

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-01-30T03:13:00.170
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 673812478196758272
 2Mass ID (if available) : 07505317+2133136

ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s

RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.387
 G magnitude : 15.660
 RP magnitude : 15.187
 BP magnitude : 15.967
 DUPflag : 0
 Distance (au) : 17.685
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.40
 Sun-Target sep (deg) : 166.10
 Sun-Moon sep (deg) : 98.81
 B (ring opening deg) : 51.23
 PA of pole (deg) : 87.57

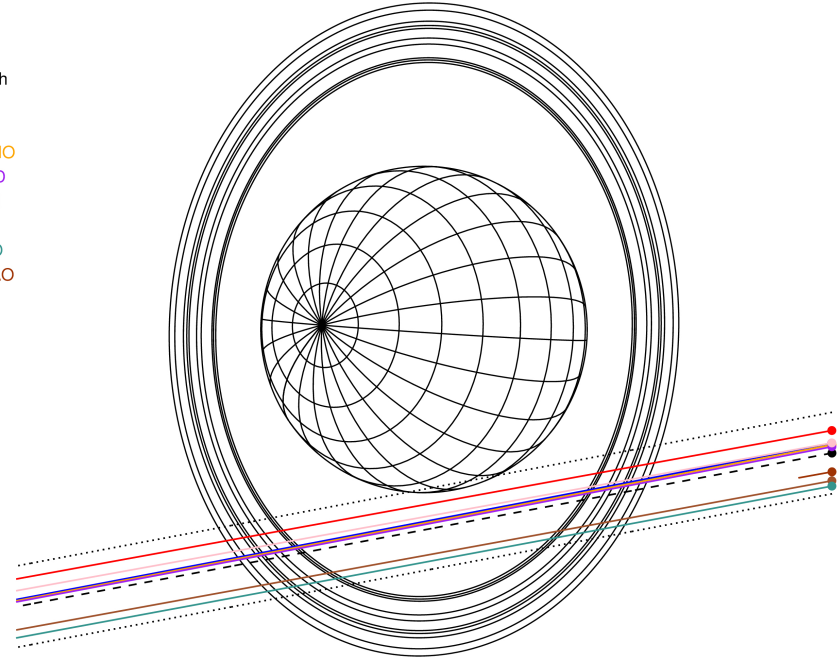
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2039-01-30T03:13:00.1700 α: 07 50 53.1693 s: +21 33 13.352 C/A 2.397'' PA 10.67 deg v_sky -22.40 km/s D 17.69 AU
 Credit: Styled after SORA/Lucky Star

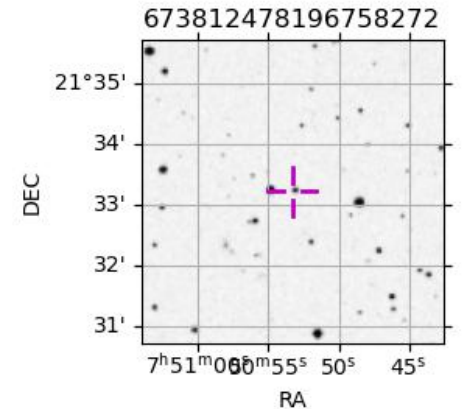
Uranus 2039-01-30T03:13:00 K14.39 G15.66 XRgt

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO
 SAAO



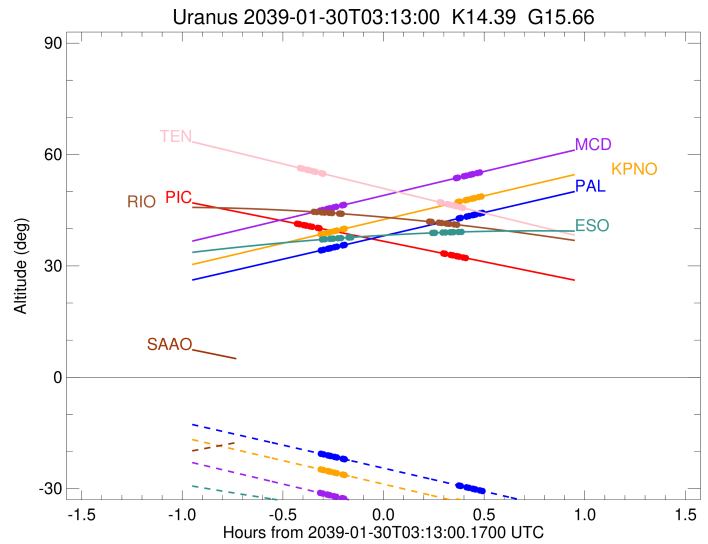
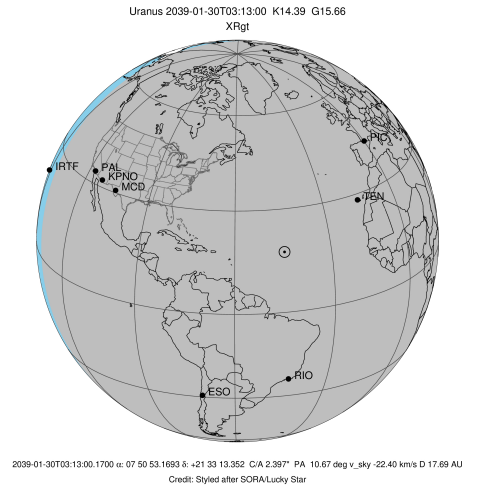
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 30 02:47 - JAN 30 03:37	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	JAN 30 02:54 - JAN 30 03:42	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	JAN 30 02:54 - JAN 30 03:42	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	JAN 30 02:53 - JAN 30 03:41	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	JAN 30 02:48 - JAN 30 03:36	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	+++++		+++++	JAN 30 02:52 - JAN 30 03:35	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	JAN 30 02:54 - JAN 30 03:36	PnnRie
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            : 2039-01-30T03:10:38.600
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       : 673812478196758272
2Mass ID (if available) : 07505317+2133136
ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.387
G magnitude           : 15.660
RP magnitude          : 15.187
BP magnitude          : 15.967
DUPflag              : 0
Distance (au)         : 17.685
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.40
Sun-Target sep (deg) : 166.10
Sun-Moon sep (deg)   : 99.26
B (ring opening deg) : 51.23
PA of pole (deg)     : 87.57
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.106
C/A sky separation (km) : 27011.3
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.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
  
```

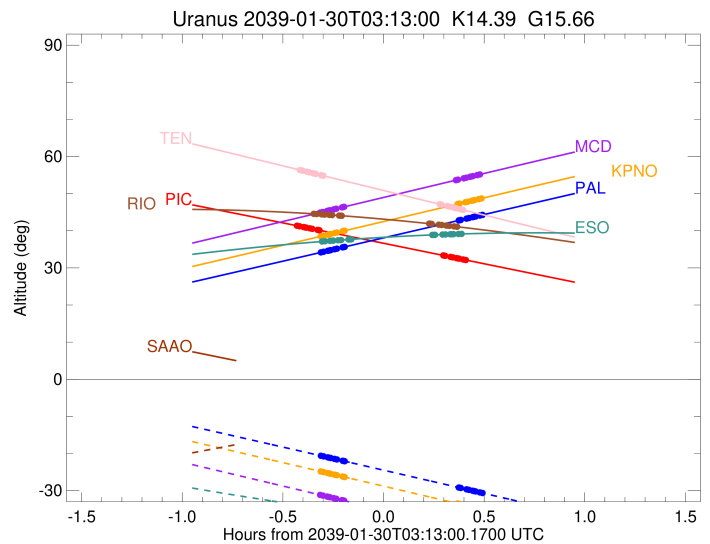
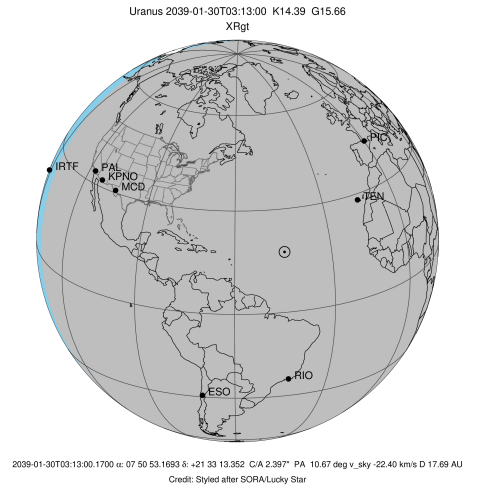


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-30T02:47:06.838		41.38	-48.85	51301.06	-24.40		
lambda	I	2039-01-30T02:47:59.571		41.22	-48.70	50026.71	-24.04		
delta	I	2039-01-30T02:49:11.940		41.00	-48.50	48300.35	-23.66		
gamma	I	2039-01-30T02:49:40.298		40.91	-48.42	47631.51	-23.51		
eta	I	2039-01-30T02:49:59.718		40.85	-48.37	47176.12	-23.39		
beta	I	2039-01-30T02:51:05.082		40.65	-48.19	45662.49	-23.00		
alpha	I	2039-01-30T02:51:45.796		40.53	-48.07	44721.55	-22.73		
4	I	2039-01-30T02:53:20.949		40.24	-47.81	42604.63	-22.00		
5	I	2039-01-30T02:53:35.319		40.20	-47.77	42283.49	-21.92		
6	I	2039-01-30T02:53:55.410		40.13	-47.71	41832.64	-21.76		

No planet occultations

6	E	2039-01-30T03:30:49.949		33.36	-41.31	41879.70	21.71		
5	E	2039-01-30T03:31:10.598		33.30	-41.25	42289.73	21.87		
4	E	2039-01-30T03:31:21.343		33.26	-41.22	42535.11	21.95		
alpha	E	2039-01-30T03:33:00.297		32.96	-40.93	44750.37	22.67		
beta	E	2039-01-30T03:33:40.886		32.83	-40.81	45679.95	22.94		
eta	E	2039-01-30T03:34:45.530		32.64	-40.62	47176.12	23.33		
gamma	E	2039-01-30T03:35:04.734		32.58	-40.56	47625.24	23.44		
delta	E	2039-01-30T03:35:33.437		32.49	-40.47	48300.35	23.60		
lambda	E	2039-01-30T03:36:46.011		32.27	-40.26	50026.71	23.97		
epsilon	E	2039-01-30T03:37:43.726		32.09	-40.09	51417.95	24.33		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-01-30T03:16:29.720
 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 : 673812478196758272
 2Mass ID (if available) : 07505317+2133136
 ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.387
 G magnitude : 15.660
 RP magnitude : 15.187
 BP magnitude : 15.967
 DUPflag : 0
 Distance (au) : 17.685
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.40
 Sun-Target sep (deg) : 166.10
 Sun-Moon sep (deg) : 99.48
 B (ring opening deg) : 51.23
 PA of pole (deg) : 87.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.304
 C/A sky separation (km) : 29549.4
 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



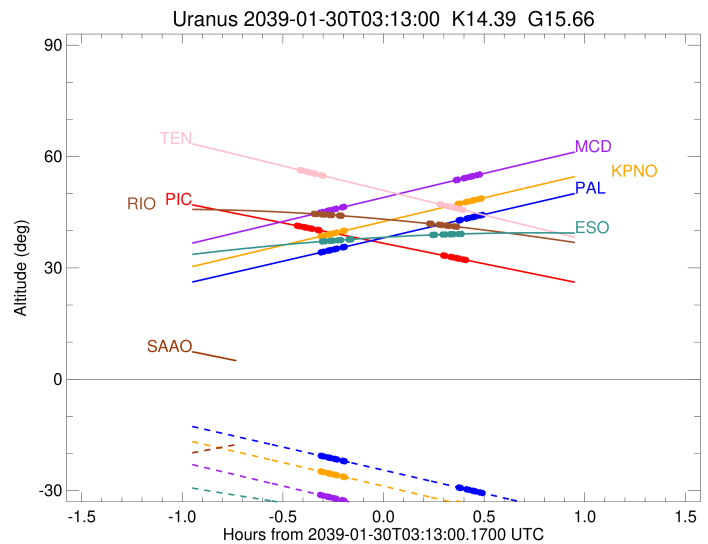
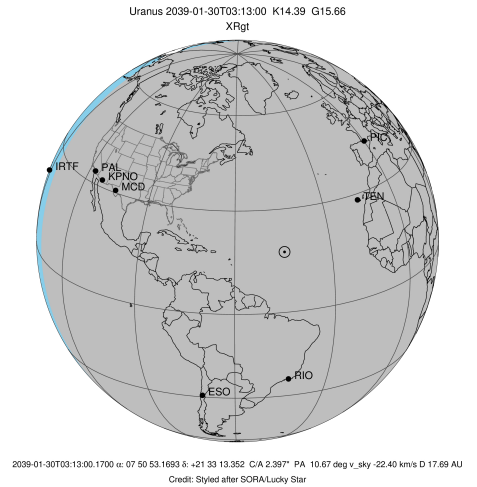
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-30T02:54:13.336		34.15	-20.59	51320.80	-23.44		
lambda	I	2039-01-30T02:55:09.210		34.35	-20.78	50026.71	-23.00		
delta	I	2039-01-30T02:56:25.019		34.61	-21.04	48300.35	-22.53		
gamma	I	2039-01-30T02:56:54.827		34.71	-21.14	47631.55	-22.34		
eta	I	2039-01-30T02:57:15.281		34.79	-21.22	47176.12	-22.20		
beta	I	2039-01-30T02:58:24.302		35.03	-21.45	45663.79	-21.70		
alpha	I	2039-01-30T02:59:07.525		35.18	-21.60	44723.84	-21.35		
4	I	2039-01-30T03:00:49.602		35.53	-21.96	42602.25	-20.43		
5	I	2039-01-30T03:01:04.800		35.59	-22.01	42288.18	-20.32		
6	I	2039-01-30T03:01:26.408		35.66	-22.08	41835.91	-20.11		

No planet occultations

6	E	2039-01-30T03:35:26.803		42.79	-29.16	41879.70	20.15		
5	E	2039-01-30T03:35:49.098		42.87	-29.24	42294.80	20.36		
4	E	2039-01-30T03:36:00.576		42.91	-29.28	42537.69	20.47		
alpha	E	2039-01-30T03:37:45.928		43.28	-29.65	44751.22	21.40		
beta	E	2039-01-30T03:38:28.854		43.43	-29.80	45680.46	21.75		
eta	E	2039-01-30T03:39:36.802		43.67	-30.03	47176.12	22.25		
gamma	E	2039-01-30T03:39:56.940		43.74	-30.10	47625.63	22.39		
delta	E	2039-01-30T03:40:26.937		43.84	-30.21	48300.35	22.59		
lambda	E	2039-01-30T03:41:42.545		44.11	-30.47	50026.71	23.06		
epsilon	E	2039-01-30T03:42:43.272		44.32	-30.68	51437.96	23.50		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2039-01-30T03:16:18.410
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      : 673812478196758272
2Mass ID (if available) : 07505317+2133136
ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
RUWE (>1.4 is poor) : 0.98
K magnitude         : 14.387
G magnitude         : 15.660
RP magnitude        : 15.187
BP magnitude        : 15.967
DUPflag            : 0
Distance (au)       : 17.685
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -22.40
Sun-Target sep (deg) : 166.10
Sun-Moon sep (deg)  : 99.53
B (ring opening deg) : 51.23
PA of pole (deg)    : 87.57
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.322
C/A sky separation (km) : 29786.9
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.bsp
earthstns_itrfr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```

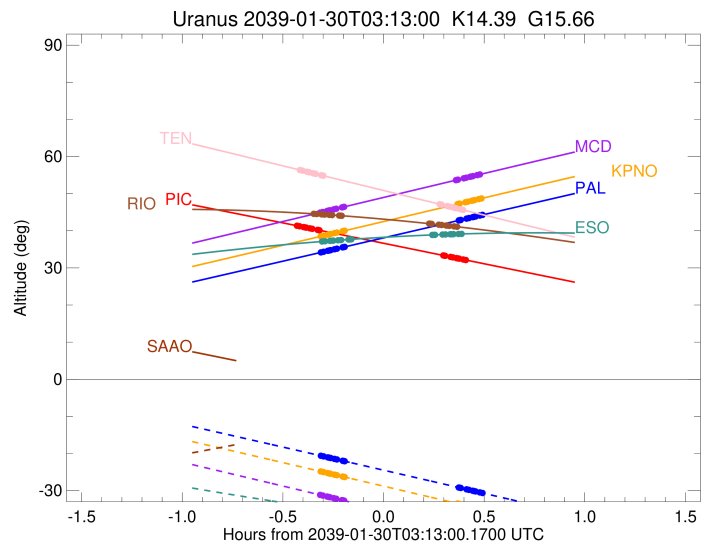
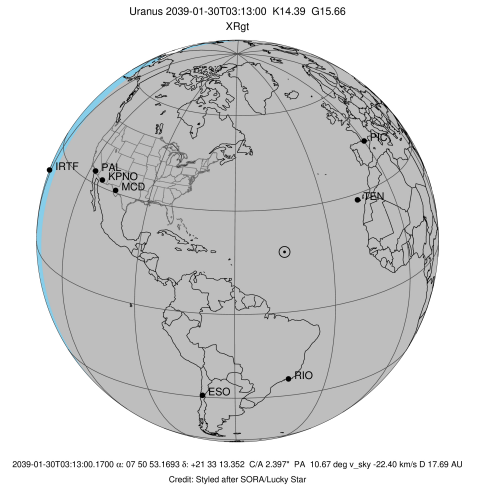


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-30T02:54:10.511		38.47	-24.81	51323.06	-23.38		
lambda	I	2039-01-30T02:55:06.639		38.67	-25.01	50026.71	-22.93		
delta	I	2039-01-30T02:56:22.695		38.94	-25.27	48300.35	-22.46		
gamma	I	2039-01-30T02:56:52.611		39.05	-25.38	47631.56	-22.25		
eta	I	2039-01-30T02:57:13.143		39.12	-25.45	47176.12	-22.11		
beta	I	2039-01-30T02:58:22.452		39.37	-25.70	45663.94	-21.60		
alpha	I	2039-01-30T02:59:05.880		39.52	-25.85	44724.09	-21.25		
4	I	2039-01-30T03:00:48.565		39.88	-26.21	42601.98	-20.30		
5	I	2039-01-30T03:01:03.830		39.94	-26.26	42288.69	-20.18		
6	I	2039-01-30T03:01:25.573		40.02	-26.34	41836.28	-19.97		

No planet occultations

6	E	2039-01-30T03:35:06.132		47.19	-33.48	41879.68	20.01		
5	E	2039-01-30T03:35:28.586		47.27	-33.56	42295.21	20.22		
4	E	2039-01-30T03:35:40.137		47.31	-33.60	42537.92	20.34		
alpha	E	2039-01-30T03:37:26.098		47.69	-33.98	44751.28	21.29		
beta	E	2039-01-30T03:38:09.238		47.84	-34.13	45680.49	21.65		
eta	E	2039-01-30T03:39:17.484		48.08	-34.37	47176.12	22.16		
gamma	E	2039-01-30T03:39:37.704		48.15	-34.44	47625.66	22.31		
delta	E	2039-01-30T03:40:07.813		48.26	-34.55	48300.35	22.51		
lambda	E	2039-01-30T03:41:23.681		48.53	-34.82	50026.71	22.99		
epsilon	E	2039-01-30T03:42:24.653		48.75	-35.03	51439.47	23.44		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-01-30T03:15:58.200
 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 : 673812478196758272
 2Mass ID (if available) : 07505317+2133136
 ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.387
 G magnitude : 15.660
 RP magnitude : 15.187
 BP magnitude : 15.967
 DUPflag : 0
 Distance (au) : 17.685
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.40
 Sun-Target sep (deg) : 166.10
 Sun-Moon sep (deg) : 99.59
 B (ring opening deg) : 51.23
 PA of pole (deg) : 87.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.341
 C/A sky separation (km) : 30026.5
 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



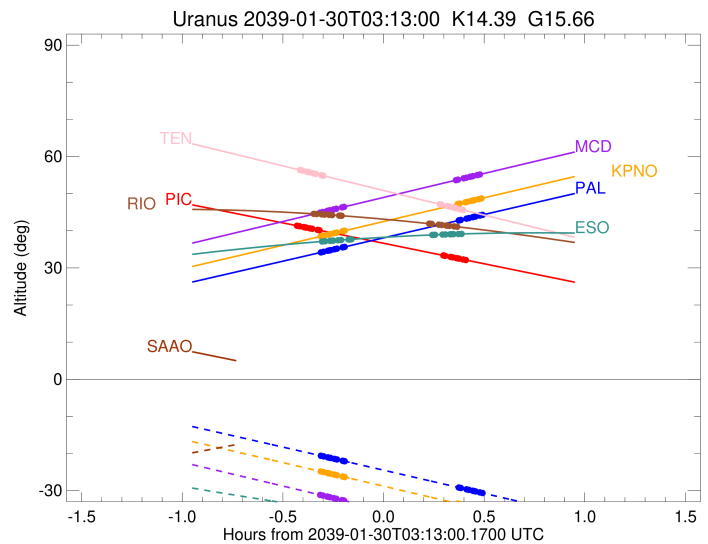
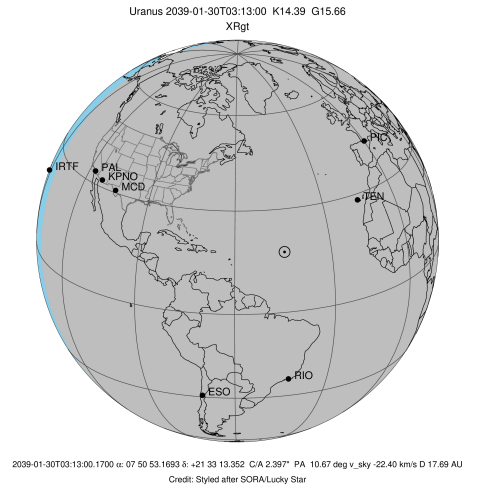
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-30T02:53:59.271		44.87	-31.13	51325.41	-23.32		
lambda	I	2039-01-30T02:54:55.639		45.07	-31.33	50026.71	-22.87		
delta	I	2039-01-30T02:56:11.916		45.35	-31.60	48300.35	-22.38		
gamma	I	2039-01-30T02:56:41.932		45.46	-31.71	47631.56	-22.18		
eta	I	2039-01-30T02:57:02.536		45.53	-31.78	47176.12	-22.03		
beta	I	2039-01-30T02:58:12.111		45.78	-32.03	45664.09	-21.51		
alpha	I	2039-01-30T02:58:55.734		45.94	-32.19	44724.35	-21.15		
4	I	2039-01-30T03:00:39.005		46.31	-32.56	42601.69	-20.17		
5	I	2039-01-30T03:00:54.333		46.36	-32.61	42289.21	-20.06		
6	I	2039-01-30T03:01:16.209		46.44	-32.69	41836.66	-19.84		

No planet occultations

6	E	2039-01-30T03:34:35.826		53.63	-39.86	41879.66	19.87		
5	E	2039-01-30T03:34:58.437		53.71	-39.95	42295.60	20.09		
4	E	2039-01-30T03:35:10.062		53.76	-39.99	42538.15	20.21		
alpha	E	2039-01-30T03:36:56.619		54.14	-40.37	44751.34	21.19		
beta	E	2039-01-30T03:37:39.967		54.29	-40.53	45680.52	21.55		
eta	E	2039-01-30T03:38:48.499		54.54	-40.77	47176.12	22.08		
gamma	E	2039-01-30T03:39:08.797		54.61	-40.84	47625.69	22.22		
delta	E	2039-01-30T03:39:39.014		54.72	-40.95	48300.35	22.43		
lambda	E	2039-01-30T03:40:55.125		54.99	-41.22	50026.71	22.92		
epsilon	E	2039-01-30T03:41:56.327		55.21	-41.44	51440.91	23.38		

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2039-01-30T03:10:34.510
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       : 673812478196758272
2Mass ID (if available) : 07505317+2133136
ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 14.387
G magnitude           : 15.660
RP magnitude          : 15.187
BP magnitude          : 15.967
DUPflag              : 0
Distance (au)        : 17.685
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.40
Sun-Target sep (deg) : 166.10
Sun-Moon sep (deg)   : 99.42
B (ring opening deg) : 51.23
PA of pole (deg)     : 87.57
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.252
C/A sky separation (km) : 28886.6
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.bsp
ural161.bsp
vgr2.ural161.bsp
peph.ural160.bsp
earthstns_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

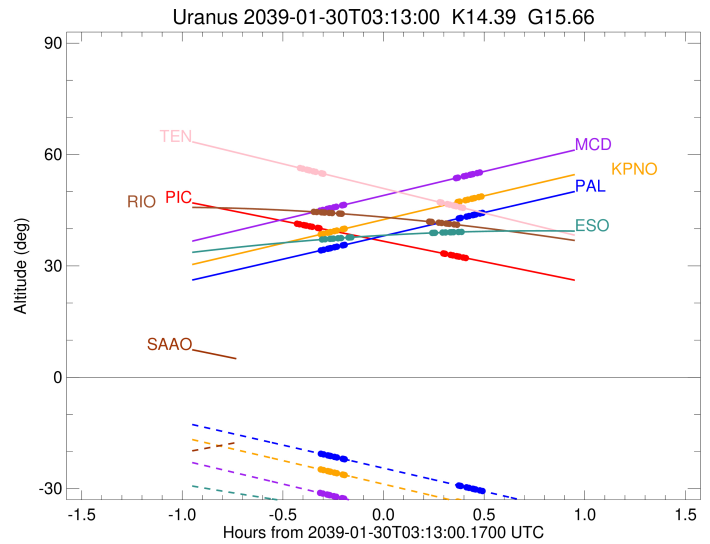
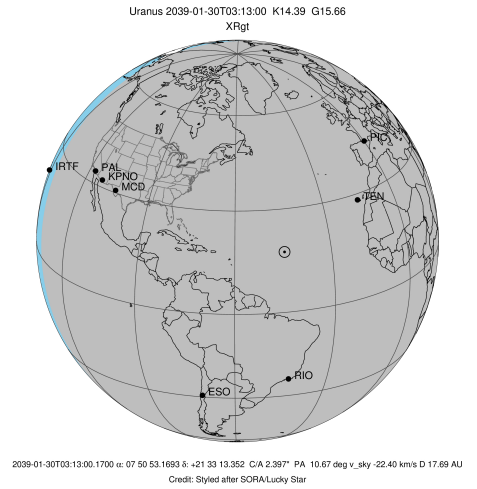


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-30T02:47:59.861		56.39	-67.09	51317.70	-23.84		
lambda	I	2039-01-30T02:48:54.617		56.18	-66.90	50026.71	-23.43		
delta	I	2039-01-30T02:50:09.008		55.91	-66.65	48300.35	-22.98		
gamma	I	2039-01-30T02:50:38.230		55.80	-66.55	47631.55	-22.79		
eta	I	2039-01-30T02:50:58.270		55.73	-66.48	47176.12	-22.66		
beta	I	2039-01-30T02:52:05.843		55.48	-66.25	45663.55	-22.19		
alpha	I	2039-01-30T02:52:48.095		55.32	-66.10	44723.41	-21.86		
4	I	2039-01-30T02:54:27.603		54.96	-65.76	42602.73	-20.98		
5	I	2039-01-30T02:54:42.450		54.90	-65.71	42287.28	-20.88		
6	I	2039-01-30T02:55:03.482		54.83	-65.64	41835.26	-20.69		

No planet occultations

6	E	2039-01-30T03:29:45.897		47.15	-58.28	41879.74	20.65		
5	E	2039-01-30T03:30:07.646		47.07	-58.20	42293.12	20.84		
4	E	2039-01-30T03:30:18.875		47.03	-58.16	42536.78	20.94		
alpha	E	2039-01-30T03:32:02.092		46.65	-57.79	44750.95	21.81		
beta	E	2039-01-30T03:32:44.235		46.50	-57.64	45680.29	22.14		
eta	E	2039-01-30T03:33:51.075		46.25	-57.40	47176.12	22.60		
gamma	E	2039-01-30T03:34:10.898		46.18	-57.33	47625.49	22.74		
delta	E	2039-01-30T03:34:40.460		46.07	-57.22	48300.35	22.92		
lambda	E	2039-01-30T03:35:55.045		45.80	-56.95	50026.71	23.36		
epsilon	E	2039-01-30T03:36:54.733		45.58	-56.73	51430.89	23.78		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-01-30T03:11:22.360
 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 : 673812478196758272
 2Mass ID (if available) : 07505317+2133136
 ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.387
 G magnitude : 15.660
 RP magnitude : 15.187
 BP magnitude : 15.967
 DUPflag : 0
 Distance (au) : 17.685
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.40
 Sun-Target sep (deg) : 166.10
 Sun-Moon sep (deg) : 99.38
 B (ring opening deg) : 51.23
 PA of pole (deg) : 87.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.716
 C/A sky separation (km) : 34836.8
 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

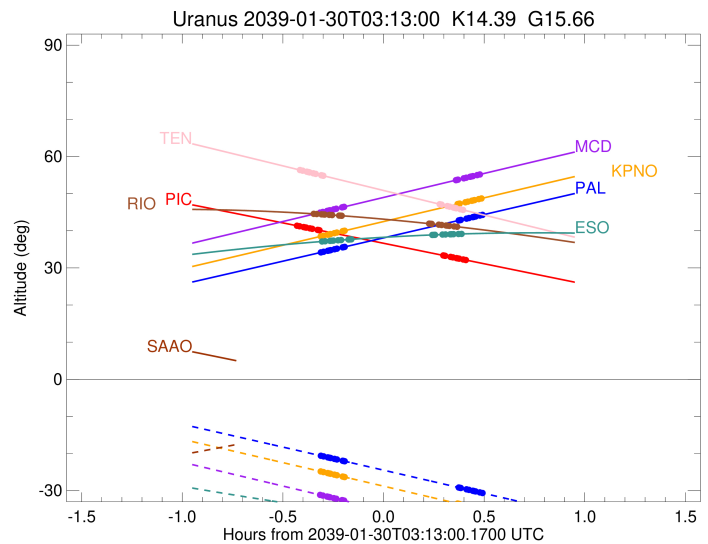
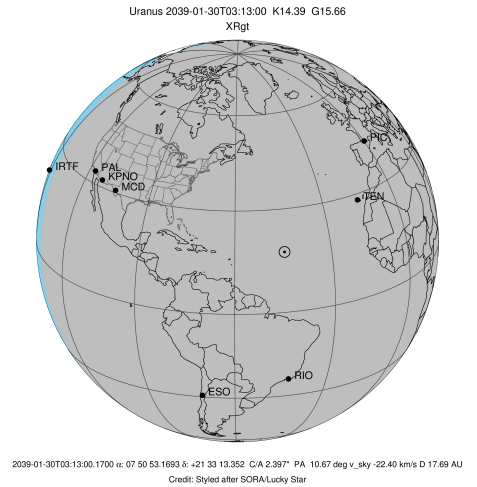


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-30T02:52:02.457		44.57	-49.38	51370.73	-21.23		
lambda	I	2039-01-30T02:53:06.933		44.51	-49.40	50026.71	-20.58		
delta	I	2039-01-30T02:54:32.326		44.43	-49.43	48300.35	-19.84		
gamma	I	2039-01-30T02:55:06.314		44.39	-49.44	47631.57	-19.52		
eta	I	2039-01-30T02:55:29.789		44.37	-49.44	47176.12	-19.29		
beta	I	2039-01-30T02:56:49.849		44.29	-49.46	45667.19	-18.46		
alpha	I	2039-01-30T02:57:41.006		44.23	-49.47	44729.77	-17.89		
4	I	2039-01-30T02:59:46.497		44.10	-49.50	42594.98	-16.28		
5	I	2039-01-30T03:00:04.673		44.08	-49.50	42299.32	-16.08		
6	I	2039-01-30T03:00:31.927		44.05	-49.50	41844.83	-15.70		

No planet occultations

6	E	2039-01-30T03:26:37.536		41.92	-49.22	41878.48	15.69		
5	E	2039-01-30T03:27:06.000		41.87	-49.20	42303.91	16.07		
4	E	2039-01-30T03:27:20.513		41.85	-49.19	42544.01	16.27		
alpha	E	2039-01-30T03:29:29.400		41.64	-49.12	44752.26	17.87		
beta	E	2039-01-30T03:30:20.461		41.56	-49.09	45681.09	18.45		
eta	E	2039-01-30T03:31:39.680		41.42	-49.05	47176.12	19.27		
gamma	E	2039-01-30T03:32:02.914		41.38	-49.03	47626.41	19.50		
delta	E	2039-01-30T03:32:37.201		41.33	-49.01	48300.35	19.82		
lambda	E	2039-01-30T03:34:02.687		41.18	-48.95	50026.71	20.56		
epsilon	E	2039-01-30T03:35:12.032		41.06	-48.91	51471.85	21.21		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-01-30T03:13:10.930
 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 : 673812478196758272
 2Mass ID (if available) : 07505317+2133136
 ICRS Star Coord at Epoch: 07h 50m 53.16930s +21:33:13.35196s
 RUWE (>1.4 is poor) : 0.98
 K magnitude : 14.387
 G magnitude : 15.660
 RP magnitude : 15.187
 BP magnitude : 15.967
 DUPflag : 0
 Distance (au) : 17.685
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -22.40
 Sun-Target sep (deg) : 166.10
 Sun-Moon sep (deg) : 99.38
 B (ring opening deg) : 51.23
 PA of pole (deg) : 87.57
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.795
 C/A sky separation (km) : 35849.9
 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	2039-01-30T02:54:29.946		37.10	-34.75	51379.29	-20.65		
lambda	I	2039-01-30T02:55:36.777		37.18	-34.90	50026.71	-19.95		
delta	I	2039-01-30T02:57:05.072		37.28	-35.08	48300.35	-19.14		
gamma	I	2039-01-30T02:57:40.342		37.32	-35.16	47631.55	-18.78		
eta	I	2039-01-30T02:58:04.748		37.35	-35.21	47176.12	-18.53		
beta	I	2039-01-30T02:59:28.288		37.44	-35.38	45667.84	-17.63		
alpha	I	2039-01-30T03:00:22.010		37.50	-35.49	44730.91	-16.99		
4	I	2039-01-30T03:02:35.415		37.64	-35.77	42593.33	-15.19		
5	I	2039-01-30T03:02:54.722		37.66	-35.81	42301.33	-14.95		
6	I	2039-01-30T03:03:24.079		37.69	-35.86	41846.69	-14.52		

No planet occultations

6	E	2039-01-30T03:27:33.614		38.88	-38.55	41877.92	14.52		
5	E	2039-01-30T03:28:04.241		38.90	-38.60	42305.81	14.96		
4	E	2039-01-30T03:28:19.849		38.91	-38.63	42545.75	15.19		
alpha	E	2039-01-30T03:30:36.485		38.99	-38.85	44752.37	16.99		
beta	E	2039-01-30T03:31:30.060		39.01	-38.94	45681.17	17.63		
eta	E	2039-01-30T03:32:52.648		39.06	-39.07	47176.12	18.54		
gamma	E	2039-01-30T03:33:16.782		39.07	-39.11	47626.59	18.79		
delta	E	2039-01-30T03:33:52.303		39.09	-39.16	48300.35	19.14		
lambda	E	2039-01-30T03:35:20.565		39.13	-39.30	50026.71	19.96		
epsilon	E	2039-01-30T03:36:32.232		39.16	-39.41	51479.19	20.66		