

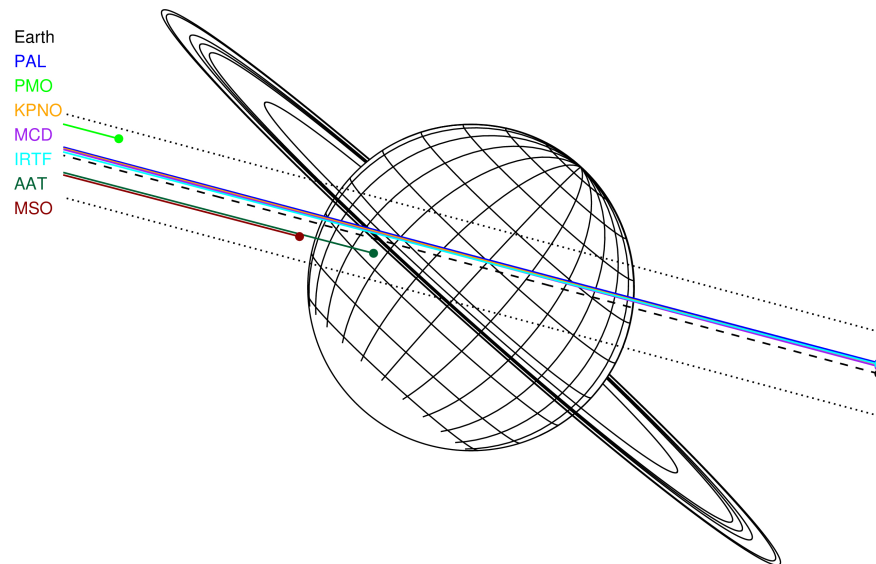
target : Neptune  
 target radius (km) : 24764.00  
 C/A epoch : 2049-10-19T10:36:03.320  
 Event type : PgtX  
 : Neptune occs: geocentric, topocentric  
 : No ring occs  
 Gaia source ID : 54865802024989568  
 2Mass ID (if available) : 03312609+1713430

Neptune 2049-10-19T10:36:03 K14.27 G17.76 PgtX

ICRS Star Coord at Epoch: 03h 31m 26.11426s +17:13:41.99313s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.272  
 G magnitude : 17.756  
 RP magnitude : 16.646  
 BP magnitude : 18.831  
 DUPflag : 0  
 Distance (au) : 28.942  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -20.90  
 Sun-Target sep (deg) : 150.98  
 Sun-Moon sep (deg) : 68.51  
 B (ring opening deg) : 4.21  
 PA of pole (deg) : -42.38



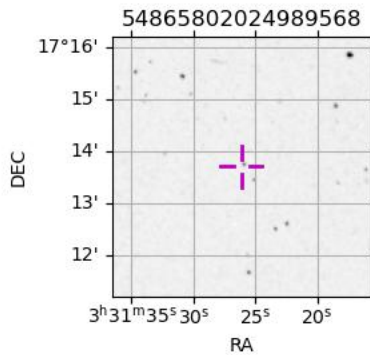
2049-10-19T10:36:03.3200 ex: 03 31 26.1143 s: +17 13 41.993 C/A 0.161'' PA 165.00 deg v\_sky -20.90 km/s D 28.94 AU  
 Credit: Styled after SORA/Lucky Star



#	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

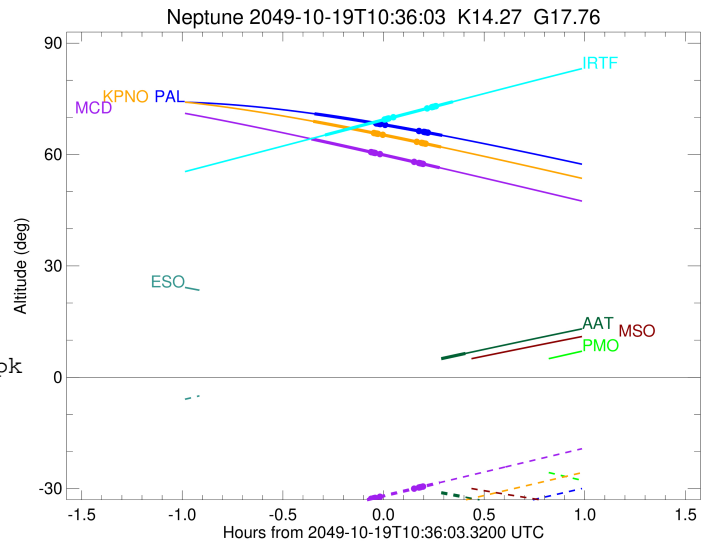
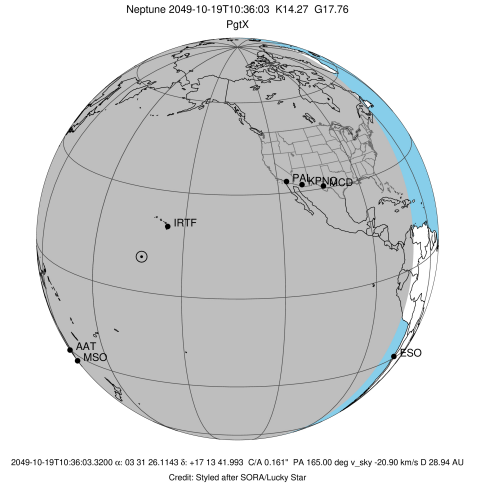
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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 19 10:15 - OCT 19 10:53	PieRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4		+	+	OCT 19 10:15 - OCT 19 10:53	PieRnn
MCD	McDonald Obs. 2.7m	30.7	256.0		+	+	OCT 19 10:14 - OCT 19 10:52	PieRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+	OCT 19 10:18 - OCT 19 10:56	PieRnn
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1		+		OCT 19 11:00 - OCT 19 11:00	PneRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



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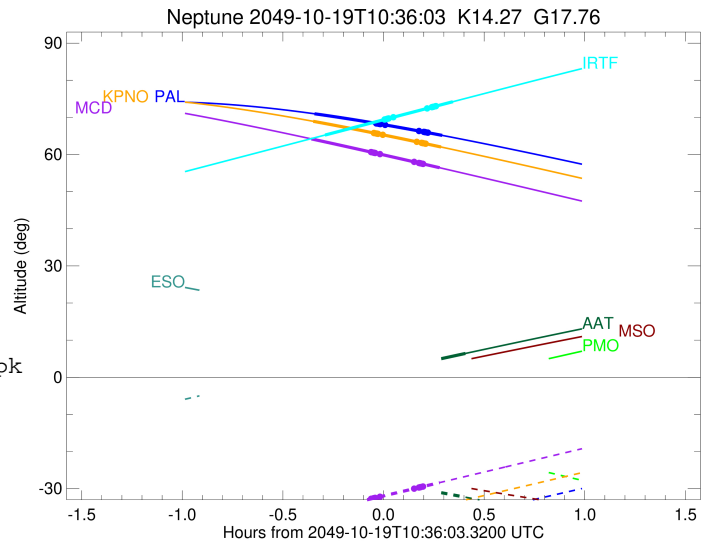
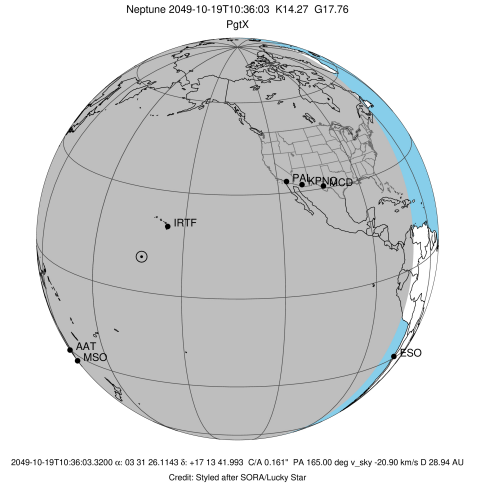
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-10-19T10:34:31.650
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 54865802024989568
2Mass ID (if available) : 03312609+1713430
ICRS Star Coord at Epoch: 03h 31m 26.11426s +17:13:41.99314s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 14.272
G magnitude          : 17.756
RP magnitude         : 16.646
BP magnitude         : 18.831
DUPflag             : 0
Distance (au)        : 28.942
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.90
Sun-Target sep (deg) : 150.98
Sun-Moon sep (deg)  : 69.20
B (ring opening deg) : 4.21
PA of pole (deg)    : -42.38
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.225
C/A sky separation (km) : 4719.6
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	2049-10-19T10:34:12.587	b	68.34	-42.41	62933.00	-134.18		
Galatea	I	2049-10-19T10:34:19.872	b	68.32	-42.39	61953.00	-134.89		
Arago	I	2049-10-19T10:34:54.601	b	68.23	-42.27	57199.99	-138.99		
Lassell	I	2049-10-19T10:35:08.898	b	68.20	-42.23	55199.99	-140.79		
LeVerrier	I	2049-10-19T10:35:23.020	b	68.16	-42.18	53200.00	-142.43		
Galle	I	2049-10-19T10:36:40.443	b	67.96	-41.92	42000.01	-144.75		
Neptune	I	2049-10-19T10:15:29.003		70.98	-46.09	24763.12		38.43	39.39
Neptune	E	2049-10-19T10:53:34.501		65.16	-38.53	24763.82		-16.51	-17.05
Galle	E	2049-10-19T10:46:26.112	b	66.37	-39.97	42000.01	131.36		
LeVerrier	E	2049-10-19T10:47:50.860	b	66.14	-39.68	53200.00	132.79		
Lassell	E	2049-10-19T10:48:05.912	b	66.09	-39.63	55200.00	132.95		
Arago	E	2049-10-19T10:48:20.946	b	66.05	-39.58	57200.00	133.10		
Galatea	E	2049-10-19T10:48:56.615	b	65.95	-39.46	61953.00	133.40		
Adams	E	2049-10-19T10:49:03.960	b	65.93	-39.44	62933.00	133.45		

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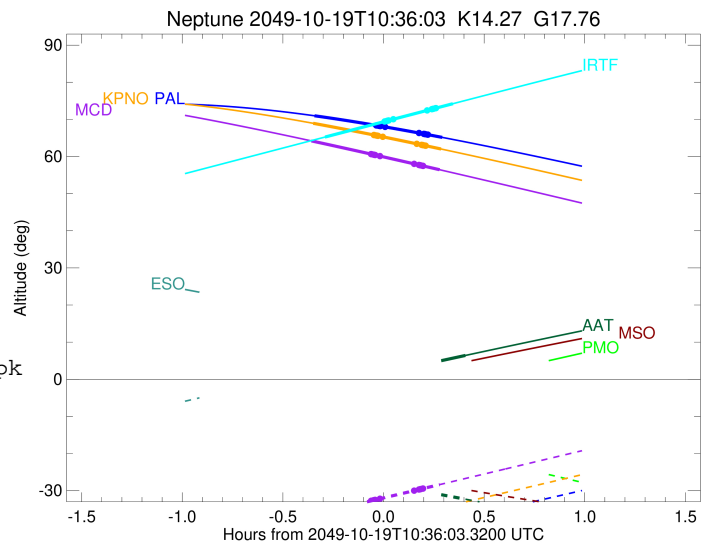
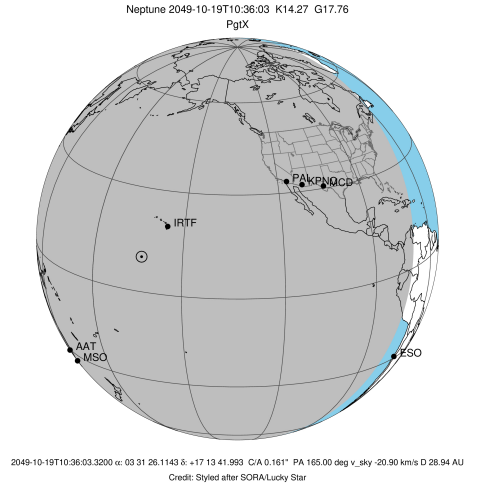
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2049-10-19T10:34:10.240
Event type            : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code         : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)        : 31.96333
E. Longitude (deg)    : 248.40000
Altitude (km)         : 2.120
Gaia source ID        : 54865802024989568
2Mass ID (if available) : 03312609+1713430
ICRS Star Coord at Epoch: 03h 31m 26.11426s +17:13:41.99314s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.272
G magnitude           : 17.756
RP magnitude          : 16.646
BP magnitude          : 18.831
DUPflag              : 0
Distance (au)         : 28.942
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.90
Sun-Target sep (deg)  : 150.98
Sun-Moon sep (deg)    : 69.16
B (ring opening deg) : 4.21
PA of pole (deg)      : -42.38
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.214
C/A sky separation (km) : 4499.2
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	2049-10-19T10:33:32.328	b	65.74	-38.65	62932.99	-131.90		
Galatea	I	2049-10-19T10:33:39.742	b	65.71	-38.62	61952.99	-132.47		
Arago	I	2049-10-19T10:34:15.140	b	65.61	-38.50	57200.00	-136.42		
Lassell	I	2049-10-19T10:34:29.690	b	65.56	-38.45	55200.00	-138.54		
LeVerrier	I	2049-10-19T10:34:44.014	b	65.52	-38.40	53200.00	-140.72		
Galle	I	2049-10-19T10:36:01.345	b	65.28	-38.13	42000.00	-146.54		
Neptune	I	2049-10-19T10:15:05.541		68.95	-42.43	24763.14		37.89	38.84
Neptune	E	2049-10-19T10:53:15.294		62.02	-34.54	24763.81		-16.99	-17.55
Galle	E	2049-10-19T10:45:47.017	b	63.46	-36.10	42000.00	131.54		
LeVerrier	E	2049-10-19T10:47:11.698	b	63.19	-35.81	53200.00	132.83		
Lassell	E	2049-10-19T10:47:26.747	b	63.14	-35.76	55199.99	132.98		
Arago	E	2049-10-19T10:47:41.780	b	63.09	-35.71	57200.00	133.11		
Galatea	E	2049-10-19T10:48:17.451	b	62.98	-35.58	61953.00	133.37		
Adams	E	2049-10-19T10:48:24.797	b	62.96	-35.56	62932.99	133.42		

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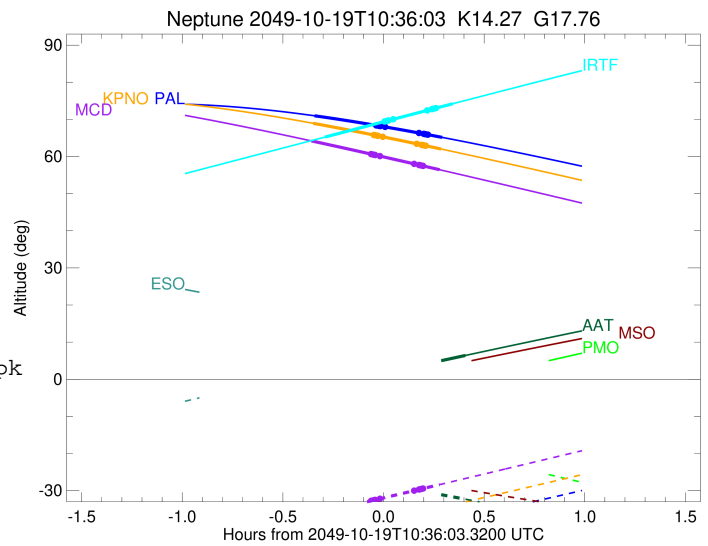
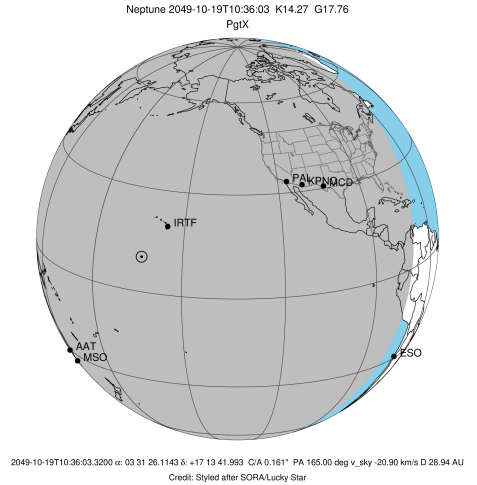
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-10-19T10:33:39.510
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 54865802024989568
2Mass ID (if available) : 03312609+1713430
ICRS Star Coord at Epoch: 03h 31m 26.11426s +17:13:41.99314s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 14.272
G magnitude          : 17.756
RP magnitude         : 16.646
BP magnitude         : 18.831
DUPflag             : 0
Distance (au)       : 28.942
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.90
Sun-Target sep (deg) : 150.98
Sun-Moon sep (deg)   : 69.09
B (ring opening deg) : 4.21
PA of pole (deg)     : -42.38
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.204
C/A sky separation (km) : 4283.9
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
    
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Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2049-10-19T10:32:42.830	b	60.59	-32.67	62933.01	-129.83		
Galatea	I	2049-10-19T10:32:50.369	b	60.56	-32.65	61953.00	-130.20		
Arago	I	2049-10-19T10:33:26.511	b	60.44	-32.52	57199.99	-133.25		
Lassell	I	2049-10-19T10:33:41.409	b	60.39	-32.47	55199.99	-135.33		
LeVerrier	I	2049-10-19T10:33:56.058	b	60.34	-32.41	53199.99	-137.80		
Galle	I	2049-10-19T10:35:13.847	b	60.07	-32.14	41999.99	-147.92		
Neptune	I	2049-10-19T10:14:32.389		64.22	-36.54	24763.16		37.33	38.28
Neptune	E	2049-10-19T10:52:47.210		56.45	-28.38	24763.80		-17.45	-18.02
Galle	E	2049-10-19T10:44:59.726	b	58.07	-30.05	42000.01	131.54		
LeVerrier	E	2049-10-19T10:46:24.453	b	57.77	-29.75	53200.00	132.70		
Lassell	E	2049-10-19T10:46:39.517	b	57.72	-29.69	55200.00	132.83		
Arago	E	2049-10-19T10:46:54.567	b	57.67	-29.64	57200.00	132.95		
Galatea	E	2049-10-19T10:47:30.284	b	57.55	-29.51	61953.00	133.19		
Adams	E	2049-10-19T10:47:37.641	b	57.52	-29.48	62933.01	133.23		

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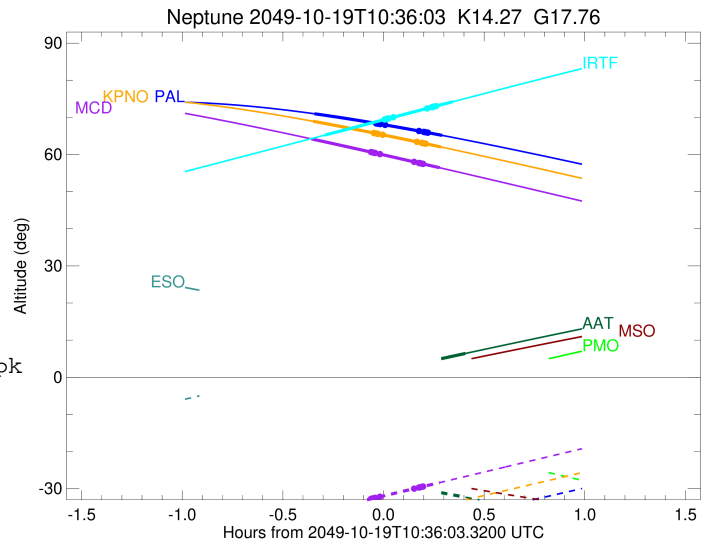
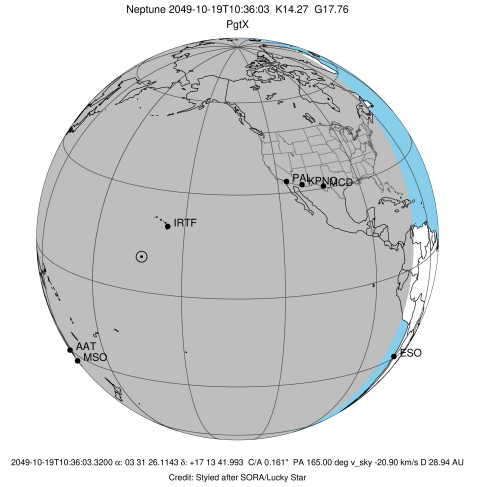
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2049-10-19T10:37:40.810
Event type           : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)  : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 54865802024989568
2Mass ID (if available) : 03312609+1713430
ICRS Star Coord at Epoch: 03h 31m 26.11426s +17:13:41.99313s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.272
G magnitude           : 17.756
RP magnitude         : 16.646
BP magnitude         : 18.831
DUPflag              : 0
Distance (au)        : 28.942
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -20.90
Sun-Target sep (deg) : 150.98
Sun-Moon sep (deg)  : 69.40
B (ring opening deg) : 4.21
PA of pole (deg)    : -42.38
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.204
C/A sky separation (km) : 4287.7
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.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	2049-10-19T10:36:44.010	b	69.52	-78.06	62933.00	-131.42		
Galatea	I	2049-10-19T10:36:51.457	b	69.55	-78.04	61953.00	-131.79		
Arago	I	2049-10-19T10:37:27.166	b	69.69	-77.95	57200.00	-134.84		
Lassell	I	2049-10-19T10:37:41.891	b	69.75	-77.92	55200.00	-136.90		
LeVerrier	I	2049-10-19T10:37:56.374	b	69.81	-77.88	53199.99	-139.35		
Galle	I	2049-10-19T10:39:13.329	b	70.11	-77.69	41999.99	-149.57		
Neptune	I	2049-10-19T10:18:34.577		65.24	-80.08	24763.15		37.65	38.60
Neptune	E	2049-10-19T10:56:46.063		74.24	-74.64	24763.79		-17.76	-18.34
Galle	E	2049-10-19T10:48:52.177	b	72.38	-76.09	42000.01	133.31		
LeVerrier	E	2049-10-19T10:50:15.785	b	72.71	-75.84	53199.99	134.47		
Lassell	E	2049-10-19T10:50:30.651	b	72.77	-75.80	55200.00	134.60		
Arago	E	2049-10-19T10:50:45.502	b	72.82	-75.75	57200.00	134.72		
Galatea	E	2049-10-19T10:51:20.749	b	72.96	-75.65	61953.01	134.97		
Adams	E	2049-10-19T10:51:28.009	b	72.99	-75.62	62933.00	135.01		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2049-10-19T10:40:51.700
Event type          : PgtX
: Neptune occs: geocentric, topocentric
: No ring occs
Observer code       : AAT
Location            : Siding Spring (AAT)
Latitude (deg)      : -31.27703
E. Longitude (deg)  : 149.06608
Altitude (km)       : 1.164
Gaia source ID      : 54865802024989568
2Mass ID (if available) : 03312609+1713430
ICRS Star Coord at Epoch: 03h 31m 26.11426s +17:13:41.99313s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 14.272
G magnitude          : 17.756
RP magnitude        : 16.646
BP magnitude        : 18.831
DUPflag             : 0
Distance (au)       : 28.942
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -20.90
Sun-Target sep (deg) : 150.98
Sun-Moon sep (deg)  : 68.83
B (ring opening deg) : 4.21
PA of pole (deg)    : -42.38
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.062
C/A sky separation (km) : 1292.5
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	2049-10-19T10:35:09.701	b	1.42x	-27.94	62933.01	-128.08		
Galatea	I	2049-10-19T10:35:17.362	b	1.44x	-27.96	61952.99	-127.74		
Arago	I	2049-10-19T10:35:54.854	b	1.57x	-28.07	57200.01	-125.66		
Lassell	I	2049-10-19T10:36:10.842	b	1.62x	-28.12	55200.01	-124.49		
LeVerrier	I	2049-10-19T10:36:26.997	b	1.67x	-28.17	53200.00	-123.06		
Galle	I	2049-10-19T10:38:03.572	b	2.00x	-28.45	42000.11	-105.79		
Neptune	I	2049-10-19T10:21:11.325		-1.39x	-25.42	24763.41		30.65	31.52
Neptune	E	2049-10-19T11:00:30.049		6.42	-32.31	24763.60		-24.70	-25.46
Galle	E	2049-10-19T10:47:52.376	b	3.94x	-30.17	42000.01	132.86		
LeVerrier	E	2049-10-19T10:49:16.535	b	4.22x	-30.41	53200.00	133.27		
Lassell	E	2049-10-19T10:49:31.538	b	4.27x	-30.45	55200.01	133.33		
Arago	E	2049-10-19T10:49:46.535	b	4.32x	-30.50	57200.01	133.39		
Galatea	E	2049-10-19T10:50:22.153	b	4.44x	-30.60	61953.01	133.50		
Adams	E	2049-10-19T10:50:29.493	b	4.46x	-30.62	62933.00	133.53		