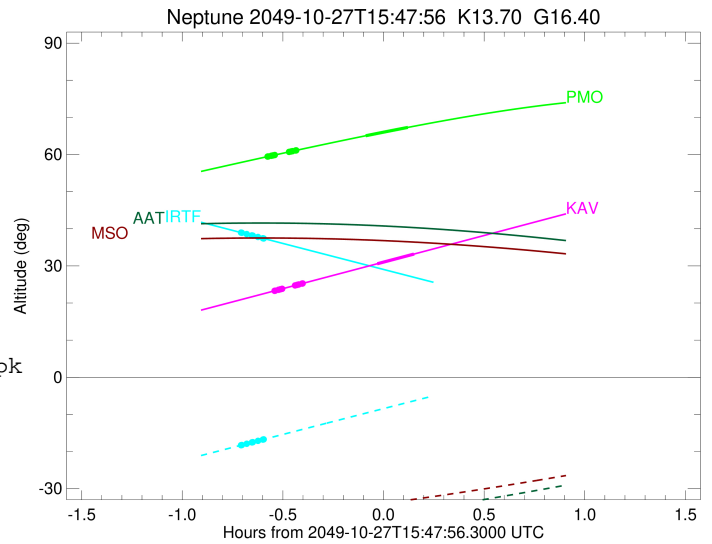
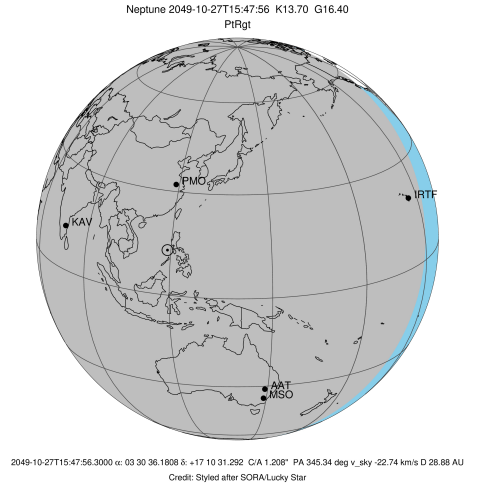



```

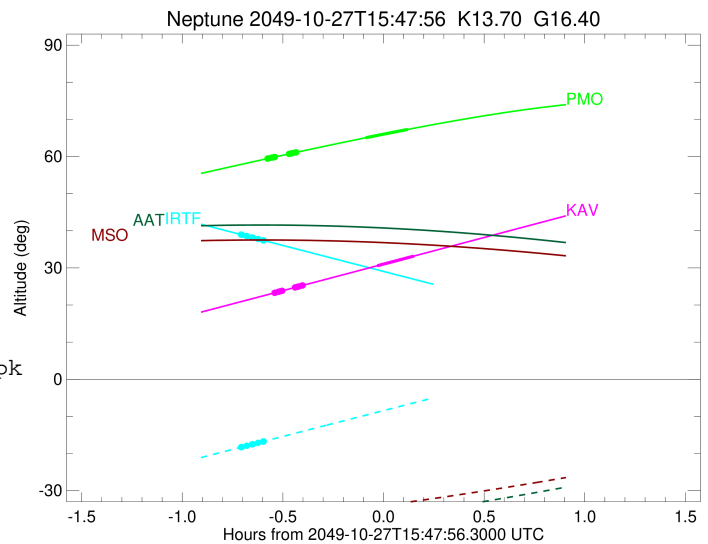
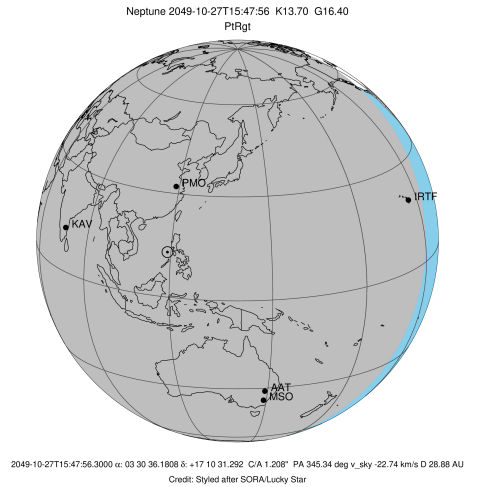
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-10-27T15:48:53.720
Event type          : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code       : PMO
Location            : Purple Mtn Obs. Nanking
Latitude (deg)      : 32.06667
E. Longitude (deg)  : 118.82089
Altitude (km)       : 0.364
Gaia source ID      : 54858934374888448
2Mass ID (if available) : 03303615+1710319
ICRS Star Coord at Epoch: 03h 30m 36.18084s +17:10:31.29152s
RUWE (>1.4 is poor) : 1.07
K magnitude          : 13.697
G magnitude          : 16.396
RP magnitude         : 15.556
BP magnitude         : 17.146
DUPflag             : 0
Distance (au)       : 28.885
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.74
Sun-Target sep (deg) : 159.34
Sun-Moon sep (deg)   : 170.85
B (ring opening deg) : 4.11
PA of pole (deg)     : -42.45
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.106
C/A sky separation (km) : 23171.4
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	2049-10-27T15:13:57.806		59.56	-69.58	62933.13	-96.77		
Galatea	I	2049-10-27T15:14:08.055		59.60	-69.60	61953.16	-94.43		
Arago	I	2049-10-27T15:15:02.344		59.78	-69.68	57200.34	-80.07		
Lassell	I	2049-10-27T15:15:28.647		59.86	-69.72	55200.46	-71.83		
LeVerrier	I	2049-10-27T15:15:58.634		59.96	-69.76	53200.61	-61.34		
Neptune	I	2049-10-27T15:42:35.318		65.05	-71.13	24763.06		-41.09	-42.06
Neptune	E	2049-10-27T15:55:11.889		67.31	-71.12	24761.89		-81.48	-81.76
LeVerrier	E	2049-10-27T15:20:37.544		60.88	-70.13	53227.65	61.56		
Lassell	E	2049-10-27T15:21:07.517		60.97	-70.16	55209.85	71.94		
Arago	E	2049-10-27T15:21:33.806		61.06	-70.19	57204.56	80.16		
Galatea	E	2049-10-27T15:22:28.060		61.24	-70.26	61954.15	94.52		
Adams	E	2049-10-27T15:22:38.301		61.27	-70.27	62933.92	96.87		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2049-10-27T15:43:56.510
Event type            : PtRgt
: Neptune occs: topocentric, not geocentric
: 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        : 54858934374888448
2Mass ID (if available) : 03303615+1710319
ICRS Star Coord at Epoch: 03h 30m 36.18084s +17:10:31.29152s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 13.697
G magnitude           : 16.396
RP magnitude          : 15.556
BP magnitude          : 17.146
DUPflag              : 0
Distance (au)         : 28.885
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.74
Sun-Target sep (deg)  : 159.34
Sun-Moon sep (deg)    : 171.87
B (ring opening deg) : 4.11
PA of pole (deg)      : -42.45
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.214
C/A sky separation (km) : 25425.6
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
    
```



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

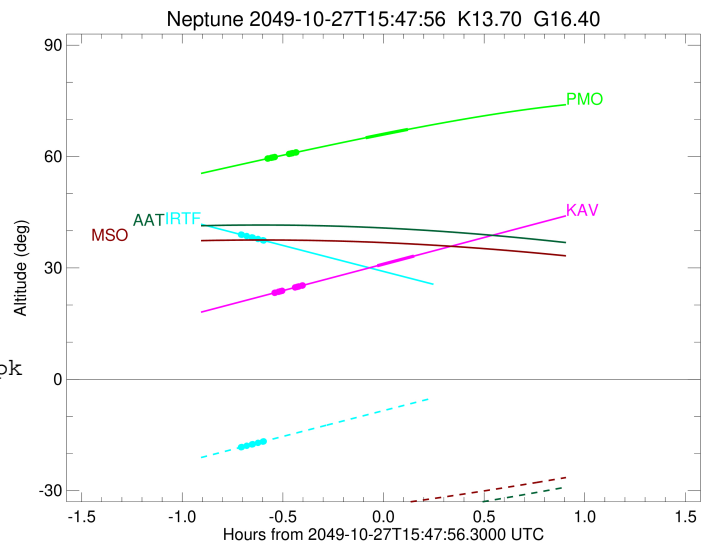
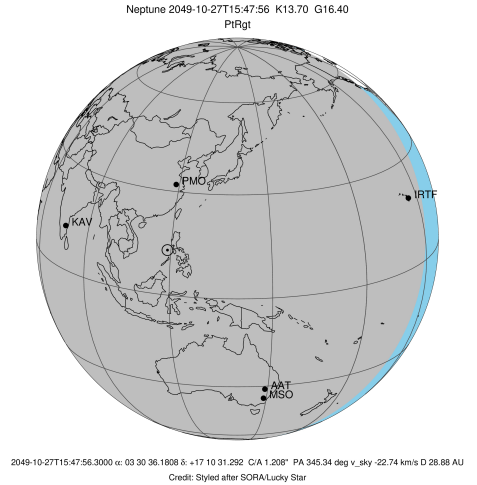
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2049-10-27T15:06:03.079		38.83	-18.17	62933.41	-76.10		
Galatea	I	2049-10-27T15:06:16.265		38.78	-18.12	61953.47	-72.48		
Arago	I	2049-10-27T15:07:34.900		38.48	-17.81	57200.63	-47.38		
Lassell	I	2049-10-27T15:08:28.243		38.27	-17.60	55200.66	-27.23		

No planet occultations

Lassell	E	2049-10-27T15:08:28.238		38.27	-17.60	55222.96	-27.55		
Arago	E	2049-10-27T15:11:34.514		37.54	-16.88	57356.46	48.55		
Galatea	E	2049-10-27T15:12:53.138		37.23	-16.58	61962.39	72.51		
Adams	E	2049-10-27T15:13:06.331		37.18	-16.52	62939.65	76.11		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-10-27T15:51:34.300
Event type           : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 54858934374888448
2Mass ID (if available) : 03303615+1710319
ICRS Star Coord at Epoch: 03h 30m 36.18084s +17:10:31.29152s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 13.697
G magnitude           : 16.396
RP magnitude          : 15.556
BP magnitude          : 17.146
DUPflag              : 0
Distance (au)         : 28.885
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.74
Sun-Target sep (deg) : 159.34
Sun-Moon sep (deg)   : 170.29
B (ring opening deg) : 4.11
PA of pole (deg)     : -42.45
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.125
C/A sky separation (km) : 23577.4
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	2049-10-27T15:16:02.815		23.42	-43.18	62933.16	-93.94		
Galatea	I	2049-10-27T15:16:13.383		23.47	-43.22	61953.19	-91.49		
Arago	I	2049-10-27T15:17:09.818		23.69	-43.45	57200.39	-76.32		
Lassell	I	2049-10-27T15:17:37.603		23.80	-43.57	55200.41	-67.46		
LeVerrier	I	2049-10-27T15:18:09.951		23.93	-43.70	53200.65	-55.95		
Neptune	I	2049-10-27T15:46:04.123		30.58	-50.47	24762.98		-43.84	-44.82
Neptune	E	2049-10-27T15:57:04.189		33.20	-53.15	24761.94		-78.80	-79.17
LeVerrier	E	2049-10-27T15:22:27.610		24.95	-44.74	53248.43	56.35		
Lassell	E	2049-10-27T15:22:59.930		25.08	-44.87	55214.56	67.62		
Arago	E	2049-10-27T15:23:27.689		25.19	-44.98	57206.27	76.45		
Galatea	E	2049-10-27T15:24:24.059		25.41	-45.21	61954.48	91.64		
Adams	E	2049-10-27T15:24:34.612		25.45	-45.25	62934.16	94.10		