

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-12T20:19:43.780
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3425422686999898752
 2Mass ID (if available) : 06121748+2341003

ICRS Star Coord at Epoch: 06h 12m 17.48074s +23:41:00.35808s

RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.539
 G magnitude : 16.198
 RP magnitude : 15.626
 BP magnitude : 16.596
 DUPflag : 0
 Distance (au) : 18.020
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.71
 Sun-Target sep (deg) : 160.59
 Sun-Moon sep (deg) : 112.55
 B (ring opening deg) : 72.89
 PA of pole (deg) : 63.04

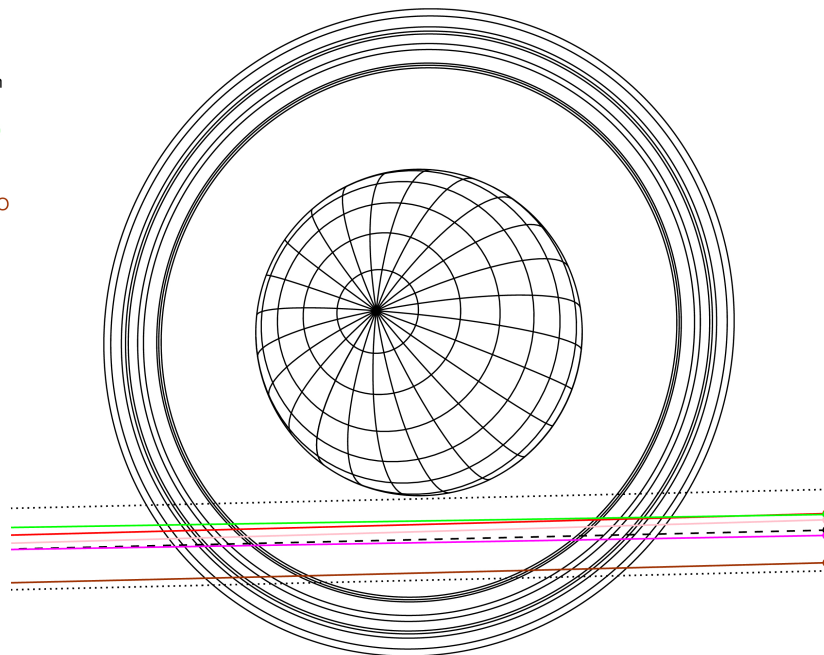
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2034-01-12T20:19:43.7800 α: 06 12 17.4807 s: +23 41 00.358 C/A 2.474" PA 1.33 deg v_sky -21.71 km/s D 18.02 AU
 Credit: Styled after SORA/Lucky Star

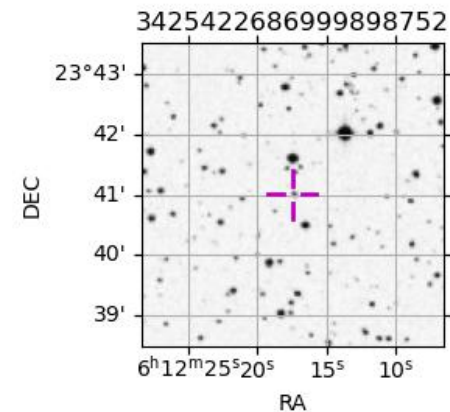
Uranus 2034-01-12T20:19:43 K14.54 G16.20 XRgt

Earth
 PIC
 PMO
 TEN
 KAV
 SAAO

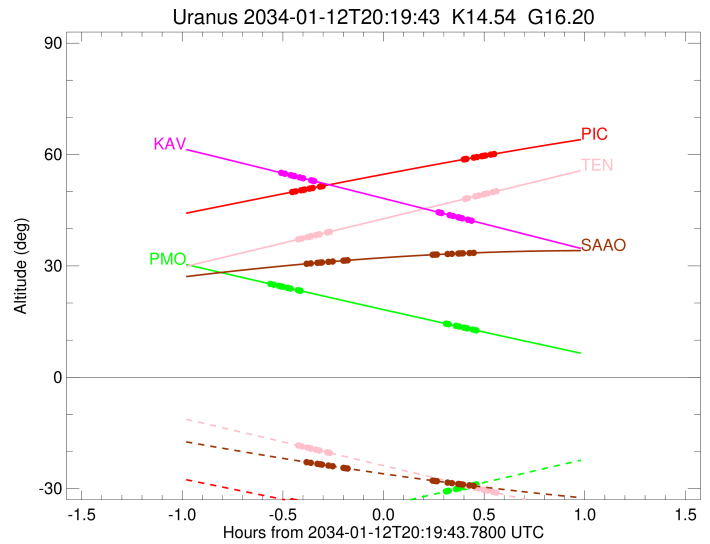
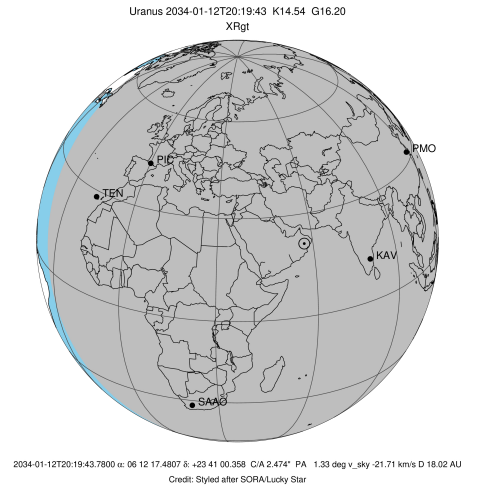


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 12 19:52 - JAN 12 20:52	PnnRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++		+++++	JAN 12 19:45 - JAN 12 20:47	PnnRie
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	+++++		+++++	JAN 12 19:54 - JAN 12 20:53	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++		+++++	JAN 12 19:49 - JAN 12 20:46	PnnRie
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	+++++		+++++	JAN 12 19:56 - JAN 12 20:46	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-12T20:21:47.600
 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 : 3425422686999898752
 2Mass ID (if available) : 06121748+2341003
 ICRS Star Coord at Epoch: 06h 12m 17.48074s +23:41:00.35808s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.539
 G magnitude : 16.198
 RP magnitude : 15.626
 BP magnitude : 16.596
 DUPflag : 0
 Distance (au) : 18.020
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.71
 Sun-Target sep (deg) : 160.59
 Sun-Moon sep (deg) : 113.07
 B (ring opening deg) : 72.89
 PA of pole (deg) : 63.04
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.301
 C/A sky separation (km) : 30068.1
 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

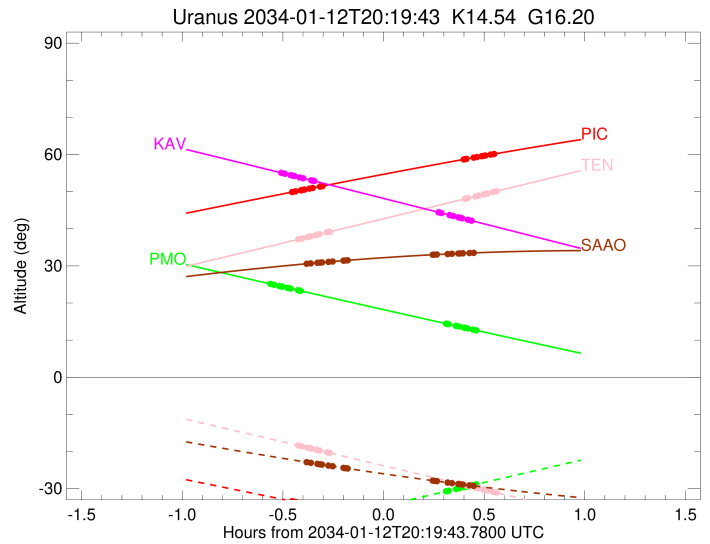
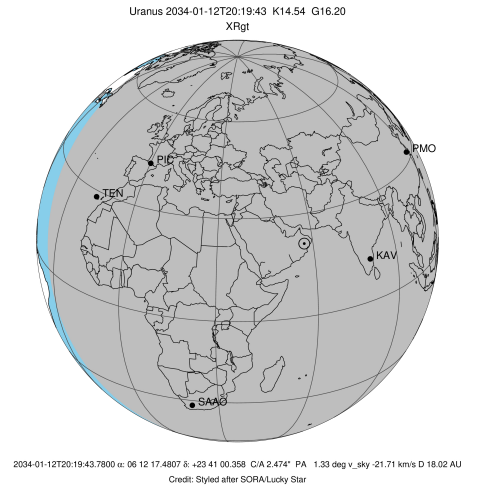


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-12T19:52:19.437		49.87	-33.36	51364.90	-18.43		
lambda	I	2034-01-12T19:53:32.922		50.09	-33.58	50026.71	-18.07		
delta	I	2034-01-12T19:55:09.455		50.37	-33.88	48300.35	-17.69		
gamma	I	2034-01-12T19:55:47.445		50.49	-34.00	47631.54	-17.52		
eta	I	2034-01-12T19:56:13.523		50.56	-34.08	47176.12	-17.41		
beta	I	2034-01-12T19:57:42.413		50.83	-34.35	45647.01	-16.98		
alpha	I	2034-01-12T19:58:39.318		50.99	-34.52	44689.59	-16.69		
4	I	2034-01-12T20:00:48.129		51.37	-34.91	42592.71	-15.96		
5	I	2034-01-12T20:01:07.730		51.43	-34.97	42265.39	-15.79		
6	I	2034-01-12T20:01:36.946		51.52	-35.06	41803.62	-15.64		

No planet occultations

6	E	2034-01-12T20:43:41.459		58.69	-42.73	41861.42	15.66		
5	E	2034-01-12T20:44:00.511		58.74	-42.79	42161.89	15.81		
4	E	2034-01-12T20:44:28.866		58.82	-42.88	42611.46	15.99		
alpha	E	2034-01-12T20:46:38.995		59.17	-43.27	44738.41	16.72		
beta	E	2034-01-12T20:47:32.847		59.32	-43.43	45648.60	17.01		
eta	E	2034-01-12T20:49:01.539		59.55	-43.70	47176.12	17.44		
gamma	E	2034-01-12T20:49:27.178		59.62	-43.77	47624.68	17.55		
delta	E	2034-01-12T20:50:05.488		59.72	-43.89	48300.35	17.72		
lambda	E	2034-01-12T20:51:41.834		59.98	-44.18	50026.71	18.11		
epsilon	E	2034-01-12T20:52:57.515		60.18	-44.40	51408.01	18.47		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-12T20:15:50.670
 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 : 3425422686999898752
 2Mass ID (if available) : 06121748+2341003
 ICRS Star Coord at Epoch: 06h 12m 17.48074s +23:41:00.35808s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.539
 G magnitude : 16.198
 RP magnitude : 15.626
 BP magnitude : 16.596
 DUPflag : 0
 Distance (au) : 18.020
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.71
 Sun-Target sep (deg) : 160.59
 Sun-Moon sep (deg) : 113.11
 B (ring opening deg) : 72.89
 PA of pole (deg) : 63.04
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.259
 C/A sky separation (km) : 29519.5
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

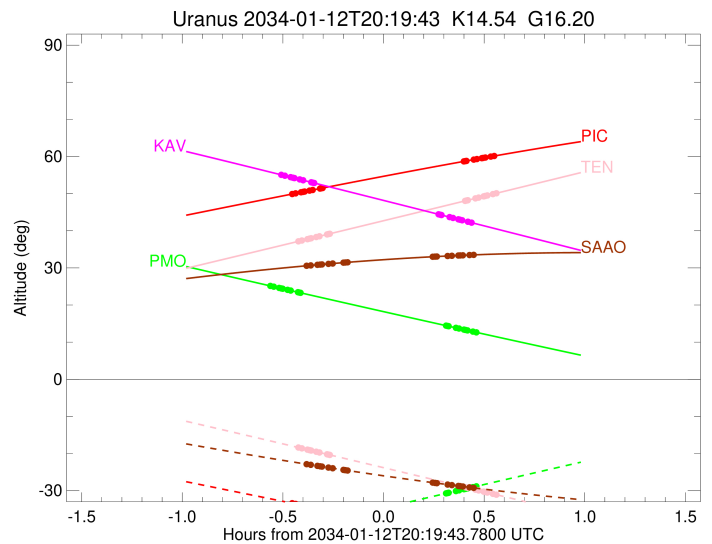
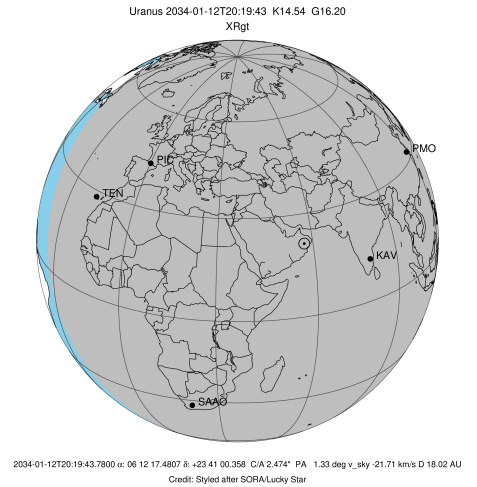


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-12T19:45:48.780		25.19	-41.86	51363.81	-18.50		
lambda	I	2034-01-12T19:47:01.909		24.94	-41.60	50026.71	-18.15		
delta	I	2034-01-12T19:48:37.968		24.60	-41.26	48300.35	-17.78		
gamma	I	2034-01-12T19:49:15.741		24.47	-41.12	47631.55	-17.63		
eta	I	2034-01-12T19:49:41.660		24.38	-41.03	47176.12	-17.52		
beta	I	2034-01-12T19:51:09.927		24.08	-40.72	45647.10	-17.11		
alpha	I	2034-01-12T19:52:06.377		23.89	-40.52	44689.47	-16.84		
4	I	2034-01-12T19:54:13.911		23.45	-40.07	42592.37	-16.15		
5	I	2034-01-12T19:54:33.217		23.38	-40.00	42266.05	-15.98		
6	I	2034-01-12T19:55:02.123		23.28	-39.90	41803.38	-15.84		

No planet occultations

6	E	2034-01-12T20:38:23.377		14.44	-30.74	41862.43	15.79		
5	E	2034-01-12T20:38:42.158		14.38	-30.67	42160.97	15.93		
4	E	2034-01-12T20:39:10.336		14.29	-30.57	42610.84	16.09		
alpha	E	2034-01-12T20:41:19.963		13.85	-30.12	44739.15	16.77		
beta	E	2034-01-12T20:42:13.662		13.67	-29.93	45649.01	17.04		
eta	E	2034-01-12T20:43:42.249		13.38	-29.62	47176.12	17.44		
gamma	E	2034-01-12T20:44:07.885		13.29	-29.53	47624.55	17.55		
delta	E	2034-01-12T20:44:46.229		13.16	-29.40	48300.35	17.70		
lambda	E	2034-01-12T20:46:22.744		12.84	-29.06	50026.71	18.07		
epsilon	E	2034-01-12T20:47:38.246		12.59	-28.79	51400.61	18.41		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-12T20:23:01.200
 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 : 3425422686999898752
 2Mass ID (if available) : 06121748+2341003
 ICRS Star Coord at Epoch: 06h 12m 17.48074s +23:41:00.35808s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.539
 G magnitude : 16.198
 RP magnitude : 15.626
 BP magnitude : 16.596
 DUPflag : 0
 Distance (au) : 18.020
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.71
 Sun-Target sep (deg) : 160.59
 Sun-Moon sep (deg) : 112.87
 B (ring opening deg) : 72.89
 PA of pole (deg) : 63.04
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.386
 C/A sky separation (km) : 31185.5
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

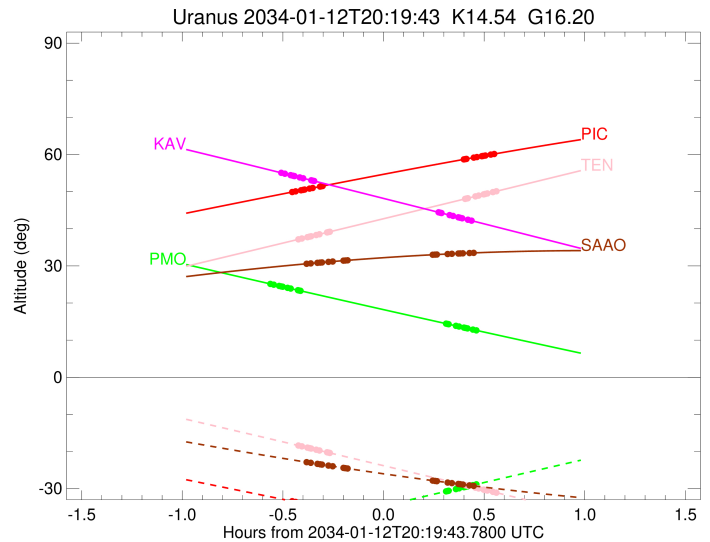
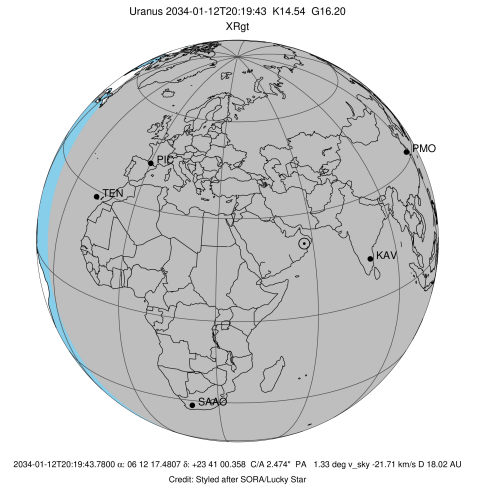


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-12T19:54:09.519		37.11	-18.34	51373.55	-18.03		
lambda	I	2034-01-12T19:55:25.234		37.39	-18.61	50026.71	-17.64		
delta	I	2034-01-12T19:57:04.285		37.75	-18.96	48300.35	-17.21		
gamma	I	2034-01-12T19:57:43.346		37.89	-19.10	47631.52	-17.03		
eta	I	2034-01-12T19:58:10.186		37.99	-19.20	47176.12	-16.90		
beta	I	2034-01-12T19:59:41.899		38.32	-19.52	45646.57	-16.43		
alpha	I	2034-01-12T20:00:40.717		38.53	-19.73	44690.18	-16.11		
4	I	2034-01-12T20:02:54.537		39.10	-20.21	42594.15	-15.30		
5	I	2034-01-12T20:03:15.287		39.10	-20.28	42262.61	-15.11		
6	I	2034-01-12T20:03:45.599		39.21	-20.39	41804.63	-14.94		

No planet occultations

6	E	2034-01-12T20:44:03.698	48.05	-29.07	41859.91	14.98
5	E	2034-01-12T20:44:23.809	48.13	-29.14	42163.32	15.15
4	E	2034-01-12T20:44:53.352	48.23	-29.25	42612.28	15.34
alpha	E	2034-01-12T20:47:08.326	48.73	-29.74	44737.38	16.16
beta	E	2034-01-12T20:48:04.015	48.93	-29.94	45648.04	16.48
eta	E	2034-01-12T20:49:35.422	49.27	-30.27	47176.12	16.95
gamma	E	2034-01-12T20:50:01.790	49.37	-30.36	47624.85	17.08
delta	E	2034-01-12T20:50:41.121	49.51	-30.51	48300.35	17.27
lambda	E	2034-01-12T20:52:19.852	49.87	-30.86	50026.71	17.70
epsilon	E	2034-01-12T20:53:37.735	50.16	-31.15	51417.22	18.09

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2034-01-12T20:16:40.900
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 3425422686999898752
 2Mass ID (if available) : 06121748+2341003
 ICRS Star Coord at Epoch: 06h 12m 17.48074s +23:41:00.35808s
 RUWE (>1.4 is poor) : 1.08
 K magnitude : 14.539
 G magnitude : 16.198
 RP magnitude : 15.626
 BP magnitude : 16.596
 DUPflag : 0
 Distance (au) : 18.020
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -21.71
 Sun-Target sep (deg) : 160.59
 Sun-Moon sep (deg) : 113.40
 B (ring opening deg) : 72.89
 PA of pole (deg) : 63.04
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.519
 C/A sky separation (km) : 32915.8
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



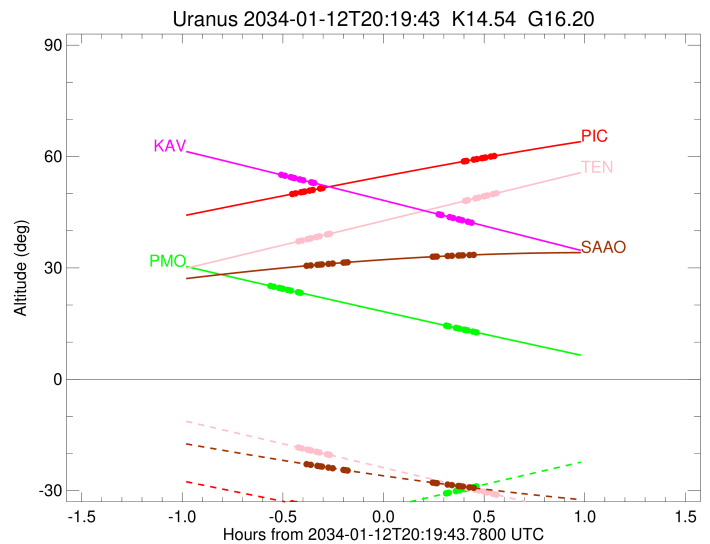
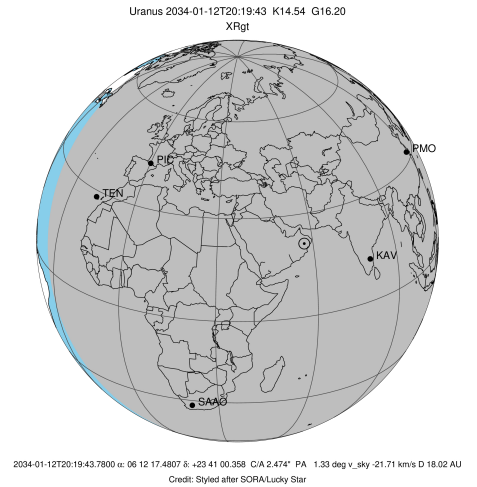
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-01-12T19:49:01.690		55.12	-73.88	51391.66	-17.54		
lambda	I	2034-01-12T19:50:20.720		54.83	-73.61	50026.71	-17.09		
delta	I	2034-01-12T19:52:03.195		54.44	-73.27	48300.35	-16.59		
gamma	I	2034-01-12T19:52:43.769		54.29	-73.14	47631.47	-16.38		
eta	I	2034-01-12T19:53:11.700		54.19	-73.04	47176.12	-16.23		
beta	I	2034-01-12T19:54:47.603		53.83	-72.72	45645.70	-15.66		
alpha	I	2034-01-12T19:55:49.320		53.59	-72.51	44691.50	-15.29		
4	I	2034-01-12T19:58:11.202		53.06	-72.02	42596.97	-14.31		
5	I	2034-01-12T19:58:34.056		52.98	-71.95	42256.87	-14.08		
6	I	2034-01-12T19:59:06.090		52.86	-71.84	41806.81	-13.87		

No planet occultations

6	E	2034-01-12T20:36:08.955		44.44	-63.81	41857.92	13.84		
5	E	2034-01-12T20:36:30.976		44.35	-63.72	42165.33	14.05		
4	E	2034-01-12T20:37:02.704		44.23	-63.61	42613.22	14.27		
alpha	E	2034-01-12T20:39:26.506		43.68	-63.07	44736.08	15.25		
beta	E	2034-01-12T20:40:25.436		43.46	-62.85	45647.40	15.62		
eta	E	2034-01-12T20:42:01.574		43.09	-62.49	47176.12	16.18		
gamma	E	2034-01-12T20:42:29.200		42.99	-62.39	47625.05	16.33		
delta	E	2034-01-12T20:43:10.297		42.83	-62.23	48300.35	16.54		
lambda	E	2034-01-12T20:44:53.118		42.44	-61.84	50026.71	17.03		
epsilon	E	2034-01-12T20:46:14.459		42.13	-61.54	51426.94	17.48		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2034-01-12T20:20:40.040
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      : 3425422686999898752
2Mass ID (if available) : 06121748+2341003
ICRS Star Coord at Epoch: 06h 12m 17.48074s +23:41:00.35808s
RUWE (>1.4 is poor) : 1.08
K magnitude          : 14.539
G magnitude          : 16.198
RP magnitude         : 15.626
BP magnitude         : 16.596
DUPflag             : 0
Distance (au)       : 18.020
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -21.71
Sun-Target sep (deg) : 160.59
Sun-Moon sep (deg)  : 112.91
B (ring opening deg) : 72.89
PA of pole (deg)    : 63.04
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.882
C/A sky separation (km) : 37663.8
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_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	2034-01-12T19:56:30.827		30.55	-22.83	51429.77	-15.48		
lambda	I	2034-01-12T19:58:03.631		30.67	-23.05	50026.71	-14.85		
delta	I	2034-01-12T20:00:02.922		30.83	-23.33	48300.35	-14.08		
gamma	I	2034-01-12T20:00:50.986		30.89	-23.45	47631.25	-13.75		
eta	I	2034-01-12T20:01:24.361		30.94	-23.52	47176.12	-13.52		
beta	I	2034-01-12T20:03:21.446		31.09	-23.80	45643.82	-12.63		
alpha	I	2034-01-12T20:04:38.581		31.18	-23.98	44695.42	-12.01		
4	I	2034-01-12T20:07:46.275		31.41	-24.41	42603.94	-10.30		
5	I	2034-01-12T20:08:20.892		31.45	-24.49	42240.35	-9.89		
6	I	2034-01-12T20:09:04.681		31.51	-24.59	41813.91	-9.50		

No planet occultations

6	E	2034-01-12T20:34:23.844		33.00	-27.84	41848.87	9.51		
5	E	2034-01-12T20:34:57.562		33.03	-27.91	42175.85	9.90		
4	E	2034-01-12T20:35:41.172		33.06	-27.99	42615.91	10.31		
alpha	E	2034-01-12T20:38:50.243		33.20	-28.37	44730.39	12.01		
beta	E	2034-01-12T20:40:04.356		33.26	-28.51	45645.04	12.63		
eta	E	2034-01-12T20:42:01.338		33.34	-28.74	47176.12	13.53		
gamma	E	2034-01-12T20:42:34.301		33.36	-28.80	47625.88	13.76		
delta	E	2034-01-12T20:43:22.723		33.39	-28.89	48300.35	14.09		
lambda	E	2034-01-12T20:45:21.930		33.46	-29.12	50026.71	14.86		
epsilon	E	2034-01-12T20:46:56.939		33.52	-29.29	51464.81	15.49		