

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-10T10:57:44.040
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4068930180968516224
 2Mass ID (if available) : 17500619-2226320

Saturn 2047-08-10T10:57:44 K8.24 G14.20 PgtRgt

ICRS Star Coord at Epoch: 17h 50m 06.18663s -22:26:32.23823s

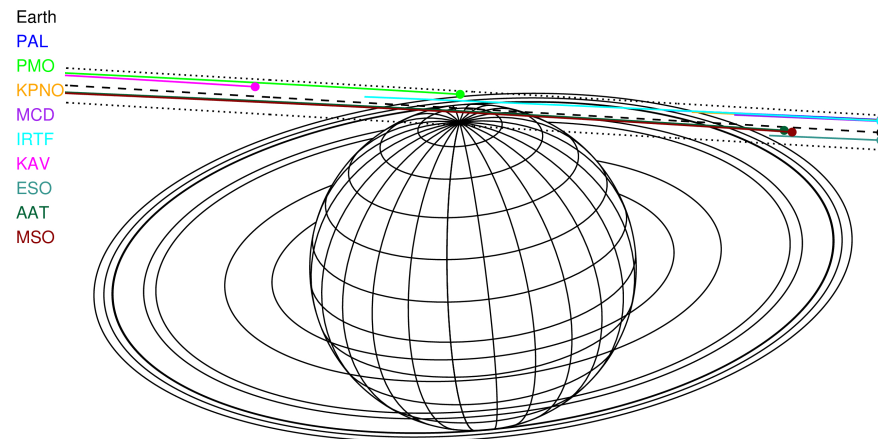
RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.236
 G magnitude : 14.203
 RP magnitude : 12.753
 BP magnitude : 16.899
 DUPflag : 0
 Distance (au) : 9.357
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -9.83
 Sun-Target sep (deg) : 130.59
 Sun-Moon sep (deg) : 103.25
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.32

a(km) ring

- 1 74490.6 C (IER)
- 2 91984.7 B (IER)
- 3 117571.2 B (OER)
- 4 122050.4 A (IER)
- 5 133423.3 Encke (IEG)
- 6 133744.9 Encke (OEG)
- 7 136774.4 A (OER)
- 8 140461.0 F ring

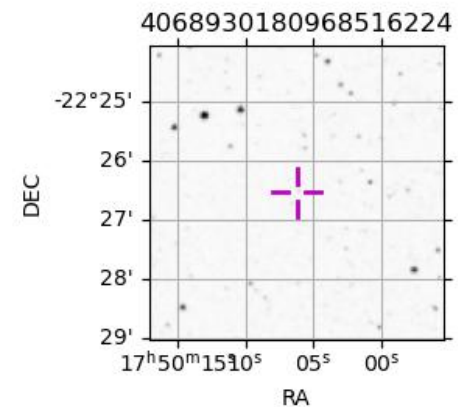


2047-08-10T10:57:44.0400 @: 17 50 06.1866 s -22 26 32.238 C/A 8.608° PA 176.68 deg v_sky - 9.83 km/s D 09.36 AU
 Credit: Styled after SORA/Lucky Star

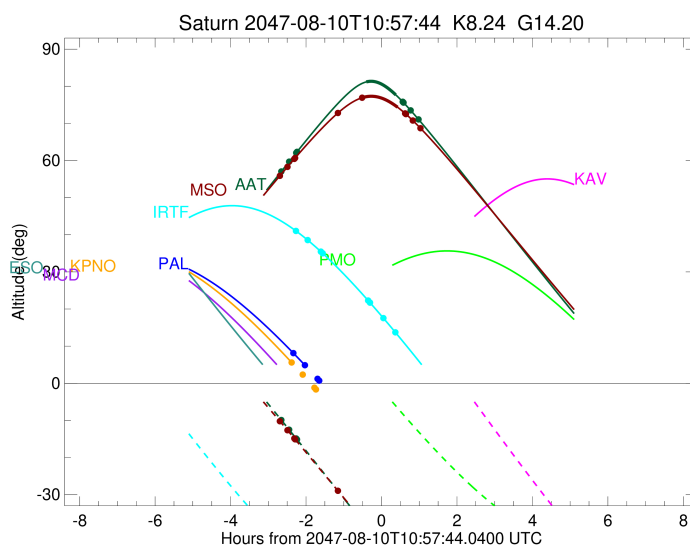
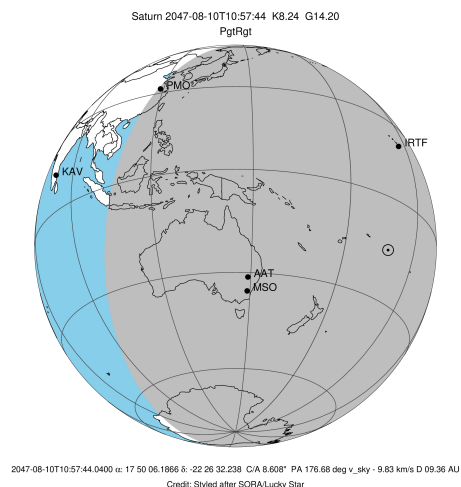


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| 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 (20 | 33.4 | 243.1 | + | | | AUG 10 08:37 - AUG 10 08:37 | PnnRin |
| PMO | Purple Mtn Obs | 32.1 | 118.8 | | | | | PnnRnn |
| KPNO | Kitt Peak Natl | 32.0 | 248.4 | + | | | AUG 10 08:34 - AUG 10 08:34 | PnnRin |
| MCD | McDonald Obs. | 30.7 | 256.0 | | | | | PnnRnn |
| TEN | Teide Obs./Ten | 28.3 | 343.5 | | | | | PnnRnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + | + | + | AUG 10 08:41 - AUG 10 11:19 | PnnRie |
| KAV | Kavalur Observ | 12.6 | 78.8 | | | | | PnnRnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | | | | | PnnRnn |
| ESO | European South | -29.3 | 289.3 | | | | | PnnRnn |
| AAT | Siding Spring | -31.3 | 149.1 | + | + | + | AUG 10 08:18 - AUG 10 11:56 | PieRie |
| SAAO | So. Afr. Astro | -32.4 | 20.8 | | | | | PnnRnn |
| MSO | Mt. Stromlo Ob | -35.3 | 149.0 | + | + | + | AUG 10 08:15 - AUG 10 11:59 | PieRie |



target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-10T10:49:58.700
 Event type : PgtRgt
 : Saturn 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 : 4068930180968516224
 2Mass ID (if available) : 17500619-2226320
 ICRS Star Coord at Epoch: 17h 50m 06.18663s -22:26:32.23823s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.236
 G magnitude : 14.203
 RP magnitude : 12.753
 BP magnitude : 16.899
 DUPflag : 0
 Distance (au) : 9.357
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -9.83
 Sun-Target sep (deg) : 130.59
 Sun-Moon sep (deg) : 103.15
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.002
 C/A sky separation (km) : 61090.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk

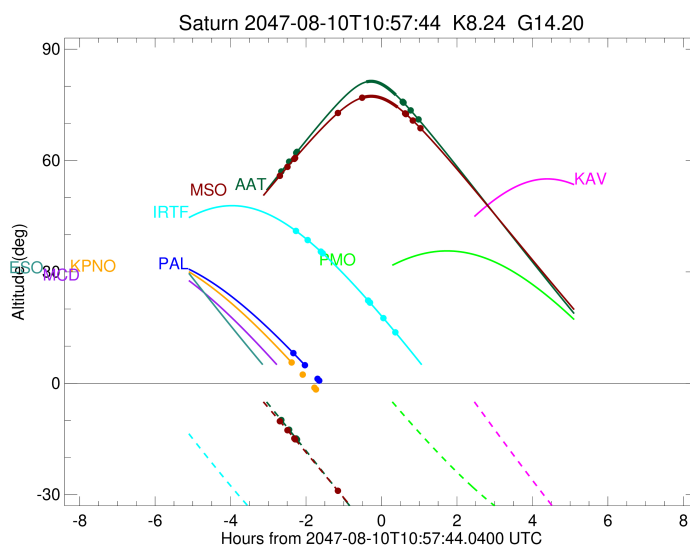
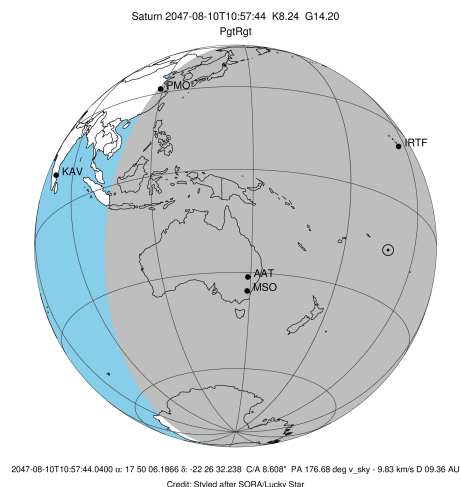


| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|-------|---------|-----------|-------|---------|--------------|
| F ring | I | 2047-08-10T08:37:07.680 | | 8.20 | -40.16 | 140461.00 | -3.75 | | |
| A (OER) | I | 2047-08-10T08:55:22.330 | | 4.97x | -39.06 | 136774.40 | -2.98 | | |
| Encke (OEG) | I | 2047-08-10T09:15:16.085 | | 1.34x | -37.47 | 133744.89 | -2.09 | | |
| Encke (IEG) | I | 2047-08-10T09:17:54.798 | | 0.85x | -37.23 | 133423.31 | -1.96 | | |

No planet occultations

| | | | | | | | | | |
|-------------|---|-------------------------|--|---------|--------|-----------|------|--|--|
| Encke (IEG) | E | 2047-08-10T10:40:44.046 | | -15.21x | -26.95 | 133423.31 | 1.94 | | |
| Encke (OEG) | E | 2047-08-10T10:43:25.150 | | -15.74x | -26.54 | 133744.89 | 2.06 | | |
| A (OER) | E | 2047-08-10T11:03:41.376 | | -19.84x | -23.35 | 136774.40 | 2.92 | | |
| F ring | E | 2047-08-10T11:22:23.229 | | -23.66x | -20.24 | 140461.00 | 3.65 | | |

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-10T10:49:58.580
 Event type : PgtRgt
 : Saturn 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 : 4068930180968516224
 2Mass ID (if available) : 17500619-2226320
 ICRS Star Coord at Epoch: 17h 50m 06.18663s -22:26:32.23823s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.236
 G magnitude : 14.203
 RP magnitude : 12.753
 BP magnitude : 16.899
 DUPflag : 0
 Distance (au) : 9.357
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -9.83
 Sun-Target sep (deg) : 130.59
 Sun-Moon sep (deg) : 103.09
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.956
 C/A sky separation (km) : 60779.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk

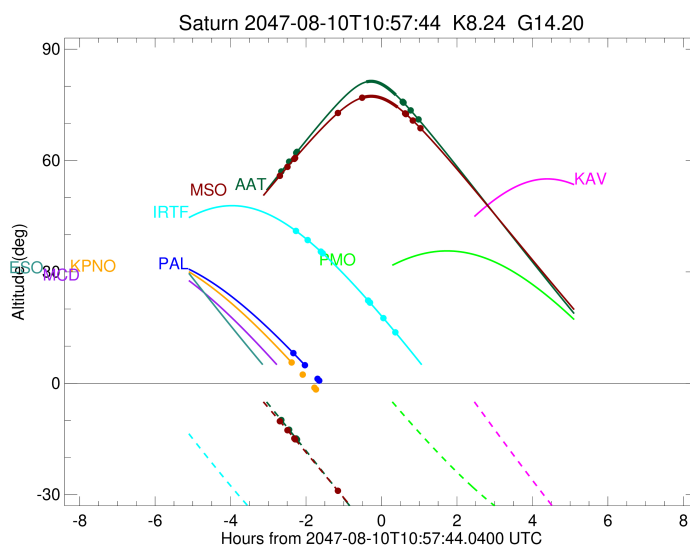
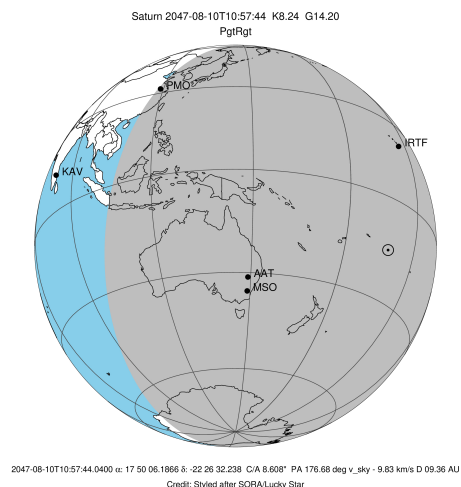


| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|--------|---------|-----------|-------|---------|--------------|
| F ring | I | 2047-08-10T08:34:22.648 | | 5.68 | -40.36 | 140461.00 | -3.86 | | |
| A (OER) | I | 2047-08-10T08:51:54.331 | | 2.43x | -38.93 | 136774.40 | -3.14 | | |
| Encke (OEG) | I | 2047-08-10T09:10:23.240 | | -1.07x | -37.11 | 133744.89 | -2.32 | | |
| Encke (IEG) | I | 2047-08-10T09:12:45.236 | | -1.52x | -36.85 | 133423.31 | -2.21 | | |

No planet occultations

| | | | | | | | | | |
|-------------|---|-------------------------|--|---------|--------|-----------|------|--|--|
| Encke (IEG) | E | 2047-08-10T10:46:17.040 | | -20.23x | -23.61 | 133423.31 | 2.17 | | |
| Encke (OEG) | E | 2047-08-10T10:48:41.429 | | -20.72x | -23.20 | 133744.89 | 2.28 | | |
| A (OER) | E | 2047-08-10T11:07:32.820 | | -24.64x | -19.95 | 136774.40 | 3.07 | | |
| F ring | E | 2047-08-10T11:25:31.712 | | -28.40x | -16.73 | 140461.00 | 3.76 | | |

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-10T10:50:24.610
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4068930180968516224
 2Mass ID (if available) : 17500619-2226320
 ICRS Star Coord at Epoch: 17h 50m 06.18663s -22:26:32.23823s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.236
 G magnitude : 14.203
 RP magnitude : 12.753
 BP magnitude : 16.899
 DUPflag : 0
 Distance (au) : 9.357
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -9.83
 Sun-Target sep (deg) : 130.59
 Sun-Moon sep (deg) : 103.71
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.035
 C/A sky separation (km) : 61314.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



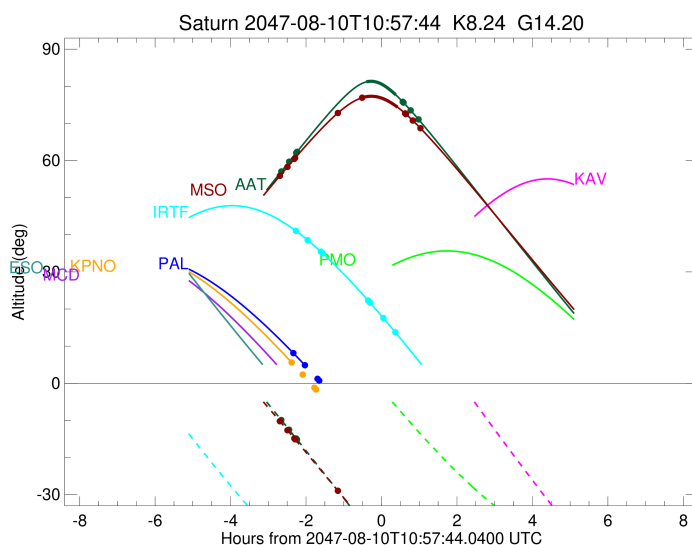
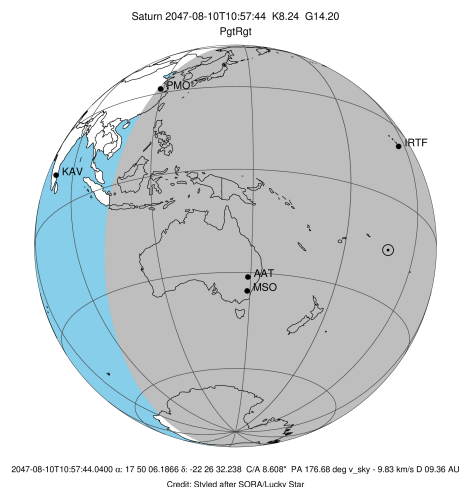
| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|-------|---------|-----------|-------|---------|--------------|
| F ring | I | 2047-08-10T08:41:13.551 | | 41.10 | -46.18 | 140461.00 | -3.72 | | |
| A (OER) | I | 2047-08-10T08:59:44.488 | | 38.65 | -48.73 | 136774.40 | -2.91 | | |
| Encke (OEG) | I | 2047-08-10T09:20:30.510 | | 35.59 | -51.15 | 133744.89 | -1.94 | | |
| Encke (IEG) | I | 2047-08-10T09:23:22.085 | | 35.14 | -51.44 | 133423.31 | -1.81 | | |

No planet occultations

| | | | | | | | | | |
|-------------|---|-------------------------|--|-------|--------|-----------|------|--|--|
| Encke (IEG) | E | 2047-08-10T10:36:55.755 | | 22.20 | -54.71 | 133423.31 | 1.78 | | |
| Encke (OEG) | E | 2047-08-10T10:39:49.601 | | 21.65 | -54.66 | 133744.89 | 1.92 | | |
| A (OER) | E | 2047-08-10T11:00:56.987 | | 17.51 | -53.84 | 136774.40 | 2.85 | | |
| F ring | E | 2047-08-10T11:19:53.817 | | 13.70 | -52.50 | 140461.00 | 3.62 | | |

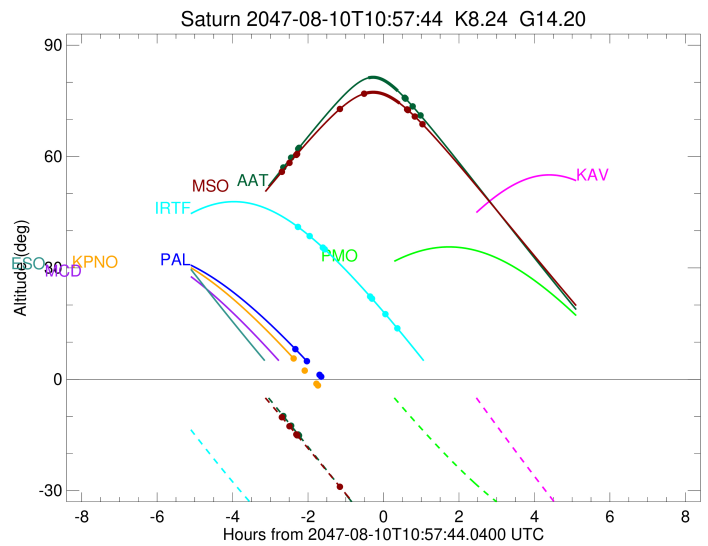
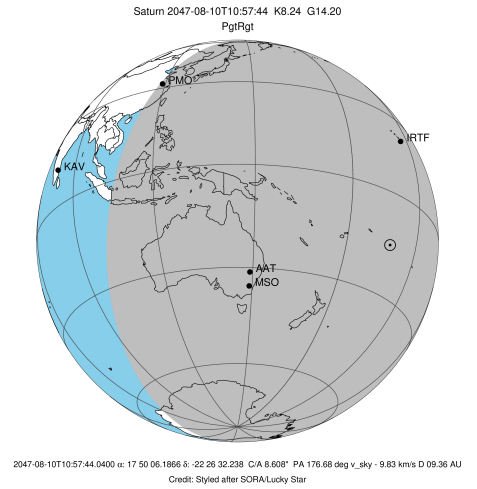
```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch             : 2047-08-10T10:57:31.200
Event type            : PgtRgt
: Saturn occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)        : -31.27703
E. Longitude (deg)    : 149.06608
Altitude (km)         : 1.164
Gaia source ID        : 4068930180968516224
2Mass ID (if available) : 17500619-2226320
ICRS Star Coord at Epoch: 17h 50m 06.18663s -22:26:32.23823s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 8.236
G magnitude           : 14.203
RP magnitude          : 12.753
BP magnitude          : 16.899
DUPflag              : 0
Distance (au)         : 9.357
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -9.83
Sun-Target sep (deg)  : 130.59
Sun-Moon sep (deg)    : 104.14
B (ring opening deg)  : 26.79
PA of pole (deg)      : 5.32
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 8.463
C/A sky separation (km) : 57435.5
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLvl.spk
Saturn_ring_plane.tf
sat378.bsp
sat286.bsp
vgr1.sat286.bsp
vgr2.sat286.bsp
HST1081HSPephemUTC.bsp
pfb10000r.bsp
cassini.bsp
earthstns_itrf93_040916.bsp
earth_200101_990628_predict.bpc
earth_720101_070426.bpc
cpck28Mar2008.tpc
pck.sat440.tpc
IAU_SATURN_for_RINGFIT.tpc
naif0012.tls
earth_flat_IAU.spk
  
```



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|-------|---------|-----------|-------|---------|--------------|
| F ring | I | 2047-08-10T08:18:09.164 | | 56.99 | -9.85 | 140461.00 | -5.19 | | |
| A (OER) | I | 2047-08-10T08:30:32.102 | | 59.62 | -12.44 | 136774.40 | -4.73 | | |
| Encke (OEG) | I | 2047-08-10T08:41:44.921 | | 62.00 | -14.81 | 133744.89 | -4.27 | | |
| Encke (IEG) | I | 2047-08-10T08:43:00.641 | | 62.26 | -15.07 | 133423.31 | -4.22 | | |
| Saturn | I | 2047-08-10T10:33:30.495 | | 81.18 | -38.64 | 59286.60 | | 55.39 | 60.34 |
| Saturn | E | 2047-08-10T11:20:29.080 | | 77.68 | -48.57 | 59127.85 | | 62.74 | 66.93 |
| Encke (IEG) | E | 2047-08-10T11:31:33.094 | | 75.82 | -50.88 | 133423.31 | 4.18 | | |
| Encke (OEG) | E | 2047-08-10T11:32:49.505 | | 75.59 | -51.14 | 133744.89 | 4.23 | | |
| A (OER) | E | 2047-08-10T11:44:08.726 | | 73.50 | -53.47 | 136774.40 | 4.68 | | |
| F ring | E | 2047-08-10T11:56:39.218 | | 71.07 | -56.01 | 140461.00 | 5.14 | | |

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-08-10T10:57:35.080
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 4068930180968516224
 2Mass ID (if available) : 17500619-2226320
 ICRS Star Coord at Epoch: 17h 50m 06.18663s -22:26:32.23823s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.236
 G magnitude : 14.203
 RP magnitude : 12.753
 BP magnitude : 16.899
 DUPflag : 0
 Distance (au) : 9.357
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -9.83
 Sun-Target sep (deg) : 130.59
 Sun-Moon sep (deg) : 104.12
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.399
 C/A sky separation (km) : 56997.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|-------|---------|-----------|-------|---------|--------------|
| F ring | I | 2047-08-10T08:15:49.833 | | 55.82 | -10.17 | 140461.00 | -5.31 | | |
| A (OER) | I | 2047-08-10T08:27:54.274 | | 58.23 | -12.59 | 136774.40 | -4.86 | | |
| Encke (OEG) | I | 2047-08-10T08:38:45.751 | | 60.37 | -14.78 | 133744.89 | -4.43 | | |
| Encke (IEG) | I | 2047-08-10T08:39:58.719 | | 60.61 | -15.02 | 133423.31 | -4.38 | | |
| A (IER) | I | 2047-08-10T09:47:18.699 | | 72.65 | -28.74 | 122050.38 | -1.10 | | |
| Saturn | I | 2047-08-10T10:30:44.733 | | 77.10 | -37.58 | 59311.38 | | 54.32 | 59.37 |
| Saturn | E | 2047-08-10T11:23:23.240 | | 74.35 | -48.09 | 59135.01 | | 62.38 | 66.61 |
| A (IER) | E | 2047-08-10T10:27:36.169 | | 76.96 | -36.95 | 122050.38 | 1.10 | | |
| Encke (IEG) | E | 2047-08-10T11:35:21.897 | | 72.68 | -50.41 | 133423.31 | 4.34 | | |
| Encke (OEG) | E | 2047-08-10T11:36:35.543 | | 72.50 | -50.65 | 133744.89 | 4.39 | | |
| A (OER) | E | 2047-08-10T11:47:33.287 | | 70.77 | -52.73 | 136774.40 | 4.82 | | |
| F ring | E | 2047-08-10T11:59:45.133 | | 68.70 | -55.00 | 140461.00 | 5.25 | | |