

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T17:02:10.310
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382

Saturn 2043-05-07T17:02:10 K8.78 G11.09 PgtRgt

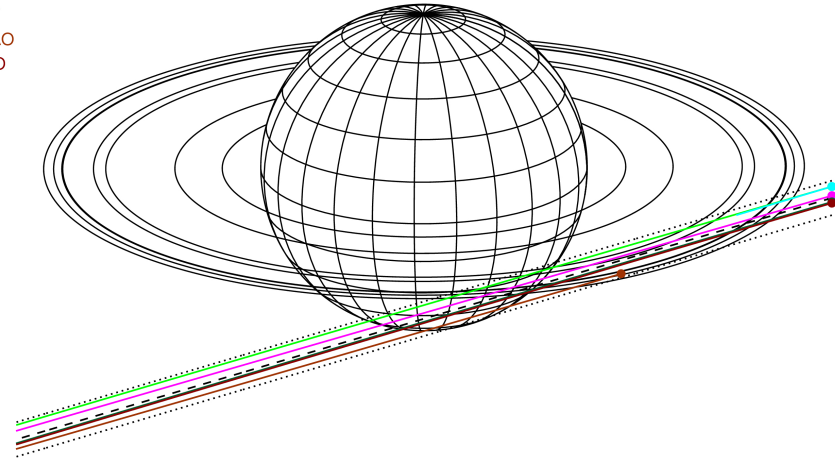
ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s

RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 161.18
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26

Saturn 2043-05-07T17:02:10 K8.78 G11.09
 PgtRgt



Earth
 PMO
 IRTF
 KAV
 AAT
 SAAO
 MSO

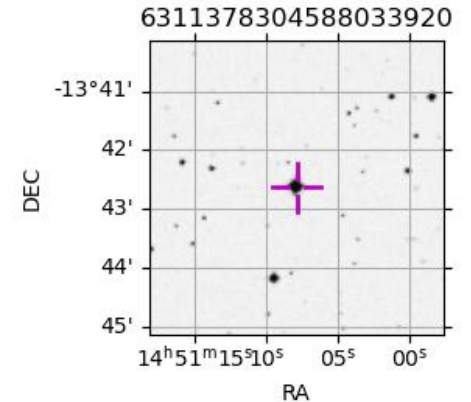


2043-05-07T17:02:10.3100 α: 14 51 07.8604 δ: -13 42 37.930 C/A 8.928° PA 16.50 deg v_sky -20.20 km/s D 08.87 AU
 Credit: Styled after SORA/Lucky Star

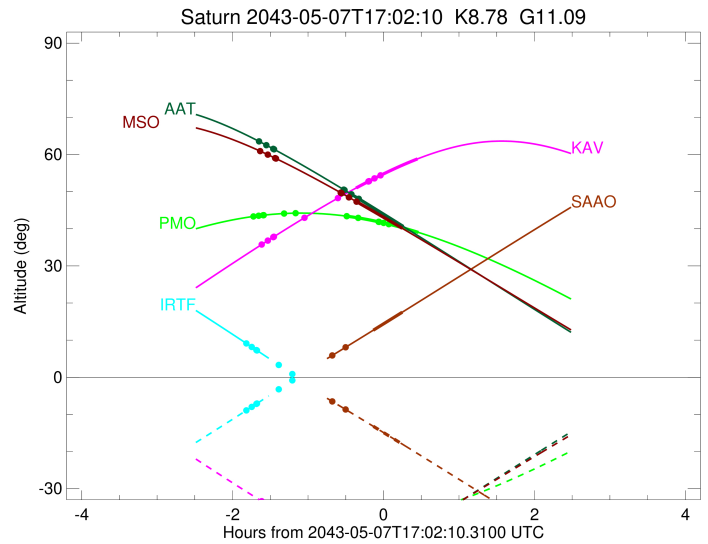
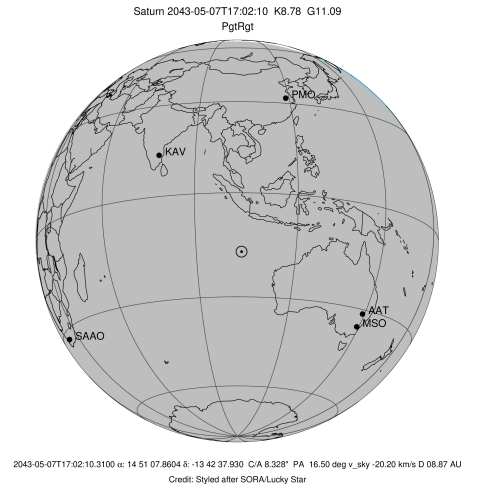
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	+	+	+	MAY 07 15:18 - MAY 07 17:29	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	+	+	+	MAY 07 15:13 - MAY 07 15:21	PnnRin
KAV	Kavalur Observ	12.6	78.8	+	+	+	MAY 07 15:25 - MAY 07 17:29	PieRie
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+	+	+	MAY 07 15:23 - MAY 07 17:17	PieRie
SAAO	So. Afr. Astro	-32.4	20.8		+	+	MAY 07 16:22 - MAY 07 17:17	PieRne
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	MAY 07 15:24 - MAY 07 17:17	PieRie



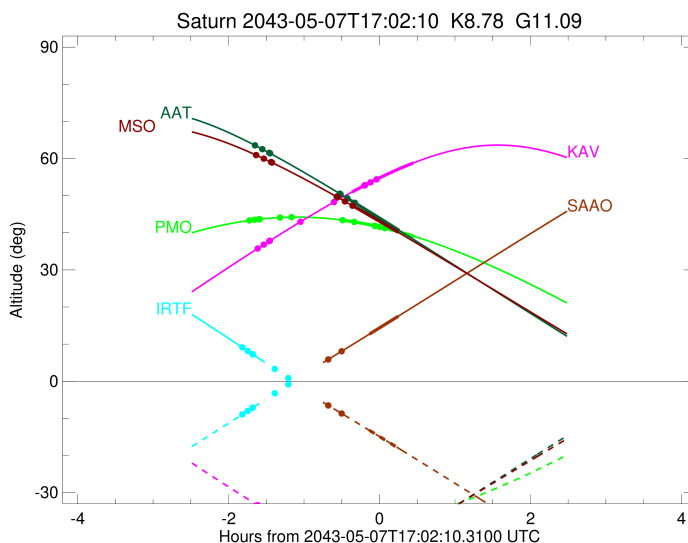
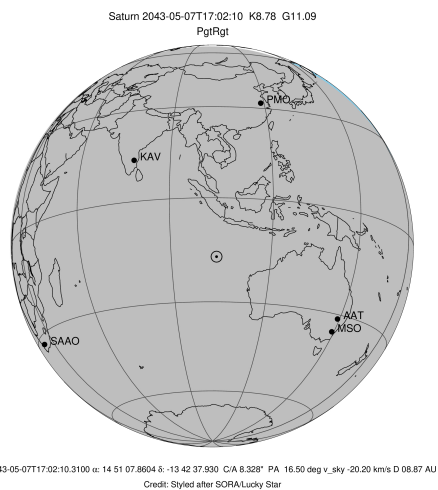
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T17:02:09.850
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382
 ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s
 RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 161.56
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.587
 C/A sky separation (km) : 48790.8
 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

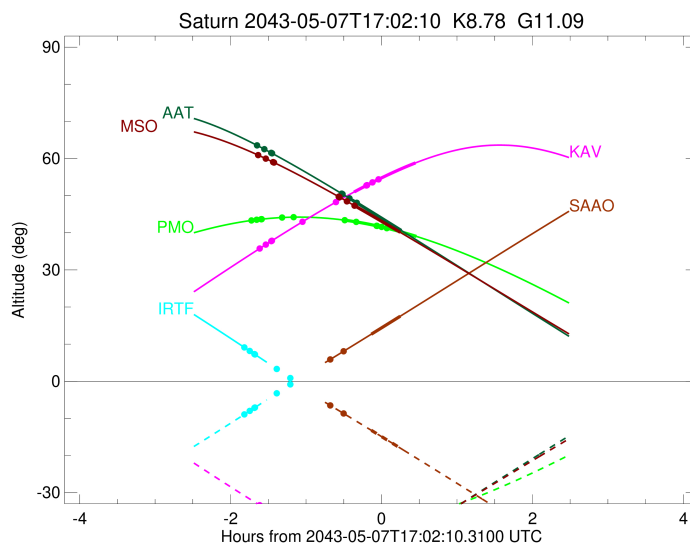
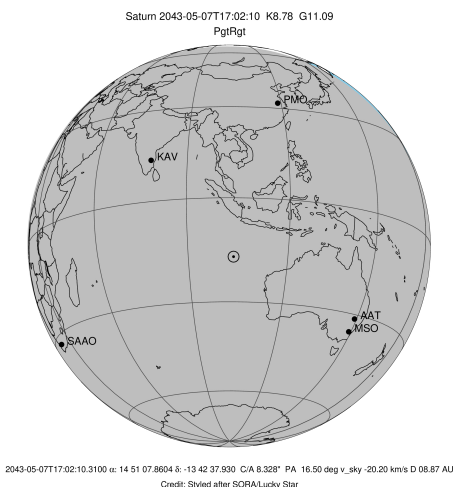
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2043-05-07T15:18:46.541		43.33	-40.15	140461.00	-15.21		
A (OER)	I	2043-05-07T15:22:55.233		43.51	-40.35	136774.40	-14.43		
Encke (OEG)	I	2043-05-07T15:26:30.654		43.65	-40.50	133744.89	-13.69		
Encke (IEG)	I	2043-05-07T15:26:54.212		43.67	-40.51	133423.31	-13.61		
A (IER)	I	2043-05-07T15:43:05.378		44.10	-41.00	122050.38	-9.63		
B (OER)	I	2043-05-07T15:52:02.954		44.21	-41.15	117571.16	-6.98		
Saturn	I	2043-05-07T16:33:53.063		43.35	-40.56	60006.26		-35.68	-41.20
Saturn	E	2043-05-07T17:29:59.026		39.02	-36.74	59667.75		-62.49	-66.71
B (OER)	E	2043-05-07T16:33:22.287		43.37	-40.58	117571.16	7.00		
A (IER)	E	2043-05-07T16:42:18.533	b	42.92	-40.20	122050.38	9.66		
Encke (IEG)	E	2043-05-07T16:58:27.155	b	41.87	-39.29	133423.31	13.64		
Encke (OEG)	E	2043-05-07T16:58:50.658	b	41.84	-39.27	133744.89	13.72		
A (OER)	E	2043-05-07T17:02:25.613	b	41.56	-39.03	136774.40	14.46		
F ring	E	2043-05-07T17:06:33.818	b	41.23	-38.73	140461.00	15.24		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T16:57:40.360
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : 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 : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382
 ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s
 RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 161.96
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.800
 C/A sky separation (km) : 50156.9
 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_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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2043-05-07T15:13:07.545		9.12	-8.92	140461.00	-14.79		
A (OER)	I	2043-05-07T15:17:23.970		8.16	-7.99	136774.40	-13.95		
Encke (OEG)	I	2043-05-07T15:21:07.392		7.33	-7.17	133744.89	-13.16		
Encke (IEG)	I	2043-05-07T15:21:31.911		7.23	-7.08	133423.31	-13.07		
A (IER)	I	2043-05-07T15:38:48.711		3.33x	-3.26x	122050.38	-8.67		
B (OER)	I	2043-05-07T15:49:19.653		0.94x	-0.91x	117571.16	-5.46		
Saturn	I	2043-05-07T16:30:30.359		-8.51x	8.37x	59985.95		-37.27	-42.84
Saturn	E	2043-05-07T17:24:23.645		-21.05x	20.73x	59648.09		-64.36	-68.36
B (OER)	E	2043-05-07T16:21:51.489		-6.52x	6.41x	117571.16	5.46		
A (IER)	E	2043-05-07T16:32:23.499	b	-8.95x	8.80x	122050.38	8.66		
Encke (IEG)	E	2043-05-07T16:49:43.989	b	-12.97x	12.76x	133423.31	13.00		
Encke (OEG)	E	2043-05-07T16:50:08.635	b	-13.06x	12.85x	133744.89	13.09		
A (OER)	E	2043-05-07T16:53:53.324	b	-13.93x	13.71x	136774.40	13.87		
F ring	E	2043-05-07T16:58:11.432	b	-14.93x	14.70x	140461.00	14.69		

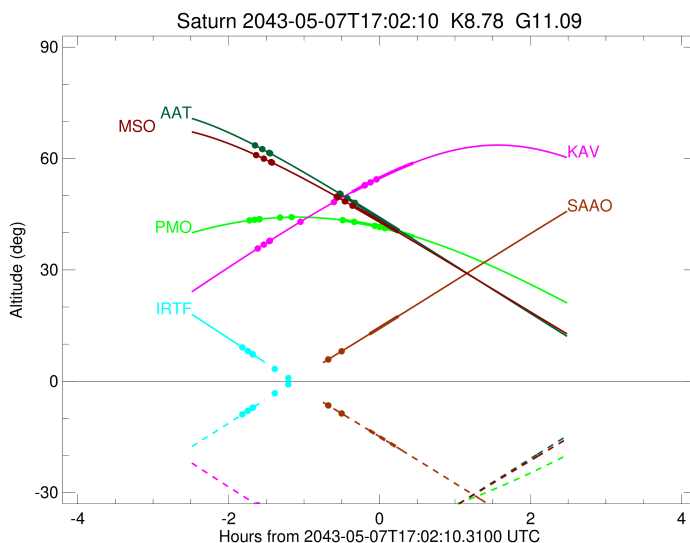
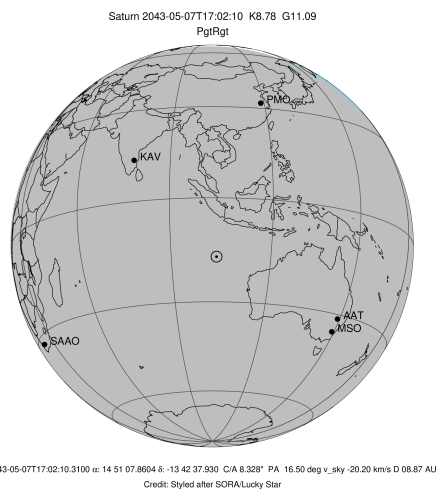
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T17:05:02.510
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382
 ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s
 RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 161.04
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.028
 C/A sky separation (km) : 51626.2
 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	2043-05-07T15:25:18.341		35.76	-33.39	140461.00	-13.16		
A (OER)	I	2043-05-07T15:30:09.608		36.81	-34.41	136774.40	-12.14		
Encke (OEG)	I	2043-05-07T15:34:29.552		37.74	-35.31	133744.89	-11.16		
Encke (IEG)	I	2043-05-07T15:34:58.520		37.84	-35.41	133423.31	-11.04		
A (IER)	I	2043-05-07T15:59:04.069		42.91	-40.32	122050.38	-4.39		
Saturn	I	2043-05-07T16:40:22.494		50.98	-48.10	59945.22		-40.40	-46.02
Saturn	E	2043-05-07T17:29:11.288		58.82	-55.62	59636.81		-65.48	-69.34
A (IER)	E	2043-05-07T16:26:25.136		48.36	-45.58	122050.38	4.40		
Encke (IEG)	E	2043-05-07T16:50:24.390	b	52.78	-49.83	133423.31	11.11		
Encke (OEG)	E	2043-05-07T16:50:53.190	b	52.86	-49.91	133744.89	11.22		
A (OER)	E	2043-05-07T16:55:11.588	b	53.61	-50.62	136774.40	12.21		
F ring	E	2043-05-07T17:00:01.057	b	54.43	-51.40	140461.00	13.24		

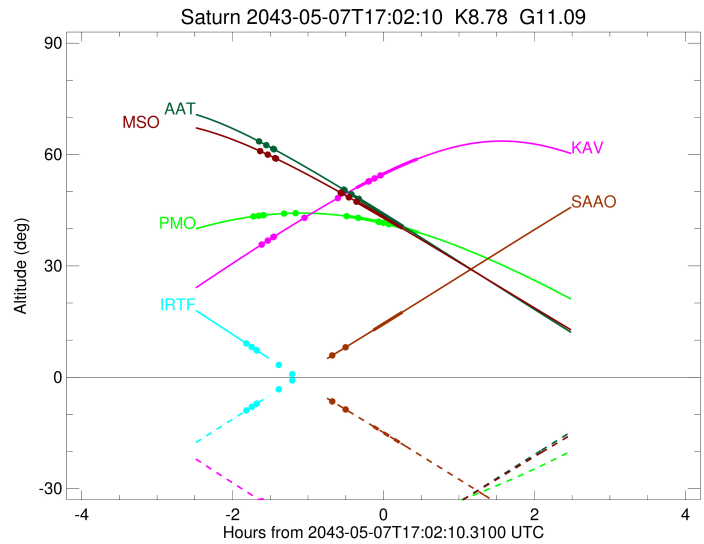
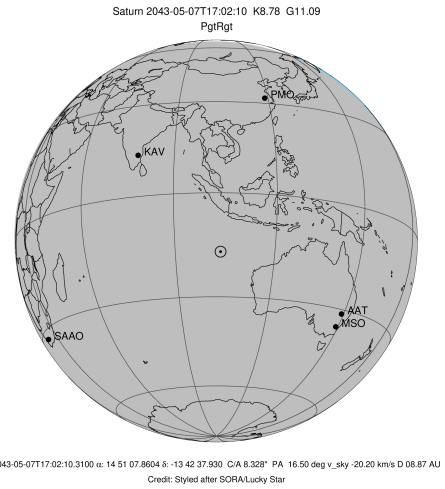
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T16:58:34.340
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382
 ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s
 RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 162.02
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.498
 C/A sky separation (km) : 54644.2
 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	2043-05-07T15:23:10.086		63.56	-66.41	140461.00	-11.30		
A (OER)	I	2043-05-07T15:28:57.097		62.54	-65.35	136774.40	-9.92		
Encke (OEG)	I	2043-05-07T15:34:25.347		61.55	-64.32	133744.89	-8.52		
Encke (IEG)	I	2043-05-07T15:35:03.476		61.43	-64.20	133423.31	-8.35		
Saturn	I	2043-05-07T16:38:41.147		48.87	-51.39	59874.98		-45.71	-51.25
Saturn	E	2043-05-07T17:17:56.534		40.62	-43.10	59607.59		-68.59	-72.03
Encke (IEG)	E	2043-05-07T16:30:52.737		50.48	-53.02	133423.31	8.36		
Encke (OEG)	E	2043-05-07T16:31:30.836		50.35	-52.89	133744.89	8.53		
A (OER)	E	2043-05-07T16:36:58.831		49.22	-51.75	136774.40	9.93		
F ring	E	2043-05-07T16:42:45.619	b	48.02	-50.54	140461.00	11.31		

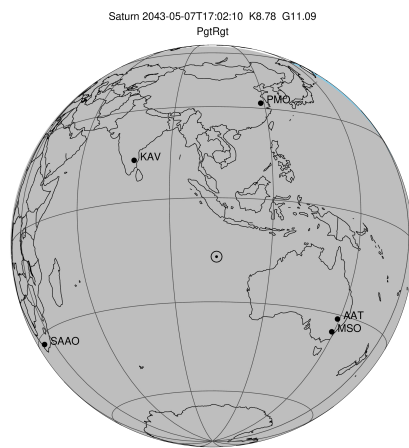
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T17:05:55.360
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382
 ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s
 RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 160.48
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.021
 C/A sky separation (km) : 58012.2
 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



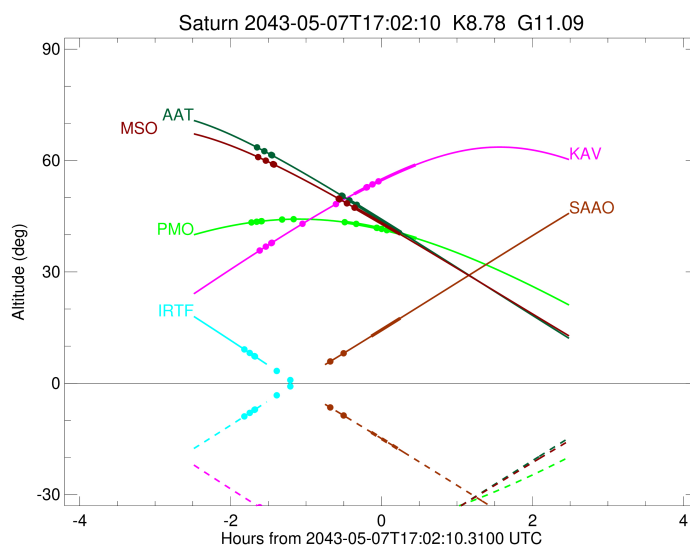
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2043-05-07T15:38:59.365	-2.80x	2.00x	140461.00	-7.20			
A (OER)	I	2043-05-07T15:49:27.192	-0.68x	-0.07x	136774.40	-4.51			
Saturn	I	2043-05-07T16:54:05.557		12.69	-13.22	59760.78		-54.52	-59.55
Saturn	E	2043-05-07T17:17:10.261		17.54	-18.02	59598.27		-69.66	-72.95
A (OER)	E	2043-05-07T16:22:01.668		6.00	-6.63	136774.40	4.52		
F ring	E	2043-05-07T16:32:27.693		8.17	-8.76	140461.00	7.23		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2043-05-07T16:58:37.210
 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 : 6311378304588033920
 2Mass ID (if available) : 14510804-1342382
 ICRS Star Coord at Epoch: 14h 51m 07.86040s -13:42:37.93046s
 RUWE (>1.4 is poor) : 10.13
 K magnitude : 8.781
 G magnitude : 11.095
 RP magnitude : 10.232
 BP magnitude : 11.443
 DUPflag : 0
 Distance (au) : 8.866
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.20
 Sun-Target sep (deg) : 176.75
 Sun-Moon sep (deg) : 161.99
 B (ring opening deg) : 20.21
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.566
 C/A sky separation (km) : 55082.5
 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



2043-05-07T17:02:10.3100 ra: 14 51 07.8604 s: -13 42 37.930 CIA 8.328° PA 16.50 deg v_sky -20.20 km/s D 08.87 AU
 Credit: Styled after SORA/Lucky Star



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2043-05-07T15:24:03.356		60.93	-63.94	140461.00	-10.91		
A (OER)	I	2043-05-07T15:30:05.090		59.99	-62.97	136774.40	-9.45		
Encke (OEG)	I	2043-05-07T15:35:53.164		59.05	-62.01	133744.89	-7.94		
Encke (IEG)	I	2043-05-07T15:36:34.147		58.94	-61.89	133423.31	-7.75		
Saturn	I	2043-05-07T16:39:33.656		47.53	-50.25	59862.67		-46.64	-52.15
Saturn	E	2043-05-07T17:17:09.307		40.11	-42.77	59604.66		-68.93	-72.32
Encke (IEG)	E	2043-05-07T16:28:28.974		49.65	-52.40	133423.31	7.76		
Encke (OEG)	E	2043-05-07T16:29:09.926		49.52	-52.27	133744.89	7.95		
A (OER)	E	2043-05-07T16:34:57.725		48.41	-51.15	136774.40	9.46		
F ring	E	2043-05-07T16:40:59.205	b	47.25	-49.97	140461.00	10.92		