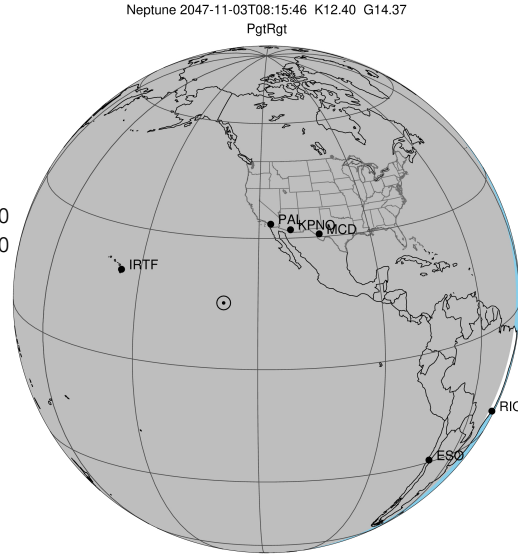


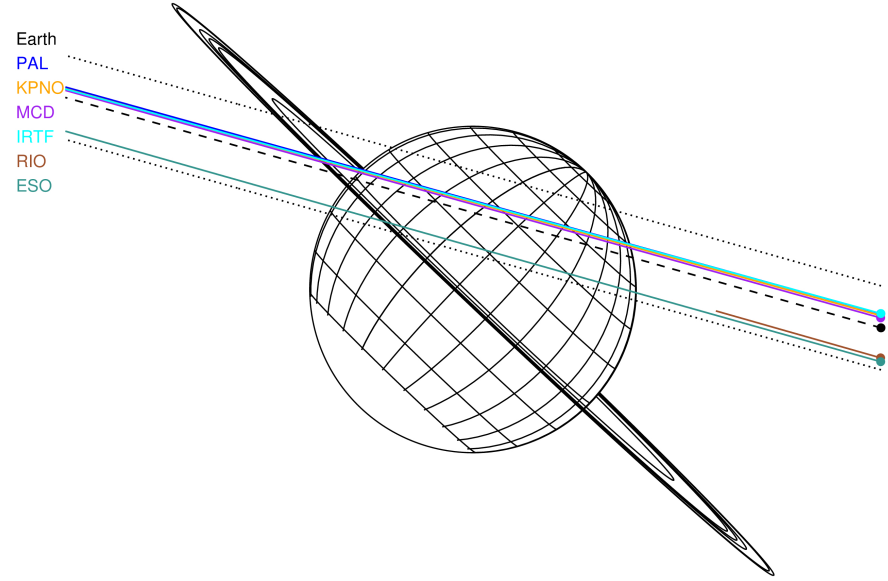
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2047-11-03T08:15:46.330
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 31391714103977088
 2Mass ID (if available) : 03112356+1556126

Neptune 2047-11-03T08:15:46 K12.40 G14.37 PgtRgt

ICRS Star Coord at Epoch: 03h 11m 23.56472s +15:56:12.47354s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 12.402
 G magnitude : 14.373
 RP magnitude : 13.732
 BP magnitude : 14.847
 DUPflag : 0
 Distance (au) : 28.838
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -24.16
 Sun-Target sep (deg) : 170.21
 Sun-Moon sep (deg) : 6.34
 B (ring opening deg) : 1.87
 PA of pole (deg) : -44.04
 # a(km) ring



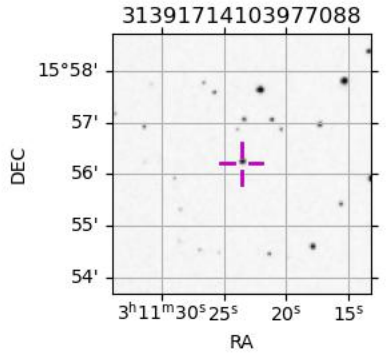
2047-11-03T08:15:46.3300 ex: 03 11 23.5647 s: +15 56 12.474 C/A 0.5377 PA 164.23 deg v_sky -24.16 km/s D 28.84 AU
 Credit: Styled after SORA/Lucky Star



- 1 42000.0 Galle
- 2 53200.0 LeVerrier
- 3 55200.0 Lassell
- 4 57200.0 Arago
- 5 61953.0 Galatea
- 6 62933.0 Adams

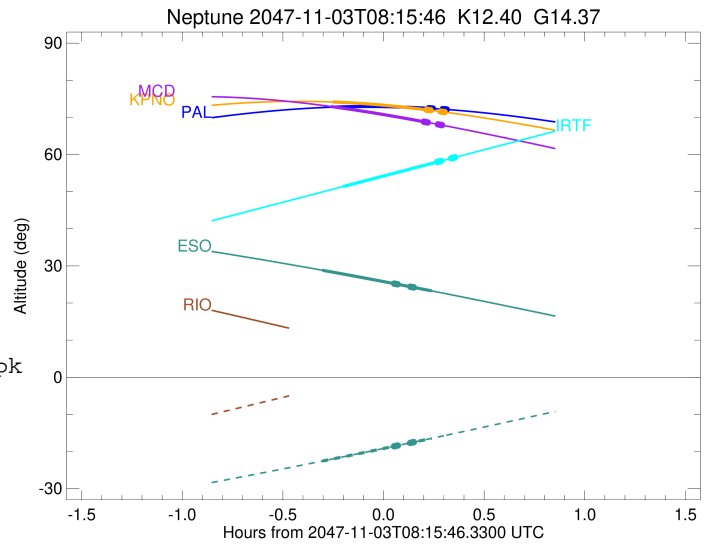
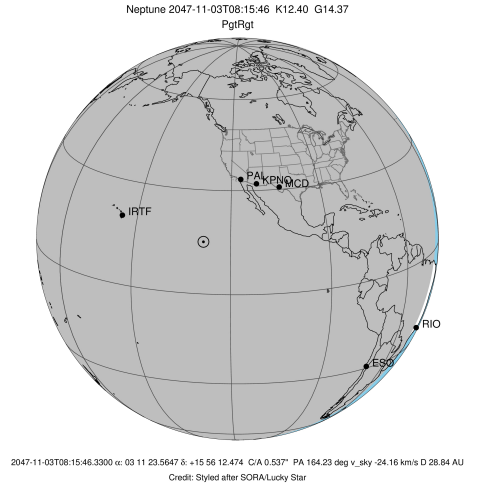
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+	+	+	NOV 03 08:01 - NOV 03 08:34	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+	NOV 03 08:00 - NOV 03 08:33	PieRne
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+	NOV 03 08:00 - NOV 03 08:32	PieRne
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+	+	NOV 03 08:03 - NOV 03 08:36	PieRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3		+	+	NOV 03 07:57 - NOV 03 08:30	PieRnn
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

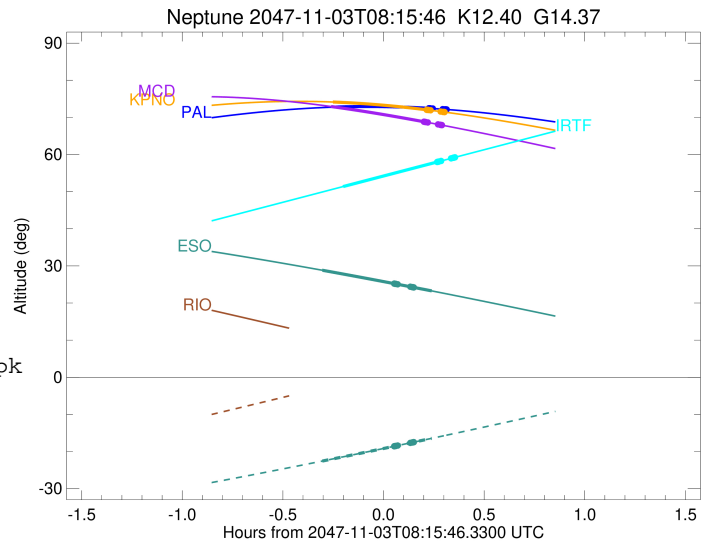
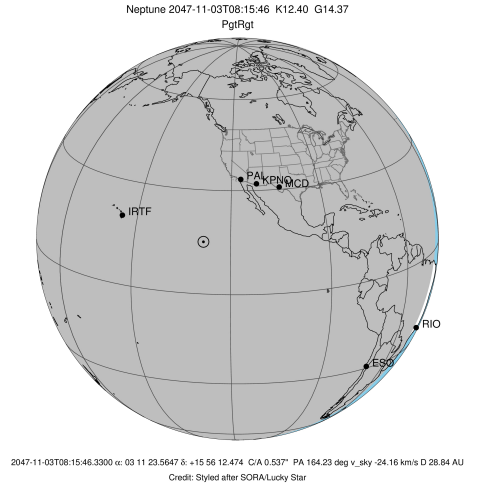
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2047-11-03T08:15:24.020
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 31391714103977088
2Mass ID (if available) : 03112356+1556126
ICRS Star Coord at Epoch: 03h 11m 23.56472s +15:56:12.47354s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 12.402
G magnitude           : 14.373
RP magnitude          : 13.732
BP magnitude          : 14.847
DUPflag              : 0
Distance (au)         : 28.838
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -24.16
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 6.25
B (ring opening deg) : 1.87
PA of pole (deg)     : -44.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.622
C/A sky separation (km) : 13005.9
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall1.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2047-11-03T08:28:58.034	b	72.47	-67.62	62933.04	-324.68		
Galatea	I	2047-11-03T08:29:01.058	b	72.47	-67.61	61953.02	-323.47		
Arago	I	2047-11-03T08:29:15.901	b	72.46	-67.58	57200.03	-316.63		
Lassell	I	2047-11-03T08:29:22.251	b	72.45	-67.57	55200.06	-313.16		
LeVerrier	I	2047-11-03T08:29:28.677	b	72.45	-67.55	53200.07	-309.24		
Galle	I	2047-11-03T08:30:06.816		72.41	-67.47	42001.42	-273.84		
Neptune	I	2047-11-03T08:01:05.221		72.78	-70.64	24763.67		60.14	60.98
Neptune	E	2047-11-03T08:29:42.754		72.43	-67.52	24764.00		3.18	3.29
Galle	E	2047-11-03T08:33:04.441		72.24	-67.06	42000.40	273.66		
LeVerrier	E	2047-11-03T08:33:42.633		72.20	-66.97	53200.07	308.80		
Lassell	E	2047-11-03T08:33:49.070		72.19	-66.96	55200.05	312.67		
Arago	E	2047-11-03T08:33:55.431		72.18	-66.94	57200.04	316.10		
Galatea	E	2047-11-03T08:34:10.303		72.17	-66.91	61953.00	322.85		
Adams	E	2047-11-03T08:34:13.333		72.17	-66.90	62933.01	324.05		

```

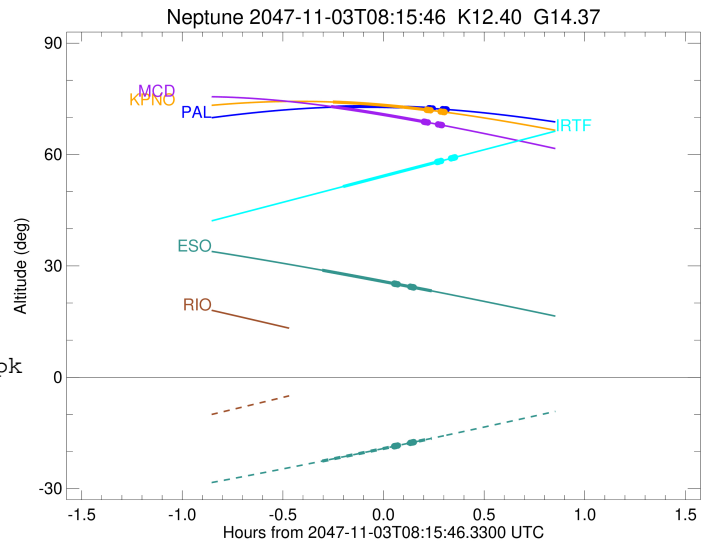
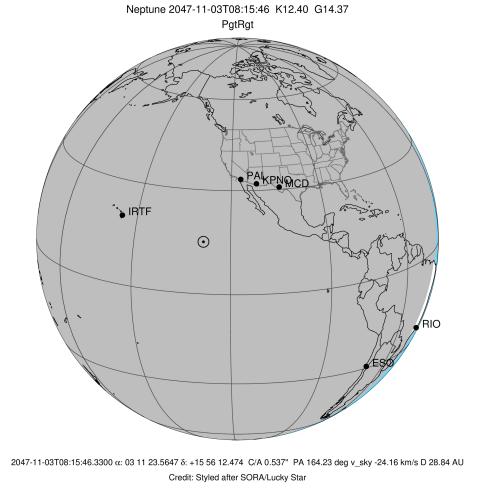
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2047-11-03T08:15:05.770
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 31391714103977088
2Mass ID (if available) : 03112356+1556126
ICRS Star Coord at Epoch: 03h 11m 23.56472s +15:56:12.47354s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 12.402
G magnitude           : 14.373
RP magnitude          : 13.732
BP magnitude          : 14.847
DUPflag               : 0
Distance (au)        : 28.838
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -24.16
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 6.31
B (ring opening deg) : 1.87
PA of pole (deg)     : -44.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.609
C/A sky separation (km) : 12739.9
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall1.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2047-11-03T08:28:19.742	b	72.09	-65.52	62933.02	-326.03		
Galatea	I	2047-11-03T08:28:22.753	b	72.09	-65.51	61953.00	-324.88		
Arago	I	2047-11-03T08:28:37.525	b	72.06	-65.47	57200.04	-318.33		
Lassell	I	2047-11-03T08:28:43.840	b	72.05	-65.45	55200.02	-315.01		
LeVerrier	I	2047-11-03T08:28:50.225	b	72.03	-65.43	53200.05	-311.28		
Galle	I	2047-11-03T08:29:28.005	b	71.96	-65.33	42001.05	-277.61		
Neptune	I	2047-11-03T08:00:40.635		74.15	-69.65	24763.67		59.41	60.25
Neptune	E	2047-11-03T08:29:30.907		71.96	-65.32	24764.01		2.48	2.57
Galle	E	2047-11-03T08:32:28.218		71.62	-64.82	42000.32	277.38		
LeVerrier	E	2047-11-03T08:33:06.056		71.54	-64.71	53200.06	310.78		
Lassell	E	2047-11-03T08:33:12.453		71.53	-64.69	55200.05	314.47		
Arago	E	2047-11-03T08:33:18.780		71.51	-64.68	57200.04	317.75		
Galatea	E	2047-11-03T08:33:33.583		71.48	-64.63	61953.00	324.20		
Adams	E	2047-11-03T08:33:36.601		71.48	-64.63	62933.00	325.34		

```

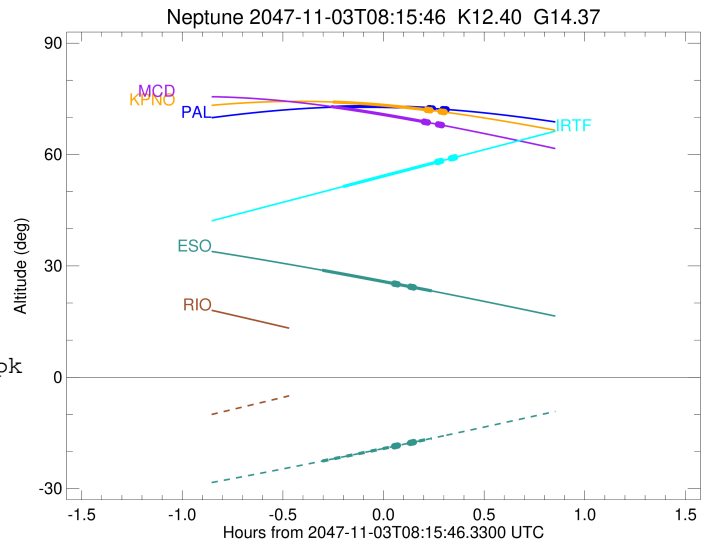
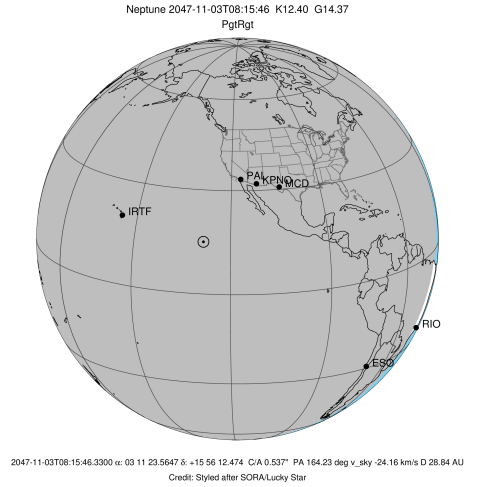
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2047-11-03T08:14:38.170
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 31391714103977088
2Mass ID (if available) : 03112356+1556126
ICRS Star Coord at Epoch: 03h 11m 23.56472s +15:56:12.47354s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 12.402
G magnitude           : 14.373
RP magnitude         : 13.732
BP magnitude         : 14.847
DUPflag              : 0
Distance (au)        : 28.838
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -24.16
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 6.39
B (ring opening deg) : 1.87
PA of pole (deg)     : -44.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.595
C/A sky separation (km) : 12448.7
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2047-11-03T08:27:30.860	b	68.89	-60.84	62933.00	-327.22		
Galatea	I	2047-11-03T08:27:33.860	b	68.88	-60.83	61953.02	-326.12		
Arago	I	2047-11-03T08:27:48.568	b	68.84	-60.79	57200.03	-319.89		
Lassell	I	2047-11-03T08:27:54.850	b	68.82	-60.77	55200.01	-316.73		
LeVerrier	I	2047-11-03T08:28:01.199	b	68.80	-60.75	53200.03	-313.18		
Galle	I	2047-11-03T08:28:38.639	b	68.70	-60.62	42000.80	-281.31		
Neptune	I	2047-11-03T08:00:06.101		72.94	-65.93	24763.68		58.59	59.45
Neptune	E	2047-11-03T08:29:10.353		68.61	-60.52	24764.00		1.73	1.79
Galle	E	2047-11-03T08:31:41.677		68.18	-60.03	42000.26	281.03		
LeVerrier	E	2047-11-03T08:32:19.180		68.07	-59.91	53200.02	312.62		
Lassell	E	2047-11-03T08:32:25.542		68.05	-59.89	55200.04	316.12		
Arago	E	2047-11-03T08:32:31.838		68.03	-59.87	57200.03	319.23		
Galatea	E	2047-11-03T08:32:46.580		67.99	-59.82	61953.01	325.36		
Adams	E	2047-11-03T08:32:49.587		67.98	-59.81	62932.99	326.44		

```

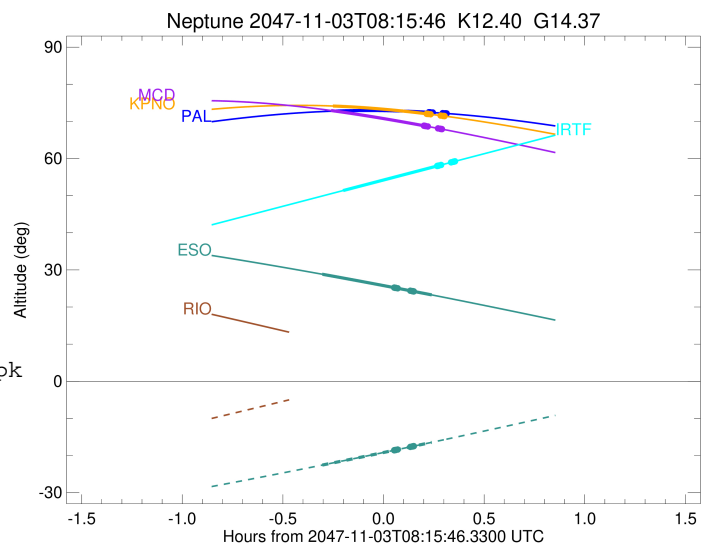
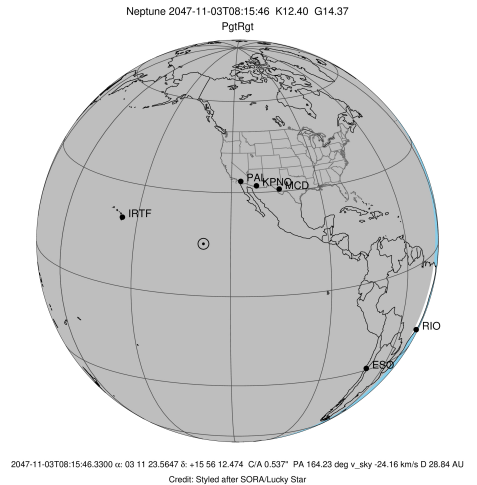
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2047-11-03T08:18:05.590
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 31391714103977088
2Mass ID (if available) : 03112356+1556126
ICRS Star Coord at Epoch: 03h 11m 23.56472s +15:56:12.47354s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 12.402
G magnitude           : 14.373
RP magnitude         : 13.732
BP magnitude         : 14.847
DUPflag              : 0
Distance (au)        : 28.838
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -24.16
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 6.01
B (ring opening deg) : 1.87
PA of pole (deg)     : -44.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.617
C/A sky separation (km) : 12904.3
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2047-11-03T08:31:28.016	b	57.92	-67.16	62933.03	-326.72		
Galatea	I	2047-11-03T08:31:31.021	b	57.93	-67.17	61953.01	-325.54		
Arago	I	2047-11-03T08:31:45.765	b	57.99	-67.23	57200.04	-318.87		
Lassell	I	2047-11-03T08:31:52.070	b	58.01	-67.25	55200.04	-315.48		
LeVerrier	I	2047-11-03T08:31:58.446	b	58.04	-67.28	53200.06	-311.67		
Galle	I	2047-11-03T08:32:36.216		58.19	-67.43	42001.18	-277.27		
Neptune	I	2047-11-03T08:03:41.908		51.36	-60.66	24763.67		60.01	60.84
Neptune	E	2047-11-03T08:32:28.640		58.16	-67.40	24764.00		2.75	2.85
Galle	E	2047-11-03T08:35:34.818		58.89	-68.12	42000.37	277.13		
LeVerrier	E	2047-11-03T08:36:12.633		59.04	-68.27	53200.06	311.30		
Lassell	E	2047-11-03T08:36:19.019		59.06	-68.29	55200.04	315.07		
Arago	E	2047-11-03T08:36:25.333		59.09	-68.31	57200.01	318.42		
Galatea	E	2047-11-03T08:36:40.102		59.15	-68.37	61953.03	325.01		
Adams	E	2047-11-03T08:36:43.112		59.16	-68.38	62932.99	326.18		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2047-11-03T08:13:49.330
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)   : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 31391714103977088
2Mass ID (if available) : 03112356+1556126
ICRS Star Coord at Epoch: 03h 11m 23.56472s +15:56:12.47354s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 12.402
G magnitude           : 14.373
RP magnitude          : 13.732
BP magnitude          : 14.847
DUPflag              : 0
Distance (au)        : 28.838
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -24.16
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 7.19
B (ring opening deg) : 1.87
PA of pole (deg)     : -44.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.299
C/A sky separation (km) : 6250.8
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itr93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2047-11-03T08:18:52.148	b	25.24	-18.61	62933.00	-355.80		
Galatea	I	2047-11-03T08:18:54.904	b	25.24	-18.60	61952.98	-355.38		
Arago	I	2047-11-03T08:19:08.320	b	25.20	-18.56	57200.00	-353.15		
Lassell	I	2047-11-03T08:19:13.991	b	25.18	-18.54	55199.99	-352.11		
LeVerrier	I	2047-11-03T08:19:19.680	b	25.16	-18.52	53200.00	-350.99		
Galle	I	2047-11-03T08:19:51.946	b	25.07	-18.42	41999.97	-342.45		
Neptune	I	2047-11-03T07:57:29.789		28.83	-22.58	24763.79		42.86	43.84
Neptune	E	2047-11-03T08:30:09.603		23.26	-16.45	24763.98		-13.62	-14.08
Galle	E	2047-11-03T08:23:34.527	b	24.42	-17.71	41999.98	337.93		
LeVerrier	E	2047-11-03T08:24:07.305	b	24.33	-17.61	53200.00	344.65		
Lassell	E	2047-11-03T08:24:13.101	b	24.31	-17.59	55199.99	345.43		
Arago	E	2047-11-03T08:24:18.886	b	24.29	-17.57	57200.02	346.11		
Galatea	E	2047-11-03T08:24:32.590	b	24.25	-17.53	61952.98	347.47		
Adams	E	2047-11-03T08:24:35.410	b	24.25	-17.52	62933.00	347.71		