

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-18T15:32:10.920
 Event type : PIRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4090691298420625792
 2Mass ID (if available) : 18144322-2219206

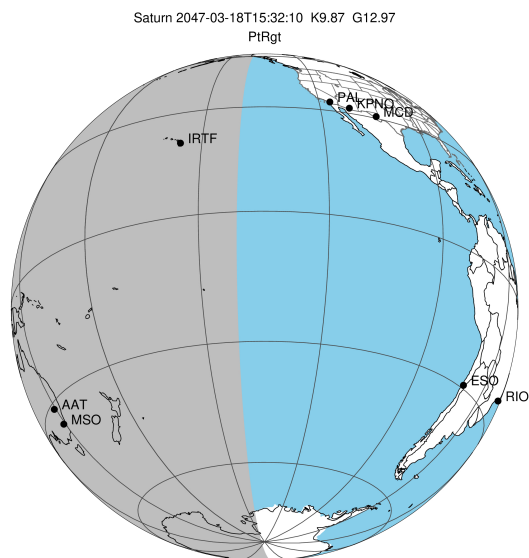
Saturn 2047-03-18T15:32:10 K9.87 G12.97 PIRgt

ICRS Star Coord at Epoch: 18h 14m 43.22703s -22:19:20.87218s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.874
 G magnitude : 12.974
 RP magnitude : 12.069
 BP magnitude : 13.823
 DUPflag : 0
 Distance (au) : 10.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.76
 Sun-Target sep (deg) : 83.89
 Sun-Moon sep (deg) : 7.22
 B (ring opening deg) : 26.12
 PA of pole (deg) : 5.79

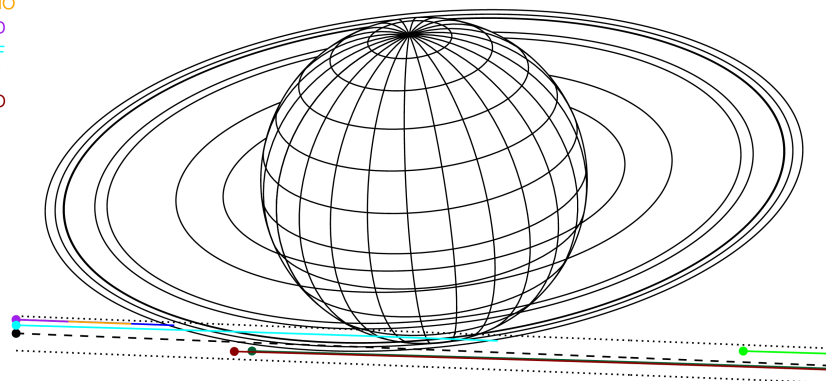
a(km) ring

- 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



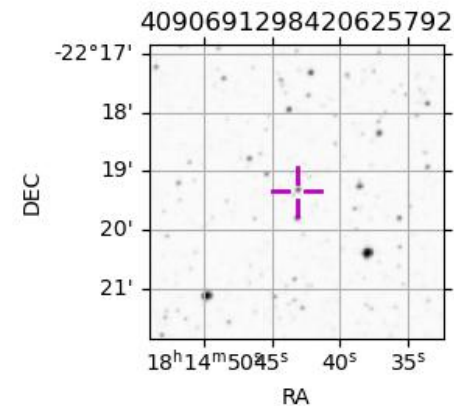
2047-03-18T15:32:10.9200 α: 18 14 43.2270 s: -22 19 20.872 C/A 8.511° PA 357.73 deg v_sky +12.76 km/s D 10.10 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT
 MSO

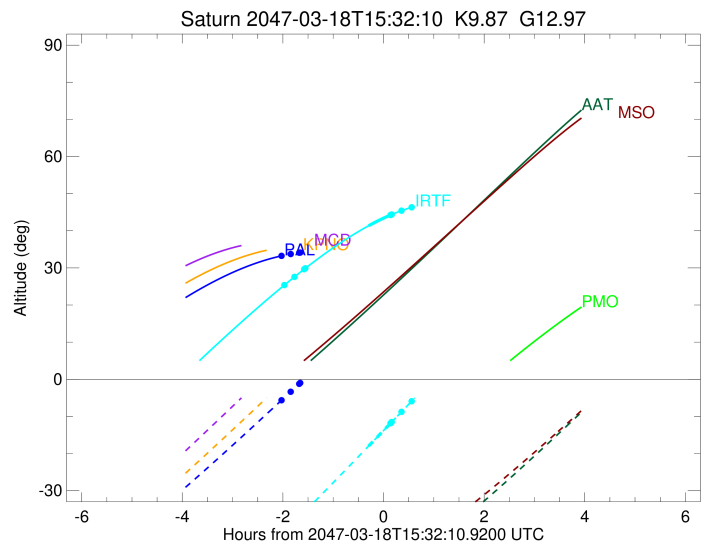
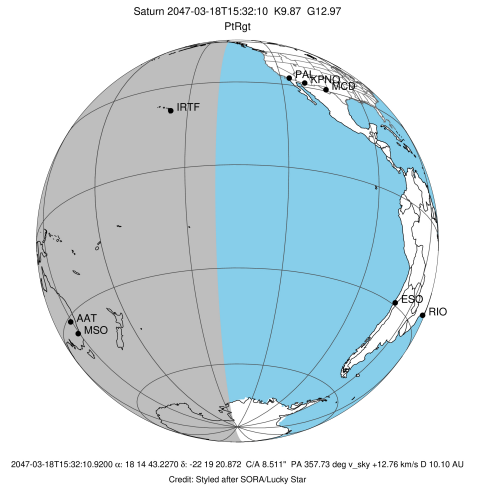


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+			MAR 18 13:30 - MAR 18 13:30	PnnRin
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	+	+	+	MAR 18 13:33 - MAR 18 16:05	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



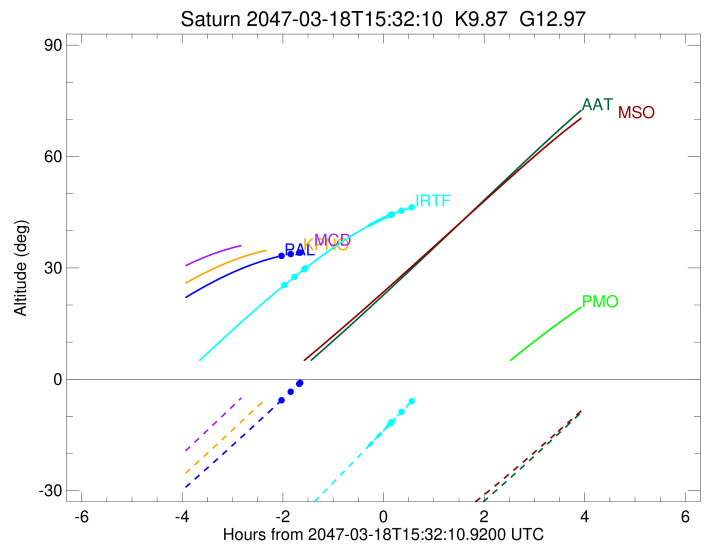
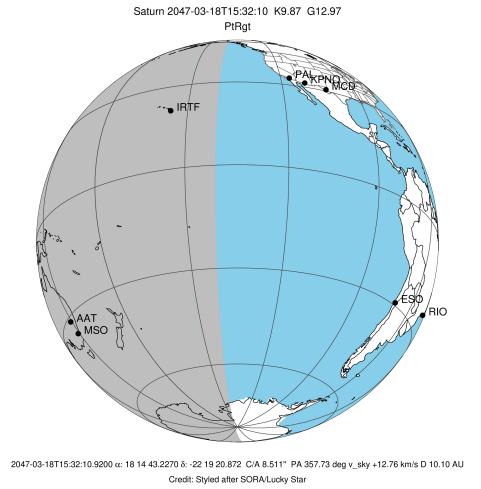
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-18T15:34:18.370
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4090691298420625792
 2Mass ID (if available) : 18144322-2219206
 ICRS Star Coord at Epoch: 18h 14m 43.22703s -22:19:20.87218s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.874
 G magnitude : 12.974
 RP magnitude : 12.069
 BP magnitude : 13.823
 DUPflag : 0
 Distance (au) : 10.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.76
 Sun-Target sep (deg) : 83.89
 Sun-Moon sep (deg) : 7.90
 B (ring opening deg) : 26.12
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.819
 C/A sky separation (km) : 57289.5
 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



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	2047-03-18T13:30:18.019		33.23	-5.71	140461.00	-5.96		
A (OER)	I	2047-03-18T13:41:12.193		33.72	-3.43x	136774.40	-5.30		
Encke (OEG)	I	2047-03-18T13:51:20.264		34.08	-1.30x	133744.89	-4.65		
Encke (IEG)	I	2047-03-18T13:52:29.965		34.11	-1.06x	133423.31	-4.57		
Saturn	I	2047-03-18T15:13:32.386		33.09	15.79x	59340.49		-55.51	-60.45
Saturn	E	2047-03-18T15:54:14.703		30.17	24.03x	59183.95		-63.23	-67.36
Encke (IEG)	E	2047-03-18T15:52:27.091	b	30.33	23.68x	133423.31	4.57		
Encke (OEG)	E	2047-03-18T15:53:36.888	b	30.23	23.91x	133744.89	4.65		
A (OER)	E	2047-03-18T16:03:45.678		29.28	25.92x	136774.40	5.30		
F ring	E	2047-03-18T16:14:40.336		28.18	28.06x	140461.00	5.95		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-18T15:29:50.320
 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 : 4090691298420625792
 2Mass ID (if available) : 18144322-2219206
 ICRS Star Coord at Epoch: 18h 14m 43.22703s -22:19:20.87218s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.874
 G magnitude : 12.974
 RP magnitude : 12.069
 BP magnitude : 13.823
 DUPflag : 0
 Distance (au) : 10.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 12.76
 Sun-Target sep (deg) : 83.89
 Sun-Moon sep (deg) : 7.35
 B (ring opening deg) : 26.12
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.936
 C/A sky separation (km) : 58148.1
 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	2047-03-18T13:33:41.383		25.32	-41.24	140461.00	-5.51		
A (OER)	I	2047-03-18T13:45:39.376		27.52	-38.53	136774.40	-4.75		
Encke (OEG)	I	2047-03-18T13:57:12.996		29.58	-35.90	133744.89	-3.97		
Encke (IEG)	I	2047-03-18T13:58:34.902		29.82	-35.59	133423.31	-3.88		
Saturn	I	2047-03-18T15:14:17.147		41.34	-18.02	59285.49		-58.09	-62.79
Saturn	E	2047-03-18T15:44:37.311		44.63	-10.90	59174.15		-63.76	-67.83
Encke (IEG)	E	2047-03-18T15:40:33.178	b	44.25	-11.85	133423.31	3.84		
Encke (OEG)	E	2047-03-18T15:41:55.875	b	44.38	-11.53	133744.89	3.94		
A (OER)	E	2047-03-18T15:53:36.798		45.42	-8.78	136774.40	4.70		
F ring	E	2047-03-18T16:05:43.345		46.32	-5.93	140461.00	5.44		