

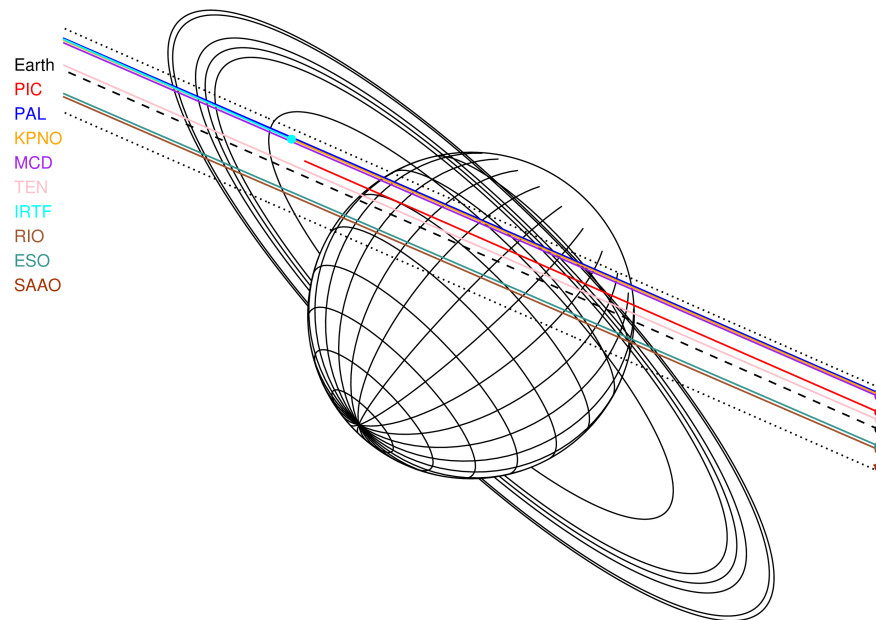
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2029-09-18T05:00:29.830
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 2550506478361238656
 2Mass ID (if available) : 00380244+0225145

Neptune 2029-09-18T05:00:29 K14.85 G16.09 PgtRgt

ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.850
 G magnitude : 16.092
 RP magnitude : 15.620
 BP magnitude : 16.388
 DUPflag : 0
 Distance (au) : 28.884
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 165.39
 Sun-Moon sep (deg) : 66.05
 B (ring opening deg) : -16.20
 PA of pole (deg) : -45.73



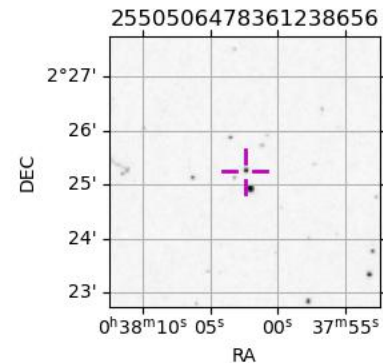
2029-09-18T05:00:29.8300 ra: 00 38 02.4472 s: +02 25 14.514 C/A 0.436° PA 156.22 deg v_sky -23.34 km/s D 28.88 AU
 Credit: Styled after SORA/Lucky Star



#	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

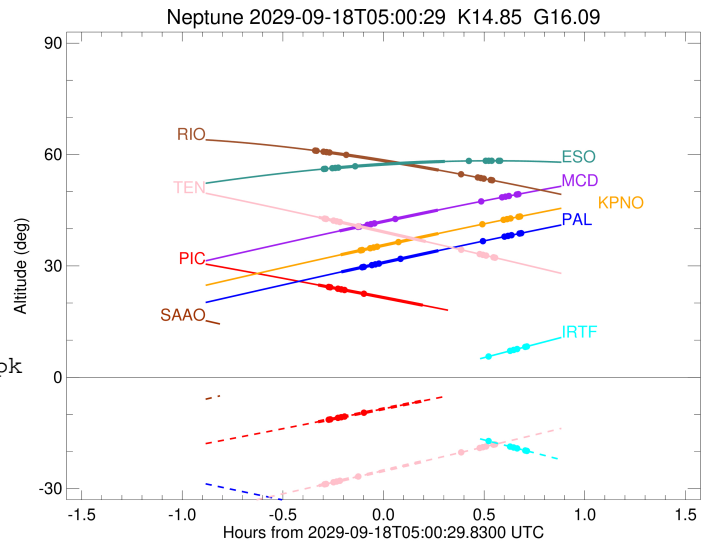
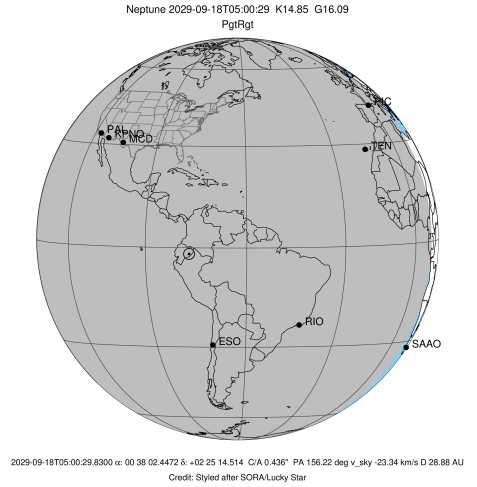
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1		+	+	SEP 18 04:41 - SEP 18 05:12	PieRnn
PAL	Palomar Mt (200")	33.4	243.1		+	+	SEP 18 04:47 - SEP 18 05:41	PieRne
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+	SEP 18 04:47 - SEP 18 05:40	PieRne
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+	SEP 18 04:47 - SEP 18 05:40	PieRne
TEN	Teide Obs./Tenerife	28.3	343.5		+	+	SEP 18 04:41 - SEP 18 05:33	PieRne
IRTF	Mauna Kea/IRTF	19.8	204.5			+	SEP 18 05:31 - SEP 18 05:42	PnnRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+	+	+	SEP 18 04:40 - SEP 18 05:32	PieRie
ESO	European Southern Obs	-29.3	289.3	+	+	+	SEP 18 04:42 - SEP 18 05:35	PieRie
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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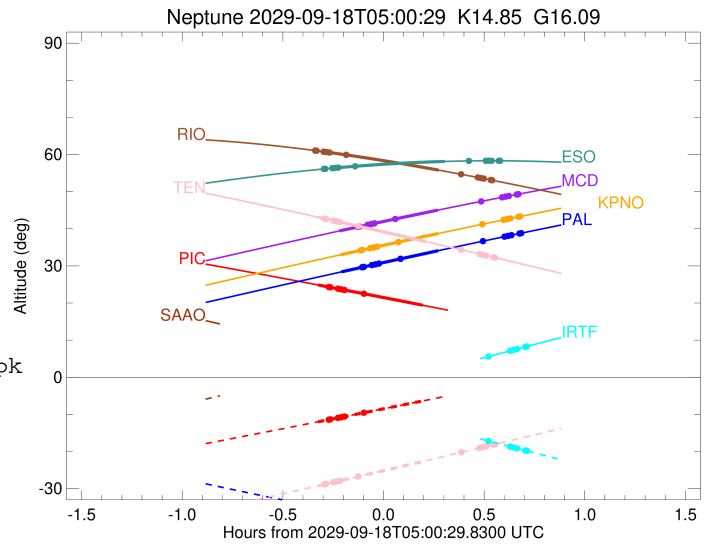
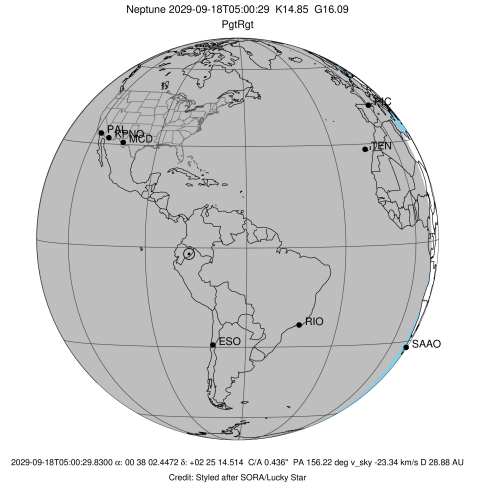
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2029-09-18T04:56:36.380
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 14.850
G magnitude          : 16.092
RP magnitude         : 15.620
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)       : 28.884
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)  : 66.68
B (ring opening deg) : -16.20
PA of pole (deg)    : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.541
C/A sky separation (km) : 11339.0
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	2029-09-18T04:44:01.952	b	24.35	-11.45	62933.00	-35.07		
Galatea	I	2029-09-18T04:44:29.947	b	24.27	-11.37	61953.00	-34.95		
Arago	I	2029-09-18T04:46:47.244	b	23.87	-10.96	57200.00	-34.27		
Lassell	I	2029-09-18T04:47:45.897	b	23.70	-10.78	55200.00	-33.93		
LeVerrier	I	2029-09-18T04:48:45.171	b	23.53	-10.61	53200.00	-33.55		
Galle	I	2029-09-18T04:54:32.773	b	22.52	-9.57	42000.00	-30.70		
Neptune	I	2029-09-18T04:41:00.622		24.87	-11.99	24745.18		46.77	47.75
Neptune	E	2029-09-18T05:12:13.710		19.40	-6.37	24763.74		4.98	5.15
Galle	E	2029-09-18T05:23:42.860		17.35	-4.28x	42000.00	30.87		
LeVerrier	E	2029-09-18T05:29:27.082		16.32	-3.23x	53200.00	33.85		
Lassell	E	2029-09-18T05:30:25.863		16.15	-3.06x	55200.00	34.19		
Arago	E	2029-09-18T05:31:24.107		15.97	-2.88x	57200.00	34.48		
Galatea	E	2029-09-18T05:33:40.740		15.56	-2.46x	61953.00	35.07		
Adams	E	2029-09-18T05:34:08.646		15.48	-2.38x	62933.00	35.17		

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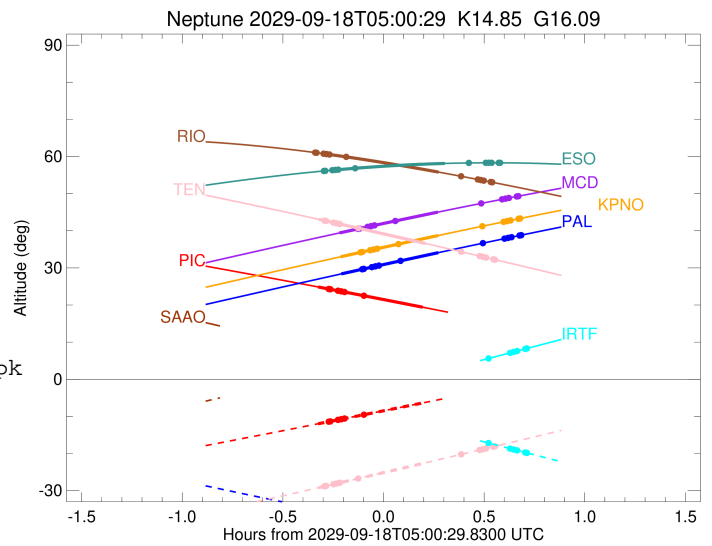
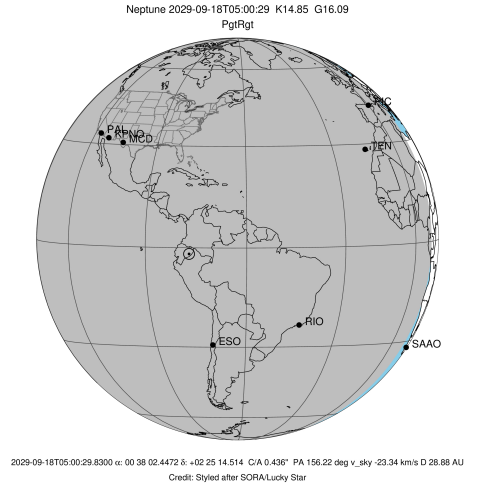
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2029-09-18T05:02:23.520
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PAL
Location              : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.850
G magnitude           : 16.092
RP magnitude         : 15.620
BP magnitude         : 16.388
DUPflag              : 0
Distance (au)        : 28.884
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)   : 66.32
B (ring opening deg) : -16.20
PA of pole (deg)     : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.665
C/A sky separation (km) : 13929.2
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	2029-09-18T04:53:55.549	b	29.59	-37.28	62933.00	-33.47		
Galatea	I	2029-09-18T04:54:24.899	b	29.69	-37.37	61953.00	-33.30		
Arago	I	2029-09-18T04:56:49.566	b	30.17	-37.79	57200.00	-32.38		
Lassell	I	2029-09-18T04:57:51.760	b	30.37	-37.97	55200.00	-31.93		
LeVerrier	I	2029-09-18T04:58:54.876	b	30.58	-38.15	53200.00	-31.44		
Galle	I	2029-09-18T05:05:15.016	b	31.84	-39.24	42000.00	-26.84		
Neptune	I	2029-09-18T04:47:54.648		28.39	-36.22	24741.30		53.17	54.10
Neptune	E	2029-09-18T05:16:52.756		34.11	-41.19	24762.58		11.53	11.93
Galle	E	2029-09-18T05:30:01.221		36.64	-43.30	42000.00	26.66		
LeVerrier	E	2029-09-18T05:36:20.761		37.84	-44.27	53200.00	31.76		
Lassell	E	2029-09-18T05:37:23.178		38.04	-44.43	55200.00	32.31		
Arago	E	2029-09-18T05:38:24.605		38.23	-44.59	57200.00	32.80		
Galatea	E	2029-09-18T05:40:47.377		38.67	-44.94	61953.00	33.75		
Adams	E	2029-09-18T05:41:16.345		38.76	-45.01	62933.00	33.91		

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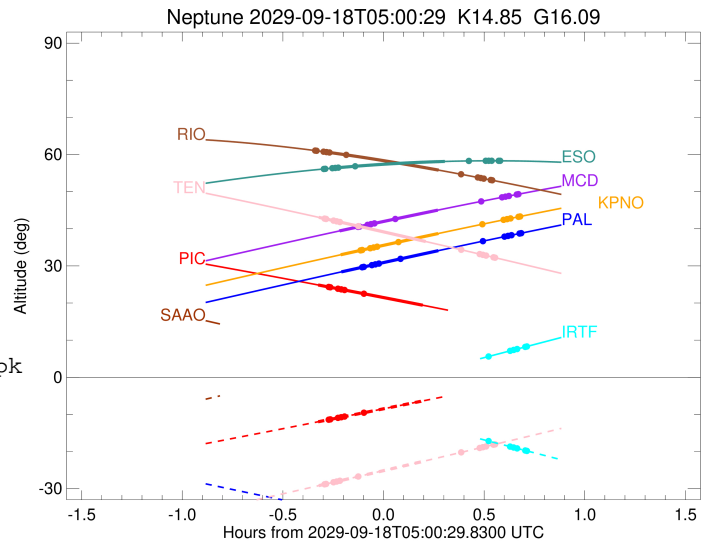
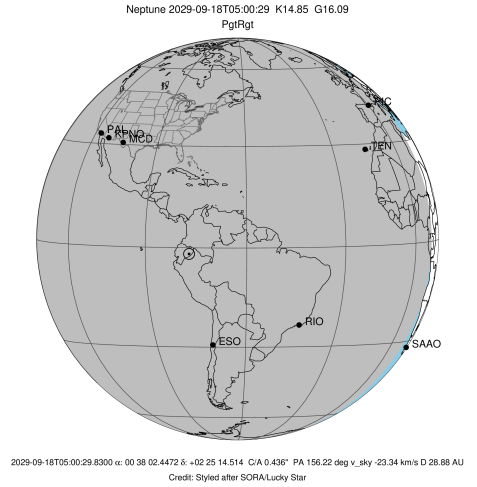
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2029-09-18T05:02:16.820
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 14.850
G magnitude          : 16.092
RP magnitude         : 15.620
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)       : 28.884
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)  : 66.39
B (ring opening deg) : -16.20
PA of pole (deg)    : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.654
C/A sky separation (km) : 13694.6
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	2029-09-18T04:53:27.058	b	34.14	-41.64	62933.00	-33.72		
Galatea	I	2029-09-18T04:53:56.191	b	34.24	-41.72	61953.00	-33.56		
Arago	I	2029-09-18T04:56:19.713	b	34.72	-42.12	57200.00	-32.65		
Lassell	I	2029-09-18T04:57:21.373	b	34.92	-42.30	55200.00	-32.21		
LeVerrier	I	2029-09-18T04:58:23.914	b	35.13	-42.47	53200.00	-31.74		
Galle	I	2029-09-18T05:04:38.969	b	36.36	-43.51	42000.00	-27.39		
Neptune	I	2029-09-18T04:47:42.337		33.00	-40.65	24741.63		52.61	53.55
Neptune	E	2029-09-18T05:16:51.670		38.73	-45.46	24762.75		10.88	11.25
Galle	E	2029-09-18T05:29:50.438		41.20	-47.42	42000.00	27.22		
LeVerrier	E	2029-09-18T05:36:04.524		42.36	-48.32	53200.00	32.09		
Lassell	E	2029-09-18T05:37:06.333		42.55	-48.46	55200.00	32.62		
Arago	E	2029-09-18T05:38:07.210		42.74	-48.60	57200.00	33.08		
Galatea	E	2029-09-18T05:40:28.853		43.18	-48.93	61953.00	33.99		
Adams	E	2029-09-18T05:40:57.613		43.26	-48.99	62933.00	34.16		

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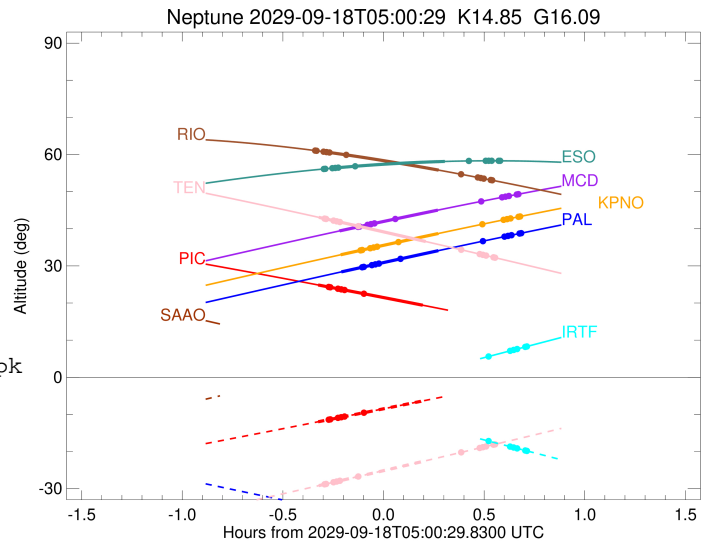
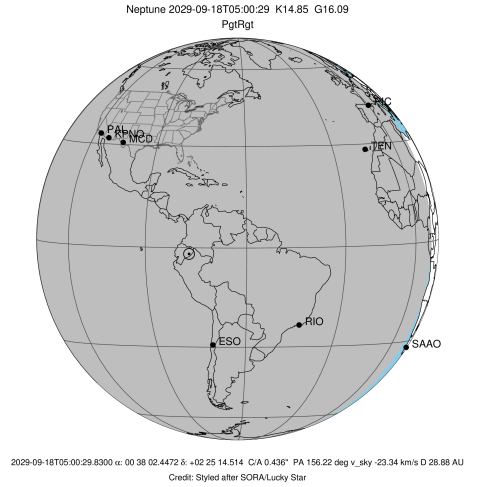
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2029-09-18T05:02:01.790
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.850
G magnitude           : 16.092
RP magnitude          : 15.620
BP magnitude          : 16.388
DUPflag               : 0
Distance (au)        : 28.884
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)   : 66.49
B (ring opening deg) : -16.20
PA of pole (deg)     : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.639
C/A sky separation (km) : 13376.3
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	2029-09-18T04:52:42.800	b	40.46	-47.30	62933.00	-34.05		
Galatea	I	2029-09-18T04:53:11.650	b	40.56	-47.37	61953.00	-33.89		
Arago	I	2029-09-18T04:55:33.687	b	41.02	-47.74	57200.00	-33.01		
Lassell	I	2029-09-18T04:56:34.655	b	41.21	-47.90	55200.00	-32.59		
LeVerrier	I	2029-09-18T04:57:36.455	b	41.41	-48.05	53200.00	-32.13		
Galle	I	2029-09-18T05:03:45.183	b	42.59	-48.97	42000.00	-28.10		
Neptune	I	2029-09-18T04:47:19.917		39.41	-46.45	24742.08		51.86	52.80
Neptune	E	2029-09-18T05:16:44.071		45.03	-50.81	24762.93		10.00	10.35
Galle	E	2029-09-18T05:29:29.289		47.35	-52.45	42000.00	27.94		
LeVerrier	E	2029-09-18T05:35:36.548		48.43	-53.18	53200.00	32.51		
Lassell	E	2029-09-18T05:36:37.586		48.61	-53.30	55200.00	33.01		
Arago	E	2029-09-18T05:37:37.764		48.79	-53.41	57200.00	33.45		
Galatea	E	2029-09-18T05:39:57.974		49.19	-53.67	61953.00	34.31		
Adams	E	2029-09-18T05:40:26.470		49.27	-53.72	62933.00	34.47		


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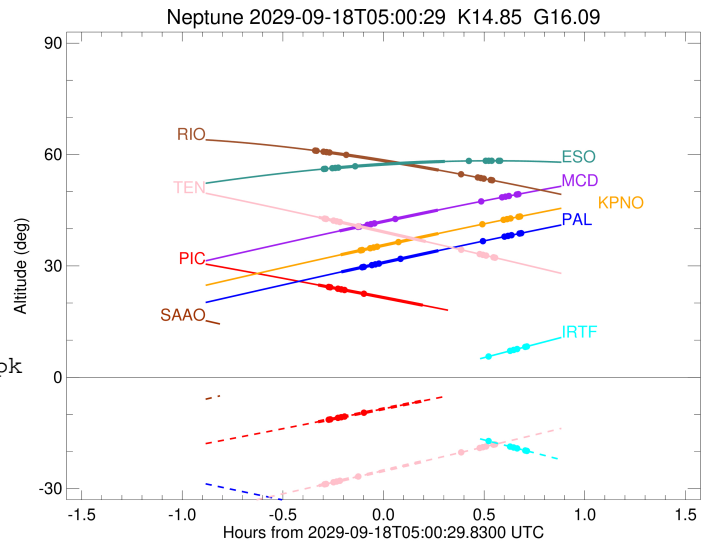
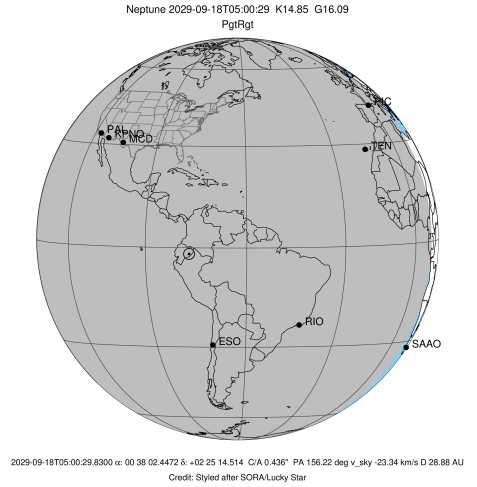
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2029-09-18T04:57:06.300
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.850
G magnitude           : 16.092
RP magnitude         : 15.620
BP magnitude         : 16.388
DUPflag              : 0
Distance (au)        : 28.884
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)   : 66.87
B (ring opening deg) : -16.20
PA of pole (deg)     : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.483
C/A sky separation (km) : 10113.1
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	2029-09-18T04:42:49.771	b	42.76	-28.85	62933.00	-36.09		
Galatea	I	2029-09-18T04:43:16.961	b	42.67	-28.76	61953.00	-35.99		
Arago	I	2029-09-18T04:45:29.978	b	42.22	-28.30	57200.00	-35.45		
Lassell	I	2029-09-18T04:46:26.615	b	42.03	-28.10	55200.00	-35.17		
LeVerrier	I	2029-09-18T04:47:23.726	b	41.84	-27.90	53200.00	-34.86		
Galle	I	2029-09-18T04:52:55.977	b	40.72	-26.75	42000.00	-32.36		
Neptune	I	2029-09-18T04:41:10.083		43.09	-29.20	24746.89		44.00	44.97
Neptune	E	2029-09-18T05:13:03.987		36.57	-22.49	24763.96		1.84	1.90
Galle	E	2029-09-18T05:23:28.374		34.39	-20.27	42000.00	32.84		
LeVerrier	E	2029-09-18T05:28:56.636		33.23	-19.10	53200.00	35.13		
Lassell	E	2029-09-18T05:29:53.363		33.03	-18.89	55200.00	35.38		
Arago	E	2029-09-18T05:30:49.701		32.83	-18.69	57200.00	35.61		
Galatea	E	2029-09-18T05:33:02.288		32.37	-18.21	61953.00	36.07		
Adams	E	2029-09-18T05:33:29.430		32.27	-18.12	62933.00	36.15		

```

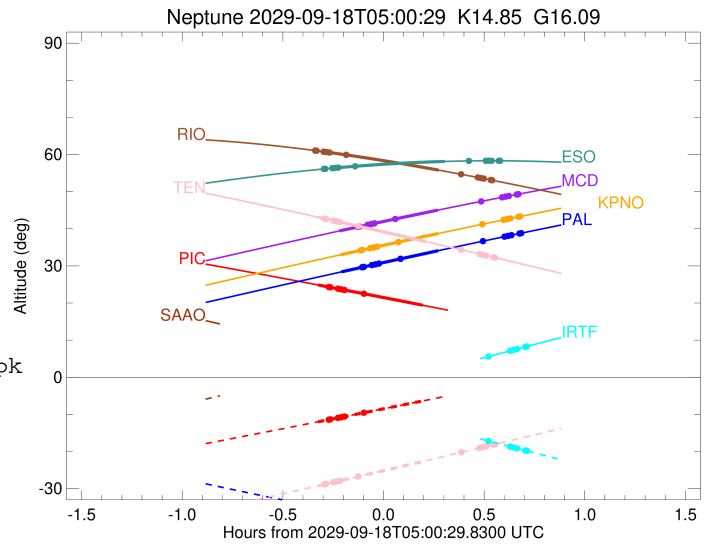
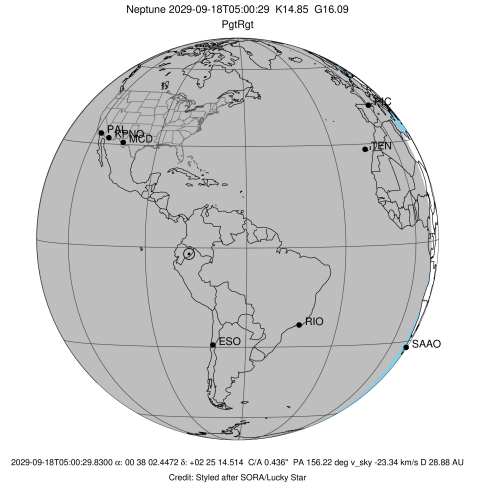
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2029-09-18T05:03:48.270
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.850
G magnitude           : 16.092
RP magnitude         : 15.620
BP magnitude         : 16.388
DUPflag              : 0
Distance (au)        : 28.884
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)   : 65.73
B (ring opening deg) : -16.20
PA of pole (deg)     : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.646
C/A sky separation (km) : 13530.7
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	2029-09-18T04:54:33.541	b	-3.19x	-8.46	62933.00	-33.15		
Galatea	I	2029-09-18T04:55:03.171	b	-3.07x	-8.58	61953.00	-32.99		
Arago	I	2029-09-18T04:57:29.126	b	-2.50x	-9.15	57200.00	-32.11		
Lassell	I	2029-09-18T04:58:31.825	b	-2.25x	-9.39	55200.00	-31.68		
LeVerrier	I	2029-09-18T04:59:35.415	b	-2.00x	-9.64	53200.00	-31.22		
Galle	I	2029-09-18T05:05:56.251	b	-0.51x	-11.13	42000.00	-27.05		
Neptune	I	2029-09-18T04:48:59.308		-4.50x	-7.16	24742.00		51.97	52.92
Neptune	E	2029-09-18T05:18:37.251		2.48x	-14.10	24762.78		10.68	11.05
Galle	E	2029-09-18T05:31:42.080		5.57	-17.15	42000.00	26.92		
LeVerrier	E	2029-09-18T05:38:00.983		7.06	-18.62	53200.00	31.65		
Lassell	E	2029-09-18T05:39:03.657		7.31	-18.87	55200.00	32.16		
Arago	E	2029-09-18T05:40:05.397		7.55	-19.10	57200.00	32.62		
Galatea	E	2029-09-18T05:42:29.076		8.11	-19.66	61953.00	33.51		
Adams	E	2029-09-18T05:42:58.253		8.23	-19.77	62933.00	33.67		

```

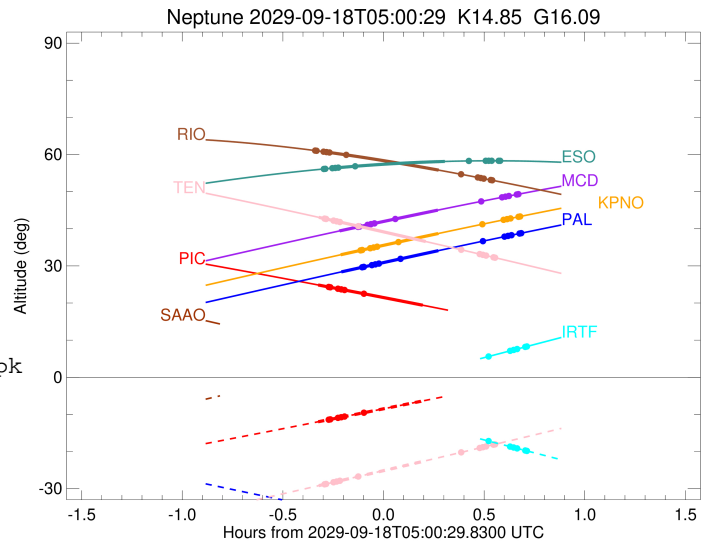
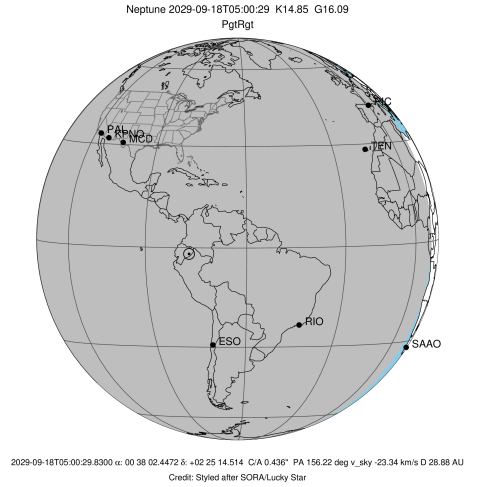
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2029-09-18T05:00:02.140
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)  : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.850
G magnitude           : 16.092
RP magnitude          : 15.620
BP magnitude          : 16.388
DUPflag              : 0
Distance (au)        : 28.884
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)   : 66.84
B (ring opening deg) : -16.20
PA of pole (deg)     : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.280
C/A sky separation (km) : 5870.9
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	2029-09-18T04:40:07.032		61.07	-55.45	62933.00	-38.15		
Galatea	I	2029-09-18T04:40:32.731		61.02	-55.37	61953.00	-38.12		
Arago	I	2029-09-18T04:42:37.710		60.77	-54.97	57200.00	-37.94		
Lassell	I	2029-09-18T04:43:30.494	b	60.66	-54.80	55200.00	-37.84		
LeVerrier	I	2029-09-18T04:44:23.414	b	60.55	-54.62	53200.00	-37.74		
Galle	I	2029-09-18T04:49:23.437	b	59.91	-53.64	42000.00	-36.80		
Neptune	I	2029-09-18T04:43:08.310		60.70	-54.87	24752.67		34.41	35.33
Neptune	E	2029-09-18T05:16:56.748		55.80	-48.01	24763.27		-8.26	-8.55
Galle	E	2029-09-18T05:23:26.676		54.72	-46.64	42000.00	37.12		
LeVerrier	E	2029-09-18T05:28:25.229		53.86	-45.58	53200.00	37.83		
Lassell	E	2029-09-18T05:29:18.046		53.70	-45.40	55200.00	37.91		
Arago	E	2029-09-18T05:30:10.755		53.55	-45.21	57200.00	37.98		
Galatea	E	2029-09-18T05:32:15.652		53.18	-44.76	61953.00	38.12		
Adams	E	2029-09-18T05:32:41.349		53.11	-44.67	62933.00	38.15		


```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2029-09-18T05:01:58.820
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      : 2550506478361238656
2Mass ID (if available) : 00380244+0225145
ICRS Star Coord at Epoch: 00h 38m 02.44716s +02:25:14.51371s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 14.850
G magnitude          : 16.092
RP magnitude         : 15.620
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)       : 28.884
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.34
Sun-Target sep (deg) : 165.39
Sun-Moon sep (deg)  : 66.67
B (ring opening deg) : -16.20
PA of pole (deg)    : -45.73
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.304
C/A sky separation (km) : 6376.2
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	2029-09-18T04:42:42.357		56.11	-62.63	62933.00	-37.96		
Galatea	I	2029-09-18T04:43:08.187		56.15	-62.63	61953.00	-37.92		
Arago	I	2029-09-18T04:45:13.855	b	56.32	-62.59	57200.00	-37.71		
Lassell	I	2029-09-18T04:46:06.960	b	56.39	-62.58	55200.00	-37.61		
LeVerrier	I	2029-09-18T04:47:00.225	b	56.46	-62.56	53200.00	-37.49		
Galle	I	2029-09-18T04:52:02.858	b	56.84	-62.43	42000.00	-36.38		
Neptune	I	2029-09-18T04:45:09.928		56.31	-62.60	24752.01		35.56	36.49
Neptune	E	2029-09-18T05:18:47.969		58.14	-60.90	24763.45		-7.13	-7.37
Galle	E	2029-09-18T05:25:45.639		58.27	-60.30	42000.00	36.84		
LeVerrier	E	2029-09-18T05:30:45.822		58.31	-59.81	53200.00	37.69		
Lassell	E	2029-09-18T05:31:38.822		58.32	-59.72	55200.00	37.78		
Arago	E	2029-09-18T05:32:31.691		58.32	-59.63	57200.00	37.87		
Galatea	E	2029-09-18T05:34:36.886		58.31	-59.41	61953.00	38.05		
Adams	E	2029-09-18T05:35:02.631		58.31	-59.36	62933.00	38.08		