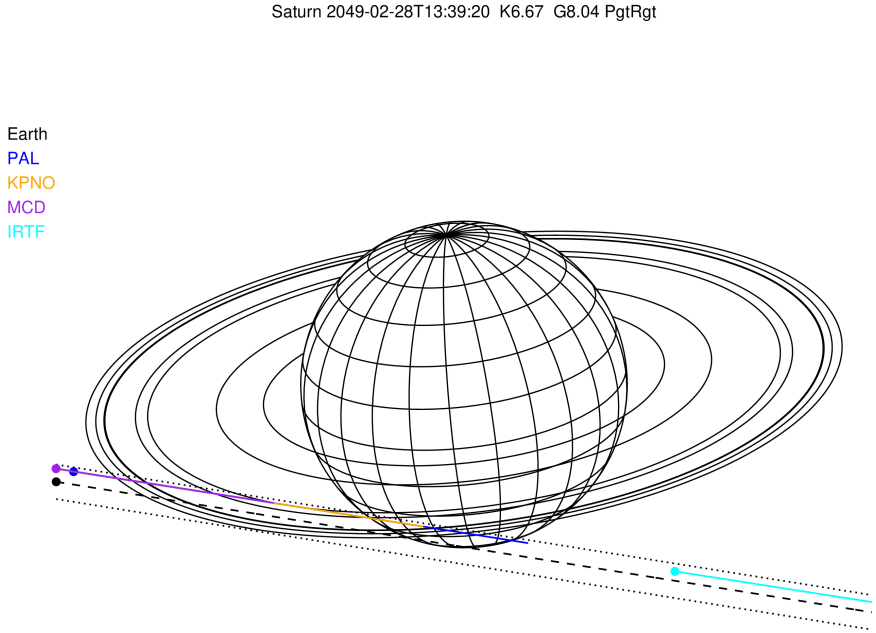
Stellar occultation prediction by rfrench@wellesley.edu Sat Jun 24 20:16:08 2023

target : Saturn
target radius (km) : 60268.00
C/A epoch : 2049-02-28T13:39:20.910
Event type : PgtRgt
: Saturn occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Gaia source ID : 6868077259531603584
2Mass ID (if available) : 19403395-2115112

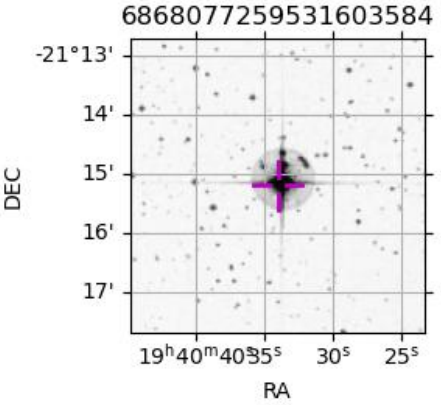
ICRS Star Coord at Epoch: 19h 40m 34.15734s -21:15:13.11250s
RUWE (>1.4 is poor) : 6.86
K magnitude : 6.667
G magnitude : 8.044
RP magnitude : 7.560
BP magnitude : 8.353
DUPflag : 1
Distance (au) : 10.677
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 30.19
Sun-Target sep (deg) : 46.39
Sun-Moon sep (deg) : 3.04
B (ring opening deg) : 22.85
PA of pole (deg) : 6.80

#	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



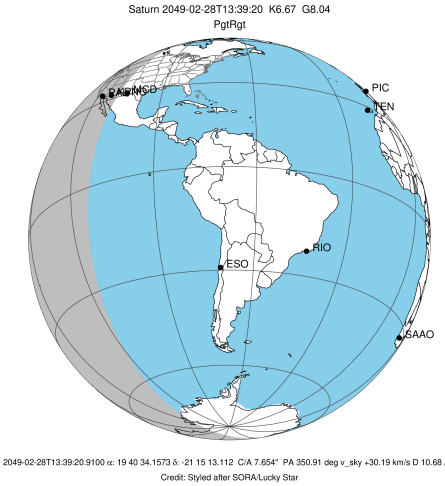
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

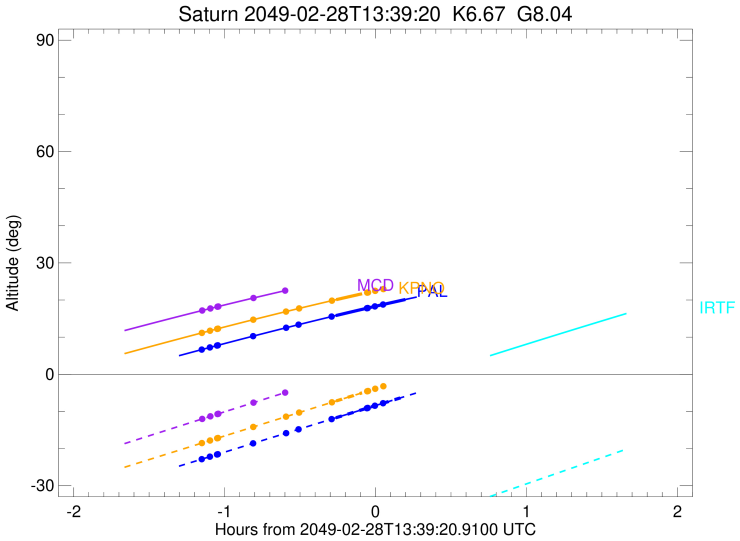
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (20	33.4	243.1	+ + + + + +	+ +	+ +	FEB 28 12:30 - FEB 28 13:51	PieRie
PMO	Purple Mtn Obs	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl	32.0	248.4	+ + + + + +	+	+ +	FEB 28 12:30 - FEB 28 13:23	PinRie
MCD	McDonald Obs.	30.7	256.0	+ + + + + +			FEB 28 12:30 - FEB 28 13:02	PnnRin
TEN	Teide Obs./Ten	28.3	343.5					PnnRnn
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					PnnRnn
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



Saturn_2049-02-28T13_39_20.9100_PAL.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:13:38 2023

target : Saturn
target radius (km) : 60268.00
C/A epoch : 2049-02-28T13:37:36.460
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 : 6868077259531603584
2Mass ID (if available) : 19403395-2115112
ICRS Star Coord at Epoch: 19h 40m 34.15734s -21:15:13.11250s
RUWE (>1.4 is poor) : 6.86
K magnitude : 6.667
G magnitude : 8.044
RP magnitude : 7.560
BP magnitude : 8.353
DUPflag : 1
Distance (au) : 10.677
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 30.19
Sun-Target sep (deg) : 46.39
Sun-Moon sep (deg) : 2.20
B (ring opening deg) : 22.85
PA of pole (deg) : 6.80
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 6.995
C/A sky separation (km) : 54168.8
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
Saturn_ring_plane.tf
sat378.bsp
sat286.bsp
vgr1.sat286.bsp
vgr2.sat286.bsp
HST1081HSPephemUTC.bsp
pfbl0000r.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



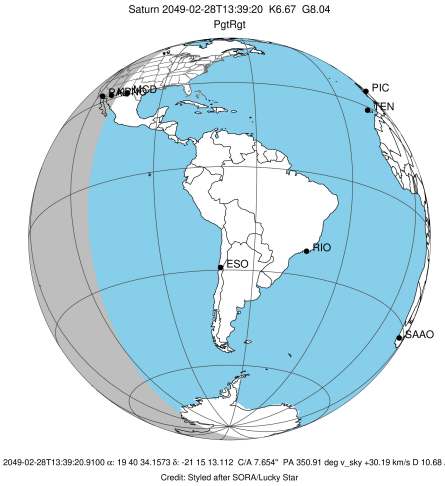


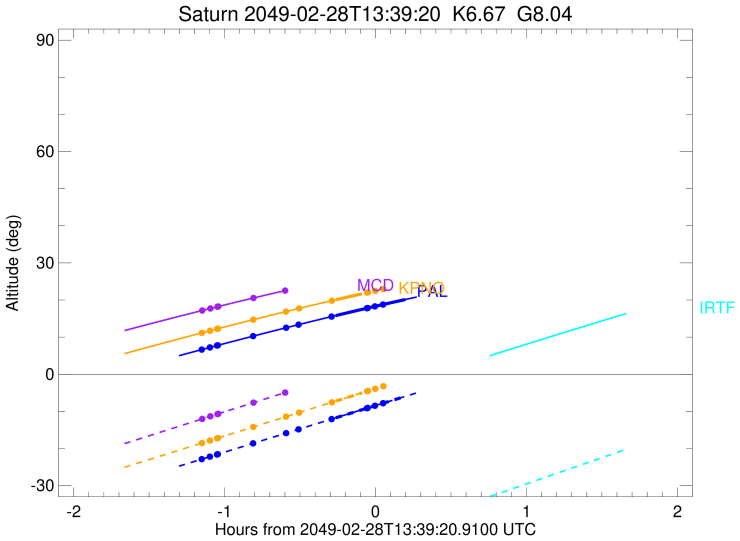
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2049-02-28T12:30:13.372		6.64	-22.88	140461.00	-19.64		
A (OER)	I	2049-02-28T12:33:27.307		7.22	-22.21	136774.40	-18.36		
Encke (OEG)	I	2049-02-28T12:36:17.896		7.73	-21.62	133744.89	-17.14		
Encke (IEG)	I	2049-02-28T12:36:36.728		7.78	-21.55	133423.31	-17.01		
A (IER)	I	2049-02-28T12:50:34.540		10.25	-18.64	122050.38	-9.82		
B (OER)	I	2049-02-28T13:02:49.747		12.36	-16.07	117571.93	-2.22		
Saturn	I	2049-02-28T13:23:32.430		15.81	-11.74	59774.60		-44.29	-49.87
Saturn	E	2049-02-28T13:51:13.856		20.14	-5.95	59434.87		-65.69	-69.52
B (OER)	E	2049-02-28T13:09:38.548		13.51	-14.65	117571.61	2.22		
A (IER)	E	2049-02-28T13:21:53.894		15.54	-12.08	122050.38	9.82		
Encke (IEG)	E	2049-02-28T13:35:52.985	b	17.78	-9.15	133423.31	16.96		
Encke (OEG)	E	2049-02-28T13:36:11.871	b	17.83	-9.09	133744.89	17.10		
A (OER)	E	2049-02-28T13:39:02.997	b	18.28	-8.49	136774.40	18.30		
F ring	E	2049-02-28T13:42:17.652	b	18.78	-7.81	140461.00	19.56		

Saturn_2049-02-28T13_39_20.9100_KPNO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:15:24 2023

target : Saturn
target radius (km) : 60268.00
C/A epoch : 2049-02-28T13:37:45.020
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 : 6868077259531603584
2Mass ID (if available) : 19403395-2115112
ICRS Star Coord at Epoch: 19h 40m 34.15734s -21:15:13.11250s
RUWE (>1.4 is poor) : 6.86
K magnitude : 6.667
G magnitude : 8.044
RP magnitude : 7.560
BP magnitude : 8.353
DUPflag : 1
Distance (au) : 10.677
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 30.19
Sun-Target sep (deg) : 46.39
Sun-Moon sep (deg) : 2.21
B (ring opening deg) : 22.85
PA of pole (deg) : 6.80
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 6.997
C/A sky separation (km) : 54184.3
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
Saturn_ring_plane.tf
sat378.bsp
sat286.bsp
vgr1.sat286.bsp
vgr2.sat286.bsp
HST1081HSPephemUTC.bsp
pfbl0000r.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



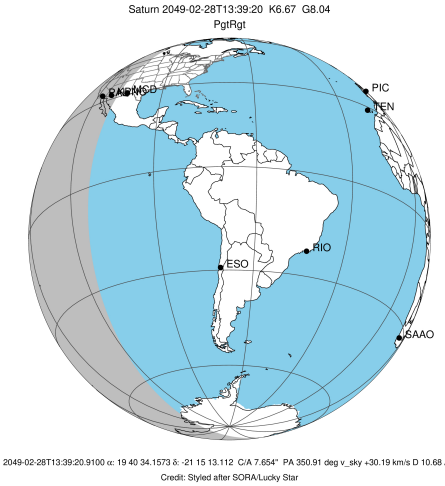


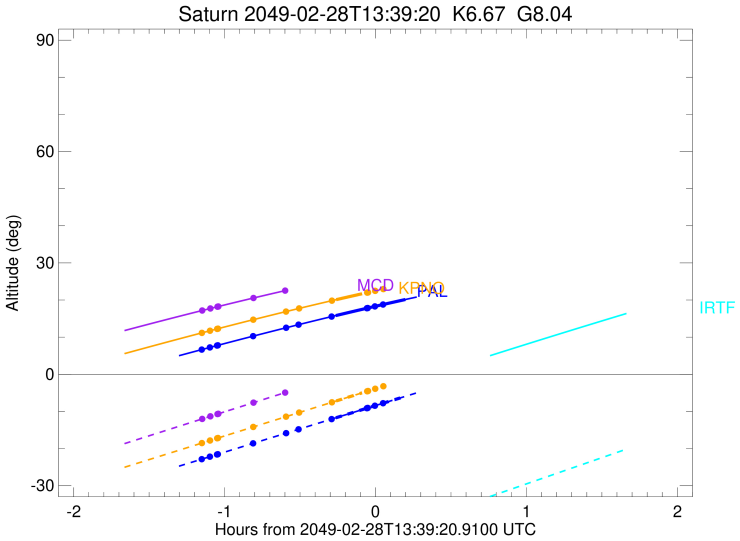
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
F ring	I	2049-02-28T12:30:16.736		11.14	-18.54	140461.00	-19.63		
A (OER)	I	2049-02-28T12:33:30.755		11.72	-17.86	136774.40	-18.35		
Encke (OEG)	I	2049-02-28T12:36:21.406		12.22	-17.25	133744.89	-17.14		
Encke (IEG)	I	2049-02-28T12:36:40.245		12.27	-17.19	133423.31	-17.00		
A (IER)	I	2049-02-28T12:50:38.004		14.68	-14.22	122050.38	-9.83		
B (OER)	I	2049-02-28T13:02:48.944		16.73	-11.63	117571.76	-2.29		
Saturn	I	2049-02-28T13:23:41.285		20.09	-7.20	59774.42		-44.31	-49.88
Saturn	E	2049-02-28T13:51:22.003		24.23	-1.35x	59434.62		-65.71	-69.54
B (OER)	E	2049-02-28T13:09:50.163		17.88	-10.14	117571.50	2.29		
A (IER)	E	2049-02-28T13:22:01.191		19.83	-7.55	122050.38	9.83		
Encke (IEG)	E	2049-02-28T13:36:00.085	b	21.98	-4.59x	133423.31	16.96		
Encke (OEG)	E	2049-02-28T13:36:18.973	b	22.03	-4.52x	133744.89	17.10		
A (OER)	E	2049-02-28T13:39:10.120	b	22.46	-3.92x	136774.40	18.29		
F ring	E	2049-02-28T13:42:24.807	b	22.94	-3.23x	140461.00	19.56		

Saturn_2049-02-28T13_39_20.9100_MCD.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:16:16 2023

target : Saturn
target radius (km) : 60268.00
C/A epoch : 2049-02-28T13:38:00.800
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 : 6868077259531603584
2Mass ID (if available) : 19403395-2115112
ICRS Star Coord at Epoch: 19h 40m 34.15734s -21:15:13.11250s
RUWE (>1.4 is poor) : 6.86
K magnitude : 6.667
G magnitude : 8.044
RP magnitude : 7.560
BP magnitude : 8.353
DUPflag : 1
Distance (au) : 10.677
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 30.19
Sun-Target sep (deg) : 46.39
Sun-Moon sep (deg) : 2.22
B (ring opening deg) : 22.85
PA of pole (deg) : 6.80
Pole direction: RA (deg): 40.60000
Dec (deg): 83.50000
C/A sky separation (") : 6.998
C/A sky separation (km) : 54191.5
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
Saturn_ring_plane.tf
sat378.bsp
sat286.bsp
vgr1.sat286.bsp
vgr2.sat286.bsp
HST1081HSPephemUTC.bsp
pfbl0000r.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	2049-02-28T12:30:24.400		17.17	-12.04	140461.00	-19.64		
A (OER)	I	2049-02-28T12:33:38.331		17.72	-11.34	136774.40	-18.36		
Encke (OEG)	I	2049-02-28T12:36:28.856		18.19	-10.73	133744.89	-17.15		
Encke (IEG)	I	2049-02-28T12:36:47.677		18.24	-10.66	133423.31	-17.02		
A (IER)	I	2049-02-28T12:50:43.312		20.53	-7.67	122050.38	-9.89		
B (OER)	I	2049-02-28T13:02:35.584		22.40	-5.12	117571.40	-2.55		
Saturn	I	2049-02-28T13:23:56.535		25.60	-0.55x	59774.71		-44.29	-49.87
Saturn	E	2049-02-28T13:51:38.173		29.34	5.32x	59434.39		-65.73	-69.55
B (OER)	E	2049-02-28T13:10:27.347		23.61	-3.43x	117571.29	2.55		
A (IER)	E	2049-02-28T13:22:19.622		25.36	-0.90x	122050.38	9.88		
Encke (IEG)	E	2049-02-28T13:36:16.161	b	27.32	2.07x	133423.31	16.98		
Encke (OEG)	E	2049-02-28T13:36:35.025	b	27.37	2.14x	133744.89	17.12		
A (OER)	E	2049-02-28T13:39:25.980	b	27.75	2.74x	136774.40	18.31		
F ring	E	2049-02-28T13:42:40.497	b	28.18	3.43x	140461.00	19.58		