

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2031-08-05T19:59:41.130
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3414261574527884032
 2Mass ID (if available) : 05144331+2132308

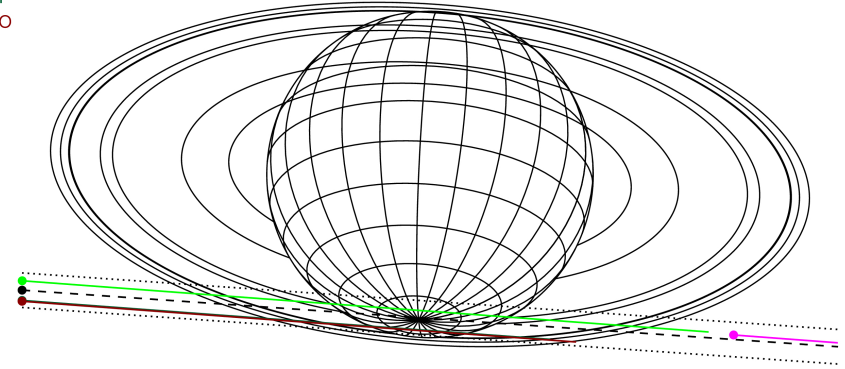
Saturn 2031-08-05T19:59:41 K9.37 G12.27 PgtRgt

ICRS Star Coord at Epoch: 05h 14m 43.31623s +21:32:30.69767s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 9.370
 G magnitude : 12.273
 RP magnitude : 11.394
 BP magnitude : 13.074
 DUPflag : 0
 Distance (au) : 9.607
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.47
 Sun-Target sep (deg) : 53.31
 Sun-Moon sep (deg) : 88.52
 B (ring opening deg) : -26.60
 PA of pole (deg) : -4.48



Earth
 PMO
 KAV
 AAT
 MSO

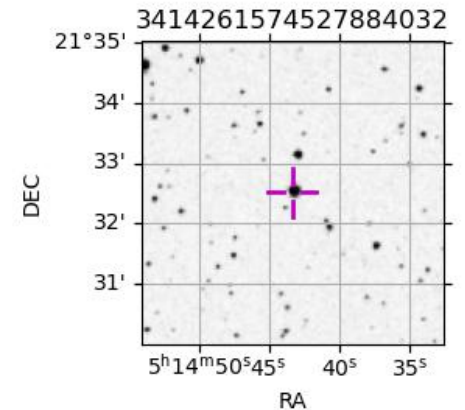


2031-08-05T19:59:41.1300 ex: 05 14 43.31623 s: +21 32 30.69767 C/A 7.613° PA 356.03 deg v_sky +27.47 km/s D 09.61 AU
 Credit: Styled after SORA/Lucky Star

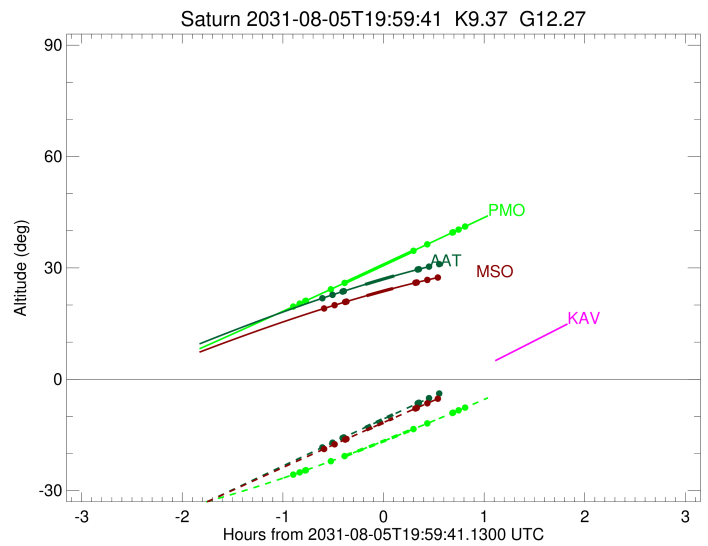
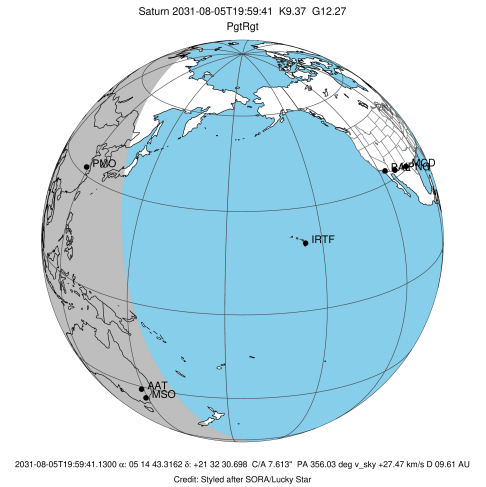
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+	+	+	AUG 05 19:05 - AUG 05 20:48	PieRie
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	+	+	+	AUG 05 19:23 - AUG 05 20:27	PieRie
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	AUG 05 19:24 - AUG 05 20:32	PieRie



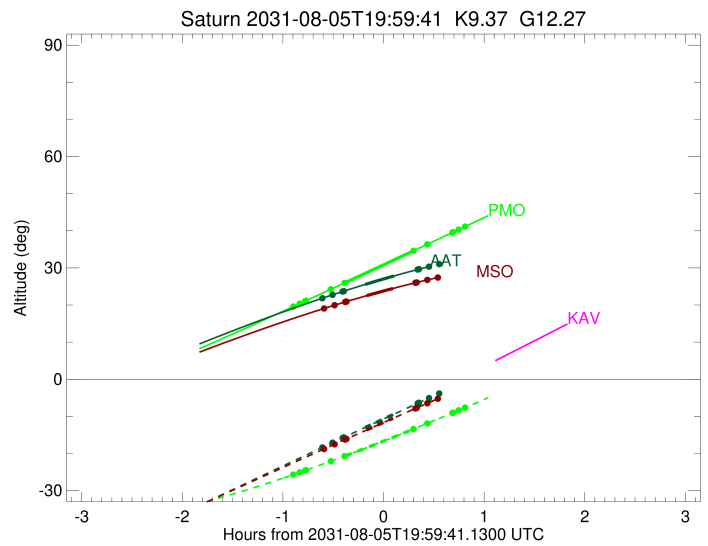
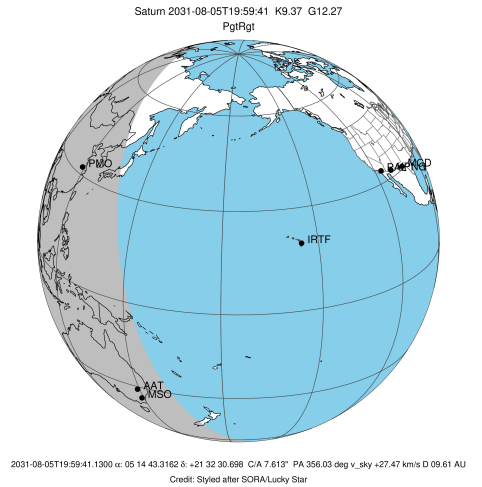
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2031-08-05T19:56:36.210
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3414261574527884032
 2Mass ID (if available) : 05144331+2132308
 ICRS Star Coord at Epoch: 05h 14m 43.31623s +21:32:30.69767s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 9.370
 G magnitude : 12.273
 RP magnitude : 11.394
 BP magnitude : 13.074
 DUPflag : 0
 Distance (au) : 9.607
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.47
 Sun-Target sep (deg) : 53.31
 Sun-Moon sep (deg) : 89.01
 B (ring opening deg) : -26.60
 PA of pole (deg) : -4.48
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.227
 C/A sky separation (km) : 50360.1
 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	2031-08-05T19:05:51.212		19.58	-25.69	140461.00	-16.40		
A (OER)	I	2031-08-05T19:09:41.714		20.38	-25.09	136774.40	-15.57		
Encke (OEG)	I	2031-08-05T19:13:01.144		21.06	-24.56	133744.89	-14.80		
Encke (IEG)	I	2031-08-05T19:13:22.936		21.14	-24.50	133423.31	-14.71		
A (IER)	I	2031-08-05T19:28:16.188		24.24	-22.08	122050.38	-10.57		
B (OER)	I	2031-08-05T19:36:20.502		25.92	-20.72	117571.16	-7.88		
Saturn	I	2031-08-05T19:37:21.005		26.14	-20.55	59444.35		-49.40	-54.78
Saturn	E	2031-08-05T20:15:53.449		34.26	-13.73	59451.21		-49.12	-54.51
B (OER)	E	2031-08-05T20:17:49.003		34.66	-13.37	117571.16	7.86		
A (IER)	E	2031-08-05T20:25:55.000		36.38	-11.87	122050.38	10.53		
Encke (IEG)	E	2031-08-05T20:40:52.939		39.56	-9.06	133423.31	14.62		
Encke (OEG)	E	2031-08-05T20:41:14.871		39.64	-8.99	133744.89	14.71		
A (OER)	E	2031-08-05T20:44:35.634		40.35	-8.35	136774.40	15.47		
F ring	E	2031-08-05T20:48:27.800		41.17	-7.61	140461.00	16.28		

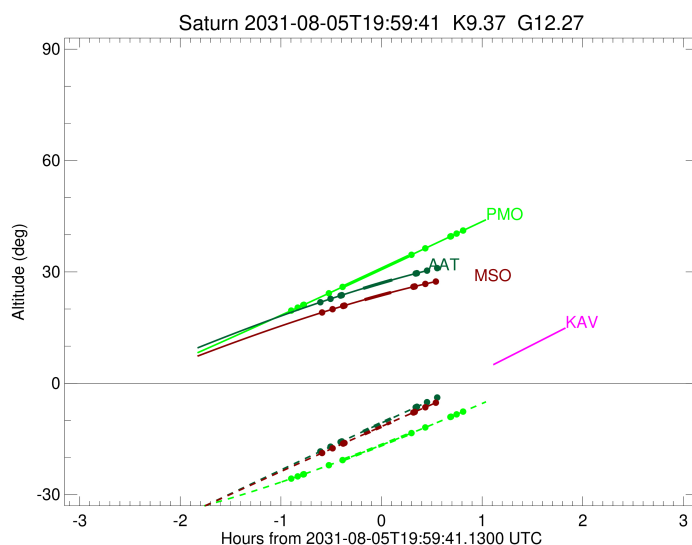
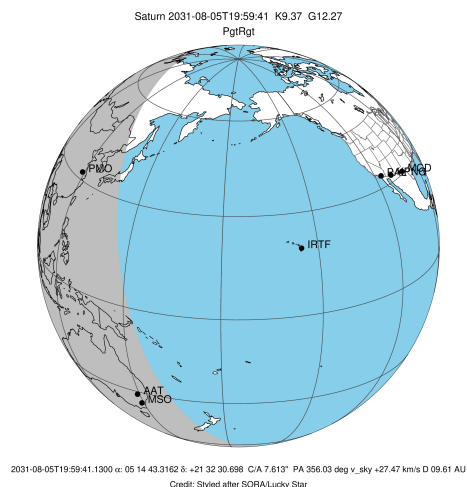
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2031-08-05T19:57:23.490
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3414261574527884032
 2Mass ID (if available) : 05144331+2132308
 ICRS Star Coord at Epoch: 05h 14m 43.31623s +21:32:30.69767s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 9.370
 G magnitude : 12.273
 RP magnitude : 11.394
 BP magnitude : 13.074
 DUPflag : 0
 Distance (au) : 9.607
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.47
 Sun-Target sep (deg) : 53.31
 Sun-Moon sep (deg) : 88.96
 B (ring opening deg) : -26.60
 PA of pole (deg) : -4.48
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.250
 C/A sky separation (km) : 57486.2
 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	2031-08-05T19:23:11.499		21.82	-18.37	140461.00	-10.98		
A (OER)	I	2031-08-05T19:29:14.491		22.73	-17.09	136774.40	-9.31		
Encke (OEG)	I	2031-08-05T19:35:13.717		23.62	-15.83	133744.89	-7.54		
Encke (IEG)	I	2031-08-05T19:35:57.020		23.72	-15.68	133423.31	-7.32		
Saturn	I	2031-08-05T19:48:43.526		25.54	-12.99	59194.56		-60.40	-64.87
Saturn	E	2031-08-05T20:06:04.432		27.85	-9.37	59199.41		-60.17	-64.66
Encke (IEG)	E	2031-08-05T20:20:16.653		29.59	-6.44	133423.31	7.30		
Encke (OEG)	E	2031-08-05T20:21:00.051		29.67	-6.29	133744.89	7.52		
A (OER)	E	2031-08-05T20:27:00.199		30.36	-5.05	136774.40	9.28		
F ring	E	2031-08-05T20:33:04.375		31.03	-3.81x	140461.00	10.94		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2031-08-05T19:57:28.400
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 3414261574527884032
 2Mass ID (if available) : 05144331+2132308
 ICRS Star Coord at Epoch: 05h 14m 43.31623s +21:32:30.69767s
 RUWE (>1.4 is poor) : 1.10
 K magnitude : 9.370
 G magnitude : 12.273
 RP magnitude : 11.394
 BP magnitude : 13.074
 DUPflag : 0
 Distance (au) : 9.607
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.47
 Sun-Target sep (deg) : 53.31
 Sun-Moon sep (deg) : 88.91
 B (ring opening deg) : -26.60
 PA of pole (deg) : -4.48
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.291
 C/A sky separation (km) : 57769.8
 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	2031-08-05T19:24:12.777		19.07	-18.79	140461.00	-10.70		
A (OER)	I	2031-08-05T19:30:27.272		19.95	-17.53	136774.40	-8.96		
Encke (OEG)	I	2031-08-05T19:36:44.457		20.81	-16.26	133744.89	-7.08		
Encke (IEG)	I	2031-08-05T19:37:30.651		20.92	-16.10	133423.31	-6.84		
Saturn	I	2031-08-05T19:49:35.014		22.51	-13.67	59183.97		-60.92	-65.32
Saturn	E	2031-08-05T20:05:22.758		24.47	-10.52	59188.60		-60.69	-65.12
Encke (IEG)	E	2031-08-05T20:18:56.046		26.02	-7.83	133423.31	6.83		
Encke (OEG)	E	2031-08-05T20:19:42.329		26.10	-7.68	133744.89	7.07		
A (OER)	E	2031-08-05T20:26:00.390		26.78	-6.44	136774.40	8.94		
F ring	E	2031-08-05T20:32:16.014		27.42	-5.21	140461.00	10.67		