

Forecasting Night Illumination





Mission:

fornire supporto all'uso dell'NVG
(Night Vision Google) mediante
previsioni del livello di luce
ambientale nelle diverse condizioni
di nuvolosità.

Unità di misura dell'illuminanza

L'unità standard di misura della luminanza è il millilux (mlx).

$$1000 \text{ mlx} = 1 \text{ lux}$$

$$1 \text{ lux} = 1 \text{ lumen incidente per m}^2$$

Alcuni dati di illuminamento per dare un'idea di quanto vale un lux:



la luce del Sole mediamente varia tra i **32.000 lx** (32 klx) e i **100.000 lx** (100 klx);

sotto i riflettori degli studi televisivi si hanno circa **1.000 lx** (1 klx);



in un ufficio luminoso si hanno circa **400 lx**;



• la luce di una stella luminosa è soltanto **0,00005 lx** ($50 \mu\text{lx}$).

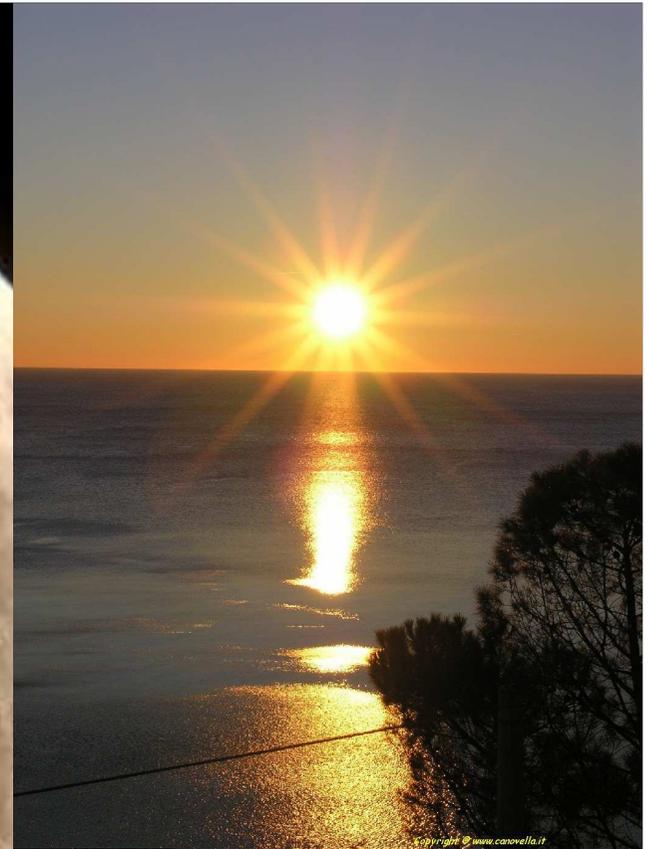


• la luce della Luna è pari a circa **1 lx**;



Il livello di luce ambientale è previsto calcolando la frazione di luce incidente al top dell'atmosfera che raggiunge effettivamente il suolo.

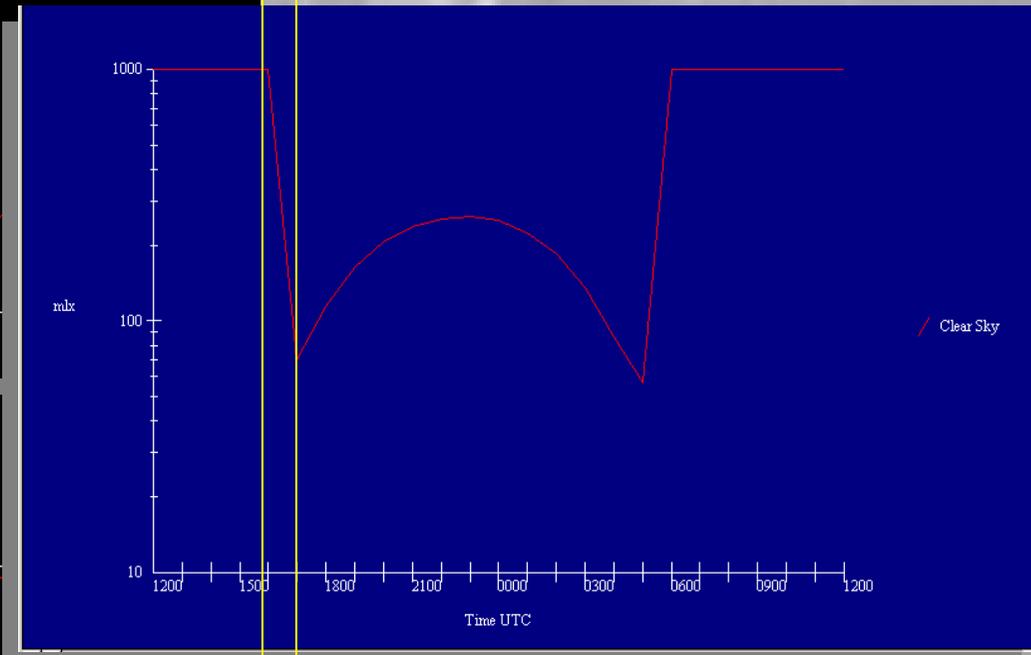
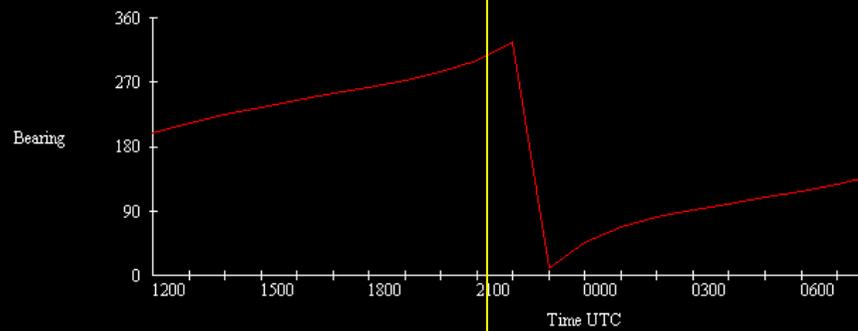
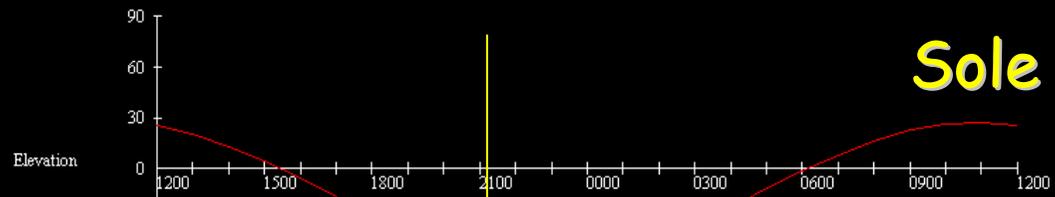
Detta frazione di luce è determinata dalla posizione relativa del Sole, della Luna e della Terra



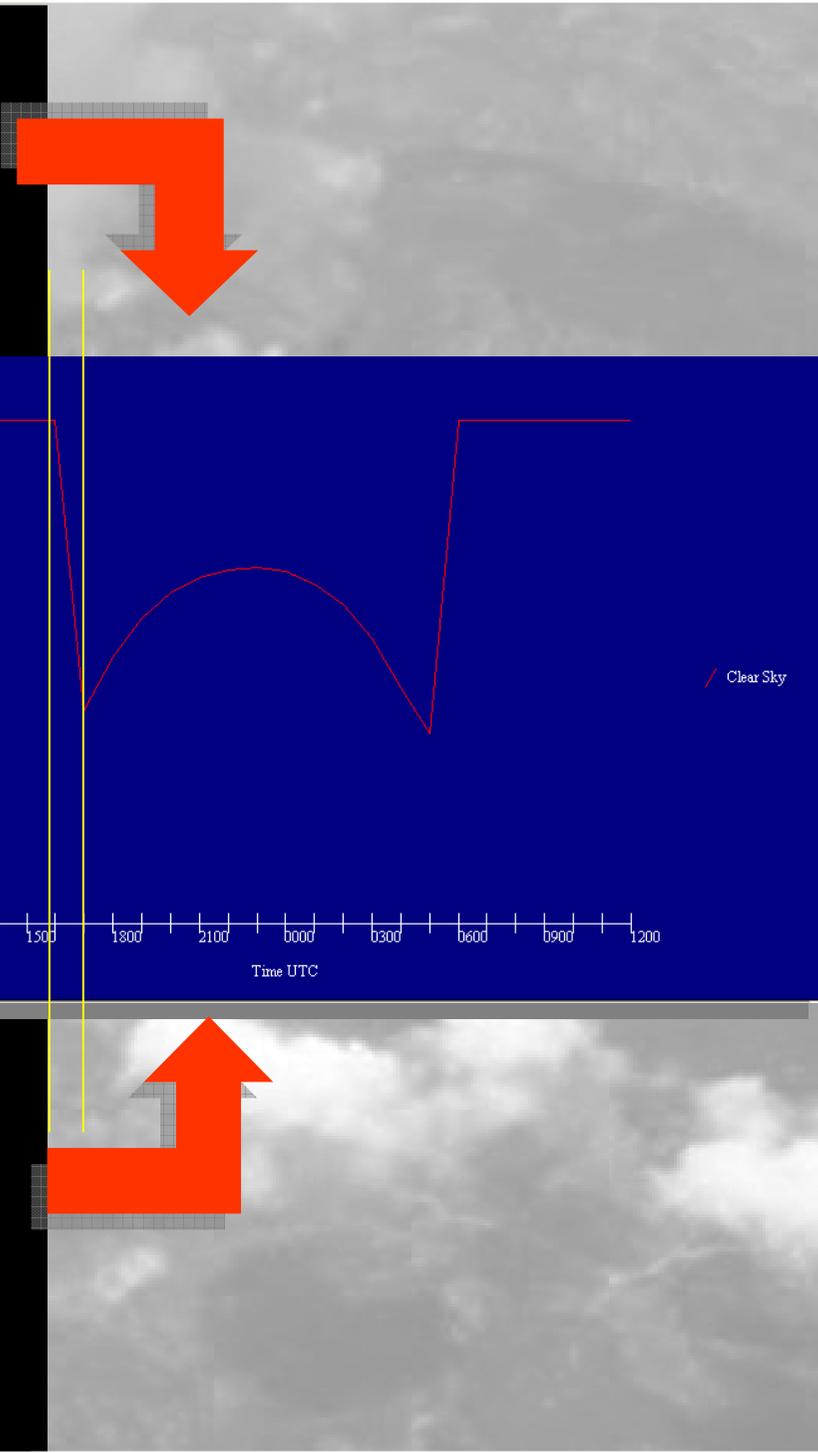
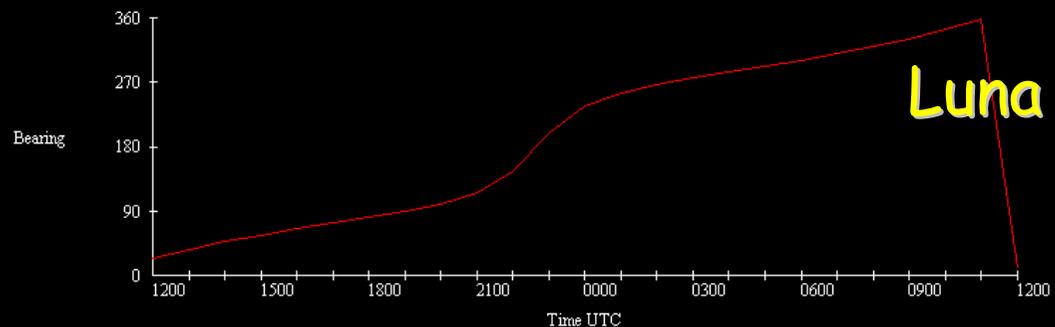
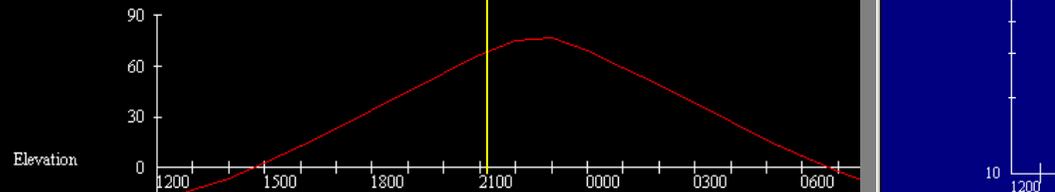


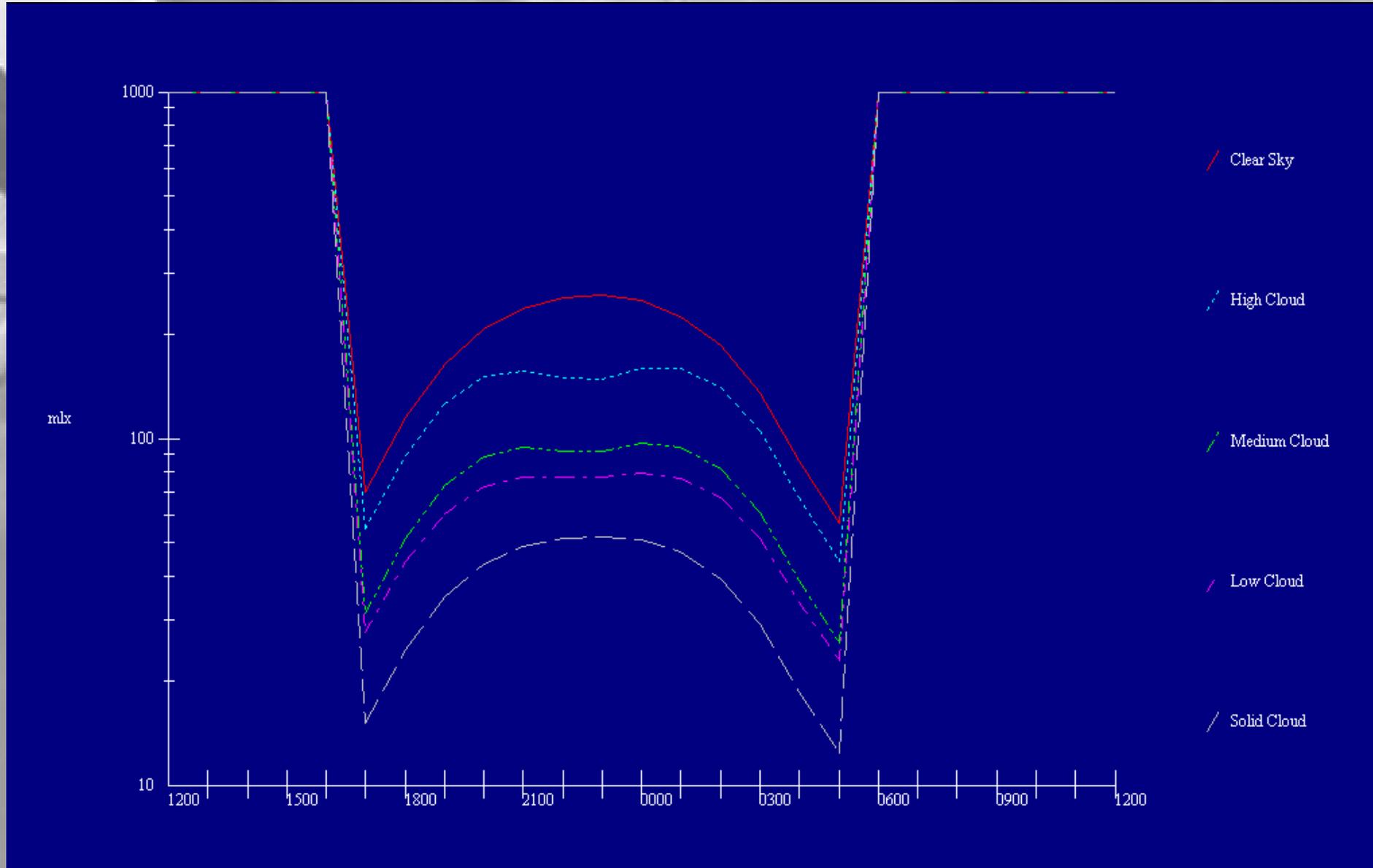
Naturalmente, la
presenza di nubi o
nebbia riduce i
valori di
illuminazione
notturna.

Sole



Luna





Quali previsioni può fornire il Servizio Meteo?



Per ogni luogo e per ogni data

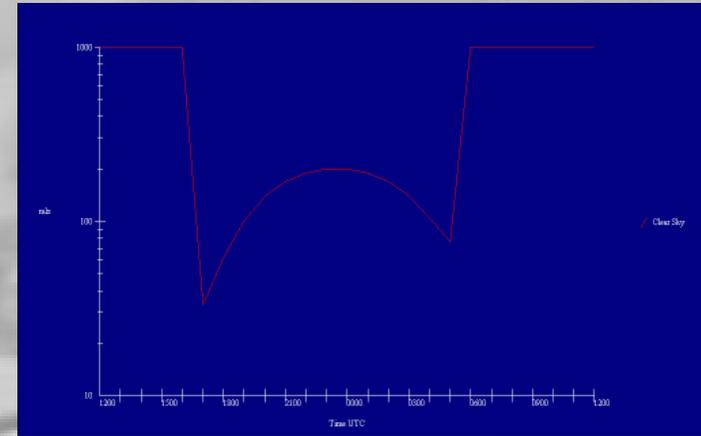


From 1200 UTC on	Sunset	Sunrise	Evening Civil Twilight	Morning Civil Twilight	Evening Nautical Twilight	Morning Nautical Twilight	Evening Astronomical Twilight	Morning Astronomical Twilight	Moonset	Moonrise
05/12/2006	1531	0603	1601	0533	1635	0459	1707	0426	0749	1535
06/12/2006	1531	0604	1601	0534	1635	0500	1707	0427	0842	1636
07/12/2006	1531	0605	1601	0535	1635	0501	1708	0428	0924	1743
08/12/2006	1531	0606	1601	0536	1635	0502	1708	0429	0957	1852
09/12/2006	1531	0607	1601	0536	1635	0502	1708	0430	1023	1959
10/12/2006	1531	0608	1601	0537	1635	0503	1708	0430	1046	2103
11/12/2006	1531	0608	1601	0538	1635	0504	1708	0431	1106	2204
12/12/2006	1531	0609	1601	0539	1635	0505	1708	0432	1125	2304
13/12/2006	1531	0610	1602	0539	1636	0505	1709	0432	1144	0002
14/12/2006	1531	0611	1602	0540	1636	0506	1709	0433	****	0102



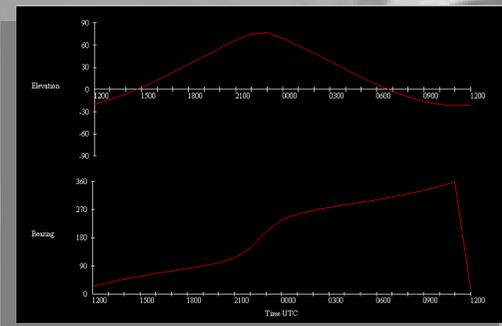
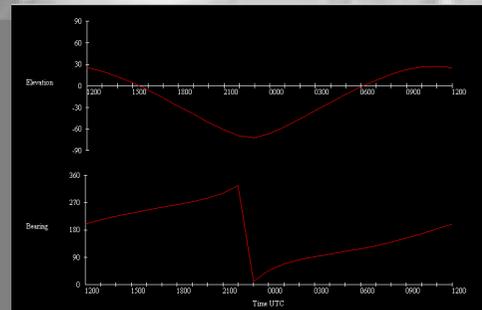
Livelli di illuminazione:

Date	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000
05/12/2006	***	***	***	***	***	33	62	100	139	170	189	200	200	188	169	140	104	76	***	***	***	***	***
06/12/2006	***	***	***	***	***	8	24	46	74	103	126	141	149	141	126	105	85	***	***	***	***	***	***
07/12/2006	***	***	***	***	***	3	5	17	34	55	77	94	106	111	110	104	93	83	***	***	***	***	***
08/12/2006	***	***	***	***	***	3	2	3	12	25	40	57	70	78	82	81	75	72	***	***	***	***	***
09/12/2006	***	***	***	***	***	3	2	2	3	9	18	30	42	52	57	59	57	59	***	***	***	***	***
10/12/2006	***	***	***	***	***	3	2	2	2	2	7	14	22	31	37	40	41	45	***	***	***	***	***
11/12/2006	***	***	***	***	***	3	2	2	2	2	2	5	10	16	22	26	27	33	***	***	***	***	***
12/12/2006	***	***	***	***	***	3	2	2	2	2	2	2	4	8	11	15	17	23	***	***	***	***	***
13/12/2006	***	***	***	***	***	3	2	2	2	2	2	2	2	3	5	8	9	15	***	***	***	***	***
14/12/2006	***	***	***	***	***	3	2	2	2	2	2	2	2	2	3	4	5	10	***	***	***	***	***

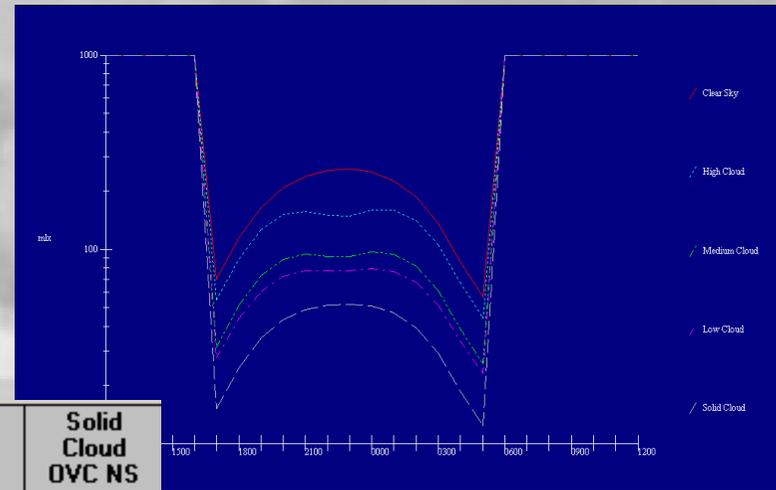


Time UTC	Sun Elevation	Sun Bearing	Moon Elevation	Moon Bearing	Moon Phase
1200	25.3	198.8	-20.9	11.2	1.00
1300	20.3	212.8	-17.6	24.1	1.00
1400	13.1	225.1	-12.0	35.9	1.00
1500	4.2	235.9	-4.7	46.4	1.00
1600	-5.8	245.5	3.9	55.7	0.99
1700	-16.6	254.4	13.4	64.1	0.99
1800	-27.9	263.1	23.7	71.9	0.99
1900	-39.3	272.5	34.3	79.7	0.99
2000	-50.7	283.8	45.3	87.9	0.99
2100	-61.4	299.9	56.3	97.9	0.99
2200	-69.8	327.1	67.0	112.4	0.99
2300	-72.2	10.0	75.9	141.5	0.99
2400	-66.6	46.9	77.9	199.1	0.99
0100	-56.9	68.1	70.7	239.3	0.99
0200	-45.8	81.5	60.5	257.5	0.99
0300	-34.3	91.8	49.5	268.7	0.98
0400	-22.9	100.8	38.5	277.4	0.98
0500	-11.9	109.5	27.7	285.3	0.98
0600	-1.4	118.6	17.3	293.0	0.98
0700	8.2	128.7	7.5	301.2	0.98
0800	16.4	140.1	-1.5	310.1	0.98
0900	22.7	153.2	-9.2	320.1	0.98
1000	26.5	167.9	-15.5	331.4	0.98
1100	27.4	183.4	-19.7	343.9	0.97
1200	25.2	198.6	-21.5	357.3	0.97

Posizione del Sole e della Luna:



Valori di illuminazione in diverse condizioni meteo:



Time UTC	Moon Elevation	Moon Bearing	Moon Phase	Clear Sky	High Cloud OVC CS	Medium Cloud OVC AS	Low Cloud OVC ST	Solid Cloud OVC NS
1700	13.4	64.1	0.99	33.2	25.8	14.9	13.3	7.2
1800	23.7	71.9	0.99	62.2	48.7	28.1	24.5	13.4
1900	34.3	79.7	0.99	99.9	78.1	45.0	38.3	21.5
2000	45.3	87.9	0.99	138.5	105.9	61.6	51.2	29.5
2100	56.3	97.9	0.99	169.6	123.1	72.6	59.3	35.6
2200	67.0	112.4	0.99	189.4	125.1	75.3	61.6	39.0
2300	75.9	141.5	0.99	199.6	115.7	71.4	60.0	40.3
2400	77.9	199.1	0.99	199.6	111.3	69.2	58.8	40.1
0100	70.7	239.3	0.99	188.5	118.6	72.0	59.5	38.5
0200	60.5	257.5	0.99	169.2	119.1	70.7	57.7	35.3
0300	49.5	268.7	0.98	140.5	105.7	61.8	50.9	29.8
0400	38.5	277.4	0.98	104.2	81.0	46.9	39.5	22.3
0500	27.7	285.3	0.98	76.2	59.6	34.4	29.9	16.4

