

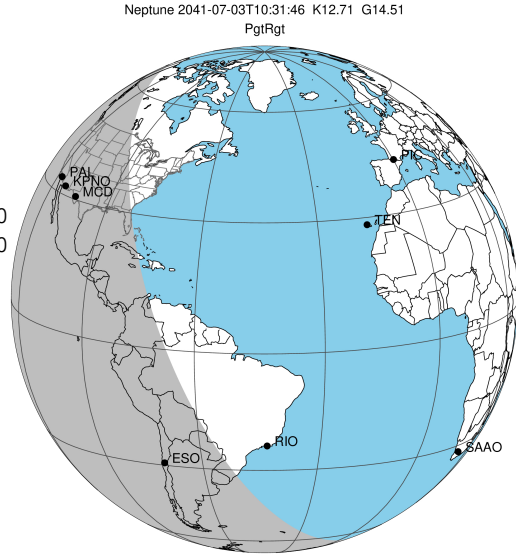
target : Neptune
 target radius (km) : 24764.00
 C/A epoch : 2041-07-03T10:31:46.470
 Event type : PgtRgt
 : Neptune occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 73052518917687552
 2Mass ID (if available) : 02213156+1215312

ICRS Star Coord at Epoch: 02h 21m 31.58020s +12:15:31.13356s
 RUWE (>1.4 is poor) : 1.14
 K magnitude : 12.709
 G magnitude : 14.512
 RP magnitude : 13.907
 BP magnitude : 14.946
 DUPflag : 0
 Distance (au) : 30.236
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 18.26
 Sun-Target sep (deg) : 64.18
 Sun-Moon sep (deg) : 119.61
 B (ring opening deg) : -4.17
 PA of pole (deg) : -46.87
 # 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

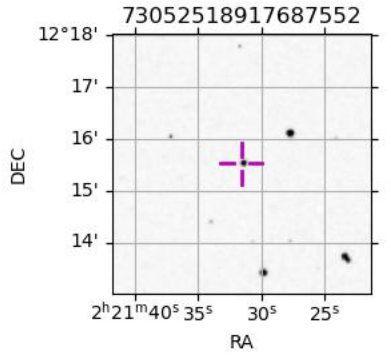
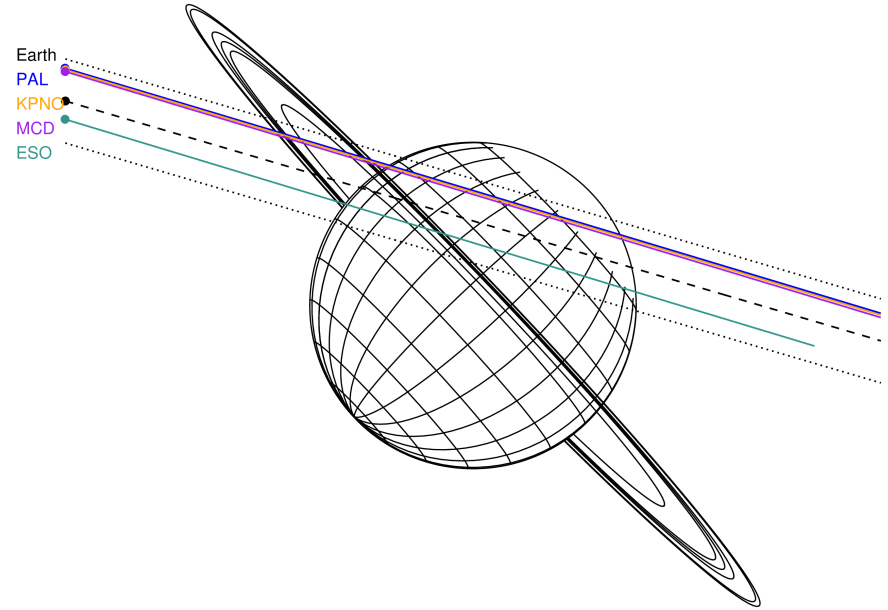
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+	+	+	+	+	+	JUL 03 09:55 - JUL 03 10:44	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn				
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	+	+	+	+	+	+	JUL 03 09:55 - JUL 03 10:45	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	+	+	+	+	+	+	JUL 03 09:56 - JUL 03 10:45	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 03 10:06 - JUL 03 10:49	PieRin	
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				



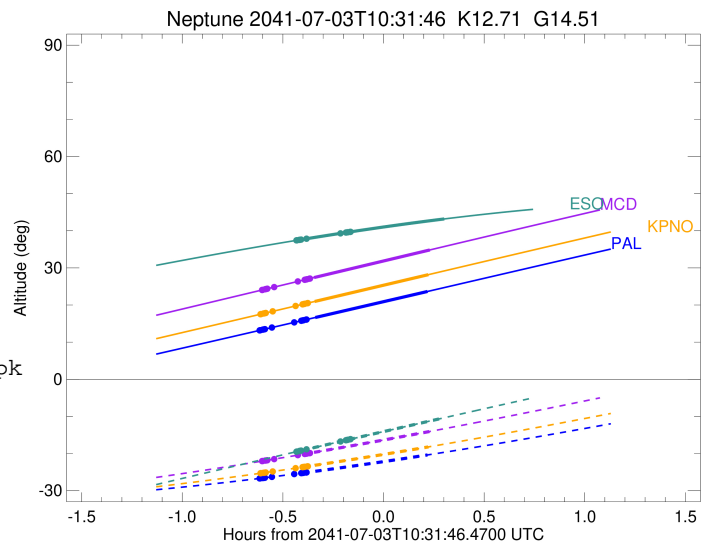
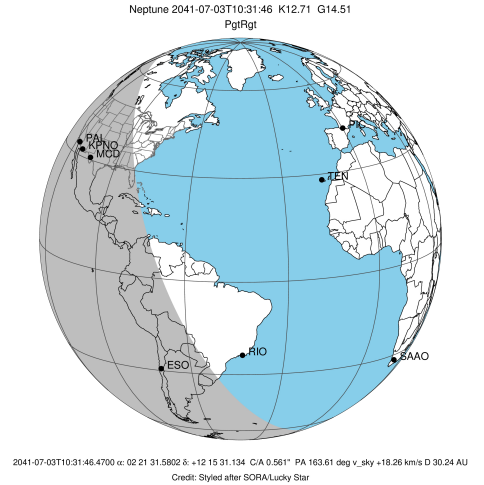
2041-07-03T10:31:46.4700 cc: 02 21 31.5802 s: +12 15 31.134 C/A 0.561" PA 163.61 deg v_sky +18.26 km/s D 30.24 AU
 Credit: Styled after SORA/Lucky Star

Neptune 2041-07-03T10:31:46 K12.71 G14.51 PgtRgt



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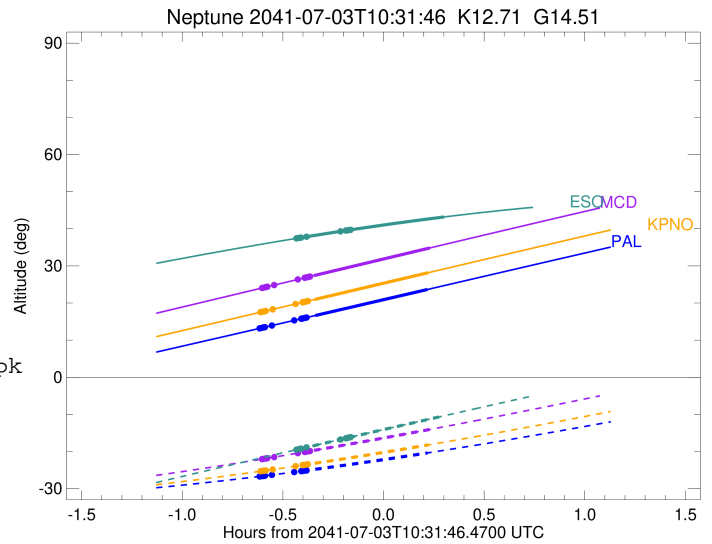
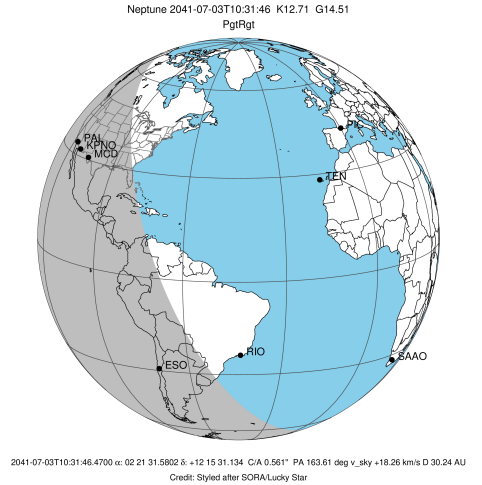
target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2041-07-03T10:28:09.690
Event type            : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 73052518917687552
2Mass ID (if available) : 02213156+1215312
ICRS Star Coord at Epoch: 02h 21m 31.58020s +12:15:31.13356s
RUWE (>1.4 is poor) : 1.14
K magnitude           : 12.709
G magnitude           : 14.512
RP magnitude          : 13.907
BP magnitude          : 14.946
DUPflag              : 0
Distance (au)         : 30.236
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 64.18
Sun-Moon sep (deg)   : 119.64
B (ring opening deg) : -4.17
PA of pole (deg)     : -46.87
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.762
C/A sky separation (km) : 16713.4
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	2041-07-03T09:55:20.845		13.28	-26.65	62932.99	-108.31		
Galatea	I	2041-07-03T09:55:29.920		13.31	-26.64	61953.00	-107.65		
Arago	I	2041-07-03T09:56:14.826		13.46	-26.55	57200.01	-103.87		
Lassell	I	2041-07-03T09:56:34.258		13.53	-26.52	55200.02	-101.93		
LeVerrier	I	2041-07-03T09:56:54.089		13.60	-26.48	53200.01	-99.72		
Galle	I	2041-07-03T09:58:58.024		14.03	-26.25	42000.10	-78.51		
Neptune	I	2041-07-03T10:11:25.178		16.63	-24.79	24763.91		12.26	12.68
Neptune	E	2041-07-03T10:44:55.826		23.66	-20.38	24762.00		72.11	72.67
Galle	E	2041-07-03T10:05:45.290		15.45	-25.46	42000.81	78.54		
LeVerrier	E	2041-07-03T10:07:49.209		15.88	-25.22	53200.04	99.75		
Lassell	E	2041-07-03T10:08:09.036		15.95	-25.18	55200.02	101.96		
Arago	E	2041-07-03T10:08:28.463		16.02	-25.14	57200.01	103.91		
Galatea	E	2041-07-03T10:09:13.357		16.17	-25.05	61953.01	107.70		
Adams	E	2041-07-03T10:09:22.429		16.21	-25.03	62933.00	108.36		

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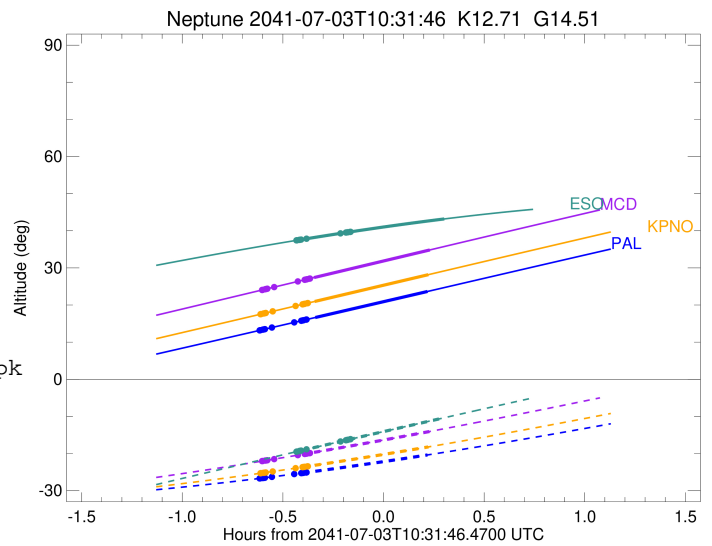
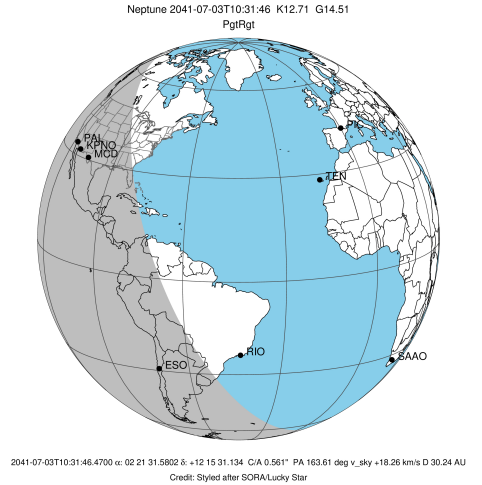
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2041-07-03T10:28:10.660
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 73052518917687552
2Mass ID (if available) : 02213156+1215312
ICRS Star Coord at Epoch: 02h 21m 31.58020s +12:15:31.13356s
RUWE (>1.4 is poor) : 1.14
K magnitude          : 12.709
G magnitude          : 14.512
RP magnitude         : 13.907
BP magnitude         : 14.946
DUPflag             : 0
Distance (au)       : 30.236
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 64.18
Sun-Moon sep (deg)  : 119.70
B (ring opening deg) : -4.17
PA of pole (deg)    : -46.87
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.751
C/A sky separation (km) : 16467.1
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
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2041-07-03T09:55:36.452		17.63	-25.25	62933.00	-108.56		
Galatea	I	2041-07-03T09:55:45.505		17.66	-25.23	61953.00	-107.93		
Arago	I	2041-07-03T09:56:30.268		17.82	-25.14	57200.00	-104.28		
Lassell	I	2041-07-03T09:56:49.616		17.89	-25.09	55200.01	-102.41		
LeVerrier	I	2041-07-03T09:57:09.345		17.96	-25.05	53200.01	-100.29		
Galle	I	2041-07-03T09:59:11.952		18.39	-24.79	42000.09	-80.01		
Neptune	I	2041-07-03T10:11:11.994		20.95	-23.18	24763.92		11.53	11.92
Neptune	E	2041-07-03T10:45:10.981		28.19	-18.22	24762.01		71.34	71.92
Galle	E	2041-07-03T10:06:09.402		19.87	-23.87	42000.65	80.05		
LeVerrier	E	2041-07-03T10:08:11.981		20.31	-23.59	53200.04	100.33		
Lassell	E	2041-07-03T10:08:31.704		20.38	-23.55	55200.02	102.46		
Arago	E	2041-07-03T10:08:51.045		20.45	-23.50	57200.01	104.33		
Galatea	E	2041-07-03T10:09:35.789		20.60	-23.40	61953.01	107.98		
Adams	E	2041-07-03T10:09:44.838		20.64	-23.38	62933.01	108.62		

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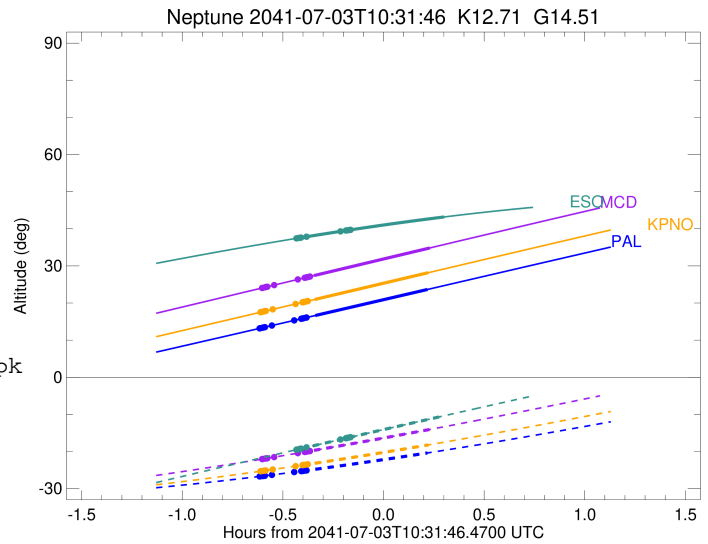
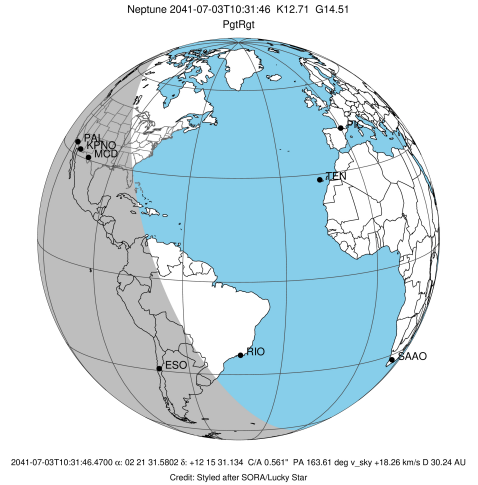
target                : Neptune
target radius (km)   : 24764.00
C/A epoch            : 2041-07-03T10:28:19.630
Event type          : PgtRgt
: Neptune occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 73052518917687552
2Mass ID (if available) : 02213156+1215312
ICRS Star Coord at Epoch: 02h 21m 31.58020s +12:15:31.13356s
RUWE (>1.4 is poor) : 1.14
K magnitude          : 12.709
G magnitude           : 14.512
RP magnitude         : 13.907
BP magnitude         : 14.946
DUPflag             : 0
Distance (au)        : 30.236
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 64.18
Sun-Moon sep (deg)   : 119.78
B (ring opening deg) : -4.17
PA of pole (deg)     : -46.87
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.736
C/A sky separation (km) : 16142.8
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	2041-07-03T09:56:04.739		24.16	-21.97	62933.00	-108.86		
Galatea	I	2041-07-03T09:56:13.766		24.19	-21.95	61953.00	-108.25		
Arago	I	2041-07-03T09:56:58.358		24.35	-21.84	57200.00	-104.78		
Lassell	I	2041-07-03T09:57:17.605		24.42	-21.79	55200.01	-103.01		
LeVerrier	I	2041-07-03T09:57:37.208		24.49	-21.74	53200.01	-100.99		
Galle	I	2041-07-03T09:59:38.200		24.93	-21.44	42000.06	-81.89		
Neptune	I	2041-07-03T10:11:02.544		27.39	-19.69	24763.93		10.57	10.93
Neptune	E	2041-07-03T10:45:38.377		34.85	-14.05	24762.03		70.33	70.94
Galle	E	2041-07-03T10:06:48.816		26.48	-20.35	42000.48	81.93		
LeVerrier	E	2041-07-03T10:08:49.761		26.91	-20.04	53200.03	101.05		
Lassell	E	2041-07-03T10:09:09.355		26.98	-19.99	55200.02	103.07		
Arago	E	2041-07-03T10:09:28.590		27.05	-19.94	57200.01	104.85		
Galatea	E	2041-07-03T10:10:13.152		27.21	-19.82	61953.01	108.34		
Adams	E	2041-07-03T10:10:22.173		27.25	-19.80	62933.01	108.95		

```

target                : Neptune
target radius (km)   : 24764.00
C/A epoch             : 2041-07-03T10:28:31.510
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       : 73052518917687552
2Mass ID (if available) : 02213156+1215312
ICRS Star Coord at Epoch: 02h 21m 31.58020s +12:15:31.13356s
RUWE (>1.4 is poor) : 1.14
K magnitude           : 12.709
G magnitude           : 14.512
RP magnitude          : 13.907
BP magnitude          : 14.946
DUPflag              : 0
Distance (au)         : 30.236
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 18.26
Sun-Target sep (deg) : 64.18
Sun-Moon sep (deg)   : 119.85
B (ring opening deg) : -4.17
PA of pole (deg)     : -46.87
Pole direction: RA (deg): 299.33374
Dec (deg): 42.95036
C/A sky separation (") : 0.416
C/A sky separation (km) : 9112.3
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
    
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
Adams	I	2041-07-03T10:06:08.192		37.47	-19.44	62933.00	-119.45		
Galatea	I	2041-07-03T10:06:16.402		37.49	-19.41	61953.00	-119.28		
Arago	I	2041-07-03T10:06:56.403		37.58	-19.27	57200.01	-118.32		
Lassell	I	2041-07-03T10:07:13.341	b	37.63	-19.21	55200.00	-117.83		
LeVerrier	I	2041-07-03T10:07:30.352	b	37.67	-19.16	53200.01	-117.29		
Galle	I	2041-07-03T10:09:07.564	b	37.91	-18.82	42000.00	-112.57		
Neptune	I	2041-07-03T10:07:07.884		37.61	-19.23	24763.95		-8.42	-8.71
Neptune	E	2041-07-03T10:49:56.889		43.20	-10.36	24762.64		51.44	52.39
Galle	E	2041-07-03T10:19:12.442	b	39.34	-16.71	42000.00	113.75		
LeVerrier	E	2041-07-03T10:20:48.433	b	39.56	-16.37	53200.00	119.07		
Lassell	E	2041-07-03T10:21:05.184	b	39.60	-16.32	55199.99	119.72		
Arago	E	2041-07-03T10:21:21.847	b	39.64	-16.26	57200.00	120.32		
Galatea	E	2041-07-03T10:22:01.144	b	39.72	-16.12	61953.00	121.55		
Adams	E	2041-07-03T10:22:09.199	b	39.74	-16.09	62933.01	121.77		