

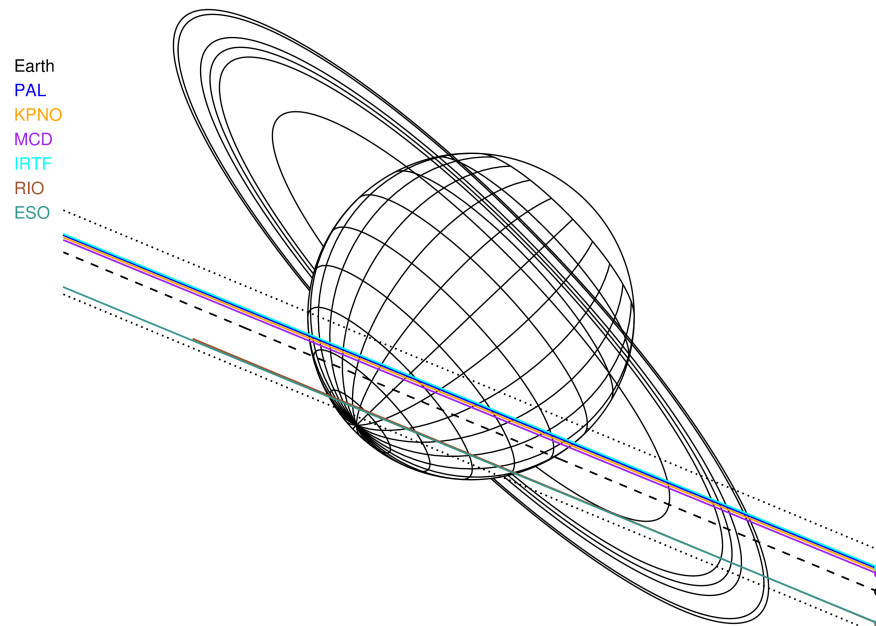
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2031-10-17T07:12:26.950
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 2551675048767534848
 2Mass ID (if available) : 00520885+0349541

Neptune 2031-10-17T07:12:26 K14.71 G16.31 PgtRgt

ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 14.714
 G magnitude : 16.306
 RP magnitude : 15.789
 BP magnitude : 16.653
 DUPflag : 0
 Distance (au) : 28.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.90
 Sun-Target sep (deg) : 170.07
 Sun-Moon sep (deg) : 158.17
 B (ring opening deg) : -14.65
 PA of pole (deg) : -46.49



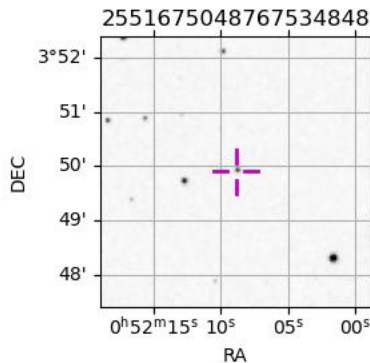
2031-10-17T07:12:26.9500 ra: 00 52 08.8709 s: +03 49 54.1012 C/A 0.7077 PA 337.38 deg v_sky -23.90 km/s D 28.87 AU
 Credit: Styled after SORA/Lucky Star



| # | a(km) | ring |
|---|---------|-----------|
| 1 | 42000.0 | Galle |
| 2 | 53200.0 | LeVerrier |
| 3 | 55200.0 | Lassell |
| 4 | 57200.0 | Arago |
| 5 | 61953.0 | Galatea |
| 6 | 62933.0 | Adams |

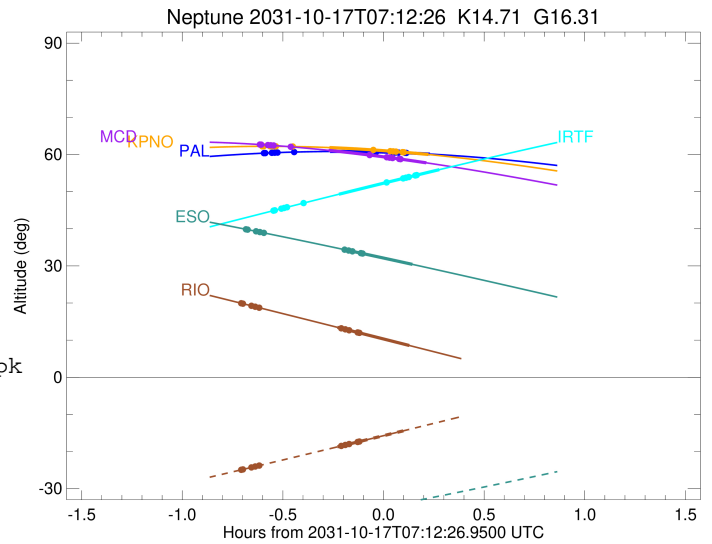
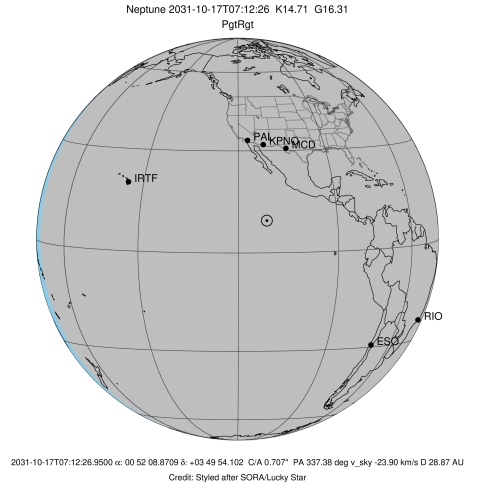
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| 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 | + | + | | OCT 17 06:37 - OCT 17 07:26 | PieRin |
| PMO | Purple Mtn Obs. Nanki | 32.1 | 118.8 | | | | | PnnRnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + | + | | OCT 17 06:36 - OCT 17 07:25 | PieRin |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + | + | | OCT 17 06:35 - OCT 17 07:25 | PieRin |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | | | PnnRnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + | + | | OCT 17 06:39 - OCT 17 07:29 | PieRin |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | | | PnnRnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | + | + | | OCT 17 06:30 - OCT 17 07:20 | PieRin |
| ESO | European Southern Obs | -29.3 | 289.3 | + | + | | OCT 17 06:31 - OCT 17 07:21 | PieRin |
| 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 |



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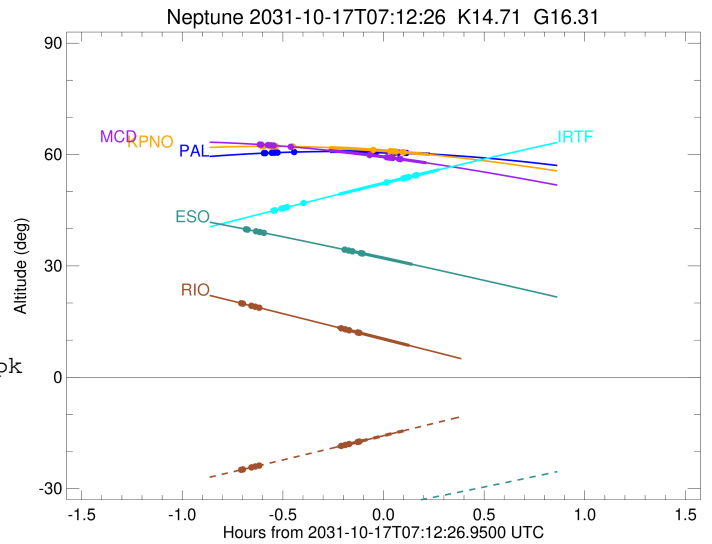
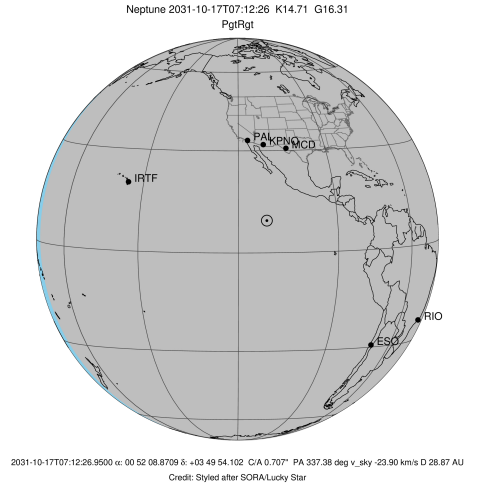
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2031-10-17T07:11:22.670
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PAL
Location              : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 2551675048767534848
2Mass ID (if available) : 00520885+0349541
ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 14.714
G magnitude           : 16.306
RP magnitude          : 15.789
BP magnitude          : 16.653
DUPflag               : 0
Distance (au)        : 28.866
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.90
Sun-Target sep (deg) : 170.07
Sun-Moon sep (deg)   : 158.22
B (ring opening deg) : -14.65
PA of pole (deg)     : -46.49
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.575
C/A sky separation (km) : 12034.9
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.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 | 2031-10-17T06:37:04.971 | | 60.38 | -62.79 | 62933.00 | -41.23 | | |
| Galatea | I | 2031-10-17T06:37:28.776 | | 60.40 | -62.83 | 61953.00 | -41.10 | | |
| Arago | I | 2031-10-17T06:39:25.420 | | 60.47 | -63.04 | 57200.00 | -40.36 | | |
| Lassell | I | 2031-10-17T06:40:15.197 | | 60.50 | -63.13 | 55200.00 | -39.99 | | |
| LeVerrier | I | 2031-10-17T06:41:05.471 | | 60.53 | -63.21 | 53200.00 | -39.57 | | |
| Galle | I | 2031-10-17T06:46:01.026 | | 60.67 | -63.70 | 42000.00 | -35.78 | | |
| Neptune | I | 2031-10-17T06:56:30.384 | | 60.82 | -64.60 | 24763.81 | | -4.70 | -4.87 |
| Neptune | E | 2031-10-17T07:26:14.208 | | 60.13 | -65.98 | 24746.74 | | -50.88 | -51.83 |
| Galle | E | 2031-10-17T07:10:25.727 | b | 60.70 | -65.48 | 42000.00 | 36.07 | | |
| LeVerrier | E | 2031-10-17T07:15:21.883 | b | 60.57 | -65.69 | 53200.00 | 39.18 | | |
| Lassell | E | 2031-10-17T07:16:12.687 | b | 60.54 | -65.72 | 55200.00 | 39.55 | | |
| Arago | E | 2031-10-17T07:17:03.023 | b | 60.52 | -65.75 | 57200.00 | 39.91 | | |
| Galatea | E | 2031-10-17T07:19:00.971 | b | 60.45 | -65.82 | 61953.00 | 40.67 | | |
| Adams | E | 2031-10-17T07:19:25.027 | b | 60.43 | -65.83 | 62933.00 | 40.81 | | |

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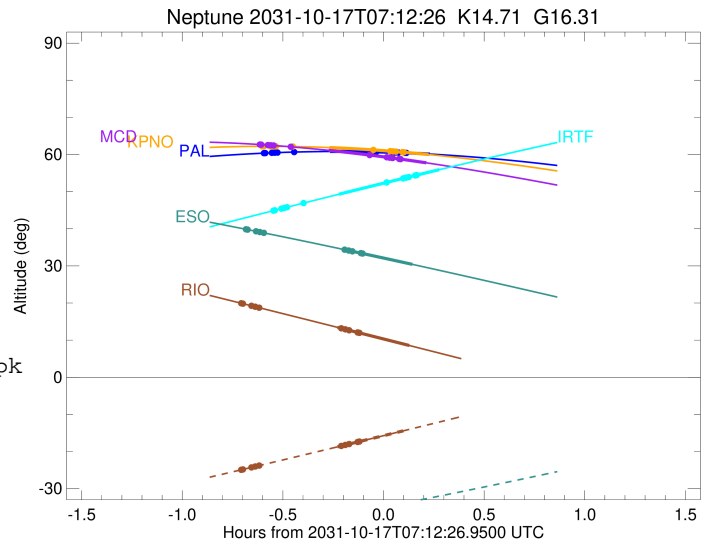
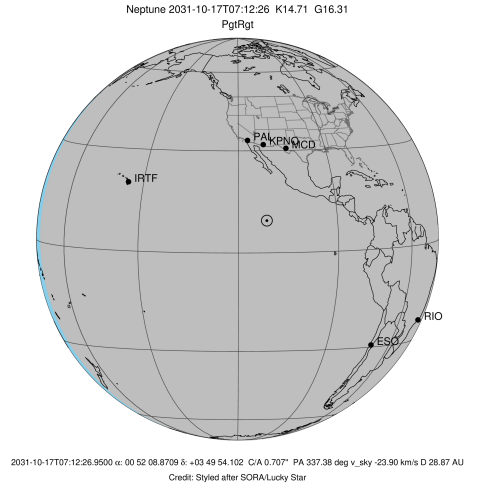
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2031-10-17T07:11:05.690
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 2551675048767534848
2Mass ID (if available) : 00520885+0349541
ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 14.714
G magnitude          : 16.306
RP magnitude         : 15.789
BP magnitude         : 16.653
DUPflag             : 0
Distance (au)       : 28.866
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.90
Sun-Target sep (deg) : 170.07
Sun-Moon sep (deg)  : 158.17
B (ring opening deg) : -14.65
PA of pole (deg)    : -46.49
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.590
C/A sky separation (km) : 12346.1
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 | 2031-10-17T06:36:34.750 | | 62.21 | -65.98 | 62933.00 | -41.03 | | |
| Galatea | I | 2031-10-17T06:36:58.672 | | 62.21 | -66.01 | 61953.00 | -40.90 | | |
| Arago | I | 2031-10-17T06:38:55.974 | | 62.21 | -66.16 | 57200.00 | -40.11 | | |
| Lassell | I | 2031-10-17T06:39:46.079 | | 62.21 | -66.22 | 55200.00 | -39.71 | | |
| LeVerrier | I | 2031-10-17T06:40:36.720 | | 62.21 | -66.28 | 53200.00 | -39.27 | | |
| Galle | I | 2031-10-17T06:45:35.509 | | 62.15 | -66.61 | 42000.00 | -35.23 | | |
| Neptune | I | 2031-10-17T06:56:20.810 | | 61.88 | -67.13 | 24763.73 | | -5.50 | -5.70 |
| Neptune | E | 2031-10-17T07:25:49.876 | | 60.01 | -67.19 | 24746.37 | | -51.63 | -52.58 |
| Galle | E | 2031-10-17T07:09:37.449 | b | 61.23 | -67.41 | 42000.00 | 35.55 | | |
| LeVerrier | E | 2031-10-17T07:14:36.345 | b | 60.90 | -67.41 | 53200.00 | 38.92 | | |
| Lassell | E | 2031-10-17T07:15:27.470 | b | 60.84 | -67.40 | 55200.00 | 39.31 | | |
| Arago | E | 2031-10-17T07:16:18.109 | b | 60.78 | -67.40 | 57200.00 | 39.68 | | |
| Galatea | E | 2031-10-17T07:18:16.720 | b | 60.63 | -67.37 | 61953.00 | 40.45 | | |
| Adams | E | 2031-10-17T07:18:40.903 | b | 60.60 | -67.36 | 62933.00 | 40.60 | | |

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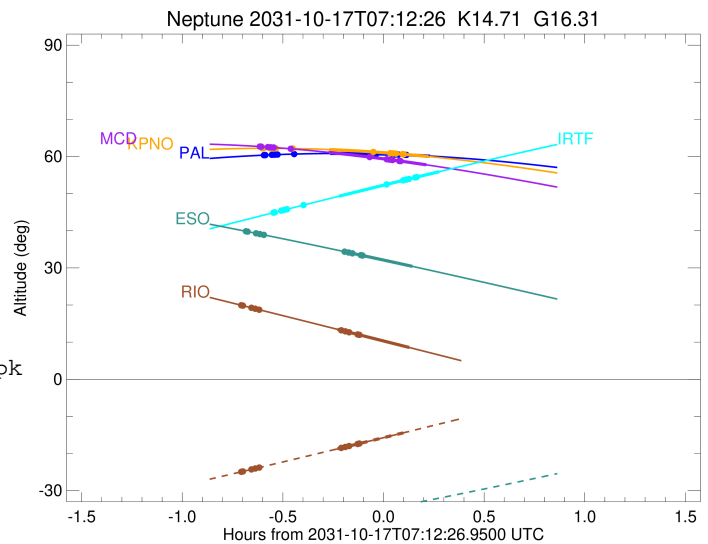
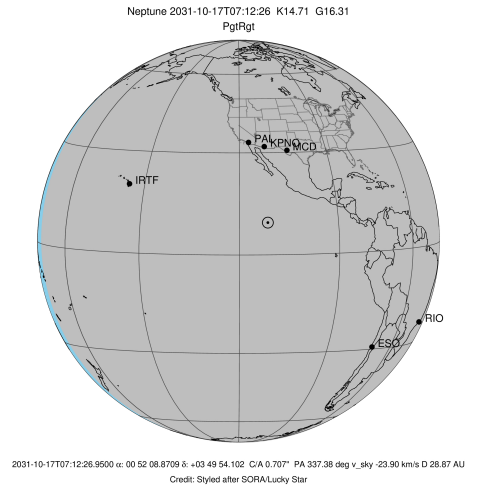
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2031-10-17T07:10:40.130
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 2551675048767534848
2Mass ID (if available) : 00520885+0349541
ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 14.714
G magnitude           : 16.306
RP magnitude          : 15.789
BP magnitude          : 16.653
DUPflag              : 0
Distance (au)        : 28.866
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.90
Sun-Target sep (deg) : 170.07
Sun-Moon sep (deg)   : 158.09
B (ring opening deg) : -14.65
PA of pole (deg)     : -46.49
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.608
C/A sky separation (km) : 12726.8
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 | 2031-10-17T06:35:52.261 | | 62.67 | -68.66 | 62933.00 | -40.76 | | |
| Galatea | I | 2031-10-17T06:36:16.349 | | 62.65 | -68.66 | 61953.00 | -40.61 | | |
| Arago | I | 2031-10-17T06:38:14.563 | | 62.53 | -68.68 | 57200.00 | -39.77 | | |
| Lassell | I | 2031-10-17T06:39:05.120 | | 62.48 | -68.69 | 55200.00 | -39.34 | | |
| LeVerrier | I | 2031-10-17T06:39:56.263 | | 62.42 | -68.69 | 53200.00 | -38.86 | | |
| Galle | I | 2031-10-17T06:44:59.485 | | 62.07 | -68.68 | 42000.00 | -34.50 | | |
| Neptune | I | 2031-10-17T06:56:04.372 | | 61.13 | -68.43 | 24763.64 | | -6.50 | -6.73 |
| Neptune | E | 2031-10-17T07:25:15.273 | | 57.76 | -66.39 | 24745.92 | | -52.55 | -53.49 |
| Galle | E | 2031-10-17T07:08:32.770 | b | 59.84 | -67.79 | 42000.00 | 34.84 | | |
| LeVerrier | E | 2031-10-17T07:13:35.568 | b | 59.25 | -67.43 | 53200.00 | 38.58 | | |
| Lassell | E | 2031-10-17T07:14:27.134 | b | 59.15 | -67.36 | 55200.00 | 38.99 | | |
| Arago | E | 2031-10-17T07:15:18.186 | b | 59.04 | -67.29 | 57200.00 | 39.36 | | |
| Galatea | E | 2031-10-17T07:17:17.702 | b | 58.80 | -67.13 | 61953.00 | 40.16 | | |
| Adams | E | 2031-10-17T07:17:42.059 | b | 58.74 | -67.09 | 62933.00 | 40.31 | | |

```

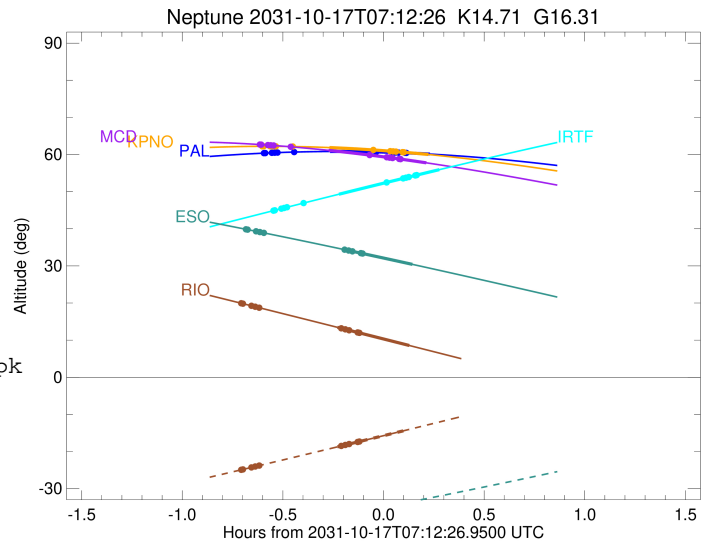
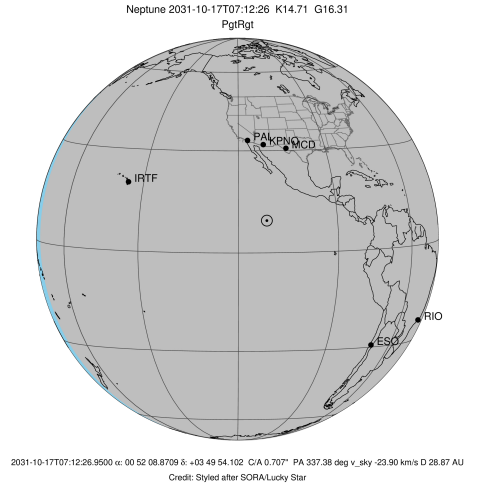
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2031-10-17T07:14:07.260
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 2551675048767534848
2Mass ID (if available) : 00520885+0349541
ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 14.714
G magnitude           : 16.306
RP magnitude         : 15.789
BP magnitude         : 16.653
DUPflag              : 0
Distance (au)        : 28.866
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.90
Sun-Target sep (deg) : 170.07
Sun-Moon sep (deg)   : 158.74
B (ring opening deg) : -14.65
PA of pole (deg)     : -46.49
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.564
C/A sky separation (km) : 11813.5
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 | 2031-10-17T06:39:55.016 | | 44.94 | -38.91 | 62933.00 | -41.24 | | |
| Galatea | I | 2031-10-17T06:40:18.813 | | 45.03 | -39.00 | 61953.00 | -41.12 | | |
| Arago | I | 2031-10-17T06:42:15.356 | | 45.48 | -39.46 | 57200.00 | -40.42 | | |
| Lassell | I | 2031-10-17T06:43:05.054 | | 45.67 | -39.65 | 55200.00 | -40.06 | | |
| LeVerrier | I | 2031-10-17T06:43:55.222 | | 45.86 | -39.85 | 53200.00 | -39.66 | | |
| Galle | I | 2031-10-17T06:48:49.364 | | 46.97 | -41.00 | 42000.00 | -36.06 | | |
| Neptune | I | 2031-10-17T06:59:08.467 | | 49.30 | -43.42 | 24763.85 | | -4.13 | -4.27 |
| Neptune | E | 2031-10-17T07:29:04.711 | | 55.92 | -50.40 | 24746.99 | | -50.37 | -51.32 |
| Galle | E | 2031-10-17T07:13:32.412 | b | 52.52 | -46.78 | 42000.00 | 36.38 | | |
| LeVerrier | E | 2031-10-17T07:18:26.937 | b | 53.60 | -47.93 | 53200.00 | 39.34 | | |
| Lassell | E | 2031-10-17T07:19:17.540 | b | 53.79 | -48.12 | 55200.00 | 39.71 | | |
| Arago | E | 2031-10-17T07:20:07.682 | b | 53.97 | -48.32 | 57200.00 | 40.06 | | |
| Galatea | E | 2031-10-17T07:22:05.202 | b | 54.40 | -48.77 | 61953.00 | 40.81 | | |
| Adams | E | 2031-10-17T07:22:29.175 | b | 54.49 | -48.87 | 62933.00 | 40.95 | | |

```

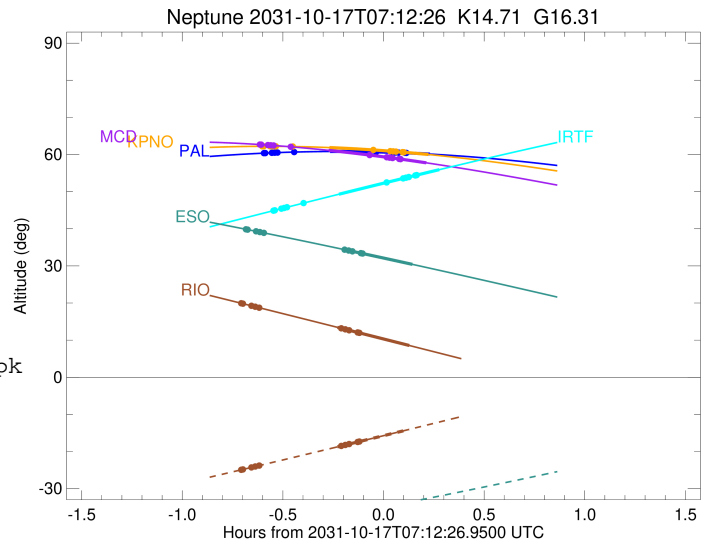
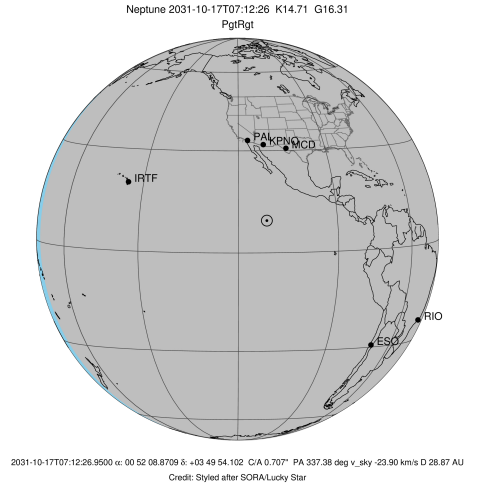
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2031-10-17T07:09:26.930
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : RIO
Location              : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 2551675048767534848
2Mass ID (if available) : 00520885+0349541
ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 14.714
G magnitude           : 16.306
RP magnitude         : 15.789
BP magnitude         : 16.653
DUPflag              : 0
Distance (au)        : 28.866
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.90
Sun-Target sep (deg) : 170.07
Sun-Moon sep (deg)   : 157.71
B (ring opening deg) : -14.65
PA of pole (deg)     : -46.49
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.924
C/A sky separation (km) : 19345.9
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.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 | 2031-10-17T06:30:17.942 | | 19.88 | -24.87 | 62933.00 | -33.43 | | |
| Galatea | I | 2031-10-17T06:30:47.435 | | 19.77 | -24.77 | 61953.00 | -33.02 | | |
| Arago | I | 2031-10-17T06:33:16.635 | | 19.21 | -24.24 | 57200.00 | -30.60 | | |
| Lassell | I | 2031-10-17T06:34:23.373 | | 18.96 | -24.00 | 55200.00 | -29.31 | | |
| LeVerrier | I | 2031-10-17T06:35:33.356 | | 18.70 | -23.75 | 53200.00 | -27.81 | | |
| Neptune | I | 2031-10-17T06:58:43.317 | | 13.45 | -18.75 | 24758.26 | | -26.52 | -27.31 |
| Neptune | E | 2031-10-17T07:20:09.755 | | 8.56 | -14.03 | 24738.90 | | -69.38 | -70.02 |
| LeVerrier | E | 2031-10-17T07:00:30.653 | b | 13.04 | -18.35 | 53200.01 | 27.87 | | |
| Lassell | E | 2031-10-17T07:01:40.485 | b | 12.78 | -18.10 | 55200.00 | 29.38 | | |
| Arago | E | 2031-10-17T07:02:47.081 | b | 12.52 | -17.86 | 57200.00 | 30.66 | | |
| Galatea | E | 2031-10-17T07:05:16.024 | b | 11.96 | -17.31 | 61953.00 | 33.06 | | |
| Adams | E | 2031-10-17T07:05:45.488 | b | 11.85 | -17.21 | 62933.00 | 33.46 | | |

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2031-10-17T07:10:35.310
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        : 2551675048767534848
2Mass ID (if available) : 00520885+0349541
ICRS Star Coord at Epoch: 00h 52m 08.87093s +03:49:54.10176s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 14.714
G magnitude           : 16.306
RP magnitude          : 15.789
BP magnitude          : 16.653
DUPflag               : 0
Distance (au)         : 28.866
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.90
Sun-Target sep (deg) : 170.07
Sun-Moon sep (deg)   : 158.07
B (ring opening deg) : -14.65
PA of pole (deg)     : -46.49
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.931
C/A sky separation (km) : 19499.1
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 | 2031-10-17T06:31:42.253 | | 39.81 | -41.52 | 62933.00 | -33.67 | | |
| Galatea | I | 2031-10-17T06:32:11.544 | | 39.73 | -41.45 | 61953.00 | -33.24 | | |
| Arago | I | 2031-10-17T06:34:39.789 | | 39.28 | -41.08 | 57200.00 | -30.78 | | |
| Lassell | I | 2031-10-17T06:35:46.153 | | 39.08 | -40.91 | 55200.00 | -29.47 | | |
| LeVerrier | I | 2031-10-17T06:36:55.792 | | 38.87 | -40.74 | 53200.00 | -27.94 | | |
| Neptune | I | 2031-10-17T07:00:03.651 | | 34.52 | -37.05 | 24758.13 | | -26.91 | -27.71 |
| Neptune | E | 2031-10-17T07:21:06.014 | | 30.41 | -33.44 | 24738.72 | | -69.89 | -70.51 |
| LeVerrier | E | 2031-10-17T07:01:30.165 | b | 34.25 | -36.81 | 53200.00 | 28.02 | | |
| Lassell | E | 2031-10-17T07:02:39.603 | b | 34.02 | -36.62 | 55200.00 | 29.56 | | |
| Arago | E | 2031-10-17T07:03:45.770 | b | 33.81 | -36.44 | 57200.00 | 30.87 | | |
| Galatea | E | 2031-10-17T07:06:13.611 | b | 33.33 | -36.02 | 61953.00 | 33.32 | | |
| Adams | E | 2031-10-17T07:06:42.839 | b | 33.24 | -35.94 | 62933.00 | 33.74 | | |