

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-07-12T04:22:17.420
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 52213749915993856
 2Mass ID (if available) : 04073581+2046056

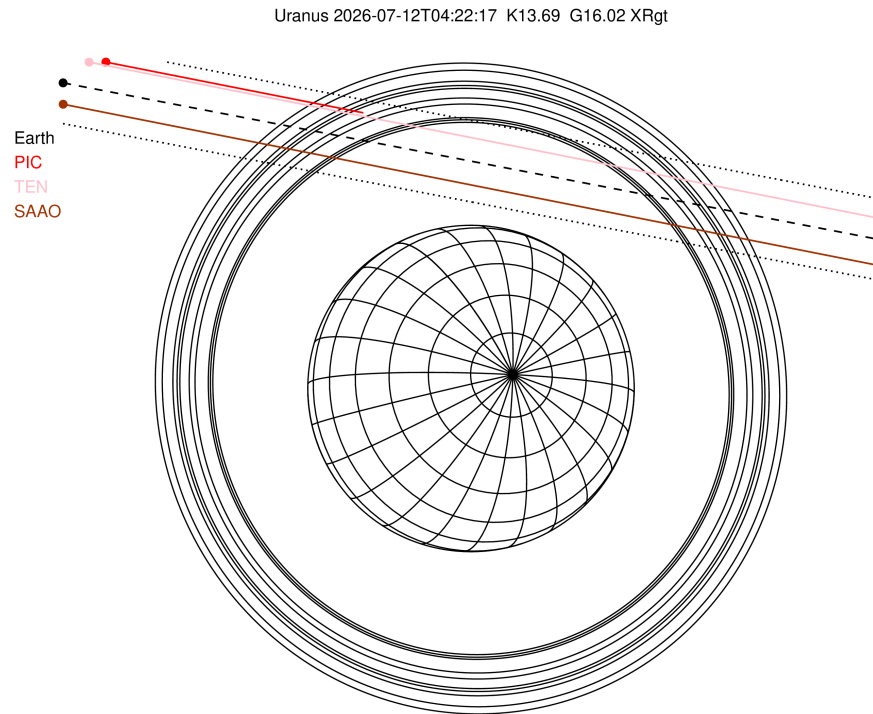
ICRS Star Coord at Epoch: 04h 07m 35.82519s +20:46:04.97409s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.693
 G magnitude : 16.022
 RP magnitude : 15.268
 BP magnitude : 16.630
 DUPflag : 0
 Distance (au) : 20.153
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.18
 Sun-Target sep (deg) : 45.63
 Sun-Moon sep (deg) : 15.05
 B (ring opening deg) : 74.32
 PA of pole (deg) : -71.63

#	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

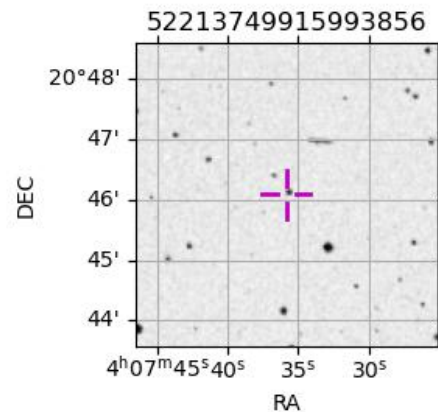


2026-07-12T04:22:17.4200 ex: 04 07 35.8252 s: +20 46 04.974 C/A 2.395° PA 169.13 deg v_sky +27.18 km/s D 20.15 AU
 Credit: Styled after SORA/Lucky Star

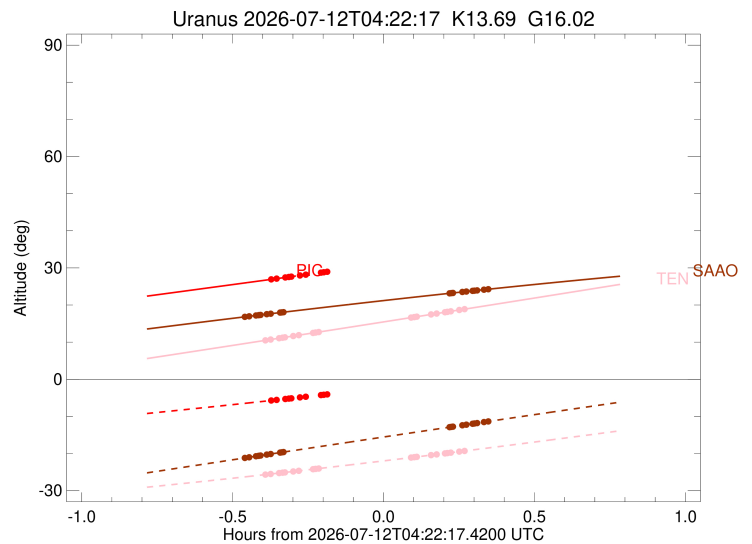
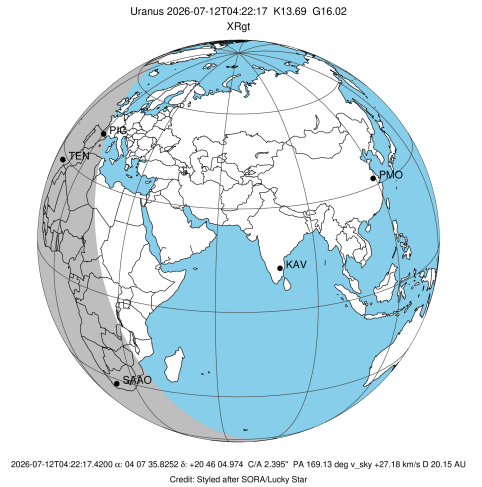


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1	+++++			JUL 12 03:59 - JUL 12 04:03	PnnRin
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
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	+++++		+++++	JUL 12 03:58 - JUL 12 04:38	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++		+++++	JUL 12 03:54 - JUL 12 04:43	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-07-12T04:20:12.090
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 52213749915993856
 2Mass ID (if available) : 04073581+2046056
 ICRS Star Coord at Epoch: 04h 07m 35.82519s +20:46:04.97409s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.693
 G magnitude : 16.022
 RP magnitude : 15.268
 BP magnitude : 16.630
 DUPflag : 0
 Distance (au) : 20.153
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.18
 Sun-Target sep (deg) : 45.63
 Sun-Moon sep (deg) : 15.52
 B (ring opening deg) : 74.32
 PA of pole (deg) : -71.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.675
 C/A sky separation (km) : 39097.9
 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

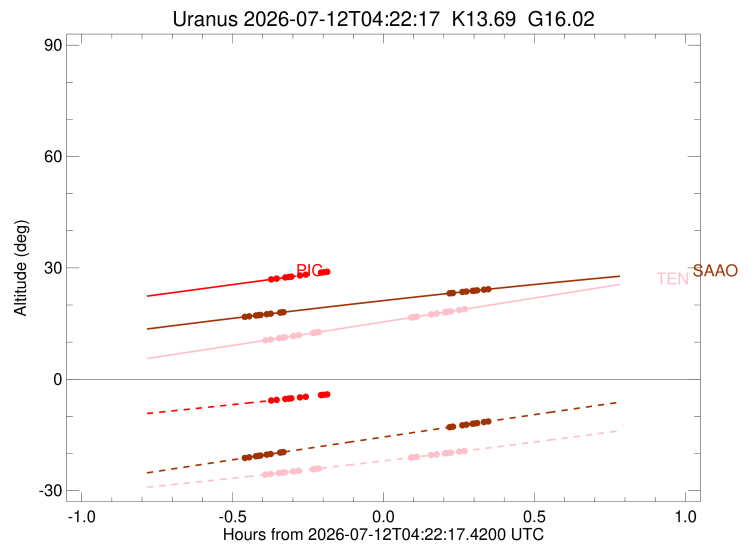
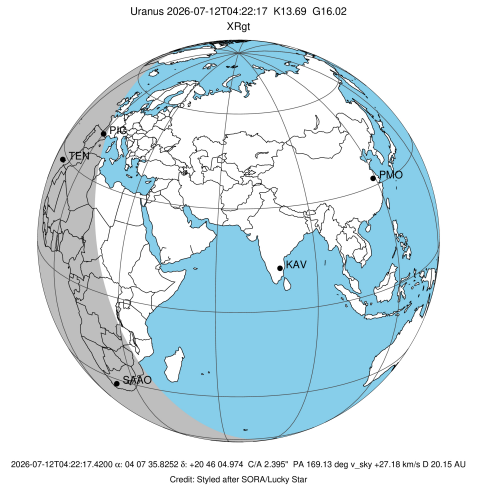


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-07-12T03:59:36.456		26.84	-5.78	51555.19	-17.95		
lambda	I	2026-07-12T04:01:03.543		27.11	-5.56	50026.71	-17.14		
delta	I	2026-07-12T04:02:47.421		27.43	-5.31	48300.35	-16.08		
gamma	I	2026-07-12T04:03:29.912		27.56	-5.20	47627.02	-15.61		
eta	I	2026-07-12T04:03:59.105		27.65	-5.13	47176.12	-15.28		
beta	I	2026-07-12T04:05:43.827		27.97	-4.87x	45641.68	-14.00		
alpha	I	2026-07-12T04:06:54.483		28.19	-4.70x	44684.61	-13.08		
4	I	2026-07-12T04:09:57.155		28.74	-4.25x	42535.72	-10.41		
5	I	2026-07-12T04:10:33.554		28.86	-4.16x	42167.63	-9.78		
6	I	2026-07-12T04:11:05.012		28.95	-4.08x	41864.69	-9.29		

No planet occultations

6	E	2026-07-12T04:27:44.911		32.02	-1.53x	41838.18	9.28		
5	E	2026-07-12T04:28:16.838		32.12	-1.45x	42155.66	9.77		
4	E	2026-07-12T04:28:57.582		32.24	-1.35x	42565.15	10.40		
alpha	E	2026-07-12T04:31:59.428		32.80	-0.87x	44699.51	13.06		
beta	E	2026-07-12T04:33:09.194		33.01	-0.69x	45647.19	13.98		
eta	E	2026-07-12T04:34:53.777		33.34	-0.42x	47176.12	15.25		
gamma	E	2026-07-12T04:35:22.683		33.42	-0.34x	47621.67	15.58		
delta	E	2026-07-12T04:36:05.602		33.56	-0.23x	48300.35	16.05		
lambda	E	2026-07-12T04:37:49.701		33.87	0.04x	50026.71	17.10		
epsilon	E	2026-07-12T04:38:58.632		34.09	0.23x	51227.95	17.91		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-07-12T04:19:20.970
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 52213749915993856
 2Mass ID (if available) : 04073581+2046056
 ICRS Star Coord at Epoch: 04h 07m 35.82519s +20:46:04.97409s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.693
 G magnitude : 16.022
 RP magnitude : 15.268
 BP magnitude : 16.630
 DUPflag : 0
 Distance (au) : 20.153
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.18
 Sun-Target sep (deg) : 45.63
 Sun-Moon sep (deg) : 15.68
 B (ring opening deg) : 74.32
 PA of pole (deg) : -71.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.638
 C/A sky separation (km) : 38555.0
 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

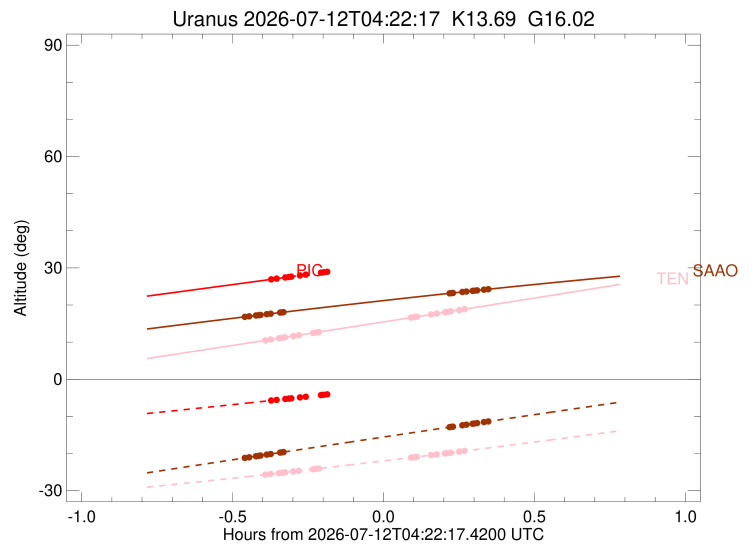
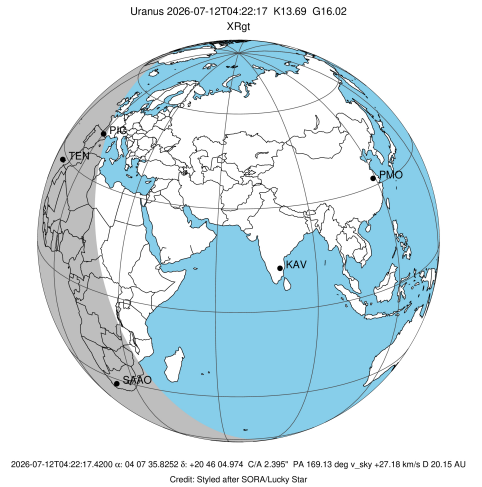


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-07-12T03:58:27.497		10.41	-25.73	51554.98	-18.37		
lambda	I	2026-07-12T03:59:52.490		10.71	-25.52	50026.71	-17.59		
delta	I	2026-07-12T04:01:33.498		11.06	-25.26	48300.35	-16.58		
gamma	I	2026-07-12T04:02:14.659		11.20	-25.16	47627.12	-16.13		
eta	I	2026-07-12T04:02:42.891		11.30	-25.09	47176.12	-15.82		
beta	I	2026-07-12T04:04:23.652		11.66	-24.83	45641.80	-14.61		
alpha	I	2026-07-12T04:05:31.129		11.89	-24.66	44684.63	-13.75		
4	I	2026-07-12T04:08:22.535		12.50	-24.21	42534.82	-11.29		
5	I	2026-07-12T04:08:55.681		12.61	-24.13	42169.18	-10.73		
6	I	2026-07-12T04:09:24.307		12.71	-24.05	41865.86	-10.29		

No planet occultations

6	E	2026-07-12T04:27:45.055		16.61	-21.09	41836.58	10.28		
5	E	2026-07-12T04:28:14.176		16.71	-21.01	42156.13	10.72		
4	E	2026-07-12T04:28:51.658		16.85	-20.91	42566.66	11.28		
alpha	E	2026-07-12T04:31:42.286		17.46	-20.44	44700.25	13.72		
beta	E	2026-07-12T04:32:48.903		17.69	-20.25	45647.54	14.58		
eta	E	2026-07-12T04:34:29.566		18.05	-19.97	47176.12	15.78		
gamma	E	2026-07-12T04:34:57.523		18.15	-19.89	47621.62	16.09		
delta	E	2026-07-12T04:35:39.129		18.30	-19.77	48300.35	16.53		
lambda	E	2026-07-12T04:37:20.407		18.66	-19.49	50026.71	17.54		
epsilon	E	2026-07-12T04:38:27.332		18.90	-19.30	51221.15	18.31		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-07-12T04:19:31.600
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : SAAO
 Location : So. Afr. Astro. Obs. (Sutherland)
 Latitude (deg) : -32.37953
 E. Longitude (deg) : 20.81070
 Altitude (km) : 1.768
 Gaia source ID : 52213749915993856
 2Mass ID (if available) : 04073581+2046056
 ICRS Star Coord at Epoch: 04h 07m 35.82519s +20:46:04.97409s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 13.693
 G magnitude : 16.022
 RP magnitude : 15.268
 BP magnitude : 16.630
 DUPflag : 0
 Distance (au) : 20.153
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 27.18
 Sun-Target sep (deg) : 45.63
 Sun-Moon sep (deg) : 16.02
 B (ring opening deg) : 74.32
 PA of pole (deg) : -71.63
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.140
 C/A sky separation (km) : 31275.8
 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



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	2026-07-12T03:54:26.434		16.77	-21.25	51543.97	-21.98		
lambda	I	2026-07-12T03:55:36.221		16.96	-21.01	50026.71	-21.53		
delta	I	2026-07-12T03:56:57.371		17.18	-20.73	48300.35	-21.01		
gamma	I	2026-07-12T03:57:29.536		17.27	-20.62	47628.30	-20.78		
eta	I	2026-07-12T03:57:51.379		17.33	-20.55	47176.12	-20.62		
beta	I	2026-07-12T03:59:06.724		17.53	-20.29	45643.82	-20.04		
alpha	I	2026-07-12T03:59:55.028		17.67	-20.12	44686.12	-19.63		
4	I	2026-07-12T04:01:47.777		17.97	-19.74	42528.21	-18.59		
5	I	2026-07-12T04:02:06.262		18.02	-19.68	42187.57	-18.37		
6	I	2026-07-12T04:02:23.468		18.07	-19.62	41874.69	-18.22		

No planet occultations

6	E	2026-07-12T04:35:24.065		23.15	-12.91	41822.45	18.18		
5	E	2026-07-12T04:35:41.987		23.19	-12.85	42165.06	18.34		
4	E	2026-07-12T04:36:04.783		23.25	-12.77	42581.02	18.56		
alpha	E	2026-07-12T04:37:56.567		23.52	-12.40	44708.61	19.59		
beta	E	2026-07-12T04:38:44.021		23.63	-12.24	45651.75	19.99		
eta	E	2026-07-12T04:39:59.204		23.81	-11.99	47176.12	20.57		
gamma	E	2026-07-12T04:40:20.755		23.86	-11.91	47621.15	20.73		
delta	E	2026-07-12T04:40:53.346		23.94	-11.81	48300.35	20.95		
lambda	E	2026-07-12T04:42:14.709		24.13	-11.53	50026.71	21.48		
epsilon	E	2026-07-12T04:43:06.241		24.26	-11.36	51141.27	21.91		