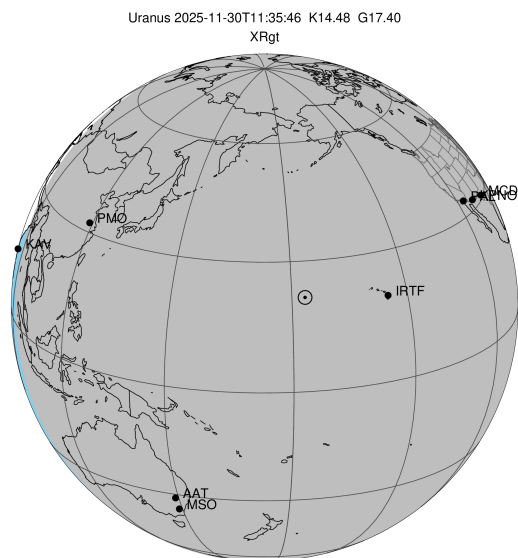


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:35:46.560
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 51049981280722048
 2Mass ID (if available) : 03460488+1940007

ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 52.99
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53

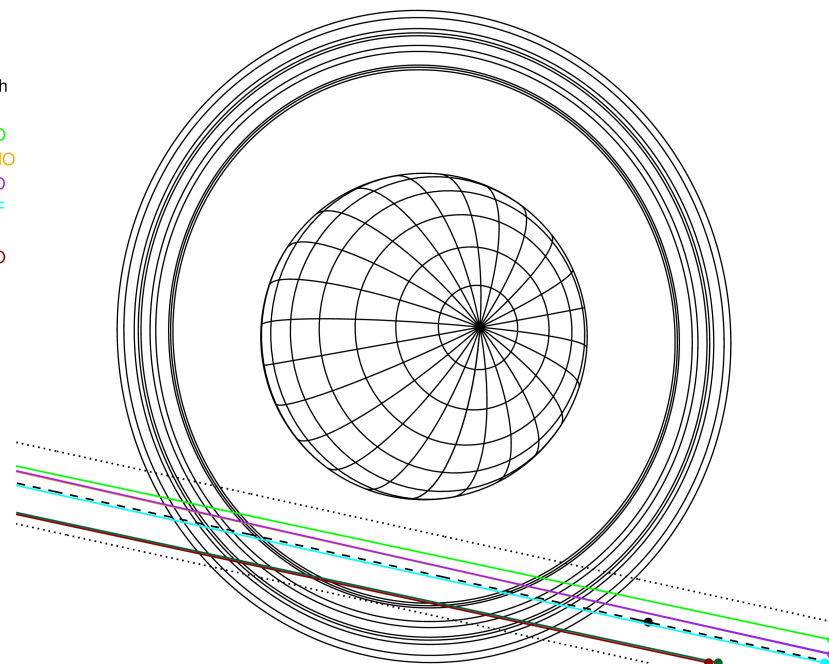
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2025-11-30T11:35:46.5600 ra: 03 46 04.8954 d: +19 40 00.727 C/A 2.6877 PA 347.59 deg v_sky -23.03 km/s D 18.52 AU
 Credit: Styled after SORA/Lucky Star

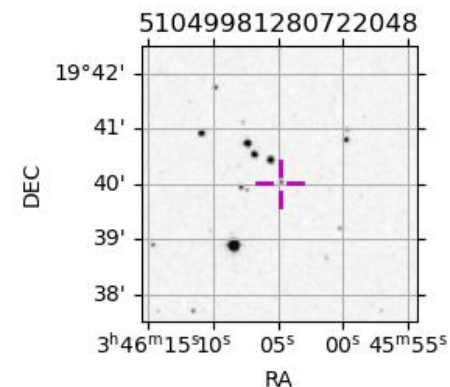
Uranus 2025-11-30T11:35:46 K14.48 G17.40 XRgt

Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 AAT
 MSO



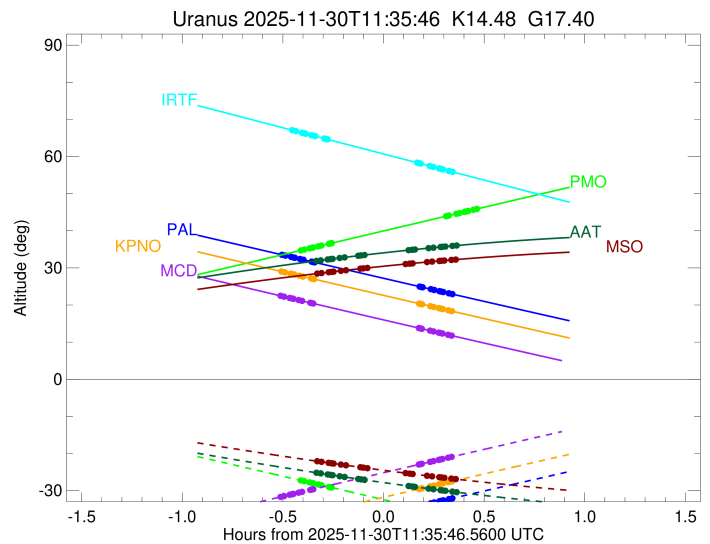
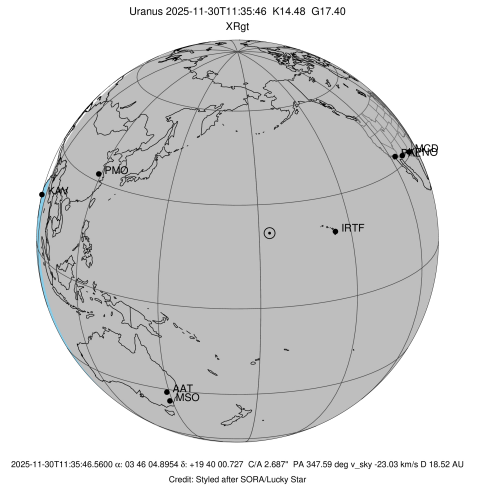
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	NOV 30 11:05 - NOV 30 11:56	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++		+++++	NOV 30 11:11 - NOV 30 12:03	PnnRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	NOV 30 11:05 - NOV 30 11:56	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	NOV 30 11:05 - NOV 30 11:56	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	NOV 30 11:08 - NOV 30 11:56	PnnRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
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	+++++		+++++	NOV 30 11:16 - NOV 30 11:57	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	NOV 30 11:16 - NOV 30 11:57	PnnRie



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2025-11-30T11:31:57.070
Event type           : XRgt
: No Uranus occs
: 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       : 51049981280722048
2Mass ID (if available) : 03460488+1940007
ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.481
G magnitude           : 17.400
RP magnitude          : 16.501
BP magnitude          : 18.236
DUPflag              : 0
Distance (au)        : 18.522
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.03
Sun-Target sep (deg) : 170.54
Sun-Moon sep (deg)   : 53.85
B (ring opening deg) : 69.68
PA of pole (deg)     : -80.53
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.578
C/A sky separation (km) : 34628.9
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrff93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

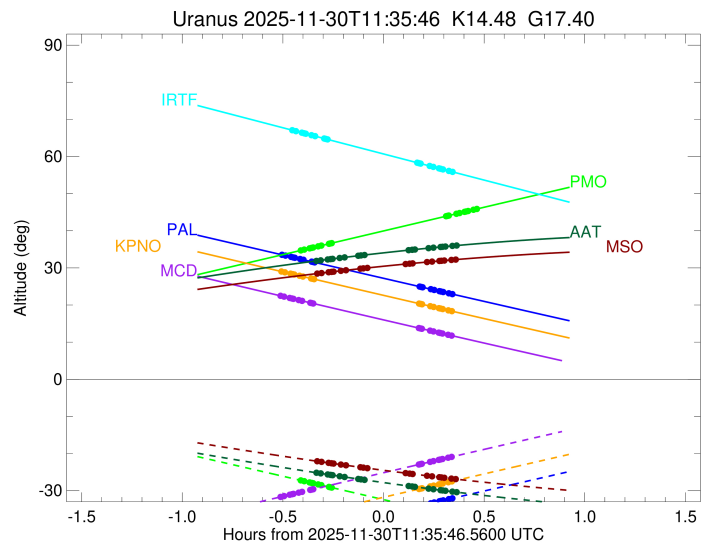
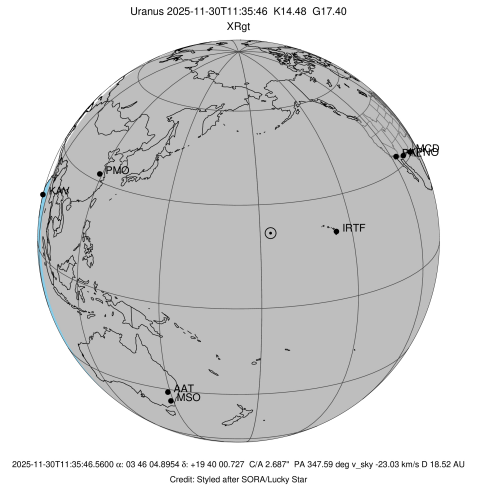


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:05:46.936		33.47	-42.61	50869.61	-17.94		
lambda	I	2025-11-30T11:06:34.529		33.31	-42.45	50026.71	-17.57		
delta	I	2025-11-30T11:08:14.511		32.96	-42.10	48300.35	-16.95		
gamma	I	2025-11-30T11:08:54.836		32.82	-41.96	47622.26	-16.68		
eta	I	2025-11-30T11:09:21.732		32.72	-41.86	47176.12	-16.49		
beta	I	2025-11-30T11:10:56.107		32.39	-41.53	45651.43	-15.80		
alpha	I	2025-11-30T11:11:57.793		32.18	-41.32	44692.57	-15.31		
4	I	2025-11-30T11:14:25.605		31.66	-40.80	42527.68	-13.98		
5	I	2025-11-30T11:14:45.297		31.59	-40.74	42254.96	-13.76		
6	I	2025-11-30T11:15:13.272		31.50	-40.64	41868.61	-13.53		

No planet occultations

6	E	2025-11-30T11:46:35.086	24.95	-34.09	41875.89	13.50
5	E	2025-11-30T11:46:56.801	24.88	-34.02	42170.20	13.73
4	E	2025-11-30T11:47:23.341	24.79	-33.92	42544.33	13.95
alpha	E	2025-11-30T11:49:52.393	24.27	-33.41	44734.10	15.27
beta	E	2025-11-30T11:50:53.360	24.06	-33.20	45676.83	15.76
eta	E	2025-11-30T11:52:26.416	23.74	-32.87	47176.12	16.45
gamma	E	2025-11-30T11:52:53.825	23.64	-32.78	47629.44	16.63
delta	E	2025-11-30T11:53:33.842	23.51	-32.64	48300.35	16.90
lambda	E	2025-11-30T11:55:14.148	23.16	-32.29	50026.71	17.51
epsilon	E	2025-11-30T11:56:35.052	22.88	-32.01	51462.17	17.88

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:38:23.070
 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 : 51049981280722048
 2Mass ID (if available) : 03460488+1940007
 ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 53.13
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.469
 C/A sky separation (km) : 33169.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



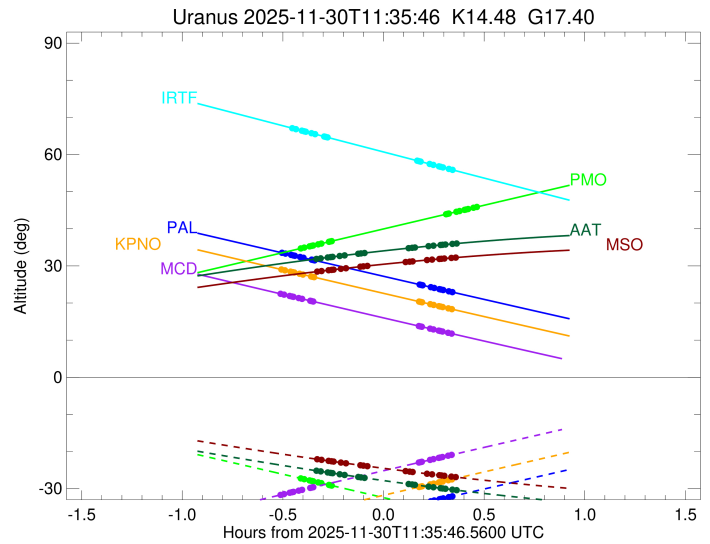
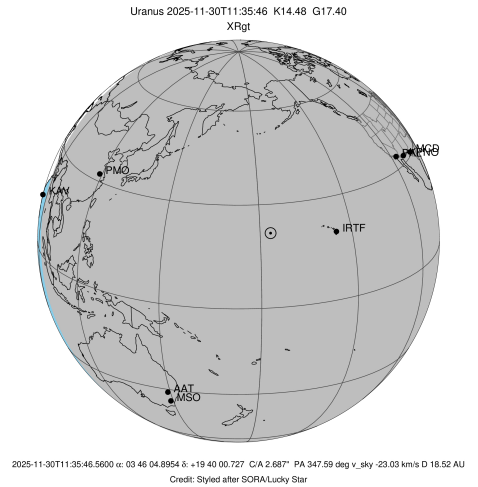
b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:11:23.996		34.77	-27.30	50855.64	-18.57		
lambda	I	2025-11-30T11:12:09.144		34.93	-27.46	50026.71	-18.24		
delta	I	2025-11-30T11:13:45.192		35.27	-27.79	48300.35	-17.70		
gamma	I	2025-11-30T11:14:23.772		35.41	-27.93	47622.07	-17.46		
eta	I	2025-11-30T11:14:49.429		35.50	-28.02	47176.12	-17.30		
beta	I	2025-11-30T11:16:19.127		35.81	-28.33	45650.41	-16.70		
alpha	I	2025-11-30T11:17:17.348		36.02	-28.53	44691.29	-16.28		
4	I	2025-11-30T11:19:35.039		36.51	-29.01	42528.64	-15.15		
5	I	2025-11-30T11:19:52.902		36.57	-29.08	42260.33	-14.96		
6	I	2025-11-30T11:20:18.995		36.66	-29.17	41866.49	-14.76		

No planet occultations

6	E	2025-11-30T11:54:27.765		43.93	-36.36	41874.93	14.79		
5	E	2025-11-30T11:54:47.469		44.00	-36.43	42167.91	14.99		
4	E	2025-11-30T11:55:12.080		44.09	-36.52	42546.15	15.18		
alpha	E	2025-11-30T11:57:30.398		44.58	-37.01	44735.34	16.32		
beta	E	2025-11-30T11:58:27.597		44.78	-37.21	45677.30	16.74		
eta	E	2025-11-30T11:59:55.488		45.09	-37.52	47176.12	17.35		
gamma	E	2025-11-30T12:00:21.507		45.18	-37.61	47629.58	17.51		
delta	E	2025-11-30T12:00:59.557		45.32	-37.74	48300.35	17.75		
lambda	E	2025-11-30T12:02:35.336		45.66	-38.08	50026.71	18.29		
epsilon	E	2025-11-30T12:03:53.325		45.93	-38.36	51469.50	18.62		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:31:47.670
 Event type : XRgt
 : No Uranus occs
 : 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 : 51049981280722048
 2Mass ID (if available) : 03460488+1940007
 ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 53.81
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.580
 C/A sky separation (km) : 34653.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

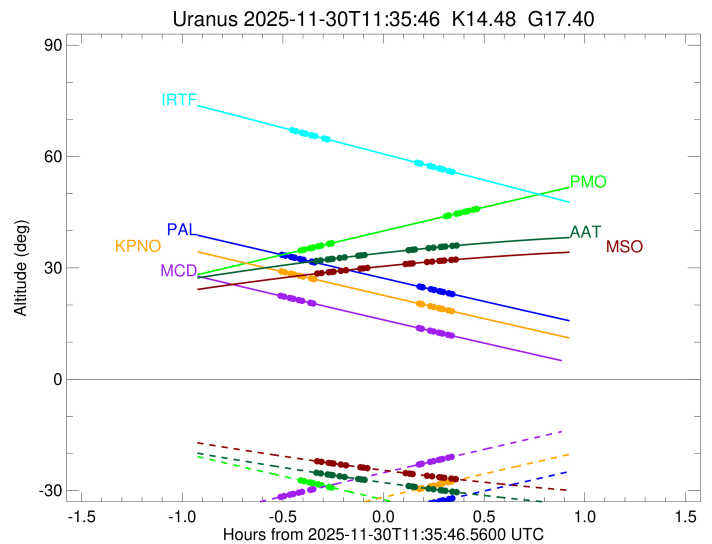
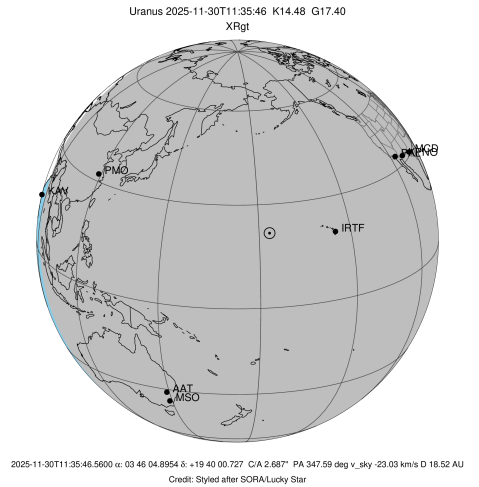


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:05:36.436		28.97	-38.17	50869.96	-17.91		
lambda	I	2025-11-30T11:06:24.139		28.80	-38.00	50026.71	-17.54		
delta	I	2025-11-30T11:08:04.318		28.45	-37.64	48300.35	-16.92		
gamma	I	2025-11-30T11:08:44.725		28.31	-37.50	47622.26	-16.65		
eta	I	2025-11-30T11:09:11.678		28.21	-37.41	47176.12	-16.46		
beta	I	2025-11-30T11:10:46.259		27.88	-37.07	45651.45	-15.77		
alpha	I	2025-11-30T11:11:48.088		27.66	-36.85	44692.61	-15.28		
4	I	2025-11-30T11:14:16.284		27.14	-36.33	42527.66	-13.94		
5	I	2025-11-30T11:14:36.040		27.07	-36.26	42254.83	-13.72		
6	I	2025-11-30T11:15:04.085		26.97	-36.16	41868.66	-13.49		

No planet occultations

6	E	2025-11-30T11:46:25.122		20.38	-29.55	41875.90	13.46		
5	E	2025-11-30T11:46:46.905		20.30	-29.48	42170.23	13.69		
4	E	2025-11-30T11:47:13.519		20.21	-29.38	42544.31	13.91		
alpha	E	2025-11-30T11:49:42.975		19.69	-28.86	44734.09	15.23		
beta	E	2025-11-30T11:50:44.094		19.48	-28.65	45676.82	15.72		
eta	E	2025-11-30T11:52:17.368		19.15	-28.32	47176.12	16.41		
gamma	E	2025-11-30T11:52:44.839		19.06	-28.22	47629.43	16.59		
delta	E	2025-11-30T11:53:24.944		18.92	-28.08	48300.35	16.86		
lambda	E	2025-11-30T11:55:05.465		18.57	-27.73	50026.71	17.48		
epsilon	E	2025-11-30T11:56:26.533		18.29	-27.45	51462.12	17.85		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:31:38.140
 Event type : XRgt
 : No Uranus occs
 : 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 : 51049981280722048
 2Mass ID (if available) : 03460488+1940007
 ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 53.75
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.575
 C/A sky separation (km) : 34587.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

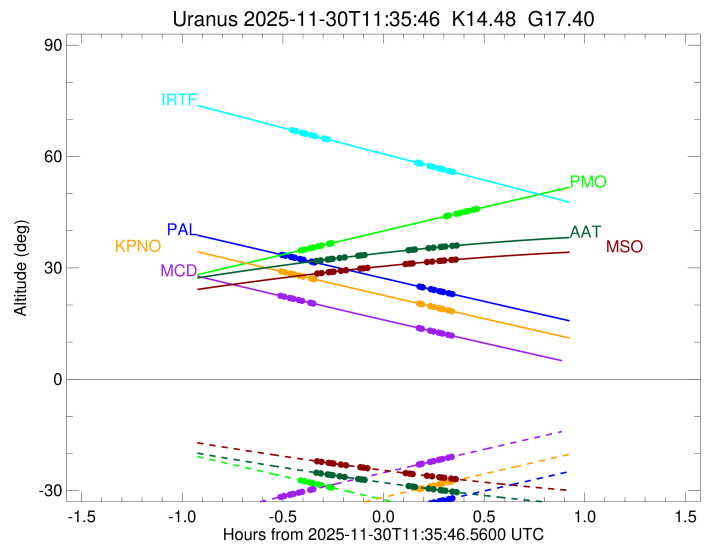
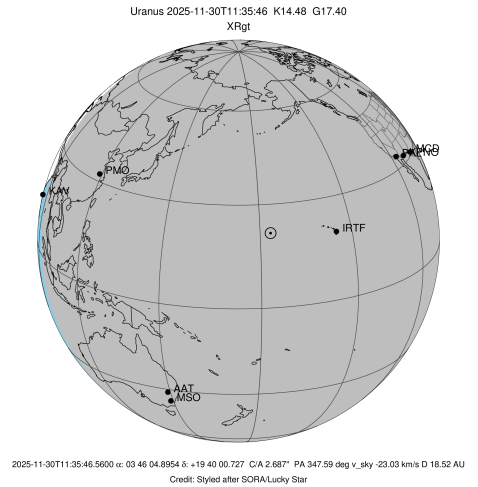


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:05:21.268		22.42	-31.64	50869.65	-17.90		
lambda	I	2025-11-30T11:06:08.964		22.25	-31.47	50026.71	-17.54		
delta	I	2025-11-30T11:07:49.147		21.90	-31.11	48300.35	-16.92		
gamma	I	2025-11-30T11:08:29.547		21.76	-30.97	47622.26	-16.65		
eta	I	2025-11-30T11:08:56.493		21.66	-30.87	47176.12	-16.46		
beta	I	2025-11-30T11:10:31.029		21.33	-30.54	45651.42	-15.78		
alpha	I	2025-11-30T11:11:32.809		21.11	-30.32	44692.57	-15.29		
4	I	2025-11-30T11:14:00.792		20.59	-29.79	42527.69	-13.97		
5	I	2025-11-30T11:14:20.499		20.52	-29.72	42255.00	-13.75		
6	I	2025-11-30T11:14:48.496		20.42	-29.62	41868.60	-13.52		

No planet occultations

6	E	2025-11-30T11:46:21.506	13.78	-22.95	41875.84	13.49
5	E	2025-11-30T11:46:43.232	13.71	-22.88	42170.06	13.72
4	E	2025-11-30T11:47:09.816	13.62	-22.78	42544.44	13.94
alpha	E	2025-11-30T11:49:39.083	13.10	-22.26	44734.18	15.25
beta	E	2025-11-30T11:50:40.158	12.89	-22.05	45676.86	15.73
eta	E	2025-11-30T11:52:13.400	12.56	-21.72	47176.12	16.41
gamma	E	2025-11-30T11:52:40.869	12.47	-21.63	47629.44	16.59
delta	E	2025-11-30T11:53:20.974	12.33	-21.49	48300.35	16.86
lambda	E	2025-11-30T11:55:01.517	11.98	-21.14	50026.71	17.47
epsilon	E	2025-11-30T11:56:22.656	11.70	-20.85	51462.74	17.84

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:33:33.780
 Event type : XRgt
 : No Uranus occs
 : 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 : 51049981280722048
 2Mass ID (if available) : 03460488+1940007
 ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 53.97
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.719
 C/A sky separation (km) : 36521.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

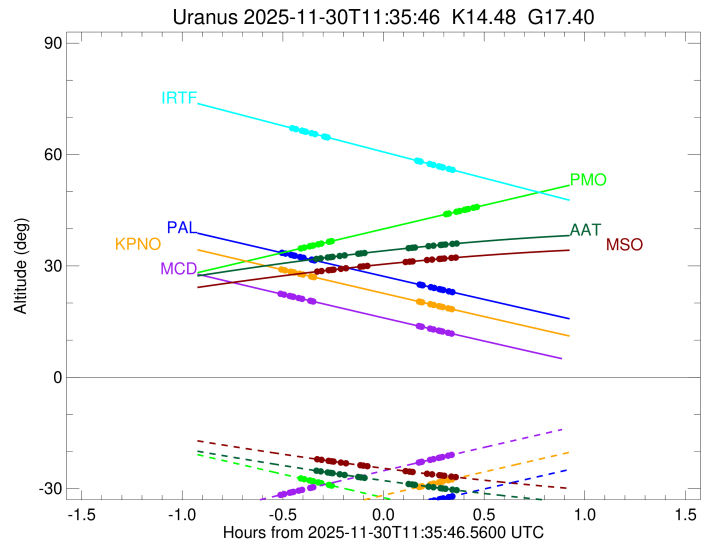
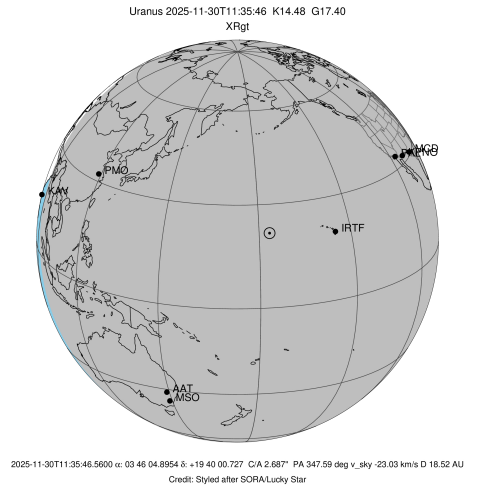


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:08:50.680		67.03	-76.25	50884.11	-17.19		
lambda	I	2025-11-30T11:09:41.350		66.83	-76.05	50026.71	-16.75		
delta	I	2025-11-30T11:11:26.669		66.42	-75.65	48300.35	-16.01		
gamma	I	2025-11-30T11:12:09.426		66.25	-75.48	47622.46	-15.69		
eta	I	2025-11-30T11:12:38.075		66.14	-75.37	47176.12	-15.47		
beta	I	2025-11-30T11:14:19.271		65.74	-74.98	45652.56	-14.63		
alpha	I	2025-11-30T11:15:26.213		65.48	-74.72	44694.11	-14.03		
4	I	2025-11-30T11:18:10.394		64.84	-74.09	42526.83	-12.36		
5	I	2025-11-30T11:18:33.182		64.75	-74.00	42248.53	-12.08		
6	I	2025-11-30T11:19:04.590		64.62	-73.88	41870.93	-11.77		

No planet occultations

6	E	2025-11-30T11:45:52.073		58.33	-67.67	41877.36	11.76		
5	E	2025-11-30T11:46:17.267		58.23	-67.57	42174.69	12.06		
4	E	2025-11-30T11:46:46.783		58.11	-67.45	42541.25	12.35		
alpha	E	2025-11-30T11:49:32.017		57.47	-66.81	44731.79	14.01		
beta	E	2025-11-30T11:50:38.192		57.21	-66.56	45675.89	14.61		
eta	E	2025-11-30T11:52:17.972		56.82	-66.17	47176.12	15.44		
gamma	E	2025-11-30T11:52:47.094		56.70	-66.06	47629.15	15.67		
delta	E	2025-11-30T11:53:29.495		56.54	-65.90	48300.35	15.99		
lambda	E	2025-11-30T11:55:15.002		56.13	-65.49	50026.71	16.72		
epsilon	E	2025-11-30T11:56:38.590		55.80	-65.16	51447.17	17.16		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:37:54.250
 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 : 51049981280722048
 2Mass ID (if available) : 03460488+1940007
 ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 53.15
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.004
 C/A sky separation (km) : 40352.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

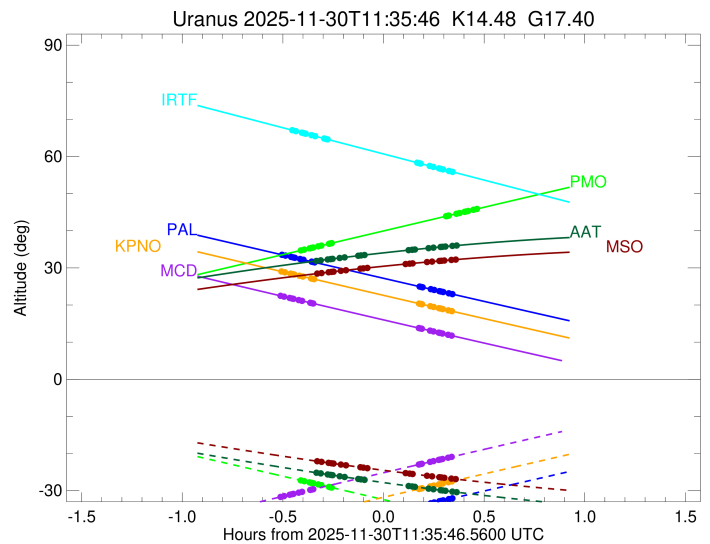
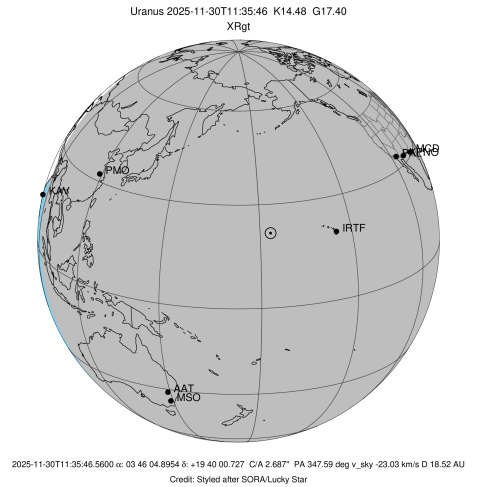


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:16:03.728		31.91	-25.22	50919.83	-14.97		
lambda	I	2025-11-30T11:17:04.880		32.03	-25.36	50026.71	-14.36		
delta	I	2025-11-30T11:19:09.608		32.27	-25.64	48300.35	-13.30		
gamma	I	2025-11-30T11:20:01.452		32.37	-25.76	47623.00	-12.83		
eta	I	2025-11-30T11:20:36.752		32.44	-25.84	47176.12	-12.49		
beta	I	2025-11-30T11:22:45.035		32.68	-26.13	45655.50	-11.20		
alpha	I	2025-11-30T11:24:14.424		32.84	-26.33	44698.46	-10.22		
4	I	2025-11-30T11:28:23.410		33.29	-26.88	42525.94	-7.16		
5	I	2025-11-30T11:29:06.416		33.36	-26.97	42229.61	-6.55		
6	I	2025-11-30T11:30:03.613		33.47	-27.10	41876.35	-5.82		

No planet occultations

6	E	2025-11-30T11:43:21.162		34.79	-28.77	41879.63	5.82		
5	E	2025-11-30T11:44:12.115		34.87	-28.87	42189.42	6.55		
4	E	2025-11-30T11:45:01.739		34.94	-28.97	42534.20	7.17		
alpha	E	2025-11-30T11:49:11.361		35.32	-29.46	44725.96	10.23		
beta	E	2025-11-30T11:50:39.843		35.45	-29.63	45673.42	11.21		
eta	E	2025-11-30T11:52:46.443		35.63	-29.87	47176.12	12.50		
gamma	E	2025-11-30T11:53:22.137		35.68	-29.94	47628.48	12.84		
delta	E	2025-11-30T11:54:13.503		35.75	-30.04	48300.35	13.31		
lambda	E	2025-11-30T11:56:18.095		35.92	-30.27	50026.71	14.38		
epsilon	E	2025-11-30T11:57:51.996		36.05	-30.45	51411.67	14.99		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-11-30T11:37:53.170
 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 : 51049981280722048
 2Mass ID (if available) : 03460488+1940007
 ICRS Star Coord at Epoch: 03h 46m 04.89536s +19:40:00.72681s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.481
 G magnitude : 17.400
 RP magnitude : 16.501
 BP magnitude : 18.236
 DUPflag : 0
 Distance (au) : 18.522
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.03
 Sun-Target sep (deg) : 170.54
 Sun-Moon sep (deg) : 53.12
 B (ring opening deg) : 69.68
 PA of pole (deg) : -80.53
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.025
 C/A sky separation (km) : 40641.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_itrff93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-11-30T11:16:16.880		28.50	-22.12	50923.09	-14.78		
lambda	I	2025-11-30T11:17:19.131		28.61	-22.25	50026.71	-14.15		
delta	I	2025-11-30T11:19:25.953		28.83	-22.52	48300.35	-13.06		
gamma	I	2025-11-30T11:20:18.816		28.93	-22.63	47623.05	-12.57		
eta	I	2025-11-30T11:20:54.880		28.99	-22.71	47176.12	-12.22		
beta	I	2025-11-30T11:23:06.441		29.21	-22.99	45655.79	-10.88		
alpha	I	2025-11-30T11:24:38.797		29.37	-23.18	44698.91	-9.86		
4	I	2025-11-30T11:29:02.202		29.81	-23.72	42525.99	-6.57		
5	I	2025-11-30T11:29:49.839		29.88	-23.81	42227.40	-5.89		
6	I	2025-11-30T11:30:54.042		29.99	-23.94	41876.86	-5.05		

No planet occultations

6	E	2025-11-30T11:42:27.373		31.04	-25.29	41879.71	5.05		
5	E	2025-11-30T11:43:25.334		31.13	-25.40	42191.23	5.89		
4	E	2025-11-30T11:44:19.589		31.21	-25.50	42533.57	6.58		
alpha	E	2025-11-30T11:48:43.632		31.57	-25.99	44725.44	9.86		
beta	E	2025-11-30T11:50:15.086		31.70	-26.15	45673.20	10.89		
eta	E	2025-11-30T11:52:24.969		31.87	-26.38	47176.12	12.23		
gamma	E	2025-11-30T11:53:01.428		31.92	-26.45	47628.42	12.58		
delta	E	2025-11-30T11:53:53.815		31.98	-26.54	48300.35	13.07		
lambda	E	2025-11-30T11:56:00.509		32.14	-26.76	50026.71	14.17		
epsilon	E	2025-11-30T11:57:35.534		32.26	-26.92	51408.79	14.79		