

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:08:39.990  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173

Saturn 2046-04-10T10:08:39 K9.61 G12.08 PgtRgt

ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s

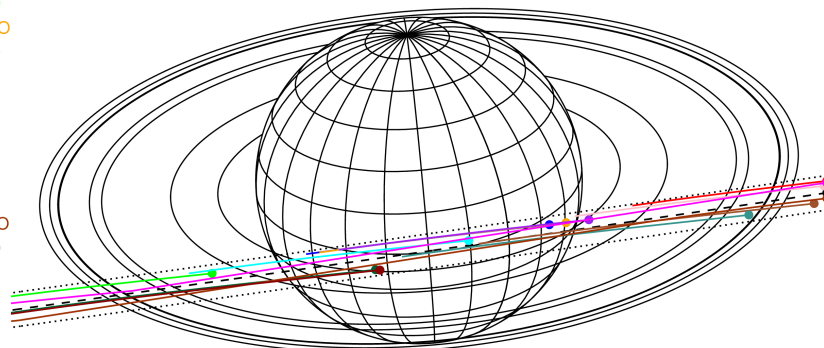
RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 161.29  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80

#	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



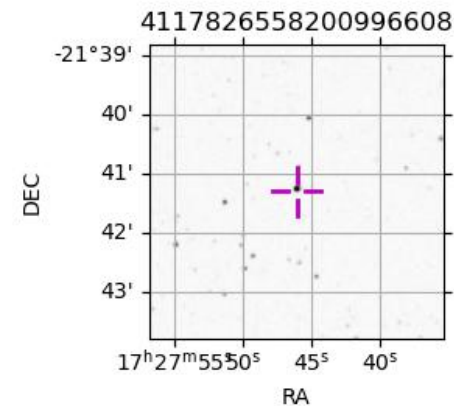
2046-04-10T10:08:39.9900 α: 17 27 46.1545 δ: -21 41 18.603 C/A 3.804° PA 8.19 deg v\_sky - 4.23 km/s D 09.53 AU  
 Credit: Styled after SORA/Lucky Star

- Earth
- PIC
- PAL
- PMO
- KPNO
- MCD
- TEN
- IRTF
- KAV
- RIO
- ESO
- AAT
- SAAO
- MSO

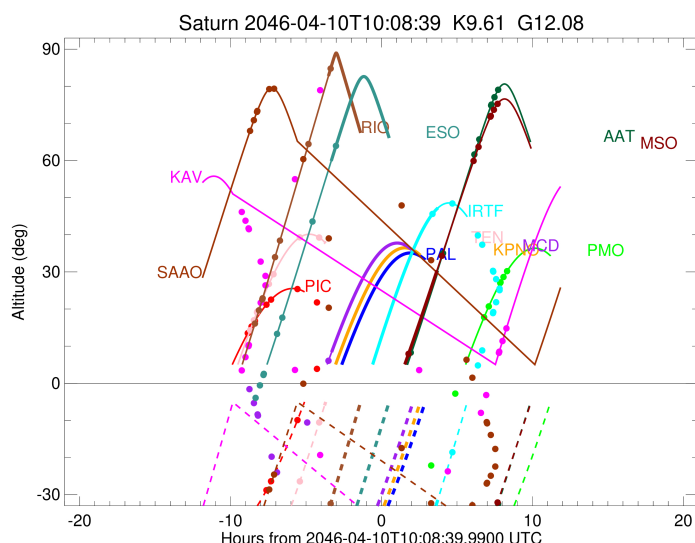
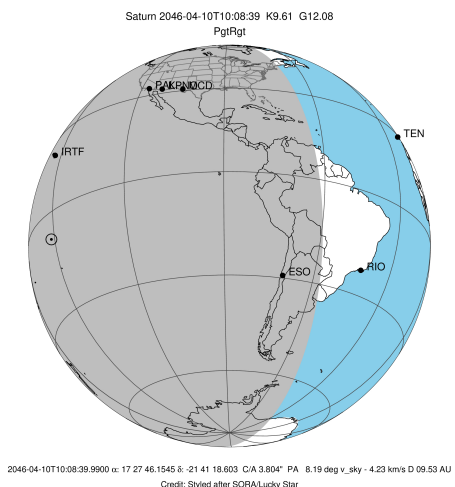


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1	+ + + + + + +			APR 10 01:17 - APR 10 04:34	PnnRin
PAL	Palomar Mt (20	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8			+ + + + + + +	APR 10 16:56 - APR 10 18:28	PnnRne
KPNO	Kitt Peak Natl	32.0	248.4					PnnRnn
MCD	McDonald Obs.	30.7	256.0		+		APR 10 06:38 - APR 10 06:50	PinRin
TEN	Teide Obs./Ten	28.3	343.5	+ + + + + + +	+		APR 10 01:26 - APR 10 06:22	PinRin
IRTF	Mauna Kea/IRTF	19.8	204.5		+	+	APR 10 13:53 - APR 10 14:50	PneRne
KAV	Kavalur Observ	12.6	78.8			+ + + + +	APR 10 17:55 - APR 10 18:25	PnnRne
RIO	Rio de Janeiro	-22.9	316.8	+ + + + + + +	+		APR 10 01:45 - APR 10 06:37	PinRin
ESO	European South	-29.3	289.3		+		APR 10 03:13 - APR 10 06:48	PinRin
AAT	Siding Spring	-31.3	149.1		+	+ + + + + + +	APR 10 13:51 - APR 10 17:52	PneRne
SAAO	So. Afr. Astro	-32.4	20.8	+ + + + + + +			APR 10 01:26 - APR 10 03:01	PnnRin
MSO	Mt. Stromlo Ob	-35.3	149.0		+	+ + + + + + +	APR 10 13:49 - APR 10 17:50	PneRne



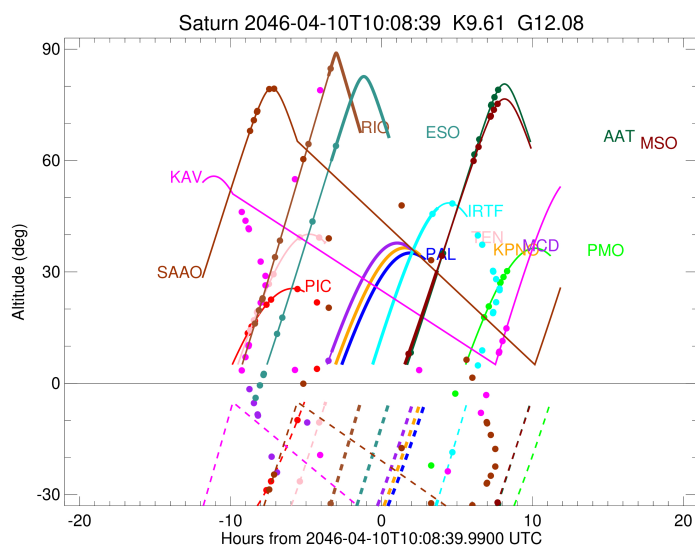
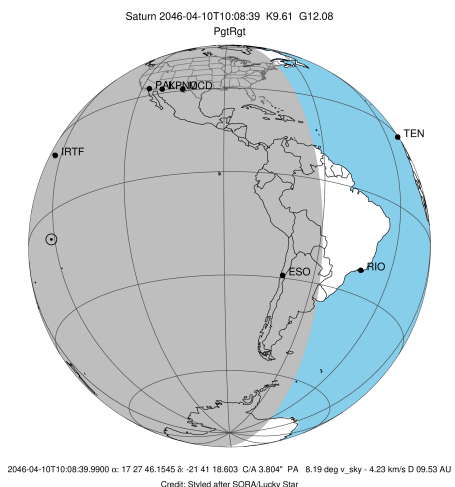
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T09:50:24.740  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 162.00  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.112  
 C/A sky separation (km) : 21502.4  
 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	2046-04-10T01:17:17.602		13.51	-36.39	140461.00	-4.13		
A (OER)	I	2046-04-10T01:32:10.426		15.30	-35.19	136774.40	-4.13		
Encke (OEG)	I	2046-04-10T01:44:23.103		16.68	-34.07	133744.89	-4.14		
Encke (IEG)	I	2046-04-10T01:45:40.835		16.82	-33.94	133423.31	-4.14		
A (IER)	I	2046-04-10T02:31:28.982		21.19	-28.78	122050.38	-4.13		
B (OER)	I	2046-04-10T02:49:33.426		22.53	-26.39	117571.16	-4.13		
B (IER)	I	2046-04-10T04:34:50.783		25.38	-9.88	91984.69	-3.93		
C (IER)	I	2046-04-10T05:52:25.553		21.76	3.93x	74490.58	-3.54		
Saturn	I	2046-04-10T06:17:33.928		19.64	8.53x	60175.28		-14.69	-17.83
Saturn	E	2046-04-10T13:34:58.469		-50.86x	49.67x	60044.53		-23.22	-27.71
C (IER)	E	2046-04-10T13:05:50.195	b	-45.71x	52.54x	74490.58	3.17		
B (IER)	E	2046-04-10T14:33:25.373		-60.34x	41.87x	91984.69	3.45		
B (OER)	E	2046-04-10T16:33:36.152		-68.57x	21.46x	117571.16	3.63		
A (IER)	E	2046-04-10T16:54:05.403		-67.33x	17.73x	122050.38	3.66		
Encke (IEG)	E	2046-04-10T17:45:28.277		-61.53x	8.31x	133423.31	3.72		
Encke (OEG)	E	2046-04-10T17:46:54.644		-61.33x	8.05x	133744.89	3.72		
A (OER)	E	2046-04-10T18:00:26.087		-59.35x	5.58x	136774.40	3.74		
F ring	E	2046-04-10T18:16:48.075		-56.79x	2.60x	140461.00	3.77		

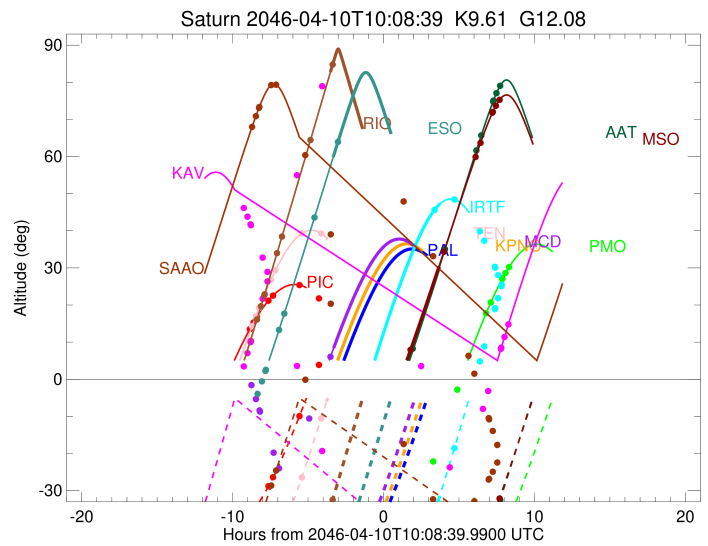
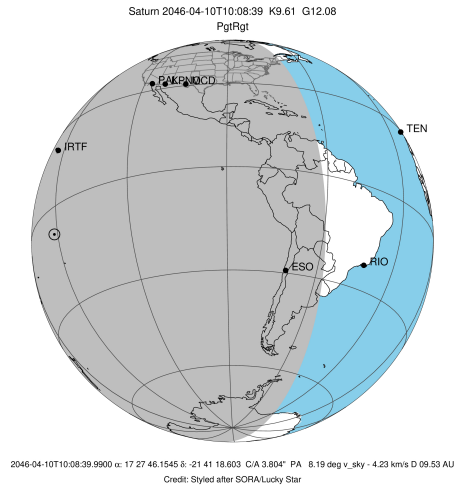
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:20:42.310  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60274s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 160.74  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.660  
 C/A sky separation (km) : 25286.7  
 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	2046-04-10T00:43:25.567		7.57	37.31x	140461.00	-3.94		
A (OER)	I	2046-04-10T00:59:05.213		4.69x	40.50x	136774.40	-3.90		
Encke (OEG)	I	2046-04-10T01:12:05.342		2.25x	43.09x	133744.89	-3.86		
Encke (IEG)	I	2046-04-10T01:13:28.597		1.99x	43.37x	133423.31	-3.86		
A (IER)	I	2046-04-10T02:03:35.166		-7.75x	52.84x	122050.38	-3.70		
B (OER)	I	2046-04-10T02:23:57.270		-11.83x	56.31x	117571.16	-3.63		
B (IER)	I	2046-04-10T04:30:28.597		-38.19x	65.44x	91984.69	-3.08		
C (IER)	I	2046-04-10T06:15:21.092		-60.40x	51.63x	74490.58	-2.44		
Saturn	I	2046-04-10T06:20:45.308		-61.52x	50.64x	60124.87		-18.37	-22.16
Saturn	E	2046-04-10T14:05:56.602		-13.96x	-40.78	60030.83		-23.97	-28.56
C (IER)	E	2046-04-10T13:26:13.277	b	-22.14x	-34.74	74490.58	2.64		
B (IER)	E	2046-04-10T15:02:14.766		-2.75x	-47.16	91984.69	3.39		
B (OER)	E	2046-04-10T16:56:57.883		17.86	-48.10	117571.16	4.01		
A (IER)	E	2046-04-10T17:15:25.177		20.74	-46.60	122050.38	4.08		
Encke (IEG)	E	2046-04-10T18:00:51.351		27.06	-41.40	133423.31	4.25		
Encke (OEG)	E	2046-04-10T18:02:06.894		27.22	-41.23	133744.89	4.26		
A (OER)	E	2046-04-10T18:13:54.918		28.64	-39.57	136774.40	4.30		
F ring	E	2046-04-10T18:28:08.098		30.23	-37.44	140461.00	4.34		

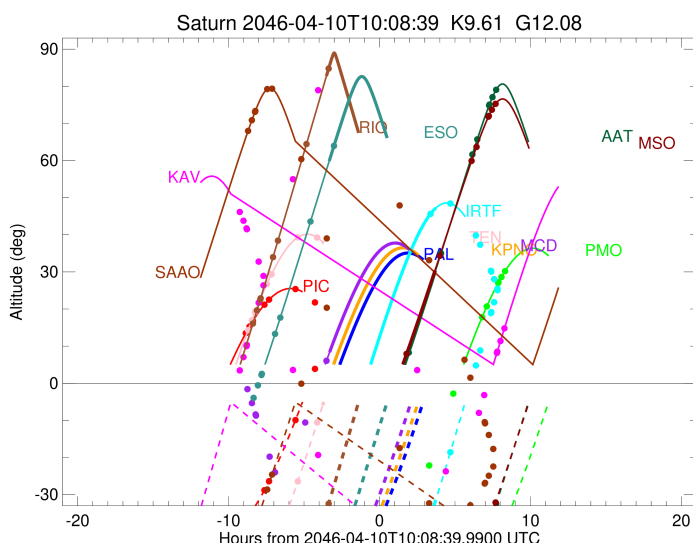
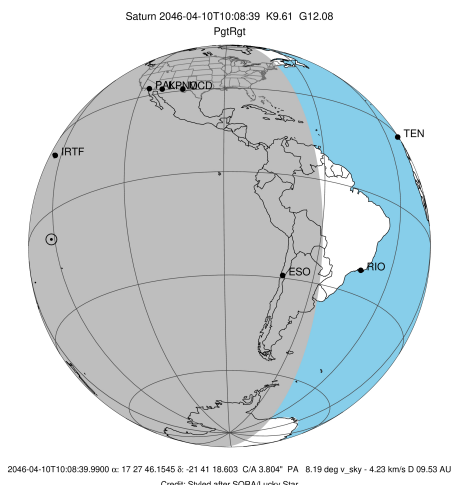
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:17:55.190  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 161.44  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.117  
 C/A sky separation (km) : 21536.8  
 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	2046-04-10T01:23:58.117		-59.39x	-1.64x	140461.00	-3.45		
A (OER)	I	2046-04-10T01:41:45.097		-55.58x	-5.39	136774.40	-3.46		
Encke (OEG)	I	2046-04-10T01:56:19.044		-52.44x	-8.44	133744.89	-3.47		
Encke (IEG)	I	2046-04-10T01:57:51.655		-52.11x	-8.76	133423.31	-3.47		
A (IER)	I	2046-04-10T02:52:07.389		-40.39x	-19.83	122050.38	-3.51		
B (OER)	I	2046-04-10T03:13:19.640		-35.83x	-23.99	117571.16	-3.53		
B (IER)	I	2046-04-10T05:13:36.906		-10.52x	-44.15	91984.69	-3.53		
C (IER)	I	2046-04-10T06:38:13.209		6.12	-51.19	74490.58	-3.31		
Saturn	I	2046-04-10T06:50:10.222		8.34	-51.42	60143.18		-17.12	-20.69
Saturn	E	2046-04-10T13:38:02.171		26.92	12.88x	60075.83		-21.44	-25.69
C (IER)	E	2046-04-10T13:23:42.862	b	28.79	9.79x	74490.58	3.65		
B (IER)	E	2046-04-10T14:39:02.043		17.67	26.01x	91984.69	4.04		
B (OER)	E	2046-04-10T16:21:51.104		-1.15x	47.43x	117571.16	4.21		
A (IER)	E	2046-04-10T16:39:33.826		-4.66x	50.88x	122050.38	4.22		
Encke (IEG)	E	2046-04-10T17:24:29.587		-13.78x	58.91x	133423.31	4.22		
Encke (OEG)	E	2046-04-10T17:25:45.867		-14.04x	59.12x	133744.89	4.22		
A (OER)	E	2046-04-10T17:37:44.867		-16.53x	60.98x	136774.40	4.21		
F ring	E	2046-04-10T17:52:20.954		-19.57x	63.04x	140461.00	4.20		

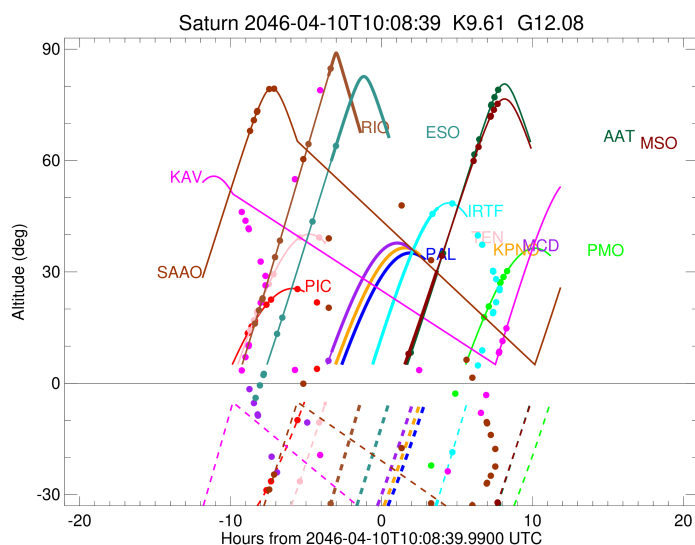
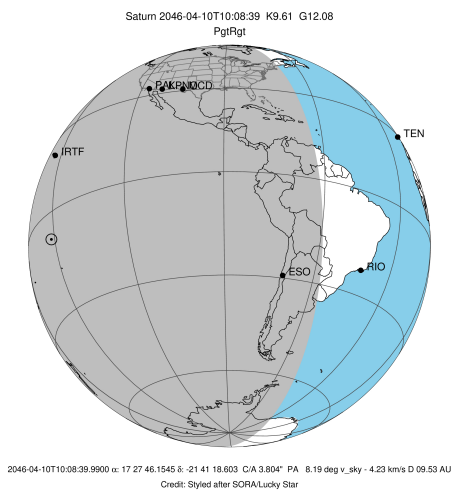
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T09:48:10.540  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 162.16  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.185  
 C/A sky separation (km) : 22010.8  
 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	2046-04-10T01:26:34.368		14.31	-53.61	140461.00	-4.08		
A (OER)	I	2046-04-10T01:41:36.223		17.01	-52.97	136774.40	-4.09		
Encke (OEG)	I	2046-04-10T01:53:55.133		19.15	-52.19	133744.89	-4.10		
Encke (IEG)	I	2046-04-10T01:55:13.465		19.37	-52.09	133423.31	-4.11		
A (IER)	I	2046-04-10T02:41:15.519		26.77	-47.35	122050.38	-4.12		
B (OER)	I	2046-04-10T02:59:21.737		29.36	-44.87	117571.16	-4.12		
B (IER)	I	2046-04-10T04:44:15.778		39.31	-26.39	91984.69	-3.96		
C (IER)	I	2046-04-10T06:01:15.584		39.25	-10.49	74490.58	-3.56		
Saturn	I	2046-04-10T06:22:05.125		38.06	-6.03	60165.85		-15.44	-18.72
Saturn	E	2046-04-10T13:26:15.986		-36.97x	69.50x	60032.47		-23.88	-28.46
C (IER)	E	2046-04-10T12:52:56.815	b	-29.69x	69.72x	74490.58	3.22		
B (IER)	E	2046-04-10T14:19:16.104		-48.65x	63.76x	91984.69	3.49		
B (OER)	E	2046-04-10T16:18:59.151		-74.74x	40.66x	117571.16	3.61		
A (IER)	E	2046-04-10T16:39:37.746		-78.82x	36.22x	122050.38	3.62		
Encke (IEG)	E	2046-04-10T17:31:44.113		-83.06x	24.84x	133423.31	3.65		
Encke (OEG)	E	2046-04-10T17:33:12.109		-82.92x	24.52x	133744.89	3.65		
A (OER)	E	2046-04-10T17:46:59.906		-81.13x	21.48x	136774.40	3.66		
F ring	E	2046-04-10T18:03:44.189		-78.18x	17.79x	140461.00	3.68		

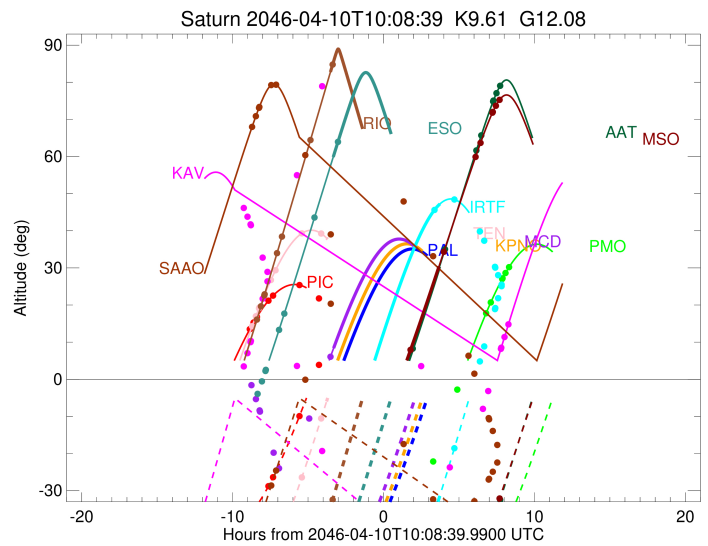
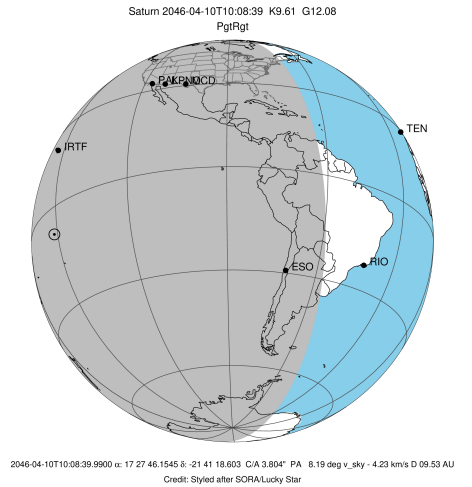
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:34:21.730  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : IRTF  
 Location : Mauna Kea/IRTF  
 Latitude (deg) : 19.82622  
 E. Longitude (deg) : 204.52800  
 Altitude (km) : 4.168  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60274s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 160.72  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.470  
 C/A sky separation (km) : 23975.1  
 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	2046-04-10T01:02:54.758		-67.56x	49.60x	140461.00	-3.28		
A (OER)	I	2046-04-10T01:21:42.434		-71.93x	45.25x	136774.40	-3.26		
Encke (OEG)	I	2046-04-10T01:37:15.946		-75.54x	41.62x	133744.89	-3.23		
Encke (IEG)	I	2046-04-10T01:38:55.385		-75.93x	41.23x	133423.31	-3.23		
A (IER)	I	2046-04-10T02:38:11.904		-87.98x	27.32x	122050.38	-3.17		
B (OER)	I	2046-04-10T03:01:52.035		-84.12x	21.75x	117571.16	-3.14		
B (IER)	I	2046-04-10T05:20:26.030		-52.04x	-10.58	91984.69	-3.00		
C (IER)	I	2046-04-10T07:01:42.060	b	-28.70x	-33.20	74490.58	-2.71		
Saturn	I	2046-04-10T06:55:34.281		-30.10x	-31.89	60103.56		-19.75	-23.75
Saturn	E	2046-04-10T13:53:07.299		47.24	-31.29	60059.45		-22.39	-26.77
C (IER)	E	2046-04-10T13:31:23.600	b	45.62	-35.93	74490.58	3.33		
B (IER)	E	2046-04-10T14:50:35.803		48.43	-18.54	91984.69	3.97		
B (OER)	E	2046-04-10T16:32:15.602		39.77	4.91x	117571.16	4.36		
A (IER)	E	2046-04-10T16:49:18.354		37.29	8.90x	122050.38	4.40		
Encke (IEG)	E	2046-04-10T17:32:05.578		30.24	18.95x	133423.31	4.46		
Encke (OEG)	E	2046-04-10T17:33:17.715		30.03	19.23x	133744.89	4.46		
A (OER)	E	2046-04-10T17:44:36.433		28.00	21.90x	136774.40	4.47		
F ring	E	2046-04-10T17:58:20.586		25.46	25.13x	140461.00	4.48		

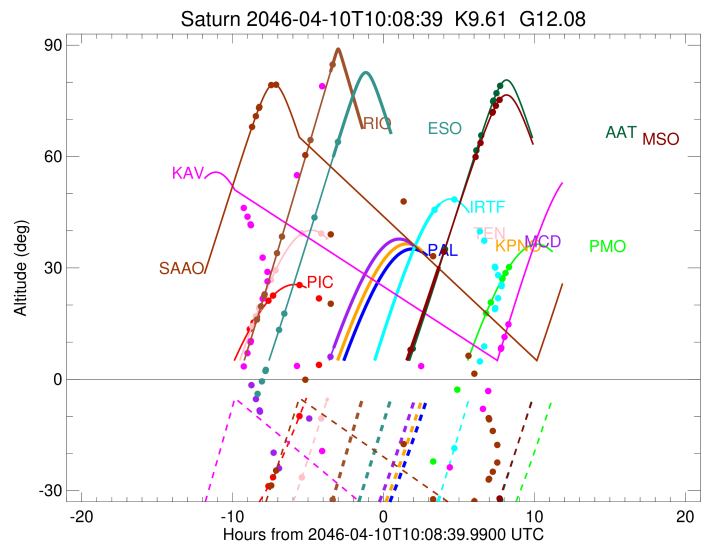
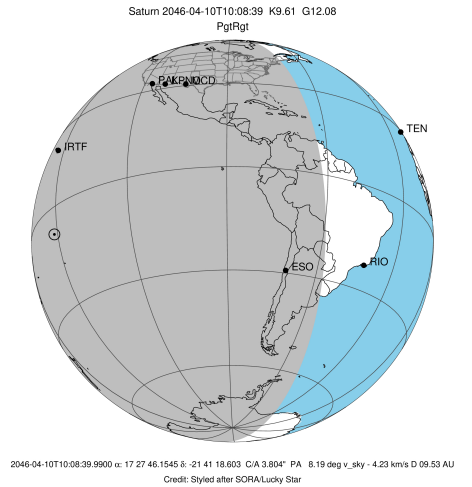
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T09:58:50.200  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KAV  
 Location : Kavalur Observatory  
 Latitude (deg) : 12.57556  
 E. Longitude (deg) : 78.83167  
 Altitude (km) : 0.722  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 161.14  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.909  
 C/A sky separation (km) : 27012.3  
 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	2046-04-10T00:53:24.075		46.12	3.51x	140461.00	-4.18		
A (OER)	I	2046-04-10T01:08:08.738		43.76	7.08x	136774.40	-4.15		
Encke (OEG)	I	2046-04-10T01:20:21.290		41.69	10.05x	133744.89	-4.12		
Encke (IEG)	I	2046-04-10T01:21:39.369		41.46	10.36x	133423.31	-4.12		
A (IER)	I	2046-04-10T02:08:27.839		32.72	21.75x	122050.38	-3.98		
B (OER)	I	2046-04-10T02:27:24.298		28.93	26.37x	117571.16	-3.91		
B (IER)	I	2046-04-10T04:24:54.179		3.53x	55.04x	91984.69	-3.30		
C (IER)	I	2046-04-10T06:05:11.673		-19.42x	79.03x	74490.58	-2.46		
Saturn	I	2046-04-10T06:07:59.081		-20.07x	79.66x	60120.44		-18.67	-22.50
Saturn	E	2046-04-10T13:53:45.764		-47.44x	-14.58	59973.29		-26.95	-31.87
C (IER)	E	2046-04-10T12:38:22.873	b	-64.67x	3.55x	74490.58	2.18		
B (IER)	E	2046-04-10T14:32:33.767		-38.42x	-23.79	91984.69	2.89		
B (OER)	E	2046-04-10T16:44:30.663		-7.84x	-53.45	117571.16	3.55		
A (IER)	E	2046-04-10T17:05:15.430		-3.10x	-57.57	122050.38	3.65		
Encke (IEG)	E	2046-04-10T17:55:43.163		8.27	-65.85	133423.31	3.86		
Encke (OEG)	E	2046-04-10T17:57:06.307		8.57	-66.02	133744.89	3.87		
A (OER)	E	2046-04-10T18:10:03.586		11.45	-67.47	136774.40	3.92		
F ring	E	2046-04-10T18:25:35.461		14.86	-68.69	140461.00	3.99		

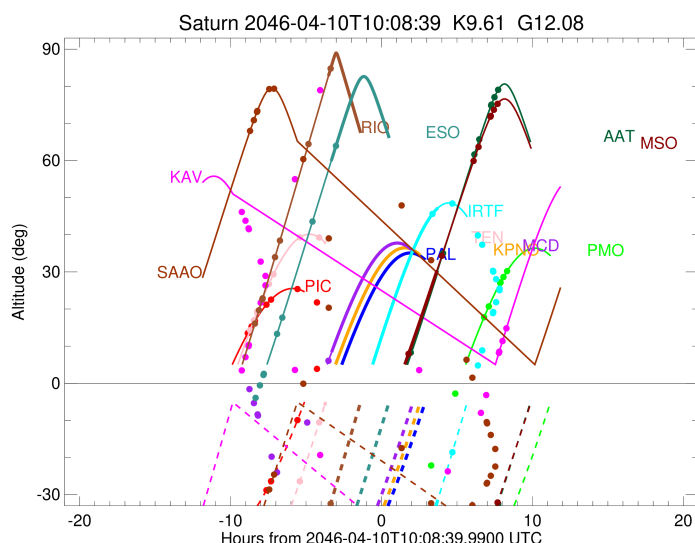
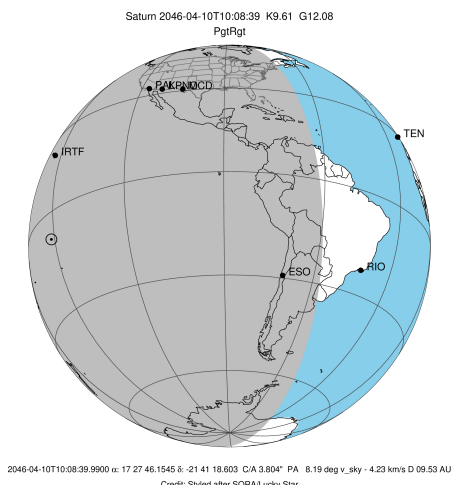
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T09:51:56.130  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 162.03  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.822  
 C/A sky separation (km) : 26407.7  
 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	2046-04-10T01:45:39.217		16.13	-67.87	140461.00	-3.81		
A (OER)	I	2046-04-10T02:01:44.644		19.69	-70.57	136774.40	-3.83		
Encke (OEG)	I	2046-04-10T02:14:55.426		22.63	-72.46	133744.89	-3.84		
Encke (IEG)	I	2046-04-10T02:16:19.249		22.94	-72.64	133423.31	-3.84		
A (IER)	I	2046-04-10T03:05:35.414		34.03	-74.97	122050.38	-3.85		
B (OER)	I	2046-04-10T03:24:59.301		38.43	-73.48	117571.16	-3.84		
B (IER)	I	2046-04-10T05:18:37.225		64.50	-52.33	91984.69	-3.59		
C (IER)	I	2046-04-10T06:46:52.052	b	84.86	-32.38	74490.58	-2.93		
Saturn	I	2046-04-10T06:37:38.799		82.75	-34.49	60095.71		-20.24	-24.32
Saturn	E	2046-04-10T13:12:29.571		7.17	50.35x	59962.90		-27.46	-32.44
C (IER)	E	2046-04-10T12:08:44.862	b	21.18	39.11x	74490.58	2.82		
B (IER)	E	2046-04-10T13:41:00.543		1.05x	54.30x	91984.69	3.41		
B (OER)	E	2046-04-10T15:40:52.684		-22.91x	57.01x	117571.16	3.64		
A (IER)	E	2046-04-10T16:01:19.556		-26.56x	54.95x	122050.38	3.66		
Encke (IEG)	E	2046-04-10T16:53:02.311		-34.84x	47.50x	133423.31	3.67		
Encke (OEG)	E	2046-04-10T16:54:29.899		-35.05x	47.25x	133744.89	3.67		
A (OER)	E	2046-04-10T17:08:14.846		-36.96x	44.86x	136774.40	3.67		
F ring	E	2046-04-10T17:24:58.332		-39.06x	41.80x	140461.00	3.67		

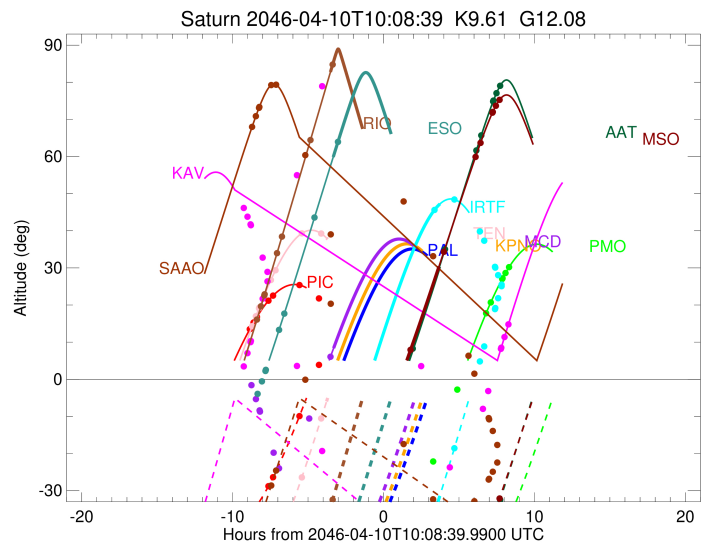
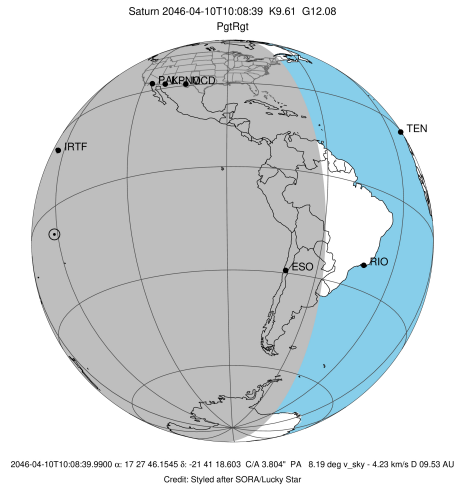
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:02:26.680  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 161.76  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 3.904  
 C/A sky separation (km) : 26972.8  
 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	2046-04-10T01:48:24.673		-3.89x	-43.66	140461.00	-3.57		
A (OER)	I	2046-04-10T02:05:35.563		-0.52x	-47.19	136774.40	-3.58		
Encke (OEG)	I	2046-04-10T02:19:39.631		2.28x	-50.02	133744.89	-3.59		
Encke (IEG)	I	2046-04-10T02:21:09.080		2.58x	-50.32	133423.31	-3.60		
A (IER)	I	2046-04-10T03:13:39.670		13.35	-60.02	122050.38	-3.62		
B (OER)	I	2046-04-10T03:34:17.482		17.68	-63.25	117571.16	-3.62		
B (IER)	I	2046-04-10T05:34:35.137		43.63	-65.82	91984.69	-3.40		
C (IER)	I	2046-04-10T07:07:59.127	b	64.02	-50.21	74490.58	-2.74		
Saturn	I	2046-04-10T06:48:32.973		59.81	-53.99	60075.17		-21.48	-25.73
Saturn	E	2046-04-10T13:16:22.526		31.80	27.68x	59967.11		-27.26	-32.21
C (IER)	E	2046-04-10T12:14:33.062	b	45.27	15.30x	74490.58	2.79		
B (IER)	E	2046-04-10T13:45:43.919		25.47	33.17x	91984.69	3.51		
B (OER)	E	2046-04-10T15:40:56.258		1.49x	49.74x	117571.16	3.82		
A (IER)	E	2046-04-10T16:00:24.671		-2.37x	51.27x	122050.38	3.84		
Encke (IEG)	E	2046-04-10T16:49:33.972		-11.70x	52.69x	133423.31	3.86		
Encke (OEG)	E	2046-04-10T16:50:57.177		-11.96x	52.67x	133744.89	3.87		
A (OER)	E	2046-04-10T17:04:00.856		-14.32x	52.40x	136774.40	3.87		
F ring	E	2046-04-10T17:19:54.383		-17.11x	51.71x	140461.00	3.87		

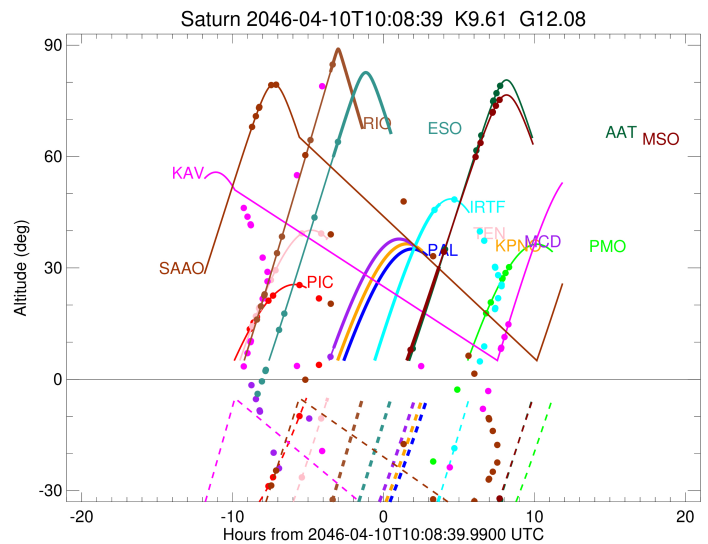
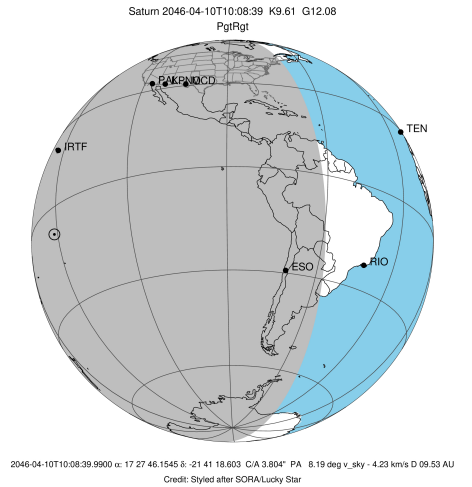
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:28:29.960  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : AAT  
 Location : Siding Spring (AAT)  
 Latitude (deg) : -31.27703  
 E. Longitude (deg) : 149.06608  
 Altitude (km) : 1.164  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60274s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 160.44  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 4.476  
 C/A sky separation (km) : 30927.6  
 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\_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	2046-04-10T00:58:52.380		3.36x	47.85x	140461.00	-3.47		
A (OER)	I	2046-04-10T01:16:45.668		-0.14x	49.26x	136774.40	-3.40		
Encke (OEG)	I	2046-04-10T01:31:42.516		-3.00x	50.13x	133744.89	-3.35		
Encke (IEG)	I	2046-04-10T01:33:18.541		-3.31x	50.20x	133423.31	-3.35		
A (IER)	I	2046-04-10T02:31:48.655		-13.94x	50.40x	122050.38	-3.13		
B (OER)	I	2046-04-10T02:56:00.253		-18.00x	49.05x	117571.16	-3.04		
B (IER)	I	2046-04-10T05:33:11.986		-36.01x	26.69x	91984.69	-2.36		
C (IER)	I	2046-04-10T08:07:17.681	b	-31.16x	-4.65x	74490.58	-1.33		
Saturn	I	2046-04-10T06:45:17.910		-36.81x	12.51x	60013.02		-24.92	-29.62
Saturn	E	2046-04-10T13:51:18.541		30.34	-66.82	59935.38		-28.80	-33.89
C (IER)	E	2046-04-10T12:04:28.985	b	8.18	-53.73	74490.58	1.50		
B (IER)	E	2046-04-10T14:13:30.382		35.07	-66.96	91984.69	2.93		
B (OER)	E	2046-04-10T16:18:23.609		61.75	-51.37	117571.16	3.82		
A (IER)	E	2046-04-10T16:37:40.350		65.76	-47.70	122050.38	3.92		
Encke (IEG)	E	2046-04-10T17:24:42.996		74.89	-38.23	133423.31	4.13		
Encke (OEG)	E	2046-04-10T17:26:00.832		75.12	-37.96	133744.89	4.13		
A (OER)	E	2046-04-10T17:38:09.610		77.12	-35.44	136774.40	4.18		
F ring	E	2046-04-10T17:52:46.253		79.09	-32.38	140461.00	4.23		

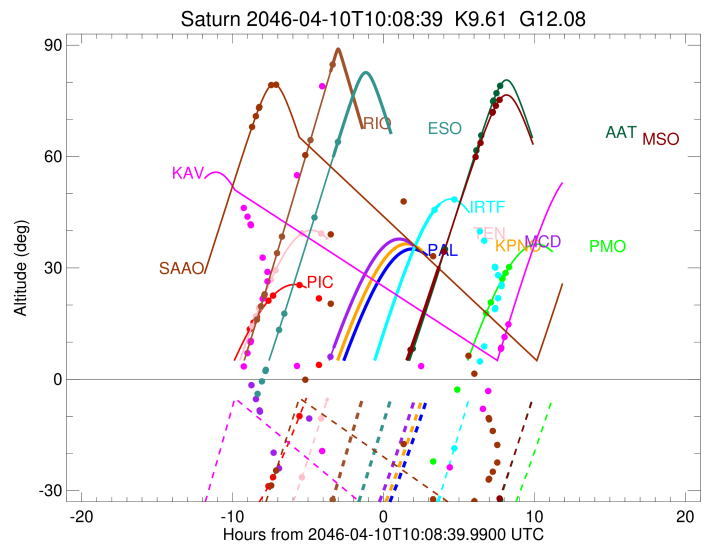
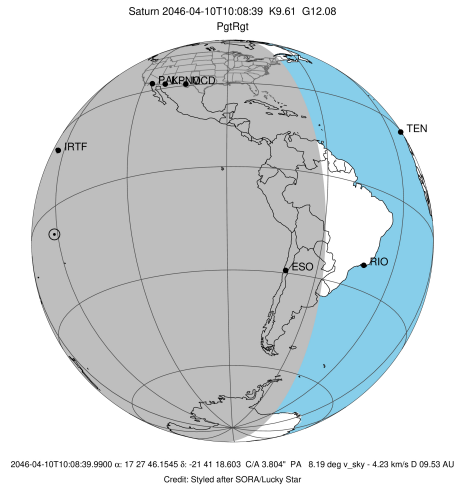
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T09:41:55.840  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : SAAO  
 Location : So. Afr. Astro. Obs. (Sutherland)  
 Latitude (deg) : -32.37953  
 E. Longitude (deg) : 20.81070  
 Altitude (km) : 1.768  
 Gaia source ID : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60273s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 161.79  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 4.217  
 C/A sky separation (km) : 29141.9  
 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	2046-04-10T01:26:22.220		68.02	-44.09	140461.00	-4.07		
A (OER)	I	2046-04-10T01:41:29.218		70.90	-41.10	136774.40	-4.06		
Encke (OEG)	I	2046-04-10T01:53:57.152		73.15	-38.60	133744.89	-4.04		
Encke (IEG)	I	2046-04-10T01:55:16.708		73.38	-38.33	133423.31	-4.04		
A (IER)	I	2046-04-10T02:42:38.387		79.26	-28.57	122050.38	-3.95		
B (OER)	I	2046-04-10T03:01:38.060		79.35	-24.59	117571.16	-3.90		
B (IER)	I	2046-04-10T04:58:03.722		60.32	-0.06x	91984.69	-3.34		
C (IER)	I	2046-04-10T06:39:28.237	b	38.93	20.43x	74490.58	-2.31		
Saturn	I	2046-04-10T06:18:59.036		43.28	16.43x	60079.04		-21.25	-25.47
Saturn	E	2046-04-10T13:18:21.290		-31.66x	34.41x	59900.02		-30.46	-35.69
C (IER)	E	2046-04-10T11:28:24.143	b	-17.41x	47.92x	74490.58	2.05		
B (IER)	E	2046-04-10T13:26:12.533		-32.35x	33.11x	91984.69	2.80		
B (OER)	E	2046-04-10T15:47:13.703		-34.42x	6.19x	117571.16	3.21		
A (IER)	E	2046-04-10T16:10:17.508		-32.83x	1.42x	122050.38	3.26		
Encke (IEG)	E	2046-04-10T17:07:15.602		-26.97x	-10.55	133423.31	3.39		
Encke (OEG)	E	2046-04-10T17:08:50.363		-26.77x	-10.88	133744.89	3.40		
A (OER)	E	2046-04-10T17:23:38.163		-24.85x	-14.02	136774.40	3.43		
F ring	E	2046-04-10T17:41:26.654		-22.37x	-17.79	140461.00	3.47		

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2046-04-10T10:27:16.570  
 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 : 4117826558200996608  
 2Mass ID (if available) : 17274615-2141173  
 ICRS Star Coord at Epoch: 17h 27m 46.15453s -21:41:18.60274s  
 RUWE (>1.4 is poor) : 0.85  
 K magnitude : 9.610  
 G magnitude : 12.077  
 RP magnitude : 11.288  
 BP magnitude : 12.753  
 DUPflag : 0  
 Distance (au) : 9.527  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.23  
 Sun-Target sep (deg) : 117.55  
 Sun-Moon sep (deg) : 160.47  
 B (ring opening deg) : 26.50  
 PA of pole (deg) : 4.80  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 4.517  
 C/A sky separation (km) : 31207.9  
 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	2046-04-10T01:01:06.668		4.57x	44.33x	140461.00	-3.46		
A (OER)	I	2046-04-10T01:19:02.937		1.23x	45.55x	136774.40	-3.40		
Encke (OEG)	I	2046-04-10T01:34:02.081		-1.51x	46.28x	133744.89	-3.34		
Encke (IEG)	I	2046-04-10T01:35:38.342		-1.79x	46.34x	133423.31	-3.34		
A (IER)	I	2046-04-10T02:34:15.811		-11.88x	46.35x	122050.38	-3.13		
B (OER)	I	2046-04-10T02:58:29.872		-15.70x	45.09x	117571.16	-3.03		
B (IER)	I	2046-04-10T05:36:03.803		-32.19x	24.22x	91984.69	-2.35		
C (IER)	I	2046-04-10T08:13:07.089	b	-27.08x	-6.24	74490.58	-1.26		
Saturn	I	2046-04-10T06:45:42.306		-32.80x	11.23x	60008.28		-25.17	-29.90
Saturn	E	2046-04-10T13:49:27.750		30.43	-62.77	59928.00		-29.15	-34.27
C (IER)	E	2046-04-10T11:55:40.795	b	7.83	-49.91	74490.58	1.41		
B (IER)	E	2046-04-10T14:08:50.116		34.39	-63.00	91984.69	2.88		
B (OER)	E	2046-04-10T16:15:15.802		60.01	-49.84	117571.16	3.78		
A (IER)	E	2046-04-10T16:34:43.503		63.73	-46.46	122050.38	3.89		
Encke (IEG)	E	2046-04-10T17:22:10.779		71.87	-37.60	133423.31	4.10		
Encke (OEG)	E	2046-04-10T17:23:29.258		72.06	-37.35	133744.89	4.10		
A (OER)	E	2046-04-10T17:35:43.960		73.72	-34.96	136774.40	4.15		
F ring	E	2046-04-10T17:50:27.529		75.30	-32.06	140461.00	4.20		