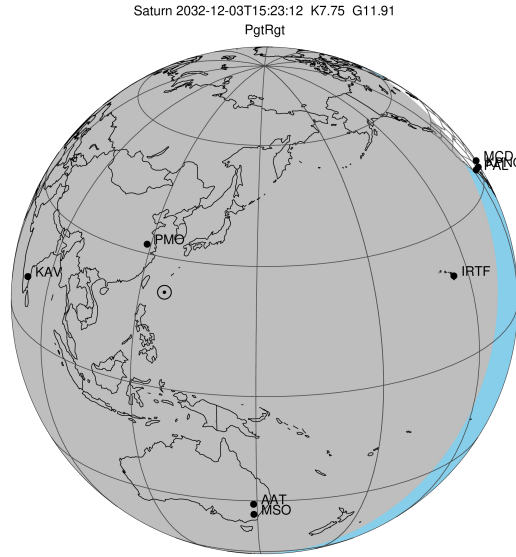


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-12-03T15:23:12.940
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3377160169558092928
 2Mass ID (if available) : 06211476+2221039

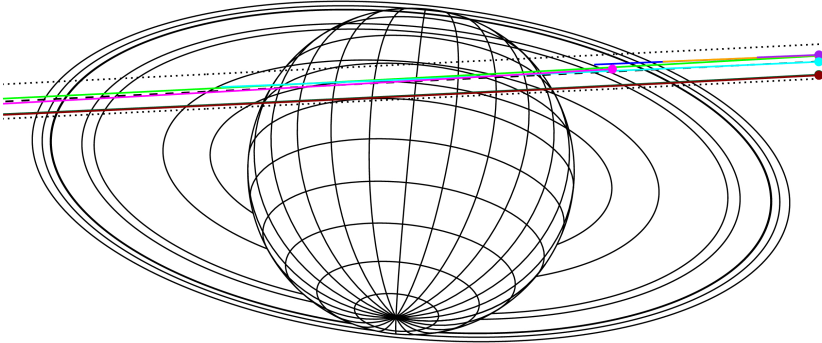
Saturn 2032-12-03T15:23:12 K7.75 G11.91 PgtRgt

ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.753
 G magnitude : 11.906
 RP magnitude : 10.796
 BP magnitude : 13.213
 DUPflag : 0
 Distance (au) : 8.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.69
 Sun-Target sep (deg) : 156.63
 Sun-Moon sep (deg) : 165.98
 B (ring opening deg) : -26.00
 PA of pole (deg) : -5.90



Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 AAT
 MSO

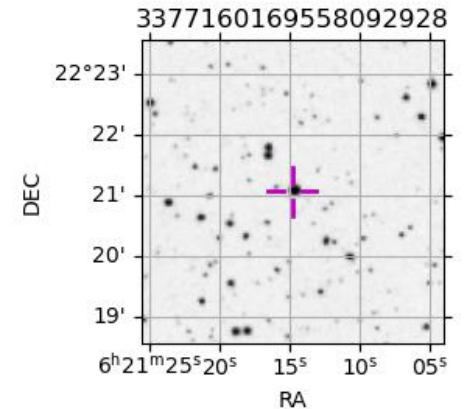


2032-12-03T15:23:12.9400 ex: 06 21 14.7717 s: +22 21 03.855 C/A 5.648° PA 182.81 deg v_sky -17.69 km/s D 08.10 AU
 Credit: Styled after SORA/Lucky Star

#	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

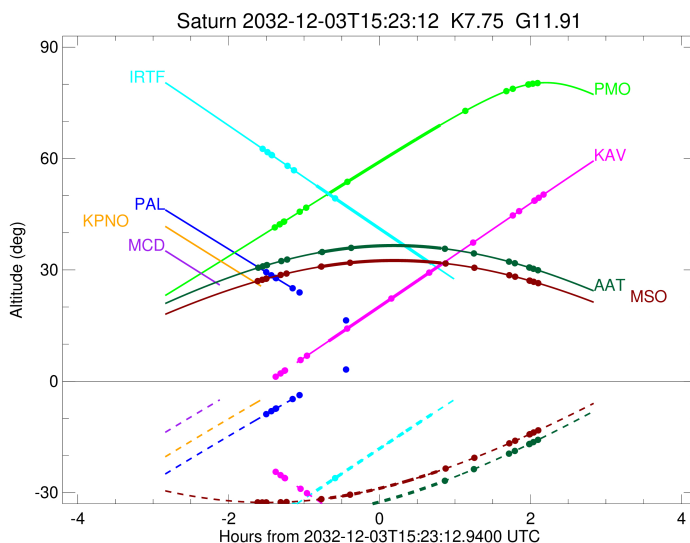
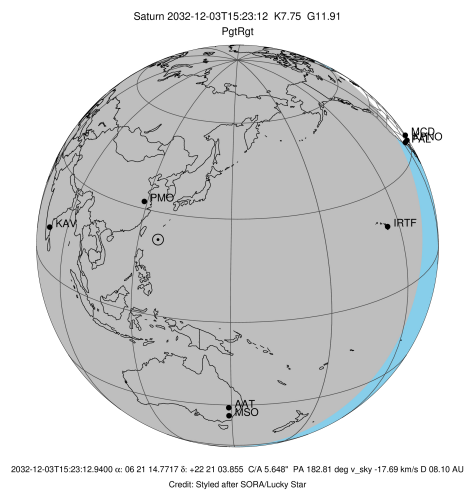
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+	+	DEC 03 13:53 - DEC 03 14:01	PnnRin
PMO	Purple Mtn Obs	32.1	118.8	+	+	+	DEC 03 14:00 - DEC 03 17:28	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	+	+		DEC 03 13:50 - DEC 03 16:04	PieRin
KAV	Kavalur Observ	12.6	78.8		+	+	DEC 03 14:20 - DEC 03 17:33	PieRie
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1	+	+	+	DEC 03 13:46 - DEC 03 17:29	PieRie
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+	+	DEC 03 13:46 - DEC 03 17:29	PieRie



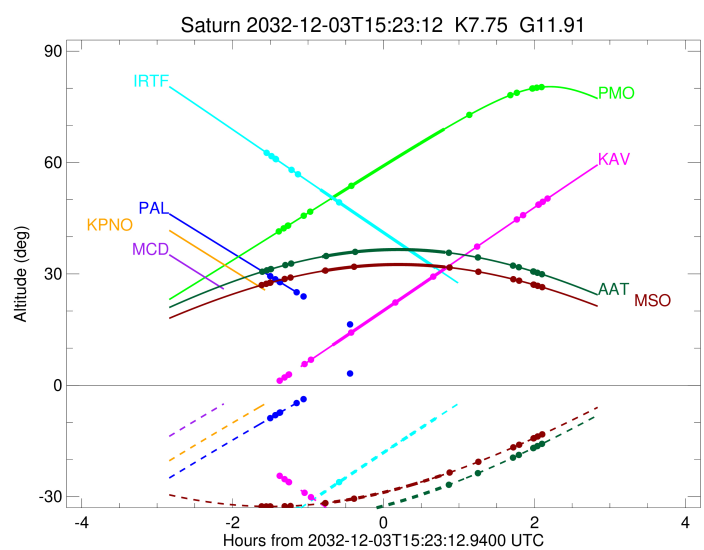
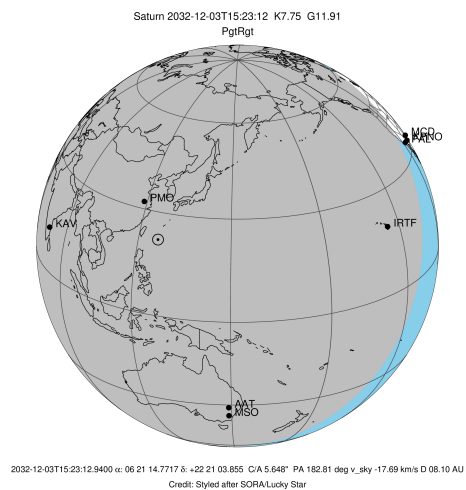
```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch             : 2032-12-03T15:18:04.070
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        : 3377160169558092928
2Mass ID (if available) : 06211476+2221039
ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 7.753
G magnitude           : 11.906
RP magnitude          : 10.796
BP magnitude          : 13.213
DUPflag               : 0
Distance (au)         : 8.102
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -17.69
Sun-Target sep (deg) : 156.63
Sun-Moon sep (deg)   : 166.88
B (ring opening deg) : -26.00
PA of pole (deg)     : -5.90
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 6.244
C/A sky separation (km) : 36690.9
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	2032-12-03T13:53:12.369		29.38	-8.85	140461.00	-15.23		
A (OER)	I	2032-12-03T13:57:16.123		28.54	-8.05	136774.40	-15.02		
Encke (OEG)	I	2032-12-03T14:00:39.110		27.84	-7.39	133744.89	-14.83		
Encke (IEG)	I	2032-12-03T14:01:00.810		27.77	-7.32	133423.31	-14.81		
A (IER)	I	2032-12-03T14:14:10.960		25.05	-4.78x	122050.38	-13.94		
B (OER)	I	2032-12-03T14:19:37.215		23.93	-3.74x	117571.16	-13.51		
B (IER)	I	2032-12-03T14:56:43.331	b	16.38	3.19x	91984.69	-8.94		
Saturn	I	2032-12-03T14:33:46.365		21.04	-1.06x	59695.91		40.39	46.01
Saturn	E	2032-12-03T16:02:54.147		3.38x	14.61x	59999.17		26.27	31.12
B (IER)	E	2032-12-03T16:17:43.206		0.57x	16.95x	91984.69	8.91		
B (OER)	E	2032-12-03T16:55:08.003		-6.28x	22.41x	117571.16	13.34		
A (IER)	E	2032-12-03T17:00:38.711		-7.26x	23.15x	122050.38	13.75		
Encke (IEG)	E	2032-12-03T17:14:01.123		-9.59x	24.87x	133423.31	14.56		
Encke (OEG)	E	2032-12-03T17:14:23.188		-9.65x	24.92x	133744.89	14.58		
A (OER)	E	2032-12-03T17:17:49.659		-10.24x	25.35x	136774.40	14.76		
F ring	E	2032-12-03T17:21:57.764		-10.95x	25.85x	140461.00	14.96		

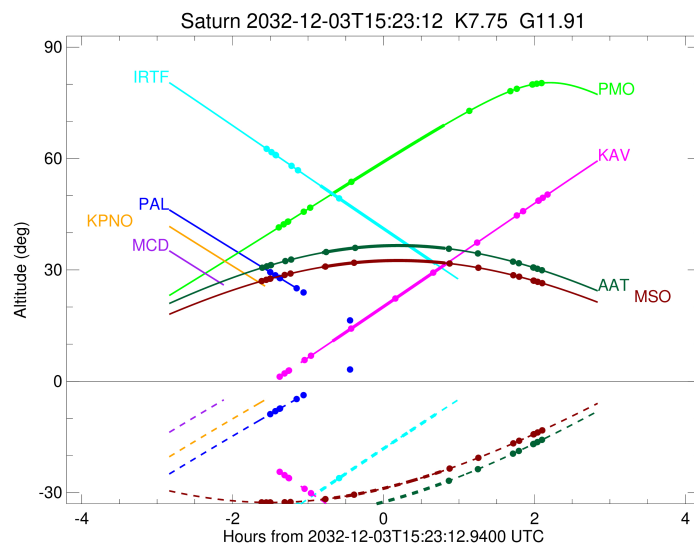
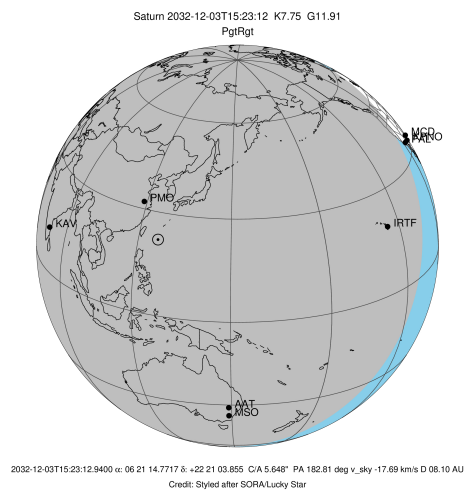
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-12-03T15:26:07.640
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 3377160169558092928
 2Mass ID (if available) : 06211476+2221039
 ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.753
 G magnitude : 11.906
 RP magnitude : 10.796
 BP magnitude : 13.213
 DUPflag : 0
 Distance (au) : 8.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.69
 Sun-Target sep (deg) : 156.63
 Sun-Moon sep (deg) : 165.80
 B (ring opening deg) : -26.00
 PA of pole (deg) : -5.90
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.858
 C/A sky separation (km) : 34418.0
 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	2032-12-03T14:00:00.981		41.46	-62.80	140461.00	-15.96		
A (OER)	I	2032-12-03T14:03:53.259		42.28	-63.59	136774.40	-15.79		
Encke (OEG)	I	2032-12-03T14:07:06.103		42.96	-64.25	133744.89	-15.63		
Encke (IEG)	I	2032-12-03T14:07:26.685		43.04	-64.32	133423.31	-15.62		
A (IER)	I	2032-12-03T14:19:51.099		45.68	-66.84	122050.38	-14.91		
B (OER)	I	2032-12-03T14:24:55.084		46.76	-67.85	117571.16	-14.56		
B (IER)	I	2032-12-03T14:57:46.822	b	53.74	-74.08	91984.69	-10.95		
Saturn	I	2032-12-03T14:40:57.128		50.17	-70.98	59734.19		38.73	44.33
Saturn	E	2032-12-03T16:11:32.559		69.02	-79.64	60052.48		23.33	27.83
B (IER)	E	2032-12-03T16:31:31.748		72.85	-77.35	91984.69	11.02		
B (OER)	E	2032-12-03T17:04:11.735		78.17	-71.81	117571.16	14.64		
A (IER)	E	2032-12-03T17:09:13.872		78.79	-70.86	122050.38	15.00		
Encke (IEG)	E	2032-12-03T17:21:33.503		79.94	-68.46	133423.31	15.72		
Encke (OEG)	E	2032-12-03T17:21:53.947		79.97	-68.39	133744.89	15.74		
A (OER)	E	2032-12-03T17:25:05.480		80.16	-67.76	136774.40	15.89		
F ring	E	2032-12-03T17:28:56.139		80.33	-66.99	140461.00	16.07		

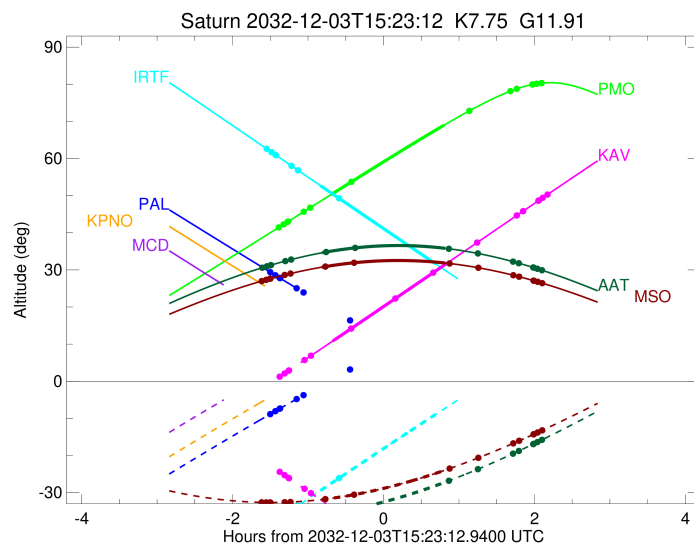
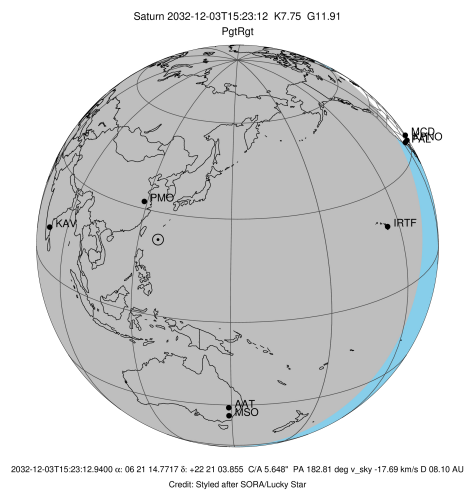
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-12-03T15:18:34.300
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 3377160169558092928
 2Mass ID (if available) : 06211476+2221039
 ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.753
 G magnitude : 11.906
 RP magnitude : 10.796
 BP magnitude : 13.213
 DUPflag : 0
 Distance (au) : 8.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.69
 Sun-Target sep (deg) : 156.63
 Sun-Moon sep (deg) : 166.84
 B (ring opening deg) : -26.00
 PA of pole (deg) : -5.90
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.787
 C/A sky separation (km) : 34004.5
 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

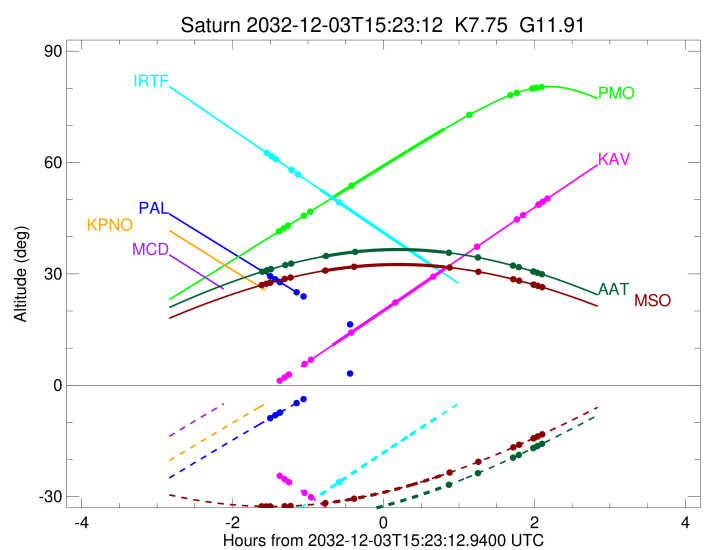
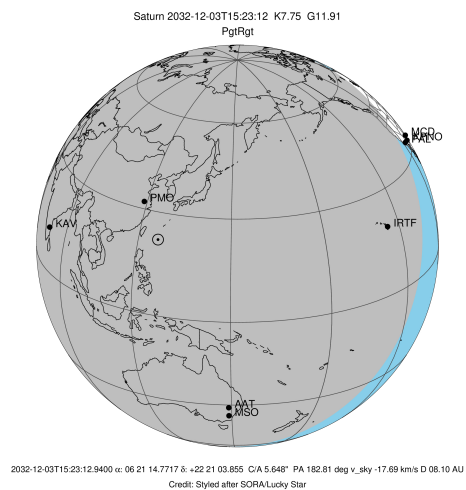
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2032-12-03T13:50:20.933		62.61	-39.21	140461.00	-16.01		
A (OER)	I	2032-12-03T13:54:12.522		61.71	-38.33	136774.40	-15.83		
Encke (OEG)	I	2032-12-03T13:57:24.857		60.97	-37.59	133744.89	-15.67		
Encke (IEG)	I	2032-12-03T13:57:45.388		60.89	-37.52	133423.31	-15.65		
A (IER)	I	2032-12-03T14:10:08.341		58.02	-34.68	122050.38	-14.93		
B (OER)	I	2032-12-03T14:15:11.907		56.85	-33.53	117571.16	-14.57		
B (IER)	I	2032-12-03T14:48:00.431	b	49.25	-26.07	91984.69	-10.99		
Saturn	I	2032-12-03T14:33:03.400		52.71	-29.46	59756.35		37.76	43.35
Saturn	E	2032-12-03T16:04:34.824		31.64	-8.95	60050.00		23.47	27.99
B (IER)	E	2032-12-03T16:24:05.626		27.20	-4.67x	91984.69	10.92		
B (OER)	E	2032-12-03T16:57:15.649		19.69	2.50x	117571.16	14.36		
A (IER)	E	2032-12-03T17:02:23.939		18.54	3.59x	122050.38	14.69		
Encke (IEG)	E	2032-12-03T17:14:59.807		15.71	6.26x	133423.31	15.37		
Encke (OEG)	E	2032-12-03T17:15:20.721		15.63	6.34x	133744.89	15.38		
A (OER)	E	2032-12-03T17:18:36.714		14.90	7.02x	136774.40	15.53		
F ring	E	2032-12-03T17:22:32.864		14.02	7.85x	140461.00	15.69		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-12-03T15:29:04.730
 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 : 3377160169558092928
 2Mass ID (if available) : 06211476+2221039
 ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.753
 G magnitude : 11.906
 RP magnitude : 10.796
 BP magnitude : 13.213
 DUPflag : 0
 Distance (au) : 8.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.69
 Sun-Target sep (deg) : 156.63
 Sun-Moon sep (deg) : 165.23
 B (ring opening deg) : -26.00
 PA of pole (deg) : -5.90
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.687
 C/A sky separation (km) : 33415.8
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2032-12-03T14:00:42.240		1.24x	-24.41	140461.00	-15.94		
A (OER)	I	2032-12-03T14:04:34.652		2.12x	-25.30	136774.40	-15.79		
Encke (OEG)	I	2032-12-03T14:07:47.393		2.84x	-26.04	133744.89	-15.65		
Encke (IEG)	I	2032-12-03T14:08:07.952		2.92x	-26.12	133423.31	-15.63		
A (IER)	I	2032-12-03T14:20:29.696		5.73	-28.98	122050.38	-15.00		
B (OER)	I	2032-12-03T14:25:31.374		6.87	-30.14	117571.16	-14.69		
B (IER)	I	2032-12-03T14:57:36.014	b	14.21	-37.56	91984.69	-11.50		
C (IER)	I	2032-12-03T15:32:54.581	b	22.35	-45.72	74490.58	-4.26		
Saturn	I	2032-12-03T14:42:42.072		10.80	-34.11	59751.20		37.99	43.58
Saturn	E	2032-12-03T16:15:34.463		32.23	-55.50	60074.74		22.02	26.35
C (IER)	E	2032-12-03T16:02:48.907	b	29.27	-52.59	74490.58	4.29		
B (IER)	E	2032-12-03T16:37:42.853		37.37	-60.50	91984.69	11.65		
B (OER)	E	2032-12-03T17:09:18.827		44.69	-67.45	117571.16	14.94		
A (IER)	E	2032-12-03T17:14:15.225		45.83	-68.50	122050.38	15.28		
Encke (IEG)	E	2032-12-03T17:26:22.913		48.63	-71.03	133423.31	15.95		
Encke (OEG)	E	2032-12-03T17:26:43.060		48.71	-71.10	133744.89	15.97		
A (OER)	E	2032-12-03T17:29:51.883		49.43	-71.74	136774.40	16.12		
F ring	E	2032-12-03T17:33:39.428		50.30	-72.49	140461.00	16.28		

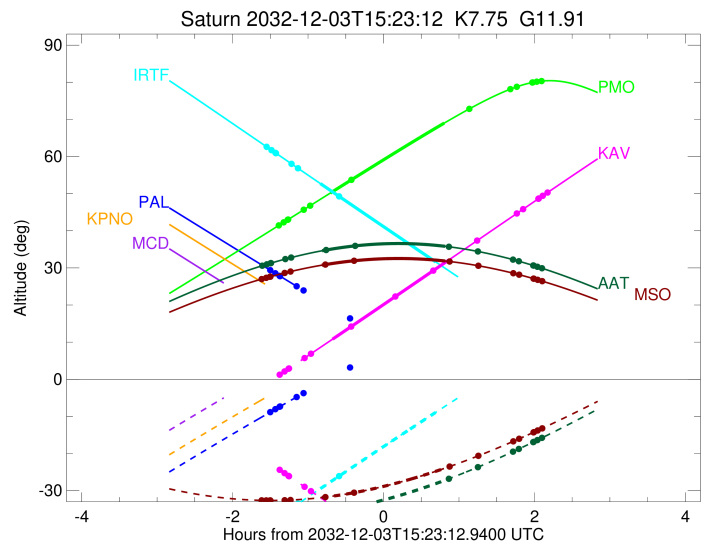
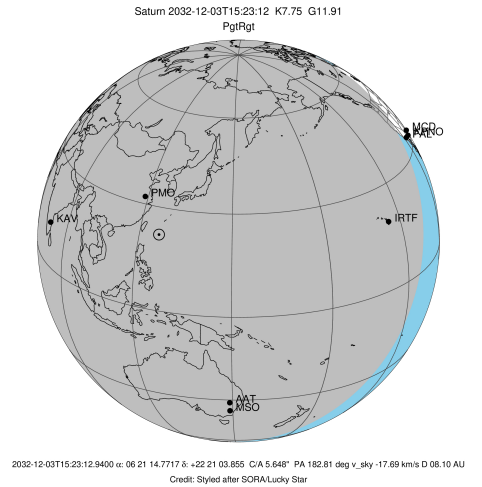
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-12-03T15:23:12.330
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 3377160169558092928
 2Mass ID (if available) : 06211476+2221039
 ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.753
 G magnitude : 11.906
 RP magnitude : 10.796
 BP magnitude : 13.213
 DUPflag : 0
 Distance (au) : 8.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.69
 Sun-Target sep (deg) : 156.63
 Sun-Moon sep (deg) : 165.93
 B (ring opening deg) : -26.00
 PA of pole (deg) : -5.90
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.777
 C/A sky separation (km) : 28068.5
 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_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	2032-12-03T13:46:53.521		30.59	-36.65	140461.00	-17.05		
A (OER)	I	2032-12-03T13:50:30.371		30.97	-36.67	136774.40	-16.95		
Encke (OEG)	I	2032-12-03T13:53:29.653		31.27	-36.68	133744.89	-16.85		
Encke (IEG)	I	2032-12-03T13:53:48.744		31.30	-36.68	133423.31	-16.84		
A (IER)	I	2032-12-03T14:05:12.708		32.38	-36.61	122050.38	-16.40		
B (OER)	I	2032-12-03T14:09:47.646		32.78	-36.54	117571.16	-16.18		
B (IER)	I	2032-12-03T14:37:41.634	b	34.82	-35.64	91984.69	-14.13		
C (IER)	I	2032-12-03T15:00:48.664	b	35.94	-34.30	74490.58	-10.73		
Saturn	I	2032-12-03T14:34:28.621		34.63	-35.79	59874.01		32.45	37.82
Saturn	E	2032-12-03T16:12:11.560		35.82	-27.19	60147.20		17.22	20.81
C (IER)	E	2032-12-03T16:15:13.436		35.69	-26.80	74490.58	10.78		
B (IER)	E	2032-12-03T16:38:18.450		34.43	-23.67	91984.69	14.13		
B (OER)	E	2032-12-03T17:06:15.083		32.22	-19.49	117571.16	16.14		
A (IER)	E	2032-12-03T17:10:50.714		31.79	-18.77	122050.38	16.35		
Encke (IEG)	E	2032-12-03T17:22:16.630		30.65	-16.93	133423.31	16.79		
Encke (OEG)	E	2032-12-03T17:22:35.780		30.62	-16.87	133744.89	16.80		
A (OER)	E	2032-12-03T17:25:35.625		30.30	-16.38	136774.40	16.89		
F ring	E	2032-12-03T17:29:13.182		29.91	-15.78	140461.00	17.00		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2032-12-03T15:23:11.260
 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 : 3377160169558092928
 2Mass ID (if available) : 06211476+2221039
 ICRS Star Coord at Epoch: 06h 21m 14.77170s +22:21:03.85453s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.753
 G magnitude : 11.906
 RP magnitude : 10.796
 BP magnitude : 13.213
 DUPflag : 0
 Distance (au) : 8.102
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -17.69
 Sun-Target sep (deg) : 156.63
 Sun-Moon sep (deg) : 165.91
 B (ring opening deg) : -26.00
 PA of pole (deg) : -5.90
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.734
 C/A sky separation (km) : 27816.4
 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



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	2032-12-03T13:46:24.449		26.99	-32.62	140461.00	-17.07		
A (OER)	I	2032-12-03T13:50:01.066		27.33	-32.64	136774.40	-16.97		
Encke (OEG)	I	2032-12-03T13:53:00.129		27.61	-32.65	133744.89	-16.87		
Encke (IEG)	I	2032-12-03T13:53:19.196		27.64	-32.65	133423.31	-16.86		
A (IER)	I	2032-12-03T14:04:42.077		28.64	-32.59	122050.38	-16.43		
B (OER)	I	2032-12-03T14:09:16.447		29.02	-32.53	117571.16	-16.22		
B (IER)	I	2032-12-03T14:37:04.129	b	30.90	-31.74	91984.69	-14.22		
C (IER)	I	2032-12-03T14:59:56.760	b	31.93	-30.55	74490.58	-10.92		
Saturn	I	2032-12-03T14:34:16.916		30.74	-31.85	59879.03		32.22	37.57
Saturn	E	2032-12-03T16:12:20.989		31.85	-23.92	60150.52		16.98	20.53
C (IER)	E	2032-12-03T16:15:49.489		31.72	-23.51	74490.58	10.97		
B (IER)	E	2032-12-03T16:38:40.134		30.58	-20.62	91984.69	14.21		
B (OER)	E	2032-12-03T17:06:30.207		28.56	-16.71	117571.17	16.18		
A (IER)	E	2032-12-03T17:11:05.214		28.16	-16.03	122050.38	16.39		
Encke (IEG)	E	2032-12-03T17:22:29.891		27.11	-14.30	133423.31	16.81		
Encke (OEG)	E	2032-12-03T17:22:49.012		27.08	-14.25	133744.89	16.82		
A (OER)	E	2032-12-03T17:25:48.595		26.79	-13.79	136774.40	16.92		
F ring	E	2032-12-03T17:29:25.862		26.43	-13.22	140461.00	17.02		