

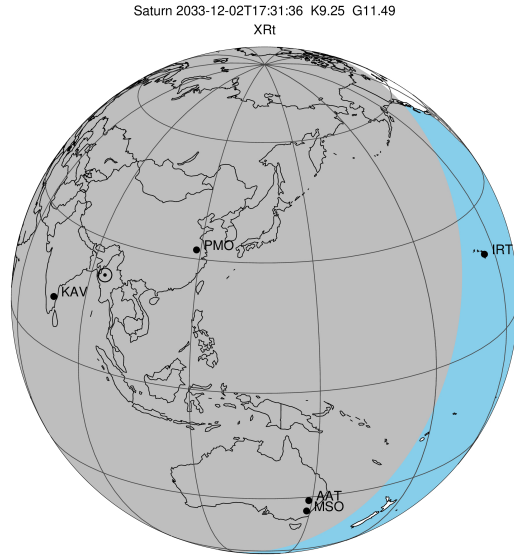
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2033-12-02T17:31:36.540
 Event type : XRT
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 865976491908550528
 2Mass ID (if available) : 07262195+2135496

Saturn 2033-12-02T17:31:36 K9.25 G11.49 XRT

ICRS Star Coord at Epoch: 07h 26m 21.95210s +21:35:49.33798s

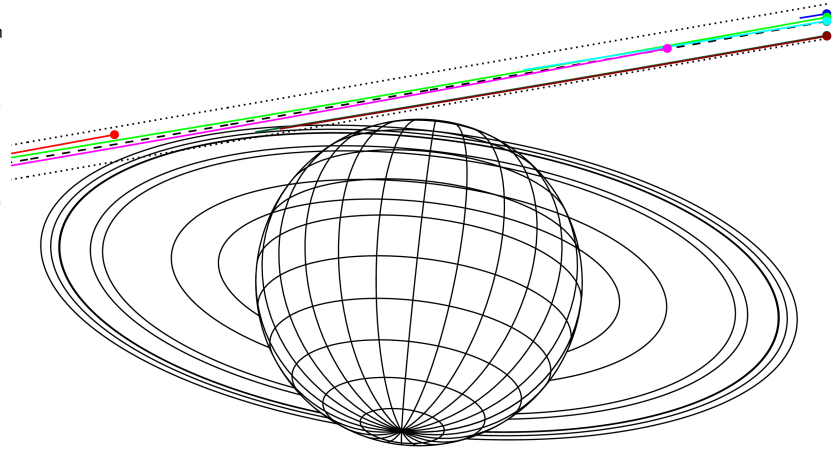
RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.250
 G magnitude : 11.491
 RP magnitude : 10.800
 BP magnitude : 12.029
 DUPflag : 0
 Distance (au) : 8.247
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.31
 Sun-Target sep (deg) : 140.37
 Sun-Moon sep (deg) : 88.81
 B (ring opening deg) : -23.58
 PA of pole (deg) : -6.71

#	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



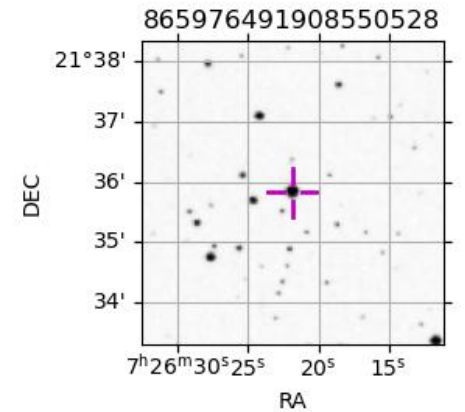
2033-12-02T17:31:36.5400 a: 07 26 21.9521 s: +21 35 49.338 C/A ***** PA 189.81 deg v_sky -13.31 km/s D 08.25 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 IRTF
 KAV
 AAT
 MSO

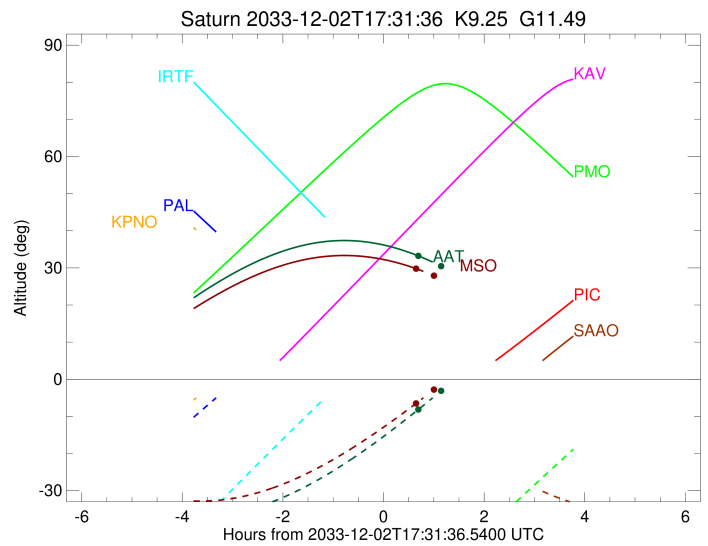
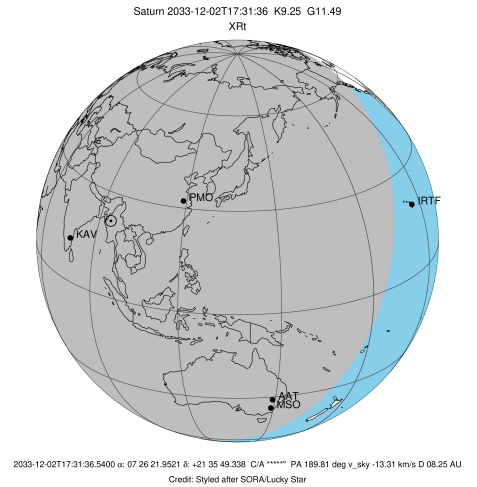


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
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				DEC 02 18:12 - DEC 02 18:12	PnnRin
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0				DEC 02 18:10 - DEC 02 18:10	PnnRin



target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2033-12-02T17:28:40.040
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 865976491908550528
 2Mass ID (if available) : 07262195+2135496
 ICRS Star Coord at Epoch: 07h 26m 21.95210s +21:35:49.33798s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.250
 G magnitude : 11.491
 RP magnitude : 10.800
 BP magnitude : 12.029
 DUPflag : 0
 Distance (au) : 8.247
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.31
 Sun-Target sep (deg) : 140.37
 Sun-Moon sep (deg) : 89.40
 B (ring opening deg) : -23.58
 PA of pole (deg) : -6.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 10.801
 C/A sky separation (km) : 64609.9
 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_itr93_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



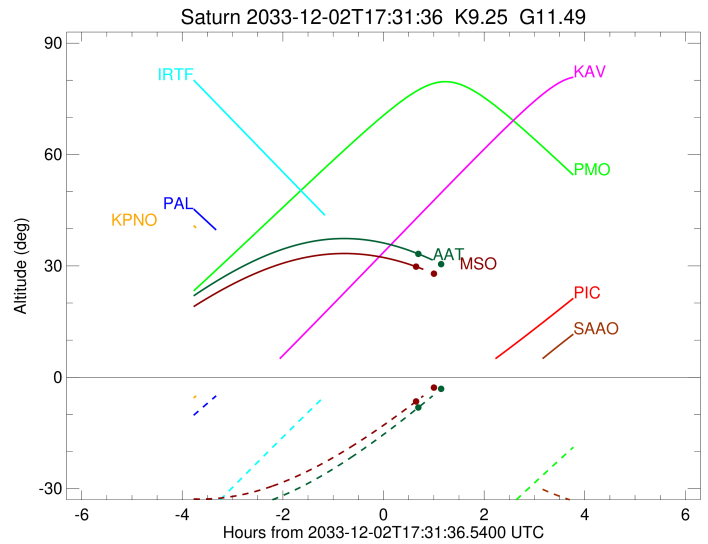
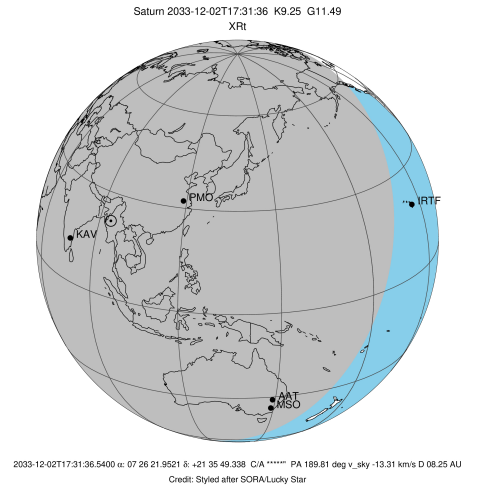
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2033-12-02T18:12:48.599		33.27	-8.21	140461.00	-3.82		
A (OER)	I	2033-12-02T18:38:20.828		30.70	-3.49x	136774.73	-0.96		

No planet occultations

A (OER)	E	2033-12-02T18:54:59.557		28.75	-0.33x	136774.85	0.96		
F ring	E	2033-12-02T19:20:38.381		25.38	4.66x	140461.00	3.79		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2033-12-02T17:28:42.120
 Event type : XRt
 : No Saturn occs
 : Ring occs: topocentric, not geocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 865976491908550528
 2Mass ID (if available) : 07262195+2135496
 ICRS Star Coord at Epoch: 07h 26m 21.95210s +21:35:49.33798s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.250
 G magnitude : 11.491
 RP magnitude : 10.800
 BP magnitude : 12.029
 DUPflag : 0
 Distance (au) : 8.247
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -13.31
 Sun-Target sep (deg) : 140.37
 Sun-Moon sep (deg) : 89.35
 B (ring opening deg) : -23.58
 PA of pole (deg) : -6.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 10.757
 C/A sky separation (km) : 64344.8
 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	2033-12-02T18:10:08.599		29.82	-6.56	140461.00	-4.10		
A (OER)	I	2033-12-02T18:30:51.719		27.99	-2.94x	136774.40	-1.81		

No planet occultations

A (OER)	E	2033-12-02T19:02:13.064		24.61	2.75x	136774.40	1.80		
F ring	E	2033-12-02T19:23:02.434		22.01	6.64x	140461.00	4.07		