

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-15T05:30:42.180
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427508421902219776
 2Mass ID (if available) : 05503560+2338128

ICRS Star Coord at Epoch: 05h 50m 35.61280s +23:38:12.92534s

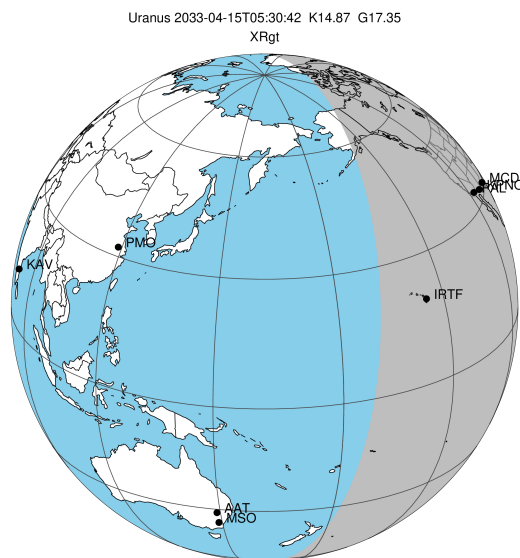
RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.871
 G magnitude : 17.351
 RP magnitude : 16.535
 BP magnitude : 18.037
 DUPflag : 0
 Distance (au) : 19.437
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.00
 Sun-Target sep (deg) : 62.73
 Sun-Moon sep (deg) : 121.93
 B (ring opening deg) : 77.10
 PA of pole (deg) : 50.88

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

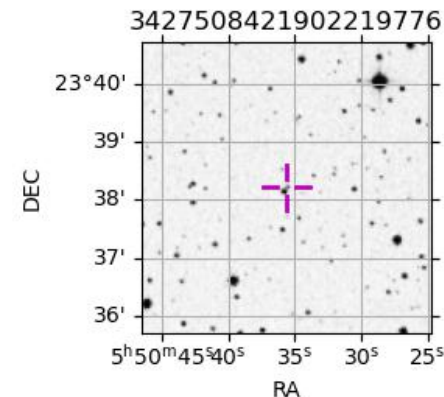
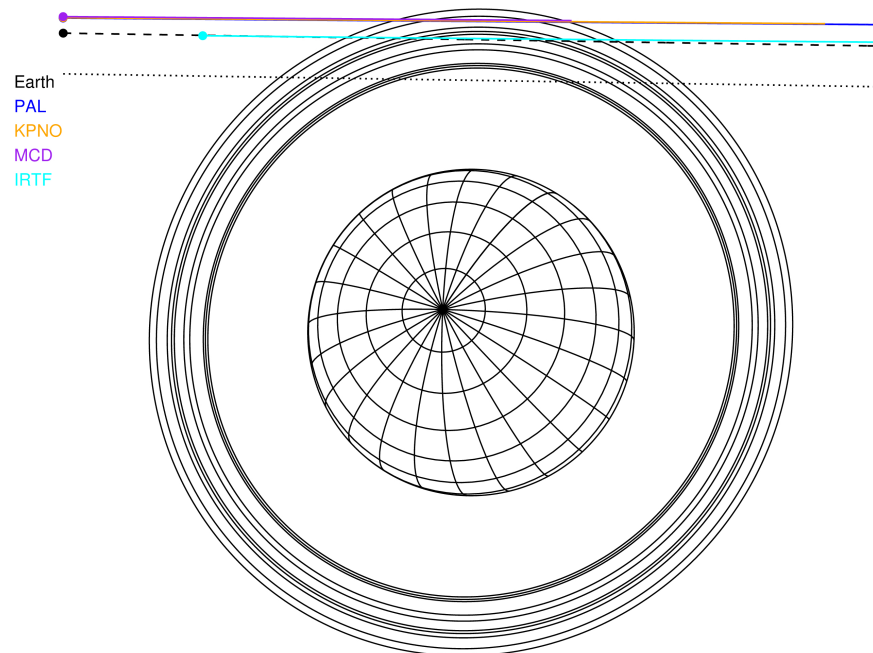
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	++		++	APR 15 05:25 - APR 15 05:46	PnnRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	++		++	APR 15 05:25 - APR 15 05:45	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	++		++	APR 15 05:26 - APR 15 05:45	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++		+++++	APR 15 05:17 - APR 15 05:51	PnnRie
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					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

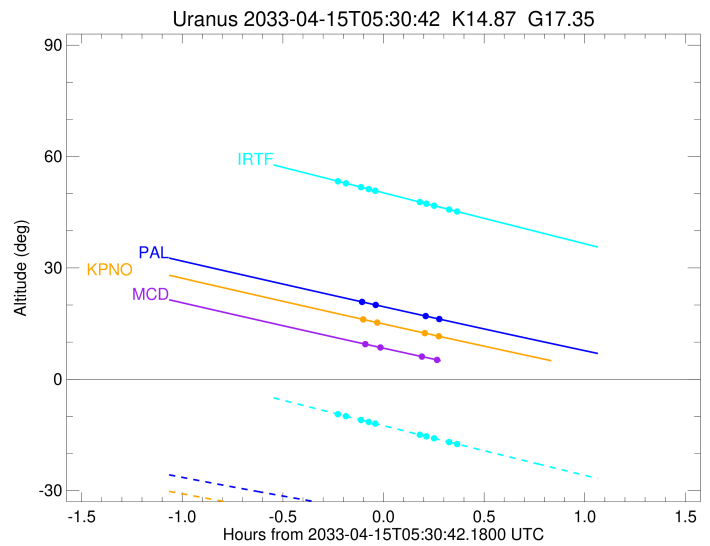
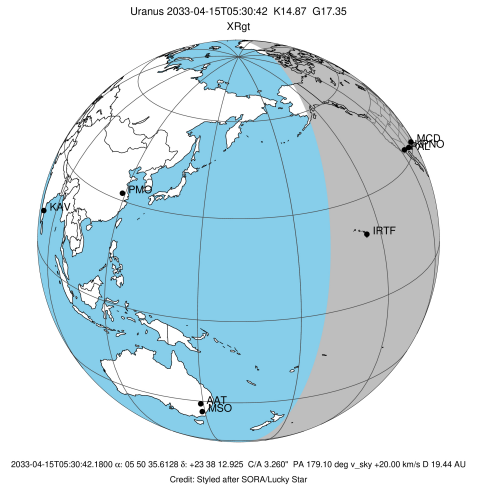


2033-04-15T05:30:42.1800 ex: 05 50 35.6128 s: +23 38 12.925 C/A 3.260" PA 179.10 deg v_sky +20.00 km/s D 19.44 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2033-04-15T05:30:42 K14.87 G17.35 XRgt



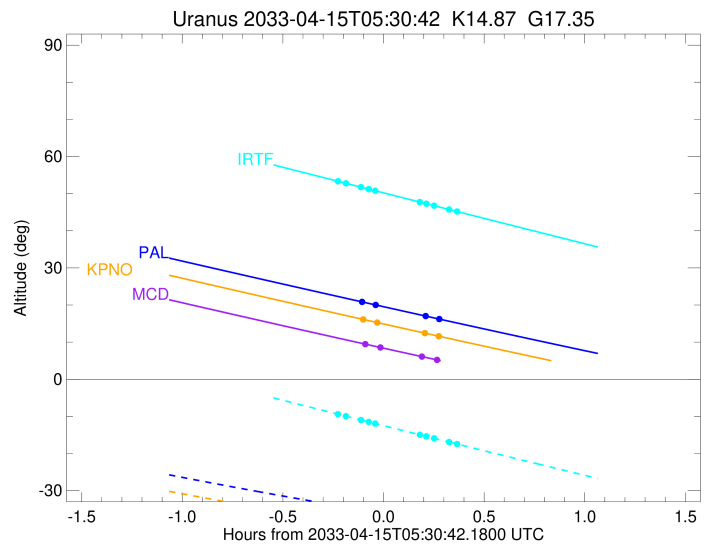
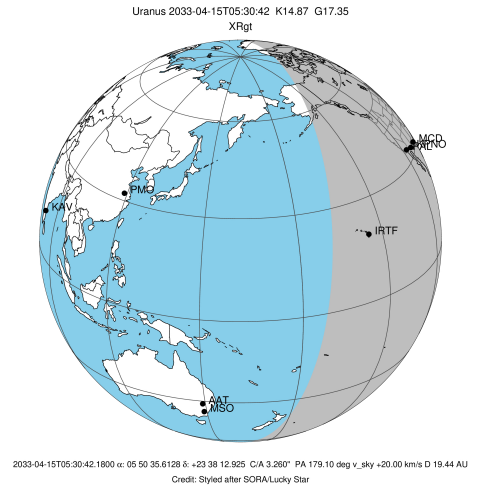
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-15T05:34:49.540
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3427508421902219776
 2Mass ID (if available) : 05503560+2338128
 ICRS Star Coord at Epoch: 05h 50m 35.61280s +23:38:12.92534s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.871
 G magnitude : 17.351
 RP magnitude : 16.535
 BP magnitude : 18.037
 DUPflag : 0
 Distance (au) : 19.437
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.00
 Sun-Target sep (deg) : 62.73
 Sun-Moon sep (deg) : 122.60
 B (ring opening deg) : 77.10
 PA of pole (deg) : 50.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.456
 C/A sky separation (km) : 48717.1
 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_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	2033-04-15T05:25:28.772		20.61	-35.26	50797.26	-4.94		
lambda	I	2033-04-15T05:28:26.665		20.01	-35.70	50026.71	-3.64		
No planet occultations									
lambda	E	2033-04-15T05:43:13.277		17.04	-37.76	50026.71	3.64		
epsilon	E	2033-04-15T05:46:00.115		16.48	-38.13	50743.73	4.95		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-15T05:34:55.400
 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 : 3427508421902219776
 2Mass ID (if available) : 05503560+2338128
 ICRS Star Coord at Epoch: 05h 50m 35.61280s +23:38:12.92534s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.871
 G magnitude : 17.351
 RP magnitude : 16.535
 BP magnitude : 18.037
 DUPflag : 0
 Distance (au) : 19.437
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.00
 Sun-Target sep (deg) : 62.73
 Sun-Moon sep (deg) : 122.55
 B (ring opening deg) : 77.10
 PA of pole (deg) : 50.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.461
 C/A sky separation (km) : 48792.0
 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

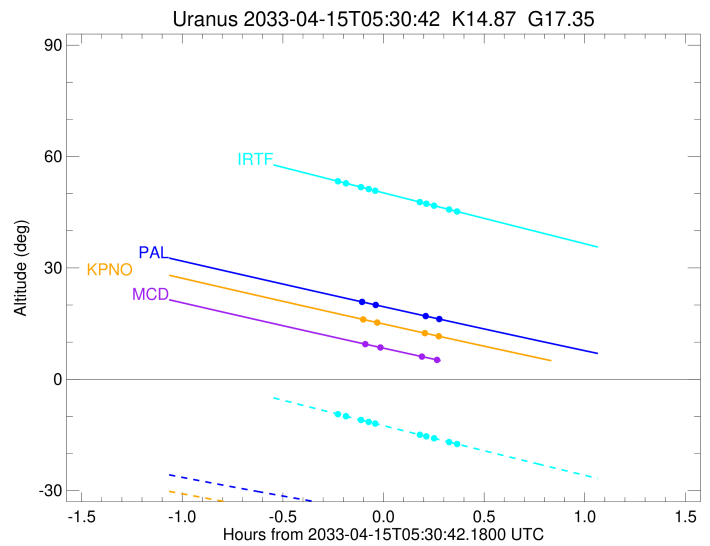
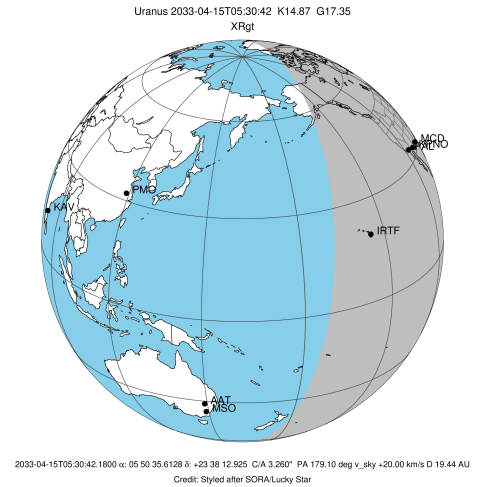


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-15T05:25:50.736		15.88	-39.32	50796.07	-4.83		
lambda	I	2033-04-15T05:28:54.262		15.26	-39.74	50026.71	-3.47		

No planet occultations

lambda	E	2033-04-15T05:42:57.424		12.44	-41.53	50026.71	3.48		
epsilon	E	2033-04-15T05:45:49.901		11.87	-41.88	50743.82	4.84		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-15T05:34:57.990
 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 : 3427508421902219776
 2Mass ID (if available) : 05503560+2338128
 ICRS Star Coord at Epoch: 05h 50m 35.61280s +23:38:12.92534s
 RUWE (>1.4 is poor) : 1.00
 K magnitude : 14.871
 G magnitude : 17.351
 RP magnitude : 16.535
 BP magnitude : 18.037
 DUPflag : 0
 Distance (au) : 19.437
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.00
 Sun-Target sep (deg) : 62.73
 Sun-Moon sep (deg) : 122.47
 B (ring opening deg) : 77.10
 PA of pole (deg) : 50.88
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.474
 C/A sky separation (km) : 48969.4
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



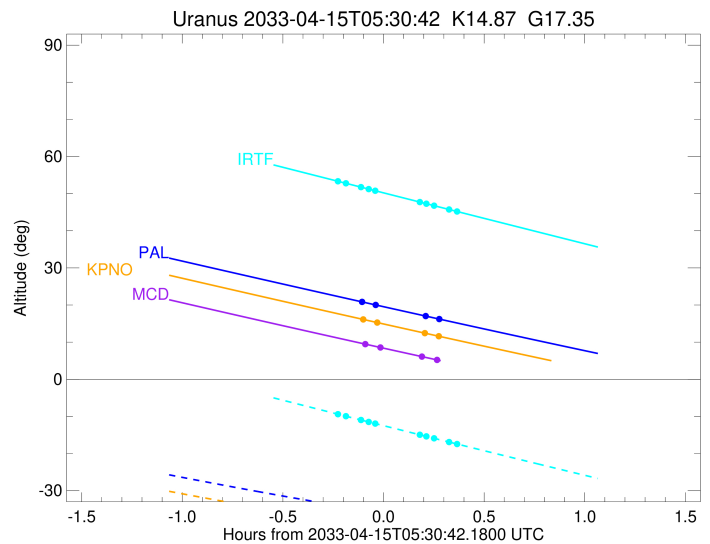
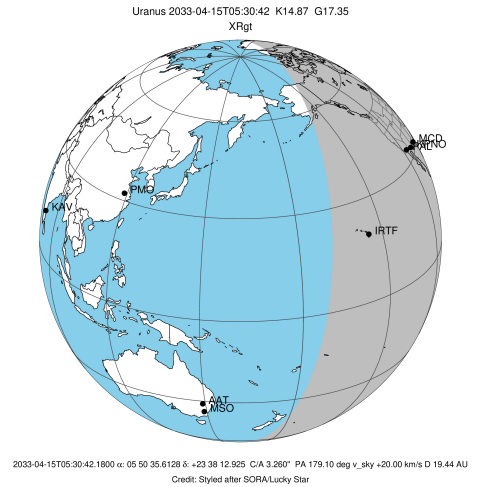
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-15T05:26:32.142		9.21	-44.24	50793.12	-4.54		
lambda	I	2033-04-15T05:29:52.367		8.54	-44.61	50026.71	-3.03		

No planet occultations

lambda	E	2033-04-15T05:42:04.731		6.12	-45.87	50026.71	3.03		
epsilon	E	2033-04-15T05:45:13.929		5.50	-46.17	50744.11	4.55		

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target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2033-04-15T05:33:55.570
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      : 3427508421902219776
2Mass ID (if available) : 05503560+2338128
ICRS Star Coord at Epoch: 05h 50m 35.61280s +23:38:12.92534s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 14.871
G magnitude          : 17.351
RP magnitude         : 16.535
BP magnitude         : 18.037
DUPflag             : 0
Distance (au)       : 19.437
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : 20.00
Sun-Target sep (deg) : 62.73
Sun-Moon sep (deg)  : 122.83
B (ring opening deg) : 77.10
PA of pole (deg)    : 50.88
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.266
C/A sky separation (km) : 46043.8
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	2033-04-15T05:17:47.449		53.18	-9.56	50834.41	-7.97		
lambda	I	2033-04-15T05:19:32.193		52.78	-9.96	50026.71	-7.36		
delta	I	2033-04-15T05:24:02.396		51.75	-10.98	48300.35	-5.39		
gamma	I	2033-04-15T05:26:21.849		51.22	-11.51	47624.71	-4.29		
eta	I	2033-04-15T05:28:19.271		50.77	-11.96	47176.12	-3.34		

No planet occultations

eta	E	2033-04-15T05:41:27.543		47.75	-14.93	47176.12	3.35		
gamma	E	2033-04-15T05:43:24.358		47.31	-15.37	47622.73	4.30		
delta	E	2033-04-15T05:45:44.053		46.77	-15.89	48300.35	5.40		
lambda	E	2033-04-15T05:50:13.680		45.75	-16.90	50026.71	7.37		
epsilon	E	2033-04-15T05:51:47.336		45.39	-17.25	50747.41	7.99		