

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-23T21:50:56.700
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4115097501622093696
 2Mass ID (if available) : 17192327-2132055

Saturn 2046-05-23T21:50:56 K8.34 G14.42 PgtRgt

ICRS Star Coord at Epoch: 17h 19m 23.26842s -21:32:05.72311s

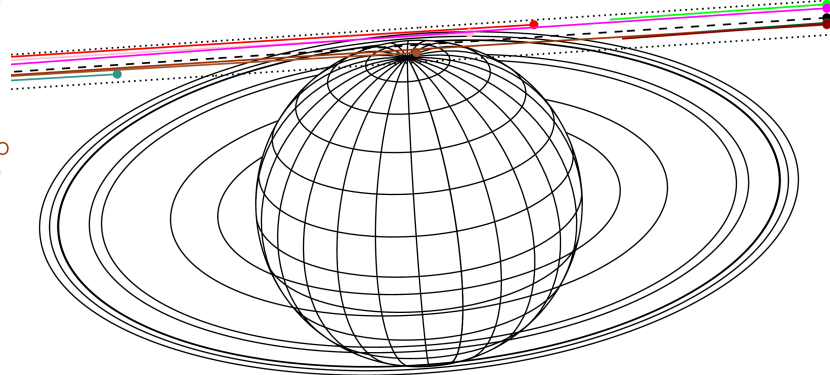
RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.342
 G magnitude : 14.422
 RP magnitude : 12.957
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 9.067
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.67
 Sun-Target sep (deg) : 161.67
 Sun-Moon sep (deg) : 29.11
 B (ring opening deg) : 26.50
 PA of pole (deg) : 4.59

#	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



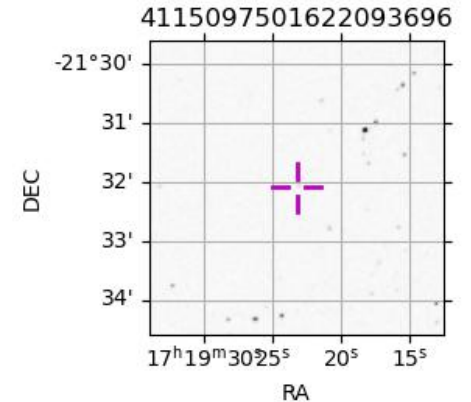
2046-05-23T21:50:56.7000 at: 17 19 23.2684 s: -21 32 05.723 C/A 8.890° PA 183.80 deg v_sky -18.67 km/s D 09.07 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO

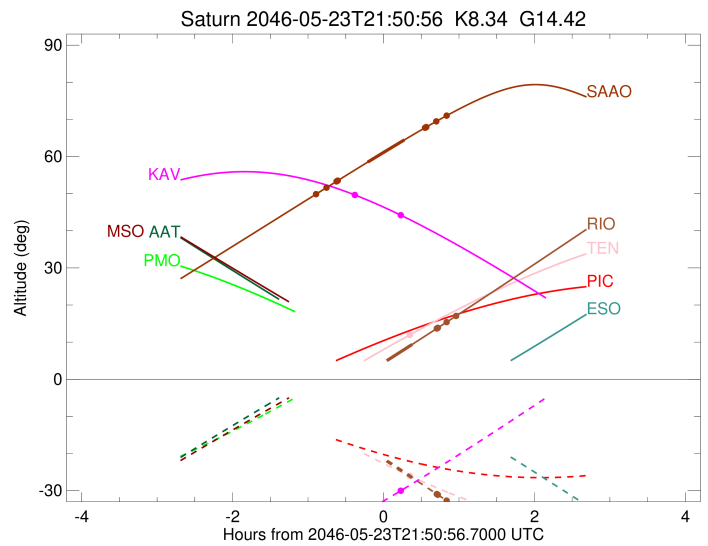
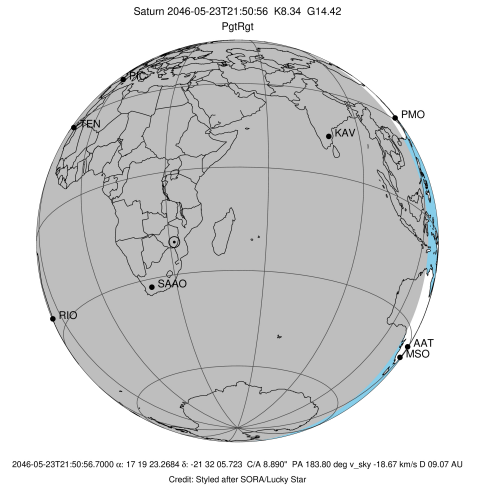


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	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			+	MAY 23 22:12 - MAY 23 22:12	PnnRne
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+		+	MAY 23 21:27 - MAY 23 22:04	PnnRie
RIO	Rio de Janeiro	-22.9	316.8		+	+	MAY 23 22:13 - MAY 23 22:48	PneRne
ESO	European South	-29.3	289.3			+		PnnRnn
AAT	Siding Spring	-31.3	149.1			+		PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8	+	+	+	MAY 23 20:57 - MAY 23 22:41	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0			+		PnnRnn



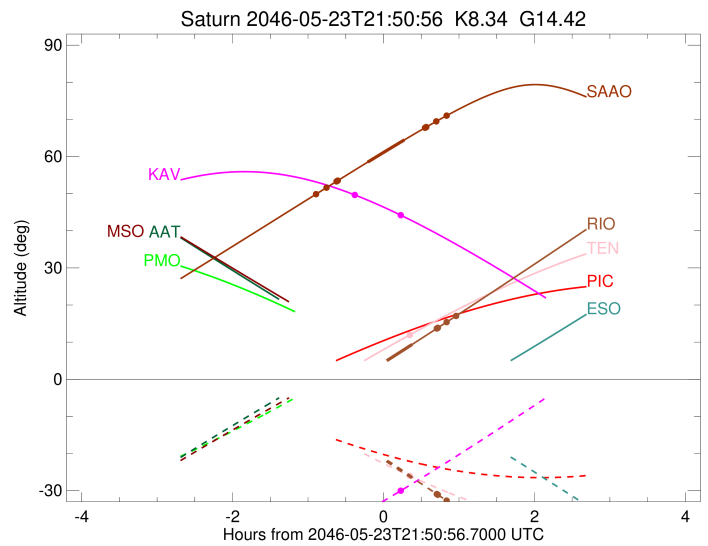
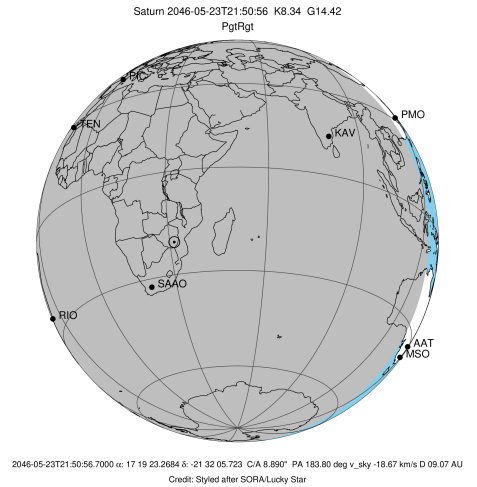
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-23T21:55:18.220
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 4115097501622093696
 2Mass ID (if available) : 17192327-2132055
 ICRS Star Coord at Epoch: 17h 19m 23.26842s -21:32:05.72311s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.342
 G magnitude : 14.422
 RP magnitude : 12.957
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 9.067
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.67
 Sun-Target sep (deg) : 161.67
 Sun-Moon sep (deg) : 29.90
 B (ring opening deg) : 26.50
 PA of pole (deg) : 4.59
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.392
 C/A sky separation (km) : 61757.2
 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	2046-05-23T21:28:50.985		3.69x	-18.90	140461.00	-3.26		
No planet occultations									
F ring	E	2046-05-23T22:12:07.060		12.00	-26.07	140461.00	3.27		

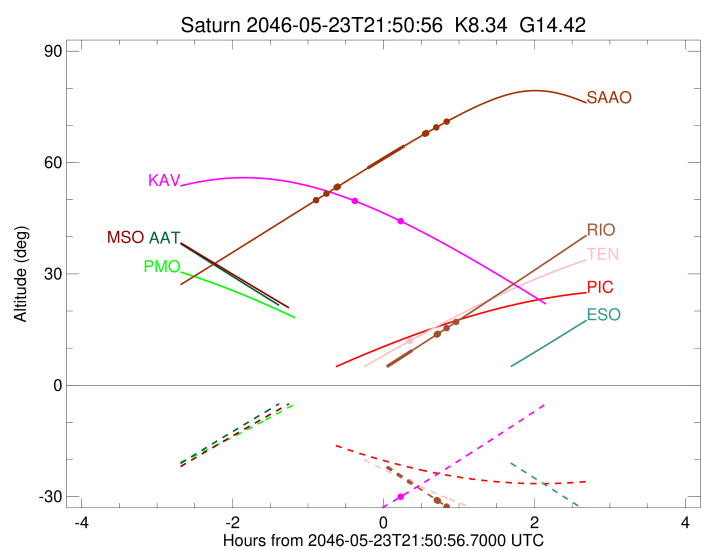
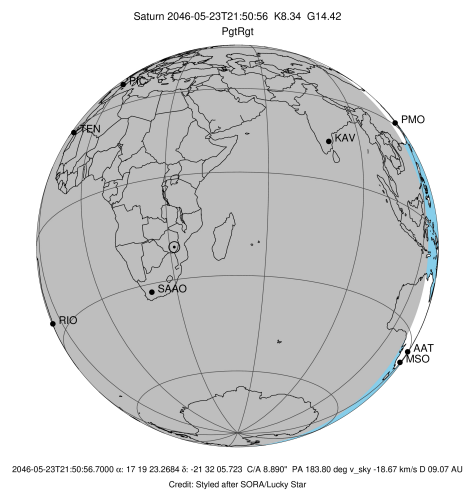
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-23T21:48:44.540
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4115097501622093696
 2Mass ID (if available) : 17192327-2132055
 ICRS Star Coord at Epoch: 17h 19m 23.26842s -21:32:05.72311s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.342
 G magnitude : 14.422
 RP magnitude : 12.957
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 9.067
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.67
 Sun-Target sep (deg) : 161.67
 Sun-Moon sep (deg) : 29.15
 B (ring opening deg) : 26.50
 PA of pole (deg) : 4.59
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.421
 C/A sky separation (km) : 61948.5
 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_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	2046-05-23T21:27:39.053		49.72	-37.35	140461.00	-2.86		
No planet occultations									
F ring	E	2046-05-23T22:04:54.657		44.16	-29.98	140461.00	2.86		

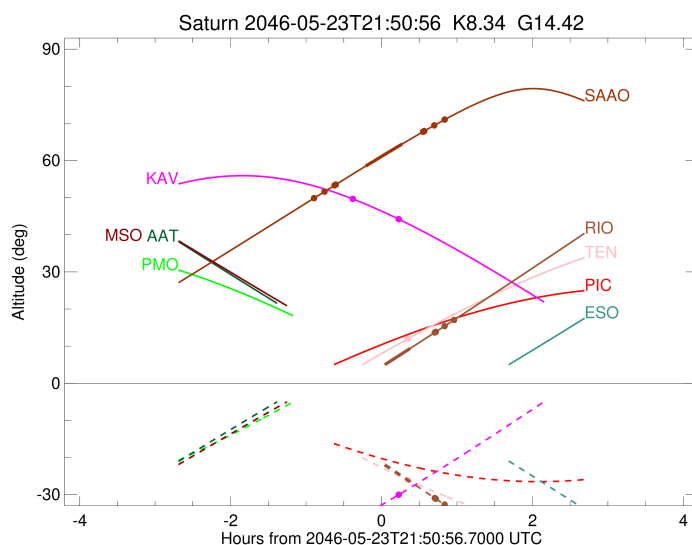
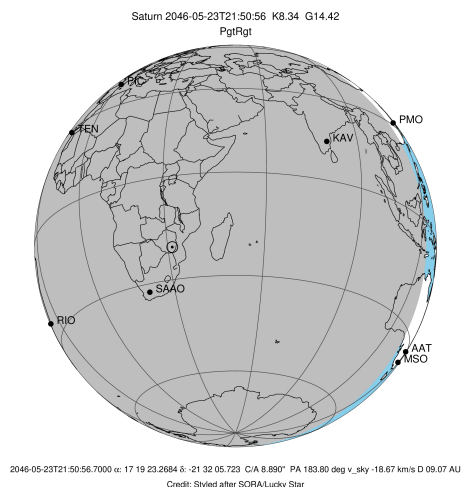
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-23T21:55:37.590
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4115097501622093696
 2Mass ID (if available) : 17192327-2132055
 ICRS Star Coord at Epoch: 17h 19m 23.26842s -21:32:05.72311s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.342
 G magnitude : 14.422
 RP magnitude : 12.957
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 9.067
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.67
 Sun-Target sep (deg) : 161.67
 Sun-Moon sep (deg) : 29.83
 B (ring opening deg) : 26.50
 PA of pole (deg) : 4.59
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.469
 C/A sky separation (km) : 55692.9
 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	2046-05-23T20:53:21.081	-7.68x	-8.68	140461.00	-8.54			
A (OER)	I	2046-05-23T21:00:57.133	-6.11x	-10.34	136774.40	-7.62			
Encke (OEG)	I	2046-05-23T21:07:59.892	-4.65x	-11.89	133744.89	-6.70			
Encke (IEG)	I	2046-05-23T21:08:48.264	-4.48x	-12.06	133423.31	-6.59			
Saturn	I	2046-05-23T21:37:26.327	1.56x	-18.39	59286.29			56.51	61.37
Saturn	E	2046-05-23T22:13:41.829	9.38	-26.50	59254.46			57.97	62.69
Encke (IEG)	E	2046-05-23T22:33:23.599	13.69	-30.94	133423.31	6.64			
Encke (OEG)	E	2046-05-23T22:34:11.627	13.86	-31.12	133744.89	6.75			
A (OER)	E	2046-05-23T22:41:11.046	15.41	-32.71	136774.40	7.69			
F ring	E	2046-05-23T22:48:42.827	17.07	-34.41	140461.00	8.62			

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-05-23T21:53:00.290
 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 : 4115097501622093696
 2Mass ID (if available) : 17192327-2132055
 ICRS Star Coord at Epoch: 17h 19m 23.26842s -21:32:05.72311s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.342
 G magnitude : 14.422
 RP magnitude : 12.957
 BP magnitude : 17.352
 DUPflag : 0
 Distance (au) : 9.067
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.67
 Sun-Target sep (deg) : 161.67
 Sun-Moon sep (deg) : 29.83
 B (ring opening deg) : 26.50
 PA of pole (deg) : 4.59
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.647
 C/A sky separation (km) : 56860.9
 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	2046-05-23T20:57:05.879		49.82	-65.65	140461.00	-7.96		
A (OER)	I	2046-05-23T21:05:22.134		51.57	-67.25	136774.40	-6.88		
Encke (OEG)	I	2046-05-23T21:13:21.126		53.25	-68.77	133744.89	-5.76		
Encke (IEG)	I	2046-05-23T21:14:17.671		53.45	-68.94	133423.31	-5.62		
Saturn	I	2046-05-23T21:38:25.287		58.50	-73.19	59238.95		58.69	63.33
Saturn	E	2046-05-23T22:07:30.437		64.47	-77.15	59216.58		59.76	64.29
Encke (IEG)	E	2046-05-23T22:24:04.912		67.77	-78.35	133423.31	5.63		
Encke (OEG)	E	2046-05-23T22:25:01.326		67.95	-78.39	133744.89	5.77		
A (OER)	E	2046-05-23T22:32:58.982		69.48	-78.54	136774.40	6.90		
F ring	E	2046-05-23T22:41:13.430		71.03	-78.42	140461.00	7.99		