

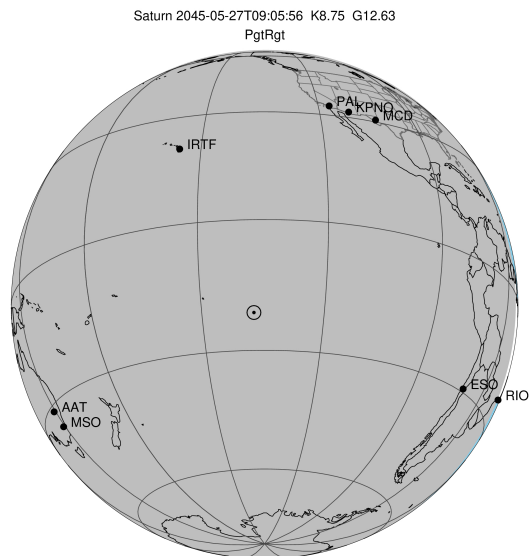
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:05:56.340
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074

Saturn 2045-05-27T09:05:56 K8.75 G12.63 PgtRgt

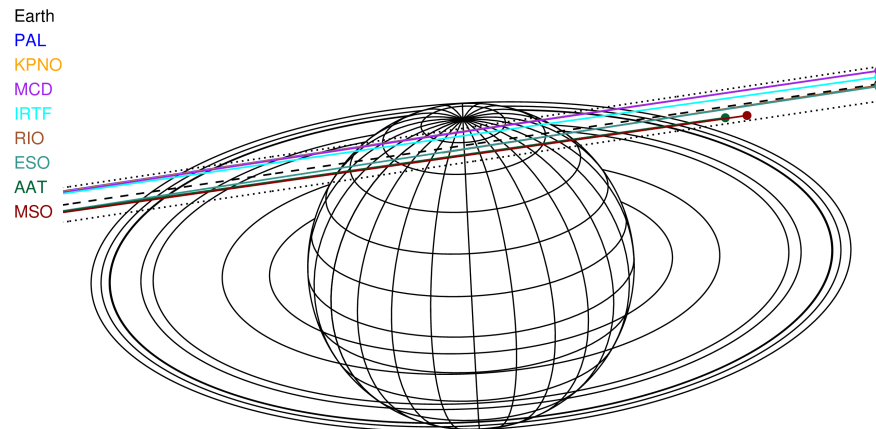
ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s

RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 43.37
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15

#	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

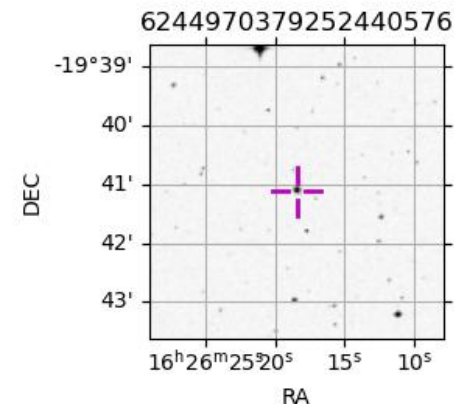


2045-05-27T09:05:56.3400 at: 16 26 18.55894 s: -19 41 07.606 C/A 6.841" PA 188.44 deg v_sky -20.16 km/s D 08.99 AU
 Credit: Styled after SORA/Lucky Star

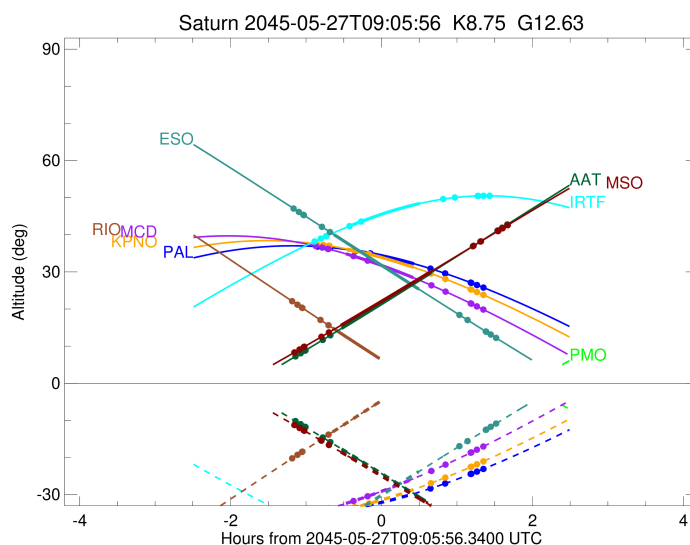
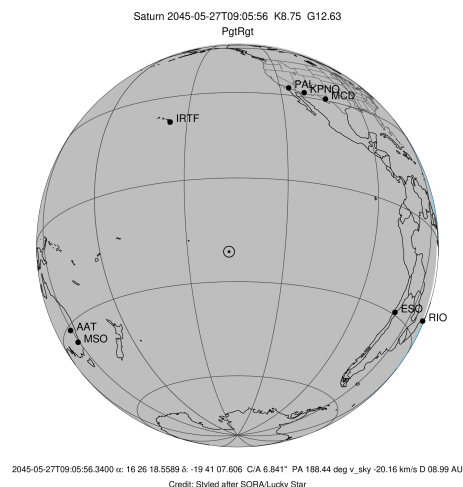


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+	+	+	MAY 27 08:14 - MAY 27 10:27	PieRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+	+	MAY 27 08:14 - MAY 27 10:26	PieRie
MCD	McDonald Obs.	30.7	256.0	+	+	+	MAY 27 08:13 - MAY 27 10:26	PieRie
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+	+	MAY 27 08:12 - MAY 27 10:31	PieRie
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+	+	+	MAY 27 07:54 - MAY 27 08:27	PinRin
ESO	European South	-29.3	289.3	+	+	+	MAY 27 07:55 - MAY 27 10:37	PieRie
AAT	Siding Spring	-31.3	149.1	+	+	+	MAY 27 07:57 - MAY 27 10:45	PieRie
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	MAY 27 07:56 - MAY 27 10:46	PieRie

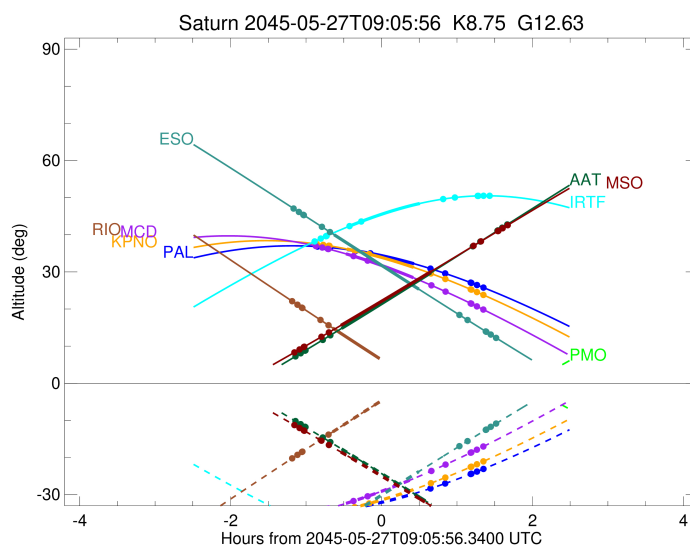
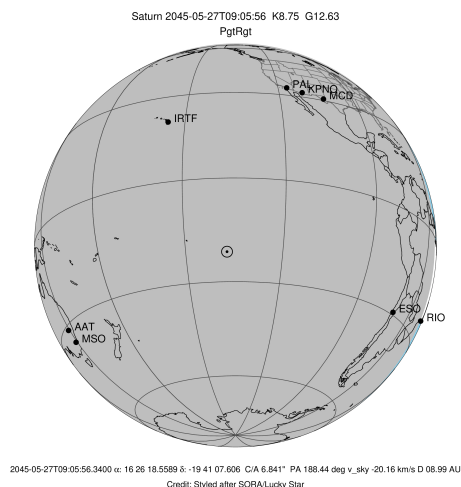


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:05:11.120
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 43.93
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.636
 C/A sky separation (km) : 49776.3
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2045-05-27T08:14:49.817		36.82	-34.96	140461.00	-12.25		
A (OER)	I	2045-05-27T08:19:58.866		36.70	-34.79	136774.40	-11.60		
Encke (OEG)	I	2045-05-27T08:24:27.050		36.57	-34.61	133744.89	-10.99		
Encke (IEG)	I	2045-05-27T08:24:56.409		36.55	-34.59	133423.31	-10.92		
A (IER)	I	2045-05-27T08:45:15.456	b	35.69	-33.55	122050.38	-7.59		
B (OER)	I	2045-05-27T08:56:45.795	b	35.02	-32.78	117571.16	-5.34		
Saturn	I	2045-05-27T08:38:47.978		36.01	-33.92	59445.22		52.93	58.08
Saturn	E	2045-05-27T09:31:50.942		32.20	-29.73	59623.33		44.81	50.37
B (OER)	E	2045-05-27T09:45:09.062		30.85	-28.32	117571.16	5.36		
A (IER)	E	2045-05-27T09:56:37.406		29.58	-26.99	122050.38	7.61		
Encke (IEG)	E	2045-05-27T10:16:54.952		27.10	-24.44	133423.31	10.92		
Encke (OEG)	E	2045-05-27T10:17:24.308		27.04	-24.38	133744.89	10.99		
A (OER)	E	2045-05-27T10:21:52.533		26.46	-23.78	136774.40	11.59		
F ring	E	2045-05-27T10:27:01.758		25.77	-23.08	140461.00	12.24		

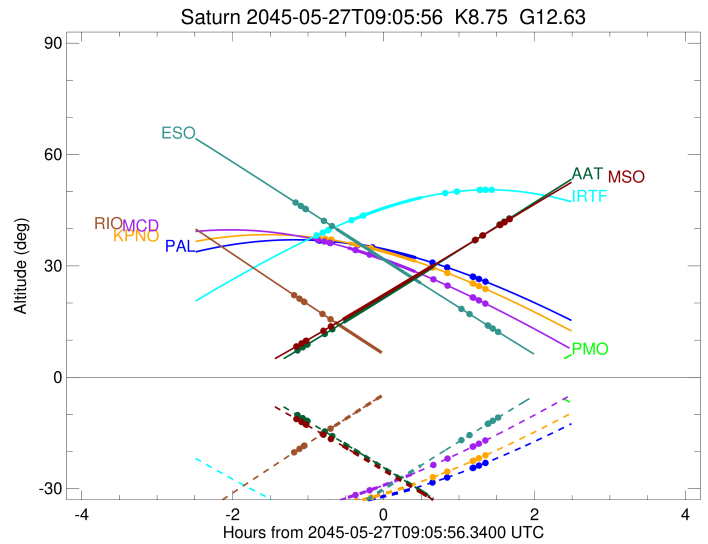
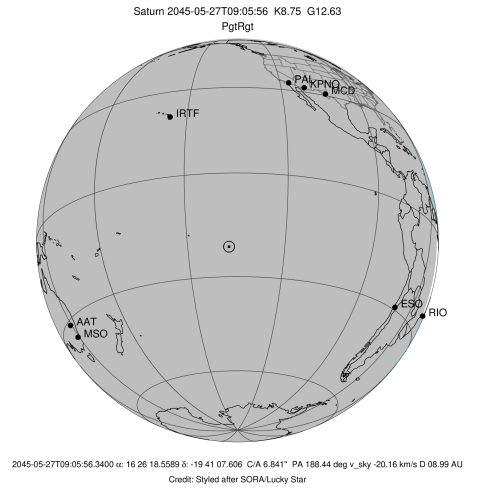
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:04:47.820
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 43.97
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.623
 C/A sky separation (km) : 49694.7
 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

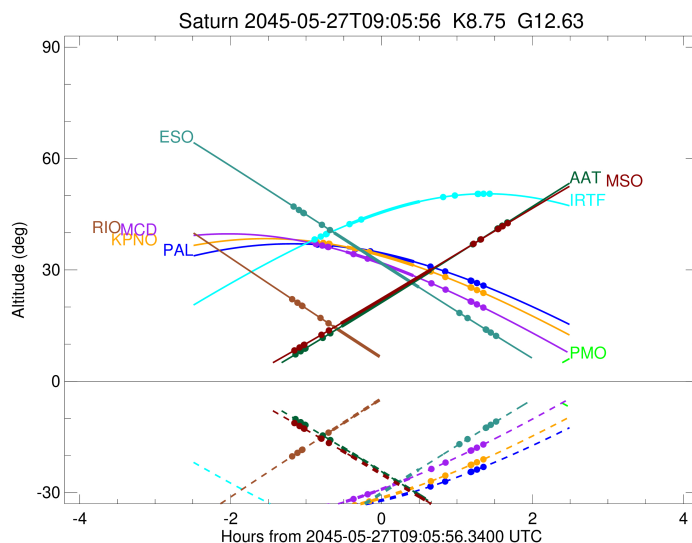
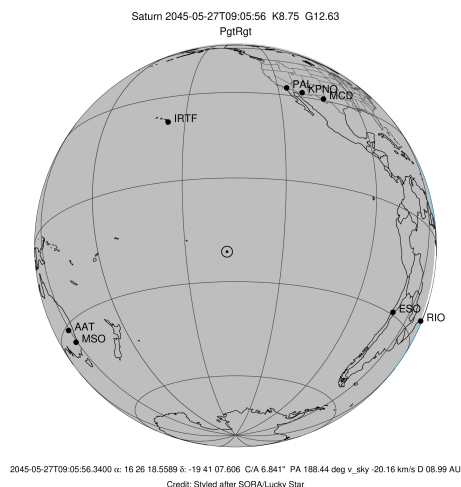
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2045-05-27T08:14:17.413		37.53	-35.45	140461.00	-12.30		
A (OER)	I	2045-05-27T08:19:25.194		37.29	-35.17	136774.40	-11.65		
Encke (OEG)	I	2045-05-27T08:23:52.110		37.06	-34.90	133744.89	-11.04		
Encke (IEG)	I	2045-05-27T08:24:21.318		37.03	-34.87	133423.31	-10.98		
A (IER)	I	2045-05-27T08:44:30.786	b	35.72	-33.40	122050.38	-7.69		
B (OER)	I	2045-05-27T08:55:48.984	b	34.82	-32.41	117571.16	-5.48		
Saturn	I	2045-05-27T08:38:18.239		36.17	-33.89	59446.88		52.85	58.01
Saturn	E	2045-05-27T09:31:34.495		31.21	-28.62	59626.58		44.66	50.23
B (OER)	E	2045-05-27T09:45:28.762		29.54	-26.89	117571.16	5.50		
A (IER)	E	2045-05-27T09:56:45.278		28.09	-25.40	122050.38	7.70		
Encke (IEG)	E	2045-05-27T10:16:54.003		25.29	-22.55	133423.31	10.97		
Encke (OEG)	E	2045-05-27T10:17:23.230		25.22	-22.47	133744.89	11.04		
A (OER)	E	2045-05-27T10:21:50.392		24.56	-21.81	136774.40	11.64		
F ring	E	2045-05-27T10:26:58.601		23.80	-21.04	140461.00	12.28		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:04:15.920
 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 : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 44.03
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.608
 C/A sky separation (km) : 49592.4
 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	2045-05-27T08:13:34.095		36.98	-34.64	140461.00	-12.35		
A (OER)	I	2045-05-27T08:18:40.365		36.58	-34.20	136774.40	-11.71		
Encke (OEG)	I	2045-05-27T08:23:05.765		36.21	-33.80	133744.89	-11.11		
Encke (IEG)	I	2045-05-27T08:23:34.794		36.17	-33.76	133423.31	-11.04		
A (IER)	I	2045-05-27T08:43:32.719	b	34.27	-31.74	122050.38	-7.80		
B (OER)	I	2045-05-27T08:54:36.522	b	33.07	-30.48	117571.16	-5.65		
Saturn	I	2045-05-27T08:37:37.595		34.87	-32.37	59448.82		52.76	57.93
Saturn	E	2045-05-27T09:31:11.916		28.45	-25.72	59630.77		44.47	50.04
B (OER)	E	2045-05-27T09:45:52.695		26.34	-23.58	117571.16	5.67		
A (IER)	E	2045-05-27T09:56:55.249		24.68	-21.90	122050.38	7.81		
Encke (IEG)	E	2045-05-27T10:16:53.490		21.51	-18.70	133423.31	11.03		
Encke (OEG)	E	2045-05-27T10:17:22.568		21.43	-18.62	133744.89	11.09		
A (OER)	E	2045-05-27T10:21:48.501		20.71	-17.89	136774.40	11.68		
F ring	E	2045-05-27T10:26:55.555		19.85	-17.03	140461.00	12.32		

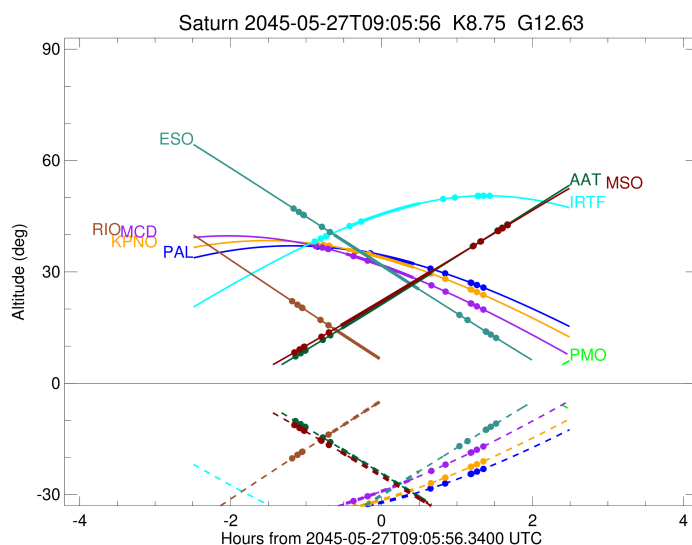
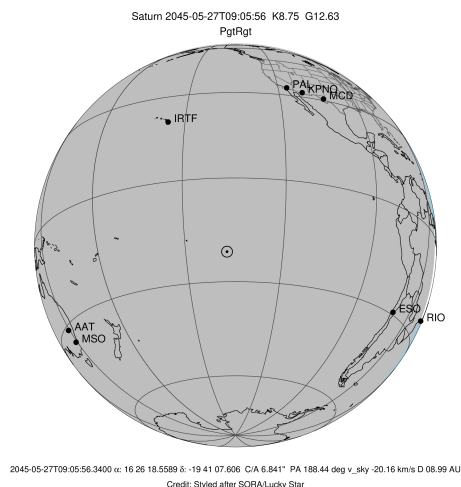
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:07:54.050
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 43.61
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.392
 C/A sky separation (km) : 48187.1
 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	2045-05-27T08:12:36.531		38.18	-38.58	140461.00	-12.89		
A (OER)	I	2045-05-27T08:17:28.976		38.95	-39.29	136774.40	-12.31		
Encke (OEG)	I	2045-05-27T08:21:40.362		39.59	-39.88	133744.89	-11.78		
Encke (IEG)	I	2045-05-27T08:22:07.726		39.66	-39.95	133423.31	-11.72		
A (IER)	I	2045-05-27T08:40:22.279	b	42.31	-42.35	122050.38	-8.93		
B (OER)	I	2045-05-27T08:49:35.027	b	43.54	-43.45	117571.16	-7.24		
Saturn	I	2045-05-27T08:39:35.420		42.20	-42.25	59491.97		50.75	56.05
Saturn	E	2045-05-27T09:36:25.494		48.44	-47.60	59667.53		42.82	48.43
B (OER)	E	2045-05-27T09:55:09.816		49.63	-48.49	117571.16	7.29		
A (IER)	E	2045-05-27T10:04:19.318		50.04	-48.74	122050.38	8.99		
Encke (IEG)	E	2045-05-27T10:22:27.794		50.47	-48.89	133423.31	11.79		
Encke (OEG)	E	2045-05-27T10:22:55.008		50.48	-48.89	133744.89	11.85		
A (OER)	E	2045-05-27T10:27:05.005		50.50	-48.85	136774.40	12.38		
F ring	E	2045-05-27T10:31:55.808		50.50	-48.78	140461.00	12.96		

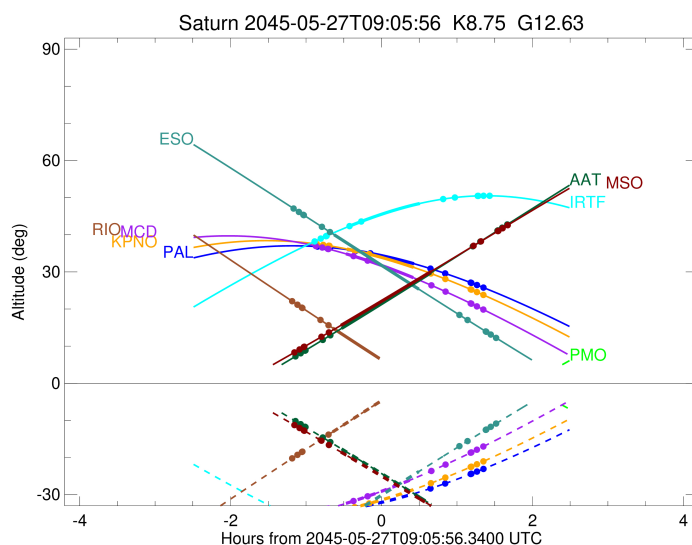
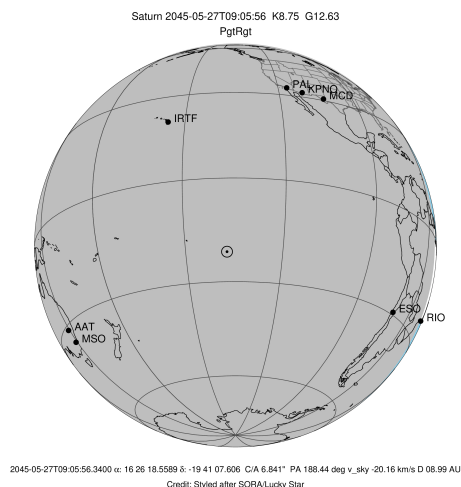
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:01:06.550
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 44.08
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.616
 C/A sky separation (km) : 43130.5
 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	2045-05-27T07:54:46.557		22.14	-20.25	140461.00	-14.80		
A (OER)	I	2045-05-27T07:58:59.009		21.19	-19.32	136774.40	-14.40		
Encke (OEG)	I	2045-05-27T08:02:31.986		20.40	-18.53	133744.89	-14.04		
Encke (IEG)	I	2045-05-27T08:02:54.919		20.31	-18.45	133423.31	-14.00		
A (IER)	I	2045-05-27T08:17:18.324		17.08	-15.27	122050.38	-12.27		
B (OER)	I	2045-05-27T08:23:37.411		15.67	-13.88	117571.16	-11.35		
Saturn	I	2045-05-27T08:27:10.271		14.88	-13.10	59610.37		45.39	50.94
Saturn	E	2045-05-27T09:35:24.184		-0.07x	1.58x	59821.08		35.82	41.35
B (OER)	E	2045-05-27T10:08:34.802		-7.12x	8.47x	117571.16	11.28		
A (IER)	E	2045-05-27T10:14:56.498		-8.45x	9.76x	122050.38	12.17		
Encke (IEG)	E	2045-05-27T10:29:27.799		-11.46x	12.69x	133423.31	13.86		
Encke (OEG)	E	2045-05-27T10:29:50.975		-11.53x	12.76x	133744.89	13.89		
A (OER)	E	2045-05-27T10:33:26.290		-12.27x	13.48x	136774.40	14.24		
F ring	E	2045-05-27T10:37:41.689		-13.14x	14.32x	140461.00	14.62		

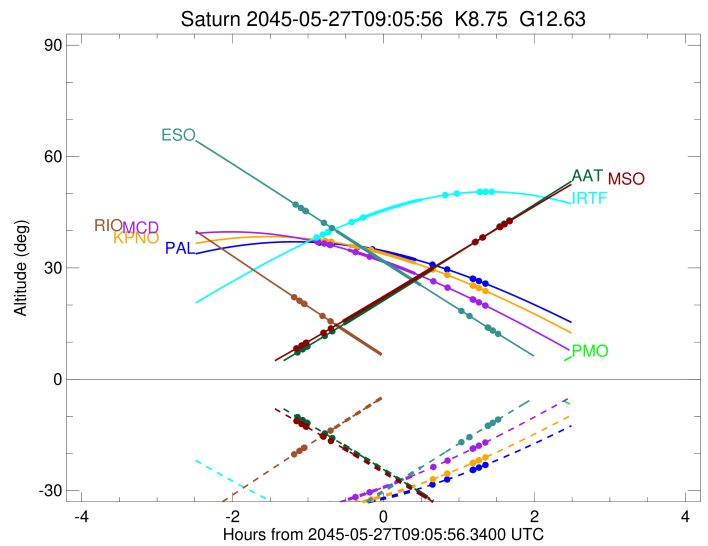
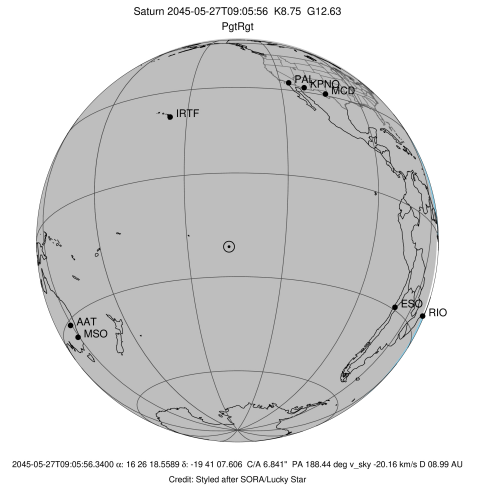
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:01:48.480
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 44.27
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.637
 C/A sky separation (km) : 43265.7
 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

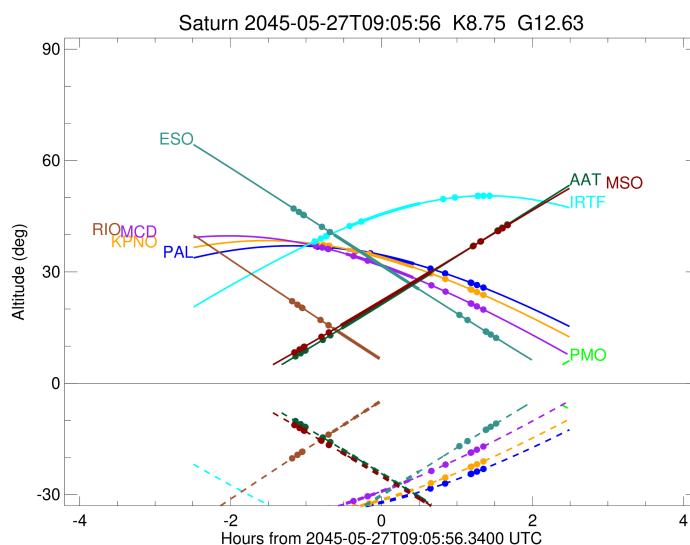
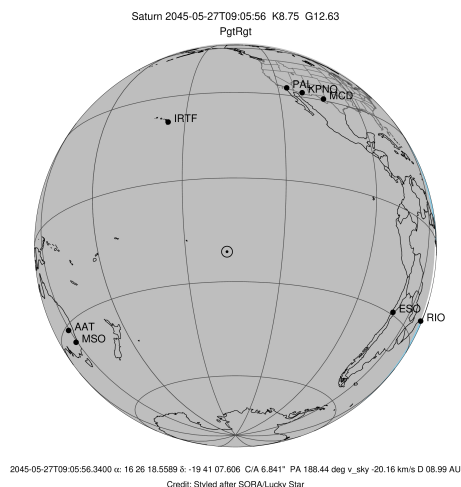
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2045-05-27T07:55:54.921		47.10	-45.36	140461.00	-14.82		
A (OER)	I	2045-05-27T08:00:07.046		46.18	-44.45	136774.40	-14.42		
Encke (OEG)	I	2045-05-27T08:03:39.822		45.40	-43.67	133744.89	-14.05		
Encke (IEG)	I	2045-05-27T08:04:02.738		45.32	-43.59	133423.31	-14.01		
A (IER)	I	2045-05-27T08:18:26.410		42.17	-40.45	122050.38	-12.25		
B (OER)	I	2045-05-27T08:24:46.450		40.78	-39.07	117571.16	-11.31		
Saturn	I	2045-05-27T08:28:16.305		40.01	-38.31	59609.70		45.42	50.96
Saturn	E	2045-05-27T09:35:40.278		25.33	-23.77	59815.21		36.10	41.64
B (OER)	E	2045-05-27T10:07:59.293		18.39	-16.92	117571.16	11.26		
A (IER)	E	2045-05-27T10:14:21.212		17.03	-15.58	122050.38	12.18		
Encke (IEG)	E	2045-05-27T10:28:50.827		13.96	-12.56	133423.31	13.90		
Encke (OEG)	E	2045-05-27T10:29:13.928		13.87	-12.48	133744.89	13.94		
A (OER)	E	2045-05-27T10:32:48.494		13.12	-11.73	136774.40	14.29		
F ring	E	2045-05-27T10:37:02.887		12.22	-10.85	140461.00	14.68		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:09:42.490
 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 : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 43.03
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.326
 C/A sky separation (km) : 41237.7
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2045-05-27T07:57:26.805		7.22	-10.16	140461.00	-15.15		
A (OER)	I	2045-05-27T08:01:32.849		8.05	-10.99	136774.40	-14.81		
Encke (OEG)	I	2045-05-27T08:04:59.528		8.76	-11.69	133744.89	-14.50		
Encke (IEG)	I	2045-05-27T08:05:21.730		8.83	-11.77	133423.31	-14.47		
A (IER)	I	2045-05-27T08:19:08.239		11.66	-14.59	122050.38	-12.99		
B (OER)	I	2045-05-27T08:25:03.537		12.88	-15.80	117571.16	-12.21		
Saturn	I	2045-05-27T08:34:08.916		14.77	-17.68	59671.58		42.64	48.25
Saturn	E	2045-05-27T09:45:22.171		29.79	-32.65	59852.77		34.33	39.80
B (OER)	E	2045-05-27T10:18:38.921		36.91	-39.74	117571.16	12.33		
A (IER)	E	2045-05-27T10:24:30.684		38.17	-41.00	122050.38	13.12		
Encke (IEG)	E	2045-05-27T10:38:08.204		41.10	-43.91	133423.31	14.64		
Encke (OEG)	E	2045-05-27T10:38:30.147		41.18	-43.99	133744.89	14.67		
A (OER)	E	2045-05-27T10:41:54.377		41.91	-44.72	136774.40	14.99		
F ring	E	2045-05-27T10:45:57.398		42.78	-45.59	140461.00	15.34		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2045-05-27T09:09:29.020
 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 : 6244970379252440576
 2Mass ID (if available) : 16261856-1941074
 ICRS Star Coord at Epoch: 16h 26m 18.55894s -19:41:07.60591s
 RUWE (>1.4 is poor) : 1.18
 K magnitude : 8.752
 G magnitude : 12.632
 RP magnitude : 11.575
 BP magnitude : 13.780
 DUPflag : 0
 Distance (au) : 8.988
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.16
 Sun-Target sep (deg) : 177.09
 Sun-Moon sep (deg) : 43.07
 B (ring opening deg) : 25.50
 PA of pole (deg) : 3.15
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.274
 C/A sky separation (km) : 40898.2
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2045-05-27T07:56:35.310		8.29	-11.24	140461.00	-15.26		
A (OER)	I	2045-05-27T08:00:39.585		9.08	-12.03	136774.40	-14.92		
Encke (OEG)	I	2045-05-27T08:04:04.638		9.75	-12.69	133744.89	-14.62		
Encke (IEG)	I	2045-05-27T08:04:26.656		9.82	-12.77	133423.31	-14.59		
A (IER)	I	2045-05-27T08:18:04.875		12.50	-15.44	122050.38	-13.15		
B (OER)	I	2045-05-27T08:23:55.414		13.66	-16.59	117571.16	-12.40		
Saturn	I	2045-05-27T08:33:38.609		15.59	-18.52	59679.50		42.29	47.90
Saturn	E	2045-05-27T09:45:25.655		30.12	-33.00	59861.24		33.92	39.37
B (OER)	E	2045-05-27T10:19:13.593		37.05	-39.91	117571.16	12.51		
A (IER)	E	2045-05-27T10:25:00.757		38.23	-41.09	122050.38	13.28		
Encke (IEG)	E	2045-05-27T10:38:30.382		41.00	-43.85	133423.31	14.75		
Encke (OEG)	E	2045-05-27T10:38:52.153		41.07	-43.92	133744.89	14.79		
A (OER)	E	2045-05-27T10:42:14.864		41.76	-44.61	136774.40	15.10		
F ring	E	2045-05-27T10:46:16.247		42.58	-45.43	140461.00	15.44		