

target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2046-10-04T02:46:40.250
 Event type : PtRgt
 : Neptune occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 30958158629830656
 2Mass ID (if available) : 03051173+1531089

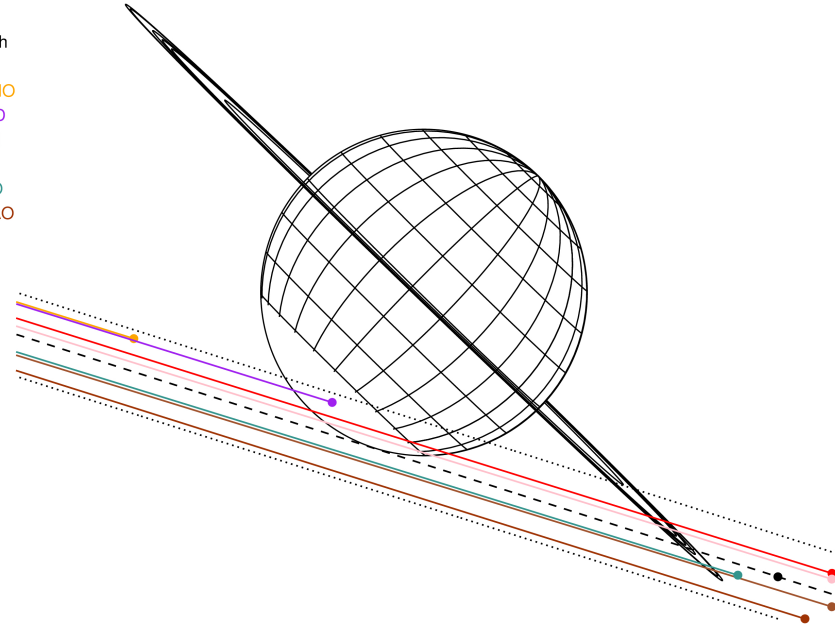
Neptune 2046-10-04T02:46:40 K14.57 G17.44 PtRgt

ICRS Star Coord at Epoch: 03h 05m 11.74273s +15:31:08.68830s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.570
 G magnitude : 17.445
 RP magnitude : 16.539
 BP magnitude : 18.347
 DUPflag : 0
 Distance (au) : 29.018
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.34
 Sun-Target sep (deg) : 142.13
 Sun-Moon sep (deg) : 161.06
 B (ring opening deg) : 1.13
 PA of pole (deg) : -44.50
 # a(km) ring



2046-10-04T02:46:40.2500 ex: 03 05 11.74273 s: +15 31 08.688 C/A 1.179° PA 342.35 deg v_sky -18.34 km/s D 29.02 AU
 Credit: Styled after SORA/Lucky Star

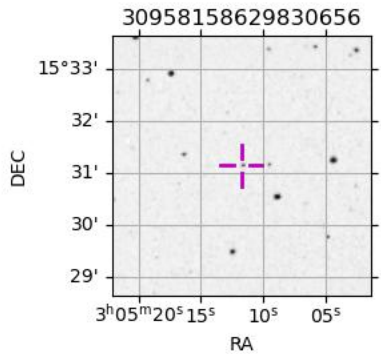
Earth
 PIC
 KPNO
 MCD
 TEN
 RIO
 ESO
 SAAO



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

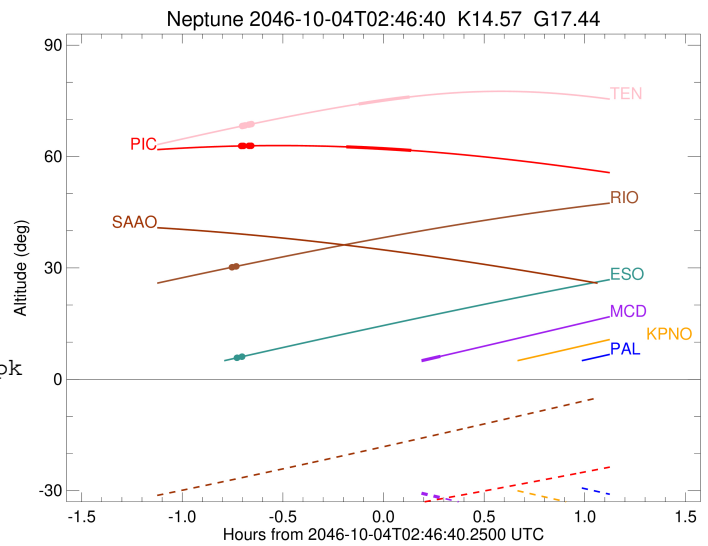
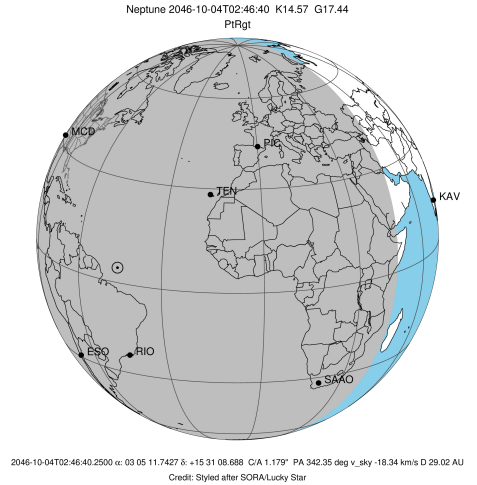
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ + + + +	+ +	+ + + + +	OCT 04 02:05 - OCT 04 02:55	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					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0		+		OCT 04 03:03 - OCT 04 03:03	PneRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+ + + + +	+ +	+ + + + +	OCT 04 02:05 - OCT 04 02:54	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 04 02:02 - OCT 04 02:02	PnnRie
ESO	European Southern Obs	-29.3	289.3	+ +		+ +	OCT 04 02:03 - OCT 04 02:04	PnnRie
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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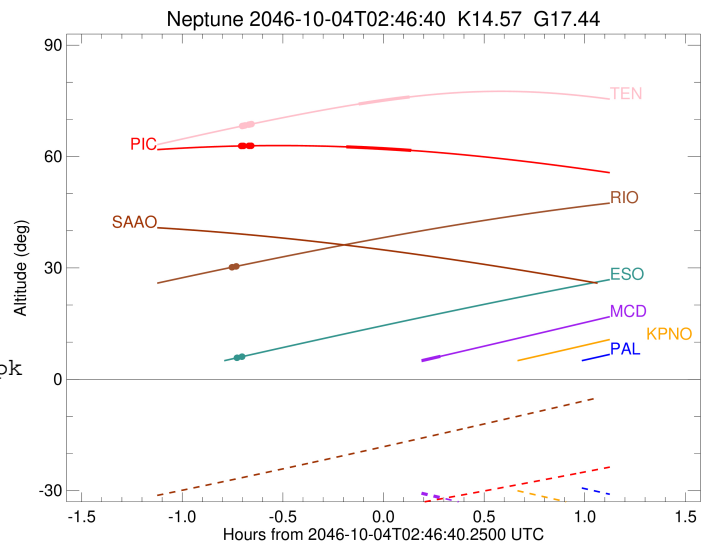
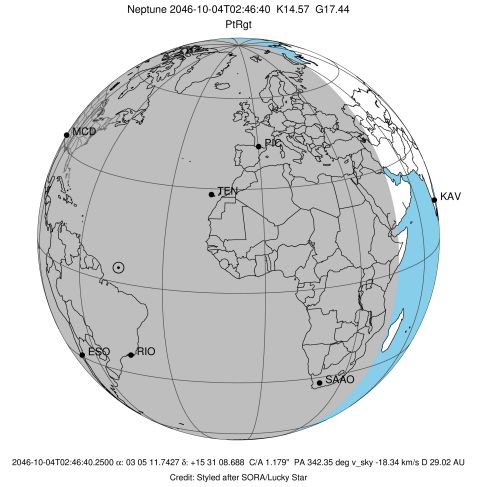
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2046-10-04T02:45:15.110
Event type            : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : PIC
Location              : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 30958158629830656
2Mass ID (if available) : 03051173+1531089
ICRS Star Coord at Epoch: 03h 05m 11.74273s +15:31:08.68830s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 14.570
G magnitude           : 17.445
RP magnitude          : 16.539
BP magnitude          : 18.347
DUPflag              : 0
Distance (au)        : 29.018
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -18.34
Sun-Target sep (deg) : 142.13
Sun-Moon sep (deg)   : 161.03
B (ring opening deg) : 1.13
PA of pole (deg)     : -44.50
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.056
C/A sky separation (km) : 22231.1
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	2046-10-04T02:05:03.583		62.87	-41.08	62948.15	-272.78		
Galatea	I	2046-10-04T02:05:07.219		62.87	-41.07	61970.60	-266.22		
Arago	I	2046-10-04T02:05:26.478		62.87	-41.03	57238.68	-226.08		
Lassell	I	2046-10-04T02:05:35.806		62.87	-41.01	55255.80	-203.18		
LeVerrier	I	2046-10-04T02:05:46.436		62.88	-40.98	53282.54	-174.35		
Neptune	I	2046-10-04T02:35:30.613		62.61	-36.67	24763.94		-36.73	-37.67
Neptune	E	2046-10-04T02:54:59.550		61.65	-33.63	24763.84		-88.51	-88.55
LeVerrier	E	2046-10-04T02:05:42.503		62.88	-40.99	59200.23	-244.70		
Lassell	E	2046-10-04T02:07:40.478		62.91	-40.72	63436.21	276.09		
Arago	E	2046-10-04T02:07:46.158		62.91	-40.71	59959.79	251.31		
Galatea	E	2046-10-04T02:08:04.855		62.91	-40.66	62506.36	270.08		
Adams	E	2046-10-04T02:08:08.484		62.91	-40.66	63359.57	275.61		

```

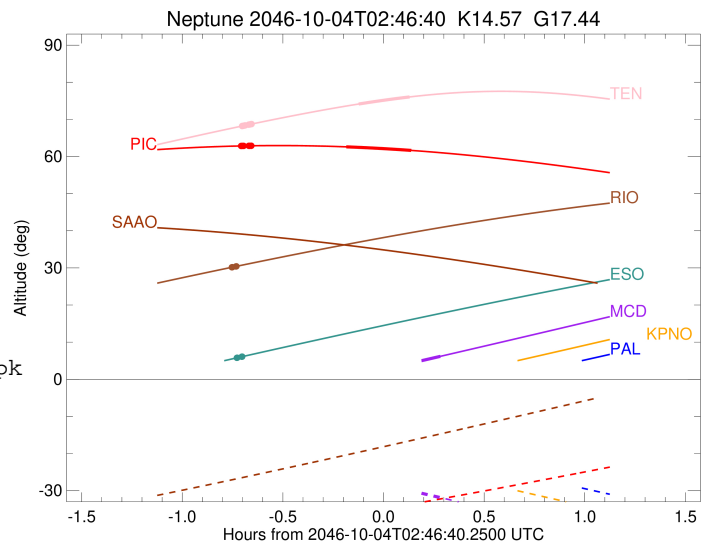
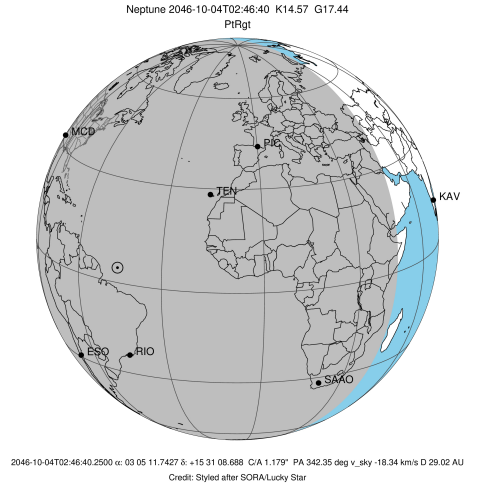
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2046-10-04T02:50:25.910
Event type          : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 30958158629830656
2Mass ID (if available) : 03051173+1531089
ICRS Star Coord at Epoch: 03h 05m 11.74273s +15:31:08.68830s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 14.570
G magnitude          : 17.445
RP magnitude         : 16.539
BP magnitude         : 18.347
DUPflag             : 0
Distance (au)       : 29.018
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -18.34
Sun-Target sep (deg) : 142.13
Sun-Moon sep (deg)  : 161.45
B (ring opening deg) : 1.13
PA of pole (deg)    : -44.50
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.954
C/A sky separation (km) : 20077.2
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	2046-10-04T02:12:52.798	-4.26x	-21.15	62938.36	-299.05			
Galatea	I	2046-10-04T02:12:56.100	-4.25x	-21.17	61959.21	-294.43			
Arago	I	2046-10-04T02:13:12.995	-4.19x	-21.23	57213.08	-267.10			
Lassell	I	2046-10-04T02:13:20.692	-4.16x	-21.25	55218.41	-252.35			
LeVerrier	I	2046-10-04T02:13:28.900	-4.14x	-21.28	53226.45	-234.85			
Neptune	I	2046-10-04T02:37:12.448	0.70x	-26.33	24763.98			-27.04	-27.85
Neptune	E	2046-10-04T03:03:38.284	6.18	-31.88	24763.85			-81.24	-81.53
LeVerrier	E	2046-10-04T02:15:51.211	-3.66x	-21.79	54519.84	246.93			
Lassell	E	2046-10-04T02:15:59.307	-3.63x	-21.82	55850.05	257.64			
Arago	E	2046-10-04T02:16:06.979	-3.60x	-21.84	57556.82	269.78			
Galatea	E	2046-10-04T02:16:23.855	-3.55x	-21.90	62062.07	295.31			
Adams	E	2046-10-04T02:16:27.155	-3.54x	-21.92	63020.84	299.81			

```

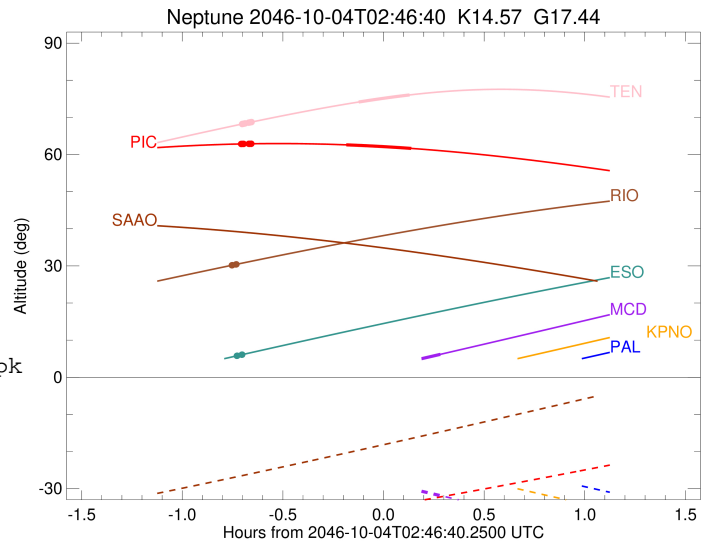
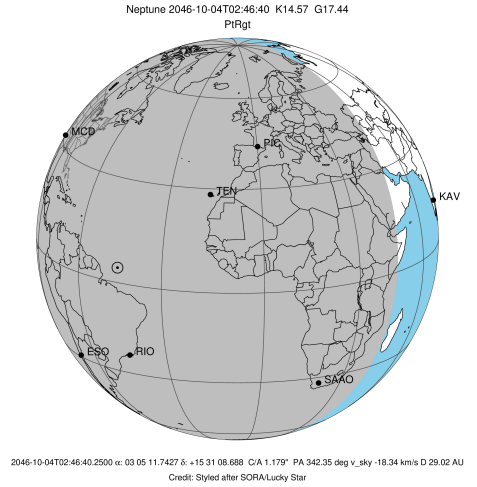
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2046-10-04T02:46:52.600
Event type           : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 30958158629830656
2Mass ID (if available) : 03051173+1531089
ICRS Star Coord at Epoch: 03h 05m 11.74273s +15:31:08.68830s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 14.570
G magnitude           : 17.445
RP magnitude          : 16.539
BP magnitude          : 18.347
DUPflag              : 0
Distance (au)        : 29.018
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -18.34
Sun-Target sep (deg) : 142.13
Sun-Moon sep (deg)   : 161.36
B (ring opening deg) : 1.13
PA of pole (deg)     : -44.50
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.104
C/A sky separation (km) : 23239.9
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	2046-10-04T02:05:23.072		68.38	-60.89	62956.28	-257.20		
Galatea	I	2046-10-04T02:05:26.941		68.39	-60.88	61980.15	-249.56		
Arago	I	2046-10-04T02:05:47.951		68.46	-60.84	57261.06	-201.73		
Lassell	I	2046-10-04T02:05:58.659		68.49	-60.81	55289.15	-173.21		
LeVerrier	I	2046-10-04T02:06:11.787		68.54	-60.78	53331.50	-134.87		
Neptune	I	2046-10-04T02:39:15.706		74.15	-55.62	24763.92		-42.51	-43.49
Neptune	E	2046-10-04T02:54:29.366		76.06	-52.93	24763.86		-82.85	-83.09
LeVerrier	E	2046-10-04T02:06:11.798		68.54	-60.78	53227.33	-132.39		
Lassell	E	2046-10-04T02:05:55.666		68.48	-60.82	60078.26	-232.79		
Arago	E	2046-10-04T02:07:55.923		68.86	-60.54	67476.80	286.47		
Galatea	E	2046-10-04T02:08:11.328		68.91	-60.50	63158.93	258.95		
Adams	E	2046-10-04T02:08:15.153		68.92	-60.49	63828.08	263.78		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2046-10-04T02:50:20.550
Event type          : PtRgt
: Neptune occs: topocentric, not geocentric
: 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      : 30958158629830656
2Mass ID (if available) : 03051173+1531089
ICRS Star Coord at Epoch: 03h 05m 11.74273s +15:31:08.68830s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 14.570
G magnitude          : 17.445
RP magnitude         : 16.539
BP magnitude         : 18.347
DUPflag             : 0
Distance (au)       : 29.018
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -18.34
Sun-Target sep (deg) : 142.13
Sun-Moon sep (deg)  : 161.97
B (ring opening deg) : 1.13
PA of pole (deg)    : -44.50
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.299
C/A sky separation (km) : 27335.4
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
    
```



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

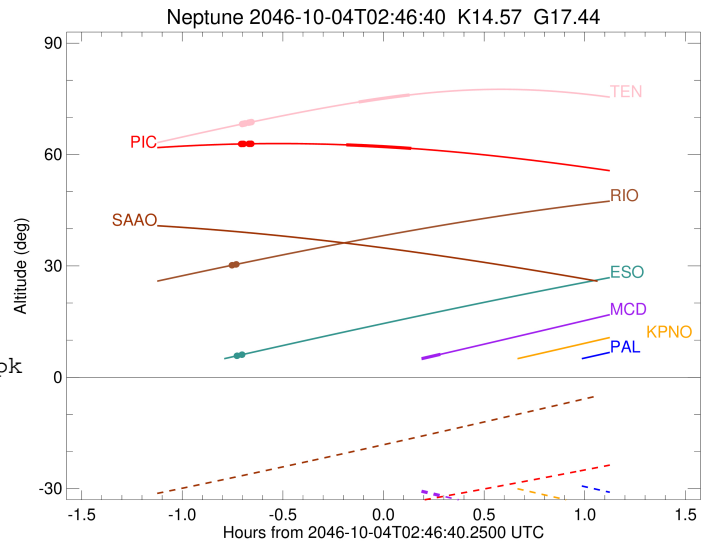
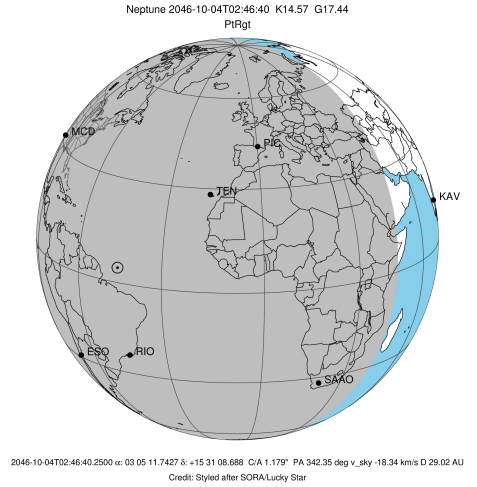
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2046-10-04T02:02:22.791		30.34	-61.24	63073.49	-144.22		
Galatea	I	2046-10-04T02:02:30.219		30.36	-61.25	62116.61	-125.12		

No planet occultations

Galatea	E	2046-10-04T02:02:30.237		30.36	-61.25	61955.09	-121.50		
Adams	E	2046-10-04T02:02:22.781		30.34	-61.24	63143.10	-145.48		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2046-10-04T02:51:44.010
Event type            : PtRgt
: Neptune occs: topocentric, not geocentric
: 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        : 30958158629830656
2Mass ID (if available) : 03051173+1531089
ICRS Star Coord at Epoch: 03h 05m 11.74273s +15:31:08.68830s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 14.570
G magnitude           : 17.445
RP magnitude          : 16.539
BP magnitude          : 18.347
DUPflag              : 0
Distance (au)         : 29.018
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -18.34
Sun-Target sep (deg)  : 142.13
Sun-Moon sep (deg)   : 162.05
B (ring opening deg) : 1.13
PA of pole (deg)      : -44.50
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.277
C/A sky separation (km) : 26878.1
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	2046-10-04T02:03:53.250		5.96	-41.26	63051.92	-157.17		
Galatea	I	2046-10-04T02:03:59.917		5.99	-41.28	62093.27	-140.77		

No planet occultations

Galatea	E	2046-10-04T02:03:59.914		5.99	-41.28	62112.42	-141.12		
Adams	E	2046-10-04T02:03:52.729		5.96	-41.25	64404.44	-176.72		