

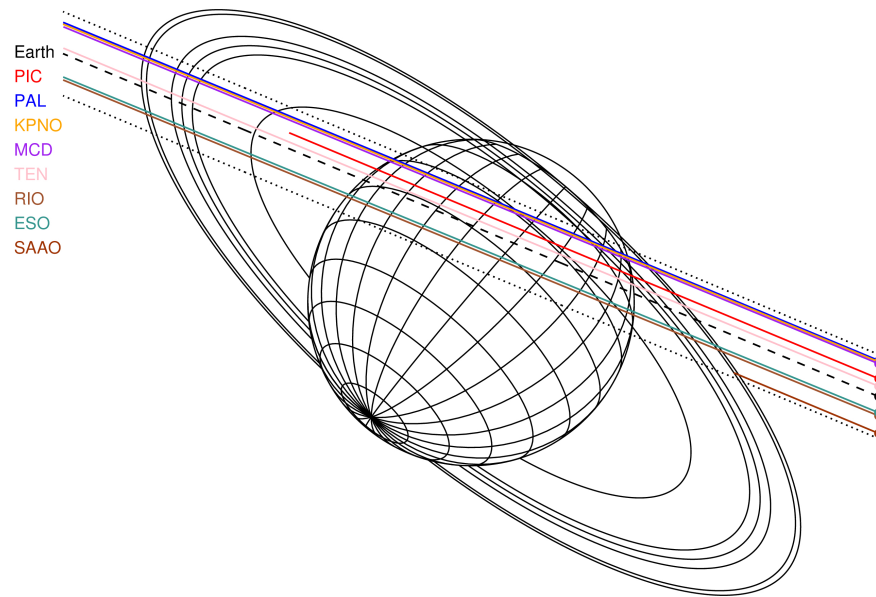
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2023-10-18T02:57:07.970
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 2639715216842421504
 2Mass ID (if available) : 23442092-0304569

Neptune 2023-10-18T02:57:07 K11.37 G14.66 PgtRgt

ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
 RUWE (>1.4 is poor) : 1.13
 K magnitude : 11.366
 G magnitude : 14.660
 RP magnitude : 13.616
 BP magnitude : 15.764
 DUPflag : 0
 Distance (au) : 29.030
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.44
 Sun-Target sep (deg) : 151.01
 Sun-Moon sep (deg) : 111.40
 B (ring opening deg) : -21.45
 PA of pole (deg) : -41.03
 # a(km) ring



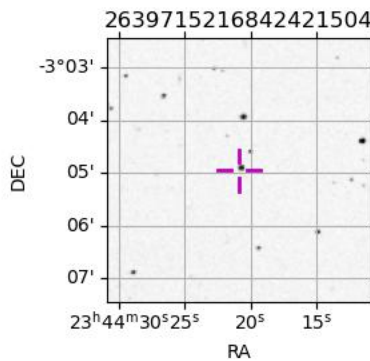
2023-10-18T02:57:07.9700 at: 23 44 21.0263 s: -03 04 57.6689 C/A 0.513° PA 157.19 deg v_sky -20.44 km/s D 29.03 AU
 Credit: Styled after SORA/Lucky Star



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

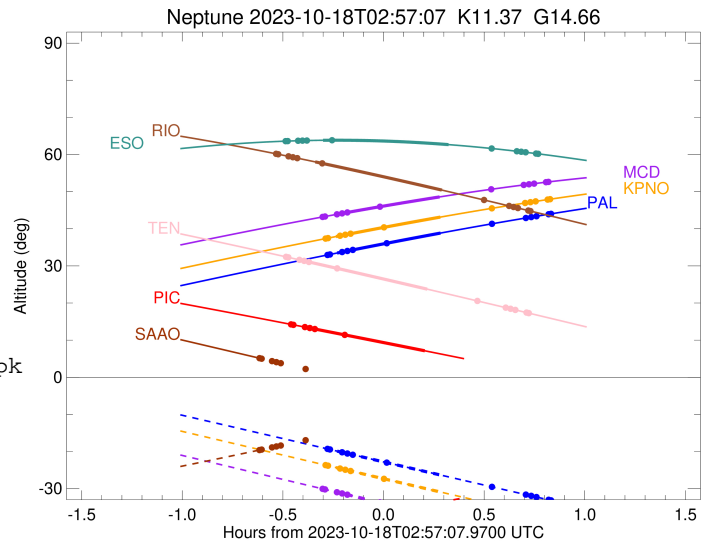
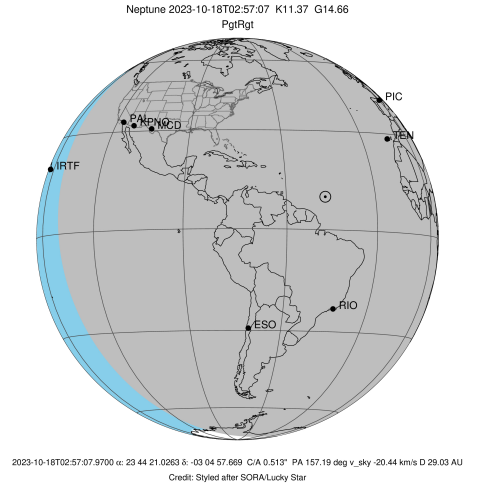
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ + + +	+ +		OCT 18 02:29 - OCT 18 03:09	PieRin
PAL	Palomar Mt (200")	33.4	243.1	+ +	+ +	+ + + + + +	OCT 18 02:40 - OCT 18 03:46	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	+ +	+ + + + + +	OCT 18 02:39 - OCT 18 03:46	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	+ +	+ + + + + +	OCT 18 02:38 - OCT 18 03:46	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+ + + + + +	+ +	+ + + + + +	OCT 18 02:27 - OCT 18 03:40	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 18 02:25 - OCT 18 03:40	PieRie
ESO	European Southern Obs	-29.3	289.3	+ + + + + +	+ +	+ + + + + +	OCT 18 02:27 - OCT 18 03:43	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+			OCT 18 02:20 - OCT 18 02:20	PnnRin
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



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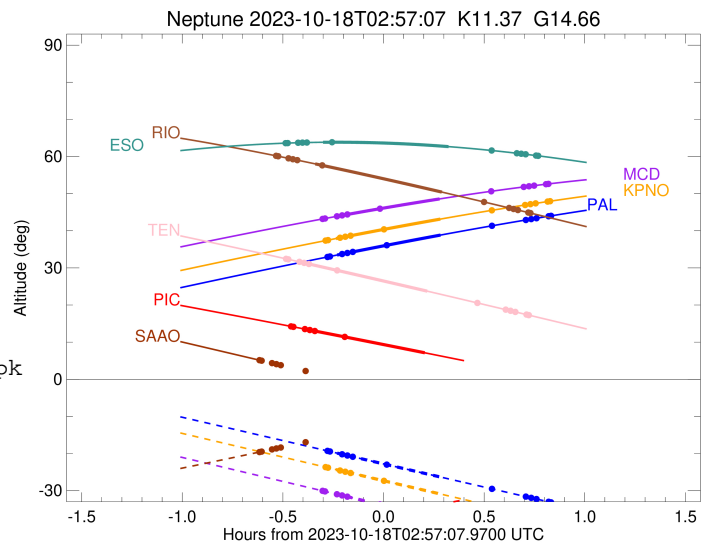
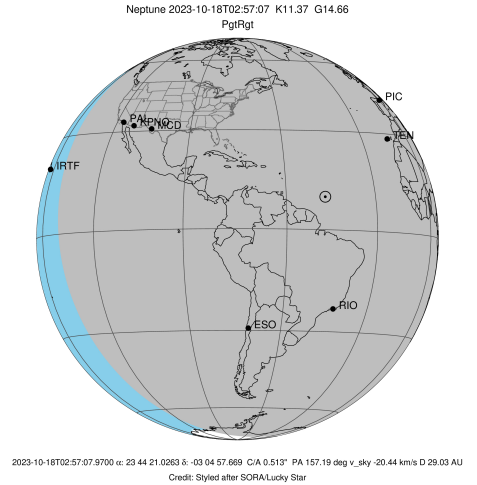
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2023-10-18T02:52:24.420
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PIC
Location              : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 11.366
G magnitude           : 14.660
RP magnitude          : 13.616
BP magnitude          : 15.764
DUPflag              : 0
Distance (au)        : 29.030
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg) : 151.01
Sun-Moon sep (deg)   : 111.22
B (ring opening deg) : -21.45
PA of pole (deg)     : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.623
C/A sky separation (km) : 13126.4
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	2023-10-18T02:29:22.720		14.28	-41.08	62933.00	-23.56		
Galatea	I	2023-10-18T02:30:04.412		14.15	-40.97	61953.00	-23.46		
Arago	I	2023-10-18T02:33:29.425		13.55	-40.43	57200.00	-22.89		
Lassell	I	2023-10-18T02:34:57.349		13.30	-40.20	55200.00	-22.60		
LeVerrier	I	2023-10-18T02:36:26.476	b	13.04	-39.96	53200.00	-22.27		
Galle	I	2023-10-18T02:45:20.695	b	11.46	-38.51	42000.00	-19.34		
Neptune	I	2023-10-18T02:35:24.026		13.22	-40.12	24730.60		45.86	46.84
Neptune	E	2023-10-18T03:09:27.819		7.13	-34.47	24760.87		12.69	13.12
Galle	E	2023-10-18T03:24:48.586		4.34x	-31.82	42000.00	19.53		
LeVerrier	E	2023-10-18T03:33:40.250		2.72x	-30.26	53200.00	22.28		
Lassell	E	2023-10-18T03:35:09.422		2.45x	-30.00	55200.00	22.58		
Arago	E	2023-10-18T03:36:37.489		2.18x	-29.74	57200.00	22.84		
Galatea	E	2023-10-18T03:40:03.158		1.56x	-29.14	61953.00	23.36		
Adams	E	2023-10-18T03:40:45.030		1.43x	-29.01	62933.00	23.45		

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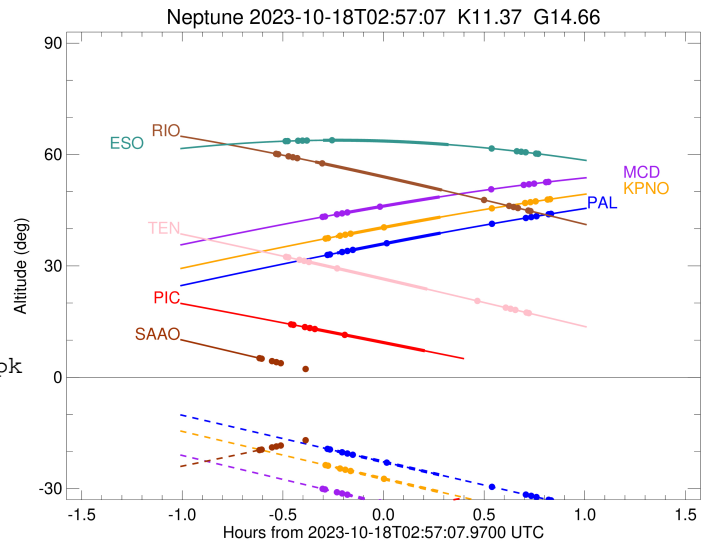
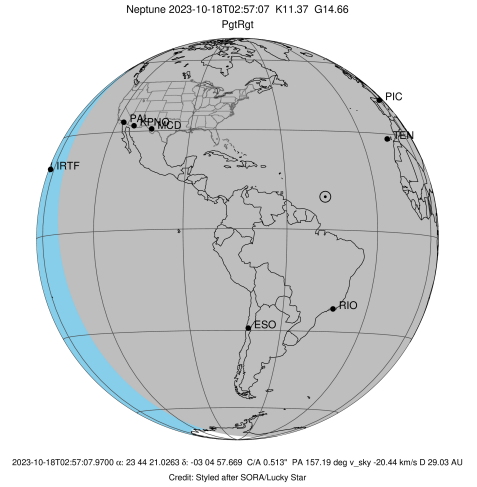
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2023-10-18T02:58:43.360
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 11.366
G magnitude           : 14.660
RP magnitude          : 13.616
BP magnitude          : 15.764
DUPflag              : 0
Distance (au)         : 29.030
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg)  : 151.01
Sun-Moon sep (deg)   : 112.00
B (ring opening deg) : -21.45
PA of pole (deg)     : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.741
C/A sky separation (km) : 15606.6
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	2023-10-18T02:40:08.471		32.90	-19.23	62933.00	-22.47		
Galatea	I	2023-10-18T02:40:52.223		33.03	-19.39	61953.00	-22.33		
Arago	I	2023-10-18T02:44:28.975	b	33.68	-20.14	57200.00	-21.50		
Lassell	I	2023-10-18T02:46:02.921	b	33.96	-20.47	55200.00	-21.07		
LeVerrier	I	2023-10-18T02:47:38.908	b	34.25	-20.81	53200.00	-20.59		
Galle	I	2023-10-18T02:57:40.487	b	36.03	-22.90	42000.00	-16.19		
Neptune	I	2023-10-18T02:43:17.025		33.47	-19.89	24723.93		51.83	52.77
Neptune	E	2023-10-18T03:14:11.161		38.85	-26.35	24757.06		19.09	19.70
Galle	E	2023-10-18T03:29:36.190		41.36	-29.55	42000.00	16.30		
LeVerrier	E	2023-10-18T03:39:30.904		42.90	-31.60	53200.00	20.84		
Lassell	E	2023-10-18T03:41:05.802		43.13	-31.93	55200.00	21.31		
Arago	E	2023-10-18T03:42:38.750		43.37	-32.25	57200.00	21.72		
Galatea	E	2023-10-18T03:46:13.429		43.90	-32.98	61953.00	22.53		
Adams	E	2023-10-18T03:46:56.795		44.00	-33.13	62933.00	22.67		

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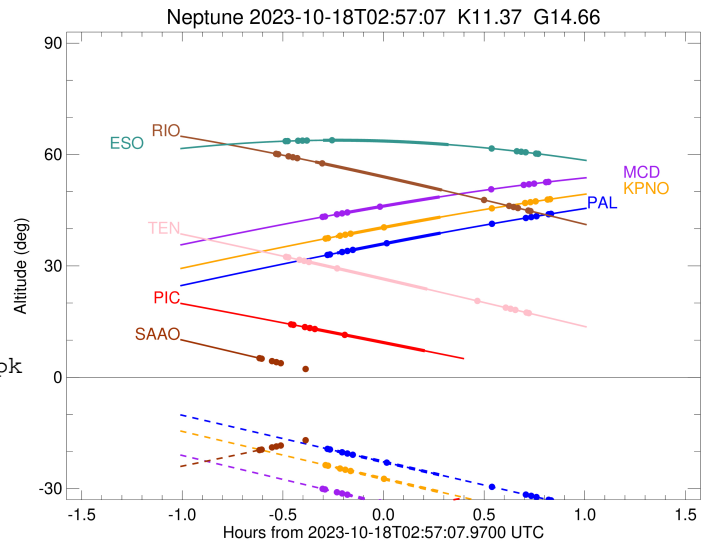
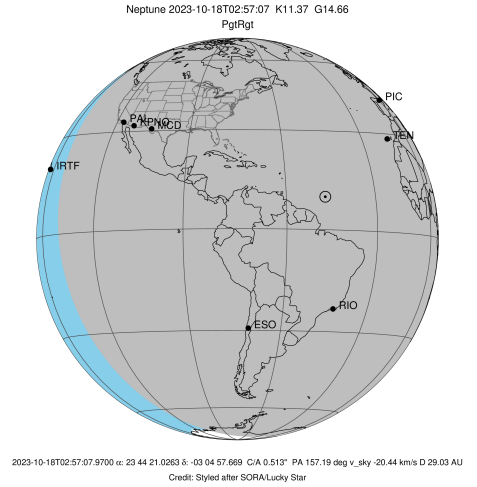
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2023-10-18T02:58:31.240
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : KPNO
Location               : Kitt Peak Natl Obs
Latitude (deg)        : 31.96333
E. Longitude (deg)    : 248.40000
Altitude (km)         : 2.120
Gaia source ID        : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 11.366
G magnitude           : 14.660
RP magnitude          : 13.616
BP magnitude          : 15.764
DUPflag              : 0
Distance (au)         : 29.030
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg)  : 151.01
Sun-Moon sep (deg)   : 112.04
B (ring opening deg) : -21.45
PA of pole (deg)     : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.730
C/A sky separation (km) : 15379.6
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	2023-10-18T02:39:34.543		37.30	-23.61	62933.00	-22.65		
Galatea	I	2023-10-18T02:40:17.945		37.43	-23.76	61953.00	-22.51		
Arago	I	2023-10-18T02:43:52.771	b	38.07	-24.52	57200.00	-21.71		
Lassell	I	2023-10-18T02:45:25.766	b	38.34	-24.85	55200.00	-21.30		
LeVerrier	I	2023-10-18T02:47:00.693	b	38.62	-25.18	53200.00	-20.83		
Galle	I	2023-10-18T02:56:52.250	b	40.31	-27.27	42000.00	-16.60		
Neptune	I	2023-10-18T02:42:57.218		37.90	-24.32	24724.49		51.31	52.26
Neptune	E	2023-10-18T03:14:06.757		43.15	-30.91	24757.51		18.43	19.03
Galle	E	2023-10-18T03:29:32.467		45.53	-34.15	42000.00	16.73		
LeVerrier	E	2023-10-18T03:39:17.173		46.94	-36.18	53200.00	21.07		
Lassell	E	2023-10-18T03:40:51.071		47.15	-36.50	55200.00	21.52		
Arago	E	2023-10-18T03:42:23.130		47.37	-36.82	57200.00	21.92		
Galatea	E	2023-10-18T03:45:56.026		47.85	-37.56	61953.00	22.70		
Adams	E	2023-10-18T03:46:39.070		47.95	-37.70	62933.00	22.84		

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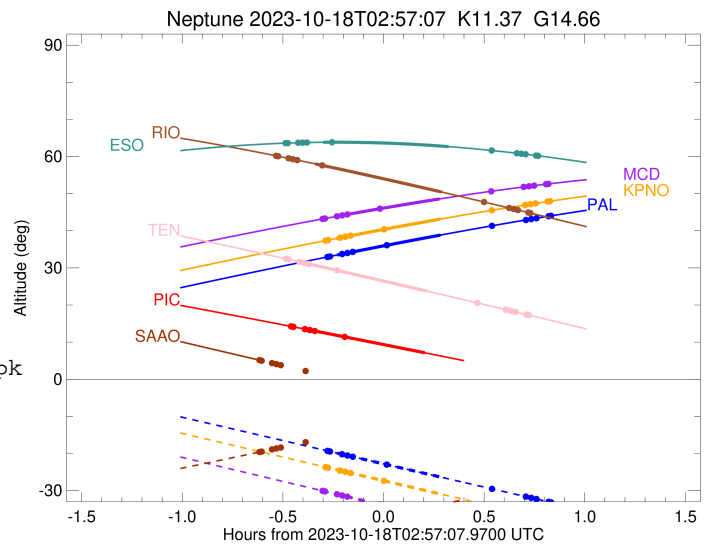
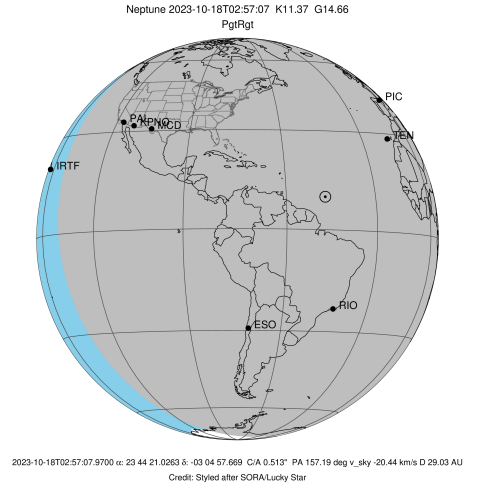
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2023-10-18T02:58:08.550
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)        : 30.67158
E. Longitude (deg)    : 255.97844
Altitude (km)         : 2.075
Gaia source ID        : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 11.366
G magnitude           : 14.660
RP magnitude          : 13.616
BP magnitude          : 15.764
DUPflag              : 0
Distance (au)         : 29.030
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg) : 151.01
Sun-Moon sep (deg)   : 112.08
B (ring opening deg) : -21.45
PA of pole (deg)     : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.716
C/A sky separation (km) : 15073.4
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	2023-10-18T02:38:42.672		43.14	-30.00	62933.00	-22.88		
Galatea	I	2023-10-18T02:39:25.626		43.26	-30.15	61953.00	-22.75		
Arago	I	2023-10-18T02:42:57.997	b	43.85	-30.91	57200.00	-21.98		
Lassell	I	2023-10-18T02:44:29.782	b	44.10	-31.23	55200.00	-21.59		
LeVerrier	I	2023-10-18T02:46:03.363	b	44.35	-31.57	53200.00	-21.15		
Galle	I	2023-10-18T02:55:42.438	b	45.89	-33.62	42000.00	-17.13		
Neptune	I	2023-10-18T02:42:24.358		43.76	-30.79	24725.27		50.61	51.56
Neptune	E	2023-10-18T03:13:54.293		48.59	-37.48	24758.08		17.57	18.14
Galle	E	2023-10-18T03:29:19.862		50.65	-40.71	42000.00	17.29		
LeVerrier	E	2023-10-18T03:38:52.233		51.80	-42.69	53200.00	21.37		
Lassell	E	2023-10-18T03:40:24.880		51.98	-43.01	55200.00	21.80		
Arago	E	2023-10-18T03:41:55.824		52.15	-43.32	57200.00	22.18		
Galatea	E	2023-10-18T03:45:26.486		52.53	-44.05	61953.00	22.92		
Adams	E	2023-10-18T03:46:09.127		52.61	-44.19	62933.00	23.05		


```

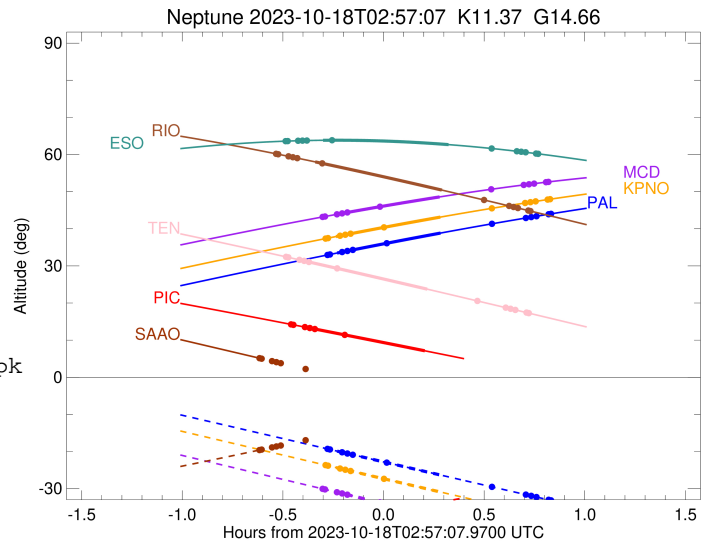
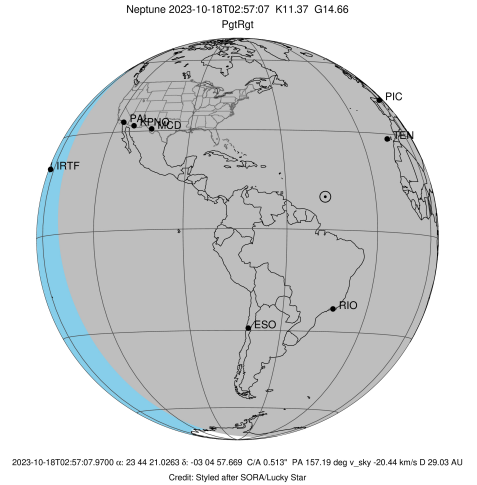
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2023-10-18T02:52:39.200
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : TEN
Location            : Teide Obs./Tenerife
Latitude (deg)      : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)       : 2.395
Gaia source ID      : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude          : 11.366
G magnitude          : 14.660
RP magnitude         : 13.616
BP magnitude         : 15.764
DUPflag             : 0
Distance (au)       : 29.030
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg) : 151.01
Sun-Moon sep (deg)  : 111.48
B (ring opening deg) : -21.45
PA of pole (deg)    : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.566
C/A sky separation (km) : 11911.9
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	2023-10-18T02:27:55.547		32.47	-60.61	62933.00	-24.30		
Galatea	I	2023-10-18T02:28:35.944		32.33	-60.49	61953.00	-24.22		
Arago	I	2023-10-18T02:31:54.002		31.67	-59.88	57200.00	-23.76		
Lassell	I	2023-10-18T02:33:18.586		31.38	-59.62	55200.00	-23.53		
LeVerrier	I	2023-10-18T02:34:44.065		31.09	-59.36	53200.00	-23.26		
Galle	I	2023-10-18T02:43:08.166	b	29.37	-57.78	42000.00	-20.90		
Neptune	I	2023-10-18T02:35:09.912		31.00	-59.28	24733.63		43.17	44.15
Neptune	E	2023-10-18T03:10:11.462		23.73	-52.43	24762.22		9.54	9.86
Galle	E	2023-10-18T03:25:03.147		20.58	-49.38	42000.00	21.08		
LeVerrier	E	2023-10-18T03:33:25.827		18.79	-47.63	53200.00	23.23		
Lassell	E	2023-10-18T03:34:51.480		18.48	-47.33	55200.00	23.47		
Arago	E	2023-10-18T03:36:16.316		18.18	-47.04	57200.00	23.68		
Galatea	E	2023-10-18T03:39:35.230		17.46	-46.34	61953.00	24.09		
Adams	E	2023-10-18T03:40:15.842		17.32	-46.19	62933.00	24.17		

```

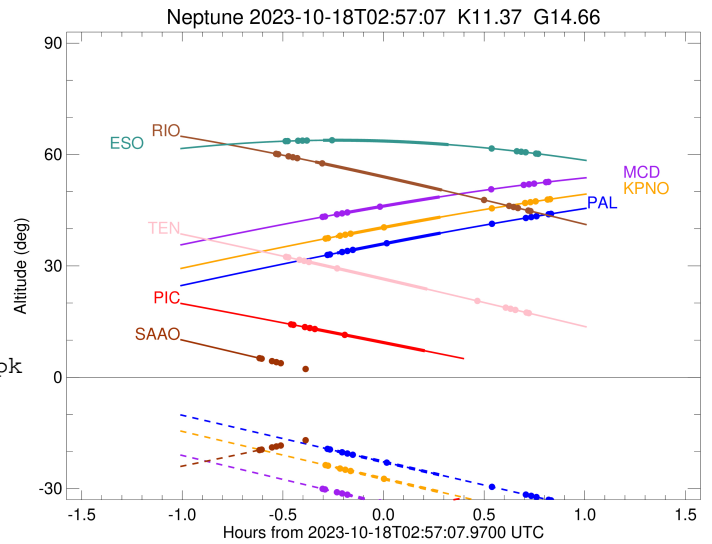
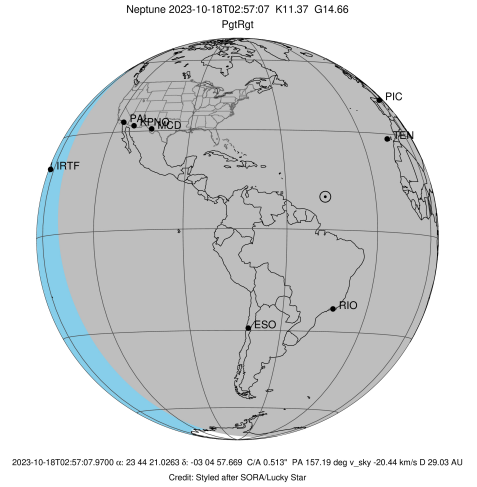
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2023-10-18T02:55:37.400
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : RIO
Location            : Rio de Janeiro
Latitude (deg)      : -22.89506
E. Longitude (deg)  : 316.77708
Altitude (km)       : 0.033
Gaia source ID      : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude          : 11.366
G magnitude          : 14.660
RP magnitude         : 13.616
BP magnitude         : 15.764
DUPflag             : 0
Distance (au)       : 29.030
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg) : 151.01
Sun-Moon sep (deg)  : 112.02
B (ring opening deg) : -21.45
PA of pole (deg)    : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.362
C/A sky separation (km) : 7626.7
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	2023-10-18T02:25:04.871		60.20	-57.61	62933.00	-25.90		
Galatea	I	2023-10-18T02:25:42.726		60.08	-57.62	61953.00	-25.87		
Arago	I	2023-10-18T02:28:47.051		59.52	-57.68	57200.00	-25.69		
Lassell	I	2023-10-18T02:30:05.030		59.28	-57.70	55200.00	-25.60		
LeVerrier	I	2023-10-18T02:31:23.301		59.04	-57.72	53200.00	-25.50		
Galle	I	2023-10-18T02:38:49.338	b	57.63	-57.76	42000.00	-24.61		
Neptune	I	2023-10-18T02:36:44.997		58.03	-57.76	24744.00		33.71	34.63
Neptune	E	2023-10-18T03:14:31.928		50.42	-56.55	24763.99		-0.66	-0.68
Galle	E	2023-10-18T03:26:58.097		47.79	-55.61	42000.00	24.65		
LeVerrier	E	2023-10-18T03:34:24.471		46.19	-54.93	53200.00	25.44		
Lassell	E	2023-10-18T03:35:42.953		45.91	-54.81	55200.00	25.53		
Arago	E	2023-10-18T03:37:01.175		45.63	-54.68	57200.00	25.61		
Galatea	E	2023-10-18T03:40:06.188		44.96	-54.36	61953.00	25.77		
Adams	E	2023-10-18T03:40:44.202		44.82	-54.29	62933.00	25.79		

```

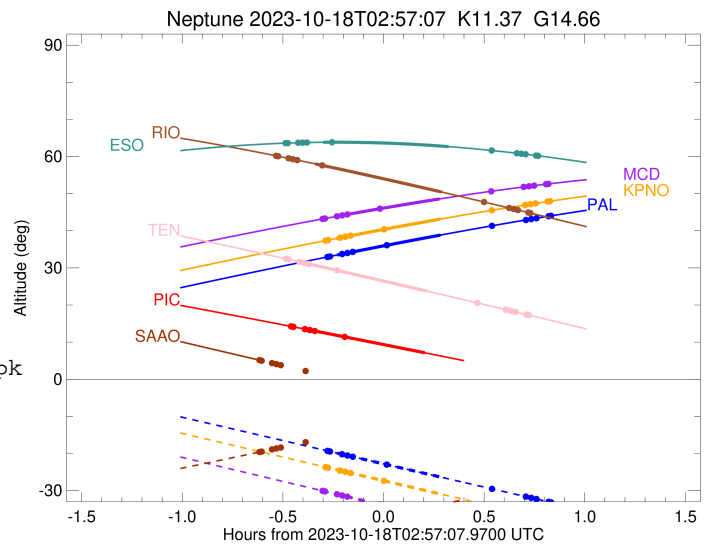
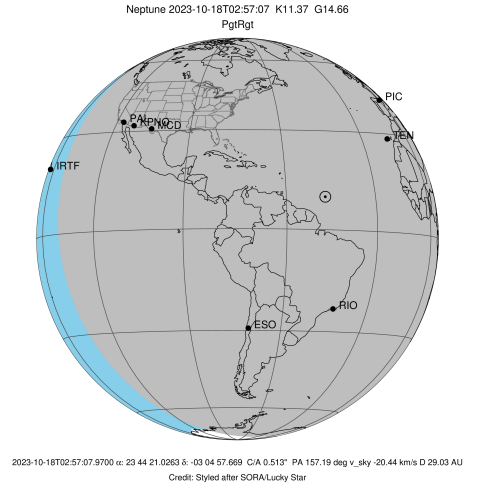
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2023-10-18T02:57:48.180
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : ESO
Location             : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)   : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 11.366
G magnitude           : 14.660
RP magnitude         : 13.616
BP magnitude         : 15.764
DUPflag              : 0
Distance (au)        : 29.030
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg) : 151.01
Sun-Moon sep (deg)   : 112.24
B (ring opening deg) : -21.45
PA of pole (deg)     : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.384
C/A sky separation (km) : 8089.7
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	2023-10-18T02:27:54.154		63.60	-41.74	62933.00	-25.79		
Galatea	I	2023-10-18T02:28:32.175		63.62	-41.83	61953.00	-25.76		
Arago	I	2023-10-18T02:31:37.383		63.71	-42.27	57200.00	-25.56		
Lassell	I	2023-10-18T02:32:55.781		63.74	-42.45	55200.00	-25.46		
LeVerrier	I	2023-10-18T02:34:14.507		63.77	-42.64	53200.00	-25.35		
Galle	I	2023-10-18T02:41:44.115	b	63.85	-43.66	42000.00	-24.35		
Neptune	I	2023-10-18T02:39:04.850		63.84	-43.30	24742.93		34.73	35.66
Neptune	E	2023-10-18T03:16:32.892		62.67	-47.72	24764.00		0.38	0.39
Galle	E	2023-10-18T03:29:14.381		61.64	-48.87	42000.00	24.47		
LeVerrier	E	2023-10-18T03:36:42.767		60.90	-49.46	53200.00	25.38		
Lassell	E	2023-10-18T03:38:01.408		60.77	-49.55	55200.00	25.48		
Arago	E	2023-10-18T03:39:19.745		60.63	-49.65	57200.00	25.58		
Galatea	E	2023-10-18T03:42:24.887		60.28	-49.86	61953.00	25.76		
Adams	E	2023-10-18T03:43:02.904		60.21	-49.90	62933.00	25.79		


```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2023-10-18T02:54:10.290
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        : 2639715216842421504
2Mass ID (if available) : 23442092-0304569
ICRS Star Coord at Epoch: 23h 44m 21.02634s -03:04:57.66860s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 11.366
G magnitude           : 14.660
RP magnitude          : 13.616
BP magnitude          : 15.764
DUPflag               : 0
Distance (au)         : 29.030
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.44
Sun-Target sep (deg) : 151.01
Sun-Moon sep (deg)   : 111.19
B (ring opening deg) : -21.45
PA of pole (deg)     : -41.03
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.265
C/A sky separation (km) : 5586.6
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	2023-10-18T02:20:11.635		5.13	-19.60	62933.00	-25.71		
Galatea	I	2023-10-18T02:20:49.770		5.00x	-19.48	61953.00	-25.69		
Arago	I	2023-10-18T02:23:55.153		4.34x	-18.89	57200.00	-25.59		
Lassell	I	2023-10-18T02:25:13.400		4.07x	-18.64	55200.00	-25.53		
LeVerrier	I	2023-10-18T02:26:31.810		3.79x	-18.38	53200.00	-25.48		
Galle	I	2023-10-18T02:33:55.108		2.22x	-16.95	42000.00	-25.00		
Neptune	I	2023-10-18T02:34:29.826		2.10x	-16.84	24748.81		28.93	29.77
Neptune	E	2023-10-18T03:13:53.495		-6.22x	-9.02	24763.54		-4.83	-5.00
Galle	E	2023-10-18T03:25:17.543		-8.62x	-6.70	42000.00	24.91		
LeVerrier	E	2023-10-18T03:32:43.257		-10.17x	-5.18	53200.00	25.30		
Lassell	E	2023-10-18T03:34:02.236		-10.45x	-4.91x	55200.00	25.35		
Arago	E	2023-10-18T03:35:21.085		-10.72x	-4.65x	57200.00	25.38		
Galatea	E	2023-10-18T03:38:28.029		-11.37x	-4.01x	61953.00	25.46		
Adams	E	2023-10-18T03:39:06.508		-11.50x	-3.87x	62933.00	25.48		