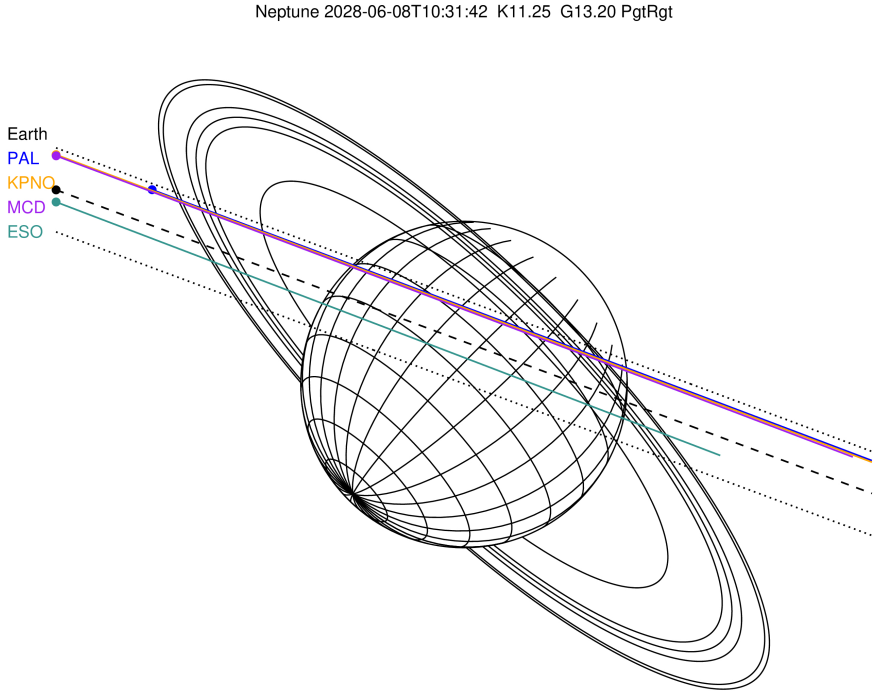
Stellar occultation prediction by rfrench@wellesley.edu Sat Jun 24 19:07:36 2023

target : Neptune
target radius (km) : 24764.00
C/A epoch : 2028-06-08T10:31:42.710
Event type : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Gaia source ID : 2544493455427430656
2Mass ID (if available) : 00322370+0156345

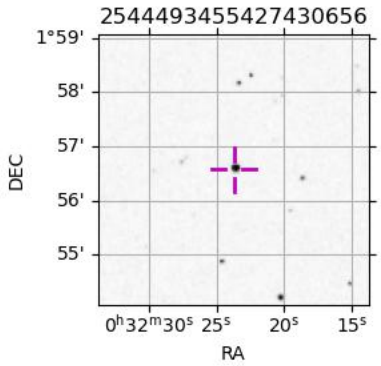
ICRS Star Coord at Epoch: 00h 32m 23.72894s +01:56:34.34487s
RUWE (>1.4 is poor) : 1.01
K magnitude : 11.254
G magnitude : 13.196
RP magnitude : 12.575
BP magnitude : 13.652
DUPflag : 0
Distance (au) : 30.204
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 15.92
Sun-Target sep (deg) : 69.56
Sun-Moon sep (deg) : 96.06
B (ring opening deg) : -16.87
PA of pole (deg) : -45.39



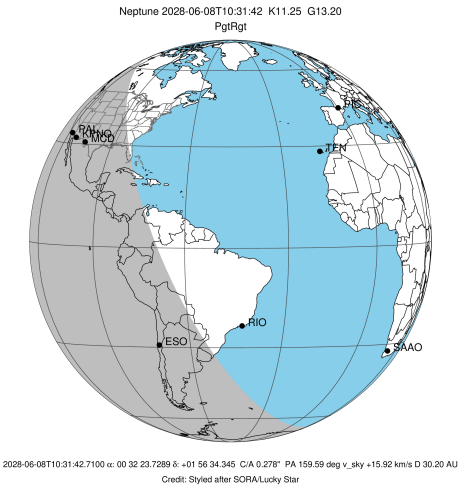
#	a(km)	ring
1	42000.0	Galle
2	53200.0	LeVerrier
3	55200.0	Lassell
4	57200.0	Arago
5	61953.0	Galatea
6	62933.0	Adams

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

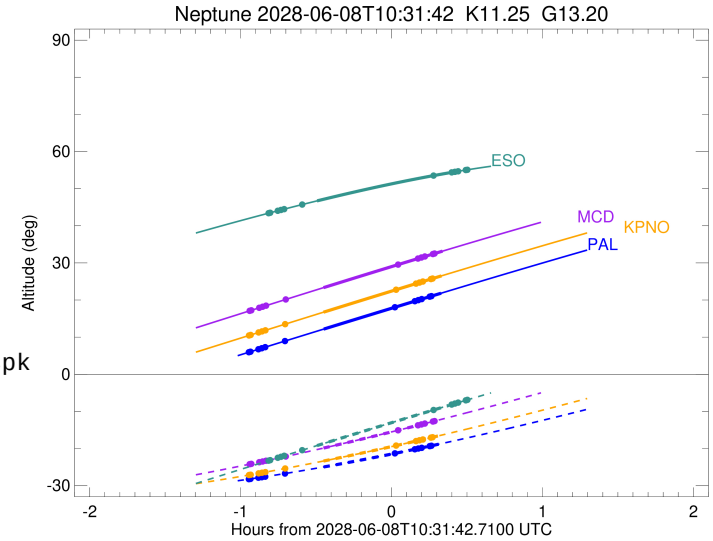
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+ + + + + +	+ +		JUN 08 09:35 - JUN 08 10:51	PieRin
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ + + + + +	+ +		JUN 08 09:35 - JUN 08 10:51	PieRin
MCD	McDonald Obs. 2.7m	30.7	256.0	+ + + + + +	+ +		JUN 08 09:35 - JUN 08 10:52	PieRin
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	+ + + + + +	+ +	+ + + + +	JUN 08 09:43 - JUN 08 11:01	PieRie
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



Neptune_2028-06-08T10_31_42.7100_PAL.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:12:37 2023



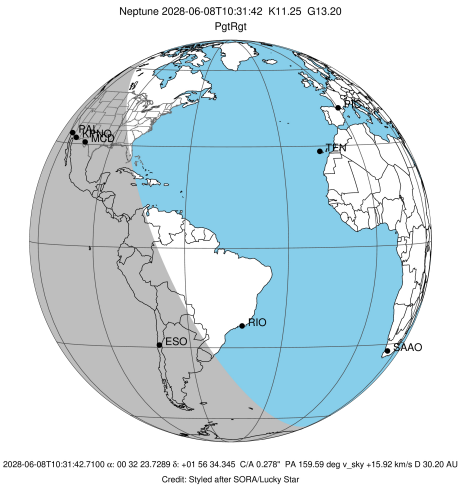
target : Neptune
target radius (km) : 24764.00
C/A epoch : 2028-06-08T10:28:03.210
Event type : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code : PAL
Location : Palomar Mt (200")
Latitude (deg) : 33.35622
E. Longitude (deg) : 243.13601
Altitude (km) : 1.706
Gaia source ID : 2544493455427430656
2Mass ID (if available) : 00322370+0156345
ICRS Star Coord at Epoch: 00h 32m 23.72894s +01:56:34.34487s
RUWE (>1.4 is poor) : 1.01
K magnitude : 11.254
G magnitude : 13.196
RP magnitude : 12.575
BP magnitude : 13.652
DUPflag : 0
Distance (au) : 30.204
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 15.92
Sun-Target sep (deg) : 69.56
Sun-Moon sep (deg) : 96.39
B (ring opening deg) : -16.87
PA of pole (deg) : -45.39
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.505
C/A sky separation (km) : 11052.2
NAIF SPICE kernels : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat440l.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itrf93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.ura111.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk



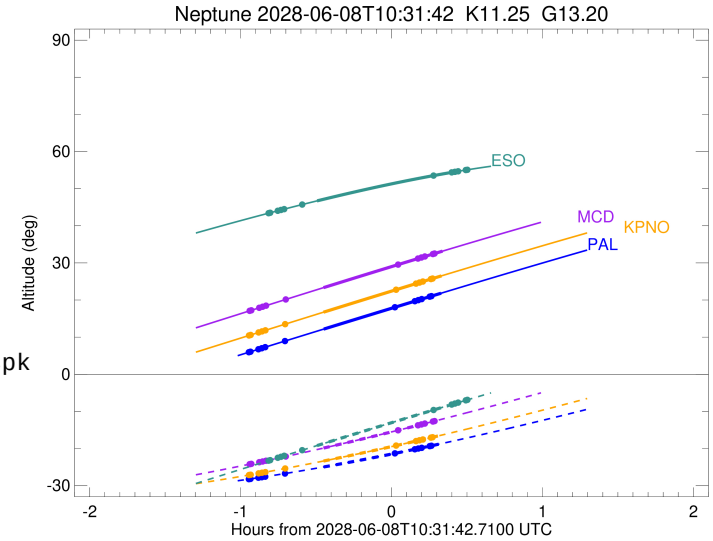
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2028-06-08T09:35:21.326		6.01	-28.22	62933.00	-25.43		
Galatea	I	2028-06-08T09:35:59.916		6.15	-28.15	61953.00	-25.36		
Arago	I	2028-06-08T09:39:08.538		6.81	-27.83	57200.00	-25.02		
Lassell	I	2028-06-08T09:40:28.747		7.09	-27.70	55200.00	-24.85		
LeVerrier	I	2028-06-08T09:41:49.548		7.37	-27.56	53200.00	-24.65		
Galle	I	2028-06-08T09:49:38.008		9.00	-26.72	42000.00	-22.97		
Neptune	I	2028-06-08T10:04:43.165		12.16	-24.97	24763.97		1.64	1.70
Neptune	E	2028-06-08T10:51:25.527		21.83	-18.70	24742.47		48.30	49.27
Galle	E	2028-06-08T10:33:11.072	b	18.08	-21.29	42000.00	22.55		
LeVerrier	E	2028-06-08T10:41:09.521	b	19.72	-20.18	53200.00	24.15		
Lassell	E	2028-06-08T10:42:31.981	b	20.01	-19.99	55200.00	24.35		
Arago	E	2028-06-08T10:43:53.789	b	20.29	-19.79	57200.00	24.54		
Galatea	E	2028-06-08T10:47:06.013	b	20.95	-19.33	61953.00	24.90		
Adams	E	2028-06-08T10:47:45.319	b	21.08	-19.24	62933.00	24.96		

Neptune_2028-06-08T10_31_42.7100_KPNO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:12:56 2023



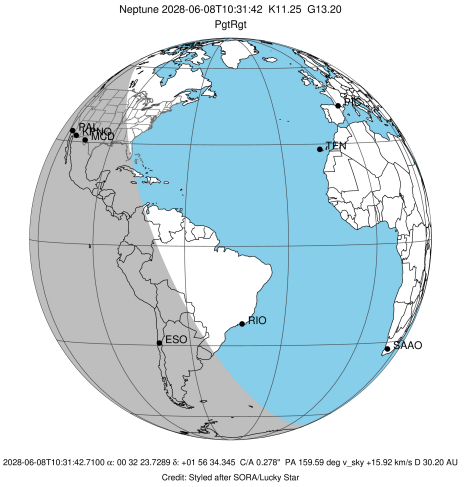
target : Neptune
target radius (km) : 24764.00
C/A epoch : 2028-06-08T10:28:06.650
Event type : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code : KPNO
Location : Kitt Peak Natl Obs
Latitude (deg) : 31.96333
E. Longitude (deg) : 248.40000
Altitude (km) : 2.120
Gaia source ID : 2544493455427430656
2Mass ID (if available) : 00322370+0156345
ICRS Star Coord at Epoch: 00h 32m 23.72894s +01:56:34.34487s
RUWE (>1.4 is poor) : 1.01
K magnitude : 11.254
G magnitude : 13.196
RP magnitude : 12.575
BP magnitude : 13.652
DUPflag : 0
Distance (au) : 30.204
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 15.92
Sun-Target sep (deg) : 69.56
Sun-Moon sep (deg) : 96.46
B (ring opening deg) : -16.87
PA of pole (deg) : -45.39
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.497
C/A sky separation (km) : 10877.1
NAIF SPICE kernels : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat440l.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itrf93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.ura111.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	2028-06-08T09:35:25.760		10.53	-27.10	62933.00	-25.39		
Galatea	I	2028-06-08T09:36:04.395		10.67	-27.03	61953.00	-25.34		
Arago	I	2028-06-08T09:39:13.191		11.33	-26.65	57200.00	-25.00		
Lassell	I	2028-06-08T09:40:33.446		11.62	-26.49	55200.00	-24.84		
LeVerrier	I	2028-06-08T09:41:54.273		11.90	-26.32	53200.00	-24.65		
Galle	I	2028-06-08T09:49:42.302		13.56	-25.35	42000.00	-23.02		
Neptune	I	2028-06-08T10:04:38.147		16.72	-23.38	24763.98		1.25	1.29
Neptune	E	2028-06-08T10:51:37.439		26.52	-16.39	24742.78		47.86	48.83
Galle	E	2028-06-08T10:33:39.259	b	22.80	-19.19	42000.00	22.58		
LeVerrier	E	2028-06-08T10:41:37.406	b	24.45	-17.97	53200.00	24.15		
Lassell	E	2028-06-08T10:42:59.877	b	24.74	-17.75	55200.00	24.35		
Arago	E	2028-06-08T10:44:21.714	b	25.02	-17.54	57200.00	24.53		
Galatea	E	2028-06-08T10:47:34.069	b	25.68	-17.04	61953.00	24.88		
Adams	E	2028-06-08T10:48:13.411	b	25.82	-16.93	62933.00	24.94		

Neptune_2028-06-08T10_31_42.7100_MCD.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:13:06 2023




```
target                  : Neptune
target radius (km)      :  24764.00
C/A epoch               : 2028-06-08T10:28:20.380
Event type              : PgtRgt
: Neptune occs: geocentric, topocentric
: 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          : 2544493455427430656
2Mass ID (if available) : 00322370+0156345
ICRS Star Coord at Epoch: 00h 32m 23.72894s +01:56:34.34487s
RUWE (>1.4 is poor)     :   1.01
K magnitude             : 11.254
G magnitude             : 13.196
RP magnitude            : 12.575
BP magnitude            : 13.652
DUPflag                 : 0
Distance (au)           : 30.204
f0 (km)                 :       0.000
g0 (km)                 :       0.000
skyplane vel. (km/s)    :  15.92
Sun-Target sep (deg)    :   69.56
Sun-Moon sep (deg)      :   96.56
B (ring opening deg)    :  -16.87
PA of pole (deg)        :  -45.39
Pole direction: RA (deg): 299.33374
Dec (deg):  42.95036
C/A sky separation (")  :   0.486
C/A sky separation (km) :  10642.8
NAIF SPICE kernels      : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat440l.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itrf93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.ura111.tpc.Neptune
naif0012.tls
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
earth_flat_IAU.spk
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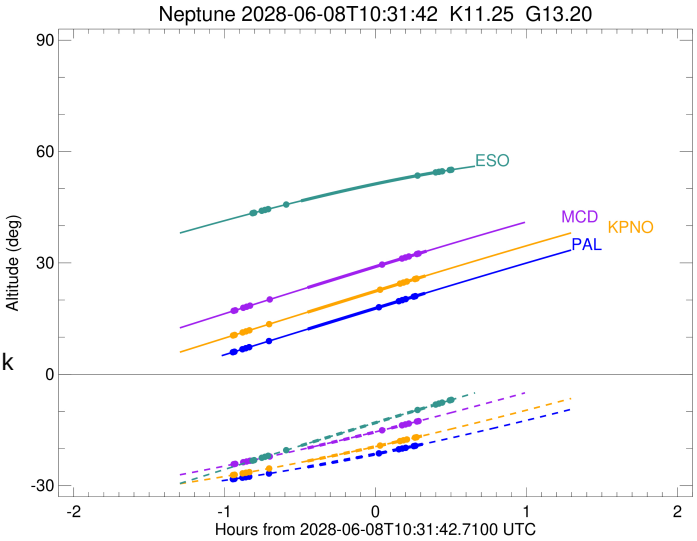
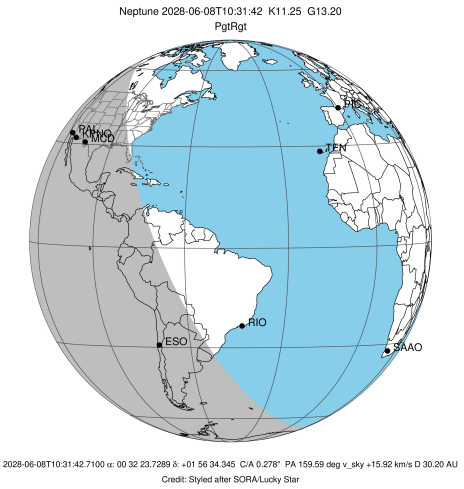


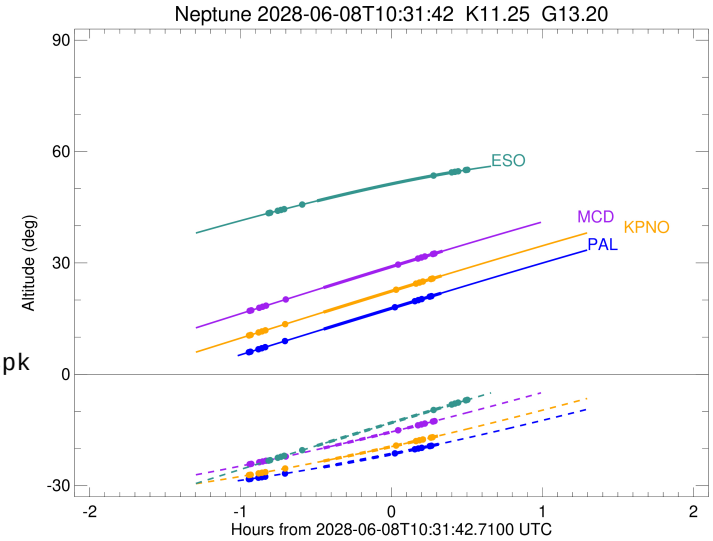
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2028-06-08T09:35:40.316		17.16	-24.17	62933.00	-25.34		
Galatea	I	2028-06-08T09:36:19.026		17.30	-24.08	61953.00	-25.29		
Arago	I	2028-06-08T09:39:28.125		17.98	-23.64	57200.00	-24.97		
Lassell	I	2028-06-08T09:40:48.472		18.26	-23.45	55200.00	-24.81		
LeVerrier	I	2028-06-08T09:42:09.366		18.55	-23.25	53200.00	-24.63		
Galle	I	2028-06-08T09:49:57.018		20.21	-22.12	42000.00	-23.09		
Neptune	I	2028-06-08T10:04:40.497		23.33	-19.88	24763.99		0.73	0.76
Neptune	E	2028-06-08T10:52:02.460		33.18	-12.06	24743.18		47.26	48.23
Galle	E	2028-06-08T10:34:26.208	b	29.56	-15.07	42000.00	22.61		
LeVerrier	E	2028-06-08T10:42:24.004	b	31.20	-13.72	53200.00	24.15		
Lassell	E	2028-06-08T10:43:46.499	b	31.49	-13.49	55200.00	24.34		
Arago	E	2028-06-08T10:45:08.383	b	31.77	-13.25	57200.00	24.51		
Galatea	E	2028-06-08T10:48:20.930	b	32.42	-12.70	61953.00	24.85		
Adams	E	2028-06-08T10:49:00.325	b	32.56	-12.58	62933.00	24.91		

Neptune_2028-06-08T10_31_42.7100_ESO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:13:57 2023



target : Neptune
target radius (km) : 24764.00
C/A epoch : 2028-06-08T10:28:15.400
Event type : PgtRgt
: Neptune occs: geocentric, topocentric
: 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 : 2544493455427430656
2Mass ID (if available) : 00322370+0156345
ICRS Star Coord at Epoch: 00h 32m 23.72894s +01:56:34.34487s
RUWE (>1.4 is poor) : 1.01
K magnitude : 11.254
G magnitude : 13.196
RP magnitude : 12.575
BP magnitude : 13.652
DUPflag : 0
Distance (au) : 30.204
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 15.92
Sun-Target sep (deg) : 69.56
Sun-Moon sep (deg) : 96.85
B (ring opening deg) : -16.87
PA of pole (deg) : -45.39
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.175
C/A sky separation (km) : 3823.9
NAIF SPICE kernels : RAJobs_U111+rgf16.spk
URKALLv1.spk
nep097.bsp
nep101.bsp
sat440l.bsp
de440.bsp
earth_720101_070426.bpc
earthstns_itrf93_040916.bsp
earth_200101_990628_predict.bpc
pck00010.tpc
pck.ura111.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	2028-06-08T09:43:05.403		43.44	-23.22	62933.00	-26.29		
Galatea	I	2028-06-08T09:43:42.689		43.55	-23.09	61953.00	-26.28		
Arago	I	2028-06-08T09:46:43.713		44.08	-22.45	57200.00	-26.23		
Lassell	I	2028-06-08T09:47:59.989		44.30	-22.18	55200.00	-26.21		
LeVerrier	I	2028-06-08T09:49:16.335		44.52	-21.91	53200.00	-26.18		
Galle	I	2028-06-08T09:56:25.561		45.75	-20.41	42000.00	-25.98		
Neptune	I	2028-06-08T10:02:06.673		46.71	-19.21	24761.44		-14.92	-15.42
Neptune	E	2028-06-08T10:54:26.320		54.25	-8.40	24753.30		31.75	32.64
Galle	E	2028-06-08T10:48:23.261	b	53.51	-9.63	42000.00	25.73		
LeVerrier	E	2028-06-08T10:55:36.190		54.38	-8.16	53200.00	25.97		
Lassell	E	2028-06-08T10:56:53.153		54.53	-7.90	55200.00	26.00		
Arago	E	2028-06-08T10:58:10.046		54.67	-7.64	57200.00	26.02		
Galatea	E	2028-06-08T11:01:12.541		55.01	-7.03	61953.00	26.07		
Adams	E	2028-06-08T11:01:50.133		55.08	-6.90	62933.00	26.07		