

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-07T16:54:24.820
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 612094279188742016
 2Mass ID (if available) : 09025718+1756457

Saturn 2036-03-07T16:54:24 K8.29 G9.36 PgtRgt

ICRS Star Coord at Epoch: 09h 02m 57.02452s +17:56:45.35911s

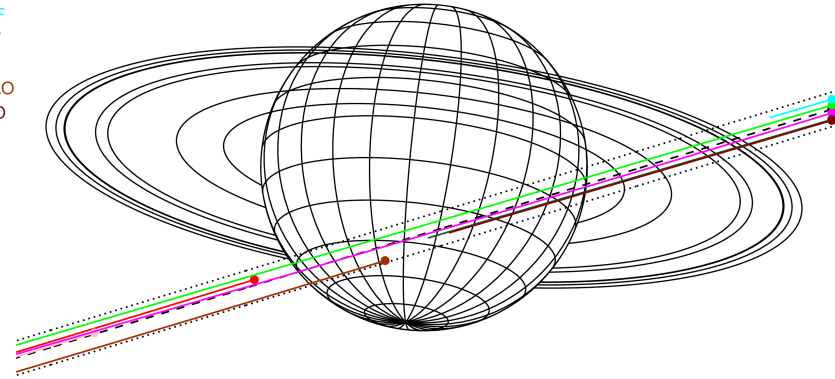
RUWE (>1.4 is poor) : 0.87
 K magnitude : 8.286
 G magnitude : 9.363
 RP magnitude : 8.974
 BP magnitude : 9.593
 DUPflag : 0
 Distance (au) : 8.315
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.00
 Sun-Target sep (deg) : 145.74
 Sun-Moon sep (deg) : 29.71
 B (ring opening deg) : -17.25
 PA of pole (deg) : -6.78

Saturn 2036-03-07T16:54:24 K8.29 G9.36
 PgtRgt



2036-03-07T16:54:24.8200 α: 09 02 57.0245 δ: +17 56 45.359 C/A 3.879° PA 16.95 deg v_sky -15.00 km/s D 08.31 AU
 Credit: Styled after SORA/Lucky Star

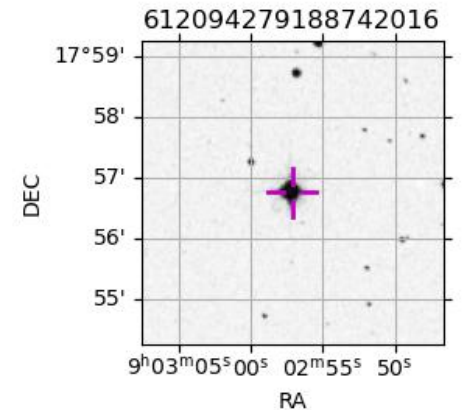
Earth
 PIC
 PMO
 TEN
 IRTF
 KAV
 AAT
 SAAO
 MSO



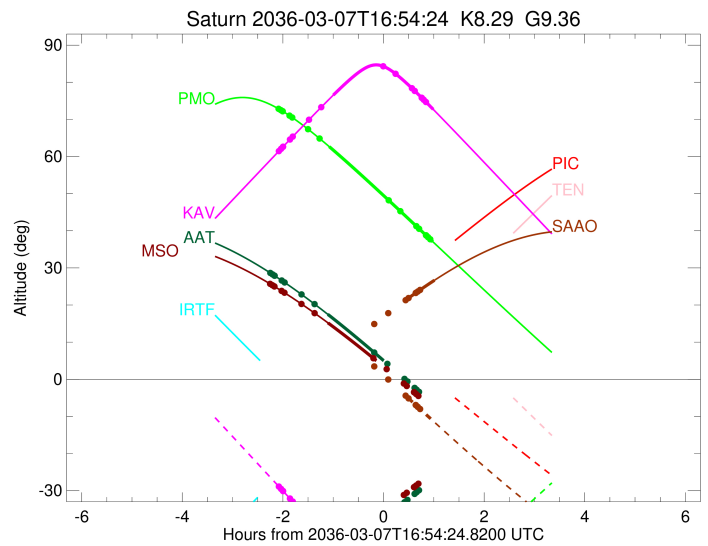
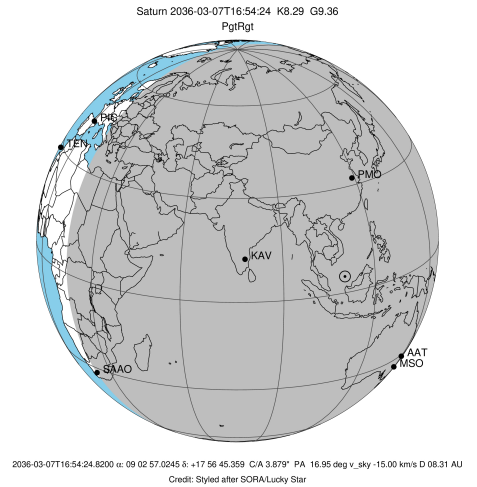
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	+	+	+	MAR 07 14:49 - MAR 07 17:53	PieRin
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	+	+	+	MAR 07 14:49 - MAR 07 17:53	PieRin
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+	+	+	MAR 07 14:39 - MAR 07 15:47	PinRin
SAAO	So. Afr. Astro	-32.4	20.8		+		MAR 07 17:55 - MAR 07 17:55	PneRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	MAR 07 14:39 - MAR 07 15:48	PinRin



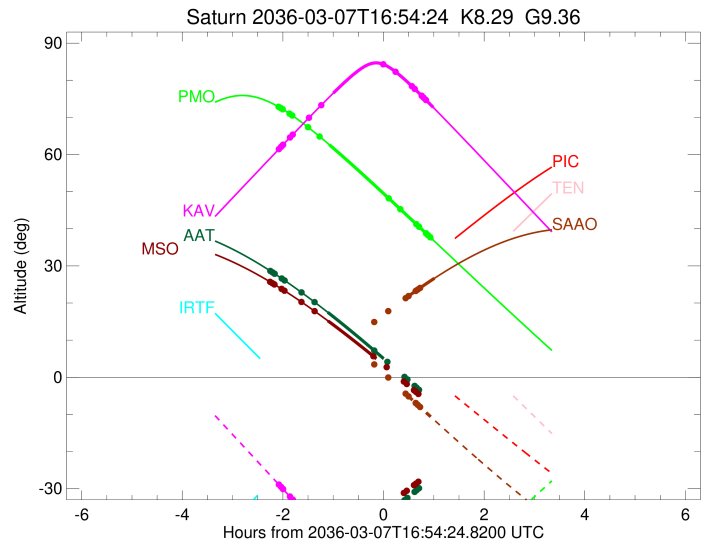
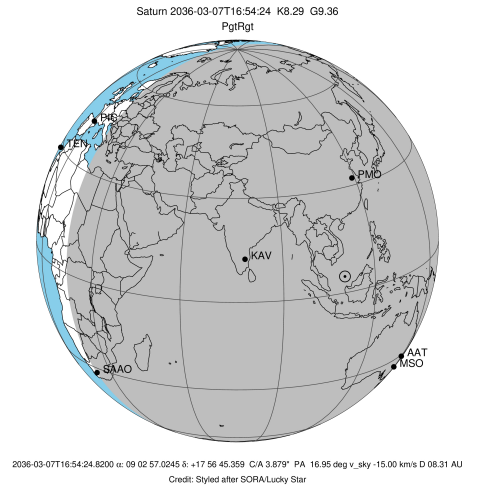
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-07T16:51:29.730
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 612094279188742016
 2Mass ID (if available) : 09025718+1756457
 ICRS Star Coord at Epoch: 09h 02m 57.02452s +17:56:45.35911s
 RUWE (>1.4 is poor) : 0.87
 K magnitude : 8.286
 G magnitude : 9.363
 RP magnitude : 8.974
 BP magnitude : 9.593
 DUPflag : 0
 Distance (au) : 8.315
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.00
 Sun-Target sep (deg) : 145.74
 Sun-Moon sep (deg) : 30.54
 B (ring opening deg) : -17.25
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.392
 C/A sky separation (km) : 20454.1
 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	2036-03-07T14:49:23.421		72.84	-56.30	140461.00	-23.69		
A (OER)	I	2036-03-07T14:51:59.254		72.50	-56.66	136774.40	-23.62		
Encke (OEG)	I	2036-03-07T14:54:07.676		72.21	-56.95	133744.89	-23.56		
Encke (IEG)	I	2036-03-07T14:54:21.328		72.17	-56.98	133423.31	-23.55		
A (IER)	I	2036-03-07T15:02:26.991		71.00	-58.03	122050.38	-23.27		
B (OER)	I	2036-03-07T15:05:40.011		70.50	-58.43	117571.16	-23.14		
B (IER)	I	2036-03-07T15:24:31.358		67.35	-60.47	91984.69	-21.95		
C (IER)	I	2036-03-07T15:38:16.517		64.84	-61.61	74490.58	-20.27		
Saturn	I	2036-03-07T15:49:44.553		62.66	-62.32	60266.38		3.11	3.82
Saturn	E	2036-03-07T17:53:19.610		37.04	-54.55	60035.86		-40.64	-46.26
C (IER)	E	2036-03-07T17:00:22.682	b	48.26	-60.99	74490.58	20.04		
B (IER)	E	2036-03-07T17:14:19.100	b	45.32	-59.65	91984.69	21.63		
B (OER)	E	2036-03-07T17:33:28.099	b	41.26	-57.37	117571.16	22.77		
A (IER)	E	2036-03-07T17:36:44.270	b	40.57	-56.93	122050.38	22.89		
Encke (IEG)	E	2036-03-07T17:44:58.129	b	38.82	-55.78	133423.31	23.15		
Encke (OEG)	E	2036-03-07T17:45:12.018	b	38.77	-55.75	133744.88	23.16		
A (OER)	E	2036-03-07T17:47:22.685	b	38.30	-55.44	136774.40	23.21		
F ring	E	2036-03-07T17:50:01.289	b	37.74	-55.05	140461.00	23.27		

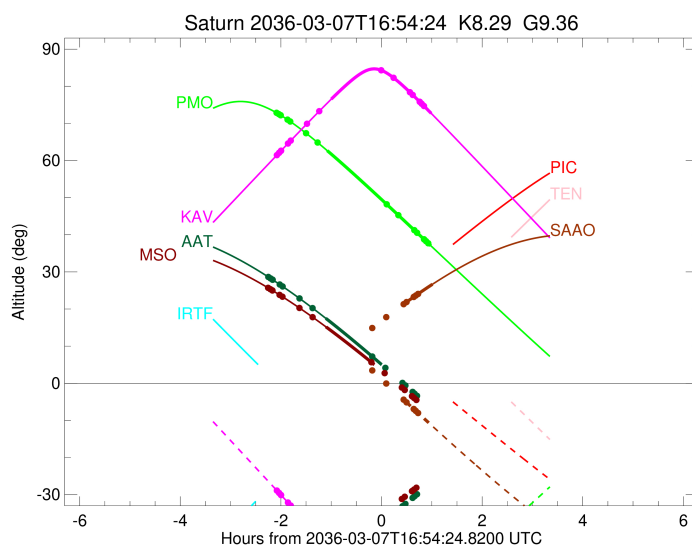
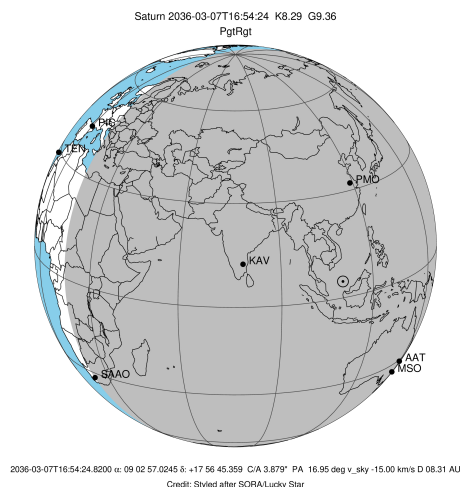
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-07T16:54:12.730
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 612094279188742016
 2Mass ID (if available) : 09025718+1756457
 ICRS Star Coord at Epoch: 09h 02m 57.02452s +17:56:45.35911s
 RUWE (>1.4 is poor) : 0.87
 K magnitude : 8.286
 G magnitude : 9.363
 RP magnitude : 8.974
 BP magnitude : 9.593
 DUPflag : 0
 Distance (au) : 8.315
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.00
 Sun-Target sep (deg) : 145.74
 Sun-Moon sep (deg) : 30.25
 B (ring opening deg) : -17.25
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.960
 C/A sky separation (km) : 23880.0
 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	2036-03-07T14:49:46.115		61.49	-28.93	140461.00	-23.48		
A (OER)	I	2036-03-07T14:52:23.436		62.11	-29.57	136774.40	-23.39		
Encke (OEG)	I	2036-03-07T14:54:33.213		62.62	-30.10	133744.89	-23.30		
Encke (IEG)	I	2036-03-07T14:54:47.016		62.67	-30.16	133423.31	-23.29		
A (IER)	I	2036-03-07T15:02:59.100		64.61	-32.16	122050.38	-22.91		
B (OER)	I	2036-03-07T15:06:15.337		65.39	-32.96	117571.16	-22.73		
B (IER)	I	2036-03-07T15:25:38.015		69.93	-37.68	91984.69	-21.08		
C (IER)	I	2036-03-07T15:40:13.441		73.31	-41.23	74490.58	-18.63		
Saturn	I	2036-03-07T15:54:27.427		76.52	-44.69	60268.00		-0.09	-0.11
Saturn	E	2036-03-07T17:53:45.339		72.70	-72.96	60004.95		-43.92	-49.50
C (IER)	E	2036-03-07T16:53:52.395	b	84.33	-59.03	74490.58	18.52		
B (IER)	E	2036-03-07T17:08:35.506	b	82.32	-62.54	91984.69	20.86		
B (OER)	E	2036-03-07T17:28:12.061	b	78.42	-67.15	117571.16	22.45		
A (IER)	E	2036-03-07T17:31:30.782	b	77.71	-67.92	122050.38	22.63		
Encke (IEG)	E	2036-03-07T17:39:49.214	b	75.87	-69.83	133423.31	22.99		
Encke (OEG)	E	2036-03-07T17:40:03.198	b	75.81	-69.88	133744.89	23.00		
A (OER)	E	2036-03-07T17:42:14.687	b	75.32	-70.38	136774.40	23.08		
F ring	E	2036-03-07T17:44:54.108	b	74.72	-70.98	140461.00	23.17		

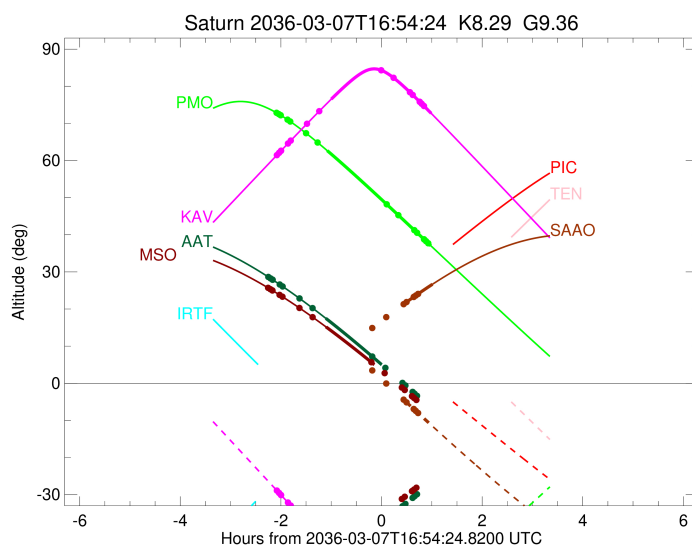
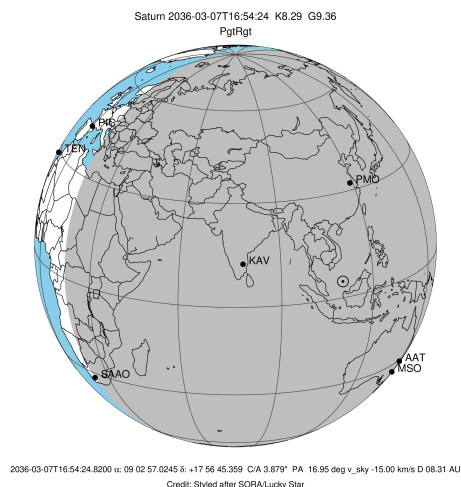
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-07T16:48:00.850
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 612094279188742016
 2Mass ID (if available) : 09025718+1756457
 ICRS Star Coord at Epoch: 09h 02m 57.02452s +17:56:45.35911s
 RUWE (>1.4 is poor) : 0.87
 K magnitude : 8.286
 G magnitude : 9.363
 RP magnitude : 8.974
 BP magnitude : 9.593
 DUPflag : 0
 Distance (au) : 8.314
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.00
 Sun-Target sep (deg) : 145.74
 Sun-Moon sep (deg) : 30.51
 B (ring opening deg) : -17.25
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.211
 C/A sky separation (km) : 25391.3
 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_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	2036-03-07T14:39:34.141		28.62	-53.51	140461.00	-22.85		
A (OER)	I	2036-03-07T14:42:15.883		28.23	-53.40	136774.40	-22.74		
Encke (OEG)	I	2036-03-07T14:44:29.406		27.90	-53.30	133744.89	-22.64		
Encke (IEG)	I	2036-03-07T14:44:43.613		27.86	-53.29	133423.31	-22.63		
A (IER)	I	2036-03-07T14:53:10.880		26.59	-52.84	122050.38	-22.19		
B (OER)	I	2036-03-07T14:56:33.656		26.07	-52.63	117571.16	-21.98		
B (IER)	I	2036-03-07T15:16:43.722		22.84	-51.07	91984.69	-20.08		
C (IER)	I	2036-03-07T15:32:14.332		20.24	-49.51	74490.58	-17.22		
Saturn	I	2036-03-07T15:47:53.248		17.51	-47.68	60267.50		-1.73	-2.13
Saturn	E	2036-03-07T17:48:14.062		-5.74x	-27.69	59990.86		-45.40	-50.95
C (IER)	E	2036-03-07T16:43:11.342	b	7.24	-39.50	74490.58	17.13		
B (IER)	E	2036-03-07T16:58:50.893	b	4.19x	-36.82	91984.69	19.83		
B (OER)	E	2036-03-07T17:19:19.015	b	0.12x	-33.15	117571.16	21.63		
A (IER)	E	2036-03-07T17:22:45.175	b	-0.56x	-32.51	122050.38	21.82		
Encke (IEG)	E	2036-03-07T17:31:21.221	b	-2.30x	-30.91	133423.31	22.23		
Encke (OEG)	E	2036-03-07T17:31:35.681	b	-2.35x	-30.86	133744.89	22.24		
A (OER)	E	2036-03-07T17:33:51.593	b	-2.81x	-30.43	136774.40	22.33		
F ring	E	2036-03-07T17:36:36.275	b	-3.36x	-29.92	140461.00	22.44		

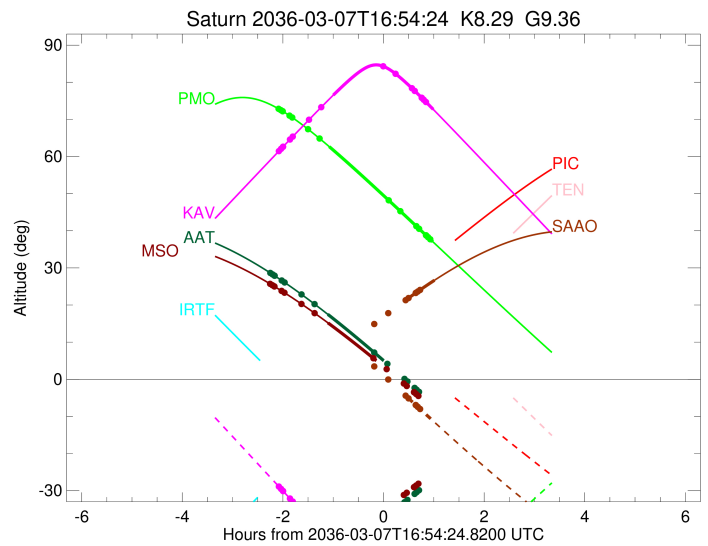
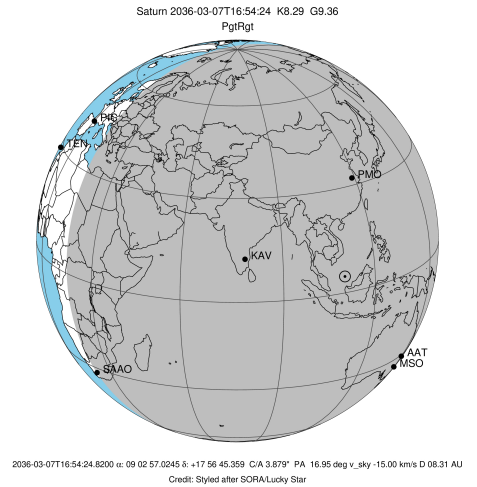
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-07T16:57:40.940
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 612094279188742016
 2Mass ID (if available) : 09025718+1756457
 ICRS Star Coord at Epoch: 09h 02m 57.02452s +17:56:45.35911s
 RUWE (>1.4 is poor) : 0.87
 K magnitude : 8.286
 G magnitude : 9.363
 RP magnitude : 8.974
 BP magnitude : 9.593
 DUPflag : 0
 Distance (au) : 8.315
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.00
 Sun-Target sep (deg) : 145.74
 Sun-Moon sep (deg) : 29.33
 B (ring opening deg) : -17.25
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.756
 C/A sky separation (km) : 28679.1
 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	2036-03-07T14:47:48.272		-7.40x	27.78x	140461.00	-22.63		
A (OER)	I	2036-03-07T14:50:31.636		-6.85x	27.22x	136774.40	-22.50		
Encke (OEG)	I	2036-03-07T14:52:46.616		-6.39x	26.75x	133744.89	-22.39		
Encke (IEG)	I	2036-03-07T14:53:00.985		-6.34x	26.70x	133423.31	-22.37		
A (IER)	I	2036-03-07T15:01:35.087		-4.61x	24.92x	122050.38	-21.85		
B (OER)	I	2036-03-07T15:05:01.298		-3.92x	24.21x	117571.16	-21.59		
B (IER)	I	2036-03-07T15:25:47.307		0.22x	19.86x	91984.69	-19.18		
C (IER)	I	2036-03-07T15:42:30.021		3.50x	16.34x	74490.58	-15.30		
Saturn	I	2036-03-07T15:59:33.967		6.79	12.73x	60264.86		-4.34	-5.32
Saturn	E	2036-03-07T17:55:11.127		26.67	-11.56	59956.20		-49.08	-54.48
C (IER)	E	2036-03-07T16:43:14.568	b	14.86	3.49x	74490.58	15.37		
B (IER)	E	2036-03-07T16:59:54.505	b	17.79	-0.03x	91984.69	19.20		
B (OER)	E	2036-03-07T17:20:40.823	b	21.29	-4.39x	117571.16	21.58		
A (IER)	E	2036-03-07T17:24:07.132	b	21.85	-5.11	122050.38	21.84		
Encke (IEG)	E	2036-03-07T17:32:41.281	b	23.23	-6.90	133423.31	22.38		
Encke (OEG)	E	2036-03-07T17:32:55.646	b	23.26	-6.95	133744.89	22.39		
A (OER)	E	2036-03-07T17:35:10.577	b	23.62	-7.42	136774.40	22.51		
F ring	E	2036-03-07T17:37:53.846	b	24.05	-7.98	140461.00	22.65		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-07T16:48:08.710
 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 : 612094279188742016
 2Mass ID (if available) : 09025718+1756457
 ICRS Star Coord at Epoch: 09h 02m 57.02452s +17:56:45.35911s
 RUWE (>1.4 is poor) : 0.87
 K magnitude : 8.286
 G magnitude : 9.363
 RP magnitude : 8.974
 BP magnitude : 9.593
 DUPflag : 0
 Distance (au) : 8.314
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.00
 Sun-Target sep (deg) : 145.74
 Sun-Moon sep (deg) : 30.48
 B (ring opening deg) : -17.25
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.275
 C/A sky separation (km) : 25777.7
 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	2036-03-07T14:39:18.834		25.69	-49.55	140461.00	-22.79		
A (OER)	I	2036-03-07T14:42:00.999		25.32	-49.46	136774.40	-22.68		
Encke (OEG)	I	2036-03-07T14:44:14.889		25.01	-49.37	133744.89	-22.58		
Encke (IEG)	I	2036-03-07T14:44:29.136		24.98	-49.36	133423.31	-22.57		
A (IER)	I	2036-03-07T14:52:57.998		23.79	-48.98	122050.38	-22.12		
B (OER)	I	2036-03-07T14:56:21.511		23.30	-48.79	117571.16	-21.90		
B (IER)	I	2036-03-07T15:16:37.971		20.27	-47.42	91984.69	-19.93		
C (IER)	I	2036-03-07T15:32:18.491		17.80	-46.02	74490.58	-16.96		
Saturn	I	2036-03-07T15:48:11.553		15.19	-44.35	60267.26		-2.09	-2.57
Saturn	E	2036-03-07T17:48:09.963		-6.87x	-25.96	59987.14		-45.80	-51.33
C (IER)	E	2036-03-07T16:42:09.598	b	5.70	-37.10	74490.58	16.88		
B (IER)	E	2036-03-07T16:57:58.413	b	2.77x	-34.61	91984.69	19.70		
B (OER)	E	2036-03-07T17:18:32.292	b	-1.13x	-31.19	117571.16	21.56		
A (IER)	E	2036-03-07T17:21:59.088	b	-1.79x	-30.60	122050.38	21.76		
Encke (IEG)	E	2036-03-07T17:30:36.459	b	-3.45x	-29.10	133423.31	22.18		
Encke (OEG)	E	2036-03-07T17:30:50.951	b	-3.49x	-29.05	133744.89	22.20		
A (OER)	E	2036-03-07T17:33:07.156	b	-3.93x	-28.65	136774.40	22.29		
F ring	E	2036-03-07T17:35:52.166	b	-4.47x	-28.17	140461.00	22.39		