

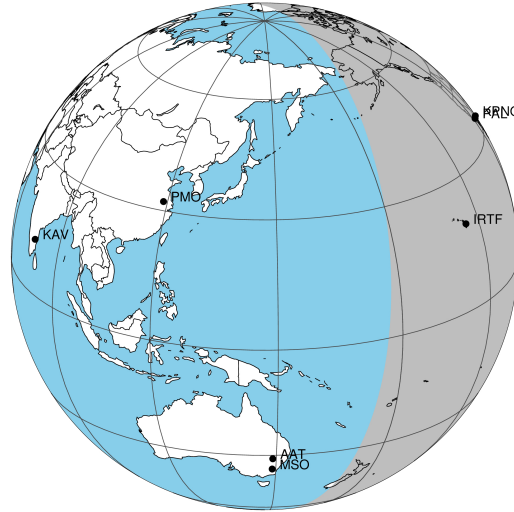
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-04-07T06:17:50.190
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3415147613398691200
 2Mass ID (if available) : 05075543+2142173

Saturn 2032-04-07T06:17:50 K4.78 G5.72 PgtRgt

ICRS Star Coord at Epoch: 05h 07m 55.43573s +21:42:17.13566s

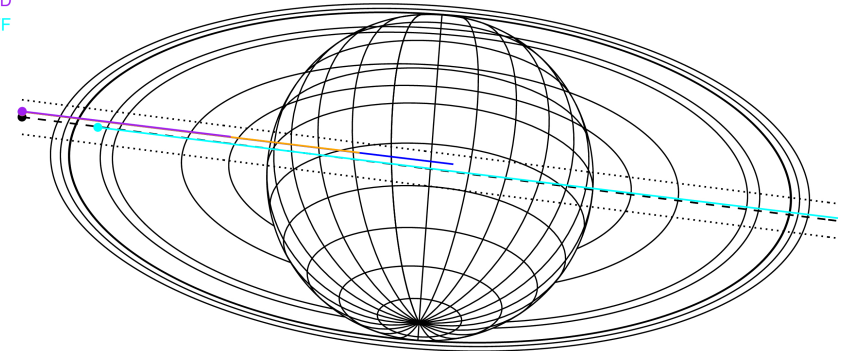
RUWE (>1.4 is poor) : 1.08
 K magnitude : 4.775
 G magnitude : 5.723
 RP magnitude : 5.437
 BP magnitude : 5.853
 DUPflag : 0
 Distance (au) : 9.473
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.40
 Sun-Target sep (deg) : 60.38
 Sun-Moon sep (deg) : 98.89
 B (ring opening deg) : -26.88
 PA of pole (deg) : -4.32

Saturn 2032-04-07T06:17:50 K4.78 G5.72
 PgtRgt



2032-04-07T06:17:50.1900 ex: 05 07 55.4357 8: +21 42 17.136 C/A 0.451" PA 172.75 deg v_sky +24.40 km/s D 09.47 AU
 Credit: Styled after SORA/Lucky Star

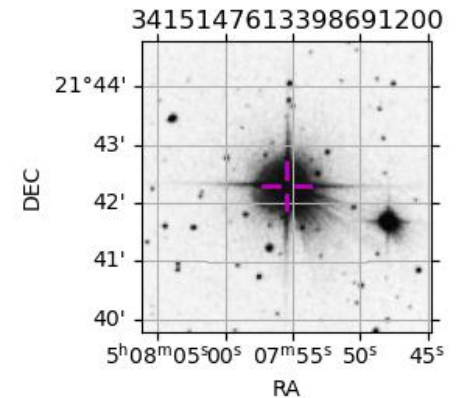
Earth
 PAL
 KPNO
 MCD
 IRTF



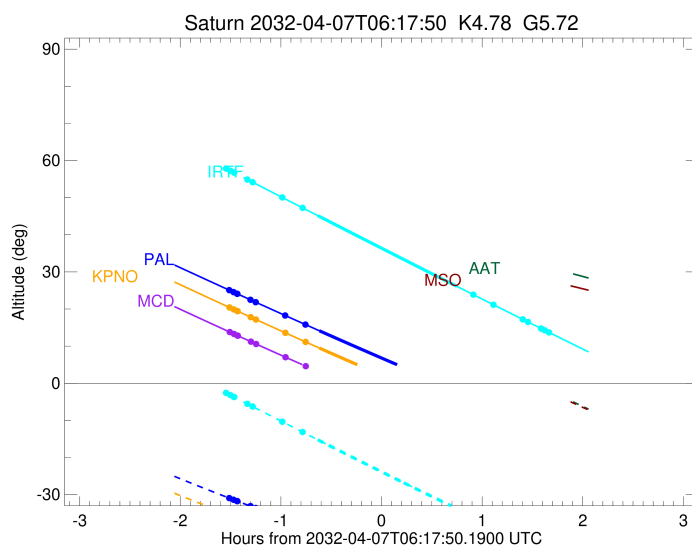
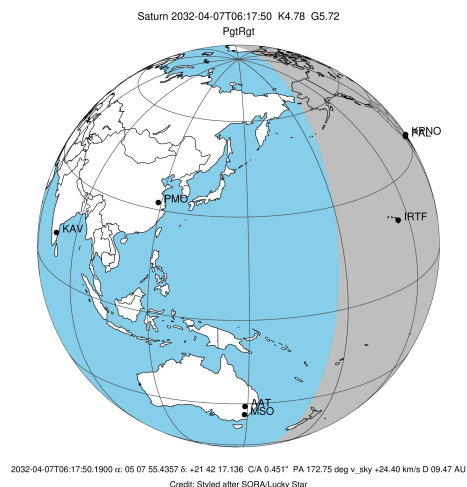
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+ + + + + + +	+		APR 07 04:47 - APR 07 05:40	PinRin
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+ + + + + + +	+		APR 07 04:47 - APR 07 05:40	PinRin
MCD	McDonald Obs.	30.7	256.0	+ + + + + + +			APR 07 04:47 - APR 07 05:20	PnnRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ + + +	+ +	+ + + + + + + +	APR 07 04:57 - APR 07 07:57	PieRie
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



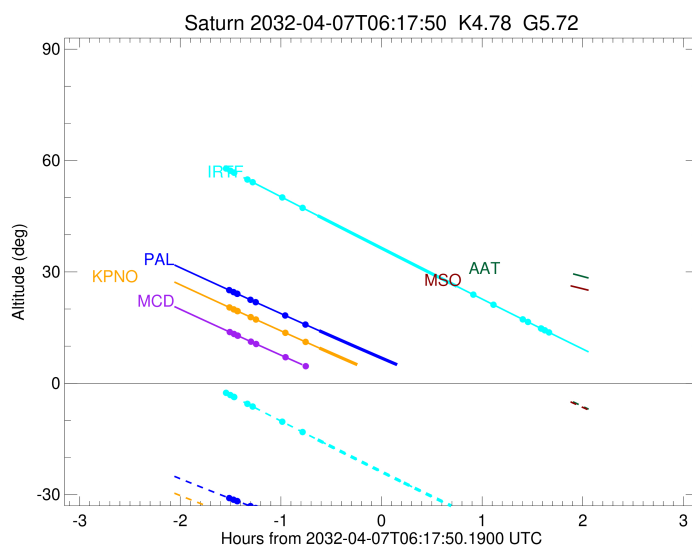
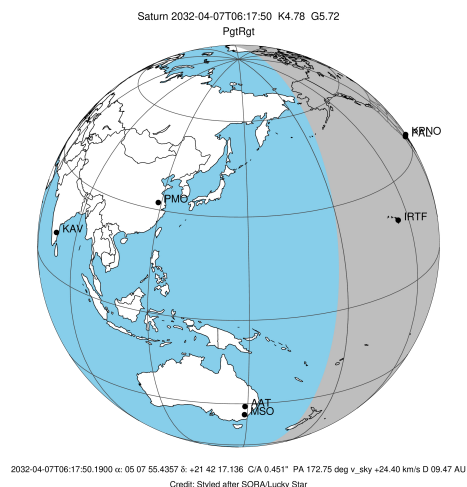
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-04-07T06:21:41.530
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3415147613398691200
 2Mass ID (if available) : 05075543+2142173
 ICRS Star Coord at Epoch: 05h 07m 55.43573s +21:42:17.13566s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 4.775
 G magnitude : 5.723
 RP magnitude : 5.437
 BP magnitude : 5.853
 DUPflag : 0
 Distance (au) : 9.473
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.40
 Sun-Target sep (deg) : 60.38
 Sun-Moon sep (deg) : 98.88
 B (ring opening deg) : -26.88
 PA of pole (deg) : -4.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.860
 C/A sky separation (km) : 5908.3
 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_itr93_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	2032-04-07T04:47:02.288		25.09	-30.93	140461.00	-24.24		
A (OER)	I	2032-04-07T04:49:34.358		24.57	-31.37	136774.40	-24.24		
Encke (OEG)	I	2032-04-07T04:51:39.331		24.14	-31.72	133744.89	-24.24		
Encke (IEG)	I	2032-04-07T04:51:52.597		24.09	-31.76	133423.31	-24.24		
A (IER)	I	2032-04-07T04:59:41.844		22.48	-33.08	122050.38	-24.23		
B (OER)	I	2032-04-07T05:02:46.715		21.85	-33.59	117571.16	-24.23		
B (IER)	I	2032-04-07T05:20:24.044		18.26	-36.43	91984.69	-24.16		
C (IER)	I	2032-04-07T05:32:29.598		15.81	-38.28	74490.58	-24.05		
Saturn	I	2032-04-07T05:40:43.877		14.15	-39.48	60243.48		7.36	9.01
Saturn	E	2032-04-07T07:02:31.885		-1.72x	-48.23	60264.71		2.69	3.30
C (IER)	E	2032-04-07T07:12:05.623		-3.49x	-48.78	74490.58	24.24		
B (IER)	E	2032-04-07T07:24:04.752		-5.67x	-49.30	91984.69	24.40		
B (OER)	E	2032-04-07T07:41:30.344		-8.77x	-49.70	117571.16	24.53		
A (IER)	E	2032-04-07T07:44:32.877		-9.30x	-49.72	122050.38	24.55		
Encke (IEG)	E	2032-04-07T07:52:15.813		-10.64x	-49.73	133423.31	24.59		
Encke (OEG)	E	2032-04-07T07:52:28.892		-10.68x	-49.73	133744.89	24.59		
A (OER)	E	2032-04-07T07:54:32.089		-11.03x	-49.72	136774.40	24.60		
F ring	E	2032-04-07T07:57:01.947		-11.45x	-49.70	140461.00	24.61		

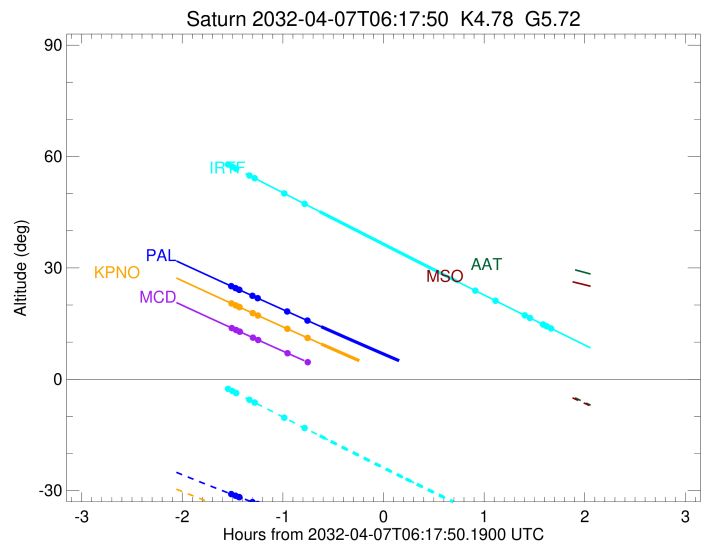
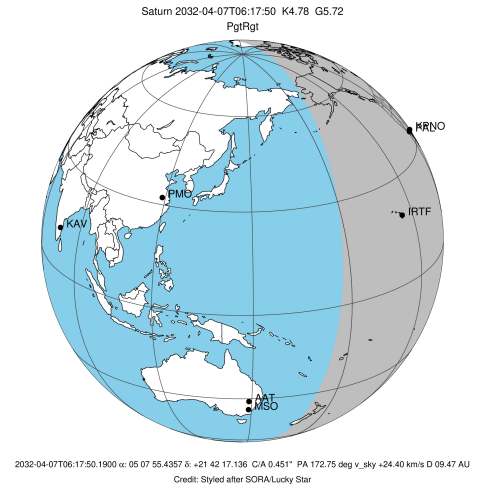
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-04-07T06:21:41.720
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3415147613398691200
 2Mass ID (if available) : 05075543+2142173
 ICRS Star Coord at Epoch: 05h 07m 55.43573s +21:42:17.13566s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 4.775
 G magnitude : 5.723
 RP magnitude : 5.437
 BP magnitude : 5.853
 DUPflag : 0
 Distance (au) : 9.473
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.40
 Sun-Target sep (deg) : 60.38
 Sun-Moon sep (deg) : 98.80
 B (ring opening deg) : -26.88
 PA of pole (deg) : -4.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.869
 C/A sky separation (km) : 5973.0
 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_itr93_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	2032-04-07T04:47:11.106		20.43	-35.36	140461.00	-24.27		
A (OER)	I	2032-04-07T04:49:42.998		19.90	-35.78	136774.40	-24.27		
Encke (OEG)	I	2032-04-07T04:51:47.823		19.47	-36.12	133744.89	-24.27		
Encke (IEG)	I	2032-04-07T04:52:01.074		19.43	-36.16	133423.31	-24.27		
A (IER)	I	2032-04-07T04:59:49.769		17.82	-37.43	122050.38	-24.26		
B (OER)	I	2032-04-07T05:02:54.423		17.18	-37.92	117571.17	-24.25		
B (IER)	I	2032-04-07T05:20:30.529		13.59	-40.61	91984.69	-24.19		
C (IER)	I	2032-04-07T05:32:35.296		11.14	-42.33	74490.58	-24.07		
Saturn	I	2032-04-07T05:40:47.961		9.49	-43.44	60243.19		7.40	9.07
Saturn	E	2032-04-07T07:02:28.213		-6.26x	-50.65	60264.56		2.75	3.38
C (IER)	E	2032-04-07T07:12:00.766		-8.00x	-50.94	74490.58	24.27		
B (IER)	E	2032-04-07T07:23:59.083		-10.15x	-51.12	91984.69	24.43		
B (OER)	E	2032-04-07T07:41:23.407		-13.19x	-51.01	117571.17	24.56		
A (IER)	E	2032-04-07T07:44:25.713		-13.71x	-50.94	122050.38	24.58		
Encke (IEG)	E	2032-04-07T07:52:08.071		-15.01x	-50.72	133423.31	24.62		
Encke (OEG)	E	2032-04-07T07:52:21.134		-15.05x	-50.71	133744.89	24.62		
A (OER)	E	2032-04-07T07:54:24.177		-15.39x	-50.63	136774.40	24.63		
F ring	E	2032-04-07T07:56:53.847		-15.80x	-50.54	140461.00	24.64		

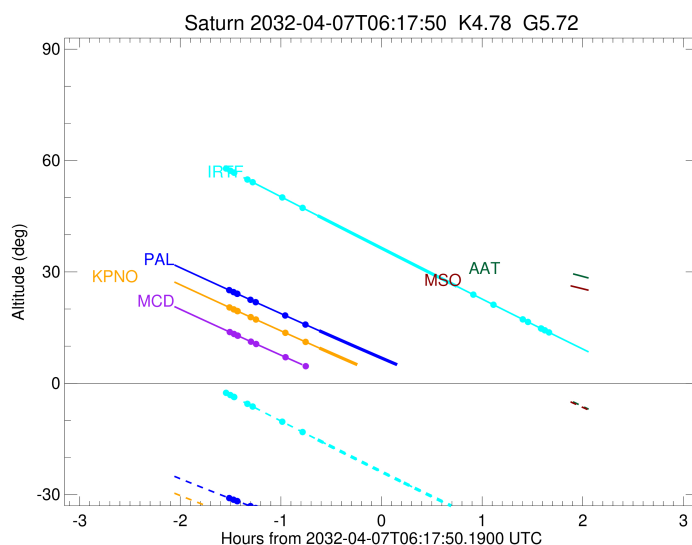
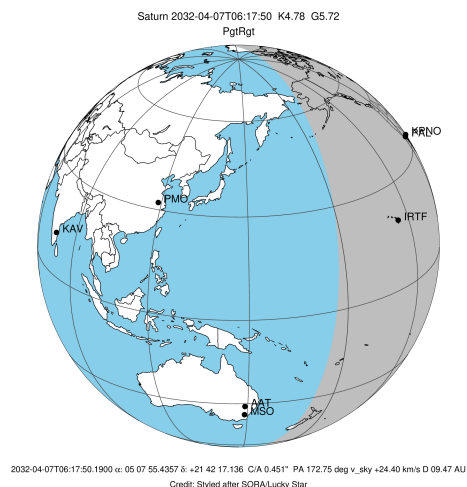
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-04-07T06:21:37.140
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3415147613398691200
 2Mass ID (if available) : 05075543+2142173
 ICRS Star Coord at Epoch: 05h 07m 55.43573s +21:42:17.13566s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 4.775
 G magnitude : 5.723
 RP magnitude : 5.437
 BP magnitude : 5.853
 DUPflag : 0
 Distance (au) : 9.473
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.40
 Sun-Target sep (deg) : 60.38
 Sun-Moon sep (deg) : 98.70
 B (ring opening deg) : -26.88
 PA of pole (deg) : -4.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.893
 C/A sky separation (km) : 6137.6
 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_itr93_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	2032-04-07T04:47:20.644		13.80	-41.10	140461.00	-24.31		
A (OER)	I	2032-04-07T04:49:52.272		13.28	-41.49	136774.40	-24.31		
Encke (OEG)	I	2032-04-07T04:51:56.882		12.85	-41.80	133744.89	-24.31		
Encke (IEG)	I	2032-04-07T04:52:10.110		12.81	-41.84	133423.31	-24.31		
A (IER)	I	2032-04-07T04:59:58.007		11.21	-42.98	122050.38	-24.30		
B (OER)	I	2032-04-07T05:03:02.351		10.58	-43.42	117571.16	-24.29		
B (IER)	I	2032-04-07T05:20:36.784		7.02	-45.78	91984.69	-24.22		
C (IER)	I	2032-04-07T05:32:40.584		4.60x	-47.23	74490.58	-24.10		
Saturn	I	2032-04-07T05:40:49.320		2.98x	-48.13	60242.31		7.53	9.23
Saturn	E	2032-04-07T07:02:17.883		-12.39x	-52.41	60264.19		2.89	3.55
C (IER)	E	2032-04-07T07:11:48.465		-14.06x	-52.28	74490.58	24.29		
B (IER)	E	2032-04-07T07:23:45.908		-16.12x	-51.92	91984.69	24.46		
B (OER)	E	2032-04-07T07:41:08.729		-19.01x	-51.03	117571.17	24.60		
A (IER)	E	2032-04-07T07:44:10.760		-19.50x	-50.83	122050.38	24.62		
Encke (IEG)	E	2032-04-07T07:51:52.409		-20.73x	-50.27	133423.31	24.65		
Encke (OEG)	E	2032-04-07T07:52:05.452		-20.76x	-50.25	133744.89	24.66		
A (OER)	E	2032-04-07T07:54:08.305		-21.09x	-50.09	136774.40	24.66		
F ring	E	2032-04-07T07:56:37.743		-21.47x	-49.88	140461.00	24.67		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-04-07T06:21:22.030
 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 : 3415147613398691200
 2Mass ID (if available) : 05075543+2142173
 ICRS Star Coord at Epoch: 05h 07m 55.43573s +21:42:17.13566s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 4.775
 G magnitude : 5.723
 RP magnitude : 5.437
 BP magnitude : 5.853
 DUPflag : 0
 Distance (au) : 9.473
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.40
 Sun-Target sep (deg) : 60.38
 Sun-Moon sep (deg) : 99.35
 B (ring opening deg) : -26.88
 PA of pole (deg) : -4.32
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.480
 C/A sky separation (km) : 3297.8
 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_itr93_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	2032-04-07T04:45:08.101		57.85	-2.58x	140461.00	-24.09		
A (OER)	I	2032-04-07T04:47:41.158		57.25	-3.17x	136774.40	-24.09		
Encke (OEG)	I	2032-04-07T04:49:46.929		56.77	-3.66x	133744.89	-24.09		
Encke (IEG)	I	2032-04-07T04:50:00.280		56.72	-3.71x	133423.31	-24.09		
A (IER)	I	2032-04-07T04:57:52.400		54.89	-5.54	122050.38	-24.09		
B (OER)	I	2032-04-07T05:00:58.336		54.17	-6.26	117571.16	-24.09		
B (IER)	I	2032-04-07T05:18:40.550		50.06	-10.35	91984.69	-24.08		
C (IER)	I	2032-04-07T05:30:47.324		47.25	-13.14	74490.58	-24.06		
Saturn	I	2032-04-07T05:39:47.912		45.17	-15.21	60255.54		5.24	6.43
Saturn	E	2032-04-07T07:02:48.620		26.10	-33.75	60267.92		0.41	0.50
C (IER)	E	2032-04-07T07:12:34.202		23.88	-35.85	74490.58	24.24		
B (IER)	E	2032-04-07T07:24:34.951		21.16	-38.39	91984.69	24.30		
B (OER)	E	2032-04-07T07:42:06.156		17.21	-42.02	117571.17	24.37		
A (IER)	E	2032-04-07T07:45:09.899		16.52	-42.64	122050.38	24.38		
Encke (IEG)	E	2032-04-07T07:52:56.101		14.77	-44.20	133423.31	24.41		
Encke (OEG)	E	2032-04-07T07:53:09.277		14.72	-44.25	133744.89	24.41		
A (OER)	E	2032-04-07T07:55:13.384		14.26	-44.66	136774.40	24.41		
F ring	E	2032-04-07T07:57:44.368		13.70	-45.16	140461.00	24.42		