

target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2024-09-15T13:18:33.430
 Event type : PtRt
 : Neptune occs: topocentric, not geocentric
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 2449296914062062848
 2Mass ID (if available) : 23555560-0153108

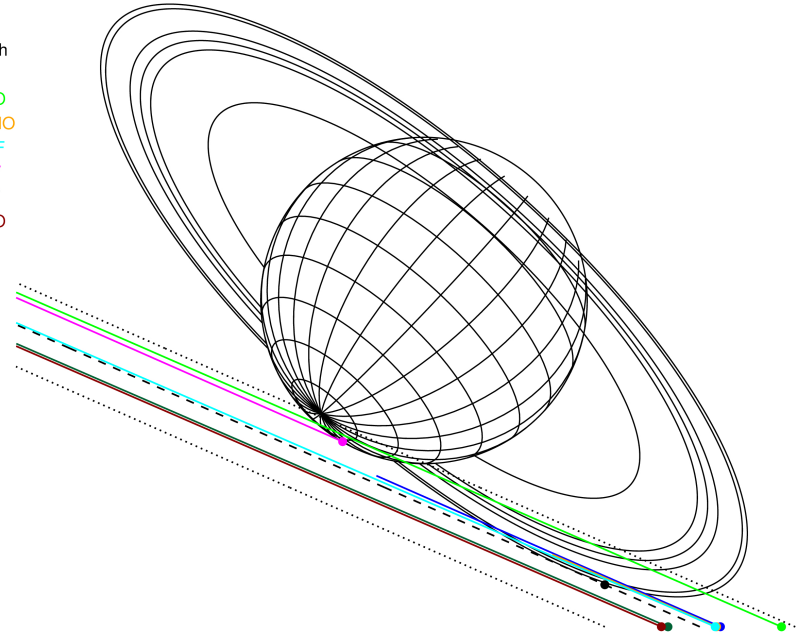
Neptune 2024-09-15T13:18:33 K12.24 G14.40 PtRt

ICRS Star Coord at Epoch: 23h 55m 55.63905s -01:53:10.81796s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 12.237
 G magnitude : 14.401
 RP magnitude : 13.699
 BP magnitude : 14.957
 DUPflag : 0
 Distance (au) : 28.896
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -24.04
 Sun-Target sep (deg) : 174.38
 Sun-Moon sep (deg) : 41.17
 B (ring opening deg) : -20.42
 PA of pole (deg) : -42.28



2024-09-15T13:18:33.4300 at: 23 55 55.6391 s: -01 53 10.818 C/A 1.354° PA 336.16 deg v_sky -24.04 km/s D 28.90 AU
 Credit: Styled after SORA/Lucky Star

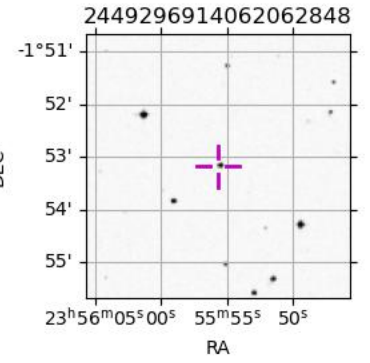
Earth
 PAL
 PMO
 KPNO
 IRTF
 KAV
 AAT
 MSO



#	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

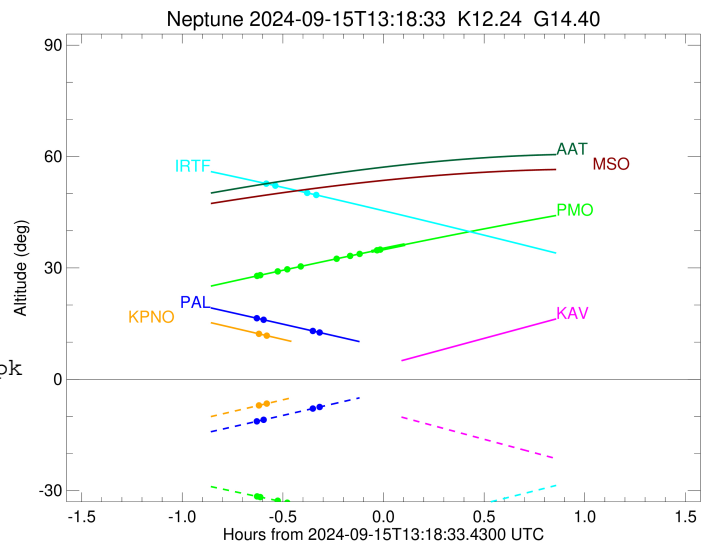
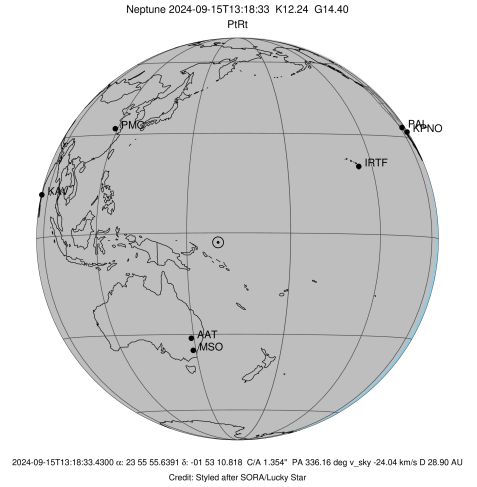
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+		+	SEP 15 12:39 - SEP 15 13:01	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+	+	+	SEP 15 12:40 - SEP 15 13:24	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+			SEP 15 12:40 - SEP 15 12:41	PnnRin
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	+		+	SEP 15 12:42 - SEP 15 13:00	PnnRie
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



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target           : Neptune
target radius (km) : 24764.00
C/A epoch       : 2024-09-15T13:14:14.060
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  : 2449296914062062848
2Mass ID (if available) : 2355560-0153108
ICRS Star Coord at Epoch: 23h 55m 55.63905s -01:53:10.81796s
RUWE (>1.4 is poor) : 1.04
K magnitude     : 12.237
G magnitude     : 14.401
RP magnitude    : 13.699
BP magnitude    : 14.957
DUPflag        : 0
Distance (au)  : 28.896
f0 (km)        : 0.000
g0 (km)        : 0.000
skyplane vel. (km/s) : -24.04
Sun-Target sep (deg) : 174.38
Sun-Moon sep (deg) : 42.00
B (ring opening deg) : -20.42
PA of pole (deg) : -42.28
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.300
C/A sky separation (km) : 27246.3
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

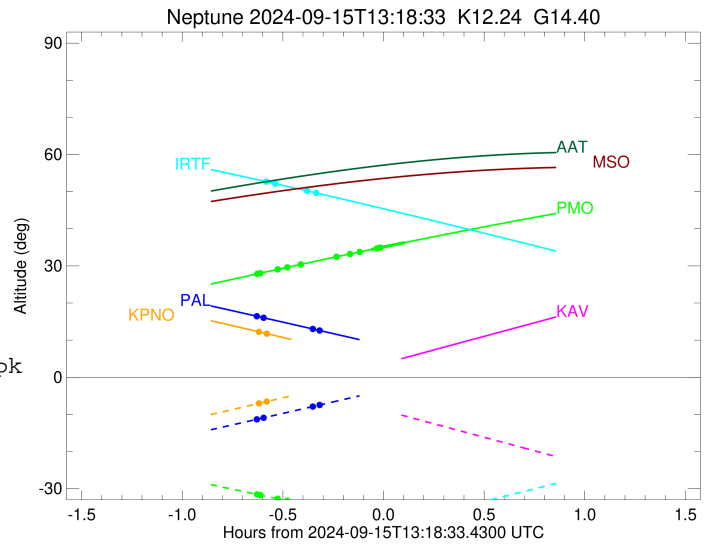
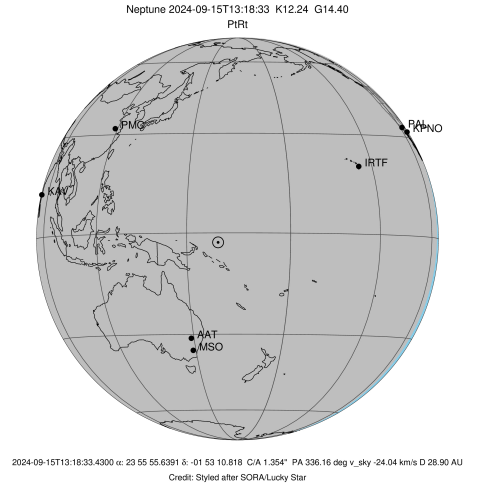
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-09-15T12:39:36.406		16.68	-11.58	62933.10	-10.53		
Galatea	I	2024-09-15T12:41:16.384		16.34	-11.23	61953.55	-9.06		

No planet occultations

Galatea	E	2024-09-15T12:59:44.893		12.55	-7.42	61956.06	9.07		
Adams	E	2024-09-15T13:01:24.871		12.21	-7.08	62933.83	10.53		

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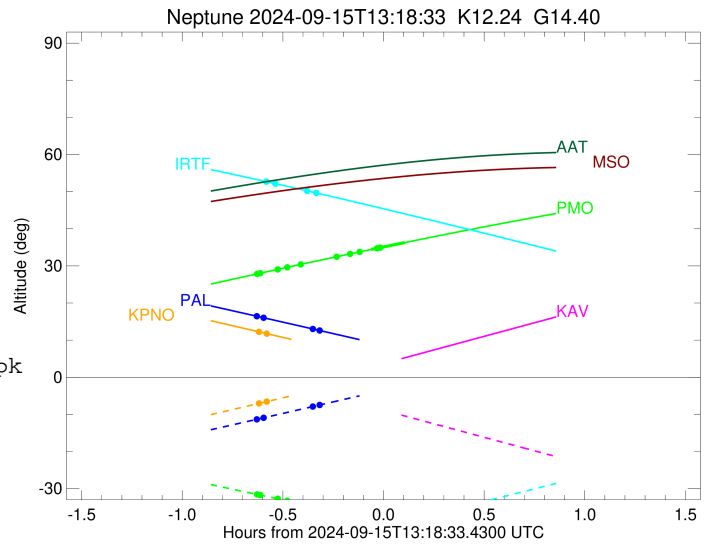
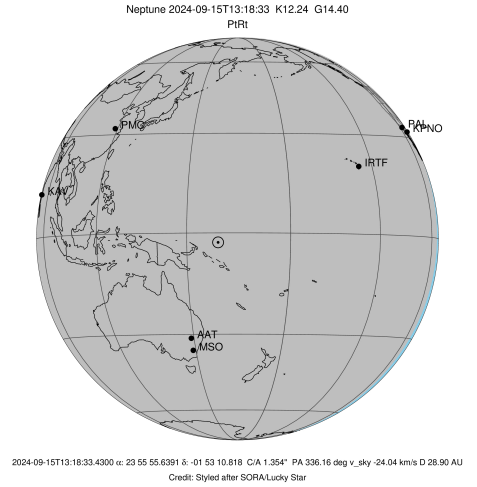
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-09-15T13:19:57.470
Event type            : PtRt
: Neptune occs: topocentric, not geocentric
: Ring occs: topocentric, not geocentric
Observer code        : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 2449296914062062848
2Mass ID (if available) : 23555560-0153108
ICRS Star Coord at Epoch: 23h 55m 55.63905s -01:53:10.81796s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 12.237
G magnitude           : 14.401
RP magnitude          : 13.699
BP magnitude          : 14.957
DUPflag              : 0
Distance (au)        : 28.896
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -24.04
Sun-Target sep (deg) : 174.38
Sun-Moon sep (deg)   : 41.35
B (ring opening deg) : -20.42
PA of pole (deg)     : -42.28
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.127
C/A sky separation (km) : 23619.3
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
    
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Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-09-15T12:40:38.011		27.80	-31.51	62933.00	-18.48		
Galatea	I	2024-09-15T12:41:31.904		27.98	-31.68	61953.00	-17.88		
Arago	I	2024-09-15T12:46:27.893		28.95	-32.61	57200.00	-14.08		
Lassell	I	2024-09-15T12:49:02.692		29.46	-33.10	55200.03	-11.72		
LeVerrier	I	2024-09-15T12:52:21.621		30.10	-33.72	53201.19	-8.33		
Neptune	I	2024-09-15T13:14:55.838		34.43	-37.82	24730.42		-49.37	-50.33
Neptune	E	2024-09-15T13:24:56.594		36.29	-39.57	24712.94		-69.52	-70.15
LeVerrier	E	2024-09-15T13:06:42.727		32.87	-36.35	53205.60	8.37		
Lassell	E	2024-09-15T13:10:00.878		33.50	-36.95	55200.28	11.77		
Arago	E	2024-09-15T13:12:34.953		33.98	-37.40	57200.05	14.15		
Galatea	E	2024-09-15T13:17:29.609	b	34.91	-38.27	61953.01	17.95		
Adams	E	2024-09-15T13:18:23.311	b	35.07	-38.43	62933.00	18.54		

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target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2024-09-15T13:14:10.710
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       : 2449296914062062848
2Mass ID (if available) : 23555560-0153108
ICRS Star Coord at Epoch: 23h 55m 55.63905s -01:53:10.81796s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 12.237
G magnitude           : 14.401
RP magnitude          : 13.699
BP magnitude          : 14.957
DUPflag              : 0
Distance (au)        : 28.896
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -24.04
Sun-Target sep (deg) : 174.38
Sun-Moon sep (deg)   : 41.96
B (ring opening deg) : -20.42
PA of pole (deg)     : -42.28
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.310
C/A sky separation (km) : 27446.0
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
    
```



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

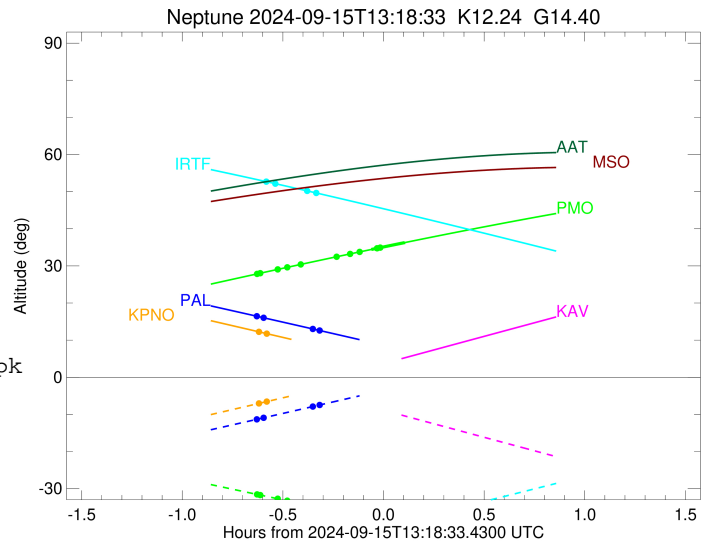
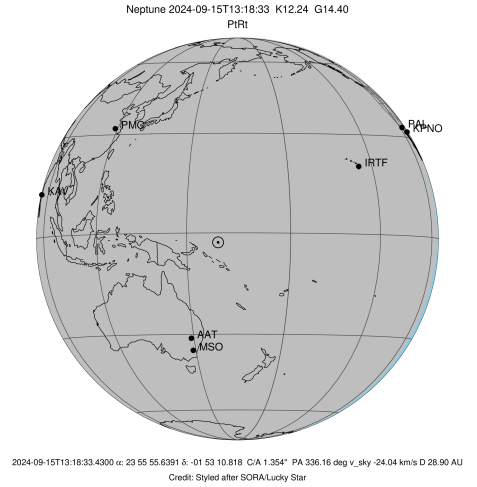
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2024-09-15T12:40:03.942		12.52	-7.33	62933.23	-9.80		
Galatea	I	2024-09-15T12:41:52.886		12.14	-6.95	61954.71	-8.18		

No planet occultations

Galatea	E	2024-09-15T12:58:37.319		8.62	-3.41x	61960.87	8.19		
Adams	E	2024-09-15T13:00:26.269		8.23	-3.03x	62934.53	9.80		

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target                : Neptune
target radius (km)    : 24764.00
C/A epoch              : 2024-09-15T13:15:23.970
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        : 2449296914062062848
2Mass ID (if available) : 23555560-0153108
ICRS Star Coord at Epoch: 23h 55m 55.63905s -01:53:10.81796s
RUWE (>1.4 is poor)  : 1.04
K magnitude            : 12.237
G magnitude            : 14.401
RP magnitude          : 13.699
BP magnitude          : 14.957
DUPflag               : 0
Distance (au)         : 28.896
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -24.04
Sun-Target sep (deg)  : 174.38
Sun-Moon sep (deg)    : 42.17
B (ring opening deg)  : -20.42
PA of pole (deg)      : -42.28
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.326
C/A sky separation (km) : 27797.3
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
    
```



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	2024-09-15T12:42:05.957		53.00	-47.90	62933.48	-9.26		
Galatea	I	2024-09-15T12:44:03.200		52.61	-47.50	61959.08	-7.45		

No planet occultations

Galatea	E	2024-09-15T12:58:47.764		49.59	-44.39	61977.61	7.50		
Adams	E	2024-09-15T13:00:44.931		49.18	-43.97	62935.92	9.28		