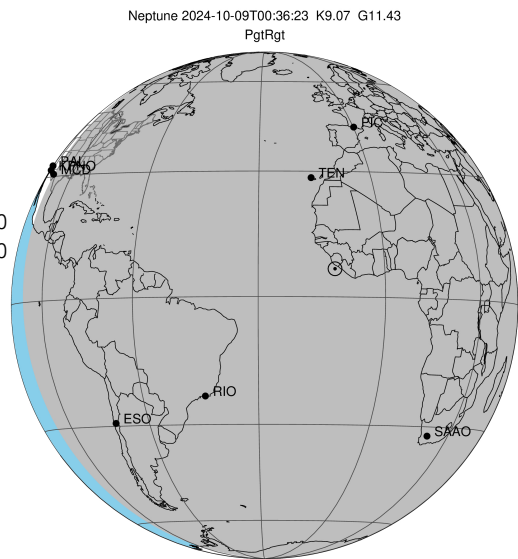


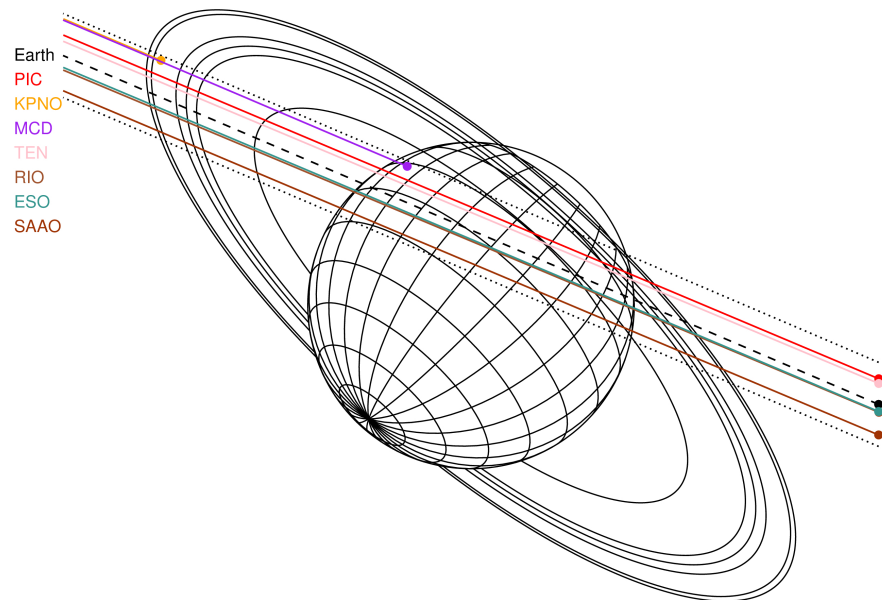
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2024-10-09T00:36:23.190
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 2449274030476179456
 2Mass ID (if available) : 23533479-0208269

Neptune 2024-10-09T00:36:23 K9.07 G11.43 PgtRgt

ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
 RUWE (>1.4 is poor) : 1.45
 K magnitude : 9.068
 G magnitude : 11.430
 RP magnitude : 10.707
 BP magnitude : 12.007
 DUPflag : 0
 Distance (au) : 28.946
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.69
 Sun-Target sep (deg) : 161.75
 Sun-Moon sep (deg) : 92.65
 B (ring opening deg) : -20.63
 PA of pole (deg) : -42.04
 # a(km) ring



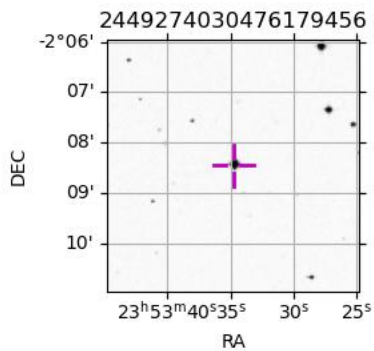
2024-10-09T00:36:23.1900 at: 23 53 34.8065 s: -02 08 27.135 C/A 0.501" PA 156.84 deg v_sky -22.69 km/s D 28.95 AU
 Credit: Styled after SORA/Lucky Star



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

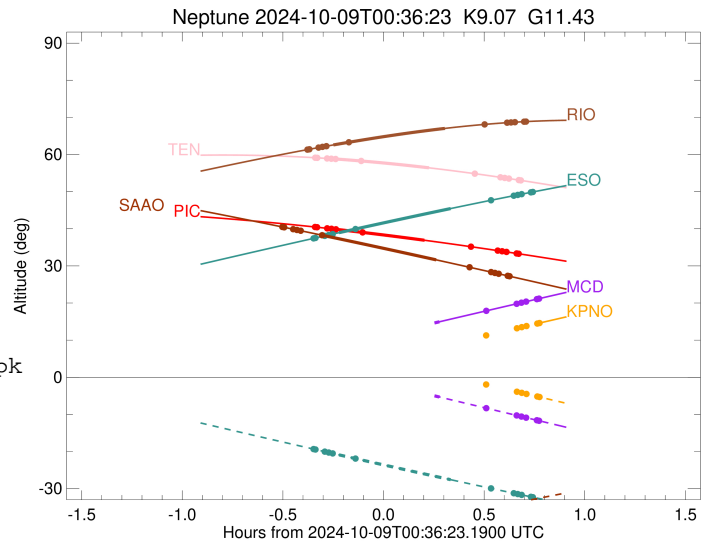
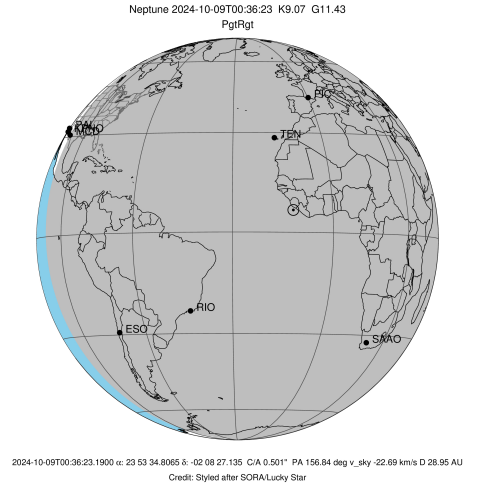
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| Obs | Location | lat | Elon | Rings I | Planet | Rings E | Observed Events Interval | OEcode |
|------|-----------------------|-------|-------|---------|--------|---------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | + | + | + | OCT 09 00:15 - OCT 09 01:16 | PieRie |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | | | | | PnnRnn |
| PMO | Purple Mtn Obs. Nanki | 32.1 | 118.8 | | | | | PnnRnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | | | + | OCT 09 01:22 - OCT 09 01:22 | PnnRne |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | | + | + | OCT 09 00:53 - OCT 09 01:22 | PneRne |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | + | + | + | OCT 09 00:15 - OCT 09 01:17 | PieRie |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | | | | | PnnRnn |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | | | PnnRnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | + | + | + | OCT 09 00:13 - OCT 09 01:18 | PieRie |
| ESO | European Southern Obs | -29.3 | 289.3 | + | + | + | OCT 09 00:15 - OCT 09 01:20 | PieRie |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | | | | | PnnRnn |
| SAAO | So. Afr. Astro. Obs. | -32.4 | 20.8 | + | + | + | OCT 09 00:06 - OCT 09 01:13 | PieRie |
| MSO | Mt. Stromlo Observato | -35.3 | 149.0 | | | | | PnnRnn |



```

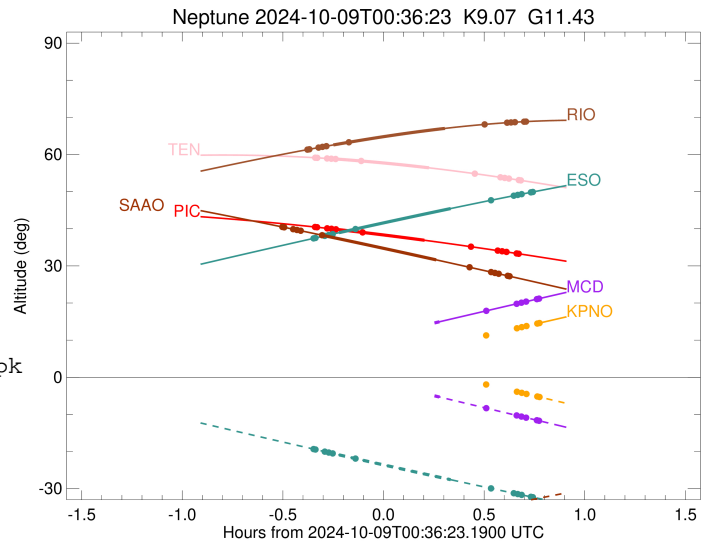
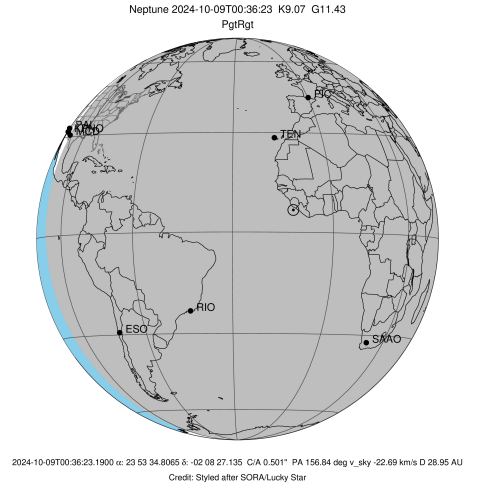
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-10-09T00:33:40.130
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PIC
Location              : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude           : 9.068
G magnitude           : 11.430
RP magnitude          : 10.707
BP magnitude          : 12.007
DUPflag              : 0
Distance (au)        : 28.946
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)   : 93.19
B (ring opening deg) : -20.63
PA of pole (deg)     : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.656
C/A sky separation (km) : 13771.6
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
    
```



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-----------|-----|-------------------------|----|-------|---------|----------|--------|---------|--------------|
| Adams | I | 2024-10-09T00:15:45.931 | | 40.50 | -53.07 | 62933.00 | -26.86 | | |
| Galatea | I | 2024-10-09T00:16:22.509 | | 40.44 | -53.05 | 61953.00 | -26.73 | | |
| Arago | I | 2024-10-09T00:19:22.712 | b | 40.14 | -52.92 | 57200.00 | -25.99 | | |
| Lassell | I | 2024-10-09T00:20:40.200 | b | 40.01 | -52.87 | 55200.00 | -25.62 | | |
| LeVerrier | I | 2024-10-09T00:21:58.902 | b | 39.88 | -52.81 | 53200.00 | -25.20 | | |
| Galle | I | 2024-10-09T00:29:55.115 | b | 39.05 | -52.40 | 42000.00 | -21.48 | | |
| Neptune | I | 2024-10-09T00:18:46.050 | | 40.20 | -52.95 | 24730.72 | | 48.40 | 49.36 |
| Neptune | E | 2024-10-09T00:48:36.216 | | 36.91 | -51.16 | 24760.68 | | 13.65 | 14.11 |
| Galle | E | 2024-10-09T01:02:26.976 | | 35.17 | -49.98 | 42000.00 | 21.68 | | |
| LeVerrier | E | 2024-10-09T01:10:19.073 | | 34.14 | -49.23 | 53200.00 | 25.34 | | |
| Lassell | E | 2024-10-09T01:11:37.393 | | 33.96 | -49.10 | 55200.00 | 25.73 | | |
| Arago | E | 2024-10-09T01:12:54.591 | | 33.79 | -48.97 | 57200.00 | 26.08 | | |
| Galatea | E | 2024-10-09T01:15:54.398 | | 33.38 | -48.66 | 61953.00 | 26.76 | | |
| Adams | E | 2024-10-09T01:16:30.935 | | 33.29 | -48.60 | 62933.00 | 26.88 | | |

```

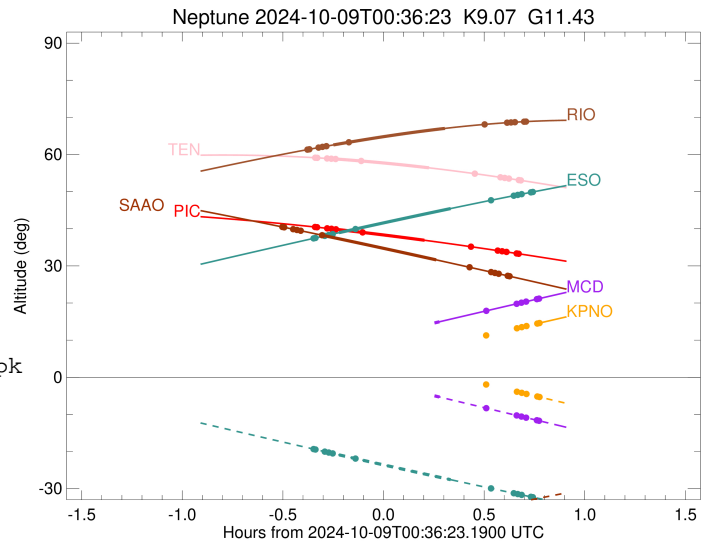
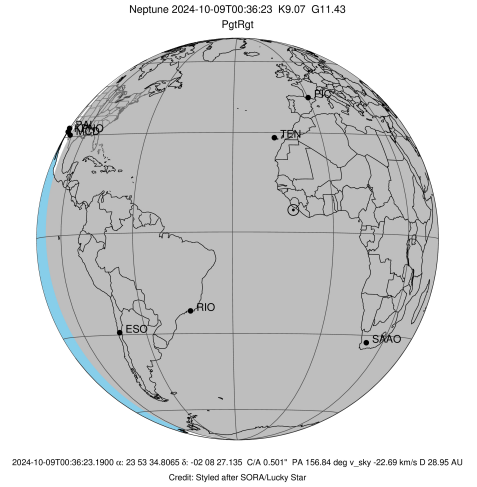
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-10-09T00:39:02.420
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude           : 9.068
G magnitude           : 11.430
RP magnitude         : 10.707
BP magnitude         : 12.007
DUPflag              : 0
Distance (au)        : 28.946
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)   : 92.75
B (ring opening deg) : -20.63
PA of pole (deg)     : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.750
C/A sky separation (km) : 15749.7
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itrfr93_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 | 2024-10-09T00:23:59.860 | | 2.18x | 7.07x | 62933.00 | -25.10 | | |
| Galatea | I | 2024-10-09T00:24:39.042 | | 2.32x | 6.94x | 61953.00 | -24.92 | | |
| Arago | I | 2024-10-09T00:27:53.404 | b | 3.01x | 6.26x | 57200.00 | -23.95 | | |
| Lassell | I | 2024-10-09T00:29:17.793 | b | 3.30x | 5.97x | 55200.00 | -23.45 | | |
| LeVerrier | I | 2024-10-09T00:30:44.118 | b | 3.61x | 5.67x | 53200.00 | -22.88 | | |
| Galle | I | 2024-10-09T00:39:48.717 | b | 5.54 | 3.77x | 42000.00 | -17.68 | | |
| Neptune | I | 2024-10-09T00:25:03.888 | | 2.40x | 6.85x | 24726.14 | | 52.90 | 53.83 |
| Neptune | E | 2024-10-09T00:53:01.979 | | 8.33 | 0.99x | 24757.54 | | 19.22 | 19.84 |
| Galle | E | 2024-10-09T01:07:07.048 | | 11.30 | -1.98x | 42000.00 | 17.73 | | |
| LeVerrier | E | 2024-10-09T01:16:05.933 | | 13.18 | -3.88x | 53200.00 | 23.20 | | |
| Lassell | E | 2024-10-09T01:17:31.107 | | 13.48 | -4.18x | 55200.00 | 23.76 | | |
| Arago | E | 2024-10-09T01:18:54.411 | | 13.77 | -4.47x | 57200.00 | 24.25 | | |
| Galatea | E | 2024-10-09T01:22:06.456 | | 14.44 | -5.15 | 61953.00 | 25.21 | | |
| Adams | E | 2024-10-09T01:22:45.199 | | 14.58 | -5.29 | 62933.00 | 25.38 | | |

```

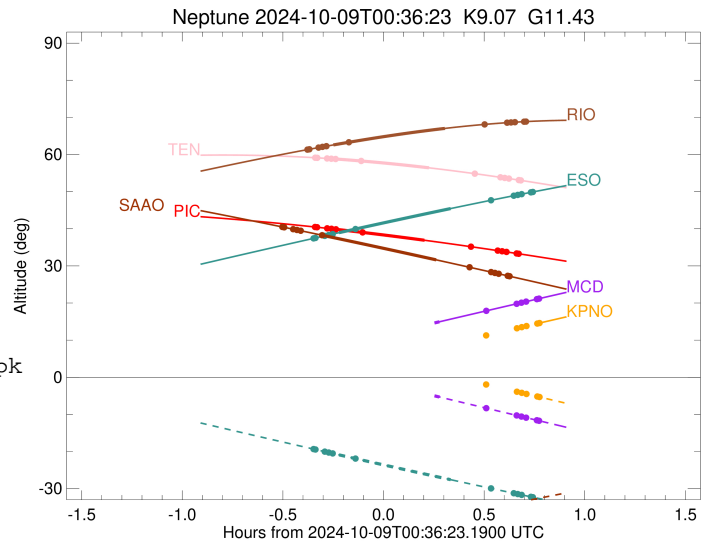
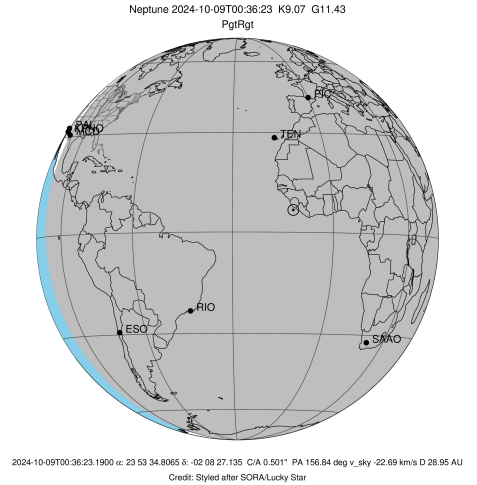
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-10-09T00:39:01.920
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude           : 9.068
G magnitude           : 11.430
RP magnitude          : 10.707
BP magnitude          : 12.007
DUPflag               : 0
Distance (au)        : 28.946
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)   : 92.86
B (ring opening deg) : -20.63
PA of pole (deg)     : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.745
C/A sky separation (km) : 15633.1
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.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 | 2024-10-09T00:23:50.824 | | 8.73 | 0.94x | 62933.00 | -25.27 | | |
| Galatea | I | 2024-10-09T00:24:29.738 | | 8.86 | 0.80x | 61953.00 | -25.10 | | |
| Arago | I | 2024-10-09T00:27:42.665 | b | 9.55 | 0.11x | 57200.00 | -24.14 | | |
| Lassell | I | 2024-10-09T00:29:06.367 | b | 9.85 | -0.18x | 55200.00 | -23.64 | | |
| LeVerrier | I | 2024-10-09T00:30:31.942 | b | 10.16 | -0.49x | 53200.00 | -23.09 | | |
| Galle | I | 2024-10-09T00:39:29.828 | b | 12.07 | -2.41x | 42000.00 | -18.01 | | |
| Neptune | I | 2024-10-09T00:25:00.963 | | 8.98 | 0.69x | 24726.38 | | 52.66 | 53.60 |
| Neptune | E | 2024-10-09T00:53:03.911 | | 14.95 | -5.32 | 24757.79 | | 18.85 | 19.46 |
| Galle | E | 2024-10-09T01:07:08.734 | | 17.92 | -8.35 | 42000.00 | 18.07 | | |
| LeVerrier | E | 2024-10-09T01:16:00.816 | | 19.78 | -10.26 | 53200.00 | 23.40 | | |
| Lassell | E | 2024-10-09T01:17:25.261 | | 20.07 | -10.57 | 55200.00 | 23.96 | | |
| Arago | E | 2024-10-09T01:18:47.901 | | 20.36 | -10.86 | 57200.00 | 24.44 | | |
| Galatea | E | 2024-10-09T01:21:58.565 | | 21.02 | -11.55 | 61953.00 | 25.38 | | |
| Adams | E | 2024-10-09T01:22:37.050 | | 21.15 | -11.69 | 62933.00 | 25.55 | | |

```

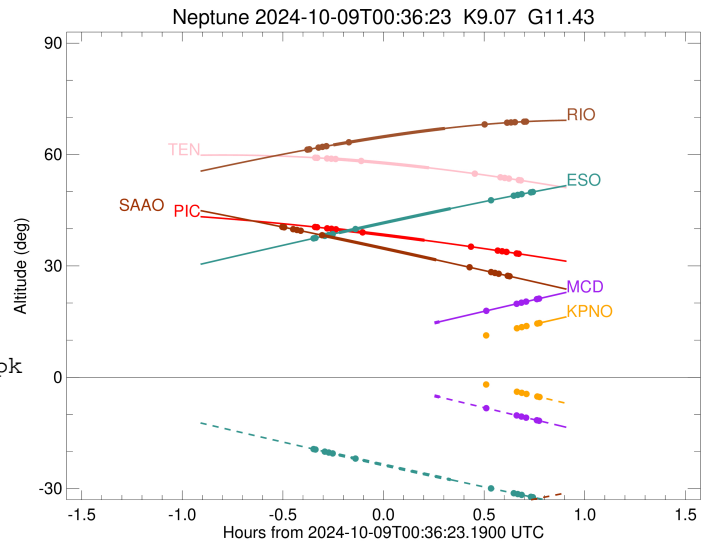
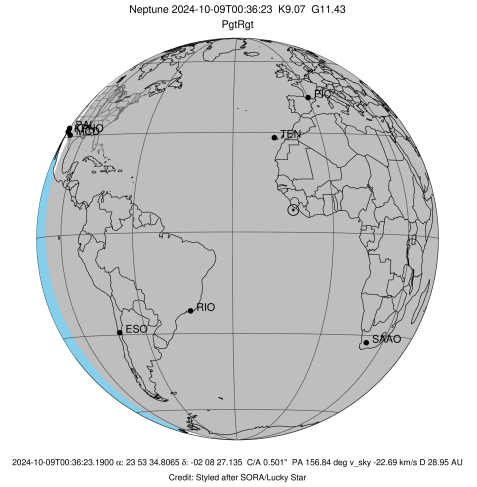
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-10-09T00:34:45.930
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude           : 9.068
G magnitude           : 11.430
RP magnitude          : 10.707
BP magnitude          : 12.007
DUPflag              : 0
Distance (au)        : 28.946
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)   : 93.42
B (ring opening deg) : -20.63
PA of pole (deg)     : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.620
C/A sky separation (km) : 13023.0
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 | 2024-10-09T00:15:51.378 | | 59.15 | -66.51 | 62933.00 | -27.43 | | |
| Galatea | I | 2024-10-09T00:16:27.180 | | 59.12 | -66.56 | 61953.00 | -27.32 | | |
| Arago | I | 2024-10-09T00:19:23.180 | | 58.96 | -66.81 | 57200.00 | -26.67 | | |
| Lassell | I | 2024-10-09T00:20:38.631 | b | 58.88 | -66.91 | 55200.00 | -26.34 | | |
| LeVerrier | I | 2024-10-09T00:21:55.093 | b | 58.81 | -67.01 | 53200.00 | -25.97 | | |
| Galle | I | 2024-10-09T00:29:32.487 | b | 58.28 | -67.53 | 42000.00 | -22.67 | | |
| Neptune | I | 2024-10-09T00:19:34.344 | | 58.95 | -66.83 | 24732.46 | | 46.71 | 47.68 |
| Neptune | E | 2024-10-09T00:49:59.277 | | 56.42 | -68.24 | 24761.57 | | 11.65 | 12.04 |
| Galle | E | 2024-10-09T01:03:33.690 | | 54.85 | -68.12 | 42000.00 | 22.95 | | |
| LeVerrier | E | 2024-10-09T01:11:06.791 | | 53.88 | -67.85 | 53200.00 | 26.11 | | |
| Lassell | E | 2024-10-09T01:12:22.866 | | 53.71 | -67.79 | 55200.00 | 26.46 | | |
| Arago | E | 2024-10-09T01:13:38.008 | | 53.55 | -67.73 | 57200.00 | 26.77 | | |
| Galatea | E | 2024-10-09T01:16:33.522 | | 53.14 | -67.57 | 61953.00 | 27.37 | | |
| Adams | E | 2024-10-09T01:17:09.258 | | 53.06 | -67.54 | 62933.00 | 27.48 | | |

```

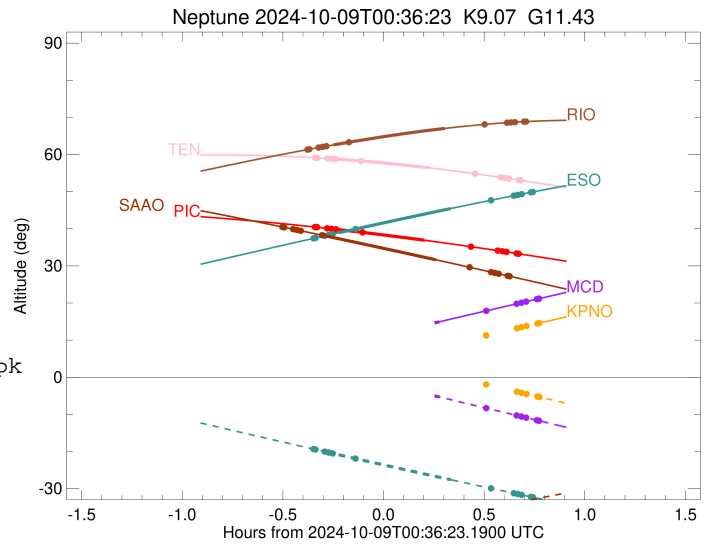
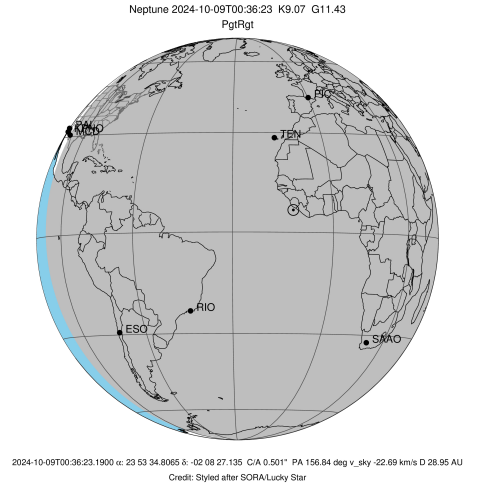
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-10-09T00:38:03.990
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude           : 9.068
G magnitude           : 11.430
RP magnitude          : 10.707
BP magnitude          : 12.007
DUPflag              : 0
Distance (au)        : 28.946
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)   : 93.51
B (ring opening deg) : -20.63
PA of pole (deg)     : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.429
C/A sky separation (km) : 9016.8
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 | 2024-10-09T00:13:39.455 | | 61.31 | -43.83 | 62933.00 | -29.14 | | |
| Galatea | I | 2024-10-09T00:14:13.112 | | 61.41 | -43.94 | 61953.00 | -29.09 | | |
| Arago | I | 2024-10-09T00:16:57.271 | | 61.86 | -44.45 | 57200.00 | -28.80 | | |
| Lassell | I | 2024-10-09T00:18:06.878 | | 62.05 | -44.67 | 55200.00 | -28.66 | | |
| LeVerrier | I | 2024-10-09T00:19:16.863 | | 62.24 | -44.89 | 53200.00 | -28.49 | | |
| Galle | I | 2024-10-09T00:25:59.046 | b | 63.30 | -46.13 | 42000.00 | -27.02 | | |
| Neptune | I | 2024-10-09T00:21:25.415 | | 62.58 | -45.29 | 24741.86 | | 37.56 | 38.51 |
| Neptune | E | 2024-10-09T00:54:43.386 | | 67.04 | -51.09 | 24763.94 | | 1.94 | 2.01 |
| Galle | E | 2024-10-09T01:06:24.392 | | 68.11 | -52.92 | 42000.00 | 27.28 | | |
| LeVerrier | E | 2024-10-09T01:13:04.011 | | 68.57 | -53.90 | 53200.00 | 28.62 | | |
| Lassell | E | 2024-10-09T01:14:13.702 | | 68.64 | -54.07 | 55200.00 | 28.77 | | |
| Arago | E | 2024-10-09T01:15:23.041 | | 68.70 | -54.23 | 57200.00 | 28.91 | | |
| Galatea | E | 2024-10-09T01:18:06.636 | | 68.84 | -54.61 | 61953.00 | 29.18 | | |
| Adams | E | 2024-10-09T01:18:40.187 | | 68.87 | -54.69 | 62933.00 | 29.23 | | |

```

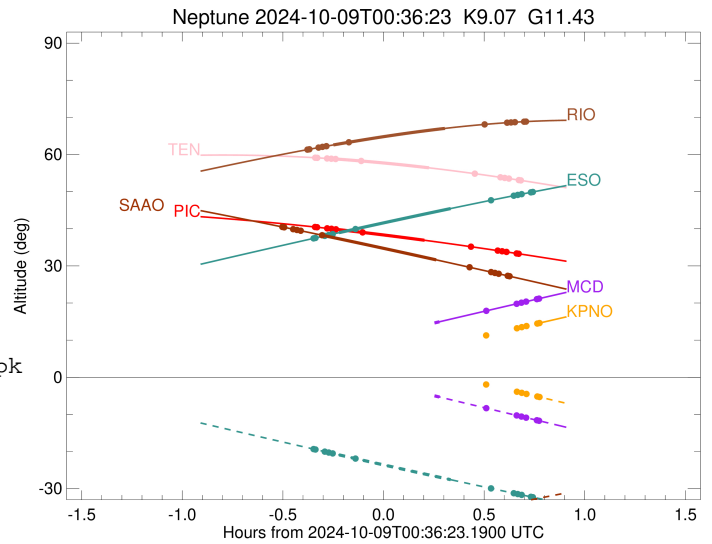
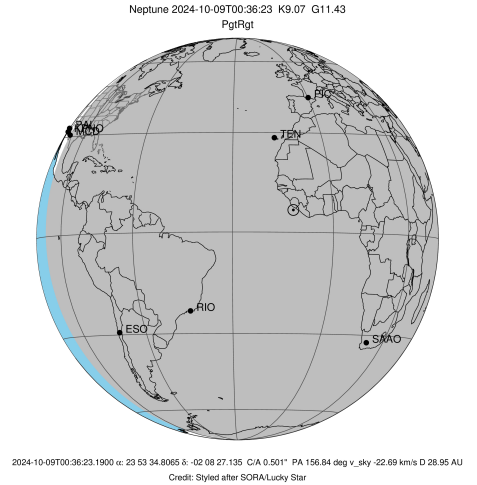
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-10-09T00:39:45.520
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)   : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude           : 9.068
G magnitude           : 11.430
RP magnitude          : 10.707
BP magnitude          : 12.007
DUPflag              : 0
Distance (au)        : 28.946
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)   : 93.31
B (ring opening deg) : -20.63
PA of pole (deg)     : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.441
C/A sky separation (km) : 9262.8
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 | 2024-10-09T00:15:28.166 | | 37.40 | -19.33 | 62933.00 | -28.82 | | |
| Galatea | I | 2024-10-09T00:16:02.206 | | 37.52 | -19.45 | 61953.00 | -28.76 | | |
| Arago | I | 2024-10-09T00:18:48.282 | | 38.08 | -20.02 | 57200.00 | -28.46 | | |
| Lassell | I | 2024-10-09T00:19:58.733 | | 38.31 | -20.26 | 55200.00 | -28.31 | | |
| LeVerrier | I | 2024-10-09T00:21:09.589 | | 38.55 | -20.50 | 53200.00 | -28.14 | | |
| Galle | I | 2024-10-09T00:27:57.475 | b | 39.92 | -21.89 | 42000.00 | -26.58 | | |
| Neptune | I | 2024-10-09T00:23:06.602 | | 38.95 | -20.90 | 24741.42 | | 38.00 | 38.95 |
| Neptune | E | 2024-10-09T00:56:24.800 | | 45.45 | -27.59 | 24763.88 | | 2.62 | 2.71 |
| Galle | E | 2024-10-09T01:08:19.001 | | 47.66 | -29.91 | 42000.00 | 26.90 | | |
| LeVerrier | E | 2024-10-09T01:15:03.331 | | 48.88 | -31.20 | 53200.00 | 28.33 | | |
| Lassell | E | 2024-10-09T01:16:13.709 | | 49.09 | -31.43 | 55200.00 | 28.50 | | |
| Arago | E | 2024-10-09T01:17:23.704 | | 49.30 | -31.65 | 57200.00 | 28.65 | | |
| Galatea | E | 2024-10-09T01:20:08.750 | | 49.78 | -32.17 | 61953.00 | 28.94 | | |
| Adams | E | 2024-10-09T01:20:42.583 | | 49.88 | -32.28 | 62933.00 | 28.99 | | |

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2024-10-09T00:34:36.560
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : SAAO
Location            : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)      : -32.37953
E. Longitude (deg)  : 20.81070
Altitude (km)       : 1.768
Gaia source ID      : 2449274030476179456
2Mass ID (if available) : 23533479-0208269
ICRS Star Coord at Epoch: 23h 53m 34.80647s -02:08:27.13508s
RUWE (>1.4 is poor) : 1.45
K magnitude          : 9.068
G magnitude          : 11.430
RP magnitude         : 10.707
BP magnitude         : 12.007
DUPflag             : 0
Distance (au)       : 28.946
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.69
Sun-Target sep (deg) : 161.75
Sun-Moon sep (deg)  : 93.16
B (ring opening deg) : -20.63
PA of pole (deg)    : -42.04
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.282
C/A sky separation (km) : 5923.4
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 | 2024-10-09T00:06:15.057 | | 40.49 | -44.39 | 62933.00 | -29.83 | | |
| Galatea | I | 2024-10-09T00:06:47.927 | | 40.39 | -44.32 | 61953.00 | -29.80 | | |
| Arago | I | 2024-10-09T00:09:27.736 | | 39.89 | -43.98 | 57200.00 | -29.67 | | |
| Lassell | I | 2024-10-09T00:10:35.205 | | 39.68 | -43.83 | 55200.00 | -29.61 | | |
| LeVerrier | I | 2024-10-09T00:11:42.831 | | 39.47 | -43.68 | 53200.00 | -29.54 | | |
| Galle | I | 2024-10-09T00:18:05.562 | b | 38.26 | -42.82 | 42000.00 | -28.91 | | |
| Neptune | I | 2024-10-09T00:17:09.050 | | 38.44 | -42.95 | 24748.50 | | 30.66 | 31.53 |
| Neptune | E | 2024-10-09T00:52:05.790 | | 31.63 | -37.75 | 24763.55 | | -4.97 | -5.14 |
| Galle | E | 2024-10-09T01:01:54.470 | | 29.66 | -36.15 | 42000.00 | 28.91 | | |
| LeVerrier | E | 2024-10-09T01:08:17.890 | | 28.37 | -35.08 | 53200.00 | 29.44 | | |
| Lassell | E | 2024-10-09T01:09:25.743 | | 28.14 | -34.89 | 55200.00 | 29.50 | | |
| Arago | E | 2024-10-09T01:10:33.465 | | 27.91 | -34.69 | 57200.00 | 29.56 | | |
| Galatea | E | 2024-10-09T01:13:13.960 | | 27.37 | -34.24 | 61953.00 | 29.67 | | |
| Adams | E | 2024-10-09T01:13:46.984 | | 27.25 | -34.14 | 62933.00 | 29.68 | | |