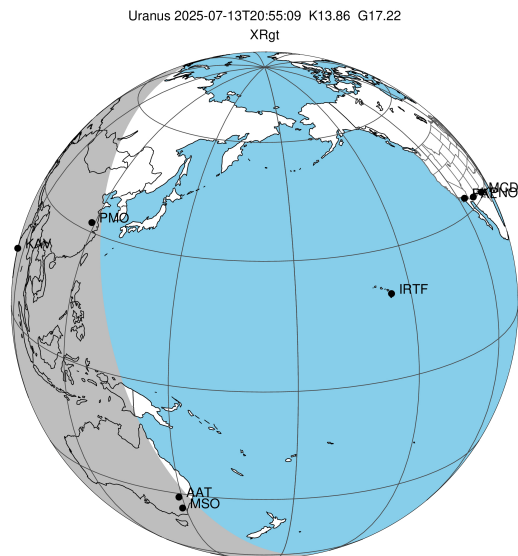


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-07-13T20:55:09.680
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 51116883988514304
 2Mass ID (if available) : 03510962+1955427

ICRS Star Coord at Epoch: 03h 51m 09.63628s +19:55:42.84467s

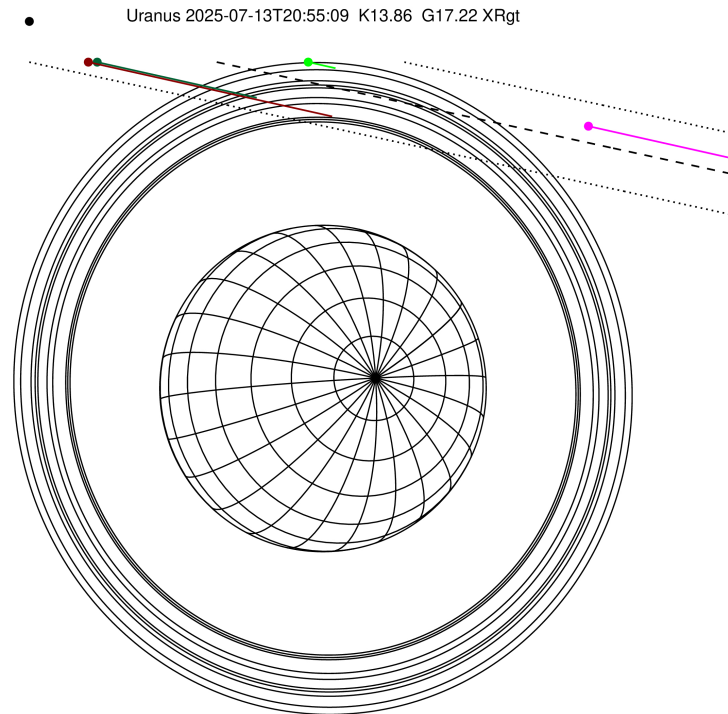
RUWE (>1.4 is poor) : 1.34
 K magnitude : 13.856
 G magnitude : 17.219
 RP magnitude : 16.182
 BP magnitude : 18.266
 DUPflag : 0
 Distance (au) : 20.138
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.91
 Sun-Target sep (deg) : 51.43
 Sun-Moon sep (deg) : 91.86
 B (ring opening deg) : 70.81
 PA of pole (deg) : -78.78

#	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



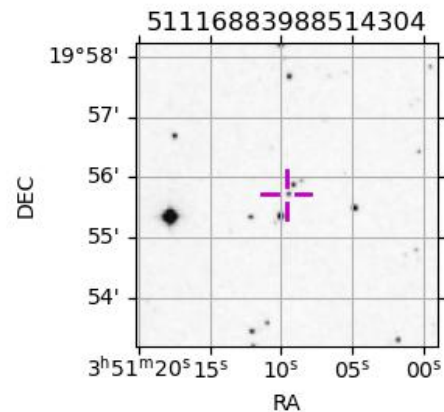
2025-07-13T20:55:09.6800 ex: 03 51 09.6363 8: +19 55 42.845 C/A 3.181" PA 167.75 deg v_sky +24.91 km/s D 20.14 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PMO
 KAV
 AAT
 MSO

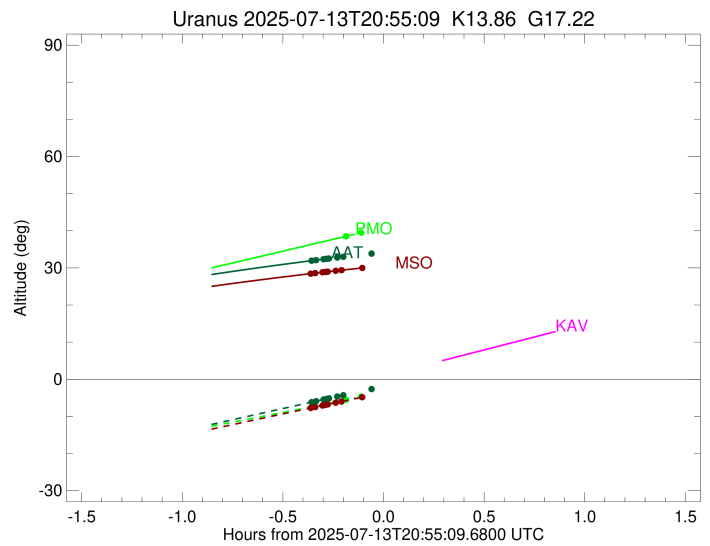
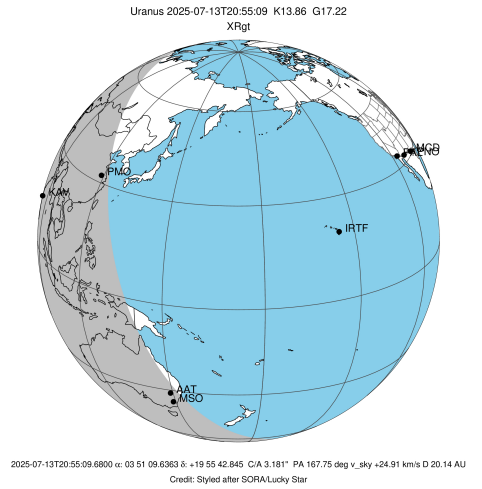


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+			JUL 13 20:44 - JUL 13 20:44	PnnRin
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					PnnRnn
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1	+++++			JUL 13 20:34 - JUL 13 20:38	PnnRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++++			JUL 13 20:33 - JUL 13 20:42	PnnRin



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-07-13T20:52:47.570
 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 : 51116883988514304
 2Mass ID (if available) : 03510962+1955427
 ICRS Star Coord at Epoch: 03h 51m 09.63628s +19:55:42.84467s
 RUWE (>1.4 is poor) : 1.34
 K magnitude : 13.856
 G magnitude : 17.219
 RP magnitude : 16.182
 BP magnitude : 18.266
 DUPflag : 0
 Distance (au) : 20.138
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.91
 Sun-Target sep (deg) : 51.43
 Sun-Moon sep (deg) : 92.52
 B (ring opening deg) : 70.81
 PA of pole (deg) : -78.78
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.381
 C/A sky separation (km) : 49377.6
 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

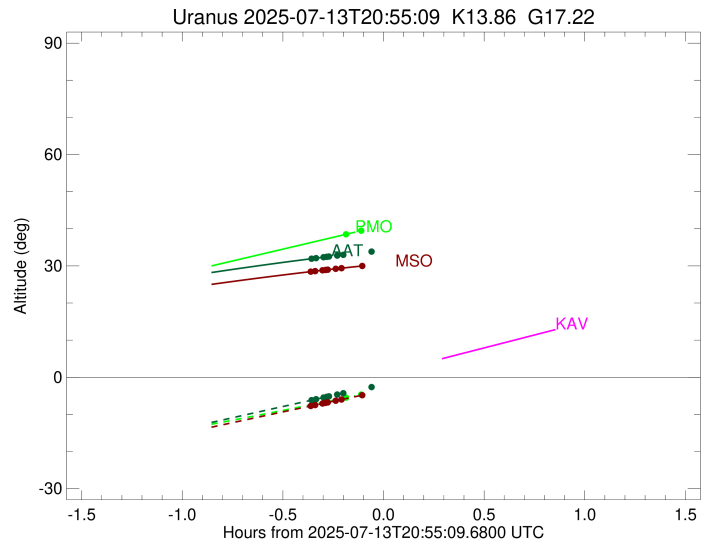
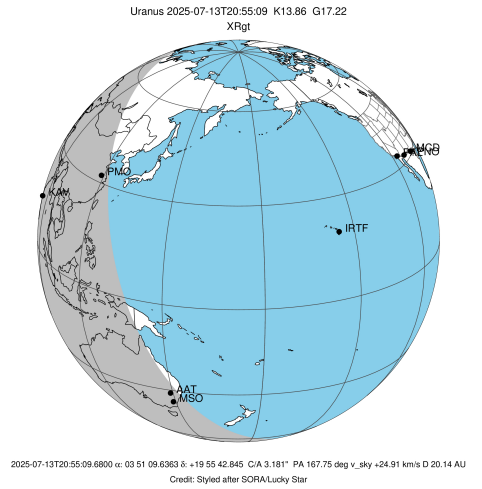


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-07-13T20:44:25.766		38.61	-5.42	51015.00	-5.74		
lambda	I	2025-07-13T20:48:37.559		39.50	-4.65x	50026.71	-2.27		

No planet occultations

lambda	E	2025-07-13T20:54:15.016		40.70	-3.60x	50026.71	2.27		
epsilon	E	2025-07-13T20:58:58.088		41.70	-2.72x	51193.50	5.73		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-07-13T20:53:11.710
 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 : 51116883988514304
 2Mass ID (if available) : 03510962+1955427
 ICRS Star Coord at Epoch: 03h 51m 09.63628s +19:55:42.84467s
 RUWE (>1.4 is poor) : 1.34
 K magnitude : 13.856
 G magnitude : 17.219
 RP magnitude : 16.182
 BP magnitude : 18.266
 DUPflag : 0
 Distance (au) : 20.138
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.91
 Sun-Target sep (deg) : 51.43
 Sun-Moon sep (deg) : 92.42
 B (ring opening deg) : 70.81
 PA of pole (deg) : -78.78
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.889
 C/A sky separation (km) : 42190.3
 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

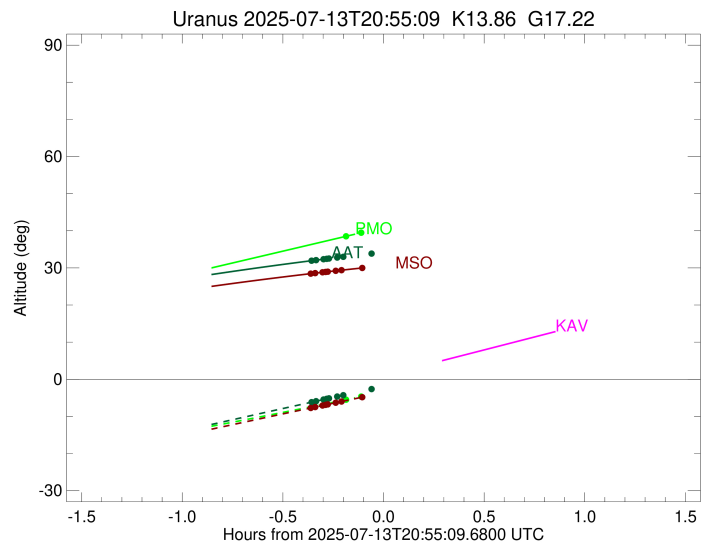
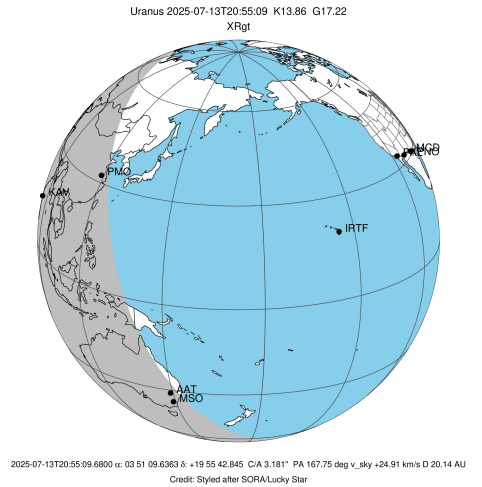


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2025-07-13T20:34:02.312		31.98	-6.11	50887.60	-14.26		
lambda	I	2025-07-13T20:35:04.509		32.09	-5.90	50026.71	-13.55		
delta	I	2025-07-13T20:37:18.600		32.34	-5.46	48300.35	-12.18		
gamma	I	2025-07-13T20:38:15.843		32.45	-5.27	47621.00	-11.55		
eta	I	2025-07-13T20:38:55.109		32.52	-5.14	47176.12	-11.11		
beta	I	2025-07-13T20:41:25.281		32.80	-4.64x	45642.67	-9.28		
alpha	I	2025-07-13T20:43:14.760		32.99	-4.28x	44703.52	-7.83		
4	I	2025-07-13T20:50:56.422		33.79	-2.77x	42620.36	-1.09		

No planet occultations

4	E	2025-07-13T20:53:06.943		34.00	-2.34x	42618.74	1.09		
alpha	E	2025-07-13T21:00:47.498		34.73	-0.85x	44688.68	7.83		
beta	E	2025-07-13T21:02:38.836		34.90	-0.49x	45642.16	9.27		
eta	E	2025-07-13T21:05:09.320		35.12	-0.00x	47176.12	11.09		
gamma	E	2025-07-13T21:05:48.770		35.18	0.12x	47622.59	11.54		
delta	E	2025-07-13T21:06:45.947		35.26	0.31x	48300.35	12.16		
lambda	E	2025-07-13T21:09:00.223		35.45	0.74x	50026.71	13.53		
epsilon	E	2025-07-13T21:10:33.796		35.58	1.04x	51333.41	14.24		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2025-07-13T20:53:12.670
 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 : 51116883988514304
 2Mass ID (if available) : 03510962+1955427
 ICRS Star Coord at Epoch: 03h 51m 09.63628s +19:55:42.84467s
 RUWE (>1.4 is poor) : 1.34
 K magnitude : 13.856
 G magnitude : 17.219
 RP magnitude : 16.182
 BP magnitude : 18.266
 DUPflag : 0
 Distance (au) : 20.138
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.91
 Sun-Target sep (deg) : 51.43
 Sun-Moon sep (deg) : 92.37
 B (ring opening deg) : 70.81
 PA of pole (deg) : -78.78
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.869
 C/A sky separation (km) : 41902.2
 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	2025-07-13T20:33:47.692		28.48	-7.67	50884.38	-14.49		
lambda	I	2025-07-13T20:34:48.602		28.59	-7.48	50026.71	-13.79		
delta	I	2025-07-13T20:36:59.928		28.82	-7.06	48300.35	-12.47		
gamma	I	2025-07-13T20:37:55.734		28.91	-6.89	47621.01	-11.87		
eta	I	2025-07-13T20:38:33.902		28.98	-6.76	47176.12	-11.44		
beta	I	2025-07-13T20:40:58.702		29.22	-6.31	45642.81	-9.70		
alpha	I	2025-07-13T20:42:42.474		29.39	-5.98	44704.16	-8.35		
4	I	2025-07-13T20:48:40.116		29.97	-4.86x	42615.97	-3.18		

No planet occultations

4	E	2025-07-13T20:55:26.307		30.59	-3.59x	42612.82	3.18		
alpha	E	2025-07-13T21:01:22.813		31.10	-2.48x	44688.36	8.34		
beta	E	2025-07-13T21:03:08.441		31.24	-2.16x	45642.28	9.70		
eta	E	2025-07-13T21:05:33.546		31.44	-1.71x	47176.12	11.43		
gamma	E	2025-07-13T21:06:11.897		31.49	-1.59x	47622.64	11.86		
delta	E	2025-07-13T21:07:07.634		31.56	-1.42x	48300.35	12.46		
lambda	E	2025-07-13T21:09:19.139		31.73	-1.02x	50026.71	13.78		
epsilon	E	2025-07-13T21:10:51.402		31.85	-0.74x	51337.02	14.47		