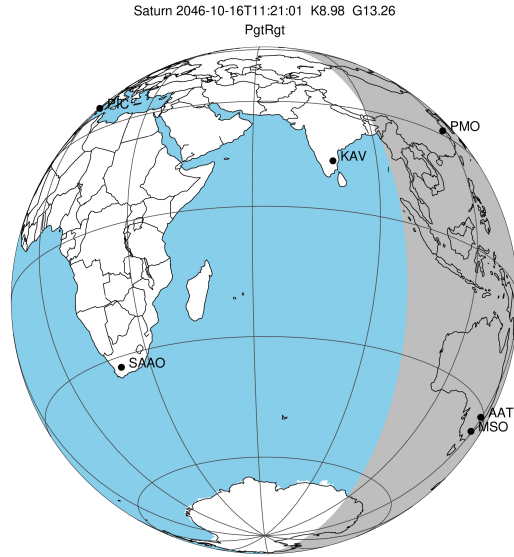


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-10-16T11:21:01.470
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4115597023494160768
 2Mass ID (if available) : 17100641-2144385

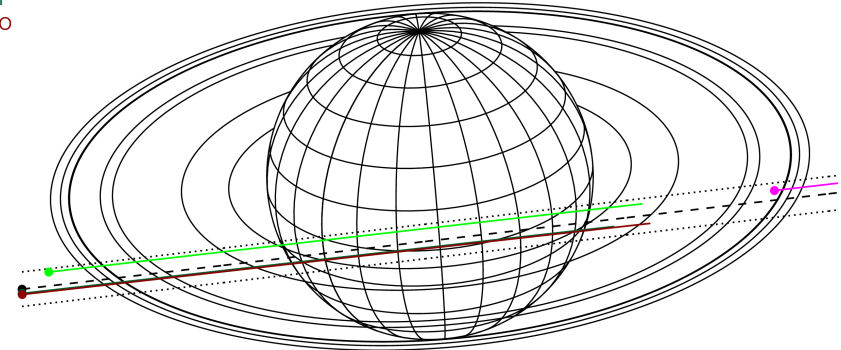
Saturn 2046-10-16T11:21:01 K8.98 G13.26 PgtRgt

ICRS Star Coord at Epoch: 17h 10m 06.42158s -21:44:38.98907s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.983
 G magnitude : 13.264
 RP magnitude : 12.112
 BP magnitude : 14.654
 DUPflag : 0
 Distance (au) : 10.567
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.31
 Sun-Target sep (deg) : 55.82
 Sun-Moon sep (deg) : 140.08
 B (ring opening deg) : 26.88
 PA of pole (deg) : 4.38



Earth
 PMO
 KAV
 AAT
 MSO

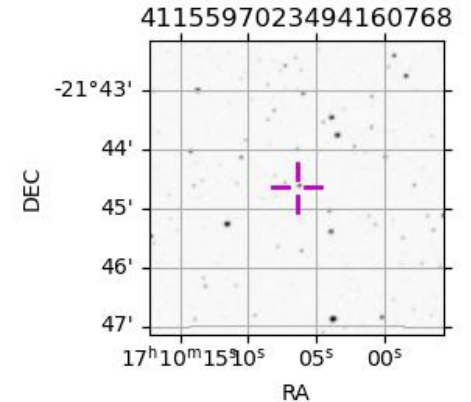


2046-10-16T11:21:01.4700 az: 17 10 06.4216 ra: -21 44 38.989 C/A 3.082° PA 6.74 deg v_sky +26.31 km/s D 10.57 AU
 Credit: Styled after SORA/Lucky Star

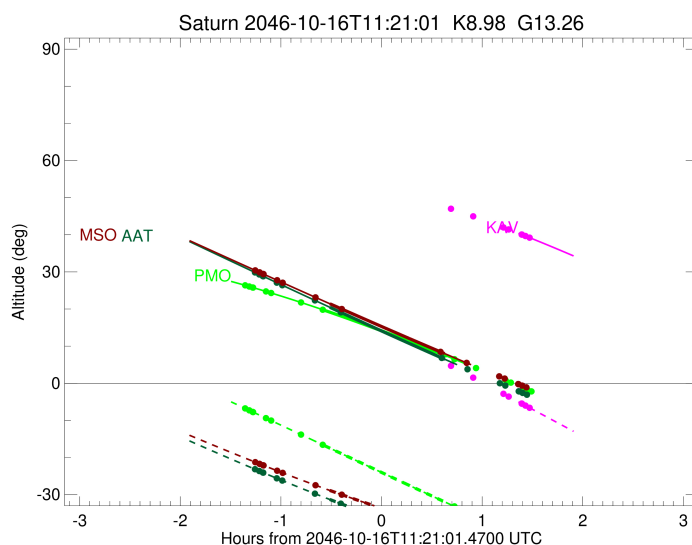
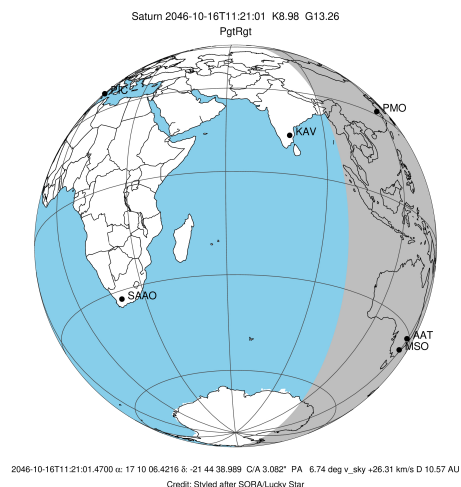
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEncode
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	+	+	+	OCT 16 09:59 - OCT 16 12:04	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					PnnRnn
KAV	Kavalur Observ	12.6	78.8			+	OCT 16 12:44 - OCT 16 12:49	PnnRne
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+	+		OCT 16 10:05 - OCT 16 11:58	PieRin
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	OCT 16 10:05 - OCT 16 12:11	PieRie



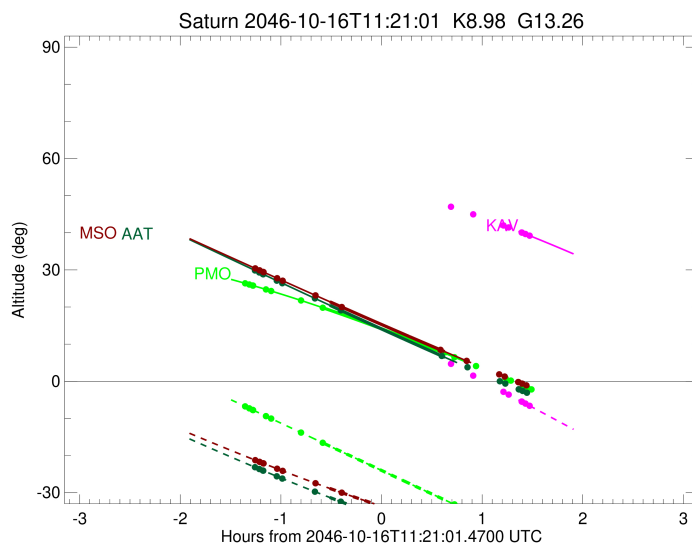
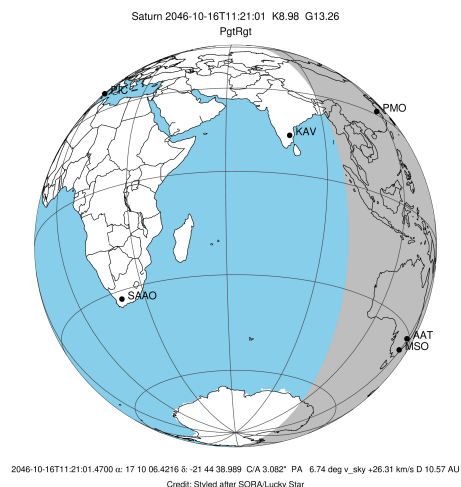
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-10-16T11:23:31.330
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4115597023494160768
 2Mass ID (if available) : 17100641-2144385
 ICRS Star Coord at Epoch: 17h 10m 06.42158s -21:44:38.98907s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.983
 G magnitude : 13.264
 RP magnitude : 12.112
 BP magnitude : 14.654
 DUPflag : 0
 Distance (au) : 10.567
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.31
 Sun-Target sep (deg) : 55.82
 Sun-Moon sep (deg) : 140.75
 B (ring opening deg) : 26.88
 PA of pole (deg) : 4.38
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.468
 C/A sky separation (km) : 18910.3
 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	2046-10-16T09:59:41.150		26.39	-6.76	140461.00	-24.88		
A (OER)	I	2046-10-16T10:02:09.525		26.07	-7.29	136774.40	-24.81		
Encke (OEG)	I	2046-10-16T10:04:11.750		25.80	-7.72	133744.89	-24.76		
Encke (IEG)	I	2046-10-16T10:04:24.740		25.77	-7.76	133423.31	-24.75		
A (IER)	I	2046-10-16T10:12:06.502		24.74	-9.39	122050.38	-24.50		
B (OER)	I	2046-10-16T10:15:09.813		24.32	-10.04	117571.16	-24.37		
B (IER)	I	2046-10-16T10:33:01.328		21.77	-13.82	91984.69	-23.24		
C (IER)	I	2046-10-16T10:45:58.446		19.82	-16.57	74490.58	-21.60		
Saturn	I	2046-10-16T10:47:01.307		19.65	-16.80	60122.03		-18.24	-22.00
Saturn	E	2046-10-16T11:59:58.409		7.30	-32.22	60176.02		-14.37	-17.46
C (IER)	E	2046-10-16T12:04:29.315		6.48	-33.16	74490.58	21.71		
B (IER)	E	2046-10-16T12:17:21.978		4.10x	-35.84	91984.69	23.39		
B (OER)	E	2046-10-16T12:35:05.571		0.76x	-39.49	117571.16	24.58		
A (IER)	E	2046-10-16T12:38:07.312		0.18x	-40.11	122050.38	24.71		
Encke (IEG)	E	2046-10-16T12:45:44.840		-1.28x	-41.66	133423.31	24.99		
Encke (OEG)	E	2046-10-16T12:45:57.705		-1.32x	-41.70	133744.89	25.00		
A (OER)	E	2046-10-16T12:47:58.740		-1.71x	-42.11	136774.40	25.06		
F ring	E	2046-10-16T12:50:25.633		-2.19x	-42.60	140461.00	25.13		

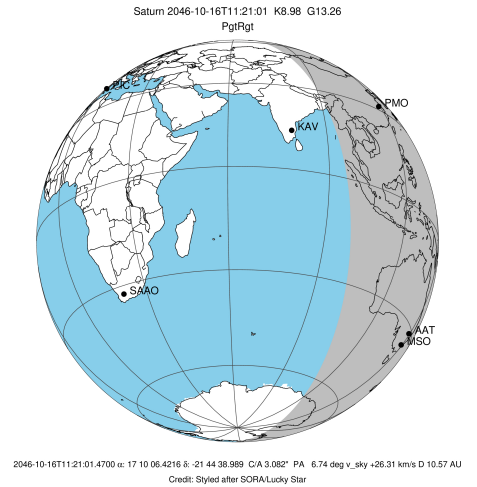
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-10-16T11:21:52.330
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4115597023494160768
 2Mass ID (if available) : 17100641-2144385
 ICRS Star Coord at Epoch: 17h 10m 06.42158s -21:44:38.98907s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.983
 G magnitude : 13.264
 RP magnitude : 12.112
 BP magnitude : 14.654
 DUPflag : 0
 Distance (au) : 10.567
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.31
 Sun-Target sep (deg) : 55.82
 Sun-Moon sep (deg) : 140.75
 B (ring opening deg) : 26.88
 PA of pole (deg) : 4.38
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 2.603
 C/A sky separation (km) : 19947.8
 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



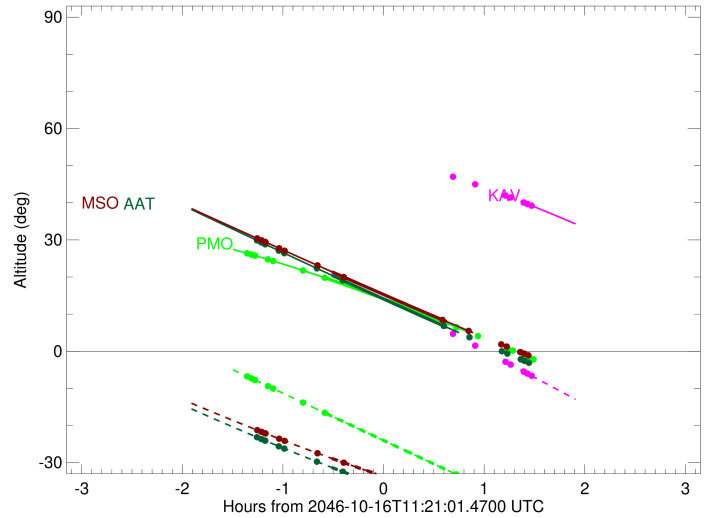
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-10-16T09:58:19.380		55.40	33.99x	140461.00	-24.65		
A (OER)	I	2046-10-16T10:00:49.151		55.48	33.41x	136774.40	-24.58		
Encke (OEG)	I	2046-10-16T10:02:52.577		55.53	32.94x	133744.89	-24.51		
Encke (IEG)	I	2046-10-16T10:03:05.698		55.54	32.89x	133423.31	-24.50		
A (IER)	I	2046-10-16T10:10:52.488		55.67	31.09x	122050.38	-24.21		
B (OER)	I	2046-10-16T10:13:58.032		55.70	30.38x	117571.17	-24.07		
B (IER)	I	2046-10-16T10:32:06.514		55.51	26.15x	91984.69	-22.79		
C (IER)	I	2046-10-16T10:45:23.404	b	55.00	23.04x	74490.58	-20.92		
Saturn	I	2046-10-16T10:45:20.605		55.01	23.05x	60104.26		-19.36	-23.30
Saturn	E	2046-10-16T11:58:24.235		47.60	5.67x	60166.52		-15.12	-18.34
C (IER)	E	2046-10-16T12:02:25.329		47.02	4.70x	74490.58	20.97		
B (IER)	E	2046-10-16T12:15:40.162		44.98	1.52x	91984.69	22.85		
B (OER)	E	2046-10-16T12:33:45.188		41.98	-2.84x	117571.16	24.16		
A (IER)	E	2046-10-16T12:36:50.054		41.44	-3.58x	122050.38	24.30		
Encke (IEG)	E	2046-10-16T12:44:35.022		40.08	-5.46	133423.31	24.61		
Encke (OEG)	E	2046-10-16T12:44:48.089		40.04	-5.51	133744.89	24.61		
A (OER)	E	2046-10-16T12:46:51.003		39.67	-6.00	136774.40	24.68		
F ring	E	2046-10-16T12:49:20.138		39.22	-6.61	140461.00	24.76		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-10-16T11:24:34.510
 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 : 4115597023494160768
 2Mass ID (if available) : 17100641-2144385
 ICRS Star Coord at Epoch: 17h 10m 06.42158s -21:44:38.98907s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.983
 G magnitude : 13.264
 RP magnitude : 12.112
 BP magnitude : 14.654
 DUPflag : 0
 Distance (au) : 10.567
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.31
 Sun-Target sep (deg) : 55.82
 Sun-Moon sep (deg) : 140.79
 B (ring opening deg) : 26.88
 PA of pole (deg) : 4.38
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.386
 C/A sky separation (km) : 25947.4
 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_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

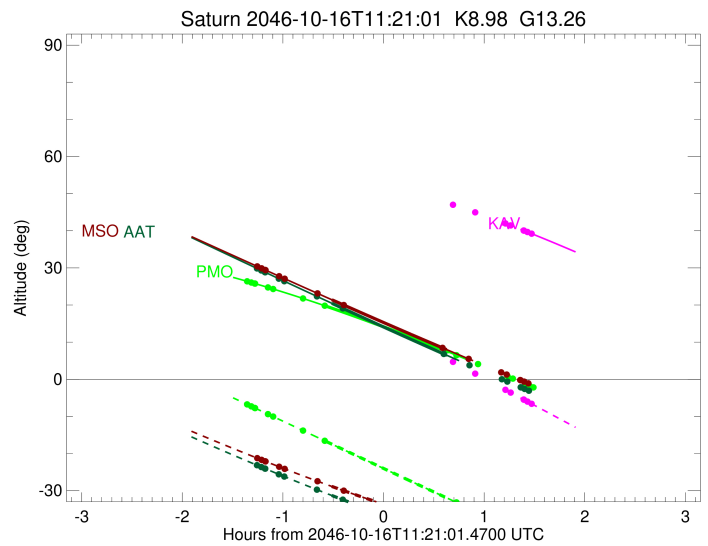
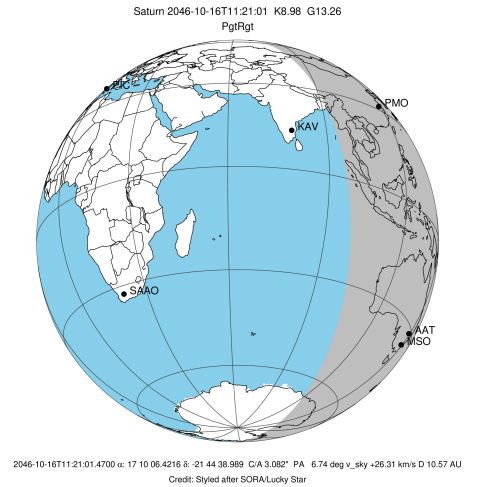


Saturn 2046-10-16T11:21:01 K8.98 G13.26



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-10-16T10:05:31.785		29.87	-23.14	140461.00	-23.93		
A (OER)	I	2046-10-16T10:08:06.272		29.32	-23.63	136774.40	-23.80		
Encke (OEG)	I	2046-10-16T10:10:13.867		28.87	-24.03	133744.89	-23.69		
Encke (IEG)	I	2046-10-16T10:10:27.448		28.82	-24.08	133423.31	-23.67		
A (IER)	I	2046-10-16T10:18:32.913		27.11	-25.59	122050.38	-23.16		
B (OER)	I	2046-10-16T10:21:47.379		26.43	-26.19	117571.16	-22.91		
B (IER)	I	2046-10-16T10:41:17.396		22.33	-29.73	91984.69	-20.54		
C (IER)	I	2046-10-16T10:56:45.678	b	19.11	-32.43	74490.58	-16.75		
Saturn	I	2046-10-16T10:50:12.844		20.47	-31.30	60012.24		-24.51	-29.16
Saturn	E	2046-10-16T11:58:53.623		6.43	-41.94	60079.31		-20.85	-25.02
C (IER)	E	2046-10-16T11:56:53.659	b	6.83	-41.67	74490.58	16.84		
B (IER)	E	2046-10-16T12:12:16.261		3.78x	-43.62	91984.69	20.68		
B (OER)	E	2046-10-16T12:31:36.777		0.00x	-45.75	117571.16	23.12		
A (IER)	E	2046-10-16T12:34:49.373		-0.62x	-46.07	122050.38	23.39		
Encke (IEG)	E	2046-10-16T12:42:49.800		-2.15x	-46.81	133423.31	23.93		
Encke (OEG)	E	2046-10-16T12:43:03.232		-2.20x	-46.82	133744.89	23.95		
A (OER)	E	2046-10-16T12:45:09.411		-2.60x	-47.01	136774.40	24.07		
F ring	E	2046-10-16T12:47:42.136		-3.08x	-47.22	140461.00	24.21		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-10-16T11:24:26.870
 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 : 4115597023494160768
 2Mass ID (if available) : 17100641-2144385
 ICRS Star Coord at Epoch: 17h 10m 06.42158s -21:44:38.98907s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 8.983
 G magnitude : 13.264
 RP magnitude : 12.112
 BP magnitude : 14.654
 DUPflag : 0
 Distance (au) : 10.567
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 26.31
 Sun-Target sep (deg) : 55.82
 Sun-Moon sep (deg) : 140.78
 B (ring opening deg) : 26.88
 PA of pole (deg) : 4.38
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.435
 C/A sky separation (km) : 26322.2
 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	2046-10-16T10:05:42.105		30.42	-21.24	140461.00	-23.86		
A (OER)	I	2046-10-16T10:08:17.010		29.89	-21.70	136774.40	-23.73		
Encke (OEG)	I	2046-10-16T10:10:24.974		29.46	-22.08	133744.89	-23.62		
Encke (IEG)	I	2046-10-16T10:10:38.595		29.41	-22.12	133423.31	-23.60		
A (IER)	I	2046-10-16T10:18:45.715		27.76	-23.56	122050.38	-23.07		
B (OER)	I	2046-10-16T10:22:00.972		27.10	-24.12	117571.16	-22.81		
B (IER)	I	2046-10-16T10:41:38.343		23.14	-27.46	91984.69	-20.35		
C (IER)	I	2046-10-16T10:57:19.740	b	20.00	-30.01	74490.58	-16.39		
Saturn	I	2046-10-16T10:50:12.594		21.42	-28.87	60005.21		-24.87	-29.56
Saturn	E	2046-10-16T11:58:38.892		8.00	-38.66	60073.48		-21.19	-25.41
C (IER)	E	2046-10-16T11:56:10.568	b	8.47	-38.36	74490.58	16.48		
B (IER)	E	2046-10-16T12:11:46.429		5.50	-40.16	91984.69	20.49		
B (OER)	E	2046-10-16T12:31:14.648		1.86x	-42.11	117571.16	23.01		
A (IER)	E	2046-10-16T12:34:28.107		1.27x	-42.39	122050.38	23.29		
Encke (IEG)	E	2046-10-16T12:42:30.383		-0.21x	-43.06	133423.31	23.85		
Encke (OEG)	E	2046-10-16T12:42:43.861		-0.25x	-43.08	133744.89	23.87		
A (OER)	E	2046-10-16T12:44:50.465		-0.63x	-43.25	136774.40	23.99		
F ring	E	2046-10-16T12:47:23.675		-1.10x	-43.44	140461.00	24.13		