



March						% Moon Illuminated at meridian	Beginning of One-Hour Period (Note: DST begins on March 14)												
Day	astronomical twilight begin	astronomical twilight end	moon rise	moon set			Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Next Morning 12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	
1	507	1937	655	1644	1%	New	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	
2	505	1938	719	1803	0%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	
3	503	1940	739	1919	2%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	
4	502	1941	757	2032	6%		sun	sun	moon	dark	dark	dark	dark	dark	dark	dark	dark	sun	
5	500	1943	815	2143	12%		sun	sun	moon	moon	dark	dark	dark	dark	dark	dark	dark	sun	
6	458	1944	833	2253	19%		sun	sun	moon	moon	moon	dark	dark	dark	dark	dark	dark	sun	
7	456	1946	853	0	28%		sun	sun	moon	moon	moon	moon	dark	dark	dark	dark	dark	sun	
8	454	1948	916	2	37%		sun	sun	moon	moon	moon	moon	moon	dark	dark	dark	dark	sun	
9	452	1949	945	110	47%		sun	sun	moon	moon	moon	moon	moon	moon	dark	dark	dark	sun	
10	449	1951	1020	214	56%	First Qtr	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	dark	dark	sun
11	447	1952	1105	313	66%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	dark	sun
12	445	1954	1159	404	75%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
13	443	1955	1301	447	83%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
14	441	1957	1409	521	90%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
15	439	1959	1520	549	95%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
16	437	2000	1634	612	NA		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
17	435	2002	1748	632	99%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
18	432	2003	1903	650	100%	Full	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun
19	430	2005	2019	708	99%		sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	moon	sun	sun
20	428	2007	2138	728	95%		sun	sun	dark	dark	dark	moon	moon	moon	moon	moon	moon	sun	sun
21	426	2008	2259	750	88%		sun	sun	dark	dark	dark	moon	moon	moon	moon	moon	moon	sun	sun
22	423	2010	0	817	80%		sun	sun	dark	dark	dark	dark	moon	moon	moon	moon	moon	sun	sun
23	421	2012	21	852	69%		sun	sun	dark	dark	dark	dark	dark	dark	moon	moon	sun	sun	
24	419	2013	139	937	58%	Last Qtr	sun	sun	dark	dark	dark	dark	dark	dark	dark	moon	sun	sun	
25	417	2015	247	1036	46%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
26	414	2017	343	1147	34%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
27	412	2019	425	1305	24%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
28	410	2020	458	1424	14%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
29	407	2022	523	1543	7%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
30	405	2024	543	1659	3%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun
31	402	2026	602	1812	0%	New	sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	sun

April						% Moon Illuminated at meridian	Beginning of One-Hour Period												
Day	astronomical twilight begin	astronomical twilight end	moon rise	moon set			Evening 6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	Next Morning 12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	
1	400	2028	619	1924	1%		sun	sun	dark	dark	dark	dark	dark	dark	dark	dark	dark	sun	
2	358	2029	636	2035	3%		sun	sun	moon	dark	dark	dark	dark	dark	dark	dark	dark	sun	
3	355	2031	655	2145	7%		sun	sun	sun	moon	dark	dark	dark	dark	dark	dark	dark	sun	
4	353	2033	717	2254	13%		sun	sun	sun	moon	moon	dark	dark	dark	dark	dark	dark	sun	
5	350	2035	743	0	21%		sun	sun	sun	moon	moon	moon	dark	dark	dark	dark	dark	sun	
6	348	2037	816	1	29%		sun	sun	sun	moon	moon	moon	moon	dark	dark	dark	dark	sun	
7	346	2039	856	103	39%		sun	sun	sun	moon	moon	moon	moon	moon	dark	dark	dark	sun	
8	343	2041	946	158	48%	First Qtr	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	dark	sun	
9	341	2043	1045	243	58%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	dark	sun	
10	338	2045	1150	320	68%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	sun	
11	336	2047	1259	350	77%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	sun	
12	333	2049	1411	415	85%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	moon	sun	
13	331	2051	1525	435	92%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun	
14	328	2053	1640	454	NA		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun	
15	326	2055	1757	512	97%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun	
16	323	2057	1916	531	100%	Full	sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun	
17	321	2059	2039	552	100%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun	
18	318	2101	2203	617	97%		sun	sun	sun	moon	moon	moon	moon	moon	moon	moon	sun	sun	
19	315	2103	2326	649	91%		sun	sun	sun	dark	dark	moon	moon	moon	moon	sun	sun	sun	
20	313	2105	0	732	82%		sun	sun	sun	dark	dark	dark	dark	moon	moon	sun	sun	sun	
21	310	2107	40	828	72%		sun	sun	sun	dark	dark	dark	dark	dark	moon	sun	sun	sun	
22	308	2110	141	936	61%		sun	sun	sun	dark	dark	dark	dark	dark	moon	sun	sun	sun	
23	305	2112	228	1053	49%	Last Qtr	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	
24	303	2114	302	1212	37%		sun	sun	sun	dark	dark	dark	dark	dark	dark	dark	sun	sun	
25	300	2116	329	1330	27%		sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	
26	258	2118	350	1446	17%		sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	
27	255	2121	408	1558	10%		sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	
28	252	2123	425	1709	5%		sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	
29	250	2125	442	1820	1%		sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	
30	247	2128	500	1930	0%	New	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun	

May						Beginning of One-Hour Period												
Day	astronomical twilight		moon		% Moon Illuminated at meridian	Next Morning												
	begin	end	rise	set		Evening	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM
1	245	2130	520	2040	1%	sun	sun	sun	sun	dark	dark	dark	dark	dark	dark	sun	sun	sun
2	242	2132	544	2148	4%	sun	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun
3	239	2135	614	2252	9%	sun	sun	sun	sun	sun	moon	dark	dark	dark	dark	sun	sun	sun
4	237	2137	651	2350	15%	sun	sun	sun	sun	sun	moon	moon	dark	dark	dark	sun	sun	sun
5	234	2140	737	0	23%	sun	sun	sun	sun	sun	moon	moon	moon	moon	dark	dark	sun	sun
6	232	2142	832	39	32%	sun	sun	sun	sun	sun	moon	moon	moon	moon	dark	sun	sun	sun
7	229	2145	935	119	41%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
8	227	2147	1042	151	51%	First Qtr	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun
9	224	2150	1152	217	61%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
10	221	2152	1303	239	71%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
11	219	2155	1416	258	81%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
12	216	2157	1530	315	89%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
13	214	2200	1648	333	95%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
14	211	2202	1809	353	NA	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
15	209	2205	1935	416	99%	Full	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
16	206	2208	2101	445	100%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
17	204	2210	2223	523	98%	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
18	201	2213	2332	615	93%	sun	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun
19	158	2215	0	721	85%	sun	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun
20	156	2218	25	838	75%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
21	154	2221	105	959	64%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
22	151	2223	134	1119	52%	Last Qtr	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
23	149	2226	157	1236	41%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
24	146	2228	216	1349	30%	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
25	144	2231	233	1500	21%	sun	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
26	141	2234	249	1609	13%	sun	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
27	139	2236	306	1719	7%	sun	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
28	137	2239	325	1828	3%	sun	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
29	134	2241	348	1937	0%	sun	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
30	132	2244	415	2042	0%	New	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun
31	130	2246	449	2143	2%	sun	sun	sun	sun	sun	sun	dark	dark	dark	sun	sun	sun	sun

June						Beginning of One-Hour Period												
Day	astronomical twilight		moon		% Moon Illuminated at meridian	Next Morning												
	begin	end	rise	set		Evening	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM
1	128	2249	532	2235	5%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	sun
2	126	2251	624	2318	11%	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	sun
3	124	2253	724	2353	18%	sun	sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun
4	122	2256	829	2359	26%	sun	sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun
5	120	2258	938	20	35%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
6	118	2300	1047	43	45%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
7	116	2302	1157	102	55%	First Qtr	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
8	114	2304	1309	120	66%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
9	113	2306	1422	137	76%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
10	111	2308	1540	155	85%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
11	110	2310	1702	215	93%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
12	108	2312	1828	241	98%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
13	107	2313	1954	314	NA	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
14	106	2314	2111	359	100%	Full	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
15	105	2316	2214	500	99%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
16	104	2317	2301	615	94%	sun	sun	sun	sun	sun	sun	moon	moon	sun	sun	sun	sun	sun
17	104	2317	2335	738	87%	sun	sun	sun	sun	sun	sun	dark	moon	sun	sun	sun	sun	sun
18	103	2318	0	902	78%	sun	sun	sun	sun	sun	sun	dark	moon	sun	sun	sun	sun	sun
19	103	2319	1	1022	67%	sun	sun	sun	sun	sun	sun	dark	moon	sun	sun	sun	sun	sun
20	103	2319	22	1138	56%	Last Qtr	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
21	103	2319	39	1251	45%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
22	104	2319	56	1401	35%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
23	104	2319	113	1510	25%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
24	105	2318	131	1619	17%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
25	106	2318	152	1728	10%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
26	107	2317	218	1834	5%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
27	108	2316	250	1936	2%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
28	109	2315	330	2031	0%	New	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
29	111	2314	419	2117	1%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun
30	112	2313	517	2154	3%	sun	sun	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun

July					% Moon Illuminated at meridian	Beginning of One-Hour Period													
Day	astronomical twilight begin	twilight end	moon rise	moon set		Evening	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	114	2311	621	2224	7%	DST>>	sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	sun	sun
2	116	2310	728	2248	13%		sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	sun	sun
3	118	2308	837	2307	21%		sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	sun	sun
4	120	2306	946	2325	30%		sun	sun	sun	sun	sun	dark	dark	sun	sun	sun	sun	sun	sun
5	122	2305	1055	2342	39%		sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun	sun
6	124	2303	1206	2359	50%	First Qtrr	sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun	sun
7	126	2301	1319	0	61%		sun	sun	sun	sun	sun	moon	dark	sun	sun	sun	sun	sun	sun
8	128	2259	1437	17	72%		sun	sun	sun	sun	sun	moon	moon	dark	sun	sun	sun	sun	sun
9	131	2257	1559	39	82%		sun	sun	sun	sun	sun	moon	moon	dark	sun	sun	sun	sun	sun
10	133	2255	1723	107	90%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
11	135	2252	1844	145	97%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
12	138	2250	1955	237	NA		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
13	140	2248	2050	346	100%	Full	sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
14	143	2246	2131	507	99%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
15	145	2243	2201	634	96%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
16	148	2241	2224	759	90%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
17	150	2238	2244	919	81%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
18	153	2236	2301	1036	71%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
19	156	2234	2318	1149	61%		sun	sun	sun	sun	sun	moon	moon	moon	sun	sun	sun	sun	sun
20	158	2231	2336	1300	50%	Last Qtrr	sun	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun
21	201	2229	2357	1410	40%		sun	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun
22	203	2226	0	1519	30%		sun	sun	sun	sun	sun	dark	dark	moon	moon	sun	sun	sun	sun
23	206	2224	21	1626	22%		sun	sun	sun	sun	sun	dark	dark	dark	moon	sun	sun	sun	sun
24	208	2221	50	1730	14%		sun	sun	sun	sun	sun	dark	dark	dark	moon	sun	sun	sun	sun
25	211	2219	128	1827	8%		sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
26	213	2216	214	1916	4%		sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
27	216	2214	310	1956	1%		sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
28	219	2211	413	2027	0%	New	sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
29	221	2209	520	2052	1%		sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
30	224	2206	628	2113	5%		sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun
31	226	2203	737	2131	10%		sun	sun	sun	sun	sun	dark	dark	dark	dark	sun	sun	sun	sun

August					% Moon Illuminated at meridian	Beginning of One-Hour Period													
Day	astronomical twilight begin	twilight end	moon rise	moon set		Evening	6:00 PM	7:00 PM	8:00 PM	9:00 PM	10:00 PM	11:00 PM	12:00 AM	1:00 AM	2:00 AM	3:00 AM	4:00 AM	5:00 AM	6:00 AM
1	229	2201	847	2148	17%	DST>>	sun	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun
2	231	2158	956	2204	25%		sun	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun
3	233	2156	1108	2222	35%		sun	sun	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun
4	236	2153	1222	2242	46%		sun	sun	sun	sun	sun	moon	dark	dark	dark	dark	sun	sun	sun
5	238	2150	1340	2306	57%	First Qtrr	sun	sun	sun	sun	sun	moon	dark	dark	dark	dark	sun	sun	sun
6	241	2148	1501	2338	69%		sun	sun	sun	sun	sun	moon	moon	dark	dark	dark	sun	sun	sun
7	243	2145	1621	0	79%		sun	sun	sun	sun	sun	moon	moon	dark	dark	dark	sun	sun	sun
8	245	2143	1735	22	88%		sun	sun	sun	sun	sun	moon	moon	moon	dark	dark	sun	sun	sun
9	248	2140	1837	122	95%		sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
10	250	2137	1923	236	NA		sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
11	252	2135	1958	401	99%	Full	sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
12	255	2132	2024	528	100%		sun	sun	sun	sun	sun	moon	moon	moon	moon	sun	sun	sun	sun
13	257	2130	2046	652	97%		sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun	sun
14	259	2127	2104	813	92%		sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun	sun
15	301	2124	2122	929	85%		sun	sun	sun	moon	moon	moon	moon	moon	sun	sun	sun	sun	sun
16	303	2122	2140	1043	76%		sun	sun	sun	dark	moon	moon	moon	moon	sun	sun	sun	sun	sun
17	306	2119	2159	1156	67%		sun	sun	sun	dark	moon	moon	moon	moon	sun	sun	sun	sun	sun
18	308	2117	2222	1307	56%	Last Qtrr	sun	sun	sun	dark	moon	moon	moon	moon	sun	sun	sun	sun	sun
19	310	2114	2250	1416	46%		sun	sun	sun	dark	dark	moon	moon	moon	sun	sun	sun	sun	sun
20	312	2111	2325	1522	37%		sun	sun	sun	dark	dark	moon	moon	moon	sun	sun	sun	sun	sun
21	314	2109	0	1622	27%		sun	sun	sun	dark	dark	dark	moon	moon	sun	sun	sun	sun	sun
22	316	2106	8	1714	19%		sun	sun	sun	dark	dark	dark	dark	moon	sun	sun	sun	sun	sun
23	318	2104	101	1756	12%		sun	sun	sun	dark	dark	dark	dark	dark	moon	sun	sun	sun	sun
24	320	2101	202	1830	6%		sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun	sun
25	322	2059	309	1857	3%		sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun	sun
26	324	2056	418	1919	0%		sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun	sun
27	326	2054	528	1938	0%	New	sun	sun	sun	dark	dark	dark	dark	dark	sun	sun	sun	sun	sun
28	328	2051	638	1955	3%		sun	sun	sun	dark	dark	dark	dark	dark	dark	dark	sun	sun	sun
29	330	2049	748	2011	7%		sun	sun	sun	dark	dark	dark	dark	dark	dark	dark	sun	sun	sun
30	332	2046	859	2028	13%		sun	sun	sun	dark	dark	dark	dark	dark	dark	dark	sun	sun	sun
31	334	2043	1013	2047	21%		sun	sun	sun	dark	dark	dark	dark	dark	dark	dark	sun	sun	sun





## About This Calendar

This calendar was created using data from Her Majesty's Nautical Almanac Office and timeanddate.com.

My usual source, the U.S. Naval Observatory, was unavailable.

The Twilight and Moon Rise/Set times are given in military time (e.g., 2148 is 9:48 PM) for Pacific Standard Time.




If Daylight Savings Time is in effect, these times are one hour behind local time.

The left side of the calendar gives the times of beginning and end of astronomical twilight, the moon rise and set times, percent illumination of the moon when it crosses the meridian, and the four primary moon phases (for Pacific time).

Shading of specific dates provide a quick means of finding the best nights for deep sky observing.

Note that on some dates the moon does not cross the meridian, and percent illumination is given as NA.

Also note that moon rise (or set) time is given as "0" when the moon does not rise (or set) on that day (under Pacific Standard Time).

	Darkest blue shading is applied to New Moon dates.
	Dark blue shaded dates are the best nights for deep sky observing.
	Light blue shaded dates are "marginal" deep sky observing nights.

In determining which dates to shade, I gave preference to dates for which moonless conditions occurred shortly after the end of astronomical twilight. Also, I took into account the moon's level of illumination. This process was not automated, and so my judgements may not always agree with yours.

The right side of the calendar gives more detail on exactly when there will be moonless conditions. The cell labels and shading were automated.

The column headings refer to the beginning of an hourly interval; for example, 6 PM refers to the hour beginning at 6 PM and ending at 7 PM.

Three entries are possible for each cell under these hourly headings, as described below.

sun	Astronomical twilight has not yet ended, or has begun (for the following morning). In some cases, the sun may even be above the horizon.
moon	The moon is above the horizon.
dark	Full astronomical darkness is in effect and the moon is below the horizon.

Note that for a given hourly interval, a cell will be labeled "dark" if there is at least 30 minutes of full, moonless darkness during that hour.

The cell labels are a convenience to allow the user to quickly see when best conditions for observing will occur. The details can be discerned from the actual data.

Denis Janky