

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:09:28.610
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283

Saturn 2047-05-06T23:09:28 K8.38 G12.85 PgtRgt

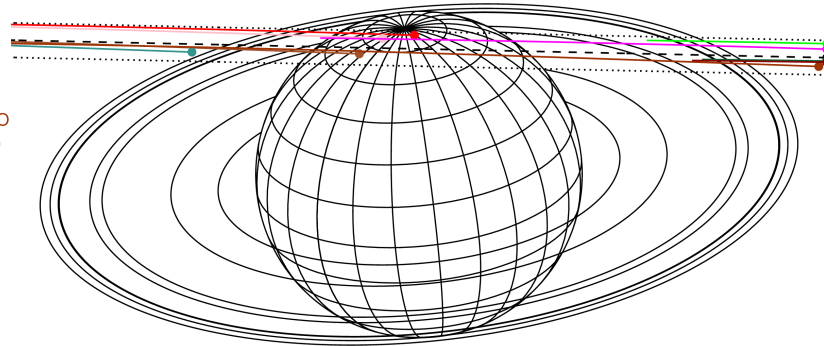
ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.340
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 87.74
 B (ring opening deg) : 26.08
 PA of pole (deg) : 5.79



2047-05-06T23:09:28.6100 at: 18 15 08.1646 s: -22 17 28.377 C/A 6.843° PA 178.77 deg v_sky -10.41 km/s D 09.34 AU
 Credit: Styled after SORA/Lucky Star

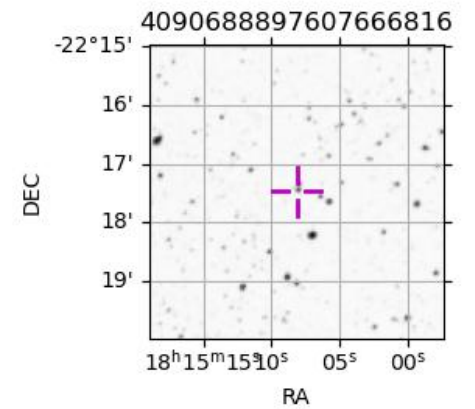
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



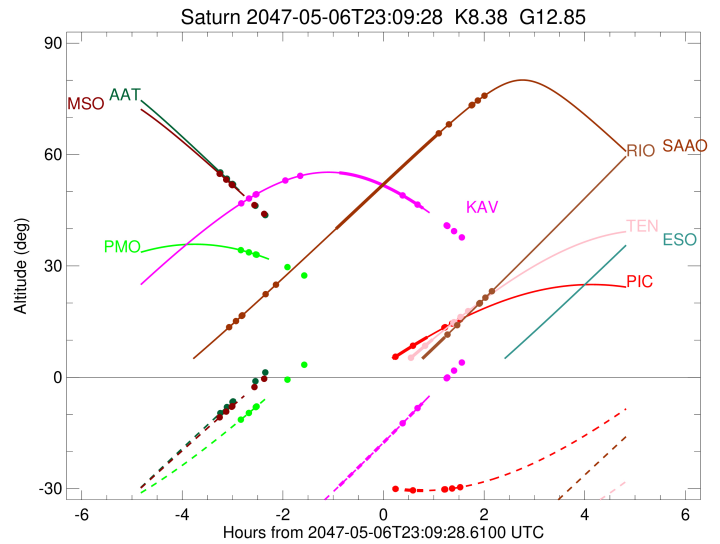
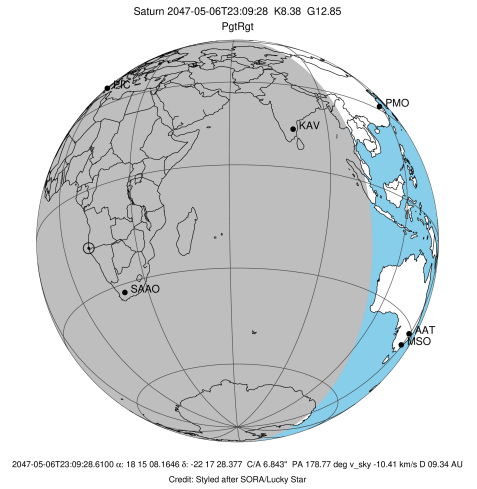
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEcode
PIC	Pic du Midi	42.9	0.1		+	+	MAY 07 00:01 - MAY 07 00:40	PneRne
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+			MAY 06 20:19 - MAY 06 20:37	PnnRin
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 07 00:08 - MAY 07 00:50	PneRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+	+		MAY 06 20:19 - MAY 06 23:56	PieRin
RIO	Rio de Janeiro	-22.9	316.8		+	+	MAY 07 00:22 - MAY 07 01:18	PneRne
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+			MAY 06 19:54 - MAY 06 20:09	PnnRin
SAAO	So. Afr. Astro	-32.4	20.8	+	+	+	MAY 06 20:05 - MAY 07 01:09	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0	+			MAY 06 19:53 - MAY 06 20:09	PnnRin



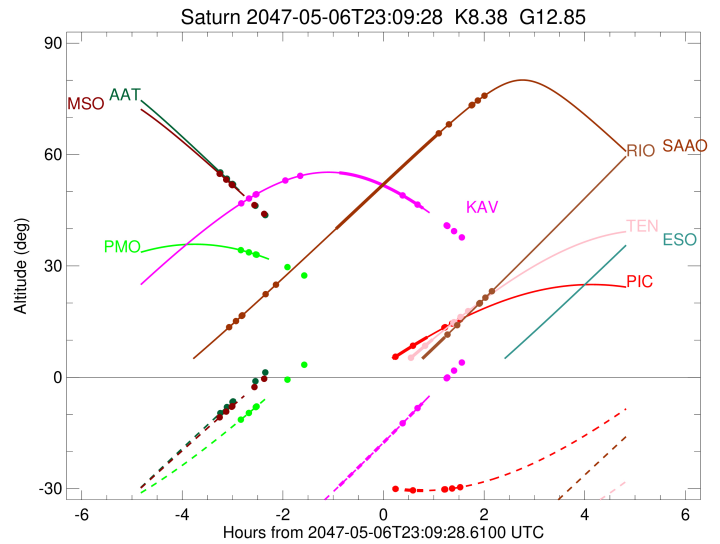
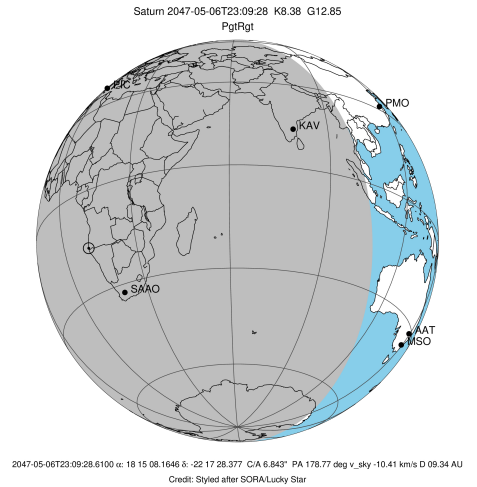
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:14:57.970
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.340
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 87.78
 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 (") : 7.578
 C/A sky separation (km) : 51334.6
 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	2047-05-06T20:23:19.246		-24.85x	-13.11	140461.00	-6.37		
A (OER)	I	2047-05-06T20:33:12.622		-23.06x	-14.52	136774.40	-6.05		
Encke (OEG)	I	2047-05-06T20:41:45.379		-21.51x	-15.70	133744.89	-5.76		
Encke (IEG)	I	2047-05-06T20:42:41.375		-21.34x	-15.83	133423.31	-5.73		
A (IER)	I	2047-05-06T21:20:52.275		-14.52x	-20.69	122050.38	-4.13		
B (OER)	I	2047-05-06T21:41:34.193		-10.91x	-23.00	117571.16	-3.07		
Saturn	I	2047-05-06T22:27:05.935		-3.26x	-27.12	59584.25		44.96	50.52
Saturn	E	2047-05-07T00:01:43.667		10.80	-30.50	59331.60		56.06	60.95
B (OER)	E	2047-05-06T23:24:08.902	b	5.59	-30.08	117571.16	3.09		
A (IER)	E	2047-05-06T23:44:36.831	b	8.50	-30.47	122050.38	4.18		
Encke (IEG)	E	2047-05-07T00:22:05.057		13.38	-30.21	133423.31	5.86		
Encke (OEG)	E	2047-05-07T00:22:59.731		13.49	-30.19	133744.89	5.90		
A (OER)	E	2047-05-07T00:31:19.781		14.48	-29.96	136774.40	6.21		
F ring	E	2047-05-07T00:40:57.137		15.59	-29.62	140461.00	6.55		

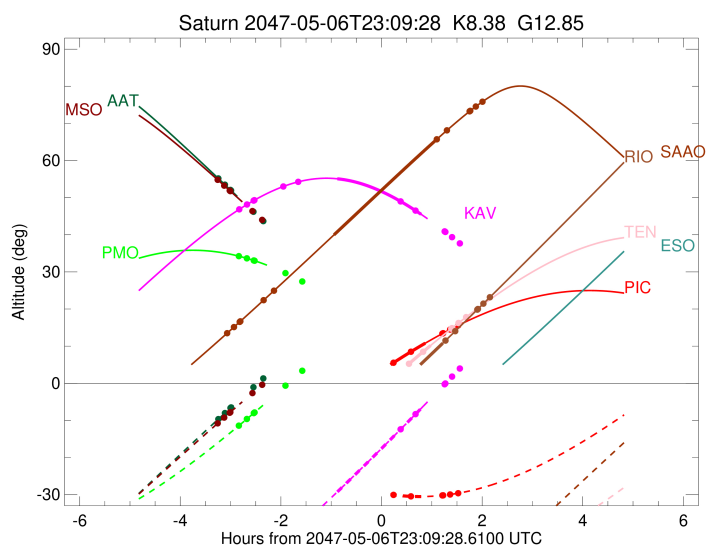
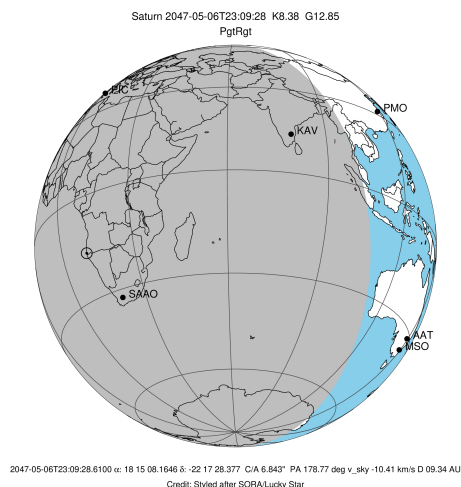
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:03:11.320
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.341
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 88.00
 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 (") : 7.460
 C/A sky separation (km) : 50540.0
 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	2047-05-06T20:19:05.779		34.26	-11.47	140461.00	-6.59		
A (OER)	I	2047-05-06T20:28:38.833		33.67	-9.67	136774.40	-6.27		
Encke (OEG)	I	2047-05-06T20:36:54.055		33.10	-8.10	133744.89	-5.96		
Encke (IEG)	I	2047-05-06T20:37:48.131		33.03	-7.92	133423.31	-5.93		
A (IER)	I	2047-05-06T21:14:34.445		29.72	-0.72x	122050.38	-4.31		
B (OER)	I	2047-05-06T21:34:13.385		27.50	3.22x	117571.16	-3.27		
Saturn	I	2047-05-06T22:13:46.084		22.28	11.32x	59588.20		44.79	50.36
Saturn	E	2047-05-06T23:52:12.731		6.00	32.05x	59370.99		54.25	59.30
B (OER)	E	2047-05-06T23:22:21.400	b	11.32	25.71x	117571.16	3.23		
A (IER)	E	2047-05-06T23:42:17.697	b	7.80	29.94x	122050.38	4.24		
Encke (IEG)	E	2047-05-07T00:19:44.359		0.88x	37.89x	133423.31	5.81		
Encke (OEG)	E	2047-05-07T00:20:39.543		0.71x	38.08x	133744.89	5.84		
A (OER)	E	2047-05-07T00:29:05.172		-0.90x	39.87x	136774.40	6.14		
F ring	E	2047-05-07T00:38:50.870		-2.78x	41.93x	140461.00	6.45		

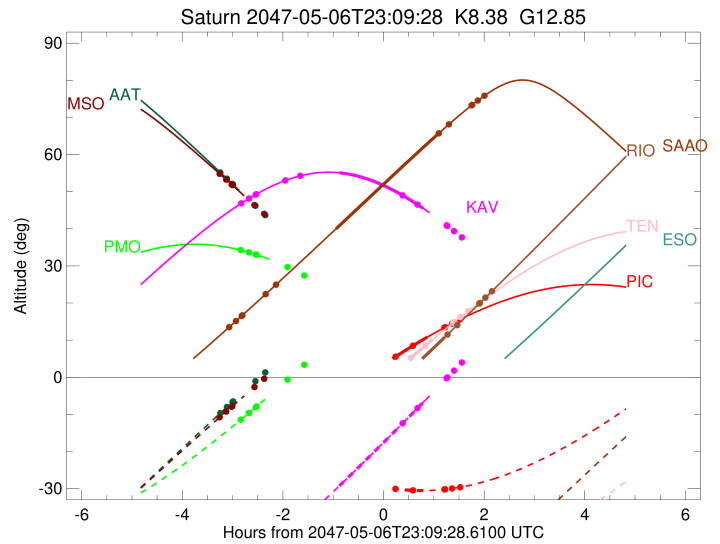
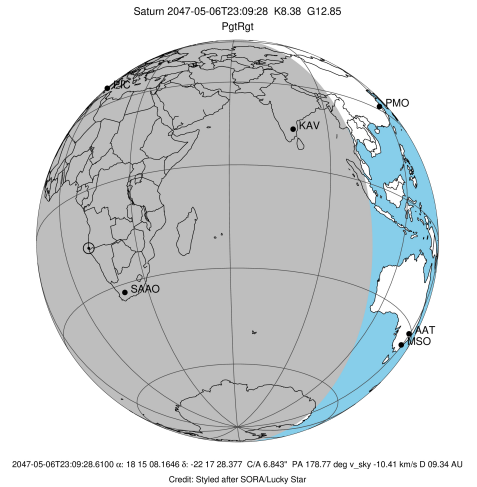
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:16:58.510
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.340
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 87.69
 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 (") : 7.347
 C/A sky separation (km) : 49770.6
 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	2047-05-06T20:17:13.418		-37.72x	-7.76	140461.00	-6.66		
A (OER)	I	2047-05-06T20:26:38.281		-35.66x	-9.65	136774.40	-6.39		
Encke (OEG)	I	2047-05-06T20:34:41.980		-33.89x	-11.26	133744.89	-6.14		
Encke (IEG)	I	2047-05-06T20:35:34.517		-33.70x	-11.43	133423.31	-6.11		
A (IER)	I	2047-05-06T21:10:10.836		-26.19x	-18.12	122050.38	-4.78		
B (OER)	I	2047-05-06T21:27:09.915		-22.53x	-21.28	117571.16	-3.99		
Saturn	I	2047-05-06T22:24:33.680		-10.40x	-31.08	59642.84		42.47	48.08
Saturn	E	2047-05-07T00:08:06.428		10.19	-43.24	59369.24		54.33	59.37
B (OER)	E	2047-05-06T23:42:28.218	b	5.31	-41.13	117571.16	4.06		
A (IER)	E	2047-05-06T23:59:06.876	b	8.50	-42.58	122050.38	4.90		
Encke (IEG)	E	2047-05-07T00:32:44.456		14.71	-44.55	133423.31	6.32		
Encke (OEG)	E	2047-05-07T00:33:35.219		14.86	-44.58	133744.89	6.35		
A (OER)	E	2047-05-07T00:41:21.936		16.24	-44.83	136774.40	6.63		
F ring	E	2047-05-07T00:50:25.549		17.82	-45.03	140461.00	6.93		

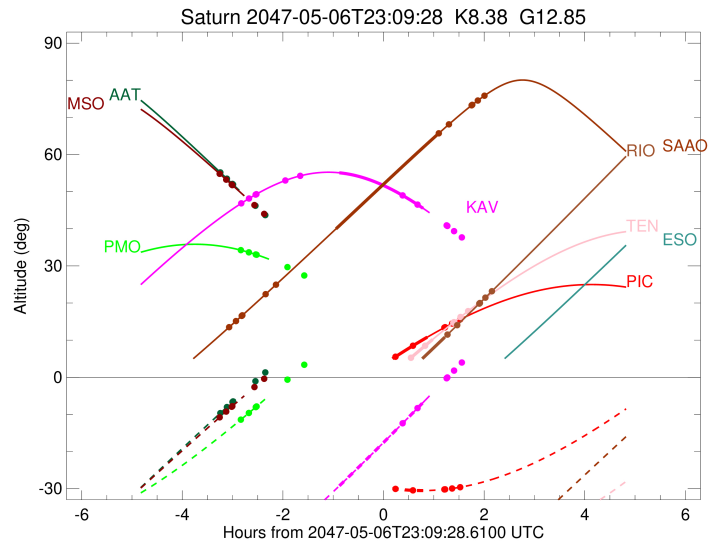
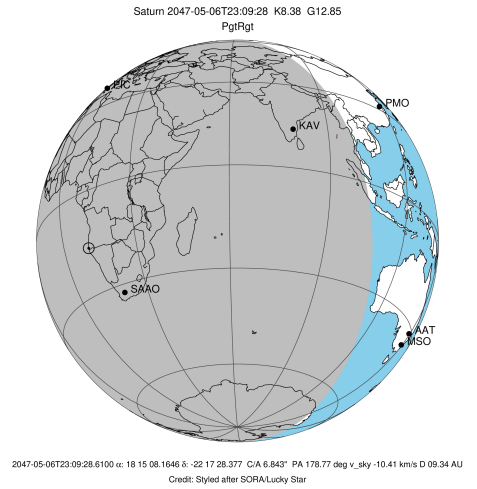
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:07:02.140
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.341
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 88.54
 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 (") : 7.360
 C/A sky separation (km) : 49861.2
 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	2047-05-06T20:19:36.965		46.82	-52.01	140461.00	-6.82		
A (OER)	I	2047-05-06T20:28:49.719		48.12	-50.52	136774.40	-6.52		
Encke (OEG)	I	2047-05-06T20:36:44.768		49.17	-49.17	133744.89	-6.24		
Encke (IEG)	I	2047-05-06T20:37:36.475		49.28	-49.02	133423.31	-6.20		
A (IER)	I	2047-05-06T21:12:04.613		52.98	-42.65	122050.38	-4.73		
B (OER)	I	2047-05-06T21:29:30.210		54.22	-39.19	117571.16	-3.82		
Saturn	I	2047-05-06T22:16:42.001		55.09	-29.28	59619.50		43.46	49.06
Saturn	E	2047-05-06T23:56:46.216		45.50	-6.77	59384.48		53.64	58.74
B (OER)	E	2047-05-06T23:32:31.719	b	48.96	-12.34	117571.16	3.80		
A (IER)	E	2047-05-06T23:50:04.705	b	46.51	-8.31	122050.38	4.69		
Encke (IEG)	E	2047-05-07T00:24:47.577		40.91	-0.26x	133423.31	6.16		
Encke (OEG)	E	2047-05-07T00:25:39.653		40.76	-0.06x	133744.89	6.19		
A (OER)	E	2047-05-07T00:33:38.104		39.36	1.80x	136774.40	6.47		
F ring	E	2047-05-07T00:42:54.855		37.68	3.97x	140461.00	6.77		

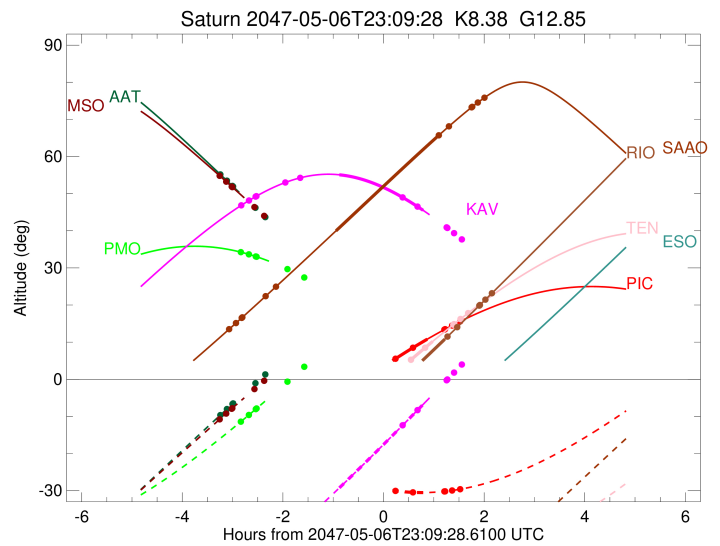
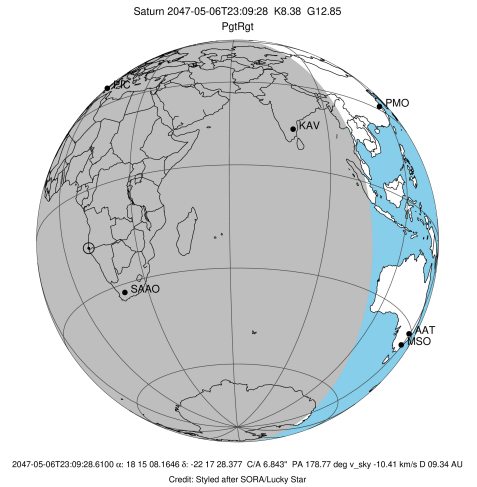
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:17:39.110
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.340
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 87.62
 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 (") : 6.453
 C/A sky separation (km) : 43713.8
 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

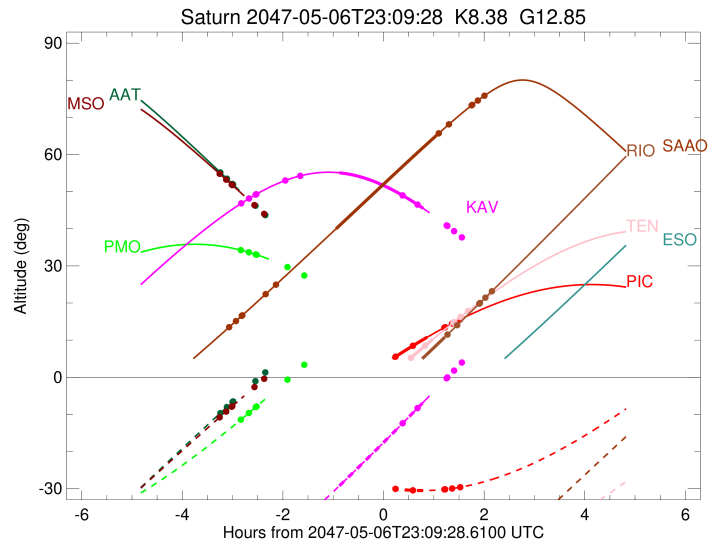
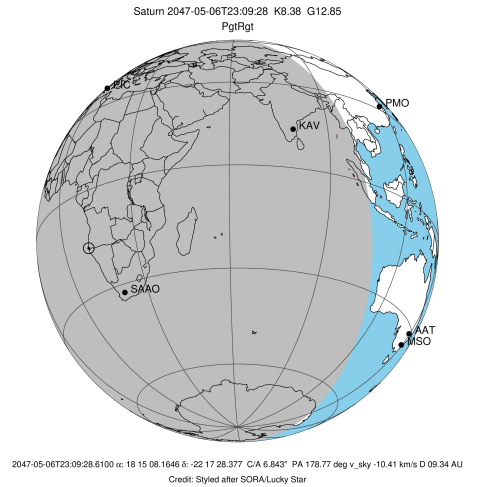
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-06T19:57:46.691		-38.17x	4.95x	140461.00	-7.62		
A (OER)	I	2047-05-06T20:05:56.215		-37.16x	3.18x	136774.40	-7.44		
Encke (OEG)	I	2047-05-06T20:12:47.657		-36.27x	1.69x	133744.89	-7.28		
Encke (IEG)	I	2047-05-06T20:13:31.869		-36.17x	1.53x	133423.31	-7.26		
A (IER)	I	2047-05-06T20:41:00.923		-32.22x	-4.52x	122050.38	-6.49		
B (OER)	I	2047-05-06T20:52:52.740		-30.36x	-7.15	117571.16	-6.09		
Saturn	I	2047-05-06T22:11:16.862		-16.40x	-24.84	59826.06		34.50	39.98
Saturn	E	2047-05-07T00:22:28.528		10.78	-55.00	59525.03		47.49	52.96
B (OER)	E	2047-05-07T00:25:55.761		11.53	-55.79	117571.16	6.29		
A (IER)	E	2047-05-07T00:37:22.809		14.03	-58.43	122050.38	6.74		
Encke (IEG)	E	2047-05-07T01:03:44.251		19.84	-64.46	133423.31	7.61		
Encke (OEG)	E	2047-05-07T01:04:26.466		20.00	-64.62	133744.89	7.63		
A (OER)	E	2047-05-07T01:10:58.889		21.45	-66.11	136774.40	7.81		
F ring	E	2047-05-07T01:18:44.786		23.18	-67.87	140461.00	8.01		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:01:54.340
 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 : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.341
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 88.01
 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 (") : 6.401
 C/A sky separation (km) : 43361.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-06T19:54:43.668		55.21	-9.69	140461.00	-7.93		
A (OER)	I	2047-05-06T20:02:34.654		53.53	-8.06	136774.40	-7.73		
Encke (OEG)	I	2047-05-06T20:09:11.337		52.11	-6.69	133744.89	-7.55		
Encke (IEG)	I	2047-05-06T20:09:54.009		51.96	-6.55	133423.31	-7.53		
A (IER)	I	2047-05-06T20:36:32.972		46.24	-1.10x	122050.38	-6.66		
B (OER)	I	2047-05-06T20:48:08.319		43.76	1.23x	117571.16	-6.21		
Saturn	I	2047-05-06T21:56:26.995		29.18	14.45x	59803.33		35.52	41.04
Saturn	E	2047-05-07T00:07:23.033		2.39x	35.00x	59565.66		45.76	51.29
B (OER)	E	2047-05-07T00:17:40.983		0.39x	36.18x	117571.16	6.06		
A (IER)	E	2047-05-07T00:29:34.342		-1.89x	37.42x	122050.38	6.49		
Encke (IEG)	E	2047-05-07T00:56:59.650		-7.01x	39.79x	133423.31	7.30		
Encke (OEG)	E	2047-05-07T00:57:43.653		-7.15x	39.84x	133744.89	7.32		
A (OER)	E	2047-05-07T01:04:32.941		-8.39x	40.31x	136774.40	7.48		
F ring	E	2047-05-07T01:12:39.431		-9.85x	40.79x	140461.00	7.67		

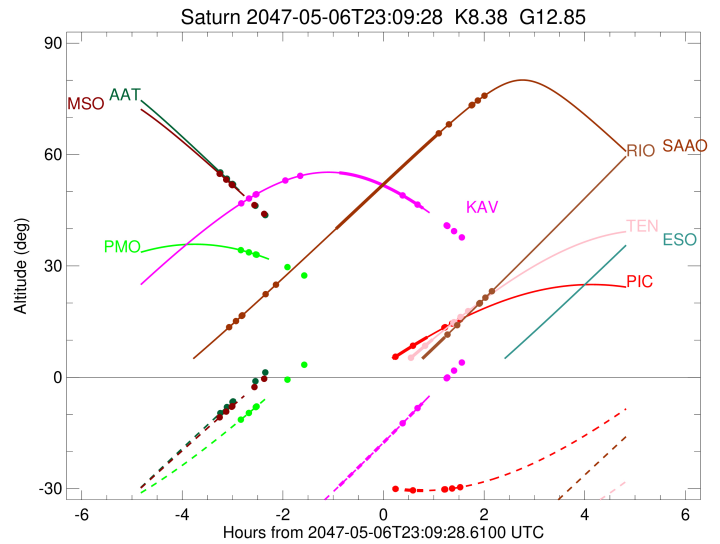
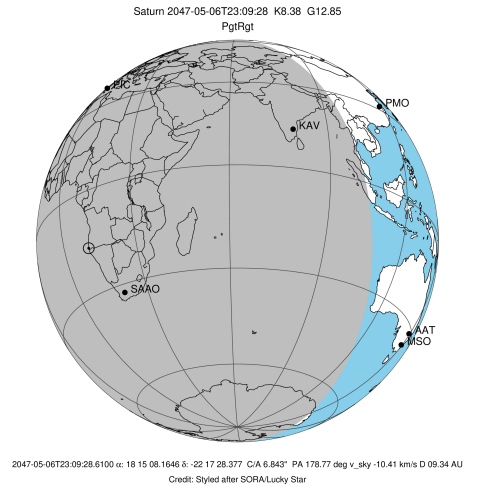
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:14:31.920
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.340
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 88.52
 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 (") : 6.623
 C/A sky separation (km) : 44870.0
 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	2047-05-06T20:05:14.219		13.46	-53.15	140461.00	-7.65		
A (OER)	I	2047-05-06T20:13:22.181		15.11	-54.80	136774.40	-7.46		
Encke (OEG)	I	2047-05-06T20:20:13.414		16.50	-56.18	133744.89	-7.28		
Encke (IEG)	I	2047-05-06T20:20:57.671		16.65	-56.33	133423.31	-7.26		
A (IER)	I	2047-05-06T20:48:41.259		22.34	-61.72	122050.38	-6.37		
B (OER)	I	2047-05-06T21:00:50.520		24.86	-63.97	117571.16	-5.90		
Saturn	I	2047-05-06T22:12:42.657		39.96	-73.83	59788.37		36.18	41.72
Saturn	E	2047-05-07T00:15:13.283		65.68	-62.25	59504.38		48.38	53.81
B (OER)	E	2047-05-07T00:15:33.676		65.75	-62.18	117571.16	6.00		
A (IER)	E	2047-05-07T00:27:29.362		68.13	-59.91	122050.38	6.50		
Encke (IEG)	E	2047-05-07T00:54:34.579		73.26	-54.56	133423.31	7.45		
Encke (OEG)	E	2047-05-07T00:55:17.684		73.38	-54.41	133744.89	7.47		
A (OER)	E	2047-05-07T01:01:57.903		74.55	-53.06	136774.40	7.67		
F ring	E	2047-05-07T01:09:52.094		75.85	-51.44	140461.00	7.88		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-06T23:02:15.600
 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 : 4090688897607666816
 2Mass ID (if available) : 18150817-2217283
 ICRS Star Coord at Epoch: 18h 15m 08.16461s -22:17:28.37710s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 8.376
 G magnitude : 12.854
 RP magnitude : 11.680
 BP magnitude : 14.334
 DUPflag : 0
 Distance (au) : 9.341
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -10.41
 Sun-Target sep (deg) : 132.19
 Sun-Moon sep (deg) : 88.03
 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 (") : 6.349
 C/A sky separation (km) : 43011.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-06T19:53:56.522		54.84	-10.82	140461.00	-7.98		
A (OER)	I	2047-05-06T20:01:44.229		53.27	-9.27	136774.40	-7.78		
Encke (OEG)	I	2047-05-06T20:08:17.827		51.94	-7.97	133744.89	-7.61		
Encke (IEG)	I	2047-05-06T20:09:00.148		51.80	-7.84	133423.31	-7.59		
A (IER)	I	2047-05-06T20:35:22.495		46.42	-2.68x	122050.38	-6.75		
B (OER)	I	2047-05-06T20:46:47.770		44.08	-0.48x	117571.16	-6.31		
Saturn	I	2047-05-06T21:56:10.716		29.89	12.31x	59813.35		35.07	40.57
Saturn	E	2047-05-07T00:08:20.727		3.93x	31.70x	59574.06		45.40	50.95
B (OER)	E	2047-05-07T00:19:52.120		1.80x	32.89x	117571.16	6.17		
A (IER)	E	2047-05-07T00:31:34.416		-0.34x	33.99x	122050.38	6.58		
Encke (IEG)	E	2047-05-07T00:58:40.567		-5.16x	36.08x	133423.31	7.37		
Encke (OEG)	E	2047-05-07T00:59:24.146		-5.28x	36.12x	133744.89	7.39		
A (OER)	E	2047-05-07T01:06:09.656		-6.45x	36.53x	136774.40	7.55		
F ring	E	2047-05-07T01:14:12.010		-7.82x	36.96x	140461.00	7.73		