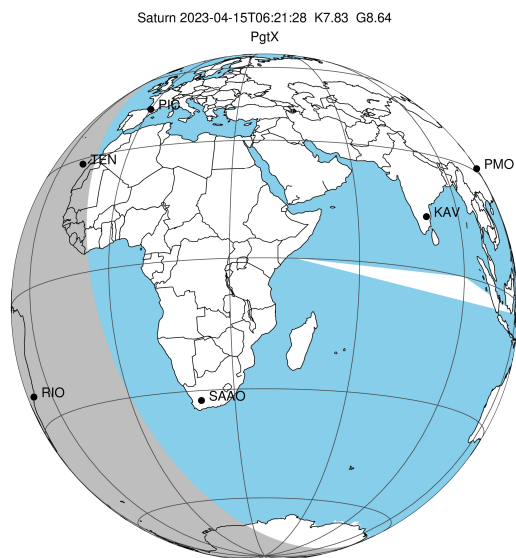


target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2023-04-15T06:21:28.590  
 Event type : PgtX  
 : Saturn occs: geocentric, topocentric  
 : No ring occs  
 Gaia source ID : 2602435862784961664  
 2Mass ID (if available) : 22244919-1123179

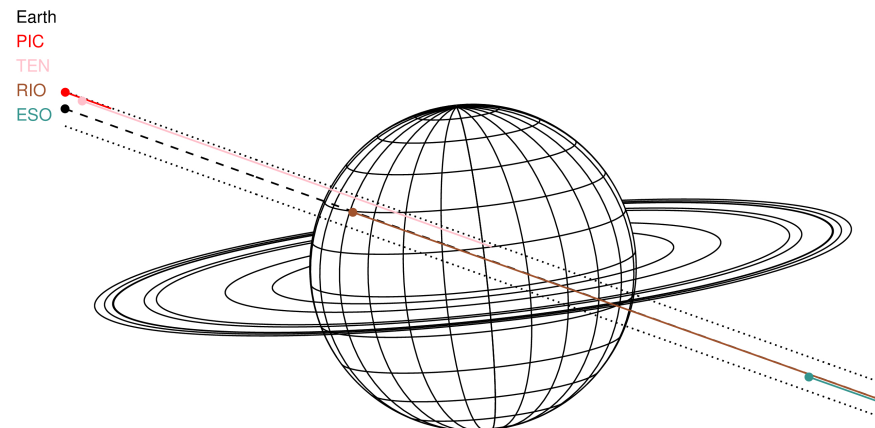
Saturn 2023-04-15T06:21:28 K7.83 G8.64 PgtX

ICRS Star Coord at Epoch: 22h 24m 49.19365s -11:23:18.66347s

RUWE (>1.4 is poor) : 2.75  
 K magnitude : 7.832  
 G magnitude : 8.640  
 RP magnitude : 8.330  
 BP magnitude : 8.810  
 DUPflag : 0  
 Distance (au) : 10.410  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 28.51  
 Sun-Target sep (deg) : 50.93  
 Sun-Moon sep (deg) : 14.51  
 B (ring opening deg) : 8.52  
 PA of pole (deg) : 5.93



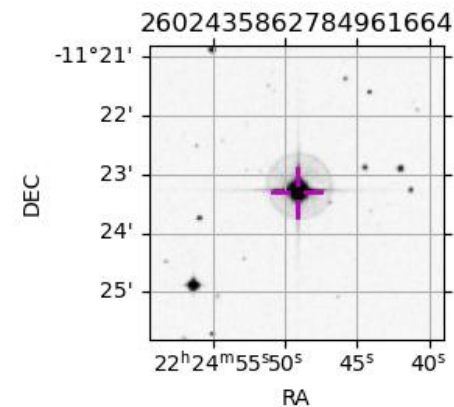
2023-04-15T06:21:28.5900 α: 22 24 49.1937 δ: -11 23 18.663 C/A 0.606° PA 160.38 deg v\_sky +28.51 km/s D 10.41 AU  
 Credit: Styled after SORA/Lucky Star



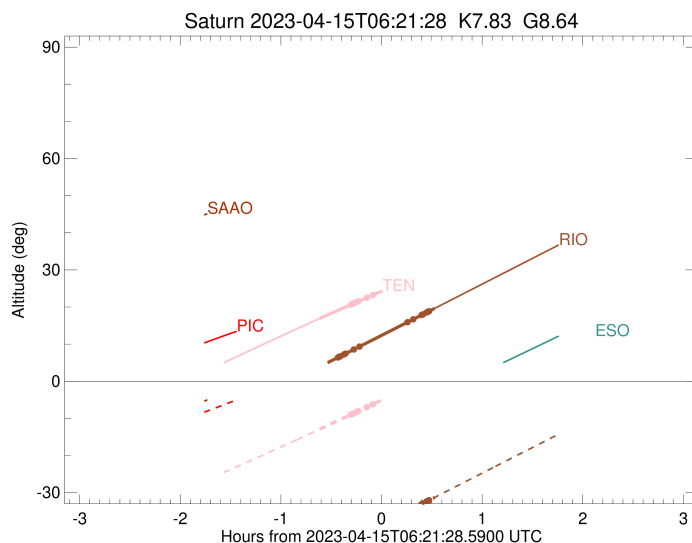
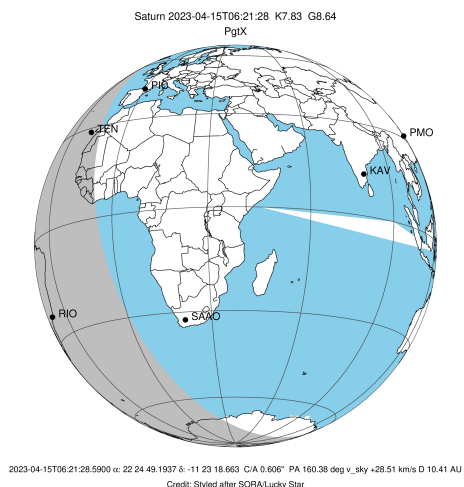
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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		+		APR 15 05:44 - APR 15 05:44	PinRnn
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		+		APR 15 06:53 - APR 15 06:53	PneRnn
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



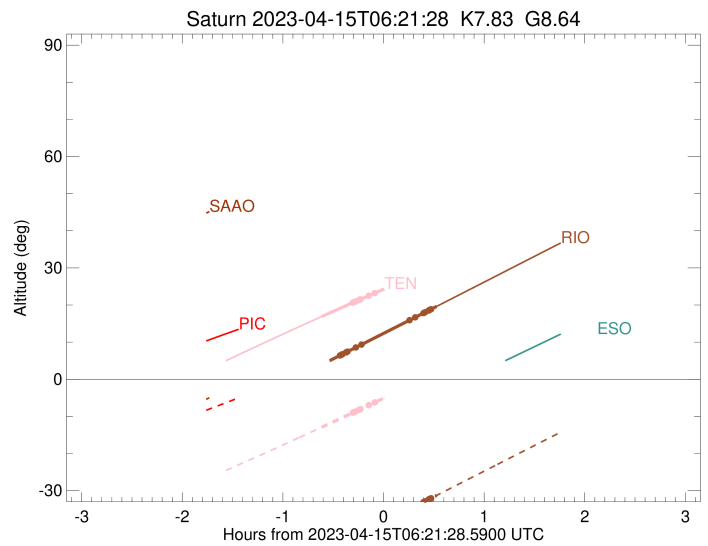
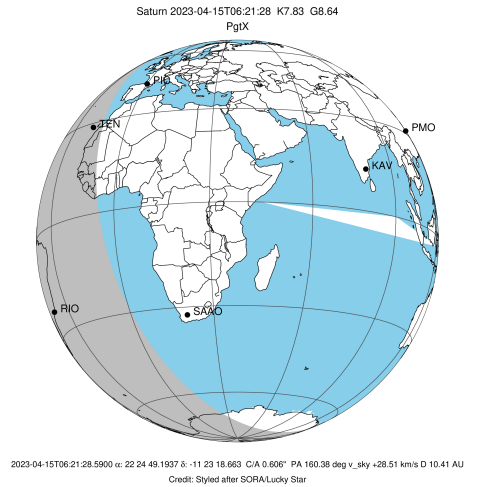
target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2023-04-15T06:19:39.080  
 Event type : PgtX  
 : Saturn occs: geocentric, topocentric  
 : No ring occs  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 2602435862784961664  
 2Mass ID (if available) : 22244919-1123179  
 ICRS Star Coord at Epoch: 22h 24m 49.19365s -11:23:18.66347s  
 RUWE (>1.4 is poor) : 2.75  
 K magnitude : 7.832  
 G magnitude : 8.640  
 RP magnitude : 8.330  
 BP magnitude : 8.810  
 DUPflag : 0  
 Distance (au) : 10.410  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 28.51  
 Sun-Target sep (deg) : 50.93  
 Sun-Moon sep (deg) : 14.40  
 B (ring opening deg) : 8.52  
 PA of pole (deg) : 5.93  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 1.259  
 C/A sky separation (km) : 9502.5  
 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



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	2023-04-15T06:03:20.397	b	20.67	-8.97	140461.00	-84.69		
A (OER)	I	2023-04-15T06:04:03.953	b	20.81	-8.82	136774.40	-84.58		
Encke (OEG)	I	2023-04-15T06:04:39.790	b	20.93	-8.69	133744.88	-84.49		
Encke (IEG)	I	2023-04-15T06:04:43.597	b	20.94	-8.68	133423.31	-84.48		
A (IER)	I	2023-04-15T06:06:58.560	b	21.39	-8.20	122050.38	-84.04		
B (OER)	I	2023-04-15T06:07:51.922	b	21.56	-8.01	117571.16	-83.84		
B (IER)	I	2023-04-15T06:12:58.907	b	22.57	-6.92	91984.69	-83.24		
C (IER)	I	2023-04-15T06:16:26.997	b	23.25	-6.18	74490.58	-84.39		
Saturn	I	2023-04-15T05:44:36.708		16.90	-12.92	60227.94		34.17	39.63
Saturn	E	2023-04-15T06:54:46.655		30.47	2.08x	60257.97		-16.32	-19.75
C (IER)	E	2023-04-15T06:43:53.077	b	28.47	-0.28x	74490.58	82.67		
B (IER)	E	2023-04-15T06:47:22.986	b	29.12	0.47x	91984.69	83.89		
B (OER)	E	2023-04-15T06:52:26.180	b	30.05	1.57x	117571.17	84.78		
A (IER)	E	2023-04-15T06:53:18.981	b	30.21	1.76x	122050.38	84.88		
Encke (IEG)	E	2023-04-15T06:55:32.789		30.61	2.25x	133423.31	85.10		
Encke (OEG)	E	2023-04-15T06:55:36.568		30.62	2.26x	133744.89	85.10		
A (OER)	E	2023-04-15T06:56:12.157		30.73	2.39x	136774.40	85.15		
F ring	E	2023-04-15T06:56:55.440		30.86	2.55x	140460.99	85.20		

target : Saturn  
 target radius (km) : 60268.00  
 C/A epoch : 2023-04-15T06:17:49.210  
 Event type : PgtX  
 : Saturn occs: geocentric, topocentric  
 : No ring occs  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 2602435862784961664  
 2Mass ID (if available) : 22244919-1123179  
 ICRS Star Coord at Epoch: 22h 24m 49.19365s -11:23:18.66347s  
 RUWE (>1.4 is poor) : 2.75  
 K magnitude : 7.832  
 G magnitude : 8.640  
 RP magnitude : 8.330  
 BP magnitude : 8.810  
 DUPflag : 0  
 Distance (au) : 10.410  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 28.51  
 Sun-Target sep (deg) : 50.93  
 Sun-Moon sep (deg) : 13.65  
 B (ring opening deg) : 8.52  
 PA of pole (deg) : 5.93  
 Pole direction: RA (deg): 40.60000  
 Dec (deg): 83.50000  
 C/A sky separation (") : 0.585  
 C/A sky separation (km) : 4414.7  
 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	2023-04-15T05:55:39.856	b	6.45	-44.47	140461.00	-85.87		
A (OER)	I	2023-04-15T05:56:22.796	b	6.61	-44.31	136774.40	-85.84		
Encke (OEG)	I	2023-04-15T05:56:58.096	b	6.74	-44.17	133744.88	-85.80		
Encke (IEG)	I	2023-04-15T05:57:01.844	b	6.76	-44.16	133423.32	-85.80		
A (IER)	I	2023-04-15T05:59:14.505	b	7.26	-43.65	122050.38	-85.65		
B (OER)	I	2023-04-15T06:00:06.826	b	7.46	-43.46	117571.16	-85.57		
B (IER)	I	2023-04-15T06:05:07.029	b	8.60	-42.31	91984.69	-84.74		
C (IER)	I	2023-04-15T06:08:35.087	b	9.39	-41.52	74490.58	-83.18		
Saturn	I	2023-04-15T05:42:38.173		3.48x	-47.43	60237.73		29.22	34.36
Saturn	E	2023-04-15T06:53:05.988		19.62	-31.30	60251.71		-20.98	-25.16
C (IER)	E	2023-04-15T06:36:53.727	b	15.89	-35.03	74490.58	85.34		
B (IER)	E	2023-04-15T06:40:18.335	b	16.67	-34.25	91984.69	85.63		
B (OER)	E	2023-04-15T06:45:16.707	b	17.82	-33.10	117571.16	85.85		
A (IER)	E	2023-04-15T06:46:08.875	b	18.02	-32.90	122050.38	85.87		
Encke (IEG)	E	2023-04-15T06:48:21.273	b	18.52	-32.39	133423.31	85.92		
Encke (OEG)	E	2023-04-15T06:48:25.016	b	18.54	-32.38	133744.88	85.93		
A (OER)	E	2023-04-15T06:49:00.271	b	18.67	-32.24	136774.41	85.94		
F ring	E	2023-04-15T06:49:43.167	b	18.84	-32.08	140461.00	85.95		