

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-08T16:33:33.750
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 612094962086986240
 2Mass ID (if available) : 09024301+1757474

Saturn 2036-03-08T16:33:33 K9.61 G11.77 PgtRgt

ICRS Star Coord at Epoch: 09h 02m 43.00259s +17:57:47.51777s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.611
 G magnitude : 11.766
 RP magnitude : 11.102
 BP magnitude : 12.272
 DUPflag : 0
 Distance (au) : 8.324
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.69
 Sun-Target sep (deg) : 144.70
 Sun-Moon sep (deg) : 15.43
 B (ring opening deg) : -17.27
 PA of pole (deg) : -6.78

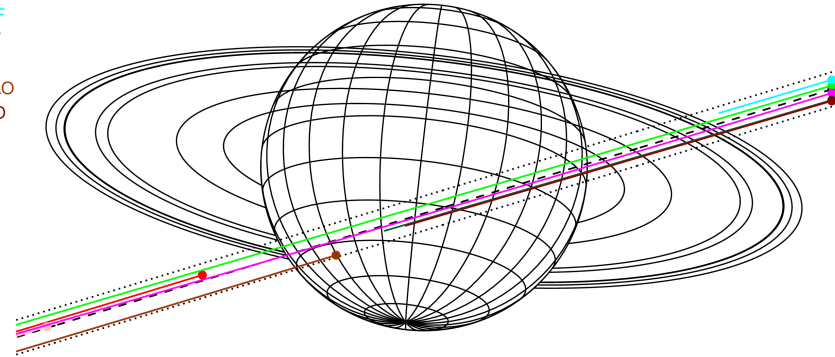
a(km) ring

- 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



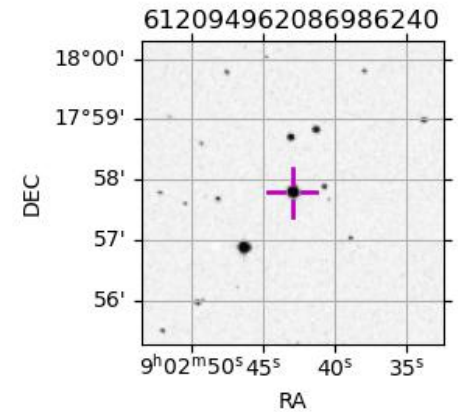
2036-03-08T16:33:33.7500 α: 09 02 43.0026 δ: +17 57 47.518 C/A 2.684° PA 16.91 deg v_sky -14.69 km/s D 08.32 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 IRTF
 KAV
 AAT
 SAAO
 MSO



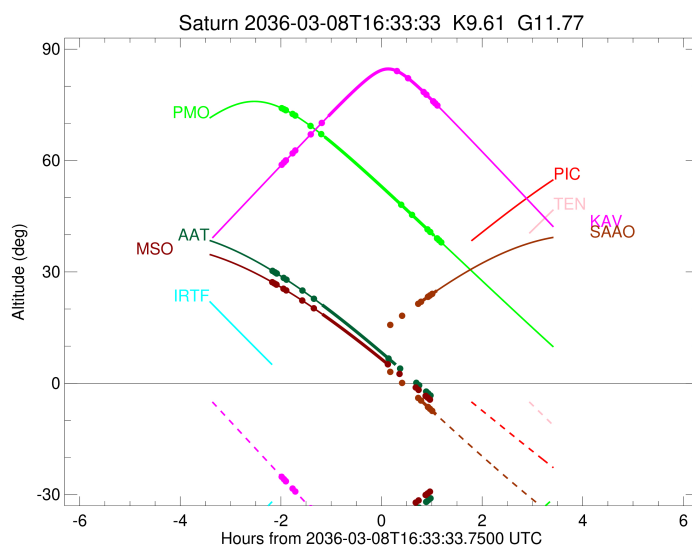
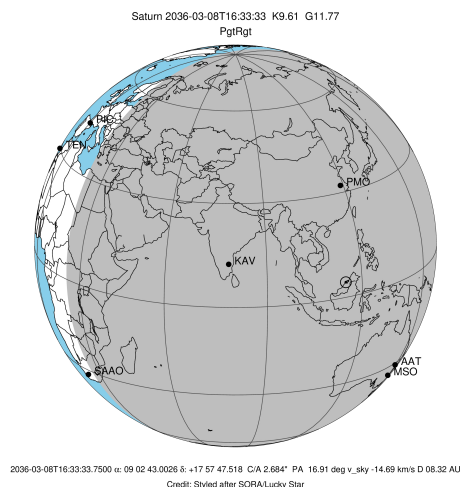
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+	+	+	MAR 08 14:34 - MAR 08 17:44	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	+	+	+	MAR 08 14:34 - MAR 08 17:40	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	+	+		MAR 08 14:23 - MAR 08 15:22	PinRin
SAAO	So. Afr. Astro	-32.4	20.8		+		MAR 08 17:39 - MAR 08 17:39	PneRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+	+		MAR 08 14:23 - MAR 08 15:22	PinRin



```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch            : 2036-03-08T16:30:47.960
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      : 612094962086986240
2Mass ID (if available) : 09024301+1757474
ICRS Star Coord at Epoch: 09h 02m 43.00259s +17:57:47.51777s
RUWE (>1.4 is poor) : 1.01
K magnitude         : 9.611
G magnitude         : 11.766
RP magnitude        : 11.102
BP magnitude        : 12.272
DUPflag            : 0
Distance (au)       : 8.324
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -14.69
Sun-Target sep (deg) : 144.70
Sun-Moon sep (deg)  : 16.14
B (ring opening deg) : -17.27
PA of pole (deg)    : -6.78
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 2.224
C/A sky separation (km) : 13429.4
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
  
```

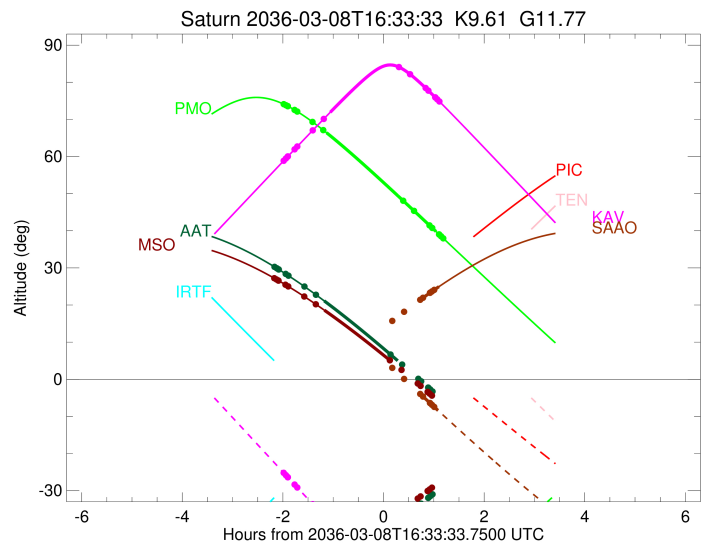
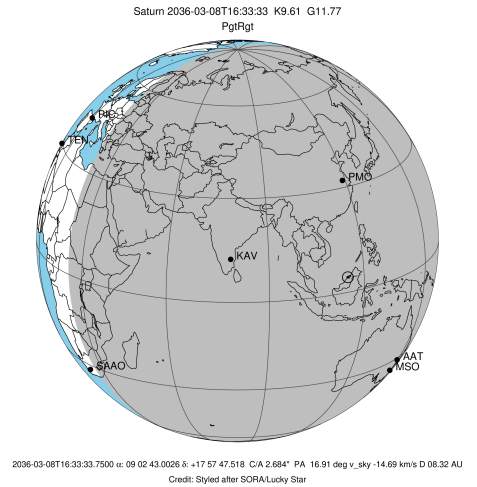


b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-03-08T14:34:42.325		74.09	-53.88	140461.00	-23.85		
A (OER)	I	2036-03-08T14:37:17.013		73.81	-54.27	136774.40	-23.82		
Encke (OEG)	I	2036-03-08T14:39:24.291		73.57	-54.58	133744.89	-23.79		
Encke (IEG)	I	2036-03-08T14:39:37.811		73.54	-54.62	133423.31	-23.78		
A (IER)	I	2036-03-08T14:47:37.167		72.54	-55.77	122050.38	-23.66		
B (OER)	I	2036-03-08T14:50:46.702		72.11	-56.21	117571.16	-23.60		
B (IER)	I	2036-03-08T15:09:00.907		69.30	-58.51	91984.69	-23.11		
C (IER)	I	2036-03-08T15:21:47.820		67.10	-59.87	74490.58	-22.45		
Saturn	I	2036-03-08T15:25:34.572		66.42	-60.23	60252.28		9.72	11.87
Saturn	E	2036-03-08T17:36:12.999		39.80	-56.64	60095.34		-34.09	-39.55
C (IER)	E	2036-03-08T16:56:52.312	b	48.13	-60.89	74490.58	22.11		
B (IER)	E	2036-03-08T17:09:50.620	b	45.39	-59.73	91984.69	22.77		
B (OER)	E	2036-03-08T17:28:21.539	b	41.47	-57.65	117571.16	23.23		
A (IER)	E	2036-03-08T17:31:34.196	b	40.79	-57.25	122050.38	23.27		
Encke (IEG)	E	2036-03-08T17:39:41.833		39.06	-56.17	133423.31	23.37		
Encke (OEG)	E	2036-03-08T17:39:55.594		39.01	-56.14	133744.89	23.37		
A (OER)	E	2036-03-08T17:42:05.174		38.55	-55.84	136774.40	23.39		
F ring	E	2036-03-08T17:44:42.716		37.99	-55.47	140461.00	23.41		

```

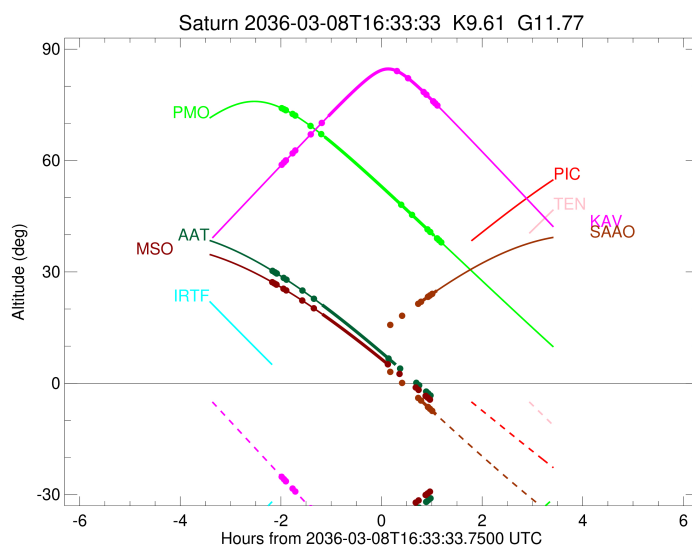
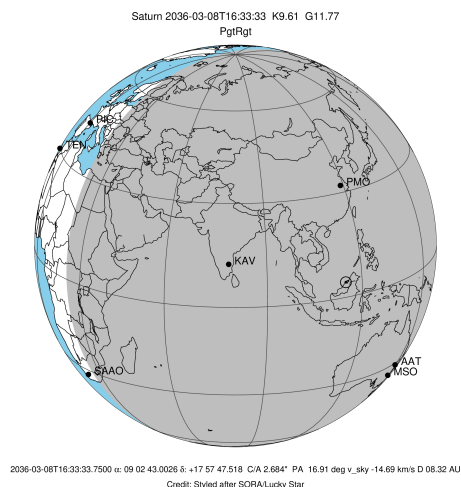
target                : Saturn
target radius (km)   : 60268.00
C/A epoch            : 2036-03-08T16:33:45.430
Event type          : PgtRgt
: Saturn occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : KAV
Location            : Kavalur Observatory
Latitude (deg)      : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)       : 0.722
Gaia source ID      : 612094962086986240
2Mass ID (if available) : 09024301+1757474
ICRS Star Coord at Epoch: 09h 02m 43.00259s +17:57:47.51777s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.611
G magnitude          : 11.766
RP magnitude         : 11.102
BP magnitude         : 12.272
DUPflag             : 0
Distance (au)       : 8.324
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -14.69
Sun-Target sep (deg) : 144.70
Sun-Moon sep (deg)  : 15.67
B (ring opening deg) : -17.27
PA of pole (deg)    : -6.78
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 2.787
C/A sky separation (km) : 16823.0
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	2036-03-08T14:34:41.101		58.89	-25.24	140461.00	-23.79		
A (OER)	I	2036-03-08T14:37:16.207		59.51	-25.87	136774.40	-23.75		
Encke (OEG)	I	2036-03-08T14:39:23.897		60.01	-26.39	133744.89	-23.71		
Encke (IEG)	I	2036-03-08T14:39:37.464		60.07	-26.44	133423.31	-23.70		
A (IER)	I	2036-03-08T14:47:39.063		61.97	-28.40	122050.38	-23.52		
B (OER)	I	2036-03-08T14:50:49.834		62.72	-29.18	117571.16	-23.44		
B (IER)	I	2036-03-08T15:09:17.321		67.08	-33.68	91984.69	-22.68		
C (IER)	I	2036-03-08T15:22:25.042		70.15	-36.87	74490.58	-21.63		
Saturn	I	2036-03-08T15:29:59.725		71.91	-38.72	60260.45		6.72	8.23
Saturn	E	2036-03-08T17:37:22.636		75.47	-69.17	60066.53		-37.28	-42.85
C (IER)	E	2036-03-08T16:51:46.609	b	84.12	-58.48	74490.58	21.36		
B (IER)	E	2036-03-08T17:05:04.143	b	82.20	-61.64	91984.69	22.41		
B (OER)	E	2036-03-08T17:23:44.861	b	78.48	-66.03	117571.17	23.16		
A (IER)	E	2036-03-08T17:26:57.965	b	77.78	-66.78	122050.38	23.24		
Encke (IEG)	E	2036-03-08T17:35:05.645	b	75.99	-68.65	133423.31	23.40		
Encke (OEG)	E	2036-03-08T17:35:19.388	b	75.93	-68.70	133744.89	23.40		
A (OER)	E	2036-03-08T17:37:28.748		75.45	-69.19	136774.40	23.44		
F ring	E	2036-03-08T17:40:05.916		74.86	-69.79	140461.00	23.48		

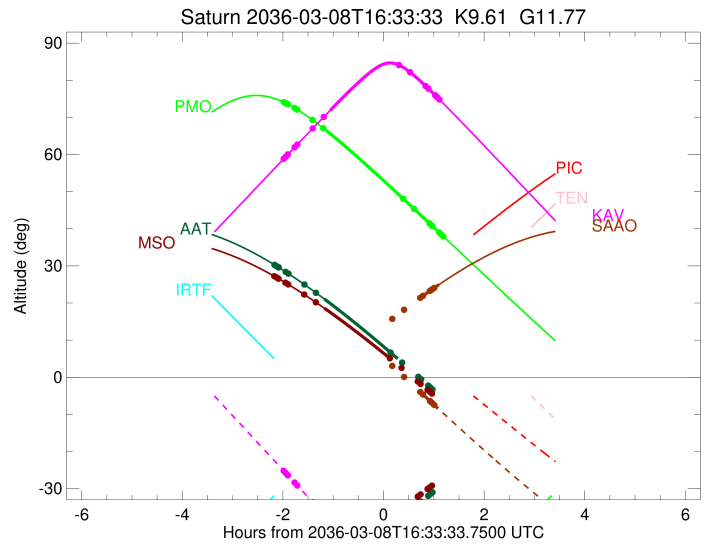
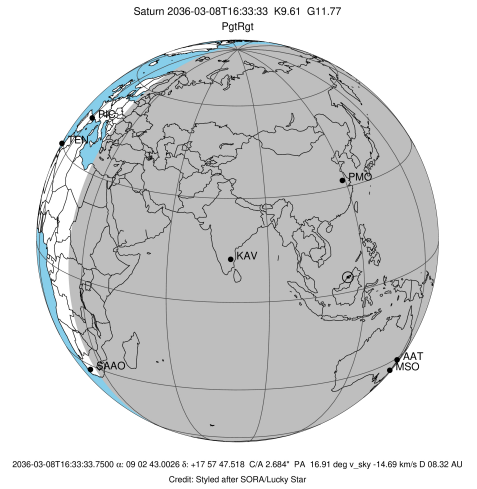
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-08T16:27:04.910
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 612094962086986240
 2Mass ID (if available) : 09024301+1757474
 ICRS Star Coord at Epoch: 09h 02m 43.00259s +17:57:47.51777s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.611
 G magnitude : 11.766
 RP magnitude : 11.102
 BP magnitude : 12.272
 DUPflag : 0
 Distance (au) : 8.324
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.69
 Sun-Target sep (deg) : 144.70
 Sun-Moon sep (deg) : 16.28
 B (ring opening deg) : -17.27
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.041
 C/A sky separation (km) : 18358.1
 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	2036-03-08T14:23:44.707		30.26	-54.32	140461.00	-23.23		
A (OER)	I	2036-03-08T14:26:23.623		29.89	-54.27	136774.40	-23.17		
Encke (OEG)	I	2036-03-08T14:28:34.519		29.58	-54.22	133744.89	-23.12		
Encke (IEG)	I	2036-03-08T14:28:48.431		29.55	-54.22	133423.31	-23.11		
A (IER)	I	2036-03-08T14:37:02.774		28.37	-53.98	122050.38	-22.89		
B (OER)	I	2036-03-08T14:40:18.903		27.89	-53.85	117571.16	-22.78		
B (IER)	I	2036-03-08T14:59:22.347		24.96	-52.81	91984.69	-21.86		
C (IER)	I	2036-03-08T15:13:04.110		22.75	-51.74	74490.58	-20.58		
Saturn	I	2036-03-08T15:22:44.640		21.13	-50.83	60263.70		5.07	6.22
Saturn	E	2036-03-08T17:31:40.077		-3.22x	-31.06	60053.38		-38.70	-44.30
C (IER)	E	2036-03-08T16:41:44.154	b	6.71	-39.99	74490.58	20.30		
B (IER)	E	2036-03-08T16:55:38.583	b	3.99x	-37.61	91984.69	21.52		
B (OER)	E	2036-03-08T17:15:00.824	b	0.14x	-34.15	117571.16	22.40		
A (IER)	E	2036-03-08T17:18:20.345	b	-0.52x	-33.54	122050.38	22.50		
Encke (IEG)	E	2036-03-08T17:26:43.580	b	-2.22x	-31.99	133423.31	22.69		
Encke (OEG)	E	2036-03-08T17:26:57.749	b	-2.26x	-31.94	133744.89	22.70		
A (OER)	E	2036-03-08T17:29:11.095	b	-2.71x	-31.52	136774.40	22.74		
F ring	E	2036-03-08T17:31:53.041		-3.26x	-31.02	140461.00	22.79		

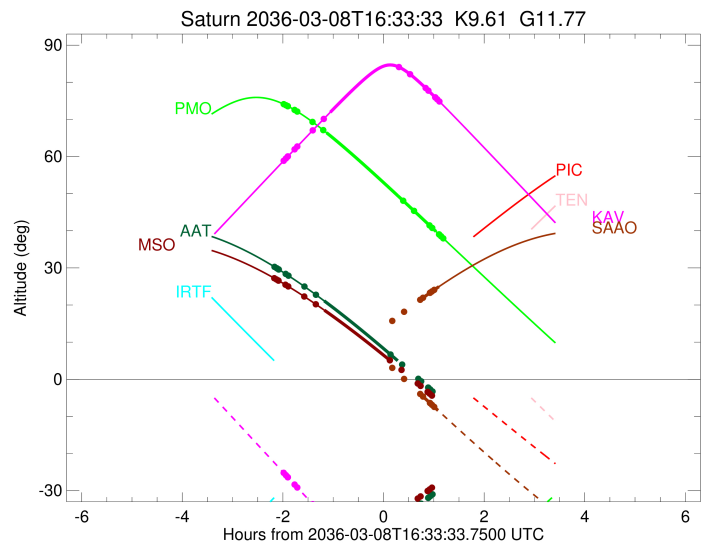
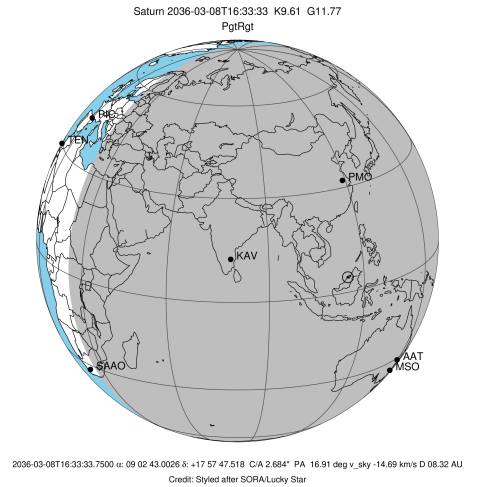
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-08T16:37:09.570
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 612094962086986240
 2Mass ID (if available) : 09024301+1757474
 ICRS Star Coord at Epoch: 09h 02m 43.00259s +17:57:47.51777s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.611
 G magnitude : 11.766
 RP magnitude : 11.102
 BP magnitude : 12.272
 DUPflag : 0
 Distance (au) : 8.324
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.69
 Sun-Target sep (deg) : 144.70
 Sun-Moon sep (deg) : 14.84
 B (ring opening deg) : -17.27
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.554
 C/A sky separation (km) : 21455.2
 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	2036-03-08T14:31:55.785	-9.80x	30.77x	140461.00	-23.13			
A (OER)	I	2036-03-08T14:34:35.385	-9.26x	30.23x	136774.40	-23.07			
Encke (OEG)	I	2036-03-08T14:36:46.894	-8.81x	29.78x	133744.89	-23.01			
Encke (IEG)	I	2036-03-08T14:37:00.873	-8.76x	29.73x	133423.31	-23.00			
A (IER)	I	2036-03-08T14:45:18.101	-7.07x	28.03x	122050.38	-22.73			
B (OER)	I	2036-03-08T14:48:35.689	-6.40x	27.35x	117571.16	-22.60			
B (IER)	I	2036-03-08T15:07:54.209	-2.51x	23.34x	91984.69	-21.42			
C (IER)	I	2036-03-08T15:22:01.548	0.29x	20.39x	74490.58	-19.69			
Saturn	I	2036-03-08T15:34:01.583	2.65x	17.86x	60266.59			2.90	3.56
Saturn	E	2036-03-08T17:39:42.290	24.96	-8.63	60020.81			-42.17	-47.78
C (IER)	E	2036-03-08T16:43:46.417	b	15.68	3.12x	74490.58	19.65		
B (IER)	E	2036-03-08T16:57:55.639	b	18.15	0.13x	91984.69	21.37		
B (OER)	E	2036-03-08T17:17:15.467	b	21.40	-3.94x	117571.16	22.61		
A (IER)	E	2036-03-08T17:20:32.970	b	21.93	-4.63x	122050.38	22.75		
Encke (IEG)	E	2036-03-08T17:28:49.644	b	23.26	-6.36	133423.31	23.04		
Encke (OEG)	E	2036-03-08T17:29:03.602	b	23.30	-6.41	133744.89	23.04		
A (OER)	E	2036-03-08T17:31:14.890	b	23.64	-6.87	136774.40	23.11		
F ring	E	2036-03-08T17:33:54.187	b	24.06	-7.42	140461.00	23.18		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2036-03-08T16:27:12.830
 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 : 612094962086986240
 2Mass ID (if available) : 09024301+1757474
 ICRS Star Coord at Epoch: 09h 02m 43.00259s +17:57:47.51777s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.611
 G magnitude : 11.766
 RP magnitude : 11.102
 BP magnitude : 12.272
 DUPflag : 0
 Distance (au) : 8.324
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -14.69
 Sun-Target sep (deg) : 144.70
 Sun-Moon sep (deg) : 16.24
 B (ring opening deg) : -17.27
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 3.104
 C/A sky separation (km) : 18737.5
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-03-08T14:23:25.382		27.21	-50.30	140461.00	-23.19		
A (OER)	I	2036-03-08T14:26:04.586		26.87	-50.26	136774.40	-23.13		
Encke (OEG)	I	2036-03-08T14:28:15.730		26.58	-50.22	133744.89	-23.07		
Encke (IEG)	I	2036-03-08T14:28:29.668		26.55	-50.22	133423.31	-23.07		
A (IER)	I	2036-03-08T14:36:45.056		25.45	-50.01	122050.38	-22.84		
B (OER)	I	2036-03-08T14:40:01.655		25.01	-49.91	117571.16	-22.73		
B (IER)	I	2036-03-08T14:59:08.823		22.27	-49.00	91984.69	-21.77		
C (IER)	I	2036-03-08T15:12:55.197		20.19	-48.06	74490.58	-20.43		
Saturn	I	2036-03-08T15:22:58.796		18.61	-47.23	60264.25		4.73	5.81
Saturn	E	2036-03-08T17:31:40.149		-4.47x	-29.14	60049.88		-39.07	-44.68
C (IER)	E	2036-03-08T16:40:54.634	b	5.15	-37.56	74490.58	20.16		
B (IER)	E	2036-03-08T16:54:53.294	b	2.55x	-35.37	91984.69	21.43		
B (OER)	E	2036-03-08T17:14:18.778	b	-1.13x	-32.15	117571.17	22.36		
A (IER)	E	2036-03-08T17:17:38.665	b	-1.76x	-31.58	122050.38	22.46		
Encke (IEG)	E	2036-03-08T17:26:02.657	b	-3.38x	-30.13	133423.31	22.66		
Encke (OEG)	E	2036-03-08T17:26:16.844	b	-3.43x	-30.09	133744.89	22.67		
A (OER)	E	2036-03-08T17:28:30.355	b	-3.86x	-29.70	136774.40	22.71		
F ring	E	2036-03-08T17:31:12.483	b	-4.38x	-29.22	140461.00	22.76		