

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-09-21T17:47:59.650
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 6310500993092031232
 2Mass ID (if available) : 14513051-1414122

Saturn 2043-09-21T17:47:59 K9.86 G12.25 PgtRgt

ICRS Star Coord at Epoch: 14h 51m 30.48739s -14:14:12.21169s

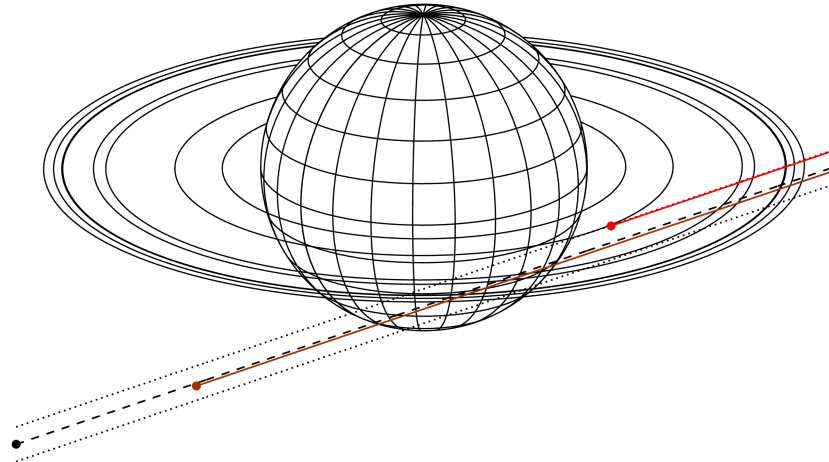
RUWE (>1.4 is poor) : 1.42
 K magnitude : 9.858
 G magnitude : 12.253
 RP magnitude : 11.509
 BP magnitude : 12.866
 DUPflag : 0
 Distance (au) : 10.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 30.00
 Sun-Target sep (deg) : 46.70
 Sun-Moon sep (deg) : 167.99
 B (ring opening deg) : 20.73
 PA of pole (deg) : 0.28

| # | 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 |



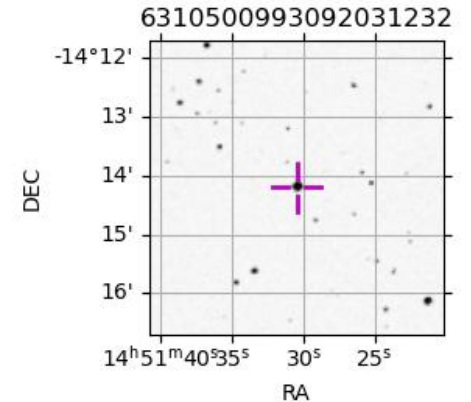
2043-09-21T17:47:59.6500 α: 14 51 30.4874 δ: -14 14 12.212 C/A 6.323° PA 18.72 deg v_sky +30.00 km/s D 10.56 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 SAAO

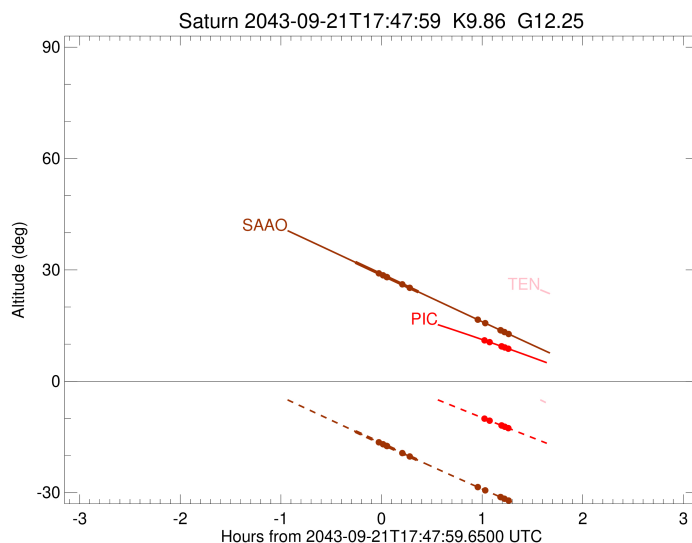
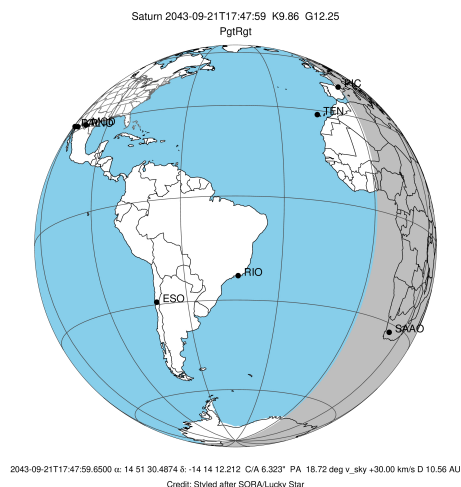


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

| Obs | Location | lat | Elon | Rings I | Planet | Rings E | Observed Events Interval | OEcode |
|------|----------------|-------|-------|---------|--------|---------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | + | SEP 21 18:49 - SEP 21 19:03 | PnnRne |
| PAL | Palomar Mt (20 | 33.4 | 243.1 | | | | | PnnRnn |
| PMO | Purple Mtn Obs | 32.1 | 118.8 | | | | | PnnRnn |
| KPNO | Kitt Peak Natl | 32.0 | 248.4 | | | | | PnnRnn |
| 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 | | | | | PnnRnn |
| 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 | | | | | PnnRnn |
| SAAO | So. Afr. Astro | -32.4 | 20.8 | | + | + | SEP 21 17:32 - SEP 21 19:03 | PieRne |
| MSO | Mt. Stromlo Ob | -35.3 | 149.0 | | | | | PnnRnn |



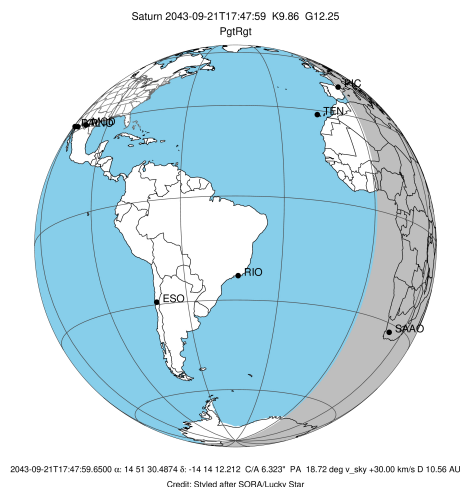
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-09-21T17:48:50.870
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 6310500993092031232
 2Mass ID (if available) : 14513051-1414122
 ICRS Star Coord at Epoch: 14h 51m 30.48739s -14:14:12.21169s
 RUWE (>1.4 is poor) : 1.42
 K magnitude : 9.858
 G magnitude : 12.253
 RP magnitude : 11.509
 BP magnitude : 12.866
 DUPflag : 0
 Distance (au) : 10.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 30.00
 Sun-Target sep (deg) : 46.70
 Sun-Moon sep (deg) : 168.65
 B (ring opening deg) : 20.73
 PA of pole (deg) : 0.28
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.566
 C/A sky separation (km) : 42646.6
 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



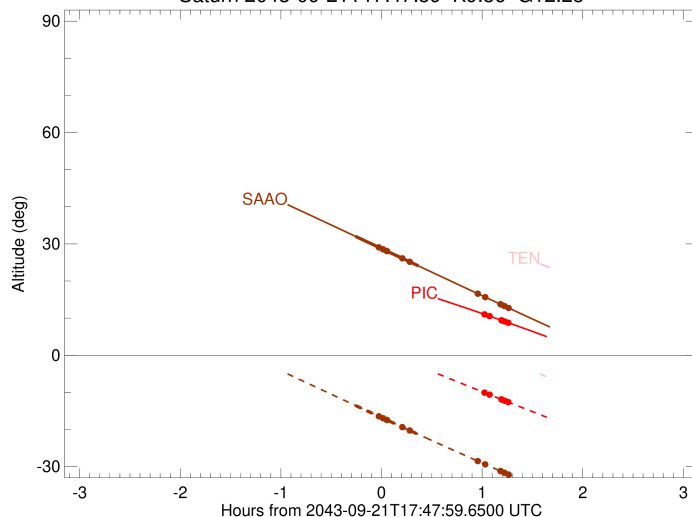
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|-------|---------|-----------|--------|---------|--------------|
| F ring | I | 2043-09-21T17:32:55.682 | b | 21.88 | 3.93x | 140461.00 | -29.17 | | |
| A (OER) | I | 2043-09-21T17:35:03.414 | b | 21.61 | 3.54x | 136774.40 | -28.55 | | |
| Encke (OEG) | I | 2043-09-21T17:36:50.552 | b | 21.39 | 3.21x | 133744.89 | -28.00 | | |
| Encke (IEG) | I | 2043-09-21T17:37:02.051 | b | 21.36 | 3.18x | 133423.31 | -27.93 | | |
| A (IER) | I | 2043-09-21T17:44:08.263 | b | 20.45 | 1.87x | 122050.38 | -25.32 | | |
| B (OER) | I | 2043-09-21T17:47:09.899 | b | 20.05 | 1.32x | 117571.16 | -23.98 | | |
| Saturn | I | 2043-09-21T17:25:26.479 | | 22.79 | 5.31x | 59695.43 | | -57.29 | -62.07 |
| Saturn | E | 2043-09-21T18:12:34.449 | | 16.55 | -3.35x | 60123.50 | | -24.86 | -29.56 |
| B (OER) | E | 2043-09-21T18:49:26.227 | | 11.02 | -10.07 | 117571.16 | 24.03 | | |
| A (IER) | E | 2043-09-21T18:52:27.367 | | 10.54 | -10.62 | 122050.38 | 25.40 | | |
| Encke (IEG) | E | 2043-09-21T18:59:32.028 | | 9.42 | -11.89 | 133423.31 | 28.05 | | |
| Encke (OEG) | E | 2043-09-21T18:59:43.480 | | 9.39 | -11.93 | 133744.89 | 28.11 | | |
| A (OER) | E | 2043-09-21T19:01:30.181 | | 9.10 | -12.25 | 136774.40 | 28.67 | | |
| F ring | E | 2043-09-21T19:03:37.386 | | 8.76 | -12.63 | 140461.00 | 29.29 | | |

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-09-21T17:51:02.070
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 6310500993092031232
 2Mass ID (if available) : 14513051-1414122
 ICRS Star Coord at Epoch: 14h 51m 30.48739s -14:14:12.21169s
 RUWE (>1.4 is poor) : 1.42
 K magnitude : 9.858
 G magnitude : 12.253
 RP magnitude : 11.509
 BP magnitude : 12.866
 DUPflag : 0
 Distance (au) : 10.564
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 30.00
 Sun-Target sep (deg) : 46.70
 Sun-Moon sep (deg) : 168.76
 B (ring opening deg) : 20.73
 PA of pole (deg) : 0.28
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.458
 C/A sky separation (km) : 49478.6
 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



Saturn 2043-09-21T17:47:59 K9.86 G12.25



| Ring | I/E | UTC | b? | alt | alt-sun | radius | r-dot | lat-geo | lat-geodetic |
|-------------|-----|-------------------------|----|-------|---------|-----------|--------|---------|--------------|
| F ring | I | 2043-09-21T17:46:19.684 | b | 29.10 | -16.42 | 140461.00 | -24.98 | | |
| A (OER) | I | 2043-09-21T17:48:50.166 | b | 28.56 | -16.94 | 136774.40 | -24.01 | | |
| Encke (OEG) | I | 2043-09-21T17:50:58.731 | b | 28.11 | -17.39 | 133744.89 | -23.11 | | |
| Encke (IEG) | I | 2043-09-21T17:51:12.676 | b | 28.06 | -17.44 | 133423.31 | -23.01 | | |
| A (IER) | I | 2043-09-21T18:00:18.698 | b | 26.13 | -19.32 | 122050.38 | -18.43 | | |
| B (OER) | I | 2043-09-21T18:04:40.129 | b | 25.21 | -20.22 | 117571.16 | -15.78 | | |
| Saturn | I | 2043-09-21T17:32:26.753 | | 32.04 | -13.52 | 59612.31 | | -64.35 | -68.34 |
| Saturn | E | 2043-09-21T18:09:59.789 | | 24.08 | -21.32 | 60007.61 | | -34.42 | -39.89 |
| B (OER) | E | 2043-09-21T18:45:29.558 | | 16.58 | -28.52 | 117571.16 | 15.78 | | |
| A (IER) | E | 2043-09-21T18:49:50.877 | | 15.66 | -29.39 | 122050.38 | 18.45 | | |
| Encke (IEG) | E | 2043-09-21T18:58:55.989 | | 13.75 | -31.18 | 133423.31 | 23.07 | | |
| Encke (OEG) | E | 2043-09-21T18:59:09.895 | | 13.71 | -31.23 | 133744.89 | 23.18 | | |
| A (OER) | E | 2043-09-21T19:01:18.076 | | 13.26 | -31.65 | 136774.40 | 24.08 | | |
| F ring | E | 2043-09-21T19:03:48.031 | | 12.73 | -32.13 | 140461.00 | 25.07 | | |