

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2036-06-12T07:57:09.260  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 635033493357566592  
 2Mass ID (if available) : 09103334+1722334

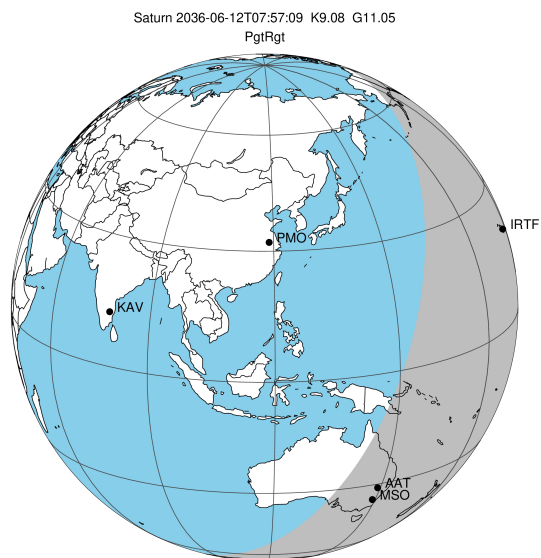
Saturn 2036-06-12T07:57:09 K9.08 G11.05 PgtRgt

ICRS Star Coord at Epoch: 09h 10m 33.32832s +17:22:31.96034s

RUWE (>1.4 is poor) : 1.21  
 K magnitude : 9.081  
 G magnitude : 11.049  
 RP magnitude : 10.424  
 BP magnitude : 11.509  
 DUPflag : 0  
 Distance (au) : 9.742  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 27.33  
 Sun-Target sep (deg) : 53.42  
 Sun-Moon sep (deg) : 164.76  
 B (ring opening deg) : -16.47  
 PA of pole (deg) : -6.73

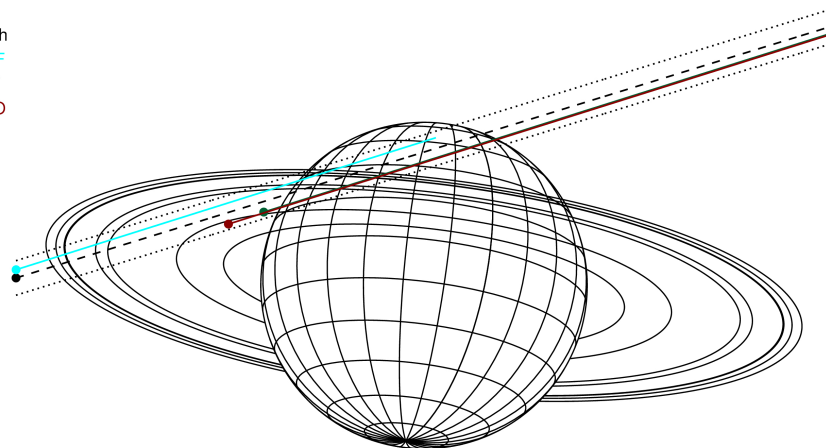
# a(km) ring

- 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



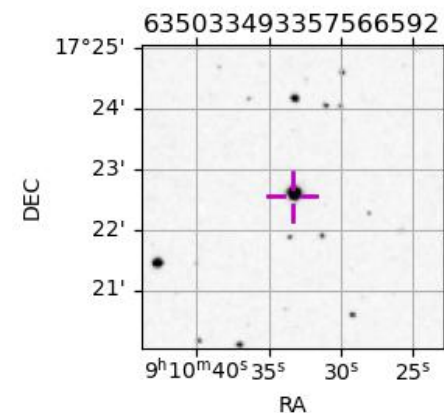
2036-06-12T07:57:09.2600 ex: 09 10 33.3283 2: +17 22 31.960 C/A 6.663° PA 197.15 deg v\_sky +27.33 km/s D 09.74 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 IRTF  
 AAT  
 MSO

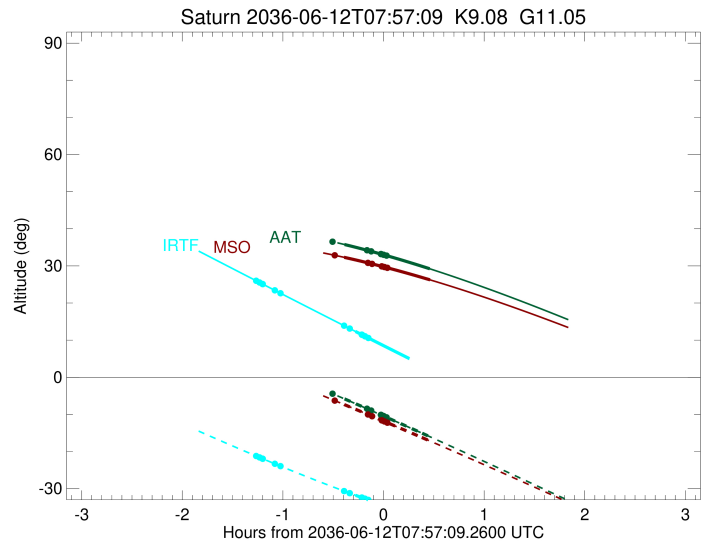
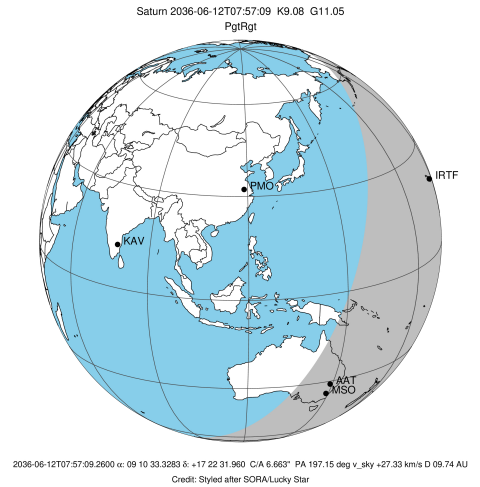


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					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	+ + + + +	+	+ +	JUN 12 06:41 - JUN 12 07:40	PinRie
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		+ +		JUN 12 07:33 - JUN 12 08:24	PieRnn
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0		+ +	+	JUN 12 07:28 - JUN 12 08:24	PieRne

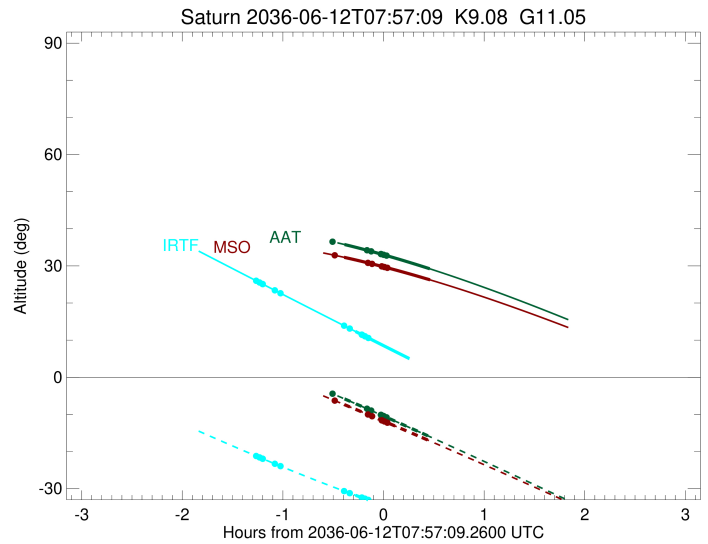
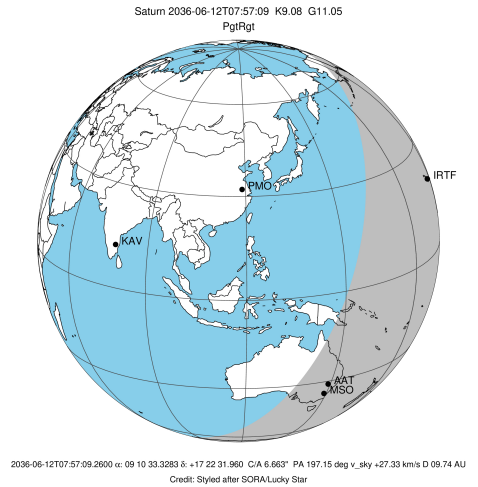


target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2036-06-12T08:00:08.580  
 Event type : PgtRgt  
 : Saturn occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : IRTF  
 Location : Mauna Kea/IRTF  
 Latitude (deg) : 19.82622  
 E. Longitude (deg) : 204.52800  
 Altitude (km) : 4.168  
 Gaia source ID : 635033493357566592  
 2Mass ID (if available) : 09103334+1722334  
 ICRS Star Coord at Epoch: 09h 10m 33.32832s +17:22:31.96034s  
 RUWE (>1.4 is poor) : 1.21  
 K magnitude : 9.081  
 G magnitude : 11.049  
 RP magnitude : 10.424  
 BP magnitude : 11.509  
 DUPflag : 0  
 Distance (au) : 9.742  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 27.33  
 Sun-Target sep (deg) : 53.42  
 Sun-Moon sep (deg) : 165.57  
 B (ring opening deg) : -16.47  
 PA of pole (deg) : -6.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 7.184  
 C/A sky separation (km) : 50761.6  
 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



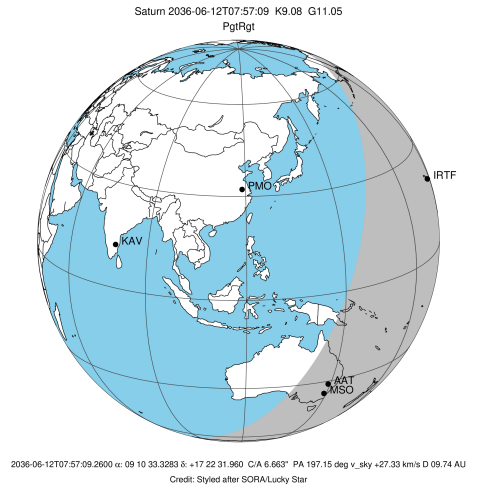
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-06-12T06:41:15.445		25.99	-21.22	140461.00	-30.95		
A (OER)	I	2036-06-12T06:43:16.649		25.52	-21.60	136774.40	-29.87		
Encke (OEG)	I	2036-06-12T06:44:59.763		25.12	-21.93	133744.89	-28.88		
Encke (IEG)	I	2036-06-12T06:45:10.919		25.08	-21.96	133423.31	-28.77		
A (IER)	I	2036-06-12T06:52:21.624		23.42	-23.31	122050.38	-23.82		
B (OER)	I	2036-06-12T06:55:41.017		22.65	-23.93	117571.17	-21.06		
Saturn	I	2036-06-12T07:40:29.167		12.33	-31.80	60129.17		31.93	37.26
Saturn	E	2036-06-12T08:19:25.272		3.48x	-37.74	59823.41		71.80	74.78
B (OER)	E	2036-06-12T07:33:42.241		13.88	-30.67	117571.16	21.12		
A (IER)	E	2036-06-12T07:37:00.993		13.12	-31.22	122050.38	23.90		
Encke (IEG)	E	2036-06-12T07:44:09.997	b	11.49	-32.40	133423.31	28.90		
Encke (OEG)	E	2036-06-12T07:44:21.104	b	11.44	-32.43	133744.89	29.01		
A (OER)	E	2036-06-12T07:46:03.754	b	11.05	-32.71	136774.40	30.01		
F ring	E	2036-06-12T07:48:04.393	b	10.59	-33.03	140461.00	31.10		

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2036-06-12T07:59:30.020  
 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 : 635033493357566592  
 2Mass ID (if available) : 09103334+1722334  
 ICRS Star Coord at Epoch: 09h 10m 33.32832s +17:22:31.96034s  
 RUWE (>1.4 is poor) : 1.21  
 K magnitude : 9.081  
 G magnitude : 11.049  
 RP magnitude : 10.424  
 BP magnitude : 11.509  
 DUPflag : 0  
 Distance (au) : 9.742  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 27.33  
 Sun-Target sep (deg) : 53.42  
 Sun-Moon sep (deg) : 165.34  
 B (ring opening deg) : -16.47  
 PA of pole (deg) : -6.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 6.176  
 C/A sky separation (km) : 43635.2  
 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

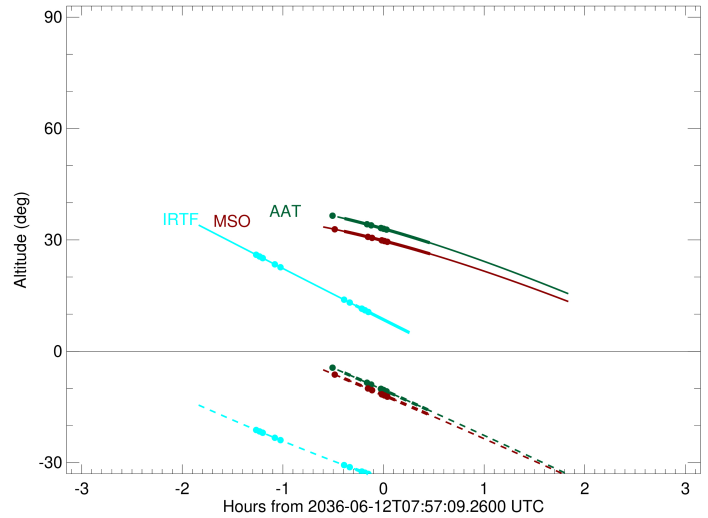


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-06-12T06:41:07.227		40.22	4.24x	140461.00	-35.35		
A (OER)	I	2036-06-12T06:42:52.506		40.12	3.92x	136774.40	-34.67		
Encke (OEG)	I	2036-06-12T06:44:20.644		40.03	3.65x	133744.88	-34.06		
Encke (IEG)	I	2036-06-12T06:44:30.094		40.02	3.62x	133423.31	-33.99		
A (IER)	I	2036-06-12T06:50:18.792		39.65	2.54x	122050.38	-31.11		
B (OER)	I	2036-06-12T06:52:46.218		39.48	2.08x	117571.16	-29.63		
B (IER)	I	2036-06-12T07:13:19.289		37.82	-1.83x	91984.69	-9.38		
Saturn	I	2036-06-12T07:33:54.867		35.76	-5.82	60202.27		21.32	25.55
Saturn	E	2036-06-12T08:24:45.081		29.22	-16.00	59862.69		65.04	68.95
B (IER)	E	2036-06-12T07:26:48.730		36.51	-4.44x	91984.69	9.39		
B (OER)	E	2036-06-12T07:47:18.017	b	34.22	-8.47	117571.17	29.77		
A (IER)	E	2036-06-12T07:49:44.756	b	33.93	-8.95	122050.38	31.25		
Encke (IEG)	E	2036-06-12T07:55:31.811	b	33.21	-10.10	133423.31	34.15		
Encke (OEG)	E	2036-06-12T07:55:41.217	b	33.19	-10.13	133744.88	34.22		
A (OER)	E	2036-06-12T07:57:08.954	b	33.00	-10.43	136774.40	34.83		
F ring	E	2036-06-12T07:58:53.767	b	32.78	-10.78	140461.00	35.51		

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2036-06-12T07:59:29.020  
 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 : 635033493357566592  
 2Mass ID (if available) : 09103334+1722334  
 ICRS Star Coord at Epoch: 09h 10m 33.32832s +17:22:31.96034s  
 RUWE (>1.4 is poor) : 1.21  
 K magnitude : 9.081  
 G magnitude : 11.049  
 RP magnitude : 10.424  
 BP magnitude : 11.509  
 DUPflag : 0  
 Distance (au) : 9.742  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 27.33  
 Sun-Target sep (deg) : 53.42  
 Sun-Moon sep (deg) : 165.31  
 B (ring opening deg) : -16.47  
 PA of pole (deg) : -6.73  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 6.130  
 C/A sky separation (km) : 43311.5  
 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



Saturn 2036-06-12T07:57:09 K9.08 G11.05



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2036-06-12T06:41:13.375		36.34	2.22x	140461.00	-35.53		
A (OER)	I	2036-06-12T06:42:58.094		36.24	1.91x	136774.40	-34.87		
Encke (OEG)	I	2036-06-12T06:44:25.724		36.17	1.66x	133744.89	-34.27		
Encke (IEG)	I	2036-06-12T06:44:35.117		36.16	1.63x	133423.31	-34.20		
A (IER)	I	2036-06-12T06:50:21.317		35.82	0.60x	122050.38	-31.37		
B (OER)	I	2036-06-12T06:52:47.384		35.67	0.17x	117571.17	-29.93		
B (IER)	I	2036-06-12T07:12:35.222		34.23	-3.42x	91984.69	-10.80		
Saturn	I	2036-06-12T07:33:42.014		32.31	-7.34	60204.67		20.91	25.08
Saturn	E	2036-06-12T08:24:56.111		26.24	-17.19	59864.98		64.69	68.65
B (IER)	E	2036-06-12T07:28:06.787		32.85	-6.30	91984.69	10.82		
B (OER)	E	2036-06-12T07:47:50.892	b	30.82	-10.02	117571.16	30.07		
A (IER)	E	2036-06-12T07:50:16.290	b	30.55	-10.48	122050.38	31.52		
Encke (IEG)	E	2036-06-12T07:56:00.908	b	29.89	-11.58	133423.31	34.35		
Encke (OEG)	E	2036-06-12T07:56:10.259	b	29.87	-11.61	133744.89	34.42		
A (OER)	E	2036-06-12T07:57:37.507	b	29.70	-11.89	136774.40	35.02		
F ring	E	2036-06-12T07:59:21.783	b	29.50	-12.22	140461.00	35.68		