

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:11:36.470
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078

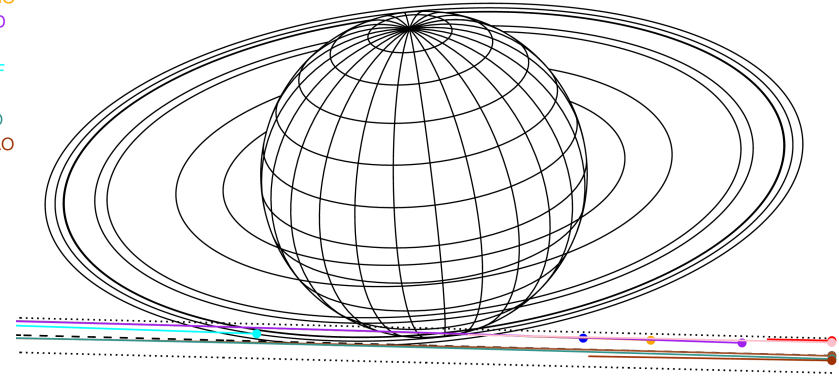
Saturn 2047-05-26T06:11:36 K8.71 G13.18 PtRgt

ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 167.01
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO

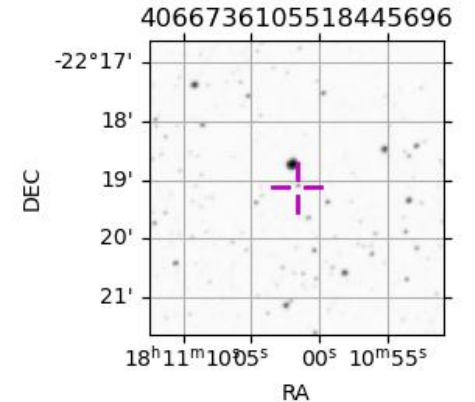


2047-05-26T06:11:36.4700 at: 18 11 01.6957 s: -22 19 07.906 C/A 9.514" PA 358.55 deg v_sky -16.64 km/s D 09.14 AU
 Credit: Styled after SORA/Lucky Star

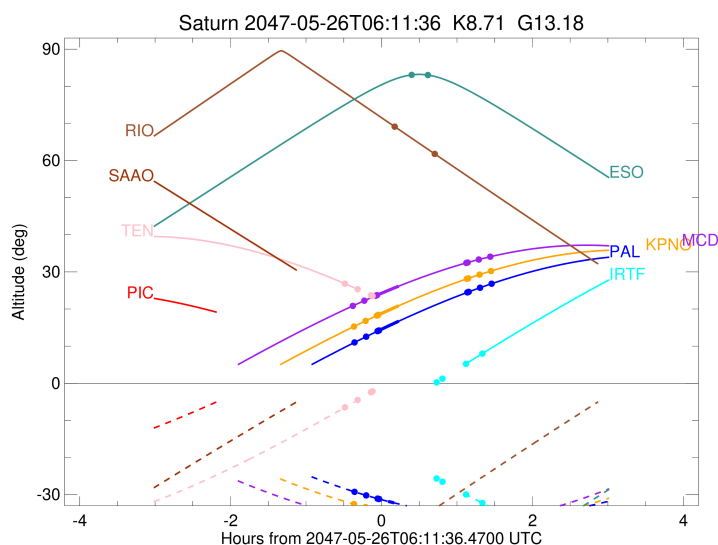
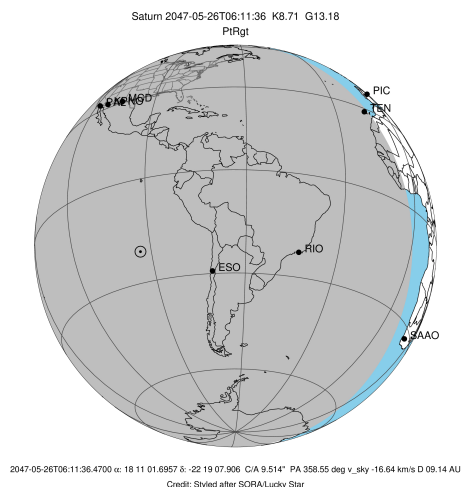
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+	+	+	MAY 26 05:50 - MAY 26 07:39	PieRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+	+	+	MAY 26 05:49 - MAY 26 07:38	PieRie
MCD	McDonald Obs.	30.7	256.0	+	+	+	MAY 26 05:48 - MAY 26 07:38	PieRie
TEN	Teide Obs./Ten	28.3	343.5	+			MAY 26 05:42 - MAY 26 05:42	PnnRin
IRTF	Mauna Kea/IRTF	19.8	204.5			+	MAY 26 07:19 - MAY 26 07:32	PnnRne
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+		+	MAY 26 06:21 - MAY 26 06:54	PnnRie
ESO	European South	-29.3	289.3	+		+	MAY 26 06:34 - MAY 26 06:50	PnnRie
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



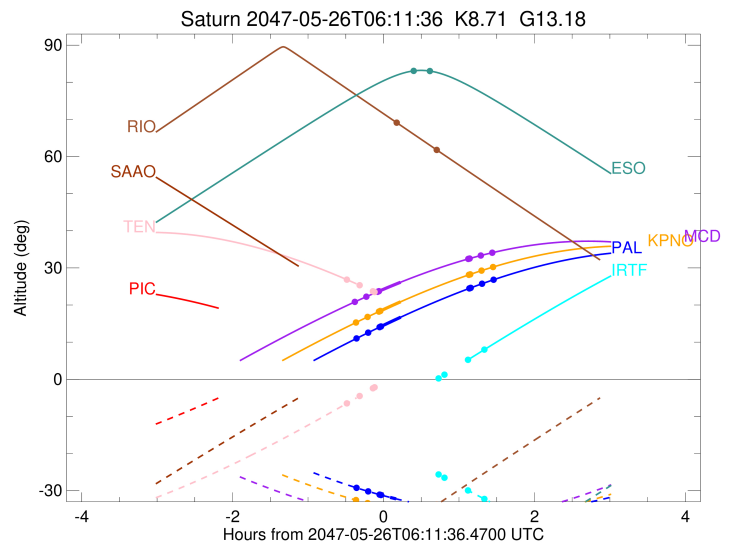
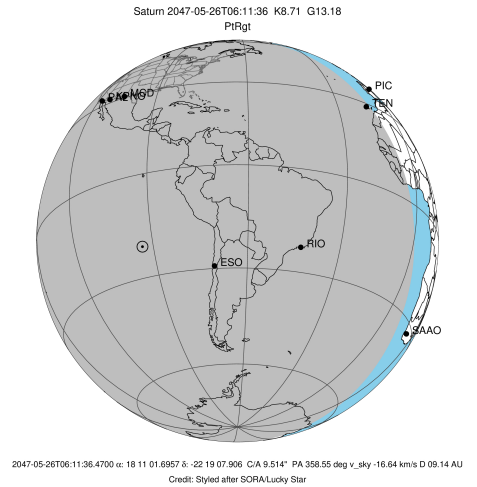
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:16:05.550
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 166.64
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.823
 C/A sky separation (km) : 58500.9
 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	2047-05-26T05:50:06.945		10.99	-29.24	140461.00	-7.16		
A (OER)	I	2047-05-26T05:59:21.491		12.54	-30.20	136774.40	-6.12		
Encke (OEG)	I	2047-05-26T06:08:24.517	b	14.03	-31.07	133744.89	-5.02		
Encke (IEG)	I	2047-05-26T06:09:29.402	b	14.21	-31.17	133423.31	-4.89		
Saturn	I	2047-05-26T06:07:21.931		13.86	-30.97	59165.51		-63.80	-67.87
Saturn	E	2047-05-26T06:25:22.426		16.73	-32.52	59253.32		-59.30	-63.88
Encke (IEG)	E	2047-05-26T07:20:13.967		24.53	-35.39	133423.31	4.93		
Encke (OEG)	E	2047-05-26T07:21:18.338		24.67	-35.41	133744.89	5.06		
A (OER)	E	2047-05-26T07:30:16.645		25.77	-35.59	136774.40	6.18		
F ring	E	2047-05-26T07:39:25.694		26.85	-35.68	140461.00	7.24		

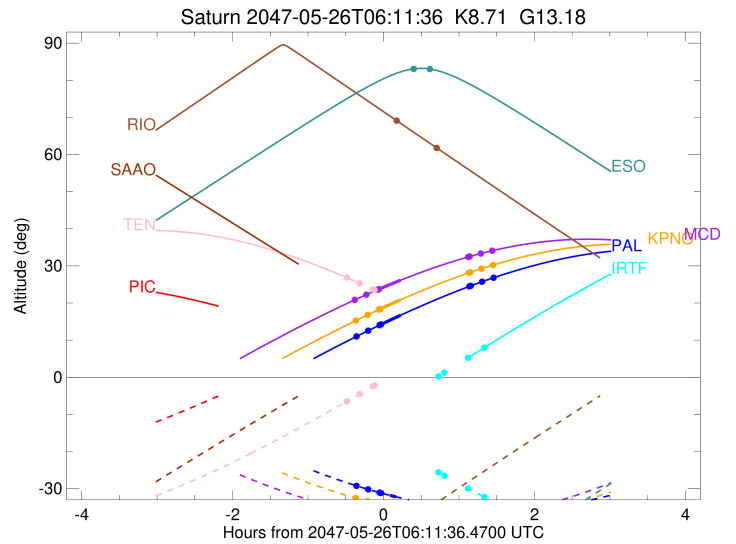
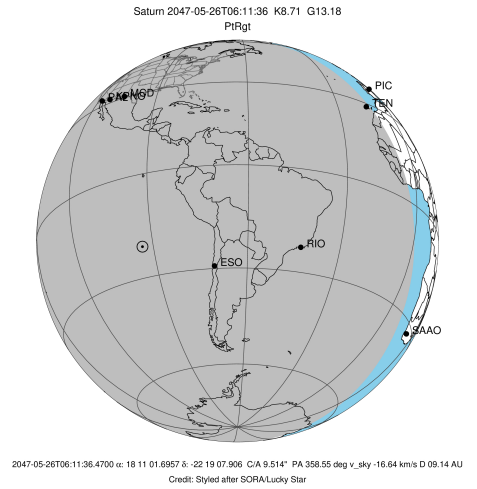
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:15:48.800
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 166.69
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.818
 C/A sky separation (km) : 58466.5
 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

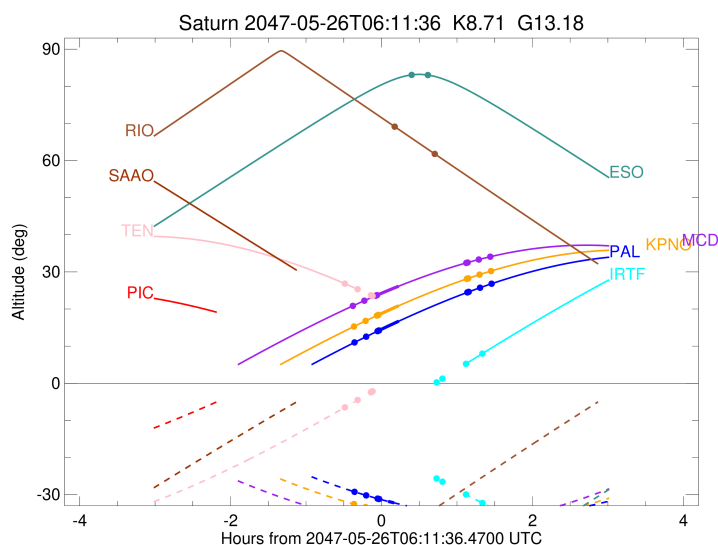
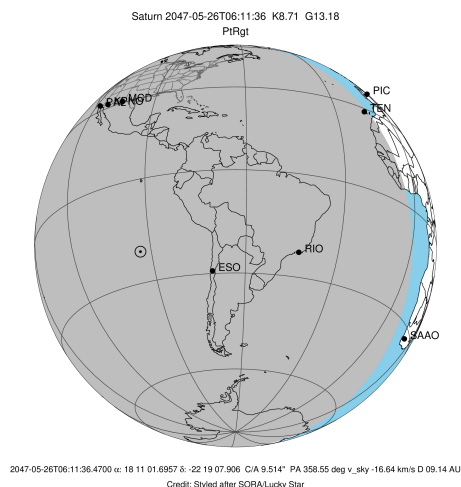
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-26T05:49:40.636		15.28	-32.53	140461.00	-7.19		
A (OER)	I	2047-05-26T05:58:52.957		16.78	-33.35	136774.40	-6.15		
Encke (OEG)	I	2047-05-26T06:07:53.314	b	18.22	-34.09	133744.89	-5.05		
Encke (IEG)	I	2047-05-26T06:08:57.828	b	18.39	-34.17	133423.31	-4.92		
Saturn	I	2047-05-26T06:06:52.831		18.06	-34.01	59165.70		-63.79	-67.86
Saturn	E	2047-05-26T06:25:17.830		20.89	-35.29	59255.28		-59.20	-63.79
Encke (IEG)	E	2047-05-26T07:19:51.799		28.18	-37.07	133423.31	4.95		
Encke (OEG)	E	2047-05-26T07:20:55.839		28.30	-37.08	133744.89	5.09		
A (OER)	E	2047-05-26T07:29:51.838		29.30	-37.06	136774.40	6.20		
F ring	E	2047-05-26T07:38:59.113		30.26	-36.95	140461.00	7.26		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:15:17.920
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 166.77
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.806
 C/A sky separation (km) : 58387.5
 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



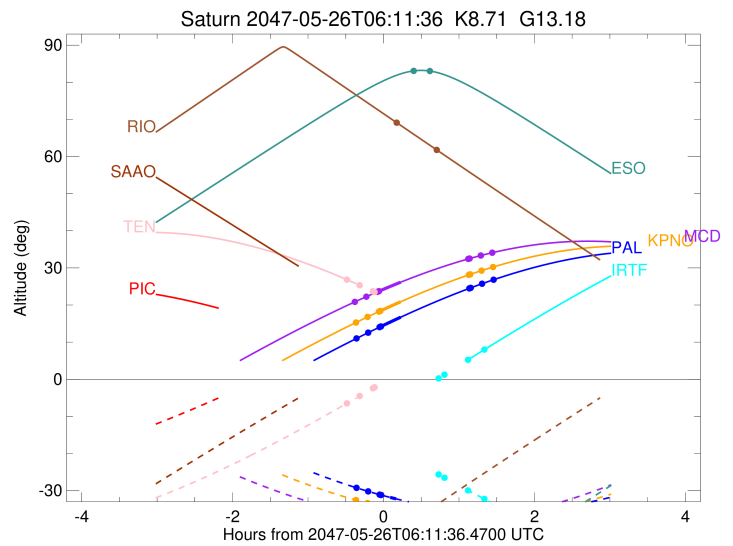
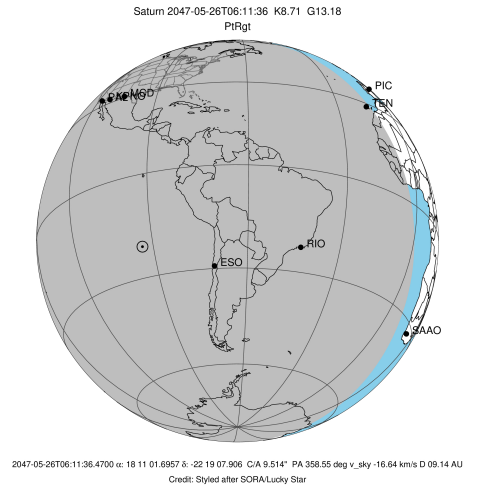
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-26T05:48:45.831		20.84	-36.12	140461.00	-7.24		
A (OER)	I	2047-05-26T05:57:53.821		22.23	-36.71	136774.40	-6.20		
Encke (OEG)	I	2047-05-26T06:06:48.595	b	23.55	-37.20	133744.89	-5.11		
Encke (IEG)	I	2047-05-26T06:07:52.304	b	23.71	-37.25	133423.31	-4.98		
Saturn	I	2047-05-26T06:05:53.851		23.42	-37.15	59166.23		-63.76	-67.83
Saturn	E	2047-05-26T06:25:14.721		26.15	-37.95	59259.88		-58.98	-63.59
Encke (IEG)	E	2047-05-26T07:19:23.199		32.45	-37.98	133423.31	5.01		
Encke (OEG)	E	2047-05-26T07:20:26.494		32.55	-37.95	133744.89	5.15		
A (OER)	E	2047-05-26T07:29:17.491		33.36	-37.64	136774.40	6.25		
F ring	E	2047-05-26T07:38:21.158		34.11	-37.23	140461.00	7.30		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:07:02.480
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : 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 : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 167.79
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 8.888
 C/A sky separation (km) : 58934.0
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-26T05:42:24.698		26.85	-6.51	140461.00	-6.65		
A (OER)	I	2047-05-26T05:52:32.744		25.34	-4.53x	136774.40	-5.46		
Encke (OEG)	I	2047-05-26T06:03:01.749	b	23.73	-2.45x	133744.89	-4.15		
Encke (IEG)	I	2047-05-26T06:04:20.778	b	23.52	-2.19x	133423.31	-3.98		
Saturn	I	2047-05-26T06:01:53.510		23.91	-2.68x	59166.01		-63.77	-67.84
Saturn	E	2047-05-26T06:12:42.020		22.19	-0.52x	59213.85		-61.26	-65.63
Encke (IEG)	E	2047-05-26T07:02:43.535		13.58	9.73x	133423.31	3.97		
Encke (OEG)	E	2047-05-26T07:04:02.821		13.34	10.01x	133744.89	4.14		
A (OER)	E	2047-05-26T07:14:34.512		11.41	12.21x	136774.40	5.44		
F ring	E	2047-05-26T07:24:46.388		9.51	14.36x	140461.00	6.60		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:18:10.200
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : 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 : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 166.24
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.191
 C/A sky separation (km) : 60941.1
 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

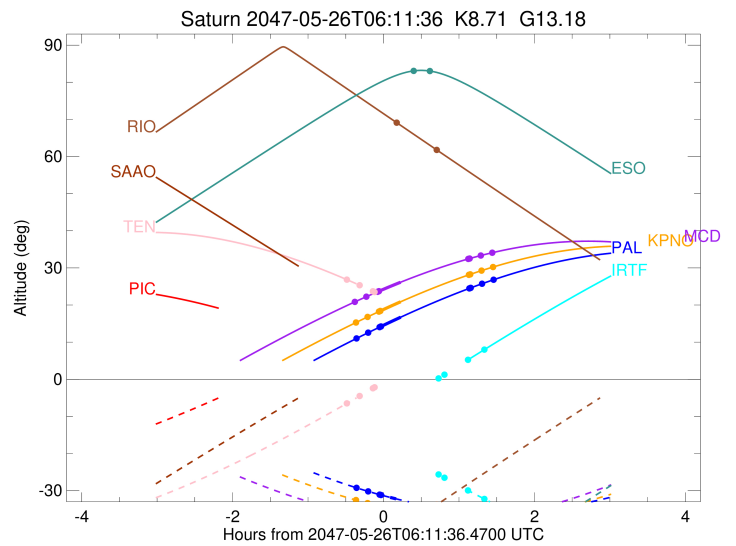
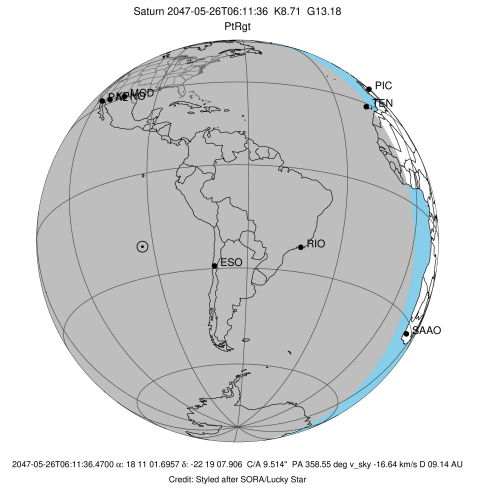


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2047-05-26T06:06:24.916	-10.49x	-16.01	140461.00	-5.47			
A (OER)	I	2047-05-26T06:19:28.403	-7.61x	-18.64	136774.40	-3.92			
Encke (OEG)	I	2047-05-26T06:37:44.268	-3.60x	-22.25	133744.89	-1.58			
Encke (IEG)	I	2047-05-26T06:41:51.519	-2.70x	-23.05	133423.38	-1.02			

No planet occultations

Encke (IEG)	E	2047-05-26T06:57:01.611	0.58x	-25.95	133423.51	1.03			
Encke (OEG)	E	2047-05-26T07:01:08.028	1.47x	-26.72	133744.90	1.58			
A (OER)	E	2047-05-26T07:19:16.049	5.34	-30.03	136774.40	3.96			
F ring	E	2047-05-26T07:32:10.113	8.06	-32.30	140461.00	5.54			

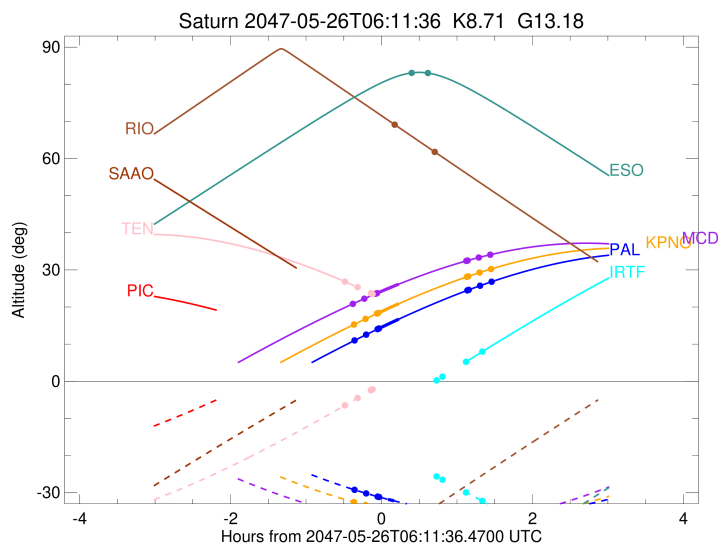
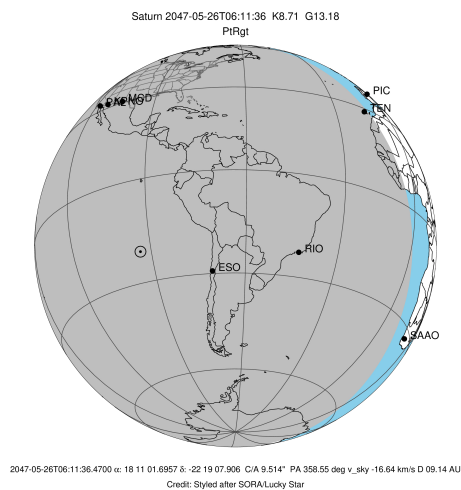
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:09:24.500
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 167.46
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.550
 C/A sky separation (km) : 63321.3
 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



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	2047-05-26T06:21:35.071		69.24	-41.14	140461.00	-2.20		
No planet occultations									
F ring	E	2047-05-26T06:54:46.163		61.59	-33.61	140461.00	2.20		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2047-05-26T06:12:22.260
 Event type : PtRgt
 : Saturn occs: topocentric, not geocentric
 : 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 : 4066736105518445696
 2Mass ID (if available) : 18110169-2219078
 ICRS Star Coord at Epoch: 18h 11m 01.69567s -22:19:07.90622s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.709
 G magnitude : 13.176
 RP magnitude : 12.012
 BP magnitude : 14.628
 DUPflag : 0
 Distance (au) : 9.142
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -16.64
 Sun-Target sep (deg) : 151.73
 Sun-Moon sep (deg) : 167.08
 B (ring opening deg) : 26.20
 PA of pole (deg) : 5.72
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 9.627
 C/A sky separation (km) : 63833.7
 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



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	2047-05-26T06:34:12.925		83.00	-63.00	140461.09	-1.07		
No planet occultations									
F ring	E	2047-05-26T06:50:12.625		82.93	-59.55	140461.22	1.07		