

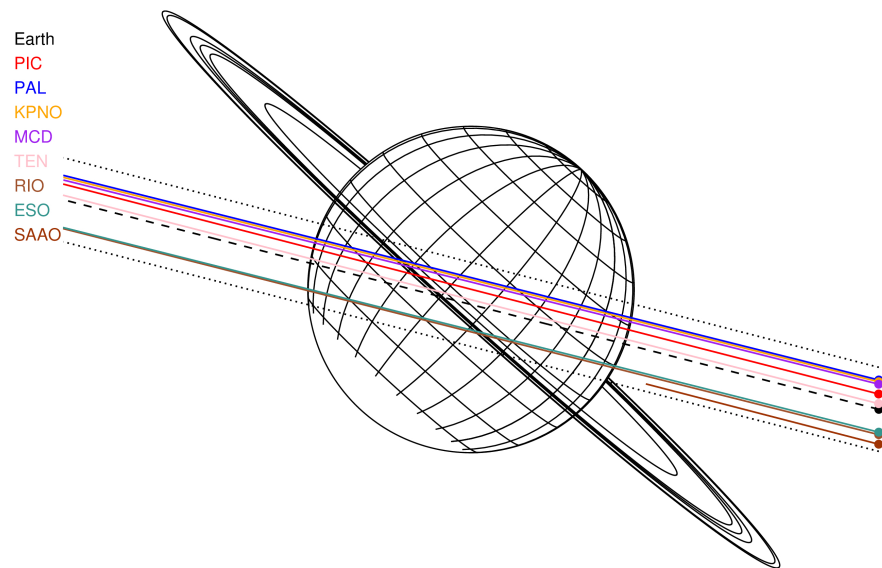
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2049-11-04T03:37:44.750
 Event type : PgtX
 : Neptune occs: geocentric, topocentric
 : No ring occs
 Gaia source ID : 54847183344385536
 2Mass ID (if available) : 03294738+1707314

Neptune 2049-11-04T03:37:44 K14.94 G17.11 PgtX

ICRS Star Coord at Epoch: 03h 29m 47.38786s +17°07'31.14324s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 14.938
 G magnitude : 17.111
 RP magnitude : 16.470
 BP magnitude : 17.607
 DUPflag : 0
 Distance (au) : 28.850
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.88
 Sun-Target sep (deg) : 166.99
 Sun-Moon sep (deg) : 83.68
 B (ring opening deg) : 4.02
 PA of pole (deg) : -42.53
 # a(km) ring



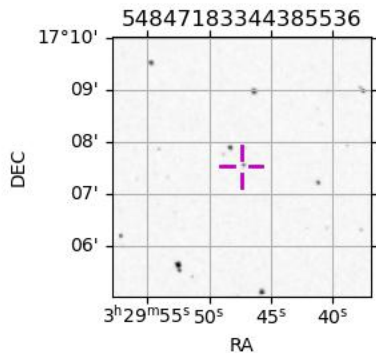
2049-11-04T03:37:44.7500 ra: 03 29 47.38789 s: +17 07 31.143 C/A 0.105° PA 345.60 deg v_sky -23.88 km/s D 28.85 AU
 Credit: Styled after SORA/Lucky Star



#	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

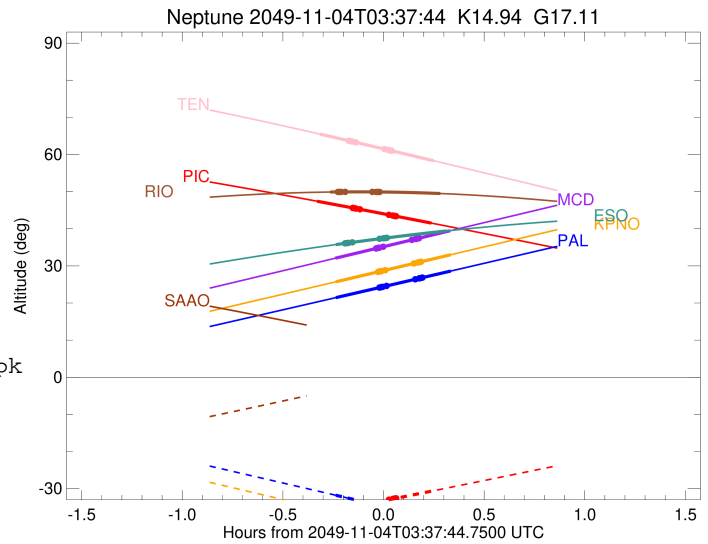
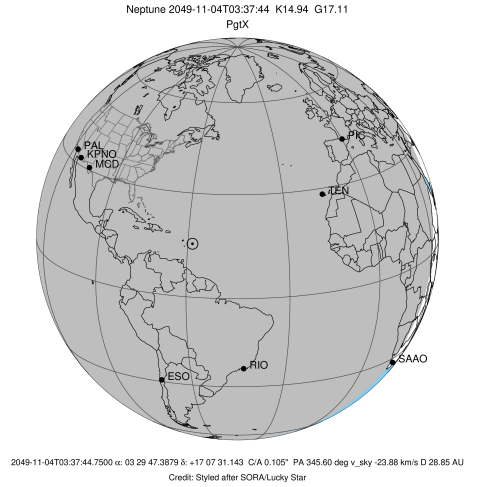
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1		+	+	NOV 04 03:17 - NOV 04 03:52	PieRnn
PAL	Palomar Mt (200")	33.4	243.1		+	+	NOV 04 03:23 - NOV 04 03:57	PieRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+	NOV 04 03:23 - NOV 04 03:57	PieRnn
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+	NOV 04 03:23 - NOV 04 03:57	PieRnn
TEN	Teide Obs./Tenerife	28.3	343.5		+	+	NOV 04 03:18 - NOV 04 03:52	PieRnn
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		+	+	NOV 04 03:21 - NOV 04 03:54	PieRnn
ESO	European Southern Obs	-29.3	289.3		+	+	NOV 04 03:23 - NOV 04 03:56	PieRnn
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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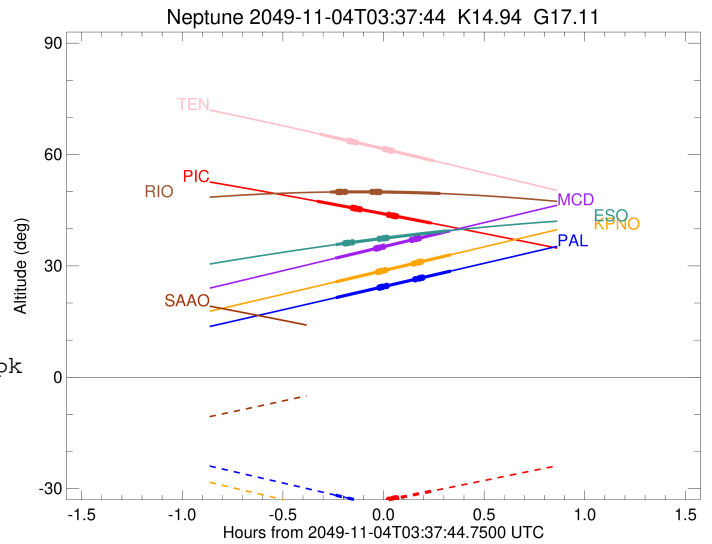
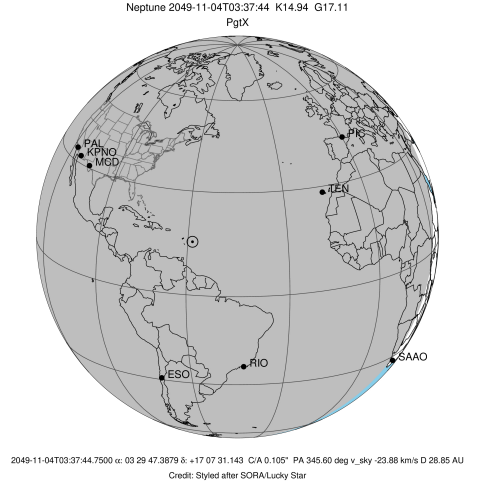
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2049-11-04T03:34:59.160
Event type           : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code        : PIC
Location             : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 14.938
G magnitude          : 17.111
RP magnitude         : 16.470
BP magnitude         : 17.607
DUPflag             : 0
Distance (au)        : 28.850
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)  : 84.42
B (ring opening deg) : 4.02
PA of pole (deg)    : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.002
C/A sky separation (km) : 32.5
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	2049-11-04T03:28:42.923	b	45.59	-34.90	62933.00	-160.43		
Galatea	I	2049-11-04T03:28:49.033	b	45.58	-34.89	61952.99	-160.31		
Arago	I	2049-11-04T03:29:18.742	b	45.49	-34.80	57200.01	-159.63		
Lassell	I	2049-11-04T03:29:31.285	b	45.46	-34.76	55199.99	-159.27		
LeVerrier	I	2049-11-04T03:29:43.858	b	45.42	-34.72	53200.00	-158.85		
Galle	I	2049-11-04T03:30:55.137	b	45.22	-34.51	41999.99	-154.75		
Neptune	I	2049-11-04T03:17:53.203		47.43	-36.84	24763.54		28.10	28.92
Neptune	E	2049-11-04T03:52:05.749		41.52	-30.67	24763.55		-27.93	-28.75
Galle	E	2049-11-04T03:39:08.561	b	43.79	-33.02	41999.99	155.36		
LeVerrier	E	2049-11-04T03:40:19.687	b	43.59	-32.81	53200.01	159.01		
Lassell	E	2049-11-04T03:40:32.250	b	43.55	-32.77	55200.01	159.38		
Arago	E	2049-11-04T03:40:44.785	b	43.51	-32.73	57199.99	159.71		
Galatea	E	2049-11-04T03:41:14.486	b	43.43	-32.64	61953.00	160.33		
Adams	E	2049-11-04T03:41:20.597	b	43.41	-32.63	62932.99	160.43		

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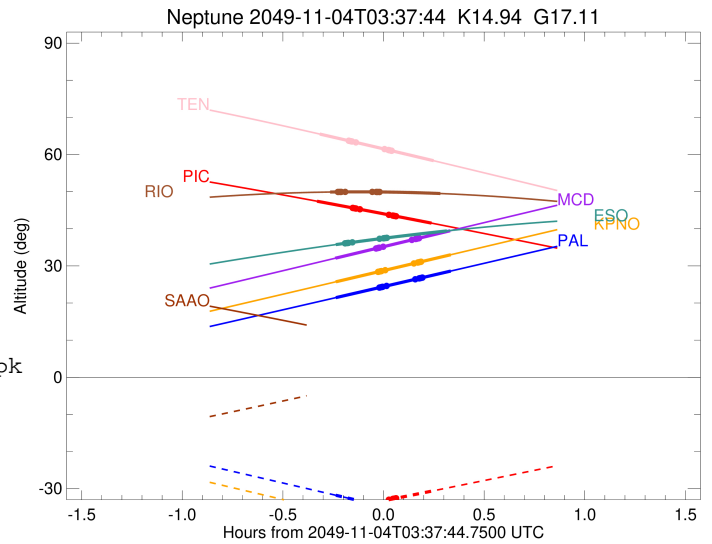
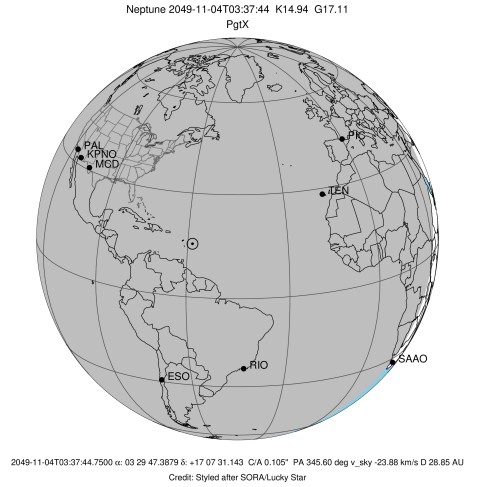
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-11-04T03:40:41.080
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 14.938
G magnitude          : 17.111
RP magnitude         : 16.470
BP magnitude         : 17.607
DUPflag             : 0
Distance (au)       : 28.850
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)  : 84.01
B (ring opening deg) : 4.02
PA of pole (deg)    : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.084
C/A sky separation (km) : 1757.2
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.urall11.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
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Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2049-11-04T03:36:45.475	b	24.21	-34.55	62933.00	-151.37		
Galatea	I	2049-11-04T03:36:51.964	b	24.23	-34.57	61952.99	-150.63		
Arago	I	2049-11-04T03:37:23.960	b	24.34	-34.68	57200.00	-146.24		
Lassell	I	2049-11-04T03:37:37.742	b	24.39	-34.73	55200.00	-143.93		
LeVerrier	I	2049-11-04T03:37:51.760	b	24.44	-34.78	53200.01	-141.38		
Galle	I	2049-11-04T03:39:12.377	b	24.72	-35.06	41998.95	-152.15		
Neptune	I	2049-11-04T03:23:30.112		21.44	-31.78	24763.40		32.41	33.31
Neptune	E	2049-11-04T03:57:50.816		28.62	-38.95	24763.65		-24.31	-25.06
Galle	E	2049-11-04T03:47:04.242	b	26.36	-36.70	41999.99	162.70		
LeVerrier	E	2049-11-04T03:48:13.001	b	26.60	-36.94	53200.00	163.05		
Lassell	E	2049-11-04T03:48:25.265	b	26.65	-36.98	55200.01	163.10		
Arago	E	2049-11-04T03:48:37.526	b	26.69	-37.03	57199.99	163.15		
Galatea	E	2049-11-04T03:49:06.649	b	26.79	-37.13	61953.01	163.26		
Adams	E	2049-11-04T03:49:12.651	b	26.81	-37.15	62933.00	163.28		

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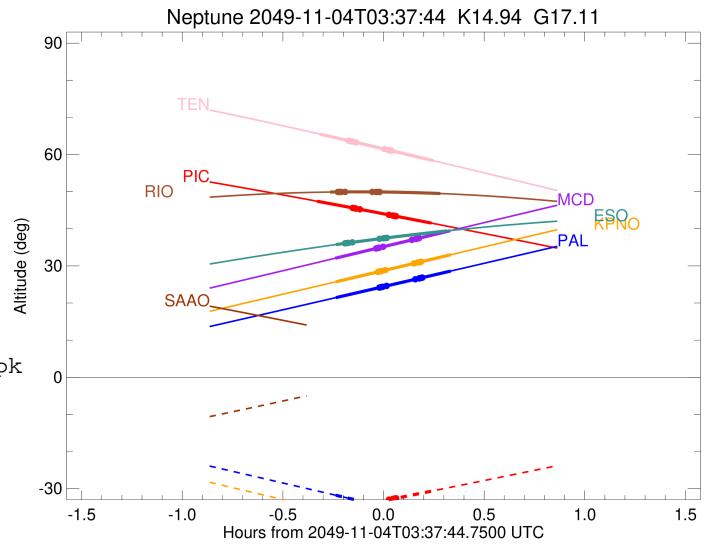
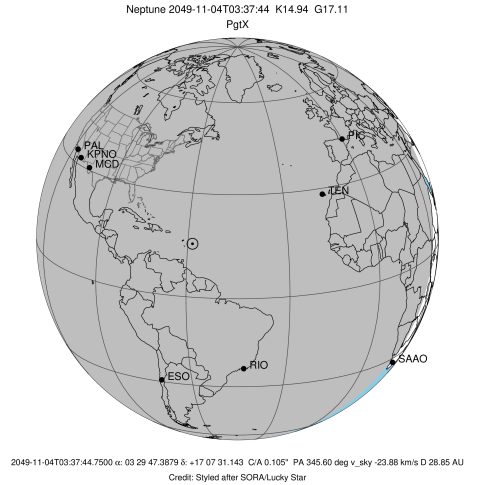
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-11-04T03:40:39.560
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 14.938
G magnitude          : 17.111
RP magnitude         : 16.470
BP magnitude         : 17.607
DUPflag             : 0
Distance (au)       : 28.850
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)  : 84.08
B (ring opening deg) : 4.02
PA of pole (deg)    : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.070
C/A sky separation (km) : 1470.6
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	2049-11-04T03:36:20.681	b	28.44	-39.00	62933.00	-154.03		
Galatea	I	2049-11-04T03:36:27.055	b	28.46	-39.02	61953.00	-153.44		
Arago	I	2049-11-04T03:36:58.385	b	28.57	-39.13	57200.00	-149.74		
Lassell	I	2049-11-04T03:37:11.832	b	28.62	-39.18	55200.00	-147.66		
LeVerrier	I	2049-11-04T03:37:25.487	b	28.67	-39.23	53200.01	-145.18		
Galle	I	2049-11-04T03:38:48.239	b	28.96	-39.52	41999.98	-127.64		
Neptune	I	2049-11-04T03:23:29.334		25.71	-36.28	24763.43		31.77	32.65
Neptune	E	2049-11-04T03:57:48.577		33.01	-43.53	24763.63		-24.99	-25.75
Galle	E	2049-11-04T03:46:40.148	b	30.63	-41.18	42000.00	162.78		
LeVerrier	E	2049-11-04T03:47:48.859	b	30.88	-41.42	53200.01	163.20		
Lassell	E	2049-11-04T03:48:01.111	b	30.92	-41.47	55200.00	163.26		
Arago	E	2049-11-04T03:48:13.359	b	30.97	-41.51	57200.00	163.32		
Galatea	E	2049-11-04T03:48:42.450	b	31.07	-41.61	61953.00	163.45		
Adams	E	2049-11-04T03:48:48.445	b	31.09	-41.63	62933.00	163.47		

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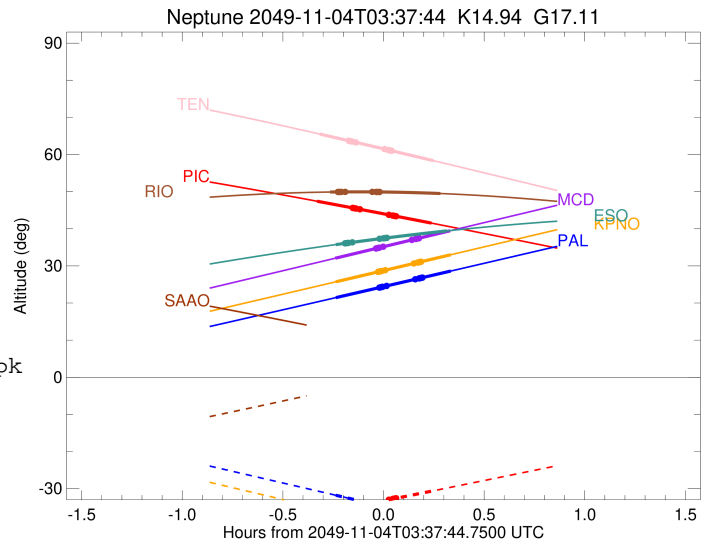
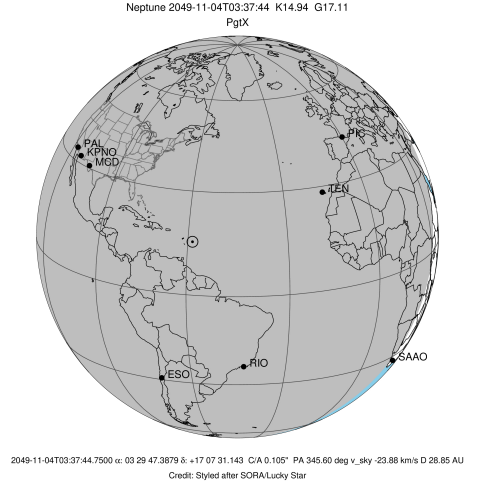
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-11-04T03:40:31.670
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 14.938
G magnitude          : 17.111
RP magnitude         : 16.470
BP magnitude         : 17.607
DUPflag             : 0
Distance (au)       : 28.850
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)  : 84.18
B (ring opening deg) : 4.02
PA of pole (deg)    : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.052
C/A sky separation (km) : 1098.2
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.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	2049-11-04T03:35:43.123	b	34.74	-45.46	62932.99	-157.09		
Galatea	I	2049-11-04T03:35:49.370	b	34.76	-45.49	61952.99	-156.67		
Arago	I	2049-11-04T03:36:19.942	b	34.87	-45.59	57200.00	-154.09		
Lassell	I	2049-11-04T03:36:32.980	b	34.92	-45.64	55200.01	-152.63		
LeVerrier	I	2049-11-04T03:36:46.157	b	34.96	-45.69	53200.00	-150.87		
Galle	I	2049-11-04T03:38:05.103	b	35.25	-45.97	42000.16	-128.44		
Neptune	I	2049-11-04T03:23:22.755		32.07	-42.83	24763.45		30.92	31.80
Neptune	E	2049-11-04T03:57:39.434		39.48	-50.11	24763.61		-25.86	-26.64
Galle	E	2049-11-04T03:46:02.812	b	36.97	-47.66	41999.99	162.55		
LeVerrier	E	2049-11-04T03:47:11.559	b	37.22	-47.90	53200.00	163.23		
Lassell	E	2049-11-04T03:47:23.808	b	37.26	-47.94	55200.01	163.32		
Arago	E	2049-11-04T03:47:36.051	b	37.30	-47.99	57200.00	163.40		
Galatea	E	2049-11-04T03:48:05.123	b	37.41	-48.09	61953.01	163.58		
Adams	E	2049-11-04T03:48:11.113	b	37.43	-48.11	62932.99	163.61		


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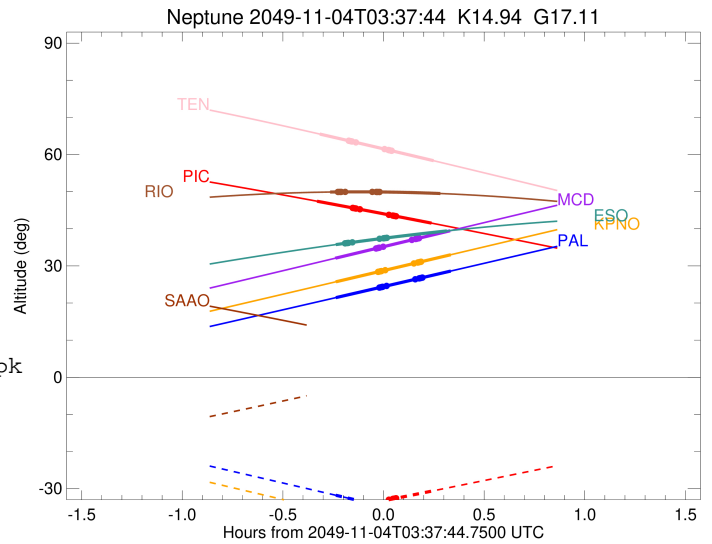
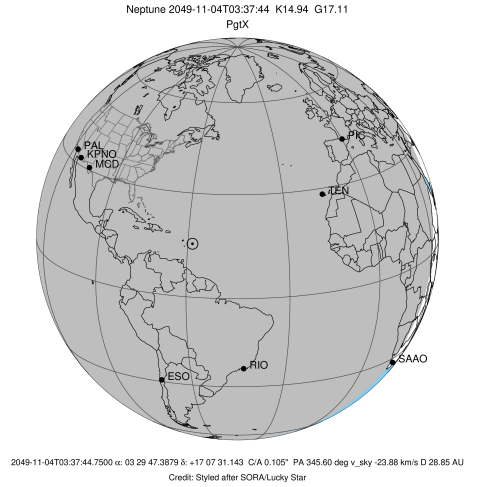
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-11-04T03:35:42.670
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : TEN
Location            : Teide Obs./Tenerife
Latitude (deg)      : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)       : 2.395
Gaia source ID      : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude         : 14.938
G magnitude         : 17.111
RP magnitude        : 16.470
BP magnitude        : 17.607
DUPflag            : 0
Distance (au)       : 28.850
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)  : 84.58
B (ring opening deg) : 4.02
PA of pole (deg)    : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.072
C/A sky separation (km) : 1501.9
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.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	2049-11-04T03:27:31.814	b	63.69	-51.39	62933.00	-163.69		
Galatea	I	2049-11-04T03:27:37.801	b	63.67	-51.37	61952.99	-163.67		
Arago	I	2049-11-04T03:28:06.852	b	63.57	-51.26	57200.01	-163.55		
Lassell	I	2049-11-04T03:28:19.082	b	63.52	-51.22	55200.01	-163.49		
LeVerrier	I	2049-11-04T03:28:31.317	b	63.48	-51.17	53200.00	-163.43		
Galle	I	2049-11-04T03:29:39.927	b	63.24	-50.93	42000.01	-163.03		
Neptune	I	2049-11-04T03:18:43.211		65.52	-53.29	24763.64		24.66	25.42
Neptune	E	2049-11-04T03:52:42.577		58.33	-45.90	24763.43		-31.57	-32.45
Galle	E	2049-11-04T03:37:31.102	b	61.58	-49.22	41999.94	128.59		
LeVerrier	E	2049-11-04T03:38:53.881	b	61.29	-48.92	53200.01	145.06		
Lassell	E	2049-11-04T03:39:07.546	b	61.24	-48.87	55200.00	147.60		
Arago	E	2049-11-04T03:39:20.998	b	61.19	-48.82	57200.01	149.72		
Galatea	E	2049-11-04T03:39:52.326	b	61.08	-48.71	61952.99	153.50		
Adams	E	2049-11-04T03:39:58.698	b	61.06	-48.68	62932.99	154.11		

```

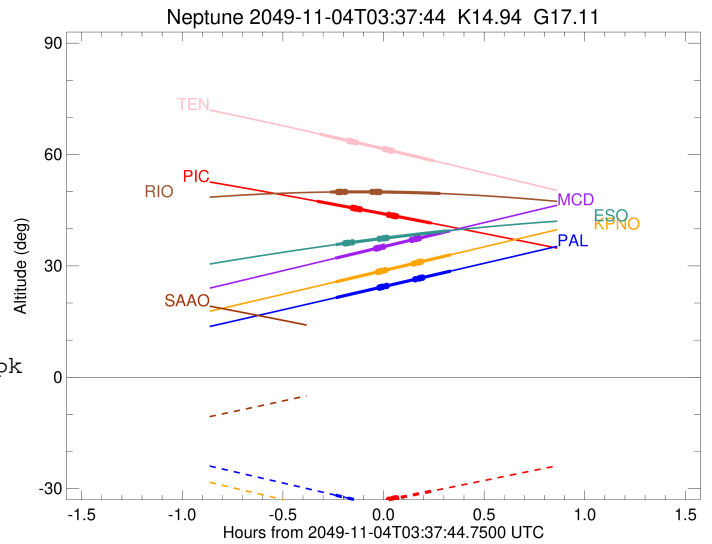
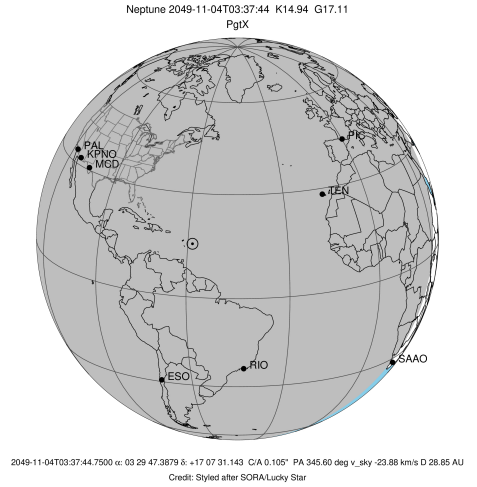
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2049-11-04T03:38:17.180
Event type            : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code         : RIO
Location              : Rio de Janeiro
Latitude (deg)        : -22.89506
E. Longitude (deg)    : 316.77708
Altitude (km)         : 0.033
Gaia source ID        : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 14.938
G magnitude           : 17.111
RP magnitude          : 16.470
BP magnitude          : 17.607
DUPflag              : 0
Distance (au)         : 28.850
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)   : 84.42
B (ring opening deg) : 4.02
PA of pole (deg)     : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.298
C/A sky separation (km) : 6233.9
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.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	2049-11-04T03:24:21.953	b	49.92	-50.00	62933.00	-162.42		
Galatea	I	2049-11-04T03:24:27.988	b	49.93	-49.99	61953.00	-162.31		
Arago	I	2049-11-04T03:24:57.327	b	49.93	-49.96	57200.01	-161.68		
Lassell	I	2049-11-04T03:25:09.709	b	49.93	-49.94	55200.00	-161.36		
LeVerrier	I	2049-11-04T03:25:22.117	b	49.93	-49.93	53200.00	-161.00		
Galle	I	2049-11-04T03:26:32.272	b	49.94	-49.84	42000.01	-157.92		
Neptune	I	2049-11-04T03:21:50.545		49.90	-50.18	24763.88		13.74	14.21
Neptune	E	2049-11-04T03:54:43.686		49.50	-47.22	24763.04		-42.79	-43.77
Galle	E	2049-11-04T03:34:27.238	b	49.94	-49.20	42000.00	163.91		
LeVerrier	E	2049-11-04T03:35:34.342	b	49.93	-49.11	53200.01	169.43		
Lassell	E	2049-11-04T03:35:46.123	b	49.93	-49.09	55200.01	170.09		
Arago	E	2049-11-04T03:35:57.863	b	49.92	-49.07	57200.00	170.63		
Galatea	E	2049-11-04T03:36:25.644	b	49.92	-49.03	61953.01	171.41		
Adams	E	2049-11-04T03:36:31.360	b	49.92	-49.02	62932.99	171.48		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2049-11-04T03:40:04.690
Event type            : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
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        : 54847183344385536
2Mass ID (if available) : 03294738+1707314
ICRS Star Coord at Epoch: 03h 29m 47.38786s +17:07:31.14324s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 14.938
G magnitude           : 17.111
RP magnitude          : 16.470
BP magnitude          : 17.607
DUPflag              : 0
Distance (au)         : 28.850
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.88
Sun-Target sep (deg) : 166.99
Sun-Moon sep (deg)   : 84.23
B (ring opening deg) : 4.02
PA of pole (deg)     : -42.53
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.285
C/A sky separation (km) : 5954.6
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	2049-11-04T03:26:29.680	b	36.11	-43.14	62933.01	-162.63		
Galatea	I	2049-11-04T03:26:35.707	b	36.12	-43.15	61952.99	-162.53		
Arago	I	2049-11-04T03:27:04.999	b	36.18	-43.18	57199.99	-161.97		
Lassell	I	2049-11-04T03:27:17.358	b	36.20	-43.20	55200.01	-161.68		
LeVerrier	I	2049-11-04T03:27:29.740	b	36.23	-43.21	53200.00	-161.36		
Galle	I	2049-11-04T03:28:39.673	b	36.37	-43.30	42000.00	-158.60		
Neptune	I	2049-11-04T03:23:31.970		35.74	-42.91	24763.87		14.50	14.98
Neptune	E	2049-11-04T03:56:36.756		39.42	-44.84	24763.07		-42.22	-43.20
Galle	E	2049-11-04T03:36:36.337	b	37.31	-43.83	42000.00	165.81		
LeVerrier	E	2049-11-04T03:37:42.710	b	37.44	-43.90	53199.99	171.12		
Lassell	E	2049-11-04T03:37:54.379	b	37.46	-43.91	55200.00	171.66		
Arago	E	2049-11-04T03:38:06.015	b	37.48	-43.92	57200.00	172.06		
Galatea	E	2049-11-04T03:38:33.605	b	37.53	-43.95	61953.00	172.32		
Adams	E	2049-11-04T03:38:39.293	b	37.54	-43.96	62933.01	172.26		