

target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2041-07-16T10:05:38.220
 Event type : PtRgt
 : Neptune occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 72889344520215296
 2Mass ID (if available) : 02222324+1219031

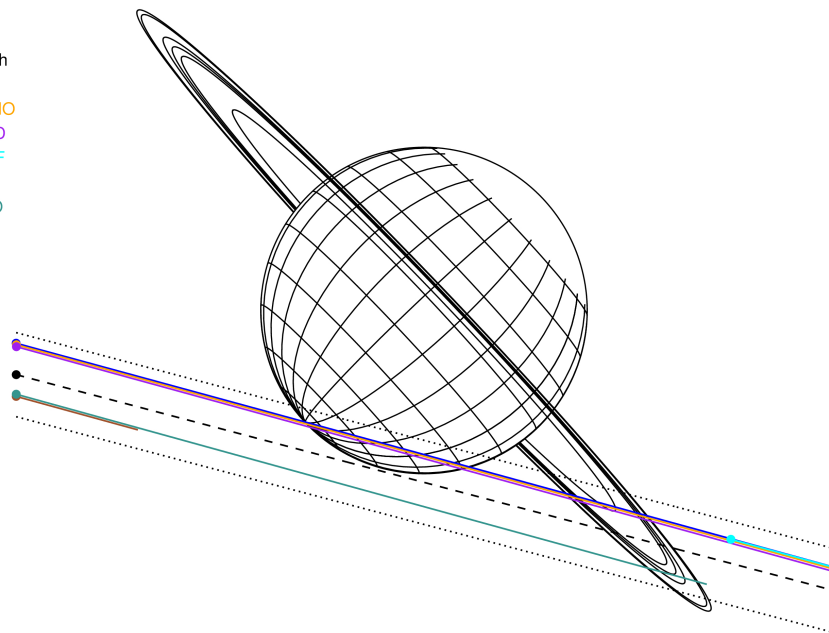
Neptune 2041-07-16T10:05:38 K13.22 G14.95 PtRgt

ICRS Star Coord at Epoch: 02h 22m 23.27179s +12:19:02.74454s
 RUWE (>1.4 is poor) : 1.15
 K magnitude : 13.216
 G magnitude : 14.947
 RP magnitude : 14.354
 BP magnitude : 15.364
 DUPflag : 0
 Distance (au) : 30.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.34
 Sun-Target sep (deg) : 76.33
 Sun-Moon sep (deg) : 66.74
 B (ring opening deg) : -4.05
 PA of pole (deg) : -46.84



2041-07-16T10:05:38.2200 cc: 02 22 23.2718 s: +12 19 02.745 C/A 1.158° PA 345.21 deg v_sky +12.34 km/s D 30.03 AU
 Credit: Styled after SORA/Lucky Star

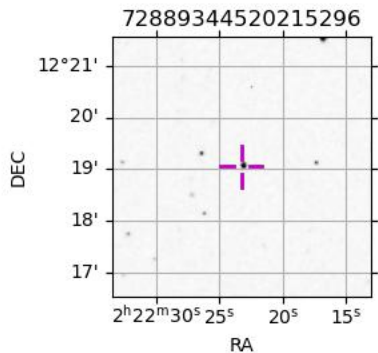
Earth
 PAL
 KPNO
 MCD
 IRTF
 RIO
 ESO



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

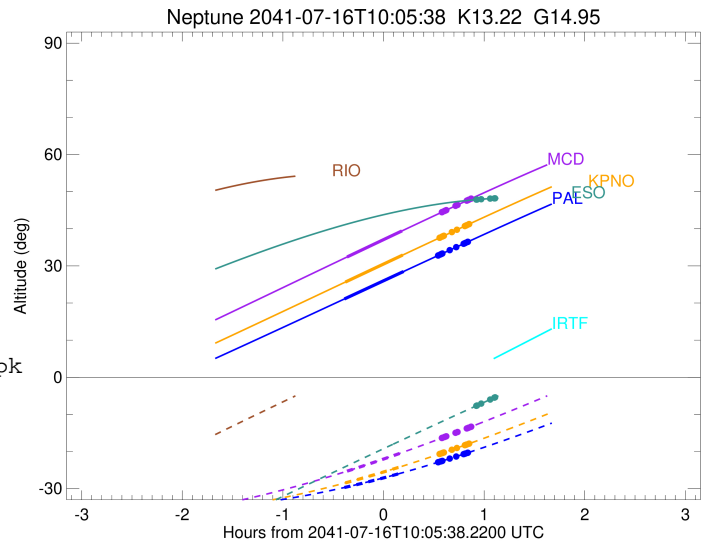
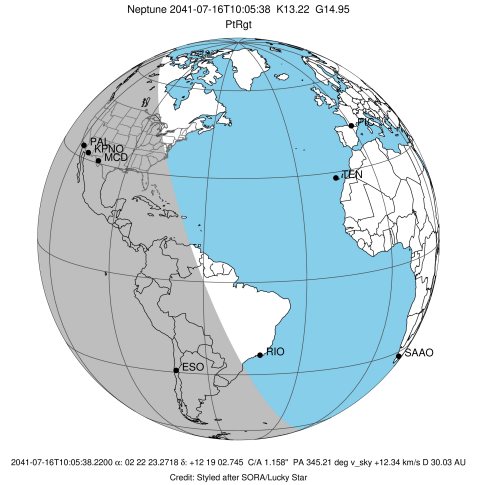
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+ + + + +	+ +	+ + + + +	JUL 16 09:42 - JUL 16 10:55	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ + + + +	+ +	+ + + + +	JUL 16 09:42 - JUL 16 10:55	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ + + + +	+ +	+ + + + +	JUL 16 09:43 - JUL 16 10:57	PieRie
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					PnnRnn
ESO	European Southern Obs	-29.3	289.3	+ + +		+ + +	JUL 16 10:59 - JUL 16 11:11	PnnRie
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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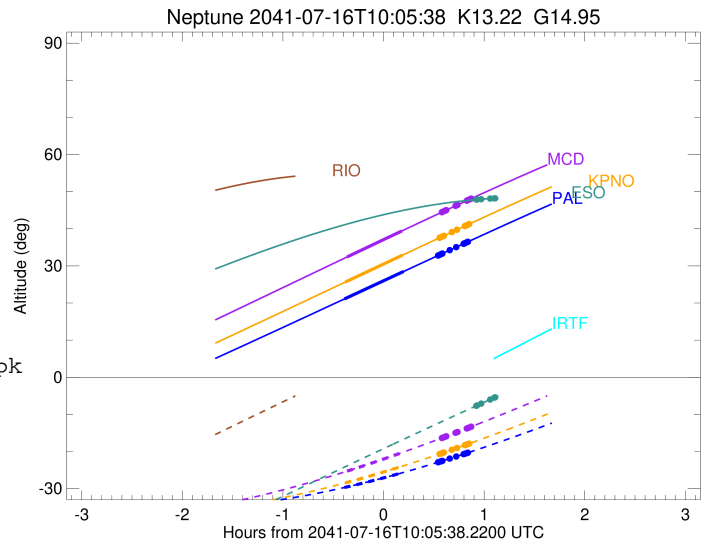
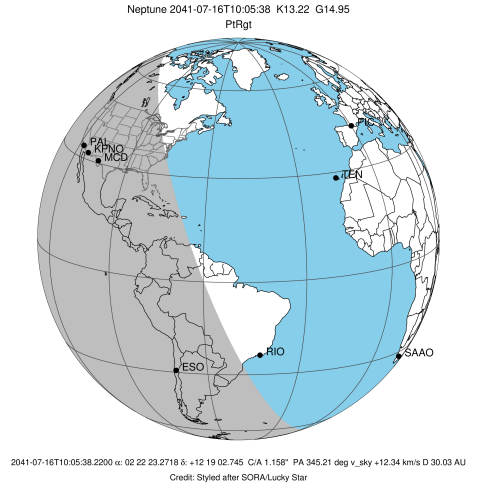
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2041-07-16T09:59:54.790
Event type            : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 72889344520215296
2Mass ID (if available) : 02222324+1219031
ICRS Star Coord at Epoch: 02h 22m 23.27179s +12:19:02.74454s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 13.216
G magnitude           : 14.947
RP magnitude          : 14.354
BP magnitude          : 15.364
DUPflag              : 0
Distance (au)         : 30.031
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 12.34
Sun-Target sep (deg)  : 76.33
Sun-Moon sep (deg)    : 66.94
B (ring opening deg) : -4.05
PA of pole (deg)      : -46.84
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (" ) : 0.968
C/A sky separation (km) : 21079.4
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	2041-07-16T10:37:11.461		32.59	-23.03	62933.07	-69.76		
Galatea	I	2041-07-16T10:37:25.586		32.64	-22.99	61953.09	-68.99		
Arago	I	2041-07-16T10:38:36.697		32.89	-22.83	57200.22	-64.51		
Lassell	I	2041-07-16T10:39:08.264		33.00	-22.75	55200.36	-62.16		
LeVerrier	I	2041-07-16T10:39:41.149		33.11	-22.68	53200.58	-59.42		
Galle	I	2041-07-16T10:43:49.914		33.97	-22.09	42147.57	-27.71		
Neptune	I	2041-07-16T09:42:13.623		21.08	-29.70	24761.92		-85.94	-86.08
Neptune	E	2041-07-16T10:17:39.162		28.51	-25.62	24763.59		-26.76	-27.56
Galle	E	2041-07-16T10:48:25.314		34.93	-21.43	42000.87	26.75		
LeVerrier	E	2041-07-16T10:52:34.653		35.79	-20.83	53200.11	59.26		
Lassell	E	2041-07-16T10:53:07.636		35.90	-20.75	55200.07	61.97		
Arago	E	2041-07-16T10:53:39.305		36.01	-20.67	57200.05	64.30		
Galatea	E	2041-07-16T10:54:50.673		36.26	-20.49	61953.02	68.72		
Adams	E	2041-07-16T10:55:04.854		36.31	-20.46	62933.03	69.48		

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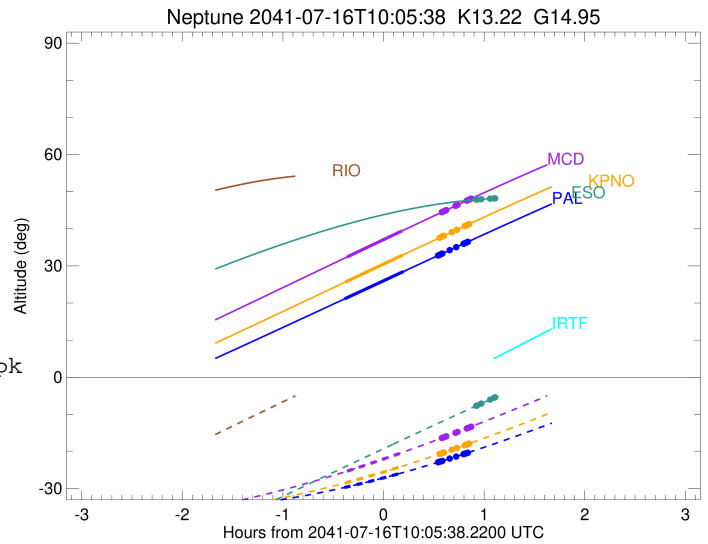
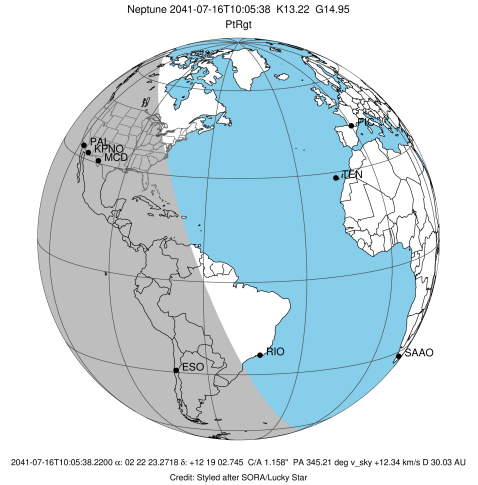
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2041-07-16T09:59:58.760
Event type           : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 72889344520215296
2Mass ID (if available) : 02222324+1219031
ICRS Star Coord at Epoch: 02h 22m 23.27179s +12:19:02.74454s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 13.216
G magnitude           : 14.947
RP magnitude          : 14.354
BP magnitude          : 15.364
DUPflag              : 0
Distance (au)         : 30.031
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 12.34
Sun-Target sep (deg) : 76.33
Sun-Moon sep (deg)   : 67.01
B (ring opening deg) : -4.05
PA of pole (deg)     : -46.84
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.980
C/A sky separation (km) : 21336.1
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
    
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Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2041-07-16T10:38:03.455		37.36	-20.82	62933.09	-68.87		
Galatea	I	2041-07-16T10:38:17.766		37.41	-20.78	61953.10	-68.08		
Arago	I	2041-07-16T10:39:29.931		37.66	-20.60	57200.26	-63.46		
Lassell	I	2041-07-16T10:40:02.054		37.77	-20.52	55200.43	-61.01		
LeVerrier	I	2041-07-16T10:40:35.597		37.89	-20.43	53200.70	-58.18		
Galle	I	2041-07-16T10:44:57.456		38.81	-19.75	42514.37	-26.45		
Neptune	I	2041-07-16T09:42:49.363		25.64	-28.45	24761.92		-85.83	-85.96
Neptune	E	2041-07-16T10:17:11.163		32.94	-23.91	24763.55		-27.94	-28.76
Galle	E	2041-07-16T10:48:54.559		39.63	-19.13	42000.71	22.74		
LeVerrier	E	2041-07-16T10:53:18.323		40.55	-18.43	53200.12	58.03		
Lassell	E	2041-07-16T10:53:51.959		40.67	-18.34	55200.09	60.85		
Arago	E	2041-07-16T10:54:24.179		40.78	-18.25	57200.07	63.27		
Galatea	E	2041-07-16T10:55:36.588		41.04	-18.06	61953.03	67.84		
Adams	E	2041-07-16T10:55:50.950		41.09	-18.02	62933.02	68.62		

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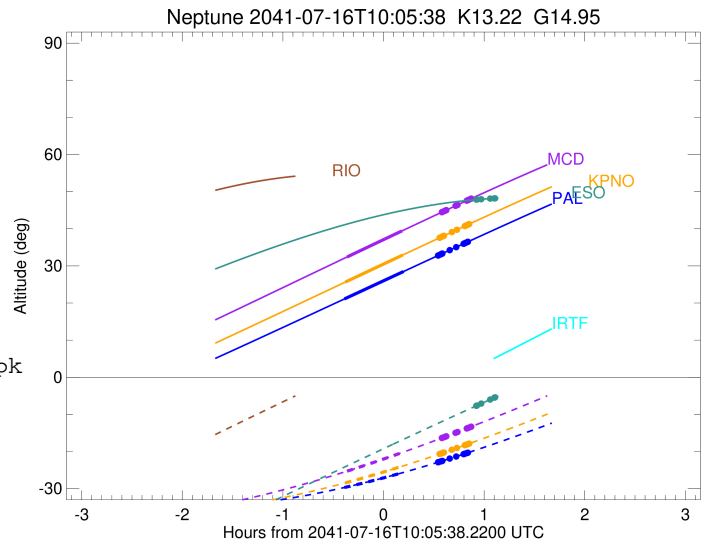
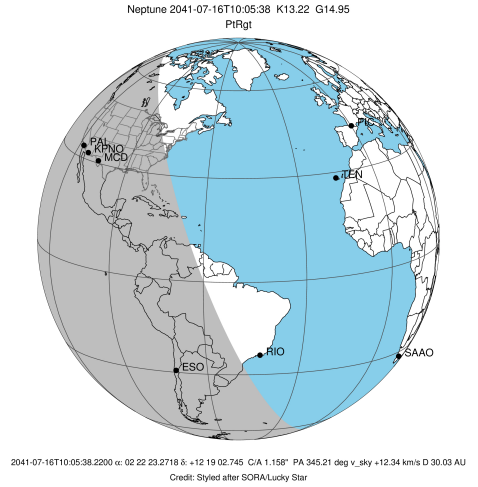
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2041-07-16T10:00:16.070
Event type            : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 72889344520215296
2Mass ID (if available) : 02222324+1219031
ICRS Star Coord at Epoch: 02h 22m 23.27179s +12:19:02.74454s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 13.216
G magnitude           : 14.947
RP magnitude          : 14.354
BP magnitude          : 15.364
DUPflag               : 0
Distance (au)        : 30.031
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 12.34
Sun-Target sep (deg) : 76.33
Sun-Moon sep (deg)   : 67.11
B (ring opening deg) : -4.05
PA of pole (deg)     : -46.84
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.995
C/A sky separation (km) : 21668.9
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	2041-07-16T10:39:23.287		44.25	-16.54	62933.10	-67.74		
Galatea	I	2041-07-16T10:39:37.841		44.30	-16.49	61953.12	-66.92		
Arago	I	2041-07-16T10:40:51.414		44.56	-16.29	57200.34	-62.09		
Lassell	I	2041-07-16T10:41:24.287		44.67	-16.19	55200.54	-59.54		
LeVerrier	I	2041-07-16T10:41:58.725		44.79	-16.09	53200.90	-56.55		
Galle	I	2041-07-16T10:49:39.174		46.40	-14.77	42354.58	19.82		
Neptune	I	2041-07-16T09:43:50.347		32.39	-25.30	24761.93		-85.23	-85.39
Neptune	E	2041-07-16T10:16:44.479		39.45	-20.28	24763.49		-29.52	-30.37
Galle	E	2041-07-16T10:49:37.391		46.39	-14.78	42000.02	16.23		
LeVerrier	E	2041-07-16T10:54:26.797		47.40	-13.93	53200.14	56.43		
Lassell	E	2041-07-16T10:55:01.318		47.52	-13.83	55200.10	59.39		
Arago	E	2041-07-16T10:55:34.277		47.63	-13.74	57200.07	61.93		
Galatea	E	2041-07-16T10:56:48.068		47.89	-13.52	61953.03	66.71		
Adams	E	2041-07-16T10:57:02.669		47.94	-13.48	62933.03	67.53		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2041-07-16T10:01:05.070
Event type            : PtRgt
: Neptune occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
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       : 72889344520215296
2Mass ID (if available) : 02222324+1219031
ICRS Star Coord at Epoch: 02h 22m 23.27179s +12:19:02.74454s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 13.216
G magnitude           : 14.947
RP magnitude          : 14.354
BP magnitude          : 15.364
DUPflag              : 0
Distance (au)        : 30.031
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 12.34
Sun-Target sep (deg) : 76.33
Sun-Moon sep (deg)   : 67.17
B (ring opening deg) : -4.05
PA of pole (deg)     : -46.84
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 1.318
C/A sky separation (km) : 28701.1
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	2041-07-16T10:59:25.592		47.80	-8.01	62941.14	-44.14		
Galatea	I	2041-07-16T10:59:48.366		47.81	-7.93	61964.44	-41.94		
Arago	I	2041-07-16T11:02:06.243		47.90	-7.46	57410.95	-27.31		

No planet occultations

Arago	E	2041-07-16T11:08:27.775		48.11	-6.16	57201.10	26.34		
Galatea	E	2041-07-16T11:10:45.822		48.17	-5.69	61953.65	41.91		
Adams	E	2041-07-16T11:11:08.603		48.18	-5.61	62933.55	44.12		