTRIC GROUPINGS**  
**PLANETS - MOON - MESSIER OBJECTS**  
 (events with 1 planet, the Moon and an object with mag<4 within 5°)

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

Times in U.T.

# CONGIUNZIONI MULTIPLE MISTE CERCHI MINIMI TOPOCENTRICI PIANETI - LUNA - OGGETTI MESSIER

(eventi con 1 pianeta, la Luna ed un oggetto di mag<4 entro 5°)

## MULTIPLE CONJUNCTIONS LEAST TOPOCENTRIC GROUPINGS PLANETS - MOON - MESSIER OBJECTS

(events with 1 planet, the Moon and an object with mag<4 within 5°)  
42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------	-----	----	--------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# PIANETI-LUNA-STELLE IN LINEA RETTA GEOCENTRICI PLANETS-MOON-STARS IN STRAIGHT LINE GEOCENTRIC

DATE	TIMES	BODIES	C
Questo anno non avvengono fenomeni - No phenomena this year			

# PIANETI-LUNA-STELLE IN LINEA RETTA TOPOCENTRICI PLANETS-MOON-STARS IN STRAIGHT LINE TOPOCENTRIC

42°N - 12°E

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
Questo anno non avvengono fenomeni - No phenomena this year							

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora  
 Bodies = corpi  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi  
 AZ.S. = azimut del Sole, in gradi da nord  
 Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °  
 AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# PIANETI-LUNA-OGGETTI IN LINEA RETTA GEOCENTRICI

## PLANETS-MOON-OBJECTS IN STRAIGHT LINE

### GEOCENTRIC

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

# PIANETI-LUNA-OGGETTI IN LINEA RETTA

## PLANETS-MOON-STARS IN STRAIGHT LINE

### TOPOCENTRIC

42°N - 12°E

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# GEOMETRIE SPAZIALI PIANETI-LUNA-OGGETTI TRIANGOLI EQUILATERI SPATIAL GEOMETRIES PLANETS-MOON-OBJECTS EQUILATERAL TRIANGLES Geocentrici - geocentric

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

# GEOMETRIE SPAZIALI PIANETI-LUNA-OGGETTI TRIANGOLI EQUILATERI SPATIAL GEOMETRIES PLANETS-MOON-OBJECTS EQUILATERAL TRIANGLES 42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .  
Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del  $15\%$ .

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Date in the format day/month/year

Dxy = distance between the body x and y, in °

DQM = middle distance between the 4 bodies, in °

MAX = maxima distance between the 4 bodies, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .

I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than  $15\%$ .

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!



# CONGIUNZIONI LUNARI GEOCENTRICHE $<1^\circ$ CON LE PLEIADI LUNAR GEOCENTRIC CONJUNCTIONS $<1^\circ$ WITH THE PLEIADES

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)
------	----	----	----	----	---	---	----	----	-------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di  $1^\circ$  tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in  $^\circ$

e = elongation, in  $^\circ$

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than  $1^\circ$

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# CONGIUNZIONI LUNARI TOPOCENTRICHE $<1^\circ$ CON LE PLEIADI LUNAR TOPOCENTRIC CONJUNCTIONS $<1^\circ$ WITH THE PLEIADES 42°N - 12°E

Date      TT              Dm      Alt      r1    p      e      m1    m\*    tm(s)   tw(h)

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di  $1^\circ$  tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in  $^\circ$  on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in  $^\circ$

e = elongation, in  $^\circ$

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than  $1^\circ$

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# LUNA A BARCHETTA E LUNA A PONTE

## MOON LIKE A BOAT AND LIKE A BRIDGE

### ANCONA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
4/	2/	2011	17:40	189.8	3	3	-15	
4/	2/	2011	17:50	189.5	3	1	-17	
4/	2/	2011	18: 0	189.2	3	-0	-18	
5/	3/	2011	17:30	172.3	1	3	-6	
5/	3/	2011	17:40	172.5	1	1	-8	
5/	3/	2011	17:50	172.8	1	0	-10	
6/	3/	2011	17:10	186.7	3	17	-3	
6/	3/	2011	17:20	186.6	3	15	-4	
6/	3/	2011	17:30	186.5	3	14	-6	
6/	3/	2011	17:40	186.4	3	12	-8	
6/	3/	2011	17:50	186.5	3	10	-10	
6/	3/	2011	18: 0	186.5	3	8	-12	
6/	3/	2011	18:10	186.7	3	7	-13	
6/	3/	2011	18:20	186.8	3	5	-15	
6/	3/	2011	18:30	187.1	3	3	-17	
6/	3/	2011	18:40	187.3	3	1	-19	
6/	3/	2011	18:50	187.7	3	0	-21	
4/	4/	2011	18: 0	182.9	1	7	-5	
4/	4/	2011	18:10	183.5	1	5	-7	
4/	4/	2011	18:20	184.1	1	4	-9	
4/	4/	2011	18:30	184.7	1	2	-10	
4/	4/	2011	18:40	185.4	1	0	-12	
4/	4/	2011	18:50	186.2	1	-0	-14	

### AOSTA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
5/	3/	2011	17:50	174.8	1	4	-6	
5/	3/	2011	18: 0	175.0	1	2	-7	
5/	3/	2011	18:10	175.2	1	1	-9	
5/	3/	2011	18:20	175.5	1	-0	-11	
6/	3/	2011	17:30	189.2	3	18	-2	
6/	3/	2011	17:40	189.0	3	16	-4	
6/	3/	2011	17:50	188.8	3	14	-5	
6/	3/	2011	18: 0	188.8	3	13	-7	
6/	3/	2011	18:10	188.7	3	11	-9	
6/	3/	2011	18:20	188.8	3	9	-11	
6/	3/	2011	18:30	188.9	3	8	-12	
6/	3/	2011	18:40	189.0	3	6	-14	
6/	3/	2011	18:50	189.2	3	4	-16	
6/	3/	2011	19: 0	189.4	3	3	-18	
6/	3/	2011	19:10	189.7	4	1	-19	
4/	4/	2011	18:20	185.1	1	8	-4	
4/	4/	2011	18:30	185.6	1	7	-6	
4/	4/	2011	18:40	186.1	1	5	-7	
4/	4/	2011	18:50	186.7	1	4	-9	
4/	4/	2011	19: 0	187.4	1	2	-11	
4/	4/	2011	19:10	188.1	1	0	-12	
4/	4/	2011	19:20	188.8	1	-0	-14	

### BARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
4/	2/	2011	16:30	189.9	2	13	-4	
4/	2/	2011	16:40	189.3	2	11	-6	
4/	2/	2011	16:50	188.8	3	10	-8	
4/	2/	2011	17: 0	188.3	3	8	-9	
4/	2/	2011	17:10	187.9	3	6	-11	
4/	2/	2011	17:20	187.5	3	4	-13	
4/	2/	2011	17:30	187.1	3	2	-15	
4/	2/	2011	17:40	186.9	3	1	-17	
4/	2/	2011	17:50	186.6	3	-0	-19	
5/	2/	2011	18:20	189.9	7	4	-24	
5/	2/	2011	18:30	189.8	7	2	-26	
5/	2/	2011	18:40	189.7	7	0	-28	
5/	2/	2011	18:50	189.7	7	-0	-30	
5/	3/	2011	17:40	170.1	1	-0	-11	
6/	3/	2011	17: 0	184.0	3	17	-3	
6/	3/	2011	17:10	183.9	3	15	-5	
6/	3/	2011	17:20	183.8	3	13	-7	
6/	3/	2011	17:30	183.8	3	11	-9	
6/	3/	2011	17:40	183.9	3	9	-11	
6/	3/	2011	17:50	184.0	3	8	-12	
6/	3/	2011	18: 0	184.1	3	6	-14	
6/	3/	2011	18:10	184.3	3	4	-16	
6/	3/	2011	18:20	184.6	3	2	-18	
6/	3/	2011	18:30	184.9	3	0	-20	

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
7/	3/	2011	17:10	189.7	7	25	-5	
7/	3/	2011	17:20	189.5	7	23	-7	
7/	3/	2011	17:30	189.4	7	22	-8	
7/	3/	2011	17:40	189.3	7	20	-10	
7/	3/	2011	17:50	189.2	7	18	-12	
7/	3/	2011	18: 0	189.3	7	16	-14	
7/	3/	2011	18:10	189.4	8	14	-16	
7/	3/	2011	18:20	189.5	8	13	-18	
7/	3/	2011	18:30	189.7	8	11	-20	
7/	3/	2011	18:40	189.9	8	9	-22	
4/	4/	2011	17:40	179.9	1	8	-5	
4/	4/	2011	17:50	180.5	1	6	-6	
4/	4/	2011	18: 0	181.1	1	4	-8	
4/	4/	2011	18:10	181.7	1	2	-10	
4/	4/	2011	18:20	182.4	1	1	-12	
4/	4/	2011	18:30	183.2	1	-0	-14	
5/	4/	2011	16:30	189.8	4	31	8	
5/	4/	2011	16:40	189.8	4	29	6	
5/	4/	2011	16:50	189.8	4	27	4	
5/	4/	2011	17: 0	189.9	4	25	2	
31/	8/	2011	7: 0	350.0	7	-0	29	

### BOLOGNA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
5/	3/	2011	17:40	173.4	1	3	-7	
5/	3/	2011	17:50	173.6	1	1	-9	
5/	3/	2011	18: 0	173.8	1	0	-10	
6/	3/	2011	17:20	187.7	3	17	-3	
6/	3/	2011	17:30	187.5	3	15	-5	
6/	3/	2011	17:40	187.4	3	13	-6	
6/	3/	2011	17:50	187.4	3	12	-8	
6/	3/	2011	18: 0	187.4	3	10	-10	
6/	3/	2011	18:10	187.5	3	8	-12	
6/	3/	2011	18:20	187.6	3	6	-14	
6/	3/	2011	18:30	187.8	3	5	-15	
6/	3/	2011	18:40	188.0	3	3	-17	
6/	3/	2011	18:50	188.3	3	1	-19	
6/	3/	2011	19: 0	188.6	3	0	-21	
4/	4/	2011	18:10	184.0	1	7	-5	
4/	4/	2011	18:20	184.5	1	5	-7	
4/	4/	2011	18:30	185.1	1	4	-9	
4/	4/	2011	18:40	185.7	1	2	-10	
4/	4/	2011	18:50	186.4	1	0	-12	
4/	4/	2011	19: 0	187.2	1	-0	-14	

### CAGLIARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
4/	2/	2011	17: 0	188.3	3	14	-3	
4/	2/	2011	17:10	187.7	3	12	-5	
4/	2/	2011	17:20	187.1	3	10	-7	
4/	2/	2011	17:30	186.6	3	9	-9	
4/	2/	2011	17:40	186.2	3	7	-11	
4/	2/	2011	17:50	185.8	3	5	-13	
4/	2/	2011	18: 0	185.4	3	3	-15	
4/	2/	2011	18:10	185.1	3	1	-16	
4/	2/	2011	18:20	184.9	3	0	-18	
5/	2/	2011	18: 0	189.6	7	14	-14	
5/	2/	2011	18:10	189.2	7	12	-16	
5/	2/	2011	18:20	188.8	7	10	-18	
5/	2/	2011	18:30	188.5	7	8	-20	
5/	2/	2011	18:40	188.3	7	7	-22	
5/	2/	2011	18:50	188.1	7	5	-24	
5/	2/	2011	19: 0	187.9	7	3	-26	
5/	2/	2011	19:10	187.8	7	1	-28	
5/	2/	2011	19:20	187.8	7	-0	-30	
6/	2/	2011	19:10	189.8	12	12	-28	
6/	2/	2011	19:20	189.7	12	10	-30	
6/	2/	2011	19:30	189.6	12	8	-32	
6/	2/	2011	19:40	189.6	12	6	-33	
6/	2/	2011	19:50	189.6	12	4	-35	
6/	2/	2011	20: 0	189.7	12	2	-37	
6/	2/	2011	20:10	189.8	12	0	-39	
6/	3/	2011	17:30	182.2	3	17	-3	
6/	3/	2011	17:40	182.1	3	15	-5	
6/	3/	2011	17:50	182.0	3	13	-7	
6/	3/	2011	18: 0	182.0	3	12	-9	
6/	3/	2011	18:10	182.1	3	10	-10	
6/	3/	2011	18:20	182.2	3	8	-12	

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
6/ 3/2011	18:30	182.4	3	6	-14	4/ 4/2011	18:20	182.3	1	2	-10
6/ 3/2011	18:40	182.6	3	4	-16	4/ 4/2011	18:30	183.0	1	1	-12
6/ 3/2011	18:50	182.8	3	2	-18	4/ 4/2011	18:40	183.8	1	-0	-14
6/ 3/2011	19: 0	183.1	3	0	-20	CATANZARO					
6/ 3/2011	19:10	183.5	4	-1	-22	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
7/ 3/2011	16:50	189.8	7	35	4	4/ 2/2011	16:30	187.9	2	14	-3
7/ 3/2011	17: 0	189.2	7	33	2	4/ 2/2011	16:40	187.3	2	12	-5
7/ 3/2011	17:10	188.7	7	31	0	4/ 2/2011	16:50	186.7	3	10	-7
7/ 3/2011	17:20	188.3	7	30	-1	4/ 2/2011	17: 0	186.2	3	9	-9
7/ 3/2011	17:30	188.0	7	28	-3	4/ 2/2011	17:10	185.7	3	7	-11
7/ 3/2011	17:40	187.7	7	26	-4	4/ 2/2011	17:20	185.3	3	5	-13
7/ 3/2011	17:50	187.5	7	24	-6	4/ 2/2011	17:30	185.0	3	3	-14
7/ 3/2011	18: 0	187.4	7	22	-8	4/ 2/2011	17:40	184.7	3	1	-16
7/ 3/2011	18:10	187.3	8	20	-10	4/ 2/2011	17:50	184.5	3	-0	-18
7/ 3/2011	18:20	187.3	8	18	-12	5/ 2/2011	17:20	189.7	6	16	-12
7/ 3/2011	18:30	187.4	8	17	-14	5/ 2/2011	17:30	189.2	6	14	-14
7/ 3/2011	18:40	187.5	8	15	-16	5/ 2/2011	17:40	188.8	6	12	-16
7/ 3/2011	18:50	187.6	8	13	-18	5/ 2/2011	17:50	188.4	6	10	-18
7/ 3/2011	19: 0	187.8	8	11	-20	5/ 2/2011	18: 0	188.1	7	8	-20
7/ 3/2011	19:10	188.1	8	9	-22	5/ 2/2011	18:10	187.9	7	6	-22
7/ 3/2011	19:20	188.4	8	7	-24	5/ 2/2011	18:20	187.7	7	5	-24
7/ 3/2011	19:30	188.7	8	5	-26	5/ 2/2011	18:30	187.6	7	3	-26
7/ 3/2011	19:40	189.1	8	4	-27	5/ 2/2011	18:40	187.5	7	1	-28
7/ 3/2011	19:50	189.6	8	2	-29	5/ 2/2011	18:50	187.5	7	-0	-30
4/ 4/2011	18:10	178.4	1	8	-5	6/ 2/2011	18:20	189.8	12	15	-24
4/ 4/2011	18:20	179.0	1	6	-7	6/ 2/2011	18:30	189.6	12	13	-26
4/ 4/2011	18:30	179.6	1	4	-9	6/ 2/2011	18:40	189.4	12	11	-28
4/ 4/2011	18:40	180.2	1	2	-10	6/ 2/2011	18:50	189.3	12	10	-30
4/ 4/2011	18:50	180.9	1	0	-12	6/ 2/2011	19: 0	189.2	12	8	-32
4/ 4/2011	19: 0	181.7	1	-1	-14	6/ 2/2011	19:10	189.2	12	6	-33
5/ 4/2011	16:30	188.2	4	37	14	6/ 2/2011	19:20	189.3	12	4	-35
5/ 4/2011	16:40	188.0	4	35	12	6/ 2/2011	19:30	189.4	12	2	-37
5/ 4/2011	16:50	187.8	4	33	10	6/ 2/2011	19:40	189.5	12	0	-39
5/ 4/2011	17: 0	187.8	4	31	8	6/ 3/2011	17: 0	181.7	3	17	-3
5/ 4/2011	17:10	187.8	4	29	6	6/ 3/2011	17:10	181.6	3	15	-5
5/ 4/2011	17:20	187.8	4	27	4	6/ 3/2011	17:20	181.6	3	13	-7
5/ 4/2011	17:30	188.0	4	25	2	6/ 3/2011	17:30	181.6	3	11	-8
5/ 4/2011	17:40	188.1	4	24	0	6/ 3/2011	17:40	181.6	3	10	-10
5/ 4/2011	17:50	188.4	4	22	-1	6/ 3/2011	17:50	181.7	3	8	-12
5/ 4/2011	18: 0	188.7	4	20	-3	6/ 3/2011	18: 0	181.9	3	6	-14
5/ 4/2011	18:10	189.0	4	18	-5	6/ 3/2011	18:10	182.1	3	4	-16
5/ 4/2011	18:20	189.4	4	16	-6	6/ 3/2011	18:20	182.4	3	2	-18
5/ 4/2011	18:30	189.8	4	14	-8	6/ 3/2011	18:30	182.7	3	0	-20
2/ 8/2011	7:30	350.6	9	0	34	7/ 3/2011	16:10	189.9	7	37	6
2/ 8/2011	7:40	350.6	9	2	36	7/ 3/2011	16:20	189.3	7	35	4
2/ 8/2011	7:50	350.6	9	4	38	7/ 3/2011	16:30	188.7	7	33	2
2/ 8/2011	8: 0	350.5	9	6	40	7/ 3/2011	16:40	188.3	7	31	1
2/ 8/2011	8:10	350.4	9	7	42	7/ 3/2011	16:50	187.9	7	29	-1
2/ 8/2011	8:20	350.2	9	9	44	7/ 3/2011	17: 0	187.5	7	28	-2
31/ 8/2011	7:30	351.9	7	-0	30	7/ 3/2011	17:10	187.3	7	26	-4
31/ 8/2011	7:40	351.5	7	1	31	7/ 3/2011	17:20	187.1	7	24	-6
31/ 8/2011	7:50	351.1	7	3	33	7/ 3/2011	17:30	187.0	7	22	-8
31/ 8/2011	8: 0	350.6	7	4	35	7/ 3/2011	17:40	186.9	7	20	-10
31/ 8/2011	8:10	350.1	7	6	37	7/ 3/2011	17:50	186.9	7	18	-12
CAMPOBASSO						7/ 3/2011	18: 0	187.0	7	16	-14
GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.	7/ 3/2011	18:10	187.1	8	15	-16
4/ 2/2011	16:50	189.7	3	11	-6	7/ 3/2011	18:20	187.2	8	13	-18
4/ 2/2011	17: 0	189.2	3	9	-8	7/ 3/2011	18:30	187.4	8	11	-20
4/ 2/2011	17:10	188.7	3	8	-10	7/ 3/2011	18:40	187.7	8	9	-22
4/ 2/2011	17:20	188.3	3	6	-12	7/ 3/2011	18:50	188.0	8	7	-24
4/ 2/2011	17:30	187.9	3	4	-13	7/ 3/2011	19: 0	188.3	8	5	-26
4/ 2/2011	17:40	187.6	3	2	-15	7/ 3/2011	19:10	188.7	8	3	-27
4/ 2/2011	17:50	187.3	3	0	-17	7/ 3/2011	19:20	189.2	8	2	-29
4/ 2/2011	18: 0	187.1	3	-0	-19	7/ 3/2011	19:30	189.7	8	0	-31
5/ 3/2011	17:30	170.3	1	2	-7	4/ 4/2011	17:40	177.7	1	7	-5
5/ 3/2011	17:40	170.5	1	1	-9	4/ 4/2011	17:50	178.3	1	5	-7
5/ 3/2011	17:50	170.8	1	-0	-11	4/ 4/2011	18: 0	178.9	1	4	-9
6/ 3/2011	17:10	184.5	3	16	-3	4/ 4/2011	18:10	179.5	1	2	-10
6/ 3/2011	17:20	184.4	3	15	-5	4/ 4/2011	18:20	180.3	1	0	-12
6/ 3/2011	17:30	184.3	3	13	-7	5/ 4/2011	16:30	187.2	4	31	8
6/ 3/2011	17:40	184.3	3	11	-9	5/ 4/2011	16:40	187.3	4	29	6
6/ 3/2011	17:50	184.4	3	9	-11	5/ 4/2011	16:50	187.3	4	27	4
6/ 3/2011	18: 0	184.5	3	7	-13	5/ 4/2011	17: 0	187.5	4	25	2
6/ 3/2011	18:10	184.6	3	6	-15	5/ 4/2011	17:10	187.6	4	23	0
6/ 3/2011	18:20	184.8	3	4	-16	5/ 4/2011	17:20	187.9	4	22	-1
6/ 3/2011	18:30	185.1	3	2	-18	5/ 4/2011	17:30	188.2	4	20	-3
6/ 3/2011	18:40	185.4	3	0	-20	5/ 4/2011	17:40	188.5	4	18	-5
7/ 3/2011	17:40	189.8	7	21	-9	5/ 4/2011	17:50	188.9	4	16	-7
7/ 3/2011	17:50	189.8	7	20	-11	5/ 4/2011	18: 0	189.3	4	14	-8
7/ 3/2011	18: 0	189.7	7	18	-12	5/ 4/2011	18:10	189.8	4	12	-10
7/ 3/2011	18:10	189.8	8	16	-14	2/ 8/2011	7: 0	351.0	9	0	34
7/ 3/2011	18:20	189.8	8	14	-16	2/ 8/2011	7:10	351.0	9	2	36
4/ 4/2011	17:50	180.5	1	8	-5	2/ 8/2011	7:20	350.9	9	4	38
4/ 4/2011	18: 0	181.1	1	6	-7	2/ 8/2011	7:30	350.9	9	6	40
4/ 4/2011	18:10	181.7	1	4	-8	2/ 8/2011	7:40	350.7	9	8	42
						2/ 8/2011	7:50	350.5	9	10	44
						2/ 8/2011	8: 0	350.3	9	11	46

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
2/ 8/2011	8:10	350.0	9	13	47
31/ 8/2011	7: 0	352.3	7	-0	30
31/ 8/2011	7:10	351.9	7	1	31
31/ 8/2011	7:20	351.5	7	3	33
31/ 8/2011	7:30	351.0	7	5	35
31/ 8/2011	7:40	350.5	7	7	37

# FIRENZE

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 2/2011	17:50	189.9	3	3	-15
4/ 2/2011	18: 0	189.6	3	1	-17
4/ 2/2011	18:10	189.4	3	-0	-19
5/ 3/2011	17:40	172.6	1	3	-7
5/ 3/2011	17:50	172.8	1	1	-8
5/ 3/2011	18: 0	173.1	1	0	-10
6/ 3/2011	17:20	186.9	3	17	-3
6/ 3/2011	17:30	186.8	3	15	-5
6/ 3/2011	17:40	186.7	3	13	-6
6/ 3/2011	17:50	186.6	3	12	-8
6/ 3/2011	18: 0	186.7	3	10	-10
6/ 3/2011	18:10	186.7	3	8	-12
6/ 3/2011	18:20	186.9	3	6	-14
6/ 3/2011	18:30	187.0	3	5	-15
6/ 3/2011	18:40	187.3	3	3	-17
6/ 3/2011	18:50	187.5	3	1	-19
6/ 3/2011	19: 0	187.9	3	0	-21

4/ 4/2011	18: 0	182.7	1	9	-4
4/ 4/2011	18:10	183.2	1	7	-5
4/ 4/2011	18:20	183.8	1	5	-7
4/ 4/2011	18:30	184.4	1	4	-9
4/ 4/2011	18:40	185.0	1	2	-11
4/ 4/2011	18:50	185.7	1	0	-12
4/ 4/2011	19: 0	186.5	1	-0	-14

# GENOVA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
5/ 3/2011	17:50	173.5	1	3	-7
5/ 3/2011	18: 0	173.7	1	1	-9
5/ 3/2011	18:10	173.9	1	0	-10
6/ 3/2011	17:30	187.6	3	17	-3
6/ 3/2011	17:40	187.5	3	15	-5
6/ 3/2011	17:50	187.4	3	13	-7
6/ 3/2011	18: 0	187.4	3	12	-8
6/ 3/2011	18:10	187.4	3	10	-10
6/ 3/2011	18:20	187.5	3	8	-12
6/ 3/2011	18:30	187.6	3	6	-14
6/ 3/2011	18:40	187.8	3	5	-15
6/ 3/2011	18:50	188.0	3	3	-17
6/ 3/2011	19: 0	188.3	3	1	-19
6/ 3/2011	19:10	188.6	4	0	-21
4/ 4/2011	18:10	183.5	1	9	-4
4/ 4/2011	18:20	184.0	1	7	-5
4/ 4/2011	18:30	184.6	1	5	-7
4/ 4/2011	18:40	185.2	1	4	-9
4/ 4/2011	18:50	185.8	1	2	-10
4/ 4/2011	19: 0	186.5	1	0	-12
4/ 4/2011	19:10	187.3	1	-0	-14

# L AQUILA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 2/2011	17:10	189.7	3	8	-9
4/ 2/2011	17:20	189.3	3	6	-11
4/ 2/2011	17:30	188.9	3	5	-13
4/ 2/2011	17:40	188.5	3	3	-14
4/ 2/2011	17:50	188.2	3	1	-16
4/ 2/2011	18: 0	188.0	3	0	-18
5/ 3/2011	17:30	171.0	1	3	-6
5/ 3/2011	17:40	171.3	1	1	-8
5/ 3/2011	17:50	171.5	1	0	-10
6/ 3/2011	17:10	185.4	3	17	-2
6/ 3/2011	17:20	185.3	3	15	-4
6/ 3/2011	17:30	185.2	3	14	-6
6/ 3/2011	17:40	185.2	3	12	-8
6/ 3/2011	17:50	185.2	3	10	-10
6/ 3/2011	18: 0	185.3	3	8	-12
6/ 3/2011	18:10	185.4	3	7	-14
6/ 3/2011	18:20	185.6	3	5	-15
6/ 3/2011	18:30	185.8	3	3	-17
6/ 3/2011	18:40	186.1	3	1	-19
6/ 3/2011	18:50	186.4	3	0	-21
4/ 4/2011	17:50	181.1	1	9	-4
4/ 4/2011	18: 0	181.7	1	7	-5
4/ 4/2011	18:10	182.2	1	5	-7
4/ 4/2011	18:20	182.8	1	3	-9

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 4/2011	18:30	183.5	1	2	-11
4/ 4/2011	18:40	184.2	1	0	-13

# MILANO

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
5/ 3/2011	17:50	174.5	1	3	-7
5/ 3/2011	18: 0	174.7	1	1	-9
5/ 3/2011	18:10	175.0	1	-0	-10
6/ 3/2011	17:30	188.7	3	16	-3
6/ 3/2011	17:40	188.5	3	15	-5
6/ 3/2011	17:50	188.4	3	13	-7
6/ 3/2011	18: 0	188.4	3	11	-9
6/ 3/2011	18:10	188.4	3	10	-10
6/ 3/2011	18:20	188.5	3	8	-12
6/ 3/2011	18:30	188.6	3	6	-14
6/ 3/2011	18:40	188.8	3	5	-16
6/ 3/2011	18:50	189.0	3	3	-17
6/ 3/2011	19: 0	189.3	3	1	-19
6/ 3/2011	19:10	189.7	4	0	-21
4/ 4/2011	18:20	185.1	1	7	-5
4/ 4/2011	18:30	185.6	1	5	-7
4/ 4/2011	18:40	186.2	1	4	-9
4/ 4/2011	18:50	186.9	1	2	-10
4/ 4/2011	19: 0	187.5	1	1	-12
4/ 4/2011	19:10	188.3	1	-0	-14

# NAPOLI

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 2/2011	16:40	189.8	2	13	-4
4/ 2/2011	16:50	189.2	3	11	-6
4/ 2/2011	17: 0	188.6	3	10	-7
4/ 2/2011	17:10	188.1	3	8	-9
4/ 2/2011	17:20	187.7	3	6	-11
4/ 2/2011	17:30	187.3	3	4	-13
4/ 2/2011	17:40	186.9	3	3	-15
4/ 2/2011	17:50	186.7	3	1	-17
4/ 2/2011	18: 0	186.4	3	-0	-19
5/ 2/2011	18:20	189.9	7	6	-22
5/ 2/2011	18:30	189.7	7	4	-24
5/ 2/2011	18:40	189.5	7	2	-26
5/ 2/2011	18:50	189.4	7	1	-28
5/ 2/2011	19: 0	189.4	7	-0	-30
5/ 3/2011	17:50	170.0	1	-0	-11
6/ 3/2011	17:10	183.8	3	17	-3
6/ 3/2011	17:20	183.7	3	15	-5
6/ 3/2011	17:30	183.6	3	13	-7
6/ 3/2011	17:40	183.6	3	11	-9
6/ 3/2011	17:50	183.7	3	10	-11
6/ 3/2011	18: 0	183.8	3	8	-12
6/ 3/2011	18:10	183.9	3	6	-14
6/ 3/2011	18:20	184.1	3	4	-16
6/ 3/2011	18:30	184.4	3	2	-18
6/ 3/2011	18:40	184.7	3	0	-20
6/ 3/2011	18:50	185.0	3	-0	-22

7/ 3/2011	17:10	189.7	7	27	-3
7/ 3/2011	17:20	189.5	7	25	-5
7/ 3/2011	17:30	189.3	7	24	-7
7/ 3/2011	17:40	189.1	7	22	-8
7/ 3/2011	17:50	189.0	7	20	-10
7/ 3/2011	18: 0	189.0	7	18	-12
7/ 3/2011	18:10	189.0	8	16	-14
7/ 3/2011	18:20	189.1	8	15	-16
7/ 3/2011	18:30	189.2	8	13	-18
7/ 3/2011	18:40	189.4	8	11	-20
7/ 3/2011	18:50	189.7	8	9	-22

4/ 4/2011	17:50	179.8	1	8	-5
4/ 4/2011	18: 0	180.3	1	6	-6
4/ 4/2011	18:10	180.9	1	4	-8
4/ 4/2011	18:20	181.6	1	2	-10
4/ 4/2011	18:30	182.3	1	1	-12
4/ 4/2011	18:40	183.0	1	-0	-14

5/ 4/2011	16:30	189.7	4	33	10
5/ 4/2011	16:40	189.6	4	31	8
5/ 4/2011	16:50	189.6	4	29	6
5/ 4/2011	17: 0	189.6	4	27	4
5/ 4/2011	17:10	189.7	4	25	2
5/ 4/2011	17:20	189.8	4	23	0

31/ 8/2011	7:10	350.3	7	-0	29

## PALERMO

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 2/2011	16:40	187.4	2	15	-2
4/ 2/2011	16:50	186.8	3	13	-4
4/ 2/2011	17: 0	186.2	3	11	-6
4/ 2/2011	17:10	185.6	3	9	-8
4/ 2/2011	17:20	185.2	3	8	-10
4/ 2/2011	17:30	184.8	3	6	-12
4/ 2/2011	17:40	184.4	3	4	-14
4/ 2/2011	17:50	184.1	3	2	-16
4/ 2/2011	18: 0	183.8	3	0	-18
5/ 2/2011	17:20	189.7	6	18	-10
5/ 2/2011	17:30	189.1	6	16	-12
5/ 2/2011	17:40	188.6	6	15	-14
5/ 2/2011	17:50	188.2	6	13	-16
5/ 2/2011	18: 0	187.8	7	11	-17
5/ 2/2011	18:10	187.5	7	9	-19
5/ 2/2011	18:20	187.2	7	7	-21
5/ 2/2011	18:30	187.0	7	5	-23
5/ 2/2011	18:40	186.9	7	3	-25
5/ 2/2011	18:50	186.8	7	1	-27
5/ 2/2011	19: 0	186.7	7	0	-29
6/ 2/2011	18:10	189.8	12	20	-19
6/ 2/2011	18:20	189.5	12	18	-21
6/ 2/2011	18:30	189.1	12	16	-23
6/ 2/2011	18:40	188.9	12	14	-25
6/ 2/2011	18:50	188.7	12	12	-27
6/ 2/2011	19: 0	188.6	12	10	-29
6/ 2/2011	19:10	188.5	12	8	-31
6/ 2/2011	19:20	188.5	12	6	-33
6/ 2/2011	19:30	188.5	12	5	-35
6/ 2/2011	19:40	188.6	12	3	-37
6/ 2/2011	19:50	188.7	12	1	-39
6/ 2/2011	20: 0	188.9	12	-0	-41
7/ 2/2011	19:20	189.9	19	17	-33
7/ 2/2011	19:30	189.9	19	15	-35
7/ 2/2011	19:40	189.9	19	13	-37
7/ 2/2011	19:50	189.9	19	11	-39
6/ 3/2011	17:10	181.0	3	18	-2
6/ 3/2011	17:20	180.9	3	16	-4
6/ 3/2011	17:30	180.8	3	14	-6
6/ 3/2011	17:40	180.8	3	12	-8
6/ 3/2011	17:50	180.9	3	10	-10
6/ 3/2011	18: 0	181.0	3	8	-12
6/ 3/2011	18:10	181.1	3	6	-14
6/ 3/2011	18:20	181.3	3	4	-16
6/ 3/2011	18:30	181.6	3	3	-18
6/ 3/2011	18:40	181.9	3	1	-20
6/ 3/2011	18:50	182.2	3	-0	-22
7/ 3/2011	16:20	189.3	7	38	7
7/ 3/2011	16:30	188.6	7	36	5
7/ 3/2011	16:40	188.0	7	34	3
7/ 3/2011	16:50	187.5	7	32	1
7/ 3/2011	17: 0	187.1	7	30	-0
7/ 3/2011	17:10	186.8	7	28	-2
7/ 3/2011	17:20	186.5	7	26	-4
7/ 3/2011	17:30	186.4	7	25	-6
7/ 3/2011	17:40	186.2	7	23	-8
7/ 3/2011	17:50	186.1	7	21	-10
7/ 3/2011	18: 0	186.1	7	19	-12
7/ 3/2011	18:10	186.2	8	17	-14
7/ 3/2011	18:20	186.3	8	15	-16
7/ 3/2011	18:30	186.4	8	13	-18
7/ 3/2011	18:40	186.6	8	11	-20
7/ 3/2011	18:50	186.9	8	9	-21
7/ 3/2011	19: 0	187.1	8	8	-23
7/ 3/2011	19:10	187.5	8	6	-25
7/ 3/2011	19:20	187.9	8	4	-27
7/ 3/2011	19:30	188.3	8	2	-29
7/ 3/2011	19:40	188.8	8	0	-31
8/ 3/2011	17:50	189.9	13	31	-10
8/ 3/2011	18: 0	189.7	13	30	-11
8/ 3/2011	18:10	189.6	13	28	-13
8/ 3/2011	18:20	189.6	13	26	-15
8/ 3/2011	18:30	189.6	13	24	-17
8/ 3/2011	18:40	189.7	13	22	-19
8/ 3/2011	18:50	189.9	13	20	-21
4/ 4/2011	17:50	177.0	1	8	-4
4/ 4/2011	18: 0	177.5	1	6	-6
4/ 4/2011	18:10	178.1	1	4	-8
4/ 4/2011	18:20	178.8	1	2	-10
4/ 4/2011	18:30	179.5	1	0	-12
4/ 4/2011	18:40	180.2	1	-0	-14
5/ 4/2011	16:30	186.5	4	33	11
5/ 4/2011	16:40	186.4	4	32	9
5/ 4/2011	16:50	186.4	4	30	7
5/ 4/2011	17: 0	186.5	4	28	5
5/ 4/2011	17:10	186.6	4	26	3

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
5/ 4/2011	17:20	186.8	4	24	1
5/ 4/2011	17:30	187.0	4	22	-0
5/ 4/2011	17:40	187.3	4	20	-2
5/ 4/2011	17:50	187.7	4	18	-4
5/ 4/2011	18: 0	188.0	4	16	-6
5/ 4/2011	18:10	188.5	4	15	-8
5/ 4/2011	18:20	188.9	4	13	-10
5/ 4/2011	18:30	189.4	4	11	-12

2/ 8/2011	7:10	351.7	9	0	34
2/ 8/2011	7:20	351.7	9	1	35
2/ 8/2011	7:30	351.7	9	3	37
2/ 8/2011	7:40	351.6	9	5	39
2/ 8/2011	7:50	351.5	9	7	41
2/ 8/2011	8: 0	351.3	9	9	43
2/ 8/2011	8:10	351.1	9	11	45
2/ 8/2011	8:20	350.8	9	13	47
2/ 8/2011	8:30	350.5	9	15	49
2/ 8/2011	8:40	350.1	9	16	51
31/ 8/2011	7:10	353.1	7	-0	29
31/ 8/2011	7:20	352.7	7	1	31
31/ 8/2011	7:30	352.3	7	2	33
31/ 8/2011	7:40	351.8	7	4	35
31/ 8/2011	7:50	351.3	7	6	37
31/ 8/2011	8: 0	350.8	7	8	39
31/ 8/2011	8:10	350.1	7	10	40

## PERUGIA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 2/2011	17:30	189.8	3	5	-12
4/ 2/2011	17:40	189.4	3	4	-14
4/ 2/2011	17:50	189.1	3	2	-16
4/ 2/2011	18: 0	188.9	3	0	-17

5/ 3/2011	17:30	171.8	1	4	-6
5/ 3/2011	17:40	172.0	1	2	-7
5/ 3/2011	17:50	172.2	1	0	-9
5/ 3/2011	18: 0	172.5	1	-0	-11

6/ 3/2011	17:10	186.3	3	18	-2
6/ 3/2011	17:20	186.1	3	16	-4
6/ 3/2011	17:30	186.0	3	14	-5
6/ 3/2011	17:40	186.0	3	13	-7
6/ 3/2011	17:50	185.9	3	11	-9
6/ 3/2011	18: 0	186.0	3	9	-11
6/ 3/2011	18:10	186.1	3	7	-13
6/ 3/2011	18:20	186.3	3	6	-15
6/ 3/2011	18:30	186.5	3	4	-16
6/ 3/2011	18:40	186.7	3	2	-18
6/ 3/2011	18:50	187.0	3	0	-20
6/ 3/2011	19: 0	187.4	3	-0	-22

4/ 4/2011	18: 0	182.2	1	8	-5
4/ 4/2011	18:10	182.8	1	6	-6
4/ 4/2011	18:20	183.4	1	4	-8
4/ 4/2011	18:30	184.0	1	3	-10
4/ 4/2011	18:40	184.7	1	1	-12
4/ 4/2011	18:50	185.4	1	-0	-13

## POTENZA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
4/ 2/2011	16:30	189.8	2	14	-3
4/ 2/2011	16:40	189.1	2	12	-5
4/ 2/2011	16:50	188.6	3	10	-7
4/ 2/2011	17: 0	188.0	3	9	-9
4/ 2/2011	17:10	187.6	3	7	-10
4/ 2/2011	17:20	187.2	3	5	-12
4/ 2/2011	17:30	186.8	3	3	-14
4/ 2/2011	17:40	186.5	3	2	-16
4/ 2/2011	17:50	186.3	3	0	-18

5/ 2/2011	18:10	189.7	7	7	-21
5/ 2/2011	18:20	189.5	7	5	-23
5/ 2/2011	18:30	189.3	7	3	-25
5/ 2/2011	18:40	189.2	7	1	-27
5/ 2/2011	18:50	189.2	7	-0	-29

6/ 3/2011	17: 0	183.6	3	17	-2
6/ 3/2011	17:10	183.5	3	16	-4
6/ 3/2011	17:20	183.4	3	14	-6
6/ 3/2011	17:30	183.3	3	12	-8
6/ 3/2011	17:40	183.4	3	10	-10
6/ 3/2011	17:50	183.5	3	8	-12
6/ 3/2011	18: 0	183.6	3	7	-14
6/ 3/2011	18:10	183.8	3	5	-15
6/ 3/2011	18:20	184.0	3	3	-17
6/ 3/2011	18:30	184.3	3	1	-19
6/ 3/2011	18:40	184.7	3	-0	-21

7/ 3/2011	17: 0	189.6	7	28	-2
7/ 3/2011	17:10	189.3	7	26	-4
7/ 3/2011	17:20	189.1	7	24	-6
7/ 3/2011	17:30	188.9	7	23	-8

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
7/	3/2011	17:40	188.8	7	21	-10		
7/	3/2011	17:50	188.8	7	19	-11		
7/	3/2011	18: 0	188.8	7	17	-13		
7/	3/2011	18:10	188.8	8	15	-15		
7/	3/2011	18:20	188.9	8	13	-17		
7/	3/2011	18:30	189.1	8	12	-19		
7/	3/2011	18:40	189.3	8	10	-21		
7/	3/2011	18:50	189.6	8	8	-23		
7/	3/2011	19: 0	189.9	8	6	-25		
4/	4/2011	17:40	179.3	1	8	-4		
4/	4/2011	17:50	179.8	1	6	-6		
4/	4/2011	18: 0	180.4	1	5	-8		
4/	4/2011	18:10	181.0	1	3	-9		
4/	4/2011	18:20	181.7	1	1	-11		
4/	4/2011	18:30	182.4	1	-0	-13		
5/	4/2011	16:30	189.3	4	31	9		
5/	4/2011	16:40	189.3	4	30	7		
5/	4/2011	16:50	189.3	4	28	5		
5/	4/2011	17: 0	189.4	4	26	3		
5/	4/2011	17:10	189.5	4	24	1		
5/	4/2011	17:20	189.7	4	22	-0		
5/	4/2011	17:30	189.9	4	20	-2		
31/	8/2011	7:10	350.3	7	0	30		

#### ROMA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
4/	2/2011	17:10	189.5	3	9	-8		
4/	2/2011	17:20	189.0	3	7	-10		
4/	2/2011	17:30	188.6	3	6	-12		
4/	2/2011	17:40	188.3	3	4	-14		
4/	2/2011	17:50	187.9	3	2	-16		
4/	2/2011	18: 0	187.7	3	0	-17		
5/	3/2011	17:30	170.6	1	4	-6		
5/	3/2011	17:40	170.8	1	2	-7		
5/	3/2011	17:50	171.0	1	0	-9		
5/	3/2011	18: 0	171.3	1	-1	-11		
6/	3/2011	17:10	185.1	3	18	-2		
6/	3/2011	17:20	184.9	3	16	-4		
6/	3/2011	17:30	184.8	3	14	-5		
6/	3/2011	17:40	184.7	3	13	-7		
6/	3/2011	17:50	184.7	3	11	-9		
6/	3/2011	18: 0	184.8	3	9	-11		
6/	3/2011	18:10	184.9	3	7	-13		
6/	3/2011	18:20	185.1	3	5	-15		
6/	3/2011	18:30	185.3	3	4	-17		
6/	3/2011	18:40	185.5	3	2	-18		
6/	3/2011	18:50	185.9	3	0	-20		
4/	4/2011	18: 0	181.1	1	7	-5		
4/	4/2011	18:10	181.6	1	6	-7		
4/	4/2011	18:20	182.2	1	4	-8		
4/	4/2011	18:30	182.9	1	2	-10		
4/	4/2011	18:40	183.6	1	1	-12		
4/	4/2011	18:50	184.3	1	-0	-14		

#### TORINO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
5/	3/2011	17:50	174.1	1	4	-6		
5/	3/2011	18: 0	174.3	1	2	-8		
5/	3/2011	18:10	174.5	1	0	-9		
5/	3/2011	18:20	174.8	1	-0	-11		
6/	3/2011	17:30	188.4	3	18	-2		
6/	3/2011	17:40	188.3	3	16	-4		
6/	3/2011	17:50	188.1	3	14	-6		
6/	3/2011	18: 0	188.1	3	12	-7		
6/	3/2011	18:10	188.1	3	11	-9		
6/	3/2011	18:20	188.1	3	9	-11		
6/	3/2011	18:30	188.2	3	7	-13		
6/	3/2011	18:40	188.3	3	6	-15		
6/	3/2011	18:50	188.5	3	4	-16		
6/	3/2011	19: 0	188.8	3	2	-18		
6/	3/2011	19:10	189.1	4	1	-20		
6/	3/2011	19:20	189.4	4	-0	-21		
4/	4/2011	18:20	184.5	1	8	-4		
4/	4/2011	18:30	185.0	1	6	-6		
4/	4/2011	18:40	185.6	1	5	-8		

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
4/	4/2011	18:50	186.2	1	3	-9		
4/	4/2011	19: 0	186.8	1	2	-11		
4/	4/2011	19:10	187.5	1	0	-13		

#### TRENTO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
5/	3/2011	17:40	174.9	1	3	-7		
5/	3/2011	17:50	175.1	1	1	-8		
5/	3/2011	18: 0	175.4	1	0	-10		
6/	3/2011	17:20	189.3	3	17	-3		
6/	3/2011	17:30	189.1	3	15	-5		
6/	3/2011	17:40	189.0	3	13	-6		
6/	3/2011	17:50	189.0	3	12	-8		
6/	3/2011	18: 0	189.0	3	10	-10		
6/	3/2011	18:10	189.0	3	8	-12		
6/	3/2011	18:20	189.2	3	7	-13		
6/	3/2011	18:30	189.3	3	5	-15		
6/	3/2011	18:40	189.5	3	3	-17		
6/	3/2011	18:50	189.8	3	2	-18		
4/	4/2011	18:10	185.5	1	8	-5		
4/	4/2011	18:20	186.0	1	6	-6		
4/	4/2011	18:30	186.6	1	4	-8		
4/	4/2011	18:40	187.2	1	3	-10		
4/	4/2011	18:50	187.9	1	1	-11		
4/	4/2011	19: 0	188.6	1	0	-13		

#### TRIESTE

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
5/	3/2011	17:30	174.3	1	3	-7		
5/	3/2011	17:40	174.5	1	1	-8		
5/	3/2011	17:50	174.8	1	0	-10		
6/	3/2011	17:10	188.8	3	17	-3		
6/	3/2011	17:20	188.7	3	15	-5		
6/	3/2011	17:30	188.5	3	13	-6		
6/	3/2011	17:40	188.5	3	12	-8		
6/	3/2011	17:50	188.5	3	10	-10		
6/	3/2011	18: 0	188.6	3	8	-12		
6/	3/2011	18:10	188.7	3	7	-13		
6/	3/2011	18:20	188.9	3	5	-15		
6/	3/2011	18:30	189.1	3	3	-17		
6/	3/2011	18:40	189.4	3	2	-19		
6/	3/2011	18:50	189.7	3	0	-20		
4/	4/2011	18: 0	184.9	1	7	-5		
4/	4/2011	18:10	185.5	1	6	-7		
4/	4/2011	18:20	186.1	1	4	-8		
4/	4/2011	18:30	186.7	1	2	-10		
4/	4/2011	18:40	187.4	1	1	-12		
4/	4/2011	18:50	188.1	1	-0	-13		

#### VENEZIA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
5/	3/2011	17:30	174.2	1	4	-6		
5/	3/2011	17:40	174.3	1	2	-7		
5/	3/2011	17:50	174.5	1	1	-9		
5/	3/2011	18: 0	174.8	1	-0	-11		
6/	3/2011	17:10	188.7	3	18	-2		
6/	3/2011	17:20	188.6	3	16	-4		
6/	3/2011	17:30	188.4	3	14	-5		
6/	3/2011	17:40	188.3	3	13	-7		
6/	3/2011	17:50	188.3	3	11	-9		
6/	3/2011	18: 0	188.4	3	9	-11		
6/	3/2011	18:10	188.4	3	8	-12		
6/	3/2011	18:20	188.6	3	6	-14		
6/	3/2011	18:30	188.8	3	4	-16		
6/	3/2011	18:40	189.0	3	2	-18		
6/	3/2011	18:50	189.3	3	1	-19		
6/	3/2011	19: 0	189.7	3	-0	-21		
4/	4/2011	18: 0	184.5	1	8	-4		
4/	4/2011	18:10	185.0	1	7	-6		
4/	4/2011	18:20	185.6	1	5	-7		
4/	4/2011	18:30	186.2	1	3	-9		
4/	4/2011	18:40	186.9	1	2	-11		
4/	4/2011	18:50	187.6	1	0	-12		
4/	4/2011	19: 0	188.3	1	-1	-14		

Si definisce "luna a barchetta" quel curioso aspetto in cui la Luna al tramonto o all'alba appare sottile e con le cuspidi rivolte verso l'alto alla stessa altezza. La "luna a ponte" è il fenomeno opposto, con la Luna con le cuspidi rivolte verso il basso.

Ore in T.U.

ZABL = angolo zenitale del lembo illuminato della Luna, in  $^{\circ}$ , nel range  $350^{\circ}<ZABL<10^{\circ}$  e  $170^{\circ}<ZABL<190^{\circ}$ . Se l'angolo ZABL è prossimo a  $180^{\circ}$  si ha la Luna "a barchetta", se è prossimo a  $0^{\circ}$  si ha la luna "a ponte".  
K = percentuale di Luna illuminata  
ALT = altezza della Luna sull'orizzonte, in  $^{\circ}$   
ALT.S. = altezza del Sole sull'orizzonte, in  $^{\circ}$

It is a "small boat Moon" that curious aspect in which the Moon at the sunset or at the dawn appears thin and with the cuspidis turned upward to the same height. The "Moon like a bridge" is the opposite phenomenon, with the Moon with the cuspidis turned downward.

Times in U.T.

ZABL = zenital angle of the bright lunar limb, in  $^{\circ}$ , in a range  $350^{\circ}<ZABL<10^{\circ}$  and  $170^{\circ}<ZABL<190^{\circ}$ . If the angle ZABL is near  $180^{\circ}$  the Moon is like a boat, if is near  $0^{\circ}$  is "like a bridge".

K = percentage of illuminated Moon

ALT = height of the Moon above the horizon, in  $^{\circ}$

ALT.S. = height of the Sun above the horizon, in  $^{\circ}$



# LUNA IN PIEDI - STANDING MOON

## ANCONA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## AOSTA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
28/	1/2011		8:20		85.1	31	18	11
25/	2/2011		6:50		86.1	47	18	4
3/	9/2011		18: 0		265.2	39	18	-0
29/	9/2011		15:40		268.2	7	18	15
29/	9/2011		15:50		266.7	7	17	13
29/	9/2011		16: 0		265.4	7	16	11
30/	9/2011		16:10		265.4	15	18	9
28/10/2011			14:40		265.7	5	18	14

## BARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## BOLOGNA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
29/	9/2011		15:40		265.0	7	17	12

## CAGLIARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## CAMPOBASSO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## CATANZARO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## FIRENZE

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## GENOVA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## L AQUILA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
----	----	------	----	----	------	---	-----	--------

## MILANO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
28/	1/2011		8:10		85.4	31	18	11
29/	9/2011		15:40		266.9	7	18	13
29/	9/2011		15:50		265.5	7	17	12
30/	9/2011		16: 0		265.6	15	18	10
28/10/2011			14:30		266.0	5	18	15

## NAPOLI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## PALERMO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## PERUGIA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## POTENZA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## ROMA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
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## TORINO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
29/	9/2011		15:50		266.1	7	18	13
28/10/2011			14:40		265.1	5	18	15

## TRENTO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
27/	1/2011		7:40		85.2	42	18	7
28/	1/2011		8: 0		86.0	31	18	10
29/	1/2011		8:30		85.0	21	18	14
25/	2/2011		6:30		87.0	47	18	4
25/	2/2011		6:40		85.3	47	18	5
31/	8/2011		16:40		265.0	10	18	11
1/	9/2011		17: 0		265.1	18	18	8
2/	9/2011		17:20		265.5	28	18	4
29/	9/2011		15:30		267.6	7	18	14
29/	9/2011		15:40		266.2	7	16	12
30/	9/2011		15:50		266.3	15	18	10
28/10/2011			14:20		266.6	5	18	15
28/10/2011			14:30		265.0	5	17	13

## TRIESTE

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
28/	1/2011		7:50		85.7	31	18	10
25/	2/2011		6:30		85.0	47	18	5
2/	9/2011		17:10		265.2	28	18	4
29/	9/2011		15:20		267.3	7	18	14
29/	9/2011		15:30		265.9	7	17	12
30/	9/2011		15:40		266.0	15	18	10
28/10/2011			14:10		266.3	5	18	15

## VENEZIA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
29/	9/2011		15:30		266.5	7	17	13
29/	9/2011		15:40		265.1	7	16	11
30/	9/2011		15:50		265.2	15	18	9
28/10/2011			14:20		265.5	5	18	15

Si definisce "luna in piedi" il fenomeno in cui la Luna al tramonto o all'alba appare con le cuspidi allineate in verticale rispetto all'orizzonte dell'osservatore.

Ore in T.U.

ZABL = angolo zenitale del lembo illuminato della Luna, in °, nel range  $85^{\circ} < \text{ZABL} < 95^{\circ}$  e  $265^{\circ} < \text{ZABL} < 275^{\circ}$ .

K = percentuale di Luna illuminata

ALT = altezza della Luna sull'orizzonte, in °

ALT.S. = altezza del Sole sull'orizzonte, in °

NB: sono visualizzati solo i giorni in cui la Luna è in piedi vicino all'orizzonte, ossia con altezza inferiore a  $18^{\circ}$

It is "standing Moon" the phenomenon in which the Moon at the setting or at the dawn appears with the cuspidis lined up in vertical in comparison to the horizon of the observer.

Times in U.T.

ZABL = zenital angle of the bright lunar limb, in °, in a range  $85^{\circ} < \text{ZABL} < 95^{\circ}$  and  $265^{\circ} < \text{ZABL} < 275^{\circ}$ .

K = percentage of illuminated Moon

ALT = height of the Moon above the horizon, in °

ALT.S. = height of the Sun above the horizon, in °

NB: are listed only the events when the Moon is standing next to the horizon, or rather with an height inferior to  $18^{\circ}$

# ASTEROIDI CON m<9 – ASTEROIDS WITH MAG<9

1 Ceres

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011	1 19	20 39.46	-24 33.9	3.929	2.963	3.2	9.0
2011	1 20	20 41.14	-24 28.6	3.931	2.963	3.0	9.0
2011	1 21	20 42.82	-24 23.4	3.933	2.964	2.9	9.0
2011	1 22	20 44.50	-24 18.1	3.935	2.964	2.7	9.0
2011	1 23	20 46.18	-24 12.7	3.937	2.964	2.6	9.0
2011	1 24	20 47.86	-24 7.3	3.938	2.965	2.5	9.0
2011	1 25	20 49.53	-24 1.9	3.939	2.965	2.4	9.0
2011	1 26	20 51.20	-23 56.4	3.941	2.965	2.3	8.9
2011	1 27	20 52.87	-23 50.9	3.942	2.966	2.2	8.9
2011	1 28	20 54.54	-23 45.3	3.943	2.966	2.1	8.9
2011	1 29	20 56.21	-23 39.7	3.944	2.966	2.1	8.9
2011	1 30	20 57.87	-23 34.1	3.944	2.967	2.0	8.9
2011	1 31	20 59.53	-23 28.4	3.945	2.967	2.0	8.9
2011	2 1	21 1.19	-23 22.7	3.945	2.967	2.1	8.9
2011	2 2	21 2.85	-23 16.9	3.945	2.968	2.1	8.9
2011	2 3	21 4.51	-23 11.1	3.945	2.968	2.1	8.9
2011	2 4	21 6.16	-23 5.3	3.945	2.968	2.2	8.9
2011	2 5	21 7.81	-22 59.4	3.945	2.969	2.3	9.0
2011	2 6	21 9.46	-22 53.5	3.944	2.969	2.4	9.0
2011	2 7	21 11.10	-22 47.6	3.944	2.969	2.5	9.0
2011	2 8	21 12.75	-22 41.6	3.943	2.969	2.6	9.0
2011	2 9	21 14.39	-22 35.6	3.942	2.970	2.8	9.0
2011	2 10	21 16.03	-22 29.6	3.941	2.970	2.9	9.0
2011	6 18	0 4.75	-11 23.9	2.811	2.985	19.9	9.0
2011	6 19	0 5.54	-11 22.8	2.797	2.985	19.9	9.0
2011	6 20	0 6.32	-11 21.9	2.784	2.985	19.9	9.0
2011	6 21	0 7.08	-11 21.0	2.771	2.985	19.9	9.0
2011	6 22	0 7.83	-11 20.2	2.757	2.985	19.9	9.0
2011	6 23	0 8.56	-11 19.6	2.744	2.985	19.9	8.9
2011	6 24	0 9.28	-11 19.1	2.730	2.985	19.8	8.9
2011	6 25	0 9.99	-11 18.7	2.717	2.985	19.8	8.9
2011	6 26	0 10.68	-11 18.5	2.704	2.985	19.8	8.9
2011	6 27	0 11.35	-11 18.4	2.690	2.985	19.8	8.9
2011	6 28	0 12.01	-11 18.4	2.677	2.985	19.7	8.9
2011	6 29	0 12.66	-11 18.5	2.664	2.985	19.7	8.9
2011	6 30	0 13.28	-11 18.8	2.651	2.985	19.7	8.9
2011	7 1	0 13.90	-11 19.2	2.637	2.985	19.6	8.8
2011	7 2	0 14.49	-11 19.7	2.624	2.985	19.6	8.8
2011	7 3	0 15.07	-11 20.4	2.611	2.984	19.5	8.8
2011	7 4	0 15.63	-11 21.1	2.598	2.984	19.4	8.8
2011	7 5	0 16.18	-11 22.1	2.585	2.984	19.4	8.8
2011	7 6	0 16.71	-11 23.1	2.572	2.984	19.3	8.8
2011	7 7	0 17.22	-11 24.3	2.559	2.984	19.2	8.8
2011	7 8	0 17.72	-11 25.7	2.546	2.984	19.2	8.8
2011	7 9	0 18.19	-11 27.1	2.533	2.984	19.1	8.7
2011	7 10	0 18.65	-11 28.7	2.521	2.984	19.0	8.7
2011	7 11	0 19.09	-11 30.5	2.508	2.984	18.9	8.7
2011	7 12	0 19.51	-11 32.3	2.495	2.984	18.8	8.7
2011	7 13	0 19.91	-11 34.4	2.483	2.983	18.7	8.7
2011	7 14	0 20.30	-11 36.5	2.470	2.983	18.6	8.7
2011	7 15	0 20.66	-11 38.8	2.458	2.983	18.5	8.7
2011	7 16	0 21.01	-11 41.2	2.445	2.983	18.4	8.6
2011	7 17	0 21.33	-11 43.8	2.433	2.983	18.3	8.6
2011	7 18	0 21.64	-11 46.5	2.421	2.983	18.1	8.6
2011	7 19	0 21.92	-11 49.3	2.409	2.983	18.0	8.6
2011	7 20	0 22.19	-11 52.3	2.397	2.983	17.9	8.6
2011	7 21	0 22.43	-11 55.4	2.385	2.982	17.7	8.6
2011	7 22	0 22.66	-11 58.7	2.373	2.982	17.6	8.5
2011	7 23	0 22.86	-12 2.1	2.361	2.982	17.4	8.5
2011	7 24	0 23.05	-12 5.6	2.350	2.982	17.3	8.5
2011	7 25	0 23.21	-12 9.3	2.338	2.982	17.1	8.5
2011	7 26	0 23.35	-12 13.0	2.327	2.982	17.0	8.5
2011	7 27	0 23.46	-12 17.0	2.316	2.982	16.8	8.5
2011	7 28	0 23.56	-12 21.0	2.305	2.981	16.6	8.4
2011	7 29	0 23.64	-12 25.2	2.294	2.981	16.4	8.4
2011	7 30	0 23.69	-12 29.5	2.283	2.981	16.2	8.4
2011	7 31	0 23.72	-12 33.9	2.272	2.981	16.1	8.4
2011	8 1	0 23.73	-12 38.5	2.262	2.981	15.9	8.4
2011	8 2	0 23.71	-12 43.2	2.251	2.981	15.7	8.4
2011	8 3	0 23.68	-12 47.9	2.241	2.981	15.5	8.3
2011	8 4	0 23.62	-12 52.9	2.231	2.980	15.2	8.3
2011	8 5	0 23.54	-12 57.9	2.221	2.980	15.0	8.3
2011	8 6	0 23.43	-13 3.0	2.211	2.980	14.8	8.3
2011	8 7	0 23.30	-13 8.2	2.201	2.980	14.6	8.3
2011	8 8	0 23.15	-13 13.6	2.192	2.980	14.4	8.3
2011	8 9	0 22.98	-13 19.0	2.182	2.979	14.1	8.2
2011	8 10	0 22.79	-13 24.6	2.173	2.979	13.9	8.2
2011	8 11	0 22.57	-13 30.2	2.164	2.979	13.6	8.2
2011	8 12	0 22.33	-13 36.0	2.156	2.979	13.4	8.2
2011	8 13	0 22.06	-13 41.8	2.147	2.979	13.1	8.2
2011	8 14	0 21.78	-13 47.7	2.139	2.979	12.9	8.1
2011	8 15	0 21.47	-13 53.6	2.130	2.978	12.6	8.1
2011	8 16	0 21.14	-13 59.7	2.122	2.978	12.4	8.1
2011	8 17	0 20.78	-14 5.8	2.115	2.978	12.1	8.1
2011	8 18	0 20.41	-14 12.0	2.107	2.978	11.8	8.1
2011	8 19	0 20.01	-14 18.2	2.100	2.977	11.6	8.1
2011	8 20	0 19.59	-14 24.5	2.092	2.977	11.3	8.0

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 8 21	0 19.15	-14 30.8	2.085	2.977	11.0	8.0	145.8W
2011 8 22	0 18.69	-14 37.2	2.079	2.977	10.7	8.0	146.8W
2011 8 23	0 18.21	-14 43.6	2.072	2.977	10.5	8.0	147.7W
2011 8 24	0 17.71	-14 50.1	2.066	2.976	10.2	8.0	148.7W
2011 8 25	0 17.18	-14 56.6	2.060	2.976	9.9	7.9	149.6W
2011 8 26	0 16.64	-15 3.0	2.054	2.976	9.6	7.9	150.5W
2011 8 27	0 16.08	-15 9.5	2.049	2.976	9.3	7.9	151.5W
2011 8 28	0 15.50	-15 16.0	2.043	2.976	9.1	7.9	152.4W
2011 8 29	0 14.90	-15 22.5	2.038	2.975	8.8	7.9	153.3W
2011 8 30	0 14.28	-15 29.0	2.033	2.975	8.5	7.9	154.2W
2011 8 31	0 13.65	-15 35.5	2.029	2.975	8.2	7.8	155.1W
2011 9 1	0 12.99	-15 42.0	2.024	2.975	8.0	7.8	155.9W
2011 9 2	0 12.32	-15 48.4	2.020	2.974	7.7	7.8	156.8W
2011 9 3	0 11.64	-15 54.8	2.016	2.974	7.4	7.8	157.6W
2011 9 4	0 10.94	-16 1.1	2.013	2.974	7.2	7.8	158.4W
2011 9 5	0 10.23	-16 7.4	2.009	2.974	6.9	7.8	159.1W
2011 9 6	0 9.50	-16 13.7	2.006	2.973	6.7	7.7	159.9W
2011 9 7	0 8.76	-16 19.8	2.004	2.973	6.5	7.7	160.6W
2011 9 8	0 8.01	-16 25.9	2.001	2.973	6.3	7.7	161.2W
2011 9 9	0 7.24	-16 32.0	1.999	2.973	6.1	7.7	161.8W
2011 9 10	0 6.46	-16 37.9	1.997	2.972	5.9	7.7	162.3W
2011 9 11	0 5.68	-16 43.8	1.995	2.972	5.7	7.7	162.8W
2011 9 12	0 4.88	-16 49.5	1.994	2.972	5.6	7.7	163.2W
2011 9 13	0 4.08	-16 55.2	1.993	2.971	5.5	7.7	163.6W
2011 9 14	0 3.27	-17 0.7	1.992	2.971	5.4	7.7	163.8W
2011 9 15	0 2.45	-17 6.1	1.991	2.971	5.4	7.7	164.0W
2011 9 16	0 1.62	-17 11.4	1.991	2.971	5.3	7.7	164.1W
2011 9 17	0 0.79	-17 16.6	1.991	2.970	5.3	7.7	164.1W
2011 9 18	23 59.96	-17 21.6	1.991	2.970	5.3	7.7	164.0W
2011 9 19	23 59.12	-17 26.5	1.991	2.970	5.4	7.7	163.9W
2011 9 20	23 58.28	-17 31.2	1.992	2.970	5.5	7.7	163.6W
2011 9 21	23 57.44	-17 35.8	1.993	2.969	5.6	7.7	163.3W
2011 9 22	23 56.60	-17 40.2	1.995	2.969	5.7	7.7	162.9W
2011 9 23	23 55.75	-17 44.5	1.996	2.969	5.8	7.7	162.5E
2011 9 24	23 54.91	-17 48.6	1.998	2.968	6.0	7.7	161.9E
2011 9 25	23 54.07	-17 52.5	2.000	2.968	6.2	7.7	161.4E
2011 9 26	23 53.24	-17 56.2	2.003	2.968	6.4	7.7	160.7E
2011 9 27	23 52.40	-17 59.8	2.005	2.967	6.6	7.7	160.0E
2011 9 28	23 51.58	-18 3.2	2.008	2.967	6.9	7.7	159.3E
2011 9 29	23 50.76	-18 6.4	2.012	2.967	7.1	7.8	158.6E
2011 9 30	23 49.94	-18 9.4	2.015	2.967	7.3	7.8	157.8E
2011 10 1	23 49.13	-18 12.2	2.019	2.966	7.6	7.8	156.9E
2011 10 2	23 48.33	-18 14.8	2.023	2.966	7.9	7.8	156.1E
2011 10 3	23 47.54	-18 17.3	2.027	2.966	8.1	7.8	155.2E
2011 10 4	23 46.76	-18 19.5	2.032	2.965	8.4	7.8	154.3E
2011 10 5	23 45.99	-18 21.5	2.036	2.965	8.7	7.9	153.4E
2011 10 6	23 45.23	-18 23.3	2.041	2.965	9.0	7.9	152.5E
2011 10 7	23 44.49	-18 25.0	2.047	2.964	9.2	7.9	151.6E
2011 10 8	23 43.75	-18 26.4	2.052	2.964	9.5	7.9	150.6E
2011 10 9	23 43.03	-18 27.6	2.058	2.964	9.8	7.9	149.7E
2011 10 10	23 42.33	-18 28.6	2.064	2.963	10.1	7.9	148.7E
2011 10 11	23 41.64	-18 29.4	2.070	2.963	10.4	8.0	147.7E
2011 10 12	23 40.96	-18 30.0	2.077	2.963	10.6	8.0	146.7E
2011 10 13	23 40.30	-18 30.4	2.084	2.962	10.9	8.0	145.8E
2011 10 14	23 39.66	-18 30.5	2.091	2.962	11.2	8.0	144.8E
2011 10 15	23 39.04	-18 30.5	2.098	2.962	11.5	8.0	143.8E
2011 10 16	23 38.43	-18 30.3	2.105	2.961	11.8	8.1	142.8E
2011 10 17	23 37.84	-18 29.9	2.113	2.961	12.0	8.1	141.8E
2011 10 18	23 37.28	-18 29.2	2.121	2.960	12.3	8.1	140.8E
2011 10 19	23 36.73	-18 28.4	2.129	2.960	12.5	8.1	139.8E
2011 10 20	23 36.20	-18 27.4	2.137	2.960	12.8	8.1	138.8E
2011 10 21	23 35.69	-18 26.1	2.145	2.959	13.1	8.1	137.8E
2011 10 22	23 35.20	-18 24.7	2.154	2.959	13.3	8.2	136.8E
2011 10 23	23 34.73	-18 23.1	2.163	2.959	13.6	8.2	135.8E
2011 10 24	23 34.28	-18 21.3	2.172	2.958	13.8	8.2	134.8E
2011 10 25	23 33.86	-18 19.3	2.181	2.958	14.0	8.2	133.8E
2011 10 26	23 33.45	-18 17.1	2.190	2.958	14.3	8.2	132.8E
2011 10 27	23 33.07	-18 14.7	2.200	2.957	14.5	8.3	131.8E
2011 10 28	23 32.71	-18 12.1	2.210	2.957	14.7	8.3	130.8E
2011 10 29	23 32.38	-18 9.4	2.220	2.956	14.9	8.3	129.9E
2011 10 30	23 32.06	-18 6.5	2.230	2.956	15.2	8.3	128.9E
2011 10 31	23 31.77	-18 3.4	2.240	2.956	15.4	8.3	127.9E
2011 11 1	23 31.50	-18 0.1	2.250	2.955	15.6	8.3	126.9E
2011 11 2	23 31.26	-17 56.7	2.261	2.955	15.8	8.4	125.9E
2011 11 3	23 31.04	-17 53.1	2.272	2.954	16.0	8.4	125.0E
2011 11 4	23 30.84	-17 49.3	2.282	2.954	16.2	8.4	124.0E
2011 11 5	23 30.66	-17 45.4	2.293	2.954	16.3	8.4	123.1E
2011 11 6	23 30.51	-17 41.3	2.305	2.953	16.5	8.4	122.1E
2011 11 7	23 30.38	-17 37.1	2.316	2.953	16.7	8.4	121.1E
2011 11 8	23 30.27	-17 32.7	2.327	2.952	16.9	8.5	120.2E
2011 11 9	23 30.18	-17 28.1	2.339	2.952	17.0	8.5	119.2E
2011 11 10	23 30.12	-17 23.4	2.350	2.952	17.2	8.5	118.3E
2011 11 11	23 30.09	-17 18.6	2.362	2.951	17.3	8.5	117.4E
2011 11 12	23 30.07	-17 13.6	2.374	2.951	17.5	8.5	116.4E
2011 11 13	23 30.08	-17 8.5	2.386	2.950	17.6	8.5	115.5E
2011 11 14	23 30.11	-17 3.2	2.398	2.950	17.8	8.6	114.6E
2011 11 15	23 30.16	-16 57.8	2.410	2.950	17.9	8.6	113.6E
2011 11 16	23 30.23	-16 52.3	2.422	2.949	18.0	8.6	112.7E
2011 11 17	23 30.33	-16 46.6	2.435	2.949	18.1	8.6	111.8E
2011 11 18	23 30.45	-16 40.8	2.447	2.948	18.3	8.6	110.9E
2011 11 19	23 30.59	-16 34.9	2.460	2.948	18.4	8.6	110.0E
2011 11 20	23 30.76	-16 28.9	2.472	2.947	18.5	8.6	109.1E

## 1 Ceres

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 11 21	23 30.94	-16 22.8	2.485	2.947	18.6	8.7	108.2E
2011 11 22	23 31.15	-16 16.5	2.498	2.946	18.7	8.7	107.3E
2011 11 23	23 31.37	-16 10.1	2.510	2.946	18.8	8.7	106.4E
2011 11 24	23 31.62	-16 3.6	2.523	2.946	18.8	8.7	105.5E
2011 11 25	23 31.89	-15 57.0	2.536	2.945	18.9	8.7	104.7E
2011 11 26	23 32.18	-15 50.3	2.549	2.945	19.0	8.7	103.8E
2011 11 27	23 32.49	-15 43.5	2.562	2.944	19.1	8.7	102.9E
2011 11 28	23 32.82	-15 36.6	2.575	2.944	19.1	8.7	102.0E
2011 11 29	23 33.17	-15 29.6	2.588	2.943	19.2	8.8	101.2E
2011 11 30	23 33.53	-15 22.5	2.602	2.943	19.3	8.8	100.3E
2011 12 1	23 33.92	-15 15.3	2.615	2.942	19.3	8.8	99.5E
2011 12 2	23 34.33	-15 8.0	2.628	2.942	19.4	8.8	98.6E
2011 12 3	23 34.76	-15 0.6	2.641	2.941	19.4	8.8	97.8E
2011 12 4	23 35.20	-14 53.1	2.655	2.941	19.4	8.8	96.9E
2011 12 5	23 35.67	-14 45.5	2.668	2.941	19.5	8.8	96.1E
2011 12 6	23 36.15	-14 37.9	2.681	2.940	19.5	8.8	95.2E
2011 12 7	23 36.65	-14 30.2	2.695	2.940	19.5	8.9	94.4E
2011 12 8	23 37.16	-14 22.3	2.708	2.939	19.5	8.9	93.6E
2011 12 9	23 37.70	-14 14.4	2.722	2.939	19.6	8.9	92.8E
2011 12 10	23 38.25	-14 6.5	2.735	2.938	19.6	8.9	91.9E
2011 12 11	23 38.82	-13 58.4	2.749	2.938	19.6	8.9	91.1E
2011 12 12	23 39.41	-13 50.3	2.762	2.937	19.6	8.9	90.3E
2011 12 13	23 40.01	-13 42.1	2.775	2.937	19.6	8.9	89.5E
2011 12 14	23 40.63	-13 33.8	2.789	2.936	19.6	8.9	88.7E
2011 12 15	23 41.26	-13 25.4	2.802	2.936	19.6	8.9	87.9E
2011 12 16	23 41.91	-13 17.0	2.816	2.935	19.6	9.0	87.1E
2011 12 17	23 42.58	-13 8.5	2.829	2.935	19.6	9.0	86.3E
2011 12 18	23 43.26	-12 60.0	2.843	2.934	19.5	9.0	85.5E
2011 12 19	23 43.95	-12 51.4	2.856	2.934	19.5	9.0	84.7E
2011 12 20	23 44.66	-12 42.7	2.870	2.933	19.5	9.0	83.9E
2011 12 21	23 45.39	-12 34.0	2.883	2.933	19.5	9.0	83.1E

## 3 Juno

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 3 7	11 32.80	+ 3 2.4	1.777	2.765	2.4	9.0	173.4W
2011 3 8	11 31.99	+ 3 12.3	1.778	2.767	1.9	9.0	174.6W
2011 3 9	11 31.19	+ 3 22.1	1.779	2.770	1.5	9.0	175.8W
2011 3 10	11 30.38	+ 3 31.9	1.780	2.773	1.0	8.9	177.1W
2011 3 11	11 29.57	+ 3 41.8	1.782	2.775	0.6	8.9	178.3W
2011 3 12	11 28.76	+ 3 51.6	1.784	2.778	0.2	8.9	179.4W
2011 3 13	11 27.95	+ 4 1.3	1.787	2.780	0.4	8.9	179.0E
2011 3 14	11 27.14	+ 4 11.1	1.789	2.783	0.8	8.9	177.8E
2011 3 15	11 26.34	+ 4 20.8	1.792	2.785	1.2	9.0	176.6E
2011 3 16	11 25.54	+ 4 30.4	1.795	2.788	1.7	9.0	175.4E

## 4 Vesta

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 1 1	16 57.47	-19 21.8	3.005	2.154	11.1	7.8	25.0W
2011 1 2	16 59.70	-19 26.2	3.000	2.154	11.3	7.8	25.5W
2011 1 3	17 1.93	-19 30.4	2.994	2.154	11.5	7.8	26.0W
2011 1 4	17 4.16	-19 34.6	2.989	2.154	11.7	7.8	26.5W
2011 1 5	17 6.39	-19 38.6	2.984	2.154	11.9	7.8	26.9W
2011 1 6	17 8.62	-19 42.5	2.978	2.153	12.1	7.8	27.4W
2011 1 7	17 10.85	-19 46.2	2.972	2.153	12.3	7.8	27.9W
2011 1 8	17 13.08	-19 49.9	2.967	2.153	12.5	7.8	28.4W
2011 1 9	17 15.31	-19 53.4	2.961	2.153	12.7	7.8	28.9W
2011 1 10	17 17.54	-19 56.9	2.955	2.153	12.9	7.8	29.4W
2011 1 11	17 19.77	-20 0.2	2.949	2.153	13.1	7.8	29.9W
2011 1 12	17 21.99	-20 3.4	2.943	2.153	13.3	7.8	30.3W
2011 1 13	17 24.22	-20 6.4	2.937	2.153	13.5	7.8	30.8W
2011 1 14	17 26.45	-20 9.4	2.931	2.152	13.7	7.8	31.3W
2011 1 15	17 28.67	-20 12.2	2.925	2.152	13.9	7.8	31.8W
2011 1 16	17 30.89	-20 14.9	2.919	2.152	14.1	7.8	32.3W
2011 1 17	17 33.12	-20 17.5	2.912	2.152	14.3	7.8	32.8W
2011 1 18	17 35.34	-20 20.0	2.906	2.152	14.5	7.8	33.3W
2011 1 19	17 37.55	-20 22.4	2.899	2.152	14.7	7.8	33.8W
2011 1 20	17 39.77	-20 24.7	2.893	2.152	14.9	7.8	34.3W
2011 1 21	17 41.99	-20 26.8	2.886	2.152	15.1	7.8	34.8W
2011 1 22	17 44.20	-20 28.8	2.879	2.152	15.3	7.8	35.3W
2011 1 23	17 46.41	-20 30.7	2.872	2.152	15.5	7.8	35.8W
2011 1 24	17 48.62	-20 32.5	2.865	2.152	15.7	7.8	36.2W
2011 1 25	17 50.83	-20 34.2	2.858	2.152	15.9	7.8	36.7W
2011 1 26	17 53.03	-20 35.8	2.851	2.152	16.1	7.8	37.2W
2011 1 27	17 55.23	-20 37.2	2.844	2.152	16.3	7.8	37.7W
2011 1 28	17 57.43	-20 38.6	2.837	2.152	16.5	7.8	38.2W
2011 1 29	17 59.63	-20 39.8	2.830	2.152	16.6	7.8	38.7W
2011 1 30	18 1.82	-20 40.9	2.822	2.152	16.8	7.8	39.2W
2011 1 31	18 4.01	-20 42.0	2.815	2.152	17.0	7.8	39.7W
2011 2 1	18 6.20	-20 42.9	2.807	2.152	17.2	7.8	40.2W
2011 2 2	18 8.38	-20 43.7	2.800	2.152	17.4	7.8	40.7W
2011 2 3	18 10.56	-20 44.3	2.792	2.152	17.6	7.8	41.2W
2011 2 4	18 12.74	-20 44.9	2.785	2.152	17.8	7.8	41.7W
2011 2 5	18 14.91	-20 45.4	2.777	2.152	17.9	7.8	42.2W
2011 2 6	18 17.08	-20 45.8	2.769	2.152	18.1	7.8	42.8W

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011	2 7	18 19.24	-20 46.0	2.761	2.152	18.3	7.8 43.3W
2011	2 8	18 21.40	-20 46.2	2.753	2.152	18.5	7.8 43.8W
2011	2 9	18 23.56	-20 46.2	2.745	2.152	18.7	7.8 44.3W
2011	2 10	18 25.71	-20 46.2	2.737	2.152	18.8	7.8 44.8W
2011	2 11	18 27.85	-20 46.0	2.729	2.152	19.0	7.8 45.3W
2011	2 12	18 30.00	-20 45.8	2.721	2.152	19.2	7.8 45.8W
2011	2 13	18 32.13	-20 45.5	2.712	2.152	19.4	7.8 46.3W
2011	2 14	18 34.27	-20 45.0	2.704	2.152	19.5	7.8 46.8W
2011	2 15	18 36.39	-20 44.5	2.695	2.152	19.7	7.8 47.3W
2011	2 16	18 38.51	-20 43.8	2.687	2.152	19.9	7.8 47.8W
2011	2 17	18 40.63	-20 43.1	2.678	2.152	20.1	7.8 48.4W
2011	2 18	18 42.74	-20 42.3	2.670	2.153	20.2	7.8 48.9W
2011	2 19	18 44.85	-20 41.4	2.661	2.153	20.4	7.8 49.4W
2011	2 20	18 46.95	-20 40.4	2.652	2.153	20.6	7.8 49.9W
2011	2 21	18 49.04	-20 39.3	2.644	2.153	20.7	7.8 50.4W
2011	2 22	18 51.13	-20 38.1	2.635	2.153	20.9	7.8 50.9W
2011	2 23	18 53.21	-20 36.8	2.626	2.153	21.1	7.8 51.5W
2011	2 24	18 55.28	-20 35.5	2.617	2.153	21.2	7.8 52.0W
2011	2 25	18 57.35	-20 34.0	2.608	2.153	21.4	7.8 52.5W
2011	2 26	18 59.41	-20 32.5	2.599	2.154	21.5	7.8 53.0W
2011	2 27	19 1.47	-20 30.9	2.590	2.154	21.7	7.8 53.5W
2011	2 28	19 3.52	-20 29.3	2.580	2.154	21.9	7.8 54.1W
2011	3 1	19 5.56	-20 27.5	2.571	2.154	22.0	7.8 54.6W
2011	3 2	19 7.59	-20 25.7	2.562	2.154	22.2	7.8 55.1W
2011	3 3	19 9.62	-20 23.8	2.552	2.154	22.3	7.8 55.6W
2011	3 4	19 11.64	-20 21.8	2.543	2.154	22.5	7.8 56.2W
2011	3 5	19 13.65	-20 19.7	2.533	2.155	22.6	7.8 56.7W
2011	3 6	19 15.66	-20 17.6	2.524	2.155	22.8	7.8 57.2W
2011	3 7	19 17.65	-20 15.4	2.514	2.155	22.9	7.7 57.8W
2011	3 8	19 19.64	-20 13.1	2.505	2.155	23.1	7.7 58.3W
2011	3 9	19 21.62	-20 10.8	2.495	2.155	23.2	7.7 58.8W
2011	3 10	19 23.60	-20 8.4	2.485	2.156	23.3	7.7 59.4W
2011	3 11	19 25.56	-20 6.0	2.476	2.156	23.5	7.7 59.9W
2011	3 12	19 27.52	-20 3.5	2.466	2.156	23.6	7.7 60.4W
2011	3 13	19 29.46	-20 0.9	2.456	2.156	23.8	7.7 61.0W
2011	3 14	19 31.40	-19 58.3	2.446	2.157	23.9	7.7 61.5W
2011	3 15	19 33.33	-19 55.6	2.436	2.157	24.0	7.7 62.0W
2011	3 16	19 35.25	-19 52.9	2.426	2.157	24.2	7.7 62.6W
2011	3 17	19 37.17	-19 50.1	2.416	2.157	24.3	7.7 63.1W
2011	3 18	19 39.07	-19 47.3	2.406	2.158	24.4	7.7 63.7W
2011	3 19	19 40.96	-19 44.4	2.396	2.158	24.5	7.7 64.2W
2011	3 20	19 42.85	-19 41.5	2.386	2.158	24.7	7.7 64.8W
2011	3 21	19 44.72	-19 38.5	2.375	2.158	24.8	7.7 65.3W
2011	3 22	19 46.59	-19 35.5	2.365	2.159	24.9	7.7 65.9W
2011	3 23	19 48.44	-19 32.5	2.355	2.159	25.0	7.7 66.4W
2011	3 24	19 50.29	-19 29.4	2.344	2.159	25.1	7.7 67.0W
2011	3 25	19 52.12	-19 26.3	2.334	2.159	25.3	7.6 67.5W
2011	3 26	19 53.94	-19 23.2	2.324	2.160	25.4	7.6 68.1W
2011	3 27	19 55.76	-19 20.0	2.313	2.160	25.5	7.6 68.7W
2011	3 28	19 57.56	-19 16.8	2.303	2.160	25.6	7.6 69.2W
2011	3 29	19 59.36	-19 13.6	2.292	2.161	25.7	7.6 69.8W
2011	3 30	20 1.14	-19 10.3	2.282	2.161	25.8	7.6 70.3W
2011	3 31	20 2.91	-19 7.1	2.271	2.161	25.9	7.6 70.9W
2011	4 1	20 4.67	-19 3.8	2.260	2.162	26.0	7.6 71.5W
2011	4 2	20 6.42	-19 0.5	2.250	2.162	26.1	7.6 72.1W
2011	4 3	20 8.15	-18 57.1	2.239	2.162	26.2	7.6 72.6W
2011	4 4	20 9.88	-18 53.8	2.228	2.163	26.3	7.6 73.2W
2011	4 5	20 11.59	-18 50.5	2.218	2.163	26.4	7.6 73.8W
2011	4 6	20 13.29	-18 47.1	2.207	2.163	26.4	7.6 74.4W
2011	4 7	20 14.98	-18 43.8	2.196	2.164	26.5	7.6 74.9W
2011	4 8	20 16.66	-18 40.4	2.185	2.164	26.6	7.5 75.5W
2011	4 9	20 18.33	-18 37.1	2.174	2.165	26.7	7.5 76.1W
2011	4 10	20 19.98	-18 33.7	2.164	2.165	26.8	7.5 76.7W
2011	4 11	20 21.62	-18 30.4	2.153	2.165	26.8	7.5 77.3W
2011	4 12	20 23.25	-18 27.0	2.142	2.166	26.9	7.5 77.9W
2011	4 13	20 24.86	-18 23.7	2.131	2.166	27.0	7.5 78.5W
2011	4 14	20 26.46	-18 20.4	2.120	2.166	27.0	7.5 79.1W
2011	4 15	20 28.05	-18 17.1	2.109	2.167	27.1	7.5 79.7W
2011	4 16	20 29.62	-18 13.8	2.098	2.167	27.1	7.5 80.3W
2011	4 17	20 31.18	-18 10.5	2.087	2.168	27.2	7.5 80.9W
2011	4 18	20 32.73	-18 7.3	2.076	2.168	27.3	7.5 81.5W
2011	4 19	20 34.26	-18 4.1	2.065	2.169	27.3	7.4 82.1W
2011	4 20	20 35.78	-18 0.9	2.054	2.169	27.3	7.4 82.7W
2011	4 21	20 37.28	-17 57.7	2.043	2.169	27.4	7.4 83.3W
2011	4 22	20 38.77	-17 54.6	2.032	2.170	27.4	7.4 84.0W
2011	4 23	20 40.24	-17 51.5	2.021	2.170	27.5	7.4 84.6W
2011	4 24	20 41.70	-17 48.5	2.010	2.171	27.5	7.4 85.2W
2011	4 25	20 43.15	-17 45.4	1.999	2.171	27.5	7.4 85.8W
2011	4 26	20 44.58	-17 42.5	1.988	2.172	27.5	7.4 86.5W
2011	4 27	20 45.99	-17 39.6	1.976	2.172	27.6	7.4 87.1W
2011	4 28	20 47.38	-17 36.7	1.965	2.173	27.6	7.3 87.7W
2011	4 29	20 48.77	-17 33.9	1.954	2.173	27.6	7.3 88.4W
2011	4 30	20 50.13	-17 31.2	1.943	2.173	27.6	7.3 89.0W
2011	5 1	20 51.48	-17 28.5	1.932	2.174	27.6	7.3 89.7W
2011	5 2	20 52.81	-17 25.8	1.921	2.174	27.6	7.3 90.3W
2011	5 3	20 54.12	-17 23.3	1.910	2.175	27.6	7.3 91.0W
2011	5 4	20 55.42	-17 20.8	1.899	2.175	27.6	7.3 91.6W
2011	5 5	20 56.70	-17 18.3	1.888	2.176	27.6	7.3 92.3W
2011	5 6	20 57.96	-17 16.0	1.877	2.176	27.6	7.2 93.0W
2011	5 7	20 59.21	-17 13.7	1.866	2.177	27.5	7.2 93.7W
2011	5 8	21 0.43	-17 11.5	1.855	2.177	27.5	7.2 94.3W
2011	5 9	21 1.64	-17 9.4	1.844	2.178	27.5	7.2 95.0W

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011	5 10	21 2.83	-17 7.4	1.833	2.179	27.5	7.2 95.7W
2011	5 11	21 4.00	-17 5.4	1.822	2.179	27.4	7.2 96.4W
2011	5 12	21 5.15	-17 3.6	1.811	2.180	27.4	7.2 97.1W
2011	5 13	21 6.28	-17 1.9	1.800	2.180	27.3	7.2 97.8W
2011	5 14	21 7.39	-17 0.2	1.789	2.181	27.3	7.1 98.5W
2011	5 15	21 8.48	-16 58.7	1.778	2.181	27.2	7.1 99.2W
2011	5 16	21 9.55	-16 57.2	1.767	2.182	27.2	7.1 99.9W
2011	5 17	21 10.60	-16 55.9	1.757	2.182	27.1	7.1 100.6W
2011	5 18	21 11.63	-16 54.7	1.746	2.183	27.0	7.1 101.3W
2011	5 19	21 12.64	-16 53.6	1.735	2.183	26.9	7.1 102.1W
2011	5 20	21 13.63	-16 52.6	1.724	2.184	26.9	7.1 102.8W
2011	5 21	21 14.60	-16 51.7	1.714	2.185	26.8	7.0 103.5W
2011	5 22	21 15.54	-16 50.9	1.703	2.185	26.7	7.0 104.3W
2011	5 23	21 16.46	-16 50.3	1.692	2.186	26.6	7.0 105.0W
2011	5 24	21 17.36	-16 49.8	1.682	2.186	26.5	7.0 105.8W
2011	5 25	21 18.23	-16 49.5	1.671	2.187	26.4	7.0 106.5W
2011	5 26	21 19.09	-16 49.2	1.661	2.188	26.2	7.0 107.3W
2011	5 27	21 19.91	-16 49.1	1.651	2.188	26.1	6.9 108.1W
2011	5 28	21 20.72	-16 49.2	1.640	2.189	26.0	6.9 108.9W
2011	5 29	21 21.50	-16 49.4	1.630	2.189	25.8	6.9 109.6W
2011	5 30	21 22.26	-16 49.7	1.620	2.190	25.7	6.9 110.4W
2011	5 31	21 22.99	-16 50.2	1.609	2.191	25.6	6.9 111.2W
2011	6 1	21 23.69	-16 50.9	1.599	2.191	25.4	6.9 112.0W
2011	6 2	21 24.37	-16 51.7	1.589	2.192	25.2	6.8 112.8W
2011	6 3	21 25.03	-16 52.6	1.579	2.193	25.1	6.8 113.6W
2011	6 4	21 25.65	-16 53.7	1.569	2.193	24.9	6.8 114.5W
2011	6 5	21 26.26	-16 55.0	1.560	2.194	24.7	6.8 115.3W
2011	6 6	21 26.83	-16 56.5	1.550	2.194	24.5	6.8 116.1W
2011	6 7	21 27.38	-16 58.1	1.540	2.195	24.3	6.8 117.0W
2011	6 8	21 27.90	-16 59.9	1.531	2.196	24.1	6.7 117.8W
2011	6 9	21 28.39	-17 1.8	1.521	2.196	23.9	6.7 118.7W
2011	6 10	21 28.86	-17 3.9	1.512	2.197	23.7	6.7 119.5W
2011	6 11	21 29.29	-17 6.2	1.502	2.198	23.5	6.7 120.4W
2011	6 12	21 29.70	-17 8.7	1.493	2.198	23.3	6.7 121.3W
2011	6 13	21 30.08	-17 11.4	1.484	2.199	23.0	6.6 122.1W
2011	6 14	21 30.43	-17 14.2	1.475	2.200	22.8	6.6 123.0W
2011	6 15	21 30.75	-17 17.2	1.466	2.200	22.5	6.6 123.9W
2011	6 16	21 31.04	-17 20.4	1.457	2.201	22.3	6.6 124.8W
2011	6 17	21 31.30	-17 23.8	1.448	2.202	22.0	6.6 125.7W
2011	6 18	21 31.53	-17 27.3	1.440	2.203	21.7	6.6 126.6W
2011	6 19	21 31.73	-17 31.1	1.431	2.203	21.4	6.5 127.6W
2011	6 20	21 31.90	-17 35.0	1.423	2.204	21.1	6.5 128.5W
2011	6 21	21 32.03	-17 39.1	1.415	2.205	20.9	6.5 129.4W
2011	6 22	21 32.14	-17 43.4	1.406	2.205	20.5	6.5 130.4W
2011	6 23	21 32.22	-17 47.9	1.398	2.206	20.2	6.5 131.3W
2011	6 24	21 32.26	-17 52.6	1.391	2.207	19.9	6.4 132.3W
2011	6 25	21 32.27	-17 57.4	1.383	2.207	19.6	6.4 133.3W
2011	6 26	21 32.25	-18 2.4	1.375	2.208	19.2	6.4 134.3W
2011	6 27	21 32.20	-18 7.6	1.368	2.209	18.9	6.4 135.2W
2011	6 28	21 32.12	-18 13.0	1.361	2.210	18.6	6.4 136.2W
2011	6 29	21 32.00	-18 18.6	1.354	2.210	18.2	6.3 137.2W
2011	6 30	21 31.86	-18 24.3	1.347	2.211	17.8	6.3 138.2W
2011	7 1	21 31.68	-18 30.2	1.340	2.212	17.5	6.3 139.3W
2011	7 2	21 31.47	-18 36.2	1.333	2.213	17.1	6.3 140.3W
2011	7 3	21 31.23	-18 42.4	1.327	2.213	16.7	6.3 141.3W
2011	7 4	21 30.96	-18 48.8	1.320	2.214	16.3	6.2 142.3W
2011	7 5	21 30.65	-18 55.4	1.314	2.215	15.9	6.2 143.4W
2011	7 6	21 30.32	-19 2.0	1.308	2.216	15.5	6.2 144.4W
2011	7 7	21 29.95	-19 8.9	1.302	2.216	15.1	6.2 145.5W
2011	7 8	21 29.56	-19 15.8	1.297	2.217	14.6	6.1 146.6W
2011	7 9	21 29.13	-19 22.9	1.292	2.218	14.2	6.1 147.6W
2011	7 10	21 28.67	-19 30.2	1.286	2.219	13.8	6.1 148.7W
2011	7 11	21 28.19	-19 37.5	1.281	2.220	13.3	6.1 149.8W
2011	7 12	21 27.67	-19 45.0	1.277	2.220	12.9	6.1 150.9W
2011	7 13	21 27.13	-19 52.6	1.272	2.221	12.4	6.0 151.9W
2011	7 14	21 26.56	-20 0.3	1.268	2.222	12.0	6.0 153.0W
2011	7 15	21 25.96	-20 8.1	1.263	2.223	11.5	6.0 154.1W
2011	7 16	21 25.34	-20 15.9	1.259	2.223	11.0	6.0 155.2W
2011	7 17	21 24.69	-20 23.9	1.256	2.224	10.6	6.0 156.3W
2011	7 18	21 24.01	-20 31.9	1.252	2.225	10.1	5.9 157.4W
2011	7 19	21 23.31	-20 40.0	1.249	2.226	9.6	5.9 158.5W
2011	7 20	21 22.59	-20 48.1	1.246	2.227	9.1	5.9 159.6W
2011	7 21	21 21.84	-20 56.3	1.243	2.227	8.7	5.9 160.7W
2011	7 22	21 21.08	-21 4.5	1.240	2.228	8.2	5.9 161.8W
2011	7 23	21 20.29	-21 12.7	1.238	2.229	7.7	5.8 162.9W
2011	7 24	21 19.48	-21 20.9	1.236	2.230	7.2	5.8 164.0W
2011	7 25	21 18.66	-21 29.2	1.234	2.231	6.7	5.8 165.1W
2011	7 26	21 17.81	-21 37.5	1.232	2.232	6.3	5.8 166.2W
2011	7 27	21 16.95	-21 45.7	1.231	2.232	5.8	5.8 167.2W
2011	7 28	21 16.08	-21 53.9	1.229	2.233	5.3	5.7 168.2W
2011	7 29	21 15.19	-22 2.1	1.229	2.234	4.9	5.7 169.2W
2011	7 30	21 14.29	-22 10.2	1.228	2.235	4.5	5.7 170.2W
2011	7 31	21 13.38	-22 18.3	1.227	2.236	4.1	5.7 171.0W
2011	8 1	21 12.46	-22 26.4	1.227	2.237	3.7	5.7 171.9W
2011	8 2	21 11.53	-22 34.3	1.227	2.237	3.4	5.7 172.6W
2011	8 3	21 10.59	-22 42.2	1.227	2.238	3.1	5.6 173.1W
2011	8 4	21 9.65	-22 50.0	1.228	2.239	2.9	5.6 173.5W
2011	8 5	21 8.70	-22 57.7	1.229	2.240	2.8	5.6 173.7W
2011	8 6	21 7.76	-23 5.3	1.230	2.241	2.9	5.6 173.7W
2011	8 7	21 6.81	-23 12.7	1.231	2.242	3.0	5.6 173.4W
2011	8 8	21 5.86	-23 20.1	1.233	2.243	3.2	5.7 173.0E
2011	8 9	21 4.91	-23 27.3	1.234	2.243	3.5	5.7 172.3E

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 8 10	21 3.96	-23 34.4	1.237	2.244	3.8	5.7	171.6E
2011 8 11	21 3.02	-23 41.3	1.239	2.245	4.2	5.7	170.8E
2011 8 12	21 2.09	-23 48.1	1.241	2.246	4.6	5.7	169.8E
2011 8 13	21 1.16	-23 54.8	1.244	2.247	5.0	5.8	168.9E
2011 8 14	21 0.24	-24 1.2	1.247	2.248	5.4	5.8	167.9E
2011 8 15	20 59.34	-24 7.5	1.250	2.249	5.9	5.8	166.9E
2011 8 16	20 58.44	-24 13.7	1.254	2.250	6.3	5.8	165.8E
2011 8 17	20 57.56	-24 19.6	1.258	2.250	6.8	5.9	164.7E
2011 8 18	20 56.69	-24 25.4	1.262	2.251	7.3	5.9	163.7E
2011 8 19	20 55.83	-24 31.0	1.266	2.252	7.7	5.9	162.6E
2011 8 20	20 55.00	-24 36.4	1.270	2.253	8.2	5.9	161.5E
2011 8 21	20 54.18	-24 41.6	1.275	2.254	8.7	6.0	160.4E
2011 8 22	20 53.38	-24 46.6	1.280	2.255	9.1	6.0	159.3E
2011 8 23	20 52.60	-24 51.4	1.285	2.256	9.6	6.0	158.2E
2011 8 24	20 51.84	-24 56.0	1.291	2.257	10.0	6.0	157.1E
2011 8 25	20 51.11	-25 0.4	1.296	2.258	10.5	6.1	156.0E
2011 8 26	20 50.39	-25 4.6	1.302	2.259	10.9	6.1	154.9E
2011 8 27	20 49.71	-25 8.6	1.308	2.259	11.4	6.1	153.8E
2011 8 28	20 49.04	-25 12.4	1.314	2.260	11.8	6.1	152.7E
2011 8 29	20 48.41	-25 16.0	1.321	2.261	12.2	6.2	151.6E
2011 8 30	20 47.80	-25 19.4	1.328	2.262	12.7	6.2	150.6E
2011 8 31	20 47.21	-25 22.6	1.334	2.263	13.1	6.2	149.5E
2011 9 1	20 46.66	-25 25.6	1.342	2.264	13.5	6.2	148.4E
2011 9 2	20 46.13	-25 28.4	1.349	2.265	13.9	6.3	147.4E
2011 9 3	20 45.63	-25 31.0	1.356	2.266	14.3	6.3	146.3E
2011 9 4	20 45.17	-25 33.4	1.364	2.267	14.7	6.3	145.2E
2011 9 5	20 44.73	-25 35.6	1.372	2.268	15.1	6.3	144.2E
2011 9 6	20 44.32	-25 37.5	1.380	2.269	15.5	6.4	143.1E
2011 9 7	20 43.95	-25 39.3	1.388	2.270	15.8	6.4	142.1E
2011 9 8	20 43.60	-25 41.0	1.397	2.270	16.2	6.4	141.1E
2011 9 9	20 43.29	-25 42.4	1.405	2.271	16.5	6.4	140.0E
2011 9 10	20 43.01	-25 43.6	1.414	2.272	16.9	6.5	139.0E
2011 9 11	20 42.76	-25 44.6	1.423	2.273	17.2	6.5	138.0E
2011 9 12	20 42.54	-25 45.5	1.432	2.274	17.6	6.5	137.0E
2011 9 13	20 42.36	-25 46.2	1.441	2.275	17.9	6.5	136.0E
2011 9 14	20 42.20	-25 46.7	1.451	2.276	18.2	6.5	135.0E
2011 9 15	20 42.08	-25 47.0	1.460	2.277	18.5	6.6	134.0E
2011 9 16	20 42.00	-25 47.1	1.470	2.278	18.8	6.6	133.1E
2011 9 17	20 41.94	-25 47.1	1.480	2.279	19.1	6.6	132.1E
2011 9 18	20 41.92	-25 46.9	1.490	2.280	19.4	6.6	131.1E
2011 9 19	20 41.93	-25 46.6	1.500	2.281	19.7	6.7	130.2E
2011 9 20	20 41.97	-25 46.0	1.510	2.282	19.9	6.7	129.2E
2011 9 21	20 42.04	-25 45.4	1.520	2.283	20.2	6.7	128.3E
2011 9 22	20 42.15	-25 44.5	1.531	2.284	20.5	6.7	127.3E
2011 9 23	20 42.28	-25 43.5	1.542	2.285	20.7	6.8	126.4E
2011 9 24	20 42.45	-25 42.3	1.552	2.286	20.9	6.8	125.5E
2011 9 25	20 42.65	-25 41.0	1.563	2.287	21.2	6.8	124.6E
2011 9 26	20 42.88	-25 39.6	1.574	2.288	21.4	6.8	123.6E
2011 9 27	20 43.14	-25 38.0	1.585	2.289	21.6	6.8	122.7E
2011 9 28	20 43.43	-25 36.2	1.597	2.289	21.8	6.9	121.8E
2011 9 29	20 43.75	-25 34.3	1.608	2.290	22.0	6.9	120.9E
2011 9 30	20 44.10	-25 32.3	1.619	2.291	22.2	6.9	120.1E
2011 10 1	20 44.48	-25 30.1	1.631	2.292	22.4	6.9	119.2E
2011 10 2	20 44.89	-25 27.8	1.643	2.293	22.6	6.9	118.3E
2011 10 3	20 45.32	-25 25.3	1.654	2.294	22.8	7.0	117.4E
2011 10 4	20 45.79	-25 22.8	1.666	2.295	22.9	7.0	116.6E
2011 10 5	20 46.28	-25 20.1	1.678	2.296	23.1	7.0	115.7E
2011 10 6	20 46.80	-25 17.2	1.690	2.297	23.3	7.0	114.9E
2011 10 7	20 47.35	-25 14.2	1.702	2.298	23.4	7.1	114.0E
2011 10 8	20 47.92	-25 11.2	1.714	2.299	23.5	7.1	113.2E
2011 10 9	20 48.52	-25 7.9	1.726	2.300	23.7	7.1	112.4E
2011 10 10	20 49.14	-25 4.6	1.739	2.301	23.8	7.1	111.5E
2011 10 11	20 49.80	-25 1.1	1.751	2.302	23.9	7.1	110.7E
2011 10 12	20 50.47	-24 57.6	1.763	2.303	24.1	7.1	109.9E
2011 10 13	20 51.17	-24 53.9	1.776	2.304	24.2	7.2	109.1E
2011 10 14	20 51.89	-24 50.1	1.789	2.305	24.3	7.2	108.3E
2011 10 15	20 52.64	-24 46.1	1.801	2.306	24.4	7.2	107.5E
2011 10 16	20 53.41	-24 42.1	1.814	2.307	24.5	7.2	106.7E
2011 10 17	20 54.21	-24 38.0	1.827	2.308	24.5	7.2	105.9E
2011 10 18	20 55.02	-24 33.7	1.839	2.309	24.6	7.3	105.1E
2011 10 19	20 55.86	-24 29.3	1.852	2.310	24.7	7.3	104.3E
2011 10 20	20 56.72	-24 24.9	1.865	2.311	24.8	7.3	103.5E
2011 10 21	20 57.60	-24 20.3	1.878	2.312	24.8	7.3	102.8E
2011 10 22	20 58.50	-24 15.6	1.891	2.313	24.9	7.3	102.0E
2011 10 23	20 59.43	-24 10.8	1.904	2.314	24.9	7.3	101.2E
2011 10 24	21 0.37	-24 5.9	1.917	2.315	25.0	7.4	100.5E
2011 10 25	21 1.33	-24 0.9	1.930	2.316	25.0	7.4	99.7E
2011 10 26	21 2.31	-23 55.8	1.943	2.317	25.1	7.4	99.0E
2011 10 27	21 3.31	-23 50.6	1.956	2.318	25.1	7.4	98.2E
2011 10 28	21 4.33	-23 45.3	1.970	2.319	25.1	7.4	97.5E
2011 10 29	21 5.36	-23 39.9	1.983	2.320	25.2	7.4	96.8E
2011 10 30	21 6.42	-23 34.4	1.996	2.321	25.2	7.5	96.0E
2011 10 31	21 7.49	-23 28.8	2.009	2.322	25.2	7.5	95.3E
2011 11 1	21 8.58	-23 23.1	2.023	2.323	25.2	7.5	94.6E
2011 11 2	21 9.68	-23 17.3	2.036	2.324	25.2	7.5	93.8E
2011 11 3	21 10.80	-23 11.4	2.049	2.325	25.2	7.5	93.1E
2011 11 4	21 11.94	-23 5.5	2.063	2.326	25.2	7.5	92.4E
2011 11 5	21 13.09	-22 59.4	2.076	2.327	25.2	7.6	91.7E
2011 11 6	21 14.25	-22 53.2	2.089	2.328	25.2	7.6	91.0E
2011 11 7	21 15.44	-22 47.0	2.103	2.329	25.2	7.6	90.3E
2011 11 8	21 16.63	-22 40.6	2.116	2.330	25.2	7.6	89.6E
2011 11 9	21 17.84	-22 34.2	2.129	2.331	25.1	7.6	88.9E



## 4 Vesta

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 11 10	21 19.06	-22 27.7	2.143	2.332	25.1	7.6	88.2E
2011 11 11	21 20.30	-22 21.1	2.156	2.333	25.1	7.6	87.5E
2011 11 12	21 21.55	-22 14.4	2.169	2.334	25.1	7.7	86.8E
2011 11 13	21 22.81	-22 7.6	2.183	2.335	25.0	7.7	86.1E
2011 11 14	21 24.09	-22 0.7	2.196	2.336	25.0	7.7	85.4E
2011 11 15	21 25.38	-21 53.8	2.210	2.337	24.9	7.7	84.7E
2011 11 16	21 26.68	-21 46.8	2.223	2.338	24.9	7.7	84.1E
2011 11 17	21 27.99	-21 39.6	2.236	2.339	24.8	7.7	83.4E
2011 11 18	21 29.31	-21 32.4	2.250	2.340	24.8	7.7	82.7E
2011 11 19	21 30.64	-21 25.2	2.263	2.341	24.7	7.7	82.1E
2011 11 20	21 31.99	-21 17.8	2.276	2.342	24.7	7.8	81.4E
2011 11 21	21 33.34	-21 10.3	2.290	2.343	24.6	7.8	80.7E
2011 11 22	21 34.70	-21 2.8	2.303	2.344	24.5	7.8	80.1E
2011 11 23	21 36.08	-20 55.2	2.316	2.345	24.5	7.8	79.4E
2011 11 24	21 37.46	-20 47.5	2.329	2.346	24.4	7.8	78.7E
2011 11 25	21 38.86	-20 39.8	2.343	2.347	24.3	7.8	78.1E
2011 11 26	21 40.26	-20 31.9	2.356	2.348	24.2	7.8	77.4E
2011 11 27	21 41.67	-20 24.0	2.369	2.349	24.1	7.8	76.8E
2011 11 28	21 43.09	-20 16.0	2.382	2.350	24.1	7.8	76.1E
2011 11 29	21 44.52	-20 8.0	2.395	2.351	24.0	7.9	75.5E
2011 11 30	21 45.96	-19 59.8	2.408	2.352	23.9	7.9	74.8E
2011 12 1	21 47.41	-19 51.6	2.421	2.353	23.8	7.9	74.2E
2011 12 2	21 48.86	-19 43.3	2.434	2.354	23.7	7.9	73.6E
2011 12 3	21 50.32	-19 35.0	2.447	2.355	23.6	7.9	72.9E
2011 12 4	21 51.79	-19 26.5	2.460	2.356	23.5	7.9	72.3E
2011 12 5	21 53.26	-19 18.0	2.473	2.357	23.4	7.9	71.7E
2011 12 6	21 54.75	-19 9.4	2.486	2.358	23.3	7.9	71.0E
2011 12 7	21 56.24	-19 0.8	2.499	2.359	23.2	7.9	70.4E
2011 12 8	21 57.73	-18 52.1	2.512	2.360	23.1	7.9	69.8E
2011 12 9	21 59.24	-18 43.3	2.525	2.361	22.9	8.0	69.1E
2011 12 10	22 0.74	-18 34.5	2.537	2.362	22.8	8.0	68.5E
2011 12 11	22 2.26	-18 25.6	2.550	2.363	22.7	8.0	67.9E
2011 12 12	22 3.78	-18 16.6	2.563	2.364	22.6	8.0	67.3E
2011 12 13	22 5.31	-18 7.6	2.575	2.365	22.5	8.0	66.7E
2011 12 14	22 6.84	-17 58.5	2.588	2.366	22.4	8.0	66.0E
2011 12 15	22 8.38	-17 49.3	2.600	2.367	22.2	8.0	65.4E
2011 12 16	22 9.92	-17 40.1	2.613	2.368	22.1	8.0	64.8E
2011 12 17	22 11.47	-17 30.8	2.625	2.369	22.0	8.0	64.2E
2011 12 18	22 13.02	-17 21.4	2.637	2.370	21.8	8.0	63.6E
2011 12 19	22 14.58	-17 12.0	2.650	2.371	21.7	8.0	63.0E
2011 12 20	22 16.14	-17 2.5	2.662	2.372	21.6	8.0	62.4E
2011 12 21	22 17.71	-16 53.0	2.674	2.373	21.4	8.1	61.8E
2011 12 22	22 19.28	-16 43.4	2.686	2.374	21.3	8.1	61.2E
2011 12 23	22 20.86	-16 33.8	2.698	2.375	21.1	8.1	60.6E
2011 12 24	22 22.44	-16 24.1	2.710	2.376	21.0	8.1	60.0E
2011 12 25	22 24.02	-16 14.3	2.722	2.377	20.9	8.1	59.4E
2011 12 26	22 25.61	-16 4.5	2.734	2.378	20.7	8.1	58.8E
2011 12 27	22 27.20	-15 54.7	2.746	2.379	20.6	8.1	58.2E
2011 12 28	22 28.80	-15 44.8	2.757	2.380	20.4	8.1	57.6E
2011 12 29	22 30.40	-15 34.8	2.769	2.381	20.3	8.1	57.0E
2011 12 30	22 32.00	-15 24.8	2.781	2.382	20.1	8.1	56.4E
2011 12 31	22 33.61	-15 14.7	2.792	2.383	20.0	8.1	55.8E

## 7 Iris

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 1 1	8 42.60	+12 10.7	1.196	2.104	13.6	8.3	149.7W
2011 1 2	8 41.78	+12 9.7	1.193	2.107	13.1	8.3	150.9W
2011 1 3	8 40.94	+12 8.8	1.190	2.109	12.6	8.3	152.1W
2011 1 4	8 40.07	+12 8.1	1.187	2.112	12.1	8.2	153.3W
2011 1 5	8 39.17	+12 7.5	1.184	2.114	11.6	8.2	154.4W
2011 1 6	8 38.25	+12 7.1	1.182	2.117	11.1	8.2	155.6W
2011 1 7	8 37.30	+12 6.8	1.180	2.120	10.5	8.2	156.8W
2011 1 8	8 36.34	+12 6.7	1.178	2.122	10.0	8.1	158.0W
2011 1 9	8 35.35	+12 6.7	1.177	2.125	9.5	8.1	159.2W
2011 1 10	8 34.34	+12 6.8	1.175	2.127	8.9	8.1	160.3W
2011 1 11	8 33.32	+12 7.1	1.174	2.130	8.4	8.1	161.5W
2011 1 12	8 32.28	+12 7.5	1.173	2.132	7.9	8.1	162.7W
2011 1 13	8 31.22	+12 8.1	1.173	2.135	7.4	8.0	163.8W
2011 1 14	8 30.15	+12 8.7	1.172	2.137	6.9	8.0	165.0W
2011 1 15	8 29.07	+12 9.5	1.172	2.140	6.4	8.0	166.1W
2011 1 16	8 27.99	+12 10.4	1.172	2.143	5.9	8.0	167.1W
2011 1 17	8 26.89	+12 11.4	1.173	2.145	5.4	8.0	168.2W
2011 1 18	8 25.78	+12 12.5	1.173	2.148	4.9	7.9	169.2W
2011 1 19	8 24.67	+12 13.7	1.174	2.150	4.5	7.9	170.1W
2011 1 20	8 23.56	+12 15.0	1.176	2.153	4.1	7.9	171.0W
2011 1 21	8 22.45	+12 16.4	1.177	2.155	3.8	7.9	171.7W
2011 1 22	8 21.33	+12 17.9	1.179	2.158	3.5	7.9	172.3W
2011 1 23	8 20.22	+12 19.4	1.181	2.161	3.3	7.9	172.7W
2011 1 24	8 19.11	+12 21.1	1.183	2.163	3.2	7.9	172.9E
2011 1 25	8 18.01	+12 22.8	1.186	2.166	3.2	7.9	172.9E
2011 1 26	8 16.91	+12 24.6	1.188	2.168	3.3	7.9	172.6E
2011 1 27	8 15.82	+12 26.5	1.191	2.171	3.5	7.9	172.2E
2011 1 28	8 14.74	+12 28.4	1.195	2.174	3.8	7.9	171.6E
2011 1 29	8 13.68	+12 30.4	1.198	2.176	4.2	8.0	170.8E
2011 1 30	8 12.62	+12 32.4	1.202	2.179	4.5	8.0	169.9E
2011 1 31	8 11.58	+12 34.5	1.206	2.181	4.9	8.0	169.0E
2011 2 1	8 10.56	+12 36.6	1.211	2.184	5.4	8.1	168.0E
2011 2 2	8 9.56	+12 38.7	1.215	2.187	5.8	8.1	167.0E

## 7 Iris

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 2 3	8 8.57	+12 40.9	1.220	2.189	6.3	8.1	165.9E
2011 2 4	8 7.60	+12 43.2	1.225	2.192	6.8	8.2	164.8E
2011 2 5	8 6.66	+12 45.4	1.231	2.195	7.2	8.2	163.7E
2011 2 6	8 5.73	+12 47.6	1.236	2.197	7.7	8.2	162.6E
2011 2 7	8 4.84	+12 49.9	1.242	2.200	8.2	8.3	161.5E
2011 2 8	8 3.96	+12 52.2	1.249	2.202	8.7	8.3	160.3E
2011 2 9	8 3.11	+12 54.5	1.255	2.205	9.1	8.3	159.2E
2011 2 10	8 2.29	+12 56.8	1.262	2.208	9.6	8.4	158.0E
2011 2 11	8 1.50	+12 59.1	1.268	2.210	10.1	8.4	156.9E
2011 2 12	8 0.73	+13 1.4	1.276	2.213	10.6	8.4	155.8E
2011 2 13	7 59.99	+13 3.7	1.283	2.216	11.0	8.5	154.6E
2011 2 14	7 59.29	+13 6.0	1.290	2.218	11.5	8.5	153.5E
2011 2 15	7 58.61	+13 8.2	1.298	2.221	11.9	8.5	152.4E
2011 2 16	7 57.96	+13 10.5	1.306	2.224	12.3	8.6	151.2E
2011 2 17	7 57.35	+13 12.7	1.315	2.226	12.8	8.6	150.1E
2011 2 18	7 56.77	+13 14.9	1.323	2.229	13.2	8.6	149.0E
2011 2 19	7 56.22	+13 17.1	1.332	2.231	13.6	8.7	147.9E
2011 2 20	7 55.70	+13 19.2	1.340	2.234	14.0	8.7	146.8E
2011 2 21	7 55.22	+13 21.3	1.350	2.237	14.4	8.7	145.7E
2011 2 22	7 54.77	+13 23.4	1.359	2.239	14.8	8.8	144.6E
2011 2 23	7 54.35	+13 25.5	1.368	2.242	15.2	8.8	143.5E
2011 2 24	7 53.97	+13 27.5	1.378	2.245	15.6	8.8	142.4E
2011 2 25	7 53.62	+13 29.4	1.388	2.247	16.0	8.8	141.3E
2011 2 26	7 53.31	+13 31.4	1.398	2.250	16.3	8.9	140.3E
2011 2 27	7 53.03	+13 33.2	1.408	2.253	16.7	8.9	139.2E
2011 2 28	7 52.78	+13 35.1	1.418	2.255	17.0	8.9	138.2E
2011 3 1	7 52.57	+13 36.8	1.429	2.258	17.4	9.0	137.1E

## 15 Eunomia

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2011 9 27	4 26.71	+36 57.6	1.573	2.156	25.6	9.0	111.7W
2011 9 28	4 27.42	+37 2.7	1.564	2.156	25.4	9.0	112.5W
2011 9 29	4 28.09	+37 7.7	1.555	2.157	25.3	9.0	113.3W
2011 9 30	4 28.73	+37 12.6	1.545	2.157	25.1	8.9	114.1W
2011 10 1	4 29.34	+37 17.4	1.536	2.158	24.9	8.9	114.9W
2011 10 2	4 29.91	+37 22.0	1.527	2.158	24.7	8.9	115.7W
2011 10 3	4 30.45	+37 26.6	1.518	2.159	24.5	8.9	116.5W
2011 10 4	4 30.95	+37 31.1	1.509	2.159	24.3	8.9	117.3W
2011 10 5	4 31.42	+37 35.4	1.500	2.160	24.1	8.8	118.1W
2011 10 6	4 31.84	+37 39.7	1.491	2.160	23.9	8.8	119.0W
2011 10 7	4 32.23	+37 43.8	1.482	2.161	23.7	8.8	119.8W
2011 10 8	4 32.58	+37 47.7	1.474	2.162	23.4	8.8	120.7W
2011 10 9	4 32.90	+37 51.6	1.465	2.162	23.2	8.8	121.5W
2011 10 10	4 33.17	+37 55.3	1.457	2.163	23.0	8.8	122.4W
2011 10 11	4 33.41	+37 58.9	1.448	2.163	22.7	8.7	123.3W
2011 10 12	4 33.60	+38 2.4	1.440	2.164	22.4	8.7	124.1W
2011 10 13	4 33.76	+38 5.7	1.432	2.165	22.2	8.7	125.0W
2011 10 14	4 33.87	+38 8.9	1.424	2.165	21.9	8.7	125.9W
2011 10 15	4 33.95	+38 11.9	1.416	2.166	21.6	8.7	126.8W
2011 10 16	4 33.99	+38 14.7	1.408	2.167	21.3	8.6	127.7W
2011 10 17	4 33.98	+38 17.4	1.400	2.167	21.1	8.6	128.6W
2011 10 18	4 33.93	+38 19.9	1.393	2.168	20.8	8.6	129.6W
2011 10 19	4 33.84	+38 22.3	1.385	2.169	20.4	8.6	130.5W
2011 10 20	4 33.72	+38 24.5	1.378	2.170	20.1	8.6	131.4W
2011 10 21	4 33.55	+38 26.5	1.371	2.170	19.8	8.5	132.3W
2011 10 22	4 33.34	+38 28.3	1.364	2.171	19.5	8.5	133.3W
2011 10 23	4 33.08	+38 29.9	1.357	2.172	19.2	8.5	134.2W
2011 10 24	4 32.79	+38 31.4	1.351	2.173	18.8	8.5	135.2W
2011 10 25	4 32.46	+38 32.6	1.344	2.173	18.5	8.5	136.2W
2011 10 26	4 32.09	+38 33.6	1.338	2.174	18.1	8.4	137.1W
2011 10 27	4 31.67	+38 34.4	1.331	2.175	17.8	8.4	138.1W
2011 10 28	4 31.22	+38 35.0	1.325	2.176	17.4	8.4	139.1W
2011 10 29	4 30.73	+38 35.3	1.319	2.177	17.0	8.4	140.0W
2011 10 30	4 30.21	+38 35.4	1.314	2.177	16.7	8.4	141.0W
2011 10 31	4 29.64	+38 35.3	1.308	2.178	16.3	8.3	142.0W
2011 11 1	4 29.04	+38 35.0	1.303	2.179	15.9	8.3	143.0W
2011 11 2	4 28.40	+38 34.3	1.298	2.180	15.5	8.3	144.0W
2011 11 3	4 27.73	+38 33.5	1.293	2.181	15.1	8.3	145.0W
2011 11 4	4 27.02	+38 32.4	1.288	2.182	14.7	8.3	146.0W
2011 11 5	4 26.28	+38 31.0	1.283	2.183	14.3	8.2	146.9W
2011 11 6	4 25.51	+38 29.3	1.279	2.184	13.9	8.2	147.9W
2011 11 7	4 24.70	+38 27.4	1.275	2.184	13.5	8.2	148.9W
2011 11 8	4 23.87	+38 25.2	1.271	2.185	13.1	8.2	149.9W
2011 11 9	4 23.01	+38 22.7	1.267	2.186	12.7	8.2	150.9W
2011 11 10	4 22.12	+38 20.0	1.264	2.187	12.3	8.2	151.8W
2011 11 11	4 21.21	+38 16.9	1.260	2.188	11.9	8.1	152.8W
2011 11 12	4 20.27	+38 13.6	1.257	2.189	11.5	8.1	153.7W
2011 11 13	4 19.31	+38 10	1.254	2.190	11.1	8.1	154.7W
2011 11 14	4 18.33	+38 6.1	1.252	2.191	10.8	8.1	155.6W
2011 11 15	4 17.34	+38 1.9	1.249	2.192	10.4	8.1	156.5W
2011 11 16	4 16.32	+37 57.4	1.247	2.193	10	8.0	157.4W
2011 11 17	4 15.29	+37 52.6	1.245	2.194	9.6	8.0	158.2W
2011 11 18	4 14.25	+37 47.6	1.243	2.195	9.3	8.0	159.0W
2011 11 19	4 13.19	+37 42.2	1.242	2.196	8.9	8.0	159.8W
2011 11 20	4 12.13	+37 36.6	1.241	2.197	8.6	8.0	160.6W
2011 11 21	4 11.05	+37 30.7	1.240	2.198	8.3	8.0	161.3W
2011 11 22	4 9.97	+37 24.5	1.239	2.199	8.0	8.0	161.9W
2011 11 23	4 8.89	+37 18.1	1.239	2.201	7.8	8.0	162.5W

## 15 Eunomia

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 11 24	4 7.81	+37 11.3	1.238	2.202	7.5	7.9	163.0W
2011 11 25	4 6.72	+37 4.4	1.238	2.203	7.3	7.9	163.5W
2011 11 26	4 5.64	+36 57.1	1.239	2.204	7.2	7.9	163.8W
2011 11 27	4 4.56	+36 49.7	1.239	2.205	7.0	7.9	164.1E
2011 11 28	4 3.49	+36 42.0	1.240	2.206	6.9	7.9	164.3E
2011 11 29	4 2.43	+36 34.0	1.241	2.207	6.9	7.9	164.4E
2011 11 30	4 1.37	+36 25.9	1.242	2.208	6.9	7.9	164.4E
2011 12 1	4 0.33	+36 17.5	1.244	2.210	6.9	7.9	164.4E
2011 12 2	3 59.30	+36 8.9	1.246	2.211	7.0	7.9	164.2E
2011 12 3	3 58.28	+36 0.2	1.248	2.212	7.1	8.0	163.9E
2011 12 4	3 57.28	+35 51.2	1.250	2.213	7.2	8.0	163.5E
2011 12 5	3 56.30	+35 42.1	1.253	2.214	7.4	8.0	163.1E
2011 12 6	3 55.34	+35 32.8	1.255	2.215	7.6	8.0	162.6E
2011 12 7	3 54.40	+35 23.4	1.259	2.217	7.9	8.0	162.0E
2011 12 8	3 53.48	+35 13.9	1.262	2.218	8.2	8.0	161.4E
2011 12 9	3 52.59	+35 4.2	1.266	2.219	8.4	8.0	160.7E
2011 12 10	3 51.72	+34 54.4	1.269	2.220	8.7	8.1	159.9E
2011 12 11	3 50.88	+34 44.5	1.273	2.222	9.1	8.1	159.2E
2011 12 12	3 50.06	+34 34.6	1.278	2.223	9.4	8.1	158.3E
2011 12 13	3 49.28	+34 24.5	1.282	2.224	9.8	8.1	157.5E
2011 12 14	3 48.52	+34 14.4	1.287	2.225	10.1	8.2	156.6E
2011 12 15	3 47.80	+34 4.3	1.292	2.227	10.5	8.2	155.7E
2011 12 16	3 47.11	+33 54.1	1.298	2.228	10.8	8.2	154.8E
2011 12 17	3 46.45	+33 43.9	1.303	2.229	11.2	8.2	153.9E
2011 12 18	3 45.82	+33 33.6	1.309	2.231	11.6	8.2	152.9E
2011 12 19	3 45.23	+33 23.4	1.315	2.232	12.0	8.3	152.0E
2011 12 20	3 44.67	+33 13.2	1.321	2.233	12.3	8.3	151.0E
2011 12 21	3 44.14	+33 3.0	1.328	2.235	12.7	8.3	150.0E
2011 12 22	3 43.65	+32 52.8	1.334	2.236	13.1	8.3	149.0E
2011 12 23	3 43.20	+32 42.6	1.341	2.237	13.5	8.4	148.0E
2011 12 24	3 42.78	+32 32.6	1.348	2.239	13.8	8.4	147.0E
2011 12 25	3 42.40	+32 22.5	1.356	2.240	14.2	8.4	146.0E
2011 12 26	3 42.06	+32 12.6	1.363	2.241	14.6	8.4	145.0E
2011 12 27	3 41.75	+32 2.7	1.371	2.243	14.9	8.5	144.0E
2011 12 28	3 41.48	+31 52.9	1.379	2.244	15.3	8.5	143.0E
2011 12 29	3 41.25	+31 43.1	1.387	2.246	15.6	8.5	142.0E
2011 12 30	3 41.05	+31 33.5	1.396	2.247	16.0	8.5	141.0E
2011 12 31	3 40.89	+31 24.0	1.404	2.248	16.3	8.6	140.0E

## 20 Massalia

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 3 11	11 38.99	+ 1 30.5	1.261	2.252	2.1	9.0	175.3W
2011 3 12	11 38.07	+ 1 36.8	1.261	2.254	1.5	8.9	176.5W
2011 3 13	11 37.14	+ 1 43.1	1.262	2.255	1.0	8.9	177.7W
2011 3 14	11 36.22	+ 1 49.5	1.263	2.257	0.5	8.9	178.9W
2011 3 15	11 35.29	+ 1 55.8	1.264	2.258	0.3	8.8	179.2E
2011 3 16	11 34.37	+ 2 2.1	1.265	2.260	0.8	8.9	178.3E
2011 3 17	11 33.46	+ 2 8.4	1.267	2.261	1.3	8.9	177.1E
2011 3 18	11 32.54	+ 2 14.7	1.269	2.263	1.8	9.0	175.9E

## 29 Amphitrite

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 10 23	2 46.33	+23 21.6	1.413	2.378	7.6	9.0	161.5W
2011 10 24	2 45.39	+23 20.9	1.409	2.377	7.2	9.0	162.6W
2011 10 25	2 44.42	+23 20.0	1.406	2.377	6.7	8.9	163.7W
2011 10 26	2 43.45	+23 18.9	1.403	2.377	6.3	8.9	164.7W
2011 10 27	2 42.46	+23 17.7	1.400	2.377	5.9	8.9	165.8W
2011 10 28	2 41.46	+23 16.3	1.398	2.376	5.5	8.9	166.8W
2011 10 29	2 40.45	+23 14.8	1.396	2.376	5.1	8.9	167.8W
2011 10 30	2 39.43	+23 13.1	1.394	2.376	4.7	8.8	168.7W
2011 10 31	2 38.40	+23 11.3	1.392	2.376	4.3	8.8	169.6W
2011 11 1	2 37.37	+23 9.4	1.391	2.375	4.0	8.8	170.4W
2011 11 2	2 36.33	+23 7.3	1.390	2.375	3.7	8.8	171.1W
2011 11 3	2 35.29	+23 5.1	1.389	2.375	3.5	8.8	171.7W
2011 11 4	2 34.25	+23 2.7	1.388	2.375	3.3	8.7	172.1E
2011 11 5	2 33.21	+23 0.3	1.388	2.374	3.2	8.7	172.3E
2011 11 6	2 32.17	+22 57.7	1.388	2.374	3.2	8.7	172.4E
2011 11 7	2 31.13	+22 55.0	1.388	2.374	3.2	8.7	172.3E
2011 11 8	2 30.10	+22 52.2	1.389	2.374	3.4	8.7	171.9E
2011 11 9	2 29.08	+22 49.3	1.389	2.374	3.6	8.8	171.4E
2011 11 10	2 28.06	+22 46.3	1.390	2.373	3.8	8.8	170.8E
2011 11 11	2 27.05	+22 43.2	1.392	2.373	4.1	8.8	170.0E
2011 11 12	2 26.05	+22 40.1	1.393	2.373	4.5	8.8	169.2E
2011 11 13	2 25.06	+22 36.8	1.395	2.373	4.9	8.8	168.3E
2011 11 14	2 24.08	+22 33.5	1.397	2.373	5.3	8.9	167.3E
2011 11 15	2 23.12	+22 30.2	1.400	2.372	5.7	8.9	166.3E
2011 11 16	2 22.17	+22 26.8	1.402	2.372	6.1	8.9	165.3E
2011 11 17	2 21.24	+22 23.3	1.405	2.372	6.5	8.9	164.2E
2011 11 18	2 20.33	+22 19.8	1.408	2.372	6.9	9.0	163.1E
2011 11 19	2 19.44	+22 16.3	1.412	2.372	7.4	9.0	162.0E
2011 11 20	2 18.57	+22 12.8	1.415	2.371	7.8	9.0	160.9E

## 44 Nysa

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 2 8	9 38.01	+15 15.5	1.109	2.095	1.5	9.0	176.8W
2011 2 9	9 37.09	+15 22.7	1.109	2.095	1	9.0	177.9W
2011 2 10	9 36.17	+15 29.9	1.110	2.096	0.6	8.9	178.7W
2011 2 11	9 35.25	+15 37.0	1.110	2.097	0.7	8.9	178.6E
2011 2 12	9 34.33	+15 44.1	1.111	2.098	1.1	9.0	177.7E

## 192 Nausikaa

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 8 20	22 56.71	- 9 19.9	0.905	1.899	8.2	9.0	164.5W
2011 8 21	22 55.88	- 9 18.9	0.901	1.897	7.6	8.9	165.6W
2011 8 22	22 55.04	- 9 18.0	0.897	1.896	7.0	8.9	166.8W
2011 8 23	22 54.18	- 9 17.1	0.893	1.894	6.4	8.8	167.9W
2011 8 24	22 53.29	- 9 16.2	0.890	1.892	5.8	8.8	169.1W
2011 8 25	22 52.39	- 9 15.3	0.886	1.890	5.2	8.7	170.2W
2011 8 26	22 51.47	- 9 14.4	0.883	1.889	4.6	8.7	171.4W
2011 8 27	22 50.53	- 9 13.6	0.880	1.887	4.0	8.7	172.6W
2011 8 28	22 49.58	- 9 12.8	0.878	1.885	3.4	8.6	173.7W
2011 8 29	22 48.62	- 9 11.9	0.875	1.884	2.7	8.5	174.9W
2011 8 30	22 47.64	- 9 11.1	0.873	1.882	2.1	8.5	176.1W
2011 8 31	22 46.66	- 9 10.2	0.871	1.880	1.5	8.4	177.2W
2011 9 1	22 45.67	- 9 9.3	0.870	1.879	1	8.4	178.2W
2011 9 2	22 44.67	- 9 8.4	0.868	1.877	0.6	8.3	178.9W
2011 9 3	22 43.67	- 9 7.5	0.867	1.876	0.8	8.3	178.6E
2011 9 4	22 42.67	- 9 6.6	0.866	1.874	1.3	8.4	177.6E
2011 9 5	22 41.67	- 9 5.6	0.865	1.872	1.9	8.4	176.5E
2011 9 6	22 40.67	- 9 4.5	0.864	1.871	2.5	8.5	175.3E
2011 9 7	22 39.68	- 9 3.4	0.864	1.869	3.2	8.5	174.1E
2011 9 8	22 38.69	- 9 2.2	0.864	1.868	3.8	8.6	173.0E
2011 9 9	22 37.70	- 9 1.0	0.864	1.866	4.4	8.6	171.8E
2011 9 10	22 36.73	- 8 59.7	0.864	1.865	5.1	8.7	170.6E
2011 9 11	22 35.77	- 8 58.4	0.865	1.864	5.7	8.7	169.4E
2011 9 12	22 34.82	- 8 56.9	0.865	1.862	6.3	8.7	168.2E
2011 9 13	22 33.88	- 8 55.4	0.866	1.861	7.0	8.8	167.1E
2011 9 14	22 32.96	- 8 53.8	0.867	1.859	7.6	8.8	165.9E
2011 9 15	22 32.06	- 8 52.1	0.869	1.858	8.2	8.8	164.7E
2011 9 16	22 31.18	- 8 50.4	0.870	1.857	8.8	8.9	163.5E
2011 9 17	22 30.31	- 8 48.5	0.872	1.855	9.4	8.9	162.4E
2011 9 18	22 29.47	- 8 46.5	0.874	1.854	10.0	8.9	161.2E
2011 9 19	22 28.66	- 8 44.5	0.876	1.853	10.7	9.0	160.1E
2011 9 20	22 27.87	- 8 42.3	0.879	1.851	11.3	9.0	158.9E

## 1036 Ganymed

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2011 10 4	1 45.37	+45 28.1	0.371	1.294	32.5	9.0	136.0W
2011 10 5	1 46.87	+44 21.5	0.369	1.297	31.4	9.0	137.6W
2011 10 6	1 48.29	+43 13.1	0.367	1.300	30.2	8.9	139.1W
2011 10 7	1 49.64	+42 3.1	0.365	1.303	29.0	8.9	140.7W
2011 10 8	1 50.91	+40 51.5	0.364	1.307	27.8	8.9	142.4W
2011 10 9	1 52.12	+39 38.4	0.363	1.310	26.6	8.8	144.0W
2011 10 10	1 53.25	+38 24.1	0.362	1.314	25.3	8.8	145.7W
2011 10 11	1 54.33	+37 8.5	0.361	1.317	24.1	8.8	147.5W
2011 10 12	1 55.34	+35 51.9	0.361	1.321	22.8	8.7	149.2W
2011 10 13	1 56.29	+34 34.4	0.360	1.325	21.5	8.7	151.0W
2011 10 14	1 57.19	+33 16.2	0.361	1.329	20.1	8.7	152.7W
2011 10 15	1 58.04	+31 57.4	0.361	1.332	18.8	8.7	154.5W
2011 10 16	1 58.83	+30 38.2	0.362	1.336	17.4	8.6	156.3W
2011 10 17	1 59.59	+29 18.7	0.363	1.340	16.1	8.6	158.2W
2011 10 18	2 0.30	+27 59.2	0.364	1.345	14.7	8.6	160.0W
2011 10 19	2 0.97	+26 39.9	0.366	1.349	13.3	8.6	161.8W
2011 10 20	2 1.60	+25 20.9	0.368	1.353	12.0	8.5	163.6W
2011 10 21	2 2.20	+24 2.3	0.370	1.357	10.6	8.5	165.4W
2011 10 22	2 2.77	+22 44.4	0.373	1.362	9.3	8.5	167.3W
2011 10 23	2 3.31	+21 27.4	0.376	1.366	7.9	8.5	169.1W
2011 10 24	2 3.83	+20 11.3	0.379	1.371	6.6	8.4	170.8W
2011 10 25	2 4.32	+18 56.4	0.383	1.375	5.3	8.4	172.6W
2011 10 26	2 4.79	+17 42.7	0.387	1.380	4.1	8.4	174.3W
2011 10 27	2 5.24	+16 30.4	0.391	1.385	2.9	8.4	176.0W
2011 10 28	2 5.68	+15 19.6	0.396	1.389	1.8	8.3	177.5E
2011 10 29	2 6.10	+14 10.5	0.401	1.394	1.1	8.3	178.4E
2011 10 30	2 6.51	+13 3.0	0.406	1.399	1.5	8.4	177.9E
2011 10 31	2 6.90	+11 57.3	0.412	1.404	2.5	8.5	176.5E
2011 11 1	2 7.29	+10 53.4	0.417	1.409	3.5	8.6	175.0E
2011 11 2	2 7.68	+ 9 51.5	0.423	1.414	4.6	8.7	173.4E
2011 11 3	2 8.06	+ 8 51.4	0.430	1.419	5.7	8.7	171.9E
2011 11 4	2 8.43	+ 7 53.4	0.437	1.424	6.7	8.8	170.3E
2011 11 5	2 8.80	+ 6 57.3	0.444	1.429	7.7	8.9	168.8E
2011 11 6	2 9.18	+ 6 3.2	0.451	1.435	8.7	9.0	167.3E

Date = data nel formato anno/mese/giorno

# CONGIUNZIONI <1° PIANETI - ASTEROIDI m<9

## CONJUNCTIONS <1° PLANETS - ASTEROIDS m<9

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)	tw(h)		
2011/02/09 06:31:16		0.37012	0.00436	0.912	2.743	1	-44	-4.1	7.6		185.8	Venus	Vesta

# CONGIUNZIONI MULTIPLE PIANETI - ASTEROIDI

(eventi con 2 o più pianeti ed un asteroide entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS - ASTEROIDS

(events with 2 or more planets and a bright asteroid within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

R2 = distanza in U.A. dell'asteroide dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m2 = magnitudine dell'asteroide

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the planet from the Earth

R2 = distance in A.U. of asteroid from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the planet

m2 = magnitude of the asteroid

tm = if present, an object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

# CONGIUNZIONI <1° ASTEROIDI m<9 - STELLE m<2

## CONJUNCTIONS <1° ASTEROIDS m<9 - STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)		
2011/10/21	12:36:48	0.99811	0.00661	0.370	85	-166	8.3	2.0		89.7	Ganymed	Alpha ARI Hamal

# CONGIUNZIONI <1° ASTEROIDI m<9 - OGGETTI

## MESSIER m<9

# CONJUNCTIONS <1° ASTEROIDS m<9 - MESSIER

## OBJECTS m<9

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)
------	----	----	----	----	---	---	----	----	-------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine dell'oggetto

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of planet from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the planet

m\* = magnitude of the object

tm = if present, an object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

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**CONGIUNZIONI MULTIPLE PIANETI-ASTEROIDI-STELLE**  
 (eventi con 1 pianeta, una stella di mag<2 ed un asteroide entro 5°)  
**MULTIPLE CONJUNCTIONS PLANETS-ASTEROIDS-STARS**  
 (events with 1 planet, a star with mag<2 and a bright asteroid within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

**CONGIUNZIONI MULTIPLE PIANETI - ASTEROIDI -**  
**OGGETTI MESSIER**  
 (eventi con 1 pianeta, un oggetto mag<2 ed un asteroide entro 5°)  
**MULTIPLE CONJUNCTIONS PLANETS - ASTEROIDS -**  
**MESSIER OBJECTS**  
 (events with 1 planet, an object with mag<2 and a bright asteroid within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

# CONGIUNZIONI <1° TRA ASTEROIDI m<9

## CONJUNCTIONS <1° BETWEEN ASTEROIDS m<9

Data	TT	Dm	Dl	r1	r2	p (°)	e	m1	m2	tm(s)	tw(h)
------	----	----	----	----	----	-------	---	----	----	-------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, an object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

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# EVENTI <1° LUNA-ASTEROIDI m<9

## EVENTS <1° MOON-ASTEROIDS m<9

### Geocentriche - Geocentric

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2011/02/28 00:10:24		0.86298	1.17914	2.580	0.003	168	-54	7.5	-9.8	2472	Vesta	Moon

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dm	Alt.	r1	r2	p	e	m1	m2	tm(s)		
2011/03/28 06:50:23		0.39812	28.76	2.299	0.003	335	-69	7.3	-10.3		Vesta	Moon

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. dell'asteroide dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine dell'asteroide

m2 = magnitudine della Luna

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the asteroid from the Earth

R2 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

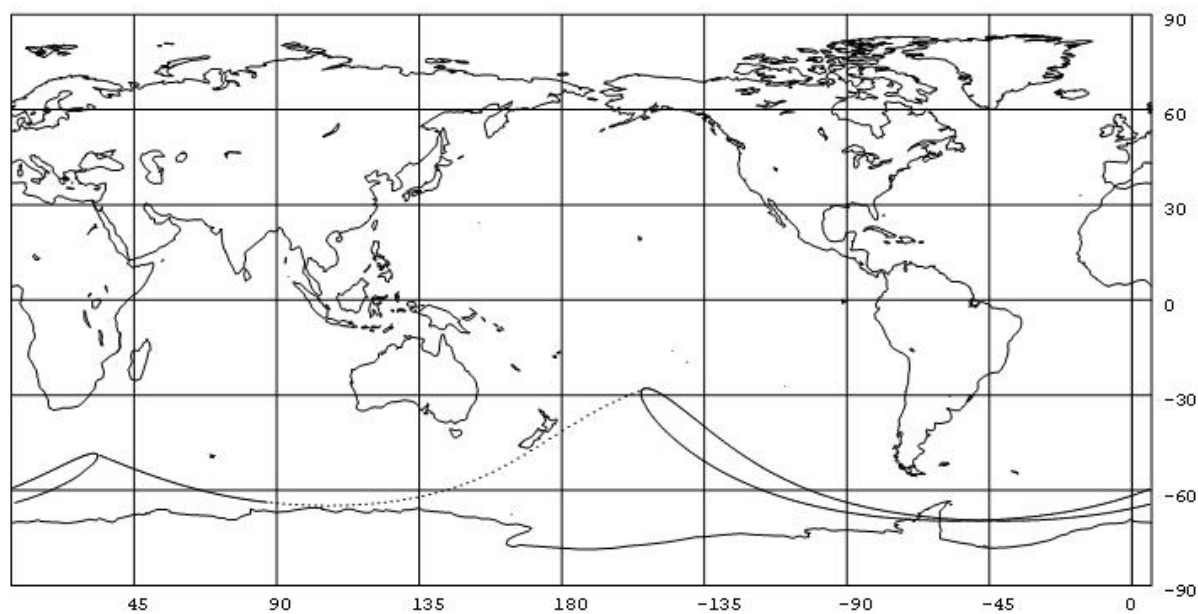
e = elongation, in °

m1 = magnitude of the asteroid

m2 = magnitude of the Moon

tm = if present, an object is occulted maximum for x seconds

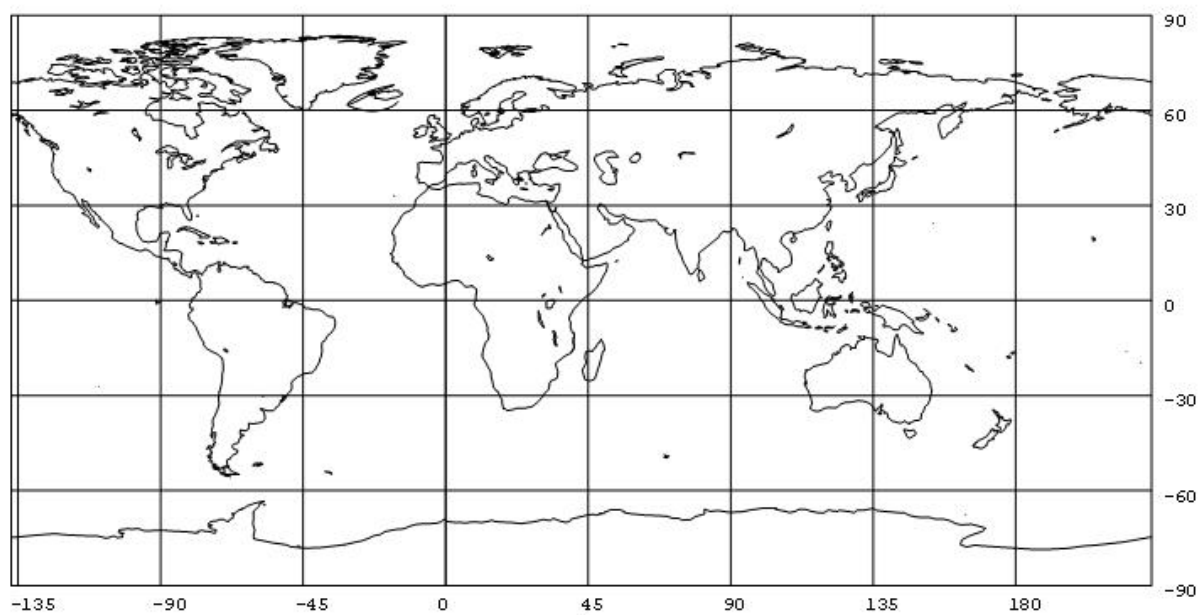
# Occultation of Vesta, Magnitude 7.8, on 2011 Feb 27



Occult 4.0.7.0

UT of conjunction = 23h 48.3m

# Occultation of Vesta, Magnitude 7.6, on 2011 Mar 28



Occult 4.0.7.0

UT of conjunction = 7h 12.1m

# CONGIUNZIONI MULTIPLE PIANETI-LUNA-ASTEROIDI

(eventi con 1 pianeta, la Luna ed un asteroide entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON-ASTEROIDS

(events with 1 planet, the Moon and an asteroid within 5°)

### Geocentriche - Geocentric

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

### Topocentriche - Topocentric 42°N - 12°E

Data UT Dmed Dmax emin mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZ. <0,5° ASTEROIDI m<9-STELLE m<6

## CONJUNCTIONS <0,5° ASTEROIDS m<9-STARS m<6

Date	TT	Dm	Dl	RA	Dec	rl	p	e	ml	m*	tm(s)	tw(h)			
2011/02/04	15:45:40	0.30671	0.00091	273.617	-20.748	2.780	181	-42	7.6	3.8		18.7	Vesta	Mu	SGR
Polis															
2011/02/05	07:22:40	0.36897	0.00091	273.969	-20.753	2.775	1	-42	7.6	6.0		16.0	Vesta		SGR
2011/02/05	07:34:47	0.02870	0.00091	273.974	-20.753	2.775	1	-42	7.6	5.4		23.6	Vesta		SGR
2011/02/10	00:22:33	0.22775	0.00093	276.509	-20.762	2.737	360	-45	7.6	4.6		21.3	Vesta		SGR
2011/02/16	08:25:38	0.32415	0.00094	279.884	-20.717	2.684	179	-48	7.6	5.9		18.5	Vesta		
2011/02/21	12:35:10	0.32363	0.00096	282.602	-20.634	2.639	358	-51	7.5	5.2		18.7	Vesta		SGR
2011/02/25	04:29:49	0.08921	0.00097	284.501	-20.551	2.606	177	-53	7.5	5.1		24.4	Vesta	Xi1	SGR
2011/03/15	20:44:29	0.39283	0.00068	332.525	-18.838	3.819	343	-28	9.0	5.8		19.8	Ceres		AQR
2011/03/22	01:59:44	0.16183	0.00107	296.739	-19.572	2.364	173	-66	7.4	4.9		25.8	Vesta		SGR
2011/03/25	09:43:02	0.38859	0.00109	298.268	-19.400	2.329	353	-68	7.4	5.9		17.4	Vesta		SGR
2011/04/14	21:30:42	0.09973	0.00120	307.011	-18.271	2.109	352	-80	7.2	5.1		31.0	Vesta	Pi	CAP
2011/04/16	00:03:10	0.23191	0.00073	343.746	-15.537	3.572	163	-47	9.0	3.3		31.1	Ceres	Delta	AQR
2011/04/16	08:41:37	0.35639	0.00121	307.586	-18.191	2.093	172	-81	7.2	5.9		22.5	Vesta	Omicron	CAP
2011/04/23	02:41:26	0.26586	0.00125	310.137	-17.834	2.019	172	-85	7.1	5.2		28.9	Vesta	Upsilon	CAP
2011/05/05	08:46:31	0.36354	0.00077	350.032	-13.745	3.366	344	-59	8.9	5.2		26.5	Ceres		AQR
2011/05/13	03:36:14	0.17711	0.00141	316.631	-17.009	1.797	174	-98	6.8	4.1		41.9	Vesta	Theta	CAP
2011/05/20	11:28:42	0.40709	0.00082	354.467	-12.600	3.184	166	-69	8.8	5.7		25.0	Ceres		
2011/05/29	23:55:10	0.18697	0.00085	357.007	-12.029	3.062	348	-76	8.7	5.8		43.6	Ceres		
2011/05/30	20:08:45	0.03714	0.00157	320.723	-16.821	1.610	3	-111	6.6	4.3		69.5	Vesta	Iota	CAP
2011/07/17	23:14:05	0.36008	0.00202	320.962	-20.524	1.252	140	-158	5.9	5.4		39.7	Vesta		CAP
2011/08/31	00:12:56	0.14994	0.00190	311.763	-25.366	1.335	338	149	6.1	4.1		83.2	Vesta	Psi	CAP
2011/09/02	10:59:00	0.43519	0.00129	3.214	-15.767	2.016	327	-157	7.6	4.9		30.2	Ceres		CET
2011/09/12	05:34:03	0.33042	0.00131	1.389	-16.759	1.991	334	-163	7.6	5.8		42.2	Ceres		
2011/09/14	10:44:35	0.33659	0.00131	0.941	-16.964	1.989	155	-164	7.6	4.5		41.2	Ceres		CET
2011/10/05	13:48:51	0.32407	0.00128	356.604	-18.291	2.036	170	153	7.7	5.6		50.1	Ceres		
2011/10/06	02:39:11	0.03945	0.00150	311.718	-25.263	1.693	338	115	6.8	4.1		90.8	Vesta	Psi	CAP
2011/10/07	14:29:37	0.13717	0.00127	356.226	-18.346	2.047	352	151	7.7	5.2		65.8	Ceres		AQR
2011/10/11	06:03:18	0.44872	0.00126	355.582	-18.408	2.069	356	148	7.7	5.4		32.8	Ceres		AQR
2011/11/17	10:05:25	0.47846	0.00113	322.171	-21.588	2.243	339	83	7.4	5.8		10.6	Vesta		CAP
2011/11/17	17:16:57	0.21554	0.00113	322.270	-21.552	2.247	159	83	7.4	4.5		32.7	Vesta		CAP
2011/12/01	16:15:17	0.14354	0.00099	353.749	-15.088	2.620	129	99	8.3	6.0		73.1	Ceres		
2011/12/10	18:17:01	0.32747	0.00095	354.870	-13.919	2.741	136	91	8.4	5.0		46.8	Ceres	Omega1	AQR
2011/12/24	01:32:30	0.23255	0.00089	357.121	-12.026	2.920	322	81	8.5	5.8		44.0	Ceres		

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

A.R. e Dec = coordinate apparenti della stella

Rl = distanza in U.A. dell'asteroide dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

ml = magnitudine dell'asteroide

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 0.5° tra loro

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

A.R. e Dec = apparent coordinates of the star

Rl = distance in A.U. of the asteroid from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

ml = magnitude of the asteroid

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 0.5°

# OCCULTAZIONI ASTEROIDALI GEOCENTRICHE DI STELLE

m<6

# GEOCENTRIC ASTEROIDAL OCCULTATIONS OF STARS m<6

Date			U.T.	Diameter	Durn	Star	Mag-Drop	Elon	%	Star	Planet	Min	R.A. (J2000)			Dec.
y	m	d	h m	km	sec/m	mag	V R	o	Ill	No.	No Name	D Error	h m s	' "	' "	
2011	01	2	1 29.8	12 0.016	1.5s	5.2	9.5 9.1	140		HIP 35951	I 1816 Liberia	0.20 0.02	7 24 40.184	-16 12 5.52		
2011	01	14	19 49.1	19 0.015	7.0s	4.7	11.2 11.3	133		HIP 20732	4343 Tetsuya	0.42 0.04	4 26 36.364	14 42 49.27		
2011	01	18	5 28.6	11 0.006	1.2s	5.9	11.8 11.4	137		HIP 49812	I 23408 Beijingaoyun	0.81 0.05	10 10 7.517	- 8 24 29.41		
2011	01	19	7 39.1	48 0.016	1.0s	5.6	11.1 10.8	10		HIP 95077	1254 Erfordia	1.07 0.09	19 20 38.141	-22 24 8.83		
2011	02	17	23 31.0	35 0.014	1.4s	5.7	12.0 11.8	73		HIP 83196	I 3157 Novikov	0.35 0.08	17 0 9.552	-24 59 21.27		
2011	03	1	5 45.0	13 0.003	1.0s	4.3	15.7 15.3	87		HIP 20648	I 63290 2001 DS87	0.77 0.12	4 25 29.468	17 55 40.07		
2011	03	3	18 16.7	51 0.023	1.4s	5.5	10.6 11.0	55		HIP 94437	I 2731 Cucula	0.99 0.07	19 13 15.532	-12 16 57.64		
2011	03	4	14 2.6	14 0.011	1.1s	5.5	10.3 10.3	162		HIP 54029	I 31227 1998 BC41	0.50 0.04	11 3 14.818	-11 18 13.70		
2011	03	14	2 4.7	43 0.019	1.1s	5.8	8.9 8.9	41		HIP 8544	I 132 Aethra	1.10 0.07	1 50 8.557	22 16 31.12		
2011	04	1	0 51.9	37 0.028	3.3s	5.8	9.1 9.5	162		HIP 64445	1582 Martir	0.42 0.04	13 12 32.880	11 33 21.61		
2011	04	4	4 54.4	12 0.008	1.0s	5.8	10.8 10.6	154		HIP 66563	I 3707 Schroter	1.22 0.05	13 38 41.995	-29 33 39.98		
2011	04	23	5 10.3	135 0.051	3.2s	5.4	8.4 8.0	27		HIP 17776	I 70 Panopaea	1.36 0.08	3 48 20.831	23 25 15.97		
2011	05	15	1 23.3	13 0.013	1.2s	5.7	9.1 9.2	173		HIP 73184	1806 Derice	1.25 0.03	14 57 28.845	-21 25 15.33		
2011	05	18	21 5.6	17 0.009	1.0s	4.7	12.2 11.9	93		HIP 106786	I 1834 Palach	0.20 0.06	21 37 45.197	- 7 51 15.41		
2011	05	27	0 54.2	55 0.016	1.2s	5.8	11.4 11.5	10		HIP 23068	I 1202 Marina	1.26 0.11	4 57 48.648	23 56 54.71		
2011	06	21	13 8.3	134 0.050	2.8s	6.0	8.0 8.1	19		HIP 25816	705 Erminia	0.47 0.08	5 30 48.654	41 27 42.78		
2011	06	26	1 7.9	63 0.049	6.4s	5.9	6.2 6.3	158		HIP 97783	I 487 Venetia	1.30 0.04	19 52 12.005	-19 2 42.67		
2011	06	26	20 17.8	19 0.012	1.4s	6.0	9.1 8.6	177		HIP 89440	I 2531 Cambridge	0.43 0.05	18 15 12.969	-20 23 16.72		
2011	06	27	21 22.2	18 0.016	1.9s	4.3	12.2 12.2	152		HIP 80894	I 4265 Kani	1.06 0.04	16 31 8.331	-16 36 46.26		
2011	07	8	8 26.2	51 0.031	2.8s	3.5	10.8 10.9	94		HIP 5364	I 986 Amelia	1.09 0.05	1 8 35.560	-10 10 57.76		
2011	07	27	5 2.3	58 0.026	1.3s	5.9	9.5 9.2	31		HIP 29616	I 585 Bilkis	0.15 0.07	6 14 28.580	17 54 22.72		
2011	07	28	1 57.2	73 0.034	2.2s	3.8	11.0 11.1	58		HIP 20455	I 380 Fiducia	0.26 0.07	4 22 56.179	17 32 32.71		
2011	07	30	7 52.5	39 0.021	1.7s	5.1	11.1 10.7	74		HIP 16322	1693 Hertzsprung	0.57 0.06	3 30 24.456	11 20 11.00		
2011	08	27	19 22.9	26 0.015	2.0s	5.2	10.7 10.6	169		HIP 107095	I 1340 Yvette	0.12 0.05	21 41 32.760	-14 2 54.99		
2011	08	31	20 2.9	32 0.014	1.0s	4.2	12.5 12.8	56		HIP 69427	2271 Kiso	0.84 0.07	14 12 53.751	-10 16 23.70		
2011	08	31	21 25.6	74 0.024	1.8s	5.6	10.7 10.3	30		HIP 61968	I 1042 Amazone	0.56 0.10	12 41 57.061	6 48 23.69		
2011	09	11	7 37.6	17 0.016	4.2s	5.3	9.8 9.4	123		HIP 10559	3093 Bergholz	1.06 0.03	2 15 56.272	33 21 31.63		
2011	09	23	7 54.8	12 0.010	1.0s	4.5	12.4 11.9	165		HIP 113889	I 5443 Encrenaz	1.23 0.04	23 3 52.623	3 49 12.05		
2011	10	8	3 14.7	13 0.013	1.2s	5.0	11.1 11.4	165		HIP 7999	11096 1994 RU1	1.31 0.03	1 42 43.503	- 3 41 25.13		
2011	10	9	8 1.4	69 0.019	7.6s	2.7	14.4 13.9	105		HIP 28380	I 3564 Talhybius	0.18 0.11	5 59 43.313	37 12 44.44		
2011	10	11	1 23.5	59 0.026	1.2s	3.6	10.0 9.8	20		HIP 57757	I 337 Devosa	0.03 0.07	11 50 42.299	1 45 49.81		
2011	10	15	14 53.3	32 0.017	1.2s	5.6	10.6 10.7	74		HIP 90260	I 1002 Olbersia	1.14 0.06	18 25 1.309	-30 45 24.46		
2011	11	2	9 9.5	19 0.013	1.5s	5.2	10.4 10.0	155		HIP 17457	5215 Tsurui	0.15 0.05	3 44 30.513	- 1 9 47.23		
2011	11	5	4 5.9	11 0.012	1.3s	6.0	9.3 9.1	153		HIP 10215	16358 Plesetsk	0.34 0.03	2 11 22.204	-10 3 9.80		
2011	11	6	15 51.8	68 0.025	2.2s	4.2	11.6 11.5	61		HIP 93825	I 1567 Alikoski	0.34 0.09	19 6 25.206	-37 3 51.73		
2011	11	18	11 20.4	10 0.006	2.2s	4.0	13.8 13.8	131		HIP 34088	I 4412 Chephren	0.66 0.05	7 4 6.525	20 34 13.07		
2011	11	27	6 57.7	26 0.016	1.8s	5.9	9.6 9.7	95		HIP 111394	I 1406 Komppa	1.24 0.05	22 34 2.944	- 1 34 27.79		
2011	12	22	14 34.2	20 0.027	2.7s	5.9	8.6 9.1	178		HIP 29196	2751 Campbell	0.93 0.02	6 9 32.433	22 11 24.92		
2011	12	25	15 0.2	25 0.023	2.5s	4.5	10.2 10.5	112		HIP 7884	I 1136 Mercedes	1.25 0.03	1 41 25.875	5 29 15.45		

Date : anno/mese/giorno

Ora : in Tempo Universale

Diameter : dimensione dell'asteroide in km ed in "

Durn : durata dell'evento in secondi o minuti

Star mag : magnitudine della stella

Mag drop : caduta di luce

Elon : elongazione, in gradi

% ill : valore nullo

Star : stella

D : distanza dell'evento dal centro della Terra

Error = incertezza di calcolo in raggio terrestri

Date = date in the format year/month/day

U.T. = times

Diameter = diameter in km and in " of the asteroid

Durn = duration of the event, in minutes or seconds

Star Mag = star magnitude - visual

Mag V = magnitude drop at occultation - based on visual magnitude

Drop R = magnitude drop at occultation - based on the star's red magnitude, and an asteroid color (B-V) of 0.83. This may be a better guide for CCD observers

Elon = elongation, in °

% ill = null

Min D = the minimum distance of the center of the occultation path from the center of the Earth

Error = the uncertainty in the location of the path, in Earth radii

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# OCCULTAZIONI ASTEROIDALI TOPOCENTRICHE DI STELLE m<6

## TOPOCENTRIC ASTEROIDAL OCCULTATIONS OF STARS m<6

42°N - 12°E

Date	U.T.	Diameter	Durn	star	Mag-Drop	Elon	%	Star	Planet	Alt	Dist	Sun	Proba-	Moon	R.A. (J2000)	Dec.
y m d	h m	Km	sec/m	mag	V R	°	o Ill	No.	No Name	° km	km	Alt	bility	ill	h m s	° ' "
2011 01 2	1 29.8	12 0.016	1.5s	5.2	9.5 9.1	140		HIP 35951	I 1816 Liberia	28 6819		0%	6 124	7 24 40.184	-16 12 5.52	
2011 01 14	19 49.1	19 0.015	7.0s	4.7	11.2 11.3	133		HIP 20732	4343 Tetsuya	63 6151		0%	72 20	4 26 36.364	14 42 49.27	
2011 01 18	5 28.6	11 0.006	1.2s	5.9	11.1 11.4	137		HIP 49812	I 23408 Beijingaoyun	16 1131		0%	96 63	10 10 7.517	-8 24 29.41	
2011 04 1	0 51.9	37 0.028	3.3s	5.8	9.1 9.5	162		HIP 64445	1582 Martir	57 6764		0%	6 143	13 12 32.880	11 33 21.61	
2011 05 15	1 23.3	13 0.013	1.2s	5.7	9.1 9.2	173		HIP 73184	1806 Derice	16 32161		0%	92 27	14 57 28.845	-21 25 15.33	
2011 06 26	1 7.9	63 0.049	6.4s	5.9	6.2 6.3	158		HIP 97783	I 487 Venetia	29 29877		0%	27 96	19 52 12.005	-19 2 42.67	
2011 06 26	20 17.8	19 0.012	1.4s	6.0	9.1 8.6	177		HIP 89440	I 2531 Cambridge	16 3466		0%	20 128	18 15 12.969	-20 23 16.72	
2011 06 27	21 22.2	18 0.016	1.9s	4.3	12.2 12.2	152		HIP 80894	I 4265 Kani	32 3039		4%	13 164	16 31 8.331	-16 36 46.26	
2011 07 8	8 26.2	51 0.031	2.8s	3.5	10.8 10.9	94		HIP 5364	I 986 Amelia	22 5193	49	10%	51 158	1 8 35.560	-10 10 57.76	
2011 07 28	1 57.2	73 0.034	2.2s	3.8	11.0 11.1	58		HIP 20455	I 380 Fiducia	20 2929		0%	9 24	4 22 56.179	17 32 32.71	
2011 08 27	19 22.9	26 0.015	2.0s	5.2	10.7 10.6	169		HIP 107095	I 1340 Yvette	19 6544		0%	3 172	21 41 32.760	-14 2 54.99	
2011 08 31	20 2.9	32 0.014	1.0s	4.2	12.5 12.8	56		HIP 69427	2271 Kiso	1 663		4%	11 20	14 12 53.751	-10 16 23.70	
2011 10 8	3 14.7	13 0.013	1.2s	5.0	11.1 11.4	165		HIP 7999	11096 1994 RUI	25 17976		0%	86 54	1 42 43.503	-3 41 25.13	
2011 10 9	8 1.4	69 0.019	7.6s	2.7	14.4 13.9	105		HIP 28380	I 3564 Talchybius	44 1749	26	0%	93 103	5 59 43.313	37 12 44.44	

Date : anno/mese/giorno  
 Ora : in Tempo Universale  
 Diameter : dimensione dell'asteroide in km ed in "  
 Durn : durata dell'evento in secondi o minuti  
 Star mag : magnitudine della stella  
 Mag drop : caduta di luce  
 Elon : elongazione, in gradi  
 % ill : valore nullo  
 Star : stella  
 Alt : altezza sull'orizzonte, in gradi  
 Sun alt : altezza del Sole sull'orizzonte in °  
 Probability : probabilità che l'evento accada  
 Moon ill : percentuale di Luna illuminata  
 Moon elon : elongazione lunare in °

Date = date in the format year/month/day  
 U.T. = times  
 Diameter = diameter in km and in " of the asteroid  
 Durn = duration of the event, in minutes or seconds  
 Star Mag = star magnitude - visual  
 Mag V = magnitude drop at occultation - based on visual magnitude  
 Drop R = magnitude drop at occultation - based on the star's red magnitude, and an asteroid color (B-V) of 0.83. This may be a better guide for CCD observers  
 Elon = elongation, in °  
 % ill = null

## CONGIUNZIONI MULTIPLE LUNA-ASTEROIDI-STELLE

(eventi con la Luna, 1 asteroide di mag<9 ed 1 stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-ASTEROIDS-STARS

(events with the Moon, 1 asteroid with mag<9 and 1 star with mag<2 within 5°)

Geocentriche - Geocentric

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Topocentriche - Topocentric 42°N - 12°E

Data	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

## CONGIUNZIONI MULTIPLE LUNA-ASTEROIDI-OGGETTI

(eventi con la Luna, 1 asteroide di mag<9 ed 1 oggetto di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-ASTEROIDS-OBJECTS

(events with the Moon, 1 asteroid with mag<9 and 1 object with mag<2 within 5°)

Geocentriche - Geocentric

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Topocentriche - Topocentric 42°N - 12°E

Data	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# **ASTEROIDI MOLTO VICINI $\Delta < 0.01$ U.A.** **NEAR ASTEROIDS $\Delta < 0.01$ A.U.**

Object	Date of approach (TDB) AAAA-mmm-DD HH:MM $\pm$ D_HH:MM	Nominal distance A.U.	Minima distance A.U.	V relative (km/s)	H (Mag)
2009 BS5	2011- 01-11 08:57 $\pm$ 2_19:59	0.0087	0.0053	5.56	27.4
2009 BD	2011- 06-02 00:52 $\pm$ 00:01	0.0023	0.0023	1.15	28.3
2007 TD	2011- 09-23 10:24 $\pm$ 18:37	0.0097	0.0057	11.89	24.4
2009 TM8	2011- 10-17 08:06 $\pm$ 07:58	0.0028	0.0012	8.17	28.6
2005 YU55	2011- 11-08 23:29 $\pm$ < 00:01	0.0022	0.0022	13.72	21.9
2000 YA	2011- 12-26 04:36 $\pm$ 06:45	0.0074	0.0074	13.64	23.7

Legenda :

Date of approach = data calcolata (anno-mese-giorno-ora-minuti  $\pm$  incertezza in giorni-ore-minuti) di avvicinamento alla Terra

Nominal/minima distance = nominale è quella calcolata, minima è quella calcolata tenendo conto dell'incertezza  $\pm 3\sigma$

V relative = velocità relativa tra Terra ed asteroide

H = magnitudine assoluta dell'asteroide

## **AVVICINAMENTI ASTEROIDI-PIANETI $\Delta < 10^6$ KM** **APPROACHES ASTEROIDS-PLANETS $\Delta < 10^6$ KM**

Data TDT Dm (Gm) V (km/s) Err (Gm) r1 (AU) r2

Questo anno non avvengono fenomeni - No phenomena this year

## **AVVICINAMENTI TRA ASTEROIDI** **APPROACHES BETWEEN ASTEROIDS**

Date	TT	Dist	V (km/s)	Err	r1	r2		
2011/01/10	04:20:46	7654	0.6903	514	2.1630	2.1629	2000RJ95	2003YP82
2011/01/19	12:03:58	6836	7.7412	383	3.0728	3.0727	2001JP5	2000AG227
2011/02/09	20:37:40	9921	2.1725	373	2.4136	2.4136	2005NV18	2004CG19
2011/02/19	02:30:37	7206	2.0705	275	2.8694	2.8694	2000GU59	2003FF17
2011/04/21	22:26:01	7475	2.0678	284	2.6071	2.6071	2002QB43	2001UZ79
2011/06/11	10:59:31	8345	2.7097	483	2.6863	2.6863	Waland	2002AE92
2011/06/26	11:52:10	7577	6.7849	194	2.4613	2.4613	1999JD68	1978VX2
2011/09/26	16:08:17	9619	4.4797	307	2.6128	2.6128	2001FB94	2001UE138
2011/10/04	20:09:13	4050	3.3798	446	2.6883	2.6883	2000RH100	2003SU218
2011/11/21	01:40:06	3887	4.5328	1383	2.3374	2.3374	1999VB116	2002TY239
2011/11/22	21:56:31	9561	6.3853	480	2.3488	2.3488	2000RY23	2000UU22
2011/12/21	01:25:36	6323	5.0919	188	2.7867	2.7867	1999JE101	2001HO59
2011/12/29	19:44:34	4811	1.7011	308	2.1514	2.1514	2001SJ307	2003QF39

Data nel formato anno/mese/giorno

Dist = distanza minima in km tra i centri dei corpi

V = velocità relativa tra i corpi

Err = incertezza del calcolo in km

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

Ultime 2 colonne : nomi dei corpi

Date in the format year/month/day

Dist = least distance in km

V = relative velocity

Err = uncertainty of the calculation in km

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

Last 2 columns : names



## TRANSITI DI ASTEROIDI SUI PIANETI PLANETARY TRANSITS OF ASTEROIDS

Data	TT	Dm	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

NB: SONO STATI PRESI IN CONSIDERAZIONE SOLO GLI ASTEROIDI CHE POTREBBERO SUPERARE 1" DI DIAMETRO ALL'OPPOSIZIONE (VEDI TABELLA SUCCESSIVA)

NB: I HAVE CONSIDERED ONLY THE ASTEROIDS THAT COULD OVERCOME 1" OF DIAMETER TO THE OPPOSITION. TO SEE THE FOLLOWING CHART.

## TRANSITI DI ASTEROIDI SUL SOLE SOLAR TRANSITS OF ASTEROIDS

Data	TT	Dm	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

NB: SONO STATI PRESI IN CONSIDERAZIONE SOLO GLI ASTEROIDI CHE POTREBBERO SUPERARE 1" DI DIAMETRO ALL'OPPOSIZIONE (VEDI TABELLA SUCCESSIVA)

NB: I HAVE CONSIDERED ONLY THE ASTEROIDS THAT COULD OVERCOME 1" OF DIAMETER TO THE OPPOSITION. TO SEE THE FOLLOWING CHART.

# OCCULTAZIONI TRA ASTEROIDI

## OCCULTAZIONS BETWEEN ASTEROIDS

Date	TT	Dm	Dl	Err	r1	r2	p	e	m1	m2	tm(s)		
2011/05/11 18:22:40		0.00008	0.00109	0.00003	2.473	1.180	69	56	12.7	19.3	2.8	Diana	2000QW69
2011/08/11 16:43:51		0.00275	0.00771	0.00025	2.540	0.282	174	-78	12.5	20.7	1.0	Ausonia	1999NB5

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

Err = incertezza del calcolo

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

**NB: SONO STATI PRESI IN CONSIDERAZIONE SOLO GLI EVENTI DI DURATA MAGGIORE DI 1 SECONDO ED IN CUI IL CORPO OCCULTATO HA  $MAG < 13$**

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

Err = uncertainty of the calculation in °

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, the asteroid is occulted maximum for x seconds

**NB: I HAVE CONSIDERED ONLY THE EVENTS OF DURATION GREATER THAN 1 SECOND AND IN WHICH THE HIDDEN HAS  $MAG < 13$**

© (6)

# ELENCO ASTEROIDI CON m MIN. TEORICA <9 ASTEROIDS WITH THEORETICAL LEAST mag. <9

Asteroidi	mag. min.	H						
(1) Ceres	6.4	3.3	(85182) 1991 AQ	8.4	17.1	2001 BF10	7.3	22.6
(2) Pallas	6.3	4.1	(85236) 1993 KH	4.3	18.9	2001 EC	5.6	18.6
(3) Juno	7.0	5.3	(85640) 1998 OX4	6.6	21.2	2001 FO32	6.4	17.7
(4) Vesta	5.1	3.2	(85713) 1998 SS49	3.2	15.7	2001 HA4	8.7	17.6
(5) Astraea	8.6	6.8	(86039) 1999 NC43	8.0	16.0	2001 TX44	8.9	19.2
(6) Hebe	7.1	5.7	(86819) 2000 GK137	8.5	17.4	2001 VK5	0.1	17.8
(7) Iris	6.5	5.5	(88254) 2001 FM129	7.3	17.3	2001 WS1	6.0	17.0
(8) Flora	7.6	6.5	(89830) 2002 CE	6.9	14.7	2001 WV1	8.9	22.5
(9) Metis	8.1	6.3	(89958) 2002 LY45	3.1	16.9	2001 XU	4.0	19.2
(10) Hygiea	8.9	5.4	(89959) 2002 NT7	1.2	16.5	2001 XP1	8.7	17.9
(11) Parthenope	8.6	6.6	(90075) 2002 VU94	8.0	15.7	2001 YN2	8.8	25.4
(12) Victoria	8.1	7.2	(90416) 2003 YK118	3.6	18.7	2001 YB5	8.9	20.9
(14) Irene	8.3	6.3	(99942) Apophis	0.4	19.2	2002 AJ129	7.6	18.5
(15) Eunomia	7.4	5.3	(100085) 1992 UY4	8.6	17.8	2002 CY9	8.2	19.5
(16) Psyche	8.8	5.9	(101869) 1999 MM	5.7	19.3	2002 EY2	3.0	19.0
(18) Melpomene	7.3	6.5	(101955) 1999 RQ36	8.3	20.9	2002 EM7	-0.9	24.4
(19) Fortuna	8.8	7.1	(111253) 2001 XU10	7.7	15.3	2002 GM2	8.6	18.5
(20) Massalia	8.3	6.5	(136617) 1994 CC	8.9	17.8	2002 JZ8	7.4	21.1
(21) Lutetia	9.0	7.3	(136618) 1994 CN2	7.4	16.9	2002 JB9	8.5	15.9
(23) Thalia	8.6	6.9	(137108) 1999 AN10	1.4	17.9	2002 LV	6.5	16.5
(27) Euterpe	8.4	7.0	(137427) 1999 TF211	7.3	15.0	2002 MN	7.9	23.6
(29) Amphitrite	8.4	5.8	(138127) 2000 EE14	9.0	17.1	2002 NY40	3.9	19.0
(39) Laetitia	8.9	6.1	(139622) 2001 QQ142	8.7	18.4	2002 SZ	6.5	20.4
(40) Harmonia	9.0	7.0	(140288) 2001 SN289	7.5	16.4	2002 SQ41	6.7	20.1
(41) Daphne	8.8	7.1	(141495) 2002 EZ11	3.6	18.2	2002 TR190	7.5	19.0
(42) Isis	8.7	7.5	(143404) 2003 BD44	8.0	16.7	2003 DZ15	4.2	22.2
(43) Ariadne	8.8	7.9	(143487) 2003 CR20	2.6	18.8	2003 EP4	8.6	23.9
(44) Nysa	8.8	7.0	(143649) 2003 QQ47	4.5	17.4	2003 HF2	7.2	19.6
(80) Sappho	8.9	8.0	(143651) 2003 QO104	4.1	16.0	2003 KO2	6.0	20.2
(89) Julia	8.4	6.6	(143992) 2004 AF	8.8	16.1	2003 LN6	8.6	24.7
(115) Thyra	8.9	7.5	(144332) 2004 DV24	5.6	16.6	2003 MH4	6.9	20.0
(192) Nausikaa	8.0	7.1	(144898) 2004 VD17	4.9	18.9	2003 MK4	7.1	20.9
(324) Bamberg	7.6	6.8	(152664) 1998 FW4	8.9	19.6	2003 QC10	3.2	18.0
(344) Desiderata	9.0	8.1	(152680) 1998 KJ9	7.9	19.4	2003 RN10	5.8	15.9
(433) Eros	7.3	11.2	(153201) 2000 WO107	6.9	19.3	2003 UV11	8.5	19.3
(471) Papagena	9.0	6.7	(153220) 2000 YN29	8.4	17.5	2003 WP7	7.5	24.2
(532) Herculina	8.3	5.8	(153249) 2001 BW15	8.9	15.0	2003 YG118	7.6	17.1
(887) Alinda	8.8	13.8	(153814) 2001 WN5	4.6	18.3	2003 YH136	8.9	19.4
(1036) Ganymed	7.8	9.4	(154276) 2002 SY50	4.6	17.6	2004 BE68	8.6	18.5
(1620) Geographos	8.1	15.6	(159857) 2004 LJ1	7.1	15.5	2004 BL86	8.5	18.9
(1627) Ivar	8.7	13.2	(161989) Cacus	8.1	17.1	2004 DC	7.8	18.1
(1685) Toro	7.9	14.2	(162162) 1999 DB7	6.4	19.9	2004 FH	1.9	25.7
(1862) Apollo	8.4	16.3	(162173) 1999 JU3	3.0	19.2	2004 FU4	5.6	18.5
(1866) Sisyphus	8.3	13.0	(162416) 2000 EH26	6.6	21.7	2004 FU162	8.8	28.7
(1917) Cuyo	8.5	13.9	(162474) 2000 LB16	6.7	18.5	2004 HE	1.3	26.8
(1981) Midas	3.2	15.5	(162825) 2001 BO61	8.5	17.9	2004 HW	6.9	17.2
(2135) Aristaeus	7.9	17.9	(163132) 2002 CU11	2.9	18.3	2004 HZ	5.6	22.6
(2201) Oljato	1.2	15.3	(163243) 2002 FB3	4.2	16.3	2004 HE12	7.2	17.5
(2340) Hathor	8.4	19.2	(163373) 2002 PZ39	6.4	19.0	2004 LV3	8.9	18.7
(3122) Florence	7.5	14.2	(163899) 2003 SD220	8.2	16.8	2004 MX2	6.5	19.3
(3200) Phaethon	6.2	14.6	(164121) 2003 YT1	3.8	16.2	2004 QY2	8.2	14.7
(3362) Khufu	9.0	18.3	(164207) 2004 GU9	6.4	21.2	2004 QT24	7.5	18.3
(3671) Dionysus	7.8	16.3	(164216) 2004 OT11	8.0	17.3	2004 RQ252	4.6	22.5
(4179) Toutatis	4.2	15.3	(170086) 2002 XR14	8.3	18.1	2004 ST26	7.4	26.3
(4183) Cuno	7.0	14.4	(171576) 1999 VP11	5.0	18.7	2004 TN1	7.3	21.8
(4581) Asclepius	8.0	20.4	(172678) 2003 YM137	6.8	18.7	2004 TL10	9.0	21.4
(4660) Nereus	5.8	18.2	(177049) 2003 EE16	0.2	19.8	2004 UE	5.5	21.2
(4769) Castalia	8.5	16.9	(177614) 2004 HK33	7.6	17.6	2004 VC17	5.7	18.4
(4953) 1990 MU	6.4	14.1	(186844) 2004 GA1	8.4	17.5	2004 XN14	7.6	20.0
(5143) Heracles	8.1	14.0	1990 HA	7.3	16.3	2004 XP14	5.7	19.4
(5693) 1993 EA	5.7	17.0	1990 SM	8.3	16.1	2004 XM29	8.3	22.9
(7335) 1989 JA	8.7	17.0	1994 AW1	9.0	17.5	2004 XL35	8.6	19.4
(7482) 1994 PC1	0.3	16.8	1994 WR12	8.2	22.0	2004 XB45	8.0	26.2
(7753) 1988 XB	7.8	18.6	1995 SA	9.0	17.4	2004 XN50	8.3	18.8
(8566) 1996 EN	8.3	16.5	1996 AJ1	8.6	20.2	2005 AD13	8.8	17.9
(12538) 1998 OH	8.5	16.1	1996 JA1	8.6	21.0	2005 BS1	7.1	27.5
(12923) Zephyr	7.9	16.1	1996 RG3	5.8	18.5	2005 CC37	8.7	22.7
(13651) 1997 BR	8.4	17.6	1996 SK	4.7	16.9	2005 EU2	7.5	23.1
(16960) 1998 QS52	4.8	14.2	1997 GL3	5.6	19.5	2005 GY8	8.8	21.8
(20425) 1998 VD35	7.6	20.4	1997 US2	8.6	19.8	2005 GC120	8.7	19.7
(20826) 2000 UV13	7.6	13.5	1997 XR2	-5.3	20.8	2005 LW3	6.2	21.7
(23187) 2000 PN9	7.1	16.1	1998 HH49	8.6	21.3	2005 NZ6	7.2	17.6
(27002) 1998 DV9	5.0	18.2	1998 KM3	7.2	19.7	2005 NB7	7.5	18.7
(31669) 1999 JT6	3.9	16.0	1998 QA1	7.4	19.0	2005 QK76	8.9	25.1
(33342) 1998 WT24	7.9	17.9	1998 QK28	8.1	19.4	2005 QZ151	8.1	20.0
(35107) 1991 VH	9.0	16.9	1998 SC15	-0.7	19.4	2005 SQ	8.8	20.3
(35396) 1997 XF11	1.0	16.9	1999 RM45	6.2	19.4	2005 SE71	5.4	18.2
(37638) 1993 VB	1.6	19.4	1999 XS35	3.7	17.2	2005 TS15	8.8	20.9
(39572) 1993 DQ1	8.8	16.5	1999 XL136	7.1	19.8	2005 VC	8.6	17.2
(52768) 1998 OR2	9.0	16.2	1999 YR14	8.0	18.9	2005 VL1	1.1	27.0
(53319) 1999 JM8	8.9	15.3	2000 EJ26	8.5	19.3	2005 VN5	8.5	27.0
(54509) YORP	5.6	22.7	2000 EK26	2.8	18.0	2005 WK4	7.9	20.1
(66146) 1998 TU3	9.0	14.5	2000 GV147	6.3	19.2	2005 WY55	8.9	20.7
(66391) 1999 KW4	7.2	16.5	2000 KA	7.0	21.6	2005 XJ8	8.1	17.0
(68216) 2001 CV26	8.4	16.4	2000 QK130	3.1	20.9	2005 YU55	7.0	21.9
(68372) 2001 PM9	6.8	18.9	2000 RS11	8.7	19.1	2006 BC10	8.5	19.4
(68950) 2002 QF15	5.4	16.4	2000 TU28	6.2	21.0	2006 BM55	8.2	23.0
(69230) Hermes	5.4	17.5	2000 YG29	8.5	18.8	2006 CT	8.3	22.3

2006 DU62	5.8	18.0	2007 VD184	7.9	23.1	2008 YQ2	5.2	22.6
2006 FX	6.3	20.0	2007 VK184	6.1	22.0	2008 YU3	9.0	19.9
2006 GY2	7.9	18.8	2007 VE191	7.7	23.6	2009 BH2	5.2	22.4
2006 JF42	6.3	19.0	2007 VN243	8.7	22.4	2009 BP5	6.7	22.7
2006 KV86	4.6	18.7	2008 AF4	6.5	19.7	2009 DD4	8.6	25.8
2006 QV89	1.9	25.3	2008 CF22	7.2	26.0	2009 DE1	7.4	24.3
2006 RJ1	8.0	22.2	2008 CK70	7.6	25.4	2009 EJ1	6.8	28.4
2006 SC	5.8	25.2	2008 CC71	8.9	24.9	2009 FG	8.7	25.5
2006 SU49	-1.2	19.6	2008 DE	8.3	19.6	2009 FH	8.2	26.6
2006 VV2	7.8	16.8	2008 DJ	4.7	20.5	2009 FJ	7.9	24.9
2006 WT1	7.5	20.1	2008 EX5	8.7	23.8	2009 HG6	6.2	22.7
2007 AG	8.0	20.1	2008 ER7	5.7	20.0	2009 JG2	1.7	22.6
2007 AB12	6.0	18.9	2008 EM68	8.1	27.5	2009 KC3	7.8	18.0
2007 AE12	8.7	19.7	2008 GD110	7.2	24.5	2009 KK	4.8	20.5
2007 CS5	8.8	24.6	2008 HB38	8.8	21.1	2009 KN4	8.9	18.4
2007 CA19	2.0	17.6	2008 KO	2.5	24.4	2009 MS	9.2	16.0
2007 CN26	7.8	21.1	2008 KZ5	7.2	20.0	2009 MS9	7.5	10.5
2007 DX40	8.6	24.6	2008 KN11	8.2	23.2	2009 OG	9.3	16.2
2007 EZ25	8.5	25.5	2008 LA	8.7	23.1	2009 QR	7.9	27.4
2007 FP3	8.8	28.4	2008 LV16	8.4	20.2	2009 SD	6.5	25.4
2007 GU1	7.0	25.0	2008 MP1	8.0	21.9	2009 SG1	9.7	17.9
2007 JD	7.7	23.1	2008 OB9	6.2	17.4	2009 SN1	8.9	27.6
2007 JY2	4.3	21.7	2008 PK3	4.9	22.0	2009 ST1	6.3	18.3
2007 LF	8.0	20.5	2008 QT3	8.3	18.4	2009 TB	9.9	29.2
2007 LB15	8.5	19.4	2008 QT3	8.7	18.8	2009 TD1	9.2	27.7
2007 LQ19	0.5	17.3	2008 TC3	6.6	30.4	2009 VA	8.8	28.6
2007 PA8	8.1	16.1	2008 TE	6.4	27.7	2009 WM1	-1.6	20.4
2007 PV27	0.8	20.2	2008 UB7	8.7	23.9	2009 WQ2	8.7	23.9
2007 RU9	5.5	20.7	2008 UB9	8.3	24.7	2009 XO	6.9	20.5
2007 RY19	8.8	22.5	2008 UM1	8.5	32.1	2009 XT6	7.5	20.2
2007 TB23	7.7	18.7	2008 WK9	7.4	23.1	2009 YG	9.6	18.6
2007 TU24	5.9	20.3	2008 WZ1	8.2	18.7	2010 AL3	4.7	27.2
2007 TH72	3.7	24.2	2008 XM	8.3	19.8	2010 CA	5.6	24.6
2007 UW1	8.6	22.7	2008 XQ2	7.1	20.0			
2007 UT3	7.9	25.9	2008 YF	7.8	20.9			
2007 UO6	8.1	27.3	2008 YO2	8.8	25.2			

La magnitudine minima teorica sarebbe quella che l'asteroide avrebbe se fosse al suo MOID (minimum orbital intersection distance).

Magnitudine assoluta (H)	Diametro
3	670 km - 1490 km
3.5	530 km - 1190 km
4	420 km - 940 km
4.5	330 km - 750 km
5	270 km - 590 km
5.5	210 km - 470 km
6	170 km - 380 km
6.5	130 km - 300 km
7	110 km - 240 km
7.5	85 km - 190 km
8	65 km - 150 km

8.5	50 km - 120 km
9	40 km - 90 km
9.5	35 km - 75 km
10	25 km - 60 km
11	15 km - 40 km
12	11 km - 24 km
13	7 km - 15 km
14	4 km - 9 km
15	3 km - 6 km
16	2 km - 4 km
17	1 km - 2 km
18	670 m - 1500 m

19	420 m - 940 m
20	270 m - 590 m
21	170 m - 380 m
22	110 m - 240 m
23	65 m - 150 m
24	40 m - 95 m
25	25 m - 60 m
26	17 m - 37 m
27	11 m - 24 m
28	7 m - 15 m
29	4 m - 9 m
30	3 m - 6 m

# ELENCO ASTEROIDI CHE ALL'OPPOSIZIONE POTREBBERO SUPERARE 1" DI DIAMETRO ASTEROIDS THAT AT THE OPPOSITION THEY COULD OVERCOME 1" OF DIAMETER

(1) Ceres		1.1	2007 EL38	3.4	7.5
(4) Vesta		1.6	2007 EN53	3.4	7.6
(1981) Midas		1.9	2007 EO53	2	4.6
(2201) Oljato	2.1	4.7	2007 EP56	2.9	6.5
(4179) Toutatis		1.2	2007 JG39	2	4.5
(7482) 1994 PC1	3.3	7.3	2007 JH39	2.6	5.9
(31669) 1999 JT6		1.4	2007 JJ39	3.1	6.8
(35396) 1997 XF11	2.3	5.1	2007 JK39	2.2	4.8
(37638) 1993 VB	1.7	3.9	2007 JL39	4.1	9.1
(85236) 1993 KH		1.1	2007 JG40	5.3	11.8
(85713) 1998 SS49		1.9	2007 KL	4.5	10
(89958) 2002 LY45		1.9	2007 KM	2.3	5.1
(89959) 2002 NT7	2.1	4.8	2007 KG1	3.3	7.4
(90416) 2003 YK118		1.5	2007 KM1	2.8	6.2
(99942) Apophis	3	6.7	2007 XS23	3.4	7.6
(137108) 1999 AN10	2	4.4	2008 AS69	2.8	6.3
(141495) 2002 EZ11		1.6	2008 DN1	3.5	7.9
(143487) 2003 CR20	1.1	2.5	2008 EX80	2.7	6
(143649) 2003 QQ47		1	2008 FR17	4.6	10.3
(143651) 2003 QO104		1.2	2008 FX24	2.1	4.8
(162173) 1999 JU3		2	2008 FY24	2.2	4.9
(163132) 2002 CU11		2.2	2008 FB25	3.4	7.7
(163243) 2002 FB3		1.2	2008 FH25	2.3	5.2
(164121) 2003 YT1		1.4	2008 FR27	2.7	6
(177049) 2003 EE16	3.4	7.6	2008 FS27	2.1	4.8
1997 XR2	41.5	92.9	2008 FH50	2.3	5.2
1998 SC15	5	11.3	2008 FL50	3.7	8.3
1999 XS35		1.5	2008 FM55	2.6	5.8
2000 EK26		2.2	2008 FA56	3.6	8.1
2000 QK130		2	2008 FX58	1.8	3.9
2001 VK5	3.6	7.9	2008 FA59	4	8.9
2001 XU		1.3	2008 GU2	3.4	7.6
2002 EY2		2	2008 GB13	3.3	7.3
2002 EM7	5.7	12.6	2008 GG13	4.9	11
2002 NY40		1.4	2008 GC20	3	6.7
2003 DZ15		1.2	2008 JW30	2.4	5.5
2003 QC10		1.9	2008 KQ5	3.9	8.7
2004 FH	1.5	3.4	2008 MH2	1.7	3.8
2004 HE	2	4.6	2008 MN2	3.3	7.4
2004 RQ252		1	2008 MR2	2	4.6
2005 VL1	2.2	4.9	2008 MS2	2.6	5.8
2006 QV89	1.6	3.5	2008 MA3	4.9	11
2006 SU49	6.5	14.4	2008 MK3	4.2	9.3
2007 CA19	1.5	3.3	2008 QR5	4.2	9.3
2007 JY2		1.2	2008 RJ69	2.4	5.3
2007 LQ19	2.9	6.5	2008 RD70	3.5	7.9
2007 PV27	2.5	5.6	2008 RE70		2.2
2007 TH72		1.5	2008 RZ92	2	4.5
2008 KO	1.1	2.6	2009 JG2	1.7	3.8
2006 YO14	2.9	6.4	2009 WM1	7.7	17.2
2007 CR13	5.2	11.6			
2007 DS4	2.3	5.2			

I due valori si riferiscono al massimo diametro in " che l'asteroide può raggiungere in base ad un albedo pari a 0.05 o 0.025

# COMETE AL PERIELIO - COMETS AT PERIHELUM

Comet	T	q	P	N	H <sub>1</sub>	K <sub>1</sub>	Peak mag
Beshore (2009 K3)	Jan 9.3	3.90			8.5	10.0	17
9P/Tempel	Jan 12.4	1.51	5.52	11	7.0	21.5	13
D/Helfenzrieder (1766 G1)	Jan 29.7	0.42	4.52	1	6.0	10.0	
D/Swift (1895 Q1)	Mar 1.4	1.48	7.40	1	11.4	10.0	
P/NEAT (2003 S2)	Mar 3.5	2.46	7.52	1	12.5	10.0	19
D/Barnard (1884 O1)	Mar 7.9	1.33	5.45	1	8.9	10.0	
P/Read (2005 U1)	Mar 10.9	2.36	5.63	1	14.5	10.0	20
P/LINEAR (2006 U1)	Apr 15.8	0.51	4.63	1	18.5	10.0	16
D/van Houten (1960 S1)	Apr 23.3	4.07	15.7	1	8.5	10.0	
P/LINEAR-NEAT (2004 T1)	Apr 24.9	1.71	6.47	1	12.5	10.0	17
P/LINEAR-NEAT (2003 CP7)	May 17.1	3.03	8.08	1	14.5	5.0	19
164P/Christensen	Jun 2.4	1.68	6.98	2	11.0	10.0	15
Boattini (2008 S3)	Jun 7.4	8.02			4.0	10.0	17
213P/Van Ness	Jun 16.2	2.12	6.33	2	10.5	10.0	14
130P/McNaught-Hughes	Jun 24.8	2.10	6.65	3	12.5	10.0	16
62P/Tsuchinshan	Jun 30.4	1.38	6.37	7	9.5	15.0	13
123P/West-Hartley	Jul 4.5	2.13	7.58	3	11.5	10.0	17
69P/Taylor	Jul 17.2	2.27	7.64	6	7.3	10.0	13
3D/Biela	Jul 29.9	0.80	6.56	6	7.5	10.0	
D/Harrington-Wilson (1952 B1)	Jul 30.1	1.28	5.58	1	12.1	10.0	
27P/Crommelin	Aug 3.8	0.75	27.92	5	12.0	20.0	11
97P/Metcalf-Brewington	Aug 21.0	2.60	10.53	3	4.6	15.0	12
228P/LINEAR (2009 U2)	Aug 23.8	3.43	8.51	1	14.5	5.0	19
P/SOHO (1999 R1)	Sep 7.1	0.05	3.99	3	22.1	12.8	6
45P/Honda-Mrkos-Pajdusakova	Sep 28.8	0.53	5.25	11	12.5	20.0	6
48P/Johnson	Sep 29.3	2.30	6.94	9	5.6	15.0	12
115P/Maury	Oct 7.0	2.04	8.76	3	11.5	15.0	17
73P-Schwassmann-Wachmann C	Oct 16.8	0.94	5.36	2			12 ?
P/Lagerkvist (1996 R2)	Oct 17.1	2.61	7.38	1	11.0	10.0	16
73P-Schwassmann-Wachmann B	Oct 18.6	0.94	5.36	6			12 ?
49P/Arend-Rigaux	Oct 19.1	1.42	6.72	9	11.3	11.0	14
41P/Tuttle-Giacobini-Kresak	Nov 12.2	1.05	5.43	10	9.4	17.2	11
P/Larsen (2004 H3)	Nov 23.3	2.45	7.72	1	13.0	10.0	19
P/LINEAR-NEAT (2004 R3)	Nov 28.4	2.13	7.49	1	14.5	10.0	19
Lemmon (2009 S3)	Dec 10.3	6.48			6.5	10.0	19
37P/Forbes	Dec 11.0	1.58	6.35	10	10.5	10.0	15
71P/Clark	Dec 15.8	1.57	5.53	7	9.7	7.9	13
Garradd (2009 P1)	Dec 24.6	1.56			4.0	10.0	7
36P/Whipple	Dec 29.6	3.09	8.54	11	8.5	15.0	17
McNaught (2009 F4)	Dec 31.7	5.45			3.0	10.0	14

T = epoca del perielio  
 q = perielio  
 P = periodo  
 N = numero di passaggi dall'anno della scoperta  
 H,K = parametri per il calcolo della luminosità  
 Peak = massima magnitudine prevista

T = epoch of perihelium  
 q = perihelium  
 P = period  
 N = number of return since discovery  
 H,K = parameters of brightness  
 Peak = max magnitude

# COMETE CON m<9 - COMETS WITH m<9

C/2009 P1 Garradd      yyyy mm dd.dddd      q      e      per.      nodo      i      G      H  
 2011 12 25.1787      1.556280      1.000000      90.6670      325.8665      106.3641      4.0      4.0

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
2011:07:28	00.00	21:49:39	+10°26'	2.508	1.613	144.2° W	9.0
2011:07:29	00.00	21:46:38	+10°45'	2.498	1.597	145.1° W	9.0
2011:07:30	00.00	21:43:32	+11°05'	2.489	1.582	145.9° W	9.0
2011:07:31	00.00	21:40:22	+11°24'	2.479	1.568	146.6° W	8.9
2011:08:01	00.00	21:37:07	+11°44'	2.470	1.554	147.3° W	8.9
2011:08:02	00.00	21:33:48	+12°03'	2.460	1.541	147.9° W	8.8
2011:08:03	00.00	21:30:25	+12°22'	2.451	1.528	148.4° W	8.8
2011:08:04	00.00	21:26:57	+12°42'	2.442	1.516	148.9° W	8.8
2011:08:05	00.00	21:23:25	+13°00'	2.432	1.504	149.3° W	8.7
2011:08:06	00.00	21:19:49	+13°19'	2.423	1.493	149.5° W	8.7
2011:08:07	00.00	21:16:09	+13°38'	2.414	1.483	149.7° W	8.7
2011:08:08	00.00	21:12:26	+13°56'	2.404	1.473	149.8° W	8.7
2011:08:09	00.00	21:08:39	+14°14'	2.395	1.464	149.7° E	8.6
2011:08:10	00.00	21:04:49	+14°31'	2.386	1.456	149.6° E	8.6
2011:08:11	00.00	21:00:55	+14°48'	2.376	1.448	149.3° E	8.6
2011:08:12	00.00	20:56:59	+15°05'	2.367	1.440	149.0° E	8.5
2011:08:13	00.00	20:53:00	+15°22'	2.358	1.434	148.5° E	8.5
2011:08:14	00.00	20:48:59	+15°38'	2.349	1.428	147.9° E	8.5
2011:08:15	00.00	20:44:56	+15°53'	2.339	1.422	147.3° E	8.5
2011:08:16	00.00	20:40:51	+16°08'	2.330	1.418	146.5° E	8.4
2011:08:17	00.00	20:36:44	+16°23'	2.321	1.413	145.7° E	8.4
2011:08:18	00.00	20:32:37	+16°37'	2.312	1.410	144.8° E	8.4
2011:08:19	00.00	20:28:28	+16°50'	2.303	1.407	143.8° E	8.4
2011:08:20	00.00	20:24:19	+17°03'	2.294	1.405	142.8° E	8.3
2011:08:21	00.00	20:20:10	+17°15'	2.285	1.403	141.7° E	8.3
2011:08:22	00.00	20:16:00	+17°27'	2.275	1.402	140.5° E	8.3
2011:08:23	00.00	20:11:52	+17°38'	2.266	1.402	139.3° E	8.3
2011:08:24	00.00	20:07:44	+17°48'	2.257	1.402	138.0° E	8.3
2011:08:25	00.00	20:03:37	+17°58'	2.248	1.403	136.8° E	8.3
2011:08:26	00.00	19:59:31	+18°07'	2.239	1.404	135.4° E	8.2
2011:08:27	00.00	19:55:27	+18°16'	2.230	1.406	134.1° E	8.2
2011:08:28	00.00	19:51:25	+18°24'	2.221	1.408	132.7° E	8.2
2011:08:29	00.00	19:47:25	+18°31'	2.213	1.411	131.4° E	8.2
2011:08:30	00.00	19:43:28	+18°38'	2.204	1.415	130.0° E	8.2
2011:08:31	00.00	19:39:33	+18°44'	2.195	1.419	128.5° E	8.2
2011:09:01	00.00	19:35:41	+18°49'	2.186	1.423	127.1° E	8.2
2011:09:02	00.00	19:31:53	+18°54'	2.177	1.428	125.7° E	8.2
2011:09:03	00.00	19:28:08	+18°59'	2.168	1.434	124.3° E	8.1
2011:09:04	00.00	19:24:26	+19°03'	2.160	1.440	122.8° E	8.1
2011:09:05	00.00	19:20:49	+19°06'	2.151	1.446	121.4° E	8.1
2011:09:06	00.00	19:17:15	+19°09'	2.142	1.453	120.0° E	8.1
2011:09:07	00.00	19:13:45	+19°12'	2.133	1.460	118.5° E	8.1
2011:09:08	00.00	19:10:19	+19°14'	2.125	1.467	117.1° E	8.1
2011:09:09	00.00	19:06:58	+19°16'	2.116	1.475	115.7° E	8.1
2011:09:10	00.00	19:03:41	+19°17'	2.108	1.483	114.3° E	8.1
2011:09:11	00.00	19:00:28	+19°18'	2.099	1.492	112.9° E	8.1
2011:09:12	00.00	18:57:20	+19°18'	2.091	1.501	111.5° E	8.1
2011:09:13	00.00	18:54:16	+19°18'	2.082	1.510	110.1° E	8.1
2011:09:14	00.00	18:51:17	+19°18'	2.074	1.519	108.7° E	8.1
2011:09:15	00.00	18:48:22	+19°18'	2.065	1.529	107.3° E	8.1
2011:09:16	00.00	18:45:32	+19°17'	2.057	1.539	106.0° E	8.1
2011:09:17	00.00	18:42:46	+19°17'	2.048	1.549	104.6° E	8.1
2011:09:18	00.00	18:40:05	+19°15'	2.040	1.559	103.3° E	8.1
2011:09:19	00.00	18:37:29	+19°14'	2.032	1.570	102.0° E	8.1
2011:09:20	00.00	18:34:56	+19°13'	2.024	1.580	100.7° E	8.1
2011:09:21	00.00	18:32:29	+19°11'	2.015	1.591	99.4° E	8.1
2011:09:22	00.00	18:30:05	+19°09'	2.007	1.602	98.1° E	8.0
2011:09:23	00.00	18:27:46	+19°08'	1.999	1.613	96.9° E	8.0
2011:09:24	00.00	18:25:31	+19°06'	1.991	1.625	95.6° E	8.0
2011:09:25	00.00	18:23:21	+19°04'	1.983	1.636	94.4° E	8.0
2011:09:26	00.00	18:21:14	+19°01'	1.975	1.647	93.2° E	8.0
2011:09:27	00.00	18:19:12	+18°59'	1.967	1.659	91.9° E	8.0
2011:09:28	00.00	18:17:13	+18°57'	1.959	1.670	90.8° E	8.0
2011:09:29	00.00	18:15:18	+18°55'	1.951	1.682	89.6° E	8.0
2011:09:30	00.00	18:13:28	+18°52'	1.944	1.694	88.4° E	8.0
2011:10:01	00.00	18:11:41	+18°50'	1.936	1.705	87.3° E	8.0
2011:10:02	00.00	18:09:57	+18°48'	1.928	1.717	86.1° E	8.0
2011:10:03	00.00	18:08:17	+18°46'	1.920	1.729	85.0° E	8.0
2011:10:04	00.00	18:06:41	+18°43'	1.913	1.740	83.9° E	8.0
2011:10:05	00.00	18:05:08	+18°41'	1.905	1.752	82.8° E	8.0

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
2011:10:06	00.00	18:03:38	+18°39'	1.898	1.763	81.7° E	8.0
2011:10:07	00.00	18:02:12	+18°37'	1.890	1.775	80.6° E	8.0
2011:10:08	00.00	18:00:48	+18°35'	1.883	1.786	79.6° E	8.0
2011:10:09	00.00	17:59:28	+18°33'	1.875	1.798	78.6° E	8.0
2011:10:10	00.00	17:58:11	+18°31'	1.868	1.809	77.5° E	8.0
2011:10:11	00.00	17:56:56	+18°29'	1.861	1.820	76.5° E	8.0
2011:10:12	00.00	17:55:45	+18°28'	1.854	1.832	75.5° E	8.0
2011:10:13	00.00	17:54:36	+18°26'	1.847	1.843	74.5° E	8.0
2011:10:14	00.00	17:53:30	+18°24'	1.839	1.854	73.6° E	8.0
2011:10:15	00.00	17:52:26	+18°23'	1.832	1.864	72.6° E	8.0
2011:10:16	00.00	17:51:25	+18°22'	1.826	1.875	71.6° E	8.0
2011:10:17	00.00	17:50:27	+18°21'	1.819	1.886	70.7° E	8.0
2011:10:18	00.00	17:49:30	+18°19'	1.812	1.896	69.8° E	8.0
2011:10:19	00.00	17:48:36	+18°19'	1.805	1.906	68.9° E	8.0
2011:10:20	00.00	17:47:45	+18°18'	1.798	1.916	68.0° E	8.0
2011:10:21	00.00	17:46:55	+18°17'	1.792	1.926	67.1° E	8.0
2011:10:22	00.00	17:46:08	+18°16'	1.785	1.936	66.3° E	8.0
2011:10:23	00.00	17:45:23	+18°16'	1.779	1.946	65.4° E	7.9
2011:10:24	00.00	17:44:39	+18°16'	1.772	1.955	64.6° E	7.9
2011:10:25	00.00	17:43:58	+18°16'	1.766	1.964	63.7° E	7.9
2011:10:26	00.00	17:43:18	+18°16'	1.760	1.973	62.9° E	7.9
2011:10:27	00.00	17:42:40	+18°16'	1.754	1.982	62.1° E	7.9
2011:10:28	00.00	17:42:04	+18°16'	1.747	1.990	61.4° E	7.9
2011:10:29	00.00	17:41:30	+18°17'	1.741	1.999	60.6° E	7.9
2011:10:30	00.00	17:40:57	+18°17'	1.735	2.007	59.8° E	7.9
2011:10:31	00.00	17:40:26	+18°18'	1.729	2.015	59.1° E	7.9
2011:11:01	00.00	17:39:57	+18°19'	1.724	2.023	58.4° E	7.9
2011:11:02	00.00	17:39:29	+18°20'	1.718	2.030	57.7° E	7.9
2011:11:03	00.00	17:39:02	+18°21'	1.712	2.037	57.0° E	7.9
2011:11:04	00.00	17:38:37	+18°23'	1.707	2.044	56.3° E	7.9
2011:11:05	00.00	17:38:13	+18°25'	1.701	2.051	55.6° E	7.9
2011:11:06	00.00	17:37:50	+18°26'	1.696	2.057	55.0° E	7.9
2011:11:07	00.00	17:37:29	+18°28'	1.690	2.064	54.4° E	7.9
2011:11:08	00.00	17:37:09	+18°30'	1.685	2.069	53.8° E	7.8
2011:11:09	00.00	17:36:50	+18°33'	1.680	2.075	53.2° E	7.8
2011:11:10	00.00	17:36:32	+18°35'	1.675	2.081	52.6° E	7.8
2011:11:11	00.00	17:36:15	+18°38'	1.670	2.086	52.0° E	7.8
2011:11:12	00.00	17:35:59	+18°41'	1.665	2.090	51.5° E	7.8
2011:11:13	00.00	17:35:45	+18°44'	1.660	2.095	51.0° E	7.8
2011:11:14	00.00	17:35:31	+18°47'	1.656	2.099	50.5° E	7.8
2011:11:15	00.00	17:35:18	+18°51'	1.651	2.103	50.0° E	7.8
2011:11:16	00.00	17:35:06	+18°55'	1.647	2.107	49.5° E	7.8
2011:11:17	00.00	17:34:55	+18°59'	1.642	2.111	49.1° E	7.8
2011:11:18	00.00	17:34:45	+19°03'	1.638	2.114	48.6° E	7.8
2011:11:19	00.00	17:34:36	+19°07'	1.634	2.117	48.2° E	7.8
2011:11:20	00.00	17:34:27	+19°12'	1.630	2.119	47.8° E	7.8
2011:11:21	00.00	17:34:20	+19°16'	1.626	2.121	47.5° E	7.7
2011:11:22	00.00	17:34:13	+19°21'	1.622	2.123	47.1° E	7.7
2011:11:23	00.00	17:34:06	+19°26'	1.618	2.125	46.8° E	7.7
2011:11:24	00.00	17:34:00	+19°32'	1.614	2.126	46.5° E	7.7
2011:11:25	00.00	17:33:55	+19°37'	1.611	2.127	46.2° E	7.7
2011:11:26	00.00	17:33:51	+19°43'	1.607	2.128	46.0° E	7.7
2011:11:27	00.00	17:33:47	+19°49'	1.604	2.128	45.7° E	7.7
2011:11:28	00.00	17:33:43	+19°56'	1.601	2.129	45.5° E	7.7
2011:11:29	00.00	17:33:40	+20°02'	1.598	2.128	45.4° E	7.7
2011:11:30	00.00	17:33:38	+20°09'	1.595	2.128	45.2° E	7.7
2011:12:01	00.00	17:33:36	+20°16'	1.592	2.127	45.1° E	7.7
2011:12:02	00.00	17:33:34	+20°23'	1.589	2.126	44.9° E	7.6
2011:12:03	00.00	17:33:33	+20°31'	1.586	2.125	44.8° E	7.6
2011:12:04	00.00	17:33:32	+20°39'	1.583	2.123	44.8° E	7.6
2011:12:05	00.00	17:33:31	+20°47'	1.581	2.121	44.7° E	7.6
2011:12:06	00.00	17:33:31	+20°55'	1.579	2.118	44.7° E	7.6
2011:12:07	00.00	17:33:31	+21°04'	1.576	2.116	44.7° E	7.6
2011:12:08	00.00	17:33:32	+21°13'	1.574	2.113	44.8° E	7.6
2011:12:09	00.00	17:33:32	+21°22'	1.572	2.109	44.8° E	7.6
2011:12:10	00.00	17:33:33	+21°32'	1.570	2.106	44.9° E	7.6
2011:12:11	00.00	17:33:34	+21°41'	1.569	2.102	45.0° E	7.6
2011:12:12	00.00	17:33:35	+21°51'	1.567	2.098	45.1° E	7.6
2011:12:13	00.00	17:33:36	+22°02'	1.565	2.093	45.3° E	7.6
2011:12:14	00.00	17:33:38	+22°13'	1.564	2.088	45.4° E	7.5
2011:12:15	00.00	17:33:39	+22°24'	1.563	2.083	45.6° E	7.5
2011:12:16	00.00	17:33:41	+22°35'	1.561	2.078	45.9° E	7.5
2011:12:17	00.00	17:33:42	+22°47'	1.560	2.072	46.1° W	7.5
2011:12:18	00.00	17:33:44	+22°59'	1.559	2.066	46.4° W	7.5
2011:12:19	00.00	17:33:45	+23°11'	1.559	2.060	46.7° W	7.5
2011:12:20	00.00	17:33:47	+23°24'	1.558	2.053	47.0° W	7.5
2011:12:21	00.00	17:33:48	+23°37'	1.557	2.046	47.3° W	7.5
2011:12:22	00.00	17:33:49	+23°50'	1.557	2.039	47.7° W	7.5



Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
2011:12:23	00.00	17:33:51	+24°04'	1.557	2.032	48.0° W	7.5
2011:12:24	00.00	17:33:51	+24°18'	1.556	2.024	48.4° W	7.5
2011:12:25	00.00	17:33:52	+24°33'	1.556	2.016	48.8° W	7.4
2011:12:26	00.00	17:33:52	+24°48'	1.556	2.008	49.3° W	7.4
2011:12:27	00.00	17:33:53	+25°04'	1.556	1.999	49.7° W	7.4
2011:12:28	00.00	17:33:52	+25°19'	1.557	1.990	50.2° W	7.4
2011:12:29	00.00	17:33:52	+25°36'	1.557	1.981	50.7° W	7.4
2011:12:30	00.00	17:33:51	+25°53'	1.558	1.972	51.2° W	7.4
2011:12:31	00.00	17:33:49	+26°10'	1.558	1.962	51.7° W	7.4

Date = data nel formato gg/mm/aaaa  
 A.R. e DEC. = coordinate per Roma (42°N, 12°E)  
 R = distanza dal Sole in U.A.  
 D = distanza dalla Terra in U.A.  
 Elong. = elongazione dal Sole in °  
 Mag = magnitudine

Date	Object			Morning twilight -18°				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elong
2011:07:28	18:51	01:38	08:18	03:03	53.5	216.9	144.3	21:30	28.9	102.1	145.0
2011:07:29	18:43	01:31	08:12	03:05	52.7	220.2	145.2	21:29	30.1	102.9	145.8
2011:07:30	18:34	01:24	08:06	03:06	52.0	223.5	146.0	21:27	31.3	103.6	146.5
2011:07:31	18:26	01:17	08:00	03:08	51.1	226.7	146.7	21:25	32.5	104.4	147.2
2011:08:01	18:18	01:10	07:54	03:09	50.1	229.8	147.4	21:23	33.8	105.3	147.8
2011:08:02	18:09	01:03	07:48	03:11	49.1	232.8	148.0	21:22	35.0	106.1	148.4
2011:08:03	18:01	00:55	07:42	03:13	48.0	235.7	148.5	21:20	36.2	107.0	148.8
2011:08:04	17:52	00:48	07:36	03:14	46.8	238.5	148.9	21:18	37.4	107.9	149.2
2011:08:05	17:43	00:41	07:30	03:16	45.6	241.2	149.3	21:16	38.7	108.8	149.5
2011:08:06	17:34	00:33	07:24	03:17	44.3	243.8	149.6	21:15	39.9	109.8	149.7
2011:08:07	17:26	00:26	07:17	03:19	43.0	246.3	149.7	21:13	41.1	110.8	149.8
2011:08:08	17:17	00:18	07:11	03:21	41.6	248.7	149.8	21:11	42.3	111.8	149.7
2011:08:09	17:08	00:10	07:04	03:22	40.2	251.1	149.7	21:09	43.6	112.9	149.6
2011:08:10	16:59	00:02	06:58	03:24	38.7	253.4	149.5	21:07	44.8	114.0	149.4
2011:08:11	16:50	23:47	06:51	03:25	37.2	255.6	149.3	21:05	46.0	115.2	149.0
2011:08:12	16:41	23:39	06:44	03:27	35.7	257.7	148.9	21:03	47.2	116.5	148.6
2011:08:13	16:32	23:31	06:37	03:28	34.1	259.8	148.4	21:01	48.4	117.8	148.0
2011:08:14	16:23	23:23	06:30	03:30	32.5	261.8	147.8	21:00	49.6	119.1	147.4
2011:08:15	16:14	23:15	06:24	03:32	30.9	263.8	147.2	20:58	50.7	120.5	146.6
2011:08:16	16:05	23:07	06:17	03:33	29.3	265.7	146.4	20:56	51.9	122.0	145.8
2011:08:17	15:56	22:59	06:09	03:35	27.7	267.6	145.6	20:54	53.0	123.6	144.9
2011:08:18	15:47	22:51	06:02	03:36	26.0	269.4	144.6	20:52	54.1	125.3	143.9
2011:08:19	15:38	22:43	05:55	03:38	24.4	271.2	143.6	20:50	55.2	127.0	142.9
2011:08:20	15:30	22:35	05:48	03:39	22.7	273.0	142.6	20:48	56.3	128.8	141.8
2011:08:21	15:21	22:27	05:41	03:41	21.1	274.7	141.5	20:46	57.3	130.7	140.7
2011:08:22	15:12	22:19	05:34	03:42	19.4	276.4	140.3	20:44	58.3	132.7	139.5
2011:08:23	15:03	22:11	05:26	03:44	17.8	278.1	139.1	20:42	59.3	134.9	138.2
2011:08:24	14:54	22:03	05:19	03:45	16.1	279.7	137.8	20:40	60.2	137.1	136.9
2011:08:25	14:46	21:55	05:12	03:47	14.5	281.3	136.6	20:38	61.1	139.4	135.6
2011:08:26	14:37	21:47	05:04	03:48	12.9	283.0	135.2	20:36	61.9	141.8	134.3
2011:08:27	14:29	21:39	04:57	03:49	11.2	284.6	133.9	20:34	62.7	144.4	132.9
2011:08:28	14:20	21:31	04:49	03:51	9.6	286.1	132.5	20:32	63.4	147.1	131.6
2011:08:29	14:12	21:23	04:42	03:52	8.1	287.7	131.1	20:30	64.1	149.8	130.2
2011:08:30	14:04	21:15	04:35	03:54	6.5	289.3	129.7	20:28	64.7	152.7	128.8
2011:08:31	13:55	21:08	04:27	03:55	4.9	290.8	128.3	20:26	65.3	155.7	127.3
2011:09:01	13:47	21:00	04:20	03:57	3.4	292.4	126.9	20:24	65.8	158.7	125.9
2011:09:02	13:39	20:52	04:13	03:58	1.9	293.9	125.5	20:22	66.2	161.8	124.5
2011:09:03	13:31	20:45	04:05	03:59	0.4	295.5	124.0	20:20	66.5	165.0	123.0
2011:09:04	13:24	20:37	03:58	04:01	-1.0	297.0	122.6	20:18	66.8	168.3	121.6
2011:09:05	13:16	20:30	03:51	04:02	-2.5	298.6	121.2	20:16	67.1	171.5	120.2
2011:09:06	13:08	20:22	03:43	04:03	-3.9	300.2	119.7	20:14	67.2	174.8	118.8
2011:09:07	13:01	20:15	03:36	04:05	-5.2	301.7	118.3	20:12	67.3	178.1	117.3
2011:09:08	12:53	20:08	03:29	04:06	-6.6	303.3	116.9	20:10	67.4	181.4	115.9
2011:09:09	12:46	20:00	03:22	04:07	-7.9	304.8	115.4	20:08	67.3	184.6	114.5
2011:09:10	12:39	19:53	03:15	04:09	-9.1	306.4	114.0	20:06	67.3	187.7	113.1
2011:09:11	12:32	19:46	03:08	04:10	-10.4	308.0	112.6	20:04	67.1	190.8	111.7
2011:09:12	12:25	19:39	03:01	04:11	-11.6	309.6	111.2	20:02	66.9	193.8	110.3
2011:09:13	12:18	19:32	02:54	04:12	-12.8	311.2	109.8	20:00	66.7	196.7	108.9
2011:09:14	12:11	19:25	02:47	04:14	-13.9	312.8	108.5	19:58	66.4	199.5	107.6

Date	Object			Morning twilight				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elong
2011:09:15	12:04	19:19	02:40	04:15	-15.0	314.4	107.1	19:56	66.1	202.2	106.2
2011:09:16	11:57	19:12	02:33	04:16	-16.0	316.0	105.7	19:54	65.7	204.8	104.9
2011:09:17	11:51	19:05	02:27	04:17	-17.1	317.6	104.4	19:52	65.3	207.3	103.5
2011:09:18	11:44	18:59	02:20	04:19	-18.0	319.3	103.1	19:50	64.9	209.7	102.2
2011:09:19	11:38	18:52	02:13	04:20	-19.0	320.9	101.8	19:48	64.4	211.9	100.9
2011:09:20	11:32	18:46	02:07	04:21	-19.9	322.6	100.5	19:46	63.9	214.1	99.6
2011:09:21	11:25	18:40	02:00	04:22	-20.8	324.3	99.2	19:44	63.4	216.2	98.3
2011:09:22	11:19	18:33	01:54	04:23	-21.6	326.0	97.9	19:42	62.9	218.2	97.1
2011:09:23	11:13	18:27	01:47	04:25	-22.4	327.7	96.6	19:40	62.4	220.0	95.8
2011:09:24	11:07	18:21	01:41	04:26	-23.1	329.4	95.4	19:39	61.8	221.8	94.6
2011:09:25	11:01	18:15	01:35	04:27	-23.8	331.1	94.1	19:37	61.3	223.6	93.4
2011:09:26	10:55	18:09	01:29	04:28	-24.5	332.8	92.9	19:35	60.7	225.2	92.2
2011:09:27	10:50	18:03	01:23	04:29	-25.1	334.5	91.7	19:33	60.1	226.8	91.0
2011:09:28	10:44	17:57	01:17	04:30	-25.7	336.3	90.5	19:31	59.5	228.3	89.8
2011:09:29	10:38	17:52	01:11	04:32	-26.2	338.0	89.4	19:29	59.0	229.7	88.6
2011:09:30	10:33	17:46	01:05	04:33	-26.7	339.7	88.2	19:28	58.4	231.1	87.5
2011:10:01	10:27	17:40	00:59	04:34	-27.2	341.5	87.0	19:26	57.8	232.4	86.3
2011:10:02	10:22	17:35	00:53	04:35	-27.6	343.2	85.9	19:24	57.2	233.7	85.2
2011:10:03	10:16	17:29	00:47	04:36	-28.0	345.0	84.8	19:22	56.6	234.9	84.1
2011:10:04	10:11	17:24	00:42	04:37	-28.3	346.7	83.7	19:20	56.0	236.1	83.0
2011:10:05	10:06	17:18	00:36	04:38	-28.6	348.5	82.6	19:19	55.4	237.2	81.9
2011:10:06	10:00	17:13	00:30	04:39	-28.9	350.2	81.5	19:17	54.8	238.3	80.9
2011:10:07	09:55	17:07	00:25	04:41	-29.1	352.0	80.4	19:15	54.1	239.3	79.8
2011:10:08	09:50	17:02	00:19	04:42	-29.3	353.7	79.4	19:14	53.5	240.4	78.8
2011:10:09	09:45	16:57	00:14	04:43	-29.4	355.4	78.3	19:12	52.9	241.4	77.7
2011:10:10	09:40	16:52	00:09	04:44	-29.6	357.2	77.3	19:10	52.3	242.3	76.7
2011:10:11	09:35	16:47	00:03	04:45	-29.6	358.9	76.3	19:09	51.7	243.3	75.7
2011:10:12	09:30	16:41	23:53	04:46	-29.7	0.6	75.3	19:07	51.1	244.2	74.7
2011:10:13	09:25	16:36	23:48	04:47	-29.7	2.3	74.3	19:05	50.5	245.1	73.8
2011:10:14	09:20	16:31	23:43	04:48	-29.6	3.9	73.4	19:04	49.9	245.9	72.8
2011:10:15	09:15	16:26	23:38	04:49	-29.6	5.6	72.4	19:02	49.3	246.8	71.8
2011:10:16	09:10	16:22	23:33	04:50	-29.4	7.2	71.5	19:01	48.8	247.6	70.9
2011:10:17	09:06	16:17	23:28	04:52	-29.3	8.9	70.5	18:59	48.2	248.4	70.0
2011:10:18	09:01	16:12	23:23	04:53	-29.1	10.5	69.6	18:58	47.6	249.2	69.1
2011:10:19	08:56	16:07	23:18	04:54	-28.9	12.1	68.7	18:56	47.0	250.0	68.2
2011:10:20	08:51	16:02	23:13	04:55	-28.7	13.6	67.8	18:55	46.4	250.7	67.3
2011:10:21	08:47	15:58	23:09	04:56	-28.4	15.2	66.9	18:53	45.8	251.5	66.4
2011:10:22	08:42	15:53	23:04	04:57	-28.2	16.7	66.1	18:52	45.2	252.2	65.6
2011:10:23	08:37	15:48	22:59	04:58	-27.8	18.2	65.2	18:51	44.6	252.9	64.7
2011:10:24	08:33	15:44	22:54	04:59	-27.5	19.7	64.4	18:49	44.0	253.6	63.9
2011:10:25	08:28	15:39	22:50	05:00	-27.1	21.2	63.6	18:48	43.4	254.4	63.1
2011:10:26	08:23	15:34	22:45	05:01	-26.7	22.7	62.8	18:47	42.9	255.1	62.3
2011:10:27	08:19	15:30	22:41	05:02	-26.3	24.1	62.0	18:45	42.3	255.7	61.5
2011:10:28	08:14	15:25	22:36	05:04	-25.9	25.5	61.2	18:44	41.7	256.4	60.8
2011:10:29	08:10	15:21	22:32	05:05	-25.4	26.9	60.4	18:43	41.1	257.1	60.0
2011:10:30	08:05	15:16	22:28	05:06	-24.9	28.2	59.7	18:42	40.5	257.8	59.3
2011:10:31	08:01	15:12	22:23	05:07	-24.4	29.5	58.9	18:41	39.9	258.4	58.5
2011:11:01	07:56	15:08	22:19	05:08	-23.9	30.9	58.2	18:39	39.4	259.1	57.8
2011:11:02	07:52	15:03	22:15	05:09	-23.3	32.1	57.5	18:38	38.8	259.8	57.1
2011:11:03	07:47	14:59	22:10	05:10	-22.7	33.4	56.8	18:37	38.2	260.4	56.5
2011:11:04	07:43	14:55	22:06	05:11	-22.2	34.6	56.2	18:36	37.6	261.1	55.8
2011:11:05	07:39	14:50	22:02	05:12	-21.6	35.9	55.5	18:35	37.0	261.7	55.1
2011:11:06	07:34	14:46	21:58	05:13	-20.9	37.1	54.9	18:34	36.4	262.3	54.5
2011:11:07	07:30	14:42	21:54	05:14	-20.3	38.2	54.2	18:33	35.8	263.0	53.9
2011:11:08	07:25	14:37	21:50	05:15	-19.6	39.4	53.6	18:32	35.3	263.6	53.3
2011:11:09	07:21	14:33	21:46	05:16	-19.0	40.5	53.0	18:31	34.7	264.3	52.7
2011:11:10	07:16	14:29	21:42	05:17	-18.3	41.6	52.5	18:30	34.1	264.9	52.2
2011:11:11	07:12	14:25	21:38	05:19	-17.6	42.7	51.9	18:29	33.5	265.5	51.6
2011:11:12	07:08	14:21	21:34	05:20	-16.9	43.8	51.4	18:29	32.9	266.2	51.1
2011:11:13	07:03	14:16	21:30	05:21	-16.1	44.9	50.9	18:28	32.3	266.8	50.6
2011:11:14	06:59	14:12	21:26	05:22	-15.4	45.9	50.4	18:27	31.7	267.5	50.1
2011:11:15	06:54	14:08	21:22	05:23	-14.7	46.9	49.9	18:26	31.1	268.1	49.6
2011:11:16	06:50	14:04	21:18	05:24	-13.9	47.9	49.4	18:26	30.5	268.7	49.2
2011:11:17	06:46	14:00	21:14	05:25	-13.1	48.9	49.0	18:25	29.9	269.4	48.7
2011:11:18	06:41	13:56	21:10	05:26	-12.3	49.8	48.5	18:24	29.3	270.0	48.3
2011:11:19	06:37	13:52	21:07	05:27	-11.5	50.8	48.1	18:24	28.7	270.7	47.9
2011:11:20	06:33	13:48	21:03	05:28	-10.7	51.7	47.8	18:23	28.1	271.3	47.6
2011:11:21	06:28	13:44	20:59	05:29	-9.9	52.6	47.4	18:23	27.5	272.0	47.2
2011:11:22	06:24	13:40	20:56	05:30	-9.1	53.5	47.1	18:22	26.9	272.6	46.9
2011:11:23	06:19	13:35	20:52	05:31	-8.3	54.3	46.7	18:22	26.3	273.3	46.6
2011:11:24	06:15	13:31	20:48	05:32	-7.5	55.2	46.4	18:21	25.7	274.0	46.3
2011:11:25	06:10	13:27	20:45	05:33	-6.6	56.0	46.2	18:21	25.0	274.6	46.0
2011:11:26	06:06	13:23	20:41	05:34	-5.8	56.9	45.9	18:21	24.4	275.3	45.8
2011:11:27	06:02	13:19	20:38	05:35	-4.9	57.7	45.7	18:20	23.8	276.0	45.6
2011:11:28	05:57	13:15	20:34	05:36	-4.0	58.5	45.5	18:20	23.2	276.6	45.4
2011:11:29	05:53	13:12	20:31	05:37	-3.2	59.2	45.3	18:20	22.6	277.3	45.2
2011:11:30	05:48	13:08	20:27	05:38	-2.3	60.0	45.2	18:19	22.0	278.0	45.1
2011:12:01	05:44	13:04	20:24	05:39	-1.4	60.8	45.0	18:19	21.3	278.7	45.0

Date	Object			Morning twilight -18°				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elong
2011:12:02	05:39	13:00	20:20	05:39	-0.5	61.5	44.9	18:19	20.7	279.4	44.9
2011:12:03	05:35	12:56	20:17	05:40	0.3	62.2	44.8	18:19	20.1	280.1	44.8
2011:12:04	05:30	12:52	20:14	05:41	1.2	62.9	44.8	18:19	19.5	280.8	44.7
2011:12:05	05:26	12:48	20:10	05:42	2.1	63.6	44.7	18:19	18.8	281.5	44.7
2011:12:06	05:21	12:44	20:07	05:43	3.0	64.3	44.7	18:19	18.2	282.3	44.7
2011:12:07	05:17	12:40	20:04	05:44	3.9	65.0	44.7	18:19	17.6	283.0	44.7
2011:12:08	05:12	12:36	20:00	05:45	4.8	65.6	44.8	18:19	17.0	283.7	44.8
2011:12:09	05:07	12:32	19:57	05:45	5.7	66.3	44.8	18:19	16.3	284.5	44.9
2011:12:10	05:03	12:28	19:54	05:46	6.7	66.9	44.9	18:19	15.7	285.2	45.0
2011:12:11	04:58	12:24	19:51	05:47	7.6	67.5	45.0	18:19	15.1	286.0	45.1
2011:12:12	04:53	12:20	19:48	05:48	8.5	68.1	45.2	18:19	14.5	286.7	45.2
2011:12:13	04:49	12:16	19:45	05:48	9.4	68.7	45.3	18:20	13.8	287.5	45.4
2011:12:14	04:44	12:13	19:42	05:49	10.3	69.3	45.5	18:20	13.2	288.3	45.6
2011:12:15	04:39	12:09	19:38	05:50	11.3	69.9	45.7	18:20	12.6	289.1	45.8
2011:12:16	04:35	12:05	19:35	05:50	12.2	70.4	45.9	18:21	12.0	289.9	46.1
2011:12:17	04:30	12:01	19:32	05:51	13.1	71.0	46.2	18:21	11.4	290.7	46.3
2011:12:18	04:25	11:57	19:30	05:52	14.0	71.5	46.4	18:21	10.8	291.5	46.6
2011:12:19	04:20	11:53	19:27	05:52	15.0	72.0	46.7	18:22	10.2	292.3	46.9
2011:12:20	04:15	11:49	19:24	05:53	15.9	72.5	47.1	18:22	9.5	293.2	47.2
2011:12:21	04:10	11:45	19:21	05:53	16.8	73.0	47.4	18:23	8.9	294.0	47.6
2011:12:22	04:05	11:41	19:18	05:54	17.8	73.5	47.8	18:23	8.4	294.9	47.9
2011:12:23	04:00	11:37	19:15	05:54	18.7	74.0	48.1	18:24	7.8	295.8	48.3
2011:12:24	03:55	11:33	19:12	05:55	19.6	74.4	48.5	18:24	7.2	296.6	48.8
2011:12:25	03:50	11:30	19:10	05:55	20.5	74.9	49.0	18:25	6.6	297.5	49.2
2011:12:26	03:45	11:26	19:07	05:56	21.5	75.3	49.4	18:25	6.0	298.4	49.6
2011:12:27	03:40	11:22	19:04	05:56	22.4	75.7	49.9	18:26	5.5	299.3	50.1
2011:12:28	03:35	11:18	19:02	05:56	23.3	76.1	50.3	18:27	4.9	300.3	50.6
2011:12:29	03:29	11:14	18:59	05:57	24.3	76.5	50.8	18:27	4.4	301.2	51.1
2011:12:30	03:24	11:10	18:57	05:57	25.2	76.9	51.3	18:28	3.8	302.1	51.6
2011:12:31	03:18	11:06	18:54	05:57	26.2	77.2	51.9	18:29	3.3	303.1	52.2

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

Times of rising and setting of the comet for Rome (42°N, 12°E), in U.T.+1

45P/Honda      yyyy mm dd.ddd      q      e      per.      nodo      i      G      H  
2006 06 29.8039    0.530256      0.824520 326.1196 89.1100    4.2531    12.0    15.0

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
2011:08:10	00.00	21:21:32	-48°09'	1.115	0.117	147.6° W	9.1
2011:08:11	00.00	21:16:59	-52°21'	1.100	0.106	143.1° E	8.7
2011:08:12	00.00	21:10:03	-57°29'	1.086	0.096	137.6° E	8.3
2011:08:13	00.00	20:58:21	-63°43'	1.072	0.086	130.8° E	7.8
2011:08:14	00.00	20:34:31	-71°11'	1.058	0.078	122.7° E	7.4
2011:08:15	00.00	19:24:14	-79°30'	1.043	0.072	112.9° E	7.0
2011:08:16	00.00	14:28:19	-83°18'	1.029	0.068	101.8° E	6.6
2011:08:17	00.00	11:24:40	-74°42'	1.014	0.067	89.7° E	6.3
2011:08:18	00.00	10:41:08	-63°38'	1.000	0.068	77.6° E	6.2
2011:08:19	00.00	10:23:31	-53°04'	0.986	0.072	66.4° E	6.0
2011:08:20	00.00	10:14:04	-43°47'	0.971	0.078	56.6° E	6.0
2011:08:21	00.00	10:08:12	-36°00'	0.957	0.086	48.4° E	6.0
2011:08:22	00.00	10:04:13	-29°37'	0.942	0.095	41.6° E	5.9
2011:08:23	00.00	10:01:20	-24°23'	0.928	0.106	36.0° W	5.9
2011:08:24	00.00	09:59:09	-20°05'	0.914	0.117	31.5° W	5.9
2011:08:25	00.00	09:57:28	-16°31'	0.899	0.129	27.8° W	5.8
2011:08:26	00.00	09:56:07	-13°33'	0.885	0.141	24.7° W	5.8
2011:08:27	00.00	09:55:03	-11°01'	0.871	0.153	22.3° W	5.7
2011:08:28	00.00	09:54:10	-08°52'	0.856	0.166	20.3° W	5.6
2011:08:29	00.00	09:53:28	-07°01'	0.842	0.180	18.7° W	5.5
2011:08:30	00.00	09:52:54	-05°24'	0.828	0.193	17.6° W	5.4
2011:08:31	00.00	09:52:27	-03°58'	0.814	0.207	16.8° W	5.2
2011:09:01	00.00	09:52:07	-02°43'	0.800	0.221	16.3° W	5.1
2011:09:02	00.00	09:51:53	-01°35'	0.786	0.235	16.0° W	4.9
2011:09:03	00.00	09:51:44	-00°35'	0.772	0.250	16.0° W	4.8
2011:09:04	00.00	09:51:41	+00°19'	0.758	0.264	16.2° W	4.6
2011:09:05	00.00	09:51:42	+01°08'	0.745	0.279	16.6° W	4.4
2011:09:06	00.00	09:51:49	+01°53'	0.732	0.295	17.0° W	4.3
2011:09:07	00.00	09:52:02	+02°33'	0.718	0.310	17.6° W	4.1
2011:09:08	00.00	09:52:19	+03°10'	0.705	0.326	18.2° W	3.9
2011:09:09	00.00	09:52:42	+03°44'	0.693	0.342	18.9° W	3.7
2011:09:10	00.00	09:53:10	+04°15'	0.680	0.359	19.6° W	3.5
2011:09:11	00.00	09:53:44	+04°43'	0.668	0.375	20.4° W	3.3
2011:09:12	00.00	09:54:24	+05°09'	0.656	0.392	21.1° W	3.1
2011:09:13	00.00	09:55:09	+05°33'	0.644	0.410	21.8° W	2.9
2011:09:14	00.00	09:56:01	+05°55'	0.633	0.427	22.6° W	2.7
2011:09:15	00.00	09:56:59	+06°14'	0.622	0.446	23.3° W	2.5
2011:09:16	00.00	09:58:04	+06°32'	0.612	0.464	24.0° W	2.3
2011:09:17	00.00	09:59:16	+06°48'	0.602	0.483	24.7° W	2.1
2011:09:18	00.00	10:00:34	+07°03'	0.592	0.502	25.4° W	2.0
2011:09:19	00.00	10:02:00	+07°15'	0.583	0.521	26.0° W	1.8
2011:09:20	00.00	10:03:32	+07°26'	0.575	0.541	26.7° W	1.7
2011:09:21	00.00	10:05:12	+07°36'	0.567	0.561	27.3° W	1.5
2011:09:22	00.00	10:07:00	+07°44'	0.560	0.581	27.8° W	1.4
2011:09:23	00.00	10:08:54	+07°51'	0.554	0.602	28.4° W	1.3
2011:09:24	00.00	10:10:56	+07°56'	0.548	0.623	28.9° W	1.2
2011:09:25	00.00	10:13:06	+08°00'	0.543	0.644	29.4° W	1.1
2011:09:26	00.00	10:15:22	+08°02'	0.539	0.666	29.8° W	1.0
2011:09:27	00.00	10:17:45	+08°03'	0.535	0.687	30.2° W	1.0
2011:09:28	00.00	10:20:15	+08°03'	0.533	0.709	30.6° W	1.0
2011:09:29	00.00	10:22:52	+08°02'	0.531	0.731	31.0° W	1.0
2011:09:30	00.00	10:25:34	+07°59'	0.530	0.753	31.3° W	1.1
2011:10:01	00.00	10:28:22	+07°55'	0.530	0.775	31.6° W	1.1
2011:10:02	00.00	10:31:15	+07°51'	0.531	0.797	31.9° W	1.2
2011:10:03	00.00	10:34:13	+07°45'	0.533	0.819	32.1° W	1.3
2011:10:04	00.00	10:37:15	+07°38'	0.536	0.841	32.4° W	1.5
2011:10:05	00.00	10:40:21	+07°30'	0.539	0.863	32.6° W	1.6
2011:10:06	00.00	10:43:30	+07°21'	0.543	0.885	32.8° W	1.8
2011:10:07	00.00	10:46:42	+07°12'	0.548	0.907	33.0° W	2.0
2011:10:08	00.00	10:49:57	+07°01'	0.554	0.928	33.2° W	2.2
2011:10:09	00.00	10:53:13	+06°50'	0.561	0.950	33.3° W	2.5
2011:10:10	00.00	10:56:30	+06°39'	0.568	0.971	33.5° W	2.7
2011:10:11	00.00	10:59:48	+06°27'	0.576	0.991	33.6° W	3.0
2011:10:12	00.00	11:03:07	+06°14'	0.584	1.012	33.8° W	3.3
2011:10:13	00.00	11:06:26	+06°01'	0.593	1.032	33.9° W	3.6
2011:10:14	00.00	11:09:45	+05°48'	0.603	1.052	34.1° W	3.9
2011:10:15	00.00	11:13:03	+05°34'	0.613	1.072	34.2° W	4.2
2011:10:16	00.00	11:16:20	+05°20'	0.623	1.091	34.4° W	4.5
2011:10:17	00.00	11:19:37	+05°06'	0.634	1.110	34.5° W	4.8
2011:10:18	00.00	11:22:52	+04°51'	0.646	1.128	34.7° W	5.1
2011:10:19	00.00	11:26:06	+04°37'	0.657	1.146	34.8° W	5.5
2011:10:20	00.00	11:29:18	+04°22'	0.669	1.164	35.0° W	5.8
2011:10:21	00.00	11:32:28	+04°07'	0.681	1.182	35.2° W	6.1
2011:10:22	00.00	11:35:37	+03°52'	0.694	1.199	35.3° W	6.4

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
2011:10:23	00.00	11:38:44	+03°38'	0.707	1.216	35.5° W	6.8
2011:10:24	00.00	11:41:48	+03°23'	0.720	1.233	35.7° W	7.1
2011:10:25	00.00	11:44:51	+03°08'	0.733	1.249	35.9° W	7.4
2011:10:26	00.00	11:47:52	+02°53'	0.746	1.265	36.1° W	7.7
2011:10:27	00.00	11:50:50	+02°38'	0.760	1.280	36.4° W	8.1
2011:10:28	00.00	11:53:46	+02°24'	0.774	1.295	36.6° W	8.4
2011:10:29	00.00	11:56:40	+02°09'	0.787	1.310	36.8° W	8.7
2011:10:30	00.00	11:59:32	+01°55'	0.801	1.325	37.1° W	9.0

Date = data nel formato gg/mm/aaaa  
A.R. e DEC. = coordinate per Roma (42°N, 12°E)  
R = distanza dal Sole in U.A.  
D = distanza dalla Terra in U.A.  
Elong. = elongazione dal Sole in °  
Mag = magnitudine

Date	Object			Morning twilight -18°				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elon
2011:08:10	--:--	00:19	--:--	03:24	-9.4	209.0	147.0	21:07	-11.9	152.9	143.7
2011:08:11	--:--	00:11	--:--	03:25	-13.9	207.9	142.4	21:05	-15.4	156.8	138.3
2011:08:12	--:--	23:44	--:--	03:27	-19.2	206.1	136.7	21:03	-19.7	161.6	131.7
2011:08:13	--:--	23:17	--:--	03:28	-25.4	203.3	129.8	21:01	-24.9	167.7	123.8
2011:08:14	--:--	22:09	--:--	03:30	-32.7	199.0	121.4	21:00	-30.9	175.5	114.2
2011:08:15	--:--	18:04	--:--	03:32	-40.9	192.4	111.4	20:58	-37.4	185.8	103.2
2011:08:16	--:--	14:34	--:--	03:33	-49.2	181.9	100.0	20:56	-43.4	198.9	91.3
2011:08:17	--:--	13:23	--:--	03:35	-56.2	166.0	87.9	20:54	-47.8	214.5	79.1
2011:08:18	--:--	12:54	--:--	03:36	-59.8	144.7	75.8	20:52	-50.0	230.9	67.8
2011:08:19	11:58	12:38	13:41	03:38	-59.1	123.4	64.8	20:50	-50.0	246.0	57.8
2011:08:20	09:42	12:27	15:28	03:39	-55.5	107.3	55.2	20:48	-48.7	258.3	49.4
2011:08:21	08:41	12:18	16:08	03:41	-50.9	96.7	47.2	20:46	-46.8	267.8	42.4
2011:08:22	08:01	12:11	16:30	03:42	-46.2	89.9	40.7	20:44	-44.8	275.2	36.7
2011:08:23	07:31	12:05	16:45	03:44	-41.8	85.5	35.3	20:42	-43.0	280.9	32.1
2011:08:24	07:08	11:59	16:55	03:45	-37.9	82.5	30.9	20:40	-41.3	285.4	28.3
2011:08:25	06:49	11:53	17:02	03:47	-34.4	80.5	27.3	20:38	-39.8	289.1	25.1
2011:08:26	06:33	11:48	17:08	03:48	-31.3	79.2	24.3	20:36	-38.6	292.1	22.6
2011:08:27	06:19	11:43	17:11	03:49	-28.5	78.3	21.9	20:34	-37.5	294.7	20.5
2011:08:28	06:07	11:39	17:14	03:51	-25.9	77.7	20.0	20:32	-36.5	296.9	18.9
2011:08:29	05:56	11:34	17:15	03:52	-23.6	77.3	18.5	20:30	-35.7	298.8	17.7
2011:08:30	05:46	11:30	17:16	03:54	-21.4	77.2	17.4	20:28	-35.0	300.5	16.9
2011:08:31	05:36	11:25	17:16	03:55	-19.4	77.1	16.7	20:26	-34.3	302.1	16.3
2011:09:01	05:28	11:21	17:16	03:57	-17.5	77.2	16.2	20:24	-33.8	303.4	16.0
2011:09:02	05:20	11:17	17:16	03:58	-15.8	77.4	16.0	20:22	-33.3	304.7	16.0
2011:09:03	05:12	11:13	17:15	03:59	-14.1	77.6	16.1	20:20	-32.9	305.8	16.2
2011:09:04	05:05	11:09	17:14	04:01	-12.5	77.9	16.3	20:18	-32.5	306.9	16.5
2011:09:05	04:58	11:05	17:13	04:02	-11.0	78.2	16.6	20:16	-32.2	307.8	17.0
2011:09:06	04:52	11:01	17:12	04:03	-9.6	78.5	17.1	20:14	-31.9	308.7	17.5
2011:09:07	04:46	10:58	17:11	04:05	-8.2	78.9	17.7	20:12	-31.6	309.5	18.1
2011:09:08	04:40	10:54	17:09	04:06	-6.9	79.3	18.3	20:10	-31.4	310.3	18.8
2011:09:09	04:34	10:50	17:08	04:07	-5.6	79.7	19.0	20:08	-31.1	311.0	19.5
2011:09:10	04:29	10:47	17:06	04:09	-4.4	80.2	19.8	20:06	-30.9	311.7	20.2
2011:09:11	04:24	10:44	17:04	04:10	-3.2	80.6	20.5	20:04	-30.8	312.3	21.0
2011:09:12	04:19	10:41	17:02	04:11	-2.1	81.0	21.2	20:02	-30.6	312.8	21.7
2011:09:13	04:15	10:37	17:01	04:12	-1.0	81.5	22.0	20:00	-30.4	313.3	22.5
2011:09:14	04:10	10:34	16:59	04:14	-0.0	82.0	22.7	19:58	-30.3	313.8	23.2
2011:09:15	04:06	10:31	16:57	04:15	1.0	82.4	23.4	19:56	-30.2	314.2	23.9
2011:09:16	04:02	10:29	16:55	04:16	1.9	82.9	24.2	19:54	-30.0	314.5	24.6
2011:09:17	03:59	10:26	16:54	04:17	2.8	83.4	24.8	19:52	-29.9	314.9	25.3
2011:09:18	03:55	10:23	16:52	04:19	3.7	83.8	25.5	19:50	-29.8	315.1	25.9
2011:09:19	03:52	10:21	16:50	04:20	4.5	84.3	26.2	19:48	-29.7	315.4	26.6
2011:09:20	03:49	10:19	16:48	04:21	5.3	84.7	26.8	19:46	-29.6	315.6	27.2
2011:09:21	03:46	10:16	16:47	04:22	6.1	85.2	27.4	19:44	-29.6	315.7	27.7
2011:09:22	03:44	10:14	16:45	04:23	6.8	85.6	27.9	19:42	-29.5	315.8	28.3
2011:09:23	03:41	10:12	16:44	04:25	7.4	86.1	28.5	19:40	-29.4	315.9	28.8
2011:09:24	03:39	10:10	16:42	04:26	8.1	86.5	29.0	19:39	-29.3	315.9	29.3
2011:09:25	03:37	10:09	16:40	04:27	8.6	87.0	29.4	19:37	-29.3	315.9	29.7
2011:09:26	03:35	10:07	16:39	04:28	9.2	87.4	29.9	19:35	-29.2	315.8	30.1
2011:09:27	03:34	10:06	16:38	04:29	9.7	87.8	30.3	19:33	-29.2	315.7	30.5
2011:09:28	03:32	10:04	16:36	04:30	10.2	88.3	30.7	19:31	-29.1	315.6	30.9
2011:09:29	03:31	10:03	16:35	04:32	10.6	88.7	31.0	19:29	-29.1	315.4	31.2
2011:09:30	03:30	10:02	16:33	04:33	11.0	89.1	31.4	19:28	-29.1	315.3	31.5
2011:10:01	03:29	10:01	16:32	04:34	11.4	89.6	31.7	19:26	-29.0	315.0	31.8
2011:10:02	03:28	10:00	16:31	04:35	11.8	90.0	31.9	19:24	-29.0	314.8	32.1
2011:10:03	03:28	09:59	16:29	04:36	12.1	90.4	32.2	19:22	-29.0	314.5	32.3
2011:10:04	03:27	09:58	16:28	04:37	12.4	90.8	32.4	19:20	-29.0	314.2	32.5
2011:10:05	03:27	09:57	16:27	04:38	12.7	91.3	32.6	19:19	-29.0	313.9	32.8

Date	Object			Morning twilight -18°				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elon
2011:10:06	03:27	09:56	16:25	04:39	12.9	91.7	32.8	19:17	-29.0	313.6	32.9
2011:10:07	03:27	09:55	16:24	04:41	13.1	92.1	33.0	19:15	-29.0	313.2	33.1
2011:10:08	03:26	09:55	16:23	04:42	13.4	92.6	33.2	19:14	-29.0	312.9	33.3
2011:10:09	03:26	09:54	16:21	04:43	13.6	93.0	33.4	19:12	-29.0	312.5	33.5
2011:10:10	03:27	09:53	16:20	04:44	13.8	93.5	33.5	19:10	-29.0	312.2	33.6
2011:10:11	03:27	09:53	16:19	04:45	14.0	93.9	33.7	19:09	-29.1	311.8	33.8
2011:10:12	03:27	09:52	16:17	04:46	14.1	94.4	33.8	19:07	-29.1	311.4	33.9
2011:10:13	03:27	09:52	16:16	04:47	14.3	94.8	34.0	19:05	-29.2	311.1	34.0
2011:10:14	03:27	09:51	16:14	04:48	14.5	95.3	34.1	19:04	-29.2	310.7	34.2
2011:10:15	03:27	09:50	16:13	04:49	14.7	95.8	34.2	19:02	-29.3	310.3	34.3
2011:10:16	03:28	09:50	16:11	04:50	14.8	96.3	34.4	19:01	-29.3	310.0	34.5
2011:10:17	03:28	09:49	16:10	04:52	15.0	96.8	34.5	18:59	-29.4	309.6	34.6
2011:10:18	03:28	09:48	16:08	04:53	15.2	97.3	34.7	18:58	-29.5	309.3	34.8
2011:10:19	03:28	09:47	16:06	04:54	15.3	97.8	34.9	18:56	-29.6	308.9	35.0
2011:10:20	03:28	09:47	16:05	04:55	15.5	98.3	35.0	18:55	-29.7	308.6	35.1
2011:10:21	03:28	09:46	16:03	04:56	15.7	98.8	35.2	18:53	-29.8	308.3	35.3
2011:10:22	03:28	09:45	16:01	04:57	15.9	99.3	35.4	18:52	-29.9	308.0	35.5
2011:10:23	03:28	09:44	16:00	04:58	16.0	99.8	35.6	18:51	-30.0	307.7	35.7
2011:10:24	03:28	09:43	15:58	04:59	16.2	100.4	35.8	18:49	-30.2	307.4	35.9
2011:10:25	03:28	09:42	15:56	05:00	16.4	100.9	36.0	18:48	-30.3	307.2	36.1
2011:10:26	03:28	09:42	15:54	05:01	16.6	101.5	36.2	18:47	-30.5	306.9	36.3
2011:10:27	03:28	09:41	15:52	05:02	16.8	102.0	36.4	18:45	-30.6	306.7	36.5
2011:10:28	03:28	09:40	15:50	05:04	17.1	102.6	36.6	18:44	-30.8	306.5	36.8
2011:10:29	03:28	09:38	15:48	05:05	17.3	103.1	36.9	18:43	-31.0	306.3	37.0
2011:10:30	03:28	09:37	15:47	05:06	17.5	103.7	37.1	18:42	-31.1	306.1	37.3

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N,12°E), aggiungere un'ora quando si adotta l'ora legale

Times of rising and setting of the comet for Rome (42°N, 12°E), in U.T.+1

NB: TUTTI I DATI RELATIVI ALLE COMETE (PARAMETRI ORBITALI E MAGNITUDINE) SONO ALTAMENTE SOGGETTI A VARIAZIONI NEL TEMPO!

# CONGIUNZIONI <5° PIANETI - COMETE m<9

## CONJUNCTIONS <5° PLANETS - COMETS m<9

Date TT Dm Dl r1 r2 p e m1 m2 tm(s)

Questo anno non avvengono fenomeni - No phenomena this year

# CONGIUNZIONI MULTIPLE PIANETI - COMETE

(eventi con 2 o più pianeti ed una cometa entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS - COMETS

(events with 2 or more planets and 1 comet within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi  
 Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi  
 R1 = distanza in U.A. del pianeta dalla Terra  
 R2 = distanza in U.A. della cometa dalla Terra  
 p = angolo di posizione tra i corpi, in gradi  
 e = elongazione, in gradi  
 m1 = magnitudine del pianeta  
 m2 = magnitudine della cometa  
 tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi  
 Dmax = diametro del cerchio comprendente gli oggetti, in gradi  
 emin = elongazione minima, in gradi  
 m2d = magnitudine del penultimo corpo più debole  
 mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dm = least distance between the centers of the bodies  
 Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies  
 R1 = distance in A.U. of planet from the Earth  
 R2 = distance in A.U. of comet from the Earth  
 P = angle of position between the bodies, in °  
 e = elongation, in °  
 m1 = magnitude of the planet  
 m2 = magnitude of the comet  
 tm = if present, an object is occulted maximum for x seconds

Dmed = middle distance between the centers of the bodies, in °  
 Dmax = diameter of the group, in °  
 emin = least elongation, in °  
 m2d = magnitude of the 2nd brightest object  
 mmax = least magnitude

# CONGIUNZIONI <5° TRA COMETE m<9 CONJUNCTIONS <5° BETWEEN COMETS m<9

Data	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del primo corpo dalla Terra

R2 = distanza in U.A. del secondo dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

P = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, an object is occulted maximum for x seconds



# CONGIUNZIONI <1° LUNA - COMETE m<9 CONJUNCTIONS <1° MOON - COMETS m<9

## Geocentriche - Geocentric

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

## Topocentriche - Topocentric 42°N - 12°E

Date	TT	Dm	Alt	r1	r2	p	e	m1	m2	tm(s)
------	----	----	-----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

Alt = altezza sull'orizzonte della cometa, in gradi

R1 = distanza in U.A. della cometa dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della cometa

m2 = magnitudine della Luna

tm = se presente, la cometa viene occultata massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

Alt = height in ° on the horizon of the comet, in °

R1 = distance in A.U. of the comet from the Earth

R2 = distance in A.U. of the Moon from the Earth

p = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the comet

m2 = magnitude of the Moon

tm = if present, the comet is occulted maximum for x seconds

# CONGIUNZIONI MULTIPLE PIANETI-LUNA-COMETE

(eventi con 1 o più pianeti, la Luna ed una cometa entro 5°)

# MULTIPLE CONJUNCTIONS PLANETS-MOON-COMETS

(events with 1 or more planets, the Moon and 1 comet within 5°)

## Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

## Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# **CONGIUNZIONI <1° ASTEROIDI m<9 - COMETE m<9** **CONJUNCTIONS <1° ASTEROIDS m<9 - COMETS m<9**

Date TT Dm Dl r1 r2 p e m1 m2 tm(s)

Questo anno non avvengono fenomeni - No phenomena this year

## **CONGIUNZIONI MULTIPLE ASTEROIDI m<9 -COMETE m<9** (eventi con 2 comete ed un asteroide o viceversa entro 5°) **MULTIPLE CONJUNCTIONS ASTEROIDS m<9 -COMETS m<9** (events with 2 comets and 1 asteroid or viceversa within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. dell'asteroide dalla Terra

R2 = distanza in U.A. della cometa dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine dell'asteroide

m2 = magnitudine della cometa

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of the asteroid from the Earth

R2 = distance in A.U. of the comet from the Earth

p = angle of position between the bodies, in °

e = elongation, in °

m1 = magnitude of the asteroid

m2 = magnitude of the comet

tm = if present, an object is occulted maximum for x seconds

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

**CONGIUNZ. MULTIPLE PIANETI-COMETE-ASTEROIDI**  
(eventi con 1 pianeta, una cometa ed un asteroide entro 5°)  
**MULTIPLE CONJUNCT. PLANETS-COMETS-ASTEROIDS**  
(events with 1 planet, 1 comet and 1 asteroid within 5°)

Data            TT            Dmed    Dmax    emin    m2d    mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI <5° COMETE m<9 - STELLE m<2 CONJUNCTIONS <5° COMETS m<9 - STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2011/08/17 06:50:47		0.44914	0.21747	0.066	115	0	8.1	1.8		45P	Gamma2	VEL Regor

# CONGIUNZIONI <5° COMETE m<9-OGGETTI MESSIER m<9 CONJUNCTIONS <5° COMETS m<9-MESSIER OBJECTS m<9

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2011/08/14 22:41:11		0.64156	0.23896	0.060	332	-2	8.1	1.2		45P		LMC

Data nel formato anno/mese/giorno  
 Dm = distanza minima in gradi tra i centri dei corpi  
 Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi  
 R1 = distanza in U.A. della cometa dalla Terra  
 p = angolo di posizione tra i corpi, in gradi  
 e = elongazione, in gradi  
 m1 = magnitudine della cometa  
 m\* = magnitudine del secondo corpo  
 tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Date in the format year/month/day  
 Dm = least distance between the centers of the bodies  
 Dl = parameter limit, if Dm < Dl there is an occultation between the bodies  
 R1 = distance in A.U. of the comet from the Earth  
 p = angle of position between the bodies, in °  
 e = elongation, in °  
 m1 = magnitude of the comet  
 m\* = magnitude of the second body  
 tm = if present, an object is occulted maximum for x seconds

## CONGIUNZIONI MULTIPLE PIANETI-COMETE-STELLE

(eventi con 1 pianeta, 1 cometa ed 1 stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-COMETS-STARS

(events with 1 planet, 1 comet and 1 star with mag<2 within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

## CONGIUNZIONI MULTIPLE PIANETI-COMETE-OGGETTI

(eventi con 1 pianeta, 1 cometa ed un oggetto di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-COMET-OBJECTS

(events with 1 planet, 1 comet and 1 object with mag<2 within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE LUNA-COMETE-STELLE

(eventi con la Luna, 1 cometa ed 1 stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-COMETS-STARS

(events with the Moon, 1 comet and 1 star with mag<2 within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE LUNA-COMETE-OGGETTI (eventi con la Luna, 1 cometa ed un oggetto di mag<2 entro 5°) MULTIPLE CONJUNCTIONS MOON-COMETS-OBJECTS (events with the Moon, 1 comet and 1 object with mag<2 within 5°)

**Geocentriche - Geocentric**

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

**Topocentriche - Topocentric 42°N - 12°E**

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

# CONGIUNZIONI MULTIPLE STELLE - COMETE - ASTEROIDI (eventi con 1 stella di mag<2, 1 cometa ed un asteroide mag<9 entro 5°) MULTIPLE CONJUNCTIONS STARS - COMETS - ASTEROIDS (events with 1 star with mag<2, 1 comet and 1 asteroid with mag<9 within 5°)

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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**CONGIUNZIONI MULTIPLE**  
**OGGETTI - COMETE - ASTEROIDI**

(eventi con un oggetto di mag<2, 1 cometa ed un asteroide mag<9 entro  
5°)

**MULTIPLE CONJUNCTIONS**  
**OBJECTS - COMETS - ASTEROIDS**

(events with 1 object with mag<2, 1 comet and 1 asteroid with mag<9  
within 5°)

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# ECLIPSE DI SOLE E DI LUNA

## SOLAR AND LUNAR ECLIPSES

### Partial Solar Eclipse of 2011 Jan 04

Geocentric Conjunction = 09:15:12.3 UT J.D. = 2455565.885559

Greatest Eclipse = 08:50:34.0 UT J.D. = 2455565.868449

Eclipse Magnitude = 0.8572 Gamma = 1.0628

Saros Series = 151 Member = 14 of 72

#### Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 18h59m14.8s

Dec. = -22°44'21.3"

S.D. = 00°16'15.9"

H.P. = 00°00'08.9"

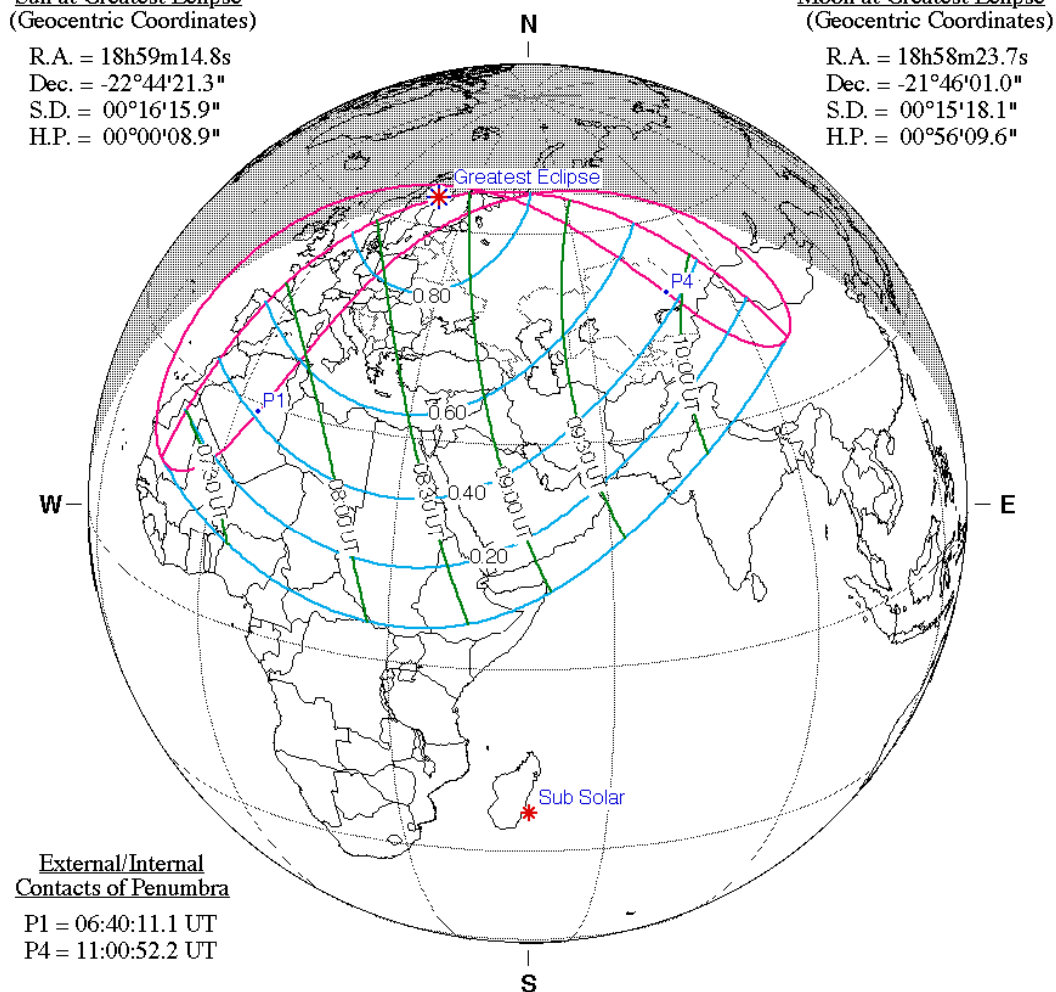
#### Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 18h58m23.7s

Dec. = -21°46'01.0"

S.D. = 00°15'18.1"

H.P. = 00°56'09.6"



#### External/Internal Contacts of Penumbra

P1 = 06:40:11.1 UT

P4 = 11:00:52.2 UT

#### Ephemeris & Constants

Eph. = Newcomb/ILE

$\Delta T = 67.6$  s

$k1 = 0.2724880$

$k2 = 0.2722810$

$\Delta b = 0.0''$   $\Delta l = 0.0''$

#### Geocentric Libration (Optical + Physical)

$l = 4.62^\circ$

$b = -1.33^\circ$

$c = -4.25^\circ$

Brown Lun. No. = 1089



F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)

## AFRICA

Site	1st Contact					2nd Contact					Maximum					3rd Contact					4th Contact					Mag	Central Durn sec
	U.T.			PA	Alt	U.T.			PA	Alt	U.T.			Alt	U.T.			PA	Alt	U.T.			PA	Alt			
	h	m	s	o	o	h	m	s	o	o	h	m	s	o	o	h	m	s	o	o	h	m	s	o	o		
CF Birao	7	9	14		326	30	..	..	..	..	7	54	42	39	..	..	..	..	..	..	8	43	45	19	47	0.119	....
CF Bria	7	31	47		342	36	..	..	..	..	7	51	21	40	..	..	..	..	..	..	8	11	14	4	44	0.020	....
CF N'Dele	7	16	49		334	31	..	..	..	..	7	49	58	38	..	..	..	..	..	..	8	24	56	13	44	0.063	....
CM Garoua	7	15	8		341	24	..	..	..	..	7	39	19	29	..	..	..	..	..	..	8	4	24	11	34	0.038	....
CM Maroua	7	7	41		334	23	..	..	..	..	7	41	4	30	..	..	..	..	..	..	8	16	34	17	37	0.073	....
DZ Adrar	..	..	..		..	..	..	..	..	..	7	38	35	8	..	..	..	..	..	..	8	43	42	47	20	0.363	....
DZ Ain Oussera	..	..	..		..	..	..	..	..	..	7	50	18	8	..	..	..	..	..	..	9	7	43	58	20	0.541	....
DZ Algier	..	..	..		..	..	..	..	..	..	7	52	12	8	..	..	..	..	..	..	9	10	43	59	20	0.564	....
DZ Annaba	6	44	20		288	0	..	..	..	..	7	57	20	12	..	..	..	..	..	..	9	20	25	60	23	0.596	....
DZ Bejaja	..	..	..		..	..	..	..	..	..	7	54	7	10	..	..	..	..	..	..	9	14	29	59	21	0.577	....
DZ Biskra	..	..	..		..	..	..	..	..	..	7	52	18	11	..	..	..	..	..	..	9	12	9	57	23	0.548	....
DZ Blida	..	..	..		..	..	..	..	..	..	7	51	34	8	..	..	..	..	..	..	9	9	34	58	19	0.557	....
DZ Bou Saada	..	..	..		..	..	..	..	..	..	7	51	22	9	..	..	..	..	..	..	9	10	1	58	21	0.547	....
DZ Bou Sfer	..	..	..		..	..	..	..	..	..	7	47	23	5	..	..	..	..	..	..	9	1	6	57	17	0.516	....
DZ Boufarik	..	..	..		..	..	..	..	..	..	7	51	41	8	..	..	..	..	..	..	9	9	46	59	19	0.559	....
DZ Constantine	..	..	..		..	..	..	..	..	..	7	55	12	11	..	..	..	..	..	..	9	16	53	59	22	0.580	....
DZ Djanet	6	41	25		305	6	..	..	..	..	7	44	45	19	..	..	..	..	..	..	8	56	59	45	31	0.367	....
DZ Ech-Cheliff	..	..	..		..	..	..	..	..	..	7	49	48	7	..	..	..	..	..	..	9	6	6	58	18	0.541	....
DZ El Golea	..	..	..		..	..	..	..	..	..	7	44	12	10	..	..	..	..	..	..	8	56	55	52	22	0.446	....
DZ Ghardaia	..	..	..		..	..	..	..	..	..	7	47	15	10	..	..	..	..	..	..	9	2	59	54	22	0.489	....
DZ Ghriess	..	..	..		..	..	..	..	..	..	7	47	27	6	..	..	..	..	..	..	9	1	45	56	18	0.514	....
DZ Hassi-Messaoud	6	40	50		296	0	..	..	..	..	7	48	52	13	..	..	..	..	..	..	9	6	35	54	24	0.493	....
DZ Illizi	6	40	40		302	4	..	..	..	..	7	45	52	17	..	..	..	..	..	..	9	0	23	48	29	0.408	....
DZ In Salah	6	40	27		305	-1	..	..	..	..	7	40	16	11	..	..	..	..	..	..	8	48	0	47	23	0.374	....
DZ Jijel	..	..	..		..	..	..	..	..	..	7	55	6	10	..	..	..	..	..	..	9	16	18	59	21	0.583	....
DZ Laghouat	..	..	..		..	..	..	..	..	..	7	48	5	9	..	..	..	..	..	..	9	4	9	56	21	0.509	....
DZ Mecheria	..	..	..		..	..	..	..	..	..	7	44	59	6	..	..	..	..	..	..	8	57	21	54	18	0.480	....
DZ Oran	..	..	..		..	..	..	..	..	..	7	47	23	5	..	..	..	..	..	..	9	1	12	57	17	0.516	....
DZ Ouargla	6	40	48		296	0	..	..	..	..	7	48	22	12	..	..	..	..	..	..	9	5	29	54	24	0.492	....
DZ Reggan	..	..	..		..	..	..	..	..	..	7	37	49	9	..	..	..	..	..	..	8	41	41	46	21	0.343	....
DZ Relizane	..	..	..		..	..	..	..	..	..	7	48	35	6	..	..	..	..	..	..	9	3	48	57	18	0.528	....
DZ Setif	..	..	..		..	..	..	..	..	..	7	53	38	10	..	..	..	..	..	..	9	13	59	59	21	0.570	....
DZ Sidi Bel Abbes	..	..	..		..	..	..	..	..	..	7	46	48	6	..	..	..	..	..	..	9	0	17	56	17	0.508	....
DZ Tamanrasset	6	42	16		311	4	..	..	..	..	7	38	48	15	..	..	..	..	..	..	8	42	37	42	27	0.301	....
DZ Tebessa	6	43	20		290	0	..	..	..	..	7	55	50	13	..	..	..	..	..	..	9	18	32	58	24	0.575	....
DZ Telergma	..	..	..		..	..	..	..	..	..	7	54	41	11	..	..	..	..	..	..	9	16	1	59	22	0.575	....
DZ Tiaret	..	..	..		..	..	..	..	..	..	7	48	44	7	..	..	..	..	..	..	9	4	33	57	19	0.527	....
DZ Tilrempt	..	..	..		..	..	..	..	..	..	7	47	25	10	..	..	..	..	..	..	9	3	10	55	21	0.496	....
DZ Timimoun	..	..	..		..	..	..	..	..	..	7	40	27	8	..	..	..	..	..	..	8	48	15	49	20	0.397	....
DZ Tindouf	..	..	..		..	..	..	..	..	..	7	33	32	1	..	..	..	..	..	..	8	27	57	42	12	0.286	....
DZ Tlemcen	..	..	..		..	..	..	..	..	..	7	45	56	5	..	..	..	..	..	..	8	58	22	56	17	0.498	....
DZ Touggourt	6	41	24		294	0	..	..	..	..	7	50	30	12	..	..	..	..	..	..	9	9	24	56	24	0.519	....
EG Abu Simbel	7	1	43		296	28	..	..	..	..	8	23	38	39	..	..	..	..	..	..	9	52	17	38	45	0.408	....
EG Alexandria	7	0	26		285	20	..	..	..	..	8	28	50	31	..	..	..	..	..	..	10	4	31	49	36	0.572	....
EG Aswan	7	3	33		293	28	..	..	..	..	8	28	4	39	..	..	..	..	..	..	9	58	43	39	43	0.438	....
EG Asyut	7	0	28		290	24	..	..	..	..	8	26	57	35	..	..	..	..	..	..	10	0	30	44	40	0.499	....
EG Cairo	7	2	16		286	22	..	..	..	..	8	31	2	33	..	..	..	..	..	..	10	6	24	47	37	0.552	....
EG El Arish	7	7	8		284	24	..	..	..	..	8	37	38	34	..	..	..	..	..	..	10	13	8	47	36	0.562	....
EG El-Gora	7	7	41		284	24	..	..	..	..	8	38	19	34	..	..	..	..	..	..	10	13	46	47	36	0.561	....
EG El-Tor	7	5	33		287	26	..	..	..	..	8	34	19	36	..	..	..	..	..	..	10	8	32	44	39	0.514	....
EG Embaba	7	1	53		286	22	..	..	..	..	8	30	30	33	..	..	..	..	..	..	10	5	50	47	37	0.552	....
EG Hurghada	7	5	35		289	26	..	..	..	..	8	33</															

## AFRICA

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Central		
	U.T.		PA	Alt	U.T.		PA		U.T.		Alt	U.T.		PA		U.T.		PA	Alt	Mag	Durn		
	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o		sec	
NE Agadez	6	49	35	322	10	..	..	..	7	37	0	20	..	..	..	..	8	29	26	31	30	0.185	....
NE Diffa	6	57	10	326	18	..	..	..	7	40	26	26	..	..	..	..	8	27	41	25	36	0.135	....
NE Dirkou	6	46	13	313	13	..	..	..	7	44	39	24	..	..	..	..	8	50	36	37	36	0.272	....
NE Maradi	6	59	35	333	13	..	..	..	7	33	54	21	..	..	..	..	8	10	39	21	28	0.091	....
NE Niamey	7	6	6	341	10	..	..	..	7	29	17	15	..	..	..	..	7	53	21	15	20	0.044	....
NE Tahoua	6	56	19	331	10	..	..	..	7	32	48	18	..	..	..	..	8	12	6	24	26	0.109	....
NE Tanout	6	53	49	326	13	..	..	..	7	36	35	22	..	..	..	..	8	23	21	27	31	0.144	....
NE Zinder	6	57	18	329	14	..	..	..	7	36	6	22	..	..	..	..	8	18	7	24	31	0.115	....
NG Gusau	7	6	5	339	15	..	..	..	7	32	44	21	..	..	..	..	8	0	42	16	26	0.054	....
NG Jos	7	22	53	350	22	..	..	..	7	33	51	24	..	..	..	..	7	44	41	4	26	0.008	....
NG Kaduna	7	15	24	346	18	..	..	..	7	32	40	22	..	..	..	..	7	50	15	9	26	0.021	....
NG Kano	7	4	29	336	16	..	..	..	7	34	38	23	..	..	..	..	8	6	33	18	29	0.067	....
NG Maiduguri	7	2	8	331	20	..	..	..	7	40	11	28	..	..	..	..	8	21	10	21	36	0.100	....
NG Sokoto	7	4	15	338	13	..	..	..	7	31	39	19	..	..	..	..	8	0	28	17	25	0.059	....
NG Yola	7	17	12	343	24	..	..	..	7	38	2	28	..	..	..	..	7	59	27	9	32	0.028	....
NG Zaria	7	10	59	342	17	..	..	..	7	33	16	22	..	..	..	..	7	56	18	12	27	0.036	....
SD Damazin	7	21	3	315	40	..	..	..	8	20	11	49	..	..	..	..	9	22	30	18	55	0.170	....
SD Dongola	7	1	28	301	29	..	..	..	8	17	47	41	..	..	..	..	9	40	55	34	48	0.343	....
SD El Fasher	7	2	1	315	29	..	..	..	8	2	1	40	..	..	..	..	9	7	56	27	49	0.211	....
SD El Obeid	7	9	43	313	34	..	..	..	8	12	3	45	..	..	..	..	9	19	18	23	53	0.207	....
SD Juba	8	7	13	348	51	..	..	..	8	8	54	52	..	..	..	..	8	10	16	349	52	0.000	....
SD Kassala	7	17	49	306	39	..	..	..	8	28	10	48	..	..	..	..	9	41	55	23	52	0.247	....
SD Khartoum	7	9	22	307	34	..	..	..	8	19	25	45	..	..	..	..	9	34	33	27	51	0.262	....
SD Malakal	7	22	50	321	40	..	..	..	8	12	20	49	..	..	..	..	9	4	37	14	55	0.120	....
SD Nyala	7	5	21	319	30	..	..	..	8	0	9	40	..	..	..	..	8	59	56	23	50	0.172	....
SD Port Sudan	7	14	53	299	36	..	..	..	8	34	24	45	..	..	..	..	9	57	20	29	47	0.333	....
SD Wau	7	25	33	330	39	..	..	..	8	3	19	46	..	..	..	..	8	42	57	10	52	0.071	....
SO Berbera	8	1	41	319	53	..	..	..	8	43	55	57	..	..	..	..	9	26	7	0	57	0.073	....
SO Hargeisa	8	2	22	322	54	..	..	..	8	40	59	57	..	..	..	..	9	19	39	359	58	0.061	....
SY Palmyra	7	18	18	280	25	..	..	..	8	51	18	32	..	..	..	..	10	25	58	48	31	0.597	....
TD Abeche	6	57	42	318	24	..	..	..	7	53	39	35	..	..	..	..	8	55	34	28	45	0.199	....
TD Faya-Largeau	6	49	56	310	19	..	..	..	7	53	39	31	..	..	..	..	9	5	27	36	42	0.287	....
TD Moundou	7	17	26	340	27	..	..	..	7	42	47	32	..	..	..	..	8	9	8	11	38	0.039	....
TD N'Djamena	7	0	41	327	21	..	..	..	7	43	6	30	..	..	..	..	8	29	11	23	38	0.122	....
TD Pala	7	13	11	338	25	..	..	..	7	41	29	31	..	..	..	..	8	11	9	13	37	0.051	....
TD Sarh	7	12	54	334	28	..	..	..	7	46	37	35	..	..	..	..	8	22	20	15	42	0.068	....
TN Bizerte	6	45	31	287	1	..	..	..	8	0	21	13	..	..	..	..	9	25	26	60	24	0.615	....
TN Bordj El Amri	6	45	8	287	1	..	..	..	7	59	50	13	..	..	..	..	9	24	51	60	24	0.607	....
TN Djerba	6	43	23	290	3	..	..	..	7	57	14	15	..	..	..	..	9	21	37	57	27	0.564	....
TN El Borma	6	41	38	294	3	..	..	..	7	52	34	15	..	..	..	..	9	13	49	55	27	0.515	....
TN Gabes	6	43	6	291	3	..	..	..	7	56	21	15	..	..	..	..	9	20	4	57	26	0.560	....
TN Gafsa	6	42	55	291	1	..	..	..	7	55	24	14	..	..	..	..	9	18	11	57	25	0.562	....
TN Monastir	6	44	43	288	2	..	..	..	7	59	38	15	..	..	..	..	9	24	59	59	25	0.596	....
TN Remada	6	42	18	293	3	..	..	..	7	54	45	16	..	..	..	..	9	17	41	55	27	0.534	....
TN Sfax	6	43	55	289	3	..	..	..	7	58	12	15	..	..	..	..	9	22	59	58	26	0.578	....
TN Tozeur	6	42	24	292	1	..	..	..	7	53	56	13	..	..	..	..	9	15	39	57	25	0.548	....
TN Tunis	6	45	22	287	2	..	..	..	8	0	23	14	..	..	..	..	9	25	42	60	24	0.611	....

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

#### Legenda:

La località e lo stato

I vari tempi dei contatti, se presenti. Se l'evento avviene il giorno prima o quello dopo la data della predizione è presente un segno "-" o "+" immediatamente dopo l'ora.

La posizione dell'angolo di contatto per ogni evento.

L'altitudine del Sole.

La magnitudine dell'eclisse.

Nel caso delle eclissi centrali, la durata.

The site name and location.

The UTC - for 1st and 4th contacts of partial eclipse, the time of maximum eclipse, and if the eclipse is central, the times of 2nd & 3rd contacts. Times are not given if the event does not occur, or the sun is not above the horizon. If the event occurs on the day preceding or following the date of the prediction, a '-' or '+' (respectively) occurs immediately after the predicted time.

The position angle of contact - at start and end of partial eclipse, and start and end of annular or total eclipse;

The altitude of the sun - at start and end of partial eclipse, and at maximum eclipse;

If maximum eclipse is visible at the location, the magnitude at maximum eclipse;

If central eclipse occurs at the location, the duration of the central eclipse.

[Note: The magnitude is computed as the fraction of the solar diameter that is obscured by the moon.

During central eclipse, this value equals (diameter of moon / diameter of sun) - irrespective of location across the center path.]

## ASIA

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec
	U.T.		PA Alt		U.T.		PA	U.T.		Alt		U.T.		PA	U.T.		PA Alt					
	h	m s	o	o	h	m s	o	h	m s	o	h	m s	o	h	m s	o	o					
AF Herat	8	25	8	287	33	..	..	..	9	41	6	28	..	..	..	10	50	34	26	20	0.354	....
AF Jalalabad	8	52	23	294	29	..	..	..	9	53	59	23	..	..	..	10	50	30	17	15	0.247	....
AF Kabul	8	47	46	293	30	..	..	..	9	52	14	23	..	..	..	10	51	14	19	15	0.268	....
AF Kandahar	8	41	14	294	34	..	..	..	9	46	30	28	..	..	..	10	46	20	17	20	0.252	....
AF Kunduz	8	43	29	289	28	..	..	..	9	51	46	22	..	..	..	10	54	8	24	14	0.313	....
AF Maimama	8	31	31	287	30	..	..	..	9	45	33	25	..	..	..	10	53	8	26	17	0.353	....
AF Mazar-I-Sharif	8	38	12	288	29	..	..	..	9	49	18	23	..	..	..	10	54	12	25	15	0.336	....
AF Sheberghan	8	34	11	287	29	..	..	..	9	47	22	24	..	..	..	10	54	9	27	15	0.353	....
AF Shindand	8	26	3	288	34	..	..	..	9	40	57	29	..	..	..	10	49	29	25	20	0.338	....
AF Taluqan	8	45	13	290	28	..	..	..	9	52	44	21	..	..	..	10	54	26	23	13	0.308	....
CN Hotan	9	15	58	301	21	..	..	..	10	4	58	14	..	..	..	10	50	34	12	7	0.180	....
CN Kashi	8	59	10	292	22	..	..	..	10	0	15	15	..	..	..	10	56	21	22	7	0.281	....
CN Urumqi	9	16	45	297	12	..	..	..	10	8	14	5	..	..	..	..	..	..	..	..	0.238	....
GE Sukhumi	7	30	49	273	20	..	..	..	9	3	23	24	..	..	..	10	35	23	54	22	0.689	....
GE Tbilisi	7	37	52	274	23	..	..	..	9	10	29	26	..	..	..	10	40	41	50	22	0.650	....
IN Amritsar	9	14	49	305	28	..	..	..	9	59	32	22	..	..	..	10	41	24	5	15	0.130	....
IN Bhatinda	9	19	56	309	28	..	..	..	9	59	18	23	..	..	..	10	36	28	1	17	0.099	....
IN Bhiwani	9	34	7	317	27	..	..	..	10	0	53	23	..	..	..	10	26	44	353	18	0.046	....
IN Bhuj	9	31	20	323	35	..	..	..	9	49	10	32	..	..	..	10	6	48	345	30	0.018	....
IN Bikaner	9	22	15	312	30	..	..	..	9	56	42	26	..	..	..	10	29	31	357	20	0.072	....
IN Chandigarh	9	27	19	312	26	..	..	..	10	1	56	21	..	..	..	10	34	52	359	15	0.079	....
IN Deesa	9	50	23	332	30	..	..	..	9	53	43	29	..	..	..	9	57	23	336	29	0.001	....
IN Dehra Dun	9	36	42	317	24	..	..	..	10	3	34	20	..	..	..	10	29	30	353	16	0.049	....
IN Delhi	9	41	54	321	25	..	..	..	10	2	0	22	..	..	..	10	21	42	348	19	0.027	....
IN Delhi	9	42	28	322	25	..	..	..	10	2	7	22	..	..	..	10	21	26	348	19	0.025	....
IN Hissar	9	29	47	314	27	..	..	..	10	0	24	23	..	..	..	10	29	46	355	18	0.060	....
IN Jaipur	9	50	58	328	26	..	..	..	9	59	54	24	..	..	..	10	9	1	340	23	0.005	....
IN Jaisalmer	9	15	33	311	33	..	..	..	9	52	51	28	..	..	..	10	28	14	358	23	0.081	....
IN Jammu	9	11	49	303	27	..	..	..	9	59	40	21	..	..	..	10	44	14	8	14	0.151	....
IN Jodhpur	9	32	16	319	31	..	..	..	9	55	51	27	..	..	..	10	18	49	349	24	0.033	....
IN Kandla	9	38	44	327	34	..	..	..	9	49	46	32	..	..	..	10	0	55	340	30	0.007	....
IN Kulu	9	23	47	309	25	..	..	..	10	2	32	20	..	..	..	10	39	8	2	14	0.101	....
IN Leh	9	17	7	304	24	..	..	..	10	3	3	18	..	..	..	10	45	56	8	11	0.147	....
IN Ludhiaha	9	22	47	309	27	..	..	..	10	0	55	21	..	..	..	10	36	58	1	16	0.095	....
IN Nainital	9	58	1	330	21	..	..	..	10	4	54	20	..	..	..	10	12	2	340	19	0.003	....
IN Pathankot	9	16	19	305	26	..	..	..	10	0	38	21	..	..	..	10	42	8	6	14	0.130	....
IN Patiala	9	27	2	312	26	..	..	..	10	1	22	21	..	..	..	10	34	3	358	16	0.077	....
IN Saharanpur	9	33	54	316	25	..	..	..	10	2	37	21	..	..	..	10	30	15	354	16	0.055	....
IN Shimla	9	26	38	311	25	..	..	..	10	2	22	20	..	..	..	10	36	17	360	15	0.085	....
IN Srinagar	9	7	53	300	26	..	..	..	9	59	40	20	..	..	..	10	47	40	11	13	0.181	....
KZ Alma-Ata	8	54	55	288	19	..	..	..	9	59	49	12	..	..	..	10	59	25	28	4	0.343	....
PK Bahawalpure	9	9	56	306	31	..	..	..	9	54	55	26	..	..	..	10	37	2	4	19	0.122	....
PK Bannu	8	55	24	297	30	..	..	..	9	53	54	24	..	..	..	10	47	45	14	16	0.217	....
PK Chitral	8	53	47	293	27	..	..	..	9	55	48	21	..	..	..	10	52	39	19	13	0.260	....
PK Dalbandin	8	40	26	297	37	..	..	..	9	43	6	31	..	..	..	10	40	50	14	24	0.218	....
PK Dera Ghazi Khan	9	2	46	302	32	..	..	..	9	53	17	26	..	..	..	10	40	14	7	19	0.153	....
PK Dera Ismail Khan	8	59	13	299	31	..	..	..	9	54	17	24	..	..	..	10	45	9	12	17	0.189	....
PK Faisalabad	9	8	46	303	29	..	..	..	9	57	7	23	..	..	..	10	42	9	7	16	0.148	....
PK Gilgit	9	1	44	296	26	..	..	..	9	59	0	19	..	..	..	10	51	46	16	11	0.228	....
PK Gwadar	8	39	20	301	41	..	..	..	9	37	19	36	..	..	..	10	31	14	9	29	0.172	....
PK Hyderabad	9	9	8	310	37	..	..	..	9	48	8	32	..	..	..	10	25	6	358	26	0.083	....
PK Islamabad	9	3	0	299	28	..	..	..	9	57	28	21	..	..	..	10	47	47	13	14	0.195	....
PK Jacobsbad	8	58	56	303	35	..	..	..	9	49	36	29	..	..	..	10	36	46	6	22	0.147	....
PK Jiwni	8	37	19	301	41	..	..	..	9	36	13	37	..	..	..	10	30	58	9	30	0.176	....
PK Karachi	9	3	10	309	38	..	..	..	9	45	29	33	..	..	..	10	25	26	360	27	0.096	....
PK Karachi	9	4	18	309	38	..	..	..	9	45	52	33	..	..	..	10	25	9	359	27	0.093	....
PK Kharan	8	45	13	298	37	..	..	..	9	44	43	31	..	..	..	10	39	39	12	23	0.198	....
PK Khuzdhar	8	52	19	301	37	..	..	..	9	46	30	31	..	..	..	10	36	46	8	24	0.163	....
PK Lahore	9	13	44	305	28	..	..	..	9	58	56	22	..	..	..	10	41	13	6	16	0.132	....
PK Lahore	9	13	52	305	28	..	..	..	9	59	1	22	..	..	..	10						

## ASIA

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec	
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt				
	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o			
RU Dnepropetrovsk	7	25	58	270	13	..	..	..	8	55	25	18	..	..	..	..	10	26	43	61	18	0.772	....
RU Donetsk	7	29	51	270	14	..	..	..	8	59	58	19	..	..	..	..	10	30	51	60	18	0.759	....
RU Dushanbe	8	40	40	287	27	..	..	..	9	51	32	20	..	..	..	..	10	56	13	27	12	0.351	....
RU Dzhzhkzagan	8	29	13	277	19	..	..	..	9	47	22	14	..	..	..	..	10	59	22	41	6	0.519	....
RU Gomel	7	25	29	268	8	..	..	..	8	51	46	13	..	..	..	..	10	20	47	65	15	0.813	....
RU Kaliningrad	7	17	35	269	1	..	..	..	8	39	9	8	..	..	..	..	10	5	35	69	12	0.833	....
RU Kazan	7	54	57	267	11	..	..	..	9	20	21	11	..	..	..	..	10	43	10	59	8	0.757	....
RU Kemorovo	8	51	56	282	6	..	..	..	9	57	50	-1	..	..	..	..	..	..	..	..	..	0.467	....
RU Kharkov	7	15	58	270	8	..	..	..	8	42	15	15	..	..	..	..	10	13	13	65	18	0.797	....
RU Kiev	7	22	25	269	9	..	..	..	8	49	44	15	..	..	..	..	10	20	13	64	17	0.798	....
RU Krasnodar	7	29	10	271	17	..	..	..	9	0	48	22	..	..	..	..	10	32	46	57	21	0.724	....
RU Krasnovodsk	7	56	17	276	27	..	..	..	9	25	36	26	..	..	..	..	10	49	24	43	20	0.558	....
RU Kurgan	8	20	39	272	12	..	..	..	9	40	19	8	..	..	..	..	10	55	5	51	2	0.642	....
RU Kustanay	8	18	22	272	14	..	..	..	9	39	34	11	..	..	..	..	10	55	33	50	4	0.632	....
RU Lvov	7	13	10	271	6	..	..	..	8	37	59	14	..	..	..	..	10	8	14	66	17	0.802	....
RU Magnetiogorsk	8	9	58	270	14	..	..	..	9	33	34	12	..	..	..	..	10	52	29	53	6	0.673	....
RU Makhachkala	7	44	33	273	23	..	..	..	9	16	13	24	..	..	..	..	10	44	22	49	20	0.643	....
RU Mineralnye Vody	7	35	52	272	20	..	..	..	9	7	57	23	..	..	..	..	10	38	32	54	20	0.693	....
RU Minsk	7	23	9	268	5	..	..	..	8	47	41	11	..	..	..	..	10	15	44	67	14	0.826	....
RU Moscow	7	37	30	266	8	..	..	..	9	3	13	12	..	..	..	..	10	29	29	64	11	0.813	....
RU Nizhnevartovsk	8	32	20	273	4	..	..	..	9	45	28	0	..	..	..	..	..	..	..	..	..	0.619	....
RU Nukus	8	13	2	277	25	..	..	..	9	37	23	22	..	..	..	..	10	55	15	40	14	0.525	....
RU Odessa	7	16	59	271	12	..	..	..	8	45	51	19	..	..	..	..	10	18	41	62	21	0.767	....
RU Omsk	8	33	33	275	10	..	..	..	9	48	30	6	..	..	..	..	..	..	..	..	..	0.571	....
RU Orenburg	8	3	57	270	15	..	..	..	9	29	36	14	..	..	..	..	10	50	46	53	9	0.682	....
RU Osh	8	48	44	288	23	..	..	..	9	56	13	16	..	..	..	..	10	57	57	27	8	0.341	....
RU Perm	8	5	55	268	9	..	..	..	9	28	24	8	..	..	..	..	10	47	26	57	4	0.731	....
RU Rostov	7	32	32	270	16	..	..	..	9	3	17	20	..	..	..	..	10	33	57	58	18	0.742	....
RU Salekhard	8	17	41	269	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
RU Samara	7	55	17	268	13	..	..	..	9	21	45	13	..	..	..	..	10	45	8	57	10	0.735	....
RU Samarkand	8	34	9	284	26	..	..	..	9	48	49	21	..	..	..	..	10	56	58	30	12	0.395	....
RU Semiplatinsk	8	50	28	283	12	..	..	..	9	58	13	5	..	..	..	..	..	..	..	..	..	0.437	....
RU Shevchenko	7	52	45	273	23	..	..	..	9	22	53	23	..	..	..	..	10	48	23	48	17	0.628	....
RU Simferopol	7	20	17	272	14	..	..	..	8	50	48	21	..	..	..	..	10	24	6	59	22	0.745	....
RU Sochi	7	29	4	272	19	..	..	..	9	1	22	24	..	..	..	..	10	33	41	55	22	0.703	....
RU St. Petersburg	7	34	26	266	2	..	..	..	8	56	21	6	..	..	..	..	10	20	10	68	8	0.845	....
RU Stavropol	7	34	43	271	18	..	..	..	9	6	30	22	..	..	..	..	10	37	14	55	20	0.709	....
RU Surgut	8	28	29	272	5	..	..	..	9	42	58	1	..	..	..	..	..	..	..	..	..	0.643	....
RU Sverdlovsk	8	13	4	270	11	..	..	..	9	34	29	8	..	..	..	..	10	51	36	54	3	0.690	....
RU Syktyvkar	8	0	1	266	5	..	..	..	9	21	18	5	..	..	..	..	10	40	29	62	2	0.782	....
RU Termez	8	37	47	287	28	..	..	..	9	49	27	22	..	..	..	..	10	54	50	26	14	0.346	....
RU Tobolsk	9	55	23	322	8	..	..	..	10	14	37	5	..	..	..	..	10	33	32	353	2	0.033	....
RU Tselinograd	8	33	55	277	15	..	..	..	9	49	41	9	..	..	..	..	10	59	44	43	2	0.532	....
RU Tver	7	36	58	266	6	..	..	..	9	1	42	10	..	..	..	..	10	27	19	65	10	0.823	....
RU Ufa	8	5	9	269	13	..	..	..	9	29	25	11	..	..	..	..	10	49	37	55	7	0.705	....
RU Uralsk	7	56	37	269	16	..	..	..	9	23	58	16	..	..	..	..	10	47	32	55	11	0.705	....
RU Vitebsk	7	27	59	267	5	..	..	..	8	52	36	11	..	..	..	..	10	19	47	67	12	0.829	....
RU Volgograd	7	42	0	269	16	..	..	..	9	11	59	19	..	..	..	..	10	40	7	57	16	0.731	....
RU Voronezh	7	36	15	268	12	..	..	..	9	4	30	15	..	..	..	..	10	32	48	61	14	0.782	....
RU Yerevan	7	35	35	275	24	..	..	..	9	8	36	27	..	..	..	..	10	39	26	49	24	0.635	....
SG Bratislava	7	4	6	273	2	..	..	..	8	25	48	12	..	..	..	..	9	54	54	67	18	0.781	....
SG Kosice	7	8	36	272	5	..	..	..	8	32	24	13	..	..	..	..	10	2	40	66	18	0.791	....
SG Malacky	7	4	22	273	2	..	..	..	8	25	59	11	..	..	..	..	9	54	57	67	18	0.783	....
SG Piestany	7	5	19	273	3	..	..	..	8	27	17	12	..	..	..	..	9	56	26	67	18	0.786	....
SG Poprad	7	8	12	272	4	..	..	..	8	31	24	13	..	..	..	..	10	1	10	67	18	0.794	....
SG Sliac	7	6	31	273	3	..	..	..	8	29	12	12	..	..	..	..	9	58	49	67	18	0.788	....
SG Trencin	7	5	49	273	2	..	..	..	8	27	51	12	..	..	..	..	9	56	57	67	17	0.788	....
SG Zilina	7	6	56	272	3	..	..	..	8	29	14	12	..	..	..	..	9	58	22	67			

## ASIA

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Central		
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt		Mag	Durn sec	
	h	m s	o		h	m s	o		h	m s	o		h	m s	o		h	m s	o				
TR Trabzon	7	26	30	274	21	..	..	..	8	59	29	26	..	..	..	..	10	32	40	53	25	0.675	....
TR Usak	7	5	57	277	16	..	..	..	8	35	45	25	..	..	..	..	10	11	44	57	29	0.684	....
TR Van	7	32	1	276	25	..	..	..	9	5	25	29	..	..	..	..	10	37	11	48	26	0.621	....
TR Yalova	7	8	4	276	14	..	..	..	8	37	40	23	..	..	..	..	10	13	3	58	27	0.708	....
TR Yenisehir	7	7	50	276	15	..	..	..	8	37	35	24	..	..	..	..	10	13	8	58	27	0.703	....
TR Zonguldak	7	13	12	274	16	..	..	..	8	43	59	24	..	..	..	..	10	19	3	58	26	0.713	....
UZ Tashkent	8	38	40	284	24	..	..	..	9	51	38	18	..	..	..	..	10	58	18	31	10	0.395	....

## EUROPA - EUROPE

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec	
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt				
	h	m s	o		h	m s	o		h	m s	o		h	m s	o		h	m s	o				
AL Tirana	6	57	9	278	7	..	..	..	8	20	41	18	..	..	..	..	9	53	6	62	25	0.713	....
AT Graz	7	0	53	275	2	..	..	..	8	21	39	11	..	..	..	..	9	50	26	67	19	0.765	....
AT Innsbruck	..	..	..	..	..	..	..	..	8	16	39	9	..	..	..	..	9	43	13	67	17	0.755	....
AT Klagenfurt	6	59	32	276	1	..	..	..	8	19	39	11	..	..	..	..	9	47	59	66	18	0.759	....
AT Klagenfurt	6	59	33	276	1	..	..	..	8	19	39	11	..	..	..	..	9	47	59	66	18	0.759	....
AT Langenlebarn	7	3	24	274	2	..	..	..	8	24	27	11	..	..	..	..	9	53	2	67	18	0.780	....
AT Linz	7	1	46	274	0	..	..	..	8	21	43	10	..	..	..	..	9	49	28	67	17	0.774	....
AT Salzburg	7	0	15	275	0	..	..	..	8	19	32	10	..	..	..	..	9	46	51	67	17	0.766	....
AT Vienna	7	3	28	274	2	..	..	..	8	24	48	11	..	..	..	..	9	53	40	67	18	0.779	....
AT Wels	7	1	35	274	0	..	..	..	8	21	27	10	..	..	..	..	9	49	9	67	17	0.773	....
AT Wiener Neustadt Ost	7	2	49	274	2	..	..	..	8	24	0	11	..	..	..	..	9	52	50	67	18	0.776	....
AT Zeltweg	7	0	38	275	1	..	..	..	8	20	59	11	..	..	..	..	9	49	22	67	18	0.766	....
BA Banja Luka	6	59	32	276	4	..	..	..	8	21	31	14	..	..	..	..	9	51	51	65	21	0.749	....
BA Mostar	6	57	47	277	5	..	..	..	8	20	7	15	..	..	..	..	9	51	11	64	23	0.731	....
BA Sarajevo	6	58	54	276	5	..	..	..	8	21	36	15	..	..	..	..	9	52	46	64	22	0.739	....
BE Antwerp	..	..	..	..	..	..	..	..	8	15	14	3	..	..	..	..	9	37	5	69	11	0.766	....
BE Beauvechain	..	..	..	..	..	..	..	..	8	14	50	3	..	..	..	..	9	36	56	69	11	0.764	....
BE Bertrix	..	..	..	..	..	..	..	..	8	13	53	4	..	..	..	..	9	36	25	68	12	0.757	....
BE Brasschaat	..	..	..	..	..	..	..	..	8	15	30	3	..	..	..	..	9	37	21	69	11	0.768	....
BE Brussels	..	..	..	..	..	..	..	..	8	14	48	3	..	..	..	..	9	36	44	69	11	0.764	....
BE Charleroi	..	..	..	..	..	..	..	..	8	14	3	3	..	..	..	..	9	36	2	69	11	0.759	....
BE Chievres	..	..	..	..	..	..	..	..	8	13	39	3	..	..	..	..	9	35	16	69	11	0.758	....
BE Florennes	..	..	..	..	..	..	..	..	8	13	53	3	..	..	..	..	9	36	2	68	12	0.758	....
BE Kleine Brogel	..	..	..	..	..	..	..	..	8	16	10	3	..	..	..	..	9	38	35	69	11	0.770	....
BE Koksijde	..	..	..	..	..	..	..	..	8	13	24	2	..	..	..	..	9	34	16	69	10	0.757	....
BE Kortrijk-Wevelgem	..	..	..	..	..	..	..	..	8	13	28	2	..	..	..	..	9	34	41	69	11	0.757	....
BE Liege	..	..	..	..	..	..	..	..	8	15	18	4	..	..	..	..	9	37	48	69	12	0.765	....
BE Ostend	..	..	..	..	..	..	..	..	8	13	46	2	..	..	..	..	9	34	44	69	10	0.759	....
BE Sint-Truiden	..	..	..	..	..	..	..	..	8	15	18	3	..	..	..	..	9	37	38	69	12	0.766	....
BE Ursel	..	..	..	..	..	..	..	..	8	14	14	2	..	..	..	..	9	35	33	69	10	0.761	....
BE Weelde	..	..	..	..	..	..	..	..	8	16	2	3	..	..	..	..	9	38	7	69	11	0.770	....
BE Zoersel	..	..	..	..	..	..	..	..	8	15	38	3	..	..	..	..	9	37	38	69	11	0.768	....
BE Zutendaal	..	..	..	..	..	..	..	..	8	15	56	4	..	..	..	..	9	38	28	69	12	0.769	....
BG Bourgas	7	7	40	275	12	..	..	..	8	36	3	21	..	..	..	..	10	10	34	61	25	0.732	....
BG Gorna Orechovica	7	6	2	275	10	..	..	..	8	33	20	20	..	..	..	..	10	7	19	62	24	0.739	....
BG Plovdiv	7	3	36	276	10	..	..	..	8	30	30	20	..	..	..	..	10	4	41	61	25	0.727	....
BG Sofia	7	2	39	276	9	..	..	..	8	28	38	19	..	..	..	..	10	2	12	62	24	0.734	....
BG Stara Zagora	7	4	59	275	11	..	..	..	8	32	21	20	..	..	..	..	10	6	37	61	25	0.731	....
BG Varna	7	8	55	274	12	..	..	..	8	37	21	21	..	..	..	..	10	11	38	61	24	0.739	....
CH Alpnach	..	..	..	..	..	..	..	..	8	12	32	7	..	..	..	..	9	37	21	67	16	0.740	....
CH Altenrhein	..	..	..	..	..	..	..	..	8	14	50	8	..	..	..	..	9	40	20	67	16	0.751	....
CH Bern	..	..	..	..	..	..	..	..	8	11	36	7	..	..	..	..	9	35	57	67	16	0.736	....
CH Buochs	..	..	..	..	..	..	..	..	8	12	43	7	..	..	..	..	9	37	36	67	16	0.740	....
CH Dubendorf	..	..	..	..	..	..	..	..	8	13	38	7	..	..	..	..	9	38	37	67	16	0.746	....
CH Emmen	..	..	..	..	..	..	..	..	8	12	47	7	..	..	..	..	9	37	36	67	16	0.741	....
CH Geneva	..	..	..	..	..	..	..	..	8	9	4	6	..	..	..	..	9	32	33	66	15	0.721	....
CH Grenchen	..	..	..	..	..	..	..	..	8	11	56	7	..	..	..	..	9	36	11	67	15	0.738	....
CH Interlaken	..	..	..	..	..	..	..	..	8	11	40	7	..	..	..	..	9	36	16	67	16	0.735	....
CH Les Eplatures	..	..	..	..	..	..	..	..	8	11	5	6	..	..	..	..	9	34	58	67	15	0.735	....
CH Lugano	..	..	..	..	..	..	..	..	8	11	50	8	..	..	..	..	9	37	10	66	17	0.732	....
CH Meiringen	..	..	..	..	..	..	..	..	8	12	1	7	..	..	..	..	9	36	46	67	16	0.737	....
CH Mollis	..	..	..	..	..	..	..	..	8	13	38	8	..	..	..	..	9	38	55	67	16	0.744	....
CH Payerne	..	..	..	..	..	..	..	..	8	10	51	6	..	..	..	..	9	34	50	67	15	0.732	....
CH Raron	..	..	..	..	..	..	..	..	8	11	2	7	..	..	..	..	9	35	39	67	16	0.730	....
CH Saanen	..	..	..	..	..	..	..	..	8	10	40	7	..	..	..	..	9	34	54	67	16	0.730	....
CH Samedan	..	..	..	..	..	..	..	..	8	13	44	8	..	..	..	..	9	39	39	67	17	0.743	....
CH Sion	..	..	..	..	..	..	..	..	8	10	21	7	..	..	..	..	9	34	39	67	16	0.727	....
CH Turtmann	..	..	..	..	..	..	..	..	8	10	54	7	..	..	..	..	9	35	27	67	16	0.730	....
CH Ulrichen	..	..	..	..	..	..	..	..	8	11	51	7	..	..	..	..	9	36	46	67	16	0.735	....
CH Zurich	..	..	..	..	..	..	..	..	8	13	38	7	..	..	..	..	9	38	32	67	16	0.746	....
CY Akrotiri	7	7	57	280	21	..	..	..	8	39	10	30	..	..	..	..	10	15	26	51	33	0.619	....
CY Larnaca	7	9	19	280	21	..	..	..	8	40	53	30	..	..	..	..	10	17	3	51	32	0.621	....
CY Paphos	7	7	10	280	20	..	..	..	8	38	11	30	..	..	..	..	10	14	29	52	32	0.622	....
CZ Caslav	7	5	17	273	0	..	..	..	8	25	44	10	..	..	..	..	9	53	19	68	16	0.792	....
CZ Ceske Budejovice	7	3	1	274	0	..	..	..	8	23	3	10	..	..	..	..	9	50	39	68	16	0.781	....
CZ Chotebor	7	5	7	273	1	..	..	..	8	25	45	10	..	..	..	..	9	53	36	68	16	0.791	....
CZ Hradec Kralove	7	6	9	272	1	..	..	..	8	26	47	10	..	..	..	..	9	54	25	68	16	0.796	....
CZ Karlovy Vary	..	..	..	..	..	..	..	..	8	22	56	8	..	..	..	..	9	49	22	68	15	0.789	....
CZ Kunovice	7	5	35	273	2	..	..	..	8	27	17	11	..	..	..	..	9	56	6	67	17	0.789	....
CZ Line	..	..	..	..	..	..	..	..	8	22	37	9	..	..	..	..	9	49	25	68	15	0.785	....
CZ Mnichovo Hradiste	7	5	56	273	0	..	..	..	8	26	5	9	..	..	..	..	9	53	16	68	15	0.796	....
CZ Namest	7	4	41	273	1	..	..	..	8	25	39	10	..	..	..	..	9	53	53	68	17	0.788	....
CZ Ostrava	7	7	12	272	2	..	..	..	8	29	8	11	..	..	..	..	9	57	52	67	17	0.796	....
CZ Pardubice	7	5	41	273	1	..	..	..	8	26	18	10	..	..	..	..	9	54	1	68	16	0.794	....
CZ Prague	7	4	40	273																			



## EUROPA - EUROPE

Site	1st Contact			2nd Contact			Maximum			3rd Contact			4th Contact			Mag	Central Durn sec				
	U.T.	PA	Alt	U.T.	PA	Alt	U.T.	PA	Alt	U.T.	PA	Alt	U.T.	PA	Alt						
DE Allendorf	h	m	s	o	o	o	h	m	s	o	h	m	s	o	h	m	s	o	o		
DE Allendorf	..	..	..	..	..	..	8	19	17	5	..	..	..	..	9	43	23	69	13	0.782	....
DE Altenburg	..	..	..	..	..	..	8	23	36	7	..	..	..	..	9	49	31	69	14	0.794	....
DE Anklam	..	..	..	..	..	..	8	29	8	6	..	..	..	..	9	54	14	70	12	0.817	....
DE Arnsberg	..	..	..	..	..	..	8	19	8	5	..	..	..	..	9	42	44	69	12	0.783	....
DE Augsburg	..	..	..	..	..	..	8	17	53	8	..	..	..	..	9	43	55	68	16	0.766	....
DE Baden-Baden	..	..	..	..	..	..	8	15	16	6	..	..	..	..	9	39	42	68	14	0.759	....
DE Bamberg	..	..	..	..	..	..	8	20	7	7	..	..	..	..	9	45	41	68	14	0.780	....
DE Barth	..	..	..	..	..	..	8	28	46	5	..	..	..	..	9	53	16	70	11	0.818	....
DE Baumholder	..	..	..	..	..	..	8	15	38	5	..	..	..	..	9	39	23	68	13	0.764	....
DE Bautzen	7	6	35	272	-1	..	8	26	24	8	..	..	..	..	9	53	4	69	14	0.800	....
DE Bayreuth	..	..	..	..	..	..	8	21	4	8	..	..	..	..	9	46	59	68	15	0.783	....
DE Berlin	..	..	..	..	..	..	8	26	52	7	..	..	..	..	9	52	36	69	13	0.807	....
DE Biberach	..	..	..	..	..	..	8	16	1	8	..	..	..	..	9	41	30	68	16	0.758	....
DE Borkum	..	..	..	..	..	..	8	21	16	3	..	..	..	..	9	43	36	70	10	0.795	....
DE Braunschweig	..	..	..	..	..	..	8	23	19	6	..	..	..	..	9	47	52	69	12	0.798	....
DE Bremen	..	..	..	..	..	..	8	22	31	4	..	..	..	..	9	46	0	70	11	0.798	....
DE Bremerhaven	..	..	..	..	..	..	8	23	0	4	..	..	..	..	9	46	13	70	11	0.801	....
DE Brueckeberg	..	..	..	..	..	..	8	21	39	5	..	..	..	..	9	45	32	69	12	0.793	....
DE Brueggen	..	..	..	..	..	..	8	16	53	4	..	..	..	..	9	39	38	69	12	0.773	....
DE Buechel	..	..	..	..	..	..	8	16	12	5	..	..	..	..	9	39	42	69	13	0.768	....
DE Burg Feuerstein	..	..	..	..	..	..	8	20	10	7	..	..	..	..	9	45	54	68	15	0.779	....
DE Celle	..	..	..	..	..	..	8	23	9	5	..	..	..	..	9	47	20	69	12	0.799	....
DE Coburg	..	..	..	..	..	..	8	20	43	7	..	..	..	..	9	46	13	69	14	0.783	....
DE Cochstedt	..	..	..	..	..	..	8	23	36	6	..	..	..	..	9	48	42	69	13	0.797	....
DE Coleman	..	..	..	..	..	..	8	16	46	6	..	..	..	..	9	41	10	68	14	0.767	....
DE Cologne	..	..	..	..	..	..	8	17	23	5	..	..	..	..	9	40	45	69	12	0.774	....
DE Cottbus	..	..	..	..	..	..	8	27	24	8	..	..	..	..	9	53	46	69	14	0.806	....
DE Dahlemer Binz	..	..	..	..	..	..	8	16	1	4	..	..	..	..	9	39	10	69	12	0.768	....
DE Dessau	..	..	..	..	..	..	8	24	28	7	..	..	..	..	9	49	54	69	13	0.799	....
DE Diepholz	..	..	..	..	..	..	8	21	20	4	..	..	..	..	9	44	46	70	11	0.793	....
DE Donaueschingen	..	..	..	..	..	..	8	14	22	7	..	..	..	..	9	39	11	68	15	0.752	....
DE Dortmund	..	..	..	..	..	..	8	18	54	4	..	..	..	..	9	42	19	69	12	0.782	....
DE Dresden	..	..	..	..	..	..	8	25	22	8	..	..	..	..	9	51	46	69	14	0.798	....
DE Duesseldorf	..	..	..	..	..	..	8	17	40	4	..	..	..	..	9	40	43	69	12	0.777	....
DE Egelsbach	..	..	..	..	..	..	8	17	35	6	..	..	..	..	9	41	59	68	14	0.772	....
DE Eggebeck	..	..	..	..	..	..	8	25	32	4	..	..	..	..	9	48	37	70	10	0.811	....
DE Eggenfelden	7	0	57	275	-1	..	8	20	3	9	..	..	..	..	9	47	2	68	16	0.771	....
DE Eisenach	..	..	..	..	..	..	8	21	13	6	..	..	..	..	9	46	13	69	13	0.788	....
DE Eisenhuettenstadt	..	..	..	..	..	..	8	27	54	8	..	..	..	..	9	54	8	69	14	0.808	....
DE Emden	..	..	..	..	..	..	8	21	27	3	..	..	..	..	9	44	6	70	10	0.796	....
DE Erding	..	..	..	..	..	..	8	18	58	9	..	..	..	..	9	45	35	68	16	0.768	....
DE Erfurt	..	..	..	..	..	..	8	21	45	7	..	..	..	..	9	46	59	69	14	0.789	....
DE Essen	..	..	..	..	..	..	8	18	1	4	..	..	..	..	9	41	8	69	12	0.778	....
DE Fassberg	..	..	..	..	..	..	8	23	49	5	..	..	..	..	9	47	58	70	12	0.802	....
DE Flensburg	..	..	..	..	..	..	8	25	48	3	..	..	..	..	9	48	50	70	10	0.812	....
DE Frankfurt	..	..	..	..	..	..	8	17	34	6	..	..	..	..	9	41	54	68	13	0.772	....
DE Freiburg	..	..	..	..	..	..	8	13	41	6	..	..	..	..	9	38	4	68	15	0.749	....
DE Friedrichshafen	..	..	..	..	..	..	8	15	3	8	..	..	..	..	9	40	29	67	16	0.753	....
DE Fritzlar	..	..	..	..	..	..	8	20	4	6	..	..	..	..	9	44	27	69	13	0.785	....
DE Fuerstenfeldbruck	..	..	..	..	..	..	8	17	57	8	..	..	..	..	9	44	14	68	16	0.765	....
DE Geilenkirchen	..	..	..	..	..	..	8	16	25	4	..	..	..	..	9	39	10	69	12	0.771	....
DE Giebelstadt	..	..	..	..	..	..	8	18	35	7	..	..	..	..	9	43	46	68	14	0.774	....
DE Grafenwoehr	..	..	..	..	..	..	8	21	0	8	..	..	..	..	9	47	10	68	15	0.781	....
DE Guetersloh	..	..	..	..	..	..	8	20	16	5	..	..	..	..	9	43	54	69	12	0.788	....
DE Hahn	..	..	..	..	..	..	8	16	4	5	..	..	..	..	9	39	44	68	13	0.767	....
DE Halle	..	..	..	..	..	..	8	23	54	7	..	..	..	..	9	49	24	69	13	0.797	....
DE Hamburg	..	..	..	..	..	..	8	24	23	4	..	..	..	..	9	48	8	70	11	0.805	....
DE Hamburg	..	..	..	..	..	..	8	24	42	4	..	..	..	..	9	48	28	70	11	0.806	....
DE Hanau	..	..	..	..	..	..	8	18	15	6	..	..	..	..	9	42	46	69	14	0.775	....
DE Hannover	..	..	..	..	..	..	8	22	35	5	..	..	..	..	9	46	40	69	12	0.797	....
DE Hassfurt	..	..	..	..	..	..	8	19	48	7	..	..	..	..	9	45	9	68	14	0.779	....
DE Heidelberg	..	..	..	..	..	..	8	16	43	6	..	..	..	..	9	41	16	68	14	0.766	....
DE Heringsdorf	..	..	..	..	..	..	8	29	46	6	..	..	..	..	9	55	1	70	12	0.819	....
DE Hildesheim	..	..	..	..	..	..	8	22	26	5	..	..	..	..	9	46	45	69	12	0.795	....
DE																					

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	U.T.			PA Alt	U.T.			PA	U.T.			Alt	U.T.			PA	U.T.			PA Alt		
	h	m	s		h	m	s		h	m	s		h	m	s		h	m	s			
DE Noervenich	..	..	..	..	..	..	..	8	16	50	4	..	..	..	9	39	57	69	12	0.772	....	
DE Norderney	..	..	..	..	..	..	..	8	21	57	3	..	..	..	9	44	30	70	10	0.798	....	
DE Nordholz	..	..	..	..	..	..	..	8	23	30	4	..	..	..	9	46	39	70	10	0.803	....	
DE Nuernberg	..	..	..	..	..	..	..	8	19	40	7	..	..	..	9	45	28	68	15	0.776	....	
DE Oberpfaffenhofen	..	..	..	..	..	..	..	8	17	47	8	..	..	..	9	44	7	67	16	0.764	....	
DE Paderborn	..	..	..	..	..	..	..	8	20	7	5	..	..	..	9	44	0	69	12	0.787	....	
DE Parchim	..	..	..	..	..	..	..	8	26	22	5	..	..	..	9	50	57	70	12	0.810	....	
DE Preschen	7	7	25	272	-1	..	..	8	27	12	8	..	..	..	9	53	43	69	14	0.804	....	
DE Ramstein	..	..	..	..	..	..	..	8	15	38	6	..	..	..	9	39	35	68	14	0.763	....	
DE Rechlin-Laerz	..	..	..	..	..	..	..	8	27	18	6	..	..	..	9	52	19	70	12	0.812	....	
DE Rendsburg	..	..	..	..	..	..	..	8	25	11	4	..	..	..	9	48	33	70	10	0.809	....	
DE Rheine-Brentlange	..	..	..	..	..	..	..	8	19	53	4	..	..	..	9	42	58	69	11	0.788	....	
DE Riesa	..	..	..	..	..	..	..	8	25	6	8	..	..	..	9	51	15	69	14	0.798	....	
DE Rosenthal	..	..	..	..	..	..	..	8	21	4	8	..	..	..	9	47	5	68	15	0.782	....	
DE Roth	..	..	..	..	..	..	..	8	19	16	8	..	..	..	9	45	10	68	15	0.774	....	
DE Rothenburg/ol	7	7	11	272	0	..	..	8	27	11	8	..	..	..	9	53	57	69	14	0.803	....	
DE Saarbruecken	..	..	..	..	..	..	..	8	14	45	5	..	..	..	9	38	29	68	14	0.759	....	
DE Schleswig	..	..	..	..	..	..	..	8	25	28	4	..	..	..	9	48	41	70	10	0.811	....	
DE Schoenhagen	..	..	..	..	..	..	..	8	26	10	7	..	..	..	9	51	51	69	13	0.805	....	
DE Schwaebisch Hall	..	..	..	..	..	..	..	8	17	34	7	..	..	..	9	42	48	68	15	0.768	....	
DE Siegerland	..	..	..	..	..	..	..	8	18	7	5	..	..	..	9	42	2	69	13	0.777	....	
DE Soest	..	..	..	..	..	..	..	8	26	1	8	..	..	..	9	52	11	69	14	0.802	....	
DE Spangdahlem	..	..	..	..	..	..	..	8	15	30	5	..	..	..	9	38	51	68	13	0.764	....	
DE Speyer	..	..	..	..	..	..	..	8	16	21	6	..	..	..	9	40	49	68	14	0.765	....	
DE Stadtlohn	..	..	..	..	..	..	..	8	18	51	4	..	..	..	9	41	45	69	11	0.783	....	
DE Stendal	..	..	..	..	..	..	..	8	25	14	6	..	..	..	9	50	10	69	12	0.804	....	
DE Straubing	..	..	..	..	..	..	..	8	20	32	9	..	..	..	9	47	15	68	16	0.775	....	
DE Strausberg	..	..	..	..	..	..	..	8	27	38	7	..	..	..	9	53	26	69	13	0.809	....	
DE Stuttgart	..	..	..	..	..	..	..	8	16	16	7	..	..	..	9	41	19	68	15	0.762	....	
DE Suhl	..	..	..	..	..	..	..	8	25	21	8	..	..	..	9	51	35	69	14	0.799	....	
DE Trier	..	..	..	..	..	..	..	8	15	26	5	..	..	..	9	38	51	68	13	0.764	....	
DE Vilseck	..	..	..	..	..	..	..	8	20	42	8	..	..	..	9	46	47	68	15	0.780	....	
DE Vilshofen	7	1	39	274	0	..	..	8	21	1	9	..	..	..	9	48	8	68	16	0.775	....	
DE Westerland	..	..	..	..	..	..	..	8	24	58	3	..	..	..	9	47	31	70	9	0.810	....	
DE Wiesbaden	..	..	..	..	..	..	..	8	17	22	6	..	..	..	9	41	34	68	13	0.771	....	
DE Wilhelmshaven	..	..	..	..	..	..	..	8	22	28	4	..	..	..	9	45	27	70	10	0.799	....	
DE Wittmundhafen	..	..	..	..	..	..	..	8	22	9	3	..	..	..	9	44	56	70	10	0.798	....	
DE Worms	..	..	..	..	..	..	..	8	16	44	6	..	..	..	9	41	4	68	14	0.767	....	
DE Wunstorf	..	..	..	..	..	..	..	8	22	17	5	..	..	..	9	46	16	69	12	0.796	....	
DE Zweibruecken	..	..	..	..	..	..	..	8	15	3	6	..	..	..	9	38	57	68	14	0.760	....	
DK Aalborg	..	..	..	..	..	..	..	8	29	49	2	..	..	..	9	51	58	71	8	0.827	....	
DK Aarhus	..	..	..	..	..	..	..	8	29	25	3	..	..	..	9	52	13	71	9	0.825	....	
DK Billund	..	..	..	..	..	..	..	8	27	3	3	..	..	..	9	49	35	71	9	0.818	....	
DK Copenhagen	..	..	..	..	..	..	..	8	29	57	4	..	..	..	9	53	37	70	10	0.824	....	
DK Esbjerg	..	..	..	..	..	..	..	8	26	8	3	..	..	..	9	48	31	70	9	0.815	....	
DK Gronholt	..	..	..	..	..	..	..	8	30	44	4	..	..	..	9	54	19	70	10	0.827	....	
DK Karup	..	..	..	..	..	..	..	8	27	53	2	..	..	..	9	50	9	71	8	0.821	....	
DK Kolding	..	..	..	..	..	..	..	8	26	46	3	..	..	..	9	49	30	70	9	0.816	....	
DK Krusa-Padborg	..	..	..	..	..	..	..	8	25	51	3	..	..	..	9	48	48	70	10	0.813	....	
DK Laeso	..	..	..	..	..	..	..	8	31	16	3	..	..	..	9	53	42	71	8	0.831	....	
DK Lindtorp	..	..	..	..	..	..	..	8	27	22	2	..	..	..	9	49	21	71	8	0.820	....	
DK Maribo	..	..	..	..	..	..	..	8	27	53	4	..	..	..	9	51	45	70	10	0.817	....	
DK Odense	..	..	..	..	..	..	..	8	27	52	3	..	..	..	9	50	57	70	9	0.819	....	
DK Ronne	..	..	..	..	..	..	..	8	32	10	6	..	..	..	9	56	58	70	11	0.827	....	
DK Sindal	..	..	..	..	..	..	..	8	30	49	2	..	..	..	9	52	54	71	8	0.830	....	
DK Skive	..	..	..	..	..	..	..	8	28	19	2	..	..	..	9	50	30	71	8	0.822	....	
DK Skrydstrup	..	..	..	..	..	..	..	8	26	23	3	..	..	..	9	49	11	70	9	0.815	....	
DK Soenderborg	..	..	..	..	..	..	..	8	26	31	4	..	..	..	9	49	38	70	10	0.815	....	
DK Stauning	..	..	..	..	..	..	..	8	26	39	2	..	..	..	9	48	46	71	8	0.817	....	
DK Thisted	..	..	..	..	..	..	..	8	28	40	2	..	..	..	9	50	26	71	8	0.824	....	
DK Vaerloose	..	..	..	..	..	..	..	8	30	27	4	..	..	..	9	54	6	70	10	0.826	....	
DK Vandel	..	..	..	..	..	..	..	8	27	2	3	..	..	..	9	49	36	71	9	0.818	....	
DK Vesthimmerland	..	..	..	..	..	..	..	8	29	4	2	..	..	..	9	51	12	71	8	0.825	....	
EE Armari Air Force Base	7	27	44	267	0	..	..	8	48	32	6	..	..	..	10	12	29	69	8	0.850	....	
EE Kardla	7	26	5	267	0	..	..	8	46	37	5	..	..	..	10	10	38					

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	U.T.			PA Alt	U.T.			PA	U.T.		Alt	U.T.		PA	U.T.		PA Alt				
	h	m	s		h	m	s		h	m		s	h		m	s		h	m		
ES Zaragoza	..	..	..	..	..	..	..	7 55	26	3	..	..	..	9 12	35	62 14	0.616	....			
FI Eura	..	..	..	..	..	..	..	8 48	10	4	..	..	..	10 10	36	70 6	0.855	....			
FI Halli	..	..	..	..	..	..	..	8 51	43	3	..	..	..	10 13	51	70 6	0.855	....			
FI Hameenkyro	..	..	..	..	..	..	..	8 49	42	3	..	..	..	10 11	49	70 6	0.856	....			
FI Hanko	7 27	38		267 -1	..	..	..	8 47	49	5	..	..	..	10 11	15	70 7	0.852	....			
FI Helsinki	7 30	0		266 0	..	..	..	8 50	29	5	..	..	..	10 13	48	69 7	0.852	....			
FI Hyvinkaa	7 30	27		266 0	..	..	..	8 50	41	5	..	..	..	10 13	42	70 7	0.853	....			
FI Immola	7 35	3		266 1	..	..	..	8 55	49	5	..	..	..	10 18	33	69 6	0.850	....			
FI Joensuu	7 37	38		265 0	..	..	..	8 57	40	4	..	..	..	10 19	22	69 5	0.851	....			
FI Jyvaskyla	..	..	..	..	..	..	..	8 53	11	3	..	..	..	10 14	58	70 5	0.855	....			
FI Kajaani	..	..	..	..	..	..	..	8 56	51	2	..	..	..	10 17	19	69 3	0.854	....			
FI Kauhajoki	..	..	..	..	..	..	..	8 49	46	2	..	..	..	10 11	16	70 5	0.857	....			
FI Kauhava	..	..	..	..	..	..	..	8 51	7	2	..	..	..	10 12	11	70 4	0.857	....			
FI Kemi	..	..	..	..	..	..	..	8 55	6	0	..	..	..	10 14	20	70 2	0.857	....			
FI Kemijarvi	..	..	..	..	..	..	..	8 58	11	-1	..	..	..	10 16	51	70 1	0.854	....			
FI Kikala	..	..	..	..	..	..	..	8 49	6	4	..	..	..	10 12	9	70 7	0.853	....			
FI Kitee	7 37	24		265 0	..	..	..	8 57	49	4	..	..	..	10 19	53	69 5	0.850	....			
FI Kittila	..	..	..	..	..	..	..	..	..	..	..	..	..	10 14	49	70 0	....	....			
FI Kruunupyy	..	..	..	..	..	..	..	8 51	47	1	..	..	..	10 12	26	70 4	0.857	....			
FI Kuopio	..	..	..	..	..	..	..	8 55	57	3	..	..	..	10 17	22	69 4	0.854	....			
FI Kuusamo	..	..	..	..	..	..	..	8 59	35	0	..	..	..	10 18	48	69 1	0.852	....			
FI Lappeenranta	7 34	2		266 0	..	..	..	8 54	47	5	..	..	..	10 17	40	69 6	0.851	....			
FI Mariehamn	..	..	..	..	..	..	..	8 44	32	4	..	..	..	10 7	21	70 7	0.852	....			
FI Menkijarvi	..	..	..	..	..	..	..	8 51	25	2	..	..	..	10 12	40	70 4	0.857	....			
FI Mikkeli	7 34	4		266 0	..	..	..	8 54	14	4	..	..	..	10 16	37	69 6	0.853	....			
FI Nummela	7 29	27		266 0	..	..	..	8 49	42	5	..	..	..	10 12	54	70 7	0.853	....			
FI Oulu	..	..	..	..	..	..	..	8 55	4	1	..	..	..	10 14	58	70 2	0.856	....			
FI Pattijoki	..	..	..	..	..	..	..	8 54	13	1	..	..	..	10 14	16	70 3	0.857	....			
FI Piikajarvi	..	..	..	..	..	..	..	8 48	17	3	..	..	..	10 10	38	70 6	0.855	....			
FI Pori	..	..	..	..	..	..	..	8 48	6	3	..	..	..	10 10	14	70 6	0.855	....			
FI Pudasjarvi	..	..	..	..	..	..	..	8 56	59	1	..	..	..	10 16	36	70 2	0.855	....			
FI Pyhasalmi	..	..	..	..	..	..	..	8 54	36	2	..	..	..	10 15	25	70 4	0.856	....			
FI Rantasalmi	7 35	39		266 0	..	..	..	8 55	50	4	..	..	..	10 17	57	69 5	0.852	....			
FI Rayskala	..	..	..	..	..	..	..	8 49	54	4	..	..	..	10 12	47	70 7	0.854	....			
FI Rovaniemi	..	..	..	..	..	..	..	8 56	53	-1	..	..	..	10 15	36	70 1	0.855	....			
FI Savonlinna	7 36	2		266 0	..	..	..	8 56	24	4	..	..	..	10 18	37	69 5	0.851	....			
FI Selanpaa	7 32	48		266 0	..	..	..	8 53	15	5	..	..	..	10 16	4	69 6	0.852	....			
FI Sodankyla	..	..	..	..	..	..	..	..	..	..	..	..	..	10 16	22	70 0	....	....			
FI Tampere	..	..	..	..	..	..	..	8 50	0	4	..	..	..	10 12	21	70 6	0.855	....			
FI Teisko	..	..	..	..	..	..	..	8 50	49	3	..	..	..	10 12	57	70 6	0.855	....			
FI Turku	..	..	..	..	..	..	..	8 47	35	4	..	..	..	10 10	27	70 7	0.854	....			
FI Utti	7 32	41		266 0	..	..	..	8 53	16	5	..	..	..	10 16	13	69 7	0.852	....			
FI Vaasa	..	..	..	..	..	..	..	8 49	44	2	..	..	..	10 10	44	70 4	0.857	....			
FI Varkaus	7 35	21		266 0	..	..	..	8 55	22	4	..	..	..	10 17	25	69 5	0.853	....			
FI Vesivehmaa	7 31	54		266 0	..	..	..	8 52	4	4	..	..	..	10 14	46	69 6	0.853	....			
FI Ylivieska-Raudaskyla	..	..	..	..	..	..	..	8 53	40	1	..	..	..	10 14	11	70 3	0.857	....			
FR Abbeville	..	..	..	..	..	..	..	8 11	8	2	..	..	..	9 31	38	68 10	0.744	....			
FR Agen	..	..	..	..	..	..	..	8 0	35	3	..	..	..	9 19	52	64 14	0.664	....			
FR Aire-Sur-L'Adour	..	..	..	..	..	..	..	7 59	10	3	..	..	..	9 17	40	64 13	0.652	....			
FR Aix-Les-Milles	..	..	..	..	..	..	..	8 4	8	7	..	..	..	9 26	59	65 17	0.683	....			
FR Albert	..	..	..	..	..	..	..	8 11	38	2	..	..	..	9 32	40	68 11	0.746	....			
FR Albi	..	..	..	..	..	..	..	8 1	32	5	..	..	..	9 21	57	65 15	0.669	....			
FR Ales	..	..	..	..	..	..	..	8 3	43	6	..	..	..	9 25	43	65 16	0.683	....			
FR Amberieu	..	..	..	..	..	..	..	8 7	52	6	..	..	..	9 30	49	66 15	0.714	....			
FR Amiens	..	..	..	..	..	..	..	8 11	11	2	..	..	..	9 32	3	68 11	0.744	....			
FR Ancenis	..	..	..	..	..	..	..	8 4	12	1	..	..	..	9 22	43	66 11	0.696	....			
FR Angers	..	..	..	..	..	..	..	8 4	49	1	..	..	..	9 23	47	66 11	0.701	....			
FR Angoulême	..	..	..	..	..	..	..	8 2	40	3	..	..	..	9 21	58	65 12	0.683	....			
FR Annecy	..	..	..	..	..	..	..	8 8	34	6	..	..	..	9 32	4	66 16	0.718	....			
FR Annemasse	..	..	..	..	..	..	..	8 9	9	6	..	..	..	9 32	46	66 15	0.722	....			
FR Apt	..	..	..	..	..	..	..	8 5	4	7	..	..	..	9 28	6	65 17	0.691	....			
FR Arcachon	..	..	..	..	..	..	..	7 59	49	2	..	..	..	9 17	53	64 12	0.659	....			
FR Aubenas-Vals-Lanas	..	..	..	..	..	..	..	8 4	40	6	..	..	..	9 26	54	65 16	0.691	....			
FR Auch	..	..	..	..	..	..	..	7 59	51	4	..	..	..	9 19	1	64 14	0.657	....			
FR Aurillac	..	..	..	..	..	..	..	8 3	18	4	..	..	..	9 24	8	65 14	0.685	....			
FR Autun	..	..	..	..	..	..	..	8 8	18	5	..	..	..	9 30	32	67 14	0.721	....			
FR Auxerre	..	..	..	..	..	..	..	8 8	58	4	..	..	..	9 30	39	67 13	0.727	....			
FR Avignon	..	..	..	..	..	..	..	8 4	15	6	..	..	..	9 26	48	65 16	0.685	....			
FR Avord	..	..	..	..	..	..	..	8 6	54	4	..	..	..	9 28	1	67 13	0.713	....			
FR Bagnole-De-L'Orne	..	..	..	..	..	..	..	8 6	39	1	..	..	..	9 25	49	67 1					

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Site	1st Contact			2nd Contact			Maximum			3rd Contact			4th Contact			Mag	Central Durn sec			
	U.T.			U.T.			U.T.			U.T.			U.T.							
	h	m	s	PA	Alt	o	h	m	s	PA	Alt	o	h	m	s			PA	Alt	o
FR Colmar	..	..	..	..	..	..	8	13	18	6	..	..	..	9	37	23	68	15	0.748	....
FR Corte	..	..	..	..	..	..	8	6	40	10	..	..	..	9	32	19	64	20	0.686	....
FR Coulommiers	..	..	..	..	..	..	8	10	5	3	..	..	..	9	31	25	68	12	0.736	....
FR Creil	..	..	..	..	..	..	8	10	18	3	..	..	..	9	31	18	68	11	0.738	....
FR Cuers	..	..	..	..	..	..	8	4	33	8	..	..	..	9	27	58	65	17	0.683	....
FR Damblain	..	..	..	..	..	..	8	11	28	5	..	..	..	9	34	32	67	14	0.740	....
FR Deauville	..	..	..	..	..	..	8	8	26	1	..	..	..	9	27	57	68	10	0.727	....
FR Dijon	..	..	..	..	..	..	8	9	37	5	..	..	..	9	32	22	67	14	0.728	....
FR Dinard	..	..	..	..	..	..	8	5	24	0	..	..	..	9	23	26	67	9	0.705	....
FR Dole	..	..	..	..	..	..	8	9	36	5	..	..	..	9	32	35	67	14	0.727	....
FR Epinal	..	..	..	..	..	..	8	12	16	5	..	..	..	9	35	32	68	14	0.745	....
FR Etain	..	..	..	..	..	..	8	13	17	5	..	..	..	9	36	11	68	13	0.752	....
FR Evreux	..	..	..	..	..	..	8	8	47	2	..	..	..	9	28	59	68	11	0.729	....
FR Granville	..	..	..	..	..	..	8	6	17	0	..	..	..	9	24	41	67	9	0.712	....
FR Grenoble	..	..	..	..	..	..	8	6	54	6	..	..	..	9	29	52	66	16	0.707	....
FR Guiscriff-Scaer	..	..	..	..	..	..	..	..	..	..	..	..	..	9	20	17	66	9	.....	....
FR Haguenau	..	..	..	..	..	..	8	14	52	6	..	..	..	9	39	5	68	14	0.757	....
FR Hyeres	..	..	..	..	..	..	8	4	21	8	..	..	..	9	27	45	64	18	0.681	....
FR Ile D'Yeu	..	..	..	..	..	..	8	2	10	0	..	..	..	9	19	44	66	10	0.680	....
FR Istres	..	..	..	..	..	..	8	3	42	7	..	..	..	9	26	13	65	17	0.680	....
FR Joigny	..	..	..	..	..	..	8	9	5	4	..	..	..	9	30	42	67	13	0.728	....
FR La Baule	..	..	..	..	..	..	8	3	6	0	..	..	..	9	20	48	66	10	0.688	....
FR La Roche-Sur-Yon	..	..	..	..	..	..	8	2	54	1	..	..	..	9	21	12	66	11	0.686	....
FR La Rochelle	..	..	..	..	..	..	8	0	4	4	..	..	..	9	19	42	64	14	0.658	....
FR Landivisiau	..	..	..	..	..	..	..	..	..	..	..	..	..	9	20	28	66	8	.....	....
FR Lannion	..	..	..	..	..	..	..	..	..	..	..	..	..	9	21	47	67	8	.....	....
FR Lanvedoc	..	..	..	..	..	..	..	..	..	..	..	..	..	9	19	37	66	8	.....	....
FR Laval	..	..	..	..	..	..	8	5	33	1	..	..	..	9	24	26	67	10	0.706	....
FR Le Castellet	..	..	..	..	..	..	8	4	11	7	..	..	..	9	27	20	65	17	0.682	....
FR Le Havre	..	..	..	..	..	..	8	8	39	1	..	..	..	9	28	8	68	10	0.728	....
FR Le Luc	..	..	..	..	..	..	8	5	2	8	..	..	..	9	28	39	65	18	0.686	....
FR Le Mans	..	..	..	..	..	..	8	6	11	2	..	..	..	9	25	42	67	11	0.710	....
FR Le Puy	..	..	..	..	..	..	8	4	52	5	..	..	..	9	26	43	66	15	0.695	....
FR Le Tourquet	..	..	..	..	..	..	8	11	34	1	..	..	..	9	31	55	68	10	0.747	....
FR Lezignan-Corbieres	..	..	..	..	..	..	8	1	0	5	..	..	..	9	21	45	64	16	0.663	....
FR Libourne	..	..	..	..	..	..	8	1	13	3	..	..	..	9	20	7	65	13	0.670	....
FR Lille	..	..	..	..	..	..	8	12	56	2	..	..	..	9	34	8	69	11	0.754	....
FR Limoges	..	..	..	..	..	..	8	3	42	3	..	..	..	9	23	44	66	13	0.690	....
FR Lorient	..	..	..	..	..	..	8	3	3	-1	..	..	..	9	20	5	66	9	0.687	....
FR Luneville	..	..	..	..	..	..	8	13	12	5	..	..	..	9	36	42	68	14	0.750	....
FR Lure	..	..	..	..	..	..	8	11	48	6	..	..	..	9	35	27	67	14	0.740	....
FR Luxeuil	..	..	..	..	..	..	8	11	44	6	..	..	..	9	35	15	67	14	0.740	....
FR Lyon	..	..	..	..	..	..	8	7	4	6	..	..	..	9	29	46	66	15	0.709	....
FR Lyon	..	..	..	..	..	..	8	7	13	6	..	..	..	9	30	1	66	15	0.710	....
FR MacOn	..	..	..	..	..	..	8	7	48	5	..	..	..	9	30	23	66	15	0.715	....
FR Marmande	..	..	..	..	..	..	8	0	45	3	..	..	..	9	19	48	65	13	0.666	....
FR Marseille	..	..	..	..	..	..	8	3	52	7	..	..	..	9	26	36	65	17	0.681	....
FR Maubeuge	..	..	..	..	..	..	8	13	24	3	..	..	..	9	35	11	68	11	0.756	....
FR Melun	..	..	..	..	..	..	8	9	24	3	..	..	..	9	30	31	68	12	0.731	....
FR Mende	..	..	..	..	..	..	8	3	45	5	..	..	..	9	25	22	65	15	0.686	....
FR Merville	..	..	..	..	..	..	8	12	38	2	..	..	..	9	33	33	69	10	0.752	....
FR Metz	..	..	..	..	..	..	8	13	29	5	..	..	..	9	36	46	68	13	0.752	....
FR Metz	..	..	..	..	..	..	8	13	30	5	..	..	..	9	36	42	68	13	0.753	....
FR Millau	..	..	..	..	..	..	8	2	38	5	..	..	..	9	23	55	65	15	0.677	....
FR Mimizan	..	..	..	..	..	..	7	59	5	2	..	..	..	9	16	58	64	12	0.652	....
FR Mont-De-Marsan	..	..	..	..	..	..	7	59	15	3	..	..	..	9	17	37	64	13	0.653	....
FR Montauban	..	..	..	..	..	..	8	1	2	4	..	..	..	9	20	54	65	14	0.666	....
FR Montbeliard	..	..	..	..	..	..	8	11	43	6	..	..	..	9	35	33	67	15	0.739	....
FR Montlucon	..	..	..	..	..	..	8	5	44	4	..	..	..	9	26	47	66	13	0.704	....
FR Montlucon-Gueret	..	..	..	..	..	..	8	5	20	4	..	..	..	9	26	14	66	13	0.702	....
FR Montpellier	..	..	..	..	..	..	8	2	48	6	..	..	..	9	24	35	65	16	0.676	....
FR Morlaix	..	..	..	..	..	..	..	..	..	..	..	..	..	9	21	3	67	8	.....	....
FR Moulins	..	..	..	..	..	..	8	6	49	4	..	..	..	9	28	28	66	14	0.711	....
FR Mulhouse	..	..	..	..	..	..	8	12	41	6	..	..	..	9	36	57	67	15	0.743	....
FR Nancy	..	..	..	..	..	..	8	12	33	5	..	..	..	9	35	43	68	14	0.747	....
FR Nangis	..	..	..	..	..	..	8	9	41	3	..	..	..	9	31	2	68	12	0.733	....
FR Nantes	..	..	..	..	..	..	8	3	27	1	..	..	..	9	21	39	66	10	0.690	....
FR Nevers	..	..	..	..	..	..	8	7	16	4	..	..	..	9	28	43	67	13	0	

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	U.T.	h	m	s	PA	Alt	U.T.	h	m	s	PA	Alt	U.T.	h	m	s	PA	Alt	U.T.	h			m	s	PA
FR Strassbourg	..	..	..	..	..	..	..	8	14	16	6	..	..	..	..	..	..	..	9	38	25	68	14	0.754	....
FR Tarbes	..	..	..	..	..	..	..	7	58	33	3	..	..	..	..	..	..	..	9	17	6	64	14	0.646	....
FR Toul	..	..	..	..	..	..	..	8	12	53	5	..	..	..	..	..	..	..	9	36	2	68	13	0.749	....
FR Toulouse	..	..	..	..	..	..	..	8	0	26	4	..	..	..	..	..	..	..	9	20	17	64	14	0.661	....
FR Tours	..	..	..	..	..	..	..	8	5	48	2	..	..	..	..	..	..	..	9	25	38	67	12	0.707	....
FR Toussous-Le-Noble	..	..	..	..	..	..	..	8	9	7	3	..	..	..	..	..	..	..	9	29	53	68	12	0.730	....
FR Troyes	..	..	..	..	..	..	..	8	10	13	4	..	..	..	..	..	..	..	9	32	13	67	13	0.735	....
FR Ussel	..	..	..	..	..	..	..	8	4	18	4	..	..	..	..	..	..	..	9	25	12	66	14	0.693	....
FR Valence	..	..	..	..	..	..	..	8	5	52	6	..	..	..	..	..	..	..	9	28	33	66	16	0.699	....
FR Valenciennes	..	..	..	..	..	..	..	8	12	54	3	..	..	..	..	..	..	..	9	34	20	68	11	0.753	....
FR Vannes	..	..	..	..	..	..	..	8	3	31	0	..	..	..	..	..	..	..	9	21	2	66	10	0.691	....
FR Verdun	..	..	..	..	..	..	..	8	12	54	4	..	..	..	..	..	..	..	9	35	42	68	13	0.751	....
FR Vesoul-Frotey	..	..	..	..	..	..	..	8	11	20	6	..	..	..	..	..	..	..	9	34	46	67	14	0.738	....
FR Vichy	..	..	..	..	..	..	..	8	6	14	4	..	..	..	..	..	..	..	9	27	52	66	14	0.707	....
FR Villefrance	..	..	..	..	..	..	..	8	7	3	5	..	..	..	..	..	..	..	9	29	32	66	15	0.710	....
FR Villacoublay	..	..	..	..	..	..	..	8	9	15	3	..	..	..	..	..	..	..	9	30	4	68	12	0.731	....
FR Villeneuve-Sur-Lot	..	..	..	..	..	..	..	8	1	4	3	..	..	..	..	..	..	..	9	20	32	65	14	0.668	....
GB Aberdeen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	37	10	70	4	.....	....
GB Barkston Heath	..	..	..	..	..	..	..	7	58	..	..	..	..	..	..	..	..	..	9	32	40	69	7	.....	....
GB Barrow Island	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	31	7	69	5	.....	....
GB Benbecula	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	3	70	1	.....	....
GB Benson	..	..	..	..	..	..	..	8	11	9	-1	..	..	..	..	..	..	..	9	29	50	69	8	0.744	....
GB Biggin Hill	..	..	..	..	..	..	..	8	11	34	0	..	..	..	..	..	..	..	9	30	55	69	9	0.747	....
GB Birmingham	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	19	69	7	.....	....
GB Blackbushe	..	..	..	..	..	..	..	8	10	51	0	..	..	..	..	..	..	..	9	29	42	68	8	0.743	....
GB Blackpool	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	49	69	6	.....	....
GB Boscombe Down	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	28	12	68	8	.....	....
GB Bournemouth	..	..	..	..	..	..	..	8	9	11	-1	..	..	..	..	..	..	..	9	27	28	68	8	0.732	....
GB Bracknell	..	..	..	..	..	..	..	8	11	0	0	..	..	..	..	..	..	..	9	29	53	68	8	0.744	....
GB Bristol	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	27	17	68	7	.....	....
GB Brize Norton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	23	69	8	.....	....
GB Brough	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	50	70	7	.....	....
GB Cambridge	..	..	..	..	..	..	..	8	13	8	0	..	..	..	..	..	..	..	9	32	29	69	8	0.756	....
GB Carlisle	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	57	70	5	.....	....
GB Chalsgrove	..	..	..	..	..	..	..	8	11	15	-1	..	..	..	..	..	..	..	9	29	57	69	8	0.745	....
GB Chivenor	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	24	56	68	7	.....	....
GB Church Fenton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	12	69	6	.....	....
GB Coltishall	..	..	..	..	..	..	..	8	15	1	0	..	..	..	..	..	..	..	9	34	55	69	8	0.767	....
GB Coningsby	..	..	..	..	..	..	..	8	14	21	-1	..	..	..	..	..	..	..	9	33	23	69	7	0.763	....
GB Cosford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	53	69	7	.....	....
GB Cottesmore	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	12	69	7	.....	....
GB Coventry	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	32	69	7	.....	....
GB Cranfield	..	..	..	..	..	..	..	8	12	17	-1	..	..	..	..	..	..	..	9	31	12	69	8	0.751	....
GB Cranwell	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	53	69	7	.....	....
GB Culdrose	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	21	46	67	7	.....	....
GB Dishforth	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	23	70	6	.....	....
GB Dundee	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	35	4	70	4	.....	....
GB Dunsfold	..	..	..	..	..	..	..	8	10	46	0	..	..	..	..	..	..	..	9	29	48	68	9	0.742	....
GB East Midlands	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	31	27	69	7	.....	....
GB Edinburgh	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	53	70	4	.....	....
GB Enniskillen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	26	29	69	3	.....	....
GB Exeter	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	25	17	68	7	.....	....
GB Fairford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	0	69	8	.....	....
GB Farnborough	..	..	..	..	..	..	..	8	10	50	0	..	..	..	..	..	..	..	9	29	43	68	8	0.743	....
GB Fowlmere	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	16	69	7	.....	....
GB Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	33	70	4	.....	....
GB Golouchestershire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	28	51	69	7	.....	....
GB Halfpenny Green	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	45	69	7	.....	....
GB Hatfield	..	..	..	..	..	..	..	8	12	28	0	..	..	..	..	..	..	..	9	31	54	69	9	0.752	....
GB Haverfordwest	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	25	11	68	6	.....	....
GB Hawarden	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	55	69	6	.....	....
GB Honington	..	..	..	..	..	..	..	8	13	51	0	..	..	..	..	..	..	..	9	33	30	69	8	0.760	....
GB Humberside	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	53	69	7	.....	....
GB Inverness	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	35	37	70	3	.....	....
GB Islay	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	12	69	3	.....	....
GB Isle Of Man	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	24	69	5	.....	....
GB Jersey	..	..	..	..	..	..	..	8	6	19	0	..	..	..	..	..	..	..	9	24	20	67	9	0.712	....
GB Lakenheath	..	..	..	..	..	..	..	8	13	47	0	..	..	..	..	..	..	..	9	33	19	69	8	0.760	....
GB Lasham	..	..	..	..	..	..	..	8	10	29	0	..	..	..	..	..	..	..	9	29	13	68	8	0.740	....
GB Leeds	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	32	40	69	6	.....	....
GB Leeming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	29	70	6	.....	....
GB Leicester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	31	30	69	7	.....	....
GB Leuchars	..	..	..	..	..																				

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Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec	
	U.T.			PA Alt	U.T.			PA	U.T.			Alt	U.T.			PA	U.T.			PA Alt			
	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o			
GB Sumburgh	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	42	4	71	2	.....	....
GB Swansea	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	25	55	68	6	.....	....
GB Teesside	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	57	70	6	.....	....
GB Ternhill	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	29	58	69	6	.....	....
GB Tiree	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	55	70	2	.....	....
GB Topcliffe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	33	70	6	.....	....
GB Turweston	..	..	..	..	..	..	..	..	..	8	11	51	-1	..	..	..	9	30	31	69	8	0.749	....
GB Valley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	28	7	69	5	.....	....
GB Waddington	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	33	2	69	7	.....	....
GB Warton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	57	69	6	.....	....
GB Wattisham	..	..	..	..	..	..	..	..	..	8	13	39	0	..	..	..	9	33	26	69	9	0.759	....
GB West Freugh	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	18	69	4	.....	....
GB Wick	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	38	4	71	3	.....	....
GB Wittering	..	..	..	..	..	..	..	..	..	8	13	18	-1	..	..	..	9	32	14	69	8	0.757	....
GB Woodfort	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	31	13	69	6	.....	....
GB Woodvale	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	30	28	69	6	.....	....
GB Wyton	..	..	..	..	..	..	..	..	..	8	13	10	0	..	..	..	9	32	20	69	8	0.757	....
GB Yeovilton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	26	46	68	8	.....	....
GE Sukhumi	7	30	49	273	20	..	..	..	..	9	3	23	24	..	..	..	10	35	23	54	22	0.689	....
GE Tbilisi	7	37	52	274	23	..	..	..	..	9	10	29	26	..	..	..	10	40	41	50	22	0.650	....
GI Gibraltar	..	..	..	..	..	..	..	..	..	7	44	43	1	..	..	..	8	54	6	56	13	0.488	....
GR Agrinion	6	55	32	280	9	..	..	..	..	8	19	57	21	..	..	..	9	53	33	60	28	0.679	....
GR Alexandria	6	59	7	278	9	..	..	..	..	8	24	31	20	..	..	..	9	58	19	61	26	0.708	....
GR Alexandroupolis	7	3	32	276	12	..	..	..	..	8	31	10	22	..	..	..	10	6	0	60	26	0.713	....
GR Andravida	6	54	45	281	10	..	..	..	..	8	19	0	21	..	..	..	9	52	36	59	28	0.670	....
GR Athens	6	57	26	280	12	..	..	..	..	8	23	28	23	..	..	..	9	58	11	58	29	0.673	....
GR Chania	6	55	37	282	13	..	..	..	..	8	21	29	25	..	..	..	9	56	24	56	31	0.640	....
GR Chios	7	0	56	279	13	..	..	..	..	8	28	40	24	..	..	..	10	4	6	58	29	0.681	....
GR Dekelia	6	57	43	280	12	..	..	..	..	8	23	49	22	..	..	..	9	58	33	59	29	0.676	....
GR Elefsis	6	57	25	280	11	..	..	..	..	8	23	20	22	..	..	..	9	57	58	59	29	0.675	....
GR Heraklion	6	56	44	282	14	..	..	..	..	8	23	18	25	..	..	..	9	58	36	56	32	0.638	....
GR Ioannina	6	56	11	279	9	..	..	..	..	8	20	22	20	..	..	..	9	53	37	61	27	0.694	....
GR Kalamata	6	54	40	281	11	..	..	..	..	8	19	17	22	..	..	..	9	53	16	58	29	0.659	....
GR Karpathos	6	59	26	281	16	..	..	..	..	8	27	24	27	..	..	..	10	3	18	55	32	0.640	....
GR Kasos	6	59	6	281	15	..	..	..	..	8	26	54	26	..	..	..	10	2	45	55	32	0.640	....
GR Kasteli	6	56	46	282	14	..	..	..	..	8	23	24	26	..	..	..	9	58	46	56	32	0.636	....
GR Kastoria	6	57	31	278	9	..	..	..	..	8	22	6	19	..	..	..	9	55	28	61	26	0.704	....
GR Kavala	7	1	39	277	11	..	..	..	..	8	28	17	21	..	..	..	10	2	39	61	26	0.714	....
GR Keffallinia	6	54	9	281	9	..	..	..	..	8	17	50	20	..	..	..	9	51	1	60	28	0.671	....
GR Kerkyra/corfu	6	55	11	280	8	..	..	..	..	8	18	41	19	..	..	..	9	51	28	61	27	0.690	....
GR Kithira	6	54	58	282	12	..	..	..	..	8	20	10	23	..	..	..	9	54	38	57	30	0.650	....
GR Kos	7	0	38	280	15	..	..	..	..	8	28	49	25	..	..	..	10	4	41	56	31	0.660	....
GR Kozani	6	57	56	278	9	..	..	..	..	8	22	54	20	..	..	..	9	56	32	61	26	0.703	....
GR Larissa	6	57	55	279	10	..	..	..	..	8	23	15	21	..	..	..	9	57	14	60	27	0.695	....
GR Leros	7	0	37	280	14	..	..	..	..	8	28	40	25	..	..	..	10	4	25	57	30	0.665	....
GR Limnos	7	1	31	277	12	..	..	..	..	8	28	43	22	..	..	..	10	3	37	60	27	0.701	....
GR Marathon	6	58	3	280	12	..	..	..	..	8	24	18	23	..	..	..	9	59	6	59	29	0.677	....
GR Megara	6	57	6	280	11	..	..	..	..	8	22	53	22	..	..	..	9	57	27	59	29	0.674	....
GR Mykonos	6	58	57	280	13	..	..	..	..	8	26	3	24	..	..	..	10	1	23	57	30	0.668	....
GR Mytilini	7	2	19	278	13	..	..	..	..	8	30	22	23	..	..	..	10	5	48	58	28	0.690	....
GR Nea Anghialos	6	57	48	279	10	..	..	..	..	8	23	19	21	..	..	..	9	57	30	60	28	0.690	....
GR Patras	6	55	8	280	10	..	..	..	..	8	19	31	21	..	..	..	9	53	11	59	28	0.673	....
GR Preveza	6	55	17	280	9	..	..	..	..	8	19	19	20	..	..	..	9	52	36	60	27	0.683	....
GR Rhodos	7	1	40	280	16	..	..	..	..	8	30	26	26	..	..	..	10	6	31	55	31	0.654	....
GR Rhodos	7	1	41	280	16	..	..	..	..	8	30	28	26	..	..	..	10	6	33	55	31	0.653	....
GR Samos	7	1	17	279	14	..	..	..	..	8	29	27	25	..	..	..	10	5	11	57	30	0.672	....
GR Santorini	6	58	6	281	14	..	..	..	..	8	25	7	25	..	..	..	10	0	33	57	31	0.654	....
GR Sitia	6	57	49	282	15	..	..	..	..	8	25	0	26	..	..	..	10	0	37	55	32	0.637	....
GR Skiathos	6	58	34	279	11	..	..	..	..	8	24	35	22	..	..	..	9	59	3	60	28	0.690	....

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	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt				
	h	m s	o		h	m s	o		h	m s	o		h	m s	o		h	m s	o				
MT Malta	6	46	56	286	5	..	..	..	8	5	2	17	..	..	..	..	9	33	44	59	28	0.616	....
MT Malta Acc	6	46	57	286	5	..	..	..	8	5	2	17	..	..	..	..	9	33	41	59	27	0.617	....
NL Amsterdam	..	..	..	..	..	..	..	..	8	17	20	2	..	..	..	..	9	39	6	69	10	0.778	....
NL De Kooy	..	..	..	..	..	..	..	..	8	18	20	2	..	..	..	..	9	39	57	70	10	0.783	....
NL Deelen	..	..	..	..	..	..	..	..	8	18	0	3	..	..	..	..	9	40	23	69	11	0.780	....
NL Drachten	..	..	..	..	..	..	..	..	8	19	56	3	..	..	..	..	9	42	10	70	10	0.790	....
NL Eindhoven	..	..	..	..	..	..	..	..	8	16	32	3	..	..	..	..	9	38	49	69	11	0.772	....
NL Enschede	..	..	..	..	..	..	..	..	8	19	20	4	..	..	..	..	9	42	10	69	11	0.786	....
NL Gilze-Rijen	..	..	..	..	..	..	..	..	8	16	18	3	..	..	..	..	9	38	19	69	11	0.772	....
NL Groningen	..	..	..	..	..	..	..	..	8	20	23	3	..	..	..	..	9	42	49	70	10	0.791	....
NL Leeuwarden	..	..	..	..	..	..	..	..	8	19	45	3	..	..	..	..	9	41	46	70	10	0.789	....
NL Lelystad	..	..	..	..	..	..	..	..	8	18	18	3	..	..	..	..	9	40	25	69	10	0.782	....
NL Maastricht	..	..	..	..	..	..	..	..	8	16	3	4	..	..	..	..	9	38	41	69	12	0.769	....
NL Rotterdam	..	..	..	..	..	..	..	..	8	16	27	2	..	..	..	..	9	38	8	69	10	0.773	....
NL Soesterberg	..	..	..	..	..	..	..	..	8	17	31	3	..	..	..	..	9	39	36	69	11	0.778	....
NL Valkenburg	..	..	..	..	..	..	..	..	8	16	47	2	..	..	..	..	9	38	25	69	10	0.775	....
NL Weert	..	..	..	..	..	..	..	..	8	16	26	3	..	..	..	..	9	38	54	69	11	0.772	....
NL Woensdrecht	..	..	..	..	..	..	..	..	8	15	32	3	..	..	..	..	9	37	17	69	11	0.768	....
NO Alesund	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	53	15	72	2	.....	....
NO Bergen	..	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	49	46	72	4	.....	....
NO Bodoe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	5	17	71	-1	.....	....
NO Bomoen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	51	37	72	4	.....	....
NO Bronnoysund	..	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	2	4	72	1	.....	....
NO Dagli	..	11	..	..	..	..	..	..	8	33	37	0	..	..	..	..	9	53	42	72	5	0.839	....
NO Fagernes	..	..	..	..	..	..	..	..	8	35	12	-1	..	..	..	..	9	55	12	72	4	0.843	....
NO Floro	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	51	1	72	3	.....	....
NO Forde	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	51	37	72	3	.....	....
NO Hamar	..	..	..	..	..	..	..	..	8	36	31	0	..	..	..	..	9	57	5	71	5	0.845	....
NO Haugesund	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	48	38	71	5	.....	....
NO Kjeller	..	6	46	57	286	5	..	..	8	35	15	1	..	..	..	..	9	56	17	71	6	0.842	....
NO Kristiansund	..	7	8	20	272	1	..	..	..	..	..	..	..	..	..	..	9	55	37	72	2	.....	....
NO Lista	..	..	..	..	..	..	..	..	8	28	21	0	..	..	..	..	9	48	55	71	6	0.824	....
NO Molde	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	54	40	72	2	.....	....
NO Mosjoen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	3	16	72	1	.....	....
NO Notodden	..	..	..	..	..	..	..	..	8	32	58	0	..	..	..	..	9	53	40	71	6	0.837	....
NO Orland	..	10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	58	1	72	2	.....	....
NO Oslo	..	..	..	..	..	..	..	..	8	34	45	1	..	..	..	..	9	55	42	71	6	0.841	....
NO Roros	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	58	55	72	3	.....	....
NO Rygge	..	..	..	..	..	..	..	..	8	34	9	1	..	..	..	..	9	55	25	71	6	0.839	....
NO Sandnessjoen	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	2	40	72	0	.....	....
NO Skien	..	..	..	..	..	..	..	..	8	32	43	1	..	..	..	..	9	53	44	71	6	0.836	....
NO Sogndal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	52	53	72	4	.....	....
NO Stavanger	..	..	..	..	..	..	..	..	8	28	43	-1	..	..	..	..	9	48	36	71	5	0.825	....
NO Stord	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	49	19	71	4	.....	....
NO Torp	..	..	..	..	..	..	..	..	8	33	22	1	..	..	..	..	9	54	35	71	6	0.838	....
NO Trondheim	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	59	12	72	2	.....	....
PL Gdansk	7	14	53	269	0	..	..	..	8	35	46	8	..	..	..	..	10	2	2	69	12	0.828	....
PL Katowice	7	9	16	271	2	..	..	..	8	31	31	11	..	..	..	..	10	0	11	68	16	0.803	....
PL Koszalin	..	..	..	..	..	..	..	..	8	32	33	7	..	..	..	..	9	58	24	69	12	0.824	....
PL Krakow	7	9	18	271	3	..	..	..	8	32	1	12	..	..	..	..	10	1	7	67	17	0.801	....
PL Lodz	7	11	30	271	2	..	..	..	8	33	35	10	..	..	..	..	10	1	39	68	15	0.813	....
PL Mielec	7	11	19	271	4	..	..	..	8	34	47	12	..	..	..	..	10	4	12	67	17	0.804	....
PL Poznan	7	10	22	271	0	..	..	..	8	31	4	8	..	..	..	..	9	57	58	69	14	0.814	....
PL Rzeszow	7	11	34	271	4	..	..	..	8	35	22	12	..	..	..	..	10	5	2	67	17	0.803	....
PL Slupsk	7	13	55	270	-1	..	..	..	8	34	11	7	..	..	..	..	10	0	1	69	12	0.827	....
PL Szczecin	..	..	..	..	..	..	..	..	8	29	40	7	..	..	..	..	9	55	19	69	12	0.816	....
PL Szczecin	..	..	..	..	..	..	..	..	8	30	15	7	..	..	..	..	9	55	54	69	12	0.818	....
PL Warsaw	7	13	40	270	3	..	..	..	8	36	20	10	..	..	..	..	10	4	33	68	15	0.817	....
PL Wroclaw	7	8	20	272	1	..	..	..	8	29	21	9	..	..	..	..	9	56	57	68	15	0.805	....
PL Zielona Gora	7	9	5	271	0	..	..	..	8	29	21	8	..	..	..	..	9	56	3	69	14	0.810	....
PT Alverca&gt																							

## EUROPA - EUROPE

Site	1st Contact				2nd Contact				Maximum		3rd Contact				4th Contact				Central	
	U.T.		PA Alt		U.T.		PA		U.T.		U.T.		PA		U.T.		PA Alt		Mag	Durn sec
	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o	h	m		
SE Emmaboda	..	..	..	..	..	..	..	..	8	35	16	5	..	..	..	..	9	59	27	0.836
SE Eskilstuna	..	..	..	..	..	..	..	..	8	40	7	3	..	..	..	..	10	2	53	0.848
SE Falkoping	..	..	..	..	..	..	..	..	8	35	13	3	..	..	..	..	9	57	57	0.840
SE Fallfors	..	..	..	..	..	..	..	..	8	50	55	0	..	..	..	..	10	10	22	0.858
SE Farila	..	..	..	..	..	..	..	..	8	42	23	1	..	..	..	..	10	3	19	0.853
SE Gallivare	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	11	5	0.851
SE Gavle	..	..	..	..	..	..	..	..	8	41	58	2	..	..	..	..	10	3	58	0.852
SE Gimo	..	..	..	..	..	..	..	..	8	42	36	3	..	..	..	..	10	5	7	0.851
SE Gothenborg	..	..	..	..	..	..	..	..	8	32	53	3	..	..	..	..	9	55	20	0.835
SE Hagfors	..	..	..	..	..	..	..	..	8	37	47	2	..	..	..	..	9	59	26	0.846
SE Hagshult	..	..	..	..	..	..	..	..	8	34	34	4	..	..	..	..	9	57	57	0.837
SE Hallviken	..	..	..	..	..	..	..	..	8	44	31	0	..	..	..	..	10	4	13	0.856
SE Halmstad	..	..	..	..	..	..	..	..	8	32	18	4	..	..	..	..	9	55	37	0.832
SE Hasslosa	..	..	..	..	..	..	..	..	8	35	13	3	..	..	..	..	9	57	43	0.840
SE Hede	..	..	..	..	..	..	..	..	8	41	13	0	..	..	..	..	10	1	27	0.852
SE Heden	..	..	..	..	..	..	..	..	8	52	19	-1	..	..	..	..	10	11	19	0.858
SE Hemavan	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	5	5	0.851
SE Hudiksvall	..	..	..	..	..	..	..	..	8	43	34	2	..	..	..	..	10	4	50	0.854
SE Hultsfred	..	..	..	..	..	..	..	..	8	36	45	4	..	..	..	..	10	0	27	0.841
SE Idre	..	..	..	..	..	..	..	..	8	39	30	0	..	..	..	..	9	59	50	0.850
SE Joenkeoping	..	..	..	..	..	..	..	..	8	35	9	4	..	..	..	..	9	58	15	0.839
SE Jokkmokk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	10	15	0.851
SE Kalixfors	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	10	47	0.851
SE Kalkmar	..	..	..	..	..	..	..	..	8	36	9	5	..	..	..	..	10	0	28	0.837
SE Karlsborg	..	..	..	..	..	..	..	..	8	36	40	3	..	..	..	..	9	59	26	0.843
SE Karlskoga	..	..	..	..	..	..	..	..	8	37	47	3	..	..	..	..	10	0	3	0.846
SE Kiruna	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	10	52	0.851
SE Knislinge	..	..	..	..	..	..	..	..	8	33	1	5	..	..	..	..	9	57	1	0.832
SE Kosta	..	..	..	..	..	..	..	..	8	35	25	5	..	..	..	..	9	59	25	0.837
SE Kramfors	..	..	..	..	..	..	..	..	8	45	48	1	..	..	..	..	10	6	19	0.856
SE Kristianstad	..	..	..	..	..	..	..	..	8	32	36	5	..	..	..	..	9	56	43	0.830
SE Kubbe	..	..	..	..	..	..	..	..	8	46	40	0	..	..	..	..	10	6	49	0.857
SE Landskrona	..	..	..	..	..	..	..	..	8	31	16	4	..	..	..	..	9	55	0	0.828
SE Lidkoping	..	..	..	..	..	..	..	..	8	35	12	3	..	..	..	..	9	57	39	0.840
SE Linkoeeping	..	..	..	..	..	..	..	..	8	37	36	4	..	..	..	..	10	0	41	0.844
SE Ljungby	..	..	..	..	..	..	..	..	8	33	52	4	..	..	..	..	9	57	22	0.835
SE Lulea	..	..	..	..	..	..	..	..	8	52	36	0	..	..	..	..	10	11	52	0.858
SE Lycksele	..	..	..	..	..	..	..	..	8	48	27	0	..	..	..	..	10	8	4	0.858
SE Malmoe	..	..	..	..	..	..	..	..	8	31	14	5	..	..	..	..	9	55	21	0.827
SE Mohed	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	7	13	0.851
SE Moholm	..	..	..	..	..	..	..	..	8	36	22	3	..	..	..	..	9	58	59	0.842
SE Mora	..	..	..	..	..	..	..	..	8	39	59	1	..	..	..	..	10	1	16	0.850
SE Norrkoeping	..	..	..	..	..	..	..	..	8	38	38	4	..	..	..	..	10	1	46	0.845
SE Optand	..	..	..	..	..	..	..	..	8	43	8	0	..	..	..	..	10	3	7	0.855
SE Orebro	..	..	..	..	..	..	..	..	8	38	11	3	..	..	..	..	10	0	39	0.846
SE Ornskoldsvik	..	..	..	..	..	..	..	..	8	47	24	1	..	..	..	..	10	7	50	0.857
SE Orsa	..	..	..	..	..	..	..	..	8	40	30	1	..	..	..	..	10	1	41	0.851
SE Oskarshamn	..	..	..	..	..	..	..	..	8	37	17	5	..	..	..	..	10	1	14	0.841
SE Ostersund	..	..	..	..	..	..	..	..	8	42	57	0	..	..	..	..	10	2	50	0.854
SE Pitea	..	..	..	..	..	..	..	..	8	51	41	0	..	..	..	..	10	10	58	0.858
SE Rada	..	..	..	..	..	..	..	..	8	35	8	3	..	..	..	..	9	57	31	0.840
SE Ronneby	..	..	..	..	..	..	..	..	8	34	25	5	..	..	..	..	9	58	42	0.834
SE Satenas	..	..	..	..	..	..	..	..	8	34	41	3	..	..	..	..	9	57	1	0.839
SE Sattna	..	..	..	..	..	..	..	..	8	44	23	1	..	..	..	..	10	5	9	0.855
SE Skelleftea	..	..	..	..	..	..	..	..	8	50	43	0	..	..	..	..	10	10	32	0.858
SE Skovde	..	..	..	..	..	..	..	..	8	36	1	3	..	..	..	..	9	58	41	0.842
SE Stockholm	..	..	..	..	..	..	..	..	8	41	13	4	..	..	..	..	10	4	19	0.849
SE Strangnas	..	..	..	..	..	..	..	..	8	40	30	3	..	..	..	..	10	3	22	0.848
SE Sundsvall	..	..	..	..	..	..	..	..	8	44	52	1	..	..	..	..	10	5	41	0.856
SE Sveg	..	..	..	..	..	..	..	..	8	41	21	0	..	..	..	..	10	1	57	0.853
SE Torsby	..	..	..	..	..	..	..	..	8	37	24	1	..	..	..	..	9	58	49	0.846
SE Trollhattan	..	..	..	..	..	..	..	..	8	34	9	2	..	..	..	..	9	56	26	0.838
SE Umea	..	..	..	..	..	..	..	..	8	49	4	1	..	..	..	..	10	9	24	0.858
SE Uppsala	..	..	..	..	..	..	..	..	8	41	46	3	..	..	..	..	10	4	20	0.850
SE Vasteras	..	..	..	..	..	..	..	..	8	40	21	3	..	..	..	..	10	2	56	0.849
SE Vaxjo	..	..	..	..	..	..	..	..	8	34	43	4	..	..	..	..	9	58	28	0.836
SE Vidsel	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	10	2	0.851
SE Vilhelmina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10	6	8	0.851
SE Visby	..	..	..	..	..	..	..	..	8	39	48	5	..	..	..	..	10	3	59	0.844
SI Cerklje	6	59	24	276	2	..	..	..	8	20	16	12	..	..	..	..	9	49	26	0.754
SI Ljubljana	6	59	1	276	1	..	..	..	8	19	13	11	..	..	..	..	9	47	45	0.755
SI Maribor	7	0	21	275	2	..	..	..	8	21	17	12	..	..	..	..	9	50	21	0.761
SI Portoroz	6	57	22	277	1	..	..	..	8	17	0	11	..	..	..	..	9	45	15	0.744
SI Slovenj Gradec	6	59	53	275	2	..	..	..	8	20	28	12	..	..	..	..	9	49	16	0.759



## ITALIA - ITALY

	1° Contatto				2° Contatto				Massimo				3° Contatto				4° Contatto				Durata	
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt			
	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o		
AGRIGENTO	6	47	38	285	4	..	..	..	8	5	36	16	..	..	..	..	9	33	59	60	0.635	....
ALESSANDRIA	..	..	..	..	..	..	..	..	8	9	49	9	..	..	..	..	9	35	2	66	0.717	....
ANCONA	6	54	46	278	2	..	..	..	8	14	12	12	..	..	..	..	9	42	44	65	0.722	....
AOSTA	..	..	..	..	..	..	..	..	8	9	36	7	..	..	..	..	9	33	55	66	0.721	....
AREZZO	6	53	29	279	1	..	..	..	8	11	46	11	..	..	..	..	9	39	17	65	0.713	....
ASCOLI PICENO	6	53	50	279	2	..	..	..	8	13	12	13	..	..	..	..	9	41	52	64	0.712	....
ASTI	..	..	..	..	..	..	..	..	8	9	21	8	..	..	..	..	9	34	18	66	0.715	....
AVELLINO	6	52	18	280	4	..	..	..	8	12	14	15	..	..	..	..	9	41	50	63	0.692	....
BARI	6	54	12	279	5	..	..	..	8	15	41	16	..	..	..	..	9	46	35	63	0.702	....
BELLUNO	6	57	19	277	0	..	..	..	8	16	6	10	..	..	..	..	9	43	25	66	0.746	....
BENEVENTO	6	52	33	280	3	..	..	..	8	12	30	15	..	..	..	..	9	42	5	63	0.695	....
BERGAMO	..	..	..	..	..	..	..	..	8	12	16	9	..	..	..	..	9	38	6	66	0.731	....
BOLOGNA	6	54	30	279	0	..	..	..	8	12	34	11	..	..	..	..	9	39	38	65	0.724	....
BOLZANO	..	..	..	..	..	..	..	..	8	15	31	9	..	..	..	..	9	42	15	67	0.747	....
BRESCIA	..	..	..	..	..	..	..	..	8	12	42	9	..	..	..	..	9	38	55	66	0.732	....
BRINDISI	6	54	25	279	6	..	..	..	8	16	29	17	..	..	..	..	9	47	58	62	0.698	....
CAGLIARI	6	47	4	285	0	..	..	..	8	2	12	12	..	..	..	..	9	27	18	62	0.642	....
CALTANISSETTA	6	48	6	284	4	..	..	..	8	6	30	16	..	..	..	..	9	35	17	60	0.640	....
CAMPOBASSO	6	52	58	280	3	..	..	..	8	12	55	14	..	..	..	..	9	42	25	63	0.700	....
CASERTA	6	52	10	281	3	..	..	..	8	11	47	14	..	..	..	..	9	41	4	63	0.692	....
CATANIA	6	48	51	284	5	..	..	..	8	8	7	17	..	..	..	..	9	37	41	60	0.645	....
CATANZARO	6	51	26	282	6	..	..	..	8	12	17	17	..	..	..	..	9	43	6	61	0.671	....
CHIETI	6	53	37	279	3	..	..	..	8	13	21	14	..	..	..	..	9	42	27	64	0.708	....
COMO	..	..	..	..	..	..	..	..	8	11	54	8	..	..	..	..	9	37	29	66	0.730	....
COSENZA	6	51	35	281	5	..	..	..	8	12	16	17	..	..	..	..	9	42	52	61	0.675	....
CREMONA	..	..	..	..	..	..	..	..	8	11	52	9	..	..	..	..	9	38	0	66	0.726	....
CUNEO	..	..	..	..	..	..	..	..	8	7	50	8	..	..	..	..	9	32	21	65	0.706	....
ENNA	6	48	19	284	4	..	..	..	8	6	56	16	..	..	..	..	9	35	55	60	0.642	....
FERRARA	6	55	7	278	0	..	..	..	8	13	23	10	..	..	..	..	9	40	33	66	0.729	....
FIRENZE	6	53	28	279	0	..	..	..	8	11	23	11	..	..	..	..	9	38	27	65	0.714	....
FOGGIA	6	53	32	280	4	..	..	..	8	14	6	15	..	..	..	..	9	44	9	63	0.702	....
FORLI`	6	54	35	279	0	..	..	..	8	13	5	11	..	..	..	..	9	40	37	65	0.723	....
FROSINONE	6	52	10	280	2	..	..	..	8	11	11	13	..	..	..	..	9	39	48	63	0.696	....
GENOVA	..	..	..	..	..	..	..	..	8	9	28	9	..	..	..	..	9	34	56	65	0.712	....
GORIZIA	6	58	1	276	1	..	..	..	8	17	40	11	..	..	..	..	9	45	48	66	0.749	....
GROSSETO	6	52	7	280	0	..	..	..	8	9	44	11	..	..	..	..	9	36	46	64	0.701	....
IMPERIA	..	..	..	..	..	..	..	..	8	7	36	9	..	..	..	..	9	32	26	65	0.701	....
ISERNIA	6	52	31	280	3	..	..	..	8	12	9	14	..	..	..	..	9	41	22	63	0.696	....
L'AQUILA	6	53	4	280	2	..	..	..	8	12	15	13	..	..	..	..	9	40	52	64	0.706	....
LA SPEZIA	..	..	..	..	..	..	..	..	8	10	4	10	..	..	..	..	9	36	9	65	0.712	....
LATINA	6	51	39	281	2	..	..	..	8	10	18	13	..	..	..	..	9	38	36	63	0.692	....
LECCE	6	54	25	280	6	..	..	..	8	16	44	17	..	..	..	..	9	48	29	62	0.695	....
LIVORNO	6	52	37	280	-1	..	..	..	8	9	50	10	..	..	..	..	9	36	17	65	0.707	....
LUCCA	6	53	8	279	-1	..	..	..	8	10	33	10	..	..	..	..	9	37	7	65	0.712	....
MACERATA	6	54	17	279	2	..	..	..	8	13	36	13	..	..	..	..	9	42	8	65	0.717	....
MANTOVA	..	..	..	..	..	..	..	..	8	12	50	10	..	..	..	..	9	39	27	66	0.729	....
MASSA	..	..	..	..	..	..	..	..	8	10	21	10	..	..	..	..	9	36	40	65	0.713	....
MATERA	6	53	25	280	5	..	..	..	8	14	39	16	..	..	..	..	9	45	26	62	0.695	....
MESSINA	6	49	54	283	5	..	..	..	8	9	45	17	..	..	..	..	9	39	48	61	0.657	....
MILANO	..	..	..	..	..	..	..	..	8	11	20	9	..	..	..	..	9	36	54	66	0.726	....
MODENA	6	54	25	279	-1	..	..	..	8	12	12	10	..	..	..	..	9	38	57	66	0.724	....
NAPOLI	6	51	52	281	3	..	..	..	8	11	23	14	..	..	..	..	9	40	37	63	0.689	....
NOVARA	..	..	..	..	..	..	..	..	8	10	38	8	..	..	..	..	9	35	50	66	0.723	....
NUORO	6	48	19	284	0	..	..	..	8	4	1	11	..	..	..	..	9	29	32	63	0.659	....
ORISTANO	6	47	32	284	-1	..	..	..	8	2	32	11	..	..	..	..	9	27	22	62	0.649	....
PADOVA	6	56	4	278	0	..	..	..	8	14	35	10	..	..	..	..	9	41	50	66	0.737	....
PALERMO	6	48	19	284	3	..	..	..	8	6	24	15	..	..	..	..	9	34	46	61	0.647	....
PARMA	..	..	..	..	..	..	..	..	8	11	45	10	..	..	..	..	9	38	8	66	0.723	....
PAVIA	..	..	..	..	..	..	..	..	8	10	53	9	..	..	..	..	9	36	27	66	0.723	....
PERUGIA	6	53	21	279	1	..	..	..	8	11	56	12	..	..	..	..	9	39	49	64	0.711	....
PESARO	6	54	44	278	1	..	..	..	8	13	47	12	..	..	..	..	9	41	54	65	0.723	....
PESCARA	6	53	46	279	3	..	..	..	8													

## ITALIA - ITALY

	1° Contatto				2° Contatto				Massimo				3° Contatto				4° Contatto				Durata			
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt		Mag	sec		
	h	m	s	o	o	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o	o		
VERONA	..	..	..	...	..	..	..	...	...	8	13	30	10	..	..	..	...	9	40	13	66	18	0.733	....
VICENZA	6	56	2	278	0	..	..	..	...	8	14	21	10	..	..	..	...	9	41	22	66	18	0.737	....
VITERBO	6	52	17	280	1	..	..	..	...	8	10	33	12	..	..	..	...	9	38	17	64	21	0.701	....

NB: per alcune località il Sole sorge già eclissato.

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrise  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrise  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunset  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunset

U1, first contact : point of the Earth in which the eclipse begins as total at sunrise  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrise  
U3, third contact : point of the Earth in which the eclipse begins as total at sunset  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunset

## Legenda:

La località e lo stato

I vari tempi dei contatti, se presenti. Se l'evento avviene il giorno prima o quello dopo la data della predizione è presente un segno "-" o "+" immediatamente dopo l'ora.

La posizione dell'angolo di contatto per ogni evento.

L'altitudine del Sole.

La magnitudine dell'eclisse.

Nel caso delle eclissi centrali, la durata.

The site name and location.

The UTC - for 1st and 4th contacts of partial eclipse, the time of maximum eclipse, and if the eclipse is central, the times of 2nd & 3rd contacts. Times are not given if the event does not occur, or the sun is not above the horizon. If the event occurs on the day preceding or following the date of the prediction, a '-' or '+' (respectively) occurs immediately after the predicted time.

The position angle of contact - at start and end of partial eclipse, and start and end of annular or total eclipse;

The altitude of the sun - at start and end of partial eclipse, and at maximum eclipse;

If maximum eclipse is visible at the location, the magnitude at maximum eclipse;

If central eclipse occurs at the location, the duration of the central eclipse.

[Note: The magnitude is computed as the fraction of the solar diameter that is obscured by the moon.

During central eclipse, this value equals (diameter of moon / diameter of sun) - irrespective of location across the center path.]

MEDIORIENTE - MIDDLEEAST

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec	
	U.T.		PA	Alt	U.T.		PA	Alt	U.T.		Alt	U.T.		PA	Alt	U.T.		PA	Alt				
	h	m s	o	o	h	m s	o	o	h	m s	o	h	m s	o	o	h	m s	o	o				
AE Abu Dhabi	8	7	28	295	43	...	...	...	9	20	35	41	...	...	...	...	10	29	9	18	34	0.262	....
AE Al Ain	8	11	46	296	43	...	...	...	9	22	55	41	...	...	...	...	10	29	28	16	34	0.248	....
AE Al Hamra	7	59	28	294	43	...	...	...	9	15	46	42	...	...	...	...	10	27	50	20	36	0.285	....
AE Arzana	7	59	6	293	42	...	...	...	9	16	35	42	...	...	...	...	10	29	38	21	35	0.298	....
AE Das Island	7	59	56	293	42	...	...	...	9	17	35	41	...	...	...	...	10	30	41	21	34	0.301	....
AE Dubai	8	9	28	294	42	...	...	...	9	23	9	40	...	...	...	...	10	31	59	19	33	0.271	....
AE Fujeirah	8	13	31	295	42	...	...	...	9	25	7	40	...	...	...	...	10	31	51	17	32	0.255	....
AE Jebel Dhana	7	59	55	294	42	...	...	...	9	16	12	42	...	...	...	...	10	28	12	20	36	0.286	....
AE Ras Al Khaimah	8	11	18	294	42	...	...	...	9	24	40	39	...	...	...	...	10	33	2	18	32	0.271	....
AE Sharjah	8	9	59	294	42	...	...	...	9	23	33	40	...	...	...	...	10	32	13	18	33	0.271	....
AE Zirku	8	1	0	293	42	...	...	...	9	17	49	41	...	...	...	...	10	30	6	21	35	0.293	....
BH Bahrain	7	51	2	291	40	...	...	...	9	13	1	41	...	...	...	...	10	30	52	25	35	0.344	....
IL Beer-Sheba	7	8	57	283	24	...	...	...	8	39	55	34	...	...	...	...	10	15	19	47	36	0.562	....
IL Elat	7	8	36	285	26	...	...	...	8	38	47	35	...	...	...	...	10	13	26	44	37	0.533	....
IL Eyn-Shemer	7	10	11	282	24	...	...	...	8	41	42	33	...	...	...	...	10	17	18	48	34	0.580	....
IL Eyn-Yahav	7	9	34	284	25	...	...	...	8	40	24	35	...	...	...	...	10	15	25	45	36	0.549	....
IL Haifa	7	10	30	282	23	...	...	...	8	42	9	33	...	...	...	...	10	17	48	48	34	0.585	....
IL Haztor	7	9	14	283	24	...	...	...	8	40	24	33	...	...	...	...	10	15	54	47	35	0.570	....
IL Jerusalem	7	10	14	283	24	...	...	...	8	41	38	34	...	...	...	...	10	17	4	47	35	0.570	....
IL Megido Airstrip	7	10	43	282	24	...	...	...	8	42	22	33	...	...	...	...	10	17	56	48	34	0.581	....
IL Metzada	7	10	19	283	25	...	...	...	8	41	32	34	...	...	...	...	10	16	42	46	35	0.560	....
IL Nevatim	7	9	27	284	25	...	...	...	8	40	31	34	...	...	...	...	10	15	50	46	36	0.560	....
IL Ovda	7	8	41	285	25	...	...	...	8	39	6	35	...	...	...	...	10	13	58	45	37	0.539	....
IL Ramat David	7	10	40	282	24	...	...	...	8	42	19	33	...	...	...	...	10	17	55	48	34	0.582	....
IL Ramon	7	8	32	284	25	...	...	...	8	39	17	34	...	...	...	...	10	14	33	46	36	0.554	....
IL Rosh Pina	7	11	37	282	24	...	...	...	8	43	32	33	...	...	...	...	10	19	5	48	34	0.586	....
IL Tel-Aviv	7	9	33	283	24	...	...	...	8	40	52	33	...	...	...	...	10	16	27	47	35	0.575	....
IL Tel-Nof	7	9	27	283	24	...	...	...	8	40	41	33	...	...	...	...	10	16	12	47	35	0.571	....
IQ Baghdad	7	31	30	281	30	...	...	...	9	3	56	34	...	...	...	...	10	34	27	42	30	0.536	....
IQ Basrah	7	40	21	284	34	...	...	...	9	9	51	37	...	...	...	...	10	35	47	35	32	0.460	....
IR Abadan	7	42	2	284	34	...	...	...	9	11	1	37	...	...	...	...	10	36	12	34	31	0.451	....
IR Abdanan	7	40	3	281	32	...	...	...	9	11	6	34	...	...	...	...	10	38	31	38	29	0.503	....
IR Abumusa I.	8	7	27	293	41	...	...	...	9	22	55	39	...	...	...	...	10	33	23	20	32	0.288	....
IR Aghajari	7	46	22	284	35	...	...	...	9	14	32	36	...	...	...	...	10	38	17	34	30	0.443	....
IR Ahwaz	7	43	36	283	34	...	...	...	9	12	53	36	...	...	...	...	10	38	5	35	30	0.463	....
IR Arak	7	46	52	281	32	...	...	...	9	17	2	33	...	...	...	...	10	42	30	38	27	0.499	....
IR Ardabil	7	44	10	277	27	...	...	...	9	16	5	29	...	...	...	...	10	43	54	44	24	0.577	....
IR Bakhtaran	7	39	29	280	30	...	...	...	9	11	16	33	...	...	...	...	10	39	32	40	28	0.529	....
IR Bam	8	16	59	291	38	...	...	...	9	32	6	35	...	...	...	...	10	41	24	22	27	0.306	....
IR Bandar Abbas	8	10	27	292	40	...	...	...	9	26	15	38	...	...	...	...	10	36	41	21	30	0.298	....
IR Bandar Lengeh	8	5	57	292	41	...	...	...	9	22	56	39	...	...	...	...	10	34	47	21	32	0.304	....
IR Bandar Mahshahr	7	44	47	284	35	...	...	...	9	13	14	36	...	...	...	...	10	37	28	34	31	0.445	....
IR Bastak	8	3	27	291	40	...	...	...	9	22	21	38	...	...	...	...	10	36	2	23	31	0.323	....
IR Birjand	8	16	28	286	34	...	...	...	9	35	27	31	...	...	...	...	10	47	58	27	23	0.368	....
IR Bojnord	8	8	6	280	30	...	...	...	9	33	5	27	...	...	...	...	10	51	33	36	20	0.472	....
IR Bushehr	7	50	25	287	37	...	...	...	9	15	53	38	...	...	...	...	10	36	42	30	31	0.398	....
IR Chah Bahar	8	30	8	298	41	...	...	...	9	33	41	37	...	...	...	...	10	32	38	12	30	0.205	....
IR Darab	8	2	44	289	38	...	...	...	9	23	39	37	...	...	...	...	10	39	4	26	30	0.351	....
IR Daran	7	51	51	282	33	...	...	...	9	20	2	34	...	...	...	...	10	42	58	35	27	0.461	....
IR Dasht-E-Naz	7	56	33	279	30	...	...	...	9	25	0	29	...	...	...	...	10	47	43	38	23	0.504	....
IR Dezfoul	7	42	35	282	33	...	...	...	9	12	48	35	...	...	...	...	10	39	0	37	29	0.485	....
IR Emam Shahr	8	1	59	280	31	...	...	...	9	28	43	29	...	...	...	...	10	49	14	36	22	0.480	....
IR Esfahan	7	52	17	283	34	...	...	...	9	20	7	34	...	...	...	...	10	42	40	34	27	0.453	....
IR Esfahan	7	52	47	283	34	...	...	...	9	20	34	34	...	...	...	...	10	43	2	34	27	0.455	....
IR Fasa	8	0	6	288	38	...	...	...	9	22	14	37	...	...	...	...	10	38	57	27	30	0.363	....
IR Gachsaran	7	49	59	285	36	...	...	...	9	16	51	36	...	...	...	...	10	38	54	32	30	0.423	....
IR Ghazvin	7	47	47	279	30	...	...	...	9	18	30	31	...	...	...	...	10	44	27	40	25	0.531	....
IR Gheshm I.	8	9	51	292	41	...	...	...	9	25	24	38	...	...	...	...	10	35	42	21	31	0.294	....
IR Golbandi	7	57	10	289	39	...	...	...	9	18	49	39	...	...	...	...	10	35	31	26	32	0.350	....
IR Gorgan	7	59	57	280	30	...	...	...	9	27	27	29	...	...	...	...	10	48	56				

MEDIORIENTE - MIDDLEEAST

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Central	
	U.T.		PA Alt		U.T.		PA	U.T.		Alt	U.T.		PA	U.T.		PA Alt	Mag	Durn				
	h	m s	o	o	h	m s	o	h	m s	o	h	m s	o	h	m s	o		sec				
OM Masirah	8	34	49	306	46	..	..	..	9	26	54	43	..	..	..	10	16	7	3	37	0.126	....
OM Muscat	8	24	28	299	44	..	..	..	9	28	4	40	..	..	..	10	27	27	11	33	0.197	....
OM Saiq	8	22	40	300	44	..	..	..	9	26	19	41	..	..	..	10	25	52	11	34	0.195	....
OM Salalah	8	21	0	309	50	..	..	..	9	12	46	49	..	..	..	10	2	28	3	44	0.116	....
OM Thumrait	8	18	33	307	50	..	..	..	9	13	17	48	..	..	..	10	5	41	4	43	0.131	....
QA Doha	7	54	59	292	41	..	..	..	9	14	43	41	..	..	..	10	30	9	23	35	0.320	....
SA Abha	7	31	4	300	42	..	..	..	8	46	33	49	..	..	..	10	2	24	22	48	0.271	....
SA Abqaiq	7	47	36	290	39	..	..	..	9	10	42	41	..	..	..	10	30	0	26	35	0.355	....
SA Al-Ahsa	7	47	36	291	40	..	..	..	9	9	56	42	..	..	..	10	28	35	26	36	0.345	....
SA Al-Jouf	7	19	56	284	30	..	..	..	8	51	21	37	..	..	..	10	23	44	41	36	0.510	....
SA Arar	7	22	50	283	30	..	..	..	8	54	50	36	..	..	..	10	26	59	41	34	0.522	....
SA Bisha	7	29	5	298	40	..	..	..	8	48	14	47	..	..	..	10	7	38	25	45	0.307	....
SA Dammam	7	48	0	290	39	..	..	..	9	11	39	41	..	..	..	10	31	19	27	35	0.364	....
SA Dhahran	7	49	19	290	39	..	..	..	9	12	18	41	..	..	..	10	31	13	26	35	0.356	....
SA El-Baha	7	25	50	297	39	..	..	..	8	46	5	46	..	..	..	10	7	8	26	45	0.322	....
SA Gassim	7	29	14	289	35	..	..	..	8	57	10	41	..	..	..	10	24	2	33	38	0.421	....
SA Gizan	7	33	0	303	43	..	..	..	8	45	0	50	..	..	..	9	57	29	19	49	0.242	....
SA Guriat	7	14	13	283	26	..	..	..	8	46	5	35	..	..	..	10	20	38	45	35	0.553	....
SA Hafr Al-Batin	7	35	51	286	35	..	..	..	9	4	34	39	..	..	..	10	30	41	34	35	0.436	....
SA Hail	7	23	27	287	33	..	..	..	8	53	6	40	..	..	..	10	22	52	37	38	0.459	....
SA Jeddah	7	18	16	295	36	..	..	..	8	41	18	44	..	..	..	10	6	33	31	45	0.366	....
SA Jubail	7	46	26	289	38	..	..	..	9	11	12	40	..	..	..	10	32	3	28	34	0.379	....
SA King Khalid Mil.City	7	34	8	287	35	..	..	..	9	2	47	39	..	..	..	10	29	12	34	35	0.434	....
SA Madinah	7	18	34	291	34	..	..	..	8	45	29	42	..	..	..	10	14	7	34	41	0.419	....
SA Nejran	7	37	52	302	44	..	..	..	8	50	16	50	..	..	..	10	2	16	18	48	0.242	....
SA Petroline 10	7	22	7	291	35	..	..	..	8	48	21	43	..	..	..	10	15	28	33	41	0.402	....
SA Petroline 3	7	40	56	291	39	..	..	..	9	5	7	42	..	..	..	10	26	27	28	37	0.364	....
SA Petroline 6	7	33	10	291	38	..	..	..	8	58	37	43	..	..	..	10	22	30	30	39	0.381	....
SA Rabigh	7	17	33	294	35	..	..	..	8	42	6	43	..	..	..	10	8	52	32	44	0.387	....
SA Rafha	7	28	31	285	32	..	..	..	8	59	22	38	..	..	..	10	29	0	38	34	0.483	....
SA Ras Tanajib	7	44	4	287	37	..	..	..	9	10	23	39	..	..	..	10	32	54	30	34	0.401	....
SA Ras Tanura	7	48	40	289	39	..	..	..	9	12	23	40	..	..	..	10	32	1	27	34	0.366	....
SA Rash Mishab	7	43	31	287	37	..	..	..	9	10	11	39	..	..	..	10	33	6	31	34	0.407	....
SA Riyadh	7	38	29	291	39	..	..	..	9	3	2	42	..	..	..	10	25	7	28	38	0.368	....
SA Sharurah	7	48	2	303	47	..	..	..	8	56	44	50	..	..	..	10	4	3	15	47	0.212	....
SA Sulayel	7	38	17	297	42	..	..	..	8	56	7	47	..	..	..	10	12	41	22	44	0.290	....
SA Tabuk	7	11	34	286	28	..	..	..	8	41	36	37	..	..	..	10	15	6	42	38	0.506	....
SA Taif	7	21	55	295	37	..	..	..	8	44	33	45	..	..	..	10	8	34	29	45	0.354	....
SA Thumamah	7	38	11	290	38	..	..	..	9	3	8	42	..	..	..	10	25	35	29	38	0.374	....
SA Turaif	7	17	30	282	27	..	..	..	8	49	47	35	..	..	..	10	23	45	44	34	0.550	....
SA Wadi-Al-Dawasir	7	36	49	297	42	..	..	..	8	55	8	47	..	..	..	10	12	20	23	44	0.295	....
SA Wejh	7	10	56	289	29	..	..	..	8	39	8	39	..	..	..	10	11	5	39	41	0.467	....
SA Yenbo	7	14	40	292	32	..	..	..	8	41	1	42	..	..	..	10	10	11	35	42	0.421	....
SY Aleppo	7	17	14	278	23	..	..	..	8	50	12	30	..	..	..	10	25	21	50	30	0.626	....
SY Damascus	7	13	47	281	24	..	..	..	8	46	7	33	..	..	..	10	21	27	48	33	0.589	....
SY Deire Zor	7	22	51	279	25	..	..	..	8	56	10	32	..	..	..	10	29	53	47	30	0.597	....
SY Kamishli	7	26	17	277	25	..	..	..	8	59	46	30	..	..	..	10	32	54	48	28	0.615	....
SY Latakia	7	14	7	279	22	..	..	..	8	46	38	31	..	..	..	10	22	14	50	31	0.620	....
SY Palmyra	7	18	18	280	25	..	..	..	8	51	18	32	..	..	..	10	25	58	48	31	0.597	....

SUD AMERICA - SOUTH AMERICA

	1st Contact				2nd Contact				Maximum		3rd Contact				4th Contact				Central					
Site	U.T.			PA Alt	U.T.			PA	U.T.		Alt	U.T.			PA	U.T.			PA Alt	Mag	Durn			
	h	m	s	o	o	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o	o	sec	
CO Turbo	8	40	44	300	40	..	..	..	...	9	39	7	35	..	..	..	...	10	33	17	9	28	0.178	....
PE Shapaja	..	..	..	..	..	..	..	..	...	8	31	40	7	..	..	..	...	9	57	31	69	12	0.821	....

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

#### Legenda:

La località e lo stato

I vari tempi dei contatti, se presenti. Se l'evento avviene il giorno prima o quello dopo la data della predizione è presente un segno "-" o "+" immediatamente dopo l'ora.

La posizione dell'angolo di contatto per ogni evento.

L'altitudine del Sole.

La magnitudine dell'eclisse.

Nel caso delle eclissi centrali, la durata.

The site name and location.

The UTC - for 1st and 4th contacts of partial eclipse, the time of maximum eclipse, and if the eclipse is central, the times of 2nd & 3rd contacts. Times are not given if the event does not occur, or the sun is not above the horizon. If the event occurs on the day preceding or following the date of the prediction, a '-' or '+' (respectively) occurs immediately after the predicted time.

The position angle of contact - at start and end of partial eclipse, and start and end of annular or total eclipse;

The altitude of the sun - at start and end of partial eclipse, and at maximum eclipse;

If maximum eclipse is visible at the location, the magnitude at maximum eclipse;

If central eclipse occurs at the location, the duration of the central eclipse.

[Note: The magnitude is computed as the fraction of the solar diameter that is obscured by the moon.

During central eclipse, this value equals (diameter of moon / diameter of sun) - irrespective of location across the center path.]

# Partial Solar Eclipse of 2011 Jun 01

Geocentric Conjunction = 21:21:58.9 UT      J.D. = 2455714.390265  
 Greatest Eclipse = 21:16:11.2 UT      J.D. = 2455714.386241

Eclipse Magnitude = 0.6013      Gamma = 1.2129

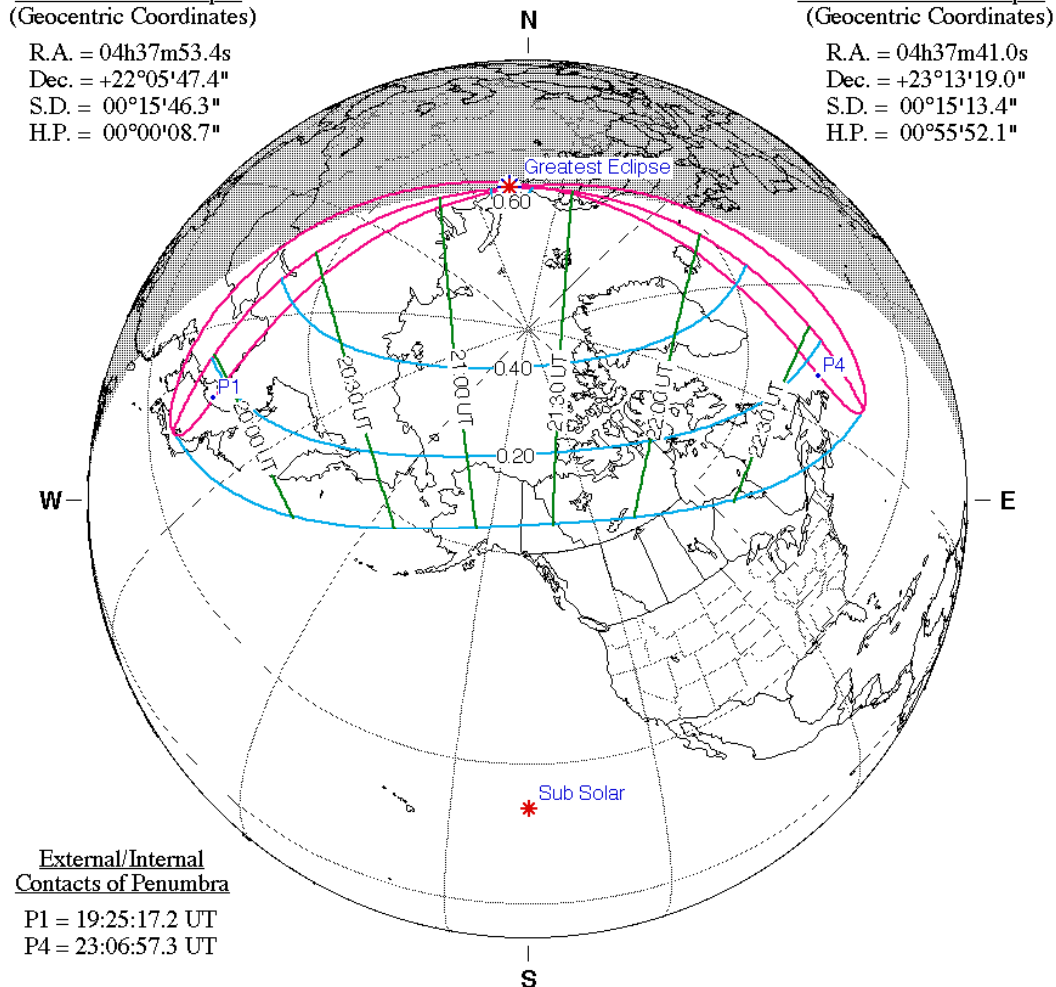
Saros Series = 118      Member = 68 of 72

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 04h37m53.4s  
 Dec. = +22°05'47.4"  
 S.D. = 00°15'46.3"  
 H.P. = 00°00'08.7"

## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 04h37m41.0s  
 Dec. = +23°13'19.0"  
 S.D. = 00°15'13.4"  
 H.P. = 00°55'52.1"



## External/Internal Contacts of Penumbra

P1 = 19:25:17.2 UT  
 P4 = 23:06:57.3 UT

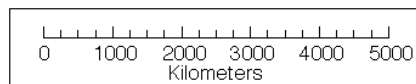
## Ephemeris & Constants

Eph. = Newcomb/ILE  
 $\Delta T = 68.0 \text{ s}$   
 $k1 = 0.2724880$   
 $k2 = 0.2722810$   
 $\Delta b = 0.0''$      $\Delta l = 0.0''$

## Geocentric Libration (Optical + Physical)

$l = -4.63^\circ$   
 $b = -1.51^\circ$   
 $c = -9.54^\circ$

Brown Lun. No. = 1094



F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

## ASIA

Site	1st Contact					2nd Contact					Maximum					3rd Contact					4th Contact					Mag	Central Durn sec
	U.T.			PA	Alt	U.T.			PA	Alt	U.T.			PA	Alt	U.T.			PA	Alt							
	h	m	s			h	m	s			h	m	s			h	m	s			h	m	s				
CN Hailar	..	..	..	..	..	..	..	..	..	..	20	9	54	0	..	..	..	..	20	50	29	39	6	0.312	....		
CN Harbin	..	..	..	..	..	..	..	..	..	..	20	1	26	1	..	..	..	..	20	37	18	31	6	0.228	....		
CN Jiamusi	..	..	..	..	..	..	..	..	..	..	20	0	49	4	..	..	..	..	20	36	45	30	9	0.218	....		
CN Mudanjiang	..	..	..	..	..	..	..	..	..	..	19	58	6	2	..	..	..	..	20	31	35	27	7	0.192	....		
CN Yanji	..	..	..	..	..	..	..	..	..	..	19	56	1	1	..	..	..	..	20	27	21	25	6	0.169	....		
JP Akita	19	30	16	334	2	..	..	..	..	..	19	46	2	5	..	..	..	..	20	1	57	6	7	0.039	....		
JP Aomori	19	28	49	332	2	..	..	..	..	..	19	47	22	6	..	..	..	..	20	6	14	9	9	0.054	....		
JP Asahikawa	19	27	11	326	5	..	..	..	..	..	19	50	57	9	..	..	..	..	20	15	22	14	13	0.087	....		
JP Chitose	19	27	22	327	4	..	..	..	..	..	19	49	57	8	..	..	..	..	20	13	5	13	12	0.079	....		
JP Fukui	..	..	..	..	..	..	..	..	..	..	19	43	37	0	..	..	..	..	19	51	21	358	1	0.010	....		
JP Hachinoe	19	29	46	333	3	..	..	..	..	..	19	46	47	6	..	..	..	..	20	4	3	7	9	0.044	....		
JP Hakodate	19	27	44	329	3	..	..	..	..	..	19	48	47	6	..	..	..	..	20	10	18	12	10	0.069	....		
JP Hanamaki	19	31	45	337	3	..	..	..	..	..	19	45	22	5	..	..	..	..	19	59	3	4	8	0.028	....		
JP Izumo	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	56	17	3	-1	.....	....		
JP Kanazawa	..	..	..	..	..	..	..	..	..	..	19	43	49	0	..	..	..	..	19	52	41	360	2	0.013	....		
JP Matsushima	19	35	44	342	3	..	..	..	..	..	19	43	56	4	..	..	..	..	19	52	1	358	6	0.010	....		
JP Memanbetsu	19	28	3	328	6	..	..	..	..	..	19	50	42	10	..	..	..	..	20	13	54	13	14	0.077	....		
JP Miho	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	55	51	2	0	.....	....		
JP Misawa	19	29	27	333	3	..	..	..	..	..	19	47	2	6	..	..	..	..	20	4	54	8	9	0.048	....		
JP Monbetsu	19	27	22	326	6	..	..	..	..	..	19	51	36	10	..	..	..	..	20	16	30	15	14	0.089	....		
JP Nakashibetsu	19	28	52	329	7	..	..	..	..	..	19	49	58	10	..	..	..	..	20	11	33	11	14	0.066	....		
JP Obihiro	19	28	21	329	5	..	..	..	..	..	19	49	16	9	..	..	..	..	20	10	38	11	12	0.066	....		
JP Oki Island	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	59	22	5	1	.....	....		
JP Rishiri Island	19	26	11	322	4	..	..	..	..	..	19	53	49	9	..	..	..	..	20	22	20	19	14	0.120	....		
JP Sapporo	19	27	24	328	4	..	..	..	..	..	19	49	54	8	..	..	..	..	20	12	58	13	12	0.079	....		
JP Sendai	19	36	27	343	3	..	..	..	..	..	19	43	43	4	..	..	..	..	19	50	51	357	5	0.008	....		
JP Shonai	19	31	38	337	1	..	..	..	..	..	19	45	9	4	..	..	..	..	19	58	44	4	6	0.028	....		
JP Tokachi	19	28	11	329	5	..	..	..	..	..	19	49	32	9	..	..	..	..	20	11	21	12	12	0.069	....		
JP Tottori	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	19	53	31	0	0	.....	....		
JP Toyama	19	35	8	342	-1	..	..	..	..	..	19	43	42	1	..	..	..	..	19	52	3	359	2	0.011	....		
JP Wakkanai	19	26	22	322	5	..	..	..	..	..	19	53	51	9	..	..	..	..	20	22	14	19	14	0.118	....		
JP Yamagata	19	33	47	340	2	..	..	..	..	..	19	44	20	4	..	..	..	..	19	54	50	1	6	0.017	....		
KR Chuncheon	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	15	2	17	0	.....	....		
KR Kangnung	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	12	55	16	1	.....	....		
KR Pyongyang	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	20	54	21	0	.....	....		
KR Seoul	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	15	17	17	-1	.....	....		
KR Seoul East	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	14	30	17	-1	.....	....		
KR Sokch'O	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	14	40	17	1	.....	....		
KR Wonju	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	13	18	16	0	.....	....		
KR Yangku	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	14	18	17	1	.....	....		
RU Anadyr	19	58	6	320	32	..	..	..	..	..	20	36	54	35	..	..	..	..	21	16	56	26	39	0.160	....		
RU Blagoveschensk	19	28	44	308	0	..	..	..	..	..	20	7	26	5	..	..	..	..	20	47	43	36	11	0.282	....		
RU Bratsk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	16	19	52	4	.....	....		
RU Chita	..	..	..	..	..	..	..	..	..	..	20	17	30	0	..	..	..	..	21	0	48	45	5	0.377	....		
RU Irkutsk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	7	39	48	2	.....	....		
RU Khabarovsk	19	26	17	314	2	..	..	..	..	..	20	1	8	8	..	..	..	..	20	37	24	29	13	0.209	....		
RU Magadan	19	36	51	311	17	..	..	..	..	..	20	18	26	22	..	..	..	..	21	1	53	33	27	0.247	....		
RU Murmansk	20	35	45	292	2	..	..	..	..	..	21	25	10	1	..	..	..	..	22	14	23	65	1	0.596	....		
RU Nizhnevartovsk	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	39	50	60	0	.....	....		
RU Okha	19	29	26	312	10	..	..	..	..	..	20	7	1	15	..	..	..	..	20	46	15	30	20	0.221	....		
RU Petropavlovsk	19	36	21	324	19	..	..	..	..	..	20	5	36	24	..	..	..	..	20	35	52	18	28	0.107	....		
RU Pevek	19	54	50	313	28	..	..	..	..	..	20	39	6	32	..	..	..	..	21	24	54	34	36	0.233	....		
RU Polyarny	19	49	36	295	6	..	..	..	..	..	20	38	21	10	..	..	..	..	21	28	41	53	14	0.483	....		
RU Provideniya Bay	19	53	51	318	29	..	..	..	..	..	20	33	44	33	..	..	..	..	21	14	59	28	38	0.177	....		
RU Salekhard	..	..	..	..	..	..	..	..	..	..	21	2	50	0	..	..	..	..	21	52	7	63	2	0.590	....		
RU Ulan-Ude	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	21	4	37	47	3	.....	....		
RU Vladivostok	..	..	..	..	..	..	..	..	..	..	19	55	12	2	..	..	..	..	20	26	1	24	8	0.158	....		
RU Yakutsk	19	39	8	301	8	..	..	..	..	..	20	25	17	13	..	..	..	..	21	13	21	45	19	0.383	....		
RU Yuzhno-Sakhalinsk	19	26	34	321	6	..	..	..	..	..	19	55	53	11	..	..	..	..	20	26	14	21	16	0.133	....		

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	U.T.			PA	Alt	U.T.			PA	Alt	U.T.			PA	Alt	U.T.			PA	Alt	U.T.			PA	Alt							
	h	m	s			h	m	s			h	m	s			h	m	s			h	m	s			h	m	s	h	m		
FI Enontekio	20	41	47	293	2	..	..	..	..	..	..	21	31	7	1	..	..	..	..	..	..	..	22	20	3	65	0	0.587	....			
FI Ivalo	20	39	10	292	2	..	..	..	..	..	..	21	28	33	1	..	..	..	..	..	..	..	22	17	38	65	1	0.591	....			
FI Kemi	20	42	47	293	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
FI Kemijarvi	20	40	28	292	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
FI Kittila	20	41	20	293	1	..	..	..	..	..	..	21	30	27	0	..	..	..	..	..	..	..	22	19	12	65	0	0.589	....			
FI Kuusamo	20	39	30	292	-1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
FI Rovaniemi	20	41	27	293	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
FI Sodankyla	20	40	24	292	1	..	..	..	..	..	..	21	29	24	0	..	..	..	..	..	..	..	22	18	4	65	-1	0.591	....			
FO Vagar	21	8	4	300	3	..	..	..	..	..	..	21	55	15	-1	..	..	..	..	..	..	..	..	..	..	..	..	0.503	....			
FR Miquelon	22	17	5	340	10	..	..	..	..	..	..	22	41	37	7	..	..	..	..	..	..	..	23	5	30	29	3	0.090	....			
GB Scatsta	21	6	4	299	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
GB Stornoway	21	12	33	302	-1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
GB Sumburgh	21	6	44	300	-1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
IS Akureyri	21	9	0	302	9	..	..	..	..	..	..	21	57	33	5	..	..	..	..	..	..	..	22	44	48	60	2	0.483	....			
IS Egilsstadir	21	7	39	301	7	..	..	..	..	..	..	21	56	5	4	..	..	..	..	..	..	..	22	43	17	61	1	0.494	....			
IS Hofn	21	9	39	301	7	..	..	..	..	..	..	21	57	41	3	..	..	..	..	..	..	..	22	44	27	60	0	0.487	....			
IS Husavik	21	8	11	301	9	..	..	..	..	..	..	21	56	52	5	..	..	..	..	..	..	..	22	44	15	60	2	0.487	....			
IS Isafjordur	21	10	50	303	11	..	..	..	..	..	..	21	59	29	7	..	..	..	..	..	..	..	22	46	44	59	3	0.467	....			
IS Keflavik	21	14	11	304	9	..	..	..	..	..	..	22	1	58	5	..	..	..	..	..	..	..	22	48	21	59	1	0.459	....			
IS Kopasker	21	7	7	301	9	..	..	..	..	..	..	21	55	56	5	..	..	..	..	..	..	..	22	43	29	60	2	0.492	....			
IS Patreksfjordur	21	12	7	303	10	..	..	..	..	..	..	22	0	33	6	..	..	..	..	..	..	..	22	47	33	59	3	0.462	....			
IS Reykjavik	21	13	35	303	9	..	..	..	..	..	..	22	1	27	5	..	..	..	..	..	..	..	22	47	55	59	1	0.462	....			
IS Sigluffjordur	21	8	39	302	9	..	..	..	..	..	..	21	57	23	6	..	..	..	..	..	..	..	22	44	48	60	2	0.483	....			
IS Vestmannaeyjar	21	13	53	303	8	..	..	..	..	..	..	22	1	28	4	..	..	..	..	..	..	..	22	47	42	59	0	0.464	....			
NO Alesund	20	58	22	297	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			
NO Alta	20	40	41	293	4	..	..	..	..	..	..	21	30	32	2	..	..	..	..	..	..	..	22	19	59	65	2	0.586	....			
NO Andoya	20	45	24	294	4	..	..	..	..	..	..	21	35	6	2	..	..	..	..	..	..	..	22	24	14	64	1	0.577	....			
NO Banak	20	39	41	293	4	..	..	..	..	..	..	21	29	33	2	..	..	..	..	..	..	..	22	19	4	65	2	0.588	....			
NO Bardufoss	20	44	12	293	4	..	..	..	..	..	..	21	33	48	2	..	..	..	..	..	..	..	22	22	54	64	1	0.580	....			
NO Batsfjord	20	36	39	292	4	..	..	..	..	..	..	21	26	39	3	..	..	..	..	..	..	..	22	16	24	65	3	0.592	....			

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Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt			
	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o		
NO Bodoe	20	48 16	294	3	..	..	..	..	21	37 19	1	..	..	..	..	..	22	25 46	64 -1	0.573	....	
NO Bronnoysund	20	51 19	295	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
NO Evenes	20	45 47	294	3	..	..	..	..	21	35 13	2	..	..	..	..	..	22	24 6	64 1	0.577	....	
NO Floro	21	0 12	297	-1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
NO Hasvik	20	41 1	293	4	..	..	..	..	21	31 2	3	..	..	..	..	..	22	20 38	64 2	0.584	....	
NO Kirkenes	20	37 1	292	3	..	..	..	..	21	26 44	2	..	..	..	..	..	22	16 13	65 2	0.593	....	
NO Kristiansund	20	56 36	296	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
NO Molde	20	57 22	296	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
NO Mosjoen	20	50 22	295	1	..	..	..	..	21	38 55	-1	..	..	..	..	..	..	..	..	..	0.569	....
NO Orland	20	54 47	296	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
NO Sandnessjoen	20	50 41	295	2	..	..	..	..	21	39 18	0	..	..	..	..	..	..	..	..	..	0.567	....
NO Sorkjosen	20	42 13	293	4	..	..	..	..	21	32 1	2	..	..	..	..	..	22	21 23	65 2	0.583	....	
NO Svalbard	20	37 38	295	12	..	..	..	..	21	29 51	11	..	..	..	..	..	22	21 40	63 10	0.556	....	
NO Svartnes	20	36 0	292	3	..	..	..	..	21	25 55	2	..	..	..	..	..	22	15 36	65 2	0.593	....	
NO Tromso	20	43 28	293	4	..	..	..	..	21	33 16	2	..	..	..	..	..	22	22 34	64 2	0.581	....	
NO Trondheim	20	54 6	296	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Amsele	20	47 17	294	-1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Arvidsjaur	20	46 31	294	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Fallfors	20	45 53	294	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Gallivare	20	44 19	293	1	..	..	..	..	21	33 16	0	..	..	..	..	..	..	..	..	..	0.583	....
SE Heden	20	44 51	293	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Hemavan	20	49 7	294	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Jokkmokk	20	45 14	293	1	..	..	..	..	21	33 59	-1	..	..	..	..	..	..	..	..	..	0.582	....
SE Kalixfors	20	44 11	293	2	..	..	..	..	21	33 21	0	..	..	..	..	..	22	22 3	65 0	0.583	....	
SE Kiruna	20	44 5	293	2	..	..	..	..	21	33 16	1	..	..	..	..	..	22	22 0	65 0	0.583	....	
SE Lulea	20	44 38	293	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Lycksele	20	47 43	294	-1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Mohed	20	48 5	294	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Pitea	20	45 19	293	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Vidsel	20	45 43	294	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	
SE Vilhelmina	20	49 0	294	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	

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Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec		
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt					
	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o				
CA Alert	20	42	53	303	25	..	..	..	..	21	36	8	23	..	..	..	..	22	28	35	55	21	0.434	....
CA Baie Comeau	22	25	19	350	17	..	..	..	..	22	41	33	15	..	..	..	..	22	57	33	20	12	0.034	....
CA Baker Lake	21	30	35	334	38	..	..	..	..	22	4	33	34	..	..	..	..	22	37	32	29	31	0.112	....
CA Broughton Island	21	20	1	315	25	..	..	..	..	22	6	59	21	..	..	..	..	22	52	11	48	17	0.306	....
CA Cambridge Bay	21	8	58	326	39	..	..	..	..	21	50	0	36	..	..	..	..	22	30	1	34	33	0.166	....
CA Cape Dorset	21	31	1	325	30	..	..	..	..	22	12	28	25	..	..	..	..	22	52	20	40	21	0.206	....
CA Charlo	22	28	11	351	15	..	..	..	..	22	43	9	13	..	..	..	..	22	57	55	19	11	0.030	....
CA Charlottetown	22	31	18	352	12	..	..	..	..	22	45	6	10	..	..	..	..	22	58	46	18	8	0.026	....
CA Chatham	22	32	18	353	14	..	..	..	..	22	44	33	12	..	..	..	..	22	56	44	16	10	0.020	....
CA Churchill	22	1	55	351	36	..	..	..	..	22	16	48	34	..	..	..	..	22	31	30	15	32	0.021	....
CA Clyde River	21	12	18	314	27	..	..	..	..	22	0	45	23	..	..	..	..	22	47	33	49	19	0.318	....
CA Coppermine	21	8	24	331	42	..	..	..	..	21	44	13	40	..	..	..	..	22	19	22	28	38	0.114	....
CA Dawson	21	10	42	350	48	..	..	..	..	21	20	4	48	..	..	..	..	21	29	20	4	48	0.006	....
CA Deer Lake	22	10	53	336	13	..	..	..	..	22	38	50	9	..	..	..	..	23	5	55	32	5	0.115	....
CA Eskimo Point	21	46	8	342	37	..	..	..	..	22	12	5	34	..	..	..	..	22	37	23	23	31	0.064	....
CA Eureka	20	46	12	307	29	..	..	..	..	21	38	33	27	..	..	..	..	22	29	57	51	25	0.373	....
CA Forestville	22	29	33	353	17	..	..	..	..	22	42	19	15	..	..	..	..	22	54	58	16	13	0.021	....
CA Fort McPherson	20	53	26	334	45	..	..	..	..	21	24	55	44	..	..	..	..	21	56	15	21	44	0.082	....
CA Gander	22	8	54	334	11	..	..	..	..	22	38	13	7	..	..	..	..	23	6	35	34	3	0.131	....
CA Gaspe	22	21	3	345	16	..	..	..	..	22	41	30	12	..	..	..	..	23	1	30	24	9	0.056	....
CA Gjoa Haven	21	14	3	325	37	..	..	..	..	21	56	24	33	..	..	..	..	22	37	28	37	30	0.188	....
CA Goose Bay	22	0	7	332	17	..	..	..	..	22	33	5	13	..	..	..	..	23	4	51	36	8	0.154	....
CA Hall Beach	21	16	32	320	32	..	..	..	..	22	1	59	28	..	..	..	..	22	45	51	43	24	0.246	....
CA Holman Island	20	56	34	325	40	..	..	..	..	21	38	30	39	..	..	..	..	22	19	45	33	37	0.168	....
CA Iles De La Madeleine	22	23	7	345	13	..	..	..	..	22	42	58	10	..	..	..	..	23	2	24	24	7	0.055	....
CA Inuvik	20	51	34	331	44	..	..	..	..	21	26	9	43	..	..	..	..	22	0	30	24	43	0.102	....
CA Iqaluit	21	31	26	321	26	..	..	..	..	22	14	25	22	..	..	..	..	22	55	42	43	17	0.241	....
CA Kuujjuarapik	22	6	15	343	27	..	..	..	..	22	30	7	23	..	..	..	..	22	53	22	25	20	0.064	....
CA La Grande Riviere	22	15	5	348	25	..	..	..	..	22	33	20	23	..	..	..	..	22	51	16	20	20	0.038	....
CA Moncton	22	36	42	356	12	..	..	..	..	22	45	47	11	..	..	..	..	22	54	54	14	9	0.011	....
CA Mont Joli	22	28	25	352	17	..	..	..	..	22	42	26	14	..	..	..	..	22	56	18	18	12	0.025	....
CA Nanisivik	21	3	48	315	32	..	..	..	..	21	52	29	29	..	..	..	..	22	39	45	46	25	0.291	....
CA Natashquan	22	12	1	339	16	..	..	..	..	22	38	35	12	..	..	..	..	23	4	21	30	8	0.098	....
CA Norman Wells	21	12	38	342	46	..	..	..	..	21	35	0	45	..	..	..	..	21	57	9	15	44	0.039	....
CA Old Crow	20	47	12	333	44	..	..	..	..	21	19	32	45	..	..	..	..	21	51	47	22	44	0.087	....
CA Pangnirtung	21	24	5	317	26	..	..	..	..	22	9	45	21	..	..	..	..	22	53	40	47	17	0.283	....
CA Pelly Bay	21	15	56	323	35	..	..	..	..	21	59	28	31	..	..	..	..	22	41	35	39	27	0.209	....
CA Pond Inlet	21	5	44	314	30	..	..	..	..	21	54	46	27	..	..	..	..	22	42	17	47	23	0.308	....
CA Port Menier	22	16	12	342	16	..	..	..	..	22	39	43	13	..	..	..	..	23	2	37	27	9	0.075	....
CA Quujuaq	21	49	16	329	24	..	..	..	..	22	25	26	19	..	..	..	..	23	0	13	37	15	0.168	....
CA Rankin Inlet	21	37	18	335	36	..	..	..	..	22	9	45	33	..	..	..	..	22	41	14	29	29	0.105	....
CA Repulse Bay	21	23	14	325	34	..	..	..	..	22	4	57	30	..	..	..	..	22	45	13	38	26	0.193	....
CA Resolute	20	56	30	315	33	..	..	..	..	21	45	37	31	..	..	..	..	22	33	33	45	28	0.286	....
CA Riviere Du Loup	22	41	47	3	15	..	..	..	..	22	44	2	15	..	..	..	..	22	46	25	7	14	0.001	....
CA Sachs Harbour	20	48	9	323	40	..	..	..	..	21	31	38	39	..	..	..	..	22	14	36	34	37	0.183	....
CA Schefferville	21	59	40	334	21	..	..	..	..	22	31	29	17	..	..	..	..	23	2	10	34	13	0.132	....
CA Sept-Iles	22	17	1	343	18	..	..	..	..	22	39	25	14	..	..	..	..	23	1	17	25	11	0.066	....
CA Spence Bay	21	11	44	322	36	..	..	..	..	21	55	48	32	..	..	..	..	22	38	32	39	29	0.211	....
CA St. Anthony	22	2	42	331	14	..	..	..	..	22	35	1	9	..	..	..	..	23	6	11	36	5	0.156	....
CA St. John'S	22	11	10	335	9	..	..	..	..	22	39	22	5	..	..	..	..	23	6	43	33	1	0.124	....
CA Stephenville	22	14	27	339	13	..	..	..	..	22	40	14	9	..	..	..	..	23	5	17	30	5	0.097	....
CA Summerside	22	32	0	352	13	..	..	..	..	22	45	3	11	..	..	..	..	22	58	0	17	8	0.023	....
CA Sydney	22	26	4	347	11	..	..	..	..	22	44	20	8	..	..	..	..	23	2	17	23	5	0.048	....
CA Tuktoyaktuk	20	48	29	328	43	..	..	..	..	21	26	15	42	..	..	..	..	22	3	46	27	41	0.126	....
CA Wabush	22	6	38	338	20	..	..	..	..	22	34	51	16	..	..	..	..	23	2	11	31	12	0.104	....
CA Yellowknife	21	45	49	356	44	..	..	..	..	21	52	15	43	..	..	..	..	21	58	39	5	43	0.003	....
US Barter Island AK	20	36	32	325	41	..	..	..	..	21	16	20	42	..	..	..	..	21	56	10	29	42	0.144	....
US Clear Mews AK	20	49	4	342	46	..	..	..	..	21	7	22	47	..	..	..	..	21	25	38	9	48	0.025	....
US Deadhorse AK	20	31	32	324	40	..	..	..	..	21	11	56	42	..	..	..	..	21	52	32	29	42	0.151	....
US Delta Junction AK	20	58	30	347	48	..	..	..	..	21	11	28	48	..	..	..	..	21	24	20	5	48	0.012	....
US Fairbanks AK	20	48	5	340	46	..	..	..	..	21	9	16	47	..	..	..	..	21	30	27	11	47	0.035	....
US Fort Yukon AK	20	43	59	334	45	..	..	..	..	21	13	17	45	..	..	..	..	21	42	37	18	46	0.070	....



P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrise  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrise  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunset  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunset

U1, first contact : point of the Earth in which the eclipse begins as total at sunrise  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrise  
U3, third contact : point of the Earth in which the eclipse begins as total at sunset  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunset

#### Legenda:

La località e lo stato

I vari tempi dei contatti, se presenti. Se l'evento avviene il giorno prima o quello dopo la data della predizione è presente un segno "-" o "+" immediatamente dopo l'ora.

La posizione dell'angolo di contatto per ogni evento.

L'altitudine del Sole.

La magnitudine dell'eclisse.

Nel caso delle eclissi centrali, la durata.

The site name and location.

The UTC - for 1st and 4th contacts of partial eclipse, the time of maximum eclipse, and if the eclipse is central, the times of 2nd & 3rd contacts. Times are not given if the event does not occur, or the sun is not above the horizon. If the event occurs on the day preceding or following the date of the prediction, a '-' or '+' (respectively) occurs immediately after the predicted time.

The position angle of contact - at start and end of partial eclipse, and start and end of annular or total eclipse;

The altitude of the sun - at start and end of partial eclipse, and at maximum eclipse;

If maximum eclipse is visible at the location, the magnitude at maximum eclipse;

If central eclipse occurs at the location, the duration of the central eclipse.

[Note: The magnitude is computed as the fraction of the solar diameter that is obscured by the moon.

During central eclipse, this value equals (diameter of moon / diameter of sun) - irrespective of location across the center path.]

# Total Lunar Eclipse of 2011 Jun 15

Ecliptic Conjunction = 20:14:41.4 TD (= 20:13:34.1 UT)

Greatest Eclipse = 20:13:43.5 TD (= 20:12:36.2 UT)

Penumbral Magnitude = 2.6868

P. Radius = 1.2504°

Gamma = 0.0897

Umbral Magnitude = 1.6999

U. Radius = 0.7256°

Axis = 0.0875°

Saros Series = 130

Member = 34 of 72

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 05h35m33.6s

Dec. = +23°19'06.1"

S.D. = 00°15'44.7"

H.P. = 00°00'08.7"

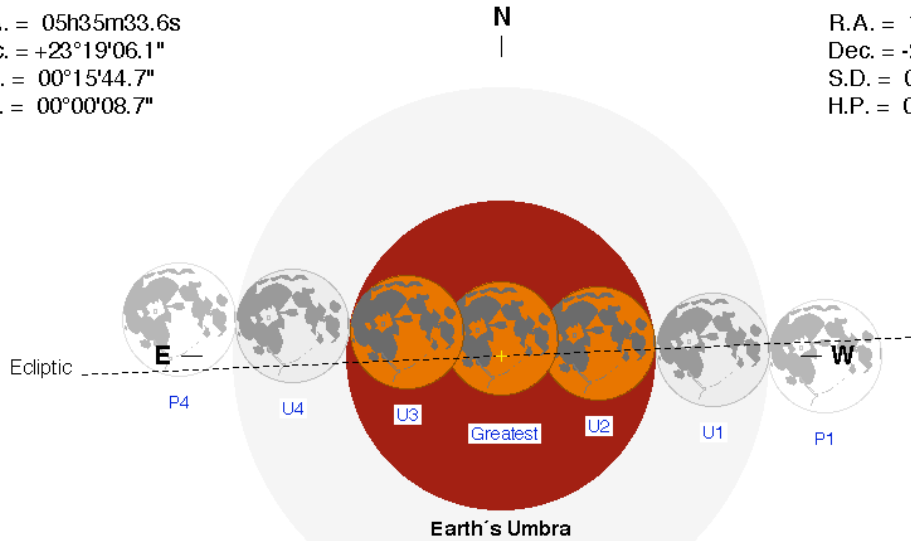
## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 17h35m32.3s

Dec. = -23°13'51.6"

S.D. = 00°15'57.2"

H.P. = 00°58'33.0"



## Eclipse Durations

Penumbra = 05h36m05s

Umbral = 03h39m17s

Total = 01h40m12s

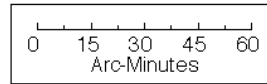
ΔT = 67 s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85

## Earth's Penumra

S



F. Espenak, NASA's GSFC

[eclipse.gsfc.nasa.gov/eclipse.html](http://eclipse.gsfc.nasa.gov/eclipse.html)

## Eclipse Contacts

P1 = 17:24:37 UT

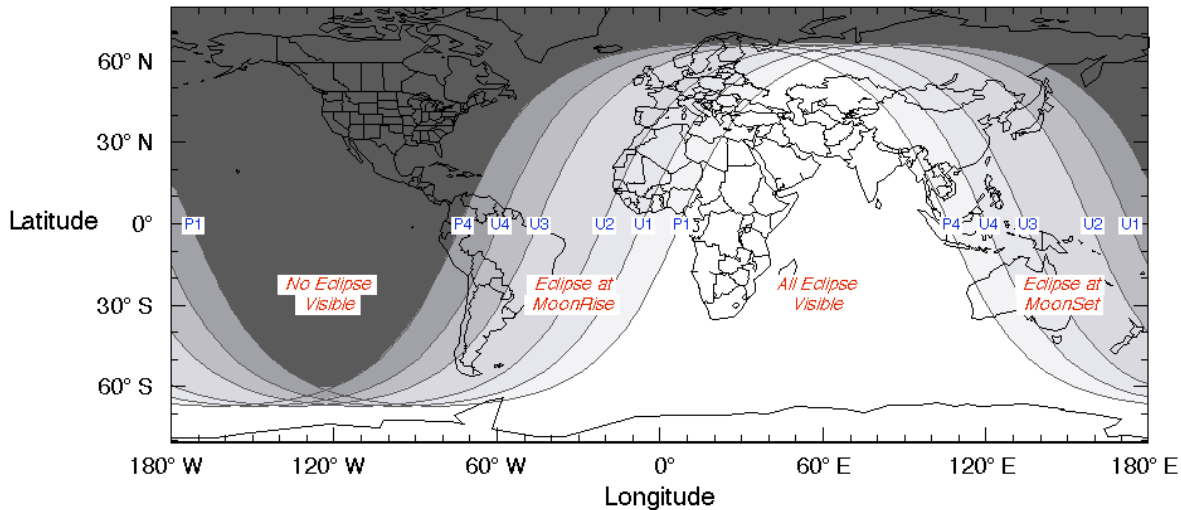
U1 = 18:22:57 UT

U2 = 19:22:29 UT

U3 = 21:02:42 UT

U4 = 22:02:14 UT

P4 = 23:00:41 UT



2009 Apr 29

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

# Partial Solar Eclipse of 2011 Jul 01

Geocentric Conjunction = 09:05:32.9 UT      J.D. = 2455743.878852  
 Greatest Eclipse = 08:38:24.3 UT      J.D. = 2455743.860004

Eclipse Magnitude = 0.0966      Gamma = -1.4919

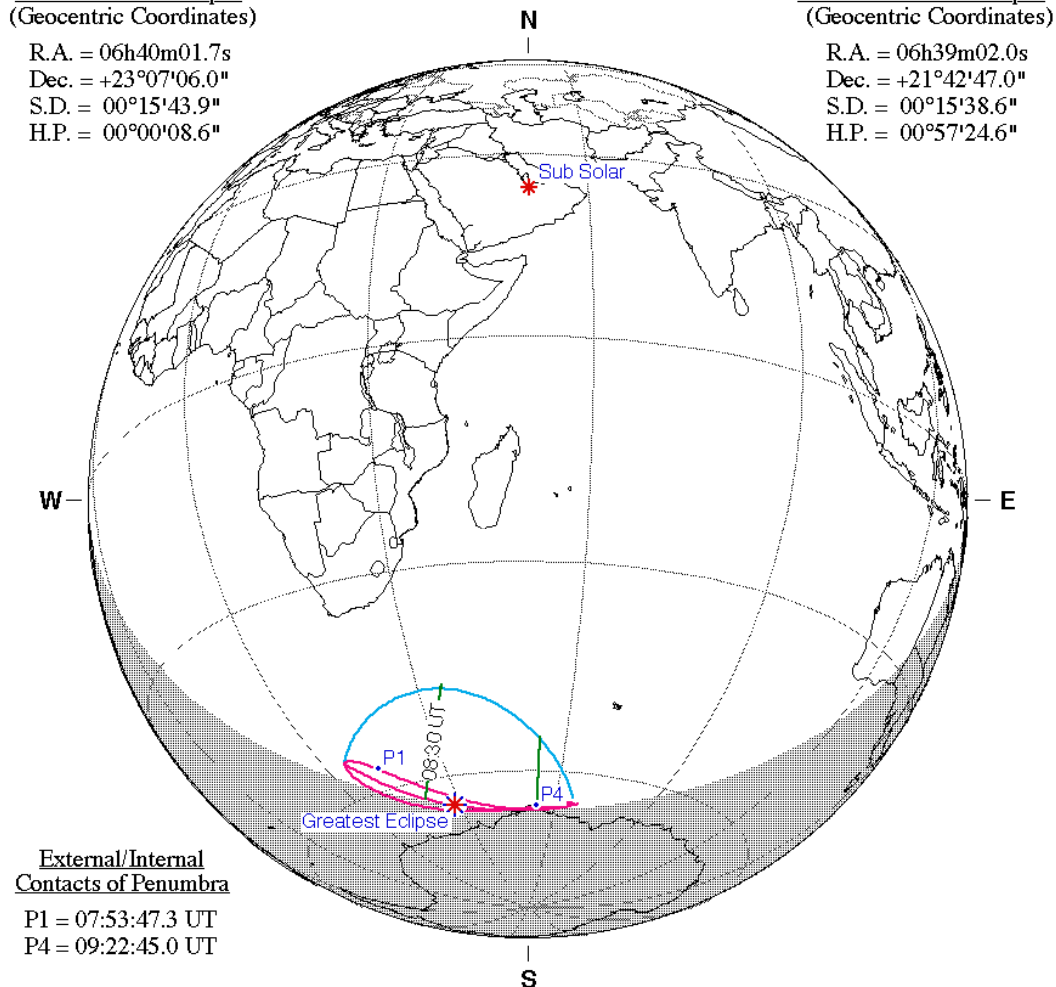
Saros Series = 156      Member = 1 of 69

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 06h40m01.7s  
 Dec. = +23°07'06.0"  
 S.D. = 00°15'43.9"  
 H.P. = 00°00'08.6"

## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 06h39m02.0s  
 Dec. = +21°42'47.0"  
 S.D. = 00°15'38.6"  
 H.P. = 00°57'24.6"



## External/Internal Contacts of Penumbra

P1 = 07:53:47.3 UT  
 P4 = 09:22:45.0 UT

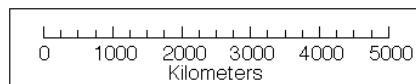
## Ephemeris & Constants

Eph. = Newcomb/ILE  
 $\Delta T = 68.1$  s  
 $k1 = 0.2724880$   
 $k2 = 0.2722810$   
 $\Delta b = 0.0''$      $\Delta l = 0.0''$

## Geocentric Libration (Optical + Physical)

$l = -5.16^\circ$   
 $b = 1.81^\circ$   
 $c = 2.39^\circ$

Brown Lun. No. = 1095



*F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)*

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
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U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

#### Legenda:

La località e lo stato

I vari tempi dei contatti, se presenti. Se l'evento avviene il giorno prima o quello dopo la data della predizione è presente un segno "-" o "+" immediatamente dopo l'ora.

La posizione dell'angolo di contatto per ogni evento.

L'altitudine del Sole.

La magnitudine dell'eclisse.

Nel caso delle eclissi centrali, la durata.

The site name and location.

The UTC - for 1st and 4th contacts of partial eclipse, the time of maximum eclipse, and if the eclipse is central, the times of 2nd & 3rd contacts. Times are not given if the event does not occur, or the sun is not above the horizon. If the event occurs on the day preceding or following the date of the prediction, a '-' or '+' (respectively) occurs immediately after the predicted time.

The position angle of contact - at start and end of partial eclipse, and start and end of annular or total eclipse;

The altitude of the sun - at start and end of partial eclipse, and at maximum eclipse;

If maximum eclipse is visible at the location, the magnitude at maximum eclipse;

If central eclipse occurs at the location, the duration of the central eclipse.

[Note: The magnitude is computed as the fraction of the solar diameter that is obscured by the moon.

During central eclipse, this value equals (diameter of moon / diameter of sun) - irrespective of location across the center path.]

# Partial Solar Eclipse of 2011 Nov 25

Geocentric Conjunction = 06:31:19.5 UT J.D. = 2455890.771754

Greatest Eclipse = 06:20:15.9 UT J.D. = 2455890.764073

Eclipse Magnitude = 0.9048 Gamma = -1.0535

Saros Series = 123 Member = 53 of 70

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 16h02m13.6s

Dec. = -20°40'56.1"

S.D. = 00°16'12.1"

H.P. = 00°00'08.9"

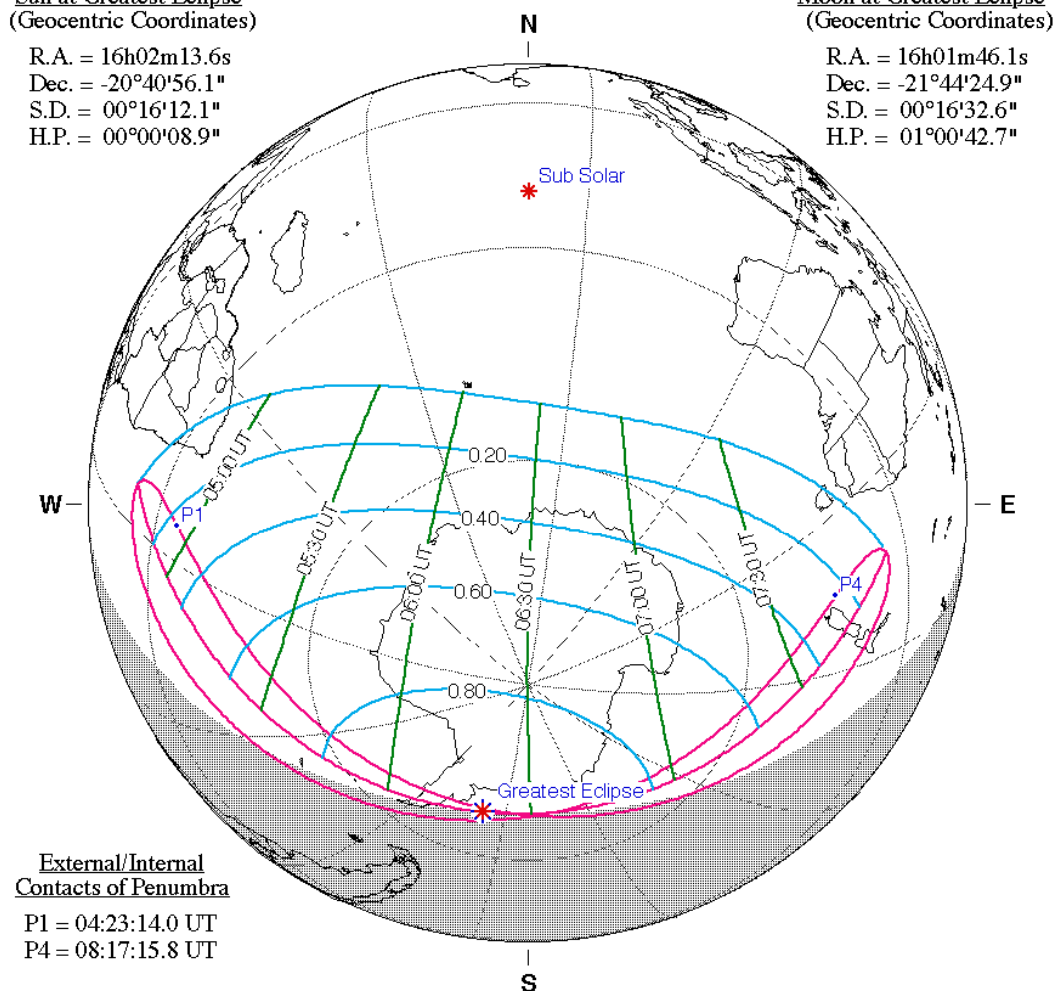
## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 16h01m46.1s

Dec. = -21°44'24.9"

S.D. = 00°16'32.6"

H.P. = 01°00'42.7"



## External/Internal Contacts of Penumbra

P1 = 04:23:14.0 UT

P4 = 08:17:15.8 UT

## Ephemeris & Constants

Eph. = Newcomb/ILE

$\Delta T = 68.5$  s

$k1 = 0.2724880$

$k2 = 0.2722810$

$\Delta b = 0.0''$   $\Delta l = 0.0''$

## Geocentric Libration (Optical + Physical)

$l = 2.91^\circ$

$b = 1.35^\circ$

$c = 12.80^\circ$

Brown Lun. No. = 1100



F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

## AFRICA

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Mag	Central Durn sec
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt			
	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o	h	m	s	o		
ZA Aggeneys	4	42	54	198	12	..	..	..	..	4	46	29	13	..	..	..	..	4	49	54	0.002	....
ZA Alexander Bay	4	38	35	202	9	..	..	..	..	4	45	58	11	..	..	..	..	4	53	16	0.009	....
ZA Calvinia	4	33	27	210	12	..	..	..	..	4	49	18	15	..	..	..	..	5	5	23	0.041	....
ZA Cape Town	4	28	15	220	10	..	..	..	..	4	52	47	15	..	..	..	..	5	18	8	0.105	....
ZA George	4	32	22	215	14	..	..	..	..	4	52	46	18	..	..	..	..	5	13	43	0.067	....
ZA Grahamstown	4	44	20	202	20	..	..	..	..	4	52	3	21	..	..	..	..	4	59	40	0.009	....
ZA Kleinsee	4	34	23	207	9	..	..	..	..	4	47	16	12	..	..	..	..	5	0	14	0.028	....
ZA Langebaanweg	4	28	55	218	10	..	..	..	..	4	51	26	14	..	..	..	..	5	14	39	0.088	....
ZA Oudtshoorn	4	32	46	214	14	..	..	..	..	4	52	11	18	..	..	..	..	5	12	4	0.061	....
ZA Overberg	4	29	13	219	12	..	..	..	..	4	53	33	17	..	..	..	..	5	18	42	0.100	....
ZA Plettenberg Bay	4	33	37	214	15	..	..	..	..	4	52	56	19	..	..	..	..	5	12	43	0.059	....
ZA Port Elizabeth	4	38	13	209	18	..	..	..	..	4	53	0	21	..	..	..	..	5	7	57	0.033	....
ZA Robertson	4	29	39	218	12	..	..	..	..	4	52	30	16	..	..	..	..	5	16	3	0.088	....
ZA Saldanha	4	28	44	218	10	..	..	..	..	4	51	27	14	..	..	..	..	5	14	52	0.090	....
ZA Springbok	4	36	8	205	10	..	..	..	..	4	47	7	13	..	..	..	..	4	58	6	0.020	....
ZA Vredendal	4	31	27	213	10	..	..	..	..	4	49	37	14	..	..	..	..	5	8	10	0.056	....
ZA Ysterplaat	4	28	14	220	10	..	..	..	..	4	52	42	15	..	..	..	..	5	18	0	0.104	....

## OCEANIA

Site	1st Contact				2nd Contact				Maximum				3rd Contact				4th Contact				Central	
	U.T.		PA Alt		U.T.		PA		U.T.		Alt		U.T.		PA		U.T.		PA Alt		Mag	Durn sec
	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o	h	m s	o	o		
AU Hobart	7	30	13	198	19	..	..	..	..	7	49	15	15	..	..	..	..	8	7	56	0.057	....
AU Launceston	7	38	17	192	17	..	..	..	..	7	51	1	15	..	..	..	..	8	3	41	0.025	....
NZ Alexandra	7	5	27	223	8	..	..	..	..	7	41	55	3	..	..	..	..	..	..	..	0.285	....
NZ Chatham Island	7	3	40	226	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Christchurch	7	7	12	223	5	..	..	..	..	7	42	33	0	..	..	..	..	..	..	..	0.277	....
NZ Dunedin	7	3	17	225	8	..	..	..	..	7	40	44	3	..	..	..	..	..	..	..	0.305	....
NZ Glentanner	7	7	58	222	7	..	..	..	..	7	43	9	1	..	..	..	..	..	..	..	0.267	....
NZ Hastings	7	12	23	219	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Hokitika	7	10	9	220	6	..	..	..	..	7	44	6	0	..	..	..	..	..	..	..	0.250	....
NZ Invercargill	7	3	19	225	10	..	..	..	..	7	40	52	4	..	..	..	..	..	..	..	0.299	....
NZ Manapouri	7	5	47	223	10	..	..	..	..	7	42	10	4	..	..	..	..	..	..	..	0.278	....
NZ Masterton	7	10	24	221	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Mount Cook	7	8	18	222	7	..	..	..	..	7	43	19	1	..	..	..	..	..	..	..	0.264	....
NZ Nelson	7	11	41	219	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ New Plymouth	7	16	17	216	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Oamaru	7	4	53	224	7	..	..	..	..	7	41	31	1	..	..	..	..	..	..	..	0.294	....
NZ Ohakea	7	12	21	219	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Palmerston North	7	11	53	219	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Paraparaumu	7	11	6	220	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Pukaki	7	7	13	222	7	..	..	..	..	7	42	46	1	..	..	..	..	..	..	..	0.273	....
NZ Queenstown International	7	6	18	223	9	..	..	..	..	7	42	24	3	..	..	..	..	..	..	..	0.277	....
NZ Taupo	7	15	6	217	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Timaru	7	6	18	223	7	..	..	..	..	7	42	13	1	..	..	..	..	..	..	..	0.282	....
NZ Waiouru	7	13	51	218	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Wanaka	7	6	40	223	8	..	..	..	..	7	42	33	2	..	..	..	..	..	..	..	0.275	....
NZ Wanganui	7	13	14	218	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Wellington	7	10	18	221	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Westport	7	12	0	219	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....
NZ Weydon	5	58	16	256	22	..	..	..	..	6	52	16	19	..	..	..	..	7	45	7	0.705	....
NZ Wigram	7	7	3	223	5	..	..	..	..	7	42	29	0	..	..	..	..	..	..	..	0.279	....
NZ Woodbourne	7	10	38	220	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	....	....

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

#### Legenda:

La località e lo stato

I vari tempi dei contatti, se presenti. Se l'evento avviene il giorno prima o quello dopo la data della predizione è presente un segno "-" o "+" immediatamente dopo l'ora.

La posizione dell'angolo di contatto per ogni evento.

L'altitudine del Sole.

La magnitudine dell'eclisse.

Nel caso delle eclissi centrali, la durata.

The site name and location.

The UTC - for 1st and 4th contacts of partial eclipse, the time of maximum eclipse, and if the eclipse is central, the times of 2nd & 3rd contacts. Times are not given if the event does not occur, or the sun is not above the horizon. If the event occurs on the day preceding or following the date of the prediction, a '-' or '+' (respectively) occurs immediately after the predicted time.

The position angle of contact - at start and end of partial eclipse, and start and end of annular or total eclipse;

The altitude of the sun - at start and end of partial eclipse, and at maximum eclipse;

If maximum eclipse is visible at the location, the magnitude at maximum eclipse;

If central eclipse occurs at the location, the duration of the central eclipse.

[Note: The magnitude is computed as the fraction of the solar diameter that is obscured by the moon.

During central eclipse, this value equals (diameter of moon / diameter of sun) - irrespective of location across the center path.]



# Total Lunar Eclipse of 2011 Dec 10

Ecliptic Conjunction = 14:37:29.1 TD (= 14:36:21.6 UT)

Greatest Eclipse = 14:32:56.5 TD (= 14:31:49.0 UT)

Penumbral Magnitude = 2.1860

P. Radius = 1.2023°

Gamma = -0.3882

Umbral Magnitude = 1.1061

U. Radius = 0.6609°

Axis = 0.3571°

Saros Series = 135

Member = 23 of 71

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 17h08m35.0s

Dec. = -22°54'38.7"

S.D. = 00°16'14.5"

H.P. = 00°00'08.9"

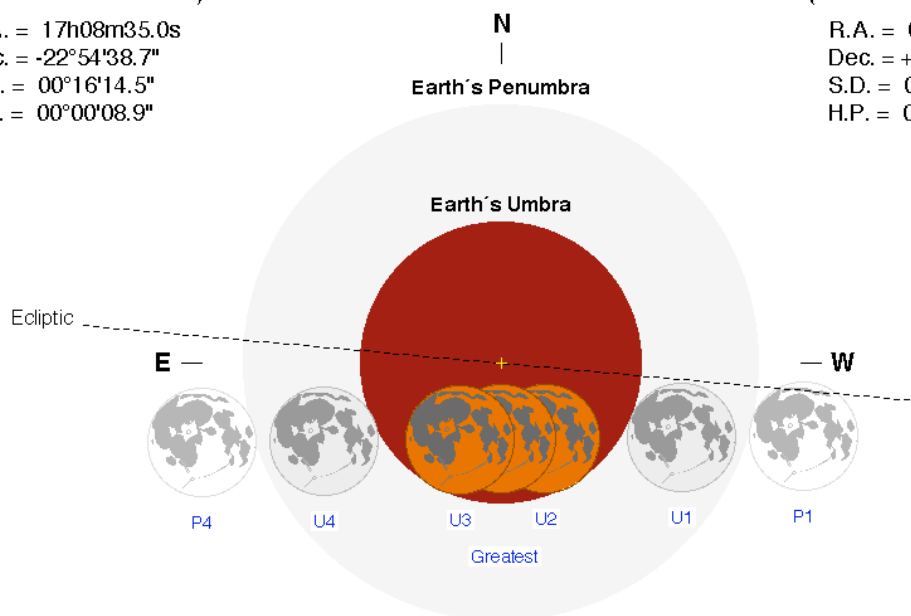
## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 05h08m33.9s

Dec. = +22°33'13.3"

S.D. = 00°15'02.4"

H.P. = 00°55'11.7"



## Eclipse Durations

Penumbral = 05h56m21s

Umbral = 03h32m15s

Total = 00h51m08s

ΔT = 68 s

Rule = CdT (Danjon)

Eph. = VSOP87/ELP2000-85

## Eclipse Contacts

P1 = 11:33:36 UT

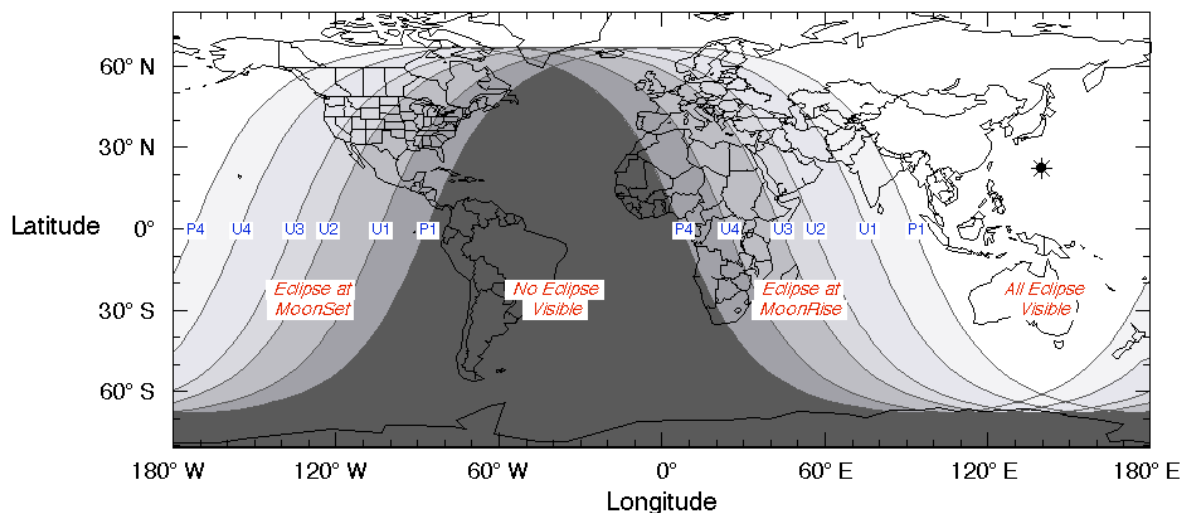
U1 = 12:45:43 UT

U2 = 14:06:16 UT

U3 = 14:57:24 UT

U4 = 16:17:58 UT

P4 = 17:29:57 UT



2009 Apr 29

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
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U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

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P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

# SCIAMI METEORICI - METEOR SHOWERS

Shower	Activity	Max	$\lambda_{sol}$	$\alpha$	$\delta$	$v_{inf}$	$r$	ZHR
Antihelion Source (ANT)	Nov 26 - Sep 24					30	3.0	4
Quadrantids (QUA)	Jan 01 - Jan 05	Jan 03	283°16	230°	+49°	41	2.1	120
$\alpha$ -Centaurids (ACE)	Jan 28 - Feb 21	Feb 07	319°2	211°	-59°	56	2.0	5
$\delta$ -Leonids (DLE)	Feb 15 - Mar 10	Feb 25	336°	168°	+16°	23	3.0	2
$\gamma$ -Normids (GNO)	Feb 25 - Mar 22	Mar 13	353°	239°	-50°	56	2.4	4
Lyrids (LYR)	Apr 16 - Apr 25	Apr 22	32°32	271°	+34°	49	2.1	18
$\pi$ -Puppids (PPU)	Apr 15 - Apr 28	Apr 23	33°5	110°	-45°	18	2.0	Var
$\eta$ -Aquariids (ETA)	Apr 19 - May 28	May 06	45°5	338°	-01°	66	2.4	85(*)
$\eta$ -Lyrids (ELY)	May 03 - May 12	May 09	48°4	287°	+44°	44	3.0	3
June Bootids (JBO)	Jun 22 - Jul 02	Jun 27	95°7	224°	+48°	18	2.2	Var
Piscis Austrinids (PAU)	Jul 15 - Aug 10	Jul 28	125°	341°	-30°	35	3.2	5
South. $\delta$ -Aquariids (SDA)	Jul 12 - Aug 19	Jul 28	125°	339°	-16°	41	3.2	20
$\alpha$ -Capricornids (CAP)	Jul 03 - Aug 15	Jul 30	127°	307°	-10°	23	2.5	4
Perseids (PER)(*)	Jul 17 - Aug 24	Aug 12	140°0	48°	+58°	59	2.6	100
$\kappa$ -Cygids (KCG)	Aug 03 - Aug 25	Aug 17	145°	286°	+59°	25	3.0	3
$\alpha$ -Aurigids (AUR)	Aug 25 - Sep 08	Sep 01	158°6	84°	+42°	66	2.6	7
September Perseids (SPE)	Sep 05 - Sep 17	Sep 09	166°7	60°	+47°	64	2.9	5
$\delta$ -Aurigids (DAU)	Sep 18 - Oct 10	Sep 29	186°	82°	+49°	64	2.9	3
Draconids (DRA)	Oct 06 - Oct 10	Oct 08	195°4	262°	+54°	20	2.6	Var
$\epsilon$ -Geminids (EGE)	Oct 14 - Oct 27	Oct 18	205°	102°	+27°	70	3.0	2
Orionids (ORI)	Oct 02 - Nov 07	Oct 21	208°	95°	+16°	66	2.5	30(*)
Leo Minorids (LMI)	Oct 19 - Oct 27	Oct 23	210°	161°	+38°	62	3.0	2
Southern Taurids (STA)	Sep 25 - Nov 25	Nov 05	223°	52°	+15°	27	2.3	5
Northern Taurids (NTA)	Sep 25 - Nov 25	Nov 12	230°	58°	+22°	29	2.3	5
Leonids (LEO)	Nov 10 - Nov 23	Nov 17	235°27	152°	+22°	71	2.5	100+(*)
$\alpha$ -Monocerotids (AMO)	Nov 15 - Nov 25	Nov 21	239°32	117°	+01°	65	2.4	Var
Dec Phoenicids (PHO)	Nov 28 - Dec 09	Dec 06	254°25	18°	-53°	18	2.8	Var
Puppids/Velids (PUP)	Dec 01 - Dec 15	(Dec 07)	(255°)	123°	-45°	40	2.9	10
Monocerotids (MON)	Nov 27 - Dec 17	Dec 09	257°	100°	+08°	42	3.0	2
$\sigma$ -Hydrids (HYD)	Dec 03 - Dec 15	Dec 12	260°	127°	+02°	58	3.0	3
Geminids (GEM)	Dec 07 - Dec 17	Dec 14	262°2	112°	+33°	35	2.6	120
Ursids (URS)	Dec 17 - Dec 26	Dec 22	270°7	217°	+76°	33	3.0	10
Coma Berenicids (CBE)	Dec 12 - Jan 23	Dec 30	278°	170°	+26°	65	3.0	5

\* Sciami con più picchi

\* An asterisk '\*' in the 'Shower' column indicates that source may have additional peak

Shower : sciame meteoric

Activity : period di attività

Max : data prevista del massimo

# VISIBILITA' DEI RADIANTI

## VISIBILITY OF THE SHOWERS

Roma : 42 N, 12 E (UT)

Oggetto: Quadrantidi

Data	Ora	Alt	Az	Sole	Luna
2011:01:04	18:00	7.0	335.7	Crep.a	Sotto
2011:01:04	19:00	3.2	344.8	Notte	Sotto
2011:01:04	20:00	1.2	354.5	Notte	Sotto
2011:01:04	21:00	1.1	4.3	Notte	Sotto
2011:01:04	22:00	2.9	14.0	Notte	Sotto
2011:01:04	23:00	6.4	23.2	Notte	Sotto
2011:01:05	00:00	11.6	31.7	Notte	Sotto
2011:01:05	01:00	18.1	39.4	Notte	Sotto
2011:01:05	02:00	25.7	46.1	Notte	Sotto
2011:01:05	03:00	34.2	52.0	Notte	Sotto
2011:01:05	04:00	43.3	56.8	Notte	Sotto
2011:01:05	05:00	52.9	60.3	Notte	Sotto
2011:01:05	06:00	62.7	61.8	Crep.a	Sotto
2011:01:05	07:00	72.4	58.2	Crep.n	Sotto

Oggetto: Liridi

Data	Ora	Alt	Az	Sole	Luna
2011:04:22	20:00	2.1	44.1	Crep.n	Sotto
2011:04:22	21:00	10.5	53.3	Notte	Sotto
2011:04:22	22:00	20.0	61.8	Notte	Sotto
2011:04:22	23:00	30.2	69.7	Notte	Sotto
2011:04:23	00:00	40.9	77.5	Notte	Sotto
2011:04:23	01:00	52.0	85.8	Notte	Sopra
2011:04:23	02:00	63.2	96.2	Notte	Sopra
2011:04:23	03:00	74.0	113.7	Notte	Sopra
2011:04:23	04:00	81.8	164.1	Crep.a	Sopra

Oggetto: Perseidi

Data	Ora	Alt	Az	Sole	Luna
2011:08:12	20:00	13.1	16.0	Crep.n	Sopra
2011:08:12	21:00	16.8	23.2	Crep.a	Sopra
2011:08:12	22:00	21.8	29.8	Notte	Sopra

2011:08:12	23:00	27.9	35.5	Notte	Sopra
2011:08:13	00:00	34.7	40.2	Notte	Sopra
2011:08:13	01:00	42.2	43.6	Notte	Sopra
2011:08:13	02:00	50.1	45.3	Notte	Sopra
2011:08:13	03:00	58.0	44.4	Notte	Sopra
2011:08:13	04:00	65.5	38.8	Crep.a	Sopra
2011:08:13	05:00	71.5	24.3	Crep.c	Sotto

Oggetto: Leonidi

Data	Ora	Alt	Az	Sole	Luna
2011:11:17	23:00	-1.1	58.7	Notte	Sopra
2011:11:18	00:00	9.0	68.4	Notte	Sopra
2011:11:18	01:00	19.7	77.7	Notte	Sopra
2011:11:18	02:00	30.7	87.0	Notte	Sopra
2011:11:18	03:00	41.9	97.4	Notte	Sopra
2011:11:18	04:00	52.8	110.4	Notte	Sopra
2011:11:18	05:00	62.5	129.3	Notte	Sopra
2011:11:18	06:00	69.1	159.9	Crep.n	Sopra

Oggetto: Geminidi

Data	Ora	Alt	Az	Sole	Luna
2011:12:14	18:00	2.2	45.7	Crep.a	Sotto
2011:12:14	19:00	10.8	55.0	Notte	Sotto
2011:12:14	20:00	20.4	63.4	Notte	Sotto
2011:12:14	21:00	30.7	71.5	Notte	Sopra
2011:12:14	22:00	41.6	79.5	Notte	Sopra
2011:12:14	23:00	52.7	88.3	Notte	Sopra
2011:12:15	00:00	63.8	99.6	Notte	Sopra
2011:12:15	01:00	74.4	119.5	Notte	Sopra
2011:12:15	02:00	81.1	173.7	Notte	Sopra
2011:12:15	03:00	75.9	235.6	Notte	Sopra
2011:12:15	04:00	65.5	258.2	Notte	Sopra
2011:12:15	05:00	54.4	270.2	Notte	Sopra
2011:12:15	06:00	43.2	279.3	Crep.a	Sopra
2011:12:15	07:00	32.4	287.3	Crep.c	Sopra

Data, ora, altezza ed azimut dei principali radianti; posizione del Sole (giorno, crepuscolo civile, crepuscolo nautico, crepuscolo astronomico, notte); Luna (sopra o sotto l'orizzonte)

Date, times, height and azimuth of some radiants; position of the Sun (giorno=day, crep.c.=civil twilight, crep.n.=nautical twilight, crep.a.=astronomical twilight, notte=night); Moon (sopra=up or sotto=down the horizon)

# TABELLA DI CONVERSIONE MAGNITUDINE ASSOLUTA

## TABLE OF CONVERSION OF ABSOLUTE MAGNITUDE

UA-H	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0,001	918,09	579,28	365,50	230,62	145,51	91,81	57,93	36,55	23,06	14,55	9,18	5,79	3,66	2,31	1,46	0,92	0,58	0,37
0,005	183,62	115,86	73,10	46,12	29,10	18,36	11,59	7,31	4,61	2,91	1,84	1,16	0,73	0,46	0,29	0,18	0,12	0,07
0,01	91,81	57,93	36,55	23,06	14,55	9,18	5,79	3,66	2,31	1,46	0,92	0,58	0,37	0,23	0,15	0,09	0,06	0,04
0,05	18,36	11,59	7,31	4,61	2,91	1,84	1,16	0,73	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01
0,1	9,18	5,79	3,66	2,31	1,46	0,92	0,58	0,37	0,23	0,15	0,09	0,06	0,04	0,02	0,01	0,01	0,01	0,00
0,2	4,59	2,90	1,83	1,15	0,73	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00
0,3	3,06	1,93	1,22	0,77	0,49	0,31	0,19	0,12	0,08	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00
0,4	2,30	1,45	0,91	0,58	0,36	0,23	0,14	0,09	0,06	0,04	0,02	0,01	0,01	0,01	0,00	0,00	0,00	0,00
0,5	1,84	1,16	0,73	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00
0,6	1,53	0,97	0,61	0,38	0,24	0,15	0,10	0,06	0,04	0,02	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00
0,7	1,31	0,83	0,52	0,33	0,21	0,13	0,08	0,05	0,03	0,02	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,00
0,8	1,15	0,72	0,46	0,29	0,18	0,11	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
0,9	1,02	0,64	0,41	0,26	0,16	0,10	0,06	0,04	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
1	0,92	0,58	0,37	0,23	0,15	0,09	0,06	0,04	0,02	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
1,5	0,61	0,39	0,24	0,15	0,10	0,06	0,04	0,02	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

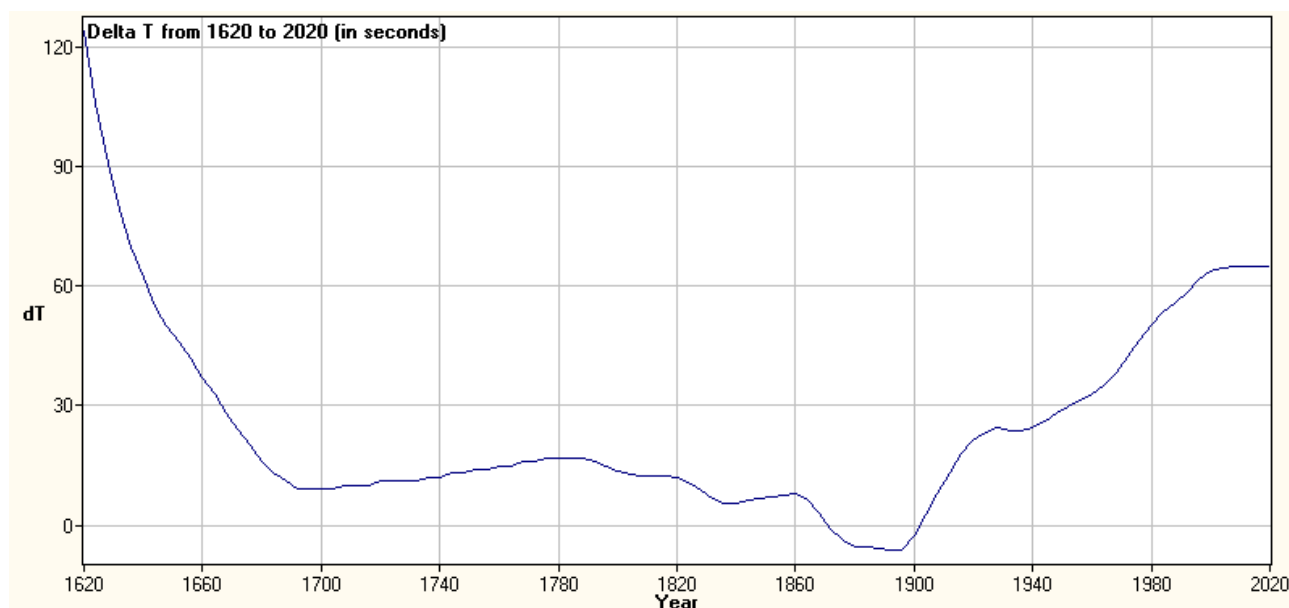
Utilizzo: conoscendo la magnitudine assoluta di un asteroide (H) e la sua distanza dalla Terra (UA) la tabella fornisce il diametro minimo del corpo in secondi d'arco.

Esempio: un asteroide con H=4 che si trovi a 0.05 U.A. dalla Terra avrà una dimensione minima di circa 11.6" d'arco. La dimensione massima è pari a circa il doppio.

How to use: knowing the absolute magnitude of an asteroid (H) and its distance from the Earth (UA) the chart furnishes the least diameter of the body in seconds of arc.

## ΔT DIFFERENZA TDT-UT

## ΔT DIFFERENCE TDT-UT



Differenza in secondi tra il Tempo Dinamico Terrestre ed il Tempo Universale, utile al fine di calcolare gli istanti geocentrici e topocentrici dei fenomeni celesti

Difference in second between Terrestrial Dynamical Time and the Universal Time, useful with the purpose to calculate the instants of the geocentric and topocentric celestial phenomena

# CORREZIONI DELL'ISTANTE DEL SORGERE E TRAMONTARE DEL SOLE, DELLA LUNA E DEI PIANETI PER LATITUDINI DIVERSE DA 42° CORRECTION OF RISING AND SETTING OF THE SUN, THE MOON AND THE PLANETS FOR LATITUDE DIFFERENT FROM 42°

	36	37	38	39	40	41	42	43	44	45	46	47	48
30	29	25	20	15	10	5	0	-5	-10	-16	-22	-28	-34
29	27	23	19	14	10	5	0	-5	-10	-15	-21	-27	-33
28	25	21	17	13	9	4	0	-5	-10	-15	-20	-25	-31
27	24	20	16	12	8	4	0	-5	-9	-14	-19	-24	-29
26	22	19	15	11	7	4	0	-5	-9	-13	-18	-23	-28
25	21	18	14	11	7	3	0	-4	-8	-13	-17	-21	-26
24	20	17	13	10	7	3	0	-4	-8	-12	-16	-20	-25
23	19	16	13	10	6	3	0	-4	-7	-11	-15	-19	-23
22	18	15	12	9	6	3	0	-3	-7	-10	-14	-18	-22
21	17	14	11	9	6	3	0	-3	-6	-10	-13	-17	-20
20	16	13	11	8	6	3	0	-3	-6	-9	-12	-15	-19
19	15	13	11	8	6	3	0	-2	-5	-8	-11	-14	-17
18	14	11	9	7	5	2	0	-3	-5	-8	-11	-14	-17
17	13	11	9	7	5	2	0	-2	-5	-7	-10	-13	-16
16	12	10	9	7	5	2	0	-2	-4	-7	-9	-12	-14
15	11	9	7	5	4	2	0	-2	-5	-7	-9	-11	-14
14	10	9	7	5	4	2	0	-2	-4	-6	-8	-10	-12
13	10	8	7	5	4	2	0	-1	-3	-5	-7	-9	-11
12	9	7	6	4	3	1	0	-2	-4	-5	-7	-9	-11
11	8	7	6	4	3	2	0	-1	-3	-4	-6	-8	-9
10	7	6	4	3	2	1	0	-2	-3	-5	-6	-8	-9
9	6	5	4	3	2	1	0	-1	-2	-4	-5	-6	-8
8	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
7	5	4	3	2	2	1	0	-1	-2	-3	-4	-5	-6
6	5	4	3	2	2	1	0	-1	-1	-2	-3	-4	-5
5	3	3	2	2	1	0	0	-1	-2	-2	-3	-4	-5
4	3	3	2	2	1	1	0	0	-1	-1	-2	-3	-3
3	2	1	1	1	0	0	0	-1	-1	-2	-2	-2	-3
2	1	1	1	1	1	0	0	0	0	-1	-1	-1	-2
1	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	1	1	1	1	1	1
-2	-1	-1	-1	-1	-1	0	0	0	0	1	1	1	2
-3	-2	-1	-1	-1	0	0	0	1	1	2	2	2	3
-4	-3	-3	-2	-2	-1	-1	0	0	1	1	2	3	3
-5	-3	-3	-2	-2	-1	0	0	1	2	2	3	4	5
-6	-5	-4	-3	-2	-2	-1	0	1	1	2	3	4	5
-7	-5	-4	-3	-2	-2	-1	0	1	2	3	4	5	6
-8	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
-9	-6	-5	-4	-3	-2	-1	0	1	2	4	5	6	8
-10	-7	-6	-4	-3	-2	-1	0	2	3	5	6	8	9
-11	-8	-7	-6	-4	-3	-2	0	1	3	4	6	8	9
-12	-9	-7	-6	-4	-3	-1	0	2	4	5	7	9	11
-13	-10	-8	-7	-5	-4	-2	0	1	3	5	7	9	11
-14	-10	-9	-7	-5	-4	-2	0	2	4	6	8	10	12
-15	-11	-9	-7	-5	-4	-2	0	2	5	7	9	11	14
-16	-12	-10	-9	-7	-5	-2	0	2	4	7	9	12	14
-17	-13	-11	-9	-7	-5	-2	0	2	5	7	10	13	16
-18	-14	-11	-9	-7	-5	-2	0	3	5	8	11	14	17
-19	-15	-13	-11	-8	-6	-3	0	2	5	8	11	14	17
-20	-16	-13	-11	-8	-6	-3	0	3	6	9	12	15	19
-21	-17	-14	-11	-9	-6	-3	0	3	6	10	13	17	20
-22	-18	-15	-12	-9	-6	-3	0	3	7	10	14	18	22
-23	-19	-16	-13	-10	-6	-3	0	4	7	11	15	19	23
-24	-20	-17	-13	-10	-7	-3	0	4	8	12	16	20	25
-25	-21	-18	-14	-11	-7	-3	0	4	8	13	17	21	26
-26	-22	-19	-15	-11	-7	-4	0	5	9	13	18	23	28
-27	-24	-20	-16	-12	-8	-4	0	5	9	14	19	24	29
-28	-25	-21	-17	-13	-9	-4	0	5	10	15	20	25	31
-29	-27	-23	-19	-14	-10	-5	0	5	10	15	21	27	33
-30	-29	-25	-20	-15	-10	-5	0	5	10	16	22	28	34

I valori sono espressi in minuti di tempo e vanno presi con il segno indicato per il sorgere dell'oggetto, e col segno opposto per il tramonto.

In alto sono indicati i valori della latitudine, a sinistra i valori della declinazione.

Vanno aggiunti anche 4 minuti ogni grado di longitudine più verso ovest rispetto ai 12° di tutte le tabelle dell'almanacco. Sottratti se verso est.

Esempio : 01/01/2009, declinazione del Sole - 23° circa. Esso sorge a Roma (42°N) alle 07.40 e tramonta alle 16.51. Per un luogo alla stessa longitudine, ma a 46° N, il Sole sorge alle 07.40+ 15 minuti =7.55 e tramonta alle 16.51- 15 minuti =16.36 circa.

The values are express in minutes of time and must be taken with the suitable sign for rising, and with the opposite sign for the sunseting.

Aloft are suitable the values of the latitude, to the left the values of the declination. They must also be added 4 minutes every degree of longitude toward west in comparison to the 12° of all the charts of the almanac.

Subtracted if toward east.

## ORIZZONTE REALE - REAL HORIZON

E' la distanza dell'orizzonte visibile da un osservatore in una giornata perfettamente limpida, trascurando la rifrazione atmosferica.

It is the distance of the visible horizon from an observer in a perfectly clear day, neglecting the atmospheric refraction.

h (m)	km
0	0,0
1	3,6
2	5,0
3	6,2
4	7,1
5	8,0
6	8,7
7	9,4
8	10,1
9	10,7
10	11,3
20	16,0

30	19,6
40	22,6
50	25,2
60	27,7
70	29,9
80	31,9
90	33,9
100	35,7
200	50,5
300	61,8
400	71,4
500	79,8
600	87,4

700	94,5
800	101,0
900	107,1
1000	112,9
1100	118,4
1200	123,7
1300	128,7
1400	133,6
1500	138,3
1600	142,8
1700	147,2
1800	151,5
1900	155,6

2000	159,7
2100	163,6
2200	167,4
2300	171,2
2400	174,9
2500	178,5
2600	182,0
2700	185,5
2800	188,9
2900	192,3

H è l'altezza a cui ci si trova sul livello del mare, in metri  
Esempio, da quota 1600 metri l'orizzonte si estende per 143 km circa.

## RIFRAZIONE - REFRACTION

Angolo in gradi Angle in degrees	Errore in primi Error in primi	Angolo in gradi Angle in degrees	Errore in primi Error in primi
0	34.5	11	4.9
15'	31.4	12	4.5
30'	28.7	13	4.1
45'	26.4	14	3.8
1.00	24.3	15	3.6
1.15	22.5	16	3.3
1.30	20.9	17	3.1
1.45	19.5	18	2.9
2.00	18.3	19	2.8
2.15	17.2	20	2.6
2.30	16.1	25	2.1
2.45	15.2	30	1.7
3.00	14.4	35	1.4
4.30	10.7	50	0.8
5	9.9	55	0.7
6	8.5	60	0.6
7	7.4	65	0.5
8	6.6	70	0.4
9	5.9	80	0.2
10	5.3	90	0.0

# COORDINATE DI ALCUNE CITTA' ITALIANE

## ITALIAN LOCALITIES COORDINATES

Località	Longitudine	Latitudine	Altezza	Località	Longitudine	Latitudine	Altezza
AGRIGENTO	13 36	37 17	230	MESSINA	15 34	38 11	3
ALESSANDRIA	8 36	44 54	95	MILANO	9 11	45 27	122
ANCONA	13 30	43 37	16	MODENA	10 53	44 38	34
AOSTA	7 19	45 44	583	NAPOLI	14 15	40 51	115
AREZZO	11 53	43 27	296	NOVARA	8 37	45 26	159
ASCOLI PICENO	13 34	42 51	154	NUORO	9 20	40 19	532
ASTI	8 12	44 54	123	ORISTANO	8 36	39 54	3
AVELLINO	14 47	40 54	348	PADOVA	11 52	45 24	38
BARI	16 52	41 07	5	PALERMO	13 22	38 08	23
BELLUNO	12 13	46 08	383	PARMA	10 20	44 48	55
BENEVENTO	14 46	41 07	135	PAVIA	9 09	45 11	77
BERGAMO	9 39	45 42	249	PERUGIA	12 23	43 06	493
BOLOGNA	11 21	44 29	84	PESARO	12 54	43 54	11
BOLZANO	11 21	46 29	262	PESCARA	14 12	42 27	4
BRESCIA	10 13	45 32	149	PIACENZA	9 41	45 03	80
BRINDISI	17 46	40 39	15	PISA	10 23	43 43	4
CAGLIARI	9 07	39 13	4	PISTOIA	10 55	43 55	65
CALTANISSETTA	14 03	37 28	568	PORDENONE	12 38	45 57	0
CAMPOBASSO	14 39	41 33	786	POTENZA	15 48	40 38	820
CASERTA	14 19	41 04	68	RAGUSA	14 45	36 56	502
CATANIA	15 05	37 30	47	RAVENNA	12 12	44 25	4
CATANZARO	16 35	38 54	343	REGGIO CALABRIA	15 38	38 06	15
CHIETI	14 10	42 21	330	REGGIO EMILIA	10 37	44 41	58
COMO	9 15	45 47	201	RIETI	12 51	42 24	406
COSENZA	16 15	39 17	238	ROMA	12 27	41 55	143
CREMONA	10 01	45 08	45	ROVERETO	11 03	45 54	220
CUNEO	7 33	44 23	534	ROVIGO	11 47	45 04	7
ENNA	14 17	37 32	931	SALERNO	14 45	40 40	4
FERRARA	11 35	44 50	9	SASSARI	8 33	40 43	225
FIRENZE	11 15	43 45	184	SAVONA	8 29	44 18	4
FOGGIA	15 32	41 27	72	SIENA	11 20	43 19	322
FORLI`	12 02	44 13	34	SIRACUSA	15 18	37 03	17
FROSINONE	13 21	41 38	291	SONDRIO	9 52	46 10	307
GENOVA	8 55	44 25	108	TARANTO	17 13	40 28	15
GORIZIA	13 37	45 56	84	TERAMO	13 44	42 39	398
GROSSETO	11 06	42 45	10	TERNI	12 38	42 33	130
IMPERIA	8 01	43 52	22	TORINO	7 41	45 04	239
ISERNIA	14 15	41 24	0	TRAPANI	12 30	38 01	3
L'AQUILA	13 24	42 21	714	TRENTO	11 07	46 03	194
LA SPEZIA	9 49	44 05	3	TREVISO	12 14	45 39	15
LATINA	12 54	41 27	21	TRIESTE	13 45	45 38	67
LECCE	18 10	40 21	49	UDINE	13 14	46 03	113
LIVORNO	10 18	43 31	3	VARESE	8 48	45 00	000
LUCCA	10 30	43 50	327	VENEZIA	12 20	45 26	1
MACERATA	13 25	43 17	314	VERCELLI	8 25	45 19	130
MANTOVA	10 47	45 09	19	VERONA	10 59	45 26	59
MASSA	10 08	44 01	65	VICENZA	11 32	45 32	39
MATERA	16 36	40 39	399	VITERBO	12 06	42 24	325

Longitudine Est e Latitudine Nord



# POTERE RISOLUTIVO DELL'OCCHIO

## RESOLUTION POWER OF THE EYE

Potere risolutivo dell'occhio nudo in funzione della magnitudine visuale delle due stelle "osservate".

mag1	mag2	p"	mag1	mag2	p"
-3.0	-3.0	1910.18	0.0	0.0	480.56
-3.0	-2.0	1558.02	0.0	1.0	391.96
-3.0	-1.0	1335.71	0.0	2.0	336.04
-3.0	0.0	1195.37	0.0	3.0	300.73
-3.0	1.0	1106.77	0.0	4.0	278.44
-3.0	2.0	1050.85	0.0	5.0	264.37
-3.0	3.0	1015.54	0.0	6.0	255.49
-3.0	4.0	993.25			
-3.0	5.0	979.18	1.0	1.0	303.37
-3.0	6.0	970.30	1.0	2.0	247.44
			1.0	3.0	212.13
-2.0	-2.0	1205.86	1.0	4.0	189.85
-2.0	-1.0	983.55	1.0	5.0	175.78
-2.0	0.0	843.21	1.0	6.0	166.89
-2.0	1.0	754.62			
-2.0	2.0	698.69	2.0	2.0	191.51
-2.0	3.0	663.38	2.0	3.0	156.21
-2.0	4.0	641.09	2.0	4.0	133.92
-2.0	5.0	627.02	2.0	5.0	119.85
-2.0	6.0	618.14	2.0	6.0	110.96
-1.0	-1.0	761.24	3.0	3.0	120.90
-1.0	0.0	620.90	3.0	4.0	98.61
-1.0	1.0	532.31	3.0	5.0	84.54
-1.0	2.0	476.38	3.0	6.0	75.66
-1.0	3.0	441.07			
-1.0	4.0	418.78	4.0	4.0	76.32
-1.0	5.0	404.71	4.0	5.0	62.25
-1.0	6.0	395.83	4.0	6.0	53.37
			5.0	5.0	48.18
			5.0	6.0	39.30
			6.0	6.0	30.42

Prese due stelle o oggetti di magnitudine mag1 e mag2, se la loro distanza angolare è minore del valore p indicato, l'occhio le vedrà come un oggetto unico

# ELENCO DELLE STELLE CON MAGNITUDINE < 5

## STARS WITH MAGNITUDE < 5

-1.5	Alpha	CMA	Sirius	2.6	Kappa	VEL	Markeb	3.1	Gamma	PER	3.5	Epsilon	HYA	
-0.8	Alpha	CAR	Canopus	2.6	Gammal	LEO	Algieba	3.1	Delta	PER	3.5	Lambda	UMA Tania Bor.	
0.0	Alpha1	CEN		2.6	Delta	LEO	Zosma	3.1	PUP	L2 (v)	3.5	Beta	PAV	
Rigil	Kentaur			2.6	Alpha	PEG	Markab	3.1	Beta	CMI	Gomeisa	3.5	Beta	LYR Sheliak
0.1	Alpha	LYR	Vega	2.6	Beta	PEG	Scheat	3.1	Iota	UMA	Talitha	3.5	Mu	HER
0.2	Beta	ORI	Rigel	2.6	Alpha	CEP	Alderamin	3.1	Epsilon	LEO	Asad Austr.	3.5	Gamma	ARA
0.2	Alpha	AUR	Capella	2.6	Epsilon	CYG	Gienah	3.1	Psi	UMA		3.5	Alpha1	HER Rasalgethi
0.2	Alpha	BOO	Arcturus	2.6	Eta	OPH	Sabik	3.1	Eta	PEG	Matar	3.5	Iota	DRA Edasich
0.5	Alpha	CMI	Procyon	2.6	Zeta	OPH	Han	3.1	Gamma	GRU		3.5	Delta	BOO
0.6	Alpha	ERI	Achernar	2.6	Beta	LIB		3.1	Zeta	ARA		3.5	Nu	CEN
0.6	Alpha	ORI	Betelgeuse	Zubeneschamali				3.1	Mul	SCO		3.6	Eta	CAS Achird
0.8	Beta	CEN		2.6	Alpha	LUP	Men	3.1	Gamma	UMI	Pherkad	3.6	Tau	CET
Hadar	(Agena)			2.7	Beta	ARI	Sheratan	3.1	Epsilon	CRV		3.6	Alpha	TRI
0.9	Alpha	AQL	Altair	2.7	Alpha	COL	Phact	3.2	Gamma	HYI		Rasalmothal.		
1.0	Alpha	SCO	Antares	2.7	Theta	AUR		3.2	Epsilon	LEP		3.6	Gamma	CET
1.1	Alpha	TAU	Aldebaran	2.7	Pi	PUP		3.2	Beta	COL	Wazn	Alkaffaljid.		
1.1	Alpha	VIR	Spica	2.7	Zeta	SGR	Ascella	3.2	Mu	GEM	Tejat	3.6	Delta	ERI Rana
1.2	Beta	GEM	Pollux	2.7	Betal	SCO	Graffias	3.2	Nu	PUP		3.6	Upsilon4	ERI
1.2	Alpha	PSA	Fomalhaut	2.7	Beta	CRV	Kraz	3.2	Epsilon	GEM	Mebstuta	3.6	Epsilon	TAU Ain
1.3	Alpha	LEO	Regulus	2.7	Gamma	CRV	Minkar	3.2	Mu	UMA	Tania	3.6	Theta2	TAU
1.3	Alpha	CYG	Deneb	2.8	Beta	HYI		Austr.				3.6	Tau	ORI
1.4	Alpha2	CEN		2.8	Gamma	CAS	Cih	3.2	Nu	HYA		3.6	Beta	DOR
1.4	Beta	CRU	Mimosa	2.8	Delta	CAS	Ruchbah	3.2	Lambda	CEN		3.6	Zeta	LEP
1.4	Alpha1	CRU	Acruz	2.8	Alpha	CET	Menkar	3.2	Alpha	AQR	Sadalmelik	3.6	Theta	GEM
1.6	Epsilon	CMA	Adhara	2.8	Beta	ERI	Kursa	3.2	Alpha	IND		3.6	Sigma	CMA
1.6	Alpha	GEM	Castor	2.8	Iota	ORI	Hatysa	3.2	Beta	CAP	Dabih	3.6	Lambda	GEM
1.6	Lambda	SCO	Shaula	2.8	Tau	PUP		3.2	Betal	CYG	Albireo	3.6	Chi	CAR
1.6	Gamma	CRU	Gacrux	2.8	Rho	PUP	Turais	3.2	Delta	DRA	Altais	3.6	Omicron	VEL
1.7	Gamma	ORI	Bellatrix	2.8	Mu	VEL		3.2	Phi	SGR		3.6	Psi	VEL
1.7	Epsilon	UMA	Alioth	2.8	Gamma	AQL	Tarazed	3.2	Eta	SGR		3.6	Phi	VEL
1.8	Beta	TAU	Elnath	2.8	Lambda	SGR	Kaus	3.2		SCO	G Sco	3.6	Eta	LEO
1.8	Epsilon	ORI	Anilam	Boreal.				3.2	Delta	HER	Sarin	3.6	Zeta	LEO Adhafera
1.8	Gamma2	VEL	Regor	2.8	Delta	SGR	Kaus Media	3.2	Zeta	DRA	Aldibah	3.6	Gamma2	LEO
1.8	Epsilon	CAR	Avior	2.8	Upsilon	SCO	Lesath	3.2	Epsilon	OPH	Yed Poster.	3.6	Xi	HYA
1.8	Beta	CAR	Miaplacidus	2.8	Beta	ARA		3.2	Eta	LUP		3.6	Omicron	AND
1.9	Alpha	PER	Mirfak	2.8	Tau	SCO		3.2	Epsilon	LUP		3.6	Epsilon	GRU
1.9	Gamma	GEM	Alhena	2.8	Beta	HER	Kornephoros	3.2	Kappa	CEN		3.6	Zeta	PEG Homam
1.9	Epsilon	SGR	Kaus	2.8	Delta	OPH	Yed Prior	3.2	Mu	CEN		3.6	Zeta	CEP
Austral				2.8	Alpha	SER	Unuk-al-hai	3.2	Gamma	HYA		3.6	Beta	IND
1.9	Alpha	TRA	Atria	2.8	Beta	LUP	Kekouan	3.3	Pi3	ORI		3.6	Eta	CEP
1.9	Eta	UMA	Alkaid	2.8	Alpha2	LIB		3.3	Eta	AUR		3.6	Delta	PAV
2.0	Omicron	CET	Mira	Zubenelgenubi				3.3	Mu	LEP		3.6	Xi2	SGR
2.0	Zeta	ORI	Alnitak	2.8	Zeta	CEN		3.3	Alpha	PIC		3.6	Alpha	TEL
2.0	Beta	CMA	Mirzam	2.8	Eta	BOO	Muphrid	3.3	Sigma	PUP		3.6	Eta	PAV
2.0	Delta	CMA	Wezea	2.8	Iota	CEN		3.3	Zeta	HYA		3.6	Xi	SER
2.0	Delta	VEL	Koo She	2.8	Alpha	MUS		3.3	Alpha	LYN		3.6	Mu2	SCO
2.0	Alpha	UMA	Dubhe	2.8	Delta	CEN		3.3	Theta	UMA		3.6	Eta	HER
2.0	Alpha	GRU	Al Na'ir	2.9	Gamma	PEG	Algenib	3.3	Beta	CEP	Alfirk	3.6	Mu	SER
2.0	Alpha	PAV	Peacock	2.9	Beta	PER	Algol	3.3	Gamma	LYR	Sulafat	3.6	Phi1	LUP
2.0	Sigma	SGR	Nunki	2.9	Zeta	PER	Atik	3.3	Delta	LUP		3.6	Beta	BOO Nekkar
2.0	Theta	SCO	Sargas	2.9	Iota	AUR	Hassaleh	3.3	Alpha	CIR		3.6	Delta	OCT
2.1	Alpha	AND	Alpheratz	2.9	Beta	LEP	Nihal	3.3	Beta	MUS		3.6	Alpha	DRA Thuban
2.1	Beta	CET	Diphda	2.9	Upsilon	CAR		3.4	Beta	PHE		3.6	Delta	MUS
2.1	Alpha	UMI	Polaris	2.9	Theta	CAR		3.4	Gamma	PHE		3.6	Epsilon	CRU
2.1	Beta	AUR	Menkalinan	2.9	Alpha	TUC		3.4	Epsilon	CAS	Segin	3.7	Iota	CET Shemali
2.1	Alpha	HYA	Alphard	2.9	Beta	OPH	Cebalrai	3.4	Thetal	ERI	Acamar	3.7	Zeta	CAS
2.1	Alpha	OPH	Rasalhague	2.9	Eta	DRA	Aldibahin	3.4	Alpha	RET		3.7	Theta	CET
2.2	Alpha	ARI	Hamal	2.9	Beta	TRA		3.4	Alpha	DOR		3.7	Eta	PSC Alpherq
2.2	Kappa	ORI	Saiph	2.9	Alpha2	CVN	Cor Caroli	3.4	Eta	ORI	Algiebbah	3.7	Chi	ERI
2.2	Lambda	VEL	Al Suhail	2.9	Gamma	VIR	Arich	3.4	Xi	GEM	Alzirr	3.7	Phi	ERI
2.2	Beta	LEO	Denebola	3.0	Alpha	HYI		3.4	Xi	PUP	Asmidiske	3.7		ARI
2.2	Beta	GRU	Al Dhanab	3.0	Eta	TAU	Alcyone	3.4		CAR		3.7	Rho	PER
2.2	Beta	UMI	Kochab	3.0	Epsilon	PER		3.4	Omega	CAR		3.7	Lambda	ORI Meissa
2.2	Theta	CEN	Menkent	3.0	Gamma	ERI	Zaurak	3.4		CAR	q Car	3.7	Gamma	LEP
2.3	Gamma1	AND	Almaak	3.0	Zeta	TAU	Alheka	3.4		CAR	p Car	3.7	Eta	GEM Propus
2.3	Zeta	PUP	Suhail	3.0	Zeta	CMA	Furud	3.4	Theta	LEO	Chertan	3.7	Kappa	GEM
Hadar				3.0	Omicron2	CMA		3.4	Gamma	CEP	Alrai	3.7		PUP
2.3	Iota	CAR	Aspidiske	3.0		VEL	N Vel	3.4	Delta	AQR	Skat	3.7	Beta	VOL
2.3	Gamma	CYG	Sadr	3.0	Delta	CAP	Deneb	3.4	Zeta	CYG		3.7	Alpha	PYX
2.3	Alpha	CRB	Alphecca	Algedi				3.4	Theta	AQL		3.7	Kappa	UMA
2.4	Beta	CAS	Caph	3.0	Beta	AQR	Sadalsuud	3.4	Delta	AQL		3.7	Lambda	HYA
2.4	Alpha	PHE	Ankaa	3.0	Delta	CYG		3.4	Tau	SGR		3.7	Nu	UMA Alula Bor.
2.4	Beta	AND	Mirach	3.0	Pi	SGR	Albaldah	3.4	Lambda	AQL	Althaimain	3.7	Delta	CRT
2.4	Eta	CMA	Aludra	3.0	Zeta	AQL	Dheneb	3.4	Eta	SER		3.7	Lambda	MUS
2.4	Beta	UMA	Merak	3.0	Gamma2	SGR	Alnasl	3.4	Nu	OPH		3.7	Mu	PEG Sadalbari
2.4	Gamma	DRA	Eltanin	3.0	Iotal	SCO		3.4	Theta	OPH		3.7	Iota	CEP
2.4	Kappa	SCO	Girtab	3.0	Alpha	ARA	Choo	3.4	Pi	HER		3.7	Theta	PEG Biham
2.4	Epsilon	SCO	Wei	3.0	Beta	DRA	Rastaban	3.4	Eta	SCO		3.7	Beta	DEL Rotanev
2.4	Delta	SCO	Dschubba	3.0	Zeta	HER	Ruticulus	3.4	Kappa	OPH		3.7	Alpha2	CAP Secunda
2.4	Eta	CEN		3.0	Sigma	SCO	Alniyat	3.4	Zeta	LUP		Gaedi		
2.4	Epsilon	CEN		3.0	Pi	SCO		3.4	Sigma	LIB		3.7	Gamma	SGE
2.4	Zeta	UMA	Mizar	3.0	Gamma	LUP		3.4	Pi	HYA		3.7	Chi	DRA
2.4	Gamma	CEN		3.0	Gamma	TRA		3.4	Zeta	VIR	Heze	3.7		OPH
2.5	Alpha	CAS	Schedar	3.0	Gamma	BOO	Seginus	3.4	Delta	UMA	Megrez	3.7	Gamma	OPH
2.5	Delta	ORI	Mintaka	3.0	Epsilon	VIR		3.5	Delta	AND		3.7	Delta	ARA
2.5	Gamma	UMA	Phecda	Vindemiatrix				3.5	Eta	CET		3.7	Beta	SER
2.5	Epsilon	PEG	Enif	3.0	Delta	CRV	Algoral	3.5	Epsilon	AUR		3.7	Upsilon	LIB
2.5	Epsilon	BOO	Izar	3.0	Delta	CRU		3.5	Delta	GEM	Wasat	3.7	Beta	CRB Nusakan
2.6	Alpha	LEP	Arneb	3.1	Beta	TRI		3.5	Omicron	UMA	Muscida	3.7	Pi	LUP

3.7	Delta	VIR	Minelauva	4.0	Delta	PHE	4.1	Mu	LEO	Rassalas	4.3		CET	
3.8		AND		4.0	Delta	CET	4.1	Gamma	CHA		4.3	Beta1	TUC	
3.8	Zeta	CET	Baten	4.0	Eta	PER	4.1	Pi	CEN		4.3	Zeta	AND	
Kaitos				4.0	Eta	ERI	Azha	4.1	Sigma	LEO	4.3	Phi	AND	
3.8	Omicron	TAU		4.0	Kappa	PER	Misam	4.1	Gamma	CRT	4.3	Alpha	PSC	
3.8	Xi	TAU		4.0	Alpha	FOR		4.1	Lambda	DRA	Giansar	4.3	Xi2	CET
3.8	Epsilon	ERI		4.0	Tau4	ERI	Angetenar	4.1		AQR		4.3		PER
3.8	Beta	RET		4.0		TAU	Maia	4.1	Tau2	AQR		4.3		TAU
3.8		TAU	Electra	4.0	Xi	PER	Menkib	4.1	Lambda	PEG		4.3	Tau5	ERI
3.8		TAU	Atlas	4.0	Lambda	TAU		4.1	Eta	AQR		4.3	Psi	PER
3.8	Alpha	HOR		4.0	Upsilon	PER	Nembus	4.1	Alpha	EQU	Kitalpha	4.3		TAU
3.8	Upsilon2	ERI	Theemini	4.0	Omicron1	ERI	Beid	4.1		CYG		4.3	Lambda	PER
3.8	Pi4	ORI		4.0		ERI		4.1	Alpha	CRA		4.3	Mu	PER
3.8	Sigma	ORI		4.0	Thetal	TAU		4.1	Thetal	SER		4.3	Mu	TAU
3.8	Delta	LEP		4.0	Nu	ERI		4.1		OPH		4.3	Upsilon1	ERI
3.8	Eta	LEP		4.0		ERI	Sceptrum	4.1	Epsilon1	ARA		4.3		TAU
3.8	Gamma2	VOL		4.0	Eta	COL		4.1	Omegal	SCO		4.3	Tau	TAU
3.8	Omega	CMA		4.0	Delta	COL	JabhalAkrab					4.3	Omicron2	ORI
3.8	Beta	CNC		4.0	Delta	VOL		4.1	Theta	DRA		4.3	Lambda	ERI
3.8	Theta	HYA		4.0	Alpha	MON		4.1	Epsilon	TRA		4.3	Lambda	LEP
3.8		LYN		4.0	Beta	PYX		4.1	Delta	SER		4.3		ORI
3.8		UMA		4.0		HYA		4.1		CEN		4.3		GEM
3.8	Omicron	LEO	Subra	4.0		CAR		4.1	Theta	BOO		4.3	Sigma	GEM
3.8		CAR	1 Car (v)	4.0		CAR		4.1	Psi	CEN		4.3		PUP
3.8	Beta	VIR	Zavijava	4.0	Mu	HYA		4.1	Iota	LUP		4.3		PUP
3.8		AQR		4.0	Iota	LEO		4.2	Zeta	TUC		4.3		PUP
3.8	Lambda	AQR		4.0	Beta	HYA		4.2	Beta2	TUC		4.3	Theta	CHA
3.8	Nu	OCT		4.0	Omega	PSC		4.2	Kappa	CAS		4.3	Eta	HYA
3.8	Gamma	CAP	Nashira	4.0	Lambda	AND		4.2	Upsilon	AND		4.3	Alpha	CNC
3.8	Zeta	CAP		4.0	Gamma	TUC		4.2	Phi	PER		4.3		VEL
3.8	Tau	CYG		4.0	Iota	GRU		4.2	Delta	HYI		4.3	Upsilon1	HYA
3.8	Epsilon	AQR	Albali	4.0	Theta	GRU		4.2	Epsilon	HYI		4.3	Kappa	AND
3.8	Delta	SGE		4.0	Deltal	GRU		4.2	Theta	PER		4.3	Iota	PSC
3.8	Zeta	TEL		4.0	Delta	CEP		4.2	Tau3	ERI		4.3	Iota	AND
3.8	Omicron	HER		4.0	Gamma	AQR	Sadachbia	4.2	Iota	PER		4.3	Phi	AQR
3.8	Theta	ARA		4.0	Iota	PEG		4.2	Tau6	ERI		4.3	Delta	PSA
3.8	Xi	HER		4.0	Mu	CEP	Granate	4.2	Epsilon	RET		4.3	Gamma	PSA
3.8	Iota	HER		Star				4.2	Delta3	TAU		4.3	Xi	PEG
3.8	Zeta2	SCO		4.0	Nu	CYG		4.2	Beta	CAM		4.3	Delta2	GRU
3.8	Eta	ARA		4.0	Epsilon	DEL		4.2	Gammal	CAE		4.3	Pi2	CYG
3.8	Gamma	HER		4.0		CYG		4.2	Iota	LEP		4.3	Kappa	PEG
3.8	Xi	SCO		4.0	Epsilon	PAV		4.2	Kappa	LEP		4.3		CAP
3.8	Rho	SCO		4.0	Eta	CYG		4.2		ORI		4.3	Iota	CAP
3.8	Epsilon	SER		4.0	Eta	AQL		4.2	Nu	AUR		4.3		PEG
3.8	Tau	LIB		4.0	Epsilon	DRA	Tyl	4.2	Mu	ORI		4.3	Sigma	CYG
3.8	Kappa1	LUP		4.0	Alpha	SGR	Rukbat	4.2	Theta	CMA		4.3		CYG
3.8	Alpha	APS		4.0	Rho1	SGR		4.2	Rho	GEM		4.3	Theta	CEP
3.8		VIR		4.0	Kappa	CYG		4.2	Upsilon	GEM		4.3		CYG
3.8	Rho	BOO		4.0	Beta	CRA		4.2		PUP		4.3	Iota	AQL
3.8	Phi	CEN		4.0	Gamma	CRA		4.2		PUP		4.3	Beta2	SGR
3.9	Epsilon	PHE		4.0		AQL		4.2		PUP		4.3		LYR
3.9	Kappa	PHE		4.0	Kappa	PAV		4.2	Zeta	MON		4.3		HER
3.9	Mu	AND		4.0	Zeta	PAV		4.2	Delta	HYA		4.3	Zeta1	LYR
3.9	Omicron	PER	Ati	4.0	Alpha	SCT		4.2	Delta	CNC	Asellus	4.3	Kappa	LYR
3.9	Nu	PER		4.0	Mu	SGR	Polis	Aus.				4.3		HER
3.9	Nu	TAU		4.0		OPH		4.2	Iotal	CNC		4.3	Iota	OPH
3.9	Gamma	TAU	Hyadum I	4.0	Theta	HER		4.2		CAR		4.3		SCO
3.9	Delta1	TAU		4.0	Gamma2	NOR		4.2	Alpha	CRT	Alkes	4.3	Sigma	HER
3.9	Pi5	ORI		4.0	Nu	SCO	Jabbah	4.2	Nu	VIR		4.3	Phi	HER
3.9	Zeta	AUR	Sadatoni	4.0	Chi	LUP		4.2	Zeta	GRU		4.3	Iotal	NOR
3.9	Epsilon	COL		4.0	Omega	LUP		4.2	Beta	OCT		4.3	Theta	LIB
3.9	Beta	PIC		4.0	Gamma	LIB		4.2	Epsilon	PSA		4.3	Kappa	SER
3.9	Delta	AUR	Zubenelhakrabi	4.0				4.2	Theta	AQR	Ancha	4.3	Zeta	UMI
3.9	Kappa	CMA		4.0		LUP		4.2		LAC		4.3	Gamma	CIR
3.9	Zeta	GEM	Mekbuda	4.0	Mu	VIR		4.2	Epsilon	CEP		4.3	Mu	LUP
3.9	Iota	GEM		4.0	Rho	LUP		4.2	Rho	CYG		4.3		CEN
3.9	Zeta	VOL		4.0	Upsilon1	CEN		4.2	Gamma	PAV		4.3	Lambda	BOO
3.9	Alpha	CHA		4.0		CEN		4.2	Theta	IND		4.3	Tau	VIR
3.9		CAR		4.0		UMA	Alcor	4.2	Theta	CAP		4.3	Upsilon	BOO
3.9	Upsilon	UMA		4.0	Zeta	UMA		4.2	Omega	CAP		4.3		CEN
3.9	Rho	LEO		4.0		CEN		4.2	Psi	CAP		4.3	Beta	COM
3.9		VEL		4.0	Tau	CEN		4.2		CYG		4.3	Mu1	CRU
3.9		LMI	Praecipua	4.0	Gamma	MUS		4.2	Iota	SGR		4.3	Beta	CVN
3.9		CAR		4.0	Sigma	CEN		4.2	Chi	CYG		4.4	Theta	AND
3.9	Xi	UMA	Alula	4.0	Eta	VIR	Zaniah	4.2	Beta1	SGR	Arkab	4.4	Eta	PHE
Austr.				4.0	Rho	CEN		4.2	Epsilon	AQL		4.4	Nu	AND
3.9	Chi	UMA	Alkafzah	4.0	Eta	CRU		4.2	Phi	DRA		4.4	Alpha	SCL
3.9	Gamma	PSC		4.1	Zeta	PHE		4.2		SCO		4.4	Psi	PHE
3.9	Alpha	LAC		4.1	Upsilon	CET		4.2		OPH		4.4	Kappa	ERI
3.9	Xi	CYG		4.1		CAS		4.2	Xi	OPH		4.4	Pi	CET
3.9	Alpha	DEL	Sualocin	4.1	Gamma	TRI		4.2	Nu	SER		4.4	Mu	CET
3.9	Beta	AQL	Alshain	4.1	Iota	ERI		4.2	Beta	APS		4.4	Theta2	ERI
3.9	Iota2	CYG		4.1	Tau	PER	Kerb	4.2	Phi	OPH		4.4		TAU
3.9	Omicron	SGR		4.1		ERI		4.2	Theta	LUP		4.4		TAU
3.9	Lambda	PAV		4.1	Mu	ERI		4.2	Epsilon	CRB		4.4	Tau8	ERI
3.9		HER		4.1	Gamma	MON		4.2	Theta	CRB		4.4	Gamma	RET
3.9	Xi	DRA	Juza	4.1	Nu	GEM		4.2	Beta	CIR		4.4	Gamma	DOR
(Grum.)				4.1	Nu2	CMA		4.2	Lambda	LUP		4.4	Kappa1	TAU
3.9	Epsilon	HER		4.1	Omicron1	CMA		4.2	Tau2	LUP		4.4	Upsilon	TAU
3.9	Gamma	APS		4.1	Gamma	CMA	Mulifen	4.2	Iota	VIR	Syrma	4.4		TAU
3.9	Lambda	OPH	Marfik	4.1	Delta	MON		4.2	Kappa	VIR		4.4	Alpha	CAE
3.9	Tau	HER		4.1		PUP		4.2	Upsilon2	CEN		4.4	Pi2	ORI
3.9	Delta	TRA		4.1		VEL		4.2	Eta	CRV		4.4	Alpha	CAM
3.9	Gamma	SER		4.1		VEL		4.2	Zeta	CRU		4.4		CAM
3.9	Gamma	CRB		4.1	Gamma	PYX		4.2	Epsilon	MUS		4.4		ORI
3.9	Zeta	BOO		4.1	Alpha	VOL		4.2	Alpha	CRV	Alchiba	4.4	Phi2	ORI
3.9	Kappa	DRA		4.1	Iota	HYA		4.2	Omicron	VIR		4.4	Delta	DOR

4.4	Gamma	PIC	4.5		CMI	4.6		UMA	4.7	Theta	LEP
4.4	Gamma	COL	4.5	Sigma	HYA	4.6	Upsilon2	HYA	4.7	Beta	MON
4.4	Nu	ORI	4.5		CAR	4.6		LEO	4.7		MON
4.4	Xi	ORI	4.5		CAR	4.6		VEL	4.7		MON
4.4	Kappa	COL	4.5		UMA	4.6	Iota	ANT	4.7		GEM
4.4		LYN	4.5		HYA	4.6	Phi	LEO	4.7		CMA
4.4	Epsilon	MON	4.5	Lambda	LEO	4.6	Mu	MUS	4.7	Gamma	CNC Asellus
4.4	Lambda	CMA	4.5	Tau2	HYA	4.6	Epsilon	TUC	Bor.		
4.4	Xi1	CMA	4.5	Phi	UMA	4.6	Delta	SCL	4.7	Tau	UMA
4.4		CAR	4.5		LMI	4.6	Omega2	AQR	4.7	Chi	LEO
4.4		CAR	4.5	Alpha	SEX	4.6	Lambda	PSC	4.7		AQR
4.4	Iota	CMA	4.5	Delta2	CHA	4.6	Upsilon	PEG	4.7		PEG
4.4	Tau	CMA	4.5		LEO	4.6	Tau	PEG	4.7		PEG
4.4		PUP	4.5	Beta	CRT	4.6	Psi2	AQR	4.7		LAC
4.4	Epsilon	VOL	4.5	Upsilon	LEO	4.6	Chi	AQR	4.7	Epsilon	IND
4.4		PUP	4.5		LEO	4.6		AND	4.7	Mu1	CYG
4.4		PUP	4.5	Theta	PSC	4.6	Pi	CEP	4.7	Gamma	MIC
4.4		LYN	4.5		AQR	4.6	Beta	PSC	4.7		CYG
4.4		CAR	4.5		AQR	4.6		LAC	4.7	Zeta	DEL
4.4	Rho	HYA	4.5		LAC	4.6		LAC	4.7		VUL
4.4	Kappa	PYX	4.5	Delta	TUC	4.6	Zeta2	AQR	4.7	Rho	DRA
4.4	Alpha	ANT	4.5	Delta	IND	4.6	Pi	AQR	4.7		VUL
4.4	Beta	LMI	4.5	Nu	CEP	4.6		LAC	4.7	Epsilon1	LYR
4.4		LEO	4.5		PEG	4.6	Beta	LAC	4.7	Delta	SCT
4.4		CEN	4.5	Kappa	CAP	4.6	Mu	PSA	4.7	Gamma	SCT
4.4	Beta	SCL	4.5	Nu	AQR	4.6	Lambda	GRU	4.7		OPH
4.4	Gamma	SCL	4.5		AQR	4.6	Omicron	AQR	4.7		HER
4.4	Psi1	AQR	4.5	Lambda	CYG	4.6	Epsilon	CAP	4.7		SCO
4.4		AQR	4.5	Gamma2	DEL	4.6	Delta	EQU	4.7	Xi	CRB
4.4	Beta	PSA	4.5	Delta	DEL	4.6		CAP	4.7		SCO
4.4	Zeta1	AQR	4.5		AQL	4.6	Eta	IND	4.7	Delta	CRB
4.4	Pi2	PEG	4.5		VUL	4.6	Phil	PAV	4.7	Psi2	LUP
4.4	Iota	AQR	4.5	Beta	SGE	4.6	Rho	CAP	4.7		LUP
4.4	Xi	CEP Kurhah	4.5	Theta	LYR	4.6		CYG	4.7		LIB
4.4	Iota	PSA	4.5	Eta	LYR	4.6		SGR	4.7	Psi	BOO
4.4	Upsilon	CYG	4.5	Delta2	LYR	4.6		SGR	4.7	Omicron	BOO
4.4	Alpha1	CAP Prima Gaedi	4.5	Zeta	SCT	4.6		SGR	4.7		HYA R Hya (v)
4.4	Kappa	CEP	4.5	Gammal	SGR	4.6	Theta	CYG	4.7		VIR
4.4	Theta1	SGR	4.5	Zeta	SER	4.6	Mu	AQL	4.7		CVN
4.4	Omega	SGR	4.5	Nu	HER	4.6	Alpha	VUL	4.7		CEN
4.4	Alpha	SGE	4.5	Lambda	HER Maasym	4.6	Upsilon	SGR	4.8	Theta	OCT
4.4	Beta	SCT	4.5	Omega	OPH	4.6	Pi	DRA	4.8		CET
4.4		HER	4.5	Chi	OPH	4.6		VUL	4.8		CET
4.4	Xi	PAV	4.5	Omega	HER Cujam	4.6	Tau	DRA	4.8	Lambda1	PHE
4.4	Pi	PAV	4.5	Eta	NOR	4.6	Psi	SGR	4.8	Upsilon2	CAS
4.4		OPH	4.5	Iota	SER	4.6	Delta	CRA	4.8	Kappa	TUC
4.4		HER	4.5	Mu1	BOO Alkalurops	4.6	Nu2	SGR	4.8		CET
4.4		SGR	4.5		LIB	4.6		HER	4.8	Chi	CET
4.4	Omicron	SER	4.5		HYA	4.6	Theta	CRA	4.8	Gamma2	ARI Mesartim
4.4	Mu	OPH	4.5	Sigma	BOO	4.6	Nu	PAV	4.8	Gammal	ARI
4.4	Delta	UMI Yildun	4.5	Chi	CEN	4.6		SGR	4.8	Xi	PSC
4.4		OPH	4.5	Tau	BOO	4.6	Epsilon	TEL	4.8		CET
4.4	Sigma	OPH	4.5	Alpha	COM Diadema	4.6	Tau	OPH	4.8	Lambda	ARI
4.4	Rho	HER	4.6		PSC	4.6	Sigma	ARA	4.8		AND
4.4		OPH	4.6		CET	4.6		HER	4.8	Sigma	CET
4.4	Epsilon	UMI	4.6		PSC	4.6	Zeta1	SCO	4.8	Zeta	HYI
4.4	Upsilon	OPH	4.6	Mu	PHE	4.6		OPH	4.8	Tau2	ERI
4.4	Psi	OPH	4.6	Phi1	CET	4.6	Omega2	SCO	4.8	Omega	PER
4.4	Omicron	SCO	4.6	Eta	AND	4.6	Upsilon	HER	4.8	Zeta	ERI Zibal
4.4		SCO	4.6	Phi	PSC	4.6	Chi	HER	4.8	Kappa	RET
4.4	Lambda	SER	4.6		CAS	4.6		SCO	4.8		ERI
4.4	Omicron	LUP	4.6	Iota	CAS	4.6	Psi1	LUP	4.8	Iota	RET
4.4	Sigma	LUP	4.6	Epsilon	CET	4.6	Phi2	LUP	4.8	Delta	HOR
4.4		UMI	4.6		ARI	4.6	Iota1	LIB	4.8	Omega2	TAU
4.4		CEN	4.6	Tau1	ERI	4.6		VIR	4.8	Delta2	TAU
4.4		CEN	4.6		ARI	4.6	Xi	BOO	4.8	Rho	TAU
4.4		VIR	4.6	Pi	PER	4.6		HYA	4.8		ERI
4.4	Theta	VIR	4.6	Epsilon	ARI	4.6	Tau1	LUP	4.8	Zeta	DOR
4.4	Xi2	CEN	4.6		ERI	4.6		HYA	4.8	Mu	AUR
4.4	Beta	CHA	4.6		ERI	4.6	Lambda	VIR Khambalia	4.8	Theta	DOR
4.4	Theta1	CRU	4.6	Pi	ERI	4.6	Kappa	BOO	4.8	Omicron	COL
4.5	Sigma	AND	4.6	Tau9	ERI	4.6		CEN	4.8		AUR
4.5	Pi	AND	4.6		ERI	4.6		CVN	4.8		TAU
4.5	Epsilon	AND	4.6		TAU	4.6	Iota	CRU	4.8		ORI
4.5	Delta	PSC	4.6		ERI	4.6	Gamma	COM	4.8		MON
4.5	Epsilon	PSC	4.6		ORI	4.6	Kappa	CHA	4.8	Delta	PIC
4.5	Theta	CAS Marfak	4.6	Rho	ORI	4.6	Pi	VIR	4.8	Eta2	DOR
4.5	Omicron	PSC	4.6		ORI	4.7	Omicron	CAS	4.8		CMA
4.5	Xi1	CET	4.6	Upsilon	ORI Thabit	4.7	Tau	PSC	4.8		LYN
4.5	Beta	FOR	4.6	Tau	AUR	4.7	Upsilon	PSC	4.8	Pi2	UMA Ta Tsun
4.5	Delta	ARI Botein	4.6	Lambda	COL	4.7	Nu	PSC	4.8		HYA
4.5	Sigma	PER	4.6	Chi1	AUR	4.7	Eta2	HYI	4.8	Theta	PYX
4.5		ERI	4.6	Pi	ORI	4.7	Nu	FOR	4.8	Lambda	PYX
4.5	Delta	RET	4.6	Beta	MON	4.7	Omega	FOR	4.8	Tau1	HYA
4.5		TAU	4.6	Nu3	CMA	4.7	Nu	HYI	4.8		LMI
4.5	Omicron2	ERI Klid	4.6		GEM	4.7		PER	4.8		CAR
4.5		PER	4.6	Pi	CMA	4.7	Lambda	CET	4.8		UMA
4.5	Omega	ERI	4.6	Gamma	CMI	4.7		PER	4.8		LMI
4.5	Phi1	ORI	4.6		PUP	4.7		CAM	4.8	Omega	UMA
4.5	Omega	ORI	4.6	Omicron	PUP	4.7	Gamma	CAM	4.8		UMA
4.5		TAU	4.6		PUP	4.7	Pi1	ORI	4.8	Theta	CRT
4.5	Kappa	AUR	4.6	Delta	PYX	4.7	Pi6	ORI	4.8	Omicron	HYA
4.5		MON	4.6		HYA	4.7	Iota	TAU	4.8	Zeta	CRT
4.5	Xi2	CMA	4.6	Kappa	LEO	4.7	Psi1	ORI	4.8	Psi	PEG
4.5		LYN	4.6	Epsilon	ANT	4.7	Psi2	ORI	4.8	Rho	CAS
4.5	Tau	GEM	4.6		LMI	4.7		TAU	4.8		AQR
4.5		LYN	4.6		UMA	4.7	Chi2	ORI	4.8	Iota	PHE

4.8		AQR	4.9		ORI	5.0	Lambda	HYI	5.0	Tau	PSA
4.8	Rho	GRU	4.9		LYN	5.0	Nu	CAS	5.0		CEP
4.8		LAC	4.9	Mu	CMA	5.0	Upsilon1	CAS	5.0		PEG
4.8	Sigma	AQR	4.9		CMI	5.0		PSC	5.0		PEG
4.8	Mul	GRU	4.9	Omicron	GEM	5.0		CET	5.0	Theta	PSA
4.8	Upsilon	PSA	4.9		MON	5.0	Xi	AND Adhil	5.0		CAP
4.8	Pil	CYG Azelfalage	4.9		LYN	5.0	Psi	CAS	5.0		CYG
4.8	Xi	AQR	4.9	Zeta1	CNC Tegmine	5.0	Omega	AND	5.0	Omicron	PAV
4.8		PEG	4.9	Sigma2	UMA	5.0	Phi	PHE	5.0	Iota	IND
4.8	Theta1	MIC	4.9		UMA	5.0	Omega	CAS	5.0		VUL
4.8	Epsilon	MIC	4.9	Theta	ANT	5.0	Chi	PHE	5.0	Rho	PAV
4.8	Gamma	EQU	4.9	Pi	LEO	5.0		PER	5.0		AQL
4.8	Eta	CAP	4.9		LEO	5.0	Nu	CET	5.0		AQL
4.8	Mu	AQR	4.9	Sigma	CAS	5.0		PER	5.0		CYG
4.8		VUL	4.9	Kappa	PSC	5.0	Beta	HOR	5.0	Rho	AQL
4.8	Alpha	MIC	4.9	Omicron	CEP	5.0		PER	5.0		CYG
4.8		VUL	4.9		CAS	5.0	Zeta	ARI	5.0		SGR
4.8	Nu	CAP Alshat	4.9		AND	5.0	Kappa1	CET	5.0		CYG
4.8		CYG	4.9	Eta	GRU	5.0		PER	5.0	Zeta	SGE
4.8		SGR	4.9	Omicron	PEG	5.0	Delta	FOR	5.0		CYG
4.8	Psi	CYG	4.9		LAC	5.0		PER	5.0		SGR
4.8	Phi	CYG	4.9	Nu	TUC	5.0		TAU	5.0		CYG
4.8	Sigma	DRA	4.9		PEG	5.0		TAU	5.0	Kappa	AQL
4.8	Epsilon	CRA	4.9		PEG	5.0		ERI	5.0	Iota	TEL
4.8	Omicron	DRA	4.9		PEG	5.0	Beta	CAE	5.0		AQL
4.8		SGR	4.9	Nu	PEG	5.0		AUR	5.0	Chi1	SGR
4.8		OPH	4.9		CEP	5.0	Omega	AUR	5.0		AQL
4.8		SGR	4.9		CEP Alphirk	5.0	Eta2	PIC	5.0		SGR
4.8	Lambda	ARA	4.9		CYG	5.0		AUR	5.0		LYR
4.8		OPH	4.9		CYG	5.0		TAU	5.0	Zeta	CRA
4.8	Zeta	APS	4.9	Zeta	IND	5.0		ERI	5.0	Lambda	TEL
4.8		HER	4.9		CYG	5.0		ORI	5.0	Nu1	SGR
4.8		OPH	4.9		CYG	5.0		ORI	5.0		SGR
4.8		DRA	4.9	Omega1	CYG	5.0	Nu2	COL	5.0		AQL
4.8	Epsilon	NOR	4.9		CYG	5.0		TAU	5.0	Epsilon	SCT
4.8	Rho	OPH	4.9	Xi	TEL	5.0		TAU	5.0		DRA
4.8	Sigma	SER	4.9		CYG	5.0	Upsilon	AUR	5.0	Delta1	TEL
4.8	Delta1	APS	4.9	Xi	AQL	5.0		ORI	5.0		DRA
4.8	Delta	NOR	4.9		VUL	5.0		MON	5.0	Mu	LYR
4.8	Pi	SER	4.9		VUL	5.0	Theta	COL	5.0		HER
4.8		LIB	4.9		CYG	5.0		MON	5.0		HER
4.8	Kappa	CRB	4.9	Nu	AQL	5.0		AUR	5.0		DRA
4.8	Kappa	LIB	4.9		CYG	5.0		AUR	5.0		HER
4.8	Epsilon	CIR	4.9		VUL	5.0		MON	5.0		DRA
4.8		BOO	4.9	Eta	SCT	5.0	Psi7	AUR	5.0	Nu2	DRA Kuma
4.8		DRA	4.9	Upsilon	DRA	5.0		CAM	5.0	Nu1	DRA Kuma
4.8		UMA	4.9		DRA	5.0		MON	5.0		DRA
4.8		VIR	4.9		OPH	5.0		MON	5.0	Mu	NOR
4.8	Lambda	CRU	4.9		OPH	5.0		CMA	5.0		HER
4.8	Psi	VIR	4.9	Psi1	DRA	5.0		GEM	5.0		DRA
4.8	Chi	VIR	4.9	Omega	DRA	5.0		LYN	5.0	Eta	UMI Alasco
4.8		COM	4.9		HER	5.0		PUP	5.0	Kappa	NOR
4.8		COM	4.9		OPH	5.0		GEM	5.0	Lambda	LIB
4.9	Chi	PEG	4.9		HER	5.0	Phi	GEM	5.0		LIB
4.9	Eta	SCL	4.9		HER	5.0		PUP	5.0	Nu2	BOO
4.9	Lambda	CAS	4.9	Zeta	TRA	5.0		MON	5.0	Epsilon	LIB
4.9	Xi	CAS	4.9	Gamma1	NOR	5.0	Chi	GEM	5.0	Eta	CRB
4.9		CET	4.9	Psi	SCO	5.0		PUP	5.0	Nu1	LUP
4.9	Chi	PSC	4.9	Tau	CRB	5.0	Zeta	PYX	5.0		LUP
4.9	Zeta1	PSC	4.9	Beta2	SCO	5.0		HYA	5.0		BOO
4.9	Nu	PHE	4.9	Iota	CRB	5.0	Rho	UMA	5.0		LIB
4.9	Chi	CAS	4.9	Rho	SER	5.0	Kappa	HYA	5.0		LIB
4.9	Tau	AND	4.9		LIB	5.0	Gamma	SEX	5.0		BOO
4.9		AND	4.9		BOO	5.0		LEO	5.0	Phi	VIR
4.9	Rho	CET	4.9	Omega	BOO	5.0	Beta	SEX	5.0		HYA
4.9		PER	4.9		BOO	5.0	Phi3	HYA	5.0		BOO
4.9		PER	4.9	Pi1	BOO	5.0		LMI	5.0		HYA
4.9	Pi	TAU	4.9	Eta	APS	5.0		LEO	5.0		LEO
4.9	Sigma2	TAU	4.9	Iota	BOO	5.0		LEO	5.0		UMI
4.9	Psi	ERI	4.9		CVN	5.0	Chi1	HYA	5.0		VIR
4.9		ORI	4.9		VIR	5.0	Lambda	CRT	5.0	Iota1	MUS
4.9	Lambda	AUR	4.9	Eta	MUS	5.0	Omicron1	CEN	5.0	Sigma	VIR
4.9	Chi	AUR	4.9		COM	5.0	Epsilon	CHA	5.0		VIR
4.9		TAU	4.9	Xi1	CEN	5.0		PSC	5.0	Psi	HYA
4.9		TAU	4.9		UMA	5.0		PEG	5.0		COM
4.9	Xi	AUR	4.9		COM	5.0		AND	5.0	Rho	VIR
4.9	Xi	COL	4.9		COM	5.0		PEG	5.0		COM
4.9		TAU	5.0	Zeta	SCL	5.0	Rho	PEG	5.0		CVN
4.9		LEP	5.0	Pi	CAS	5.0		AQR	5.0	Theta2	CRU

# CATALOGO 100 STELLE PIU' LUMINOSE

## 100 BRIGHTEST STARS

Nome	HH MM SS	° ° ' "	magn.	moto proprio
Bayer	J2000	J2000	vis.	AR DEC
Alp CMa	06 45 08.9	-16 42 58	-1.46	-0.553 -1.205
Alp Car	06 23 57.1	-52 41 45	-0.72	+0.022 +0.021
Alp Boo	14 15 39.7	+19 10 57	-0.04	-1.093 -1.998
Alp1Cen	14 39 35.9	-60 50 07	-0.01	-3.642 +0.699
Alp Lyr	18 36 56.3	+38 47 01	0.03	+0.202 +0.286
Alp Aur	05 16 41.4	+45 59 53	0.08	+0.076 -0.425
Bet Ori	05 14 32.3	-08 12 06	0.12	0.000 -0.001
Alp CMi	07 39 18.1	+05 13 30	0.38	-0.710 -1.023
Alp Eri	01 37 42.9	-57 14 12	0.46	+0.095 -0.035
Alp Ori	05 55 10.3	+07 24 25	0.50	+0.026 +0.009
Bet Cen	14 03 49.4	-60 22 23	0.61	-0.032 -0.019
Alp Aql	19 50 47.0	+08 52 06	0.77	+0.538 +0.386
Alp Tau	04 35 55.2	+16 30 33	0.85	+0.063 -0.190
Alp Sco	16 29 24.4	-26 25 55	0.96	-0.010 -0.020
Alp Vir	13 25 11.6	-11 09 41	0.98	-0.041 -0.028
Bet Gem	07 45 18.9	+28 01 34	1.14	-0.628 -0.046
Alp PsA	22 57 39.1	-29 37 20	1.16	+0.333 -0.165
Bet Cru	12 47 43.2	-59 41 19	1.25	-0.048 -0.014
Alp Cyg	20 41 25.9	+45 16 49	1.25	+0.003 +0.002
Alp1Cru	12 26 35.9	-63 05 57	1.33	-0.036 -0.012
Alp2Cen	14 39 36.1	-60 50 08	1.33	-3.646 +0.700
Alp Leo	10 08 22.3	+11 58 02	1.35	-0.248 +0.006
Eps CMa	06 58 37.5	-28 58 20	1.50	+0.004 +0.003
Lam Sco	17 33 36.5	-37 06 14	1.63	-0.001 -0.029
Gam Cru	12 31 09.9	-57 06 48	1.63	+0.023 -0.262
Gam Ori	05 25 07.9	+06 20 59	1.64	-0.009 -0.014
Bet Tau	05 26 17.5	+28 36 27	1.65	+0.022 -0.175
Bet Car	09 13 12.0	-69 43 02	1.68	-0.162 +0.108
Eps Ori	05 36 12.8	-01 12 07	1.70	+0.001 -0.002
Alp2Cru	12 26 36.5	-63 05 58	1.73	-0.034 -0.007
Alp Gru	22 08 14.0	-46 57 40	1.74	+0.129 -0.151
Eps UMa	12 54 01.7	+55 57 35	1.77	+0.112 -0.006
Gam2Vel	08 09 32.0	-47 20 12	1.78	-0.004 +0.006
Alp UMa	11 03 43.7	+61 45 03	1.79	-0.119 -0.067
Alp Per	03 24 19.4	+49 51 40	1.79	+0.024 -0.025
Del CMa	07 08 23.5	-26 23 36	1.84	-0.003 +0.004
Eps Sgr	18 24 10.3	-34 23 05	1.85	-0.038 -0.124
Eta UMa	13 47 32.4	+49 18 48	1.86	-0.122 -0.011
Eps Car	08 22 30.8	-59 30 35	1.86	-0.026 +0.014
The Sco	17 37 19.2	-42 59 52	1.87	+0.015 -0.002
Bet Aur	05 59 31.7	+44 56 51	1.90	-0.057 0.000
Alp TrA	16 48 39.9	-69 01 40	1.92	+0.014 -0.034
Gam Gem	06 37 42.7	+16 23 57	1.93	+0.042 -0.042
Alp Pav	20 25 38.9	-56 44 06	1.94	+0.007 -0.089
Del Vel	08 44 42.2	-54 42 30	1.96	+0.023 -0.078
Bet CMa	06 22 42.0	-17 57 21	1.98	-0.006 0.000
Alp Hya	09 27 35.2	-08 39 31	1.98	-0.014 +0.033
Alp Gem	07 34 36.0	+31 53 18	1.98	-0.171 -0.098
	15 59 30.2	+25 55 13	2.0	-0.005 +0.013
Alp Ari	02 07 10.4	+23 27 45	2.00	+0.190 -0.148
Sig Sgr	18 55 15.9	-26 17 48	2.02	+0.013 -0.054
Alp UMi	02 31 48.7	+89 15 51	2.02	+0.038 -0.015
Bet Cet	00 43 35.4	-17 59 12	2.04	+0.234 +0.033
Zet Ori	05 40 45.5	-01 56 34	2.05	+0.003 -0.002
Kap Ori	05 47 45.4	-09 40 11	2.06	+0.002 -0.002
The Cen	14 06 41.0	-36 22 12	2.06	-0.519 -0.519
Bet And	01 09 43.9	+35 37 14	2.06	+0.178 -0.114
Alp And	00 08 23.3	+29 05 26	2.06	+0.136 -0.163
Bet UMi	14 50 42.3	+74 09 20	2.08	-0.031 +0.012
Alp Oph	17 34 56.1	+12 33 36	2.08	+0.120 -0.226
Bet Gru	22 42 40.1	-46 53 05	2.10	+0.137 -0.008
Bet Per	03 08 10.1	+40 57 20	2.12	+0.004 -0.001
Bet Leo	11 49 03.6	+14 34 19	2.14	-0.497 -0.114
Gam Cen	12 41 31.0	-48 57 35	2.17	-0.189 -0.005
Gam Cyg	20 22 13.7	+40 15 24	2.20	+0.004 0.000
Lam Vel	09 07 59.8	-43 25 57	2.21	-0.019 +0.013
Del Ori	05 32 00.4	-00 17 57	2.23	+0.001 -0.002
Alp CrB	15 34 41.3	+26 42 53	2.23	+0.121 -0.089
Gam Dra	17 56 36.4	+51 29 20	2.23	-0.008 -0.019
Alp Cas	00 40 30.5	+56 32 14	2.23	+0.053 -0.032
Zet Pup	08 03 35.1	-40 00 12	2.25	-0.027 +0.012
Iot Car	09 17 05.4	-59 16 31	2.25	-0.020 +0.008
Gam1And	02 03 54.0	+42 19 47	2.26	+0.045 -0.052
Zet UMa	13 23 55.5	+54 55 31	2.27	+0.122 -0.020
Bet Cas	00 09 10.7	+59 08 59	2.27	+0.525 -0.181
Eps Sco	16 50 09.8	-34 17 36	2.29	-0.611 -0.255

Nome	HH MM SS	° ° ' ' " "	magn.	moto proprio	
Bayer	J2000	J2000	vis.	AR	DEC
Alp Lup	14 41 55.8	-47 23 18	2.30	-0.021	-0.018
Eps Cen	13 39 53.2	-53 27 59	2.30	-0.028	-0.016
Eta Cen	14 35 30.4	-42 09 28	2.31	-0.035	-0.035
Del Sco	16 00 20.0	-22 37 18	2.32	-0.012	-0.022
Bet UMa	11 01 50.5	+56 22 57	2.37	+0.082	+0.034
Alp Phe	00 26 17.0	-42 18 22	2.39	+0.203	-0.396
Eps Peg	21 44 11.2	+09 52 30	2.39	+0.031	-0.001
Kap Sco	17 42 29.3	-39 01 48	2.41	-0.006	-0.027
Bet Peg	23 03 46.5	+28 04 58	2.42	+0.189	+0.137
Eta Oph	17 10 22.7	-15 43 29	2.43	+0.039	+0.098
Alp Cep	21 18 34.8	+62 35 08	2.44	+0.151	+0.049
Gam UMa	11 53 49.8	+53 41 41	2.44	+0.095	+0.012
Eta CMa	07 24 05.7	-29 18 11	2.45	-0.004	+0.005
Eps Cyg	20 46 12.7	+33 58 13	2.46	+0.356	+0.328
Gam Cas	00 56 42.5	+60 43 00	2.47	+0.026	-0.005
Alp Peg	23 04 45.7	+15 12 19	2.49	+0.063	-0.042
Kap Vel	09 22 06.8	-55 00 39	2.50	-0.008	+0.009
Alp Cet	03 02 16.8	+04 05 23	2.53	-0.009	-0.078
Zet Cen	13 55 32.4	-47 17 18	2.55	-0.057	-0.042
Del Leo	11 14 06.5	+20 31 25	2.56	+0.142	-0.130
Zet Oph	16 37 09.5	-10 34 02	2.56	+0.014	+0.026
Alp Lep	05 32 43.8	-17 49 20	2.58	+0.001	+0.002
Gam Crv	12 10 39.7	-16 59 12	2.59	-0.161	+0.023
Zet Sgr	18 56 15.0	-30 01 23	2.60	-0.015	-0.002

Moto proprio in secondi/anno  
Moto proprio in seconds/year

# OGGETTI MESSIER - MESSIER OBJECTS

Numero Messier	Numero NGC	Nome comune	Tipo di oggetto	Distanza in migliaia di anni luce	Costellazione	Mag. app.
Number Messier	Number NGC	Common name	Type of object	Distance in thousand of light years	Constellation	App. mag.
M1	NGC 1952	Neb del Granchio	Resto di supernova	6,3	Toro	9,0
M2	NGC 7089		Amm. glob.	36	Acquario	7,5
M3	NGC 5272		Amm. glob.	31	Can da Caccia	7,0
M4	NGC 6121		Amm. glob.	7	Scorpione	7,5
M5	NGC 5904		Amm. glob.	23	Serpente	7,0
M6	NGC 6405	Amm. della Farfalla	Amm. ap.	2	Scorpione	4,5
M7	NGC 6475	Amm. di Tolomeo	Amm. ap.	1	Scorpione	3,5
M8	NGC 6523	Neb Laguna	Amm. con Neb	6,5	Sagittario	5,0
M9	NGC 6333		Amm. glob.	26	Ofiuco	9,0
M10	NGC 6254		Amm. glob.	13	Ofiuco	7,5
M11	NGC 6705	Amm. dell'Anitra Selvatica	Amm. ap.	6	Scudo	7,0
M12	NGC 6218		Amm. glob.	18	Ofiuco	8,0
M13	NGC 6205	Amm. glob. di Ercole	Amm. glob.	22	Ercole	7,0
M14	NGC 6402		Amm. glob.	27	Ofiuco	9,5
M15	NGC 7078		Amm. glob.	33	Pegaso	7,5
M16	NGC 6611	Amm. della Neb Aquila	Amm. con Neb	7	Serpente	6,5
M17	NGC 6618	Neb Omega	Amm. con Neb	5	Sagittario	7,0
M18	NGC 6613		Amm. ap.	6	Sagittario	8,0
M19	NGC 6273		Amm. glob.	27	Ofiuco	8,5
M20	NGC 6514	Neb Trifida	Amm. con Neb	2,2	Sagittario	5,0
M21	NGC 6531		Amm. ap.	3	Sagittario	7,0
M22	NGC 6656		Amm. glob.	10	Sagittario	6,5
M23	NGC 6494		Amm. ap.	4,5	Sagittario	6,0
M24	Nessuno, contiene NGC 6603		nube Delle Caustiche	10	Sagittario	11,5
M25	Nessuno, IC 4725		Amm. ap.	2	Sagittario	4,9
M26	NGC 6694		Amm. ap.	5	Scudo	9,5
M27	NGC 6853	Neb Manubrio	Neb planetaria	1,25	Volpetta	7,5
M28	NGC 6626		Amm. glob.	18	Sagittario	8,5
M29	NGC 6913		Amm. ap.	7,2	Cigno	9,0
M30	NGC 7099		Amm. glob.	25	Capricorno	8,5
M31	NGC 224	Galassia di Andromeda	Galassia	2200	Andromeda	4,5
M32	NGC 221		Galassia	2200	Andromeda	10,0
M33	NGC 598	Galassia del Triangolo	Galassia	2300	Triangolo	7,0
M34	NGC 1039		Amm. ap.	1,4	Perseo	6,0
M35	NGC 2168		Amm. ap.	2,8	Gemelli	5,5
M36	NGC 1960		Amm. ap.	4,1	Auriga	6,5
M37	NGC 2099		Amm. ap.	4,6	Auriga	6,0
M38	NGC 1912		Amm. ap.	4,2	Auriga	7,0
M39	NGC 7092		Amm. ap.	0,3	Cigno	5,5
M40	Nessuno		Stella doppia WNC4		Orsa Maggiore	9,0
M41	NGC 2287		Amm. ap.	2,4	Cane Maggiore	5,0
M42	NGC 1976	Neb di Orione	Neb diffusa	1,6	Orione	5,0
M43	NGC 1982	Neb De Mairan (parte della Neb di Orione)	Neb diffusa	1,6	Orione	7,0
M44	NGC 2632	Amm. Alveare	Amm. ap.	0,5	Cancro	4,0
M45	NGC 1432	Pleiadi	Amm. ap.	0,4	Toro	1,4
M46	NGC 2437		Amm. ap.	5,4	Poppa	6,5
M47	NGC 2422		Amm. ap.	1,6	Poppa	4,5
M48	NGC 2548		Amm. ap.	1,5	Idra	5,5
M49	NGC 4472		Galassia	60000	Vergine	10,0
M50	NGC 2323		Amm. ap.	3	Unicorno	7,0
M51	NGC 5194, NGC 5195	Galassia vortice	Galassia	37000	Can da Caccia	8,0
M52	NGC 7654		Amm. ap.	7	Cassiopea	8,0
M53	NGC 5024		Amm. glob.	56	Chioma di Berenice	8,5
M54	NGC 6715		Amm. glob.	83	Sagittario	8,5
M55	NGC 6809		Amm. glob.	17	Sagittario	7,0
M56	NGC 6779		Amm. glob.	32	Lira	9,5
M57	NGC 6720	Neb anello	Neb planetaria	4,1	Lira	9,5
M58	NGC 4579		Galassia	60000	Vergine	11,0
M59	NGC 4621		Galassia	60000	Vergine	11,5
M60	NGC 4649		Galassia	60000	Vergine	10,5
M61	NGC 4303		Galassia	60000	Vergine	10,5
M62	NGC 6266		Amm. glob.	22	Ofiuco	8,0
M63	NGC 5055	Galassia Girasole	Galassia	37000	Can da Caccia	8,5



Numero Messier	Numero NGC	Nome comune	Tipo di oggetto	Distanza in migliaia di anni luce	Costellazione	Mag. app.
Number Messier	Number NGC	Common name	Type of object	Distance in thousand of light years	Constellation	App. mag.
M64	NGC 4826	Galassia Occhio Nero	Galassia	12000	Chioma di Berenice	9,0
M65	NGC 3623		Galassia	35000	Leone	10,5
M66	NGC 3627		Galassia	35000	Leone	10,0
M67	NGC 2682		Amm. ap.	2,25	Cancro	7,5
M68	NGC 4590		Amm. glob.	32	Idra	9,0
M69	NGC 6637		Amm. glob.	25	Sagittario	9,0
M70	NGC 6681		Amm. glob.	28	Sagittario	9,0
M71	NGC 6838		Amm. glob.	12	Freccia	8,5
M72	NGC 6981		Amm. glob.	53	Acquario	10,0
M73	NGC 6994				Acquario	9,0
M74	NGC 628		Galassia	35000	Pesci	10,5
M75	NGC 6864		Amm. glob.	58	Sagittario	9,5
M76	NGC 650, NGC 651	Neb piccola campana muta	Neb planetaria	3,4	Perseo	12,0
M77	NGC 1068		Galassia	60000	Balena	10,5
M78	NGC 2068		Neb diffusa	1,6	Orione	8,0
M79	NGC 1904		Amm. glob.	40	Lepre	8,5
M80	NGC 6093		Amm. glob.	27	Scorpione	8,5
M81	NGC 3031	Galassia di Bode	Galassia	11000	Orsa Maggiore	8,5
M82	NGC 3034	Galassia Sigaro	Galassia	11000	Orsa Maggiore	9,5
M83	NGC 5236	Galassia girandola del sud	Galassia	10000	Idra	8,5
M84	NGC 4374		Galassia	60000	Vergine	11,0
M85	NGC 4382		Galassia	60000	Chioma di Berenice	10,5
M86	NGC 4406		Galassia	60000	Vergine	11,0
M87	NGC 4486	Galassia Virgo A	Galassia	60000	Vergine	11,0
M88	NGC 4501		Galassia	60000	Chioma di Berenice	11,0
M89	NGC 4552		Galassia	60000	Vergine	11,5
M90	NGC 4569		Galassia	60000	Vergine	11,0
M91	NGC 4548		Galassia	60000	Chioma di Berenice	11,5
M92	NGC 6341		Amm. glob.	26	Ercole	7,5
M93	NGC 2447		Amm. ap.	4,5	Poppa	6,5
M94	NGC 4736		Galassia	14500	Can da Caccia	9,5
M95	NGC 3351		Galassia	38000	Leone	11,0
M96	NGC 3368		Galassia	38000	Leone	10,5
M97	NGC 3587	Neb Gufo	Neb planetaria	2,6	Orsa Maggiore	12,0
M98	NGC 4192		Galassia	60000	Chioma di Berenice	11,0
M99	NGC 4254		Galassia	60000	Chioma di Berenice	10,5
M100	NGC 4321		Galassia	60000	Chioma di Berenice	10,5
M101	NGC 5457	Galassia girandola	Galassia	24000	Orsa Maggiore	8,5
M102		Galassia Fuso	Galassia	40000	Dragone	10,5
M103	NGC 581		Amm. ap.	8	Cassiopea	7,0
M104	NGC 4594	Galassia Sombbrero	Galassia	50000	Vergine	9,5
M105	NGC 3379		Galassia	38000	Leone	11,0
M106	NGC 4258		Galassia	25000	Can da Caccia	9,5
M107	NGC 6171		Amm. glob.	20	Ofiuco	10,0
M108	NGC 3556		Galassia	45000	Orsa Maggiore	11,0
M109	NGC 3992		Galassia	55000	Orsa Maggiore	11,0
M110	NGC 205		Galassia	2200	Andromeda	10,0

# VISIBILITA' OGGETTI MESSIER

## VISIBILITY MESSIER OBJECTS

Catalogo Messier	Costellazione	Oggetto	Mesi di visibilità
Catalog Messier	Constellation	Object	Months of visibility
M1	Toro	Nebulosa diffusa	XII-II
M2	Acquario	Ammasso globulare	X-XII
M3	Cani da Caccia	Ammasso globulare	I-IX
M4	Scorpione	Ammasso globulare	VII-VIII
M5	Serpente	Ammasso globulare	VII-X
M6	Scorpione	Ammasso aperto	VII-VIII
M7	Scorpione	Ammasso aperto	VII-VIII
M8	Sagittario	Nebulosa diffusa	VIII-IX
M9	Ofiuco	Ammasso globulare	VII-VIII
M10	Ofiuco	Ammasso globulare	VII-VIII
M11	Scudo	Ammasso aperto	VII-IX
M12	Ofiuco	Ammasso globulare	VII-VIII
M13	Ercole	Ammasso globulare	VI-IX
M14	Ofiuco	Ammasso globulare	VII-VIII
M15	Pegaso	Ammasso globulare	VIII-X
M16	Serpente	Nebulosa/ammasso	VII-X
M17	Sagittario	Nebulosa diffusa	VIII-IX
M18	Sagittario	Ammasso aperto	VIII-IX
M19	Ofiuco	Ammasso globulare	VII-VIII
M20	Sagittario	Nebulosa diffusa	VIII-IX
M21	Sagittario	Ammasso aperto	VIII-IX
M22	Sagittario	Ammasso globulare	VIII-IX
M23	Sagittario	Ammasso aperto	VIII-IX
M24	Sagittario	Ammasso aperto	VIII-IX
M25	Sagittario	Ammasso aperto	VIII-IX
M26	Scudo	Ammasso aperto	VII-IX
M27	Volpetta	Nebulosa planetaria	VIII-X
M28	Sagittario	Ammasso globulare	VIII-IX
M29	Cigno	Ammasso aperto	VIII-X
M30	Capricorno	Ammasso globulare	IX-X
M31	Andromeda	Galassia	X-XII
M32	Andromeda	Galassia	X-XII
M33	Triangolo	Galassia	X-XII
M34	Perseo	Ammasso aperto	X-XII
M35	Gemelli	Ammasso aperto	I-III
M36	Auriga	Ammasso aperto	I-III
M37	Auriga	Ammasso aperto	I-III
M38	Auriga	Ammasso aperto	I-III
M39	Cigno	Ammasso aperto	VIII-X
M40			
M41	Cane maggiore	Ammasso aperto	XII-III

Catalogo Messier	Costellazione	Oggetto	Mesi di visibilità
Catalog Messier	Constellation	Object	Months of visibility
M42	Orione	Nebulosa diffusa	XII-III
M43	Orione	Nebulosa diffusa	XII-III
M44	Cancro	Ammasso aperto	II-V
M45	Toro	Ammasso aperto	XII-II
M46	Poppa	Ammasso aperto	II-IV
M47	Poppa	Ammasso aperto	II-IV
M48	Idra	Ammasso aperto	IV-VI
M49	Vergine	Galassia	V-VII
M50	Unicorno	Ammasso aperto	II-IV
M51	Cani da caccia	Galassia	I-IX
M52	Cassiopea	Ammasso aperto	circumpolare
M53	Chioma Berenice	Ammasso globulare	VI-VIII
M54	Sagittario	Ammasso globulare	VIII-IX
M55	Sagittario	Ammasso globulare	VIII-IX
M56	Lira	Ammasso globulare	VII-IX
M57	Lira	Nebulosa planetaria	VII-IX
M58	Vergine	Galassia	V-VII
M59	Vergine	Galassia	V-VII
M60	Vergine	Galassia	V-VII
M61	Vergine	Galassia	V-VII
M62	Ofiuco	Ammasso globulare	VII-VIII
M63	Cani da caccia	Galassia	I-IX
M64	Chioma Berenice	Galassia	IV-VIII
M65	Leone	Galassia	III-IV
M66	Leone	Galassia	III-IV
M67	Cancro	ammasso aperto	II-V
M68	Cancro	Ammasso globulare	IV-VI
M69	Idra	Ammasso globulare	VIII-IX
M70	Sagittario	Ammasso globulare	VIII-IX
M71	Sagittario	Ammasso globulare	VIII-X
M72	Acquario	Ammasso globulare	X-XII
M73	Acquario	ammasso aperto	X-XII
M74	Pesci	Galassia	X-XII
M75	Sagittario	Ammasso globulare	VIII-IX
M76	Perseo	Nebulosa planetaria	IX-IV
M77	Balena	Galassia	XI-I
M78	Orione	Nebulosa diffusa	XII-III
M79	Lepre	Ammasso globulare	XII-III
M80	Scorpione	Ammasso globulare	VII-VIII
M81	Orsa maggiore	Galassia	circumpolare
M82	Orsa maggiore	Galassia	circumpolare
M83	Idra	Galassia	IV-VI
M84	Vergine	Galassia	V-VII
M85	Chioma Berenice	Galassia	VI-VII
M86	Vergine	Galassia	V-VII

Catalogo Messier	Costellazione	Oggetto	Mesi di visibilità
Catalog Messier	Constellation	Object	Months of visibility
M87	Vergine	Galassia	V-VII
M88	Chioma Berenice	Galassia	VI-VII
M89	Vergine	Galassia	V-VII
M91	Chioma Berenice	Galassia	VI-VIII
M92	Ercole	Ammasso globulare	VI-IX
M93	Poppa	Ammasso aperto	II-IV
M94	Cani da Caccia	Galassia	I-IX
M95	Leone	Galassia	III-IV
M96	Leone	Galassia	III-IV
M97	Orsa Maggiore	Nebulosa planetaria	circumpolare
M98	Chioma Berenice	Galassia	VI-VIII
M99	Chioma Berenice	Galassia	VI-VIII
M100	Chioma Berenice	Galassia	VI-VIII
M101	Orsa Maggiore	Galassia	circumpolare
M102			
M103	Cassiopea	Ammasso aperto	circumpolare
M104	Vergine	Galassia	V-VII
M105	Leone	Galassia	III-IV
M106	Cani da Caccia	Galassia	I-IX
M107	Ofiuco	Ammasso globulare	VII-VIII
M108	Orsa Maggiore	Galassia	circumpolare
M109	Orsa Maggiore	Galassia	circumpolare
M110	Andromeda	Galassia	X-XII

# STELLE DOPPIE DI MAG.<6

## DOUBLE STARS WITH MAG.<6

COS	NOME	A.R.	DEC.	COMP	ALTRO NOME	Mag	Mag2	SEP	PA
AND	56 And	01 56.2	+37 15			5.7	6	190	300
AND	Gamma And	02 03.9	+42 20		Almach	2.3	5.5	9.8	63
AQR	Zeta Aqr	22 28.8	-00 01			4.3	4.5	2.3	183
ARI	Epsilon Ari	02 59.2	+21 20	AB		5.2	5.5	1.5	208
ARI	Gamma Ari	01 53.5	+19 18		Mesarthim	4.8	4.8	7.8	0
BOO	Epsilon Boo	14 45.0	+27 04		Izar	2.5	4.9	2.8	339
BOO	Pi Boo	14 40.7	+16 25			4.9	5.8	5.6	108
BOO	Zeta Boo	14 41.1	+13 44			4.5	4.6	1	307
CAM	32 Cam	12 49.2	+83 25		STF 1694	5.3	5.8	21.6	326
CAP	Alpha1/2 Cap	20 18.1	-12 33		Algedi	3.6	4.2	378	291
CAR	Upsilon Car	09 47.1	-65 04			3.2	6	5	128
CEN	3 Cen	13 51.8	-33 00		K Cen	4.5	6	11.9	112
CEN	Alpha Cen	14 39.7	-60 50			0	1.5	9.4	233
CEN	Beta Cen	14 03.9	-60 23			0.7	3.9	1.3	251
CNC	Zeta Cnc	08 12.2	+17 39	AB		5.6	6	6	72
CRA	Gamma CrA	19 06.4	-37 04		h 5084	4.8	5.1	1.3	54
CRA	h 5014	18 06.8	-43 25			5.8	5.8	1.6	221
CRB	Eta CrB	15 23.2	+30 17	AB		5.6	5.9	0.5	128
CRB	Nu1 CrB	16 22.4	+33 48		2 CrB	5.4	5.3	364.4	165
CRB	Zeta2 CrB	15 39.4	+36 38		STF 1965	5.1	6	6.3	305
CRU	Alpha Cru	12 26.6	-63 06	AB		1.4	1.9	4.1	111
CRU	Alpha Cru	12 26.6	-63 06	AC		1.4	4.9	90.1	202
CRU	Mu Cru	12 54.6	-57 11			4	5.2	34.9	17
CVN	Alpha CVn	12 56.0	+38 19		Cor Caroli	2.9	5.5	19.4	229
CYG	61 Cyg	21 06.9	+38 45			5.2	6	28	144
CYG	Beta Cyg	19 30.7	+27 58		Albireo	3.1	5.1	34.4	54
CYG	Omicron1 Cyg	20 13.6	+46 44	AD	31 Cygni2	4	5	338	338
DEL	Gamma Del	20 46.7	+16 07			4.5	5.5	9.6	268
DRA	Mu Dra	17 05.3	+54 28			5.7	5.7	2.3	10
DRA	Nu Dra	17 32.2	+55 11		Kuma	4.9	4.9	62	312
EQU	Delta Equ	21 14.5	+10 00	AB	STF 535	5.2	5.3		25
EQU	Gamma Equ	21 10.3	+10 08			4.7	5.9	353	153
ERI	Dunlop 16	03 48.6	-37 37		f Eri	4.8	5.3	7.9	212
ERI	Rho Eri	01 39.8	-56 12		p Eri	5.8	5.8	11.4	191
ERI	STF 470	03 54	-02 57			4.5	5.7	6.9	348
ERI	Theta Eri	02 58.3	-40 18		Acamar	3.4	4.5	8.2	88
GEM	Alpha Gem	07 34.6	+31 53		Castor	1.9	2.9	2.2	164
HER	100 Her	18 07.8	+26 06		STF 2280	5.9	6	14.2	183
HER	95 Her	18 01.5	+21 35		STF 2264	5.1	5.2	6.3	258
HER	Alpha Her	17 14.6	+14 23		Ras Algethi	3.5	5.4	4.7	107
HER	Rho Her	17 23.7	+37 09			4.6	5.6	4.1	316
HER	Zeta Her	16 41.3	+31 36			2.9	5.5	1.1	210
HYA	Beta Hya	11 52.9	-33 54			4.7	5.5	0.9	8
HYA	Epsilon Hya	08 46.8	+06 25	AB		3.8	4.7	2.7	113
HYA	N Hya	11 32.3	-29 16		17 Crt; H 96	5.8	5.9	9.2	210
LEO	Gamma Leo	10 20.0	+19 51		Algieba	2.2	3.5	4.4	122
LIB	Alpha Lib	14 50.9	-16 02		Zubenelgenubi	2.8	5.2	231	314
LIB	Sh 179	14 25.5	-19 58			6	6	35	295
LUP	Mu Lup	15 15.0	-47 42			4.8	5.2	1.6	150
LUP	Pi Lup	15 01.7	-46 51		h 4728	4.7	4.8	1.5	78
LUP	Xi Lup	15 56.9	-34 58			5.3	5.8	10.4	49
LYN	12 Lyn	06 46	+59 26	AB	STF 948	5.5	6	1.8	73
LYN	15 Lyn	06 57.3	+58 25	AB		4.8	5.9	0.9	33
LYR	Delta1/2 Lyr	18 54.5	+36 54			5.6	4.5	630	115
LYR	Epsilon2 Lyr	18 44.3	+39 40	CD		5.2	5.5	2.3	94
LYR	Zeta2 Lyr	18 44.8	+37 36			4.3	5.9	43.7	150
MON	Beta Mon	06 28.8	-07 02	AB	11 Mon	4.7	5.2	7.3	132
MUS	Beta Mus	12 46.3	-68 06			3.9	4.2	1.3	4
OPH	36 Oph	17 15.3	-26 36			5.1	5.1	4.8	
OPH	70 Oph	18 05.5	+02 30			4.2	6	5.2	136
OPH	Eta Oph	17 10.4	-15 43		Sabik	3	3.5	1	325
OPH	Lambda Oph	16 30.9	+01 59		Marfik	4.2	5.2	1.6	35
OPH	Rho Oph	16 25.6	-23 27		5 Oph	5.3	6	3.1	344
OPH	Tau Oph	18 03.1	-08 11			5.2	5.9	1.6	286
ORI	42/45 Ori	05 35.4	-04 50			4.7	5.3	252	105
ORI	Eta Ori	05 24.5	-02 24			3.8	4.8	1.5	77
ORI	Lambda Ori	05 35.1	+09 56		Meissa	3.6	5.5	4.4	43
ORI	Lambda Ori	05 35.4	+09 56	AB		4	6	4.4	44
ORI	Sh 49	04 59.2	+14 32	AB		5	6	39.4	305
ORI	Sigma Ori	05 38.7	-02 36	AB		4	6	0.2	
ORI	STF 747	05 35.0	-06 00			4.8	5.7	35.7	223
ORI	Theta1/2 Ori	05 35.4	-05 25			4.9	5	135	314
ORI	Zeta Ori	05 40.8	-01 57	AB	Alnitak	1.9	4	2.4	162

PAV	L 8550	20 51.6	-62 26		RMK 26	5.8	5.8	2.7	93
PHE	Beta Phe	01 06.1	-46 43			4.1	4.2	0.7	307
PSC	Alpha Psc	02 02.0	+02 46		Al Risha (Alrescha)	4.2	5.1	1.8	267
PSC	Psil Psc	01 05.6	+21 28			5.6	5.8	30	159
PUP	Dunlop 67	08 14.0	-36 19			5.1	6	67.4	175
PUP	H N 19	07 34.3	-23 28		South 552	5.8	5.9	9.3	114
PUP	Kappa Pup	07 38.8	-26 48	AB	Markeb	3.8	4	8.8	318
SCO	Alpha Sco	16 29.4	-26 26		Antares	1.2	5.4	2.9	275
SCO	Beta Sco	16 05.4	-19 48		Graffias	2.6	4.9	13.6	21
SCO	Xi Sco	16 04.4	-11 22	AB	STF 1998	4.8	5.1	0.5	358
SER	Delta Ser	15 34.5	+10 32			4.2	5.2	3.9	178
SER	STF 2375	18 45.5	+05 30			5.8	5.8	2.6	119
SER	Theta1/2 Ser	18 56.2	+04 12	AB	Alya	4	5	22	104
TAU	27 Tau	03 49.2	+24 03		Atlas; H N 870	3.7	5	300	180
TAU	Kappa Tau	04 25.4	+22 18			4.4	5.4	340	173
TAU	Theta Tau	04 28.7	+15 52			3.4	3.8	337.4	346
TUC	Beta Tuc	00 31.5	-62 58			4.5	4.5	27.1	170
UMA	Xi UMa	11 18.2	+31 32		Alula Australis	4.3	4.8	1.6	273
UMA	Zeta UMa	13 23.9	+54 56		Mizar/Alcor; STF 1744	2.3	4	14.4	150
VEL	Gamma2 Vel	08 09.6	-47 20	AB	Regor; Dunlop 65	2.2	4.5	41.2	220
VIR	Gamma Vir	12 41.7	-01 27		Porrima; STF 1070	3.5	3.5	0.6	209
VOL	Gamma Vol	07 08.8	-70 30			3.9	5.8	13.7	297
VUL	6/8 Vul	19 28.7	+24 40			4.4	5.8	413.7	28

# STELLE VARIABILI CON MAX MAG.<6

## VARIABLE STARS WITH MAX MAG.<6

GCVS	Cos	A.R.	J2000	DEC.	J2000	magMax	Periodo	GCVS	Cos	A.R.	J2000	DEC.	J2000	magMax	Periodo
R	And	00 24 01.9	+38 34 37	5.800	409.3300000			omi 1	Cen	11 31 46.1	-59 26 31	5.800	200.0000000		
S	And	00 42 43.1	+41 16 05	5.800				LZ	Cep	22 02 04.6	+58 00 01	5.560	3.0705100		
AN	And	23 18 23.3	+41 46 25	6.000	3.2195665			V0381	Cep	21 19 15.7	+58 37 25	5.510			
KK	And	01 34 16.6	+37 14 14	5.910	0.6684000			V0388	Cep	23 15 37.7	+70 53 17	5.560			
OP	And	01 36 27.2	+48 43 22	5.920				V0414	Cep	20 44 22.1	+56 29 18	5.870			
OU	And	23 49 41.0	+36 25 31	5.900				AB	Cet	02 26 00.3	-15 20 28	5.710	2.9978140		
PZ	And	02 20 58.2	+50 09 05	5.590				BK	Cet	01 52 52.1	-16 55 45	5.730			
V0340	And	23 34 37.5	+40 14 11	5.590				EL	Cet	03 12 26.4	+06 39 39	5.660			
V0388	And	23 27 07.4	+42 54 43	5.730				DR	Cha	10 41 51.5	-79 47 00	5.940			
NO	Aps	17 31 27.5	-80 51 33	5.710				AX	Cir	14 52 35.3	-63 48 35	5.650	5.2732680		
R	Aqr	23 43 49.5	-15 17 04	5.800	386.9600000			CO	Cir	14 48 44.6	-66 35 37	5.790			
DV	Aqr	20 58 41.8	-14 28 59	5.890	1.5755310			SW	Col	05 23 24.0	-39 40 42	5.710			
HI	Aqr	22 53 28.7	-11 36 59	5.800				V0701	CrA	19 03 17.7	-38 15 11	5.690			
R	Aql	19 06 22.3	+08 13 48	5.500	284.2000000			V0710	CrA	19 01 50.7	-36 58 10	5.840			
EL	Aql	18 56 02.0	-03 19 20	5.500				R	CrB	15 48 34.4	+28 09 24	5.710			
QS	Aql	19 41 05.5	+13 48 56	5.930	2.5132940			S	CrB	15 21 24.0	+31 22 03	5.800	360.2600000		
V0606	Aql	19 20 24.3	-00 08 02	5.500				TZ	CrB	16 14 40.9	+33 51 31	5.690	1.1397890		
V1208	Aql	19 19 39.3	+12 22 29	5.510	0.1496630			DS	Cru	12 51 18.0	-60 19 47	5.790			
V1286	Aql	18 58 46.9	+13 54 24	5.830	6.0500000			U	Cyg	20 19 36.6	+47 53 39	5.900	463.2400000		
V1291	Aql	19 53 18.7	-03 06 52	5.610	224.5000000			X	Cyg	20 43 24.2	+35 35 16	5.850	16.3863320		
V1363	Aql	18 51 26.3	-01 03 52	5.800				RT	Cyg	19 43 37.8	+48 46 41	6.000	190.2800000		
V1370	Aql	19 23 21.1	+02 29 26	6.000				CH	Cyg	19 24 33.1	+50 14 29	5.600			
R	Ara	16 39 44.7	-56 59 40	6.000	4.4250700			DT	Cyg	21 06 30.2	+31 11 05	5.570	2.4992150		
V0539	Ara	17 50 28.4	-53 36 45	5.660	3.1691280			V0380	Cyg	19 50 37.3	+40 35 59	5.610	12.4256120		
V0854	Ara	17 11 38.7	-48 52 24	5.870				V0389	Cyg	21 08 38.9	+30 12 20	5.550			
V0862	Ara	17 31 23.3	-56 55 15	5.920				V0460	Cyg	21 42 01.1	+35 30 37	5.570	180.0000000		
RZ	Ari	02 55 48.5	+18 19 54	5.620	30.0000000			V1143	Cyg	19 38 41.2	+54 58 26	5.850	7.6407613		
SX	Ari	03 12 14.2	+27 15 25	5.670	0.7278925			V1334	Cyg	21 19 22.2	+38 14 15	5.770	3.3328160		
VZ	Ari	02 48 45.9	+25 11 17	5.820				V1339	Cyg	21 42 08.4	+45 45 57	5.900	35.0000000		
AV	Ari	02 10 37.6	+19 30 01	5.680				V1610	Cyg	21 02 18.7	+36 41 41	5.800			
WW	Aur	06 32 27.2	+32 27 18	5.790	2.5250192			V1668	Cyg	21 42 35.3	+44 01 55	6.000			
AE	Aur	05 16 18.1	+34 18 44	5.780				V1679	Cyg	20 14 31.8	+36 39 40	5.990			
OX	Aur	06 53 01.4	+38 52 09	5.940	0.1544120			V1743	Cyg	19 33 41.6	+49 15 44	5.960	40.0000000		
PU	Aur	05 18 15.7	+42 47 32	5.640				V1762	Cyg	19 08 25.8	+52 25 33	5.810			
QZ	Aur	05 28 34.1	+33 18 22	6.000				V1768	Cyg	20 04 36.2	+32 13 07	5.560			
V0444	Aur	06 00 58.6	+47 54 07	5.700				V2015	Cyg	20 33 54.8	+46 41 38	5.620			
CH	Boo	14 34 39.6	+49 22 06	5.740				V2093	Cyg	19 50 46.9	+37 49 35	6.000			
CY	Boo	14 17 28.5	+15 15 48	5.740				V2119	Cyg	20 23 44.4	+37 28 35	5.740			
DE	Boo	14 53 23.8	+19 09 10	6.000				V2121	Cyg	20 27 02.2	+49 23 00	5.750			
i	Boo	15 03 47.3	+47 39 15	5.800	0.2678159			V2140	Cyg	20 55 49.8	+47 25 04	5.650			
AX	Cam	08 01 42.5	+60 19 28	5.950	8.0278000			V2157	Cyg	21 25 47.0	+36 40 03	5.870			
DL	Cam	04 32 01.8	+53 54 39	5.810				EU	Del	20 37 54.7	+18 16 07	5.790	59.7000000		
X	Cnc	08 55 22.9	+17 13 53	5.600	195.0000000			UX	Dra	19 21 35.5	+76 33 35	5.940	168.0000000		
BI	Cnc	08 44 45.0	+10 04 54	5.580	4.2359000			VW	Dra	17 16 29.4	+60 40 14	6.000	170.0000000		
BL	Cnc	08 06 18.4	+22 38 08	5.970				CX	Dra	18 46 43.1	+52 59 17	5.680			
BM	Cnc	08 13 08.9	+29 39 24	5.530	4.1160000			DE	Dra	20 19 36.7	+62 15 27	5.720	5.2980360		
BO	Cnc	08 52 28.6	+28 15 33	5.900				DQ	Dra	16 24 25.3	+55 12 18	5.740			
TU	CVn	12 54 56.5	+47 11 48	5.550	50.0000000			EE	Dra	18 58 52.6	+69 31 53	5.840			
AI	CVn	12 23 47.0	+42 32 34	5.890	0.2085000			R	Eri	04 55 18.6	-16 25 04	5.720			
R	CMa	07 19 28.2	-16 23 43	5.700	1.1359405			DO	Eri	03 55 16.1	-12 05 57	5.970	12.4580000		
FV	CMa	07 07 22.6	-23 50 27	5.640				DX	Eri	04 44 05.3	-08 30 13	5.760			
FY	CMa	07 26 59.5	-23 05 10	5.540				DZ	Eri	04 32 37.6	-03 12 34	5.730	1.3740000		
HZ	CMa	06 50 23.3	-31 42 22	5.690				EH	Eri	04 33 54.7	-06 44 20	5.720	3.8200000		
IY	CMa	06 28 39.2	-32 22 17	5.640				EM	Eri	04 20 42.8	-07 35 33	5.840			
LS	CMa	07 01 05.9	-25 12 56	5.570				GW	Eri	04 11 36.2	-20 21 22	5.840			
LZ	CMa	07 09 43.0	-25 13 52	5.630				GZ	Eri	04 18 16.1	-20 42 55	5.940			
MM	CMa	07 12 12.2	-25 56 33	5.840				S	For	03 46 13.2	-24 23 28	5.600			
MZ	CMa	07 21 04.3	-25 53 30	5.870				AI	For	03 19 34.9	-24 07 22	5.650			
NR	CMa	07 27 08.0	-17 51 53	5.670				R	Gem	07 07 21.3	+22 42 13	6.000	369.9100000		
AG	Cap	21 46 16.3	-09 16 33	5.900	25.0000000			BU	Gem	06 12 19.1	+22 54 31	5.740			
U	Car	10 57 48.2	-59 43 56	5.720	38.7681000			NP	Gem	07 02 25.5	+17 45 20	5.890			
QY	Car	10 11 46.5	-58 03 38	5.630				NZ	Gem	07 42 03.2	+14 12 31	5.520			
V0366	Car	09 54 43.4	-57 18 52	5.700	433.0000000			OT	Gem	07 24 27.6	+15 31 02	6.000			
V0372	Car	07 52 29.7	-54 22 02	5.690	0.1160000			OV	Gem	06 49 49.8	+16 12 10	5.850			
V0374	Car	07 58 50.6	-60 49 28	5.720				PU	Gem	06 09 44.0	+23 06 48	5.780			
V0448	Car	06 47 18.7	-55 32 24	5.660				S	Gru	22 26 05.5	-48 26 19	6.000	401.5100000		
V0482	Car	09 30 23.4	-58 21 43	5.850				DL	Gru	23 10 09.7	-40 35 30	5.860			
V0514	Car	10 38 02.6	-57 15 23	5.830				LQ	Her	16 11 38.0	+23 29 41	5.580			
RU	Cas	01 11 41.4	+65 01 08	5.500				OP	Her	17 56 48.5	+45 21 03	5.850	120.5000000		
SU	Cas	02 51 58.8	+68 53 19	5.700	1.9493190			V0636	Her	16 47 19.7	+42 14 20	5.830			
YZ	Cas	00 45 39.1	+74 59 17	5.710	4.4672240			V0640	Her	17 25 54.4	+16 55 03	5.980			
V0373	Cas	23 55 33.8	+57 24 44	5.900	13.4192000			V0819	Her	17 21 43.6	+39 58 29	5.510			
V0557	Cas	01 42 20.5	+68 02 35	5.550	3.1848000			V0839	Her	15 55 30.6	+42 33 58	5.740			
V0567	Cas	00 05 06.1	+61 18 50	5.710	6.4322000			TU	Hor	03 30 37.0	-47 22 30	5.900	0.9359710		
V0638	Cas	23 02 43.9	+55 14 11	5.700	5.3600000			HW	Hor	03 12 33.2	-57 19 18	5.520	158.0000000		
V0640	Cas	00 06 15.8	+58 26 12	5.960				TV	Hya	08 35 28.2	-07 58 56	5.660	5.5700000		
V0705	Cas	23 41 47.2	+57 31 01	5.800				LM	Hya	08 26 27.2	-03 59 15	5.800			
V0746	Cas	00 24 15.7	+52 01 12	5.540				V0335	Hya	12 13 12.9	-34 07 31	5.840			
V0762	Cas	01 16 11.9	+71 44 38	5.920				khi 2	Hya	11 05 57.6	-27 17 16	5.650	2.2677010		
T	Cen	13 41 45.6	-33 35 51	5.500	90.4400000			BN	Hyi	03 07 32.1	-78 59 21	5.700			
V0716	Cen	14 13 39.8	-54 37 32	5.960	1.4900960			V0360	Lac	22 50 21.8	+41 57 12	5.910	10.0750000		
V0763	Cen	11 35 13.3	-47 22 21	5.550	60.0000000			TX	Leo	10 35 02.2	+08 39 02	5.660	2.4450566		
V0767	Cen	13 53 57.2	-47 07 41	5.860				VY	Leo	10 56 01.5	+06 11 07	5.690			
V0768	Cen	14 48 38.0	-36 38 05	5.930				CX	Leo	10 27 39.0	+09 45 45	5.970	7.8970000		
V0788	Cen	12 08 53.8	-44 19 34	5.740	4.9663770			DE	Leo	10 25 15.2	+08 47 05	5.600			
V0869	Cen	14 09 35.0	-51 30 17	5.920				DR	Leo	09 41 35.1	+31 16 40	5.840			
V0893	Cen	14 00 29.3													

GCVS	Cos	A.R. J2000	DEC.J2000	magMax	Periodo
R	Lep	04 59 36.3	-14 48 23	5.500	427.0700000
S	Lep	06 05 45.5	-24 11 44	6.000	89.0000000
YY	Lep	06 06 57.5	-21 48 44	5.600	
HR	Lup	15 08 12.1	-40 35 02	5.760	
HZ	Lup	15 06 33.2	-30 55 07	5.960	
RR	Lyn	06 26 25.8	+56 17 06	5.520	9.9450790
XY	Lyr	18 38 06.5	+39 40 06	5.800	
V0471	Lyr	19 11 46.0	+31 17 00	5.910	1.1608980
V0473	Lyr	19 15 59.5	+27 55 35	5.990	1.4907800
V0542	Lyr	18 58 01.9	+38 15 58	5.830	
WX	Men	05 34 44.8	-73 44 29	5.720	
iot	Men	05 35 36.2	-78 49 15	6.000	5.2880000
T	Mon	06 25 13.0	+07 05 09	5.580	27.0246490
V	Mon	06 22 43.6	-02 11 43	6.000	340.5000000
V0474	Mon	05 59 01.1	-09 22 56	5.930	0.1361260
R	Mus	12 42 05.0	-69 24 27	5.930	7.5102110
S	Mus	12 12 47.0	-70 09 06	5.890	9.6600700
BO	Mus	12 34 54.4	-67 45 25	5.850	
LS	Mus	13 03 05.4	-71 28 33	5.900	
tet	Mus	13 08 07.2	-65 18 22	5.500	18.3410000
V0360	Nor	15 51 06.8	-55 03 20	5.770	
V0367	Nor	16 13 17.0	-53 40 16	5.940	
U	Oph	17 16 31.7	+01 12 38	5.840	1.6773461
X	Oph	18 38 21.1	+08 50 03	5.900	328.8500000
Y	Oph	17 52 38.7	-06 08 37	5.870	17.1241300
V2052	Oph	17 56 18.4	+00 40 13	5.810	0.1398903
V2347	Oph	18 27 51.0	+07 52 21	5.800	
CK	Ori	05 30 19.9	+04 12 17	5.900	120.0000000
V0529	Ori	05 58 20.2	+20 15 45	6.000	
V1004	Ori	05 58 24.4	+01 50 14	5.880	0.0611000
AG	Peg	21 51 02.0	+12 37 32	6.000	
HH	Peg	23 51 21.2	+09 18 48	5.740	
HN	Peg	21 44 31.3	+14 46 19	5.920	24.9000000
HV	Peg	23 27 40.4	+25 10 02	5.960	6.9700000
IM	Peg	22 53 02.3	+16 50 28	5.600	24.4400000
MR	Peg	22 54 12.1	+22 39 35	5.710	
NV	Peg	21 28 59.8	+22 10 46	5.660	
NZ	Peg	21 39 01.2	+20 15 56	5.830	
V0342	Peg	23 07 28.7	+21 08 03	6.000	
IW	Per	03 33 35.0	+39 53 58	5.790	0.9171877
V0376	Per	03 49 08.1	+43 57 47	5.770	0.0993700
V0472	Per	02 08 40.6	+58 25 25	5.640	
V0582	Per	04 08 36.6	+38 02 23	5.630	
BD	Phe	01 50 54.4	-50 12 22	5.900	
ksi	Phe	00 41 46.4	-56 30 05	5.680	3.9516000
VX	Psc	01 29 52.9	+18 21 20	5.900	0.1310000
WW	Psc	00 59 49.7	+06 29 00	5.970	
XZ	Psc	23 54 46.6	+00 06 34	5.610	
AG	Psc	00 36 47.3	+15 13 54	5.810	0.0800000
UU	PsA	22 04 36.8	-26 49 21	5.860	
VZ	PsA	22 38 51.5	-33 04 53	5.680	
WX	PsA	22 59 35.8	-29 27 44	5.570	
MY	Pup	07 38 18.2	-48 36 05	5.540	5.6948200
PR	Pup	07 14 46.0	-46 50 59	5.690	1.9347000
PT	Pup	07 36 41.0	-19 42 08	5.720	0.1628400
QS	Pup	07 49 12.9	-46 51 28	5.840	0.1182000
V0336	Pup	08 02 44.8	-41 18 35	5.520	
V0363	Pup	07 12 25.8	-36 32 40	5.890	
V0378	Pup	07 36 03.9	-14 29 34	5.600	
V0390	Pup	07 44 34.2	-24 40 27	5.530	
V0392	Pup	07 46 10.5	-37 56 01	5.820	
V0397	Pup	07 49 14.7	-35 14 36	5.910	
V0438	Pup	08 24 57.2	-42 46 11	5.900	
V0468	Pup	07 39 58.0	-37 34 46	5.920	
XY	Pyx	08 27 59.4	-35 06 50	5.680	
RT	Sgr	20 17 43.6	-39 06 46	6.000	306.4600000
RU	Sgr	19 58 42.9	-41 50 58	6.000	240.4900000
RY	Sgr	19 16 32.8	-33 31 20	5.800	
V0732	Sgr	17 56 07.5	-27 22 17	6.000	
V3970	Sgr	17 58 30.0	-29 13 08	6.000	350.0000000
V3974	Sgr	17 58 57.0	-28 50 54	5.890	450.0000000

GCVS	Cos	A.R. J2000	DEC.J2000	magMax	Periodo
V3999	Sgr	18 02 19.0	-29 59 15	5.670	470.0000000
V4001	Sgr	18 02 42.0	-30 05 25	5.770	465.0000000
V4037	Sgr	18 02 35.0	-29 59 56	5.740	400.0000000
V4089	Sgr	19 34 08.4	-40 02 05	5.870	
V4452	Sgr	17 44 29.4	-29 04 59	5.930	
V4501	Sgr	17 45 31.5	-28 46 22	5.910	
V4530	Sgr	17 45 56.1	-28 55 51	5.570	
V4531	Sgr	17 45 55.8	-28 45 18	5.810	
V0906	Sco	17 53 54.8	-34 45 10	5.960	2.7858470
V0923	Sco	17 03 50.9	-38 09 09	5.860	34.8269000
V0927	Sco	15 54 39.5	-25 14 37	5.800	1.4593700
V0929	Sco	16 06 06.4	-23 36 23	5.890	
V0957	Sco	17 52 13.7	-34 47 57	5.870	
V1003	Sco	16 38 26.3	-43 23 54	5.830	
V1036	Sco	17 34 42.5	-32 34 54	5.710	
V1068	Sco	16 53 42.4	-43 03 03	5.710	
V1075	Sco	17 15 19.2	-33 32 54	5.570	
S	Scl	00 15 22.3	-32 02 43	5.500	362.5700000
AI	Scl	01 12 45.4	-37 51 23	5.890	
BU	Scl	23 59 27.9	-29 29 07	5.700	
sig	Scl	01 02 26.4	-31 33 07	5.500	
V0373	Sct	18 55 27.0	-07 43 05	6.000	
V0432	Sct	18 29 46.8	-14 34 55	5.960	2.1912000
CT	Ser	15 45 39.1	+14 22 32	6.000	
FL	Ser	15 12 04.3	+18 58 34	5.790	
FS	Ser	16 08 28.1	+08 32 04	5.680	
tau 4	Ser	15 36 28.2	+15 06 05	5.890	100.0000000
SS	Sex	10 23 27.0	-04 04 27	5.940	4.3700000
TU	Tau	05 45 13.7	+24 25 12	5.900	190.0000000
XX	Tau	05 19 24.4	+16 43 00	6.000	
HU	Tau	04 38 15.8	+20 41 05	5.850	2.0562997
V0483	Tau	04 19 57.7	+14 02 07	5.550	0.0540000
V0711	Tau	03 36 47.3	+00 35 16	5.710	2.8406120
V0731	Tau	05 43 19.5	+23 12 16	5.980	
V0775	Tau	04 22 03.5	+14 04 38	5.720	0.0625000
V0809	Tau	05 52 22.3	+14 10 18	5.590	2.6541000
V0892	Tau	04 18 40.6	+28 19 16	5.550	
V0960	Tau	05 33 31.6	+18 32 25	5.530	
V1083	Tau	03 43 43.9	+06 55 30	5.990	
V1141	Tau	04 23 32.4	+20 58 55	6.000	
V1155	Tau	05 07 55.4	+21 42 17	5.820	
V1156	Tau	05 09 45.1	+28 01 50	6.000	
PW	Tel	19 33 21.6	-45 16 18	5.610	2.9213000
YY	Tri	02 18 06.0	+28 36 45	5.840	
S	TrA	16 01 10.7	-63 46 36	5.950	6.3234400
LX	TrA	15 27 33.1	-64 31 53	5.810	
MX	TrA	16 59 34.0	-69 16 05	5.750	
BQ	Tuc	00 53 37.9	-62 52 17	5.700	
CG	Tuc	23 29 01.0	-63 06 38	5.660	2.3148000
ST	UMa	11 27 50.4	+45 11 07	6.000	110.0000000
VY	UMa	10 45 04.0	+67 24 41	5.870	
CO	UMa	11 09 19.1	+36 18 34	5.740	
CR	UMa	13 46 35.7	+54 25 58	5.650	1.3799600
EN	UMa	10 21 03.3	+68 44 52	5.830	
pi 1	UMa	08 39 11.7	+65 01 15	5.640	
RW	Umi	16 47 54.8	+77 02 12	6.000	
AH	Vel	08 12 00.0	-46 38 40	5.500	4.2271710
HV	Vel	08 35 52.0	-50 58 11	5.770	2.6674500
IU	Vel	09 00 22.3	-43 10 26	5.970	
IV	Vel	09 57 10.9	-52 38 20	5.990	0.1608000
IW	Vel	10 57 07.8	-50 45 54	5.900	0.1500000
IZ	Vel	09 01 20.9	-41 51 51	5.530	
KL	Vel	09 12 30.5	-43 36 48	5.560	
LR	Vel	09 18 42.4	-51 33 38	5.820	
NN	Vel	08 09 09.5	-48 41 04	5.620	
OP	Vel	08 46 30.5	-45 54 45	5.500	
V0335	Vel	09 53 50.1	-51 08 48	5.880	
SS	Vir	12 25 14.0	+00 46 12	6.000	364.1400000
CS	Vir	14 18 38.5	-18 42 56	5.840	9.2954000
FW	Vir	12 38 22.7	+01 51 17	5.630	15.0000000
LN	Vir	13 14 31.3	+11 19 54	5.750	



## COSTANTI ASTRONOMICHE

0,0027379093110	Anni per giorno al 2000
0,0748042315774	Anni per orbita lunare al 2000
0,999961212611	Anni per rivoluzione al 2000
365,25	Anno giuliano
365,2425	Anno gregoriano
365,24219876	Anno tropico in giorni al 1900
365,24219264	Anno tropico in giorni al 2000
13,4225120288	Cicli nodali lunari per rivoluzione solare terrestre al 2000
346,620031	Ciclo eclittico lunare, in giorni, al 1900
346,620063	Ciclo eclittico lunare, in giorni, al 2000
6.700,52877977	Ciclo lunare da punto fisso, in giorni
6.798,36320013	Ciclo lunare da punto fisso, in gradi
6.816,97578004	Ciclo lunare da punto fisso, rotazioni
40.030.005,6967	Circonferenza media terrestre, in metri
40.075.003,5535	Circonferenza terrestre, equatoriale, in metri
10.001.965,72930	Circonferenza terrestre, in m,etri, quadrante meridiano, IUGG
0,518102946	Diametro angolare lunare, medio geocentrico, in gradi
12.756.280,0	Diametro terrestre equatoriale, in metri, IUGG, WGS84
149.597.870.000	Distanza del Sole, in metri (unità astronomiche)
356.375.000,0	Distanza della Luna al perigeo, in metri
406.720.000,0	Distanza della Luna all'apogeo, in metri
384.400.000,0	Distanza media della Luna, in metri
25.781,5756912	Durata in anni della precessione, al 2000
9.416.519,24934	Durata in giorni della precessione, al 2000
0,054900489	Eccentricità dell'orbita lunare
0,01671022	Eccentricità dell'orbita terrestre
365,25964438	Giorni per anno anomalistico al 2000
365,25964134	Giorni per anno anomalistico, 1900
29,5305888844	Giorni per periodo sinodico medio al 2000
27,32166156	Giorni per rivoluzione lunare al 2000
365,2563605	Giorni per rivoluzione media
365,25636053	Giorni per rivoluzione, al 2000
0,99726967199	Giorni per rotazione al 2000
36525	Giorni per secolo giuliano
57,2957795131	Gradi per radiante
5,1453964	Inclinazione dell'orbita lunare
0,996647189318820	Inverso dello schiacciamento terrestre
298,257222101	Inverso dello schiacciamento terrestre, IUGG
298,257223563	Inverso dello schiacciamento terrestre, WGS84
111.950,42769	Lunghezza di un ° di circonferenza terrestre in metri
18,6133019052	Ciclo dei nodi lunari, in anni
0,00511666	Nutazione dell'asse terrestre
23,439291111	Obliquità dell'eclittica
26,8206129544	Orbita per periodo lunare nodale, °
13,3687462502	Orbite lunari per orbita solare terrestre al 2000
1,00003878889	Orbite per anno al 2000
27,55454650	Periodo anomalistico lunare in giorni
27,2122207637	Periodo nodale lunare in giorni
0,0367481951835	Periodo nodale lunare per giorno al 2000
0,0366478605569	Periodo nodale lunare per rotazione al 2000
29,5305888844	Periodo sinodico lunare, medio, al 2000
3,87873887918E-05	Precessione annuale al 2000
0,0139634599651	Precessione annuale in gradi
3,82306869946E-05	Precessione giornaliera
3,87888933117E-05	Precessione per rivoluzione al 2000
6.378.140,0	Raggio equatoriale terrestre, in metri, IAU 1979
6.371.000,79	Raggio in metri di una sfera con la stessa superficie della Terra, IUGG
6.371.007,18	Raggio in metri di una sfera con lo stesso volume della Terra, IUGG

1.738.000,0	Raggio lunare in metri
6.371.008,77	Raggio terrestre medio, in metri, IUGG
6.356.755,28816	Raggio terrestre polare, in metri
27,32166156	Rivoluzione lunare in giorni al 2000
13,1403824445	Rivoluzioni lunari per rotazione, in gradi
18,6140238945	Rivoluzioni lunari per ciclo nodale (lunar major)
0,0366009950677	Rivoluzioni lunari per giorno al 2000
0,985609119791	Rivoluzioni lunari per giorno, in gradi
13,1763582244	Rivoluzioni lunari per giorno, media, in gradi
0,036501066623457	Rivoluzioni lunari per rotazione al 2000
0,982918083604	Rivoluzioni lunari per rotazione, in gradi
359,98603654	Rivoluzioni per anno in gradi
0,00273780311053	Rivoluzioni per giorno al 2000
0,0745017026513	Rivoluzioni per mese nodale al 2000
0,0748013300039	Rivoluzioni per orbita lunare al 2000
26,9284788014	Rivoluzioni per orbita lunare in gradi
27,1580123221	Rivoluzioni per periodo anomalistico lunare, in gradi
29,1056177173	Rivoluzioni per periodo lunare sinodico in gradi
0,00273032801001	Rivoluzioni per rotazione al 2000
29,6114378225	Rotazioni lunari per ciclo sinodico
366,2421544	Rotazioni per anno tropico al 2000
366,242154403	Rotazioni per anno, al 2000
347,569040486	Rotazioni per ciclo lunare eclittico
1,00273780311	Rotazioni per giorno al 2000
27,6299854231	Rotazioni per periodo anomalistico
27,2867224663	Rotazioni per periodo nodale al 2000
366,25636053	Rotazioni per rivoluzione al 2000
27,39646289	Rotazioni per rivoluzione lunare al 2000
0,00335281068118	Schiacciamento terrestre
8640	Secondi per giorno giuliano
6.378.137,0	Semiasse maggiore terrestre, in metri, WGS84
6.356.752,3141	Semiasse minore terrestre, in metri, WGS84

# SOLE - THE SUN

Classificazione	Sequenza principale
Classe spettrale	G2

PARAMETRI ORBITALI (epoca di riferimento: J2000)

Semiasse maggiore	26-28000 anni luce
Periodo orbitale	$2,25-2,50 \times 10^6$ anni
Velocità orbitale	217 km/s (media)
Sistema planetario	sì

## DATI FISICI

Diametro medio	1 392 000 km
Superficie	$6,09 \times 10^{18} \text{ m}^2$
Volume	$1,41 \times 10^{27} \text{ m}^3$
Massa	$1,9891 \times 10^{30} \text{ kg}$
Densità	$1,411 \times 10^3 \text{ kg/m}^3$
Acceleraz. di gravità in superficie	$274 \text{ m/s}^2$ (27,9 g)
Velocità di fuga	617,54 km/s
Periodo di rotazione	
All'equatore:	27 d 6 h 36 min
A 30° di latitudine:	28 d 4 h 48 min
A 60° di latitudine:	30 d 19 h 12 min
A 75° di latitudine:	31 d 19 h 12 min
Velocità di rotazione (all'equatore)	1993 m/s
Inclinaz. dell'asse sull'eclittica	7,25°
Inclinaz. dell'asse sul piano galattico	67,23°
A.R. polo nord	286,13° (19 h 4 min 30 s)
Declinazione	63,87° (63° 52')
Temperatura superficiale	5780 K (media)
T. della corona	$5 \times 10^6 \text{ K}$
T. del nucleo	$\sim 13,6 \times 10^6 \text{ K}$
Luminosità	$3,827 \times 10^{26} \text{ J/s}$
Radianza	$2,009 \times 10^7 \text{ W/(sr}\cdot\text{m}^2)$

## DATI OSSERVATIVI

Magnitudine apparente da Terra	-26,8 (media)
Magnitudine ass.	4,8

PIANETI

	MERCURIO	VENERE	TERRA	LUNA	MARTE	GIOVE	SATURNO	URANO	NETTUNO
Massa (10 <sup>24</sup> kg)	0,33	4,87	5,97	0,073	0,642	1899	568	86,8	102
Diametro (km)	4879	12104	12756	3475	6794	142984	120536	51118	49528
Densità (kg/m3)	5427	5243	5515	3340	3933	1326	687	1270	1638
Gravità (m/s²)	3,7	8,9	9,8	1,6	3,7	23,1	9	8,7	11
Velocità di fuga (km/s)	4,3	10,4	11,2	2,4	5	59,5	35,5	21,3	23,5
Periodo di rotazione (ore)	1407,6	-5832,5	23,9	655,7	24,6	9,9	10,7	-17,2	16,1
Lunghezza del giorno (ore)	4222,6	2802	24	708,7	24,7	9,9	10,7	17,2	16,1
Distanza dal Sole (10 <sup>6</sup> km)	57,9	108,2	149,6	0,384*	227,9	778,6	1433,5	2872,5	4495,1
Perielio (10 <sup>6</sup> km)	46	107,5	147,1	0,363*	206,6	740,5	1352,6	2741,3	4444,5
Afelio (10 <sup>6</sup> km)	69,8	108,9	152,1	0,406*	249,2	816,6	1514,5	3003,6	4545,7
Periodo orbitale (giorni)	88	224,7	365,2	27,3	687	4331	10756	30706	60223
Velocità orbitale (km/s)	47,9	35	29,8	1	24,1	13,1	9,7	6,8	5,4
Inclinazione orbitale (gradi)	7	3,4	0	5,1	1,9	1,3	2,5	0,8	1,8
Eccentricità orbitale	0,205	0,007	0,017	0,055	0,094	0,049	0,057	0,046	0,011
Inclinazione dell'asse (gradi)	0,01	177,4	23,5	6,7	25,2	3,1	26,7	97,8	28,3
Temperatura media (C)	167	464	15	-20	-65	-110	-140	-195	-200
Pressione sulla superficie (bar)	0	92	1	0	0,01	Sconosciuta	Sconosciuta	Sconosciuta	Sconosciuta
Satelliti	0	0	1	0	2	63	60	27	13
Anelli	No	No	No	No	No	Yes	Yes	Yes	Yes
Campo magnetico	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes

\* valori riferiti alla Terra

	Sole	Mercurio	Venere	Terra	Luna	Marte	Giove	Saturno	Urano	Nettuno
Sole	-	4960,5	2654,8	1920,2	1920,2	1260,5	369,0	200,4	100,0	63,9
Mercurio	17,4	-	20,0	11,0	11,0	5,9	1,4	0,7	0,4	0,2
Venere	23,1	49,7	-	60,3	60,3	20,9	3,7	1,9	0,9	0,6
Terra	17,6	28,7	63,6	-	-	33,6	4,2	2,1	1,0	0,6
Luna	4,8	7,8	17,3	-	-	9,2	1,1	0,6	0,3	0,2
Marte	6,2	8,2	11,7	17,9	17,9	-	2,5	1,2	0,5	0,3
Giove	37,9	40,9	44,0	46,9	46,9	53,6	-	45,1	14,1	7,9
Saturno	17,4	18,1	18,8	19,4	19,4	20,6	38,0	-	17,3	8,1
Urano	3,7	3,7	3,8	3,9	3,9	4,0	5,0	7,3	-	6,5
Nettuno	2,3	2,3	2,3	2,4	2,4	2,4	2,8	3,3	6,3	-

Diametri medi in " che i pianeti sottendono visti da un corpo all'altro

# PLANETS

	MERCURY	VENUS	EARTH	MOON	MARS	JUPITER	SATURN	URANUS	NEPTUNE
Weight ( $10^{24}$ kg)	0,33	4,87	5,97	0,073	0,642	1899	568	86,8	102
Diameter (km)	4879	12104	12756	3475	6794	142984	120536	51118	49528
Density (kg/m <sup>3</sup> )	5427	5243	5515	3340	3933	1326	687	1270	1638
Gravity (m/s <sup>2</sup> )	3,7	8,9	9,8	1,6	3,7	23,1	9	8,7	11
Velocità of escape (km/s)	4,3	10,4	11,2	2,4	5	59,5	35,5	21,3	23,5
Period of rotation (hours)	1407,6	-5832,5	23,9	655,7	24,6	9,9	10,7	-17,2	16,1
Length of the day (hours)	4222,6	2802	24	708,7	24,7	9,9	10,7	17,2	16,1
distance from the Sun ( $10^6$ km)	57,9	108,2	149,6	0,384*	227,9	778,6	1433,5	2872,5	4495,1
Perihelion ( $10^6$ km)	46	107,5	147,1	0,363*	206,6	740,5	1352,6	2741,3	4444,5
Aphelion ( $10^6$ km)	69,8	108,9	152,1	0,406*	249,2	816,6	1514,5	3003,6	4545,7
Orbital period (days)	88	224,7	365,2	27,3	687	4331	10,747	30,589	59,8
Orbital velocity (km/s)	47,9	35	29,8	1	24,1	13,1	9,7	6,8	5,4
Orbital inclination (degrees)	7	3,4	0	5,1	1,9	1,3	2,5	0,8	1,8
Eccentricity	0,205	0,007	0,017	0,055	0,094	0,049	0,057	0,046	0,011
Inclination (gradi)	0,01	177,4	23,5	6,7	25,2	3,1	26,7	97,8	28,3
Temperatur (C)	167	464	15	-20	-65	-110	-140	-195	-200
Pressure (bar)	0	92	1	0	0,01	Sconosciuta	Sconosciuta	Sconosciuta	Sconosciuta
Satellites	0	0	1	0	2	63	60	27	13
Rings	No	No	No	No	No	Yes	Yes	Yes	Yes
Magnetic field	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes

\* data referred to the Earth

# SATELLITI DI MARTE - SATELLITES OF MARS

Nome		Diametro medio	Massa	Raggio orbitale medio	Periodo orbitale	Scoperta
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery
Marte I	Fobos	27,0x21,6x18,8 km	10,8x1015 kg	9 377 km	7,66 ore	1877
Marte II	Deimos	10x12x16 km	2x1015 kg	23 460 km	30,35 ore	1877

# SATELLITI DI GIOVE - SATELLITES OF JUPITER

Nome		Diametro medio	Massa	Raggio Orbitale Medio	Periodo orbitale	Scoperta	Gruppo
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery	Group
Giove XVI	Metide	43 km	120x1015 kg	127 690 km	0,294780 giorni	1979	Gruppo di Amaltea
Giove XV	Adrastea	26x20x16 km	7,5x1015 kg	128 694 km	0,29826 giorni	1979	Gruppo di Amaltea
Giove V	Amaltea	262x146x134 km	2,1x1018 kg	181 170 km	0,498179 giorni	1892	Gruppo di Amaltea
Giove XIV	Tebe	110x90 km	1,5x1018 kg	221 700 km	0,6745 giorni	1979	Gruppo di Amaltea
Giove I	Io	3 643 km	89x1021 kg	421 700 km	1,769138 giorni	1610	Satelliti galileiani
Giove II	Europa	3 122 km	48x1021 kg	671 034 km	3,551181 giorni	1610	Satelliti galileiani
Giove III	Ganimede	5 262 km	150x1021 kg	1 070 412 km	7,154553 giorni	1610	Satelliti galileiani
Giove IV	Callisto	4 821 km	110x1021 kg	1 882 709 km	16,689018 giorni	1610	Satelliti galileiani
Giove XVIII	Temisto	8 km	0,69x1015 kg	7 391 645 km	129,8276 giorni	1975	
Giove XIII	Leda	20 km	11x1015 kg	11 097 245 km	238,8242 giorni	1974	Gruppo di Imalia
Giove VI	Imalia	170 km	6,7x1018 kg	11 432 435 km	249,7263 giorni	1904	Gruppo di Imalia
Giove X	Lisitea	36 km	63x1015 kg	11 653 225 km	256,9954 giorni	1938	Gruppo di Imalia
Giove VII	Elara	86 km	870x1015 kg	11 683 115 km	257,9849 giorni	1905	Gruppo di Imalia
S/2000 J 11		4 km	90x1012 kg	12 570 575 km	287,9310 giorni	2000	Gruppo di Imalia
Giove XLVI	Carpo	3 km	45x1012 kg	17 144 875 km	1,2556 anni	2003	
S/2003 J 12		1 km	1,5x1012 kg	17 739 540 km	1,3215 anni	2000	
Giove XXXIV	Euporia	2 km	15x1012 kg	19 088 435 km	1,4751 anni	2001	Gruppo di Ananke?
S/2003 J 3		2 km	15x1012 kg	19 621 780 km	1,5374 anni	2003	Gruppo di Ananke
S/2003 J 18		2 km	15x1012 kg	19 812 575 km	1,5598 anni	2003	Gruppo di Ananke
Giove XLII	Telsinoe	2 km	15x1012 kg	20 453 755 km	1,6362 anni	2003	Gruppo di Ananke
Giove XXXIII	Euante	3 km	45x1012 kg	20 464 855 km	1,6375 anni	2001	Gruppo di Ananke
Giove XLV	Elice	4 km	90x1012 kg	20 540 265 km	1,6465 anni	2003	Gruppo di Ananke?
Giove XXXV	Ortosia	2 km	15x1012 kg	20 567 970 km	1,6499 anni	2001	Gruppo di Ananke?
Giove XXIV	Iocaste	5 km	190x1012 kg	20 722 565 km	1,6685 anni	2000	Gruppo di Ananke
S/2003 J 16		2 km	15x1012 kg	20 743 780 km	1,6711 anni	2003	Gruppo di Ananke
Giove XII	Ananke	28 km	30x1015 kg	20 815 225 km	1,6797 anni	1951	Gruppo di Ananke
Giove XXVII	Praxidike	7 km	430x1012 kg	20 823 950 km	1,6808 anni	2000	Gruppo di Ananke
Giove XXII	Arpalice	4 km	120x1012 kg	21 063 815 km	1,7099 anni	2000	Gruppo di Ananke
Giove XXX	Ermippe	4 km	90x1012 kg	21 182 085 km	1,7243 anni	2001	Gruppo di Ananke?
Giove XXIX	Tione	4 km	90x1012 kg	21 405 570 km	1,7517 anni	2001	Gruppo di Ananke
Giove XL	Mneme	2 km	15x1012 kg	21 427 110 km	1,7543 anni	2003	Gruppo di Ananke
S/2003 J 17		2 km	15x1012 kg	22 134 305 km	1,8419 anni	2003	Gruppo di Carme
Giove XXXI	Aitne	3 km	45x1012 kg	22 285 160 km	1,8608 anni	2001	Gruppo di Carme
Giove XXXVII	Cale	2 km	15x1012 kg	22 409 210 km	1,8763 anni	2001	Gruppo di Carme
Giove XX	Taigete	5 km	160x1012 kg	22 438 650 km	1,8800 anni	2000	Gruppo di Carme
S/2003 J 19		2 km	15x1012 kg	22 709 060 km	1,9141 anni	2003	Gruppo di Carme
Giove XXI	Caldene	4 km	75x1012 kg	22 713 445 km	1,9147 anni	2000	Gruppo di Carme
S/2003 J 15		2 km	15x1012 kg	22 721 000 km	1,9156 anni	2003	Gruppo di Ananke?
S/2003 J 10		2 km	15x1012 kg	22 730 815 km	1,9168 anni	2003	Gruppo di Carme?
S/2003 J 23		2 km	15x1012 kg	22 739 655 km	1,9180 anni	2003	Gruppo di Pasife
Giove XXV	Erinome	3 km	45x1012 kg	22 986 265 km	1,9493 anni	2000	Gruppo di Carme
Giove XLI	Aede	4 km	90x1012 kg	23 044 175 km	1,9566 anni	2003	Gruppo di Pasife
Giove XLIV	Callicore	2 km	15x1012 kg	23 111 825 km	1,9652 anni	2003	Gruppo di Carme?
Giove XXIII	Calice	5 km	190x1012 kg	23 180 775 km	1,9740 anni	2000	Gruppo di Carme
Giove XXXII	Euridome	3 km	45x1012 kg	23 230 860 km	1,9804 anni	2001	Gruppo di Pasife?
S/2003 J 14		2 km	15x1012 kg	23 238 595 km	1,9814 anni	2003	Gruppo di Pasife
Giove XXXVIII	Pasitee	2 km	15x1012 kg	23 307 320 km	1,9902 anni	2001	Gruppo di Carme
Giove XLVIII	Cillene	2 km	15x1012 kg	23 396 270 km	2,0016 anni	2003	Gruppo di Pasife
Giove XLVII	Eukelade	4 km	90x1012 kg	23 483 695 km	2,0129 anni	2003	Gruppo di Carme
S/2003 J 4		2 km	15x1012 kg	23 570 790 km	2,0241 anni	2003	Gruppo di Pasife
Giove XXXIX	Egemone	3 km	45x1012 kg	23 702 510 km	2,0411 anni	2003	Gruppo di Pasife
Giove XLIII	Arche	3 km	45x1012 kg	23 717 050 km	2,0429 anni	2002	Gruppo di Carme
Giove XI	Carme	46 km	0,13x1018 kg	23 734 465 km	2,0452 anni	1938	Gruppo di Carme
Giove XXVI	Isonoe	4 km	75x1012 kg	23 832 630 km	2,0579 anni	2000	Gruppo di Carme
S/2003 J 9		1 km	1,5x1012 kg	23 857 810 km	2,0612 anni	2003	Gruppo di Carme
S/2003 J 5		4 km	90x1012 kg	23 973 925 km	2,0762 anni	2003	Gruppo di Carme
Giove VIII	Pasife	60 km	300x1015 kg	24 094 770 km	2,0919 anni	1908	Gruppo di Pasife
Giove IX	Sinope	38 km	75x1015 kg	24 214 390 km	2,1075 anni	1908	Gruppo di Pasife
Giove XXXVI	Sponde	2 km	15x1012 kg	24 252 625 km	2,1125 anni	2001	Gruppo di Pasife
Giove XXVIII	Autonoe	4 km	90x1012 kg	24 264 445 km	2,1141 anni	2001	Gruppo di Pasife
Giove XVII	Calliroe	9 km	870x1012 kg	24 356 030 km	2,1261 anni	1999	Gruppo di Pasife
Giove XIX	Megaclite	5 km	210x1012 kg	24 687 240 km	2,1696 anni	2000	Gruppo di Pasife
S/2003 J 2		2 km	15x1012 kg	30 290 845 km	2,9487 anni	2003	

# SATELLITI DI SATURNO - SATELLITES OF SATURN

Nome		Diametro medio	Massa	Raggio Orbitale medio	Periodo orbitale	Scoperta	Gruppo
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery	Group
Saturno XVIII	Pan	35x35x23 km	2,7x1015 kg	133 583 km	0,575 giorni	1990	
Saturno XXXV	Dafni	7 km	?	136 505 km	0,59537 giorni	2005	
Saturno XV	Atlante	40x20 km	?	137 670 km	0,6019 giorni	1980	
Saturno XVI	Prometeo	145x85x62 km	0,270x1018 kg	139 350 km	0,6130 giorni	1980	
Saturno XVII	Pandora	114x84x62 km	0,220x1018 kg	141 700 km	0,6285 giorni	1980	
Saturno XI	Epimeteo	144x108x98 km	0,560x1018 kg	151 422 km	0,6942 giorni	1980	
Saturno X	Giano	196x192x150 km	2,01x1018 kg	151 472 km	0,6945 giorni	1966	
Saturno I	Mimante	397 km	38,0x1018 kg	185 520 km	0,942422 giorni	1789	
Saturno XXXII	Metone	3 km	?	194 000 km	1,01 giorni	2004	
Saturno XLIX	Antea	2 km	?	197 700 km	1,04 giorni	2007	
Saturno XXXIII	Pallene	4 km	?	211 000 km	1,14 giorni	2004	
Saturno II	Encelado	499 km	73,0x1018 kg	238 020 km	1,370218 giorni	1789	
Saturno XIII	Telesto	34x28x36 km	?	294 660 km	1,887802 giorni	1980	
Saturno III	Teti	1 060 km	0,622x1021 kg	294 660 km	1,887802 giorni	1684	
Saturno XIV	Calipso	34x22x22 km	?	294 660 km	1,887802 giorni	1980	
Saturno XII	Elena	36x32x30 kg	?	377 400 km	2,736915 giorni	1980	
Saturno IV	Dione	1 118 km	1,05x1021 kg	377 400 km	2,736915 giorni	1684	
Saturno XXXIV	Polluce	13 km	?	377 400 km	2,736915 giorni	2004	
Saturno V	Rea	1 528 km	2,49x1021 kg	527 040 km	4,5175 giorni	1672	
Saturno VI	Titano	5 151 km	135x1021 kg	1 221 850 km	15,94542 giorni	1655	
Saturno VII	Iperione	410x260x220 km	17,7x1018 kg	1 481 100 km	21,27661 giorni	1848	
Saturno VIII	Giapeto	1 460 km	1,88x1021 kg	3 561 300 km	79,33018 giorni	1671	
Saturno XXIV	Kiviuq	16 km	3,3x1015 kg	11 365 000 km	1,2298 anni	2000	Gruppo Inuit
Saturno XXII	Ijiraq	12 km	?	11 442 000 km	1,2361 anni	2000	Gruppo Inuit
Saturno IX	Febe	220 km	4,00x1018 kg	12 944 300 km	-1,5009 anni	1899	Gruppo Nordico
Saturno XX	Paaliaq	22 km	?	15 199 000 km	1,8806 anni	2000	Gruppo Inuit
Saturno XXVII	Skadi	8 km	?	15 647 000 km	-1,9956 anni	2000	Gruppo Nordico
Saturno XXVI	Albiorix	32 km	?	16 404 000 km	2,1451 anni	2000	Gruppo Gallico
S/2007 S 2		6		16 560 000 km	-2,171 anni	2007	Gruppo Nordico
Saturno XXXVII	Bebhionn	6 km	?	16 950 000 km	2,25 anni	2004	Gruppo Inuit
Saturno XLVII	Skoll	6 km		17 610 000 km	-2,3792 anni	2006	
Saturno XXVIII	Erriapo	10 km	?	17 616 000 km	2,3871 anni	2000	Gruppo Gallico
S/2007 S 1		7 km	?	17 910 600 km	-2,44 anni	2007	Gruppo Inuit
S/2006 S 4		6 km		18 105 000 km	-2,4778 anni	2006	
Saturno XXIX	Siarnaq	40 km	?	18 160 000 km	2,4452 anni	2000	Gruppo Inuit
Saturno XLIV	Hyrrokkin	8 km		18 217 125 km	-2,4970 anni	2004	
Saturno XXI	Tarvos	15 km	?	18 247 000 km	2,5342 anni	2000	Gruppo Gallico
S/2004 S 13		6 km	?	18 450 000 km	-2,48 anni	2004	Gruppo Nordico
S/2006 S 6		6 km		18 600 000 km	-2,5791 anni	2006	
S/2004 S 17		4 km	?	18 600 000 km	-2,70 anni	2004	Gruppo Nordico
Saturno XXV	Mundilfari	7 km	?	18 722 000 km	-2,6048 anni	2000	Gruppo Nordico
Saturno XXXVIII	Bergelmir	6 km	?	18 750 000 km	-2,76 anni	2004	Gruppo Nordico
S/2006 S 1		6 km		18 981 135 km	-2,6558 anni	2006	
Saturno XXXVI	Ægir	6 km	?	19 350 000 km	-2,81 anni	2004	Gruppo Nordico
Saturno XXXI	Narvi	7 km	?	19 370 700 km	-2,7558 anni	2003	Gruppo Nordico
S/2004 S 12		5 km	?	19 650 000 km	-2,87 anni	2004	Gruppo Nordico
Saturno XXXIX	Bestla	7 km	?	19 650 000 km	-2,88 anni	2004	Gruppo Nordico
Saturno XXIII	Suttungr	7 km	?	19 666 700 km	-2,8192 anni	2000	Gruppo Nordico
Saturno XL	Farbauti	5 km	?	19 800 800 km	-2,95 anni	2004	Gruppo Nordico
S/2004 S 7		6 km	?	19 800 000 km	-3,02 anni	2004	Gruppo Nordico
Saturno XLIII	Hati	6 km	?	19 950 000 km	-2,96 anni	2004	Gruppo Nordico
S/2007 S 3		5 km		20 518 500 km	-3,01 anni	2007	
Saturno XXX	Thrymr	7 km	?	20 810 300 km	-3,07 anni	2000	Gruppo Nordico
S/2006 S 3		6 km		21 132 000 km	-3,13 anni	2006	

## SATELLITI DI URANO - SATELLITES OF URANUS

Nome		Diametro medio	Massa	Raggio orbitale medio	Periodo orbitale	Scoperta
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery
Urano VI	Cordelia	13 ± 2 km	0,8×1018 kg	49 752 km	0,3350338 giorni	1986
Urano VII	Ofelia	15 ± 8 km	0,8×1018 kg	53 764	0,376400 giorni	1986
Urano VIII	Bianca	21 ± 4 km	0,8×1018 kg	59 166	0,43457899 giorni	1986
Urano IX	Cressida	80 ± 4 km	0,343×1018 kg	61 780 km	0,463570 giorni	1986
Urano X	Desdemona	64 ± 8 km	0,178×1018 kg	62 680 km	0,473650 giorni	1986
Urano XI	Juliet	94 ± 8 km	0,557×1018 kg	64 350 km	0,493065 giorni	1986
Urano XII	Porzia	135 ± 8 km	1,68×1018 kg	66 090 km	0,513196 giorni	1986
Urano XIII	Rosalind	72 ± 12 km	0,254×1018 kg	69 940 km	0,558460 giorni	1986
Urano XXVII	Cupido	~17,8 km	3,8×1015 kg	74 800 km	0,618 giorni	2003
Urano XIV	Belinda	81 ± 16 km	0,357×1018 kg	75 260 km	0,623527 giorni	1986
Urano XXV	Perdita	~26,6 km	13×1015 kg	76 420 km	0,638 giorni	1986
Urano XV	Puck	162 ± 4 km	2,89 × 1018 kg	86 010 km	0,761833 giorni	1986
Urano XXVI	Mab	~24,8 km	1,0 × 1016 kg	97 734 km	0,923 giorni	2003
Urano V	Miranda	471,6 ± 1,4 km	(66 ± 7) × 1018 kg	129 390 km	1,413479 giorni	1948
Urano I	Ariel	1157,8 ± 1,2 km	(1,35 ± 0,12) × 1021 kg	191 020 km	2,520379 giorni	1851
Urano II	Umbriel	1169,4 ± 5,6 km	(1,17 ± 0,13) × 1021 kg	266 300 km	4,144177 giorni	1851
Urano III	Titania	1577,8 ± 3,6 km	(3,53 ± 0,09) × 1021 kg	435 910 km	8,705872 giorni	1787
Urano IV	Oberon	1522,8 ± 5,2 km	(3,01 ± 0,07) × 1021 kg	583 520 km	13,463239 giorni	1787
Urano XXII	Francisco	~12 km	1,3×1015 kg	4 276 000 km	-0,7299 anni	2001
Urano XVI	Calibano	~98 km	0,73×1018 kg	7 231 000 km	-1,5871 anni	1997
Urano XX	Stefano	~20 km	6×1015 kg	8 004 000 km	-1,8546 anni	1999
Urano XXI	Trinculo	~10 km	0,75×1015 kg	8 504 000 km	-2,0780 anni	2001
Urano XVII	Sicorace	~190 km	5,4×1018 kg	12 179 000 km	-3,5272 anni	1997
Urano XXIII	Margherita	~11 km	1,3×1015 kg	14 345 000 km	4,6401 anni	2003
Urano XVIII	Prospero	~30 km	21×1015 kg	16 256 000 km	-5,4136 anni	1999
Urano XIX	Setebos	~30 km	21×1015 kg	17 418 000 km	-6,1185 anni	1999
Urano XXIV	Ferdinando	~12 km	1,3×1015 kg	20 901 000 km	-7,7300 anni	2001

## SATELLITI DI NETTUNO - SATELLITES OF NEPTUNE

Nome		Diametro medio	Massa	Raggio orbitale medio	Periodo orbitale	Scoperta
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery
Nettuno III	Naiade	58 km	~0,19×1018 kg	48 227 km	0,294 giorni	1989
Nettuno IV	Talassa	80 km	~0,37×1018 kg	50 075 km	0,311 giorni	1989
Nettuno V	Despina	148 km	~2,10×1018 kg	52 526 km	0,335 giorni	1989
Nettuno VI	Galatea	158 km	~3,70×1018 kg	61 593 km	0,429 giorni	1989
Nettuno VII	Larissa	208×178 km	~4,90×1018 kg	73 548 km	0,555 giorni	1981
Nettuno VIII	Proteo	436×416×402 km	~50×1018 kg	117 647 km	1,122 giorni	1989
Nettuno I	Tritone	2700 km	21,4×1021 kg	354 800 km	-5,877 giorni	1846
Nettuno II	Nereide	340 km	~31×1018 kg	5 513 400 km	0,99 anni	1949
Nettuno IX	Alimede	60 km	~0,09×1018 kg	15 728 000 km	-5,15 anni	2002
Nettuno XI	Sao	38 km	~0,09×1018 kg	22 422 000 km	7,98 anni	2002
Nettuno XII	Laomedea	38 km	~0,09×1018 kg	23 571 000 km	8,67 anni	2002
Nettuno X	Psamate	28 km	~0,015×1018 kg	46 695 000 km	-24,96 anni	2003
Nettuno XIII	Neso	60 km	~0,09×1018 kg	48 387 000 km	-25,67 anni	2002



# EVENTI EXTRATERRESTRI

Nelle tabelle seguenti sono calcolati i transiti e le eclissi che potrebbe osservare un ipotetico essere vivente o sonda presente sul pianeta indicato.

## EXTRATERRESTRIAL EVENTS

In the following charts they are calculated the transits and the eclipses that could observe a hypothetical living being or probe present on the suitable planet.

Mercurio - Mercury

Questo anno non avvengono fenomeni - No phenomena this year

Venere - Venus

Date	TT	Dm (ø)	Dl	r1	r2	e	m1	m2	tm(s)		
2011/06/03 08:40:35		0.19215	0.37280	0.725	0.394	-0	-27.6	9.4	16760	Sun	Mercury

Marte - Mars

Questo anno non avvengono fenomeni - No phenomena this year

Giove - Jupiter

Date	TT	Dm (ø)	Dl	r1	r2	e	m1	m2	tm(s)		
2011/11/28 20:50:31		0.00767	0.05423	4.968	4.647	-0	-23.4	17.2	23193	Sun	Mercury

Saturno - Saturn

Date	TT	Dm (ø)	Dl	r1	r2	e	m1	m2	tm(s)		
2011/12/30 16:46:18		0.02569	0.02771	9.692	9.272	-0	-21.9	16.0	11715	Sun	Mercury

Urano - Uranus

Questo anno non avvengono fenomeni - No phenomena this year

Nettuno - Neptune

Questo anno non avvengono fenomeni - No phenomena this year

Luna - Moon

Date	TT	Dm	Dl	r1	r2	e	m1	m2	tm(s)		
2011/01/18 05:47:06		0.08377	1.24659	1.165	0.002	171	-22	-0.2	-11.9	Mercury	Earth
2011/02/15 03:52:26		0.81845	1.24912	0.957	0.002	169	-43	-4.1	-13.3	Venus	Earth
2011/06/15 20:13:43		0.08729	1.50258	1.018	0.003	183	-0	-26.8	0.2	Sun	Earth
2011/07/12 12:04:27		0.70033	1.23703	0.003	2.196	179	-35	-12.8	1.2	Earth	Mars
2011/08/14 05:31:10		0.25248	1.17215	0.608	0.003	22	7	2.8	-9.1	Mercury	Earth
2011/11/12 22:06:08		0.65537	1.16307	1.531	0.003	1	23	-3.8	-11.8	Venus	Earth
2011/12/10 14:32:54		0.35610	1.43961	0.987	0.003	359	-0	-26.9	-2.8	Sun	Earth

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del primo corpo

R2 = distanza in U.A. del secondo corpo

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Esempio di lettura :

Luna. Il giorno 2 febbraio la Terra occluderà Venere se visto dalla nostra Luna.

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation of the planet

R1 = distance in A.U. of the first body

R2 = distance in A.U. of the second body

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, the planet is occulted maximum for x seconds

# EVENTI EXTRATERRESTRI

Nelle tabelle seguenti sono calcolati i fenomeni Terra-Luna che potrebbe osservare un ipotetico essere vivente o sonda presente sul pianeta indicato.

## EXTRATERRESTRIAL EVENTS

In the following charts they are calculated the phenomena Earth-Moon that could observe a hypothetical living being or probe present on the suitable planet.

### Mercurio - Mercury

Date	TT	Dm (°)	Dl	r1	r2	e2	m1	m2	tm(s)		
2011/01/18 05:58:47		0.00017	0.00267	1.163	1.165	56	-3.0	0.8	16923	Earth	Moon
2011/08/14 05:35:36		0.00111	0.00514	0.605	0.608	-163	-4.5	-0.7	15005	Earth	Moon
2011/10/28 02:24:24		0.00041	0.00241	1.292	1.289	-41	-2.8	1.0	16110	Earth	Moon

### Venere - Venus

Date	TT	Dm (°)	Dl	r1	r2	e2	m1	m2	tm(s)		
2011/01/18 04:58:47		0.00213	0.00326	0.955	0.957	71	-3.0	0.8	12736	Earth	Moon
2011/06/30 07:51:31		0.00013	0.00186	1.675	1.673	18	-2.3	1.5	17456	Earth	Moon
2011/11/12 22:21:44		0.00115	0.00204	1.528	1.531	-32	-2.4	1.4	15120	Earth	Moon

### Marte - Mars

Date	TT	Dm (°)	Dl	r1	r2	e2	m1	m2	tm(s)		
2011/07/12 12:24:36		0.00080	0.00142	2.193	2.196	23	-1.3	2.5	13479	Earth	Moon
2011/07/27 17:10:41		0.00057	0.00145	2.145	2.142	25	-1.3	2.5	15423	Earth	Moon

### Giove - Jupiter

Questo anno non avvengono fenomeni - No phenomena this year

### Saturno - Saturn

Questo anno non avvengono fenomeni - No phenomena this year

### Urano - Uranus

Questo anno non avvengono fenomeni - No phenomena this year

### Nettuno - Neptune

Questo anno non avvengono fenomeni - No phenomena this year

### Esempio di lettura :

Il giorno 26 giugno la Terra occulterà la Luna se vista da Mercurio.

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del primo corpo

R2 = distanza in U.A. del secondo corpo

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation of the planet

R1 = distance in A.U. of the first body

R2 = distance in A.U. of the second body

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, the planet is occulted maximum for x seconds

# GLOSSARIO ASTRONOMICO

**Aberrazione** - Deviazione della direzione dei raggi luminosi provenienti da un corpo celeste.

**Aberrazione annua** - Spostamento angolare apparente delle stelle rispetto alla volta celeste, dovuto al moto di rivoluzione della Terra attorno al Sole.

**Aberrazione astronomica** (o aberrazione della luce) - Variazione apparente della posizione di un astro dovuta al movimento della Terra e alla velocità finita della luce. L'aberrazione annua, scoperta da Bradley nel 1727, dipende dal moto di rivoluzione, quella diurna dal moto di rotazione.

**Aberrazione diurna** - Spostamento angolare apparente delle stelle rispetto alla volta celeste, dovuto al moto di rotazione della Terra attorno al proprio asse.

**Absidi** - Punti estremi dell'asse maggiore di un'orbita ellittica. La retta che li congiunge si dice linea degli absidi.

**Afelio** - Punto dell'orbita di un corpo del sistema solare di massima distanza dal Sole.

**Albedo** - Rapporto fra la luce incidente e fra quella riflessa dalla superficie di ogni corpo celeste.

**Alumcàntarat** - Circolo sulla sfera celeste parallelo all'orizzonte, che unisce i punti con la stessa altezza.

**Altazimutali, coordinate** - Sistema di coordinate celesti relative all'orizzonte terrestre ed alla verticale del luogo, le cui componenti sono l'azimut e l'altezza.

**Altezza** - Distanza angolare di un oggetto celeste dall'orizzonte. E' tracciata sul cerchio verticale passante per lo zenit, il nadir e per l'astro in osservazione e si misura da 0 e 90 gradi, partendo dall'orizzonte, positivamente sopra di esso e negativamente al contrario.

**Ammasso** - Insieme di stelle o di galassie che si raggruppano per via delle forze gravitazionali reciproche.

**Ammasso aperto** - Ammasso stellare situato nel disco della Galassia e contenente migliaia di stelle giovani e molto luminose.

**Ammasso di Galassie** - Gruppo di galassie legate dall'attrazione gravitazionale. La nostra Galassia appartiene al cosiddetto Gruppo Locale.

**Ammasso globulare (cluster)** - Ammasso sferico situato nell'alone della Galassia e contenente centinaia di migliaia di stelle molto vecchie e ravvicinate.

**Ammasso stellare** - Gruppo di stelle tenute insieme dalle interazioni gravitazionali. Può essere aperto, qualora abbia una forma irregolare, o globulare se è caratterizzato da una forma sferica.

**Anello** - Insieme di detriti e particelle che disponendosi sul piano equatoriale caratterizza i pianeti gioviani. Può avere diverse dimensioni:maestose, come in Saturno, od impercettibili all'osservazione telescopica come in Giove, Urano e Nettuno.

**Angolo orario** - Distanza angolare di un corpo celeste dal meridiano del luogo.

**Anno** - Periodo di tempo corrispondente alla durata di una intera rivoluzione della Terra attorno al Sole.

**Anno anomalistico** - Periodo di tempo compreso fra due successivi passaggi della Terra al perielio.

**Anno astronomico** - Periodo definito da due passaggi consecutivi della Terra per lo stesso punto della sua orbita.

**Anno bisestile** - Anno di 366 giorni introdotto per recuperare la differenza di 0,25 giorni (6 ore) fra l'anno civile e l'anno solare. Comporta l'aggiunta, all'anno civile, di un giorno ogni 4 anni.

**Anno civile** - Periodo di tempo usato in ambito civile, che basandosi sull'anno solare tiene conto solo della parte intera di tale valore (365 giorni).

**Anno draconico** - Periodo orbitale misurato tra due passaggi della Terra al nodo lunare ascendente (346g 14h 53m).

**Anno luce** - Unità di misura delle distanze interstellari corrispondente alla distanza coperta dalla luce in un anno, alla velocità propria di 300000 km al secondo. Ammonta a circa 9.460 miliardi di km o 63 U.A.

**Anno siderale** - Intervallo di tempo fra due successivi allineamenti di una stella con la Terra. Corrisponde ad una completa rivoluzione del nostro pianeta attorno al Sole. Dura 365 giorni, 6 ore, 9 minuti.

**Anno solare o tropico** - Intervallo di tempo fra due successivi passaggi del Sole all'equinozio di primavera. E' piu' corto di quello siderale per effetto della precessione degli equinozi, ammonta infatti a circa 365 giorni, 5 ore, 48 minuti.

**Anomalia** - Distanza angolare, calcolata per un dato istante, fra la posizione di un pianeta ed il perielio della sua orbita. Può essere media, se si tiene conto della velocità orbitale media, o vera, nel caso si consideri quella effettiva.

**Apastro** - Punto dell'orbita ellittica di una stella binaria di maggior distanza dal fuoco.

**Apogeo** - Punto dell'orbita lunare, o di un satellite artificiale, di maggior distanza dalla Terra.

**Apsidi** - I due punti di intersezione tra l'orbita ellittica percorsa da un corpo e il suo asse maggiore (detto linea degli apsi). Nel caso di un'orbita intorno al Sole i punti sono detti afelio e perielio.

**Arco diurno** - Traiettoria descritta nel cielo da ogni corpo celeste, fra l'istante di levata e quello del tramonto.

**Argomento del perielio** - Angolo compreso fra il nodo ascendente ed il perielio, misurato in direzione del senso di rivoluzione del corpo celeste attorno al Sole.

**Ascensione retta** - Componente delle coordinate equatoriali che rappresenta la distanza angolare fra il punto di Ariete e l'intersezione del cerchio orario passante per l'astro in osservazione con l'equatore celeste. Si misura in ore, a partire dal punto d'ariete, in senso antiorario (verso Est), ed è compresa fra 0 e 24.

**Asse** - Retta ideale attorno alla quale ruotano su se stessi i corpi celesti. Quello della Terra, passante per i poli Nord e Sud è detto asse terrestre.

**Asse celeste** - Prolungamento dell'asse terrestre attorno al quale, per effetto della rotazione della Terra, ruota apparentemente la sfera celeste.

**Asse maggiore** - Diametro massimo di un'orbita ellittica.

**Asse polare** - Asse puntato parallelamente all'asse terrestre intorno al quale ruota un telescopio equatoriale per variare solamente l'ascensione retta.

**Associazione stellare** - Raggruppamento di giovani stelle avente origine comune.

**Asterismo** - Struttura di stelle che non costituisce una costellazione, ma che è conosciuta con un nome (per esempio il Grande Carro).

**Asteroidi** - Corpi del sistema solare dalle piccole dimensioni che ruotano attorno al Sole con orbite ellittiche. Detti anche pianetini occupano principalmente una posizione fra l'orbita di Marte e Giove chiamata fascia degli asteroidi.

**Astro** - Corpo celeste generico (stella, pianeta, satellite).

**Astrometria** - Branca dell'astronomia che studia i moti stellari.

**Attività solare** - Insieme dei fenomeni che caratterizzano la vita del Sole. Si distinguono in macchie solari, protuberanze, brillamenti, vento solare. Raggiungono il massimo di intensità ogni 11 anni, così si parla di ciclo undecennale delle attività solari.

**Aurora polare** - Fenomeno luminoso creato nell'atmosfera dall'interazione di particelle solari ionizzate con il campo magnetico terrestre. Può essere boreale od australe, a seconda dell'emisfero in cui si verifica.

**Azimut** - Distanza angolare fra l'intersezione con l'orizzonte del cerchio verticale passante per l'oggetto osservato ed il polo Nord. Si misura sull'orizzonte, in senso orario, da 0 a 360 gradi a partire dal polo Nord.

**Binaria** - Sistema costituito da due stelle legate dall'attrazione gravitazionale e orbitanti attorno al baricentro. Nell'Universo almeno la metà delle stelle è doppia o multipla. Le stelle binarie si dividono in binarie visuali, astrometriche, spettroscopiche, e a eclisse, mentre le binarie ottiche appaiono doppie solamente per causa prospettica.

**Bolide** - Meteorite che attraversando l'atmosfera terrestre dà vita ad eccezionali fenomeni luminosi ed acustici causati dall'attrito con gli strati atmosferici.

**Calendario** - Suddivisione del tempo basata sul movimento degli astri. Può essere solare, centrato sul moto apparente del Sole, lunare, riferito alle fasi lunari o lunisolare, se si riferisce ad ambedue gli astri.

**Calendario giuliano** - Calendario istituito da Giulio Cesare nel 46 a.C. costituito da 12 mesi per anno, con tre anni di 365 giorni seguiti da uno di 366 giorni. Dato che l'anno medio su 4 anni vale 365,25 giorni, dura oltre 11 minuti più lungo dell'anno tropico, nel XVI secolo venne riformato perché le stagioni non corrispondevano più all'anno civile.

**Calendario gregoriano** - Calendario civile utilizzato in molti paesi e istituito nel 1582 da Papa Gregorio XIII, quando vennero eliminati dieci giorni di calendario. Sono bisestili gli anni divisibili per 4, mentre gli anni di fine secolo sono bisestili solo se divisibili per 400. Dato che l'anno medio su 400 anni vale 365,2425 giorni, questo ha una durata molto simile ai 365,2422 giorni dell'anno tropico.

**Cassini, divisione di** - Separazione fra gli anelli del pianeta Saturno scoperta dall'omonimo astronomo.

**Cerchio di altezza** - Cerchio ottenuto intersecando la sfera celeste con un piano passante per lo zenit e l'osservatore.

**Cerchio massimo** - Intersezione di un piano con una sfera che la taglia in due parti uguali detti emisferi, ed il cui centro è corrispondente a quello della sfera.

**Cerchio meridiano** - Cerchio massimo della sfera celeste passante per i poli celesti Nord e Sud e per i punti detti Zenit e Nadir.

**Cerchio orario** - Cerchio massimo della sfera celeste passante per i poli celesti.

**Cerchio di perpetua apparizione** - Parallelo della sfera celeste che delimita le stelle circumpolari, ossia quelle stelle che in un determinato posto della Terra distano dal polo celeste visibile, attorno a cui ruotano, di una distanza angolare pari o minore alla latitudine del luogo.

**Cerchio di perpetua occultazione** - Analogamente a quello di perpetua apparizione delimita quelle stelle che ruotano ad una distanza pari o inferiore alla latitudine del luogo dal polo celeste invisibile, così da restare permanentemente occultate sotto l'orizzonte.

**Cerchio verticale** - Cerchio massimo della sfera celeste passante per lo zenit ed il nadir. Su di esso viene misurata l'altezza di un astro dall'orizzonte nel sistema di coordinate altazimutali.

**Chioma** - Involucro di gas che circonda il nucleo di una cometa per effetto della radiazione solare.

**Ciclo metonico** - Periodo scoperto da Metone nel V secolo a.C., costituito da 19 anni tropici, dopo i quali le fasi della Luna ricorrono negli stessi giorni dell'anno.

**Circolo polare** - Parallelo della superficie terrestre, distante dall'equatore 66,5 gradi, che delimita la zona polare. Può essere antartico o artico a seconda dell'emisfero cui si riferisce.

**Circumpolari** - Detto di quelle stelle che descrivendo un arco di cerchio completo, attorno al polo visibile e da un determinato posto della Terra, rimangono sempre sopra l'orizzonte ruotando attorno al polo celeste.

**Cluster** - Nome inglese di un Ammasso globulare.

**Coda** - La parte di una cometa espulsa quando questa è vicina al Sole.

**Coluro** - Nome dei cerchi orari passanti per i punti equinoziali e solstiziali.

**Cometa** - Piccolo corpo del sistema solare, orbitante attorno al Sole su un'orbita fortemente eccentrica, che in prossimità del Sole inizia ad evaporare dando vita alla classica coda.

**Congiunzione** - Configurazione planetaria di due o più corpi celesti che hanno più o meno le medesime coordinate astronomiche. Per i pianeti inferiori si distingue in inferiore e superiore.

**Congiunzione inferiore** - Configurazione planetaria di un pianeta inferiore che si trova fra la Terra ed il Sole.

**Congiunzione superiore** - Configurazione planetaria di un pianeta inferiore che si trova oltre il Sole lungo la direzione Terra-Sole-Pianeta.

**Cono d'ombra** - Regione occupata dall'ombra proiettata da un pianeta o un satellite illuminato dal Sole. Se un oggetto passa nel cono d'ombra di un corpo si è in presenza di un'eclissi.

**Contatto** - Fase di un'eclisse dove i bordi dei dischi lunari e solari sembrano apparentemente toccarsi.

**Coordinate astronomiche** - Insieme di valori che permettono l'orientamento lungo la sfera celeste. A seconda del sistema cui si riferiscono abbiamo quelle altazimutali, quelle equatoriali, quelle eclittiche e quelle galattiche.

**Coordinate Celesti (o astronomiche)** - Sistemi di coordinate che descrivono la posizione di un astro sulla sfera celeste. Le principali coordinate utilizzate sono le altazimutali, le equatoriali, le eclittiche e le galattiche.

**Coordinate Eclittiche** - Sistema di coordinate celesti in cui la posizione di un oggetto è definita dalla latitudine eclittica ( $b$ ), misurata in gradi a nord e a sud dell'eclittica, e dalla longitudine eclittica ( $l$ ), misurata in gradi lungo l'eclittica a partire dal punto  $g$ .

**Coordinate equatoriali** - Sistema di coordinate celesti in cui la posizione di un oggetto è definita dalla declinazione ( $d$ ), misurata in gradi a nord e a sud dell'equatore celeste, e dall'ascensione retta ( $a$ , A.R.), misurata in ore, minuti e secondi lungo l'equatore celeste a partire dal punto  $g$ . A causa della precessione degli equinozi le coordinate equatoriali sono specifiche per una particolare epoca.

**Coordinate galattiche** - Sistema di coordinate in cui la posizione di un oggetto è definita dalla latitudine, misurata dal piano galattico, e dalla longitudine, misurata in gradi lungo il piano galattico a partire dal centro della Galassia.

**Coordinate geografiche** - Sistema di coordinate in cui la posizione di un punto sulla superficie è individuato dalla latitudine, misurata in gradi a nord e a sud dell'equatore, la longitudine, misurata in gradi est e ovest lungo l'equatore a partire dal meridiano di Greenwich, e l'altitudine, misurata in metri rispetto al livello del mare.

**Corona solare** - La zona più esterna dell'atmosfera solare visibile durante le eclissi totali.

**Costellazioni** - Gruppo di stelle sulla sfera celeste che unite da linee immaginarie formano delle figure. Fin dall'antichità le configurazioni celesti sono state associate a figure mitologiche o di animali, e ben 48 delle odierne costellazioni sono quelle elencate da Tolomeo nel periodo ellenistico. Dal XVII secolo furono proposte altre denominazioni, finché nel 1930 l'Unione Astronomica Internazionale ha definitivamente diviso il cielo in 88 aree, ciascuna della quali corrisponde ad una costellazione. Le stelle più luminose sono denominate con una lettera greca minuscola seguita dal genitivo del nome latino della costellazione.

**Crepuscolo** - Passaggio graduale dal giorno alla notte per effetto dell'atmosfera terrestre che diffonde la luce solare. Si distingue in civile, nautico ed astronomico a seconda che il Sole sia sotto l'orizzonte rispettivamente di 6, 12 o 18 gradi.

**Culminazione** - Rappresenta il passaggio di un corpo celeste al meridiano. Può essere superiore, il punto di minor distanza zenitale, od inferiore, il punto di maggior distanza zenitale. Nelle stelle circumpolari ambedue i punti si trovano sopra l'orizzonte.

**Cuspide** - Una delle due estremità della falce lunare, o di quella di un pianeta inferiore.

**Data giuliana (DG)** - Intervallo di tempo in giorni trascorso dal mezzogiorno dell'1 gennaio 4713 a.C. di Greenwich.

**Declinazione** - Distanza angolare di un corpo dall'equatore celeste. Tracciata sul cerchio orario passante per i poli celesti e l'astro osservato, è compresa fra 0 e 90 gradi e si conta a partire dall'equatore celeste, positivamente verso il polo Nord celeste e negativamente verso quello Sud.

**Deep sky** - Termine con il quale si indicano alcuni oggetti celesti: ammassi stellari, galassie, nebulose.

**Dicotomia** - Aspetto di un corpo celeste illuminato per metà durante le fasi parziali.

**Disco apparente** - Diametro apparente del Sole e della Luna che a causa delle loro diverse distanze sembra avere le medesime dimensioni.

**Diretto** - Direzione del moto celeste di un pianeta da Ovest verso Est, od anche in senso antiorario, se osservato dal Nord dell'eclittica.

**Distanza Angolare** - Lunghezza di un arco espressa in radianti o gradi, corrispondente alla misura dell'angolo fra le linee immaginarie che congiungono l'osservatore con i due estremi dell'arco.

**Doppie, stelle** - Stelle ruotanti attorno ad un comune centro di massa per effetto di reciproci vincoli gravitazionali.

**Draconico** - Periodo di tempo riferito ai nodi lunari, detti dagli antichi testa e coda del drago che mangiava il Sole durante le eclissi.

**Eccentricità** - Elemento orbitale dell'orbita di un corpo celeste pari al rapporto fra il semiasse maggiore e la distanza di un fuoco dal centro dell'orbita. Può essere uguale a 0 (circolare), ad 1 (parabolica) o compresa fra questi due valori (ellittica).

**Eclisse** - Fenomeno astronomico in cui la luce di un corpo celeste è temporaneamente oscurata a causa del passaggio nel cono d'ombra di un altro astro. Nella eclisse di Luna il nostro satellite attraversa il cono d'ombra della Terra e non riceve più la luce del Sole, nella eclissi di Sole la Luna proietta il suo cono d'ombra sulla Terra. Poiché l'orbita lunare è inclinata sul piano dell'orbita terrestre, si ha una eclissi soltanto quando la Luna si trova vicino ai suoi nodi: ogni anno non si verificano più di sette eclissi e ci sono almeno due eclissi solari.

**Eclisse anulare** - Eclissi di Sole in cui il disco lunare non riesce ad ostruire completamente quello solare lasciandone visibile una parte a forma di anello.

**Eclisse Lunare** - Una eclisse di Luna si verifica al plenilunio quando la Luna passa nell'ombra della Terra. Il nostro satellite non compare del tutto, ma assume una luce rossastra a causa della luce riflessa dall'atmosfera terrestre.

**Eclisse parziale** - Tipo di eclisse, solare o lunare, nella quale i dischi dei rispettivi corpi celesti sono interessati dal fenomeno solo parzialmente.

**Eclissi Solare** - Una eclisse di Sole si verifica al novilunio quando la Luna passa davanti al disco solare. Quando il diametro apparente della Luna è minore di quello del Sole l'eclisse è detta anulare. L'ombra proiettata dalla Luna è larga qualche centinaio di chilometri e si muove sulla superficie terrestre: la fase di totalità può durare al massimo 7 minuti e 40 secondi e in tutta la regione circostante si vede un'eclisse parziale.

**Eclisse totale** - Tipo di eclisse che interessa integralmente i dischi lunari e solari.

**Eclittica** - Fascia del cielo lungo la quale si muove apparentemente il Sole. Il nome significa cerchio delle eclissi, in quanto affinché possa verificarsi una di queste, è necessario che la Luna sia in prossimità di quei punti chiamati nodi che sono le intersezioni del suo piano orbitale con l'eclittica. E' anche il piano disegnato dall'orbita della Terra, nel suo moto di rivoluzione attorno al Sole, che è inclinato rispetto all'equatore celeste di 23,5 gradi.

**Eclittiche, coordinate** - Sistema di coordinate che come riferimento si basa sul piano dell'eclittica. Le sue componenti sono la longitudine eclittica e la latitudine eclittica.

**Effemeridi** - Raccolta di dati astronomici che sulla base delle coordinate astronomiche permettono di risalire alla posizione dei corpi celesti.

**Elementi orbitali** - Parametri che determinano il moto e la posizione nel sistema solare di un corpo celeste e della sua orbita. Sono: l'eccentricità, il semiasse maggiore, l'inclinazione, la distanza e la longitudine del perielio dal nodo ed il passaggio al perielio.

**Elongazione** - Distanza angolare vista dalla Terra tra il Sole e un pianeta. Valori particolari di elongazione sono la congiunzione (0°), la quadratura (90°) e l'opposizione (180°).

**Emersione** - Successiva apparizione di un corpo celeste, da dietro il disco di un altro, o dell'ombra di questo, durante il fenomeno delle occultazioni o delle eclissi.

**Emisfero** - Parti uguali di una sfera tagliata in due da un piano equatoriale. Quelli terrestri si indicano come emisferi boreale (settentrionale) ed australe (meridionale).

**Epatta** - Numero di giorni che separano la prima Luna Nuova dell'anno dal primo di Gennaio. Grazie ad un calcolo ad esso legato si ottiene la data della Pasqua.

**Epoca** - Riferimento temporale di validità, per cui sono state calcolate le effemeridi di un dato corpo celeste, al fine di correggere l'errore derivante dal fenomeno della precessione degli equinozi.

**Equatore** - Intersezione di un piano perpendicolare all'asse di una sfera con la superficie della stessa, che la taglia diametralmente in due parti uguali.

**Equatore celeste** - Prolungamento di quello terrestre è quel cerchio massimo che essendo perpendicolare all'asse di rotazione taglia la sfera celeste in due emisferi uguali.

**Equatore terrestre** - Cerchio massimo di latitudine 0 gradi che taglia la Terra in due emisferi.

**Equazione delle effemeridi** - Differenza fra il tempo siderale e quello siderale medio.

**Equazione del tempo** - Differenza fra il tempo solare e quello solare medio.

**Equatoriali, coordinate** - Sistema di coordinate astronomiche basate sull'equatore celeste e sull'asse di rotazione del cielo. Le sue componenti sono l'ascensione retta e la declinazione.

**Equinozi** - Punti dell'orbita terrestre che segnano l'inizio della primavera e dell'autunno e nei quali la durata del giorno è uguale a quella della notte. Rappresentano inoltre le intersezioni dell'equatore

celeste con l'eclittica e sono anche chiamati nodo discendente e nodo ascendente o anche rispettivamente punto della Bilancia e punto d'Ariete. La linea che congiunge i suddetti punti è detta linea degli equinozi e ruota per effetto della precessione degli equinozi.

**Evezione** - Perturbazione causata nel moto della Luna dalla variazione nella spinta gravitazionale del Sole.

**Fasi** - Variazione della porzione illuminata del disco lunare (o di quello dei due pianeti inferiori) per effetto dei rispettivi moti orbitali.

**Fuga, velocità di** - Velocità necessaria a sfuggire all'attrazione gravitazionale di qualsiasi corpo celeste.

**Galassie** - Insieme di stelle, gas e polvere interstellare. Hanno forme diverse: di disco a spirale, ellittiche o irregolari. Furono classificate in passato da E.Hubble che studiandole scoprì anche la legge che porta il suo nome e che dimostra, basandosi sulla reciproca velocità di allontanamento delle galassie, come l'universo sia in perenne espansione. Le galassie hanno la caratteristica di aggregarsi in ammassi e superammassi.

**Galattiche, coordinate** - Sistema di coordinate astronomiche relative alla galassia le cui componenti sono la longitudine e la latitudine galattiche. Il piano di riferimento è quello equatoriale della galassia.

**Galileiani, satelliti** - Le 4 lune maggiori del pianeta Giove, scoperte da G.Galilei.

**Geocentrico** - Sistema di riferimento relativo alla Terra.

**Giorno** - Durata media del periodo di rotazione della Terra attorno al proprio asse.

**Giorno lunare** - Intervallo di tempo fra due successivi passaggi della Luna al meridiano.

**Giorno solare** - Intervallo di tempo fra due successivi passaggi del Sole al meridiano.

**Giorno siderale** - Intervallo di tempo fra due successivi passaggi di una stella per il meridiano. E' piu' breve del giorno solare di circa 4 minuti per effetto del moto orbitale della Terra attorno al Sole.

**Giorno giuliano** - Unità di misura del calendario omonimo che conta i giorni, in modo progressivo, a partire dal 1 gennaio del 4713 A.C.

**Greenwich, meridiano di** - Circolo della sfera terrestre di longitudine 0°.

**Immersione** - Inizio della occultazione di un corpo celeste da parte di un altro.

**Inclinazione** - Distanza angolare fra l'equatore di un corpo celeste ed il suo piano orbitale.

**Inclinazione orbitale** - Elemento orbitale di un corpo del sistema solare che misura la differenza angolare fra il suo piano orbitale e quello dell'eclittica.

**Index Catalogue (IC)** - Catalogo di oggetti non stellari compilato e pubblicato da J.L.E.Dreyer nel 1895 (IC 1) e nel 1908 (IC 2) e contenente circa 5.000 nuovi oggetti che si aggiungono a quelli indicati nel New General Catalogue (NGC).

**Inferiore** - Pianeta la cui orbita attorno al Sole è contenuta entro quella della Terra.

**Latitudine** - Distanza angolare, positiva o negativa, di un punto da un piano equatoriale di riferimento (terrestre, celeste, eclittico, galattico).

**Latitudine eclittica** - Distanza angolare, positiva o negativa, di un punto situato a Nord od a Sud del piano dell'eclittica.

**Latitudine galattica** - Distanza angolare di un punto posto a Nord od a Sud del piano galattico.

**Levare eliaco** - Prima apparizione di una stella ad oriente dopo la congiunzione con il Sole.

**Librazione lunare** - Oscillazione della Luna che permette di vedere fino al 10 % in piu' della superficie rivolta verso la Terra. Opera sia in latitudine che in longitudine.

**Limbo** - Bordo estremo del disco apparente di un corpo celeste.

**Longitudine** - Distanza angolare, positiva o negativa, di un punto della superficie terrestre dal meridiano di Greenwich. Può essere orientale od occidentale. In generale, distanza angolare di un punto da un cerchio massimo di riferimento.

**Longitudine del perielio** - Somma dell'argomento del perielio e della longitudine del nodo ascendente dell'orbita.

**Longitudine del nodo ascendente** - Angolo compreso fra il punto d'Ariete e l'intersezione del piano orbitale con l'eclittica.

**Longitudine eclittica** - Distanza angolare di un punto del piano dell'eclittica dal punto d'ariete.

**Longitudine galattica** - Distanza angolare di un punto del piano galattico dal punto di centro galattico.

**Luce cinerea** - Debole illuminazione del disco lunare, durante le fasi crescenti o calanti, da parte della luce solare riflessa dalla Terra verso la Luna.

**Luce zodiacale** - Fenomeno luminoso creato per diffusione della luce solare da parte di particelle di materia giacenti sul piano dell'eclittica.

**Lunazione** - Periodo di tempo compreso fra due fasi lunari uguali la cui durata è di circa 29,5 giorni. E' detta anche mese sinodico.

**M** - Riferita al catalogo Messier e sguita da un numero d'ordine (es. M32) riporta l'oggetto relativo che ha quel numero d'ordine nel catalogo (nell'esempio precedente, la galassia di Andromeda).

**Magnitudine** - Misura della luminosità dei corpi celesti. Data la differente distanza che ci separa dalle stelle essa si distingue in apparente, quella che appare nel cielo, ed in assoluta che corrisponde alla luminosità effettiva osservata dalla distanza di 10 parsec. Viene divisa in classi decrescenti con una differenza fra le piu' luminose e le meno luminose di circa 500 volte.

**Meccanica celeste** - Branca dell'astronomia avente come studio la dinamica dei movimenti degli astri posti sotto l'effetto di campi gravitazionali.

**Megaparsec** - Unità di misura delle distanze galattiche e cosmologiche, pari a 1 milione di parsec.

**Meridiano** - Cerchio massimo della sfera celeste passante per i poli celesti, lo zenit ed il nadir di una data località terrestre.

**Mese anomalistico** - Periodo di tempo fra due successivi passaggi della Luna all'apogeo od al perigeo. E' uguale a 27,6 giorni.

**Mese draconico** - Intervallo di tempo fra due successivi passaggi della Luna allo stesso nodo. E' uguale a 27,2 giorni.

**Mese siderale** - Durata del periodo di rivoluzione della Luna attorno alla Terra. Durata 27,3 giorni.

**Mese sinodico** - Periodo di tempo fra due fasi lunari uguali. E' uguale a 29,5 giorni.

**Meteora (stella cadente)** - Raggio di luce causato da un meteoroido che si consuma per attrito con gli strati atmosferici.

**Meteorite** - Meteoroido, che attraversando l'atmosfera terrestre, resiste all'attrito con essa per via delle sue grandi dimensioni, riuscendo così a raggiungere la superficie e causando un impatto con essa.

**Meteoroido** - Corpo roccioso vagante nel sistema solare.

**Mezzanotte** - Culminazione inferiore del Sole.

**Mezzocielo** - Punto di intersezione fra il meridiano del luogo e l'equatore celeste.

**Mezzogiorno** - Culminazione superiore del Sole.

**Moto diurno** - Rotazione apparente della sfera celeste, da Est ad Ovest, dovuto al moto rotatorio della

Terra attorno al proprio asse nella direzione contraria.

**Moto planetario** - Moto apparente dei pianeti nel cielo (od orbitale nel sistema solare). Si distingue in retrogrado, se avviene da oriente verso occidente (od in senso orario, se visto dal Nord dell'eclittica), ed in diretto (antiorario) nella direzione contraria.

**Nadir** - Punto di intersezione inferiore della verticale del luogo con la sfera celeste. E' l'opposto dello Zenit.

**Nebulosa** - Nube di gas e polvere interstellare che può essere oscura, se assorbe la luce di una stella impedendone la visuale, o luminosa, se riflette (nebulosa a riflessione) o viene ionizzata (nebulosa ad emissione) dalla luce di stelle vicine.

**Nebulosa planetaria** - Gas emessi, sotto forma di anello in rapida espansione, dagli strati esterni di una stella nelle sue ultime fasi di vita.

**Nodo** - Generalmente indica l'intersezione di un'orbita con il piano dell'eclittica. Può essere ascendente o discendente.

**Numero d'oro** - Numero d'ordine, compreso fra 1 e 19, che indicava ognuno degli anni nell'ambito del ciclo di Metone.

**Nutazione** - Movimento oscillatorio dell'asse del pianeta Terra. E' causato dal fatto che l'attrazione gravitazionale della Luna e del Sole sul rigonfiamento equatoriale terrestre varia nel tempo a seconda delle loro posizioni relative. Per l'effetto congiunto della nutazione e di un'altra perturbazione di ampiezza maggiore (la precessione), l'asse di rotazione terrestre compie un moto sinuoso nel cielo, anziché mantenere una direzione fissa nello spazio.

**Occultazione** - Fenomeno astronomico che si verifica allorché un corpo celeste passando davanti ad un altro ne oscura la sua visuale nel cielo.

**Opposizione** - Configurazione planetaria di un corpo del sistema solare che dista dal Sole, rispetto alla Terra, di un angolo di 180° o di 12 ore in ascensione retta.

**Orarie, stelle** - Stelle che descrivono nel cielo un arco di cerchio per metà sopra l'orizzonte e per l'altra sotto di esso.

**Orbita** - Traiettoria di un corpo celeste che ruota attorno ad un altro per via della forza gravitazionale. Generalmente è di forma ellittica.

**Orizzonte** - Intersezione del piano tangente al luogo d'osservazione con la sfera celeste.

**Parallasse** - Apparente spostamento angolare di una stella. Può essere annua, se riferita al moto di rivoluzione della Terra attorno al Sole, o diurna se riferita al moto di rotazione terrestre. Da essa si risale alla distanza astronomica di un corpo celeste.

**Parallelo** - Circolo paralleli all'equatore terrestre sui quali viene misurata la longitudine.

**Parsec** - Unità di misura delle distanze interstellari, equivalente a circa 3 anni luce, che corrispondono ad uno spostamento angolare nel cielo di un primo d'arco da parte di una stella che viene osservata da due punti distanti fra loro una unità astronomica (dist. media fra Sole e Terra).

**Passaggio al perielio** - Istante del transito di ogni corpo del sistema solare per il punto più prossimo al Sole.

**Periastro** - Punto dell'orbita ellittica di una stella binaria di minor distanza dal fuoco.

**Perigeo** - Punto dell'orbita della Luna, o di un satellite artificiale, di minima distanza dalla Terra.

**Perielio** - Punto dell'orbita di un corpo del sistema solare di minima distanza dal Sole.

**Periodo orbitale** - Intervallo di tempo impiegato da un corpo celeste a descrivere una rivoluzione completa.

**Periodo siderale** - Intervallo di tempo compreso fra due successivi passaggi di un corpo celeste per lo stesso punto della sua orbita.

**Periselenio** - Punto dell'orbita di un corpo celeste più vicino alla Luna.

**Perturbazioni** - Variazioni dell'orbita di un corpo celeste causate da passaggi ravvicinati a grandi masse che con la loro forza gravitazionale ne sconvolgono gli elementi orbitali.

**Pianeta** - Corpo celeste orbitante attorno al Sole, caratterizzato da grandi dimensioni e dalla mancanza di emissione di energia.

**Pianeti esterni** - Marte, Giove, Saturno, Urano, Nettuno e Plutone sono i pianeti esterni all'orbita terrestre.

**Pianeti interni** - Mercurio e Venere sono i pianeti interni all'orbita della Terra.

**Pianetini** - Piccoli corpi del sistema solare caratterizzati dalle dimensioni e dalle orbite irregolari. Detti anche asteroidi occupano un'orbita fra Marte e Giove che per questo viene detta fascia degli asteroidi.

**Piano orbitale** - Piano descritto dall'orbita di un corpo celeste.

**Planetesimi** - Oggetti rocciosi primordiali, formati per aggregazione di polveri nella nube protosolare, dai quali si pensa si siano formati asteroidi e pianeti per mutua attrazione gravitazionale.

**Polare, stella** - Stella dell'Orsa minore che approssimativamente indica il polo Nord celeste.

**Poli** - In generale, estremità dell'asse di rotazione di ogni corpo celeste.

**Poli celesti** - Punti di intersezione del prolungamento dell'asse terrestre, l'asse celeste, con la sfera celeste.

**Poli terrestri** - Punti di intersezione dell'asse terrestre con la superficie terrestre.

**Precessione degli equinozi** - Oscillazione dell'asse terrestre, per effetto della forza gravitazionale del Sole e della Luna sul nostro pianeta, che conferisce un movimento a forma di trottola all'asse celeste, che descrive così un cerchio in circa 26000 anni. Una sua conseguenza è la variazione di tutti i riferimenti celesti, principalmente degli equinozi, che anticipano ogni anno di circa 20 minuti.

**Punti cardinali** - Intersezioni del meridiano e dell'equatore celeste con l'orizzonte, che in tal modo generano i 4 punti cardinali: Nord, Sud, Est ed Ovest.

**Quadratura** - Configurazione di un corpo celeste che dalla Terra viene visto ad una distanza angolare di 90 gradi dal Sole.

**Raggio vettore** - Linea congiungente il Sole con la posizione di un pianeta lungo la sua orbita.

**Radiante** - Punto apparente del cielo dal quale sembrano provenire le meteore durante una pioggia di stelle cadenti.

**Retrogradazione** - Particolare spostamento apparente di un pianeta rispetto alla Terra durante il quale la longitudine geocentrica decresce. La retrogradazione è un effetto ottico dovuto ai movimenti della Terra e del pianeta considerato attorno al Sole; accade così che durante la sua normale orbita apparente, il pianeta rallenti, si fermi e poi torni indietro rispetto alle stelle fisse. In seguito rallenterà di nuovo e tornerà a seguire il percorso originario, compiendo una specie di asola tra le stelle.

**Retrogrado** - Direzione del moto celeste di un pianeta da Est verso Ovest, od anche in senso orario, se osservato dal Nord dell'eclittica.

**Rivoluzione** - Moto orbitale di uno o più corpi attorno ad un centro di massa.

**Rotazione** - Moto rotatorio di un corpo celeste attorno ad un asse.

**Saros, ciclo di** - Periodo di tempo uguale a 18 anni 10 giorni ed 8 ore dopo il quale le eclissi solari e

lunari si ripetono alle medesime condizioni.

**Satellite** - In genere ogni corpo minore che orbita attorno ad un altro di dimensioni molto maggiori. Nel caso della Terra possono essere anche artificiali.

**Schiacciamento polare** - Appiattimento delle regioni polari di un pianeta, dovuto alla forza centrifuga derivante dal moto di rotazione. In generale rapporto fra il raggio equatoriale e quello polare.

**Semiasse maggiore** - La metà dell'asse maggiore di ogni orbita ellittica. Si misura in unità astronomiche.

**Sestante** - Strumento astronomico atto alla misurazione dell'altezza sull'orizzonte del Sole o di qualsiasi altro corpo celeste.

**Sfera celeste** - Astrazione geometrica di forma sferica, concentrica alla Terra, sulla quale appaiono proiettati tutti i corpi celesti per effetto prospettico.

**Siderite** - Meteorite costituito quasi completamente da ferro e nickel.

**Sigizie** - Punti dell'orbita lunare dove la Luna, il Sole e la Terra sono allineati.

**Solstizi** - Punti dell'eclittica, e corrispondentemente della sfera celeste, dove il Sole raggiunge la massima e minima declinazione del suo percorso annuale apparente. Relativi alle stagioni sono detti solstizio d'inverno e solstizio d'estate.

**Stagioni** - Intervallo di tempo impiegato dalla Terra per passare da un punto equinoziale ad uno solstiziale e viceversa.

**Stelle orarie** - Stelle delle quali si conosce con esattezza la posizione celeste, ed usate per la determinazione del tempo siderale.

**Superiore** - Pianeta la cui orbita è dislocata al di là di quella terrestre.

**Tempo solare** - Misurazione del tempo basata sul moto diurno ed annuale del Sole nel cielo, e conseguentemente sui moti del pianeta Terra. L'unità di misura è il secondo, sottomultiplo del giorno che è pari a circa 24 ore.

**Tempo siderale** - Misurazione del tempo basato sull'intervallo di tempo compreso fra due successivi passaggi di una stella al meridiano. Inferiore a quello solare, è pari a 23 ore e 56 minuti.

**Tempo universale** - Tempo locale del meridiano di Greenwich di longitudine 0°.

**Terminatore** - Linea di separazione fra l'emisfero illuminato e quello buio di un corpo celeste.

**Transito** - Passaggio di un corpo celeste al meridiano o davanti al disco di un altro corpo di dimensioni maggiori.

**Troiano** - Aggettivo riferito a un asteroide appartenente alla famiglia dei Troiani (vedi Lagrange, punti di).

**Tropici** - Paralleli delle coordinate geografiche terrestri distanti dall'equatore +23.5 gradi, quello del Cancro, e -23,5 gradi quello del Capricorno. Sono chiamati con i rispettivi nomi delle costellazioni sulle quali appariva proiettato il Sole nell'antichità, ai rispettivi solstizi d'estate e d'inverno, cui ora non corrispondono più per effetto della precessione degli equinozi.

**UA , Ua, Unità astronomica** - Distanza media della Terra dal Sole. E' pari a 149,6 milioni di km.

**Universale, tempo (T.U.)** - Corrispondente al tempo medio di Greenwich.

**Variabili, stelle** - Stelle che variano la propria luminosità in funzione di caratteristiche geometriche (eclissi) o fisiche (alternanza di espansioni e contrazioni).

**Velocità radiale** - Misura della velocità in relazione alla direzione di osservazione.

**Via Lattea** - Fascia celeste lattiginosa creata dal piano equatoriale della nostra galassia.

**Zenit** - Intersezione della verticale del luogo con la volta celeste.

**Zodiaco** - Settore celeste, concentrico all'eclittica, e suddiviso in dodici segni zodiacali di 30 gradi ciascuno. Rappresenta l'insieme delle 12 costellazioni che il Sole attraversa durante il suo ciclo annuale. A causa della precessione degli equinozi le costellazioni che originariamente occupavano un segno sono attualmente spostate in quello a fianco, anche se per convenzione gli astronomi hanno sinora mantenuto la disposizione iniziale dei segni zodiacali.

**Zodiacale, luce** - Luminosità dovuta a nubi di polvere interplanetaria, che illuminata dalla luce solare è vista all'alba od al tramonto in direzione dell'eclittica essendo appunto situata lungo il suo piano.



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- (1) ICE - Interactive computer ephemeris
- (2) [www.sym454.org](http://www.sym454.org)
- (3) Planets visibility, Alcyone software, freeware
- (4) Alcyone ephemeris
- (5) Ephemeris tools, <http://virtualskysoft.de>
- (6) Solex, A.Vitagliano
- (7) <http://www.iota-es.de/>
- (8) Win Occult
- (9) Minor Planets software, S.Foglia
- (10) <http://www.aerith.net>
- (11) Accurate times

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