

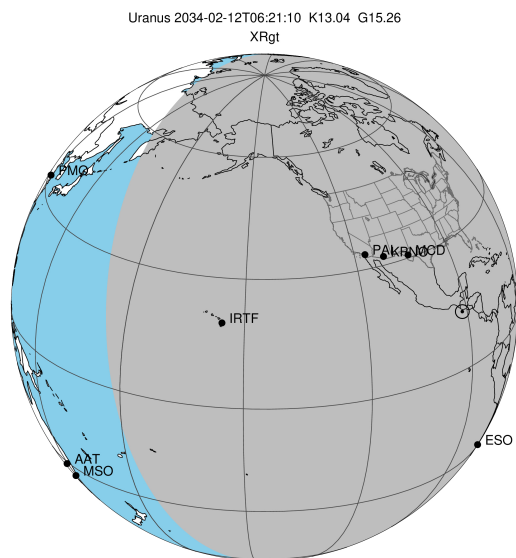
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-12T06:21:10.610
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3425396470518996608
 2Mass ID (if available) : 06080168+2342021

ICRS Star Coord at Epoch: 06h 08m 01.68145s +23:42:02.26147s

RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.045
 G magnitude : 15.262
 RP magnitude : 14.540
 BP magnitude : 15.827
 DUPflag : 0
 Distance (au) : 18.312
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.26
 Sun-Target sep (deg) : 128.71
 Sun-Moon sep (deg) : 149.72
 B (ring opening deg) : 73.75
 PA of pole (deg) : 61.03

a(km) ring

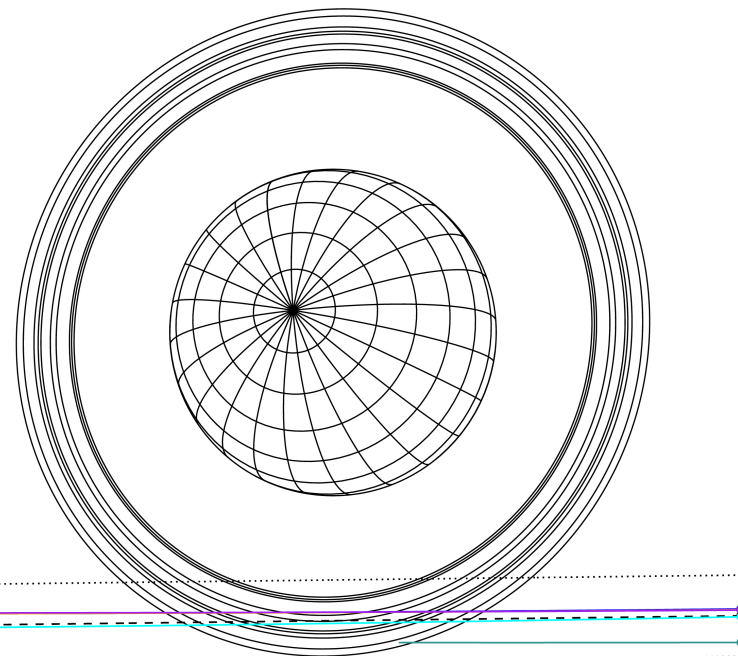
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon



2034-02-12T06:21:10.6100 α: 06 08 01.6815 δ: +23 42 02.261 C/A 3.392" PA 0.68 deg v_sky -12.26 km/s D 18.31 AU
 Credit: Styled after SORA/Lucky Star

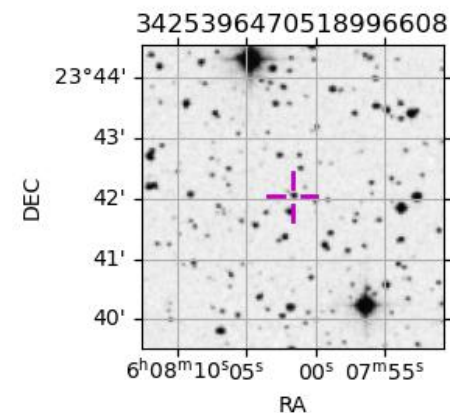
Uranus 2034-02-12T06:21:10 K13.04 G15.26 XRgt

Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO

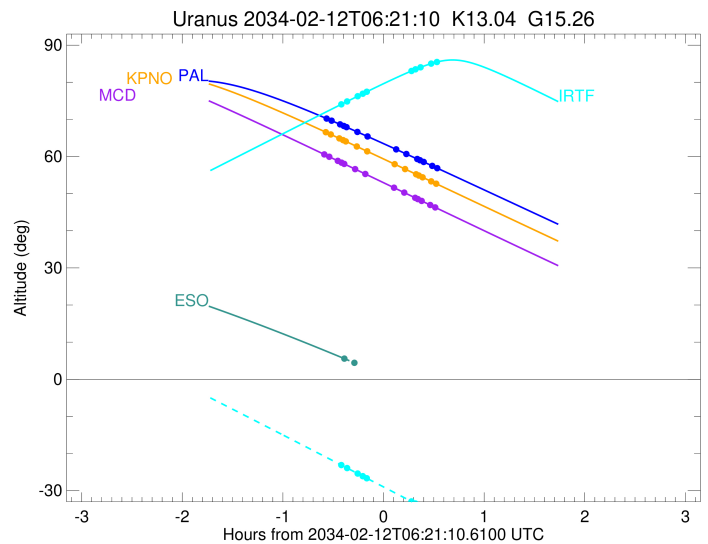
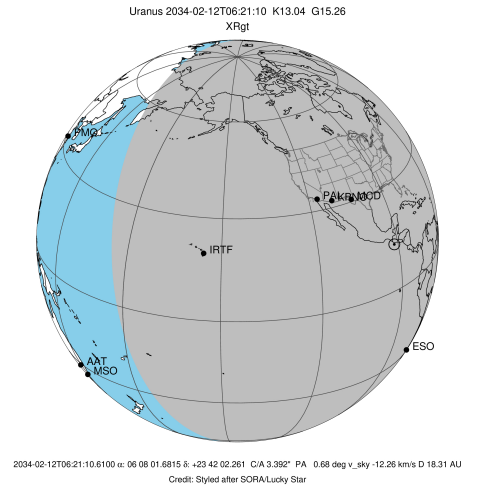


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	FEB 12 05:46 - FEB 12 06:53	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	FEB 12 05:45 - FEB 12 06:52	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	FEB 12 05:44 - FEB 12 06:52	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	++++		++++	FEB 12 05:54 - FEB 12 06:53	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	+			FEB 12 05:56 - FEB 12 05:56	PnnRin
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-12T06:18:13.110
 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 : 3425396470518996608
 2Mass ID (if available) : 06080168+2342021
 ICRS Star Coord at Epoch: 06h 08m 01.68145s +23:42:02.26147s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.045
 G magnitude : 15.262
 RP magnitude : 14.540
 BP magnitude : 15.827
 DUPflag : 0
 Distance (au) : 18.312
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.26
 Sun-Target sep (deg) : 128.71
 Sun-Moon sep (deg) : 150.45
 B (ring opening deg) : 73.75
 PA of pole (deg) : 61.03
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.298
 C/A sky separation (km) : 43803.2
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

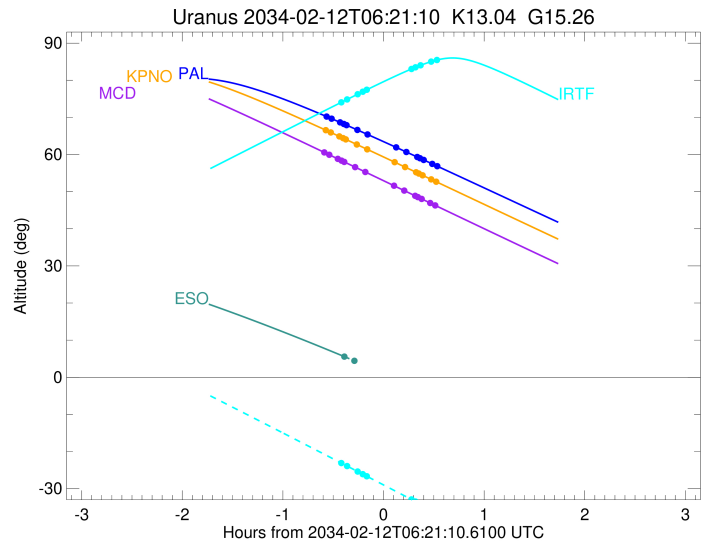
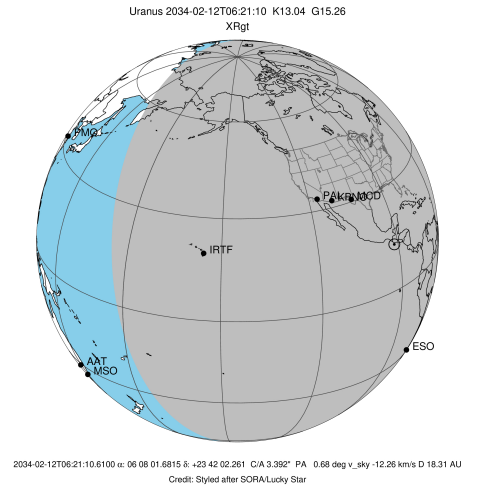


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-12T05:46:16.768		70.42	-53.60	51551.80	-6.68		
lambda	I	2034-02-12T05:50:15.498		69.65	-54.35	50026.71	-6.08		
delta	I	2034-02-12T05:55:20.486		68.66	-55.31	48300.35	-5.23		
gamma	I	2034-02-12T05:57:34.612		68.22	-55.72	47626.34	-4.82		
eta	I	2034-02-12T05:59:10.970		67.90	-56.02	47176.12	-4.52		
beta	I	2034-02-12T06:05:45.042		66.60	-57.23	45648.55	-3.21		
alpha	I	2034-02-12T06:11:34.417		65.43	-58.27	44743.39	-1.96		

No planet occultations

alpha	E	2034-02-12T06:28:52.264		61.90	-61.26	44749.15	1.96		
beta	E	2034-02-12T06:34:42.620		60.70	-62.22	45657.62	3.21		
eta	E	2034-02-12T06:41:14.968		59.35	-63.25	47176.12	4.51		
gamma	E	2034-02-12T06:42:50.905		59.02	-63.50	47622.66	4.80		
delta	E	2034-02-12T06:45:06.323		58.55	-63.84	48300.35	5.20		
lambda	E	2034-02-12T06:50:12.690		57.49	-64.60	50026.71	6.05		
epsilon	E	2034-02-12T06:53:33.393		56.79	-65.07	51292.40	6.64		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-12T06:17:39.530
 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 : 3425396470518996608
 2Mass ID (if available) : 06080168+2342021
 ICRS Star Coord at Epoch: 06h 08m 01.68145s +23:42:02.26147s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.045
 G magnitude : 15.262
 RP magnitude : 14.540
 BP magnitude : 15.827
 DUPflag : 0
 Distance (au) : 18.312
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.26
 Sun-Target sep (deg) : 128.71
 Sun-Moon sep (deg) : 150.49
 B (ring opening deg) : 73.75
 PA of pole (deg) : 61.03
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.302
 C/A sky separation (km) : 43847.5
 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

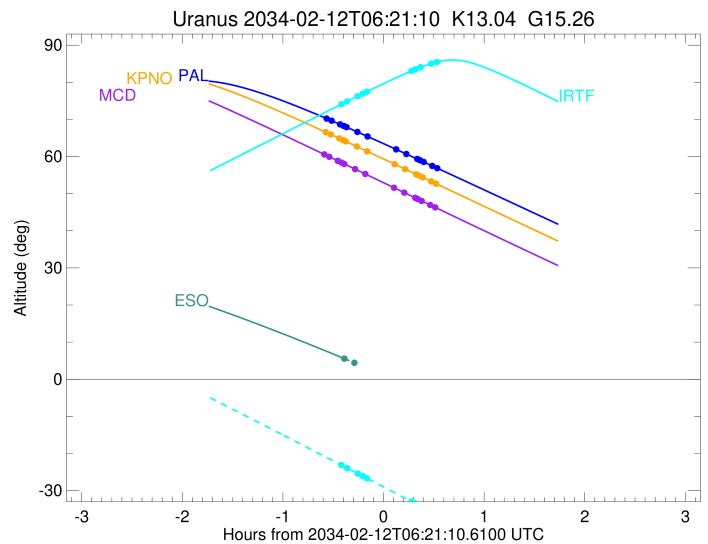
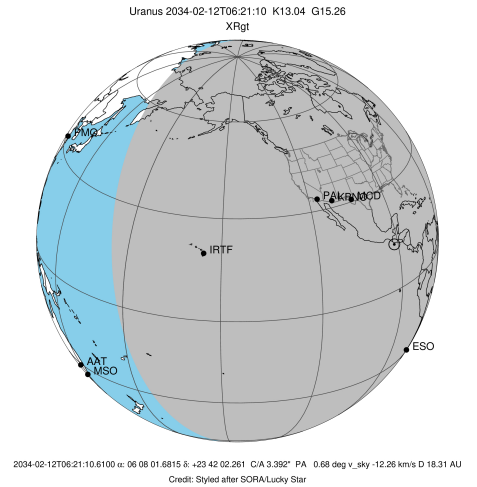


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-12T05:45:47.350		66.77	-58.10	51551.65	-6.65		
lambda	I	2034-02-12T05:49:46.931		65.94	-58.84	50026.71	-6.06		
delta	I	2034-02-12T05:54:53.398		64.88	-59.78	48300.35	-5.20		
gamma	I	2034-02-12T05:57:08.370		64.41	-60.19	47626.32	-4.79		
eta	I	2034-02-12T05:58:45.431		64.07	-60.48	47176.12	-4.49		
beta	I	2034-02-12T06:05:23.905		62.68	-61.66	45648.63	-3.16		
alpha	I	2034-02-12T06:11:22.696		61.42	-62.70	44743.57	-1.87		

No planet occultations

alpha	E	2034-02-12T06:27:56.959		57.92	-65.40	44749.06	1.87		
beta	E	2034-02-12T06:33:56.829		56.64	-66.30	45657.56	3.16		
eta	E	2034-02-12T06:40:33.735		55.24	-67.24	47176.12	4.47		
gamma	E	2034-02-12T06:42:10.424		54.90	-67.46	47622.66	4.77		
delta	E	2034-02-12T06:44:26.762		54.41	-67.77	48300.35	5.17		
lambda	E	2034-02-12T06:49:34.799		53.32	-68.42	50026.71	6.02		
epsilon	E	2034-02-12T06:52:56.430		52.60	-68.83	51292.65	6.61		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-12T06:16:54.810
 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 : 3425396470518996608
 2Mass ID (if available) : 06080168+2342021
 ICRS Star Coord at Epoch: 06h 08m 01.68145s +23:42:02.26147s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.045
 G magnitude : 15.262
 RP magnitude : 14.540
 BP magnitude : 15.827
 DUPflag : 0
 Distance (au) : 18.312
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.26
 Sun-Target sep (deg) : 128.71
 Sun-Moon sep (deg) : 150.54
 B (ring opening deg) : 73.75
 PA of pole (deg) : 61.03
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.298
 C/A sky separation (km) : 43807.1
 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



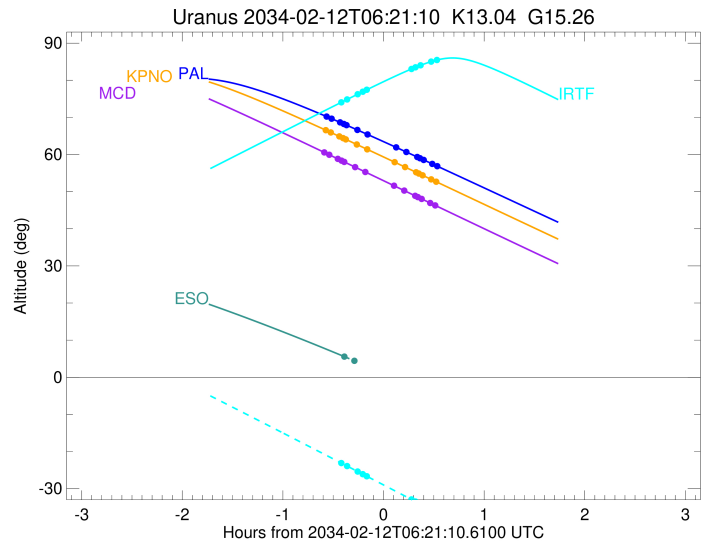
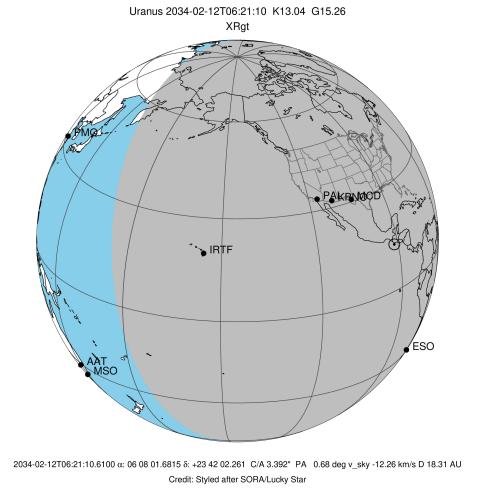
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-12T05:44:53.575		60.78	-64.12	51551.66	-6.66		
lambda	I	2034-02-12T05:48:52.764		59.93	-64.81	50026.71	-6.07		
delta	I	2034-02-12T05:53:58.404		58.83	-65.67	48300.35	-5.21		
gamma	I	2034-02-12T05:56:12.834		58.35	-66.04	47626.33	-4.81		
eta	I	2034-02-12T05:57:49.411		58.00	-66.30	47176.12	-4.51		
beta	I	2034-02-12T06:04:24.430		56.58	-67.34	45648.59	-3.21		
alpha	I	2034-02-12T06:10:14.727		55.32	-68.21	44743.45	-1.95		

No planet occultations

alpha	E	2034-02-12T06:27:35.385		51.57	-70.49	44749.18	1.95		
beta	E	2034-02-12T06:33:26.894		50.31	-71.14	45657.67	3.20		
eta	E	2034-02-12T06:40:00.556		48.89	-71.76	47176.12	4.49		
gamma	E	2034-02-12T06:41:36.825		48.54	-71.90	47622.65	4.79		
delta	E	2034-02-12T06:43:52.722		48.06	-72.08	48300.35	5.19		
lambda	E	2034-02-12T06:49:00.194		46.95	-72.45	50026.71	6.03		
epsilon	E	2034-02-12T06:52:21.511		46.23	-72.65	51291.54	6.61		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-02-12T06:22:28.120
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      : 3425396470518996608
2Mass ID (if available) : 06080168+2342021
ICRS Star Coord at Epoch: 06h 08m 01.68145s +23:42:02.26147s
RUWE (>1.4 is poor) : 1.07
K magnitude         : 13.045
G magnitude         : 15.262
RP magnitude        : 14.540
BP magnitude        : 15.827
DUPflag            : 0
Distance (au)       : 18.312
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -12.26
Sun-Target sep (deg) : 128.71
Sun-Moon sep (deg)  : 150.03
B (ring opening deg) : 73.75
PA of pole (deg)    : 61.03
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.430
C/A sky separation (km) : 45557.5
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
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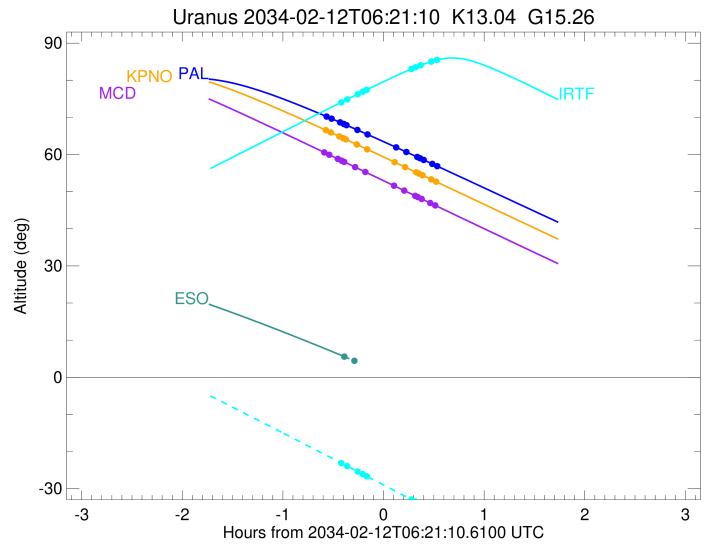
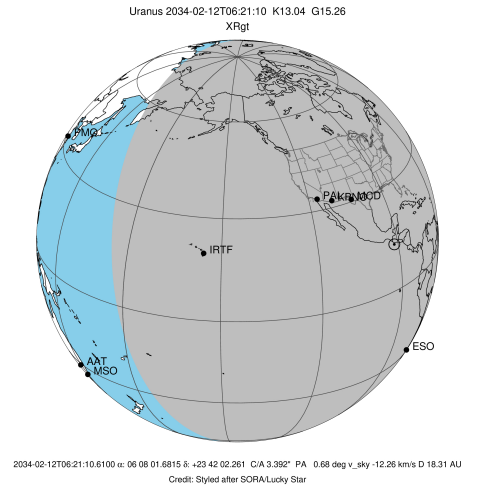


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-02-12T05:54:55.377		73.81	-22.86	51547.52	-5.87		
lambda	I	2034-02-12T05:59:31.264		74.85	-23.93	50026.71	-5.13		
delta	I	2034-02-12T06:05:50.044		76.26	-25.41	48300.35	-3.97		
gamma	I	2034-02-12T06:08:53.852		76.94	-26.12	47625.75	-3.36		
eta	I	2034-02-12T06:11:17.825		77.47	-26.68	47176.12	-2.88		

No planet occultations

eta	E	2034-02-12T06:37:46.404		83.03	-32.89	47176.12	2.88		
gamma	E	2034-02-12T06:40:09.599		83.48	-33.45	47623.18	3.37		
delta	E	2034-02-12T06:43:14.148		84.03	-34.18	48300.35	3.97		
lambda	E	2034-02-12T06:49:32.870		85.02	-35.66	50026.71	5.13		
epsilon	E	2034-02-12T06:53:30.136		85.51	-36.59	51322.35	5.87		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-02-12T06:14:42.760
 Event type : XRgt
 : No Uranus occs
 : 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 : 3425396470518996608
 2Mass ID (if available) : 06080168+2342021
 ICRS Star Coord at Epoch: 06h 08m 01.68145s +23:42:02.26147s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 13.045
 G magnitude : 15.262
 RP magnitude : 14.540
 BP magnitude : 15.827
 DUPflag : 0
 Distance (au) : 18.312
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -12.26
 Sun-Target sep (deg) : 128.71
 Sun-Moon sep (deg) : 150.32
 B (ring opening deg) : 73.75
 PA of pole (deg) : 61.03
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.656
 C/A sky separation (km) : 48555.9
 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



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	2034-02-12T05:56:14.191		5.86	-44.92	51528.36	-3.91		
lambda	I	2034-02-12T06:03:54.892		4.42x	-44.30	50026.71	-2.55		
No planet occultations									
lambda	E	2034-02-12T06:29:57.544		-0.59x	-41.73	50026.71	2.54		
epsilon	E	2034-02-12T06:37:00.371		-1.97x	-40.92	51372.67	3.89		