

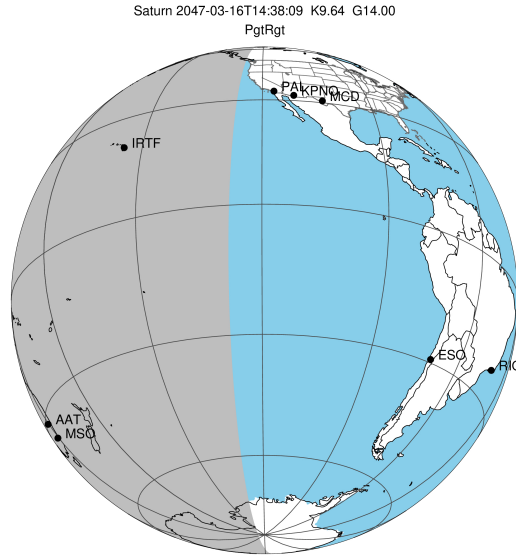
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:38:09.070
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266

Saturn 2047-03-16T14:38:09 K9.64 G14.00 PgtRgt

ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s

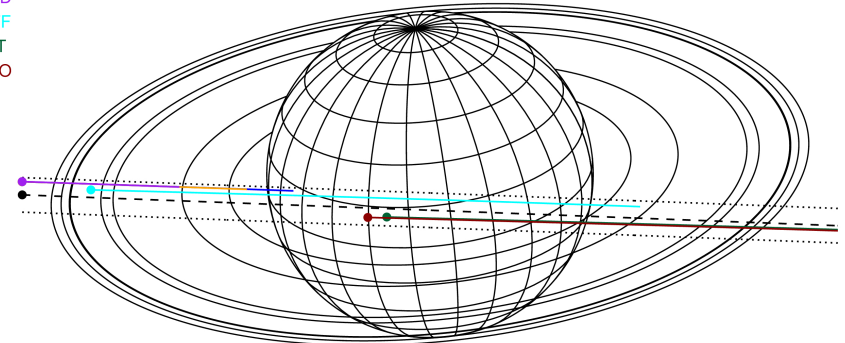
RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 35.09
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78

#	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



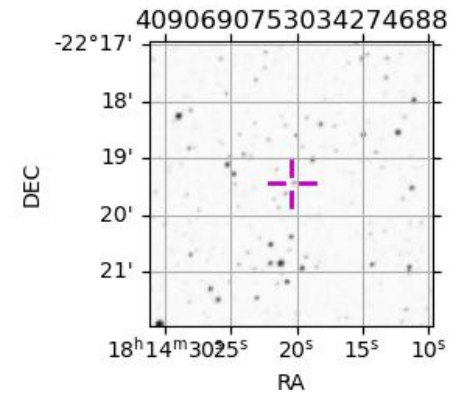
2047-03-16T14:38:09.0700 ci: 18 14 20.3049 s: -22 19 26.483 C/A 1.795° PA 357.84 deg v_sky +13.76 km/s D 10.14 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 KPNO
 MCD
 IRTF
 AAT
 MSO

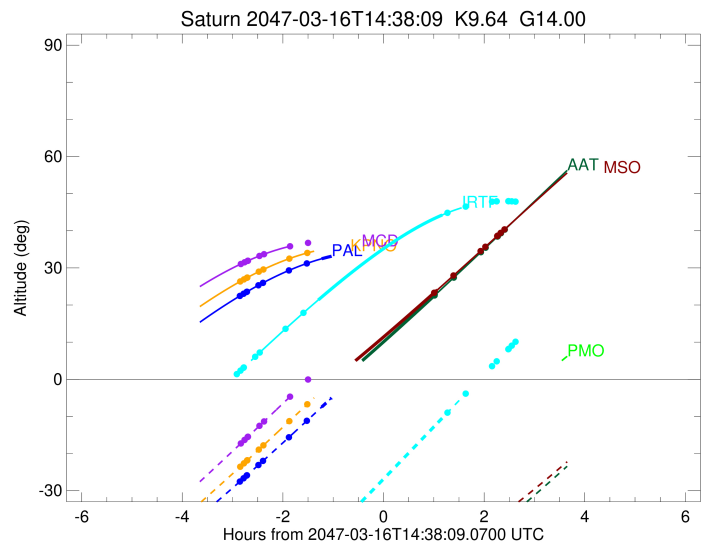
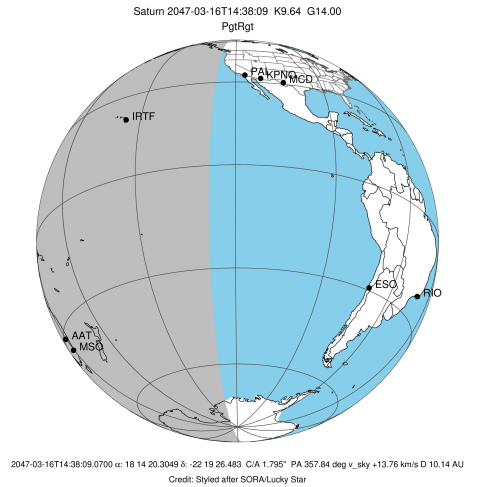


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+		MAR 16 11:46 - MAR 16 13:24	PinRin
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+		MAR 16 11:47 - MAR 16 13:07	PnnRin
MCD	McDonald Obs.	30.7	256.0	+	+		MAR 16 11:48 - MAR 16 12:15	PnnRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+	+	MAR 16 12:05 - MAR 16 15:54	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		+	+	MAR 16 15:42 - MAR 16 17:02	PneRne
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0		+	+	MAR 16 15:42 - MAR 16 17:02	PneRne



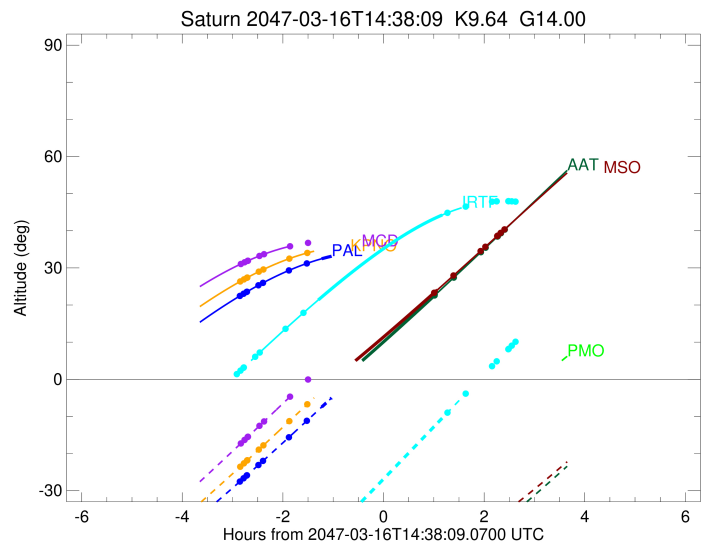
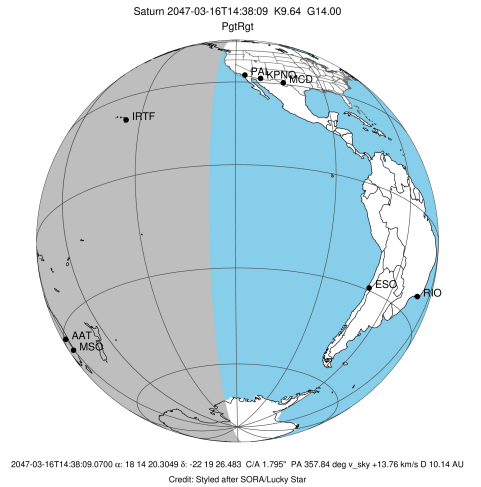
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:38:42.330
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266
 ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 35.58
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.083
 C/A sky separation (km) : 7962.5
 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	2047-03-16T11:46:54.364		22.45	-27.55	140461.00	-13.90		
A (OER)	I	2047-03-16T11:51:19.614		23.05	-26.66	136774.40	-13.89		
Encke (OEG)	I	2047-03-16T11:54:57.749		23.53	-25.93	133744.89	-13.88		
Encke (IEG)	I	2047-03-16T11:55:20.912		23.58	-25.86	133423.31	-13.88		
A (IER)	I	2047-03-16T12:09:01.252		25.32	-23.09	122050.38	-13.84		
B (OER)	I	2047-03-16T12:14:24.994		25.97	-21.99	117571.16	-13.83		
B (IER)	I	2047-03-16T12:45:23.214		29.32	-15.62	91984.69	-13.70		
C (IER)	I	2047-03-16T13:06:46.529		31.21	-11.18	74490.58	-13.55		
Saturn	I	2047-03-16T13:24:20.522		32.46	-7.51	60267.97		0.28	0.35
Saturn	E	2047-03-16T15:53:04.105		30.91	23.20x	60185.39		-14.08	-17.10
C (IER)	E	2047-03-16T16:00:02.264		30.32	24.58x	74490.58	13.55		
B (IER)	E	2047-03-16T16:21:25.094		28.25	28.75x	91984.69	13.71		
B (OER)	E	2047-03-16T16:52:22.378		24.67	34.56x	117571.16	13.83		
A (IER)	E	2047-03-16T16:57:45.957		23.98	35.54x	122050.38	13.85		
Encke (IEG)	E	2047-03-16T17:11:25.909		22.16	37.97x	133423.31	13.89		
Encke (OEG)	E	2047-03-16T17:11:49.062		22.11	38.04x	133744.89	13.89		
A (OER)	E	2047-03-16T17:15:27.103		21.60	38.67x	136774.40	13.90		
F ring	E	2047-03-16T17:19:52.247		20.98	39.43x	140461.00	13.91		

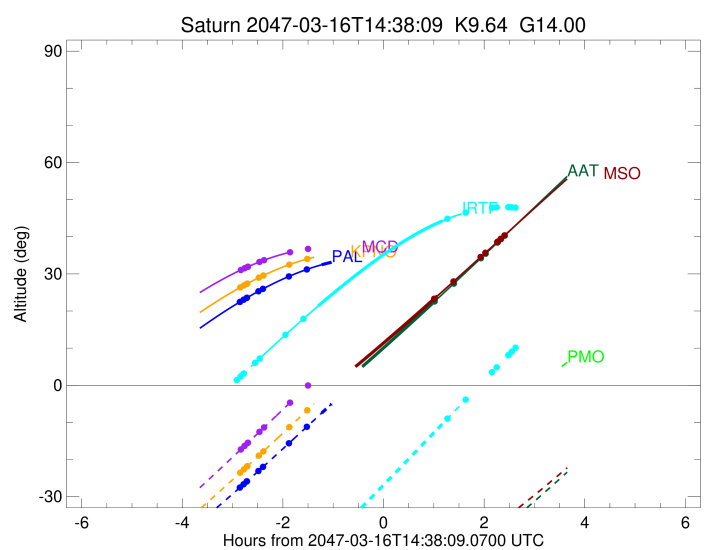
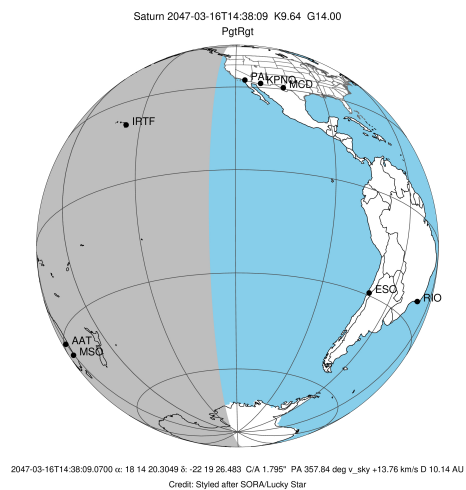
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:39:18.650
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266
 ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 35.64
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.101
 C/A sky separation (km) : 8090.9
 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



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	2047-03-16T11:47:19.665		26.36	-23.56	140461.00	-13.88		
A (OER)	I	2047-03-16T11:51:45.386		26.91	-22.64	136774.40	-13.87		
Encke (OEG)	I	2047-03-16T11:55:23.902		27.35	-21.88	133744.89	-13.86		
Encke (IEG)	I	2047-03-16T11:55:47.106		27.40	-21.80	133423.31	-13.86		
A (IER)	I	2047-03-16T12:09:28.833		28.99	-18.94	122050.38	-13.82		
B (OER)	I	2047-03-16T12:14:53.104		29.57	-17.81	117571.16	-13.80		
B (IER)	I	2047-03-16T12:45:54.212		32.50	-11.27	91984.69	-13.68		
C (IER)	I	2047-03-16T13:07:19.499		34.03	-6.72	74490.58	-13.53		
Saturn	I	2047-03-16T13:24:55.418		34.96	-2.98x	60267.98		0.23	0.28
Saturn	E	2047-03-16T15:53:37.683		30.17	27.96x	60183.51		-14.24	-17.30
C (IER)	E	2047-03-16T16:00:22.246		29.46	29.29x	74490.58	13.56		
B (IER)	E	2047-03-16T16:21:44.171		26.99	33.42x	91984.69	13.72		
B (OER)	E	2047-03-16T16:52:39.168		22.89	39.13x	117571.16	13.85		
A (IER)	E	2047-03-16T16:58:02.259		22.12	40.08x	122050.38	13.87		
Encke (IEG)	E	2047-03-16T17:11:40.879		20.10	42.43x	133423.31	13.91		
Encke (OEG)	E	2047-03-16T17:12:03.993		20.04	42.50x	133744.89	13.91		
A (OER)	E	2047-03-16T17:15:41.657		19.49	43.10x	136774.40	13.92		
F ring	E	2047-03-16T17:20:06.331		18.80	43.83x	140461.00	13.93		

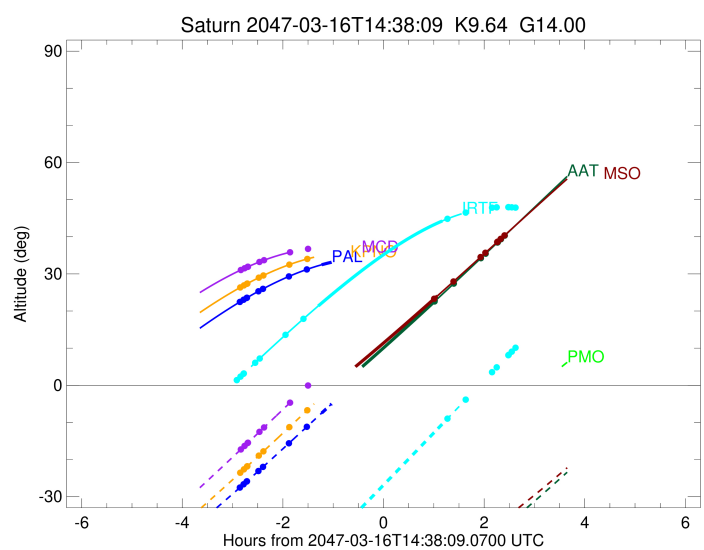
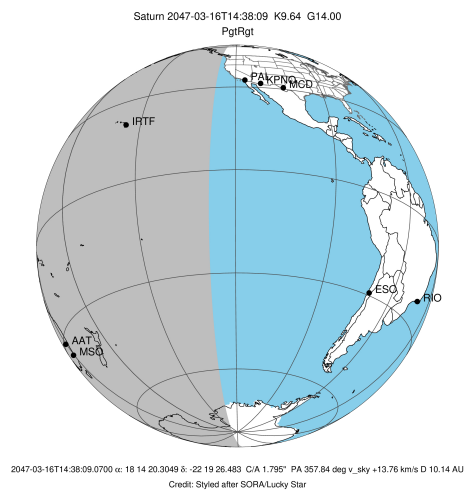
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:40:11.080
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266
 ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 35.73
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.125
 C/A sky separation (km) : 8266.5
 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	2047-03-16T11:48:03.303		31.05	-17.28	140461.00	-13.85		
A (OER)	I	2047-03-16T11:52:29.546		31.52	-16.33	136774.40	-13.84		
Encke (OEG)	I	2047-03-16T11:56:08.480		31.89	-15.55	133744.89	-13.83		
Encke (IEG)	I	2047-03-16T11:56:31.728		31.93	-15.47	133423.31	-13.83		
A (IER)	I	2047-03-16T12:10:14.948		33.23	-12.53	122050.38	-13.80		
B (OER)	I	2047-03-16T12:15:39.776		33.69	-11.37	117571.16	-13.78		
B (IER)	I	2047-03-16T12:46:43.807		35.83	-4.68x	91984.69	-13.66		
C (IER)	I	2047-03-16T13:08:11.024		36.74	-0.06x	74490.58	-13.51		
Saturn	I	2047-03-16T13:25:48.885		37.12	3.74x	60267.99		0.16	0.19
Saturn	E	2047-03-16T15:54:23.108		27.68	34.56x	60180.90		-14.46	-17.56
C (IER)	E	2047-03-16T16:00:48.679		26.84	35.79x	74490.58	13.58		
B (IER)	E	2047-03-16T16:22:08.555		23.89	39.78x	91984.69	13.75		
B (OER)	E	2047-03-16T16:52:59.315		19.18	45.17x	117571.16	13.89		
A (IER)	E	2047-03-16T16:58:21.556		18.32	46.06x	122050.38	13.91		
Encke (IEG)	E	2047-03-16T17:11:57.903		16.07	48.20x	133423.31	13.95		
Encke (OEG)	E	2047-03-16T17:12:20.950		16.01	48.26x	133744.89	13.95		
A (OER)	E	2047-03-16T17:15:57.984		15.39	48.81x	136774.40	13.96		
F ring	E	2047-03-16T17:20:21.876		14.64	49.46x	140461.00	13.98		

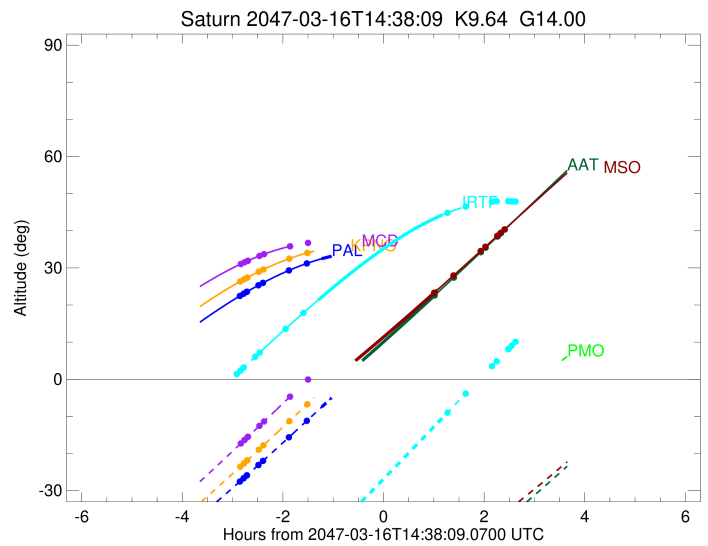
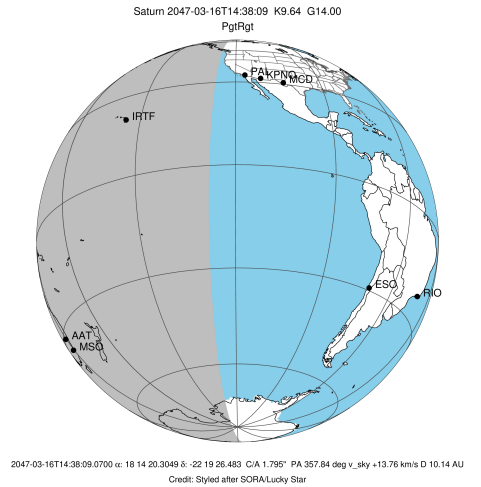
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:34:01.960
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266
 ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 35.07
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.257
 C/A sky separation (km) : 9237.3
 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	2047-03-16T11:43:14.045		1.39x	-64.65	140461.00	-14.05		
A (OER)	I	2047-03-16T11:47:36.667		2.33x	-63.89	136774.40	-14.03		
Encke (OEG)	I	2047-03-16T11:51:12.731		3.10x	-63.24	133744.89	-14.01		
Encke (IEG)	I	2047-03-16T11:51:35.679		3.19x	-63.17	133423.31	-14.01		
A (IER)	I	2047-03-16T12:05:09.050		6.07	-60.64	122050.38	-13.95		
B (OER)	I	2047-03-16T12:10:30.411		7.20	-59.59	117571.16	-13.92		
B (IER)	I	2047-03-16T12:41:19.946		13.59	-53.25	91984.69	-13.73		
C (IER)	I	2047-03-16T13:02:44.016		17.91	-48.62	74490.58	-13.50		
Saturn	I	2047-03-16T13:20:20.748		21.36	-44.71	60267.36		-1.22	-1.50
Saturn	E	2047-03-16T15:48:12.349		44.26	-10.46	60177.38		-14.76	-17.92
C (IER)	E	2047-03-16T15:54:20.628		44.83	-9.01	74490.58	13.30		
B (IER)	E	2047-03-16T16:16:06.498		46.51	-3.89x	91984.69	13.48		
B (OER)	E	2047-03-16T16:47:35.056		47.84	3.52x	117571.16	13.61		
A (IER)	E	2047-03-16T16:53:04.095		47.93	4.81x	122050.38	13.62		
Encke (IEG)	E	2047-03-16T17:06:58.047		47.97	8.08x	133423.31	13.65		
Encke (OEG)	E	2047-03-16T17:07:21.600		47.97	8.17x	133744.89	13.65		
A (OER)	E	2047-03-16T17:11:03.414		47.93	9.04x	136774.40	13.66		
F ring	E	2047-03-16T17:15:33.177		47.86	10.09x	140461.00	13.67		

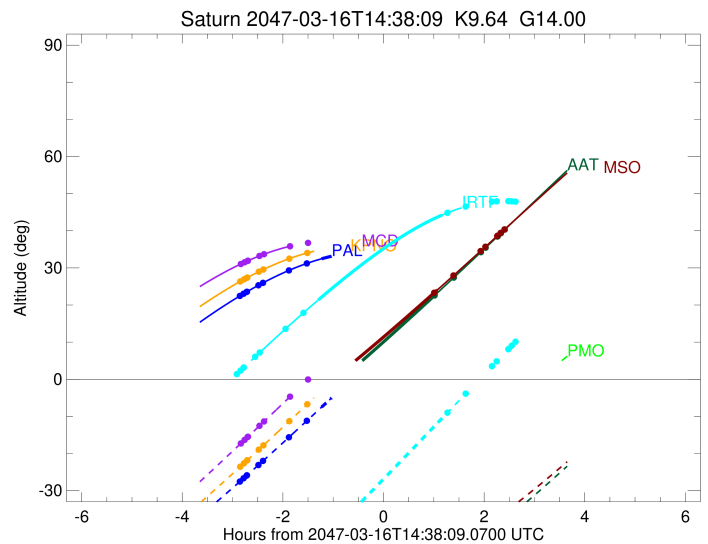
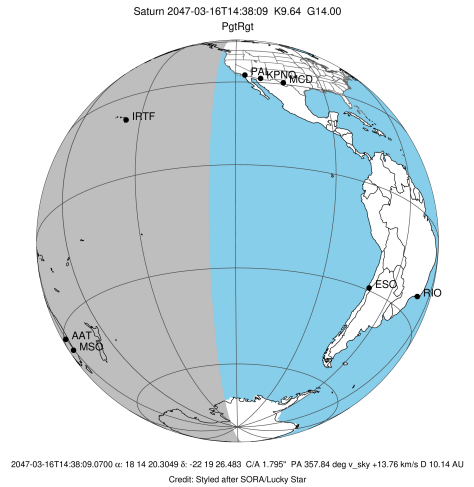
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:31:36.500
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266
 ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 34.43
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.193
 C/A sky separation (km) : 16123.3
 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	2047-03-16T11:44:53.457		-21.33x	-42.07	140461.00	-14.10		
A (OER)	I	2047-03-16T11:49:15.320		-20.67x	-42.82	136774.40	-14.06		
Encke (OEG)	I	2047-03-16T11:52:50.998		-20.12x	-43.43	133744.89	-14.03		
Encke (IEG)	I	2047-03-16T11:53:13.919		-20.06x	-43.49	133423.31	-14.03		
A (IER)	I	2047-03-16T12:06:48.236		-17.91x	-45.72	122050.38	-13.90		
B (OER)	I	2047-03-16T12:12:11.178		-17.04x	-46.57	117571.16	-13.84		
B (IER)	I	2047-03-16T12:43:30.502		-11.73x	-51.05	91984.69	-13.34		
C (IER)	I	2047-03-16T13:05:52.695		-7.74x	-53.65	74490.58	-12.67		
Saturn	I	2047-03-16T13:21:44.964		-4.81x	-55.13	60244.87		-7.39	-9.05
Saturn	E	2047-03-16T15:42:01.163		23.20	-50.95	60098.50		-20.41	-24.51
C (IER)	E	2047-03-16T15:38:58.831	b	22.56	-51.34	74490.58	12.38		
B (IER)	E	2047-03-16T16:01:55.842		27.38	-48.18	91984.69	12.96		
B (OER)	E	2047-03-16T16:34:17.289		34.24	-43.02	117571.16	13.34		
A (IER)	E	2047-03-16T16:39:52.472		35.43	-42.07	122050.38	13.38		
Encke (IEG)	E	2047-03-16T16:53:59.646		38.44	-39.57	133423.31	13.46		
Encke (OEG)	E	2047-03-16T16:54:23.532		38.53	-39.50	133744.89	13.46		
A (OER)	E	2047-03-16T16:58:08.403		39.33	-38.82	136774.40	13.48		
F ring	E	2047-03-16T17:02:41.689		40.30	-37.99	140461.00	13.50		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-03-16T14:31:52.990
 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 : 4090690753034274688
 2Mass ID (if available) : 18142029-2219266
 ICRS Star Coord at Epoch: 18h 14m 20.30487s -22:19:26.48287s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.639
 G magnitude : 14.001
 RP magnitude : 12.952
 BP magnitude : 15.083
 DUPflag : 0
 Distance (au) : 10.136
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 13.76
 Sun-Target sep (deg) : 81.95
 Sun-Moon sep (deg) : 34.47
 B (ring opening deg) : 26.13
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.241
 C/A sky separation (km) : 16474.4
 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	2047-03-16T11:45:06.767	-18.44x	-39.61	140461.00	-14.06			
A (OER)	I	2047-03-16T11:49:29.207	-17.82x	-40.30	136774.40	-14.03			
Encke (OEG)	I	2047-03-16T11:53:05.373	-17.30x	-40.86	133744.89	-14.00			
Encke (IEG)	I	2047-03-16T11:53:28.347	-17.24x	-40.92	133423.31	-14.00			
A (IER)	I	2047-03-16T12:07:04.654	-15.22x	-42.96	122050.38	-13.86			
B (OER)	I	2047-03-16T12:12:28.459	-14.39x	-43.73	117571.16	-13.80			
B (IER)	I	2047-03-16T12:43:54.143	-9.36x	-47.78	91984.69	-13.28			
C (IER)	I	2047-03-16T13:06:23.499	-5.54x	-50.11	74490.58	-12.58			
Saturn	I	2047-03-16T13:22:07.587	-2.78x	-51.39	60243.06			-7.68	-9.40
Saturn	E	2047-03-16T15:42:09.440	24.02	-47.69	60093.19			-20.75	-24.90
C (IER)	E	2047-03-16T15:38:29.343	b	23.28	-48.11	74490.58	12.31		
B (IER)	E	2047-03-16T16:01:32.267		27.93	-45.28	91984.69	12.92		
B (OER)	E	2047-03-16T16:33:57.754		34.53	-40.58	117571.16	13.33		
A (IER)	E	2047-03-16T16:39:33.339		35.68	-39.70	122050.38	13.37		
Encke (IEG)	E	2047-03-16T16:53:41.270		38.57	-37.40	133423.31	13.45		
Encke (OEG)	E	2047-03-16T16:54:05.173		38.65	-37.34	133744.89	13.45		
A (OER)	E	2047-03-16T16:57:50.188		39.42	-36.71	136774.40	13.47		
F ring	E	2047-03-16T17:02:23.621		40.35	-35.94	140461.00	13.49		