

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-01-27T04:21:09.970
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3416184315424172032
 2Mass ID (if available) : 05302995+2325255

ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 12.266
 G magnitude : 15.435
 RP magnitude : 14.507
 BP magnitude : 16.302
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.40
 Sun-Target sep (deg) : 136.91
 Sun-Moon sep (deg) : 39.50
 B (ring opening deg) : 80.35
 PA of pole (deg) : 32.22

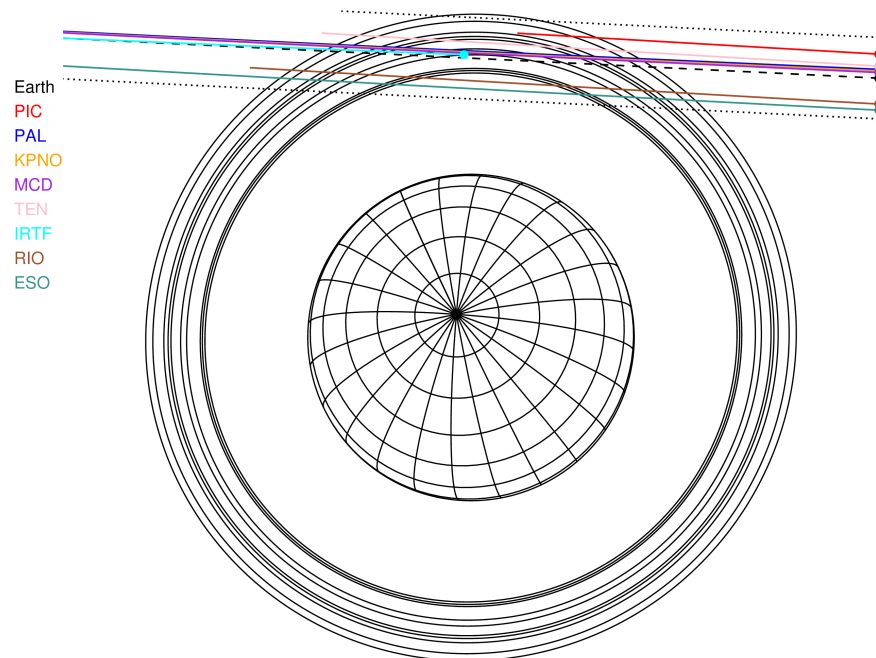
a(km) ring

- 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



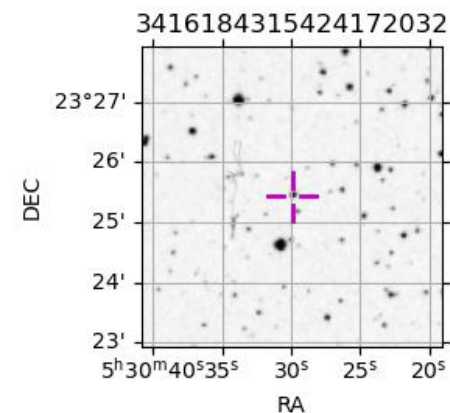
2032-01-27T04:21:09.9700 ra: 05 30 29.95758 s: +23 25 25.539 C/A 3.290° PA 177.19 deg v_sky -15.41 km/s D 18.35 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2032-01-27T04:21:09 K12.27 G15.43 XRgt



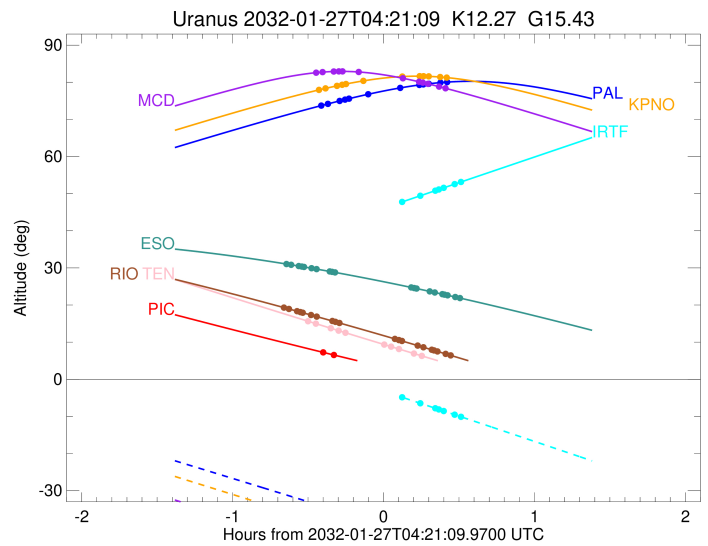
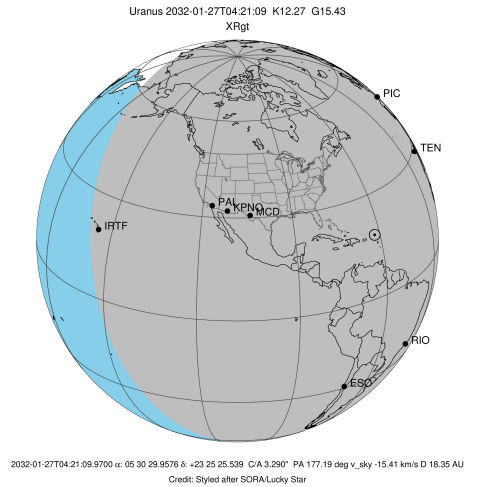
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	++			JAN 27 03:56 - JAN 27 04:01	PnnRin
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	JAN 27 03:55 - JAN 27 04:46	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	JAN 27 03:55 - JAN 27 04:45	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	JAN 27 03:53 - JAN 27 04:45	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	JAN 27 03:50 - JAN 27 04:36	PnnRie
IRTF	Mauna Kea/IRTF	19.8	204.5			+++++	JAN 27 04:35 - JAN 27 04:51	PnnRne
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++		+++++	JAN 27 03:41 - JAN 27 04:47	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	JAN 27 03:42 - JAN 27 04:51	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            : 2032-01-27T04:15:39.130
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      : 3416184315424172032
2Mass ID (if available) : 05302995+2325255
ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
RUWE (>1.4 is poor) : 1.00
K magnitude         : 12.266
G magnitude         : 15.435
RP magnitude        : 14.507
BP magnitude        : 16.302
DUPflag            : 0
Distance (au)       : 18.348
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 136.91
Sun-Moon sep (deg)  : 39.10
B (ring opening deg) : 80.35
PA of pole (deg)    : 32.22
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.607
C/A sky separation (km) : 47994.9
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl.spk
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
  
```

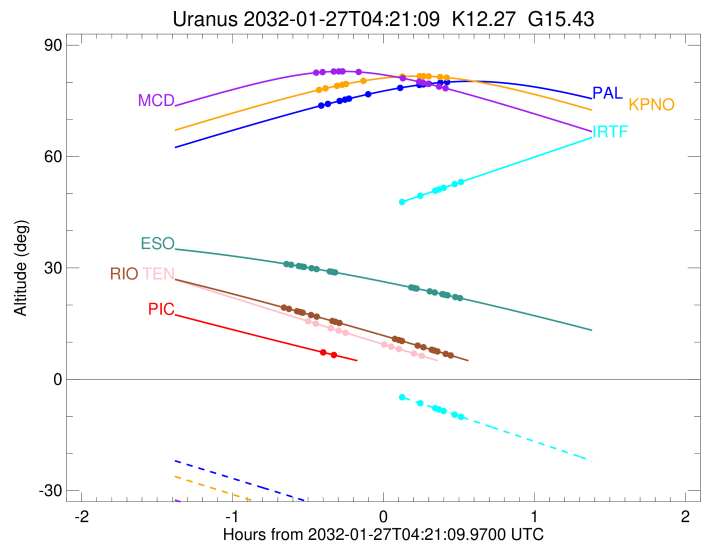
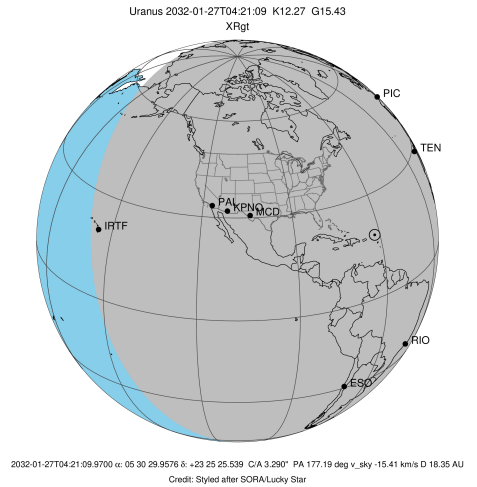


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:56:35.709		7.34	-37.16	51343.71	-4.99		
lambda	I	2032-01-27T04:01:30.620		6.53	-36.26	50026.71	-3.82		

No planet occultations

lambda	E	2032-01-27T04:28:23.883		2.17x	-31.35	50026.71	3.81		
epsilon	E	2032-01-27T04:32:27.709		1.52x	-30.61	51084.82	4.97		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-01-27T04:22:04.850
 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 : 3416184315424172032
 2Mass ID (if available) : 05302995+2325255
 ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 12.266
 G magnitude : 15.435
 RP magnitude : 14.507
 BP magnitude : 16.302
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.40
 Sun-Target sep (deg) : 136.91
 Sun-Moon sep (deg) : 40.16
 B (ring opening deg) : 80.35
 PA of pole (deg) : 32.22
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.368
 C/A sky separation (km) : 44826.4
 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

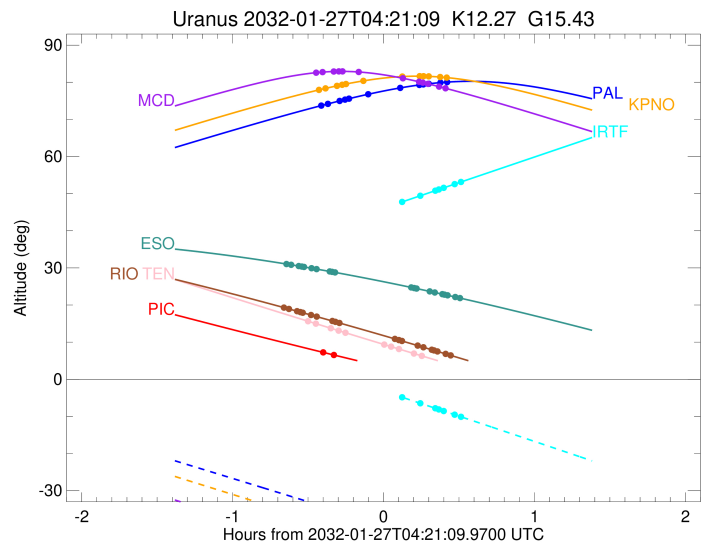
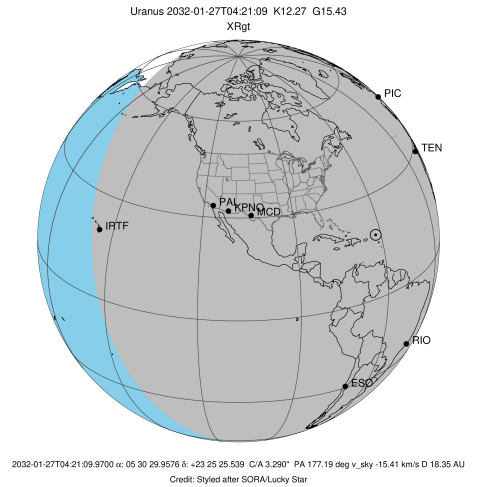


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:55:54.638		73.63	-33.97	51393.20	-7.42		
lambda	I	2032-01-27T03:59:06.047		74.19	-34.63	50026.71	-6.75		
delta	I	2032-01-27T04:03:46.550		74.98	-35.61	48300.35	-5.53		
gamma	I	2032-01-27T04:05:55.167		75.34	-36.06	47627.20	-4.93		
eta	I	2032-01-27T04:07:31.168		75.60	-36.39	47176.12	-4.46		
beta	I	2032-01-27T04:15:02.433		76.77	-37.97	45681.16	-2.12		

No planet occultations

beta	E	2032-01-27T04:27:50.536		78.49	-40.64	45680.01	2.12		
eta	E	2032-01-27T04:35:22.274		79.28	-42.21	47176.12	4.47		
gamma	E	2032-01-27T04:36:58.854		79.43	-42.55	47630.10	4.93		
delta	E	2032-01-27T04:39:06.869		79.60	-42.99	48300.35	5.53		
lambda	E	2032-01-27T04:43:47.338		79.92	-43.96	50026.71	6.76		
epsilon	E	2032-01-27T04:46:08.248		80.04	-44.45	51018.83	7.43		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-01-27T04:21:32.430
 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 : 3416184315424172032
 2Mass ID (if available) : 05302995+2325255
 ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 12.266
 G magnitude : 15.435
 RP magnitude : 14.507
 BP magnitude : 16.302
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.40
 Sun-Target sep (deg) : 136.91
 Sun-Moon sep (deg) : 40.11
 B (ring opening deg) : 80.35
 PA of pole (deg) : 32.22
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.354
 C/A sky separation (km) : 44633.3
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

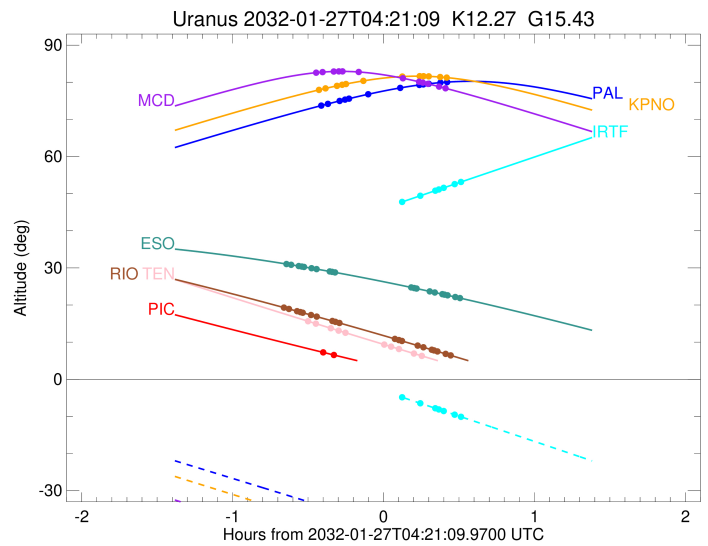
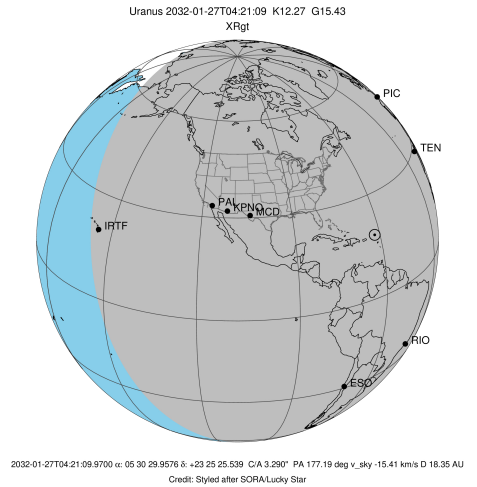


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:55:00.597		77.87	-38.21	51396.09	-7.55		
lambda	I	2032-01-27T03:58:09.027		78.36	-38.88	50026.71	-6.89		
delta	I	2032-01-27T04:02:42.625		79.04	-39.85	48300.35	-5.71		
gamma	I	2032-01-27T04:04:46.819		79.34	-40.28	47627.13	-5.13		
eta	I	2032-01-27T04:06:18.682		79.54	-40.61	47176.12	-4.69		
beta	I	2032-01-27T04:13:08.213		80.38	-42.06	45681.20	-2.58		

No planet occultations

beta	E	2032-01-27T04:28:40.279		81.55	-45.35	45679.81	2.58		
eta	E	2032-01-27T04:35:30.368		81.65	-46.79	47176.12	4.69		
gamma	E	2032-01-27T04:37:02.837		81.64	-47.12	47630.15	5.13		
delta	E	2032-01-27T04:39:06.470		81.60	-47.55	48300.35	5.71		
lambda	E	2032-01-27T04:43:40.142		81.42	-48.51	50026.71	6.89		
epsilon	E	2032-01-27T04:45:58.192		81.29	-49.00	51016.04	7.54		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-01-27T04:20:43.620
 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 : 3416184315424172032
 2Mass ID (if available) : 05302995+2325255
 ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 12.266
 G magnitude : 15.435
 RP magnitude : 14.507
 BP magnitude : 16.302
 DUPflag : 0
 Distance (au) : 18.348
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.40
 Sun-Target sep (deg) : 136.91
 Sun-Moon sep (deg) : 40.04
 B (ring opening deg) : 80.35
 PA of pole (deg) : 32.22
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.341
 C/A sky separation (km) : 44461.4
 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



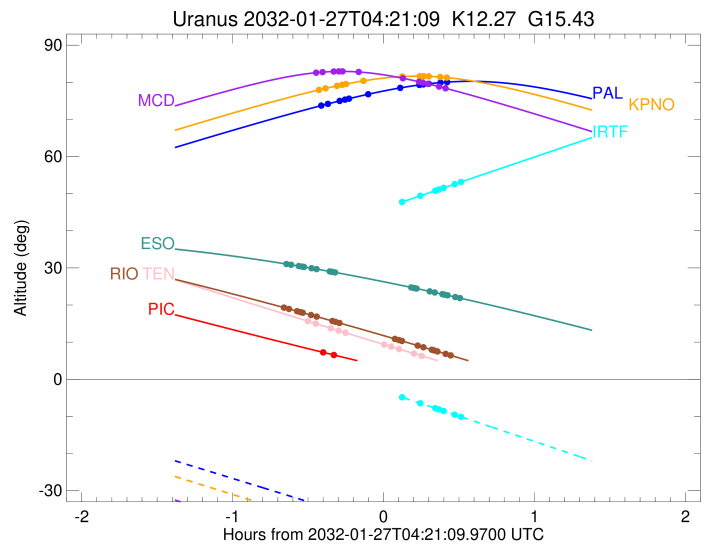
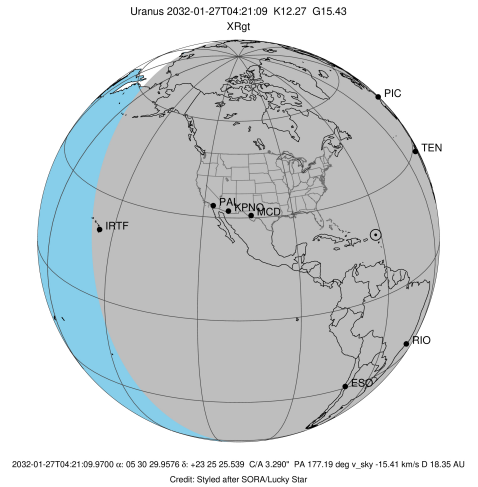
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:53:52.699		82.55	-44.50	51398.78	-7.65		
lambda	I	2032-01-27T03:56:58.633		82.74	-45.16	50026.71	-7.01		
delta	I	2032-01-27T04:01:26.510		82.91	-46.12	48300.35	-5.86		
gamma	I	2032-01-27T04:03:27.137		82.94	-46.55	47627.06	-5.30		
eta	I	2032-01-27T04:04:55.738		82.94	-46.87	47176.12	-4.88		
beta	I	2032-01-27T04:11:17.383		82.78	-48.23	45681.22	-2.92		

No planet occultations

beta	E	2032-01-27T04:28:53.817		81.08	-51.99	45679.65	2.92		
eta	E	2032-01-27T04:35:16.148		80.15	-53.34	47176.12	4.87		
gamma	E	2032-01-27T04:36:45.396		79.91	-53.66	47630.18	5.30		
delta	E	2032-01-27T04:38:45.523		79.59	-54.08	48300.35	5.85		
lambda	E	2032-01-27T04:43:13.635		78.84	-55.03	50026.71	7.00		
epsilon	E	2032-01-27T04:45:29.335		78.44	-55.50	51013.80	7.64		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-01-27T04:14:25.530
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      : 3416184315424172032
2Mass ID (if available) : 05302995+2325255
ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 12.266
G magnitude          : 15.435
RP magnitude         : 14.507
BP magnitude         : 16.302
DUPflag             : 0
Distance (au)       : 18.348
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 136.91
Sun-Moon sep (deg)  : 39.01
B (ring opening deg) : 80.35
PA of pole (deg)    : 32.22
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.471
C/A sky separation (km) : 46193.4
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
  
```



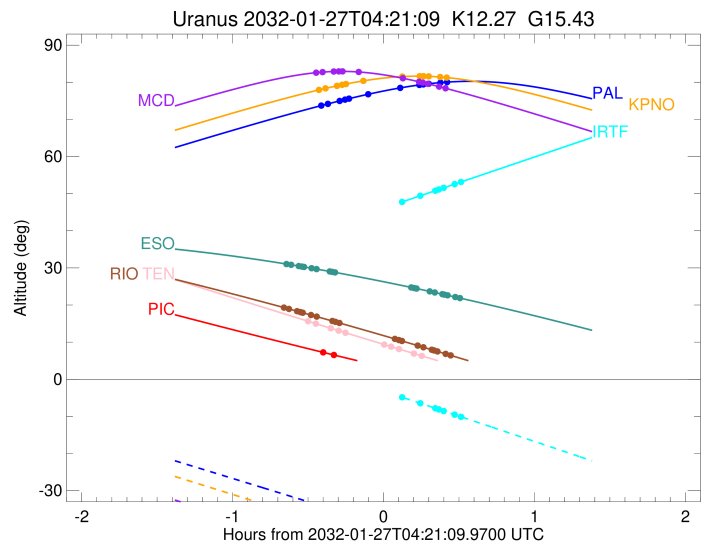
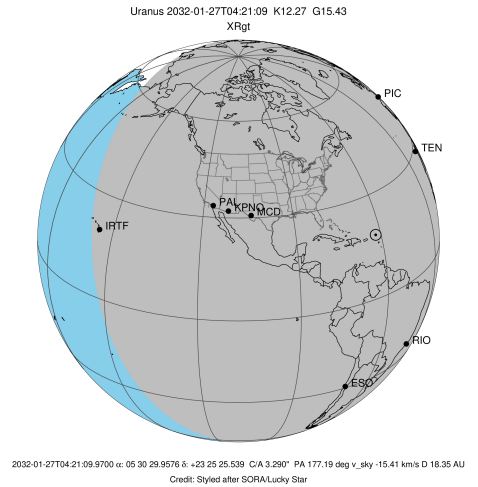
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:50:36.822		15.75	-53.98	51377.66	-6.42		
lambda	I	2032-01-27T03:54:19.314		14.98	-53.17	50026.71	-5.62		
delta	I	2032-01-27T04:00:16.260		13.73	-51.86	48300.35	-4.03		
gamma	I	2032-01-27T04:03:23.790		13.08	-51.17	47627.71	-3.14		
eta	I	2032-01-27T04:06:09.080		12.51	-50.57	47176.12	-2.32		

No planet occultations

eta	E	2032-01-27T04:21:21.208		9.37	-47.22	47176.12	2.32		
gamma	E	2032-01-27T04:24:07.511		8.80	-46.61	47629.62	3.13		
delta	E	2032-01-27T04:27:15.041		8.16	-45.93	48300.35	4.02		
lambda	E	2032-01-27T04:33:13.588		6.94	-44.61	50026.71	5.59		
epsilon	E	2032-01-27T04:36:05.559		6.36	-43.98	51047.30	6.38		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-01-27T04:26:14.630
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      : 3416184315424172032
2Mass ID (if available) : 05302995+2325255
ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 12.266
G magnitude          : 15.435
RP magnitude         : 14.507
BP magnitude         : 16.302
DUPflag             : 0
Distance (au)        : 18.348
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 136.91
Sun-Moon sep (deg)  : 40.39
B (ring opening deg) : 80.35
PA of pole (deg)    : 32.22
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.322
C/A sky separation (km) : 44202.6
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
    
```



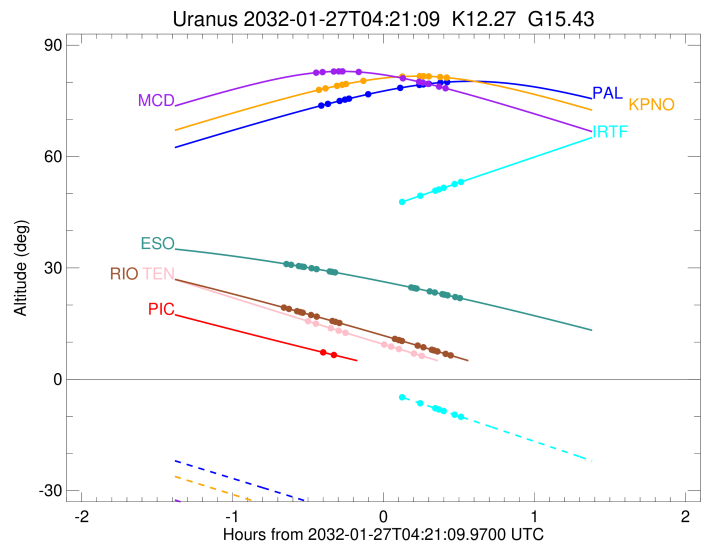
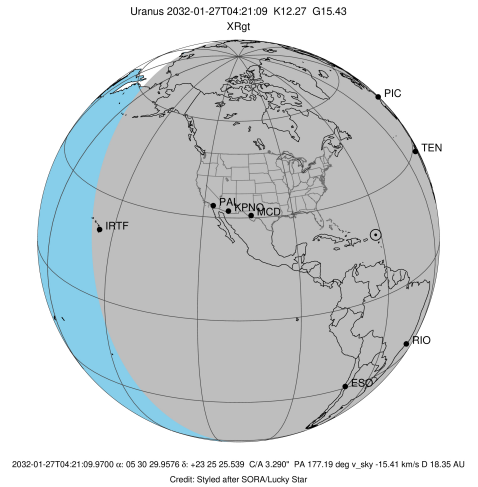
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:58:41.940		40.93	1.79x	51399.42	-7.72		
lambda	I	2032-01-27T04:01:45.926		41.63	1.11x	50026.71	-7.11		
delta	I	2032-01-27T04:06:08.674		42.63	0.14x	48300.35	-6.01		
gamma	I	2032-01-27T04:08:05.711		43.08	-0.29x	47627.02	-5.49		
eta	I	2032-01-27T04:09:30.916		43.41	-0.60x	47176.12	-5.09		
beta	I	2032-01-27T04:15:24.181		44.75	-1.91x	45681.23	-3.34		
alpha	I	2032-01-27T04:22:31.199		46.39	-3.50x	44742.86	-1.03		

No planet occultations

alpha	E	2032-01-27T04:28:39.343		47.79	-4.87x	44739.60	1.03		
beta	E	2032-01-27T04:35:48.827		49.44	-6.47	45679.35	3.34		
eta	E	2032-01-27T04:41:41.907		50.79	-7.79	47176.12	5.11		
gamma	E	2032-01-27T04:43:07.485		51.11	-8.12	47630.27	5.51		
delta	E	2032-01-27T04:45:03.605		51.56	-8.55	48300.35	6.03		
lambda	E	2032-01-27T04:49:25.492		52.56	-9.54	50026.71	7.13		
epsilon	E	2032-01-27T04:51:38.044		53.07	-10.03	51006.67	7.75		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-01-27T04:15:14.600
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      : 3416184315424172032
2Mass ID (if available) : 05302995+2325255
ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
RUWE (>1.4 is poor) : 1.00
K magnitude         : 12.266
G magnitude         : 15.435
RP magnitude        : 14.507
BP magnitude        : 16.302
DUPflag            : 0
Distance (au)       : 18.348
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 136.91
Sun-Moon sep (deg)  : 39.00
B (ring opening deg) : 80.35
PA of pole (deg)    : 32.22
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.017
C/A sky separation (km) : 40150.4
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
ural11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.ural11.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
  
```



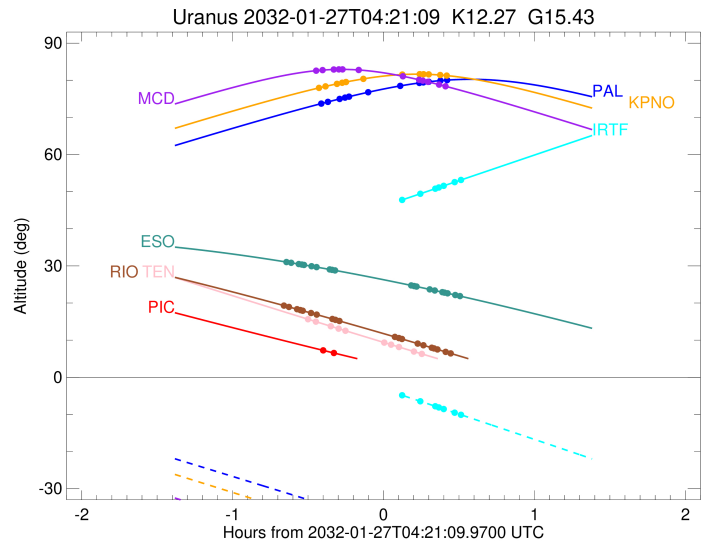
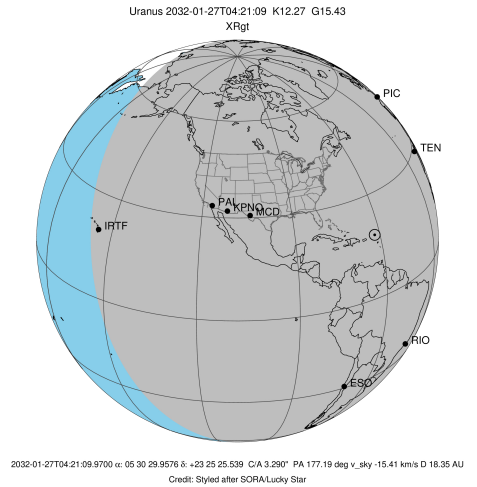
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-01-27T03:41:05.677		19.40	-47.76	51448.10	-9.63		
lambda	I	2032-01-27T03:43:35.858		18.94	-47.63	50026.71	-9.23		
delta	I	2032-01-27T03:46:49.917		18.34	-47.45	48300.35	-8.56		
gamma	I	2032-01-27T03:48:10.138		18.09	-47.37	47625.89	-8.26		
eta	I	2032-01-27T03:49:05.310		17.92	-47.31	47176.12	-8.05		
beta	I	2032-01-27T03:52:20.713		17.31	-47.11	45680.49	-7.25		
alpha	I	2032-01-27T03:54:34.512		16.89	-46.96	44749.99	-6.65		
4	I	2032-01-27T04:00:57.971		15.67	-46.50	42549.14	-4.78		
5	I	2032-01-27T04:02:25.638		15.40	-46.39	42157.06	-4.29		
6	I	2032-01-27T04:03:42.885		15.15	-46.29	41842.09	-3.86		

No planet occultations

6	E	2032-01-27T04:25:31.353		10.91	-44.28	41821.46	3.85		
5	E	2032-01-27T04:26:55.693		10.63	-44.13	42158.78	4.28		
4	E	2032-01-27T04:28:28.516		10.32	-43.96	42576.11	4.77		
alpha	E	2032-01-27T04:34:44.645		9.08	-43.27	44729.11	6.62		
beta	E	2032-01-27T04:37:02.039		8.62	-43.01	45676.72	7.21		
eta	E	2032-01-27T04:40:19.092		7.96	-42.62	47176.12	7.99		
gamma	E	2032-01-27T04:41:15.223		7.77	-42.51	47630.82	8.21		
delta	E	2032-01-27T04:42:35.386		7.50	-42.35	48300.35	8.50		
lambda	E	2032-01-27T04:45:50.872		6.84	-41.95	50026.71	9.15		
epsilon	E	2032-01-27T04:47:31.055		6.51	-41.74	50959.52	9.56		


```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-01-27T04:17:35.330
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      : 3416184315424172032
2Mass ID (if available) : 05302995+2325255
ICRS Star Coord at Epoch: 05h 30m 29.95758s +23:25:25.53885s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 12.266
G magnitude          : 15.435
RP magnitude         : 14.507
BP magnitude         : 16.302
DUPflag             : 0
Distance (au)       : 18.348
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 136.91
Sun-Moon sep (deg)  : 39.34
B (ring opening deg) : 80.35
PA of pole (deg)    : 32.22
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.925
C/A sky separation (km) : 38920.9
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	2032-01-27T03:42:06.446		31.09	-39.14	51457.36	-10.18		
lambda	I	2032-01-27T03:44:29.097		30.83	-39.34	50026.71	-9.81		
delta	I	2032-01-27T03:47:30.438		30.49	-39.58	48300.35	-9.22		
gamma	I	2032-01-27T03:48:44.690		30.35	-39.68	47625.66	-8.96		
eta	I	2032-01-27T03:49:35.416		30.26	-39.74	47176.12	-8.77		
beta	I	2032-01-27T03:52:32.872		29.91	-39.96	45680.18	-8.08		
alpha	I	2032-01-27T03:54:31.579		29.68	-40.11	44750.66	-7.57		
4	I	2032-01-27T03:59:53.657		29.04	-40.48	42546.04	-6.08		
5	I	2032-01-27T04:01:00.152		28.90	-40.55	42159.03	-5.72		
6	I	2032-01-27T04:01:56.265		28.78	-40.61	41846.14	-5.41		

No planet occultations

6	E	2032-01-27T04:32:02.644		24.76	-42.00	41817.43	5.40		
5	E	2032-01-27T04:33:05.715		24.61	-42.03	42161.52	5.70		
4	E	2032-01-27T04:34:17.187		24.44	-42.06	42580.07	6.06		
alpha	E	2032-01-27T04:39:31.441		23.68	-42.18	44726.98	7.55		
beta	E	2032-01-27T04:41:33.461		23.38	-42.22	45675.94	8.05		
eta	E	2032-01-27T04:44:32.162		22.93	-42.26	47176.12	8.73		
gamma	E	2032-01-27T04:45:23.715		22.80	-42.27	47630.96	8.91		
delta	E	2032-01-27T04:46:37.725		22.62	-42.29	48300.35	9.17		
lambda	E	2032-01-27T04:49:39.990		22.16	-42.32	50026.71	9.76		
epsilon	E	2032-01-27T04:51:12.696		21.92	-42.33	50944.48	10.12		