

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:17:57.180
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531

Saturn 2047-05-10T08:17:57 K8.67 G12.96 PgtRgt

ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 36.50
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78

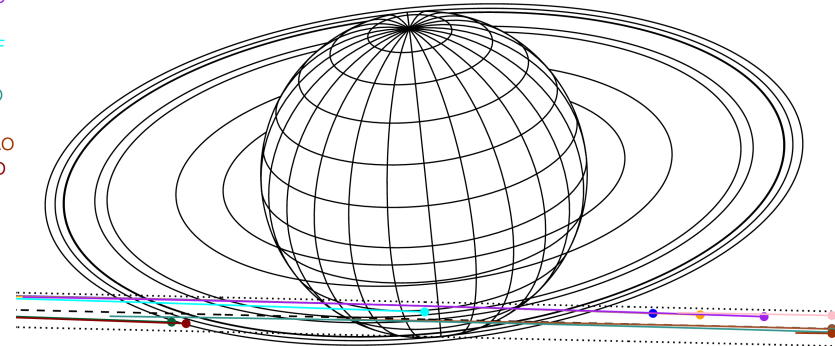
a(km) ring

- 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



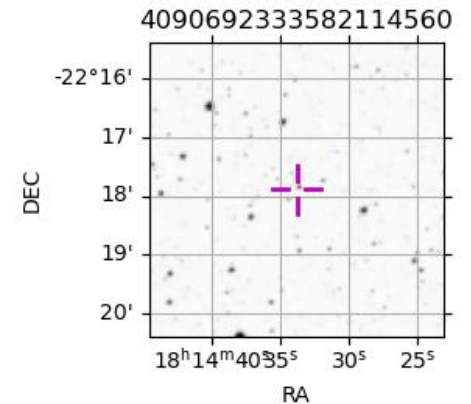
2047-05-10T08:17:57.1800 at: 18 14 33.7965 S: -22 17 53.804 C/A 7.927° PA 358.68 deg v_sky -11.67 km/s D 09.30 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO

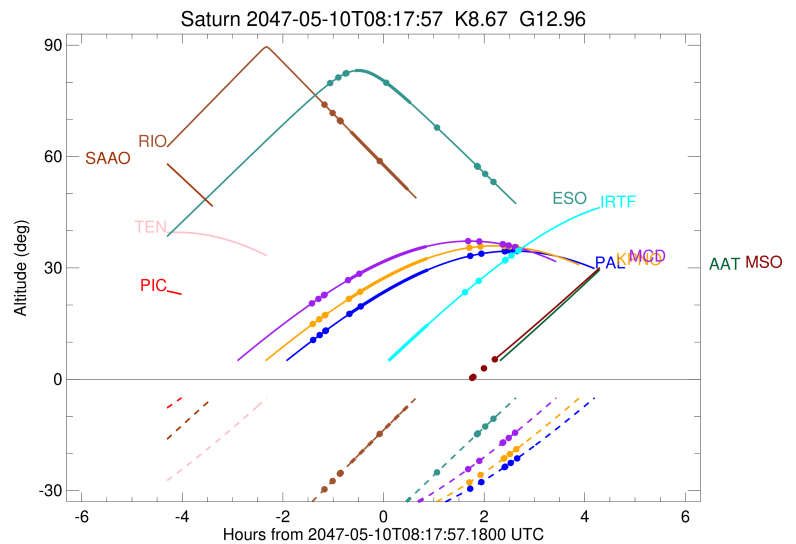
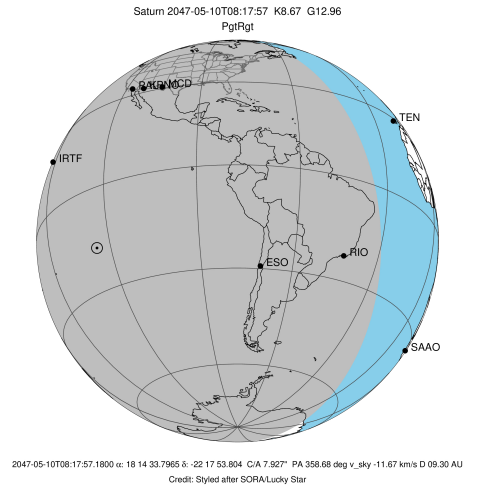


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+	+	MAY 10 06:54 - MAY 10 10:57	PieRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+	+	MAY 10 06:53 - MAY 10 10:56	PieRie
MCD	McDonald Obs.	30.7	256.0	+	+	+	MAY 10 06:52 - MAY 10 10:55	PieRie
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+	MAY 10 09:11 - MAY 10 10:58	PneRne
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+	+		MAY 10 07:07 - MAY 10 08:47	PieRin
ESO	European South	-29.3	289.3	+	+	+	MAY 10 07:14 - MAY 10 10:29	PieRie
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			+	MAY 10 10:31 - MAY 10 10:31	PnnRne



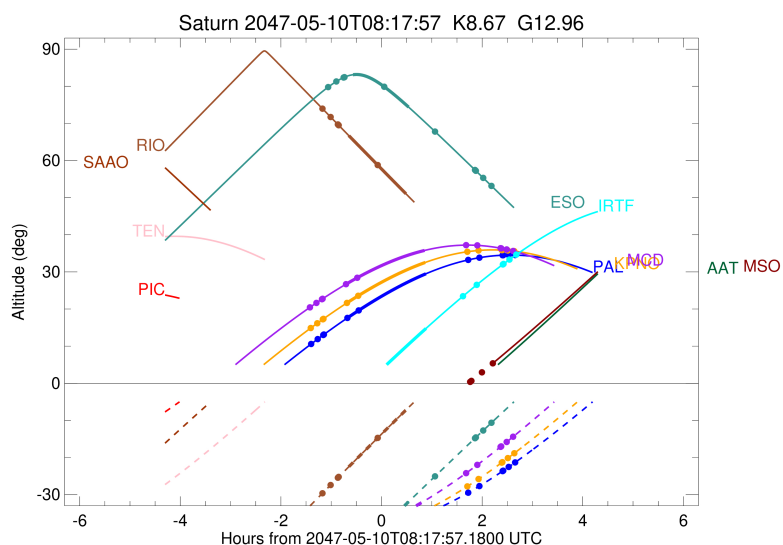
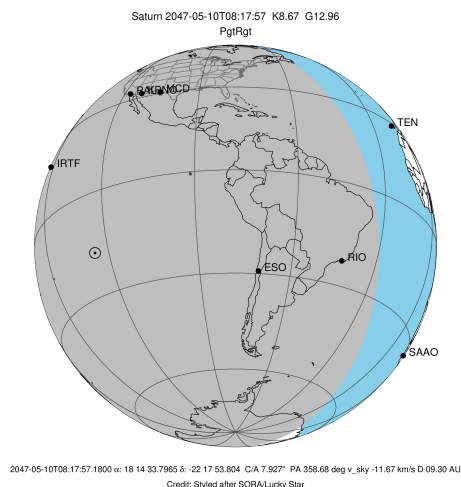
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:22:51.150
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 36.43
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.198
 C/A sky separation (km) : 48546.4
 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	2047-05-10T06:54:07.349		10.59	-37.83	140461.00	-8.03		
A (OER)	I	2047-05-10T07:01:55.317		11.91	-38.22	136774.40	-7.73		
Encke (OEG)	I	2047-05-10T07:08:34.460		13.02	-38.50	133744.89	-7.45		
Encke (IEG)	I	2047-05-10T07:09:17.712		13.14	-38.53	133423.31	-7.42		
A (IER)	I	2047-05-10T07:37:23.337	b	17.61	-39.17	122050.38	-6.01		
B (OER)	I	2047-05-10T07:50:41.694	b	19.61	-39.16	117571.16	-5.20		
Saturn	I	2047-05-10T07:35:11.242		17.28	-39.15	59404.28		-52.70	-57.87
Saturn	E	2047-05-10T09:10:55.152		29.50	-35.08	59673.96		-41.10	-46.72
B (OER)	E	2047-05-10T10:01:46.888		33.25	-29.43	117571.16	5.26		
A (IER)	E	2047-05-10T10:14:54.626		33.83	-27.67	122050.38	6.09		
Encke (IEG)	E	2047-05-10T10:42:34.735		34.50	-23.63	133423.31	7.54		
Encke (OEG)	E	2047-05-10T10:43:17.274		34.50	-23.52	133744.89	7.58		
A (OER)	E	2047-05-10T10:49:49.694		34.54	-22.51	136774.40	7.86		
F ring	E	2047-05-10T10:57:29.432		34.53	-21.30	140461.00	8.17		

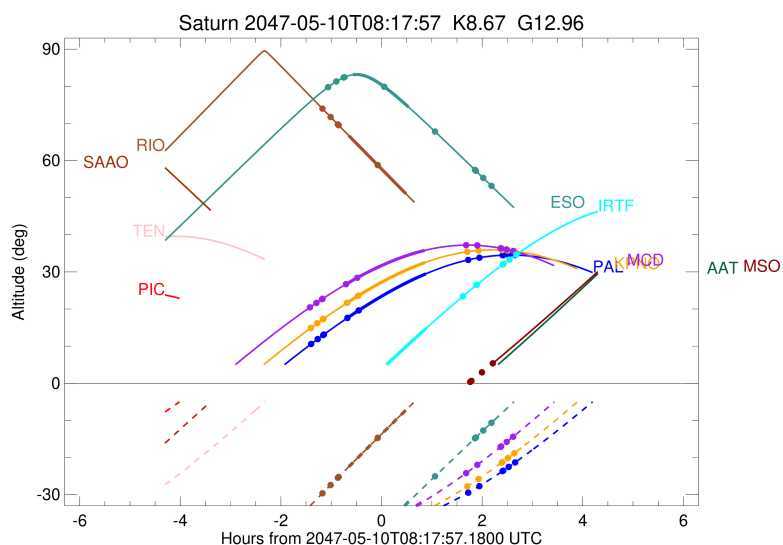
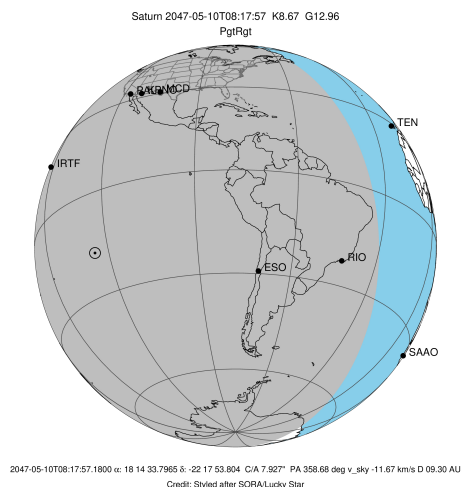
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:22:17.820
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 36.51
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.197
 C/A sky separation (km) : 48545.9
 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



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	2047-05-10T06:53:38.842		14.89	-40.10	140461.00	-8.04		
A (OER)	I	2047-05-10T07:01:25.727		16.17	-40.32	136774.40	-7.74		
Encke (OEG)	I	2047-05-10T07:08:04.007		17.24	-40.46	133744.89	-7.47		
Encke (IEG)	I	2047-05-10T07:08:47.170		17.36	-40.47	133423.31	-7.43		
A (IER)	I	2047-05-10T07:36:50.033	b	21.66	-40.46	122050.38	-6.01		
B (OER)	I	2047-05-10T07:50:07.801	b	23.56	-40.14	117571.16	-5.20		
Saturn	I	2047-05-10T07:34:44.508		21.35	-40.50	59405.02		-52.66	-57.84
Saturn	E	2047-05-10T09:10:16.295		32.56	-34.25	59672.93		-41.15	-46.77
B (OER)	E	2047-05-10T10:00:44.313		35.44	-27.72	117571.16	5.26		
A (IER)	E	2047-05-10T10:13:52.965		35.77	-25.76	122050.38	6.09		
Encke (IEG)	E	2047-05-10T10:41:34.360		35.87	-21.34	133423.31	7.54		
Encke (OEG)	E	2047-05-10T10:42:16.928		35.86	-21.22	133744.89	7.57		
A (OER)	E	2047-05-10T10:48:49.619		35.76	-20.13	136774.40	7.86		
F ring	E	2047-05-10T10:56:29.681		35.59	-18.82	140461.00	8.17		

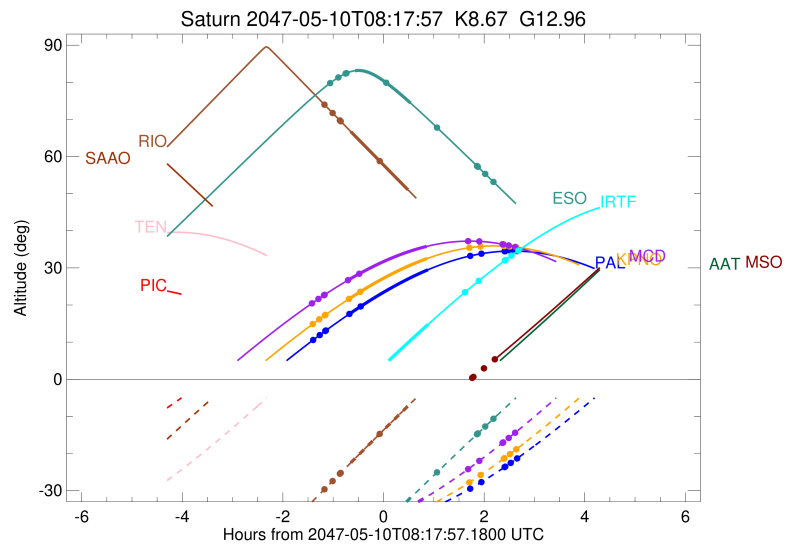
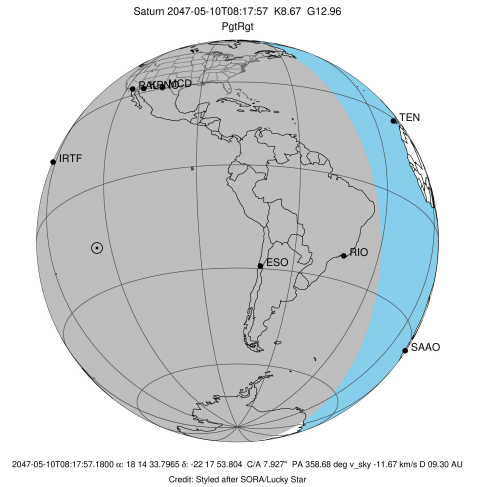
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:21:22.350
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 36.63
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.194
 C/A sky separation (km) : 48523.4
 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_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	2047-05-10T06:52:39.807		20.46	-41.88	140461.00	-8.07		
A (OER)	I	2047-05-10T07:00:25.178		21.66	-41.84	136774.40	-7.77		
Encke (OEG)	I	2047-05-10T07:07:02.234		22.66	-41.74	133744.89	-7.49		
Encke (IEG)	I	2047-05-10T07:07:45.267		22.76	-41.73	133423.31	-7.46		
A (IER)	I	2047-05-10T07:35:43.796	b	26.71	-40.75	122050.38	-6.03		
B (OER)	I	2047-05-10T07:49:00.117	b	28.41	-39.98	117571.16	-5.21		
Saturn	I	2047-05-10T07:33:54.223		26.47	-40.84	59406.82		-52.58	-57.76
Saturn	E	2047-05-10T09:09:17.375		35.78	-31.68	59672.00		-41.19	-46.81
B (OER)	E	2047-05-10T09:59:16.121		37.22	-24.15	117571.16	5.25		
A (IER)	E	2047-05-10T10:12:25.599		37.14	-21.95	122050.38	6.08		
Encke (IEG)	E	2047-05-10T10:40:08.775		36.38	-17.10	133423.31	7.53		
Encke (OEG)	E	2047-05-10T10:40:51.395		36.35	-16.97	133744.89	7.56		
A (OER)	E	2047-05-10T10:47:24.572		36.04	-15.78	136774.40	7.85		
F ring	E	2047-05-10T10:55:05.248		35.63	-14.37	140461.00	8.16		

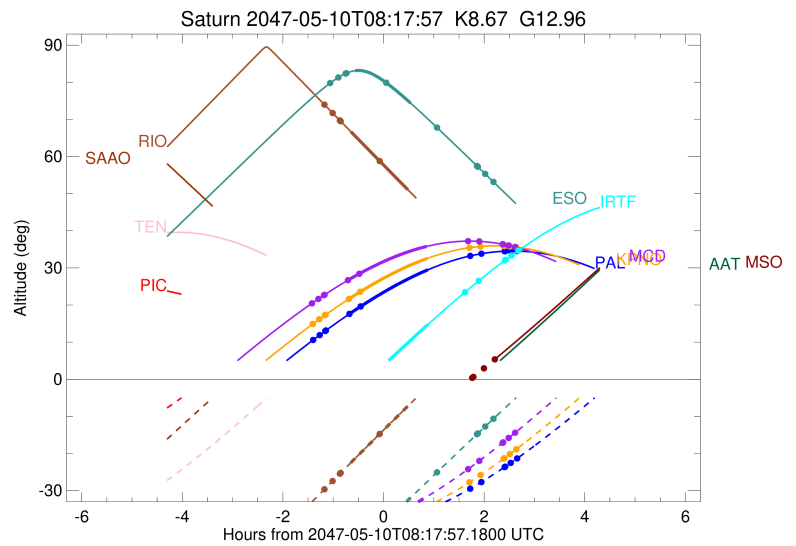
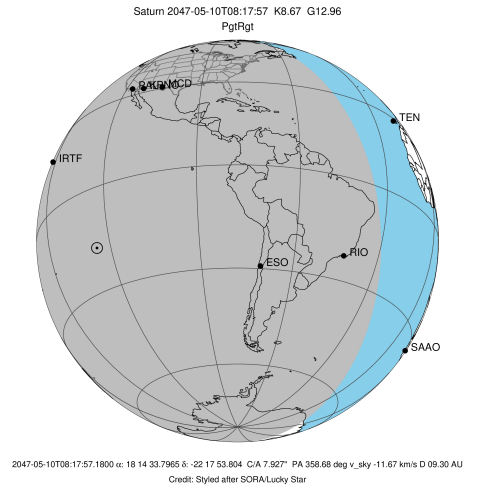
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:27:05.560
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 35.85
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.521
 C/A sky separation (km) : 50729.6
 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	2047-05-10T07:07:22.819		-11.70x	-30.11	140461.00	-7.39		
A (OER)	I	2047-05-10T07:15:53.295		-9.81x	-31.72	136774.40	-7.05		
Encke (OEG)	I	2047-05-10T07:23:12.546		-8.20x	-33.09	133744.89	-6.74		
Encke (IEG)	I	2047-05-10T07:24:00.394		-8.02x	-33.24	133423.31	-6.70		
A (IER)	I	2047-05-10T07:56:05.823	b	-1.00x	-38.90	122050.38	-5.03		
B (OER)	I	2047-05-10T08:12:38.052	b	2.56x	-41.58	117571.16	-3.98		
Saturn	I	2047-05-10T07:43:26.578		-3.75x	-36.74	59341.82		-55.52	-60.47
Saturn	E	2047-05-10T09:11:06.858		14.79	-49.18	59608.43		-43.89	-49.48
B (OER)	E	2047-05-10T09:55:39.523		23.55	-52.23	117571.16	4.06		
A (IER)	E	2047-05-10T10:11:48.293		26.56	-52.60	122050.38	5.16		
Encke (IEG)	E	2047-05-10T10:42:54.676		32.05	-52.14	133423.31	6.95		
Encke (OEG)	E	2047-05-10T10:43:40.841		32.18	-52.11	133744.89	6.98		
A (OER)	E	2047-05-10T10:50:44.166		33.35	-51.79	136774.40	7.32		
F ring	E	2047-05-10T10:58:55.040		34.68	-51.32	140461.00	7.69		

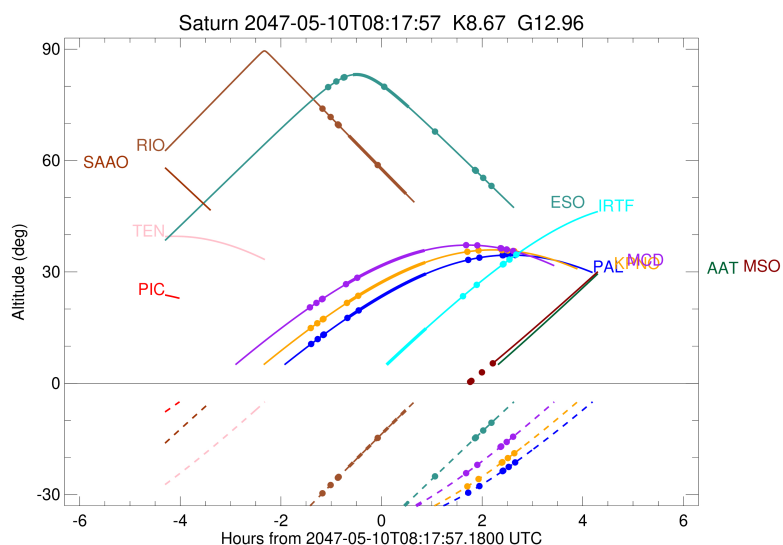
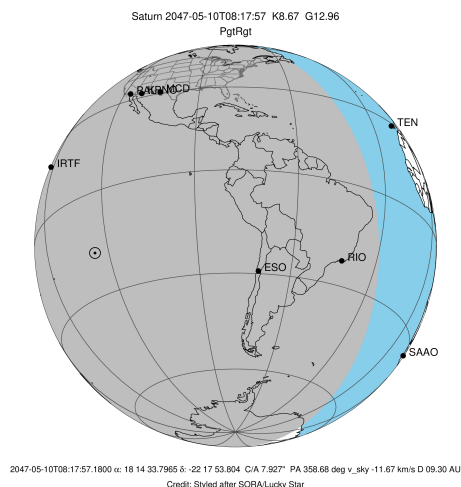
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:12:40.510
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 37.44
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.004
 C/A sky separation (km) : 53988.6
 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	2047-05-10T07:07:35.704		73.96	-29.62	140461.00	-6.56		
A (OER)	I	2047-05-10T07:17:19.410		71.71	-27.41	136774.40	-6.06		
Encke (OEG)	I	2047-05-10T07:25:59.060		69.71	-25.43	133744.89	-5.59		
Encke (IEG)	I	2047-05-10T07:26:56.867		69.49	-25.22	133423.31	-5.54		
A (IER)	I	2047-05-10T08:13:28.873	b	58.76	-14.70	122050.38	-2.48		
Saturn	I	2047-05-10T07:38:52.105		66.74	-22.51	59272.23		-58.82	-63.45
Saturn	E	2047-05-10T08:47:11.986		51.02	-7.19	59463.21		-50.11	-55.45
A (IER)	E	2047-05-10T09:19:06.747		43.73	-0.18x	122050.38	2.47		
Encke (IEG)	E	2047-05-10T10:06:08.792		33.06	9.90x	133423.31	5.44		
Encke (OEG)	E	2047-05-10T10:07:07.584		32.84	10.11x	133744.89	5.50		
A (OER)	E	2047-05-10T10:15:56.799		30.85	11.96x	136774.40	5.95		
F ring	E	2047-05-10T10:25:52.732		28.62	14.02x	140461.00	6.42		

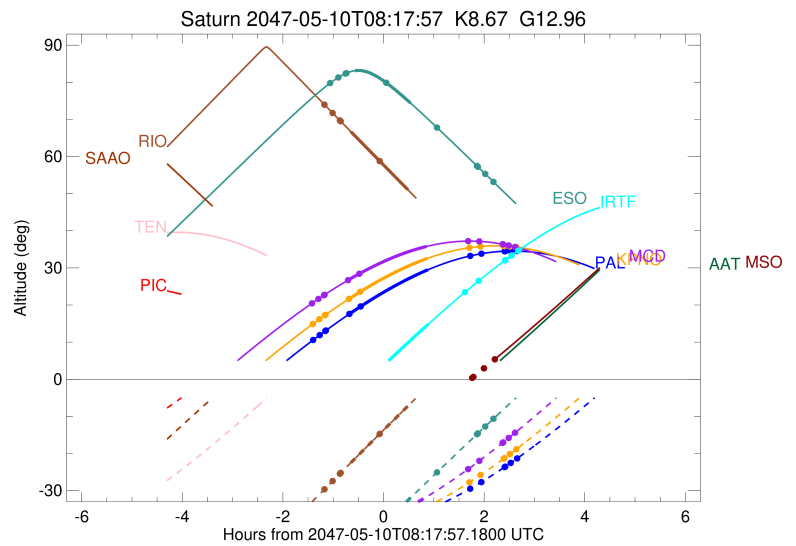
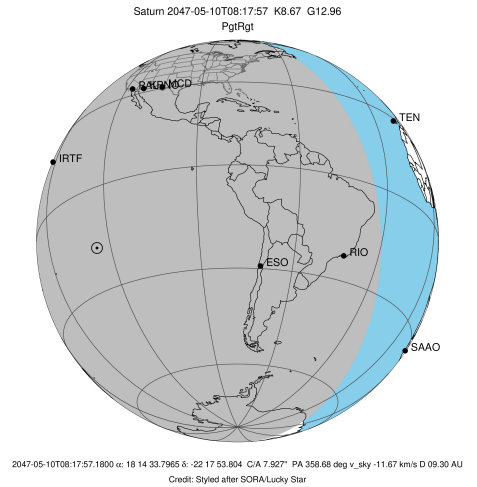
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:16:47.430
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 37.18
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.045
 C/A sky separation (km) : 54261.1
 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	2047-05-10T07:14:22.326		79.79	-52.80	140461.00	-6.54		
A (OER)	I	2047-05-10T07:24:08.253		81.30	-50.69	136774.40	-6.04		
Encke (OEG)	I	2047-05-10T07:32:50.382		82.37	-48.80	133744.89	-5.56		
Encke (IEG)	I	2047-05-10T07:33:48.506		82.46	-48.59	133423.31	-5.50		
A (IER)	I	2047-05-10T08:21:13.244	b	79.87	-38.26	122050.38	-2.35		
Saturn	I	2047-05-10T07:43:58.085		83.12	-46.38	59261.58		-59.34	-63.91
Saturn	E	2047-05-10T08:50:16.870		74.39	-31.92	59457.86		-50.34	-55.67
A (IER)	E	2047-05-10T09:22:13.618		67.70	-24.97	122050.38	2.35		
Encke (IEG)	E	2047-05-10T10:09:46.484		57.39	-14.74	133423.31	5.47		
Encke (OEG)	E	2047-05-10T10:10:44.946		57.18	-14.53	133744.89	5.53		
A (OER)	E	2047-05-10T10:19:30.469		55.26	-12.67	136774.40	6.00		
F ring	E	2047-05-10T10:29:20.962		53.11	-10.58	140461.00	6.48		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-10T08:24:34.940
 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 : 4090692333582114560
 2Mass ID (if available) : 18143379-2217531
 ICRS Star Coord at Epoch: 18h 14m 33.79649s -22:17:53.80430s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.667
 G magnitude : 12.956
 RP magnitude : 11.834
 BP magnitude : 14.280
 DUPflag : 0
 Distance (au) : 9.300
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 135.59
 Sun-Moon sep (deg) : 35.74
 B (ring opening deg) : 26.10
 PA of pole (deg) : 5.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.607
 C/A sky separation (km) : 58051.7
 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	2047-05-10T07:44:38.654		-21.77x	-6.96	140461.00	-4.93		
A (OER)	I	2047-05-10T07:57:59.259		-20.01x	-9.58	136774.40	-4.27		
Encke (OEG)	I	2047-05-10T08:10:49.587	b	-18.22x	-12.13	133744.89	-3.59		
Encke (IEG)	I	2047-05-10T08:12:20.322	b	-18.00x	-12.43	133423.31	-3.50		
Saturn	I	2047-05-10T08:07:47.303		-18.65x	-11.53	59177.21		-63.70	-67.78
Saturn	E	2047-05-10T08:42:10.300		-13.53x	-18.42	59291.03		-57.91	-62.63
Encke (IEG)	E	2047-05-10T10:04:08.436		0.45x	-35.13	133423.31	3.59		
Encke (OEG)	E	2047-05-10T10:05:37.031		0.72x	-35.43	133744.89	3.67		
A (OER)	E	2047-05-10T10:18:07.236		3.02x	-37.98	136774.40	4.40		
F ring	E	2047-05-10T10:31:03.416		5.43	-40.62	140461.00	5.10		