

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:04:43.990  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414

ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s

RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 133.26  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84

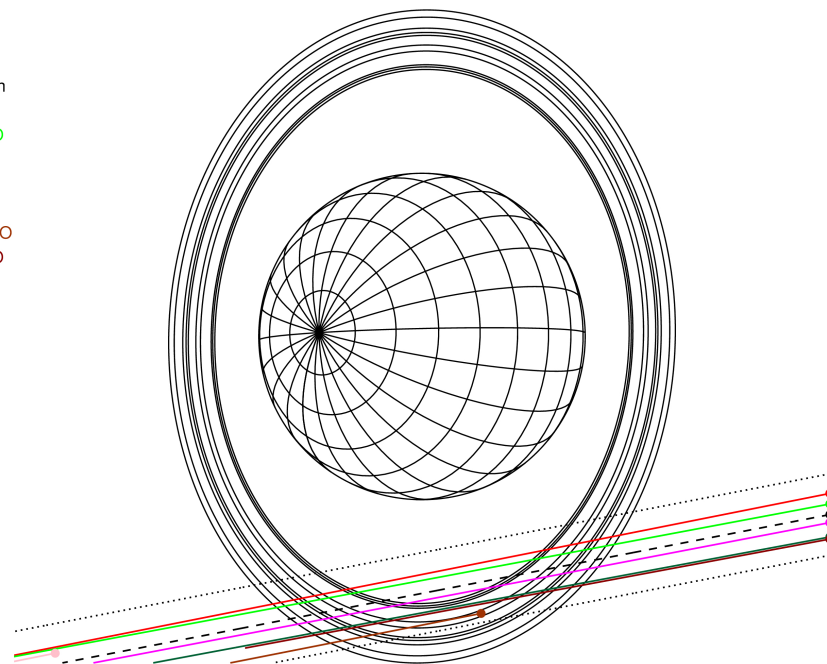
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2039-01-20T18:04:43.9900 α: 07 52 35.00013 s: +21 28 41.517 C/A 3.075° PA 10.94 deg v\_sky -23.20 km/s D 17.66 AU  
 Credit: Styled after SORA/Lucky Star

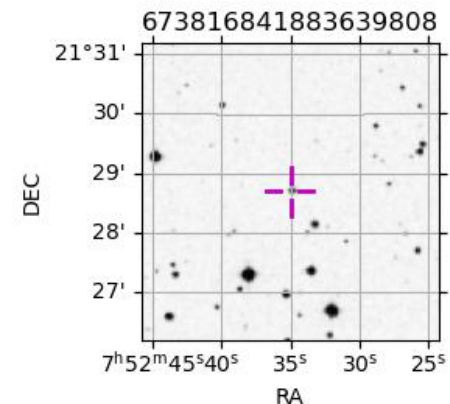
Uranus 2039-01-20T18:04:43 K13.39 G15.74 XRgt

Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 AAT  
 SAAO  
 MSO

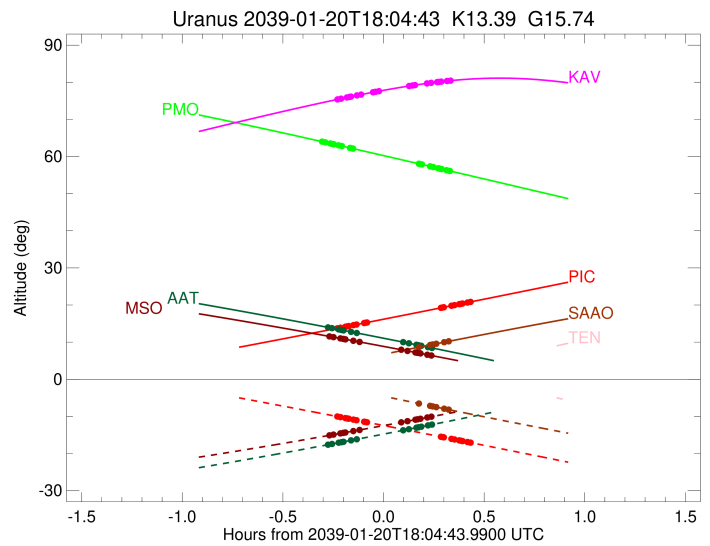
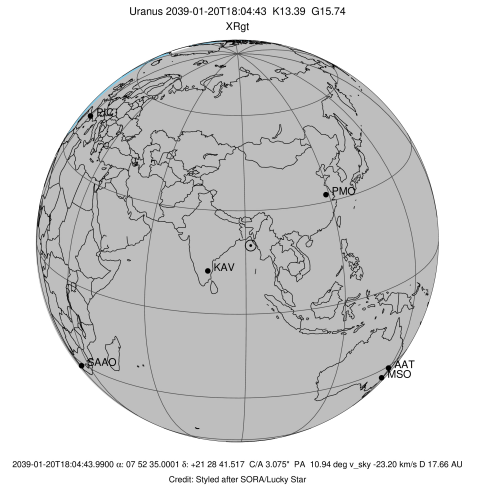


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 20 17:50 - JAN 20 18:31	PnnRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++		+++++	JAN 20 17:46 - JAN 20 18:24	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					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++		+++++	JAN 20 17:50 - JAN 20 18:25	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	+++++		+++++	JAN 20 17:47 - JAN 20 18:19	PnnRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8			+++++	JAN 20 18:15 - JAN 20 18:24	PnnRne
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++		+++++	JAN 20 17:48 - JAN 20 18:19	PnnRie



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:08:26.160  
 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 : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414  
 ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 132.91  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.854  
 C/A sky separation (km) : 36558.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.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

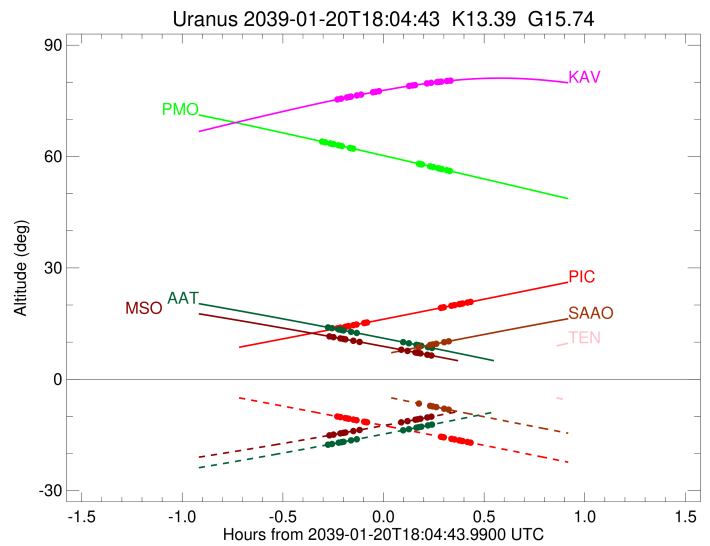
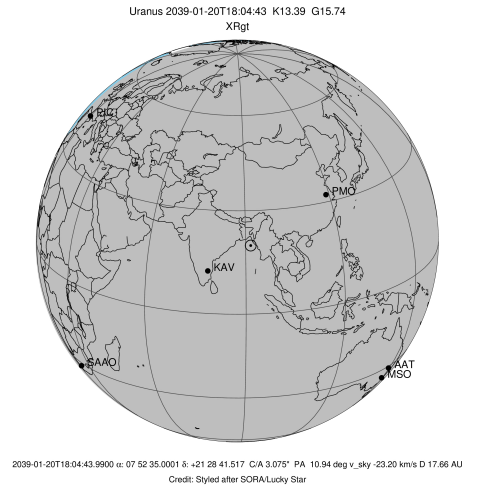


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-20T17:50:50.871		13.71	-10.01	51304.95	-20.69		
lambda	I	2039-01-20T17:51:53.989		13.89	-10.20	50026.71	-19.96		
delta	I	2039-01-20T17:53:22.433		14.15	-10.45	48300.35	-19.06		
gamma	I	2039-01-20T17:53:57.870		14.26	-10.56	47631.50	-18.68		
eta	I	2039-01-20T17:54:22.428		14.33	-10.63	47176.12	-18.40		
beta	I	2039-01-20T17:55:47.140		14.58	-10.88	45661.70	-17.40		
alpha	I	2039-01-20T17:56:42.112		14.74	-11.04	44719.83	-16.69		
4	I	2039-01-20T17:58:57.394		15.14	-11.43	42606.97	-14.71		
5	I	2039-01-20T17:59:20.283		15.21	-11.50	42277.93	-14.41		
6	I	2039-01-20T17:59:49.520		15.30	-11.59	41828.91	-13.89		

No planet occultations

6	E	2039-01-20T18:21:51.820	19.24	-15.49	41867.11	13.91		
5	E	2039-01-20T18:22:24.758	19.34	-15.59	42315.25	14.43		
4	E	2039-01-20T18:22:41.563	19.39	-15.64	42565.29	14.73		
alpha	E	2039-01-20T18:25:00.161	19.81	-16.05	44750.55	16.72		
beta	E	2039-01-20T18:25:54.438	19.97	-16.21	45680.41	17.44		
eta	E	2039-01-20T18:27:17.760	20.22	-16.46	47176.12	18.44		
gamma	E	2039-01-20T18:27:42.092	20.30	-16.54	47628.24	18.72		
delta	E	2039-01-20T18:28:17.625	20.40	-16.64	48300.35	19.11		
lambda	E	2039-01-20T18:29:45.865	20.67	-16.91	50026.71	20.01		
epsilon	E	2039-01-20T18:30:59.622	20.89	-17.13	51527.76	20.75		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:03:08.060  
 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 : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414  
 ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 134.16  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.931  
 C/A sky separation (km) : 37551.5  
 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

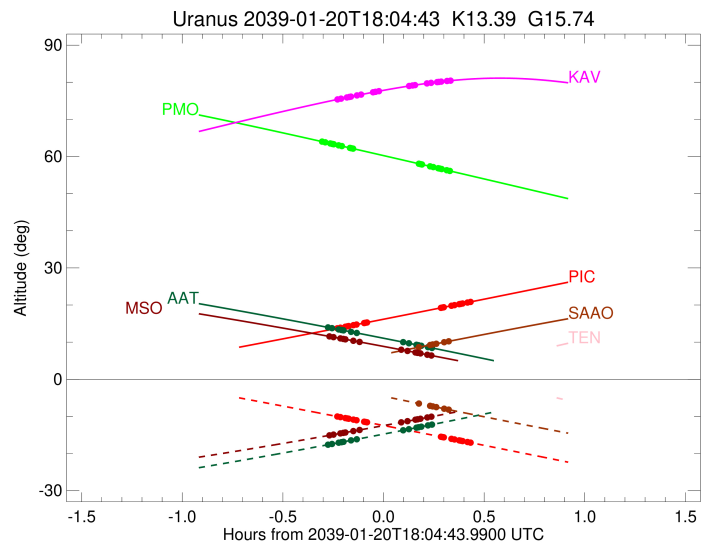
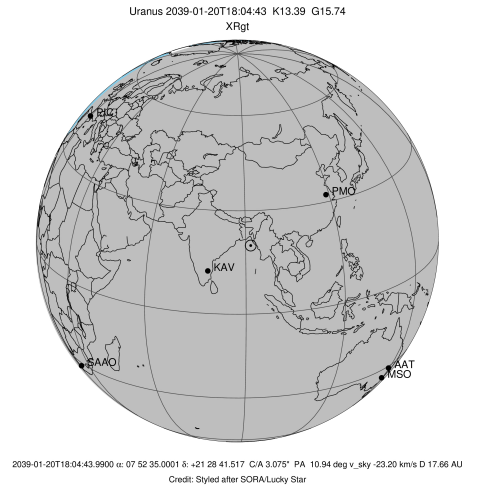


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-20T17:46:18.039		64.04	-66.50	51318.33	-20.40		
lambda	I	2039-01-20T17:47:22.886		63.82	-66.29	50026.71	-19.59		
delta	I	2039-01-20T17:48:53.260		63.52	-66.00	48300.35	-18.60		
gamma	I	2039-01-20T17:49:29.638		63.39	-65.89	47631.53	-18.17		
eta	I	2039-01-20T17:49:54.916		63.31	-65.80	47176.12	-17.86		
beta	I	2039-01-20T17:51:22.531		63.01	-65.52	45662.61	-16.73		
alpha	I	2039-01-20T17:52:19.902		62.81	-65.33	44721.46	-15.92		
4	I	2039-01-20T17:54:43.639		62.32	-64.86	42605.34	-13.65		
5	I	2039-01-20T17:55:07.986		62.24	-64.78	42281.77	-13.29		
6	I	2039-01-20T17:55:40.061		62.13	-64.68	41831.43	-12.69		

No planet occultations

6	E	2039-01-20T18:15:16.826		58.06	-60.74	41865.78	12.68		
5	E	2039-01-20T18:15:52.711		57.93	-60.62	42315.21	13.28		
4	E	2039-01-20T18:16:11.098		57.87	-60.56	42567.07	13.64		
alpha	E	2039-01-20T18:18:38.447		57.35	-60.06	44750.19	15.91		
beta	E	2039-01-20T18:19:35.292		57.16	-59.86	45680.24	16.72		
eta	E	2039-01-20T18:21:01.808		56.85	-59.57	47176.12	17.84		
gamma	E	2039-01-20T18:21:26.943		56.77	-59.48	47628.36	18.15		
delta	E	2039-01-20T18:22:03.542		56.64	-59.36	48300.35	18.57		
lambda	E	2039-01-20T18:23:34.039		56.32	-59.05	50026.71	19.56		
epsilon	E	2039-01-20T18:24:49.455		56.06	-58.79	51530.47	20.37		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:05:19.810  
 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 : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414  
 ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 133.87  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.171  
 C/A sky separation (km) : 40623.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ural11.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ural11.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

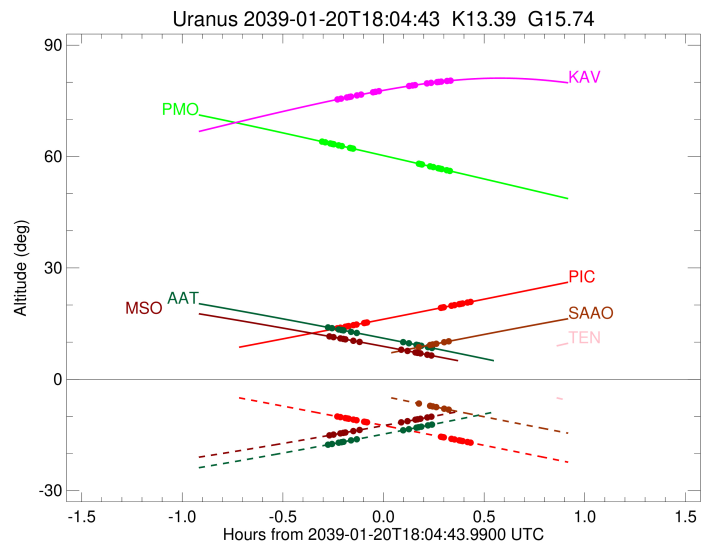
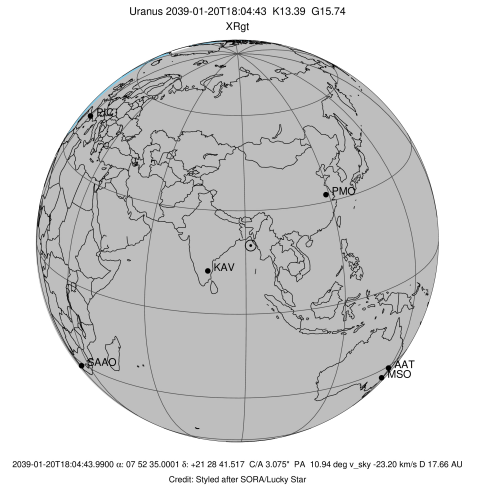


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-20T17:50:50.656		75.36	-72.74	51351.58	-18.30		
lambda	I	2039-01-20T17:52:05.528		75.59	-73.01	50026.71	-17.25		
delta	I	2039-01-20T17:53:49.609		75.92	-73.38	48300.35	-15.90		
gamma	I	2039-01-20T17:54:32.462		76.05	-73.53	47631.58	-15.31		
eta	I	2039-01-20T17:55:02.646		76.14	-73.64	47176.12	-14.87		
beta	I	2039-01-20T17:56:50.249		76.47	-74.02	45665.28	-13.23		
alpha	I	2039-01-20T17:58:04.471		76.69	-74.28	44726.39	-12.00		
4	I	2039-01-20T18:01:36.934		77.31	-75.02	42598.73	-8.02		
5	I	2039-01-20T18:02:17.258		77.42	-75.16	42294.47	-7.28		
6	I	2039-01-20T18:03:22.550		77.61	-75.38	41841.51	-5.88		

No planet occultations

6	E	2039-01-20T18:12:22.982		79.00	-77.18	41857.38	5.89		
5	E	2039-01-20T18:13:32.361		79.16	-77.41	42312.79	7.28		
4	E	2039-01-20T18:14:06.675		79.24	-77.52	42576.34	8.03		
alpha	E	2039-01-20T18:17:42.471		79.70	-78.19	44747.98	12.00		
beta	E	2039-01-20T18:18:56.109		79.85	-78.42	45679.19	13.23		
eta	E	2039-01-20T18:20:42.480		80.05	-78.74	47176.12	14.88		
gamma	E	2039-01-20T18:21:12.483		80.10	-78.83	47628.93	15.31		
delta	E	2039-01-20T18:21:55.499		80.18	-78.95	48300.35	15.91		
lambda	E	2039-01-20T18:23:39.552		80.35	-79.25	50026.71	17.25		
epsilon	E	2039-01-20T18:25:04.880		80.47	-79.49	51542.22	18.30		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:01:01.970  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Observer code : AAT  
 Location : Siding Spring (AAT)  
 Latitude (deg) : -31.27703  
 E. Longitude (deg) : 149.06608  
 Altitude (km) : 1.164  
 Gaia source ID : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414  
 ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 133.97  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.322  
 C/A sky separation (km) : 42552.0  
 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



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

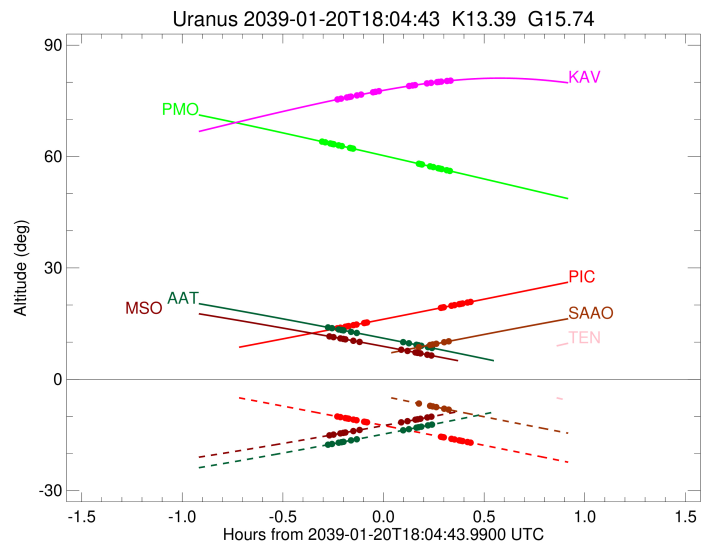
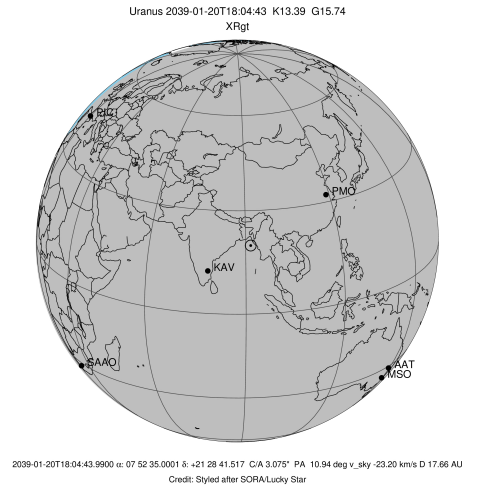
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-20T17:47:58.613		14.01	-17.67	51375.23	-16.53		
lambda	I	2039-01-20T17:49:23.795		13.76	-17.43	50026.71	-15.28		
delta	I	2039-01-20T17:51:23.114		13.42	-17.09	48300.35	-13.62		
gamma	I	2039-01-20T17:52:13.592		13.27	-16.94	47631.56	-12.87		
eta	I	2039-01-20T17:52:49.767		13.16	-16.84	47176.12	-12.31		
beta	I	2039-01-20T17:55:04.425		12.77	-16.46	45667.46	-10.10		
alpha	I	2039-01-20T17:56:46.215		12.47	-16.16	44730.64	-8.28		

No planet occultations

alpha	E	2039-01-20T18:10:37.488		10.00	-13.74	44745.66	8.27		
beta	E	2039-01-20T18:12:18.811		9.69	-13.44	45678.16	10.09		
eta	E	2039-01-20T18:14:32.414		9.29	-13.04	47176.12	12.29		
gamma	E	2039-01-20T18:15:08.465		9.18	-12.94	47629.30	12.85		
delta	E	2039-01-20T18:15:59.198		9.02	-12.79	48300.35	13.60		
lambda	E	2039-01-20T18:17:58.726		8.66	-12.43	50026.71	15.26		
epsilon	E	2039-01-20T18:19:34.603		8.36	-12.14	51547.81	16.50		



target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:07:31.410  
 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 : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414  
 ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 132.88  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.462  
 C/A sky separation (km) : 44343.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ural11.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ural11.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

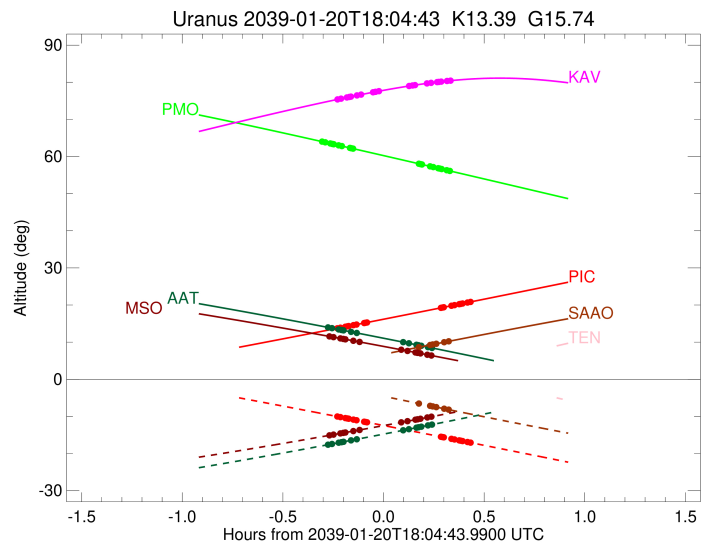
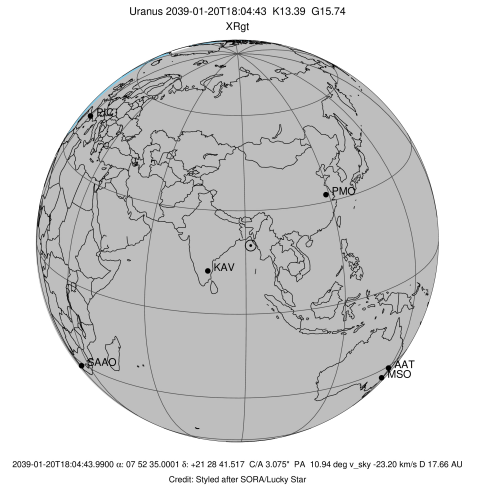


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2039-01-20T17:56:22.664		5.19	-2.99x	51395.20	-14.74		
lambda	I	2039-01-20T17:58:01.061		5.49	-3.30x	50026.71	-13.22		
delta	I	2039-01-20T18:00:22.845		5.93	-3.75x	48300.35	-11.09		
gamma	I	2039-01-20T18:01:26.055		6.12	-3.95x	47631.51	-10.06		
eta	I	2039-01-20T18:02:13.134		6.26	-4.10x	47176.12	-9.28		
beta	I	2039-01-20T18:05:33.981		6.88	-4.73x	45670.14	-5.68		

No planet occultations

beta	E	2039-01-20T18:15:17.082		8.64	-6.54	45676.21	5.69		
eta	E	2039-01-20T18:18:36.516		9.23	-7.16	47176.12	9.29		
gamma	E	2039-01-20T18:19:23.370		9.37	-7.30	47629.76	10.08		
delta	E	2039-01-20T18:20:26.675		9.56	-7.50	48300.35	11.10		
lambda	E	2039-01-20T18:22:48.252		9.98	-7.93	50026.71	13.25		
epsilon	E	2039-01-20T18:24:37.211		10.30	-8.26	51552.63	14.76		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2039-01-20T18:01:08.100  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Observer code : MSO  
 Location : Mt. Stromlo Observatory  
 Latitude (deg) : -35.32000  
 E. Longitude (deg) : 149.00833  
 Altitude (km) : 0.770  
 Gaia source ID : 673816841883639808  
 2Mass ID (if available) : 07523500+2128414  
 ICRS Star Coord at Epoch: 07h 52m 35.00013s +21:28:41.51672s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.393  
 G magnitude : 15.741  
 RP magnitude : 14.995  
 BP magnitude : 16.333  
 DUPflag : 0  
 Distance (au) : 17.662  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.20  
 Sun-Target sep (deg) : 176.01  
 Sun-Moon sep (deg) : 133.92  
 B (ring opening deg) : 50.84  
 PA of pole (deg) : 87.84  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.348  
 C/A sky separation (km) : 42893.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLvl.spk  
 ural11.bsp  
 IAU\_URANUS\_for\_RINGFIT.tpc  
 vgr2.ural11.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	2039-01-20T17:48:23.621		11.58	-15.14	51379.29	-16.21		
lambda	I	2039-01-20T17:49:50.914		11.34	-14.91	50026.71	-14.92		
delta	I	2039-01-20T17:51:53.574		11.01	-14.58	48300.35	-13.19		
gamma	I	2039-01-20T17:52:45.827		10.86	-14.44	47631.56	-12.40		
eta	I	2039-01-20T17:53:23.451		10.76	-14.34	47176.12	-11.81		
beta	I	2039-01-20T17:55:45.376		10.36	-13.96	45667.90	-9.44		
alpha	I	2039-01-20T17:57:36.221		10.05	-13.66	44731.56	-7.43		

No planet occultations

alpha	E	2039-01-20T18:10:02.773		7.95	-11.60	44745.05	7.43		
beta	E	2039-01-20T18:11:53.147		7.63	-11.29	45677.90	9.43		
eta	E	2039-01-20T18:14:14.007		7.23	-10.89	47176.12	11.79		
gamma	E	2039-01-20T18:14:51.506		7.12	-10.79	47629.38	12.38		
delta	E	2039-01-20T18:15:44.011		6.97	-10.64	48300.35	13.17		
lambda	E	2039-01-20T18:17:46.870		6.61	-10.29	50026.71	14.90		
epsilon	E	2039-01-20T18:19:24.861		6.33	-10.01	51548.75	16.18		