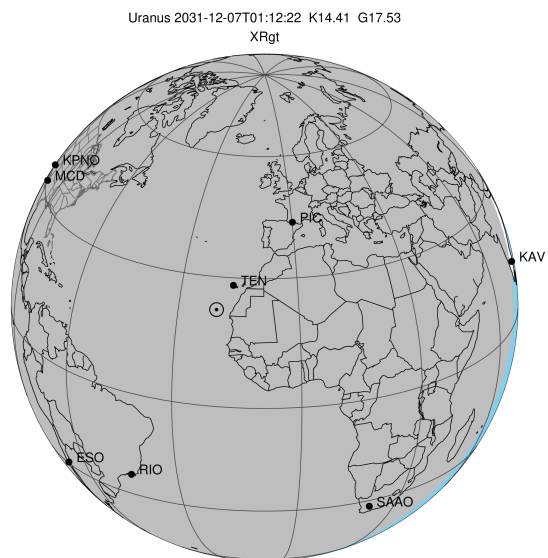


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:12:22.890
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069

ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s

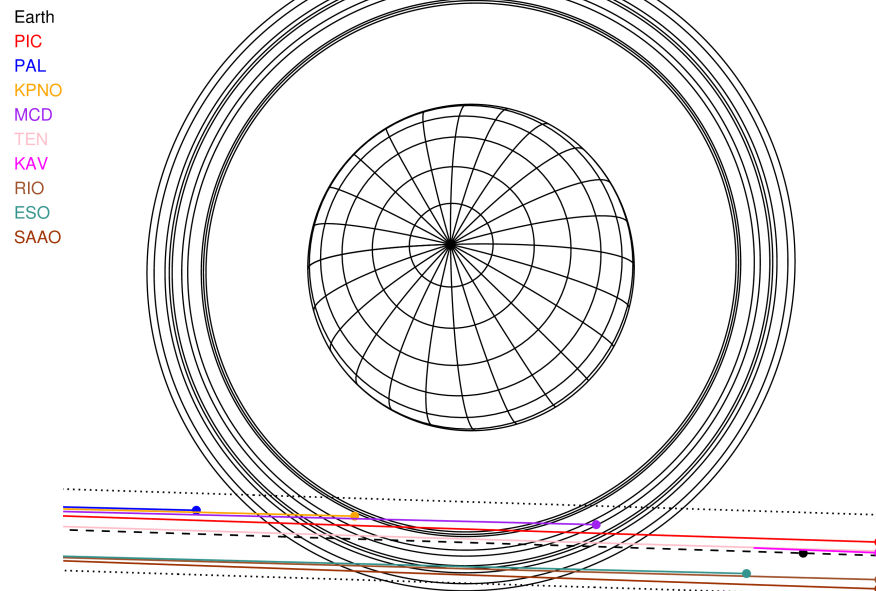
RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.12
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54

#	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



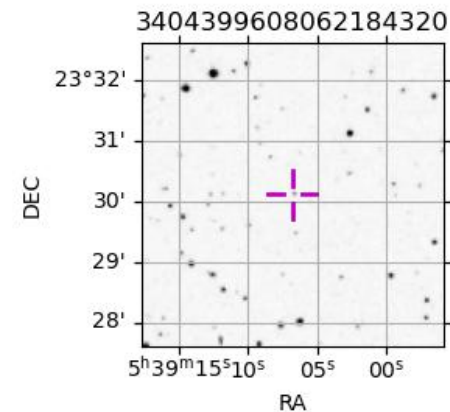
2031-12-07T01:12:22.8900 ra: 05 39 06.7850 s: +23 30 06.826 C/A 3.271" PA 358.19 deg v_sky -22.90 km/s D 18.12 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2031-12-07T01:12:22 K14.41 G17.53 XRgt

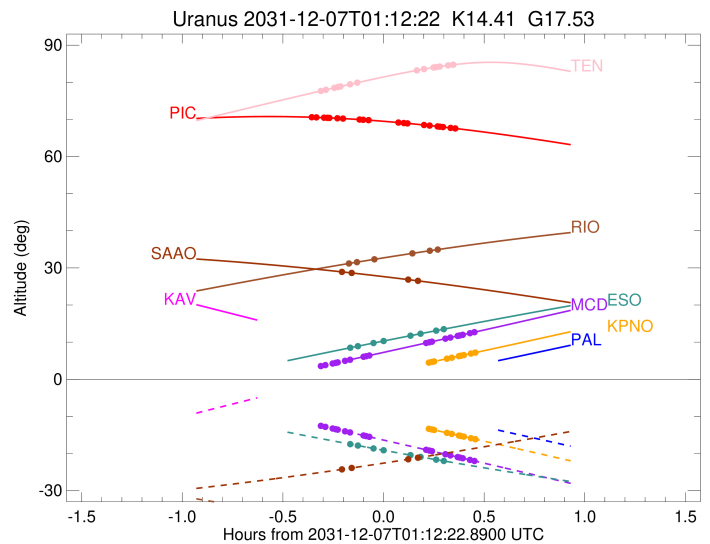
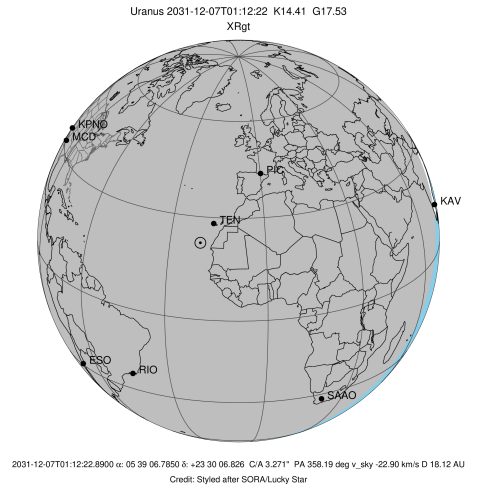


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	DEC 07 00:50 - DEC 07 01:33	PnnRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			+++++	DEC 07 01:31 - DEC 07 01:39	PnnRne
MCD	McDonald Obs. 2.7m	30.7	256.0	++++		+++++	DEC 07 01:02 - DEC 07 01:39	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	DEC 07 00:53 - DEC 07 01:33	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	+++		+++	DEC 07 01:01 - DEC 07 01:29	PnnRie
ESO	European Southern Obs	-29.3	289.3	++++		++++	DEC 07 01:01 - DEC 07 01:30	PnnRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	++		++	DEC 07 00:59 - DEC 07 01:23	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:11:51.020
 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 : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.94
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.118
 C/A sky separation (km) : 40974.9
 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

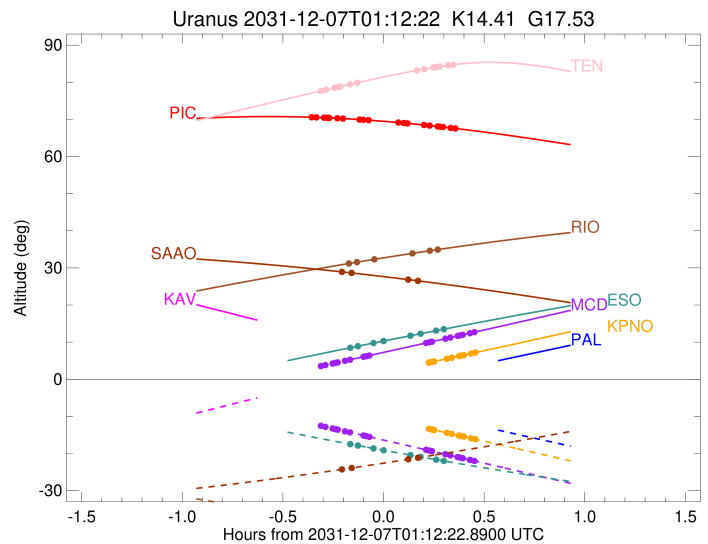
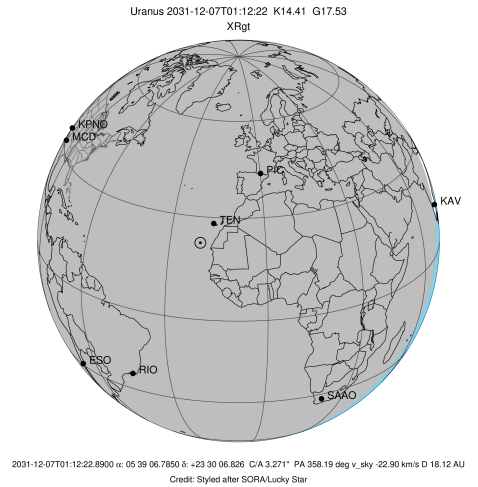


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-12-07T00:50:31.089		70.60	-66.28	51552.00	-13.99		
lambda	I	2031-12-07T00:52:23.472		70.54	-66.07	50026.71	-13.16		
delta	I	2031-12-07T00:54:40.150		70.47	-65.81	48300.35	-12.08		
gamma	I	2031-12-07T00:55:37.335		70.43	-65.70	47623.41	-11.59		
eta	I	2031-12-07T00:56:16.500		70.40	-65.63	47176.12	-11.25		
beta	I	2031-12-07T00:58:38.037		70.30	-65.35	45676.82	-9.91		
alpha	I	2031-12-07T01:00:15.941		70.23	-65.15	44752.42	-8.92		
4	I	2031-12-07T01:05:22.780		69.95	-64.52	42539.38	-5.40		
5	I	2031-12-07T01:06:39.048		69.88	-64.36	42165.18	-4.51		
6	I	2031-12-07T01:07:54.888		69.80	-64.20	41853.04	-3.54		

No planet occultations

6	E	2031-12-07T01:16:54.277		69.15	-63.00	41864.12	3.54		
5	E	2031-12-07T01:18:12.312		69.04	-62.82	42185.26	4.51		
4	E	2031-12-07T01:19:21.243		68.95	-62.66	42528.30	5.40		
alpha	E	2031-12-07T01:24:29.259		68.49	-61.94	44743.23	8.92		
beta	E	2031-12-07T01:26:06.783		68.34	-61.70	45661.55	9.91		
eta	E	2031-12-07T01:28:29.915		68.11	-61.36	47176.12	11.25		
gamma	E	2031-12-07T01:29:08.876		68.04	-61.26	47620.96	11.59		
delta	E	2031-12-07T01:30:06.280		67.95	-61.12	48300.35	12.08		
lambda	E	2031-12-07T01:32:22.984		67.71	-60.78	50026.71	13.16		
epsilon	E	2031-12-07T01:33:58.261		67.54	-60.54	51313.79	13.99		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:15:58.270
 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 : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.31
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.997
 C/A sky separation (km) : 39388.6
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

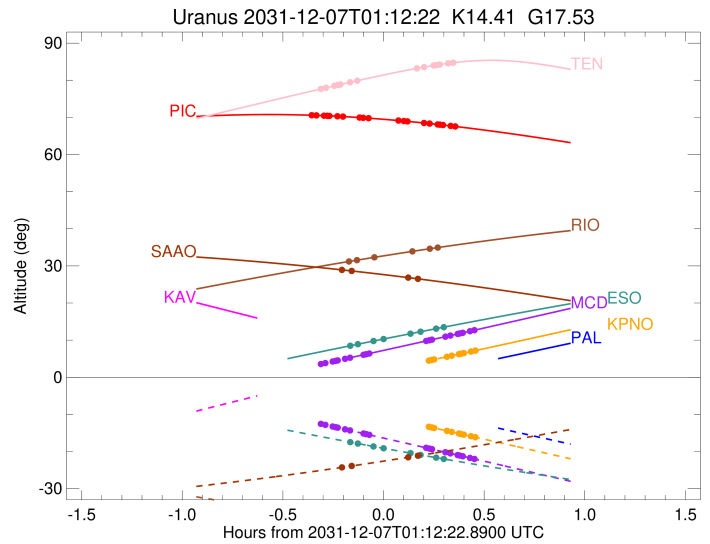
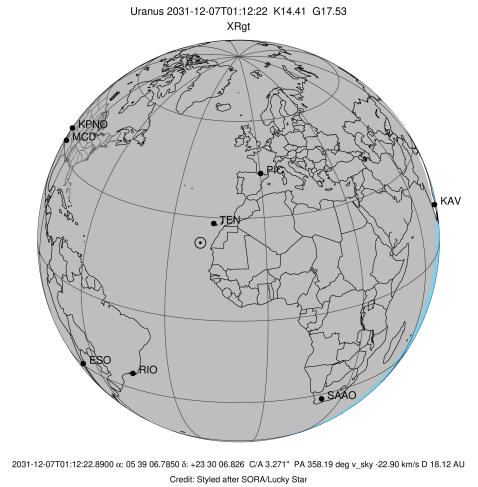


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-12-07T00:52:43.997	-1.81x	-6.74	51548.38	-14.63			
lambda	I	2031-12-07T00:54:30.651	-1.47x	-7.09	50026.71	-13.92			
delta	I	2031-12-07T00:56:38.708	-1.08x	-7.51	48300.35	-13.02			
gamma	I	2031-12-07T00:57:31.463	-0.91x	-7.68	47623.73	-12.62			
eta	I	2031-12-07T00:58:07.315	-0.80x	-7.80	47176.12	-12.34			
beta	I	2031-12-07T01:00:14.013	-0.40x	-8.22	45677.81	-11.28			
alpha	I	2031-12-07T01:01:38.698	-0.14x	-8.50	44752.19	-10.52			
4	I	2031-12-07T01:05:34.633	0.60x	-9.28	42544.02	-8.12			
5	I	2031-12-07T01:06:24.116	0.76x	-9.44	42160.04	-7.61			
6	I	2031-12-07T01:07:05.410	0.89x	-9.58	41846.07	-7.15			

No planet occultations

6	E	2031-12-07T01:25:56.480	4.49x	-13.35	41868.96	7.16			
5	E	2031-12-07T01:26:39.853	4.63x	-13.50	42194.33	7.63			
4	E	2031-12-07T01:27:21.829	4.77x	-13.64	42526.86	8.13			
alpha	E	2031-12-07T01:31:18.514	5.53	-14.44	44741.35	10.55			
beta	E	2031-12-07T01:32:42.579	5.80	-14.72	45660.16	11.31			
eta	E	2031-12-07T01:34:50.540	6.22	-15.15	47176.12	12.38			
gamma	E	2031-12-07T01:35:26.073	6.34	-15.27	47620.98	12.66			
delta	E	2031-12-07T01:36:18.890	6.51	-15.45	48300.35	13.06			
lambda	E	2031-12-07T01:38:26.540	6.92	-15.88	50026.71	13.97			
epsilon	E	2031-12-07T01:39:55.649	7.21	-16.18	51297.60	14.68			

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:16:06.000
 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 : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.39
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.027
 C/A sky separation (km) : 39777.2
 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

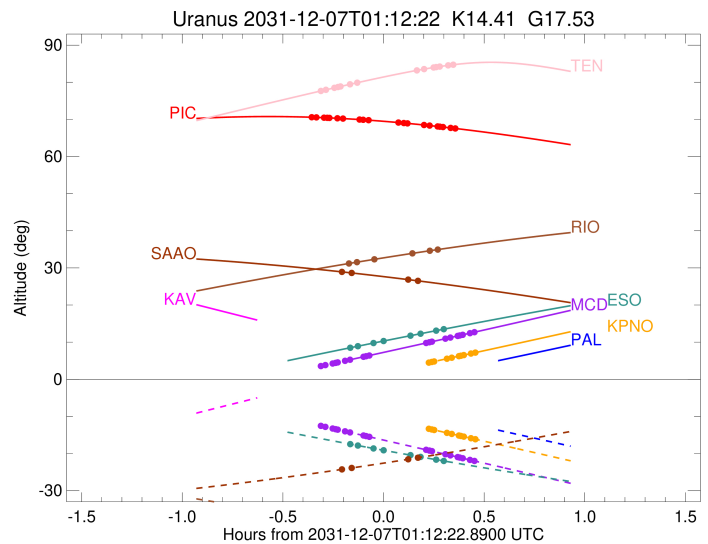
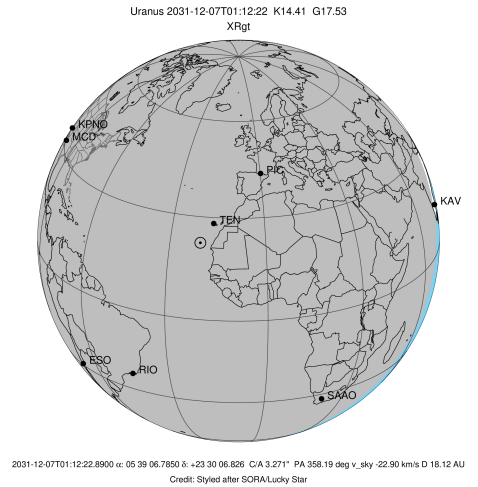


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-12-07T00:53:15.940		3.47x	-12.46	51549.23	-14.44		
lambda	I	2031-12-07T00:55:04.145		3.82x	-12.83	50026.71	-13.71		
delta	I	2031-12-07T00:57:14.410		4.25x	-13.27	48300.35	-12.78		
gamma	I	2031-12-07T00:58:08.249		4.42x	-13.45	47623.66	-12.36		
eta	I	2031-12-07T00:58:44.894		4.54x	-13.58	47176.12	-12.06		
beta	I	2031-12-07T01:00:54.977		4.97x	-14.02	45677.61	-10.95		
alpha	I	2031-12-07T01:02:22.491		5.26	-14.32	44752.26	-10.14		
4	I	2031-12-07T01:06:31.056		6.07	-15.17	42543.06	-7.55		
5	I	2031-12-07T01:07:24.296		6.25	-15.35	42160.90	-6.99		
6	I	2031-12-07T01:08:09.568		6.40	-15.51	41847.37	-6.47		

No planet occultations

6	E	2031-12-07T01:25:08.335		9.78	-19.01	41868.04	6.48		
5	E	2031-12-07T01:25:55.686		9.94	-19.18	42192.30	7.00		
4	E	2031-12-07T01:26:41.425		10.10	-19.34	42527.13	7.56		
alpha	E	2031-12-07T01:30:50.727		10.93	-20.20	44741.84	10.17		
beta	E	2031-12-07T01:32:17.618		11.23	-20.50	45660.52	10.97		
eta	E	2031-12-07T01:34:28.950		11.67	-20.96	47176.12	12.10		
gamma	E	2031-12-07T01:35:05.274		11.79	-21.08	47620.97	12.39		
delta	E	2031-12-07T01:35:59.170		11.97	-21.27	48300.35	12.82		
lambda	E	2031-12-07T01:38:09.017		12.41	-21.72	50026.71	13.76		
epsilon	E	2031-12-07T01:39:39.711		12.72	-22.04	51302.26	14.50		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:12:53.320
 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 : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 79.03
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.235
 C/A sky separation (km) : 42517.3
 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

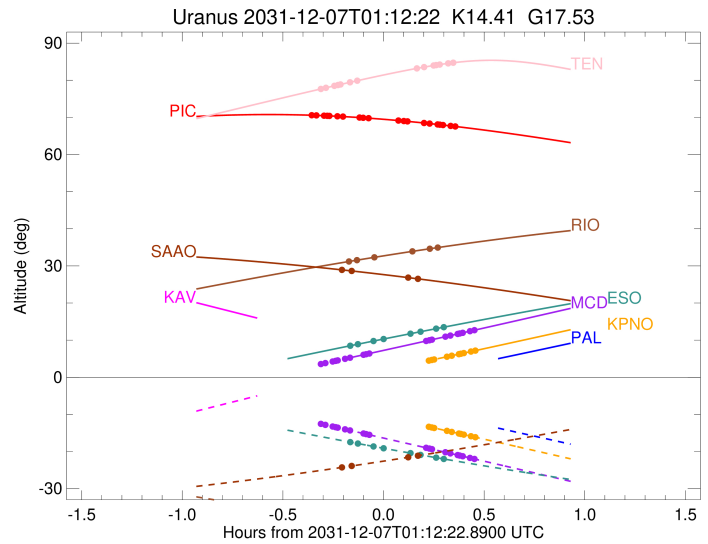
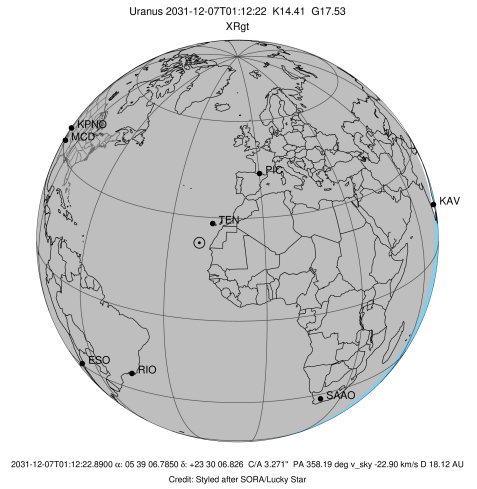


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-12-07T00:53:12.100		77.56	-84.36	51554.11	-13.01		
lambda	I	2031-12-07T00:55:14.010		77.98	-84.41	50026.71	-12.05		
delta	I	2031-12-07T00:57:45.292		78.51	-84.42	48300.35	-10.75		
gamma	I	2031-12-07T00:58:50.066		78.73	-84.41	47623.11	-10.15		
eta	I	2031-12-07T00:59:35.029		78.88	-84.40	47176.12	-9.72		
beta	I	2031-12-07T01:02:24.007		79.46	-84.30	45675.66	-8.00		
alpha	I	2031-12-07T01:04:29.913		79.88	-84.18	44752.33	-6.61		

No planet occultations

alpha	E	2031-12-07T01:22:22.105		83.21	-82.03	44745.57	6.62		
beta	E	2031-12-07T01:24:27.583		83.55	-81.69	45663.38	8.00		
eta	E	2031-12-07T01:27:18.068		83.98	-81.20	47176.12	9.73		
gamma	E	2031-12-07T01:28:02.801		84.09	-81.07	47620.96	10.16		
delta	E	2031-12-07T01:29:07.756		84.24	-80.88	48300.35	10.76		
lambda	E	2031-12-07T01:31:38.960		84.56	-80.42	50026.71	12.06		
epsilon	E	2031-12-07T01:33:23.779		84.76	-80.10	51333.87	13.02		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:14:42.860
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.69
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.590
 C/A sky separation (km) : 47180.6
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

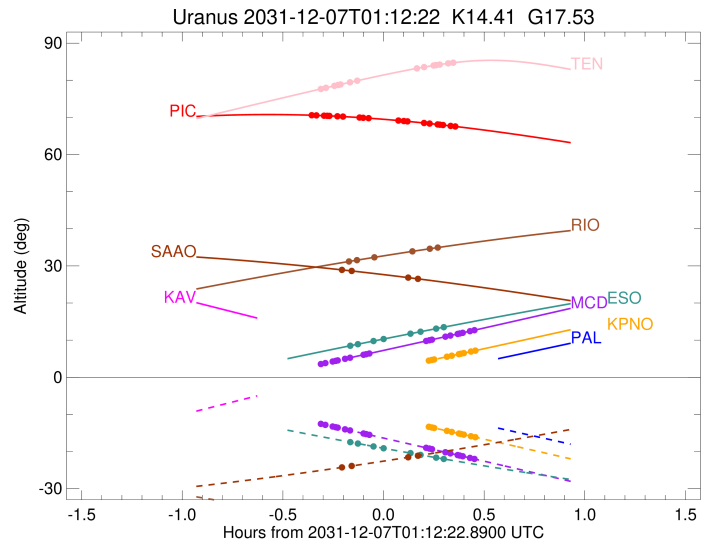
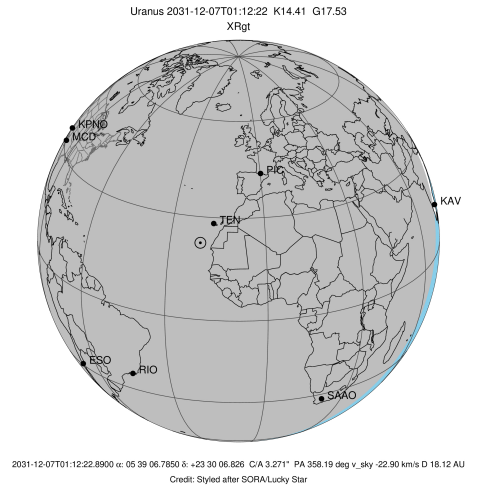


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-12-07T01:01:20.307		31.08	-38.26	51552.52	-8.92		
lambda	I	2031-12-07T01:04:29.892		31.55	-38.62	50026.71	-7.13		
delta	I	2031-12-07T01:09:43.303		32.32	-39.21	48300.35	-3.83		

No planet occultations

delta	E	2031-12-07T01:20:56.282		33.91	-40.38	48300.35	3.83		
lambda	E	2031-12-07T01:26:09.441		34.62	-40.88	50026.71	7.14		
epsilon	E	2031-12-07T01:29:01.825		35.00	-41.15	51401.96	8.93		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:15:48.190
 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 : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.42
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.564
 C/A sky separation (km) : 46841.1
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

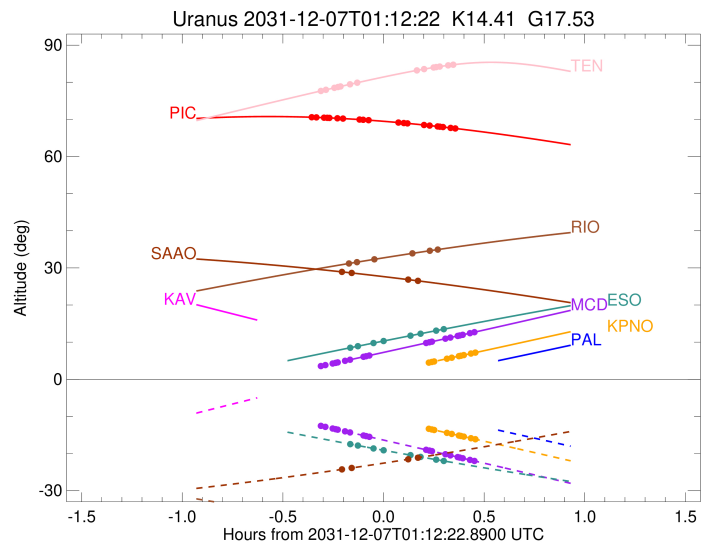
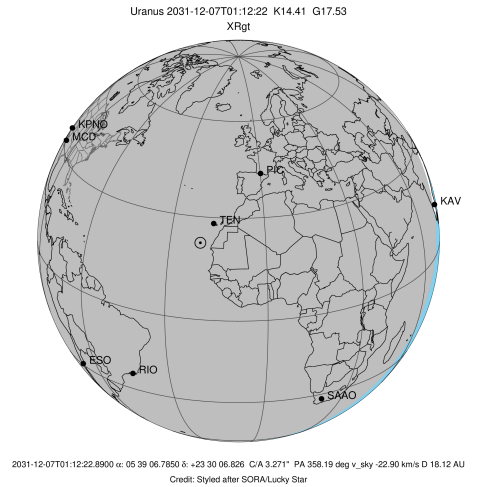


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2031-12-07T01:01:44.988		8.36	-17.35	51553.34	-9.22		
lambda	I	2031-12-07T01:04:46.467		8.91	-17.86	50026.71	-7.56		
delta	I	2031-12-07T01:09:27.248		9.77	-18.64	48300.35	-4.69		
gamma	I	2031-12-07T01:12:31.711		10.32	-19.15	47621.90	-2.65		

No planet occultations

gamma	E	2031-12-07T01:20:18.277		11.72	-20.42	47621.33	2.66		
delta	E	2031-12-07T01:23:22.814		12.27	-20.91	48300.35	4.69		
lambda	E	2031-12-07T01:28:03.228		13.09	-21.65	50026.71	7.57		
epsilon	E	2031-12-07T01:30:47.352		13.57	-22.08	51397.07	9.24		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2031-12-07T01:10:41.420
 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 : 3404399608062184320
 2Mass ID (if available) : 05390677+2330069
 ICRS Star Coord at Epoch: 05h 39m 06.78499s +23:30:06.82591s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 14.413
 G magnitude : 17.532
 RP magnitude : 16.631
 BP magnitude : 18.402
 DUPflag : 0
 Distance (au) : 18.120
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.90
 Sun-Target sep (deg) : 169.05
 Sun-Moon sep (deg) : 78.45
 B (ring opening deg) : 79.10
 PA of pole (deg) : 41.54
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.663
 C/A sky separation (km) : 48144.6
 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_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	2031-12-07T00:59:08.237		29.01	-24.39	51548.92	-7.76		
lambda	I	2031-12-07T01:02:56.321		28.64	-23.88	50026.71	-5.52		

No planet occultations

lambda	E	2031-12-07T01:19:42.203		26.85	-21.56	50026.71	5.52		
epsilon	E	2031-12-07T01:23:13.212		26.45	-21.05	51416.27	7.76		