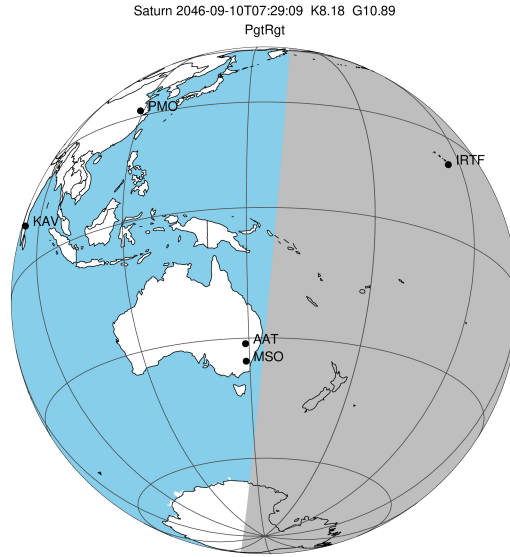


target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:29:09.780
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050

Saturn 2046-09-10T07:29:09 K8.18 G10.89 PgtRgt

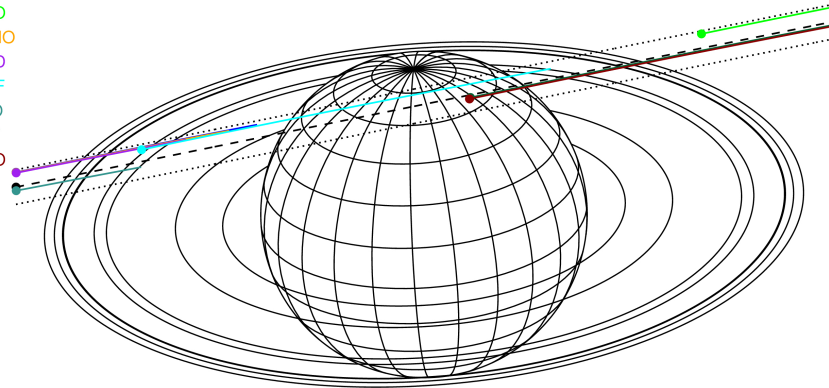
ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 35.81
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14



2046-09-10T07:29:09.7800 ra: 17 01 00.3424 s: -21 26 05.236 C/A 5.499° PA 191.45 deg v_sky +10.05 km/s D 10.00 AU
 Credit: Styled after SORA/Lucky Star

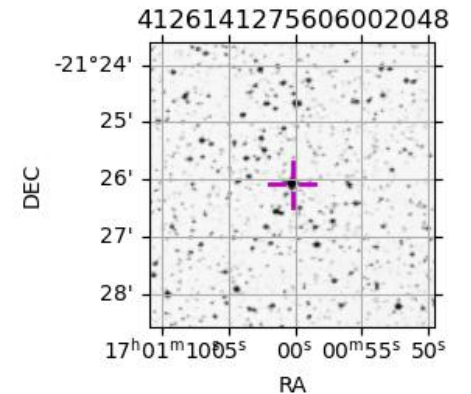
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO



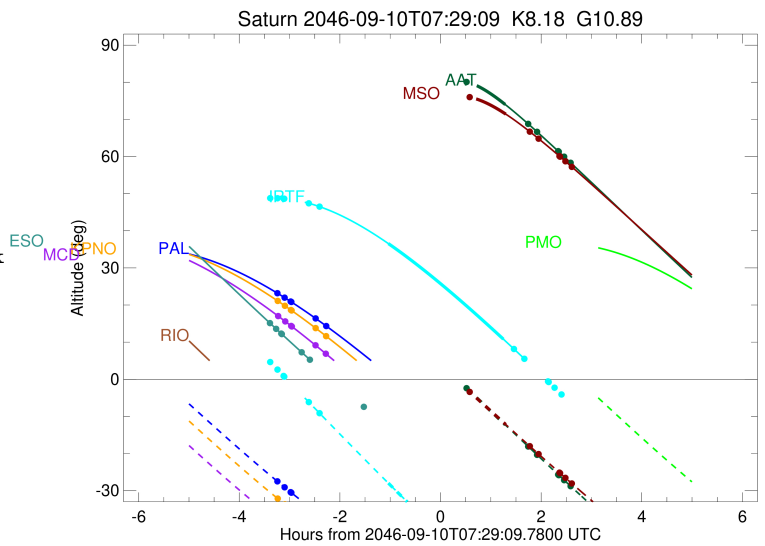
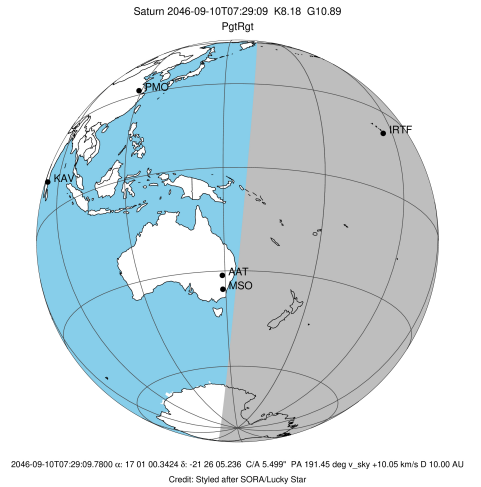
#	a(km)	ring
1	74490.6	C (IER)
2	91984.7	B (IER)
3	117571.2	B (OER)
4	122050.4	A (IER)
5	133423.3	Encke (IEG)
6	133744.9	Encke (OEG)
7	136774.4	A (OER)
8	140461.0	F ring

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	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+			SEP 10 04:14 - SEP 10 05:12	PnnRin
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+			SEP 10 04:15 - SEP 10 05:12	PnnRin
MCD	McDonald Obs.	30.7	256.0	+			SEP 10 04:15 - SEP 10 05:12	PnnRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+		+	SEP 10 04:52 - SEP 10 09:09	PieRie
KAV	Kavalur Observ	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European South	-29.3	289.3	+			SEP 10 04:05 - SEP 10 04:53	PnnRin
AAT	Siding Spring	-31.3	149.1		+	+	SEP 10 08:46 - SEP 10 10:04	PneRne
SAAO	So. Afr. Astro	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Ob	-35.3	149.0		+	+	SEP 10 08:47 - SEP 10 10:06	PneRne



target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:37:50.650
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : 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 : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050
 ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 35.15
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.074
 C/A sky separation (km) : 44065.3
 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

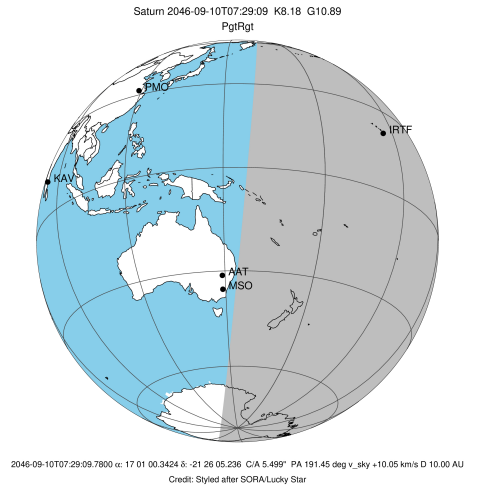


b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

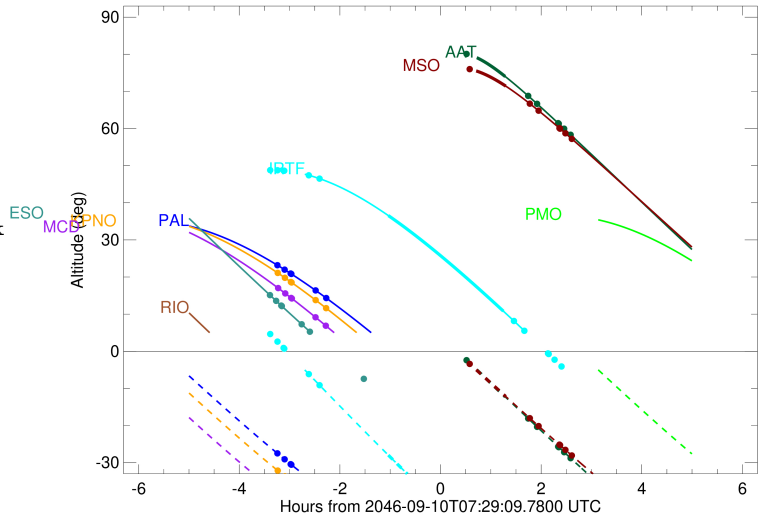
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-09-10T04:14:41.781		23.18	-27.51	140461.00	-7.22		
A (OER)	I	2046-09-10T04:23:18.387		21.98	-29.11	136774.40	-7.05		
Encke (OEG)	I	2046-09-10T04:30:32.491		20.93	-30.43	133744.89	-6.90		
Encke (IEG)	I	2046-09-10T04:31:19.131		20.82	-30.57	133423.31	-6.89		
A (IER)	I	2046-09-10T05:00:17.734		16.38	-35.64	122050.38	-6.16		
B (OER)	I	2046-09-10T05:12:47.383		14.36	-37.71	117571.16	-5.78		
Saturn	I	2046-09-10T06:30:11.535		0.63x	-48.11	59769.36		35.80	41.32
Saturn	E	2046-09-10T08:43:55.166		-25.98x	-49.48	59506.81		46.47	51.98
B (OER)	E	2046-09-10T08:57:22.032		-28.76x	-48.27	117571.16	6.04		
A (IER)	E	2046-09-10T09:09:17.378		-31.25x	-47.02	122050.38	6.47		
Encke (IEG)	E	2046-09-10T09:36:43.209		-36.98x	-43.63	133423.31	7.31		
Encke (OEG)	E	2046-09-10T09:37:27.122		-37.13x	-43.54	133744.89	7.33		
A (OER)	E	2046-09-10T09:44:15.269		-38.56x	-42.59	136774.40	7.51		
F ring	E	2046-09-10T09:52:19.681		-40.25x	-41.43	140461.00	7.71		

```

target                : Saturn
target radius (km)   : 60268.00
C/A epoch             : 2046-09-10T07:38:04.440
Event type            : PgtRgt
: Saturn occs: geocentric, topocentric
: 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        : 4126141275606002048
2Mass ID (if available) : 17010035-2126050
ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.176
G magnitude           : 10.891
RP magnitude          : 10.079
BP magnitude          : 11.593
DUPflag              : 0
Distance (au)         : 10.003
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : 10.05
Sun-Target sep (deg)  : 89.16
Sun-Moon sep (deg)    : 35.10
B (ring opening deg) : 26.73
PA of pole (deg)      : 4.14
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 6.034
C/A sky separation (km) : 43775.8
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_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
    
```



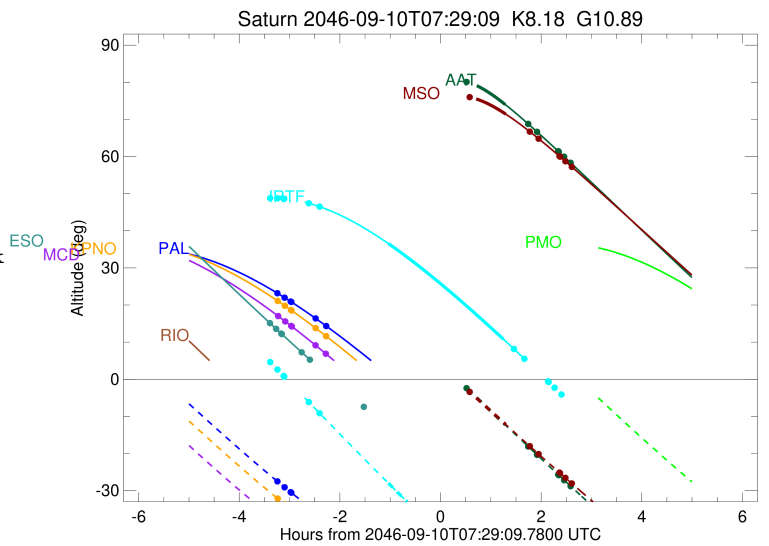
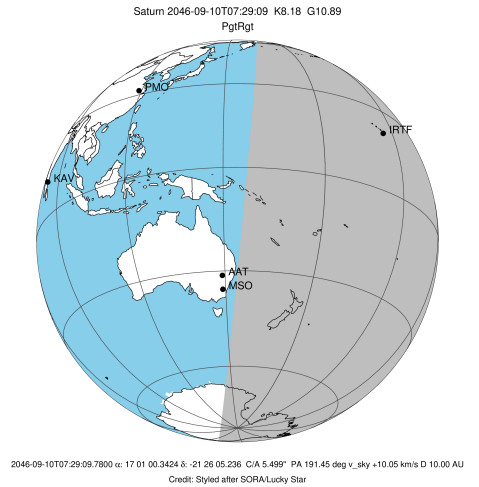
Saturn 2046-09-10T07:29:09 K8.18 G10.89



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

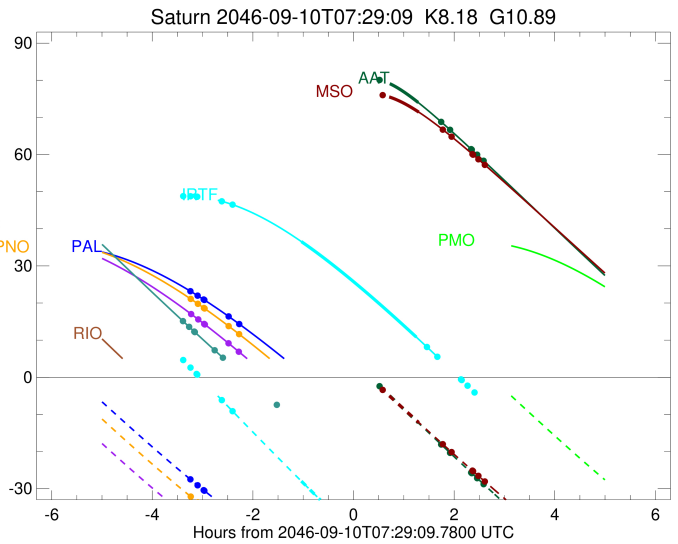
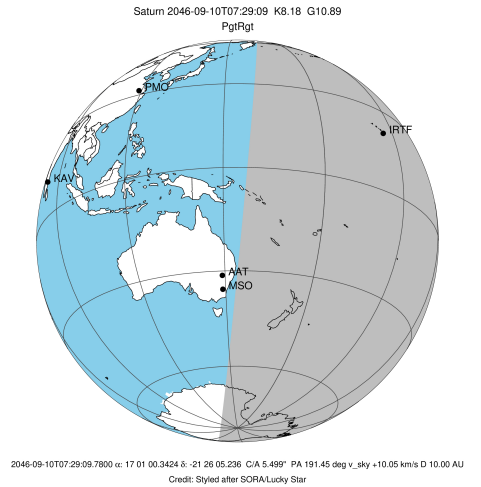
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-09-10T04:15:06.856		21.09	-32.15	140461.00	-7.27		
A (OER)	I	2046-09-10T04:23:39.673		19.78	-33.70	136774.40	-7.11		
Encke (OEG)	I	2046-09-10T04:30:50.296		18.64	-34.98	133744.89	-6.96		
Encke (IEG)	I	2046-09-10T04:31:36.545		18.52	-35.12	133423.31	-6.94		
A (IER)	I	2046-09-10T05:00:17.598		13.77	-39.98	122050.38	-6.24		
B (OER)	I	2046-09-10T05:12:37.359		11.64	-41.93	117571.16	-5.87		
Saturn	I	2046-09-10T06:30:07.628		-2.79x	-51.24	59776.51		35.49	41.01
Saturn	E	2046-09-10T08:44:26.258		-30.26x	-48.62	59515.39		46.13	51.65
B (OER)	E	2046-09-10T08:58:59.566		-33.34x	-46.90	117571.16	6.14		
A (IER)	E	2046-09-10T09:10:43.895		-35.83x	-45.36	122050.38	6.57		
Encke (IEG)	E	2046-09-10T09:37:49.178		-41.59x	-41.39	133423.31	7.39		
Encke (OEG)	E	2046-09-10T09:38:32.612		-41.74x	-41.28	133744.89	7.41		
A (OER)	E	2046-09-10T09:45:16.439		-43.18x	-40.21	136774.40	7.59		
F ring	E	2046-09-10T09:53:16.015		-44.88x	-38.91	140461.00	7.78		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:38:09.100
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : 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 : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050
 ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 35.04
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.981
 C/A sky separation (km) : 43393.1
 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	2046-09-10T04:15:35.862		17.02	-38.36	140461.00	-7.35		
A (OER)	I	2046-09-10T04:24:03.083		15.58	-39.81	136774.40	-7.19		
Encke (OEG)	I	2046-09-10T04:31:08.630		14.35	-41.00	133744.89	-7.05		
Encke (IEG)	I	2046-09-10T04:31:54.312		14.22	-41.12	133423.31	-7.03		
A (IER)	I	2046-09-10T05:00:10.533		9.15	-45.52	122050.38	-6.34		
B (OER)	I	2046-09-10T05:12:16.736		6.90	-47.21	117571.16	-5.98		
Saturn	I	2046-09-10T06:29:52.394	-8.28x	-54.23	59786.11			35.09	40.59
Saturn	E	2046-09-10T08:44:51.358	-36.65x	-45.71	59526.38			45.68	51.22
B (OER)	E	2046-09-10T09:00:46.346	-40.07x	-43.32	117571.16		6.28		
A (IER)	E	2046-09-10T09:12:16.339	-42.55x	-41.48	122050.38		6.69		
Encke (IEG)	E	2046-09-10T09:38:54.703	-48.31x	-36.93	133423.31		7.50		
Encke (OEG)	E	2046-09-10T09:39:37.507	-48.46x	-36.80	133744.89		7.52		
A (OER)	E	2046-09-10T09:46:15.660	-49.89x	-35.61	136774.40		7.69		
F ring	E	2046-09-10T09:54:08.887	-51.59x	-34.17	140461.00		7.88		

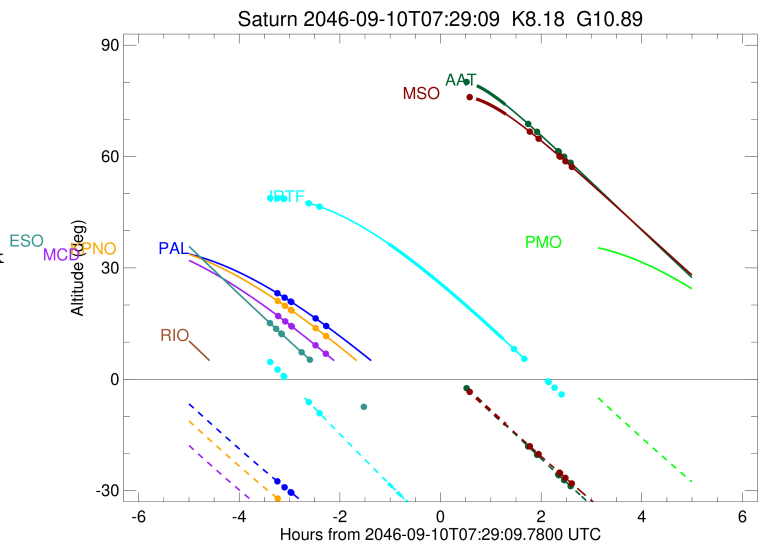
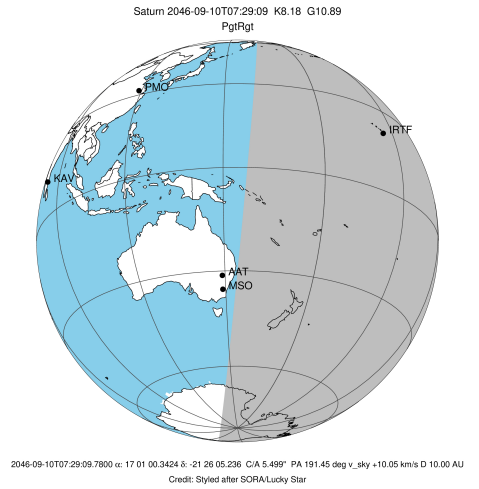
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:36:21.270
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : IRTF
 Location : Mauna Kea/IRTF
 Latitude (deg) : 19.82622
 E. Longitude (deg) : 204.52800
 Altitude (km) : 4.168
 Gaia source ID : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050
 ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 35.57
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 6.077
 C/A sky separation (km) : 44091.3
 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_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	2046-09-10T04:06:07.778		48.79	4.63x	140461.00	-7.16		
A (OER)	I	2046-09-10T04:14:48.487		48.76	2.59x	136774.40	-6.99		
Encke (OEG)	I	2046-09-10T04:22:06.454		48.65	0.88x	133744.89	-6.84		
Encke (IEG)	I	2046-09-10T04:22:53.531		48.63	0.69x	133423.31	-6.82		
A (IER)	I	2046-09-10T04:52:11.069		47.40	-6.17	122050.38	-6.09		
B (OER)	I	2046-09-10T05:04:50.159		46.51	-9.12	117571.16	-5.71		
Saturn	I	2046-09-10T06:26:49.330		36.57	-27.95	59778.04		35.43	40.95
Saturn	E	2046-09-10T08:44:18.954		10.77	-56.23	59500.48		46.73	52.23
B (OER)	E	2046-09-10T08:57:06.835		8.08	-58.32	117571.16	5.87		
A (IER)	E	2046-09-10T09:09:23.303		5.47	-60.14	122050.38	6.29		
Encke (IEG)	E	2046-09-10T09:37:39.388		-0.63x	-63.50	133423.31	7.09		
Encke (OEG)	E	2046-09-10T09:38:24.658		-0.79x	-63.57	133744.89	7.11		
A (OER)	E	2046-09-10T09:45:25.425		-2.32x	-64.17	136774.40	7.29		
F ring	E	2046-09-10T09:53:44.821		-4.15x	-64.75	140461.00	7.48		

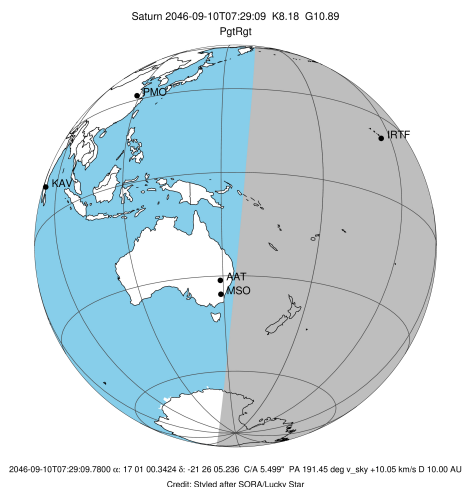
target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:37:38.520
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : ESO
 Location : European Southern Obs. (3.6m)
 Latitude (deg) : -29.26097
 E. Longitude (deg) : 289.26831
 Altitude (km) : 2.400
 Gaia source ID : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050
 ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 35.06
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.006
 C/A sky separation (km) : 36318.9
 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_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



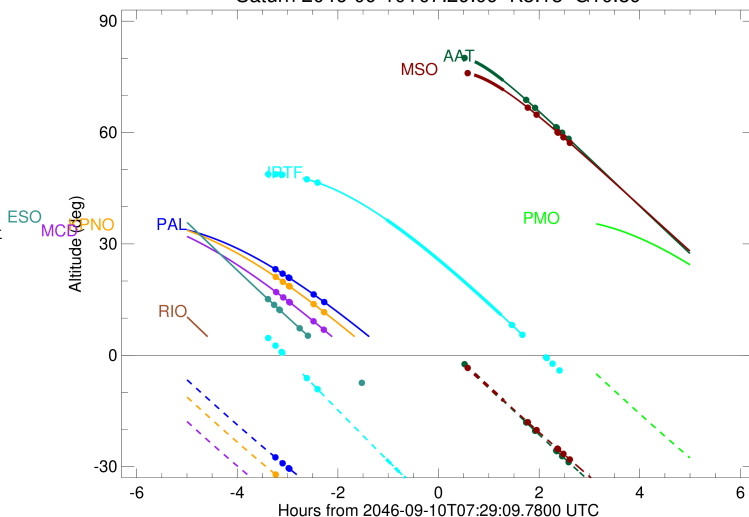
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-09-10T04:05:49.014		15.12	-64.47	140461.00	-8.38		
A (OER)	I	2046-09-10T04:13:11.353		13.57	-64.97	136774.40	-8.29		
Encke (OEG)	I	2046-09-10T04:19:18.754		12.29	-65.29	133744.89	-8.20		
Encke (IEG)	I	2046-09-10T04:19:57.977		12.16	-65.32	133423.31	-8.19		
A (IER)	I	2046-09-10T04:43:38.843		7.26	-65.76	122050.38	-7.79		
B (OER)	I	2046-09-10T04:53:20.999		5.28	-65.56	117571.16	-7.59		
B (IER)	I	2046-09-10T05:57:48.118		-7.44x	-59.53	91984.69	-5.34		
Saturn	I	2046-09-10T06:20:08.417		-11.62x	-56.07	59960.64		27.26	32.22
Saturn	E	2046-09-10T08:53:40.699		-34.50x	-25.45	59707.72		38.35	43.95
B (IER)	E	2046-09-10T08:27:13.874	b	-31.58x	-31.13	91984.69	5.48		
B (OER)	E	2046-09-10T09:29:10.710		-37.43x	-17.75	117571.16	8.00		
A (IER)	E	2046-09-10T09:38:22.168		-37.99x	-15.74	122050.38	8.24		
Encke (IEG)	E	2046-09-10T10:00:40.332		-38.97x	-10.87	133423.31	8.73		
Encke (OEG)	E	2046-09-10T10:01:17.122		-38.99x	-10.74	133744.89	8.75		
A (OER)	E	2046-09-10T10:07:01.348		-39.14x	-9.48	136774.40	8.85		
F ring	E	2046-09-10T10:13:54.892		-39.28x	-7.97	140461.00	8.97		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:28:04.990
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050
 ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 36.38
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.339
 C/A sky separation (km) : 38735.0
 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_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

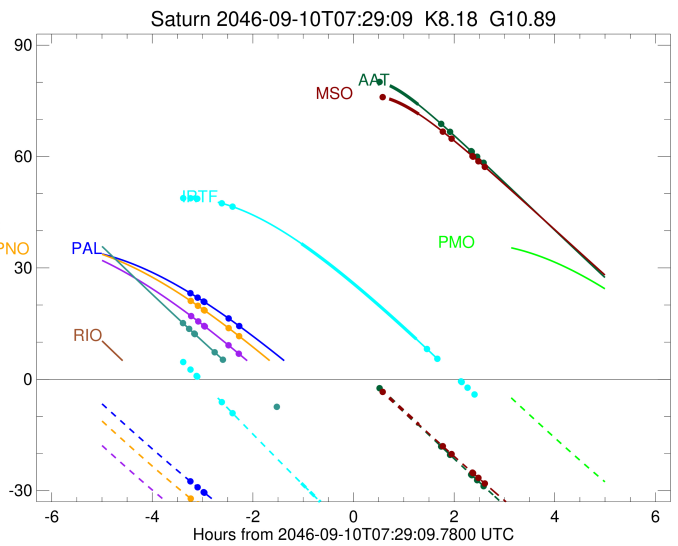
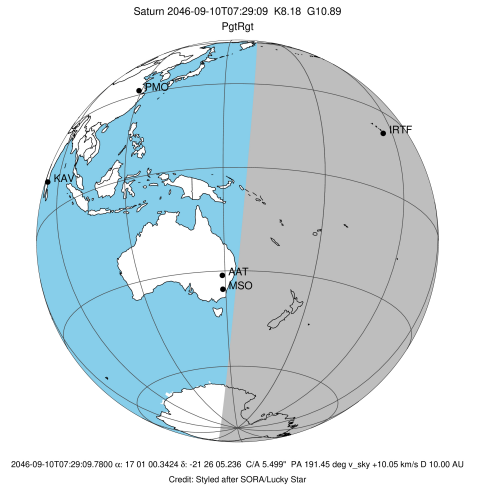


Saturn 2046-09-10T07:29:09 K8.18 G10.89



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-09-10T03:46:18.416		35.21	46.06x	140461.00	-8.20		
A (OER)	I	2046-09-10T03:53:51.724		36.82	45.01x	136774.40	-8.07		
Encke (OEG)	I	2046-09-10T04:00:10.004		38.17	44.09x	133744.89	-7.95		
Encke (IEG)	I	2046-09-10T04:00:50.488		38.32	43.99x	133423.31	-7.94		
A (IER)	I	2046-09-10T04:25:31.290		43.61	40.12x	122050.38	-7.40		
B (OER)	I	2046-09-10T04:35:47.194		45.81	38.41x	117571.16	-7.14		
B (IER)	I	2046-09-10T05:48:24.898		61.29	24.94x	91984.69	-4.28		
Saturn	I	2046-09-10T06:09:03.359		65.58	20.83x	59935.26		28.48	33.54
Saturn	E	2046-09-10T08:46:23.318		74.01	-12.27	59623.26		41.78	47.40
B (IER)	E	2046-09-10T08:00:12.676	b	80.09	-2.40x	91984.69	4.21		
B (OER)	E	2046-09-10T09:14:03.509		68.73	-18.18	117571.16	7.00		
A (IER)	E	2046-09-10T09:24:31.435		66.62	-20.40	122050.38	7.26		
Encke (IEG)	E	2046-09-10T09:49:43.058		61.41	-25.73	133423.31	7.77		
Encke (OEG)	E	2046-09-10T09:50:24.421		61.26	-25.88	133744.89	7.78		
A (OER)	E	2046-09-10T09:56:51.005		59.91	-27.23	136774.40	7.89		
F ring	E	2046-09-10T10:04:34.471		58.28	-28.85	140461.00	8.02		

target : Saturn
 target radius (km) : 60268.00
 C/A epoch : 2046-09-10T07:28:17.700
 Event type : PgtRgt
 : Saturn occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : MSO
 Location : Mt. Stromlo Observatory
 Latitude (deg) : -35.32000
 E. Longitude (deg) : 149.00833
 Altitude (km) : 0.770
 Gaia source ID : 4126141275606002048
 2Mass ID (if available) : 17010035-2126050
 ICRS Star Coord at Epoch: 17h 01m 00.34239s -21:26:05.23590s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.176
 G magnitude : 10.891
 RP magnitude : 10.079
 BP magnitude : 11.593
 DUPflag : 0
 Distance (au) : 10.003
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 10.05
 Sun-Target sep (deg) : 89.16
 Sun-Moon sep (deg) : 36.37
 B (ring opening deg) : 26.73
 PA of pole (deg) : 4.14
 Pole direction: RA (deg): 40.60000
 Dec (deg): 83.50000
 C/A sky separation (") : 5.280
 C/A sky separation (km) : 38309.0
 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_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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2046-09-10T03:46:13.770		35.44	42.94x	140461.00	-8.25		
A (OER)	I	2046-09-10T03:53:44.123		36.98	42.00x	136774.40	-8.12		
Encke (OEG)	I	2046-09-10T03:59:59.731		38.26	41.17x	133744.89	-8.01		
Encke (IEG)	I	2046-09-10T04:00:39.916		38.40	41.08x	133423.31	-8.00		
A (IER)	I	2046-09-10T04:25:07.956		43.41	37.58x	122050.38	-7.48		
B (OER)	I	2046-09-10T04:35:17.234		45.49	36.01x	117571.16	-7.22		
B (IER)	I	2046-09-10T05:46:14.271		59.74	23.77x	91984.69	-4.48		
Saturn	I	2046-09-10T06:08:46.559		64.03	19.53x	59944.50		28.04	33.07
Saturn	E	2046-09-10T08:47:05.619		71.41	-12.21	59634.44		41.33	46.95
B (IER)	E	2046-09-10T08:03:56.056	b	76.00	-3.40x	91984.69	4.42		
B (OER)	E	2046-09-10T09:16:00.076		66.64	-18.10	117571.16	7.10		
A (IER)	E	2046-09-10T09:26:20.347		64.78	-20.19	122050.38	7.34		
Encke (IEG)	E	2046-09-10T09:51:16.544		60.05	-25.20	133423.31	7.84		
Encke (OEG)	E	2046-09-10T09:51:57.533		59.92	-25.33	133744.89	7.85		
A (OER)	E	2046-09-10T09:58:20.722		58.67	-26.60	136774.40	7.96		
F ring	E	2046-09-10T10:06:00.343		57.17	-28.12	140461.00	8.08		