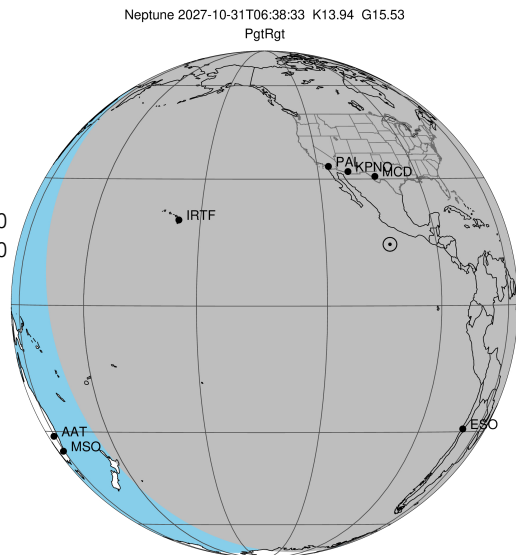


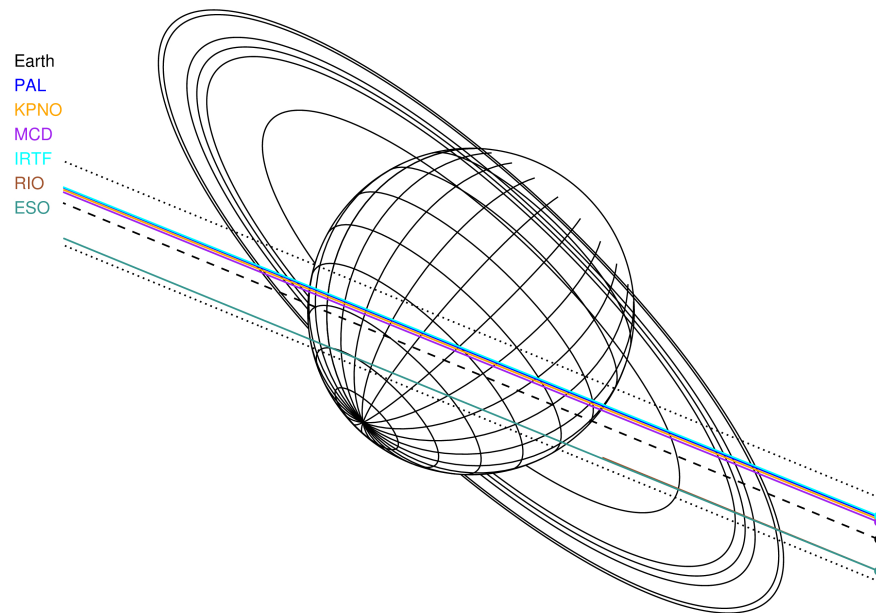
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2027-10-31T06:38:33.390
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 2545527339955749760
 2Mass ID (if available) : 00165920+0014561

Neptune 2027-10-31T06:38:33 K13.94 G15.53 PgtRgt

ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 13.941
 G magnitude : 15.529
 RP magnitude : 14.971
 BP magnitude : 15.921
 DUPflag : 0
 Distance (au) : 29.034
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -19.39
 Sun-Target sep (deg) : 146.74
 Sun-Moon sep (deg) : 125.06
 B (ring opening deg) : -18.38
 PA of pole (deg) : -44.22



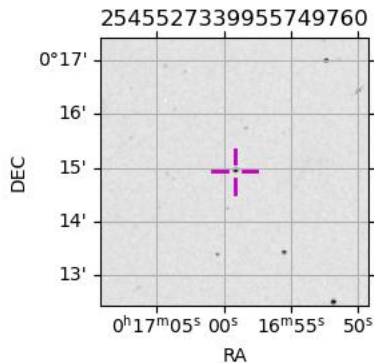
2027-10-31T06:38:33.3900 ex: 00 16 59.2065 s: +00 14 55.758 C/A 0.598" PA 337.59 deg v_sky -19.39 km/s D 29.03 AU
 Credit: Styled after SORA/Lucky Star



#	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

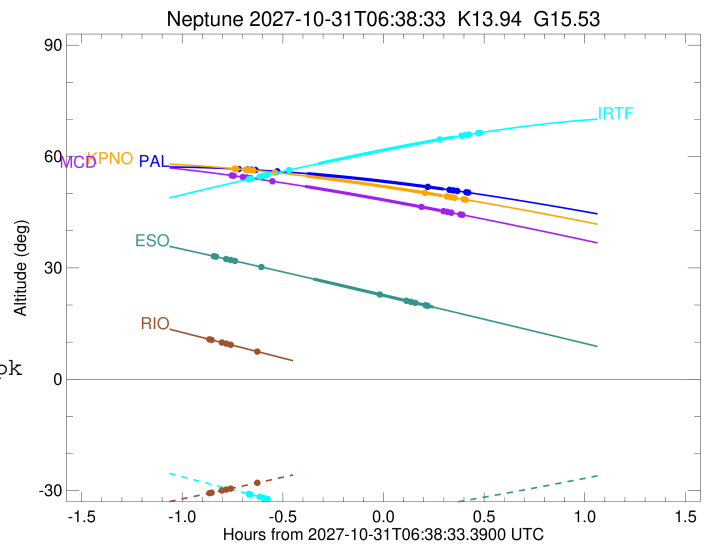
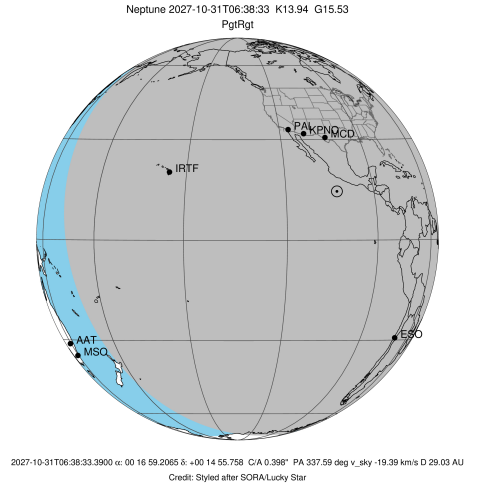
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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 31 05:55 - OCT 31 07:03	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+	+	+		PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	+	+	OCT 31 05:54 - OCT 31 07:03	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	+	+	OCT 31 05:53 - OCT 31 07:02	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+	+	OCT 31 05:58 - OCT 31 07:07	PieRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+	+	+	OCT 31 05:46 - OCT 31 06:01	PnnRin
ESO	European Southern Obs	-29.3	289.3	+	+	+	OCT 31 05:48 - OCT 31 06:53	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



```

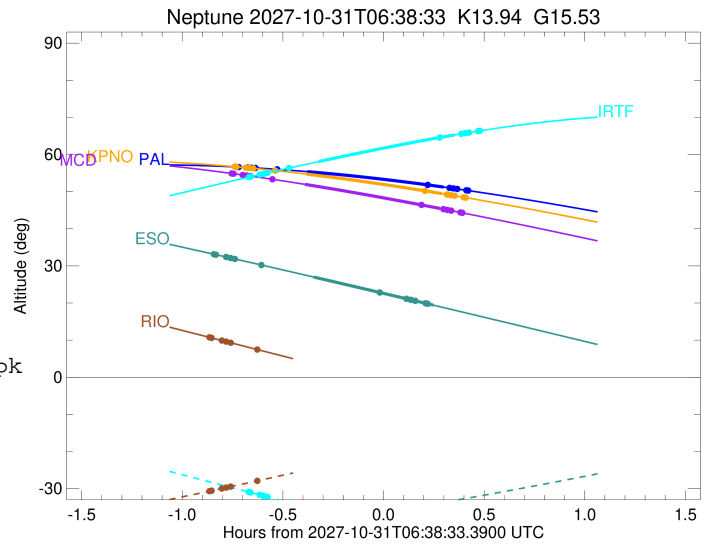
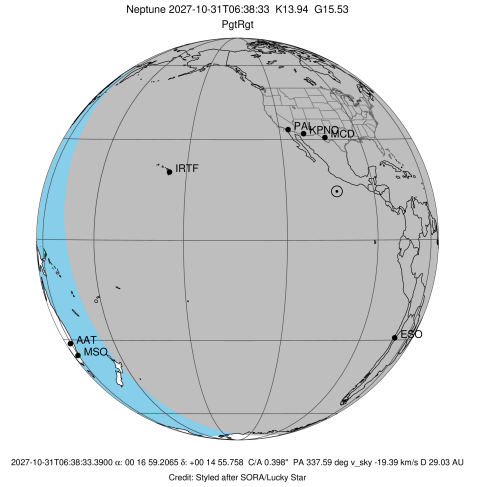
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2027-10-31T06:36:09.390
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 2545527339955749760
2Mass ID (if available) : 00165920+0014561
ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 13.941
G magnitude          : 15.529
RP magnitude         : 14.971
BP magnitude         : 15.921
DUPflag             : 0
Distance (au)        : 29.034
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -19.39
Sun-Target sep (deg) : 146.74
Sun-Moon sep (deg)  : 125.41
B (ring opening deg) : -18.38
PA of pole (deg)    : -44.22
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation ("): 0.274
C/A sky separation (km) : 5775.9
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	2027-10-31T05:55:02.178		56.64	-60.98	62933.00	-29.37		
Galatea	I	2027-10-31T05:55:35.558		56.62	-61.07	61953.00	-29.35		
Arago	I	2027-10-31T05:58:17.780		56.49	-61.53	57200.00	-29.25		
Lassell	I	2027-10-31T05:59:26.227		56.43	-61.72	55200.00	-29.19		
LeVerrier	I	2027-10-31T06:00:34.804		56.37	-61.91	53200.00	-29.13		
Galle	I	2027-10-31T06:07:02.140		56.00	-62.97	42000.00	-28.64		
Neptune	I	2027-10-31T06:15:49.568		55.39	-64.34	24763.04		8.28	8.57
Neptune	E	2027-10-31T06:56:29.354		51.24	-69.32	24749.77		-33.63	-34.54
Galle	E	2027-10-31T06:51:45.553	b	51.82	-68.89	42000.00	28.41		
LeVerrier	E	2027-10-31T06:58:15.307		51.02	-69.47	53200.00	28.99		
Lassell	E	2027-10-31T06:59:24.224		50.87	-69.56	55200.00	29.05		
Arago	E	2027-10-31T07:00:32.997		50.72	-69.65	57200.00	29.11		
Galatea	E	2027-10-31T07:03:15.956		50.37	-69.86	61953.00	29.22		
Adams	E	2027-10-31T07:03:49.483		50.29	-69.90	62933.00	29.24		

```

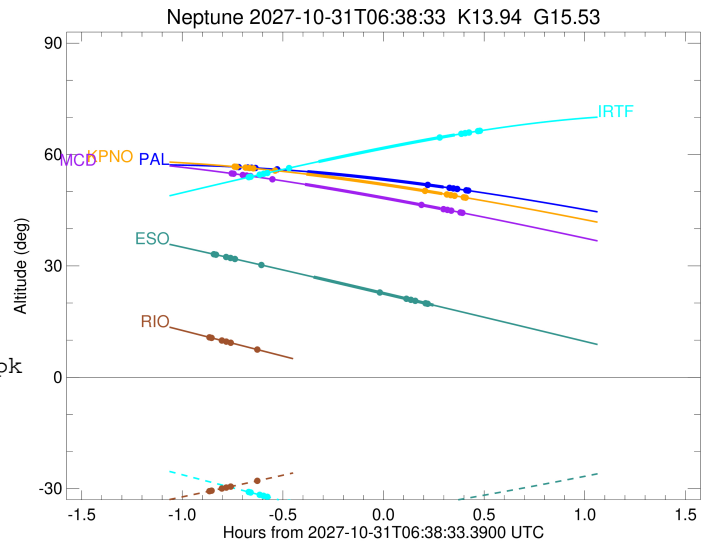
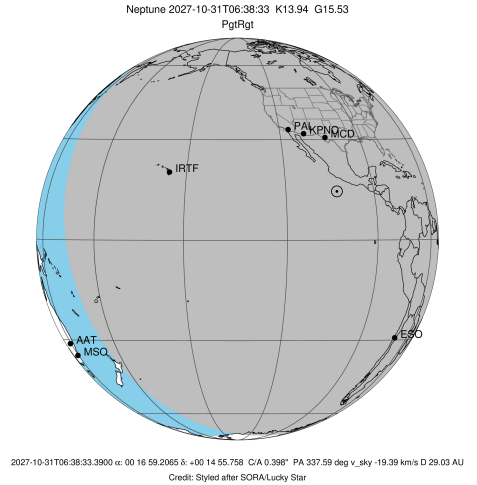
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2027-10-31T06:35:48.700
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 2545527339955749760
2Mass ID (if available) : 00165920+0014561
ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 13.941
G magnitude           : 15.529
RP magnitude          : 14.971
BP magnitude          : 15.921
DUPflag              : 0
Distance (au)        : 29.034
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -19.39
Sun-Target sep (deg) : 146.74
Sun-Moon sep (deg)   : 125.37
B (ring opening deg) : -18.38
PA of pole (deg)     : -44.22
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.289
C/A sky separation (km) : 6080.5
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	2027-10-31T05:54:23.923		56.72	-65.22	62933.00	-29.31		
Galatea	I	2027-10-31T05:54:57.373		56.67	-65.30	61953.00	-29.29		
Arago	I	2027-10-31T05:57:39.975		56.45	-65.73	57200.00	-29.17		
Lassell	I	2027-10-31T05:58:48.605		56.36	-65.91	55200.00	-29.11		
LeVerrier	I	2027-10-31T05:59:57.380		56.26	-66.09	53200.00	-29.05		
Galle	I	2027-10-31T06:06:26.231		55.66	-67.05	42000.00	-28.49		
Neptune	I	2027-10-31T06:15:32.416		54.73	-68.31	24763.19		7.59	7.85
Neptune	E	2027-10-31T06:56:05.264		49.45	-71.98	24749.27		-34.29	-35.21
Galle	E	2027-10-31T06:50:57.157	b	50.21	-71.73	42000.00	28.24		
LeVerrier	E	2027-10-31T06:57:28.795		49.24	-72.03	53200.00	28.88		
Lassell	E	2027-10-31T06:58:37.970		49.07	-72.07	55200.00	28.95		
Arago	E	2027-10-31T06:59:46.985		48.89	-72.11	57200.00	29.01		
Galatea	E	2027-10-31T07:02:30.465		48.47	-72.18	61953.00	29.13		
Adams	E	2027-10-31T07:03:04.092		48.38	-72.19	62933.00	29.15		

```

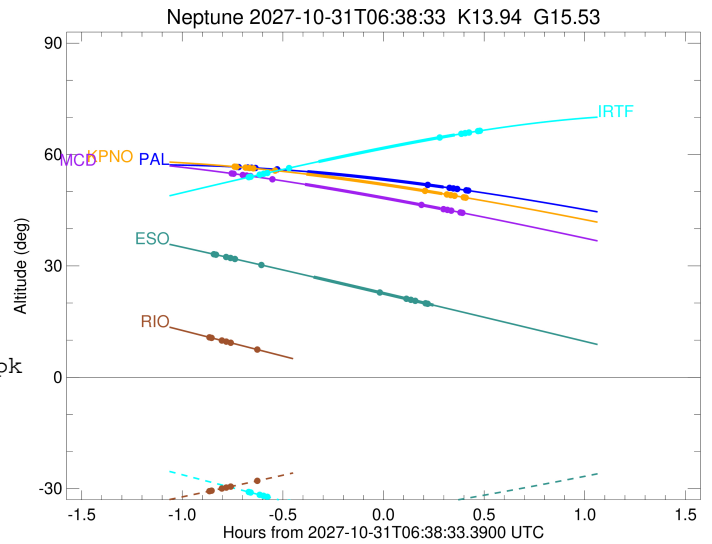
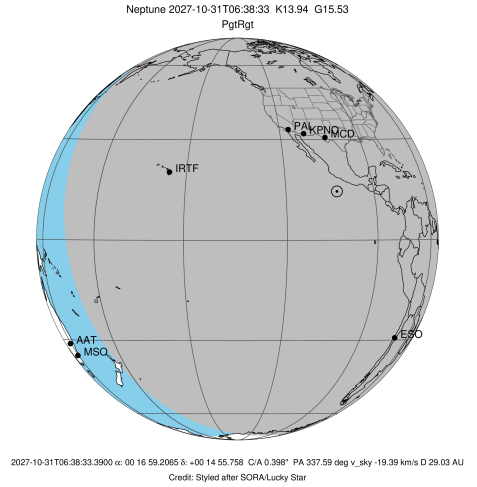
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2027-10-31T06:35:19.080
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 2545527339955749760
2Mass ID (if available) : 00165920+0014561
ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 13.941
G magnitude           : 15.529
RP magnitude          : 14.971
BP magnitude          : 15.921
DUPflag               : 0
Distance (au)         : 29.034
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -19.39
Sun-Target sep (deg) : 146.74
Sun-Moon sep (deg)   : 125.30
B (ring opening deg) : -18.38
PA of pole (deg)     : -44.22
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.306
C/A sky separation (km) : 6447.8
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	2027-10-31T05:53:31.723		54.87	-70.40	62933.00	-29.21		
Galatea	I	2027-10-31T05:54:05.286		54.80	-70.47	61953.00	-29.19		
Arago	I	2027-10-31T05:56:48.487		54.46	-70.80	57200.00	-29.05		
Lassell	I	2027-10-31T05:57:57.400		54.32	-70.94	55200.00	-28.99		
LeVerrier	I	2027-10-31T05:59:06.477		54.17	-71.07	53200.00	-28.92		
Galle	I	2027-10-31T06:05:37.557		53.30	-71.77	42000.00	-28.29		
Neptune	I	2027-10-31T06:15:06.761		51.97	-72.60	24763.36		6.74	6.97
Neptune	E	2027-10-31T06:55:31.862		45.45	-73.16	24748.67		-35.08	-36.01
Galle	E	2027-10-31T06:49:54.255	b	46.42	-73.39	42000.00	27.99		
LeVerrier	E	2027-10-31T06:56:28.630		45.28	-73.11	53200.00	28.71		
Lassell	E	2027-10-31T06:57:38.189		45.08	-73.04	55200.00	28.79		
Arago	E	2027-10-31T06:58:47.568		44.88	-72.98	57200.00	28.86		
Galatea	E	2027-10-31T07:01:31.843		44.39	-72.81	61953.00	29.00		
Adams	E	2027-10-31T07:02:05.624		44.29	-72.77	62933.00	29.02		

```

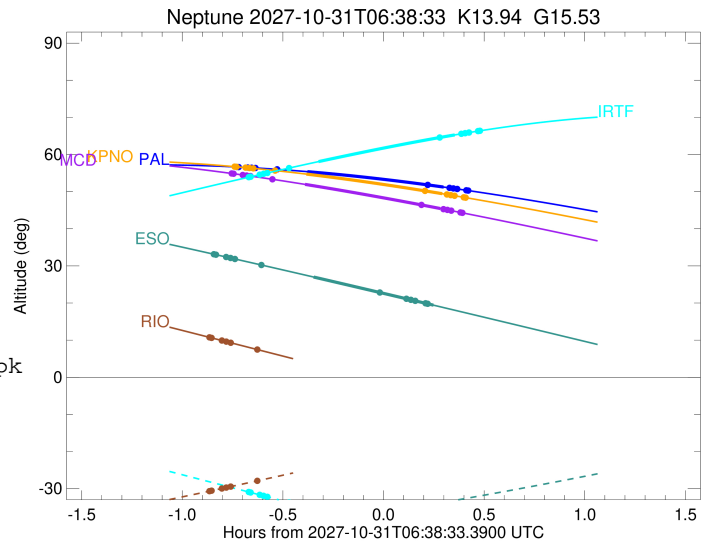
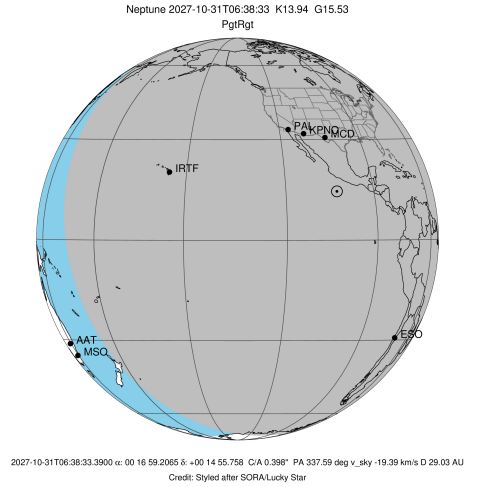
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2027-10-31T06:39:31.500
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)        : 19.82622
E. Longitude (deg)    : 204.52800
Altitude (km)         : 4.168
Gaia source ID        : 2545527339955749760
2Mass ID (if available) : 00165920+0014561
ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 13.941
G magnitude           : 15.529
RP magnitude          : 14.971
BP magnitude          : 15.921
DUPflag              : 0
Distance (au)         : 29.034
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -19.39
Sun-Target sep (deg) : 146.74
Sun-Moon sep (deg)   : 125.81
B (ring opening deg) : -18.38
PA of pole (deg)     : -44.22
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.266
C/A sky separation (km) : 5609.0
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.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	2027-10-31T05:58:36.191		53.95	-30.96	62933.00	-29.38		
Galatea	I	2027-10-31T05:59:09.555		54.06	-31.09	61953.00	-29.37		
Arago	I	2027-10-31T06:01:51.655		54.62	-31.72	57200.00	-29.27		
Lassell	I	2027-10-31T06:03:00.029		54.85	-31.99	55200.00	-29.23		
LeVerrier	I	2027-10-31T06:04:08.518		55.09	-32.26	53200.00	-29.18		
Galle	I	2027-10-31T06:10:35.027		56.39	-33.77	42000.00	-28.72		
Neptune	I	2027-10-31T06:19:11.106		58.10	-35.79	24762.94		8.69	8.99
Neptune	E	2027-10-31T06:59:50.682		65.29	-45.35	24750.00		-33.31	-34.22
Galle	E	2027-10-31T06:55:19.520	b	64.59	-44.29	42000.00	28.61		
LeVerrier	E	2027-10-31T07:01:46.663		65.59	-45.81	53200.00	29.18		
Lassell	E	2027-10-31T07:02:55.137		65.76	-46.08	55200.00	29.24		
Arago	E	2027-10-31T07:04:03.471		65.92	-46.35	57200.00	29.30		
Galatea	E	2027-10-31T07:06:45.390		66.32	-46.98	61953.00	29.41		
Adams	E	2027-10-31T07:07:18.703		66.39	-47.11	62933.00	29.43		

```

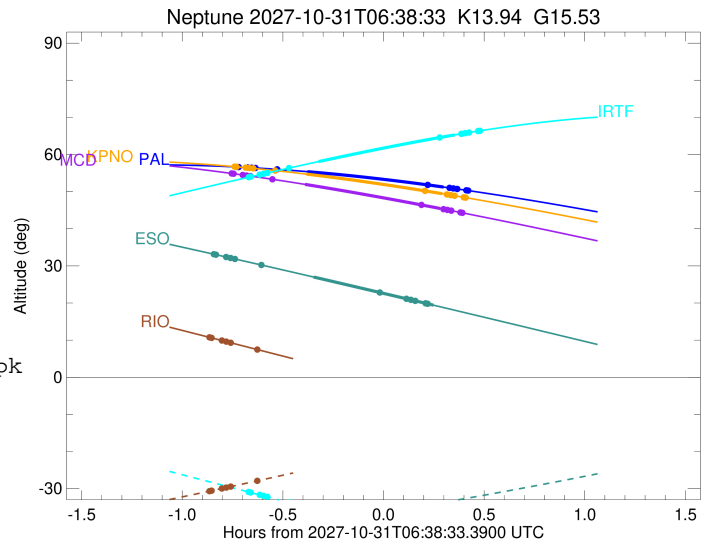
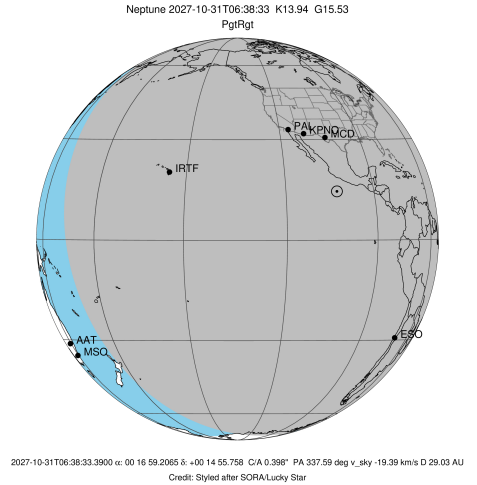
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2027-10-31T06:34:41.670
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : RIO
Location              : Rio de Janeiro
Latitude (deg)        : -22.89506
E. Longitude (deg)    : 316.77708
Altitude (km)         : 0.033
Gaia source ID        : 2545527339955749760
2Mass ID (if available) : 00165920+0014561
ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 13.941
G magnitude           : 15.529
RP magnitude          : 14.971
BP magnitude          : 15.921
DUPflag              : 0
Distance (au)         : 29.034
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -19.39
Sun-Target sep (deg)  : 146.74
Sun-Moon sep (deg)    : 124.72
B (ring opening deg) : -18.38
PA of pole (deg)      : -44.22
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.612
C/A sky separation (km) : 12895.6
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	2027-10-31T05:46:56.995		10.69	-30.62	62933.00	-26.37		
Galatea	I	2027-10-31T05:47:34.222		10.55	-30.50	61953.00	-26.27		
Arago	I	2027-10-31T05:50:37.013		9.84	-29.92	57200.00	-25.71		
Lassell	I	2027-10-31T05:51:55.235		9.54	-29.66	55200.00	-25.42		
LeVerrier	I	2027-10-31T05:53:14.398		9.24	-29.41	53200.00	-25.10		
Galle	I	2027-10-31T06:01:04.662		7.43	-27.87	42000.00	-22.19		
Neptune	I	2027-10-31T06:16:32.187		3.86x	-24.79	24762.85		-9.08	-9.39
Neptune	E	2027-10-31T06:52:51.587		-4.53x	-17.28	24737.23		-49.45	-50.41
Galle	E	2027-10-31T06:37:22.343	b	-0.95x	-20.52	42000.00	21.93		
LeVerrier	E	2027-10-31T06:45:20.672	b	-2.80x	-18.86	53200.00	24.66		
Lassell	E	2027-10-31T06:46:41.226	b	-3.11x	-18.58	55200.00	24.99		
Arago	E	2027-10-31T06:48:00.777	b	-3.41x	-18.30	57200.00	25.29		
Galatea	E	2027-10-31T06:51:06.513	b	-4.13x	-17.65	61953.00	25.87		
Adams	E	2027-10-31T06:51:44.319	b	-4.27x	-17.52	62933.00	25.97		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2027-10-31T06:35:35.840
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       : 2545527339955749760
2Mass ID (if available) : 00165920+0014561
ICRS Star Coord at Epoch: 00h 16m 59.20652s +00:14:55.75760s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 13.941
G magnitude           : 15.529
RP magnitude          : 14.971
BP magnitude          : 15.921
DUPflag              : 0
Distance (au)         : 29.034
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -19.39
Sun-Target sep (deg) : 146.74
Sun-Moon sep (deg)   : 125.12
B (ring opening deg) : -18.38
PA of pole (deg)     : -44.22
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.624
C/A sky separation (km) : 13148.6
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	2027-10-31T05:48:15.424		33.09	-42.57	62933.00	-26.62		
Galatea	I	2027-10-31T05:48:52.314		32.96	-42.51	61953.00	-26.51		
Arago	I	2027-10-31T05:51:53.514		32.35	-42.20	57200.00	-25.92		
Lassell	I	2027-10-31T05:53:11.099		32.08	-42.06	55200.00	-25.63		
LeVerrier	I	2027-10-31T05:54:29.649		31.82	-41.92	53200.00	-25.29		
Galle	I	2027-10-31T06:02:17.388		30.21	-41.06	42000.00	-22.24		
Neptune	I	2027-10-31T06:17:43.803		27.00	-39.19	24762.72		-9.54	-9.86
Neptune	E	2027-10-31T06:53:27.928		19.42	-34.15	24736.61		-50.24	-51.19
Galle	E	2027-10-31T06:37:42.527	b	22.78	-36.48	42000.00	22.04		
LeVerrier	E	2027-10-31T06:45:37.280	b	21.10	-35.33	53200.00	24.88		
Lassell	E	2027-10-31T06:46:57.091	b	20.81	-35.13	55200.00	25.23		
Arago	E	2027-10-31T06:48:15.876	b	20.53	-34.94	57200.00	25.54		
Galatea	E	2027-10-31T06:51:19.712	b	19.88	-34.47	61953.00	26.15		
Adams	E	2027-10-31T06:51:57.113	b	19.74	-34.38	62933.00	26.26		