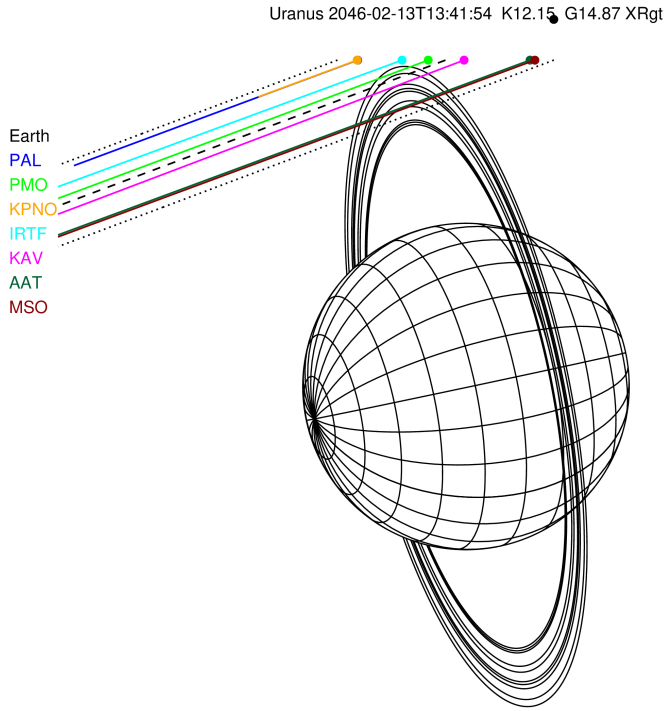
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 02:42:56 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-02-13T13:41:54.490
Event type : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Gaia source ID : 3881617032093419008
2Mass ID (if available) : 10061138+1230466

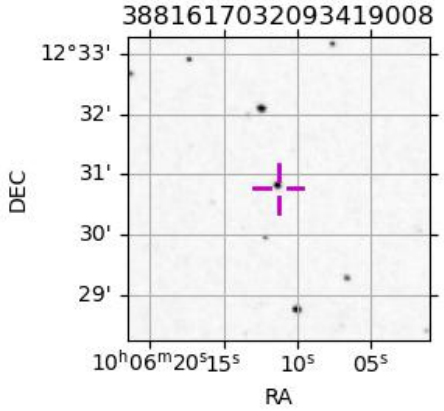
ICRS Star Coord at Epoch: 10h 06m 11.32796s +12:30:45.00242s
RUWE (>1.4 is poor) : 1.03
K magnitude : 12.148
G magnitude : 14.875
RP magnitude : 14.019
BP magnitude : 15.637
DUPflag : 0
Distance (au) : 17.353
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -22.93
Sun-Target sep (deg) : 175.17
Sun-Moon sep (deg) : 101.27
B (ring opening deg) : 18.22
PA of pole (deg) : 102.08

#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



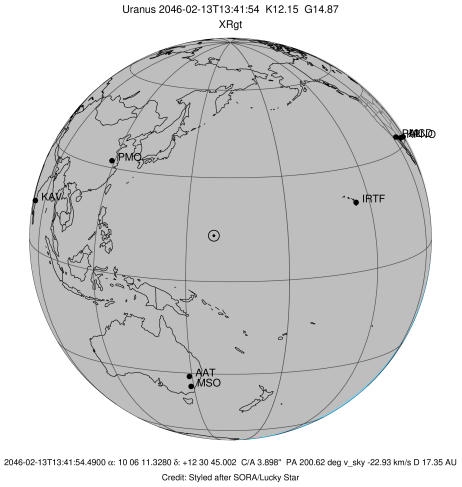
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

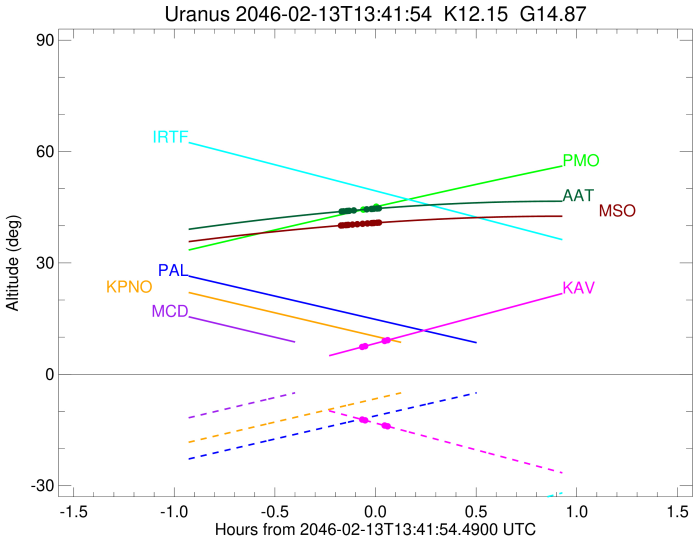
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	|	|	|	|	PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	|	|	|	|	PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+|	|	+ |	FEB 13 13:38 - FEB 13 13:42 |	PnnRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	|	|	|	|	PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0	|	|	|	|	PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	|	|	|	|	PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	|	|	|	|	PnnRnn
KAV	Kavalur Observatory	12.6	78.8	++|	|	++ |	FEB 13 13:37 - FEB 13 13:45 |	PnnRie
RIO	Rio de Janeiro	-22.9	316.8	|	|	|	|	PnnRnn
ESO	European Southern Obs	-29.3	289.3	|	|	|	|	PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1	++++++|	|	++++++ |	FEB 13 13:31 - FEB 13 13:43 |	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	|	|	|	|	PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++++|	|	+++++++ |	FEB 13 13:31 - FEB 13 13:43 |	PnnRie



Uranus_2046-02-13T13_41_54.4900_PMO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:21:28 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-02-13T13:44:59.200
Event type : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Observer code : PMO
Location : Purple Mtn Obs. Nanking
Latitude (deg) : 32.06667
E. Longitude (deg) : 118.82089
Altitude (km) : 0.364
Gaia source ID : 3881617032093419008
2Mass ID (if available) : 10061138+1230466
ICRS Star Coord at Epoch: 10h 06m 11.32796s +12:30:45.00242s
RUWE (>1.4 is poor) : 1.03
K magnitude : 12.148
G magnitude : 14.875
RP magnitude : 14.019
BP magnitude : 15.637
DUPflag : 0
Distance (au) : 17.353
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -22.93
Sun-Target sep (deg) : 175.17
Sun-Moon sep (deg) : 102.05
B (ring opening deg) : 18.22
PA of pole (deg) : 102.08
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.968
C/A sky separation (km) : 49944.2
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
ura111.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ura111.bsp
ura161.bsp
vgr2.ura161.bsp
peph.ura160.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk





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

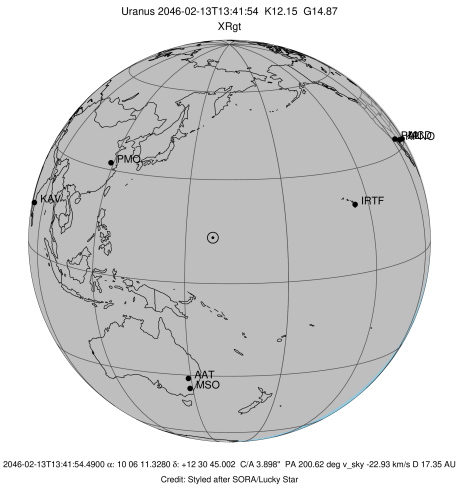
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-02-13T13:38:15.585		44.35	-48.82	51174.46	-12.91		

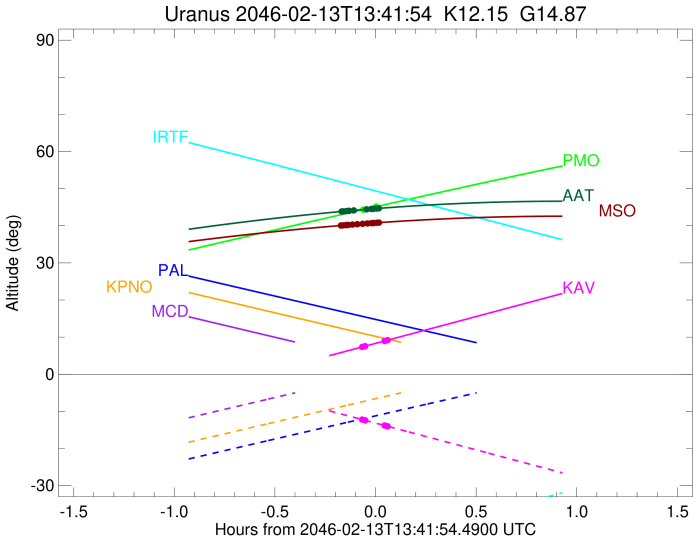
No planet occultations

epsilon	E	2046-02-13T13:42:19.771		45.19	-49.64	51312.96	12.92		

Uranus_2046-02-13T13_41_54.4900_KAV.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:32:10 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-02-13T13:46:31.070
Event type : XRgt
: No Uranus occs
: 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 : 3881617032093419008
2Mass ID (if available) : 10061138+1230466
ICRS Star Coord at Epoch: 10h 06m 11.32796s +12:30:45.00242s
RUWE (>1.4 is poor) : 1.03
K magnitude : 12.148
G magnitude : 14.875
RP magnitude : 14.019
BP magnitude : 15.637
DUPflag : 0
Distance (au) : 17.353
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -22.93
Sun-Target sep (deg) : 175.17
Sun-Moon sep (deg) : 101.58
B (ring opening deg) : 18.22
PA of pole (deg) : 102.08
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.805
C/A sky separation (km) : 47884.7
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
ura111.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ura111.bsp
ura161.bsp
vgr2.ura161.bsp
peph.ura160.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk





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

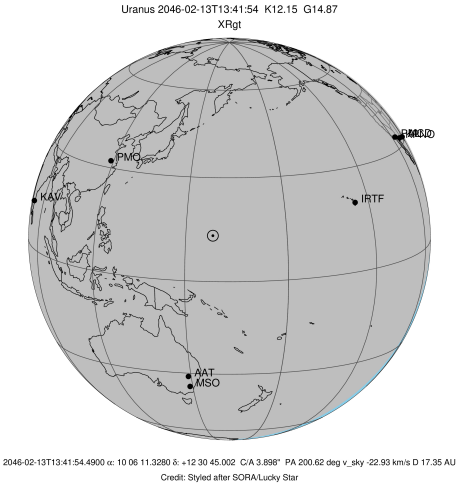
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-02-13T13:37:58.523		7.37	-12.21	51110.92	-23.93		
lambda	I	2046-02-13T13:38:50.341		7.58	-12.42	50026.71	-18.40		

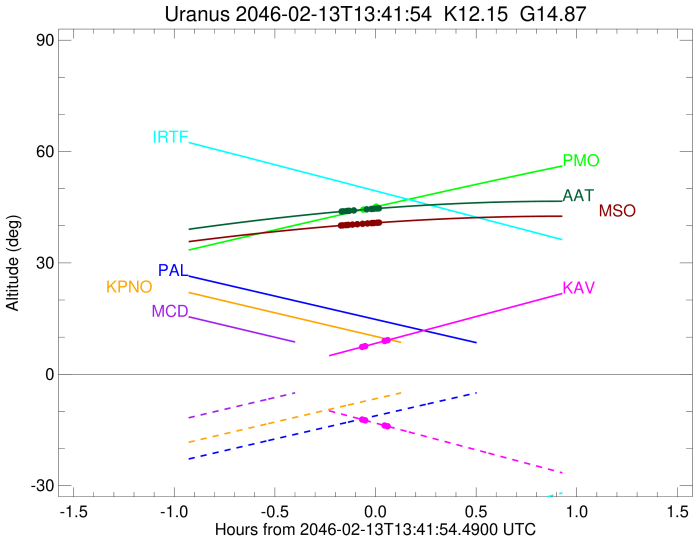
No planet occultations

lambda	E	2046-02-13T13:44:37.345	8.97	-13.80	50026.71	18.42		
epsilon	E	2046-02-13T13:45:39.969	9.22	-14.05	51370.01	23.96		

Uranus_2046-02-13T13_41_54.4900_AAT.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:38:39 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-02-13T13:41:31.160
Event type : XRgt
: No Uranus occs
: 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 : 3881617032093419008
2Mass ID (if available) : 10061138+1230466
ICRS Star Coord at Epoch: 10h 06m 11.32796s +12:30:45.00242s
RUWE (>1.4 is poor) : 1.03
K magnitude : 12.148
G magnitude : 14.875
RP magnitude : 14.019
BP magnitude : 15.637
DUPflag : 0
Distance (au) : 17.353
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -22.93
Sun-Target sep (deg) : 175.17
Sun-Moon sep (deg) : 101.89
B (ring opening deg) : 18.22
PA of pole (deg) : 102.08
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.531
C/A sky separation (km) : 44438.4
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
ura111.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ura111.bsp
ura161.bsp
vgr2.ura161.bsp
peph.ura160.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk





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

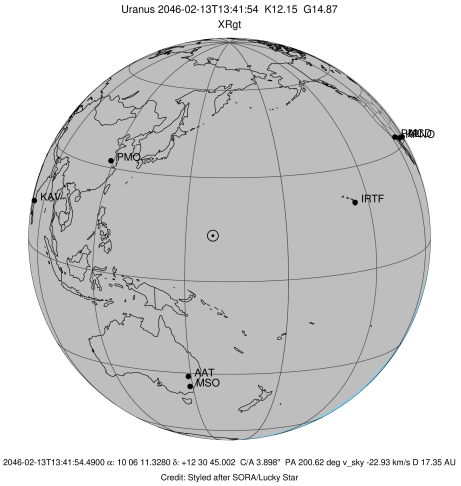
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2046-02-13T13:31:52.610		43.86	-44.36	51042.30	-35.69		
lambda	I	2046-02-13T13:32:22.541		43.90	-44.39	50026.71	-32.64		
delta	I	2046-02-13T13:33:20.028		43.97	-44.45	48300.35	-27.32		
gamma	I	2046-02-13T13:33:45.837		44.01	-44.47	47628.13	-24.76		
eta	I	2046-02-13T13:34:04.847		44.03	-44.49	47176.12	-22.79		
beta	I	2046-02-13T13:35:26.334		44.14	-44.56	45680.05	-13.81		

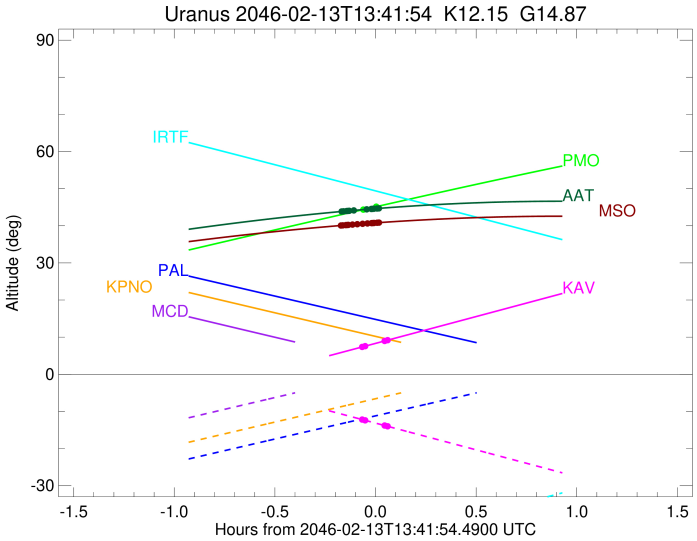
No planet occultations

beta	E	2046-02-13T13:39:17.678		44.43	-44.76	45676.23	13.82		
eta	E	2046-02-13T13:40:39.156		44.53	-44.83	47176.12	22.80		
gamma	E	2046-02-13T13:40:58.273		44.55	-44.84	47630.85	24.77		
delta	E	2046-02-13T13:41:23.968		44.58	-44.86	48300.35	27.33		
lambda	E	2046-02-13T13:42:21.444		44.65	-44.91	50026.71	32.66		
epsilon	E	2046-02-13T13:43:02.067		44.70	-44.94	51423.58	35.70		

Uranus_2046-02-13T13_41_54.4900_MSO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:42:53 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2046-02-13T13:41:24.690
Event type : XRgt
: No Uranus occs
: 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 : 3881617032093419008
2Mass ID (if available) : 10061138+1230466
ICRS Star Coord at Epoch: 10h 06m 11.32796s +12:30:45.00242s
RUWE (>1.4 is poor) : 1.03
K magnitude : 12.148
G magnitude : 14.875
RP magnitude : 14.019
BP magnitude : 15.637
DUPflag : 0
Distance (au) : 17.353
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : -22.93
Sun-Target sep (deg) : 175.17
Sun-Moon sep (deg) : 101.84
B (ring opening deg) : 18.22
PA of pole (deg) : 102.08
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.509
C/A sky separation (km) : 44162.5
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.spk
ura111.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ura111.bsp
ura161.bsp
vgr2.ura161.bsp
peph.ura160.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
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
epsilon	I	2046-02-13T13:31:40.147		40.08	-40.45	51037.99	-36.37		
lambda	I	2046-02-13T13:32:09.313		40.11	-40.47	50026.71	-33.43		
delta	I	2046-02-13T13:33:05.120		40.18	-40.52	48300.35	-28.34		
gamma	I	2046-02-13T13:33:29.897		40.21	-40.54	47628.05	-25.91		
eta	I	2046-02-13T13:33:47.979		40.23	-40.56	47176.12	-24.07		
beta	I	2046-02-13T13:35:02.518		40.32	-40.62	45680.24	-15.97		
alpha	I	2046-02-13T13:36:25.789		40.42	-40.69	44751.70	-6.14		

No planet occultations

alpha	E	2046-02-13T13:38:06.642		40.53	-40.77	44752.40	6.16		
beta	E	2046-02-13T13:39:30.485		40.63	-40.83	45675.82	15.98		
eta	E	2046-02-13T13:40:45.017		40.71	-40.88	47176.12	24.08		
gamma	E	2046-02-13T13:41:03.205		40.73	-40.90	47630.90	25.93		
delta	E	2046-02-13T13:41:27.868		40.76	-40.91	48300.35	28.35		
lambda	E	2046-02-13T13:42:23.666		40.81	-40.95	50026.71	33.45		
epsilon	E	2046-02-13T13:43:03.531		40.86	-40.98	51426.91	36.39		