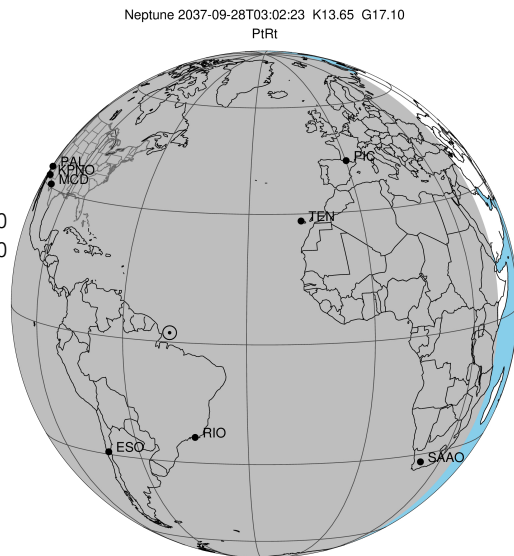


target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2037-09-28T03:02:23.360
 Event type : PtRt
 : Neptune occs: topocentric, not geocentric
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 2572203931585743232
 2Mass ID (if available) : 01454613+0902135

ICRS Star Coord at Epoch: 01h 45m 46.18799s +09:02:13.36229s
 RUWE (>1.4 is poor) : 1.13
 K magnitude : 13.653
 G magnitude : 17.096
 RP magnitude : 15.977
 BP magnitude : 18.390
 DUPflag : 0
 Distance (au) : 28.899
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.06
 Sun-Target sep (deg) : 156.97
 Sun-Moon sep (deg) : 17.33
 B (ring opening deg) : -8.42
 PA of pole (deg) : -47.61



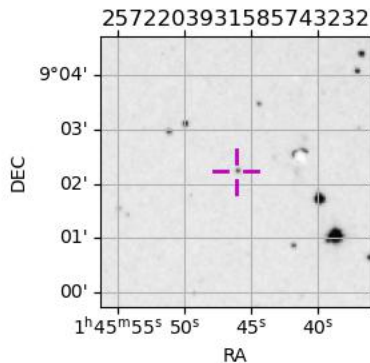
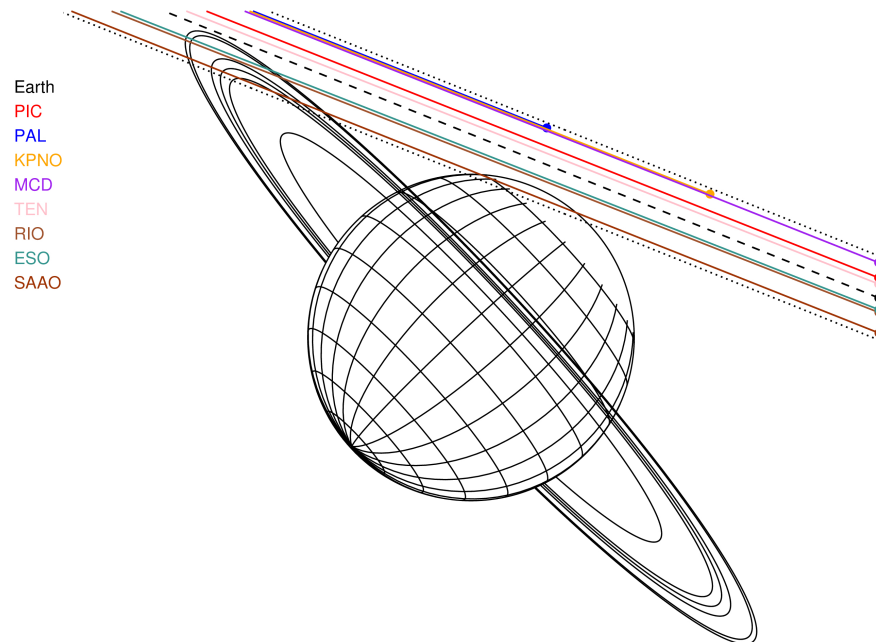
2037-09-28T03:02:23.3600 α: 01 45 46.1880 δ: +09 02 13.362 C/A 1.365° PA 158.13 deg v_sky -22.06 km/s D 28.90 AU
 Credit: Styled after SORA/Lucky Star

#	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

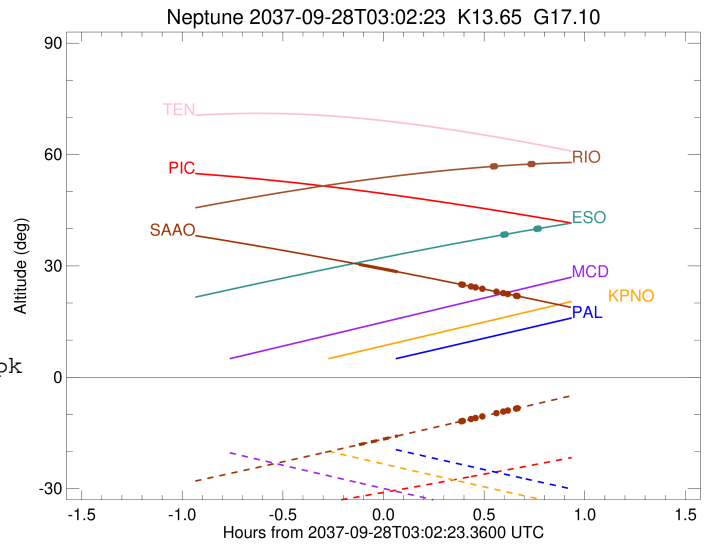
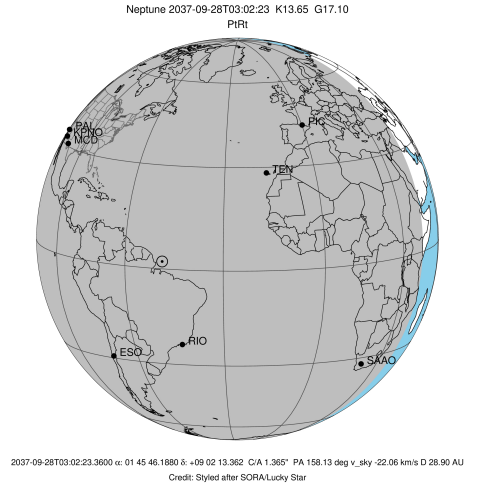
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
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	+		+	SEP 28 03:33 - SEP 28 03:46	PnnRie
ESO	European Southern Obs	-29.3	289.3	+		+	SEP 28 03:36 - SEP 28 03:48	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+	+	+	SEP 28 02:55 - SEP 28 03:41	PieRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

Neptune 2037-09-28T03:02:23 K13.65 G17.10 PtRt



```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2037-09-28T03:04:39.730
Event type          : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code       : RIO
Location            : Rio de Janeiro
Latitude (deg)      : -22.89506
E. Longitude (deg)  : 316.77708
Altitude (km)       : 0.033
Gaia source ID      : 2572203931585743232
2Mass ID (if available) : 01454613+0902135
ICRS Star Coord at Epoch: 01h 45m 46.18799s +09:02:13.36229s
RUWE (>1.4 is poor) : 1.13
K magnitude          : 13.653
G magnitude          : 17.096
RP magnitude         : 15.977
BP magnitude         : 18.390
DUPflag             : 0
Distance (au)        : 28.899
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.06
Sun-Target sep (deg) : 156.97
Sun-Moon sep (deg)  : 17.87
B (ring opening deg) : -8.42
PA of pole (deg)    : -47.61
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation ("): 1.248
C/A sky separation (km) : 26148.0
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
    
```



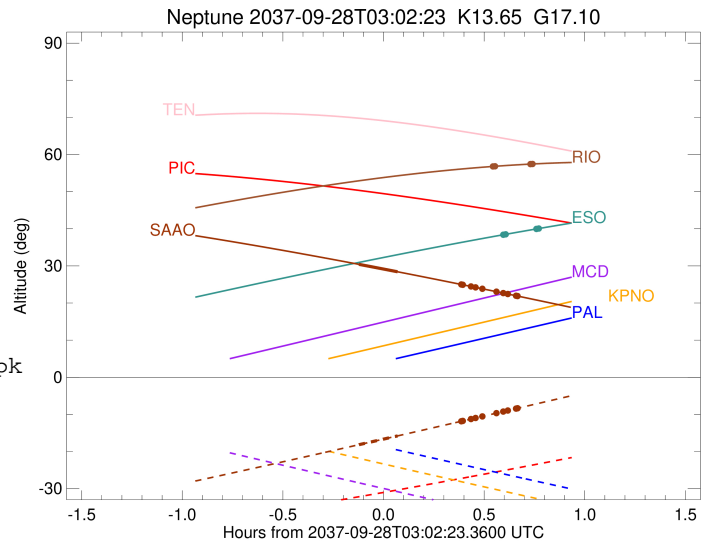
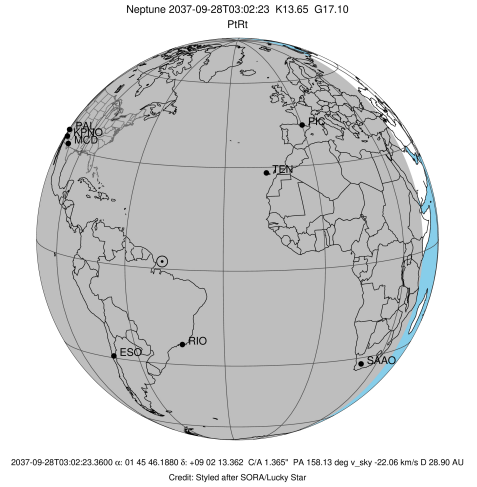
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2037-09-28T03:33:46.721		56.71	-62.26	62934.83	-30.32		
Galatea	I	2037-09-28T03:34:20.264		56.75	-62.20	61956.13	-28.10		

No planet occultations

Galatea	E	2037-09-28T03:45:58.729		57.42	-60.82	61953.00	28.09		
Adams	E	2037-09-28T03:46:32.288		57.44	-60.75	62933.00	30.31		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2037-09-28T03:06:16.190
Event type           : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
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       : 2572203931585743232
2Mass ID (if available) : 01454613+0902135
ICRS Star Coord at Epoch: 01h 45m 46.18799s +09:02:13.36229s
RUWE (>1.4 is poor) : 1.13
K magnitude           : 13.653
G magnitude           : 17.096
RP magnitude          : 15.977
BP magnitude          : 18.390
DUPflag              : 0
Distance (au)         : 28.899
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.06
Sun-Target sep (deg) : 156.97
Sun-Moon sep (deg)   : 18.10
B (ring opening deg) : -8.42
PA of pole (deg)     : -47.61
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation ("): 1.270
C/A sky separation (km): 26609.6
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
    
```



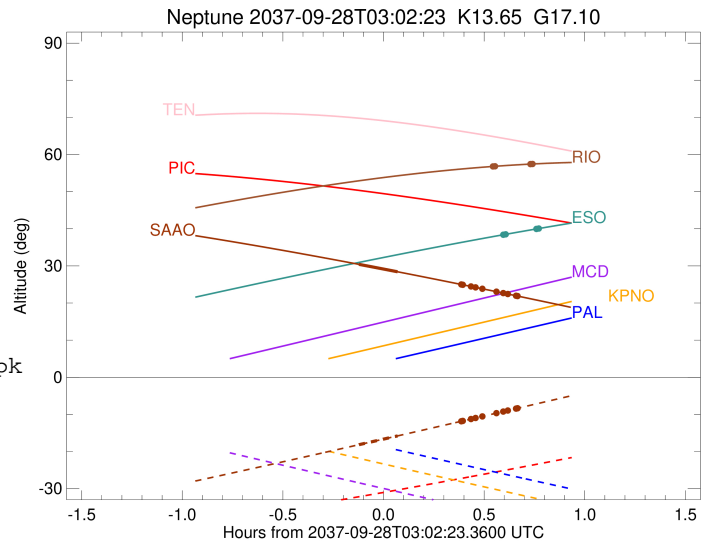
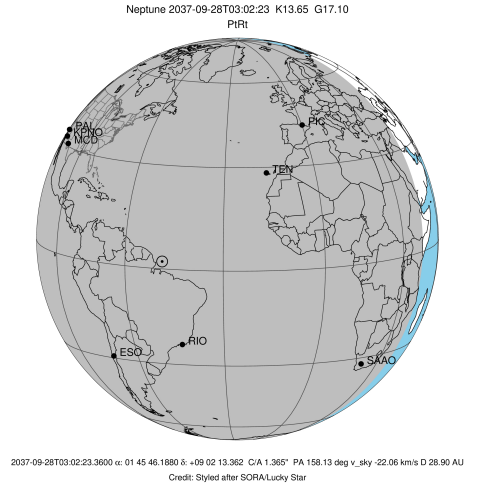
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2037-09-28T03:36:46.013		38.17	-55.94	62936.56	-27.52		
Galatea	I	2037-09-28T03:37:23.330		38.28	-56.00	61959.96	-25.00		

No planet occultations

Galatea	E	2037-09-28T03:47:50.710		39.94	-56.91	61953.00	24.99		
Adams	E	2037-09-28T03:48:28.017		40.03	-56.96	62933.00	27.53		

```

target                : Neptune
target radius (km)    : 24764.00
C/A epoch             : 2037-09-28T03:00:48.370
Event type            : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
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        : 2572203931585743232
2Mass ID (if available) : 01454613+0902135
ICRS Star Coord at Epoch: 01h 45m 46.18799s +09:02:13.36229s
RUWE (>1.4 is poor)  : 1.13
K magnitude           : 13.653
G magnitude           : 17.096
RP magnitude          : 15.977
BP magnitude          : 18.390
DUPflag              : 0
Distance (au)         : 28.899
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.06
Sun-Target sep (deg)  : 156.97
Sun-Moon sep (deg)    : 17.04
B (ring opening deg)  : -8.42
PA of pole (deg)      : -47.61
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.121
C/A sky separation (km) : 23502.7
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	2037-09-28T03:24:36.592		25.18	-12.06	62933.17	-39.77		
Galatea	I	2037-09-28T03:25:01.645		25.10	-11.97	61953.23	-38.45		
Arago	I	2037-09-28T03:27:19.913		24.68	-11.49	57201.60	-29.97		
Lassell	I	2037-09-28T03:28:33.010		24.45	-11.24	55206.26	-24.68		
LeVerrier	I	2037-09-28T03:30:08.815		24.16	-10.90	53321.47	-17.49		
Neptune	I	2037-09-28T02:55:00.388		30.43	-18.18	24755.16		78.68	79.05
Neptune	E	2037-09-28T03:06:37.033		28.41	-15.79	24759.39		45.15	46.13
LeVerrier	E	2037-09-28T03:36:22.392		23.00	-9.60	53200.04	16.88		
Lassell	E	2037-09-28T03:37:58.438		22.70	-9.27	55200.00	24.63		
Arago	E	2037-09-28T03:39:11.663		22.47	-9.01	57200.00	29.91		
Galatea	E	2037-09-28T03:41:30.257		22.04	-8.53	61953.00	38.35		
Adams	E	2037-09-28T03:41:55.381		21.96	-8.44	62933.00	39.66		