

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-21T00:42:56.630
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4069860539549347328
 2Mass ID (if available) : 18032070-2221268

Saturn 2047-06-21T00:42:56 K8.96 G14.97 PgtRgt

ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s

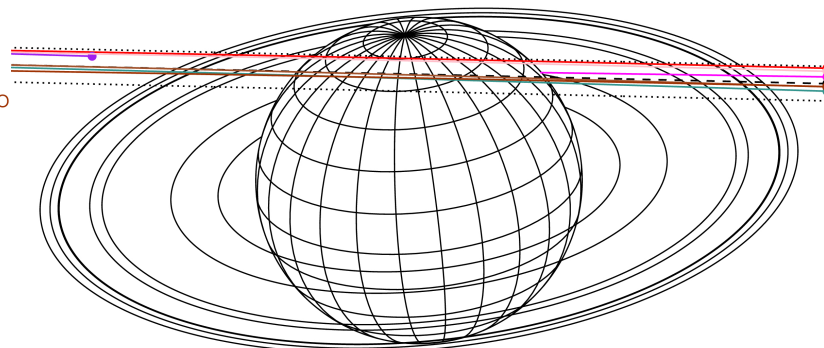
RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.959
 G magnitude : 14.967
 RP magnitude : 13.551
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 9.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.17
 Sun-Target sep (deg) : 177.90
 Sun-Moon sep (deg) : 150.55
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.58

#	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



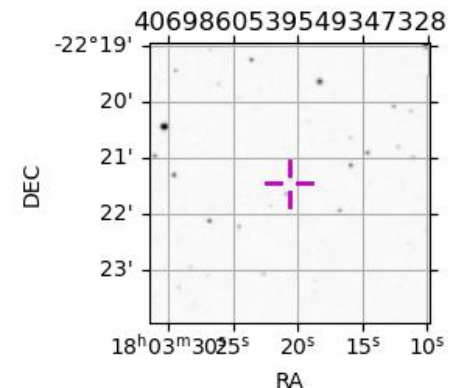
2047-06-21T00:42:56.6300 at: 18 03 20.6920 6: -22 21 27.188 C/A 5.988° PA 178.68 deg v_sky -20.17 km/s D 09.03 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO

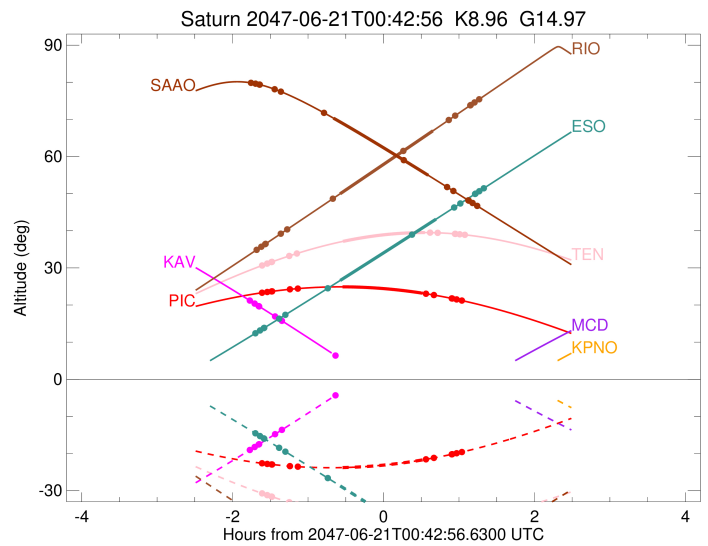
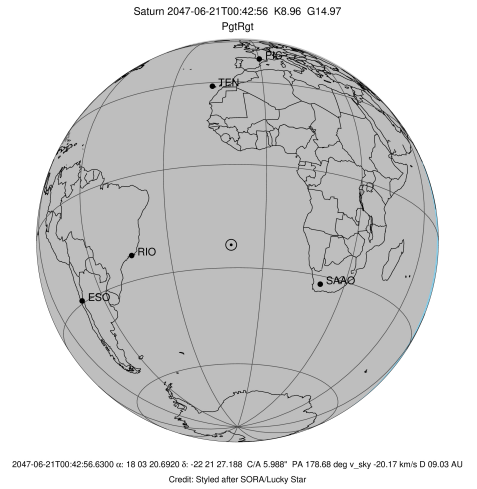


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ + + + +	+ +	+ + + + +	JUN 20 23:06 - JUN 21 01:45	PieRie
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	+ + + + +	+ +	+ + + + +	JUN 20 23:06 - JUN 21 01:47	PieRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observ	12.6	78.8	+ + + + +	+		JUN 20 22:56 - JUN 21 00:01	PinRin
RIO	Rio de Janeiro	-22.9	316.8	+ + + + +	+ +	+ + + + +	JUN 20 23:02 - JUN 21 01:58	PieRie
ESO	European South	-29.3	289.3	+ + + + +	+ +	+ + + + +	JUN 20 23:01 - JUN 21 02:02	PieRie
AAT	Siding Spring	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro	-32.4	20.8	+ + + + +	+ +	+ + + + +	JUN 20 22:57 - JUN 21 01:57	PieRie
MSO	Mt. Stromlo Ob	-35.3	149.0					PnnRnn

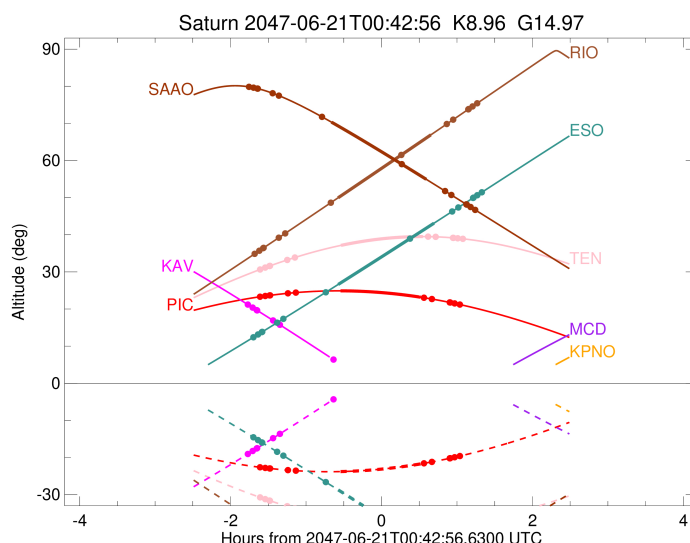
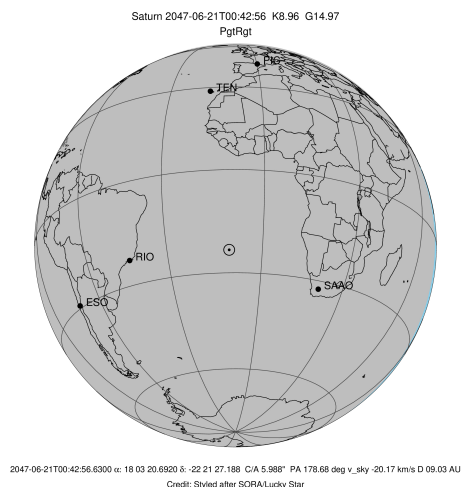


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-21T00:42:18.050
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 4069860539549347328
 2Mass ID (if available) : 18032070-2221268
 ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.959
 G magnitude : 14.967
 RP magnitude : 13.551
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 9.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.17
 Sun-Target sep (deg) : 177.90
 Sun-Moon sep (deg) : 150.93
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.864
 C/A sky separation (km) : 44958.7
 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



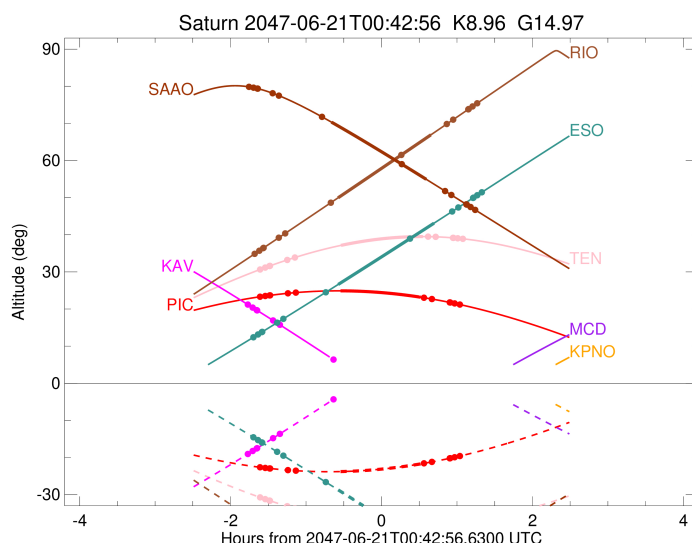
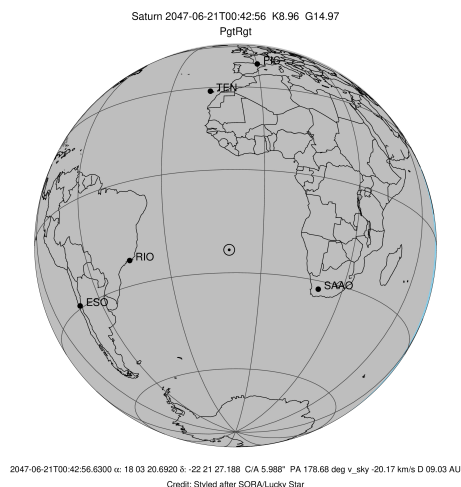
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-20T23:06:17.247		23.30	-22.63	140461.00	-15.04		
A (OER)	I	2047-06-20T23:10:25.672		23.51	-22.80	136774.40	-14.64		
Encke (OEG)	I	2047-06-20T23:13:55.211		23.67	-22.94	133744.89	-14.27		
Encke (IEG)	I	2047-06-20T23:14:17.771		23.68	-22.95	133423.31	-14.23		
A (IER)	I	2047-06-20T23:28:26.898		24.23	-23.40	122050.38	-12.47		
B (OER)	I	2047-06-20T23:34:39.608		24.42	-23.54	117571.16	-11.54		
Saturn	I	2047-06-21T00:10:17.581		24.90	-23.79	59759.07		36.81	42.37
Saturn	E	2047-06-21T01:13:59.473		23.19	-21.72	59494.20		47.84	53.30
B (OER)	E	2047-06-21T01:16:45.954		23.04	-21.56	117571.16	11.50		
A (IER)	E	2047-06-21T01:23:00.056		22.69	-21.18	122050.38	12.43		
Encke (IEG)	E	2047-06-21T01:37:12.070		21.78	-20.22	133423.31	14.19		
Encke (OEG)	E	2047-06-21T01:37:34.704		21.76	-20.19	133744.89	14.23		
A (OER)	E	2047-06-21T01:41:04.930		21.51	-19.93	136774.40	14.59		
F ring	E	2047-06-21T01:45:14.170		21.21	-19.61	140461.00	14.99		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-21T00:43:27.530
 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 : 4069860539549347328
 2Mass ID (if available) : 18032070-2221268
 ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.959
 G magnitude : 14.967
 RP magnitude : 13.551
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 9.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.17
 Sun-Target sep (deg) : 177.90
 Sun-Moon sep (deg) : 150.82
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.739
 C/A sky separation (km) : 44137.8
 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_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	2047-06-20T23:06:21.107		30.64	-30.73	140461.00	-15.34		
A (OER)	I	2047-06-20T23:10:24.451		31.15	-31.21	136774.40	-14.96		
Encke (OEG)	I	2047-06-20T23:13:49.285		31.57	-31.60	133744.89	-14.62		
Encke (IEG)	I	2047-06-20T23:14:11.313		31.62	-31.64	133423.31	-14.58		
A (IER)	I	2047-06-20T23:27:55.826		33.21	-33.11	122050.38	-12.93		
B (OER)	I	2047-06-20T23:33:53.866		33.86	-33.71	117571.16	-12.07		
Saturn	I	2047-06-21T00:10:46.136		37.15	-36.65	59784.75		35.71	41.23
Saturn	E	2047-06-21T01:15:48.626		39.51	-38.40	59514.37		47.00	52.49
B (OER)	E	2047-06-21T01:20:02.242		39.50	-38.35	117571.16	12.05		
A (IER)	E	2047-06-21T01:26:00.835		39.45	-38.25	122050.38	12.92		
Encke (IEG)	E	2047-06-21T01:39:46.091		39.17	-37.86	133423.31	14.57		
Encke (OEG)	E	2047-06-21T01:40:08.131		39.16	-37.85	133744.89	14.61		
A (OER)	E	2047-06-21T01:43:33.065		39.06	-37.72	136774.40	14.95		
F ring	E	2047-06-21T01:47:36.498		38.92	-37.55	140461.00	15.33		

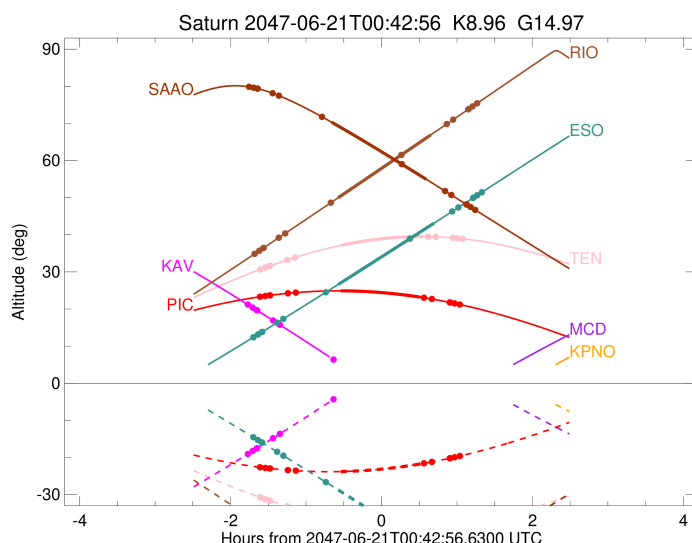
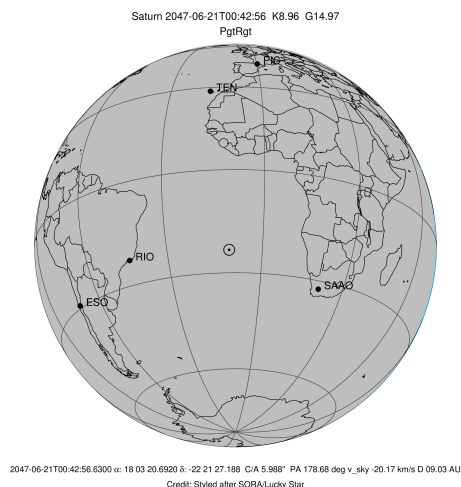
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-21T00:38:04.000
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 4069860539549347328
 2Mass ID (if available) : 18032070-2221268
 ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.959
 G magnitude : 14.967
 RP magnitude : 13.551
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 9.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.17
 Sun-Target sep (deg) : 177.90
 Sun-Moon sep (deg) : 151.33
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.182
 C/A sky separation (km) : 40489.3
 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	2047-06-20T22:56:37.170		21.21	-19.06	140461.00	-16.18		
A (OER)	I	2047-06-20T23:00:27.162		20.40	-18.25	136774.40	-15.88		
Encke (OEG)	I	2047-06-20T23:03:39.615		19.72	-17.58	133744.89	-15.60		
Encke (IEG)	I	2047-06-20T23:04:00.244		19.65	-17.50	133423.31	-15.57		
A (IER)	I	2047-06-20T23:16:40.307		16.93	-14.81	122050.38	-14.30		
B (OER)	I	2047-06-20T23:22:00.722		15.78	-13.66	117571.16	-13.65		
B (IER)	I	2047-06-21T00:04:40.142	b	6.41	-4.36x	91984.69	-5.34		
Saturn	I	2047-06-21T00:01:44.188		7.06	-5.00	59870.56		31.92	37.25
Saturn	E	2047-06-21T01:14:14.430		-9.30x	11.23x	59619.42		42.65	48.26
B (IER)	E	2047-06-21T00:42:45.174	b	-2.14x	4.13x	91984.69	5.30		
B (OER)	E	2047-06-21T01:25:51.790		-11.96x	13.87x	117571.16	13.48		
A (IER)	E	2047-06-21T01:31:16.243		-13.20x	15.10x	122050.38	14.11		
Encke (IEG)	E	2047-06-21T01:44:06.804		-16.15x	18.02x	133423.31	15.35		
Encke (OEG)	E	2047-06-21T01:44:27.737		-16.23x	18.10x	133744.89	15.38		
A (OER)	E	2047-06-21T01:47:43.080		-16.98x	18.85x	136774.40	15.64		
F ring	E	2047-06-21T01:51:36.647		-17.88x	19.73x	140461.00	15.93		

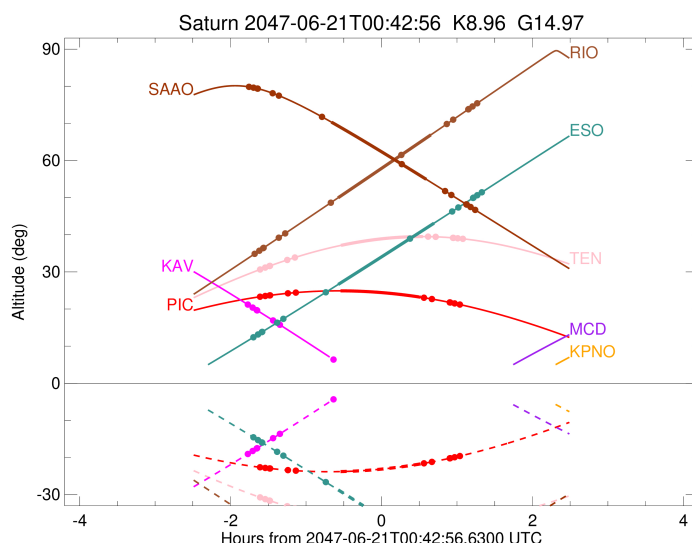
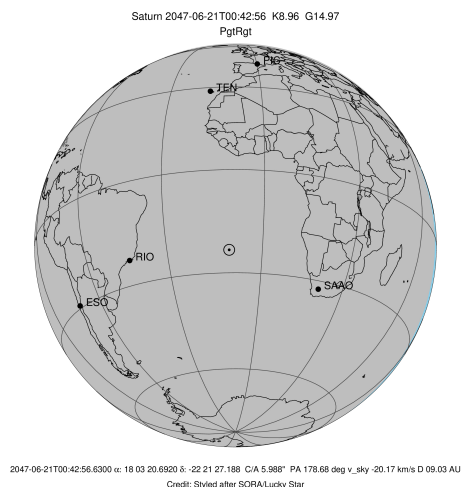
```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch             : 2047-06-21T00:45:33.340
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       : 4069860539549347328
2Mass ID (if available) : 18032070-2221268
ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 8.959
G magnitude           : 14.967
RP magnitude          : 13.551
BP magnitude          : 17.147
DUPflag               : 0
Distance (au)         : 9.031
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -20.17
Sun-Target sep (deg) : 177.90
Sun-Moon sep (deg)   : 150.50
B (ring opening deg) : 26.42
PA of pole (deg)     : 5.58
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 5.936
C/A sky separation (km) : 38881.4
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
  
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-06-20T23:02:02.734		34.86	-36.92	140461.00	-16.74		
A (OER)	I	2047-06-20T23:05:44.627		35.69	-37.75	136774.40	-16.48		
Encke (OEG)	I	2047-06-20T23:08:49.735		36.39	-38.44	133744.89	-16.25		
Encke (IEG)	I	2047-06-20T23:09:09.543		36.46	-38.52	133423.31	-16.22		
A (IER)	I	2047-06-20T23:21:14.102		39.20	-41.24	122050.38	-15.12		
B (OER)	I	2047-06-20T23:26:15.755		40.34	-42.37	117571.16	-14.57		
B (IER)	I	2047-06-21T00:02:33.463		48.62	-50.60	91984.69	-8.13		
Saturn	I	2047-06-21T00:08:28.791		49.97	-51.94	59923.16		29.48	34.64
Saturn	E	2047-06-21T01:22:16.041		66.94	-68.79	59646.64		41.53	47.14
B (IER)	E	2047-06-21T00:58:36.915	b	61.49	-63.38	91984.69	8.11		
B (OER)	E	2047-06-21T01:34:53.240		69.85	-71.68	117571.16	14.62		
A (IER)	E	2047-06-21T01:39:53.661		71.01	-72.83	122050.38	15.19		
Encke (IEG)	E	2047-06-21T01:51:54.587		73.78	-75.58	133423.31	16.31		
Encke (OEG)	E	2047-06-21T01:52:14.284		73.86	-75.66	133744.89	16.34		
A (OER)	E	2047-06-21T01:55:18.321		74.57	-76.36	136774.40	16.58		
F ring	E	2047-06-21T01:58:58.863		75.42	-77.21	140461.00	16.85		

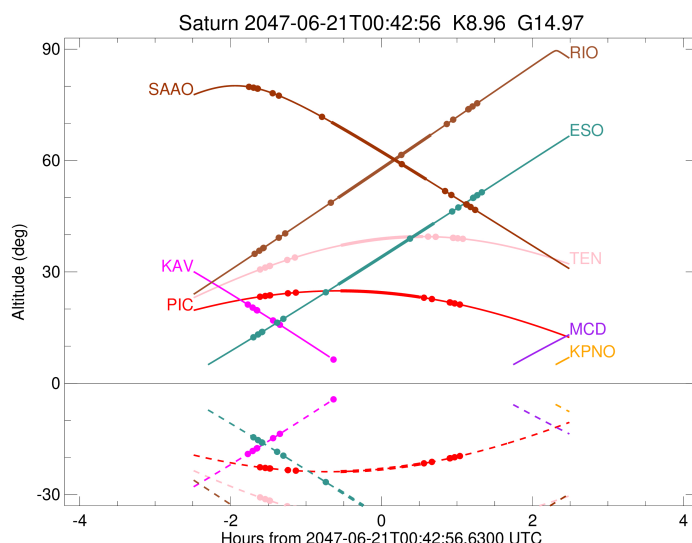
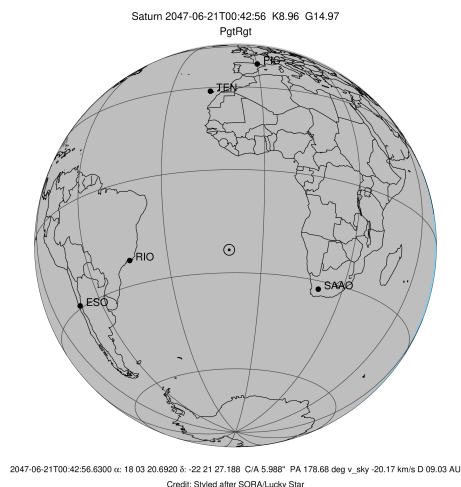
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-21T00:46:49.710
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4069860539549347328
 2Mass ID (if available) : 18032070-2221268
 ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.959
 G magnitude : 14.967
 RP magnitude : 13.551
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 9.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.17
 Sun-Target sep (deg) : 177.90
 Sun-Moon sep (deg) : 150.16
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.726
 C/A sky separation (km) : 37505.6
 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_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	2047-06-20T23:01:03.474		12.38	-14.54	140461.00	-16.94		
A (OER)	I	2047-06-20T23:04:42.548		13.14	-15.29	136774.40	-16.71		
Encke (OEG)	I	2047-06-20T23:07:44.985		13.77	-15.92	133744.89	-16.50		
Encke (IEG)	I	2047-06-20T23:08:04.489		13.84	-15.99	133423.31	-16.48		
A (IER)	I	2047-06-20T23:19:54.940		16.31	-18.46	122050.38	-15.49		
B (OER)	I	2047-06-20T23:24:48.585		17.34	-19.48	117571.16	-15.00		
B (IER)	I	2047-06-20T23:58:34.059		24.49	-26.60	91984.69	-9.59		
Saturn	I	2047-06-21T00:08:29.131		26.61	-28.71	59956.41		27.88	32.90
Saturn	E	2047-06-21T01:24:46.143		43.14	-45.17	59677.70		40.24	45.85
B (IER)	E	2047-06-21T01:05:31.687	b	38.95	-40.99	91984.69	9.58		
B (OER)	E	2047-06-21T01:39:08.847		46.29	-48.30	117571.16	15.12		
A (IER)	E	2047-06-21T01:44:00.104		47.35	-49.36	122050.38	15.63		
Encke (IEG)	E	2047-06-21T01:55:43.861		49.92	-51.92	133423.31	16.65		
Encke (OEG)	E	2047-06-21T01:56:03.163		49.99	-51.99	133744.89	16.67		
A (OER)	E	2047-06-21T01:59:03.678		50.65	-52.65	136774.40	16.89		
F ring	E	2047-06-21T02:02:40.344		51.44	-53.44	140461.00	17.14		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-06-21T00:40:57.680
 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 : 4069860539549347328
 2Mass ID (if available) : 18032070-2221268
 ICRS Star Coord at Epoch: 18h 03m 20.69201s -22:21:27.18790s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.959
 G magnitude : 14.967
 RP magnitude : 13.551
 BP magnitude : 17.147
 DUPflag : 0
 Distance (au) : 9.031
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -20.17
 Sun-Target sep (deg) : 177.90
 Sun-Moon sep (deg) : 151.23
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.58
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.772
 C/A sky separation (km) : 37806.0
 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	2047-06-20T22:57:32.952		79.85	-80.26	140461.00	-17.05		
A (OER)	I	2047-06-20T23:01:10.789		79.63	-79.89	136774.40	-16.80		
Encke (OEG)	I	2047-06-20T23:04:12.356		79.40	-79.54	133744.89	-16.57		
Encke (IEG)	I	2047-06-20T23:04:31.776		79.37	-79.50	133423.31	-16.55		
A (IER)	I	2047-06-20T23:16:20.532		78.13	-77.87	122050.38	-15.50		
B (OER)	I	2047-06-20T23:21:14.394		77.49	-77.11	117571.16	-14.98		
B (IER)	I	2047-06-20T23:55:33.363		71.78	-70.86	91984.69	-9.17		
Saturn	I	2047-06-21T00:03:10.817		70.34	-69.36	59939.26		28.71	33.80
Saturn	E	2047-06-21T01:18:31.725		54.94	-53.75	59682.21		40.05	45.66
B (IER)	E	2047-06-21T00:58:58.745	b	59.04	-57.87	91984.69	9.10		
B (OER)	E	2047-06-21T01:33:31.867		51.77	-50.58	117571.16	14.87		
A (IER)	E	2047-06-21T01:38:27.778		50.73	-49.54	122050.38	15.39		
Encke (IEG)	E	2047-06-21T01:50:21.807		48.20	-47.02	133423.31	16.42		
Encke (OEG)	E	2047-06-21T01:50:41.379		48.14	-46.95	133744.89	16.44		
A (OER)	E	2047-06-21T01:53:44.388		47.49	-46.31	136774.40	16.66		
F ring	E	2047-06-21T01:57:24.006		46.71	-45.53	140461.00	16.91		