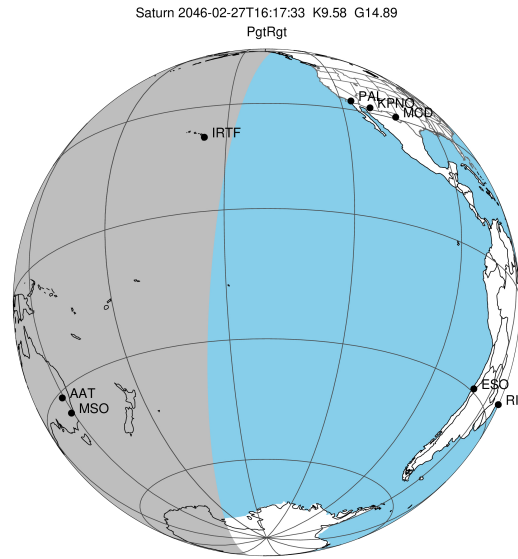


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-27T16:17:33.270
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4114859977094252544
 2Mass ID (if available) : 17241355-2141489

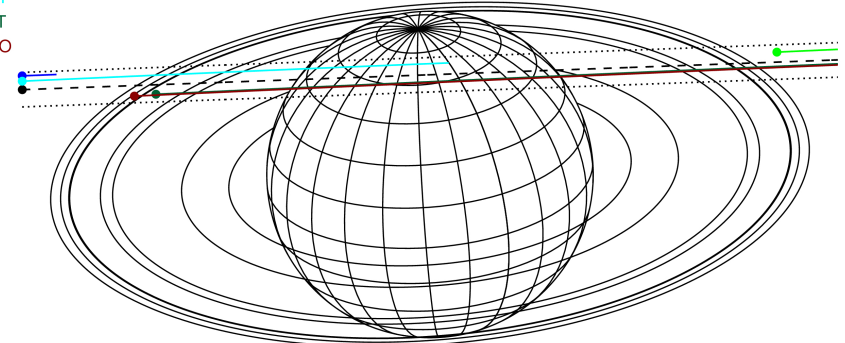
Saturn 2046-02-27T16:17:33 K9.58 G14.89 PgtRgt

ICRS Star Coord at Epoch: 17h 24m 13.54856s -21:41:49.37535s

RUWE (>1.4 is poor) : 0.95
 K magnitude : 9.584
 G magnitude : 14.890
 RP magnitude : 13.560
 BP magnitude : 16.998
 DUPflag : 0
 Distance (au) : 10.205
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.34
 Sun-Target sep (deg) : 76.90
 Sun-Moon sep (deg) : 14.54
 B (ring opening deg) : 26.58
 PA of pole (deg) : 4.71



Earth
 PAL
 PMO
 IRTF
 AAT
 MSO

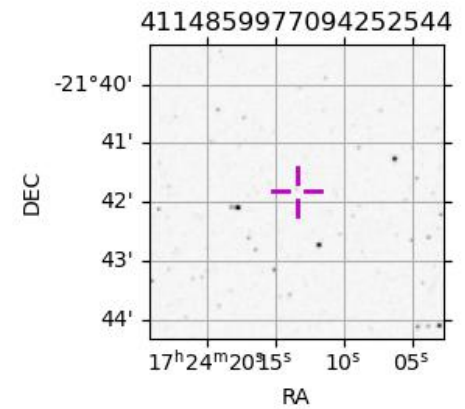


2046-02-27T16:17:33.2700 ra: 17 24 13.5486 s: -21 41 49.375 C/A 4.973° PA 182.09 deg v_sky +16.34 km/s D 10.20 AU
 Credit: Styled after SORA/Lucky Star

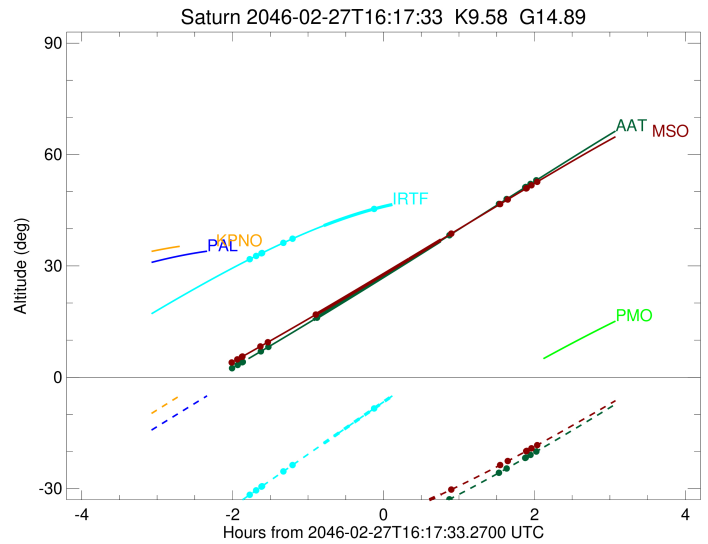
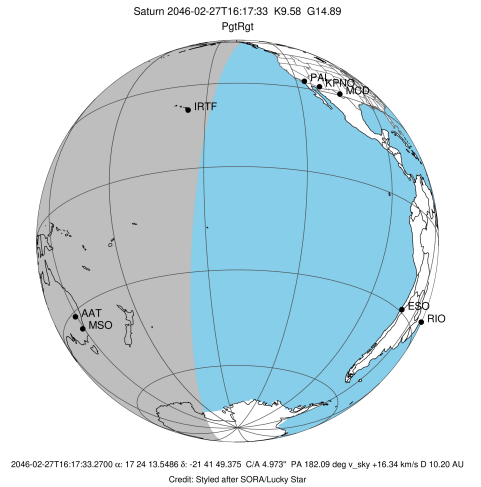
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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					PnnRnn
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	+ + + + +	+		FEB 27 14:31 - FEB 27 15:30	PinRin
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3					PnnRnn
AAT	Siding Spring	-31.3	149.1		+ +	+ + + + + + +	FEB 27 14:40 - FEB 27 18:19	PieRie
SAAO	So. Afr. Astro	-32.4	20.8			+ + + + + + +		PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0	+ + + +	+ +	+ + + + + + +	FEB 27 14:25 - FEB 27 18:19	PieRie



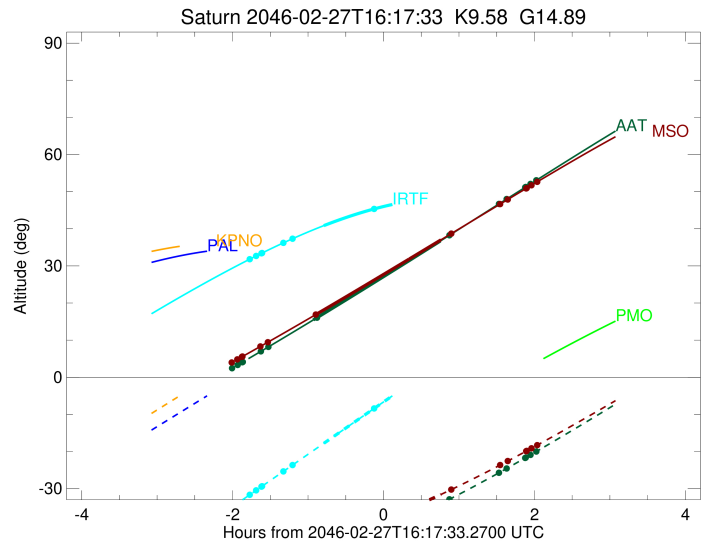
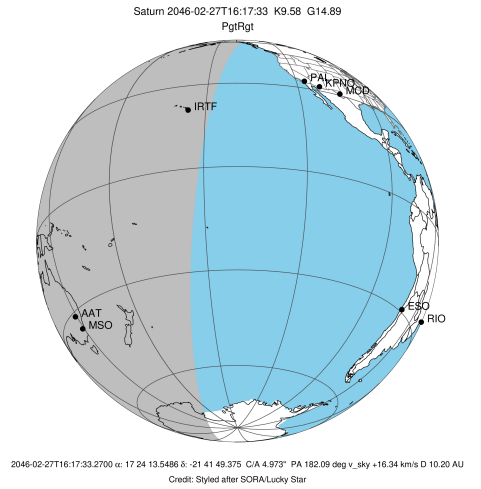
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-27T16:15:37.290
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4114859977094252544
 2Mass ID (if available) : 17241355-2141489
 ICRS Star Coord at Epoch: 17h 24m 13.54856s -21:41:49.37535s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 9.584
 G magnitude : 14.890
 RP magnitude : 13.560
 BP magnitude : 16.998
 DUPflag : 0
 Distance (au) : 10.205
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.34
 Sun-Target sep (deg) : 76.90
 Sun-Moon sep (deg) : 14.74
 B (ring opening deg) : 26.58
 PA of pole (deg) : 4.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.526
 C/A sky separation (km) : 40896.1
 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	2046-02-27T14:31:13.295		31.81	-31.66	140461.00	-12.20		
A (OER)	I	2046-02-27T14:36:18.541		32.68	-30.46	136774.40	-11.95		
Encke (OEG)	I	2046-02-27T14:40:34.459		33.40	-29.45	133744.89	-11.72		
Encke (IEG)	I	2046-02-27T14:41:01.919		33.47	-29.35	133423.31	-11.70		
A (IER)	I	2046-02-27T14:57:58.472		36.21	-25.36	122050.38	-10.63		
B (OER)	I	2046-02-27T15:05:10.627		37.32	-23.66	117571.16	-10.09		
B (IER)	I	2046-02-27T16:10:26.445	b	45.38	-8.32	91984.69	-2.04		
Saturn	I	2046-02-27T15:30:07.993		40.85	-17.79	59682.21		39.72	45.33
Saturn	E	2046-02-27T17:01:21.985		48.36	3.56x	59778.26		35.70	41.23
B (IER)	E	2046-02-27T16:35:25.169	b	47.27	-2.48x	91984.69	2.04		
B (OER)	E	2046-02-27T17:40:50.271		48.18	12.66x	117571.16	10.02		
A (IER)	E	2046-02-27T17:48:05.691		47.90	14.32x	122050.38	10.55		
Encke (IEG)	E	2046-02-27T18:05:11.289		46.97	18.21x	133423.31	11.58		
Encke (OEG)	E	2046-02-27T18:05:39.018		46.94	18.31x	133744.89	11.61		
A (OER)	E	2046-02-27T18:09:57.510		46.64	19.28x	136774.40	11.83		
F ring	E	2046-02-27T18:15:05.970		46.26	20.44x	140461.00	12.07		

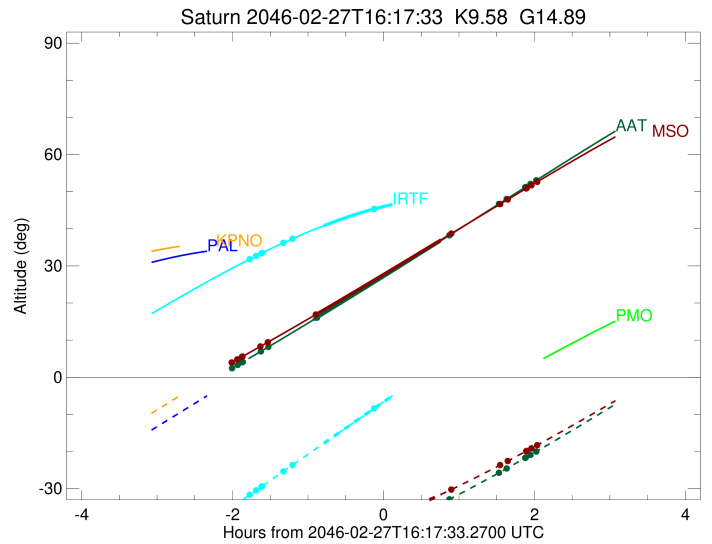
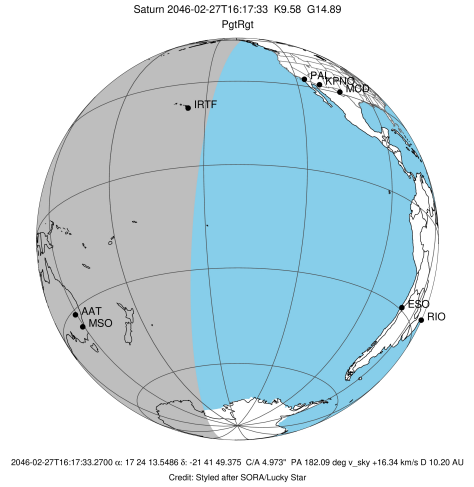
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-27T16:12:01.910
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4114859977094252544
 2Mass ID (if available) : 17241355-2141489
 ICRS Star Coord at Epoch: 17h 24m 13.54856s -21:41:49.37535s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 9.584
 G magnitude : 14.890
 RP magnitude : 13.560
 BP magnitude : 16.998
 DUPflag : 0
 Distance (au) : 10.205
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.34
 Sun-Target sep (deg) : 76.90
 Sun-Moon sep (deg) : 13.82
 B (ring opening deg) : 26.58
 PA of pole (deg) : 4.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.623
 C/A sky separation (km) : 34213.2
 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	2046-02-27T14:17:09.916		2.44x	-50.76	140461.00	-13.86		
A (OER)	I	2046-02-27T14:21:37.524		3.32x	-50.74	136774.40	-13.69		
Encke (OEG)	I	2046-02-27T14:25:20.006		4.05x	-50.70	133744.89	-13.54		
Encke (IEG)	I	2046-02-27T14:25:43.768		4.13x	-50.69	133423.31	-13.52		
A (IER)	I	2046-02-27T14:40:05.562		6.99	-50.35	122050.38	-12.84		
B (OER)	I	2046-02-27T14:45:58.942		8.17	-50.12	117571.17	-12.50		
B (IER)	I	2046-02-27T15:24:43.940	b	16.06	-47.48	91984.69	-9.10		
Saturn	I	2046-02-27T15:21:43.699		15.44	-47.75	59851.57		32.52	37.90
Saturn	E	2046-02-27T17:02:45.332		36.71	-34.11	59930.71		28.91	34.01
B (IER)	E	2046-02-27T17:10:02.723		38.27	-32.86	91984.69	8.99		
B (OER)	E	2046-02-27T17:49:30.477		46.73	-25.70	117571.16	12.21		
A (IER)	E	2046-02-27T17:55:32.527		48.02	-24.56	122050.38	12.52		
Encke (IEG)	E	2046-02-27T18:10:17.720		51.19	-21.72	133423.31	13.14		
Encke (OEG)	E	2046-02-27T18:10:42.172		51.27	-21.64	133744.89	13.16		
A (OER)	E	2046-02-27T18:14:31.226		52.09	-20.90	136774.40	13.29		
F ring	E	2046-02-27T18:19:07.012		53.07	-20.00	140461.00	13.44		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-02-27T16:12:18.030
 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 : 4114859977094252544
 2Mass ID (if available) : 17241355-2141489
 ICRS Star Coord at Epoch: 17h 24m 13.54856s -21:41:49.37535s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 9.584
 G magnitude : 14.890
 RP magnitude : 13.560
 BP magnitude : 16.998
 DUPflag : 0
 Distance (au) : 10.205
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 16.34
 Sun-Target sep (deg) : 76.90
 Sun-Moon sep (deg) : 13.83
 B (ring opening deg) : 26.58
 PA of pole (deg) : 4.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 4.573
 C/A sky separation (km) : 33844.9
 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	2046-02-27T14:16:54.642		3.99x	-46.73	140461.00	-13.92		
A (OER)	I	2046-02-27T14:21:21.036		4.82x	-46.71	136774.40	-13.76		
Encke (OEG)	I	2046-02-27T14:25:02.428		5.52	-46.68	133744.89	-13.61		
Encke (IEG)	I	2046-02-27T14:25:26.069		5.59	-46.68	133423.31	-13.59		
A (IER)	I	2046-02-27T14:39:42.754		8.31	-46.38	122050.38	-12.93		
B (OER)	I	2046-02-27T14:45:33.548		9.44	-46.19	117571.16	-12.60		
B (IER)	I	2046-02-27T15:23:46.922	b	16.90	-43.92	91984.69	-9.32		
Saturn	I	2046-02-27T15:21:44.253		16.50	-44.08	59859.39		32.18	37.53
Saturn	E	2046-02-27T17:03:16.479		37.02	-31.56	59938.96		28.51	33.59
B (IER)	E	2046-02-27T17:11:31.718		38.71	-30.24	91984.69	9.21		
B (OER)	E	2046-02-27T17:50:26.153		46.68	-23.62	117571.16	12.32		
A (IER)	E	2046-02-27T17:56:25.269		47.90	-22.55	122050.38	12.62		
Encke (IEG)	E	2046-02-27T18:11:04.413		50.88	-19.89	133423.31	13.22		
Encke (OEG)	E	2046-02-27T18:11:28.716		50.96	-19.82	133744.89	13.24		
A (OER)	E	2046-02-27T18:15:16.417		51.73	-19.12	136774.40	13.37		
F ring	E	2046-02-27T18:19:50.662		52.66	-18.27	140461.00	13.51		