

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T15:02:51.580
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4115099842417337344
 2Mass ID (if available) : 17185284-2131547

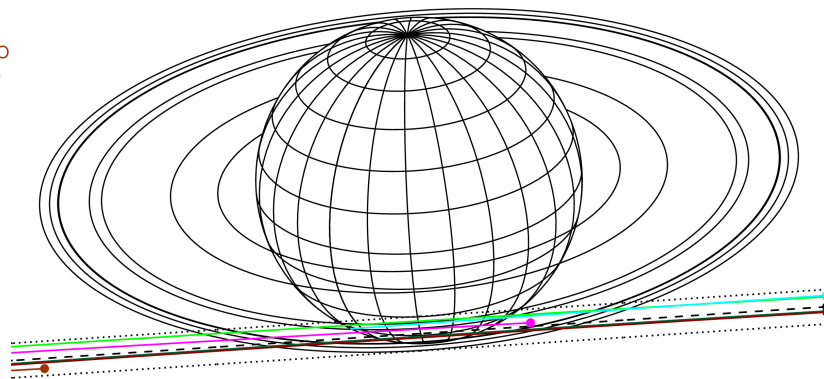
Saturn 2046-05-25T15:02:51 K8.45 G14.20 PgtRgt

ICRS Star Coord at Epoch: 17h 18m 52.82674s -21:31:55.11580s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.447
 G magnitude : 14.204
 RP magnitude : 12.822
 BP magnitude : 16.639
 DUPflag : 0
 Distance (au) : 9.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.95
 Sun-Target sep (deg) : 163.43
 Sun-Moon sep (deg) : 50.46
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58



Earth
 PMO
 IRTF
 KAV
 AAT
 SAAO
 MSO

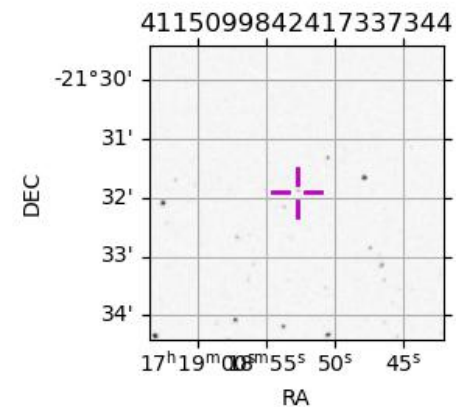


2046-05-25T15:02:51.5800 a: 17 18 52.8267 s -21 31 55.116 C/A 8.593° PA 3.78 deg v_sky -18.95 km/s D 09.06 AU
 Credit: Styled after SORA/Lucky Star

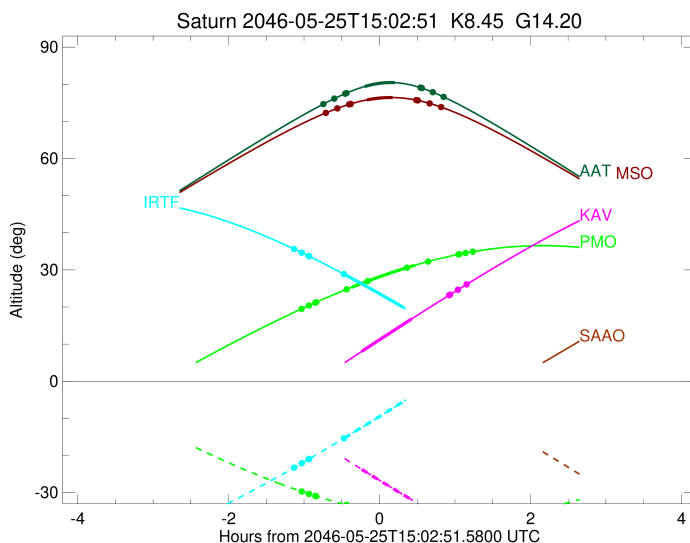
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+	+	+	MAY 25 14:00 - MAY 25 16:17	PieRie
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					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	+		MAY 25 13:54 - MAY 25 15:22	PieRin
KAV	Kavalur Observ	12.6	78.8		+	+	MAY 25 14:48 - MAY 25 16:12	PieRne
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+	+	+	MAY 25 14:18 - MAY 25 15:54	PieRie
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	MAY 25 14:20 - MAY 25 15:52	PieRie

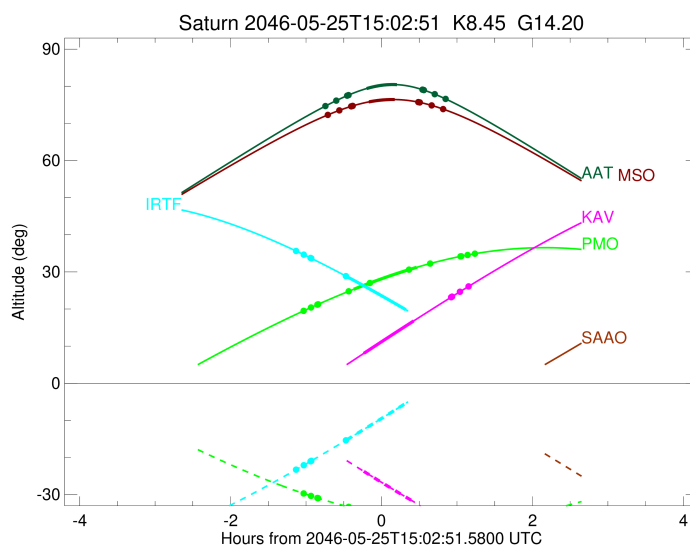
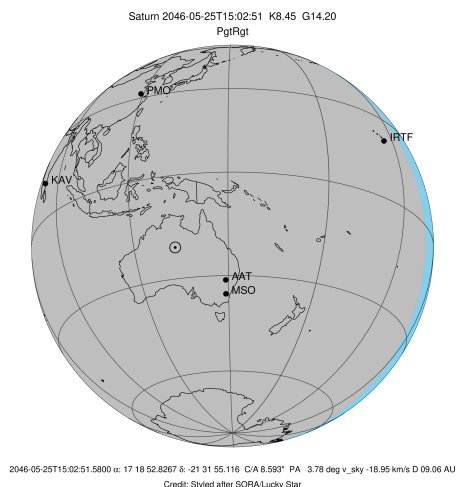


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T15:05:50.760
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4115099842417337344
 2Mass ID (if available) : 17185284-2131547
 ICRS Star Coord at Epoch: 17h 18m 52.82674s -21:31:55.11580s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.447
 G magnitude : 14.204
 RP magnitude : 12.822
 BP magnitude : 16.639
 DUPflag : 0
 Distance (au) : 9.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.95
 Sun-Target sep (deg) : 163.43
 Sun-Moon sep (deg) : 51.10
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 7.886
 C/A sky separation (km) : 51808.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-05-25T14:00:55.537		19.50	-29.69	140461.00	-10.85		
A (OER)	I	2046-05-25T14:06:45.853		20.41	-30.34	136774.40	-10.19		
Encke (OEG)	I	2046-05-25T14:11:52.275		21.18	-30.90	133744.89	-9.57		
Encke (IEG)	I	2046-05-25T14:12:25.986		21.27	-30.96	133423.31	-9.50		
A (IER)	I	2046-05-25T14:36:41.986		24.77	-33.29	122050.38	-5.96		
B (OER)	I	2046-05-25T14:53:09.821	b	26.94	-34.57	117571.16	-3.06		
Saturn	I	2046-05-25T14:40:44.872		25.32	-33.63	59387.05		-52.09	-57.30
Saturn	E	2046-05-25T15:30:58.403		31.25	-36.54	59423.22		-50.56	-55.87
B (OER)	E	2046-05-25T15:25:21.832	b	30.68	-36.34	117571.16	3.07		
A (IER)	E	2046-05-25T15:41:45.957		32.27	-36.84	122050.38	5.98		
Encke (IEG)	E	2046-05-25T16:05:53.649		34.20	-37.04	133423.31	9.57		
Encke (OEG)	E	2046-05-25T16:06:27.129		34.23	-37.03	133744.89	9.64		
A (OER)	E	2046-05-25T16:11:31.369		34.57	-36.99	136774.40	10.27		
F ring	E	2046-05-25T16:17:19.002		34.92	-36.91	140461.00	10.93		

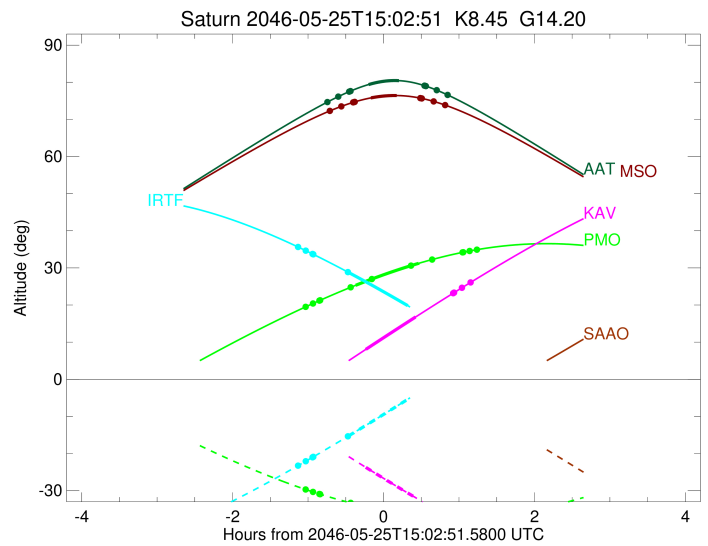
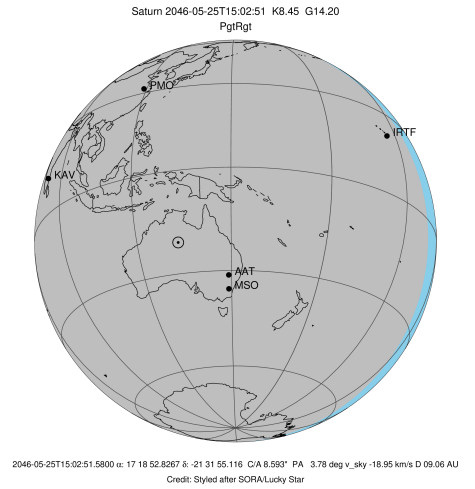
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T14:58:36.530
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4115099842417337344
 2Mass ID (if available) : 17185284-2131547
 ICRS Star Coord at Epoch: 17h 18m 52.82674s -21:31:55.11580s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.447
 G magnitude : 14.204
 RP magnitude : 12.822
 BP magnitude : 16.639
 DUPflag : 0
 Distance (au) : 9.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.95
 Sun-Target sep (deg) : 163.43
 Sun-Moon sep (deg) : 50.33
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.039
 C/A sky separation (km) : 52810.3
 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



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

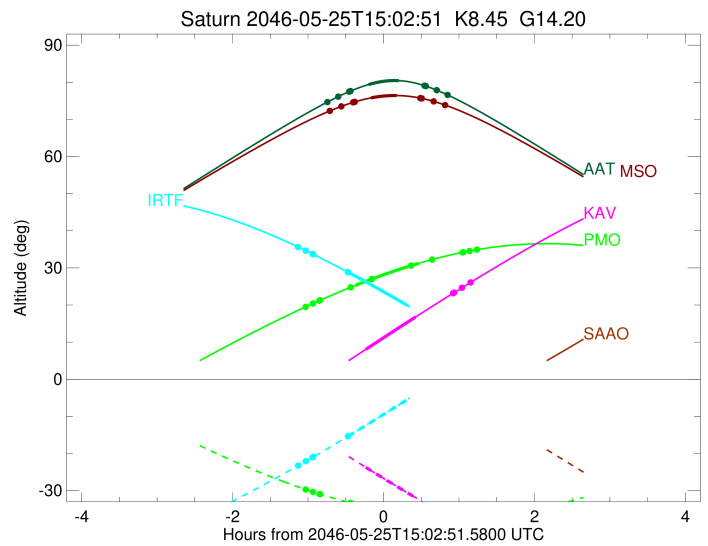
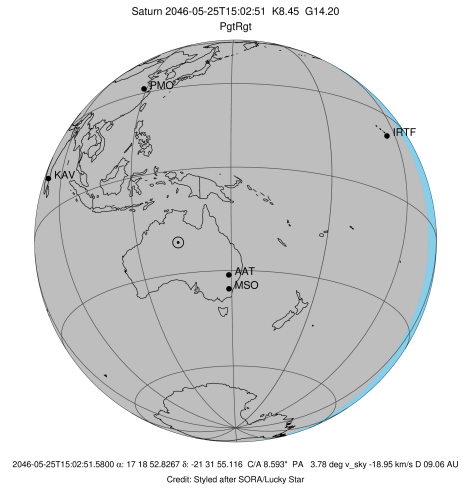
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-05-25T13:54:53.801		35.64	-23.28	140461.00	-10.43		
A (OER)	I	2046-05-25T14:00:59.979		34.65	-22.09	136774.40	-9.70		
Encke (OEG)	I	2046-05-25T14:06:23.770		33.76	-21.03	133744.89	-9.01		
Encke (IEG)	I	2046-05-25T14:06:59.634		33.66	-20.91	133423.31	-8.93		
A (IER)	I	2046-05-25T14:34:28.240		28.88	-15.38	122050.38	-4.69		
Saturn	I	2046-05-25T14:35:08.273		28.76	-15.25	59363.79		-53.09	-58.23
Saturn	E	2046-05-25T15:22:08.867		19.83	-5.39	59378.28		-52.47	-57.65
A (IER)	E	2046-05-25T15:25:50.583		19.09	-4.60x	122050.38	4.67		
Encke (IEG)	E	2046-05-25T15:53:29.182		13.49	1.39x	133423.31	8.85		
Encke (OEG)	E	2046-05-25T15:54:05.349		13.37	1.52x	133744.89	8.93		
A (OER)	E	2046-05-25T15:59:32.037		12.24	2.71x	136774.40	9.61		
F ring	E	2046-05-25T16:05:41.840		10.96	4.06x	140461.00	10.32		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T15:08:33.570
 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 : 4115099842417337344
 2Mass ID (if available) : 17185284-2131547
 ICRS Star Coord at Epoch: 17h 18m 52.82674s -21:31:55.11580s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.447
 G magnitude : 14.204
 RP magnitude : 12.822
 BP magnitude : 16.639
 DUPflag : 0
 Distance (au) : 9.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.95
 Sun-Target sep (deg) : 163.43
 Sun-Moon sep (deg) : 51.15
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.340
 C/A sky separation (km) : 54787.4
 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	2046-05-25T14:13:06.287	0.02x	-16.05	140461.00	-9.24			
A (OER)	I	2046-05-25T14:20:03.980	1.60x	-17.57	136774.40	-8.40			
Encke (OEG)	I	2046-05-25T14:26:23.347	3.03x	-18.94	133744.89	-7.57			
Encke (IEG)	I	2046-05-25T14:27:06.128	3.19x	-19.09	133423.31	-7.47			
Saturn	I	2046-05-25T14:48:45.895	8.05	-23.72	59284.76			-56.58	-61.43
Saturn	E	2046-05-25T15:28:23.657	16.78	-31.89	59320.66			-54.97	-59.96
Encke (IEG)	E	2046-05-25T15:58:30.803	23.24	-37.75	133423.31	7.55			
Encke (OEG)	E	2046-05-25T15:59:13.103	23.39	-37.88	133744.89	7.65			
A (OER)	E	2046-05-25T16:05:27.935	24.70	-39.05	136774.40	8.50			
F ring	E	2046-05-25T16:12:20.073	26.14	-40.30	140461.00	9.38			

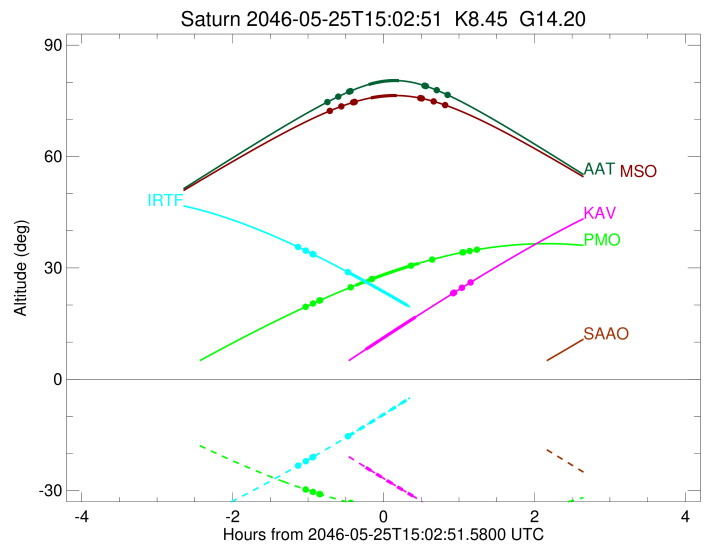
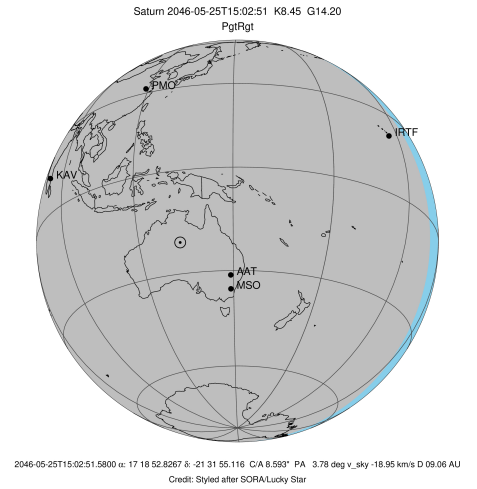
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T15:03:03.850
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4115099842417337344
 2Mass ID (if available) : 17185284-2131547
 ICRS Star Coord at Epoch: 17h 18m 52.82674s -21:31:55.11580s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.447
 G magnitude : 14.204
 RP magnitude : 12.822
 BP magnitude : 16.639
 DUPflag : 0
 Distance (au) : 9.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.95
 Sun-Target sep (deg) : 163.43
 Sun-Moon sep (deg) : 51.18
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.755
 C/A sky separation (km) : 57515.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



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

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-05-25T14:18:09.903		74.66	-79.21	140461.00	-7.72		
A (OER)	I	2046-05-25T14:26:48.046		76.12	-78.36	136774.40	-6.50		
Encke (OEG)	I	2046-05-25T14:35:26.111		77.46	-77.28	133744.89	-5.18		
Encke (IEG)	I	2046-05-25T14:36:29.148		77.61	-77.14	133423.31	-5.02		
Saturn	I	2046-05-25T14:51:00.734		79.39	-74.89	59195.08		-60.79	-65.21
Saturn	E	2046-05-25T15:15:10.314		80.44	-70.53	59210.93		-60.02	-64.52
Encke (IEG)	E	2046-05-25T15:35:48.339		79.05	-66.46	133423.31	5.02		
Encke (OEG)	E	2046-05-25T15:36:51.298		78.94	-66.25	133744.89	5.19		
A (OER)	E	2046-05-25T15:45:28.697		77.84	-64.50	136774.40	6.51		
F ring	E	2046-05-25T15:54:06.152		76.55	-62.72	140461.00	7.73		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-25T15:03:02.100
 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 : 4115099842417337344
 2Mass ID (if available) : 17185284-2131547
 ICRS Star Coord at Epoch: 17h 18m 52.82674s -21:31:55.11580s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.447
 G magnitude : 14.204
 RP magnitude : 12.822
 BP magnitude : 16.639
 DUPflag : 0
 Distance (au) : 9.058
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.95
 Sun-Target sep (deg) : 163.43
 Sun-Moon sep (deg) : 51.17
 B (ring opening deg) : 26.51
 PA of pole (deg) : 4.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.822
 C/A sky separation (km) : 57953.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 Saturn_ring_plane.tf
 sat378.bsp
 sat286.bsp
 vgr1.sat286.bsp
 vgr2.sat286.bsp
 HST1081HSPephemUTC.bsp
 pfb10000r.bsp
 cassini.bsp
 earthstns_itrf93_040916.bsp
 earth_200101_990628_predict.bpc
 earth_720101_070426.bpc
 cpck28Mar2008.tpc
 pck.sat440.tpc
 IAU_SATURN_for_RINGFIT.tpc
 naif0012.tls
 earth_flat_IAU.spk



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

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-05-25T14:20:05.640		72.28	-75.29	140461.00	-7.39		
A (OER)	I	2046-05-25T14:29:12.208		73.50	-74.60	136774.40	-6.08		
Encke (OEG)	I	2046-05-25T14:38:36.601		74.58	-73.66	133744.89	-4.64		
Encke (IEG)	I	2046-05-25T14:39:47.416		74.70	-73.53	133423.31	-4.45		
Saturn	I	2046-05-25T14:52:42.521		75.79	-71.90	59179.81		-61.55	-65.88
Saturn	E	2046-05-25T15:13:25.068		76.43	-68.76	59193.43		-60.87	-65.28
Encke (IEG)	E	2046-05-25T15:32:28.639		75.71	-65.48	133423.31	4.45		
Encke (OEG)	E	2046-05-25T15:33:39.369		75.63	-65.27	133744.89	4.64		
A (OER)	E	2046-05-25T15:43:03.056		74.82	-63.56	136774.40	6.09		
F ring	E	2046-05-25T15:52:08.908		73.83	-61.86	140461.00	7.40		