

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:21:17.550
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 145336779854872192
 2Mass ID (if available) : 04220629+2126343

ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s

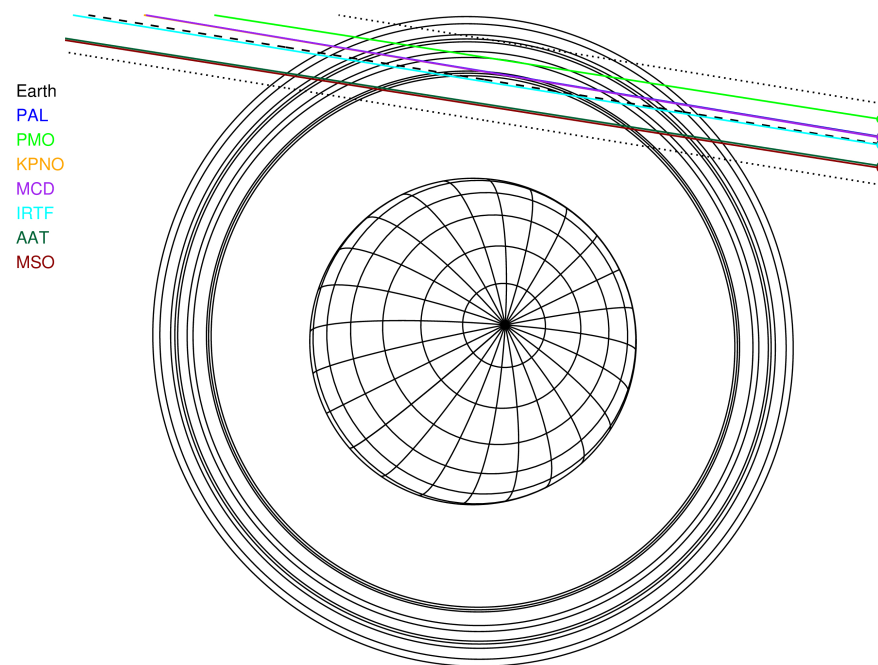
RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 93.27
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70

#	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



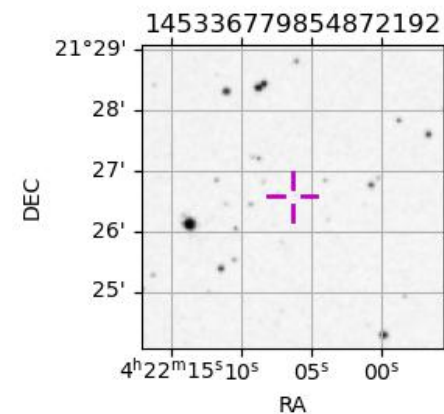
2027-12-05T10:21:17.5500 ra: 04 22 06.3376 s: +21 26 34.325 C/A 3.063° PA 170.75 deg v_sky -23.33 km/s D 18.38 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2027-12-05T10:21:17 K14.58 G18.83 XRgt

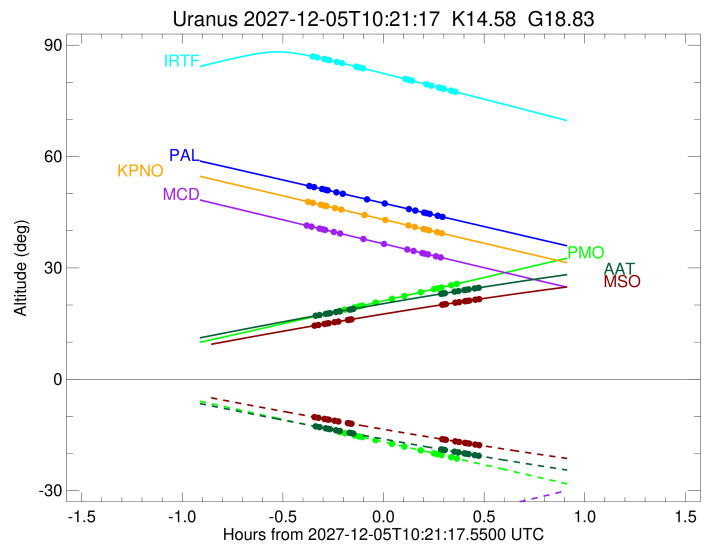
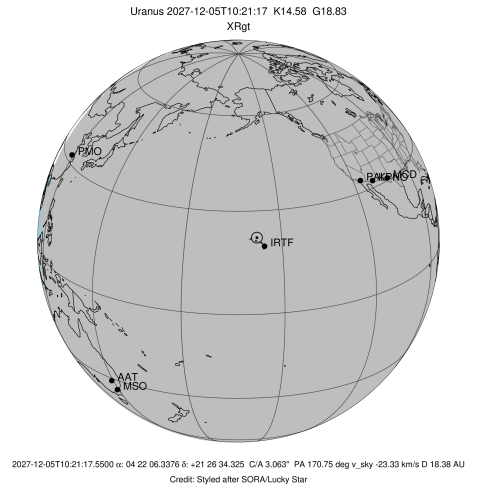


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++		+++++	DEC 05 09:58 - DEC 05 10:39	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++		+++++	DEC 05 10:07 - DEC 05 10:43	PnnRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	DEC 05 09:58 - DEC 05 10:39	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	DEC 05 09:58 - DEC 05 10:38	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	DEC 05 09:59 - DEC 05 10:43	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	+++++		+++++	DEC 05 10:00 - DEC 05 10:50	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	DEC 05 10:00 - DEC 05 10:50	PnnRie



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:18:18.610
 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 : 145336779854872192
 2Mass ID (if available) : 04220629+2126343
 ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 93.90
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.153
 C/A sky separation (km) : 42026.9
 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

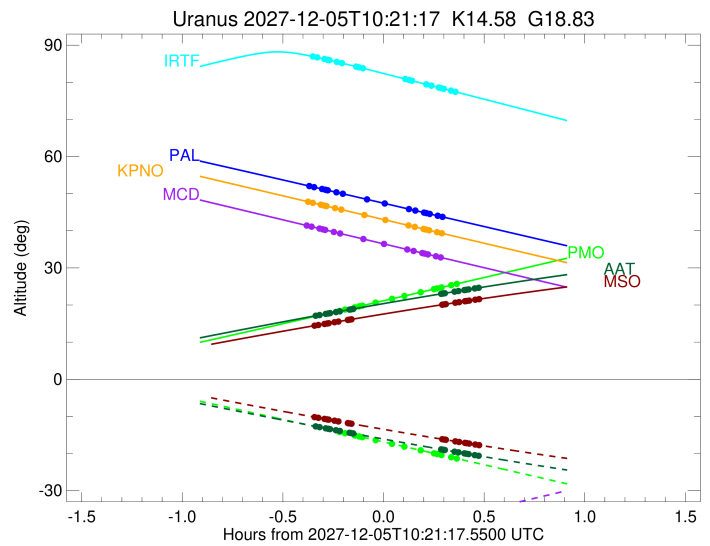
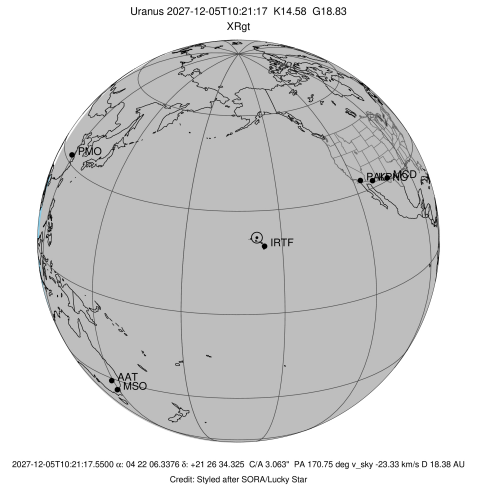


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T09:58:52.206		52.12	-57.19	51409.83	-13.70		
lambda	I	2027-12-05T10:00:37.260		51.75	-56.83	50026.71	-12.74		
delta	I	2027-12-05T10:02:59.609		51.26	-56.34	48300.35	-11.49		
gamma	I	2027-12-05T10:03:59.373		51.05	-56.13	47630.21	-10.93		
eta	I	2027-12-05T10:04:41.717		50.90	-55.99	47176.12	-10.52		
beta	I	2027-12-05T10:07:19.947		50.35	-55.44	45641.12	-8.87		
alpha	I	2027-12-05T10:09:12.044		49.96	-55.05	44714.44	-7.58		
4	I	2027-12-05T10:16:46.411		48.38	-53.48	42540.61	-1.84		

No planet occultations

4	E	2027-12-05T10:21:18.872		47.43	-52.54	42546.08	1.85		
alpha	E	2027-12-05T10:28:48.093		45.86	-50.98	44695.10	7.58		
beta	E	2027-12-05T10:30:43.876		45.45	-50.58	45647.71	8.86		
eta	E	2027-12-05T10:33:21.515		44.90	-50.03	47176.12	10.50		
gamma	E	2027-12-05T10:34:03.508		44.76	-49.89	47625.70	10.91		
delta	E	2027-12-05T10:35:03.778		44.55	-49.68	48300.35	11.47		
lambda	E	2027-12-05T10:37:26.372		44.05	-49.18	50026.71	12.72		
epsilon	E	2027-12-05T10:39:20.646		43.65	-48.78	51532.33	13.67		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:24:54.840
 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 : 145336779854872192
 2Mass ID (if available) : 04220629+2126343
 ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 93.64
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.320
 C/A sky separation (km) : 44256.3
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



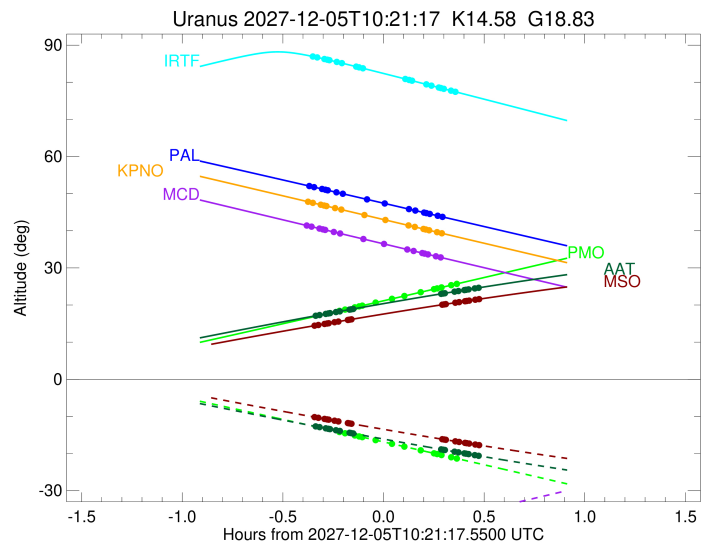
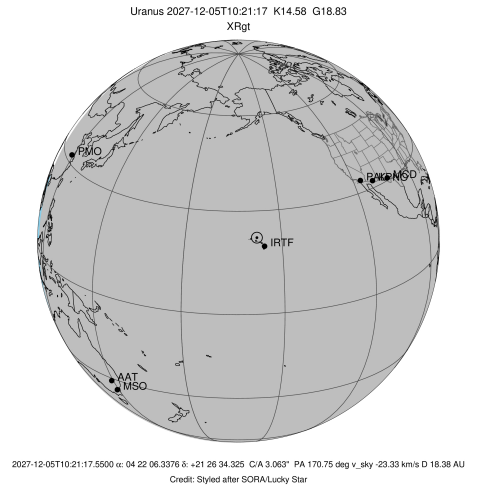
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T10:07:46.196		18.34	-14.13	51436.81	-11.90		
lambda	I	2027-12-05T10:09:51.469		18.77	-14.55	50026.71	-10.71		
delta	I	2027-12-05T10:12:45.912		19.37	-15.14	48300.35	-9.05		
gamma	I	2027-12-05T10:14:03.327		19.64	-15.40	47629.73	-8.26		
eta	I	2027-12-05T10:15:00.273		19.84	-15.59	47176.12	-7.66		
beta	I	2027-12-05T10:19:03.535		20.68	-16.42	45641.74	-4.91		
alpha	I	2027-12-05T10:24:11.220		21.74	-17.46	44705.22	-1.10		

No planet occultations

alpha	E	2027-12-05T10:27:05.965		22.35	-18.06	44702.40	1.11		
beta	E	2027-12-05T10:32:17.084		23.43	-19.12	45645.49	4.92		
eta	E	2027-12-05T10:36:19.221		24.27	-19.95	47176.12	7.68		
gamma	E	2027-12-05T10:37:15.657		24.47	-20.14	47626.27	8.28		
delta	E	2027-12-05T10:38:33.353		24.74	-20.41	48300.35	9.07		
lambda	E	2027-12-05T10:41:27.433		25.34	-21.00	50026.71	10.73		
epsilon	E	2027-12-05T10:43:41.196		25.81	-21.46	51541.08	11.94		

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2027-12-05T10:18:01.280
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        : 145336779854872192
2Mass ID (if available) : 04220629+2126343
ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.576
G magnitude           : 18.831
RP magnitude          : 17.610
BP magnitude          : 20.214
DUPflag              : 0
Distance (au)         : 18.381
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.33
Sun-Target sep (deg)  : 174.66
Sun-Moon sep (deg)    : 93.85
B (ring opening deg) : 77.18
PA of pole (deg)     : -62.70
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.147
C/A sky separation (km) : 41958.3
NAIF SPICE kernels    : RAJobs_U111+rgf15.spk
URKALLvl1.bsp
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

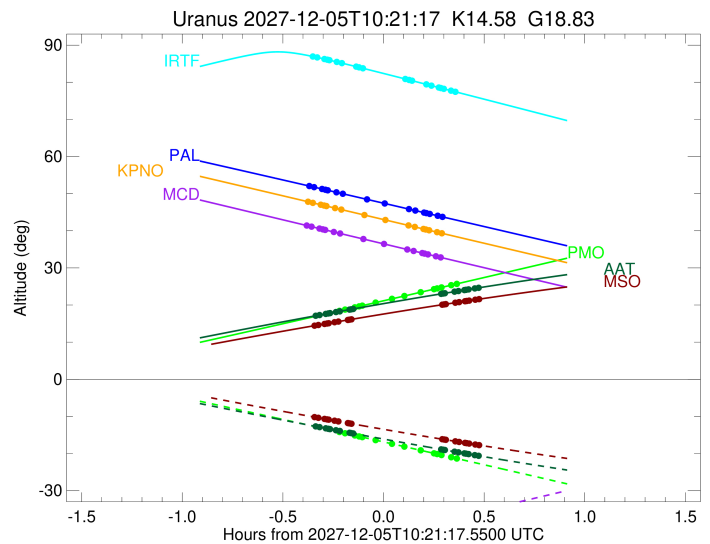
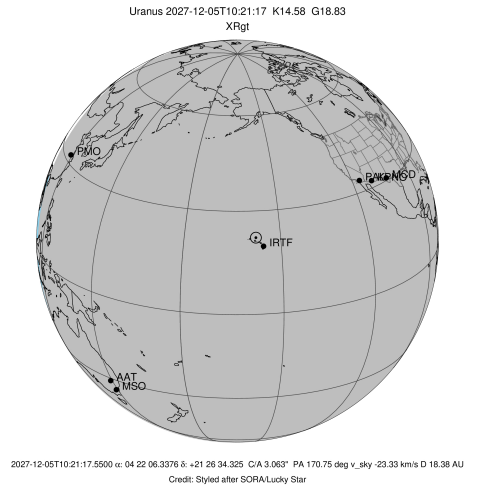


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T09:58:29.749		47.89	-53.04	51408.91	-13.74		
lambda	I	2027-12-05T10:00:14.424		47.52	-52.67	50026.71	-12.78		
delta	I	2027-12-05T10:02:36.215		47.01	-52.17	48300.35	-11.55		
gamma	I	2027-12-05T10:03:35.681		46.80	-51.96	47630.22	-10.99		
eta	I	2027-12-05T10:04:17.788		46.65	-51.81	47176.12	-10.58		
beta	I	2027-12-05T10:06:54.841		46.09	-51.25	45641.12	-8.95		
alpha	I	2027-12-05T10:08:45.662		45.70	-50.86	44714.62	-7.69		
4	I	2027-12-05T10:15:55.887		44.17	-49.34	42539.96	-2.29		

No planet occultations

4	E	2027-12-05T10:21:34.713		42.97	-48.14	42546.76	2.29		
alpha	E	2027-12-05T10:28:39.819		41.46	-46.64	44694.99	7.68		
beta	E	2027-12-05T10:30:34.341		41.05	-46.23	45647.76	8.94		
eta	E	2027-12-05T10:33:10.827		40.50	-45.68	47176.12	10.56		
gamma	E	2027-12-05T10:33:52.590		40.35	-45.53	47625.68	10.97		
delta	E	2027-12-05T10:34:52.573		40.14	-45.32	48300.35	11.53		
lambda	E	2027-12-05T10:37:14.636		39.63	-44.81	50026.71	12.76		
epsilon	E	2027-12-05T10:39:08.582		39.23	-44.41	51532.09	13.70		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:17:39.290
 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 : 145336779854872192
 2Mass ID (if available) : 04220629+2126343
 ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 93.76
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.148
 C/A sky separation (km) : 41966.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl1.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

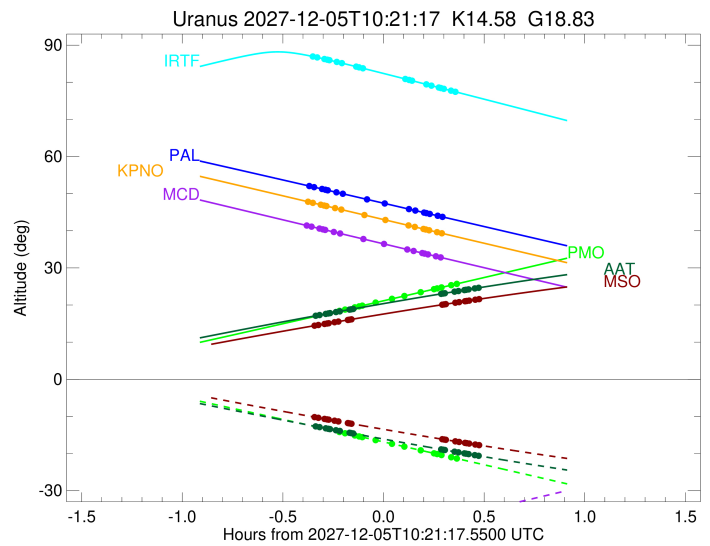
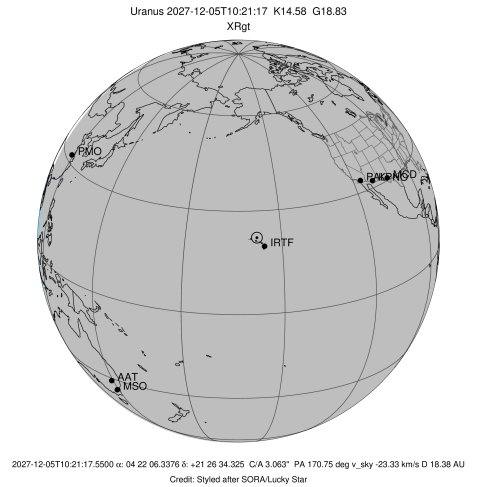


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T09:58:06.548		41.48	-46.68	51408.76	-13.71		
lambda	I	2027-12-05T09:59:51.415		41.10	-46.30	50026.71	-12.76		
delta	I	2027-12-05T10:02:13.502		40.59	-45.79	48300.35	-11.52		
gamma	I	2027-12-05T10:03:13.101		40.38	-45.58	47630.22	-10.96		
eta	I	2027-12-05T10:03:55.306		40.23	-45.42	47176.12	-10.55		
beta	I	2027-12-05T10:06:32.763		39.66	-44.86	45641.12	-8.93		
alpha	I	2027-12-05T10:08:23.923		39.26	-44.46	44714.62	-7.66		
4	I	2027-12-05T10:15:37.632		37.71	-42.91	42540.01	-2.23		

No planet occultations

4	E	2027-12-05T10:21:09.194		36.52	-41.72	42546.64	2.23		
alpha	E	2027-12-05T10:28:17.816		34.98	-40.18	44695.03	7.65		
beta	E	2027-12-05T10:30:12.699		34.57	-39.77	45647.74	8.91		
eta	E	2027-12-05T10:32:49.619		34.01	-39.21	47176.12	10.54		
gamma	E	2027-12-05T10:33:31.487		33.86	-39.06	47625.69	10.94		
delta	E	2027-12-05T10:34:31.617		33.64	-38.85	48300.35	11.50		
lambda	E	2027-12-05T10:36:54.011		33.13	-38.34	50026.71	12.73		
epsilon	E	2027-12-05T10:38:48.219		32.73	-37.93	51532.24	13.68		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:20:47.790
 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 : 145336779854872192
 2Mass ID (if available) : 04220629+2126343
 ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 94.16
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.036
 C/A sky separation (km) : 40466.8
 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

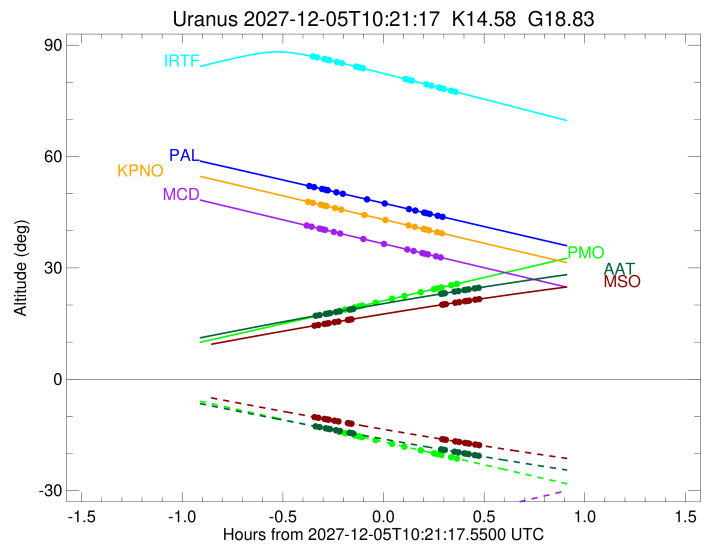
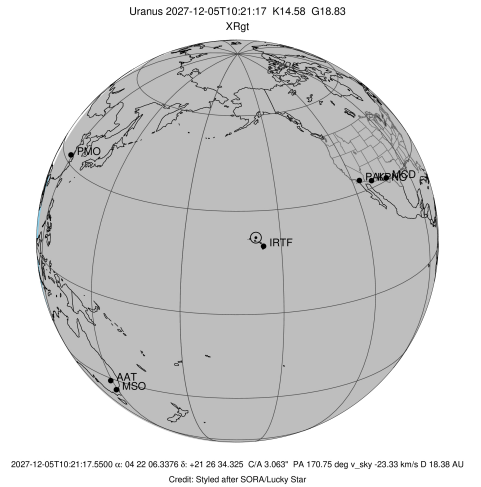


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T09:59:57.494		87.00	-86.07	51394.66	-14.79		
lambda	I	2027-12-05T10:01:33.024		86.69	-86.34	50026.71	-13.96		
delta	I	2027-12-05T10:03:41.477		86.26	-86.66	48300.35	-12.90		
gamma	I	2027-12-05T10:04:34.346		86.08	-86.78	47630.43	-12.43		
eta	I	2027-12-05T10:05:11.379		85.95	-86.86	47176.12	-12.10		
beta	I	2027-12-05T10:07:25.460		85.48	-87.10	45641.06	-10.79		
alpha	I	2027-12-05T10:08:54.633		85.15	-87.22	44717.59	-9.83		
4	I	2027-12-05T10:13:16.464		84.19	-87.33	42534.51	-6.77		
5	I	2027-12-05T10:14:08.047		84.00	-87.31	42210.77	-6.14		
6	I	2027-12-05T10:15:07.469		83.78	-87.27	41862.59	-5.34		

No planet occultations

6	E	2027-12-05T10:27:51.884		80.88	-85.51	41874.80	5.34		
5	E	2027-12-05T10:28:56.086		80.63	-85.31	42251.43	6.14		
4	E	2027-12-05T10:29:43.277		80.45	-85.16	42554.52	6.77		
alpha	E	2027-12-05T10:33:59.754		79.46	-84.30	44692.73	9.83		
beta	E	2027-12-05T10:35:32.477		79.11	-83.98	45649.08	10.79		
eta	E	2027-12-05T10:37:45.793		78.59	-83.51	47176.12	12.10		
gamma	E	2027-12-05T10:38:22.424		78.45	-83.38	47625.31	12.43		
delta	E	2027-12-05T10:39:15.718		78.24	-83.19	48300.35	12.90		
lambda	E	2027-12-05T10:41:24.208		77.75	-82.73	50026.71	13.95		
epsilon	E	2027-12-05T10:43:08.576		77.34	-82.35	51524.13	14.79		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:24:45.620
 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 : 145336779854872192
 2Mass ID (if available) : 04220629+2126343
 ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 93.63
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.777
 C/A sky separation (km) : 37021.7
 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

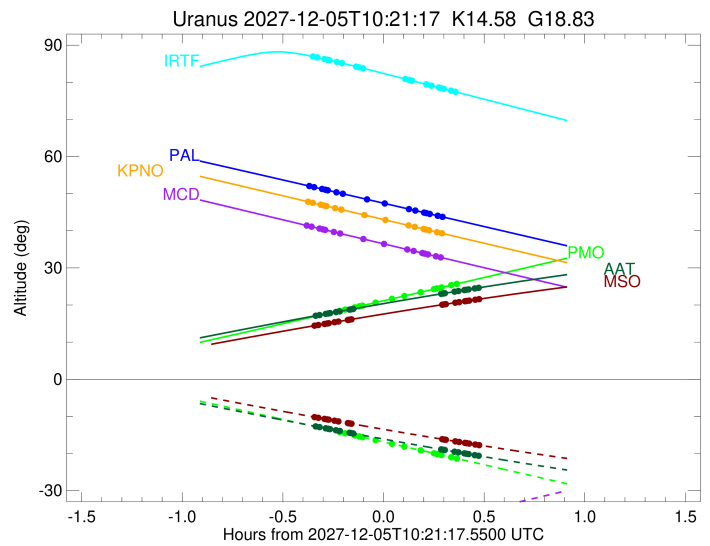
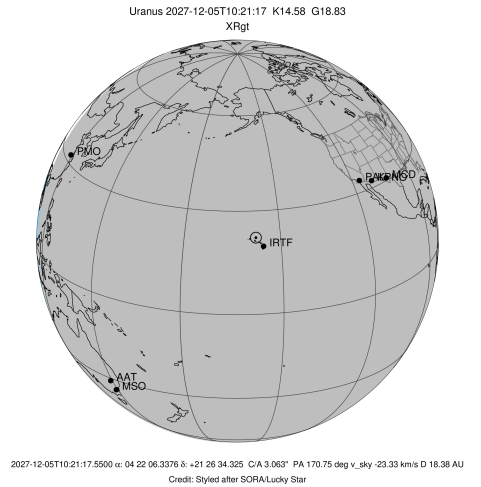


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T10:00:52.442		17.07	-12.66	51361.06	-16.55		
lambda	I	2027-12-05T10:02:14.904		17.30	-12.90	50026.71	-15.92		
delta	I	2027-12-05T10:04:05.864		17.61	-13.21	48300.35	-15.18		
gamma	I	2027-12-05T10:04:50.447		17.73	-13.34	47630.80	-14.85		
eta	I	2027-12-05T10:05:21.293		17.82	-13.43	47176.12	-14.62		
beta	I	2027-12-05T10:07:09.442		18.11	-13.74	45641.26	-13.76		
alpha	I	2027-12-05T10:08:17.397		18.30	-13.93	44722.94	-13.15		
4	I	2027-12-05T10:11:15.232		18.78	-14.43	42529.78	-11.45		
5	I	2027-12-05T10:11:45.704		18.86	-14.52	42194.42	-11.16		
6	I	2027-12-05T10:12:16.114		18.94	-14.60	41853.69	-10.82		

No planet occultations

6	E	2027-12-05T10:38:31.780		23.02	-18.89	41878.56	10.84		
5	E	2027-12-05T10:39:06.940		23.10	-18.98	42269.04	11.18		
4	E	2027-12-05T10:39:33.002		23.17	-19.05	42564.06	11.47		
alpha	E	2027-12-05T10:42:25.080		23.59	-19.50	44689.43	13.18		
beta	E	2027-12-05T10:43:36.438		23.76	-19.68	45651.68	13.79		
eta	E	2027-12-05T10:45:23.554		24.02	-19.96	47176.12	14.66		
gamma	E	2027-12-05T10:45:53.916		24.10	-20.04	47624.63	14.89		
delta	E	2027-12-05T10:46:38.810		24.20	-20.15	48300.35	15.21		
lambda	E	2027-12-05T10:48:29.497		24.47	-20.44	50026.71	15.97		
epsilon	E	2027-12-05T10:50:00.464		24.69	-20.67	51505.00	16.59		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T10:24:39.660
 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 : 145336779854872192
 2Mass ID (if available) : 04220629+2126343
 ICRS Star Coord at Epoch: 04h 22m 06.33760s +21:26:34.32456s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.576
 G magnitude : 18.831
 RP magnitude : 17.610
 BP magnitude : 20.214
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.33
 Sun-Target sep (deg) : 174.66
 Sun-Moon sep (deg) : 93.58
 B (ring opening deg) : 77.18
 PA of pole (deg) : -62.70
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.754
 C/A sky separation (km) : 36713.2
 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	2027-12-05T10:00:32.017		14.41	-10.16	51357.92	-16.69		
lambda	I	2027-12-05T10:01:53.527		14.62	-10.39	50026.71	-16.08		
delta	I	2027-12-05T10:03:43.301		14.91	-10.68	48300.35	-15.36		
gamma	I	2027-12-05T10:04:27.344		15.02	-10.80	47630.83	-15.04		
eta	I	2027-12-05T10:04:57.796		15.10	-10.89	47176.12	-14.82		
beta	I	2027-12-05T10:06:44.375		15.37	-11.17	45641.30	-13.98		
alpha	I	2027-12-05T10:07:51.145		15.54	-11.35	44723.37	-13.40		
4	I	2027-12-05T10:10:45.141		15.99	-11.82	42529.50	-11.76		
5	I	2027-12-05T10:11:14.854		16.06	-11.90	42193.33	-11.49		
6	I	2027-12-05T10:11:44.350		16.14	-11.98	41853.04	-11.16		

No planet occultations

6	E	2027-12-05T10:38:51.034		20.09	-16.15	41878.71	11.18		
5	E	2027-12-05T10:39:25.280		20.17	-16.24	42270.14	11.50		
4	E	2027-12-05T10:39:50.588		20.23	-16.30	42564.72	11.78		
alpha	E	2027-12-05T10:42:38.837		20.62	-16.71	44689.22	13.42		
beta	E	2027-12-05T10:43:49.016		20.78	-16.88	45651.88	14.01		
eta	E	2027-12-05T10:45:34.572		21.01	-17.14	47176.12	14.85		
gamma	E	2027-12-05T10:46:04.543		21.08	-17.21	47624.58	15.08		
delta	E	2027-12-05T10:46:48.901		21.18	-17.32	48300.35	15.39		
lambda	E	2027-12-05T10:48:38.413		21.43	-17.58	50026.71	16.12		
epsilon	E	2027-12-05T10:50:08.452		21.63	-17.80	51503.32	16.74		