

target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2024-09-07T06:31:17.030
 Event type : PtRt
 : Neptune occs: topocentric, not geocentric
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 2449301926286745344
 2Mass ID (if available) : 23564503-0147413

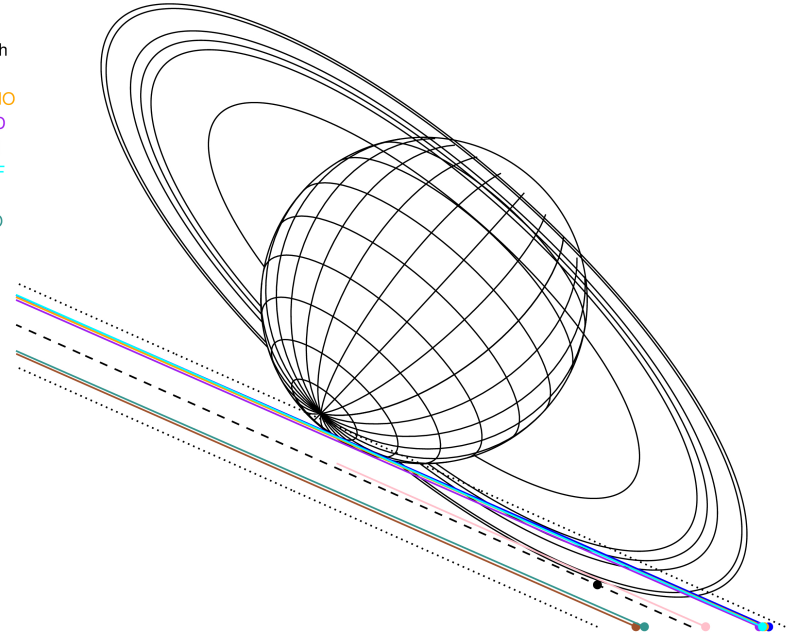
Neptune 2024-09-07T06:31:17 K14.87 G18.02 PtRt

ICRS Star Coord at Epoch: 23h 56m 45.04618s -01:47:41.52900s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 14.874
 G magnitude : 18.020
 RP magnitude : 17.037
 BP magnitude : 19.024
 DUPflag : 0
 Distance (au) : 28.918
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.35
 Sun-Target sep (deg) : 166.19
 Sun-Moon sep (deg) : 148.10
 B (ring opening deg) : -20.35
 PA of pole (deg) : -42.37
 # a(km) ring



2024-09-07T06:31:17.0300 at: 23 56 45.0462 s: -01 47 41.529 C/A 1.366° PA 335.90 deg v_sky -23.35 km/s D 28.92 AU
 Credit: Styled after SORA/Lucky Star

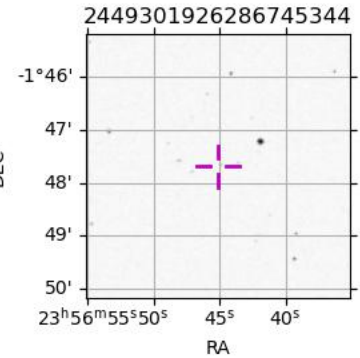
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO



- 1 42000.0 Galle
- 2 53200.0 LeVerrier
- 3 55200.0 Lassell
- 4 57200.0 Arago
- 5 61953.0 Galatea
- 6 62933.0 Adams

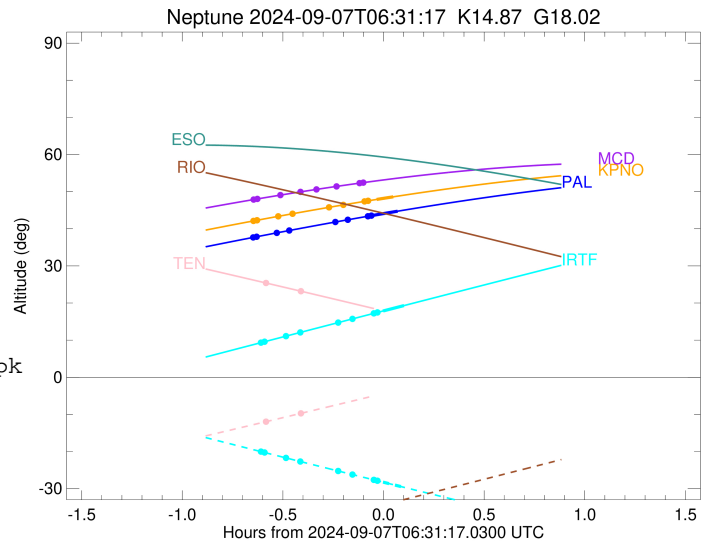
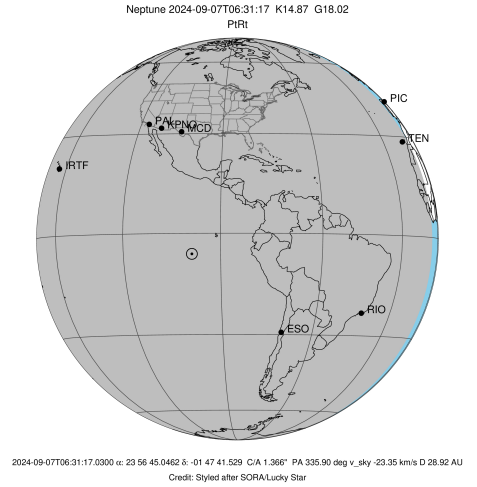
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+	+	SEP 07 05:52 - SEP 07 06:35	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	+	+	SEP 07 05:52 - SEP 07 06:34	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	+	+	SEP 07 05:52 - SEP 07 06:26	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+			SEP 07 05:53 - SEP 07 06:09	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+	+	SEP 07 05:54 - SEP 07 06:37	PieRie
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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

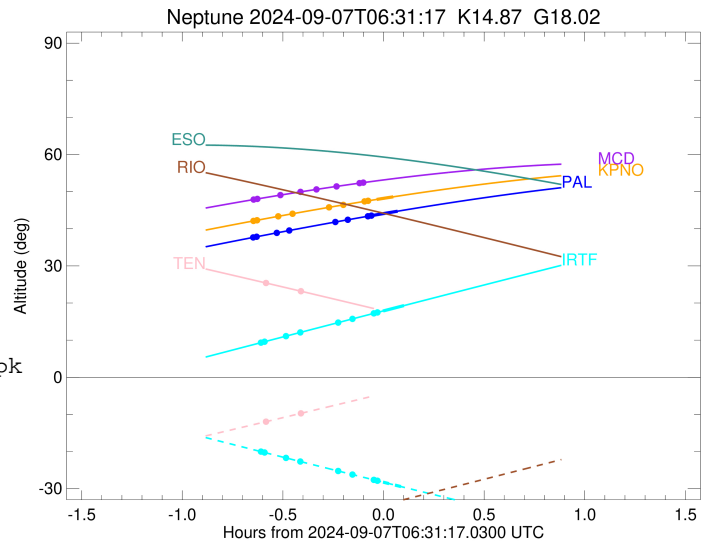
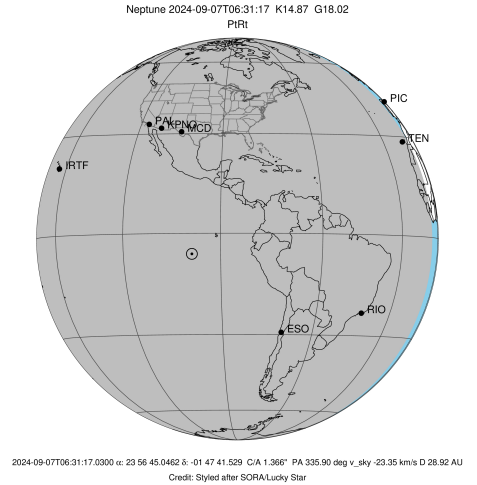
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-09-07T06:31:57.170
Event type            : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code        : PAL
Location              : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 2449301926286745344
2Mass ID (if available) : 23564503-0147413
ICRS Star Coord at Epoch: 23h 56m 45.04618s -01:47:41.52900s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.874
G magnitude           : 18.020
RP magnitude          : 17.037
BP magnitude          : 19.024
DUPflag              : 0
Distance (au)        : 28.918
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.35
Sun-Target sep (deg) : 166.19
Sun-Moon sep (deg)   : 148.50
B (ring opening deg) : -20.35
PA of pole (deg)     : -42.37
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation ("): 1.154
C/A sky separation (km): 24196.8
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	2024-09-07T05:52:06.041		37.62	-42.61	62933.00	-16.92		
Galatea	I	2024-09-07T05:53:05.092		37.79	-42.74	61953.00	-16.27		
Arago	I	2024-09-07T05:58:40.000		38.76	-43.47	57200.02	-11.94		
Lassell	I	2024-09-07T06:01:50.204		39.30	-43.88	55200.38	-9.03		
Neptune	I	2024-09-07T06:28:22.018		43.64	-46.90	24726.26		-53.92	-54.84
Neptune	E	2024-09-07T06:35:29.742		44.74	-47.59	24713.96		-68.58	-69.23
Lassell	E	2024-09-07T06:18:54.362		42.14	-45.90	55202.19	9.07		
Arago	E	2024-09-07T06:22:03.833		42.65	-46.25	57200.20	12.00		
Galatea	E	2024-09-07T06:27:37.291		43.53	-46.83	61953.01	16.33		
Adams	E	2024-09-07T06:28:36.117	b	43.68	-46.93	62933.01	16.98		

```

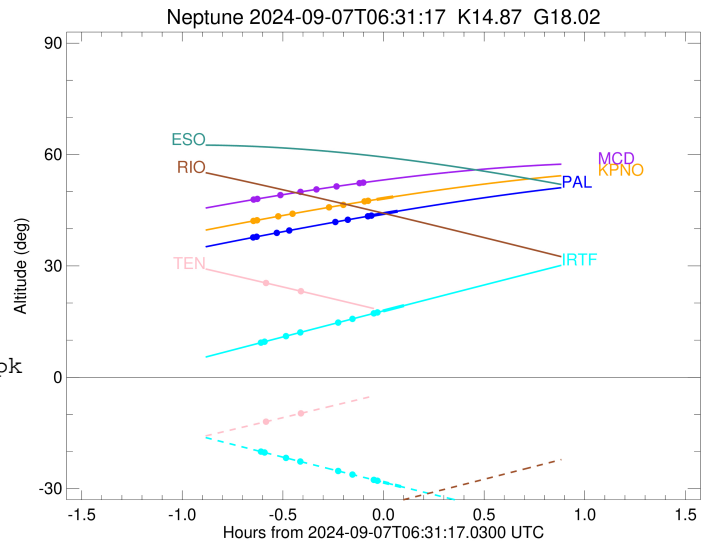
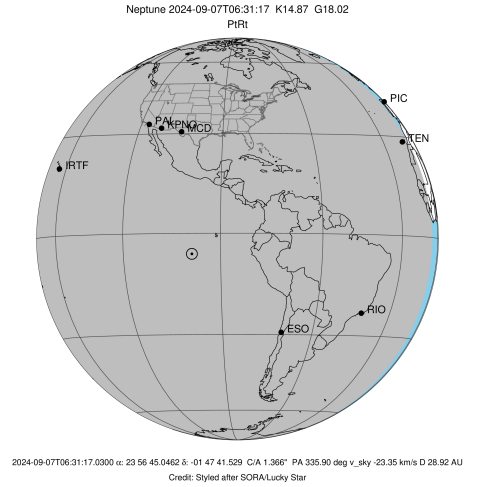
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-09-07T06:31:43.650
Event type            : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code        : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 2449301926286745344
2Mass ID (if available) : 23564503-0147413
ICRS Star Coord at Epoch: 23h 56m 45.04618s -01:47:41.52900s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.874
G magnitude           : 18.020
RP magnitude          : 17.037
BP magnitude          : 19.024
DUPflag              : 0
Distance (au)        : 28.918
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.35
Sun-Target sep (deg) : 166.19
Sun-Moon sep (deg)   : 148.49
B (ring opening deg) : -20.35
PA of pole (deg)     : -42.37
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.166
C/A sky separation (km) : 24465.2
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.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	2024-09-07T05:52:08.970		42.05	-46.40	62933.00	-16.51		
Galatea	I	2024-09-07T05:53:09.563		42.23	-46.52	61953.00	-15.83		
Arago	I	2024-09-07T05:58:58.822		43.20	-47.20	57200.03	-11.20		
Lassell	I	2024-09-07T06:02:27.154		43.77	-47.59	55201.67	-7.94		
Neptune	I	2024-09-07T06:29:13.073		47.90	-50.13	24723.62		-56.74	-57.62
Neptune	E	2024-09-07T06:34:11.645		48.61	-50.50	24714.92		-67.22	-67.91
Lassell	E	2024-09-07T06:17:24.121		46.14	-49.11	55207.50	7.98		
Arago	E	2024-09-07T06:20:51.745		46.67	-49.43	57200.35	11.25		
Galatea	E	2024-09-07T06:26:39.569		47.53	-49.92	61953.01	15.89		
Adams	E	2024-09-07T06:27:39.932		47.68	-50.00	62933.01	16.58		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-09-07T06:31:20.440
Event type           : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 2449301926286745344
2Mass ID (if available) : 23564503-0147413
ICRS Star Coord at Epoch: 23h 56m 45.04618s -01:47:41.52900s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 14.874
G magnitude          : 18.020
RP magnitude         : 17.037
BP magnitude         : 19.024
DUPflag             : 0
Distance (au)        : 28.918
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.35
Sun-Target sep (deg) : 166.19
Sun-Moon sep (deg)   : 148.46
B (ring opening deg) : -20.35
PA of pole (deg)     : -42.37
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.184
C/A sky separation (km) : 24824.7
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
    
```



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

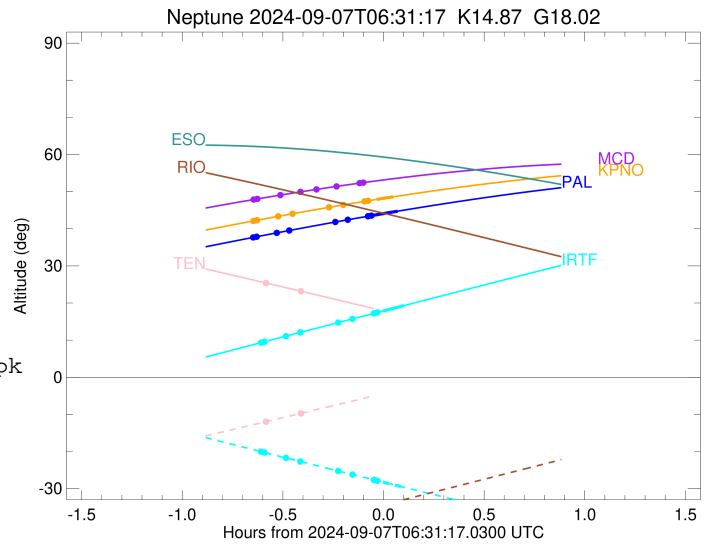
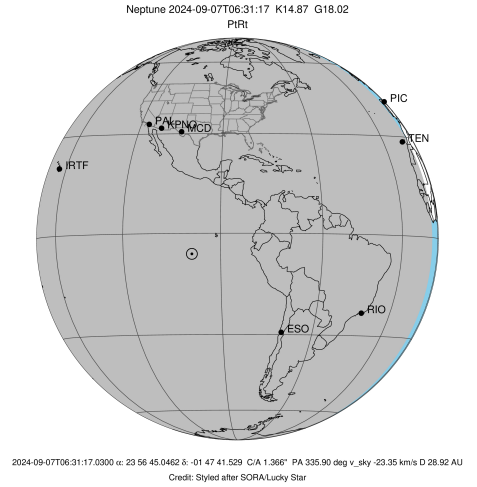
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-09-07T05:52:09.037		47.81	-50.73	62933.00	-15.94		
Galatea	I	2024-09-07T05:53:11.977		47.97	-50.82	61953.00	-15.20		
Arago	I	2024-09-07T05:59:24.733		48.91	-51.35	57200.12	-10.10		
Lassell	I	2024-09-07T06:03:30.224		49.51	-51.68	55265.35	-6.29		

No planet occultations

Lassell	E	2024-09-07T06:15:00.224		51.11	-52.46	55412.68	6.69		
Arago	E	2024-09-07T06:19:03.797		51.65	-52.69	57200.89	10.13		
Galatea	E	2024-09-07T06:25:15.175		52.43	-52.99	61953.02	15.26		
Adams	E	2024-09-07T06:26:17.889		52.56	-53.04	62933.01	15.99		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2024-09-07T06:26:56.440
Event type           : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code        : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 2449301926286745344
2Mass ID (if available) : 23564503-0147413
ICRS Star Coord at Epoch: 23h 56m 45.04618s -01:47:41.52900s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.874
G magnitude           : 18.020
RP magnitude         : 17.037
BP magnitude         : 19.024
DUPflag              : 0
Distance (au)        : 28.918
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.35
Sun-Target sep (deg) : 166.19
Sun-Moon sep (deg)   : 147.53
B (ring opening deg) : -20.35
PA of pole (deg)     : -42.37
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation ("): 1.333
C/A sky separation (km): 27961.7
NAIF SPICE kernels   : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itrf93_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
    
```

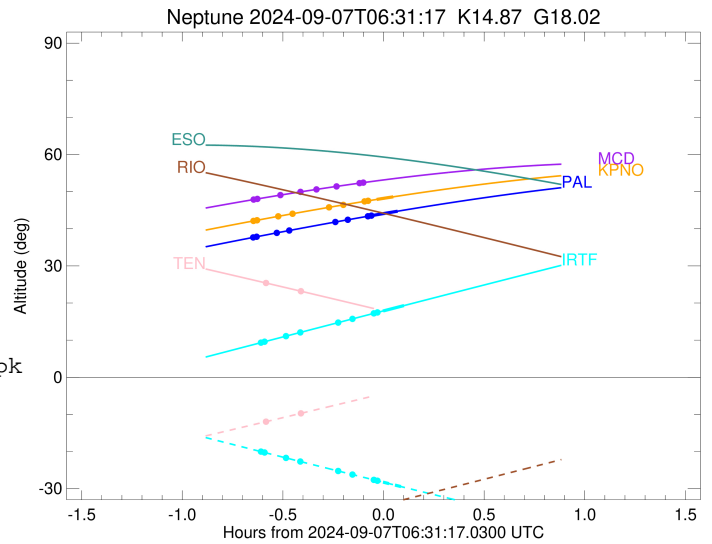
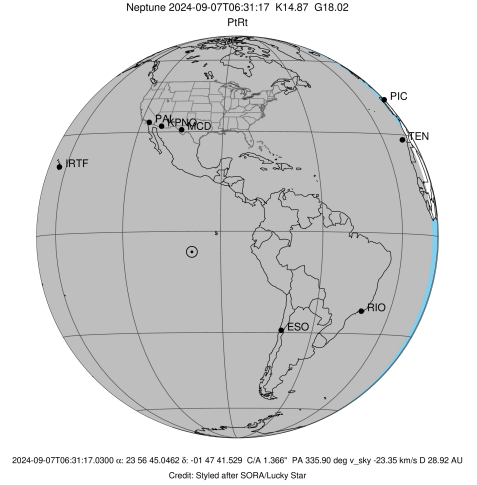


b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-09-07T05:53:53.975		25.89	-12.46	62938.52	-7.28		
No planet occultations									
Adams	E	2024-09-07T06:09:46.931		22.52	-9.05	62954.72	7.31		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-09-07T06:34:16.130
Event type            : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code        : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 2449301926286745344
2Mass ID (if available) : 23564503-0147413
ICRS Star Coord at Epoch: 23h 56m 45.04618s -01:47:41.52900s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 14.874
G magnitude           : 18.020
RP magnitude          : 17.037
BP magnitude          : 19.024
DUPflag              : 0
Distance (au)        : 28.918
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.35
Sun-Target sep (deg) : 166.19
Sun-Moon sep (deg)   : 148.70
B (ring opening deg) : -20.35
PA of pole (deg)     : -42.37
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.160
C/A sky separation (km) : 24322.2
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.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	2024-09-07T05:54:22.410		9.24	-19.94	62933.00	-16.32		
Galatea	I	2024-09-07T05:55:23.719		9.48	-20.17	61953.00	-15.64		
Arago	I	2024-09-07T06:01:16.483		10.86	-21.51	57200.03	-11.12		
Lassell	I	2024-09-07T06:04:45.795		11.68	-22.30	55201.51	-7.94		
Neptune	I	2024-09-07T06:31:06.966		17.85	-28.25	24724.97		-55.29	-56.19
Neptune	E	2024-09-07T06:37:22.699		19.31	-29.64	24714.27		-68.13	-68.80
Lassell	E	2024-09-07T06:20:06.893		15.28	-25.78	55206.62	7.98		
Arago	E	2024-09-07T06:23:35.247		16.09	-26.56	57200.33	11.18		
Galatea	E	2024-09-07T06:29:25.982		17.45	-27.87	61953.01	15.74		
Adams	E	2024-09-07T06:30:26.940		17.69	-28.10	62933.01	16.41		