

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-05T14:33:08.650
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4115015901590367104
 2Mass ID (if available) : 17174549-2137288

Saturn 2046-02-05T14:33:08 K9.93 G14.07 PtRgt

ICRS Star Coord at Epoch: 17h 17m 45.47524s -21:37:28.88521s

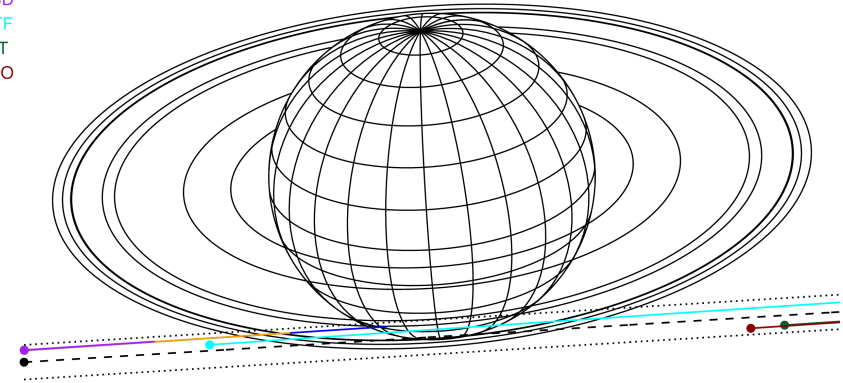
RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.931
 G magnitude : 14.073
 RP magnitude : 12.960
 BP magnitude : 15.367
 DUPflag : 0
 Distance (au) : 10.541
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.20
 Sun-Target sep (deg) : 56.13
 Sun-Moon sep (deg) : 52.22
 B (ring opening deg) : 26.62
 PA of pole (deg) : 4.56

#	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



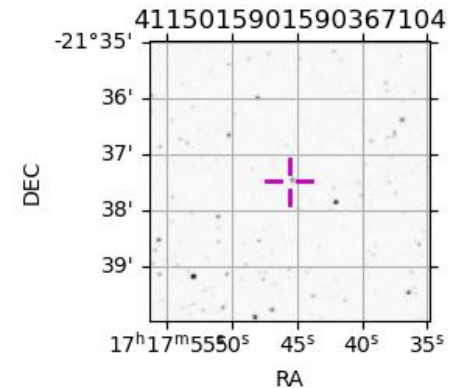
2046-02-05T14:33:08.6500 α: 17 17 45.47524 δ: -21 37 28.885 C/A 7.741° PA 3.53 deg v_sky +26.20 km/s D 10.54 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 KPNO
 MCD
 IRTF
 AAT
 MSO

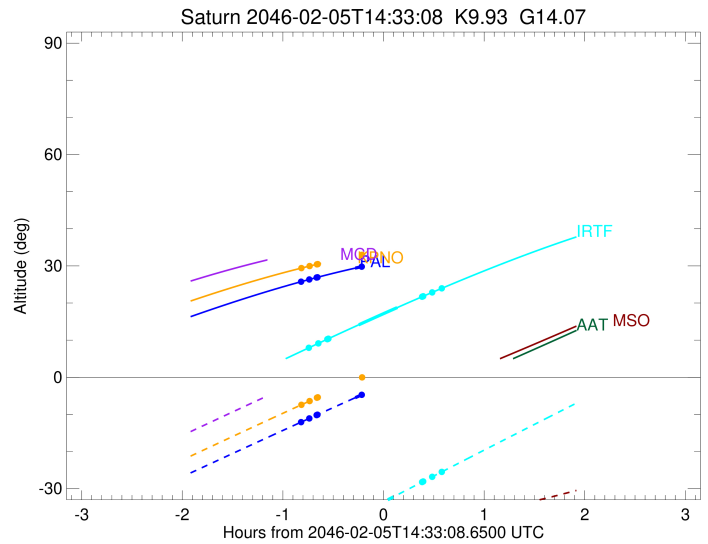
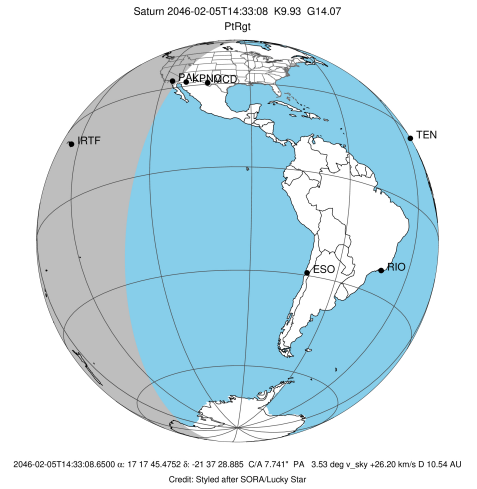


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+	+		FEB 05 13:43 - FEB 05 14:16	PinRin
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+		FEB 05 13:44 - FEB 05 13:53	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	+	+	+	FEB 05 13:48 - FEB 05 15:07	PieRie
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



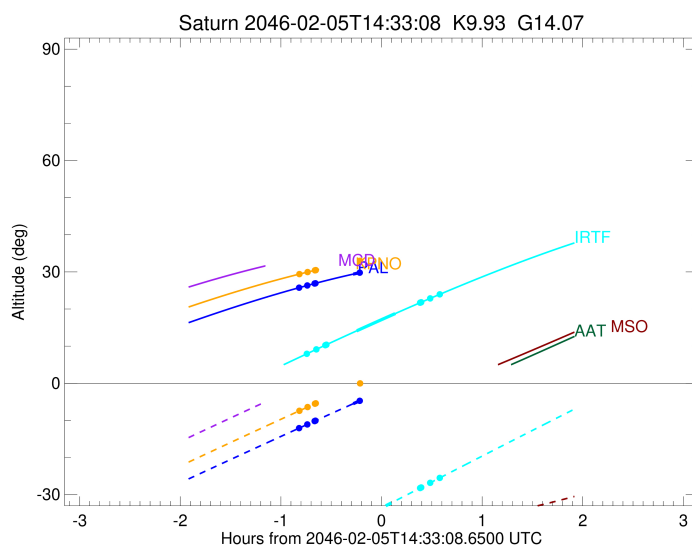
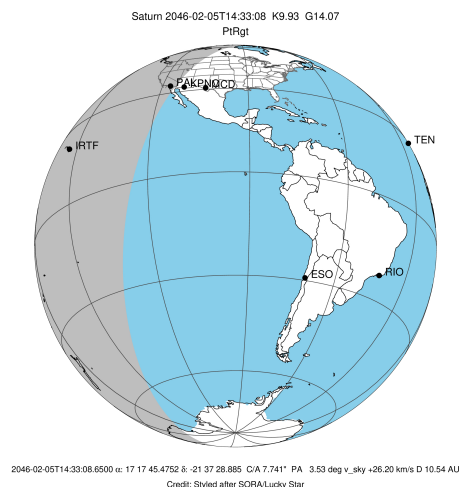
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-05T14:31:44.000
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4115015901590367104
 2Mass ID (if available) : 17174549-2137288
 ICRS Star Coord at Epoch: 17h 17m 45.47524s -21:37:28.88521s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.931
 G magnitude : 14.073
 RP magnitude : 12.960
 BP magnitude : 15.367
 DUPflag : 0
 Distance (au) : 10.541
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.20
 Sun-Target sep (deg) : 56.13
 Sun-Moon sep (deg) : 52.81
 B (ring opening deg) : 26.62
 PA of pole (deg) : 4.56
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.097
 C/A sky separation (km) : 54254.2
 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	2046-02-05T13:43:51.741		25.73	-12.12	140461.00	-13.15		
A (OER)	I	2046-02-05T13:48:44.141		26.33	-11.12	136774.40	-12.06		
Encke (OEG)	I	2046-02-05T13:53:06.770		26.85	-10.22	133744.89	-11.00		
Encke (IEG)	I	2046-02-05T13:53:36.159		26.91	-10.12	133423.31	-10.88		
A (IER)	I	2046-02-05T14:19:56.431	b	29.77	-4.77x	122050.38	-3.18		
Saturn	I	2046-02-05T14:16:15.894		29.40	-5.51	59325.73		-54.34	-59.38
Saturn	E	2046-02-05T14:47:10.284		32.15	0.66x	59300.96		-55.42	-60.37
A (IER)	E	2046-02-05T14:39:19.536	b	31.53	-0.89x	122050.38	3.18		
Encke (IEG)	E	2046-02-05T15:05:43.480		33.41	4.30x	133423.31	10.85		
Encke (OEG)	E	2046-02-05T15:06:12.958		33.44	4.39x	133744.89	10.97		
A (OER)	E	2046-02-05T15:10:36.406		33.68	5.24x	136774.40	12.02		
F ring	E	2046-02-05T15:15:29.783		33.94	6.18x	140461.00	13.10		

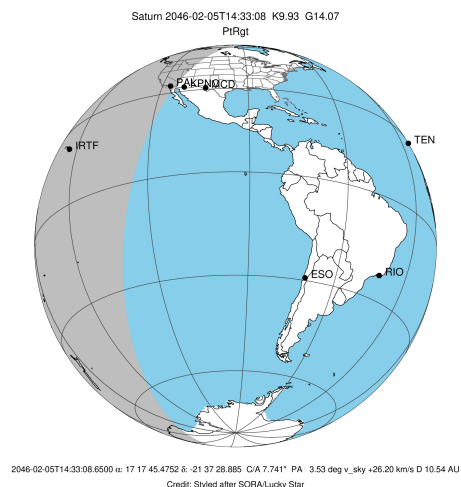
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-05T14:31:59.940
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4115015901590367104
 2Mass ID (if available) : 17174549-2137288
 ICRS Star Coord at Epoch: 17h 17m 45.47524s -21:37:28.88521s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.931
 G magnitude : 14.073
 RP magnitude : 12.960
 BP magnitude : 15.367
 DUPflag : 0
 Distance (au) : 10.541
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.20
 Sun-Target sep (deg) : 56.13
 Sun-Moon sep (deg) : 52.81
 B (ring opening deg) : 26.62
 PA of pole (deg) : 4.56
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.097
 C/A sky separation (km) : 54256.3
 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



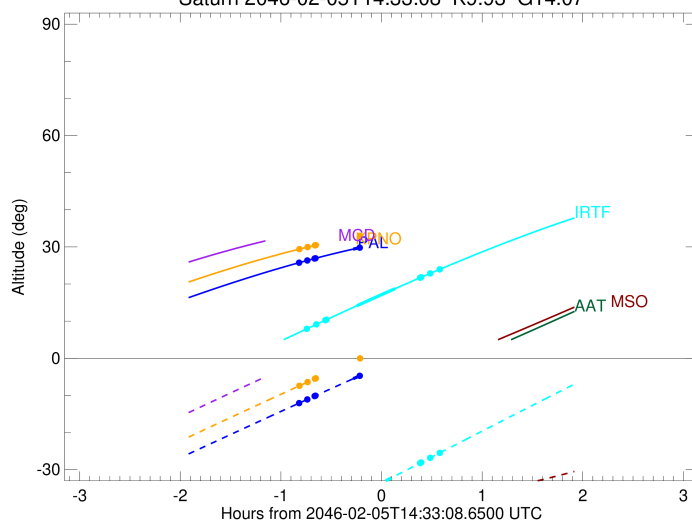
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-02-05T13:44:02.357		29.39	-7.45	140461.00	-13.13		
A (OER)	I	2046-02-05T13:48:55.001		29.94	-6.44	136774.40	-12.05		
Encke (OEG)	I	2046-02-05T13:53:17.849		30.41	-5.54	133744.89	-10.99		
Encke (IEG)	I	2046-02-05T13:53:47.262		30.46	-5.44	133423.31	-10.87		
A (IER)	I	2046-02-05T14:20:09.035	b	32.96	-0.08x	122050.38	-3.18		
Saturn	I	2046-02-05T14:16:31.294		32.65	-0.81x	59326.00		-54.33	-59.37
Saturn	E	2046-02-05T14:47:26.620		34.90	5.36x	59300.52		-55.44	-60.39
A (IER)	E	2046-02-05T14:39:31.720	b	34.41	3.80x	122050.38	3.17		
Encke (IEG)	E	2046-02-05T15:05:56.842		35.80	8.97x	133423.31	10.84		
Encke (OEG)	E	2046-02-05T15:06:26.334		35.82	9.06x	133744.89	10.96		
A (OER)	E	2046-02-05T15:10:49.904		35.98	9.91x	136774.40	12.01		
F ring	E	2046-02-05T15:15:43.405		36.14	10.84x	140461.00	13.10		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-05T14:29:52.390
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : 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 : 4115015901590367104
 2Mass ID (if available) : 17174549-2137288
 ICRS Star Coord at Epoch: 17h 17m 45.47524s -21:37:28.88521s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.931
 G magnitude : 14.073
 RP magnitude : 12.960
 BP magnitude : 15.367
 DUPflag : 0
 Distance (au) : 10.541
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.20
 Sun-Target sep (deg) : 56.13
 Sun-Moon sep (deg) : 52.91
 B (ring opening deg) : 26.62
 PA of pole (deg) : 4.56
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.384
 C/A sky separation (km) : 56453.9
 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



Saturn 2046-02-05T14:33:08 K9.93 G14.07



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-02-05T13:48:26.995		7.90	-44.09	140461.00	-11.52		
A (OER)	I	2046-02-05T13:54:07.183		9.09	-42.75	136774.40	-10.13		
Encke (OEG)	I	2046-02-05T13:59:28.301		10.22	-41.50	133744.89	-8.72		
Encke (IEG)	I	2046-02-05T14:00:05.537		10.35	-41.35	133423.31	-8.55		
Saturn	I	2046-02-05T14:18:22.135		14.13	-37.06	59241.41		-58.10	-62.80
Saturn	E	2046-02-05T14:41:21.298		18.78	-31.68	59226.04		-58.81	-63.44
Encke (IEG)	E	2046-02-05T14:56:13.512		21.71	-28.21	133423.31	8.51		
Encke (OEG)	E	2046-02-05T14:56:50.916		21.83	-28.06	133744.89	8.68		
A (OER)	E	2046-02-05T15:02:13.605		22.87	-26.81	136774.40	10.08		
F ring	E	2046-02-05T15:07:55.686		23.96	-25.48	140461.00	11.46		