

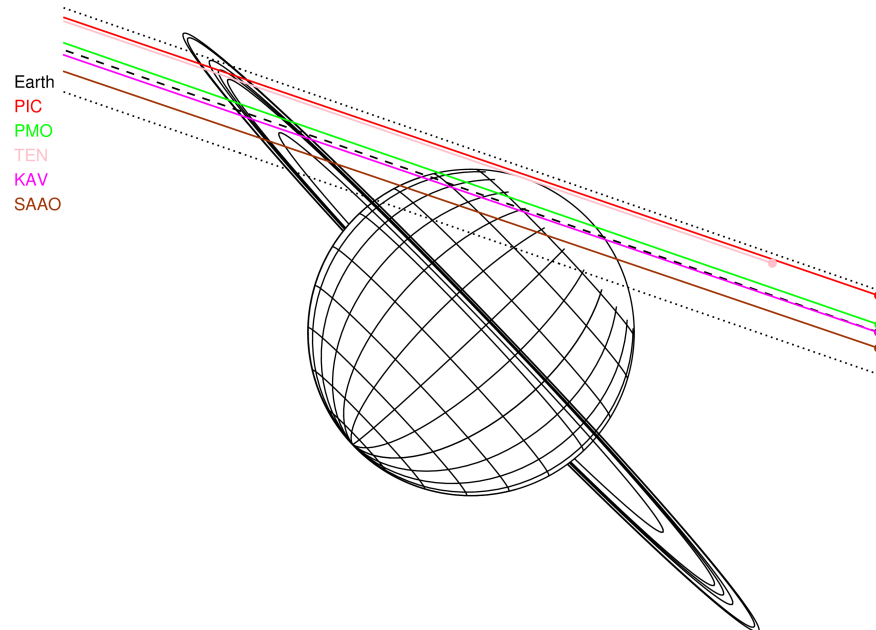
target : Neptune  
 target radius (km) : 24764.00  
 C/A epoch : 2042-10-17T20:10:32.750  
 Event type : PgtRgt  
 : Neptune occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 74371520554280448  
 2Mass ID (if available) : 02274884+1240583

ICRS Star Coord at Epoch: 02h 27m 48.86420s +12:40:58.26612s  
 RUWE (>1.4 is poor) : 0.99  
 K magnitude : 14.488  
 G magnitude : 16.220  
 RP magnitude : 15.581  
 BP magnitude : 16.699  
 DUPflag : 0  
 Distance (au) : 28.842  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.57  
 Sun-Target sep (deg) : 165.15  
 Sun-Moon sep (deg) : 153.35  
 B (ring opening deg) : -3.35  
 PA of pole (deg) : -46.62



2042-10-17T20:10:32.7500 α: 02 27 48.8642 δ: +12 40 58.266 C/A 0.970° PA 160.89 deg v\_sky -23.57 km/s D 28.84 AU  
 Credit: Styled after SORA/Lucky Star

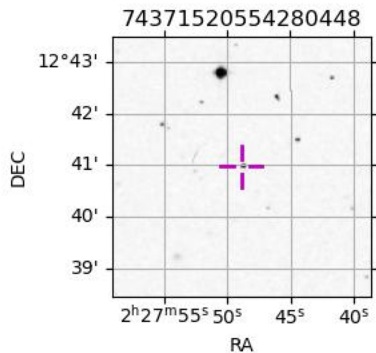
Neptune 2042-10-17T20:10:32 K14.49 G16.22 PgtRgt



#	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

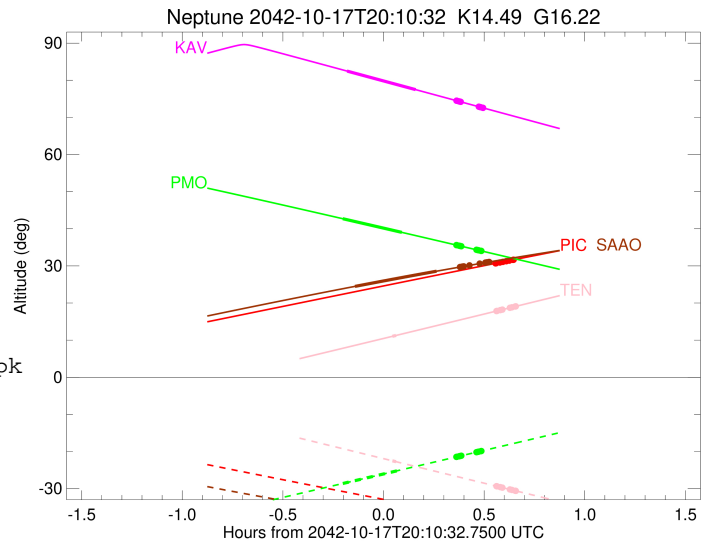
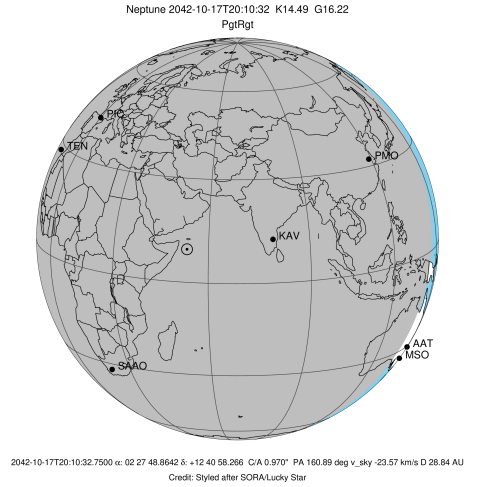
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ + + +		+ + + +	OCT 17 20:43 - OCT 17 20:48	PnnRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+ + + + +	+ +	+ + + + +	OCT 17 19:58 - OCT 17 20:39	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+ + + +	+ +	+ + + +	OCT 17 20:13 - OCT 17 20:49	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+ + + + +	+ +	+ + + + +	OCT 17 19:59 - OCT 17 20:39	PieRie
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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+ + + + +	+ +	+ + + + +	OCT 17 20:02 - OCT 17 20:41	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2042-10-17T20:12:38.750
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      : 74371520554280448
2Mass ID (if available) : 02274884+1240583
ICRS Star Coord at Epoch: 02h 27m 48.86420s +12:40:58.26612s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 14.488
G magnitude          : 16.220
RP magnitude         : 15.581
BP magnitude         : 16.699
DUPflag             : 0
Distance (au)       : 28.842
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.57
Sun-Target sep (deg) : 165.15
Sun-Moon sep (deg)  : 153.73
B (ring opening deg) : -3.35
PA of pole (deg)    : -46.62
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.210
C/A sky separation (km) : 25303.3
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.urall1.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
    
```



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

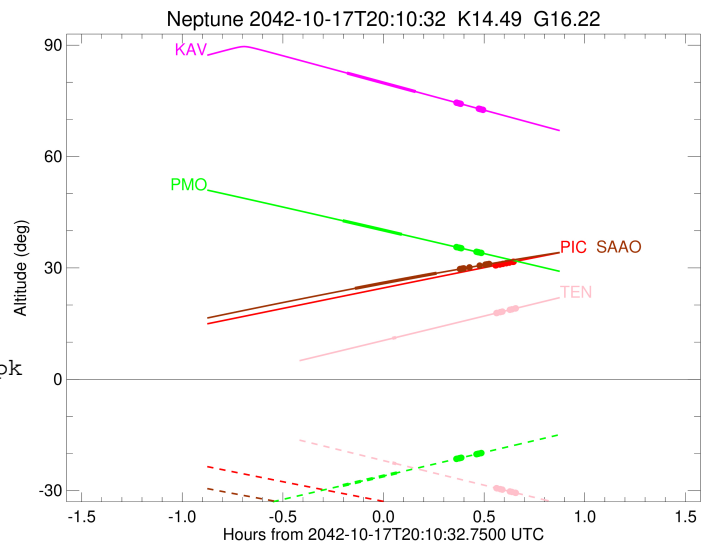
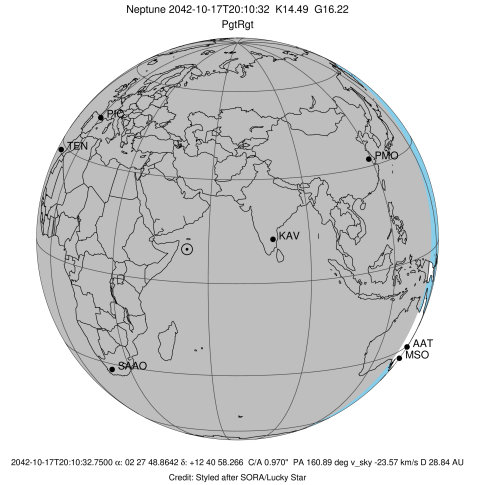
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2042-10-17T20:43:05.599		30.53	-38.40	62948.61	-98.07		
Galatea	I	2042-10-17T20:43:15.827		30.56	-38.43	61974.71	-93.65		
Arago	I	2042-10-17T20:44:15.970		30.74	-38.60	57496.67	-65.61		
Lassell	I	2042-10-17T20:46:58.767		31.23	-39.04	56324.38	54.43		

No planet occultations

Lassell	E	2042-10-17T20:46:55.589		31.22	-39.03	55200.55	39.84		
Arago	E	2042-10-17T20:47:34.325		31.34	-39.14	57202.29	63.10		
Galatea	E	2042-10-17T20:48:34.547		31.52	-39.30	61954.19	93.61		
Adams	E	2042-10-17T20:48:44.774		31.55	-39.33	62934.02	98.06		

```

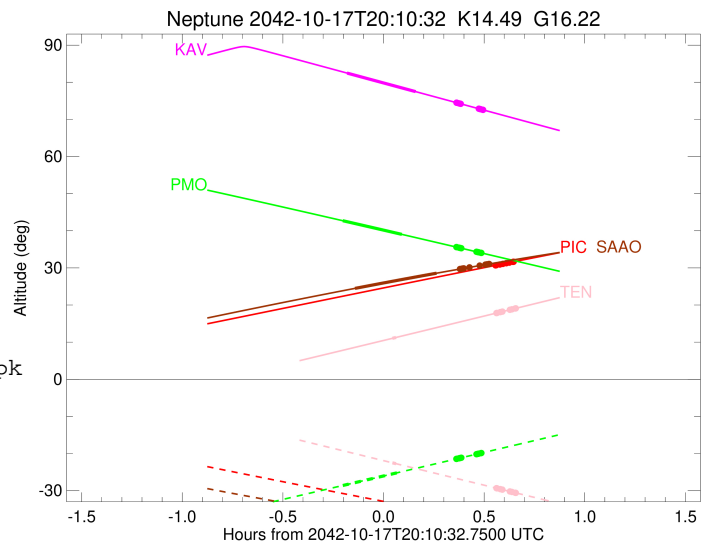
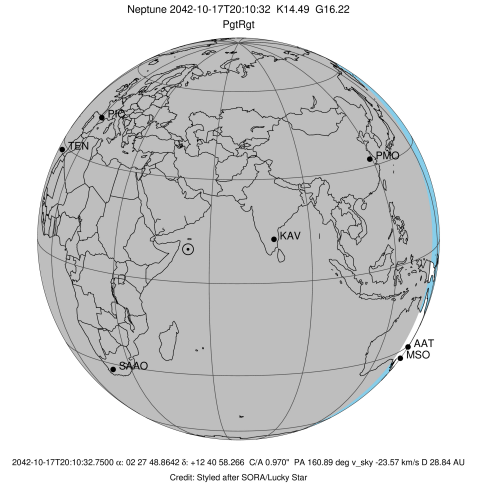
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2042-10-17T20:07:13.730
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 74371520554280448
2Mass ID (if available) : 02274884+1240583
ICRS Star Coord at Epoch: 02h 27m 48.86420s +12:40:58.26612s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.488
G magnitude           : 16.220
RP magnitude          : 15.581
BP magnitude          : 16.699
DUPflag              : 0
Distance (au)         : 28.842
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.57
Sun-Target sep (deg) : 165.15
Sun-Moon sep (deg)   : 153.00
B (ring opening deg) : -3.35
PA of pole (deg)     : -46.62
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.019
C/A sky separation (km) : 21308.1
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.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	2042-10-17T20:31:35.768		35.75	-21.60	62933.99	-130.03		
Galatea	I	2042-10-17T20:31:43.372		35.73	-21.57	61954.23	-127.66		
Arago	I	2042-10-17T20:32:22.695		35.59	-21.43	57203.95	-113.50		
Lassell	I	2042-10-17T20:32:40.931		35.52	-21.37	55207.16	-105.72		
LeVerrier	I	2042-10-17T20:33:00.716		35.45	-21.30	53214.46	-96.34		
Neptune	I	2042-10-17T19:58:24.546		42.71	-28.61	24762.56		85.46	85.61
Neptune	E	2042-10-17T20:16:03.206		39.03	-24.89	24763.61		31.76	32.65
LeVerrier	E	2042-10-17T20:37:45.341		34.45	-20.29	53200.91	96.23		
Lassell	E	2042-10-17T20:38:05.144		34.38	-20.22	55200.64	105.64		
Arago	E	2042-10-17T20:38:23.398		34.32	-20.16	57200.45	113.40		
Galatea	E	2042-10-17T20:39:02.767		34.18	-20.02	61953.22	127.53		
Adams	E	2042-10-17T20:39:10.382		34.15	-19.99	62933.19	129.89		

```

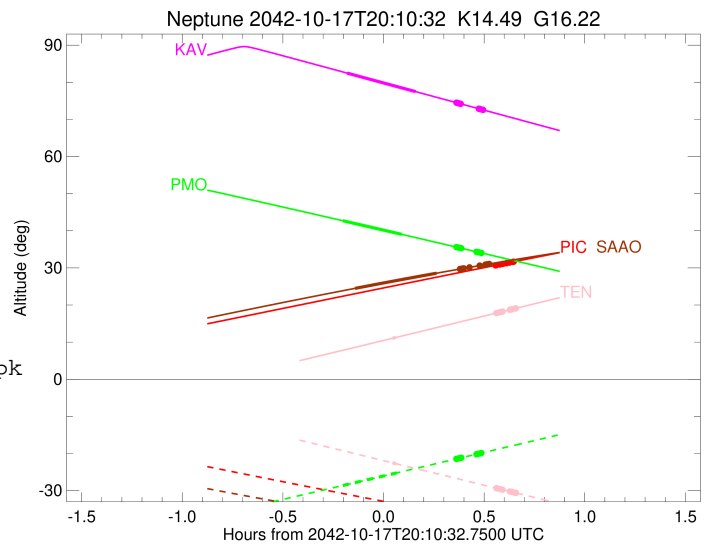
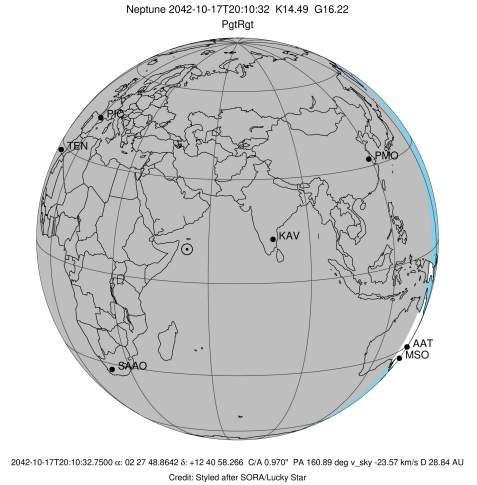
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2042-10-17T20:13:42.980
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 74371520554280448
2Mass ID (if available) : 02274884+1240583
ICRS Star Coord at Epoch: 02h 27m 48.86420s +12:40:58.26612s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.488
G magnitude           : 16.220
RP magnitude          : 15.581
BP magnitude          : 16.699
DUPflag               : 0
Distance (au)         : 28.842
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.57
Sun-Target sep (deg) : 165.15
Sun-Moon sep (deg)   : 153.84
B (ring opening deg) : -3.35
PA of pole (deg)     : -46.62
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.183
C/A sky separation (km) : 24750.3
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.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	2042-10-17T20:43:23.997		17.65	-29.16	62942.98	-103.29		
Galatea	I	2042-10-17T20:43:33.672		17.69	-29.19	61966.43	-99.31		
Arago	I	2042-10-17T20:44:28.554		17.89	-29.40	57306.37	-73.61		
Lassell	I	2042-10-17T20:44:58.919		18.00	-29.51	55991.30	-62.93		
Neptune	I	2042-10-17T20:13:09.532		11.02	-22.50	24762.85		63.88	64.64
Neptune	E	2042-10-17T20:14:16.529		11.26	-22.74	24762.94		60.25	61.08
Lassell	E	2042-10-17T20:47:48.111		18.62	-30.13	55202.17	55.16		
Arago	E	2042-10-17T20:48:19.287		18.74	-30.24	57201.99	72.92		
Galatea	E	2042-10-17T20:49:14.159		18.94	-30.44	61953.94	99.33		
Adams	E	2042-10-17T20:49:23.831		18.97	-30.48	62933.81	103.34		

```

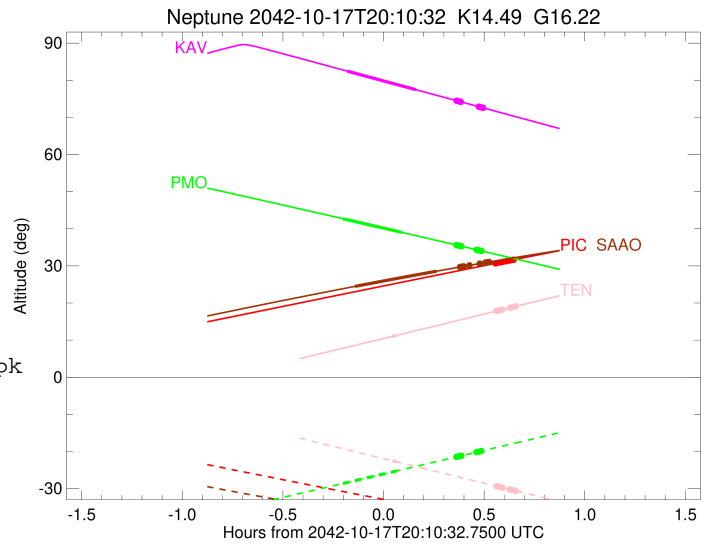
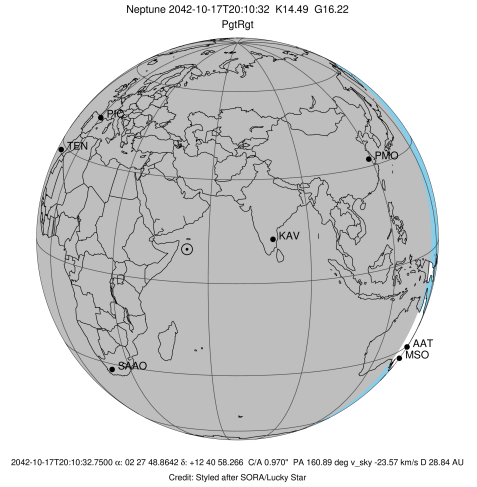
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2042-10-17T20:09:53.060
Event type           : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 74371520554280448
2Mass ID (if available) : 02274884+1240583
ICRS Star Coord at Epoch: 02h 27m 48.86420s +12:40:58.26612s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.488
G magnitude           : 16.220
RP magnitude         : 15.581
BP magnitude         : 16.699
DUPflag              : 0
Distance (au)        : 28.842
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.57
Sun-Target sep (deg) : 165.15
Sun-Moon sep (deg)   : 153.62
B (ring opening deg) : -3.35
PA of pole (deg)     : -46.62
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.951
C/A sky separation (km) : 19903.1
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	2042-10-17T20:31:41.530		74.66	-59.97	62933.33	-142.50		
Galatea	I	2042-10-17T20:31:48.453		74.63	-59.94	61953.40	-140.58		
Arago	I	2042-10-17T20:32:23.608		74.49	-59.80	57201.17	-129.34		
Lassell	I	2042-10-17T20:32:39.429		74.42	-59.74	55201.94	-123.35		
LeVerrier	I	2042-10-17T20:32:56.110		74.35	-59.67	53203.37	-116.30		
Neptune	I	2042-10-17T19:59:39.176		82.49	-67.77	24762.61		80.69	81.00
Neptune	E	2042-10-17T20:20:07.050		77.49	-62.79	24763.73		25.64	26.41
LeVerrier	E	2042-10-17T20:38:28.451		73.00	-58.32	53200.25	116.24		
Lassell	E	2042-10-17T20:38:45.146		72.93	-58.25	55200.29	123.27		
Arago	E	2042-10-17T20:39:00.982		72.87	-58.19	57200.20	129.25		
Galatea	E	2042-10-17T20:39:36.176		72.73	-58.04	61953.10	140.44		
Adams	E	2042-10-17T20:39:43.107		72.70	-58.02	62933.08	142.35		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2042-10-17T20:14:11.920
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       : 74371520554280448
2Mass ID (if available) : 02274884+1240583
ICRS Star Coord at Epoch: 02h 27m 48.86420s +12:40:58.26612s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.488
G magnitude           : 16.220
RP magnitude         : 15.581
BP magnitude         : 16.699
DUPflag              : 0
Distance (au)        : 28.842
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.57
Sun-Target sep (deg) : 165.15
Sun-Moon sep (deg)   : 154.23
B (ring opening deg) : -3.35
PA of pole (deg)     : -46.62
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.844
C/A sky separation (km) : 17646.7
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	2042-10-17T20:32:49.320		29.61	-40.80	62933.07	-154.33		
Galatea	I	2042-10-17T20:32:55.698		29.63	-40.81	61953.08	-152.95		
Arago	I	2042-10-17T20:33:27.562		29.71	-40.88	57200.20	-145.04		
Lassell	I	2042-10-17T20:33:41.545		29.75	-40.91	55200.32	-140.92		
LeVerrier	I	2042-10-17T20:33:55.975		29.79	-40.94	53200.51	-136.17		
Galle	I	2042-10-17T20:35:34.178		30.05	-41.14	42026.99	-86.20		
Neptune	I	2042-10-17T20:02:01.772		24.48	-36.55	24762.69		72.99	73.52
Neptune	E	2042-10-17T20:26:21.631		28.57	-39.97	24763.88		17.55	18.13
Galle	E	2042-10-17T20:38:49.613		30.56	-41.54	42001.13	86.04		
LeVerrier	E	2042-10-17T20:40:27.852		30.81	-41.74	53200.12	136.14		
Lassell	E	2042-10-17T20:40:42.289		30.85	-41.77	55200.08	140.87		
Arago	E	2042-10-17T20:40:56.280		30.89	-41.79	57200.06	144.98		
Galatea	E	2042-10-17T20:41:28.163		30.97	-41.86	61953.03	152.87		
Adams	E	2042-10-17T20:41:34.546		30.98	-41.87	62933.02	154.24		