

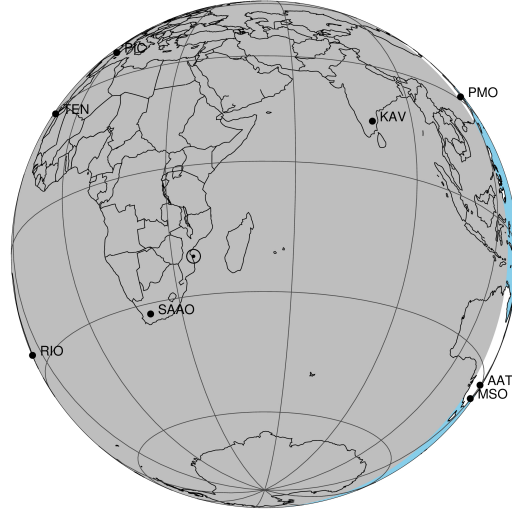
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:34:57.150
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413

Saturn 2046-05-25T21:34:57 K6.49 G12.67 PgtRgt

ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s

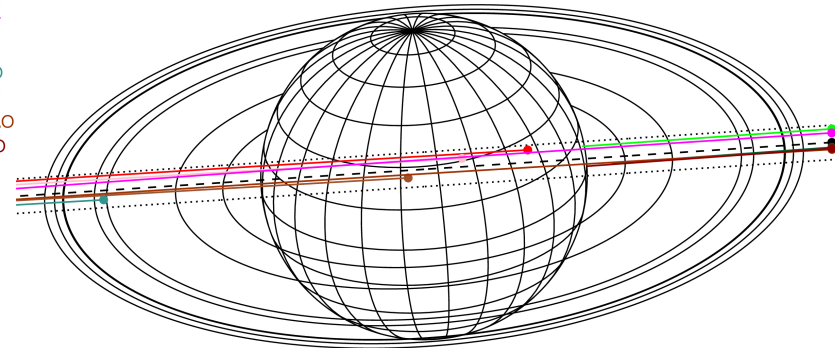
RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 53.79
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58

Saturn 2046-05-25T21:34:57 K6.49 G12.67
 PgtRgt



2046-05-25T21:34:57.1500 at: 17 18 48.0110 s: -21 31 41.665 C/A 0.402° PA 183.78 deg v_sky -18.99 km/s D 09.06 AU
 Credit: Styled after SORA/Lucky Star

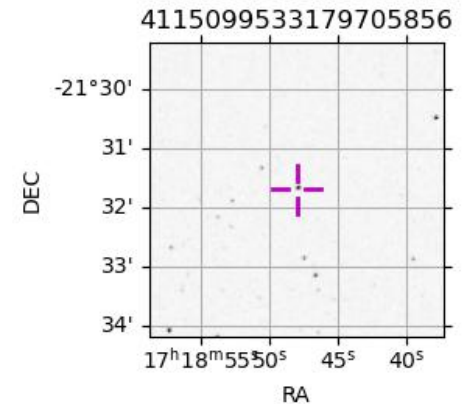
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



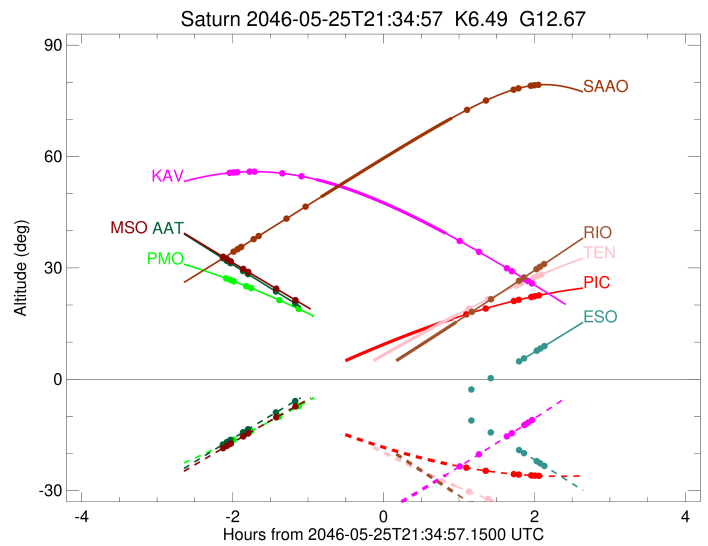
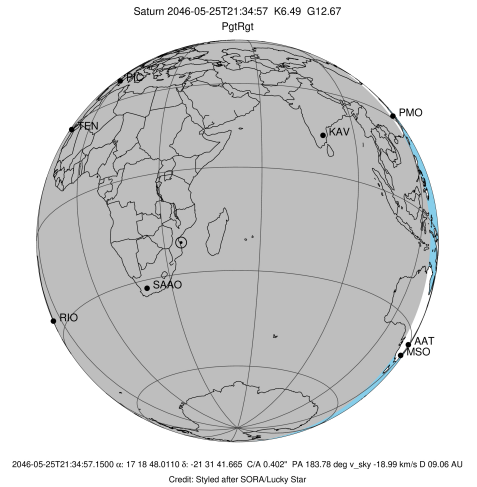
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEncode
PIC	Pic du Midi	42.9	0.1		+	+	MAY 25 22:30 - MAY 25 23:38	PneRne
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+	+		MAY 25 19:29 - MAY 25 20:38	PinRin
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		+		MAY 25 22:31 - MAY 25 23:40	PneRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+	+		MAY 25 19:32 - MAY 25 23:33	PieRie
RIO	Rio de Janeiro	-22.9	316.8		+		MAY 25 22:32 - MAY 25 23:42	PneRne
ESO	European South	-29.3	289.3				MAY 25 23:26 - MAY 25 23:42	PnnRne
AAT	Siding Spring	-31.3	149.1	+	+		MAY 25 19:27 - MAY 25 20:24	PnnRin
SAAO	So. Afr. Astro	-32.4	20.8	+	+		MAY 25 19:35 - MAY 25 23:38	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+		MAY 25 19:27 - MAY 25 20:25	PnnRin



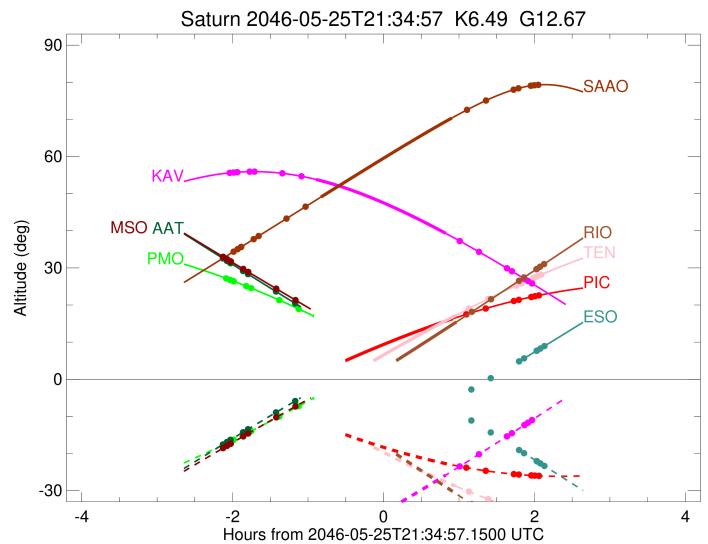
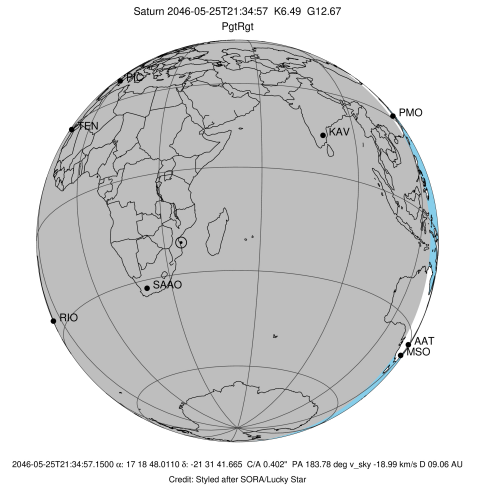
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:38:24.950
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 54.25
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.139
 C/A sky separation (km) : 7484.6
 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	2046-05-25T19:36:21.652	-9.29x	-2.60x	140461.00	-18.89			
A (OER)	I	2046-05-25T19:39:36.799	-8.73x	-3.10x	136774.40	-18.89			
Encke (OEG)	I	2046-05-25T19:42:17.186	-8.28x	-3.51x	133744.89	-18.89			
Encke (IEG)	I	2046-05-25T19:42:34.212	-8.23x	-3.56x	133423.31	-18.89			
A (IER)	I	2046-05-25T19:52:36.575	-6.52x	-5.08	122050.38	-18.87			
B (OER)	I	2046-05-25T19:56:33.965	-5.86x	-5.67	117571.16	-18.86			
B (IER)	I	2046-05-25T20:19:13.088	-2.11x	-8.96	91984.69	-18.77			
C (IER)	I	2046-05-25T20:34:48.334	0.40x	-11.10	74490.58	-18.62			
Saturn	I	2046-05-25T20:46:24.277	2.22x	-12.63	60255.30			5.38	6.60
Saturn	E	2046-05-25T22:30:14.241	16.33	-23.13	60244.31			7.35	9.01
C (IER)	E	2046-05-25T22:40:44.842	17.48	-23.81	74490.58	18.77			
B (IER)	E	2046-05-25T22:56:11.650	19.06	-24.66	91984.69	18.96			
B (OER)	E	2046-05-25T23:18:35.340	21.08	-25.55	117571.16	19.11			
A (IER)	E	2046-05-25T23:22:29.660	21.40	-25.67	122050.38	19.12			
Encke (IEG)	E	2046-05-25T23:32:23.740	22.16	-25.90	133423.31	19.16			
Encke (OEG)	E	2046-05-25T23:32:40.522	22.18	-25.91	133744.89	19.16			
A (OER)	E	2046-05-25T23:35:18.581	22.37	-25.96	136774.40	19.17			
F ring	E	2046-05-25T23:38:30.831	22.59	-26.01	140461.00	19.18			

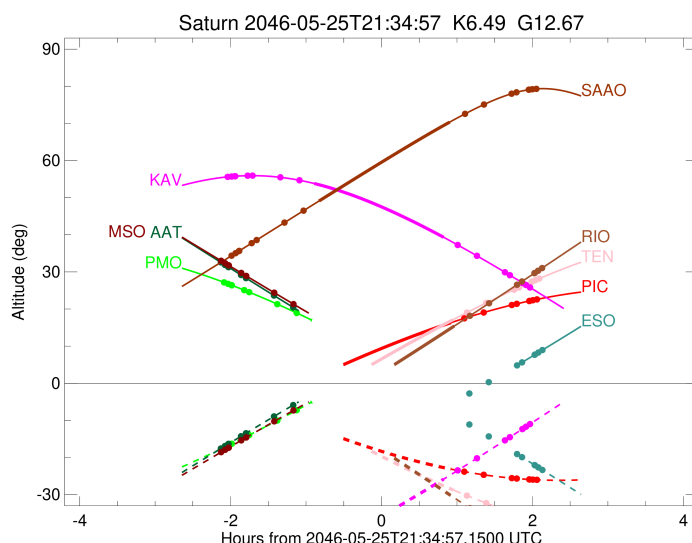
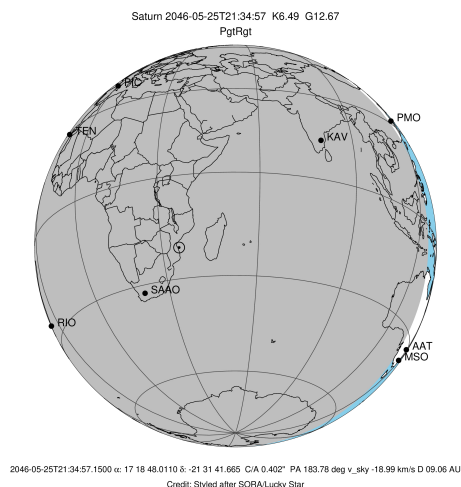
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:30:54.900
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 53.49
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.052
 C/A sky separation (km) : 6907.6
 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	2046-05-25T19:29:48.780		27.18	-17.29	140461.00	-19.18		
A (OER)	I	2046-05-25T19:33:00.987		26.77	-16.77	136774.40	-19.18		
Encke (OEG)	I	2046-05-25T19:35:39.008		26.43	-16.33	133744.89	-19.17		
Encke (IEG)	I	2046-05-25T19:35:55.785		26.40	-16.29	133423.31	-19.17		
A (IER)	I	2046-05-25T19:45:49.678		25.08	-14.62	122050.38	-19.13		
B (OER)	I	2046-05-25T19:49:43.900		24.55	-13.96	117571.16	-19.12		
B (IER)	I	2046-05-25T20:12:06.566		21.31	-10.04	91984.69	-18.98		
C (IER)	I	2046-05-25T20:27:31.764		18.94	-7.25	74490.58	-18.82		
Saturn	I	2046-05-25T20:38:57.427		17.10	-5.14	60254.76		5.49	6.74
Saturn	E	2046-05-25T22:23:04.315		-1.64x	15.31x	60250.92		6.24	7.65
C (IER)	E	2046-05-25T22:34:14.305		-3.82x	17.60x	74490.58	18.64		
B (IER)	E	2046-05-25T22:49:49.222		-6.89x	20.82x	91984.69	18.77		
B (OER)	E	2046-05-25T23:12:29.599		-11.43x	25.54x	117571.16	18.84		
A (IER)	E	2046-05-25T23:16:27.339		-12.23x	26.37x	122050.38	18.84		
Encke (IEG)	E	2046-05-25T23:26:30.708		-14.28x	28.48x	133423.31	18.85		
Encke (OEG)	E	2046-05-25T23:26:47.765		-14.33x	28.54x	133744.89	18.85		
A (OER)	E	2046-05-25T23:29:28.446		-14.88x	29.10x	136774.40	18.85		
F ring	E	2046-05-25T23:32:43.964		-15.55x	29.78x	140461.00	18.86		

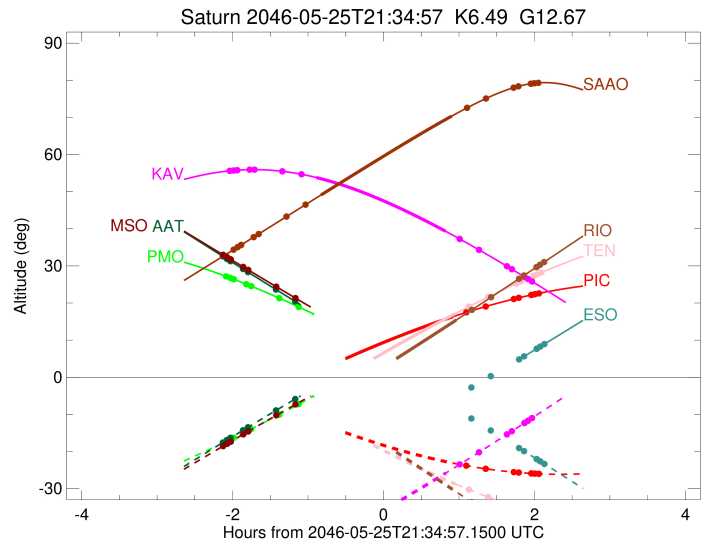
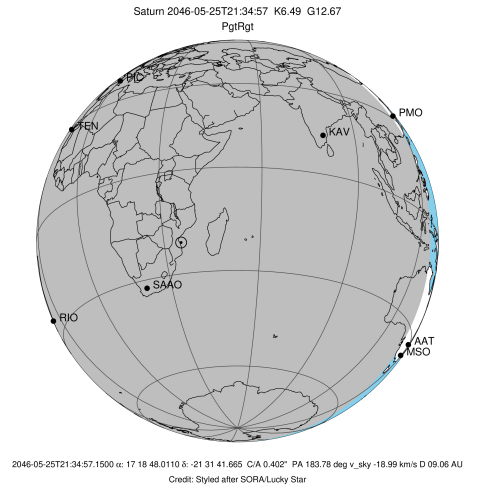
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:39:40.780
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 54.34
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.894
 C/A sky separation (km) : 5872.5
 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	2046-05-25T19:36:49.703	-17.65x	2.77x	140461.00	-18.84			
A (OER)	I	2046-05-25T19:40:05.383	-16.96x	2.11x	136774.40	-18.84			
Encke (OEG)	I	2046-05-25T19:42:46.176	-16.39x	1.57x	133744.89	-18.84			
Encke (IEG)	I	2046-05-25T19:43:03.243	-16.33x	1.51x	133423.31	-18.84			
A (IER)	I	2046-05-25T19:53:06.837	-14.19x	-0.52x	122050.38	-18.84			
B (OER)	I	2046-05-25T19:57:04.574	-13.36x	-1.31x	117571.16	-18.84			
B (IER)	I	2046-05-25T20:19:43.591	-8.62x	-5.79	91984.69	-18.80			
C (IER)	I	2046-05-25T20:35:15.547	-5.40x	-8.79	74490.58	-18.73			
Saturn	I	2046-05-25T20:47:18.522	-2.94x	-11.08	60261.30			3.90	4.79
Saturn	E	2046-05-25T22:31:47.437	17.11	-28.71	60251.75			6.08	7.46
C (IER)	E	2046-05-25T22:42:51.005	19.04	-30.26	74490.58	18.94			
B (IER)	E	2046-05-25T22:58:11.108	21.64	-32.27	91984.69	19.07			
B (OER)	E	2046-05-25T23:20:28.471	25.22	-34.89	117571.16	19.18			
A (IER)	E	2046-05-25T23:24:21.901	25.82	-35.30	122050.38	19.20			
Encke (IEG)	E	2046-05-25T23:34:13.885	27.30	-36.29	133423.31	19.23			
Encke (OEG)	E	2046-05-25T23:34:30.611	27.34	-36.32	133744.89	19.23			
A (OER)	E	2046-05-25T23:37:08.142	27.73	-36.57	136774.40	19.23			
F ring	E	2046-05-25T23:40:19.763	28.19	-36.86	140461.00	19.24			

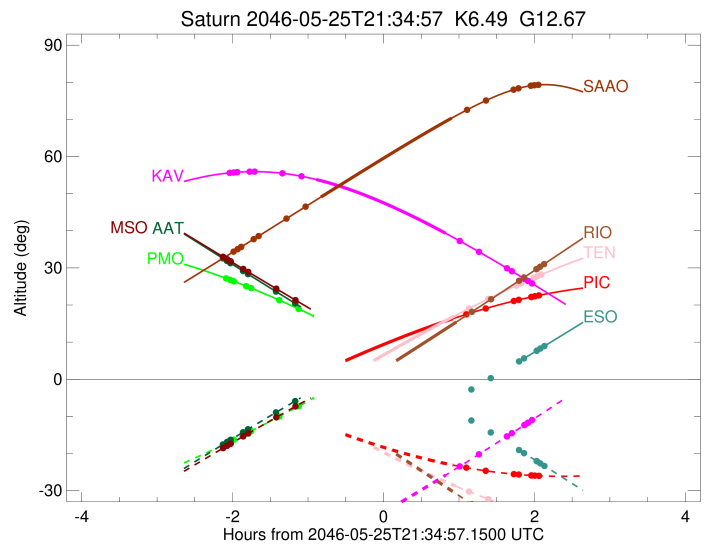
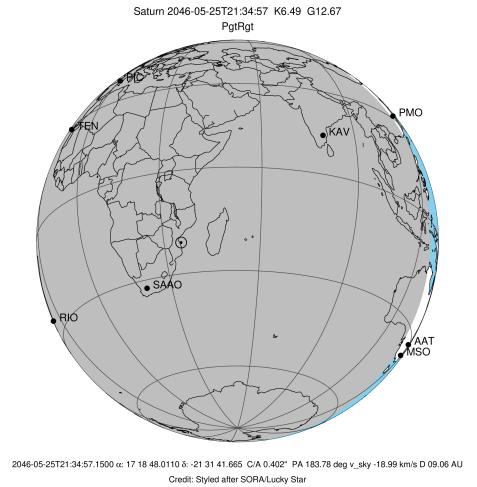
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:32:48.840
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 54.13
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.936
 C/A sky separation (km) : 6147.7
 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	2046-05-25T19:32:39.117		55.60	-54.16	140461.00	-19.33		
A (OER)	I	2046-05-25T19:35:49.820		55.70	-53.88	136774.40	-19.33		
Encke (OEG)	I	2046-05-25T19:38:26.567		55.77	-53.64	133744.89	-19.33		
Encke (IEG)	I	2046-05-25T19:38:43.207		55.78	-53.61	133423.31	-19.32		
A (IER)	I	2046-05-25T19:48:31.994		55.92	-52.61	122050.38	-19.31		
B (OER)	I	2046-05-25T19:52:24.064		55.93	-52.19	117571.16	-19.30		
B (IER)	I	2046-05-25T20:14:32.658		55.48	-49.40	91984.69	-19.21		
C (IER)	I	2046-05-25T20:29:45.966		54.68	-47.18	74490.58	-19.09		
Saturn	I	2046-05-25T20:41:21.667		53.82	-45.36	60258.62		4.62	5.67
Saturn	E	2046-05-25T22:24:21.508		39.32	-25.83	60253.41		5.77	7.07
C (IER)	E	2046-05-25T22:35:31.710		37.26	-23.48	74490.58	19.00		
B (IER)	E	2046-05-25T22:50:49.817		34.33	-20.21	91984.69	19.10		
B (OER)	E	2046-05-25T23:13:07.157		29.90	-15.38	117571.16	19.16		
A (IER)	E	2046-05-25T23:17:00.965		29.11	-14.53	122050.38	19.16		
Encke (IEG)	E	2046-05-25T23:26:54.435		27.08	-12.35	133423.31	19.17		
Encke (OEG)	E	2046-05-25T23:27:11.213		27.03	-12.29	133744.89	19.17		
A (OER)	E	2046-05-25T23:29:49.275		26.48	-11.71	136774.40	19.17		
F ring	E	2046-05-25T23:33:01.614		25.81	-11.00	140461.00	19.17		

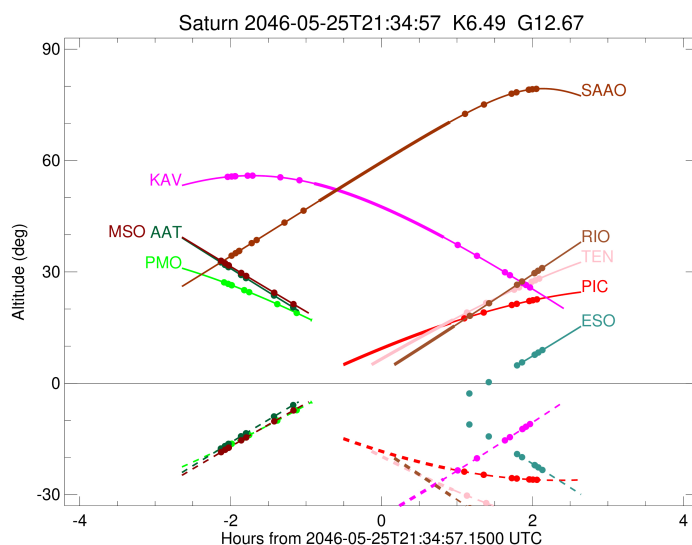
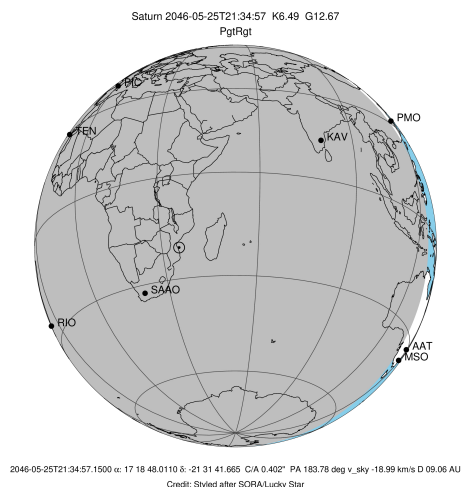
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:39:57.080
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 54.30
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.031
 C/A sky separation (km) : 201.1
 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	2046-05-25T19:35:45.915	-21.29x	7.71x	140461.00	-18.73			
A (OER)	I	2046-05-25T19:39:02.699	-20.67x	7.03x	136774.40	-18.74			
Encke (OEG)	I	2046-05-25T19:41:44.367	-20.17x	6.47x	133744.89	-18.74			
Encke (IEG)	I	2046-05-25T19:42:01.526	-20.11x	6.41x	133423.31	-18.74			
A (IER)	I	2046-05-25T19:52:08.084	-18.19x	4.31x	122050.38	-18.76			
B (OER)	I	2046-05-25T19:56:06.829	-17.42x	3.48x	117571.16	-18.76			
B (IER)	I	2046-05-25T20:18:48.983	-12.96x	-1.32x	91984.69	-18.80			
C (IER)	I	2046-05-25T20:34:18.742	-9.84x	-4.64x	74490.58	-18.83			
Saturn	I	2046-05-25T20:46:47.248	-7.29x	-7.34	60267.30	-1.26		-1.55	
Saturn	E	2046-05-25T22:32:49.536	15.42	-30.86	60267.60	0.95		1.17	
C (IER)	E	2046-05-25T22:45:11.454	18.16	-33.66	74490.58	19.08			
B (IER)	E	2046-05-25T23:00:27.363	21.55	-37.12	91984.69	19.12			
B (OER)	E	2046-05-25T23:22:44.270	26.54	-42.19	117571.16	19.16			
A (IER)	E	2046-05-25T23:26:38.000	27.42	-43.08	122050.38	19.17			
Encke (IEG)	E	2046-05-25T23:36:31.047	29.65	-45.33	133423.31	19.19			
Encke (OEG)	E	2046-05-25T23:36:47.808	29.71	-45.40	133744.89	19.19			
A (OER)	E	2046-05-25T23:39:25.683	30.30	-46.00	136774.40	19.19			
F ring	E	2046-05-25T23:42:37.748	31.03	-46.73	140461.00	19.20			

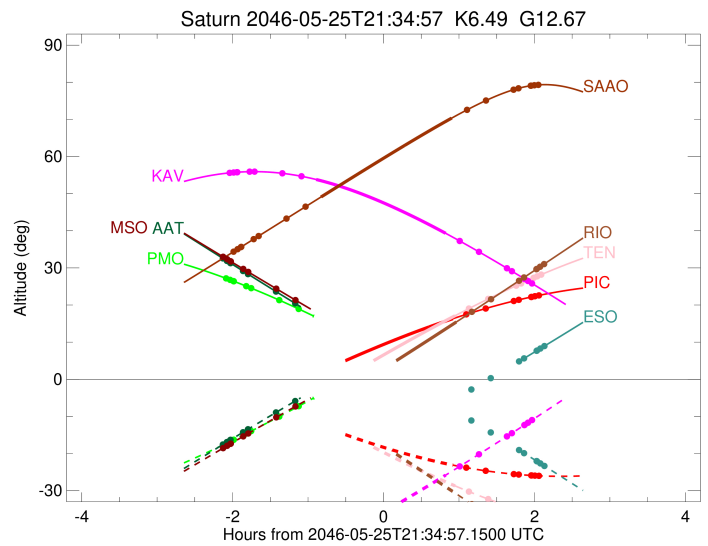
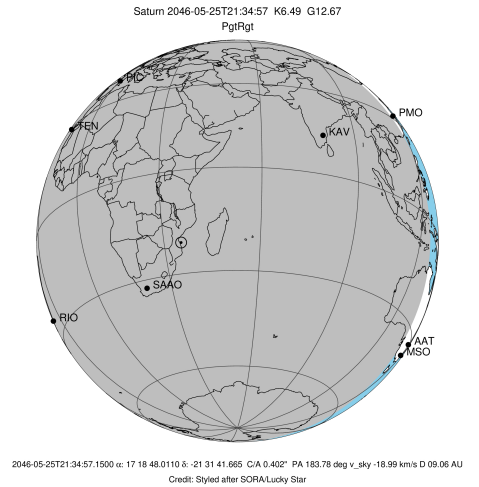
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:38:51.090
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 53.96
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.248
 C/A sky separation (km) : 1631.8
 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	2046-05-25T19:33:46.626	-33.52x	24.62x	140461.00	-18.61			
A (OER)	I	2046-05-25T19:37:04.722	-33.16x	24.11x	136774.40	-18.61			
Encke (OEG)	I	2046-05-25T19:39:47.490	-32.86x	23.69x	133744.89	-18.61			
Encke (IEG)	I	2046-05-25T19:40:04.766	-32.83x	23.64x	133423.31	-18.61			
A (IER)	I	2046-05-25T19:50:15.633	-31.65x	22.01x	122050.38	-18.62			
B (OER)	I	2046-05-25T19:54:16.150	-31.16x	21.36x	117571.16	-18.62			
B (IER)	I	2046-05-25T20:17:09.269	-28.17x	17.49x	91984.69	-18.64			
C (IER)	I	2046-05-25T20:32:47.437	-25.93x	14.73x	74490.58	-18.65			
Saturn	I	2046-05-25T20:45:13.635	-24.05x	12.47x	60265.56	-2.36		-2.89	
Saturn	E	2046-05-25T22:32:14.332	-5.20x	-8.51	60267.94	-0.36		-0.44	
C (IER)	E	2046-05-25T22:44:47.233	-2.76x	-11.10	74490.58	18.86			
B (IER)	E	2046-05-25T23:00:13.784	0.29x	-14.32	91984.69	18.90			
B (OER)	E	2046-05-25T23:22:45.756	4.82x	-19.07	117571.16	18.95			
A (IER)	E	2046-05-25T23:26:42.076	5.62	-19.91	122050.38	18.96			
Encke (IEG)	E	2046-05-25T23:36:41.644	7.67	-22.03	133423.31	18.98			
Encke (OEG)	E	2046-05-25T23:36:58.588	7.73	-22.09	133744.89	18.98			
A (OER)	E	2046-05-25T23:39:38.186	8.27	-22.66	136774.40	18.98			
F ring	E	2046-05-25T23:42:52.338	8.94	-23.35	140461.00	18.99			

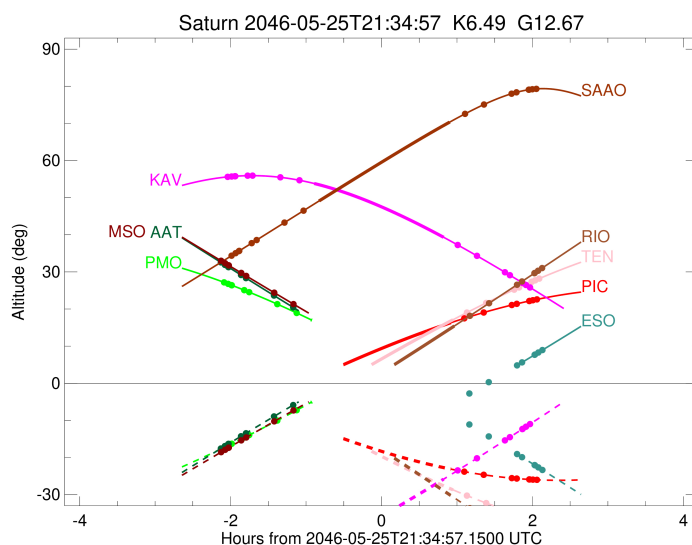
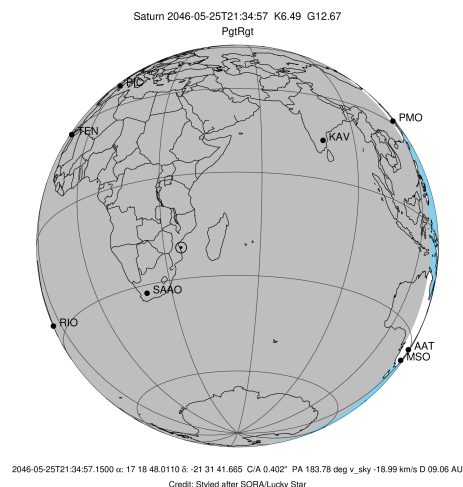
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:30:00.850
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 53.38
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.039
 C/A sky separation (km) : 254.8
 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	2046-05-25T19:27:15.755		32.57	-17.58	140461.00	-19.16		
A (OER)	I	2046-05-25T19:30:28.190		31.89	-16.91	136774.40	-19.16		
Encke (OEG)	I	2046-05-25T19:33:06.362		31.33	-16.37	133744.89	-19.15		
Encke (IEG)	I	2046-05-25T19:33:23.154		31.27	-16.31	133423.31	-19.15		
A (IER)	I	2046-05-25T19:43:17.251		29.16	-14.27	122050.38	-19.14		
B (OER)	I	2046-05-25T19:47:11.366		28.34	-13.47	117571.16	-19.13		
B (IER)	I	2046-05-25T20:09:30.182		23.63	-8.93	91984.69	-19.09		
C (IER)	I	2046-05-25T20:24:47.102		20.43	-5.86	74490.58	-19.07		
Saturn	I	2046-05-25T20:37:10.434		17.85	-3.40x	60267.88		-0.52	-0.64
Saturn	E	2046-05-25T22:23:05.722		-3.32x	16.19x	60268.00		0.08	0.10
C (IER)	E	2046-05-25T22:35:38.098		-5.69x	18.28x	74490.58	18.85		
B (IER)	E	2046-05-25T22:51:06.462		-8.55x	20.77x	91984.69	18.83		
B (OER)	E	2046-05-25T23:13:46.119		-12.61x	24.20x	117571.17	18.80		
A (IER)	E	2046-05-25T23:17:44.371		-13.30x	24.77x	122050.38	18.80		
Encke (IEG)	E	2046-05-25T23:27:49.605		-15.04x	26.19x	133423.31	18.78		
Encke (OEG)	E	2046-05-25T23:28:06.725		-15.09x	26.23x	133744.89	18.78		
A (OER)	E	2046-05-25T23:30:48.022		-15.55x	26.60x	136774.40	18.78		
F ring	E	2046-05-25T23:34:04.345		-16.10x	27.04x	140461.00	18.78		

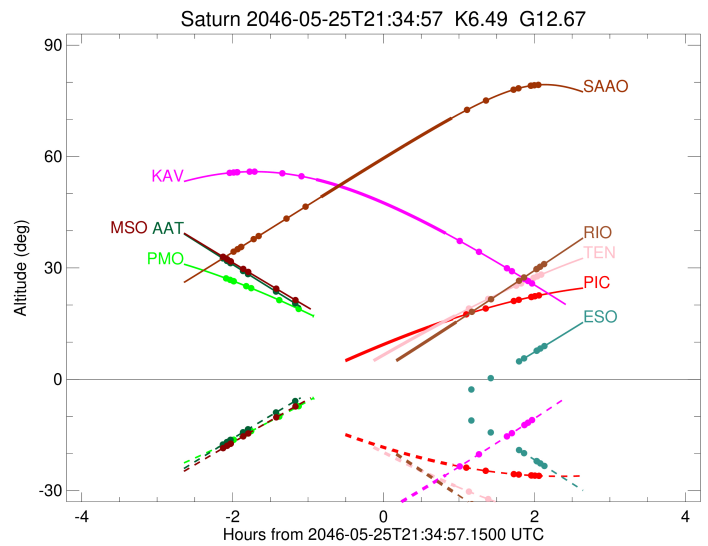
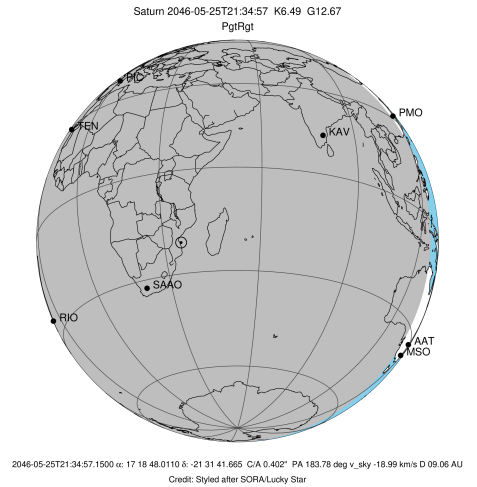
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:37:20.630
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 54.66
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.152
 C/A sky separation (km) : 998.8
 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	2046-05-25T19:35:45.657		34.37	-49.02	140461.00	-19.17		
A (OER)	I	2046-05-25T19:38:57.970		35.05	-49.70	136774.40	-19.17		
Encke (OEG)	I	2046-05-25T19:41:35.970		35.60	-50.25	133744.89	-19.18		
Encke (IEG)	I	2046-05-25T19:41:52.739		35.66	-50.31	133423.31	-19.18		
A (IER)	I	2046-05-25T19:51:45.575		37.75	-52.39	122050.38	-19.19		
B (OER)	I	2046-05-25T19:55:38.941		38.58	-53.21	117571.16	-19.20		
B (IER)	I	2046-05-25T20:17:50.773		43.28	-57.84	91984.69	-19.23		
C (IER)	I	2046-05-25T20:33:00.336		46.50	-60.96	74490.58	-19.24		
Saturn	I	2046-05-25T20:45:16.917		49.10	-63.45	60267.99		-0.13	-0.16
Saturn	E	2046-05-25T22:29:15.680		70.37	-78.86	60266.63		1.76	2.17
C (IER)	E	2046-05-25T22:41:21.266		72.57	-78.77	74490.58	19.37		
B (IER)	E	2046-05-25T22:56:24.257		75.09	-77.81	91984.69	19.38		
B (OER)	E	2046-05-25T23:18:24.071		78.00	-75.10	117571.16	19.39		
A (IER)	E	2046-05-25T23:22:15.045		78.38	-74.51	122050.38	19.39		
Encke (IEG)	E	2046-05-25T23:32:01.426		79.07	-72.93	133423.31	19.40		
Encke (OEG)	E	2046-05-25T23:32:18.005		79.09	-72.88	133744.89	19.40		
A (OER)	E	2046-05-25T23:34:54.190		79.20	-72.44	136774.40	19.40		
F ring	E	2046-05-25T23:38:04.244		79.30	-71.88	140461.00	19.40		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T21:30:12.530
 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 : 4115099533179705856
 2Mass ID (if available) : 17184802-2131413
 ICRS Star Coord at Epoch: 17h 18m 48.01103s -21:31:41.66461s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 6.494
 G magnitude : 12.668
 RP magnitude : 11.252
 BP magnitude : 15.278
 DUPflag : 0
 Distance (au) : 9.057
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.99
 Sun-Target sep (deg) : 163.71
 Sun-Moon sep (deg) : 53.42
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.093
 C/A sky separation (km) : 609.9
 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	2046-05-25T19:27:26.958		32.99	-18.55	140461.00	-19.15		
A (OER)	I	2046-05-25T19:30:39.478		32.33	-17.91	136774.40	-19.15		
Encke (OEG)	I	2046-05-25T19:33:17.719		31.79	-17.39	133744.89	-19.14		
Encke (IEG)	I	2046-05-25T19:33:34.517		31.74	-17.33	133423.31	-19.14		
A (IER)	I	2046-05-25T19:43:28.861		29.72	-15.37	122050.38	-19.13		
B (OER)	I	2046-05-25T19:47:23.070		28.92	-14.61	117571.16	-19.12		
B (IER)	I	2046-05-25T20:09:42.375		24.40	-10.25	91984.69	-19.09		
C (IER)	I	2046-05-25T20:24:59.603		21.32	-7.31	74490.58	-19.06		
Saturn	I	2046-05-25T20:37:22.102		18.85	-4.96x	60267.68		-0.84	-1.03
Saturn	E	2046-05-25T22:23:16.725		-1.43x	13.69x	60267.98		-0.21	-0.25
C (IER)	E	2046-05-25T22:35:48.937		-3.69x	15.66x	74490.58	18.86		
B (IER)	E	2046-05-25T22:51:17.069		-6.41x	17.99x	91984.69	18.84		
B (OER)	E	2046-05-25T23:13:56.231		-10.26x	21.21x	117571.16	18.81		
A (IER)	E	2046-05-25T23:17:54.381		-10.92x	21.75x	122050.38	18.81		
Encke (IEG)	E	2046-05-25T23:27:59.335		-12.56x	23.07x	133423.31	18.79		
Encke (OEG)	E	2046-05-25T23:28:16.446		-12.61x	23.10x	133744.89	18.79		
A (OER)	E	2046-05-25T23:30:57.665		-13.04x	23.45x	136774.40	18.79		
F ring	E	2046-05-25T23:34:13.888		-13.56x	23.86x	140461.00	18.79		