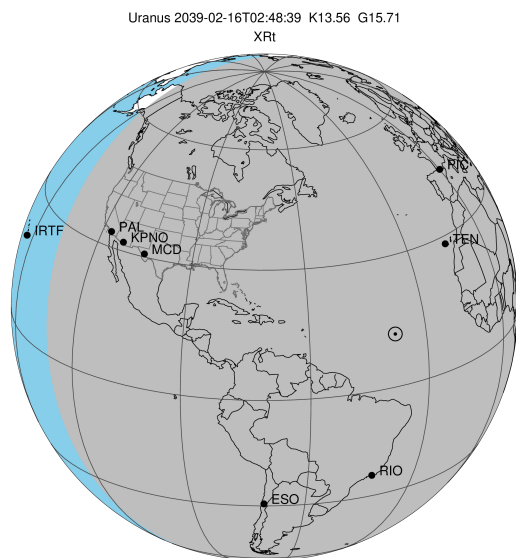


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-02-16T02:48:39.700
 Event type : XRT
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Gaia source ID : 674531146483338752
 2Mass ID (if available) : 07480572+2140298

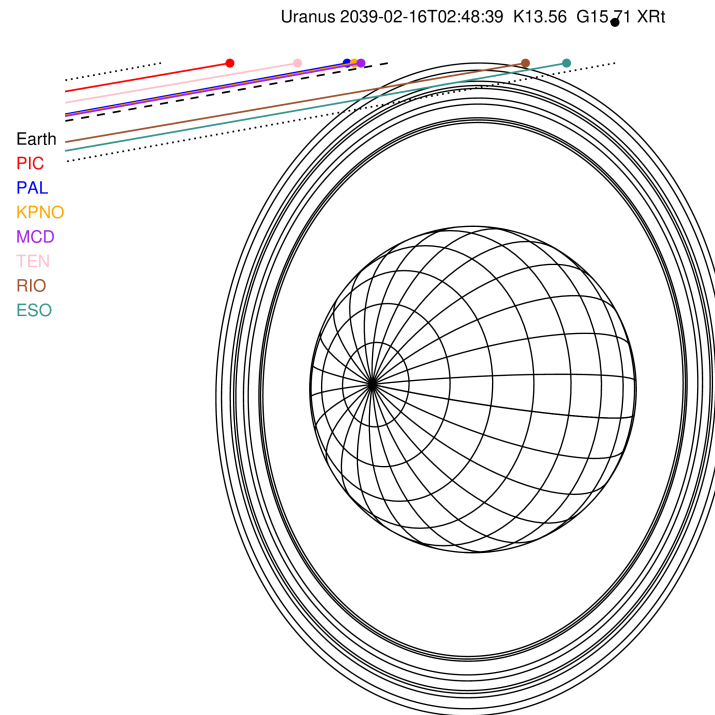
ICRS Star Coord at Epoch: 07h 48m 05.72334s +21:40:29.78019s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.560
 G magnitude : 15.708
 RP magnitude : 15.055
 BP magnitude : 16.201
 DUPflag : 0
 Distance (au) : 17.793
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.82
 Sun-Target sep (deg) : 148.24
 Sun-Moon sep (deg) : 121.79
 B (ring opening deg) : 51.87
 PA of pole (deg) : 87.13

#	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

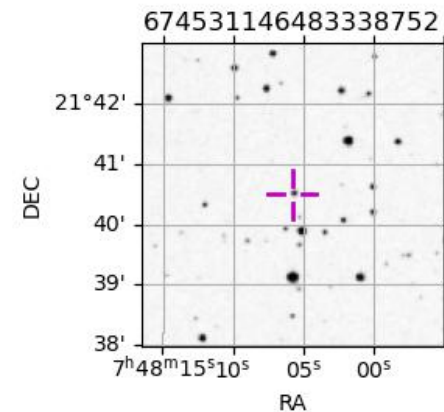


2039-02-16T02:48:39.7000 cc: 07 48 05.7233 s : +21 40 29.780 C/A 4.088° PA 190.17 deg v_sky -18.82 km/s D 17.79 AU
 Credit: Styled after SORA/Lucky Star

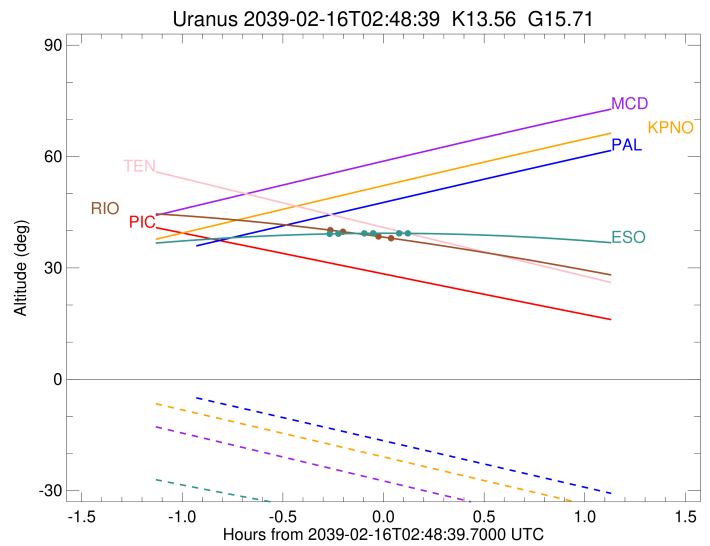
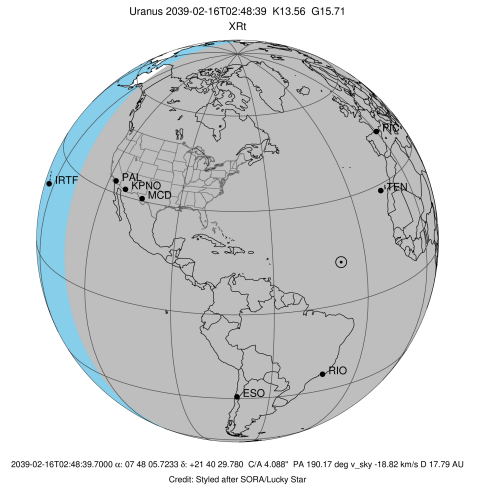


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
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					PnnRnn
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	++		++	FEB 16 02:33 - FEB 16 02:49	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++		+++	FEB 16 02:33 - FEB 16 02:55	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 : 2039-02-16T02:45:23.390
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 Observer code : RIO
 Location : Rio de Janeiro
 Latitude (deg) : -22.89506
 E. Longitude (deg) : 316.77708
 Altitude (km) : 0.033
 Gaia source ID : 674531146483338752
 2Mass ID (if available) : 07480572+2140298
 ICRS Star Coord at Epoch: 07h 48m 05.72334s +21:40:29.78019s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.560
 G magnitude : 15.708
 RP magnitude : 15.055
 BP magnitude : 16.201
 DUPflag : 0
 Distance (au) : 17.793
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.82
 Sun-Target sep (deg) : 148.24
 Sun-Moon sep (deg) : 122.57
 B (ring opening deg) : 51.87
 PA of pole (deg) : 87.13
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.795
 C/A sky separation (km) : 48979.0
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

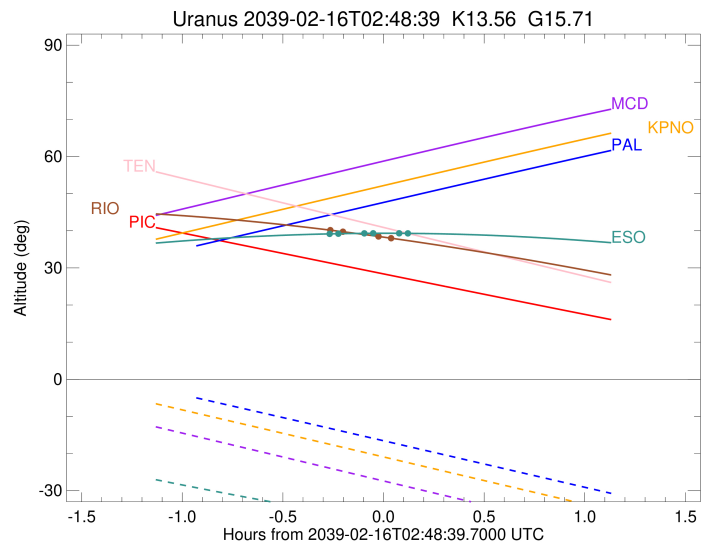
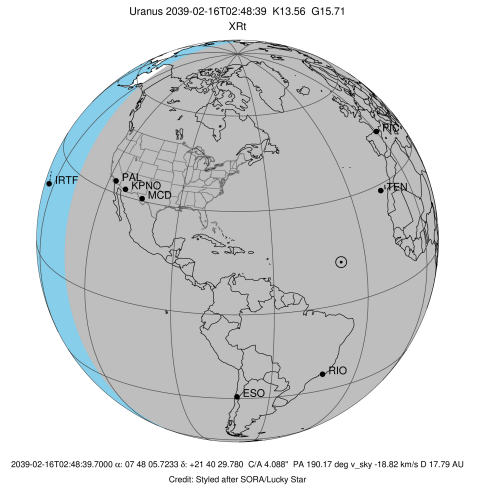


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-02-16T02:33:52.779		40.05	-53.91	50786.65	-5.44		
lambda	I	2039-02-16T02:36:37.730		39.74	-54.05	50026.71	-3.68		

No planet occultations

lambda	E	2039-02-16T02:47:06.387		38.48	-54.50	50026.71	3.67		
epsilon	E	2039-02-16T02:49:43.602		38.15	-54.58	50743.65	5.44		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2039-02-16T02:47:45.080
 Event type : XRt
 : No Uranus occs
 : Ring occs: topocentric, not geocentric
 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 : 674531146483338752
 2Mass ID (if available) : 07480572+2140298
 ICRS Star Coord at Epoch: 07h 48m 05.72334s +21:40:29.78019s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 13.560
 G magnitude : 15.708
 RP magnitude : 15.055
 BP magnitude : 16.201
 DUPflag : 0
 Distance (au) : 17.793
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -18.82
 Sun-Target sep (deg) : 148.24
 Sun-Moon sep (deg) : 122.36
 B (ring opening deg) : 51.87
 PA of pole (deg) : 87.13
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.705
 C/A sky separation (km) : 47806.1
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-02-16T02:33:22.811		39.18	-35.94	50802.92	-7.45		
lambda	I	2039-02-16T02:35:14.456		39.21	-36.22	50026.71	-6.35		
delta	I	2039-02-16T02:43:13.035		39.31	-37.42	48300.36	-0.76		

No planet occultations

delta	E	2039-02-16T02:45:19.014		39.32	-37.73	48300.37	0.77		
lambda	E	2039-02-16T02:53:17.652		39.32	-38.88	50026.71	6.35		
epsilon	E	2039-02-16T02:55:01.566		39.31	-39.12	50744.73	7.45		