

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:11:59.280
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351

Saturn 2047-05-07T03:11:59 K9.22 G13.39 PgtRgt

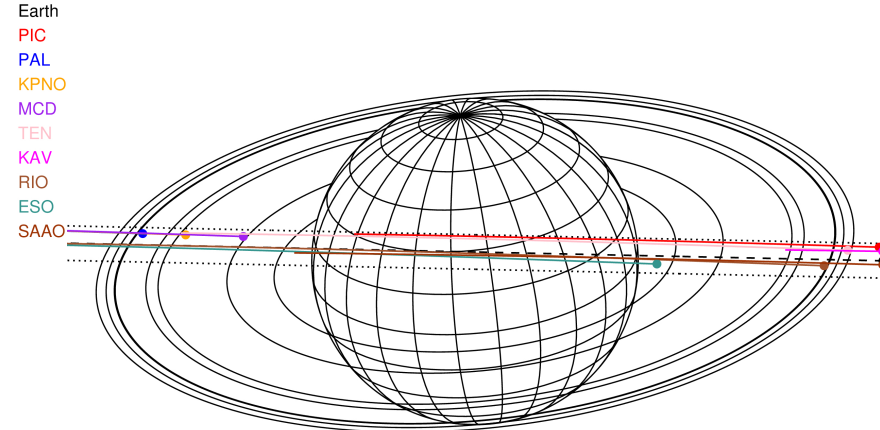
ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 85.23
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79

#	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

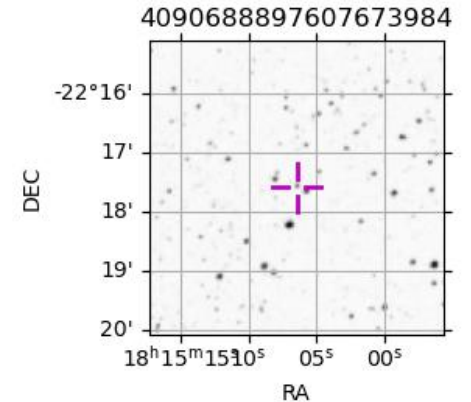


2047-05-07T03:11:59.2800 at: 18 15 06.5584 s: -22 17 35.187 C/A 0.518° PA 178.76 deg v_sky -10.48 km/s D 09.34 AU
 Credit: Styled after SORA/Lucky Star

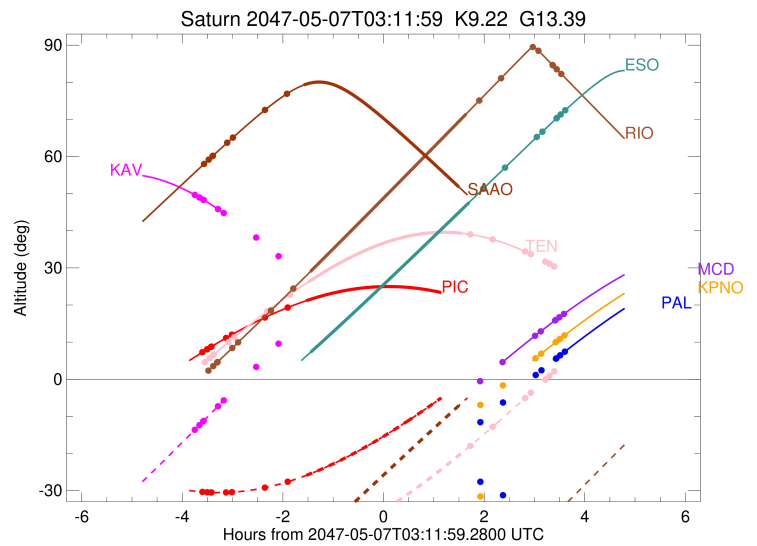
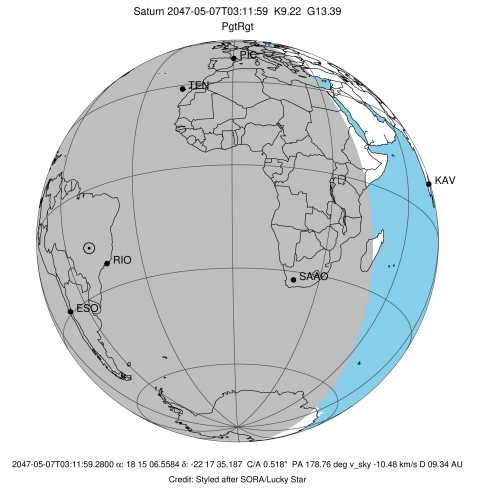


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ + + + + + + +	+		MAY 06 23:36 - MAY 07 01:39	PinRin
PAL	Palomar Mt (20	33.4	243.1			+ + + +	MAY 07 06:37 - MAY 07 06:48	PnnRne
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4			+ + + + + +	MAY 07 06:13 - MAY 07 06:47	PnnRne
MCD	McDonald Obs.	30.7	256.0			+ + + + + +	MAY 07 06:12 - MAY 07 06:47	PnnRne
TEN	Teide Obs./Ten	28.3	343.5	+ + + + + + + +	+ +	+ + +	MAY 06 23:44 - MAY 07 06:00	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+ + + + + +			MAY 06 23:26 - MAY 07 00:01	PnnRin
RIO	Rio de Janeiro	-22.9	316.8		+ +	+ + + + + + + +	MAY 07 00:11 - MAY 07 06:43	PieRie
ESO	European South	-29.3	289.3		+ +	+ + + + + + + +	MAY 07 01:45 - MAY 07 06:48	PieRne
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8	+ + + + + + + +	+ +		MAY 06 23:38 - MAY 07 04:42	PieRin
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn

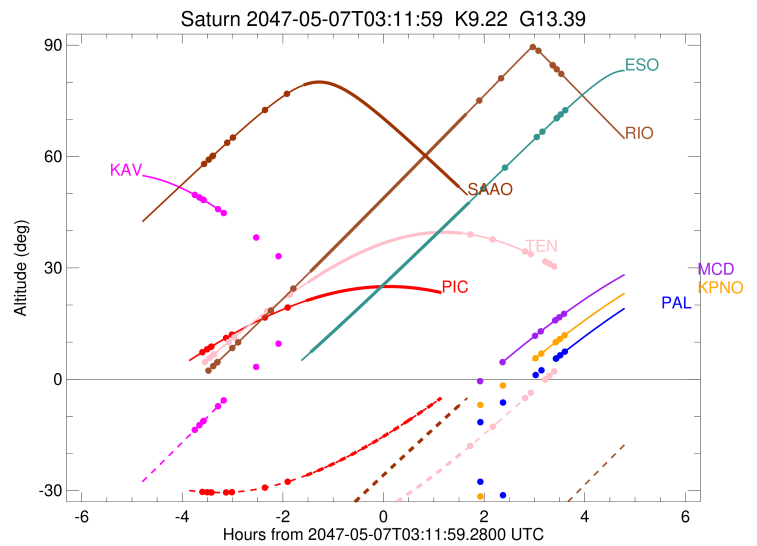
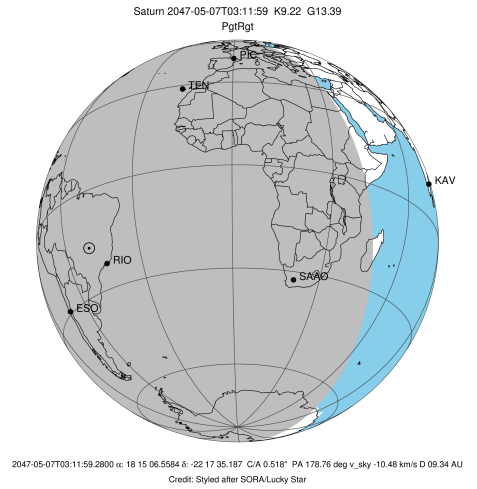


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:11:56.260
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 85.66
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.371
 C/A sky separation (km) : 9282.6
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-06T23:36:02.162		7.30	-30.35	140461.00	-10.86		
A (OER)	I	2047-05-06T23:41:41.601		8.09	-30.43	136774.40	-10.86		
Encke (OEG)	I	2047-05-06T23:46:20.531		8.74	-30.48	133744.89	-10.86		
Encke (IEG)	I	2047-05-06T23:46:50.139		8.80	-30.49	133423.31	-10.86		
A (IER)	I	2047-05-07T00:04:17.430		11.14	-30.49	122050.38	-10.86		
B (OER)	I	2047-05-07T00:11:10.108		12.02	-30.41	117571.16	-10.85		
B (IER)	I	2047-05-07T00:50:33.969		16.64	-29.20	91984.69	-10.78		
C (IER)	I	2047-05-07T01:17:45.063		19.32	-27.60	74490.58	-10.65		
Saturn	I	2047-05-07T01:39:57.900		21.17	-25.87	60266.95		1.57	1.93
Saturn	E	2047-05-07T04:43:33.948		22.02	-1.28x	60185.76		14.08	17.10
C (IER)	E	2047-05-07T04:52:24.258		21.39	0.21x	74490.58	10.66		
B (IER)	E	2047-05-07T05:19:33.285		19.14	4.87x	91984.69	10.80		
B (OER)	E	2047-05-07T05:58:52.522		15.08	11.84x	117571.16	10.88		
A (IER)	E	2047-05-07T06:05:44.188		14.28	13.08x	122050.38	10.88		
Encke (IEG)	E	2047-05-07T06:23:08.609		12.15	16.23x	133423.31	10.89		
Encke (OEG)	E	2047-05-07T06:23:38.129		12.09	16.32x	133744.89	10.89		
A (OER)	E	2047-05-07T06:28:16.215		11.50	17.16x	136774.40	10.89		
F ring	E	2047-05-07T06:33:54.583		10.76	18.19x	140461.00	10.90		

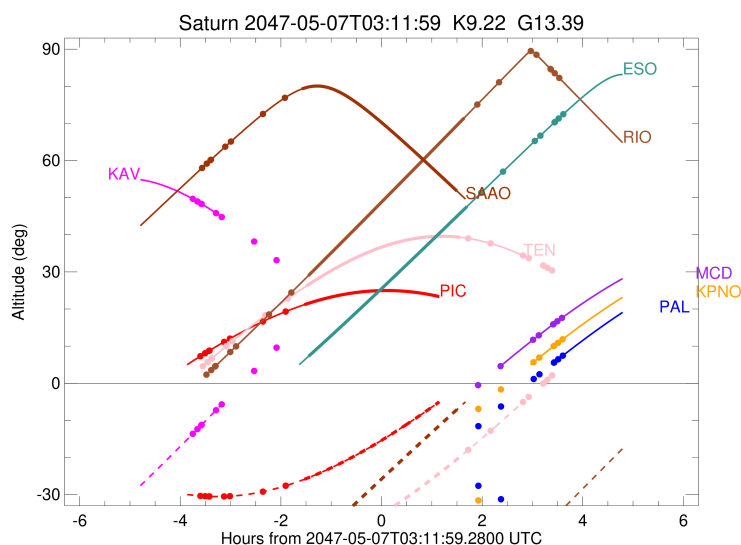
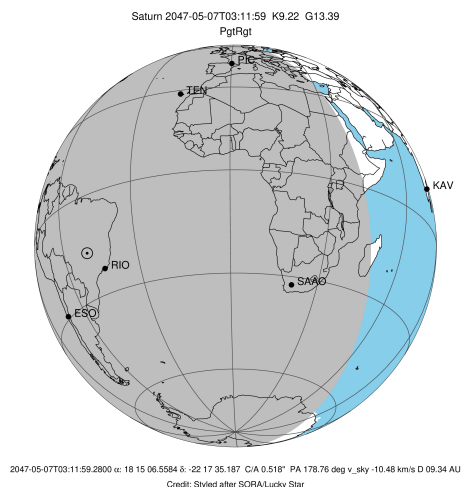
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:19:21.000
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 84.59
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.879
 C/A sky separation (km) : 5956.6
 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	2047-05-06T23:32:33.530	-77.65x	36.33x	140461.00	-10.32			
A (OER)	I	2047-05-06T23:38:30.667	-76.99x	35.08x	136774.40	-10.32			
Encke (OEG)	I	2047-05-06T23:43:24.088	-76.36x	34.06x	133744.89	-10.33			
Encke (IEG)	I	2047-05-06T23:43:55.231	-76.30x	33.95x	133423.31	-10.33			
A (IER)	I	2047-05-07T00:02:16.235	-73.52x	30.11x	122050.38	-10.33			
B (OER)	I	2047-05-07T00:09:29.657	-72.29x	28.60x	117571.16	-10.34			
B (IER)	I	2047-05-07T00:50:43.961	-64.51x	20.01x	91984.69	-10.34			
C (IER)	I	2047-05-07T01:18:56.504	-58.79x	14.19x	74490.58	-10.32			
Saturn	I	2047-05-07T01:41:37.739	-54.10x	9.55x	60266.63	-1.80		-2.21	
Saturn	E	2047-05-07T04:55:22.663	-13.97x	-25.85	60207.05	12.08		14.73	
C (IER)	E	2047-05-07T05:07:25.415	-11.57x	-27.60	74490.58	10.74			
B (IER)	E	2047-05-07T05:34:25.385	-6.27x	-31.23	91984.69	10.85			
B (OER)	E	2047-05-07T06:13:29.957	1.15x	-35.55	117571.16	10.97			
A (IER)	E	2047-05-07T06:20:18.028	2.40x	-36.17	122050.38	10.98			
Encke (IEG)	E	2047-05-07T06:37:31.431	5.53	-37.55	133423.31	11.03			
Encke (OEG)	E	2047-05-07T06:38:00.598	5.62	-37.59	133744.89	11.03			
A (OER)	E	2047-05-07T06:42:35.233	6.44	-37.90	136774.40	11.04			
F ring	E	2047-05-07T06:48:09.105	7.42	-38.26	140461.00	11.05			

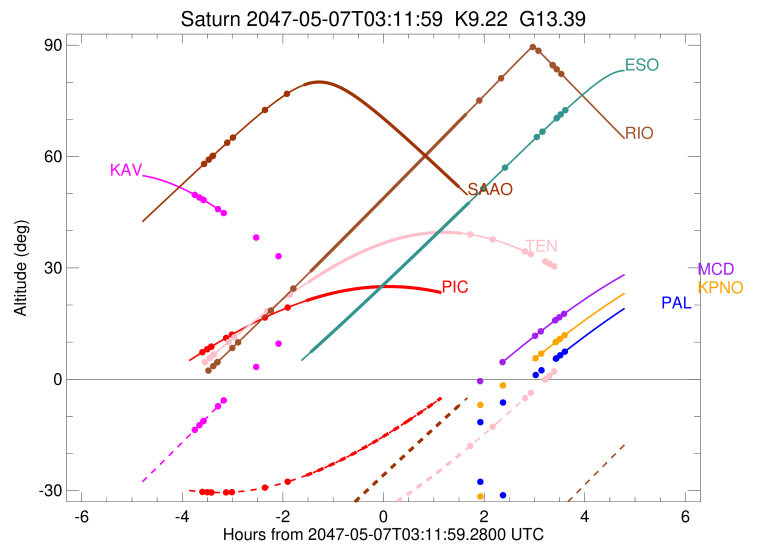
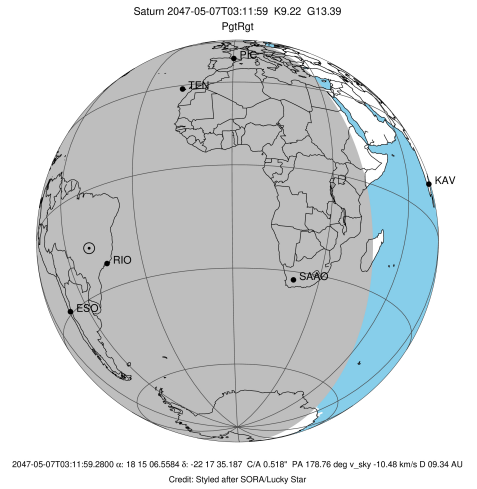
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:19:47.250
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 84.65
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.887
 C/A sky separation (km) : 6005.8
 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	2047-05-06T23:33:27.116	-75.68x	31.73x	140461.00	-10.33			
A (OER)	I	2047-05-06T23:39:24.001	-74.66x	30.46x	136774.40	-10.33			
Encke (OEG)	I	2047-05-06T23:44:17.191	-73.80x	29.42x	133744.89	-10.33			
Encke (IEG)	I	2047-05-06T23:44:48.307	-73.70x	29.31x	133423.31	-10.33			
A (IER)	I	2047-05-07T00:03:08.243	-70.25x	25.43x	122050.38	-10.34			
B (OER)	I	2047-05-07T00:10:21.164	-68.83x	23.90x	117571.16	-10.35			
B (IER)	I	2047-05-07T00:51:31.803	-60.40x	15.24x	91984.69	-10.36			
C (IER)	I	2047-05-07T01:19:41.167	-54.46x	9.40x	74490.58	-10.34			
Saturn	I	2047-05-07T01:42:19.522	-49.65x	4.76x	60266.62			-1.80	-2.22
Saturn	E	2047-05-07T04:55:29.522	-9.29x	-29.93	60206.45			12.14	14.80
C (IER)	E	2047-05-07T05:07:24.460	-6.93x	-31.56	74490.58	10.77			
B (IER)	E	2047-05-07T05:34:19.451	-1.67x	-34.88	91984.69	10.89			
B (OER)	E	2047-05-07T06:13:16.992	5.66	-38.61	117571.16	11.00			
A (IER)	E	2047-05-07T06:20:03.881	6.90	-39.12	122050.38	11.02			
Encke (IEG)	E	2047-05-07T06:37:14.367	9.97	-40.18	133423.31	11.06			
Encke (OEG)	E	2047-05-07T06:37:43.453	10.05	-40.20	133744.89	11.06			
A (OER)	E	2047-05-07T06:42:17.334	10.85	-40.43	136774.40	11.07			
F ring	E	2047-05-07T06:47:50.302	11.82	-40.67	140461.00	11.08			

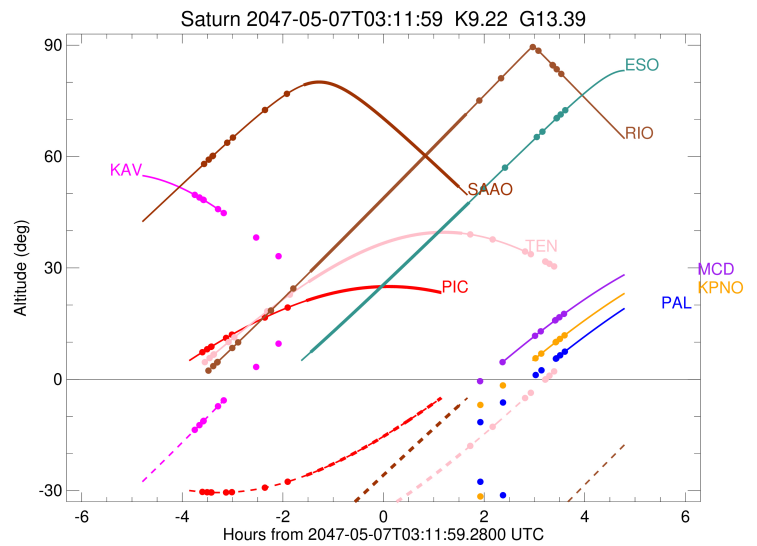
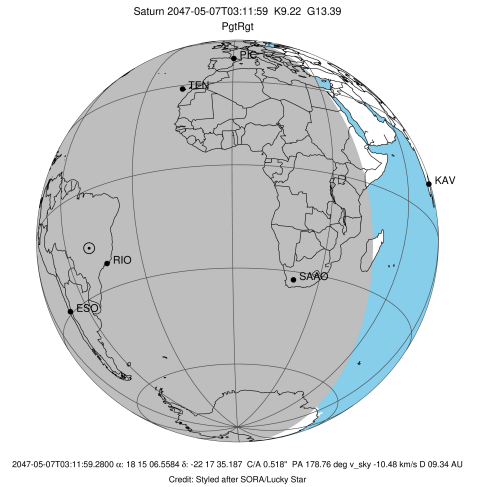
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:20:13.940
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 84.75
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.909
 C/A sky separation (km) : 6156.7
 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

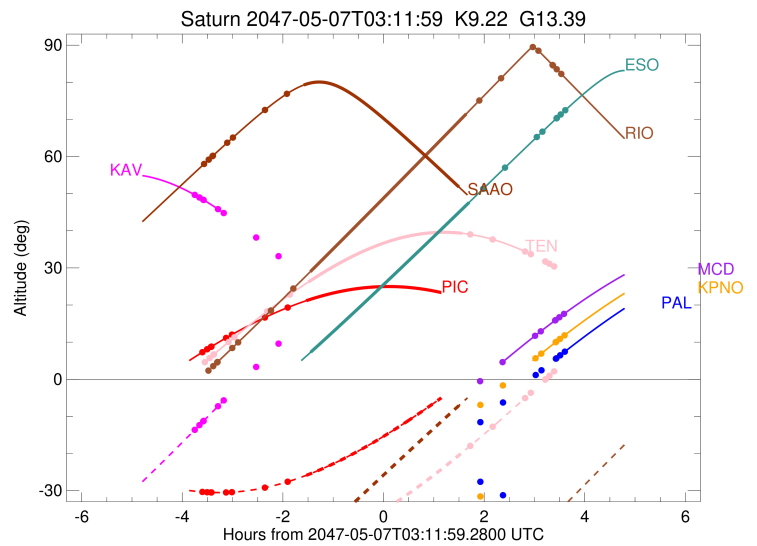
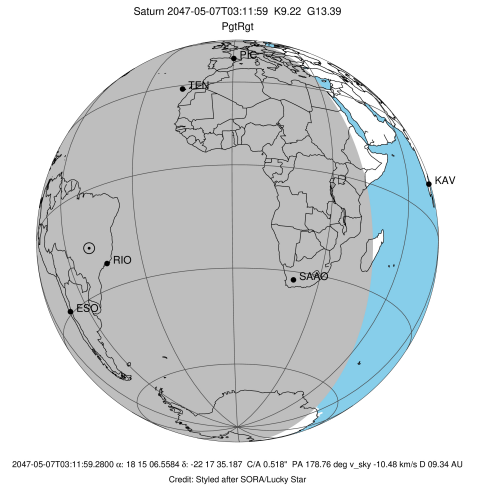
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-06T23:34:39.697	-70.39x	24.92x	140461.00	-10.35			
A (OER)	I	2047-05-06T23:40:35.931	-69.17x	23.65x	136774.40	-10.35			
Encke (OEG)	I	2047-05-06T23:45:28.555	-68.17x	22.61x	133744.89	-10.35			
Encke (IEG)	I	2047-05-06T23:45:59.611	-68.06x	22.49x	133423.31	-10.36			
A (IER)	I	2047-05-07T00:04:17.178	-64.23x	18.59x	122050.38	-10.37			
B (OER)	I	2047-05-07T00:11:29.071	-62.71x	17.06x	117571.16	-10.37			
B (IER)	I	2047-05-07T00:52:32.977	-53.90x	8.42x	91984.69	-10.39			
C (IER)	I	2047-05-07T01:20:37.166	-47.84x	2.62x	74490.58	-10.38			
Saturn	I	2047-05-07T01:43:12.644	-42.97x	-1.97x	60266.74			-1.72	-2.12
Saturn	E	2047-05-07T04:55:26.399	-2.82x	-34.94	60205.07			12.28	14.96
C (IER)	E	2047-05-07T05:07:05.836	-0.54x	-36.32	74490.58	10.81			
B (IER)	E	2047-05-07T05:33:54.686	4.60x	-39.05	91984.69	10.93			
B (OER)	E	2047-05-07T06:12:43.522	11.71	-41.73	117571.16	11.04			
A (IER)	E	2047-05-07T06:19:28.962	12.90	-42.02	122050.38	11.06			
Encke (IEG)	E	2047-05-07T06:36:35.898	15.84	-42.53	133423.31	11.09			
Encke (OEG)	E	2047-05-07T06:37:04.886	15.92	-42.54	133744.89	11.09			
A (OER)	E	2047-05-07T06:41:37.857	16.69	-42.61	136774.40	11.10			
F ring	E	2047-05-07T06:47:09.739	17.60	-42.66	140461.00	11.11			

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:14:25.290
 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 : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 85.82
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 1.235
 C/A sky separation (km) : 8365.1
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-06T23:38:57.816	4.62x	-40.79	140461.00	-10.85			
A (OER)	I	2047-05-06T23:44:37.643	5.72	-41.34	136774.40	-10.85			
Encke (OEG)	I	2047-05-06T23:49:16.792	6.62	-41.76	133744.89	-10.85			
Encke (IEG)	I	2047-05-06T23:49:46.418	6.71	-41.80	133423.31	-10.85			
A (IER)	I	2047-05-07T00:07:13.653	10.03	-43.18	122050.38	-10.86			
B (OER)	I	2047-05-07T00:14:05.922	11.31	-43.63	117571.16	-10.87			
B (IER)	I	2047-05-07T00:53:22.492	18.33	-45.07	91984.69	-10.84			
C (IER)	I	2047-05-07T01:20:22.122	22.81	-44.91	74490.58	-10.75			
Saturn	I	2047-05-07T01:42:28.556	26.22	-44.08	60267.86			0.57	0.70
Saturn	E	2047-05-07T04:45:39.491	39.32	-19.78	60192.65			13.46	16.37
C (IER)	E	2047-05-07T04:55:22.685	39.03	-17.97	74490.58	10.85			
B (IER)	E	2047-05-07T05:22:05.325	37.67	-12.82	91984.69	10.97			
B (OER)	E	2047-05-07T06:00:50.370	34.42	-5.05	117571.16	11.03			
A (IER)	E	2047-05-07T06:07:36.327	33.71	-3.67x	122050.38	11.04			
Encke (IEG)	E	2047-05-07T06:24:46.488	31.74	-0.11x	133423.31	11.04			
Encke (OEG)	E	2047-05-07T06:25:15.609	31.68	-0.01x	133744.89	11.04			
A (OER)	E	2047-05-07T06:29:49.947	31.12	0.94x	136774.40	11.04			
F ring	E	2047-05-07T06:35:23.779	30.41	2.11x	140461.00	11.04			

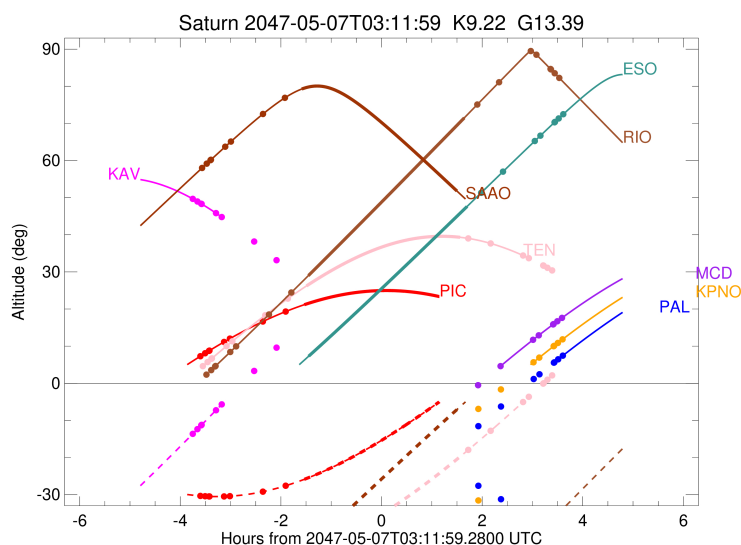
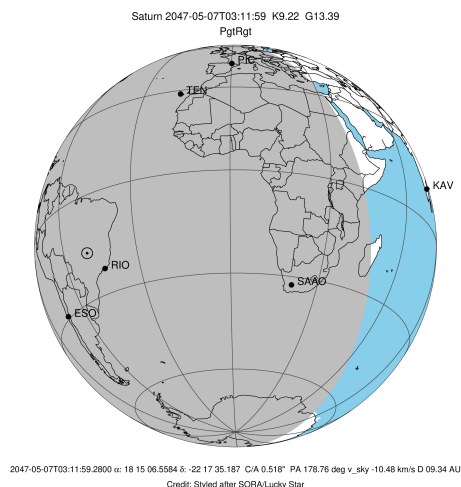
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:02:28.770
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 85.43
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.774
 C/A sky separation (km) : 5239.2
 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	2047-05-06T23:26:57.738		49.67	-13.61	140461.00	-11.09		
A (OER)	I	2047-05-06T23:32:30.299		48.96	-12.35	136774.40	-11.08		
Encke (OEG)	I	2047-05-06T23:37:03.734		48.35	-11.30	133744.89	-11.08		
Encke (IEG)	I	2047-05-06T23:37:32.767		48.29	-11.19	133423.31	-11.08		
A (IER)	I	2047-05-06T23:54:40.656		45.82	-7.25	122050.38	-11.05		
B (OER)	I	2047-05-07T00:01:26.134		44.78	-5.69	117571.16	-11.04		
B (IER)	I	2047-05-07T00:40:11.210		38.17	3.33x	91984.69	-10.96		
C (IER)	I	2047-05-07T01:06:52.786		33.14	9.61x	74490.58	-10.88		
Saturn	I	2047-05-07T01:28:37.135		28.83	14.74x	60267.53		-1.05	-1.29
Saturn	E	2047-05-07T04:37:39.047		-12.67x	59.84x	60226.68		9.92	12.13
C (IER)	E	2047-05-07T04:53:06.612		-16.22x	63.53x	74490.58	10.51		
B (IER)	E	2047-05-07T05:20:50.615		-22.62x	70.11x	91984.69	10.51		
B (OER)	E	2047-05-07T06:01:26.444		-32.03x	79.47x	117571.16	10.49		
A (IER)	E	2047-05-07T06:08:33.463		-33.68x	81.01x	122050.38	10.49		
Encke (IEG)	E	2047-05-07T06:26:38.629		-37.87x	84.43x	133423.31	10.47		
Encke (OEG)	E	2047-05-07T06:27:09.332		-37.99x	84.51x	133744.89	10.47		
A (OER)	E	2047-05-07T06:31:58.640		-39.11x	85.14x	136774.40	10.47		
F ring	E	2047-05-07T06:37:50.827		-40.47x	85.61x	140461.00	10.47		

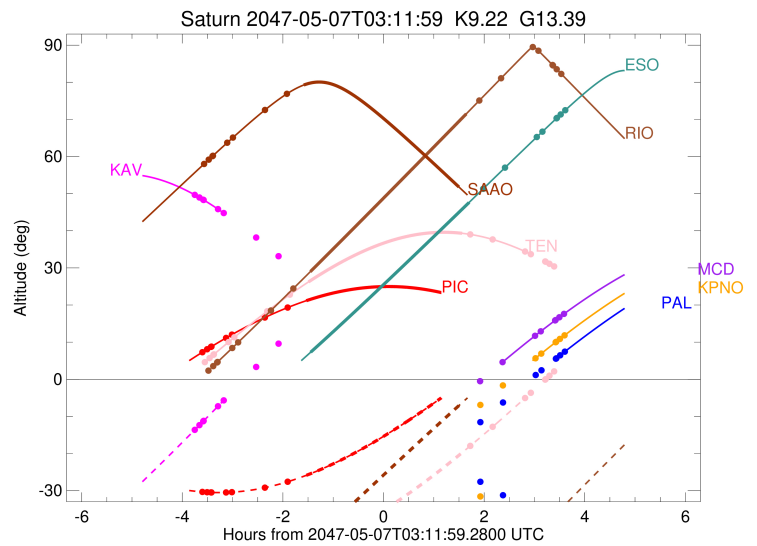
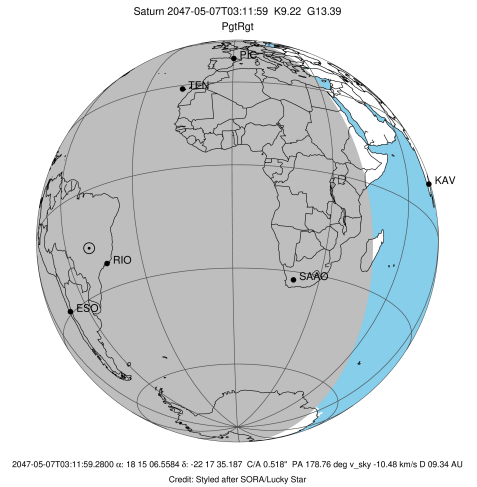
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:18:22.180
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 85.94
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.437
 C/A sky separation (km) : 2957.2
 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	2047-05-06T23:43:16.549	2.35x	-45.96	140461.00	-10.76			
A (OER)	I	2047-05-06T23:48:58.865	3.56x	-47.28	136774.40	-10.78			
Encke (OEG)	I	2047-05-06T23:53:39.891	4.56x	-48.36	133744.89	-10.78			
Encke (IEG)	I	2047-05-06T23:54:09.706	4.67x	-48.47	133423.31	-10.79			
A (IER)	I	2047-05-07T00:11:42.399	8.44	-52.52	122050.38	-10.82			
B (OER)	I	2047-05-07T00:18:36.075	9.94	-54.11	117571.16	-10.83			
B (IER)	I	2047-05-07T00:57:49.811	18.53	-63.11	91984.69	-10.90			
C (IER)	I	2047-05-07T01:24:31.271	24.46	-69.17	74490.58	-10.94			
Saturn	I	2047-05-07T01:44:44.018	28.99	-73.66	60259.93			-4.36	-5.36
Saturn	E	2047-05-07T04:50:45.497	71.51	-60.89	60232.69			9.16	11.21
C (IER)	E	2047-05-07T05:06:10.628	75.07	-57.35	74490.58	11.22			
B (IER)	E	2047-05-07T05:32:08.489	81.07	-51.38	91984.69	11.24			
B (OER)	E	2047-05-07T06:10:02.927	89.50	-42.64	117571.16	11.25			
A (IER)	E	2047-05-07T06:16:40.893	88.52	-41.11	122050.38	11.26			
Encke (IEG)	E	2047-05-07T06:33:31.345	84.68	-37.24	133423.31	11.25			
Encke (OEG)	E	2047-05-07T06:33:59.918	84.57	-37.13	133744.89	11.25			
A (OER)	E	2047-05-07T06:38:29.108	83.53	-36.10	136774.40	11.25			
F ring	E	2047-05-07T06:43:56.713	82.27	-34.85	140461.00	11.25			

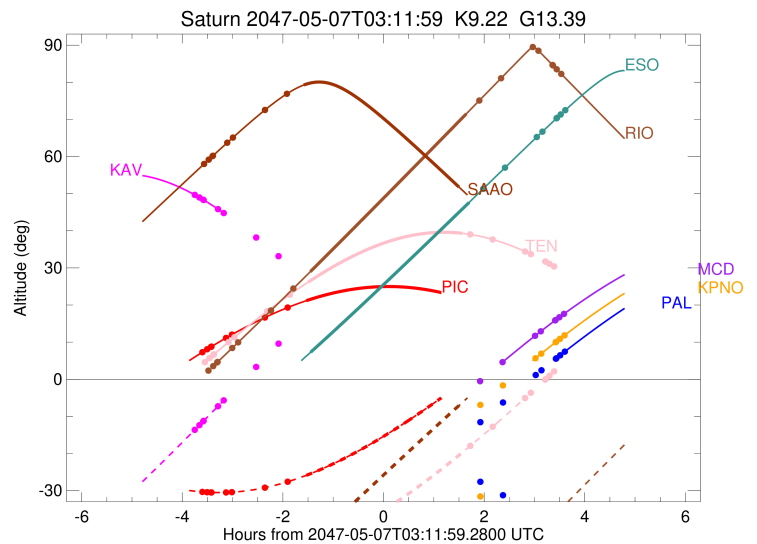
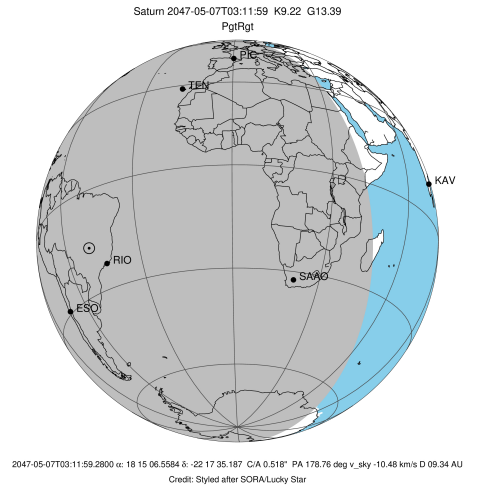
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:20:22.970
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 85.60
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.221
 C/A sky separation (km) : 1494.8
 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	2047-05-06T23:42:28.912		-16.11x	-21.55	140461.00	-10.57		
A (OER)	I	2047-05-06T23:48:17.408		-15.09x	-22.81	136774.40	-10.58		
Encke (OEG)	I	2047-05-06T23:53:03.513		-14.25x	-23.84	133744.89	-10.59		
Encke (IEG)	I	2047-05-06T23:53:33.867		-14.16x	-23.95	133423.31	-10.59		
A (IER)	I	2047-05-07T00:11:25.575		-10.95x	-27.84	122050.38	-10.63		
B (OER)	I	2047-05-07T00:18:26.692		-9.65x	-29.37	117571.16	-10.64		
B (IER)	I	2047-05-07T00:58:21.727		-2.05x	-38.09	91984.69	-10.72		
C (IER)	I	2047-05-07T01:25:29.277		3.32x	-44.01	74490.58	-10.77		
Saturn	I	2047-05-07T01:45:00.192		7.26	-48.25	60254.05		-5.74	-7.05
Saturn	E	2047-05-07T04:54:08.707		47.65	-77.24	60239.95		8.16	9.99
C (IER)	E	2047-05-07T05:10:46.064		51.29	-75.75	74490.58	11.17		
B (IER)	E	2047-05-07T05:36:49.441		56.99	-71.99	91984.69	11.21		
B (OER)	E	2047-05-07T06:14:48.593		65.26	-64.92	117571.16	11.24		
A (IER)	E	2047-05-07T06:21:26.872		66.69	-63.59	122050.38	11.25		
Encke (IEG)	E	2047-05-07T06:38:17.365		70.28	-60.13	133423.31	11.26		
Encke (OEG)	E	2047-05-07T06:38:45.923		70.38	-60.03	133744.89	11.26		
A (OER)	E	2047-05-07T06:43:14.930		71.32	-59.09	136774.40	11.26		
F ring	E	2047-05-07T06:48:42.202		72.46	-57.95	140461.00	11.27		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-07T03:09:19.540
 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 : 4090688897607673984
 2Mass ID (if available) : 18150656-2217351
 ICRS Star Coord at Epoch: 18h 15m 06.55837s -22:17:35.18653s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.216
 G magnitude : 13.394
 RP magnitude : 12.274
 BP magnitude : 14.698
 DUPflag : 0
 Distance (au) : 9.338
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.48
 Sun-Target sep (deg) : 132.36
 Sun-Moon sep (deg) : 86.20
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.333
 C/A sky separation (km) : 2256.1
 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	2047-05-06T23:38:04.627		58.02	-68.69	140461.00	-11.10		
A (OER)	I	2047-05-06T23:43:36.607		59.17	-67.81	136774.40	-11.11		
Encke (OEG)	I	2047-05-06T23:48:09.312		60.12	-67.06	133744.89	-11.11		
Encke (IEG)	I	2047-05-06T23:48:38.254		60.22	-66.98	133423.31	-11.11		
A (IER)	I	2047-05-07T00:05:41.215		63.74	-64.00	122050.38	-11.12		
B (OER)	I	2047-05-07T00:12:23.819		65.10	-62.77	117571.16	-11.13		
B (IER)	I	2047-05-07T00:50:41.434		72.55	-55.34	91984.69	-11.14		
C (IER)	I	2047-05-07T01:16:51.558		76.91	-50.00	74490.58	-11.14		
Saturn	I	2047-05-07T01:36:49.083		79.26	-45.86	60260.43		-4.23	-5.19
Saturn	E	2047-05-07T04:42:02.448		51.77	-7.07	60242.26		7.82	9.57
C (IER)	E	2047-05-07T04:59:14.383		48.13	-3.58x	74490.58	11.02		
B (IER)	E	2047-05-07T05:25:43.815		42.51	1.70x	91984.69	10.99		
B (OER)	E	2047-05-07T06:04:35.666		34.29	9.22x	117571.16	10.95		
A (IER)	E	2047-05-07T06:11:24.924		32.85	10.50x	122050.38	10.94		
Encke (IEG)	E	2047-05-07T06:28:45.570		29.21	13.71x	133423.31	10.92		
Encke (OEG)	E	2047-05-07T06:29:15.027		29.11	13.79x	133744.89	10.92		
A (OER)	E	2047-05-07T06:33:52.629		28.14	14.63x	136774.40	10.91		
F ring	E	2047-05-07T06:39:30.662		26.96	15.65x	140461.00	10.90		