

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T10:02:26.130
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541

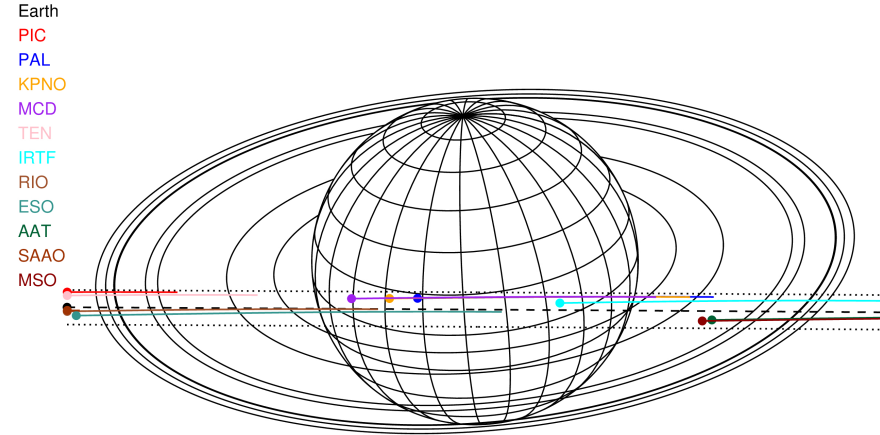
Saturn 2046-03-18T10:02:26 K9.86 G14.75 PgtRgt

ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 140.50
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 # a(km) ring



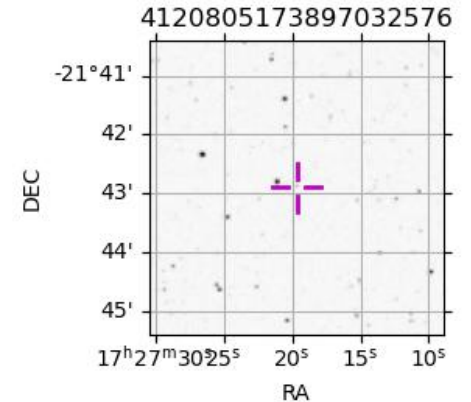
2046-03-18T10:02:26.1300 α: 17 27 19.71756 δ: -21 42 54.102 C/A 2.475° PA 359.65 deg v_sky + 7.02 km/s D 09.89 AU
 Credit: Styled after SORA/Lucky Star



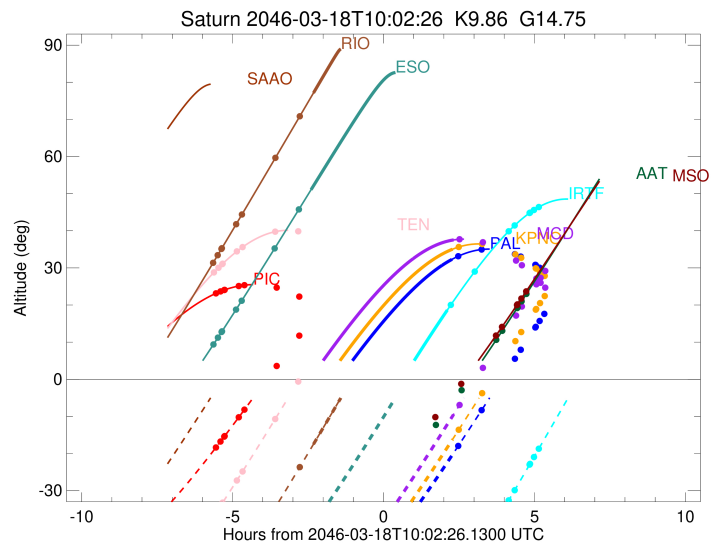
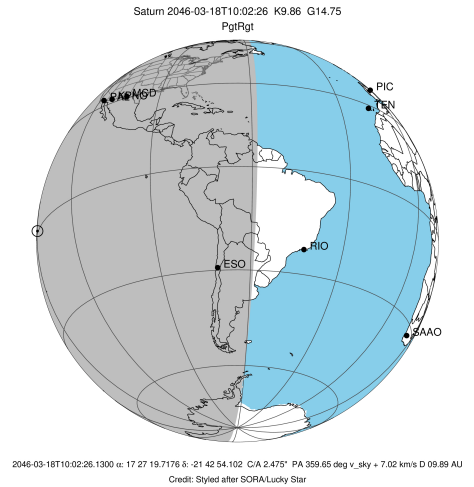
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEncode
PIC	Pic du Midi	42.9	0.1	+ + + + +			MAR 18 04:29 - MAR 18 05:25	PnnRin
PAL	Palomar Mt (20	33.4	243.1		+ +		MAR 18 12:18 - MAR 18 13:17	PneRne
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4		+ +		MAR 18 12:19 - MAR 18 12:31	PneRne
MCD	McDonald Obs.	30.7	256.0		+ +		MAR 18 12:21 - MAR 18 12:33	PneRne
TEN	Teide Obs./Ten	28.3	343.5	+ + + + +			MAR 18 04:25 - MAR 18 06:27	PnnRin
IRTF	Mauna Kea/IRTF	19.8	204.5		+ + + + + + + +		MAR 18 12:09 - MAR 18 15:11	PneRne
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+ + + + + + + +	+		MAR 18 04:23 - MAR 18 07:43	PinRin
ESO	European South	-29.3	289.3	+ + + + + + + +	+		MAR 18 04:24 - MAR 18 07:38	PinRin
AAT	Siding Spring	-31.3	149.1			+ + + + +	MAR 18 13:46 - MAR 18 14:46	PnnRne
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0			+ + + + +	MAR 18 13:46 - MAR 18 14:45	PnnRne



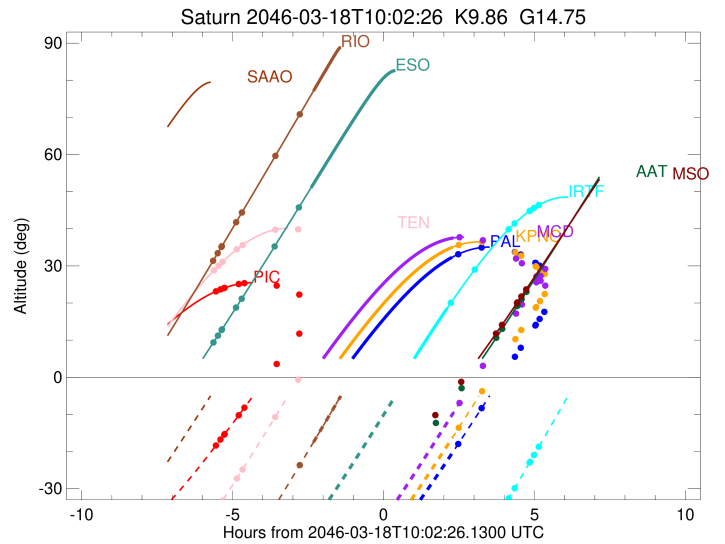
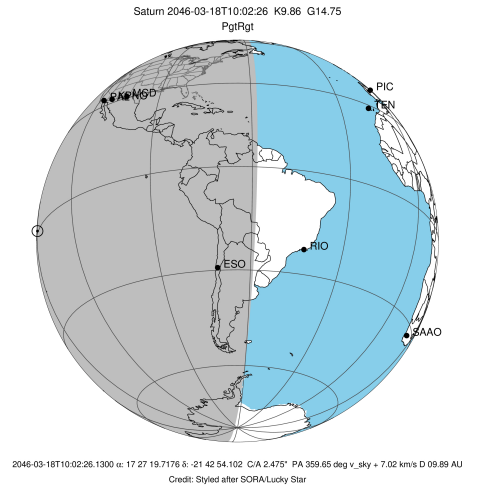
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T10:12:14.710
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 140.08
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.826
 C/A sky separation (km) : 13101.7
 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	2046-03-18T04:29:24.799		23.15	-18.37	140461.00	-6.80		
A (OER)	I	2046-03-18T04:38:27.770		23.67	-16.77	136774.40	-6.78		
Encke (OEG)	I	2046-03-18T04:45:54.794		24.05	-15.44	133744.89	-6.77		
Encke (IEG)	I	2046-03-18T04:46:42.289		24.08	-15.30	133423.31	-6.77		
A (IER)	I	2046-03-18T05:14:47.700		25.11	-10.23	122050.38	-6.73		
B (OER)	I	2046-03-18T05:25:54.687		25.34	-8.20	117571.16	-6.71		
B (IER)	I	2046-03-18T06:30:07.668		24.69	3.58x	91984.69	-6.56		
C (IER)	I	2046-03-18T07:15:06.588		22.26	11.76x	74490.58	-6.38		
Saturn	I	2046-03-18T07:48:37.076		19.52	17.70x	60252.43		-5.95	-7.29
Saturn	E	2046-03-18T12:32:49.487		-23.23x	46.11x	60148.59		-16.70	-20.20
C (IER)	E	2046-03-18T12:40:06.317		-24.55x	45.87x	74490.58	6.64		
B (IER)	E	2046-03-18T13:23:10.283		-32.46x	43.28x	91984.69	6.88		
B (OER)	E	2046-03-18T14:24:16.304		-43.64x	36.75x	117571.16	7.06		
A (IER)	E	2046-03-18T14:34:49.613		-45.55x	35.36x	122050.38	7.08		
Encke (IEG)	E	2046-03-18T15:01:29.864		-50.27x	31.57x	133423.31	7.13		
Encke (OEG)	E	2046-03-18T15:02:14.972		-50.40x	31.46x	133744.89	7.13		
A (OER)	E	2046-03-18T15:09:19.592		-51.63x	30.40x	136774.40	7.14		
F ring	E	2046-03-18T15:17:55.552		-53.10x	29.08x	140461.00	7.15		

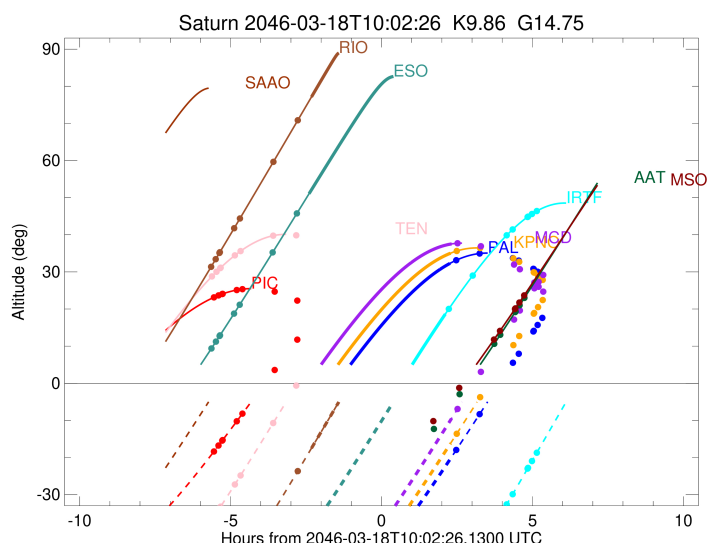
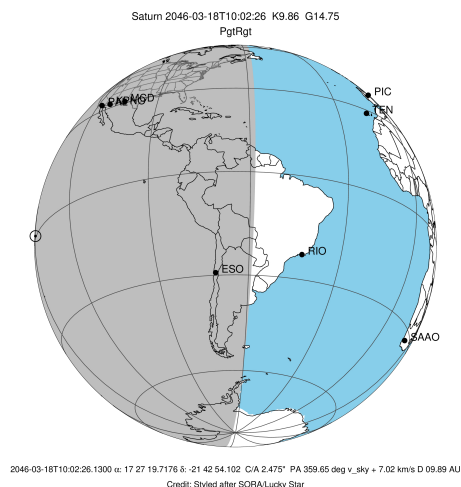
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T09:52:42.390
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 141.23
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.858
 C/A sky separation (km) : 13332.6
 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	2046-03-18T04:25:41.531	-50.50x	-31.25	140461.00	-7.32			
A (OER)	I	2046-03-18T04:34:05.964	-48.74x	-32.87	136774.40	-7.30			
Encke (OEG)	I	2046-03-18T04:41:01.661	-47.29x	-34.19	133744.89	-7.28			
Encke (IEG)	I	2046-03-18T04:41:45.851	-47.13x	-34.33	133423.31	-7.28			
A (IER)	I	2046-03-18T05:07:57.242	-41.64x	-39.17	122050.38	-7.20			
B (OER)	I	2046-03-18T05:18:21.128	-39.46x	-41.02	117571.16	-7.16			
B (IER)	I	2046-03-18T06:18:55.116	-26.83x	-50.54	91984.69	-6.90			
C (IER)	I	2046-03-18T07:02:00.476	-17.99x	-55.33	74490.58	-6.61			
Saturn	I	2046-03-18T07:31:31.989	-12.05x	-57.18	60240.85			-7.87	-9.63
Saturn	E	2046-03-18T12:18:45.661	32.32	-20.47	60166.36			-15.37	-18.64
C (IER)	E	2046-03-18T12:30:51.045	33.13	-17.99	74490.58	6.17			
B (IER)	E	2046-03-18T13:17:21.355	34.95	-8.35	91984.69	6.35			
B (OER)	E	2046-03-18T14:23:41.182	33.71	5.53x	117571.16	6.49			
A (IER)	E	2046-03-18T14:35:09.815	33.05	7.92x	122050.38	6.51			
Encke (IEG)	E	2046-03-18T15:04:09.537	30.84	13.93x	133423.31	6.56			
Encke (OEG)	E	2046-03-18T15:04:58.555	30.77	14.10x	133744.89	6.56			
A (OER)	E	2046-03-18T15:12:39.889	30.06	15.68x	136774.40	6.57			
F ring	E	2046-03-18T15:22:00.191	29.13	17.59x	140461.00	6.59			

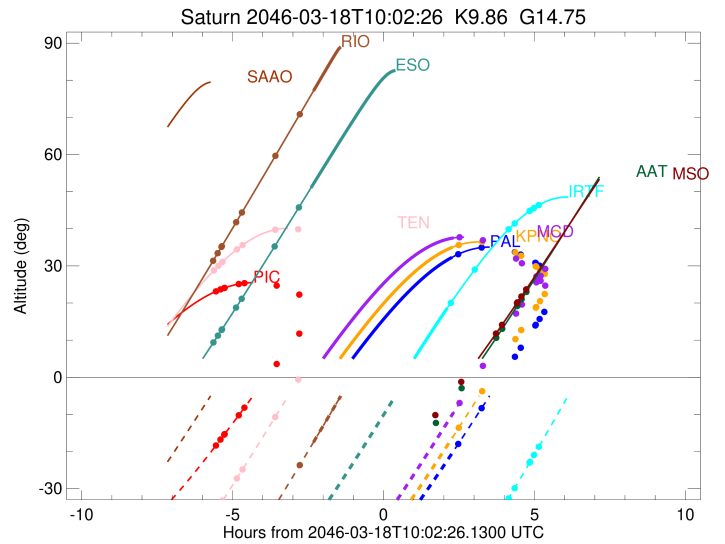
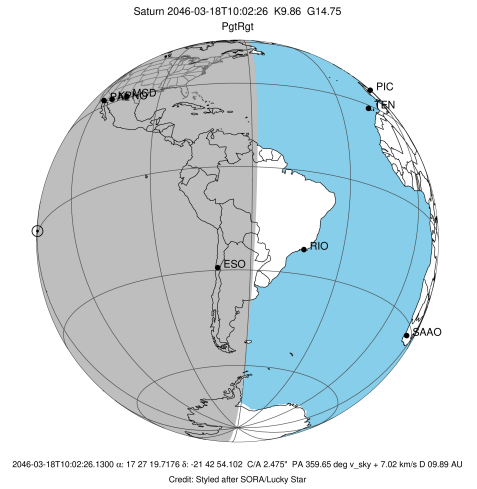
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T09:53:15.210
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 141.25
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.852
 C/A sky separation (km) : 13288.1
 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	2046-03-18T04:24:47.144		-46.33x	-35.70	140461.00	-7.30		
A (OER)	I	2046-03-18T04:33:12.845		-44.54x	-37.31	136774.40	-7.28		
Encke (OEG)	I	2046-03-18T04:40:09.632		-43.06x	-38.62	133744.89	-7.26		
Encke (IEG)	I	2046-03-18T04:40:53.940		-42.90x	-38.76	133423.31	-7.26		
A (IER)	I	2046-03-18T05:07:09.807		-37.31x	-43.52	122050.38	-7.18		
B (OER)	I	2046-03-18T05:17:35.610		-35.10x	-45.32	117571.16	-7.14		
B (IER)	I	2046-03-18T06:18:22.000		-22.32x	-54.25	91984.69	-6.88		
C (IER)	I	2046-03-18T07:01:36.896		-13.42x	-58.11	74490.58	-6.59		
Saturn	I	2046-03-18T07:31:20.637		-7.44x	-59.05	60241.23		-7.81	-9.57
Saturn	E	2046-03-18T12:19:52.776		35.05	-16.15	60165.87		-15.41	-18.68
C (IER)	E	2046-03-18T12:31:51.359		35.62	-13.63	74490.58	6.17		
B (IER)	E	2046-03-18T13:18:21.733		36.43	-3.78x	91984.69	6.35		
B (OER)	E	2046-03-18T14:24:37.098		33.64	10.28x	117571.16	6.51		
A (IER)	E	2046-03-18T14:36:04.387		32.72	12.69x	122050.38	6.53		
Encke (IEG)	E	2046-03-18T15:04:59.979		29.91	18.73x	133423.31	6.58		
Encke (OEG)	E	2046-03-18T15:05:48.866		29.82	18.90x	133744.89	6.58		
A (OER)	E	2046-03-18T15:13:28.927		28.96	20.49x	136774.40	6.59		
F ring	E	2046-03-18T15:22:47.590		27.85	22.40x	140461.00	6.61		

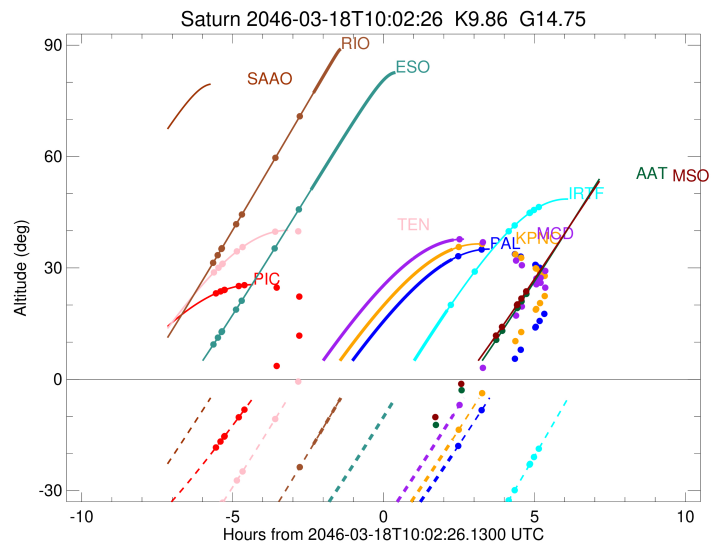
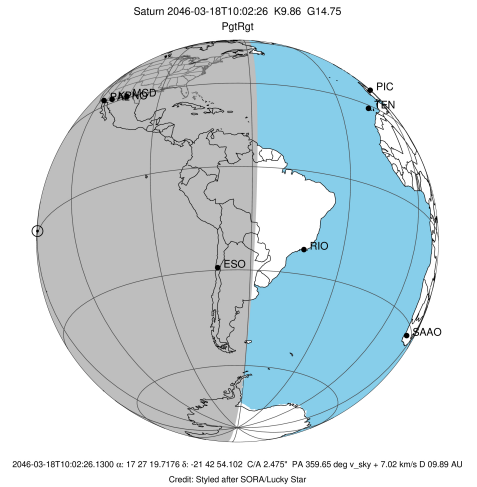
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T09:54:18.270
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
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 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 141.25
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.838
 C/A sky separation (km) : 13189.3
 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	2046-03-18T04:23:36.572		-40.07x	-41.82	140461.00	-7.27		
A (OER)	I	2046-03-18T04:32:04.447		-38.25x	-43.38	136774.40	-7.25		
Encke (OEG)	I	2046-03-18T04:39:03.079		-36.75x	-44.64	133744.89	-7.23		
Encke (IEG)	I	2046-03-18T04:39:47.586		-36.59x	-44.77	133423.31	-7.22		
A (IER)	I	2046-03-18T05:06:10.842		-30.93x	-49.28	122050.38	-7.14		
B (OER)	I	2046-03-18T05:16:39.731		-28.70x	-50.94	117571.16	-7.10		
B (IER)	I	2046-03-18T06:17:45.187		-15.85x	-58.39	91984.69	-6.84		
C (IER)	I	2046-03-18T07:01:13.690		-6.96x	-60.34	74490.58	-6.55		
Saturn	I	2046-03-18T07:31:20.183		-0.97x	-59.64	60242.14		-7.68	-9.40
Saturn	E	2046-03-18T12:21:37.516		37.54	-9.50	60165.30		-15.46	-18.74
C (IER)	E	2046-03-18T12:33:26.965		37.71	-6.96	74490.58	6.17		
B (IER)	E	2046-03-18T13:19:52.595		36.92	3.04x	91984.69	6.37		
B (OER)	E	2046-03-18T14:25:55.395		31.97	17.17x	117571.16	6.53		
A (IER)	E	2046-03-18T14:37:19.786		30.72	19.57x	122050.38	6.56		
Encke (IEG)	E	2046-03-18T15:06:07.160		27.16	25.56x	133423.31	6.61		
Encke (OEG)	E	2046-03-18T15:06:55.796		27.05	25.73x	133744.89	6.61		
A (OER)	E	2046-03-18T15:14:33.464		26.01	27.29x	136774.40	6.63		
F ring	E	2046-03-18T15:23:49.111		24.70	29.17x	140461.00	6.64		

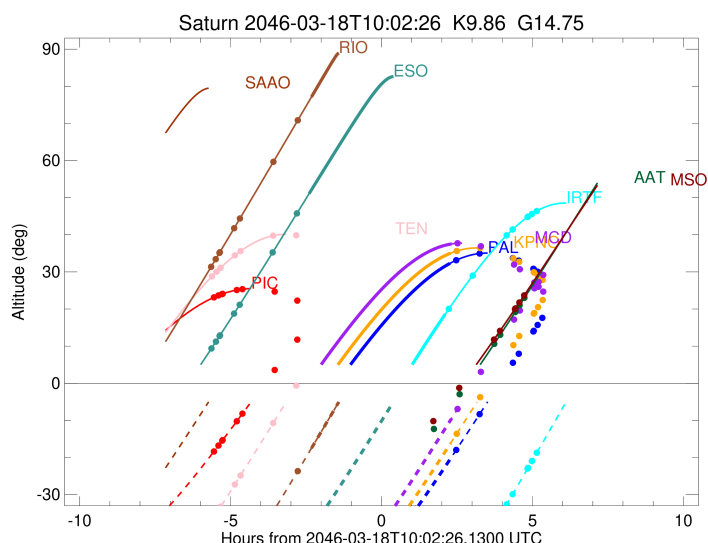
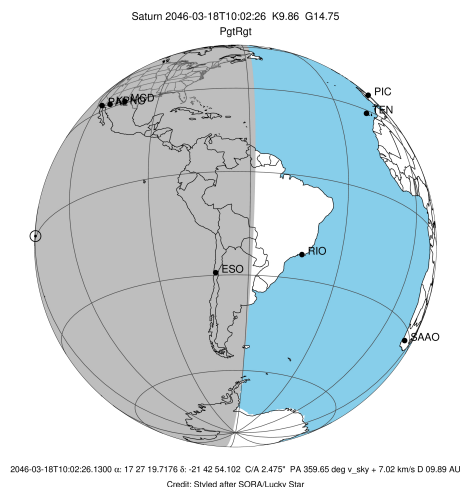
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T10:12:13.800
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 140.29
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.906
 C/A sky separation (km) : 13674.5
 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	2046-03-18T04:25:21.634		28.79	-36.81	140461.00	-6.77		
A (OER)	I	2046-03-18T04:34:26.716		30.04	-34.94	136774.40	-6.75		
Encke (OEG)	I	2046-03-18T04:41:55.827		31.02	-33.39	133744.89	-6.74		
Encke (IEG)	I	2046-03-18T04:42:43.563		31.13	-33.22	133423.31	-6.74		
A (IER)	I	2046-03-18T05:10:59.835		34.46	-27.26	122050.38	-6.67		
B (OER)	I	2046-03-18T05:22:12.387		35.59	-24.86	117571.16	-6.65		
B (IER)	I	2046-03-18T06:27:12.112		39.76	-10.70	91984.69	-6.46		
C (IER)	I	2046-03-18T07:13:00.105		39.86	-0.61x	74490.58	-6.25		
Saturn	I	2046-03-18T07:46:25.316		38.40	6.76x	60249.21		-6.54	-8.01
Saturn	E	2046-03-18T12:34:49.511		-6.71x	59.63x	60139.69		-17.33	-20.94
C (IER)	E	2046-03-18T12:40:16.083		-7.84x	60.00x	74490.58	6.52		
B (IER)	E	2046-03-18T13:24:00.079		-17.02x	61.02x	91984.69	6.79		
B (OER)	E	2046-03-18T14:25:41.127		-30.30x	56.39x	117571.16	7.02		
A (IER)	E	2046-03-18T14:36:18.295		-32.61x	55.02x	122050.38	7.04		
Encke (IEG)	E	2046-03-18T15:03:05.653		-38.48x	51.03x	133423.31	7.11		
Encke (OEG)	E	2046-03-18T15:03:50.907		-38.64x	50.91x	133744.89	7.11		
A (OER)	E	2046-03-18T15:10:56.770		-40.20x	49.75x	136774.40	7.12		
F ring	E	2046-03-18T15:19:33.899		-42.10x	48.29x	140461.00	7.14		

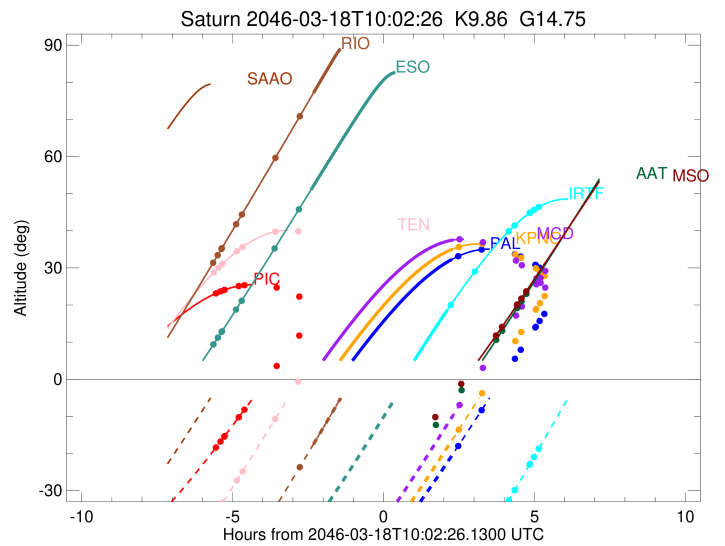
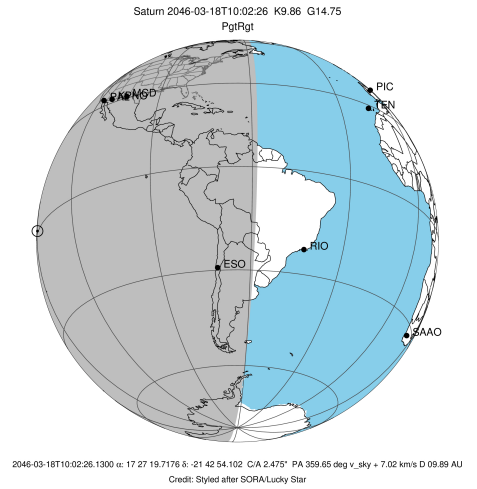
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T09:49:08.070
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 141.16
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.211
 C/A sky separation (km) : 15868.0
 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	2046-03-18T04:33:46.783	-83.68x	-1.23x	140461.00	-7.38			
A (OER)	I	2046-03-18T04:42:06.776	-81.81x	-3.19x	136774.40	-7.36			
Encke (OEG)	I	2046-03-18T04:48:58.693	-80.24x	-4.80x	133744.89	-7.35			
Encke (IEG)	I	2046-03-18T04:49:42.475	-80.08x	-4.97x	133423.31	-7.34			
A (IER)	I	2046-03-18T05:15:38.977	-74.08x	-11.07	122050.38	-7.27			
B (OER)	I	2046-03-18T05:25:56.925	-71.69x	-13.49	117571.16	-7.23			
B (IER)	I	2046-03-18T06:26:03.933	-57.70x	-27.54	91984.69	-6.93			
C (IER)	I	2046-03-18T07:09:15.067	-47.67x	-37.47	74490.58	-6.54			
Saturn	I	2046-03-18T07:34:38.469	-41.80x	-43.19	60222.87			-10.17	-12.42
Saturn	E	2046-03-18T12:09:14.499	18.64	-59.16	60143.57			-17.06	-20.62
C (IER)	E	2046-03-18T12:16:05.149	20.00	-57.82	74490.58	6.00			
B (IER)	E	2046-03-18T13:03:38.055	28.99	-47.86	91984.69	6.23			
B (OER)	E	2046-03-18T14:11:16.878	39.86	-32.62	117571.16	6.36			
A (IER)	E	2046-03-18T14:23:00.754	41.42	-29.92	122050.38	6.37			
Encke (IEG)	E	2046-03-18T14:52:42.488	44.79	-23.02	133423.31	6.40			
Encke (OEG)	E	2046-03-18T14:53:32.768	44.87	-22.82	133744.89	6.40			
A (OER)	E	2046-03-18T15:01:26.204	45.60	-20.98	136774.40	6.40			
F ring	E	2046-03-18T15:11:01.748	46.38	-18.74	140461.00	6.41			

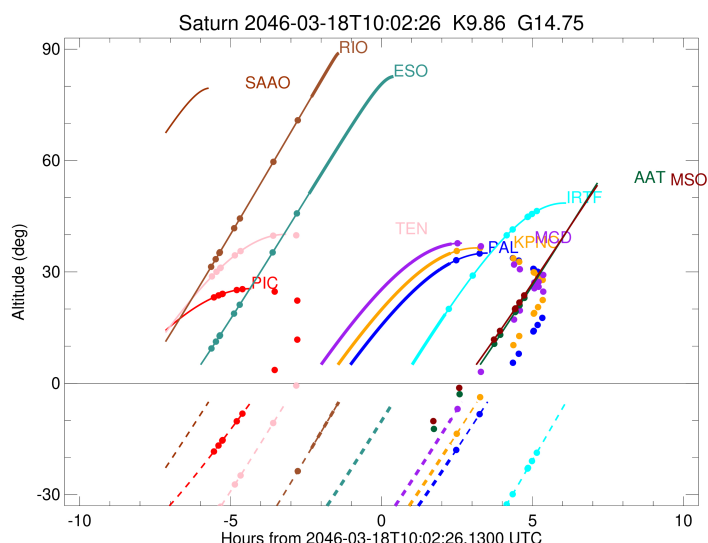
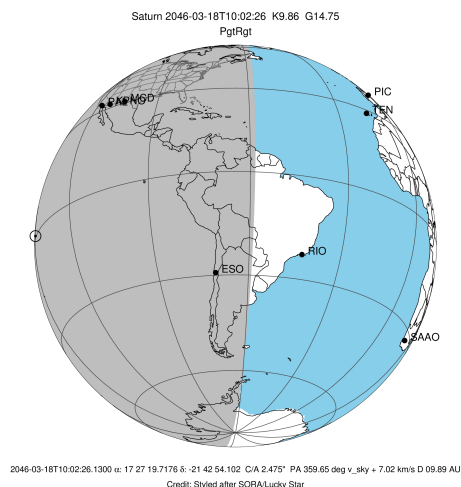
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T10:07:17.720
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 140.83
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.515
 C/A sky separation (km) : 18049.6
 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	2046-03-18T04:23:46.007		31.37	-58.91	140461.00	-6.78		
A (OER)	I	2046-03-18T04:32:50.990		33.42	-57.43	136774.40	-6.75		
Encke (OEG)	I	2046-03-18T04:40:20.792		35.12	-56.15	133744.89	-6.72		
Encke (IEG)	I	2046-03-18T04:41:08.643		35.30	-56.01	133423.31	-6.72		
A (IER)	I	2046-03-18T05:09:34.963		41.77	-50.75	122050.38	-6.61		
B (OER)	I	2046-03-18T05:20:55.060		44.36	-48.52	117571.16	-6.56		
B (IER)	I	2046-03-18T06:27:33.777		59.65	-34.47	91984.69	-6.21		
C (IER)	I	2046-03-18T07:16:02.741		70.85	-23.66	74490.58	-5.78		
Saturn	I	2046-03-18T07:43:00.795		77.08	-17.54	60216.18		-10.90	-13.31
Saturn	E	2046-03-18T12:30:14.252		36.60	47.34x	60084.11		-20.91	-25.08
C (IER)	E	2046-03-18T12:23:10.893	b	38.21	45.86x	74490.58	5.87		
B (IER)	E	2046-03-18T13:10:52.835		27.42	55.40x	91984.69	6.32		
B (OER)	E	2046-03-18T14:16:21.163		12.88	65.47x	117571.16	6.68		
A (IER)	E	2046-03-18T14:27:29.654		10.44	66.54x	122050.38	6.72		
Encke (IEG)	E	2046-03-18T14:55:28.413		4.38x	67.93x	133423.31	6.82		
Encke (OEG)	E	2046-03-18T14:56:15.532		4.22x	67.94x	133744.89	6.83		
A (OER)	E	2046-03-18T15:03:38.579		2.64x	67.95x	136774.40	6.85		
F ring	E	2046-03-18T15:12:35.713		0.73x	67.77x	140461.00	6.88		

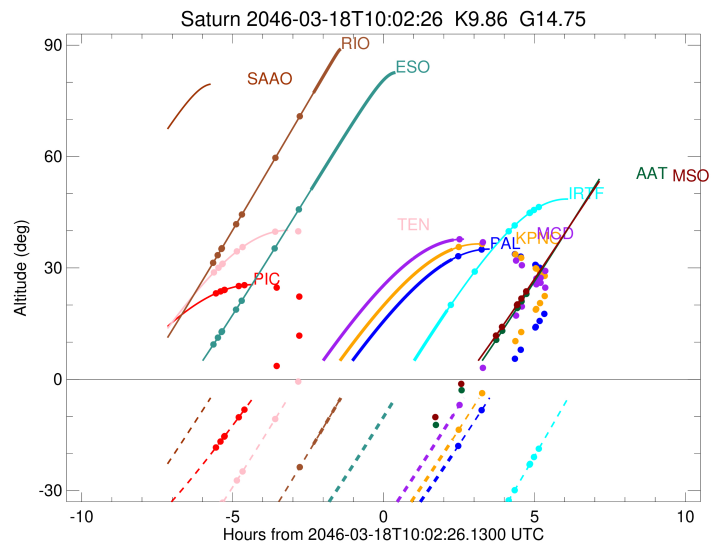
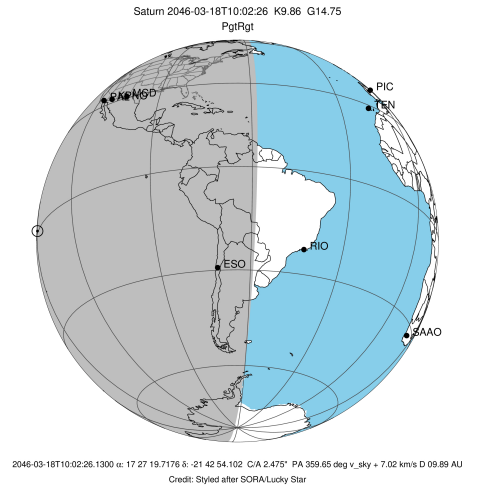
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T10:00:55.360
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 141.18
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.588
 C/A sky separation (km) : 18572.8
 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	2046-03-18T04:24:24.140		9.38	-59.35	140461.00	-6.92		
A (OER)	I	2046-03-18T04:33:17.861		11.22	-59.72	136774.40	-6.89		
Encke (OEG)	I	2046-03-18T04:40:38.484		12.74	-59.91	133744.89	-6.86		
Encke (IEG)	I	2046-03-18T04:41:25.366		12.91	-59.93	133423.31	-6.86		
A (IER)	I	2046-03-18T05:09:18.230		18.76	-59.70	122050.38	-6.74		
B (OER)	I	2046-03-18T05:20:25.740		21.12	-59.20	117571.16	-6.68		
B (IER)	I	2046-03-18T06:26:04.259		35.25	-52.38	91984.69	-6.28		
C (IER)	I	2046-03-18T07:14:13.792		45.76	-44.51	74490.58	-5.79		
Saturn	I	2046-03-18T07:38:20.000		51.04	-40.05	60206.04		-11.94	-14.55
Saturn	E	2046-03-18T12:24:52.808		62.69	20.80x	60085.40		-20.84	-25.00
C (IER)	E	2046-03-18T12:17:53.526	b	64.20	19.30x	74490.58	5.68		
B (IER)	E	2046-03-18T13:07:05.483		53.49	29.73x	91984.69	6.13		
B (OER)	E	2046-03-18T14:14:31.217		38.74	43.20x	117571.16	6.49		
A (IER)	E	2046-03-18T14:25:59.327		36.24	45.34x	122050.38	6.53		
Encke (IEG)	E	2046-03-18T14:54:46.743		30.00	50.38x	133423.31	6.63		
Encke (OEG)	E	2046-03-18T14:55:35.213		29.82	50.52x	133744.89	6.64		
A (OER)	E	2046-03-18T15:03:10.914		28.19	51.75x	136774.40	6.66		
F ring	E	2046-03-18T15:12:23.269		26.21	53.18x	140461.00	6.69		

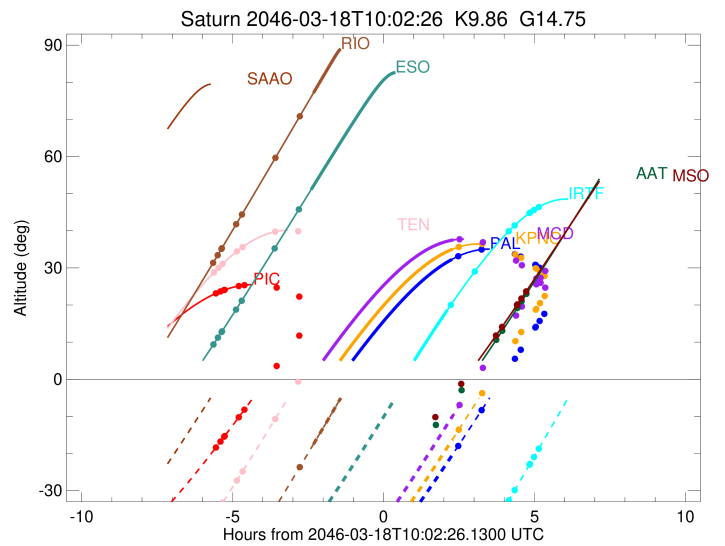
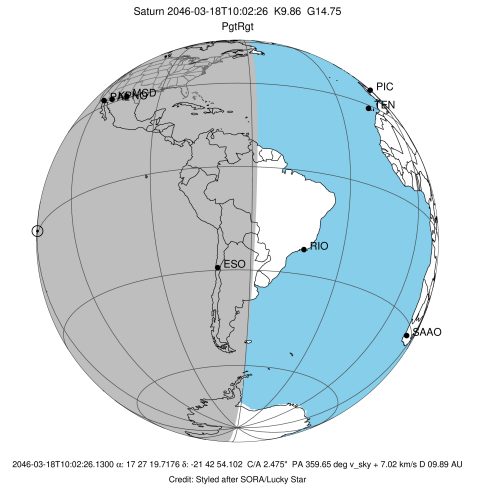
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T09:56:05.280
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 140.49
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.135
 C/A sky separation (km) : 22498.5
 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	2046-03-18T04:48:07.504		-21.48x	42.25x	140461.00	-7.01		
A (OER)	I	2046-03-18T04:56:54.503		-22.80x	40.63x	136774.40	-6.98		
Encke (OEG)	I	2046-03-18T05:04:08.923		-23.86x	39.27x	133744.89	-6.96		
Encke (IEG)	I	2046-03-18T05:04:55.114		-23.97x	39.12x	133423.31	-6.96		
A (IER)	I	2046-03-18T05:32:20.062		-27.70x	33.80x	122050.38	-6.86		
B (OER)	I	2046-03-18T05:43:15.239		-29.04x	31.63x	117571.16	-6.81		
B (IER)	I	2046-03-18T06:47:51.806		-35.10x	18.29x	91984.69	-6.33		
C (IER)	I	2046-03-18T07:36:31.073		-37.05x	7.95x	74490.58	-5.58		
Saturn	I	2046-03-18T07:50:28.585		-37.14x	4.97x	60166.74		-15.34	-18.60
Saturn	E	2046-03-18T12:04:05.627		-9.18x	-46.06	60042.01		-23.32	-27.83
C (IER)	E	2046-03-18T11:46:24.545	b	-12.34x	-43.08	74490.58	5.35		
B (IER)	E	2046-03-18T12:37:33.302		-2.96x	-51.10	91984.69	5.97		
B (OER)	E	2046-03-18T13:46:34.817		10.63	-57.60	117571.16	6.32		
A (IER)	E	2046-03-18T13:58:21.785		13.03	-58.00	122050.38	6.35		
Encke (IEG)	E	2046-03-18T14:28:04.870		19.16	-57.92	133423.31	6.40		
Encke (OEG)	E	2046-03-18T14:28:55.099		19.33	-57.90	133744.89	6.40		
A (OER)	E	2046-03-18T14:36:47.905		20.98	-57.61	136774.40	6.41		
F ring	E	2046-03-18T14:46:22.427		22.98	-57.12	140461.00	6.42		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-03-18T09:56:22.070
 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 : 4120805173897032576
 2Mass ID (if available) : 17271973-2142541
 ICRS Star Coord at Epoch: 17h 27m 19.71756s -21:42:54.10177s
 RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.861
 G magnitude : 14.747
 RP magnitude : 13.508
 BP magnitude : 16.429
 DUPflag : 0
 Distance (au) : 9.894
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 7.02
 Sun-Target sep (deg) : 94.92
 Sun-Moon sep (deg) : 140.50
 B (ring opening deg) : 26.53
 PA of pole (deg) : 4.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.173
 C/A sky separation (km) : 22769.7
 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	2046-03-18T04:48:01.627	-18.58x	40.10x	140461.00	-6.98			
A (OER)	I	2046-03-18T04:56:50.460	-19.82x	38.60x	136774.40	-6.96			
Encke (OEG)	I	2046-03-18T05:04:06.456	-20.82x	37.33x	133744.89	-6.94			
Encke (IEG)	I	2046-03-18T05:04:52.818	-20.92x	37.20x	133423.31	-6.94			
A (IER)	I	2046-03-18T05:32:24.325	-24.40x	32.21x	122050.38	-6.83			
B (OER)	I	2046-03-18T05:43:22.398	-25.66x	30.16x	117571.16	-6.78			
B (IER)	I	2046-03-18T06:48:20.883	-31.26x	17.47x	91984.69	-6.28			
C (IER)	I	2046-03-18T07:37:26.902	-33.03x	7.52x	74490.58	-5.51			
Saturn	I	2046-03-18T07:50:43.722	-33.11x	4.81x	60163.69			-15.58	-18.88
Saturn	E	2046-03-18T12:04:18.749	-7.01x	-43.36	60036.90			-23.60	-28.14
C (IER)	E	2046-03-18T11:45:17.586	b	-10.22x	-40.42	74490.58	5.29		
B (IER)	E	2046-03-18T12:36:48.881		-1.26x	-47.80	91984.69	5.94		
B (OER)	E	2046-03-18T13:46:04.403		11.78	-53.62	117571.16	6.31		
A (IER)	E	2046-03-18T13:57:52.694		14.09	-53.98	122050.38	6.34		
Encke (IEG)	E	2046-03-18T14:27:38.117		19.98	-53.94	133423.31	6.40		
Encke (OEG)	E	2046-03-18T14:28:28.393		20.15	-53.92	133744.89	6.40		
A (OER)	E	2046-03-18T14:36:21.596		21.73	-53.68	136774.40	6.41		
F ring	E	2046-03-18T14:45:56.490		23.65	-53.26	140461.00	6.42		