

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-08-23T22:08:25.210  
 Event type : XRT  
 : No Saturn occs  
 : Ring occs: topocentric, not geocentric  
 Gaia source ID : 4068973955290833152  
 2Mass ID (if available) : 17484000-2228388

Saturn 2047-08-23T22:08:25 K8.83 G14.39 XRT

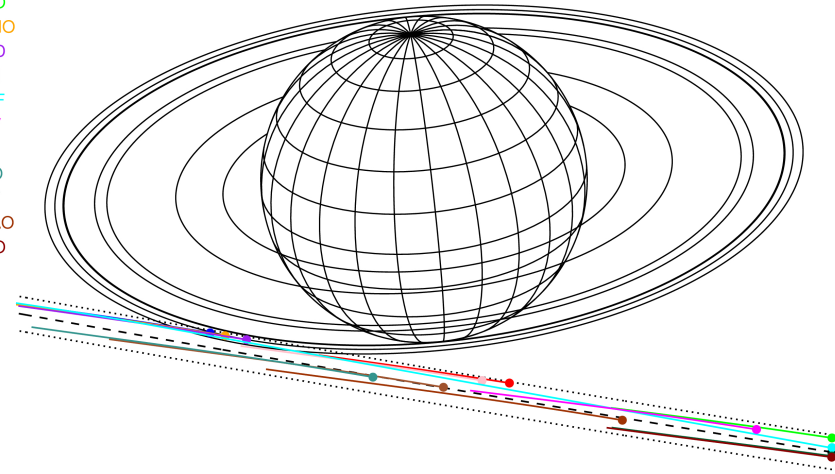
ICRS Star Coord at Epoch: 17h 48m 40.01176s -22:28:39.24117s

RUWE (>1.4 is poor) : 0.93  
 K magnitude : 8.829  
 G magnitude : 14.389  
 RP magnitude : 13.012  
 BP magnitude : 16.650  
 DUPflag : 0  
 Distance (au) : 9.542  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.18  
 Sun-Target sep (deg) : 117.32  
 Sun-Moon sep (deg) : 83.69  
 B (ring opening deg) : 26.86  
 PA of pole (deg) : 5.29



2047-08-23T22:08:25.2100 α: 17 48 40.0118 δ: -22 28 39.241 C/A \*\*\*\*\* PA 350.30 deg v\_sky - 4.18 km/s D 09.54 AU  
 Credit: Styled after SORA/Lucky Star

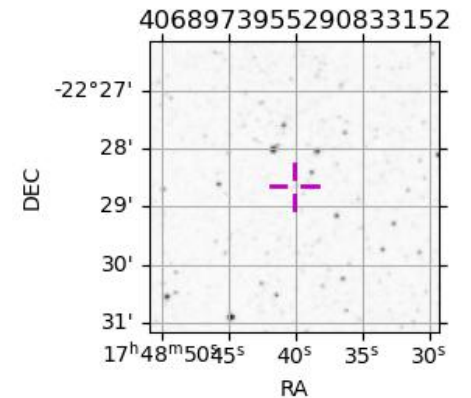
Earth  
 PIC  
 PAL  
 PMO  
 KPNO  
 MCD  
 TEN  
 IRTF  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



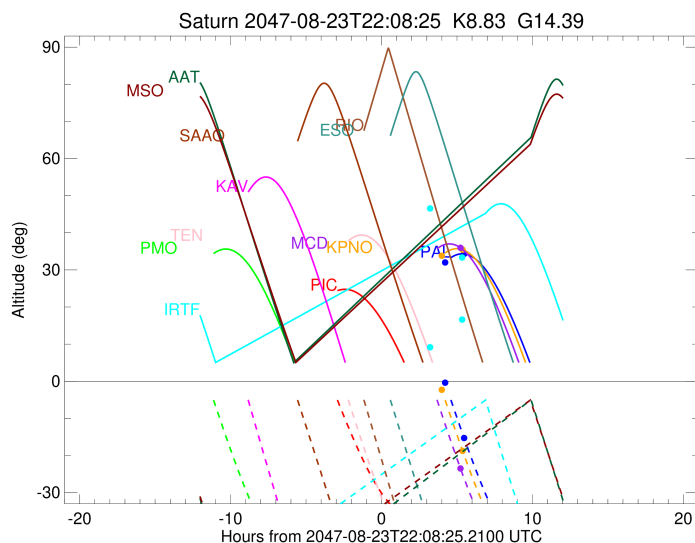
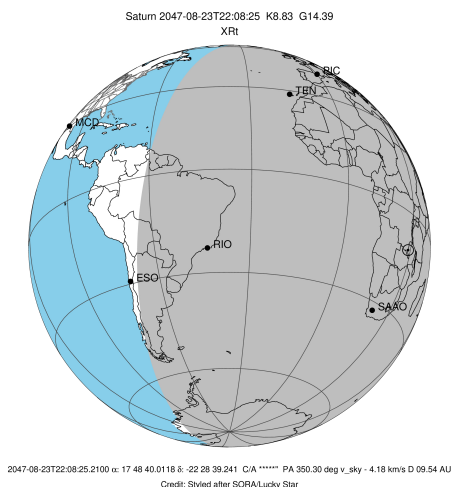
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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			+	AUG 24 03:38 - AUG 24 03:38	PnnRne
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4			+	AUG 24 03:32 - AUG 24 03:32	PnnRne
MCD	McDonald Obs.	30.7	256.0			+	AUG 24 03:24 - AUG 24 03:24	PnnRne
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					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					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn



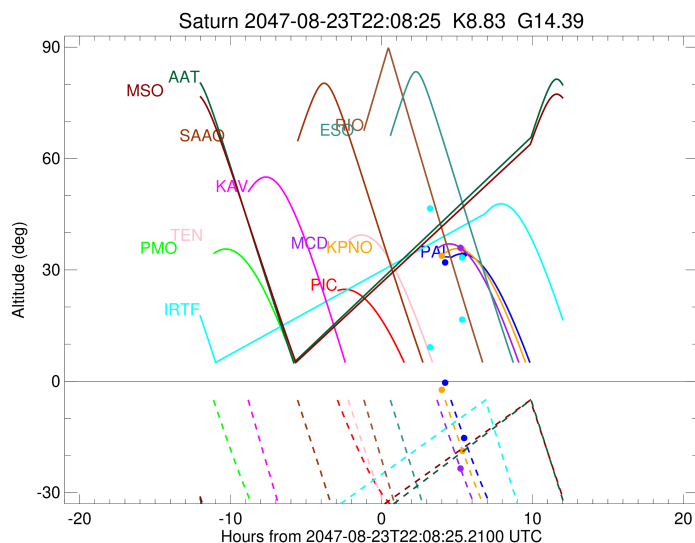
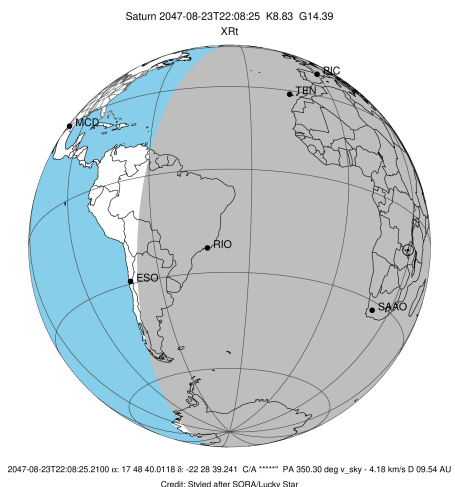
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-08-23T22:34:02.540  
 Event type : XRt  
 : No Saturn occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : PAL  
 Location : Palomar Mt (200")  
 Latitude (deg) : 33.35622  
 E. Longitude (deg) : 243.13601  
 Altitude (km) : 1.706  
 Gaia source ID : 4068973955290833152  
 2Mass ID (if available) : 17484000-2228388  
 ICRS Star Coord at Epoch: 17h 48m 40.01176s -22:28:39.24117s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 8.829  
 G magnitude : 14.389  
 RP magnitude : 13.012  
 BP magnitude : 16.650  
 DUPflag : 0  
 Distance (au) : 9.542  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.18  
 Sun-Target sep (deg) : 117.32  
 Sun-Moon sep (deg) : 83.52  
 B (ring opening deg) : 26.86  
 PA of pole (deg) : 5.29  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 10.119  
 C/A sky separation (km) : 70029.4  
 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	2047-08-24T00:05:09.592		15.96	27.94x	140461.00	-1.27		
A (OER)	I	2047-08-24T01:16:47.118		25.93	12.96x	136774.45	-0.43		
No planet occultations									
A (OER)	E	2047-08-24T02:26:12.736		32.31	-1.36x	136774.45	0.43		
F ring	E	2047-08-24T03:38:17.544		34.29	-15.58	140461.00	1.26		

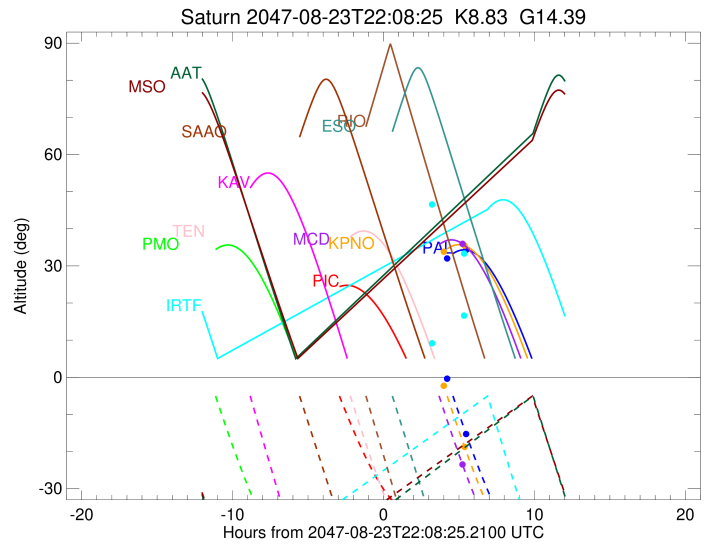
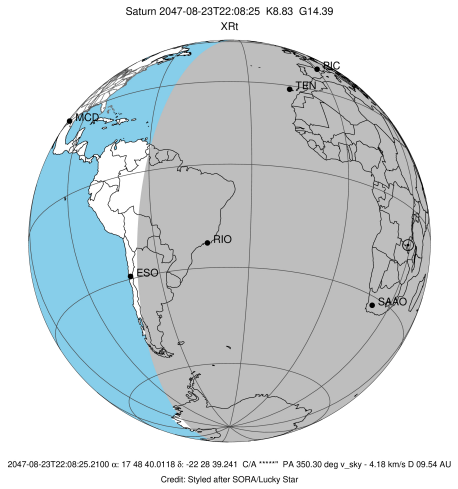
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-08-23T22:33:08.240  
 Event type : XRt  
 : No Saturn occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : KPNO  
 Location : Kitt Peak Natl Obs  
 Latitude (deg) : 31.96333  
 E. Longitude (deg) : 248.40000  
 Altitude (km) : 2.120  
 Gaia source ID : 4068973955290833152  
 2Mass ID (if available) : 17484000-2228388  
 ICRS Star Coord at Epoch: 17h 48m 40.01176s -22:28:39.24117s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 8.829  
 G magnitude : 14.389  
 RP magnitude : 13.012  
 BP magnitude : 16.650  
 DUPflag : 0  
 Distance (au) : 9.542  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.18  
 Sun-Target sep (deg) : 117.32  
 Sun-Moon sep (deg) : 83.60  
 B (ring opening deg) : 26.86  
 PA of pole (deg) : 5.29  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 10.112  
 C/A sky separation (km) : 69977.0  
 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	2047-08-24T00:04:22.122		20.03	23.74x	140461.00	-1.25		
A (OER)	I	2047-08-24T01:21:17.170		29.94	7.44x	136774.78	-0.33		
No planet occultations									
A (OER)	E	2047-08-24T02:14:39.099		34.21	-3.65x	136774.81	0.33		
F ring	E	2047-08-24T03:32:22.156		35.42	-19.05	140461.00	1.23		

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2047-08-23T22:31:13.160  
 Event type : XRt  
 : No Saturn occs  
 : Ring occs: topocentric, not geocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 4068973955290833152  
 2Mass ID (if available) : 17484000-2228388  
 ICRS Star Coord at Epoch: 17h 48m 40.01176s -22:28:39.24117s  
 RUWE (>1.4 is poor) : 0.93  
 K magnitude : 8.829  
 G magnitude : 14.389  
 RP magnitude : 13.012  
 BP magnitude : 16.650  
 DUPflag : 0  
 Distance (au) : 9.542  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -4.18  
 Sun-Target sep (deg) : 117.32  
 Sun-Moon sep (deg) : 83.71  
 B (ring opening deg) : 26.86  
 PA of pole (deg) : 5.29  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 10.097  
 C/A sky separation (km) : 69876.2  
 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	2047-08-24T00:02:26.194		25.09	17.66x	140461.00	-1.22		
No planet occultations									
F ring	E	2047-08-24T03:24:03.470		35.87	-23.80	140461.00	1.19		