

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2048-02-20T05:35:55.520
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4078738683632141568
 2Mass ID (if available) : 18523736-2215302

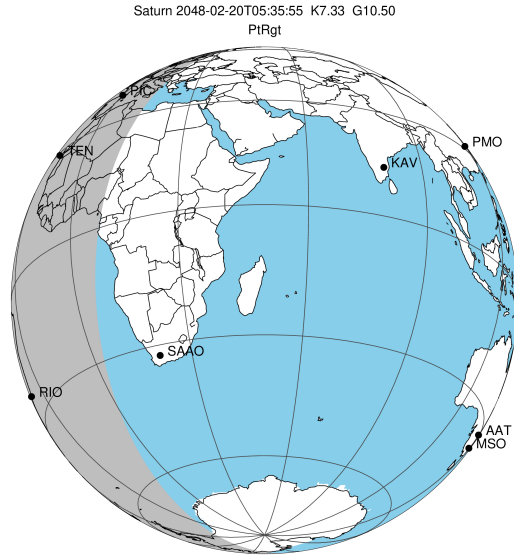
Saturn 2048-02-20T05:35:55 K7.33 G10.50 PtRgt

ICRS Star Coord at Epoch: 18h 52m 37.37281s -22:15:30.87971s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 7.328
 G magnitude : 10.498
 RP magnitude : 9.590
 BP magnitude : 11.361
 DUPflag : 1
 Distance (au) : 10.671
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 29.37
 Sun-Target sep (deg) : 48.42
 Sun-Moon sep (deg) : 121.20
 B (ring opening deg) : 25.13
 PA of pole (deg) : 6.37

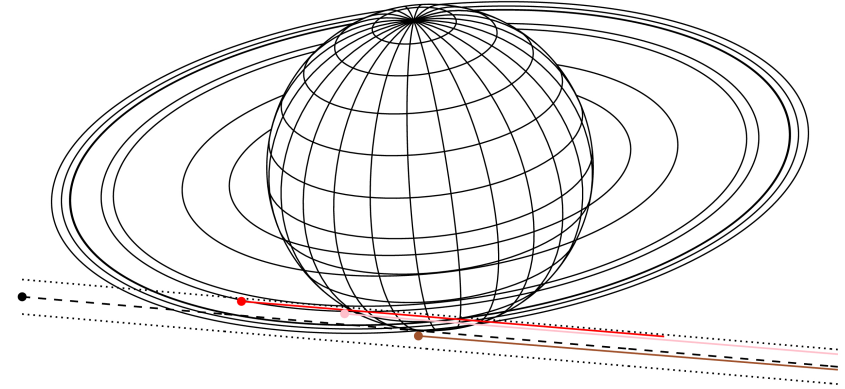
a(km) ring

- 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



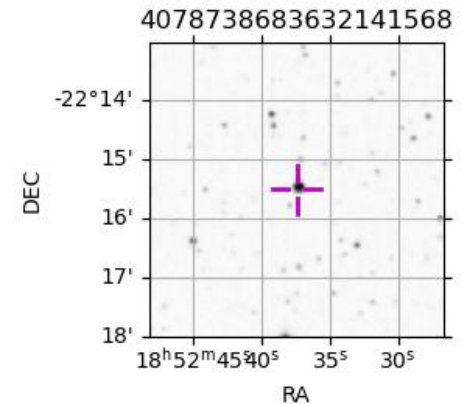
2048-02-20T05:35:55.5200 α: 18 52 37.3728 δ: -22 15 30.880 C/A 7.810° PA 355.10 deg v_sky +29.37 km/s D 10.67 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 TEN
 RIO

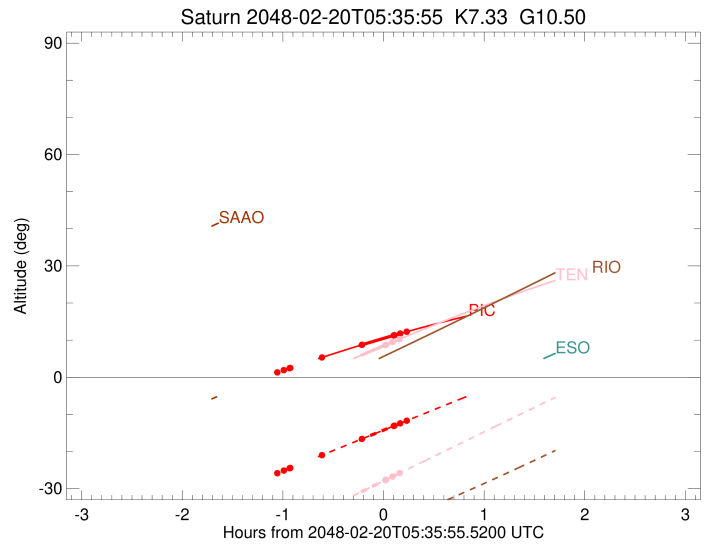
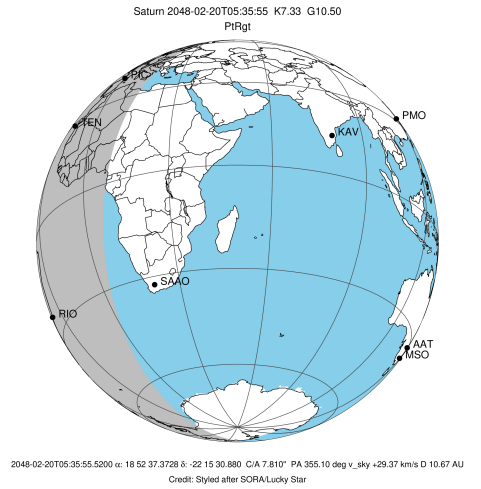


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1	+	+	+	FEB 20 04:59 - FEB 20 05:49	PieRie
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		+	+	FEB 20 05:22 - FEB 20 05:45	PieRne
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					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



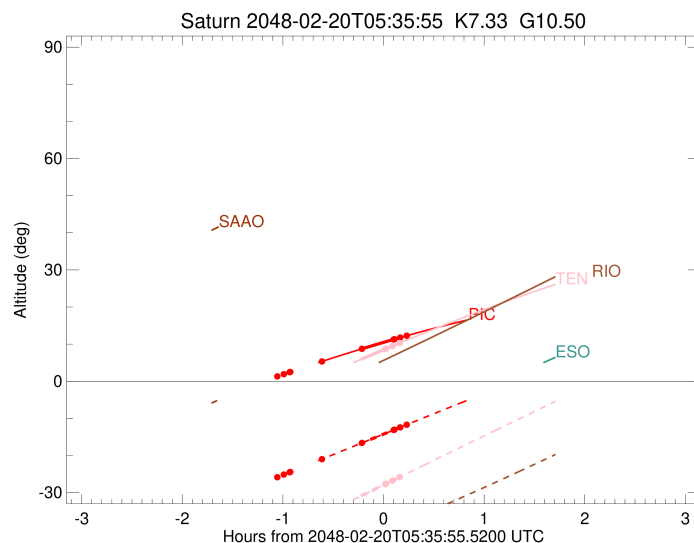
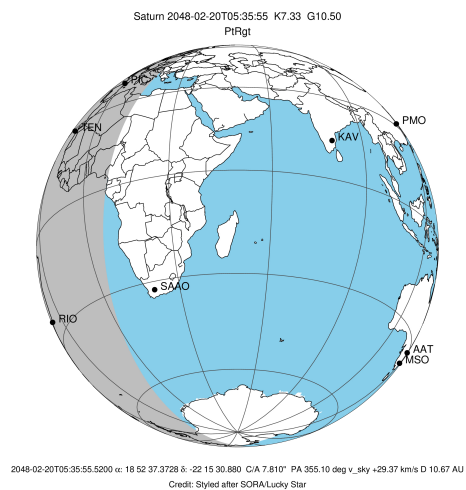
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2048-02-20T05:34:14.360
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4078738683632141568
 2Mass ID (if available) : 18523736-2215302
 ICRS Star Coord at Epoch: 18h 52m 37.37281s -22:15:30.87971s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 7.328
 G magnitude : 10.498
 RP magnitude : 9.590
 BP magnitude : 11.361
 DUPflag : 1
 Distance (au) : 10.671
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 29.37
 Sun-Target sep (deg) : 48.42
 Sun-Moon sep (deg) : 121.15
 B (ring opening deg) : 25.13
 PA of pole (deg) : 6.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.107
 C/A sky separation (km) : 55007.2
 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



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	2048-02-20T04:32:30.662		1.30x	-25.86	140461.00	-16.48		
A (OER)	I	2048-02-20T04:36:23.088		1.90x	-25.15	136774.40	-15.22		
Encke (OEG)	I	2048-02-20T04:39:50.203		2.43x	-24.53	133744.89	-14.02		
Encke (IEG)	I	2048-02-20T04:40:13.259		2.49x	-24.46	133423.31	-13.88		
A (IER)	I	2048-02-20T04:59:02.642		5.31	-21.02	122050.38	-5.91		
Saturn	I	2048-02-20T05:21:11.674		8.48	-16.95	59555.44		-48.94	-54.35
Saturn	E	2048-02-20T05:46:52.821		11.90	-12.23	59283.38		-62.81	-66.99
A (IER)	E	2048-02-20T05:23:05.810	b	8.74	-16.60	122050.38	5.90		
Encke (IEG)	E	2048-02-20T05:41:59.328	b	11.27	-13.13	133423.31	13.81		
Encke (OEG)	E	2048-02-20T05:42:22.503	b	11.32	-13.06	133744.89	13.95		
A (OER)	E	2048-02-20T05:45:50.720	b	11.77	-12.42	136774.40	15.14		
F ring	E	2048-02-20T05:49:44.426		12.27	-11.71	140461.00	16.39		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2048-02-20T05:33:19.340
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4078738683632141568
 2Mass ID (if available) : 18523736-2215302
 ICRS Star Coord at Epoch: 18h 52m 37.37281s -22:15:30.87971s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 7.328
 G magnitude : 10.498
 RP magnitude : 9.590
 BP magnitude : 11.361
 DUPflag : 1
 Distance (au) : 10.671
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 29.37
 Sun-Target sep (deg) : 48.42
 Sun-Moon sep (deg) : 120.99
 B (ring opening deg) : 25.13
 PA of pole (deg) : 6.37
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.285
 C/A sky separation (km) : 56383.6
 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	2048-02-20T04:34:05.783		-3.70x	-41.49	140461.00	-15.28		
A (OER)	I	2048-02-20T04:38:18.823		-2.85x	-40.57	136774.40	-13.84		
Encke (OEG)	I	2048-02-20T04:42:09.491		-2.07x	-39.73	133744.89	-12.42		
Encke (IEG)	I	2048-02-20T04:42:35.566		-1.98x	-39.64	133423.31	-12.25		
Saturn	I	2048-02-20T05:22:29.804		5.90	-30.90	59492.26		-51.94	-57.17
Saturn	E	2048-02-20T05:43:44.261		9.95	-26.22	59262.93		-64.01	-68.05
Encke (IEG)	E	2048-02-20T05:36:58.887	b	8.67	-27.71	133423.31	12.18		
Encke (OEG)	E	2048-02-20T05:37:25.106	b	8.75	-27.61	133744.89	12.35		
A (OER)	E	2048-02-20T05:41:17.133	b	9.48	-26.76	136774.40	13.75		
F ring	E	2048-02-20T05:45:31.793		10.28	-25.82	140461.00	15.18		