

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-02-27T22:24:35.070
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4066738167103154816
 2Mass ID (if available) : 18101349-2221085

Saturn 2047-02-27T22:24:35 K8.69 G14.49 PgtRgt

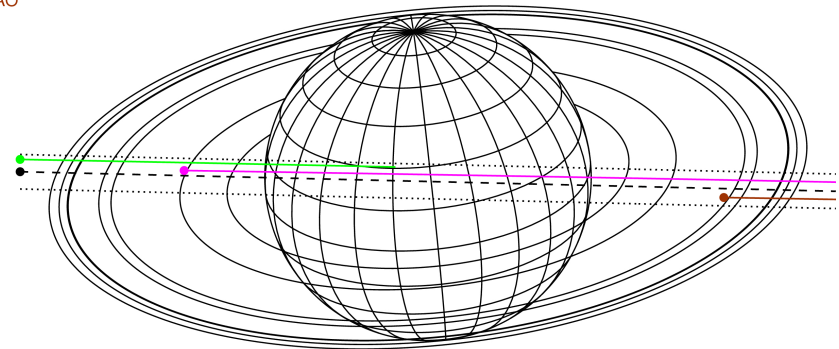
ICRS Star Coord at Epoch: 18h 10m 13.49761s -22:21:08.57099s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 8.686
 G magnitude : 14.494
 RP magnitude : 13.102
 BP magnitude : 16.927
 DUPflag : 0
 Distance (au) : 10.403
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 21.59
 Sun-Target sep (deg) : 66.23
 Sun-Moon sep (deg) : 101.16
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.71



2047-02-27T22:24:35.0700 α: 18 10 13.4976 δ: -22 21 08.571 C/A 0.196° PA 358.63 deg v_sky +21.59 km/s D 10.40 AU
 Credit: Styled after SORA/Lucky Star

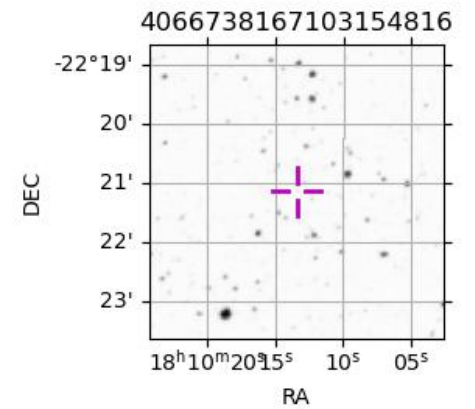
Earth
 PMO
 KAV
 SAAO



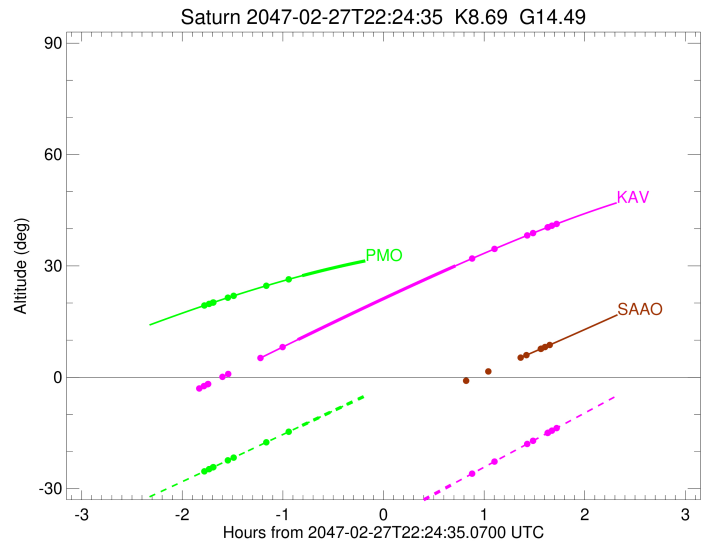
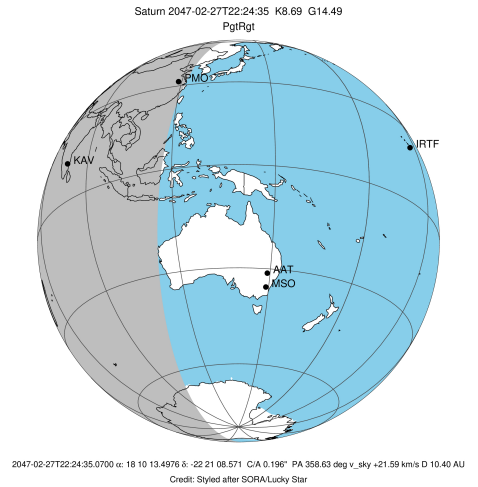
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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					PnnRnn
PMO	Purple Mtn Obs	32.1	118.8	+	+		FEB 27 20:37 - FEB 27 21:36	PinRin
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	+	+	+	FEB 27 21:11 - FEB 28 00:07	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					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8			+	FEB 27 23:46 - FEB 28 00:03	PnnRne
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



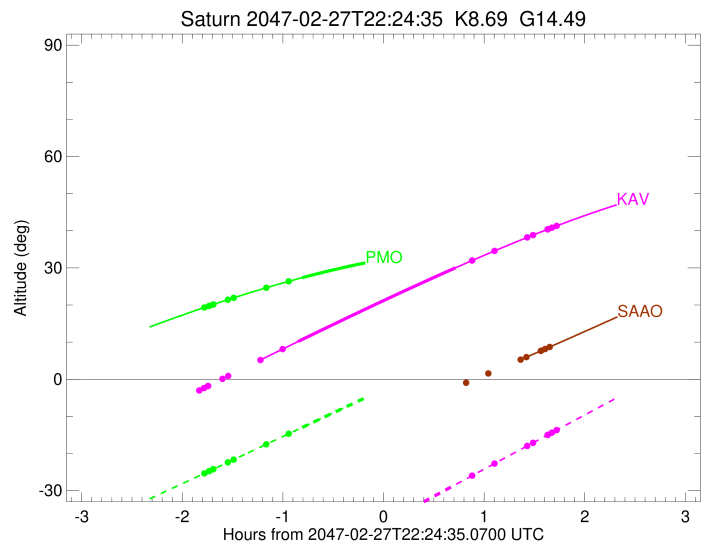
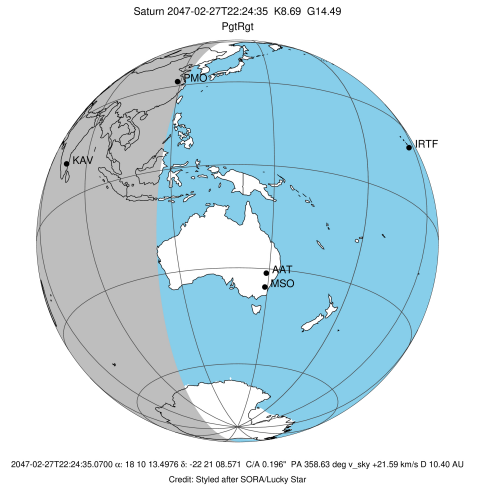
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-02-27T22:23:11.970
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 4066738167103154816
 2Mass ID (if available) : 18101349-2221085
 ICRS Star Coord at Epoch: 18h 10m 13.49761s -22:21:08.57099s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 8.686
 G magnitude : 14.494
 RP magnitude : 13.102
 BP magnitude : 16.927
 DUPflag : 0
 Distance (au) : 10.403
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 21.59
 Sun-Target sep (deg) : 66.23
 Sun-Moon sep (deg) : 101.60
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.479
 C/A sky separation (km) : 3612.6
 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_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	2047-02-27T20:37:48.656		19.34	-25.34	140461.00	-21.92		
A (OER)	I	2047-02-27T20:40:36.830		19.77	-24.74	136774.40	-21.92		
Encke (OEG)	I	2047-02-27T20:42:55.064		20.12	-24.26	133744.89	-21.91		
Encke (IEG)	I	2047-02-27T20:43:09.739		20.15	-24.20	133423.31	-21.91		
A (IER)	I	2047-02-27T20:51:48.982		21.44	-22.37	122050.38	-21.89		
B (OER)	I	2047-02-27T20:55:13.620		21.94	-21.65	117571.16	-21.88		
B (IER)	I	2047-02-27T21:14:44.269		24.66	-17.51	91984.69	-21.83		
C (IER)	I	2047-02-27T21:28:06.887		26.39	-14.67	74490.58	-21.76		
Saturn	I	2047-02-27T21:36:02.282		27.36	-12.99	60231.41		9.26	11.32
Saturn	E	2047-02-27T23:10:29.054		35.07	6.86x	60263.66		-3.17	-3.90
C (IER)	E	2047-02-27T23:21:01.497		35.42	9.02x	74490.58	21.69		
B (IER)	E	2047-02-27T23:34:27.058		35.69	11.76x	91984.69	21.74		
B (OER)	E	2047-02-27T23:54:03.163		35.74	15.70x	117571.16	21.77		
A (IER)	E	2047-02-27T23:57:28.892		35.71	16.38x	122050.38	21.77		
Encke (IEG)	E	2047-02-28T00:06:11.086		35.57	18.10x	133423.31	21.78		
Encke (OEG)	E	2047-02-28T00:06:25.848		35.56	18.15x	133744.89	21.78		
A (OER)	E	2047-02-28T00:08:44.913		35.51	18.60x	136774.40	21.79		
F ring	E	2047-02-28T00:11:34.122		35.44	19.16x	140461.00	21.79		

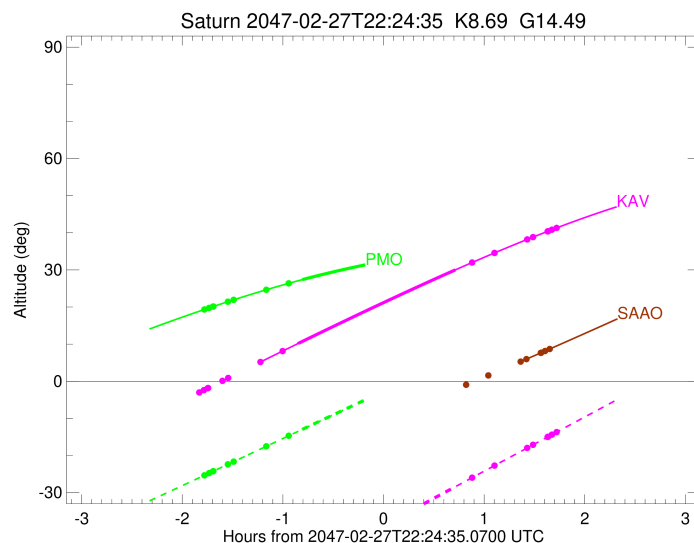
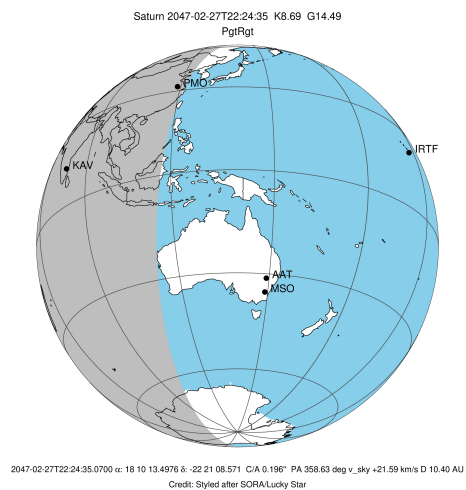
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-02-27T22:20:24.320
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4066738167103154816
 2Mass ID (if available) : 18101349-2221085
 ICRS Star Coord at Epoch: 18h 10m 13.49761s -22:21:08.57099s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 8.686
 G magnitude : 14.494
 RP magnitude : 13.102
 BP magnitude : 16.927
 DUPflag : 0
 Distance (au) : 10.403
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 21.59
 Sun-Target sep (deg) : 66.23
 Sun-Moon sep (deg) : 101.34
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.144
 C/A sky separation (km) : 1082.8
 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	2047-02-27T20:34:45.601	-3.01x	-65.61	140461.00	-22.19			
A (OER)	I	2047-02-27T20:37:31.787	-2.38x	-64.94	136774.40	-22.18			
Encke (OEG)	I	2047-02-27T20:39:48.391	-1.86x	-64.39	133744.89	-22.17			
Encke (IEG)	I	2047-02-27T20:40:02.893	-1.81x	-64.33	133423.31	-22.17			
A (IER)	I	2047-02-27T20:48:36.038	0.12x	-62.26	122050.38	-22.15			
B (OER)	I	2047-02-27T20:51:58.276	0.88x	-61.44	117571.16	-22.14			
B (IER)	I	2047-02-27T21:11:15.022	5.20	-56.75	91984.69	-22.09			
C (IER)	I	2047-02-27T21:24:27.483	8.14	-53.54	74490.58	-22.06			
Saturn	I	2047-02-27T21:33:32.685	10.14	-51.32	60247.75			6.87	8.42
Saturn	E	2047-02-27T23:07:29.194	30.02	-28.39	60256.93			-5.07	-6.23
C (IER)	E	2047-02-27T23:17:23.404	31.98	-25.98	74490.58	21.84			
B (IER)	E	2047-02-27T23:30:44.660	34.57	-22.72	91984.69	21.83			
B (OER)	E	2047-02-27T23:50:17.499	38.21	-17.96	117571.16	21.80			
A (IER)	E	2047-02-27T23:53:42.940	38.83	-17.13	122050.38	21.80			
Encke (IEG)	E	2047-02-28T00:02:24.728	40.37	-15.01	133423.31	21.79			
Encke (OEG)	E	2047-02-28T00:02:39.486	40.42	-14.95	133744.89	21.79			
A (OER)	E	2047-02-28T00:04:58.520	40.82	-14.39	136774.40	21.79			
F ring	E	2047-02-28T00:07:47.731	41.31	-13.70	140461.00	21.79			

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-02-27T22:20:53.860
 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 : 4066738167103154816
 2Mass ID (if available) : 18101349-2221085
 ICRS Star Coord at Epoch: 18h 10m 13.49761s -22:21:08.57099s
 RUWE (>1.4 is poor) : 1.05
 K magnitude : 8.686
 G magnitude : 14.494
 RP magnitude : 13.102
 BP magnitude : 16.927
 DUPflag : 0
 Distance (au) : 10.403
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 21.59
 Sun-Target sep (deg) : 66.23
 Sun-Moon sep (deg) : 100.87
 B (ring opening deg) : 26.26
 PA of pole (deg) : 5.71
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 0.728
 C/A sky separation (km) : 5491.1
 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_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	2047-02-27T20:35:17.843	-26.50x	-38.56	140461.00	-22.49			
A (OER)	I	2047-02-27T20:38:01.779	-26.16x	-38.96	136774.40	-22.48			
Encke (OEG)	I	2047-02-27T20:40:16.546	-25.88x	-39.28	133744.89	-22.48			
Encke (IEG)	I	2047-02-27T20:40:30.854	-25.85x	-39.32	133423.31	-22.47			
A (IER)	I	2047-02-27T20:48:57.237	-24.77x	-40.51	122050.38	-22.44			
B (OER)	I	2047-02-27T20:52:16.887	-24.33x	-40.97	117571.16	-22.43			
B (IER)	I	2047-02-27T21:11:20.291	-21.68x	-43.40	91984.69	-22.32			
C (IER)	I	2047-02-27T21:24:26.272	-19.75x	-44.89	74490.58	-22.19			
Saturn	I	2047-02-27T21:35:03.908	-18.12x	-45.97	60267.24			1.33	1.64
Saturn	E	2047-02-27T23:06:52.233	-2.25x	-49.49	60219.57			-10.67	-13.02
C (IER)	E	2047-02-27T23:13:48.663	-0.95x	-49.28	74490.58	21.97			
B (IER)	E	2047-02-27T23:27:03.303	1.56x	-48.71	91984.69	22.05			
B (OER)	E	2047-02-27T23:46:22.458	5.29	-47.47	117571.16	22.09			
A (IER)	E	2047-02-27T23:49:45.242	5.95	-47.21	122050.38	22.09			
Encke (IEG)	E	2047-02-27T23:58:20.081	7.64	-46.48	133423.31	22.09			
Encke (OEG)	E	2047-02-27T23:58:34.638	7.69	-46.45	133744.89	22.09			
A (OER)	E	2047-02-28T00:00:51.783	8.14	-46.24	136774.40	22.09			
F ring	E	2047-02-28T00:03:38.680	8.69	-45.98	140461.00	22.09			