

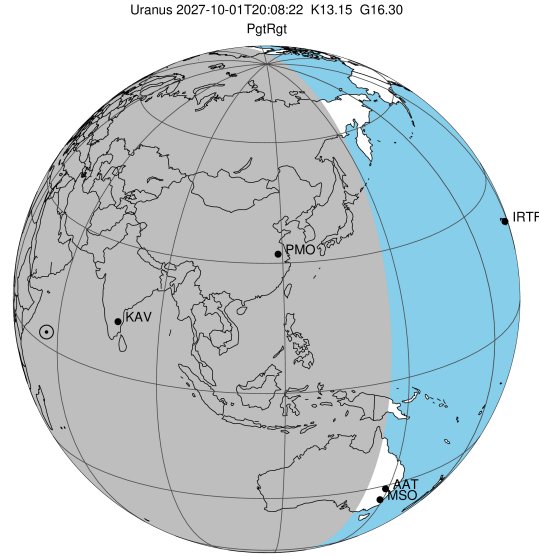
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-01T20:08:22.370  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 145031360436889088  
 2Mass ID (if available) : 04310930+2146096

ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s

RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.149  
 G magnitude : 16.296  
 RP magnitude : 15.365  
 BP magnitude : 17.184  
 DUPflag : 0  
 Distance (au) : 18.875  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -7.94  
 Sun-Target sep (deg) : 118.59  
 Sun-Moon sep (deg) : 141.26  
 B (ring opening deg) : 78.82  
 PA of pole (deg) : -55.46

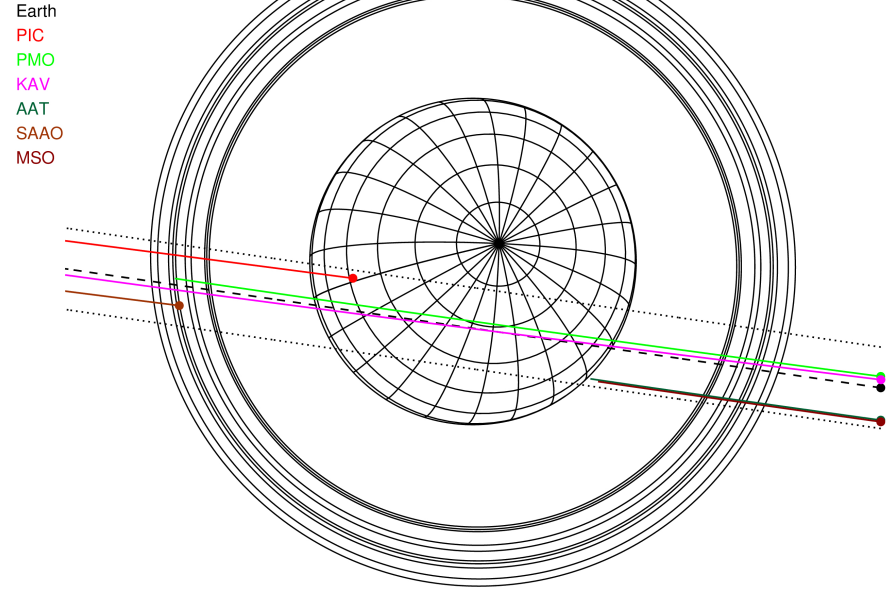
# a(km) ring

- 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



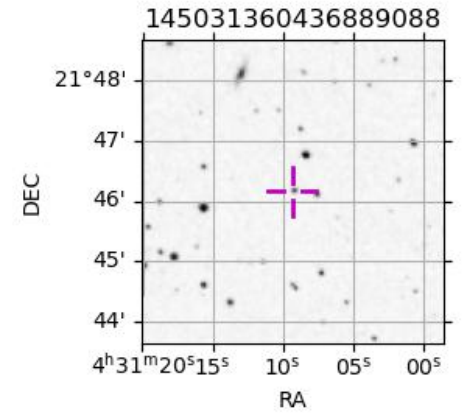
2027-10-01T20:08:22.3700 α: 04 31 09.3088 s: +21 46 09.637 C/A 0.752" PA 351.69 deg v\_sky - 7.94 km/s D 18.87 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2027-10-01T20:08:22 K13.15 G16.30 PgtRgt

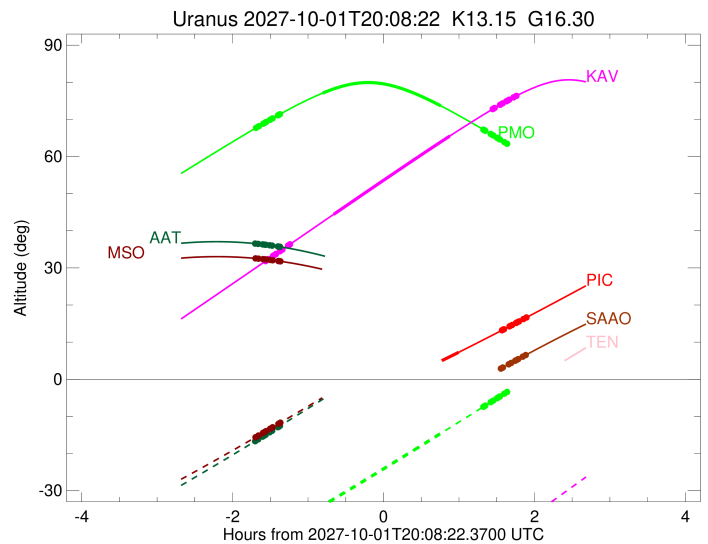
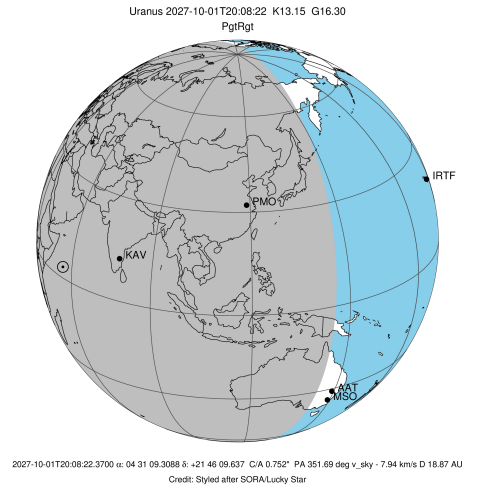


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1		+	+++++	OCT 01 21:08 - OCT 01 22:01	PneRne
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	OCT 01 18:26 - OCT 01 21:38	PieRie
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	+++++	+ +	+++++	OCT 01 18:33 - OCT 01 21:53	PieRie
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	+++++			OCT 01 18:25 - OCT 01 18:45	PnnRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8			++++	OCT 01 21:54 - OCT 01 22:00	PnnRne
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++			OCT 01 18:25 - OCT 01 18:46	PnnRin

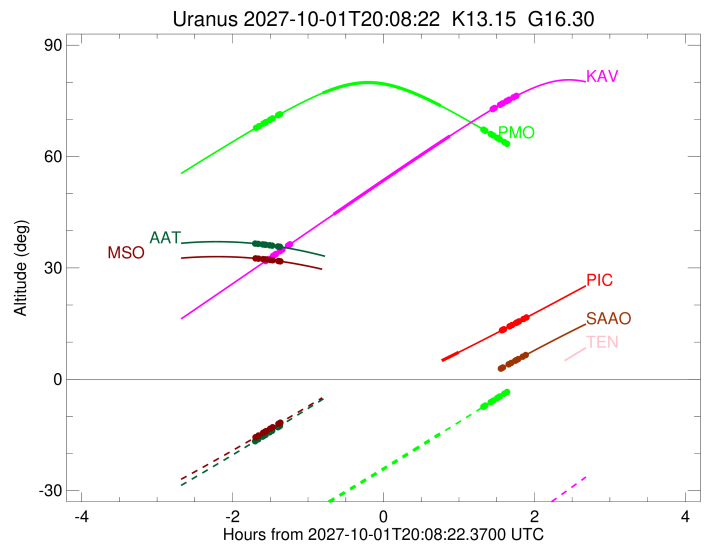
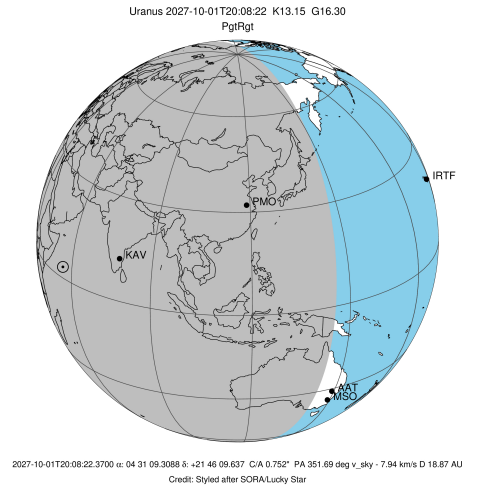


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-01T20:15:44.120  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 145031360436889088  
 2Mass ID (if available) : 04310930+2146096  
 ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.149  
 G magnitude : 16.296  
 RP magnitude : 15.365  
 BP magnitude : 17.184  
 DUPflag : 0  
 Distance (au) : 18.875  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -7.94  
 Sun-Target sep (deg) : 118.59  
 Sun-Moon sep (deg) : 140.74  
 B (ring opening deg) : 78.82  
 PA of pole (deg) : -55.46  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.371  
 C/A sky separation (km) : 5074.8  
 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\_itrfr93\_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	2027-10-01T18:25:51.956	-16.25x	-9.00	51524.92	-7.67			
lambda	I	2027-10-01T18:29:07.160	-15.89x	-9.60	50026.71	-7.68			
delta	I	2027-10-01T18:32:52.049	-15.46x	-10.28	48300.35	-7.68			
gamma	I	2027-10-01T18:34:19.813	-15.29x	-10.55	47626.54	-7.68			
eta	I	2027-10-01T18:35:18.478	-15.18x	-10.73	47176.12	-7.68			
beta	I	2027-10-01T18:38:36.967	-14.79x	-11.34	45651.71	-7.68			
alpha	I	2027-10-01T18:40:42.897	-14.54x	-11.72	44686.50	-7.68			
4	I	2027-10-01T18:45:15.274	-14.00x	-12.55	42596.37	-7.68			
5	I	2027-10-01T18:45:52.128	-13.92x	-12.66	42311.90	-7.68			
6	I	2027-10-01T18:46:48.934	-13.81x	-12.83	41869.09	-7.68			
Uranus	I	2027-10-01T19:22:17.779	-9.19x	-19.24	25357.83			6.58	6.89
Uranus	E	2027-10-01T21:08:06.428	7.26	-36.83	25136.33			-9.62	-10.07
6	E	2027-10-01T21:42:31.105	13.19	-41.61	41813.09	7.96			
5	E	2027-10-01T21:43:13.357	13.32	-41.70	42154.91	7.96			
4	E	2027-10-01T21:44:01.006	13.46	-41.81	42537.84	7.97			
alpha	E	2027-10-01T21:48:38.945	14.27	-42.39	44752.24	7.98			
beta	E	2027-10-01T21:50:33.753	14.61	-42.63	45666.37	7.99			
eta	E	2027-10-01T21:53:42.621	15.16	-43.01	47176.12	8.00			
gamma	E	2027-10-01T21:54:39.020	15.33	-43.13	47627.13	8.00			
delta	E	2027-10-01T21:56:03.171	15.58	-43.30	48300.35	8.00			
lambda	E	2027-10-01T21:59:38.780	16.22	-43.72	50026.71	8.01			
epsilon	E	2027-10-01T22:01:09.068	16.49	-43.89	50750.25	8.01			

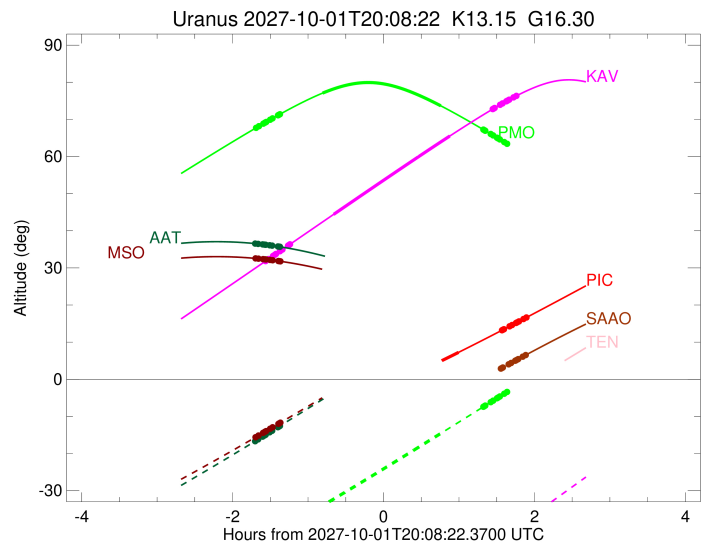
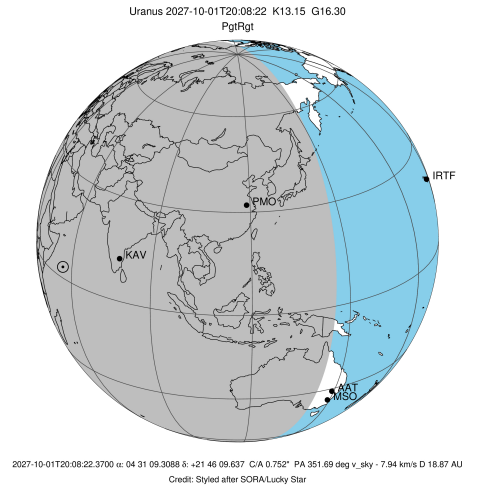
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-01T20:07:22.690  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 145031360436889088  
 2Mass ID (if available) : 04310930+2146096  
 ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.149  
 G magnitude : 16.296  
 RP magnitude : 15.365  
 BP magnitude : 17.184  
 DUPflag : 0  
 Distance (au) : 18.875  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -7.94  
 Sun-Target sep (deg) : 118.59  
 Sun-Moon sep (deg) : 141.89  
 B (ring opening deg) : 78.82  
 PA of pole (deg) : -55.46  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.678  
 C/A sky separation (km) : 9282.7  
 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	2027-10-01T18:26:20.937		67.59	-44.31	51510.79	-8.20		
lambda	I	2027-10-01T18:29:21.948		68.18	-43.76	50026.71	-8.20		
delta	I	2027-10-01T18:32:52.679		68.87	-43.11	48300.35	-8.19		
gamma	I	2027-10-01T18:34:14.924		69.14	-42.86	47627.02	-8.19		
eta	I	2027-10-01T18:35:10.021		69.32	-42.69	47176.12	-8.18		
beta	I	2027-10-01T18:38:16.580		69.92	-42.11	45650.08	-8.17		
alpha	I	2027-10-01T18:40:14.543		70.30	-41.74	44687.72	-8.17		
4	I	2027-10-01T18:44:31.479		71.11	-40.93	42592.40	-8.15		
5	I	2027-10-01T18:45:06.131		71.22	-40.82	42309.14	-8.15		
6	I	2027-10-01T18:45:59.006		71.38	-40.65	41871.84	-8.15		
Uranus	I	2027-10-01T19:19:52.662		77.08	-34.04	25446.17		4.91	5.14
Uranus	E	2027-10-01T20:53:58.436		73.66	-14.57	25064.84		-10.43	-10.92
6	E	2027-10-01T21:27:42.821		67.27	-7.43	41816.41	8.19		
5	E	2027-10-01T21:28:23.568		67.13	-7.28	42154.90	8.20		
4	E	2027-10-01T21:29:09.448		66.98	-7.12	42535.21	8.20		
alpha	E	2027-10-01T21:33:39.701		66.07	-6.17	44752.42	8.22		
beta	E	2027-10-01T21:35:30.959		65.70	-5.77	45664.75	8.23		
eta	E	2027-10-01T21:38:34.475		65.08	-5.12	47176.12	8.24		
gamma	E	2027-10-01T21:39:29.264		64.89	-4.93x	47627.54	8.24		
delta	E	2027-10-01T21:40:50.889		64.62	-4.64x	48300.35	8.24		
lambda	E	2027-10-01T21:44:20.150		63.91	-3.90x	50026.71	8.25		
epsilon	E	2027-10-01T21:45:47.268		63.61	-3.59x	50746.00	8.26		

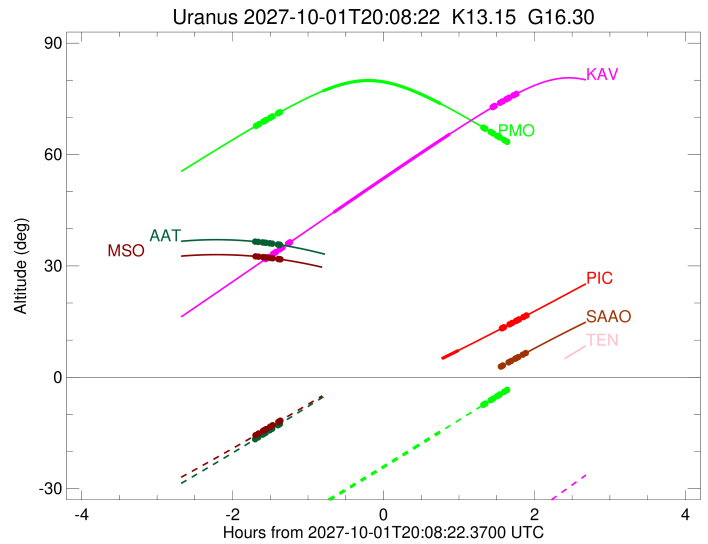
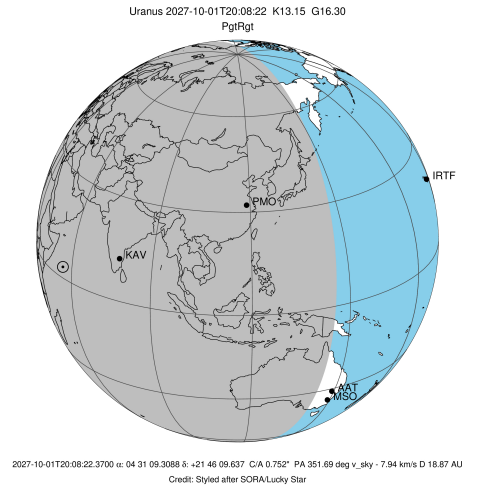
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch              : 2027-10-01T20:15:36.460
Event type             : PgtRgt
: Uranus occs: geocentric, topocentric
: 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        : 145031360436889088
2Mass ID (if available) : 04310930+2146096
ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s
RUWE (>1.4 is poor)  : 1.02
K magnitude           : 13.149
G magnitude           : 16.296
RP magnitude          : 15.365
BP magnitude          : 17.184
DUPflag              : 0
Distance (au)         : 18.875
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -7.94
Sun-Target sep (deg)  : 118.59
Sun-Moon sep (deg)    : 141.31
B (ring opening deg)  : 78.82
PA of pole (deg)     : -55.46
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.763
C/A sky separation (km) : 10450.1
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
  
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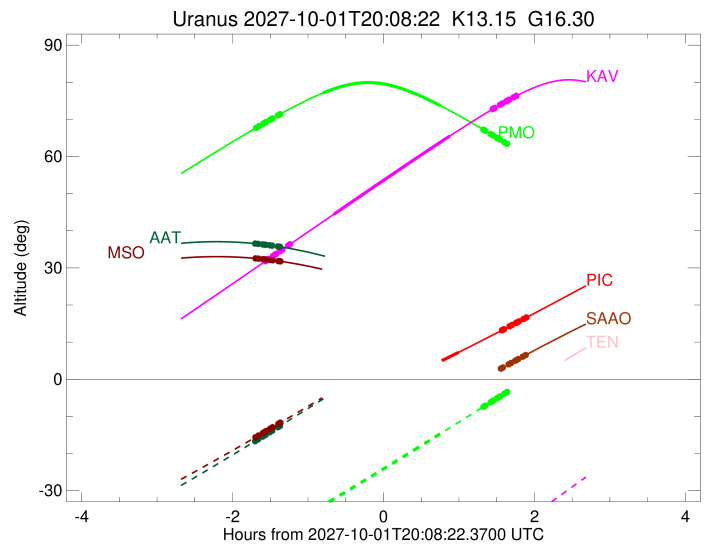
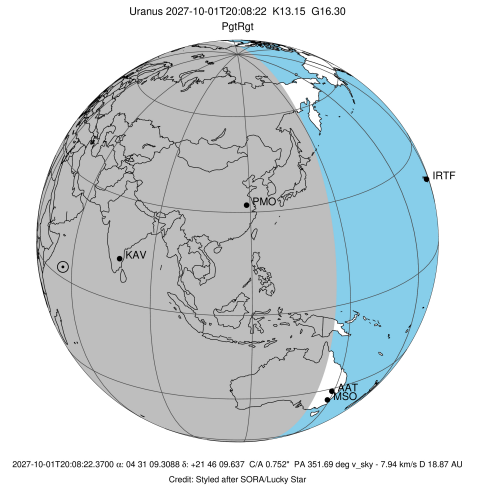
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-10-01T18:33:54.141		31.67	-80.82	51508.38	-8.01		
lambda	I	2027-10-01T18:36:58.940		32.38	-80.80	50026.71	-8.02		
delta	I	2027-10-01T18:40:34.405		33.22	-80.70	48300.35	-8.01		
gamma	I	2027-10-01T18:41:58.484		33.55	-80.63	47627.10	-8.01		
eta	I	2027-10-01T18:42:54.823		33.76	-80.58	47176.12	-8.00		
beta	I	2027-10-01T18:46:05.586		34.50	-80.38	45649.82	-7.99		
alpha	I	2027-10-01T18:48:06.115		34.97	-80.22	44687.95	-7.99		
4	I	2027-10-01T18:52:28.912		35.99	-79.79	42591.68	-7.97		
5	I	2027-10-01T18:53:04.334		36.13	-79.72	42308.58	-7.97		
6	I	2027-10-01T18:53:58.276		36.34	-79.62	41872.28	-7.97		
Uranus	I	2027-10-01T19:28:43.063		44.42	-73.72	25462.98		4.52	4.74
Uranus	E	2027-10-01T21:01:10.983		65.55	-52.55	25043.29		-10.67	-11.16
6	E	2027-10-01T21:35:09.984		72.77	-44.37	41817.96	8.20		
5	E	2027-10-01T21:35:50.591		72.90	-44.20	42155.11	8.21		
4	E	2027-10-01T21:36:36.225		73.06	-44.02	42534.12	8.21		
alpha	E	2027-10-01T21:41:06.123		73.94	-42.93	44752.42	8.24		
beta	E	2027-10-01T21:42:56.994		74.30	-42.48	45663.97	8.25		
eta	E	2027-10-01T21:45:59.981		74.88	-41.74	47176.12	8.27		
gamma	E	2027-10-01T21:46:54.580		75.05	-41.52	47627.74	8.27		
delta	E	2027-10-01T21:48:15.840		75.30	-41.19	48300.35	8.28		
lambda	E	2027-10-01T21:51:44.100		75.93	-40.35	50026.71	8.30		
epsilon	E	2027-10-01T21:53:10.587		76.19	-40.00	50744.64	8.30		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-01T20:03:52.510  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 145031360436889088  
 2Mass ID (if available) : 04310930+2146096  
 ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.149  
 G magnitude : 16.296  
 RP magnitude : 15.365  
 BP magnitude : 17.184  
 DUPflag : 0  
 Distance (au) : 18.875  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -7.94  
 Sun-Target sep (deg) : 118.59  
 Sun-Moon sep (deg) : 141.90  
 B (ring opening deg) : 78.82  
 PA of pole (deg) : -55.46  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.131  
 C/A sky separation (km) : 15488.1  
 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	2027-10-01T18:25:39.486		36.57	-16.82	51482.47	-7.97		
lambda	I	2027-10-01T18:28:42.211		36.47	-16.19	50026.71	-7.95		
delta	I	2027-10-01T18:32:19.646		36.33	-15.44	48300.35	-7.92		
gamma	I	2027-10-01T18:33:44.596		36.27	-15.14	47627.78	-7.91		
eta	I	2027-10-01T18:34:41.724		36.23	-14.95	47176.12	-7.90		
beta	I	2027-10-01T18:37:55.542		36.09	-14.27	45647.67	-7.87		
alpha	I	2027-10-01T18:39:57.524		36.00	-13.85	44690.28	-7.85		
4	I	2027-10-01T18:44:26.855		35.77	-12.91	42585.59	-7.79		
5	I	2027-10-01T18:45:03.137		35.74	-12.78	42303.10	-7.78		
6	I	2027-10-01T18:45:57.417		35.69	-12.59	41875.45	-7.77		
Uranus	I	2027-10-01T19:22:59.462		33.04	-4.76x	25542.43		1.87	1.96
Uranus	E	2027-10-01T20:43:28.460		23.44	12.45x	24999.19		-11.14	-11.65
6	E	2027-10-01T21:20:51.876		17.64	20.41x	41822.10	7.69		
5	E	2027-10-01T21:21:34.930		17.52	20.56x	42156.27	7.70		
4	E	2027-10-01T21:22:22.946		17.39	20.73x	42531.62	7.71		
alpha	E	2027-10-01T21:27:10.074		16.60	21.75x	44752.20	7.77		
beta	E	2027-10-01T21:29:07.454		16.28	22.16x	45662.08	7.78		
eta	E	2027-10-01T21:32:21.460		15.73	22.84x	47176.12	7.82		
gamma	E	2027-10-01T21:33:19.274		15.57	23.04x	47628.18	7.82		
delta	E	2027-10-01T21:34:45.126		15.33	23.34x	48300.35	7.84		
lambda	E	2027-10-01T21:38:25.068		14.71	24.12x	50026.71	7.86		
epsilon	E	2027-10-01T21:39:56.173		14.45	24.43x	50743.52	7.87		

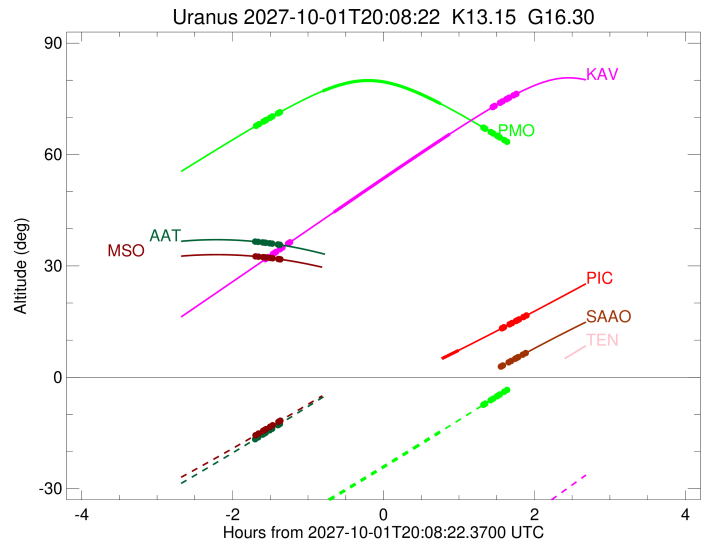
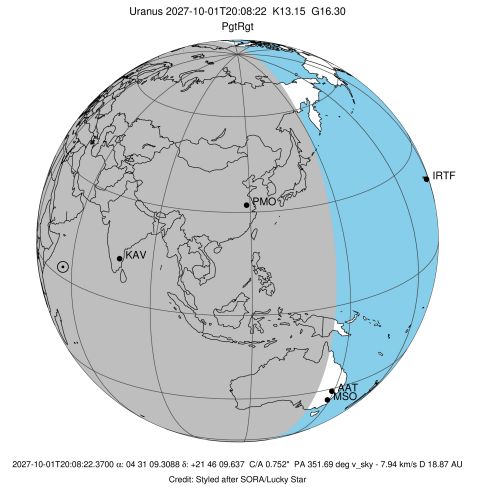
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-01T20:20:00.610  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : SAAO  
 Location : So. Afr. Astro. Obs. (Sutherland)  
 Latitude (deg) : -32.37953  
 E. Longitude (deg) : 20.81070  
 Altitude (km) : 1.768  
 Gaia source ID : 145031360436889088  
 2Mass ID (if available) : 04310930+2146096  
 ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.149  
 G magnitude : 16.296  
 RP magnitude : 15.365  
 BP magnitude : 17.184  
 DUPflag : 0  
 Distance (au) : 18.875  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -7.94  
 Sun-Target sep (deg) : 118.59  
 Sun-Moon sep (deg) : 140.46  
 B (ring opening deg) : 78.82  
 PA of pole (deg) : -55.46  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.923  
 C/A sky separation (km) : 12638.3  
 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\_itrff93\_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	2027-10-01T18:34:10.047	-35.03x	-24.59	51498.72	-7.54		
lambda	I	2027-10-01T18:37:25.175	-34.34x	-25.23	50026.71	-7.54		
delta	I	2027-10-01T18:41:14.350	-33.53x	-25.97	48300.35	-7.53		
gamma	I	2027-10-01T18:42:43.798	-33.22x	-26.26	47627.37	-7.52		
eta	I	2027-10-01T18:43:43.812	-33.01x	-26.46	47176.12	-7.52		
beta	I	2027-10-01T18:47:07.137	-32.30x	-27.12	45648.94	-7.50		
alpha	I	2027-10-01T18:49:15.368	-31.85x	-27.53	44688.81	-7.49		
4	I	2027-10-01T18:53:56.214	-30.86x	-28.43	42589.33	-7.47		
5	I	2027-10-01T18:54:34.036	-30.73x	-28.55	42306.60	-7.46		
6	I	2027-10-01T18:55:31.250	-30.53x	-28.74	41873.63	-7.46		
Uranus	I	2027-10-01T19:33:04.610	-22.69x	-35.70	25500.95		3.51	3.68
Uranus	E	2027-10-01T21:05:13.966	-4.09x	-49.56	25016.75		-10.95	-11.46
6	E	2027-10-01T21:41:38.876	2.87x	-52.88	41820.19	7.77		
5	E	2027-10-01T21:42:21.599	3.00x	-52.93	42155.63	7.78		
4	E	2027-10-01T21:43:09.428	3.15x	-52.98	42532.69	7.78		
alpha	E	2027-10-01T21:47:53.921	4.03x	-53.27	44752.34	7.83		
beta	E	2027-10-01T21:49:50.425	4.39x	-53.38	45662.91	7.85		
eta	E	2027-10-01T21:53:02.814	4.98x	-53.56	47176.12	7.88		
gamma	E	2027-10-01T21:54:00.164	5.16	-53.60	47628.00	7.88		
delta	E	2027-10-01T21:55:25.394	5.42	-53.67	48300.35	7.89		
lambda	E	2027-10-01T21:59:03.701	6.08	-53.84	50026.71	7.92		
epsilon	E	2027-10-01T22:00:34.150	6.36	-53.90	50743.65	7.93		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-01T20:04:13.230  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : 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 : 145031360436889088  
 2Mass ID (if available) : 04310930+2146096  
 ICRS Star Coord at Epoch: 04h 31m 09.30882s +21:46:09.63664s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 13.149  
 G magnitude : 16.296  
 RP magnitude : 15.365  
 BP magnitude : 17.184  
 DUPflag : 0  
 Distance (au) : 18.875  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -7.94  
 Sun-Target sep (deg) : 118.59  
 Sun-Moon sep (deg) : 141.85  
 B (ring opening deg) : 78.82  
 PA of pole (deg) : -55.46  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.150  
 C/A sky separation (km) : 15736.7  
 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\_itrff93\_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	2027-10-01T18:25:57.618		32.58	-15.75	51481.27	-7.94		
lambda	I	2027-10-01T18:29:00.887		32.49	-15.15	50026.71	-7.92		
delta	I	2027-10-01T18:32:39.177		32.36	-14.43	48300.35	-7.89		
gamma	I	2027-10-01T18:34:04.465		32.31	-14.15	47627.80	-7.88		
eta	I	2027-10-01T18:35:01.830		32.27	-13.96	47176.12	-7.87		
beta	I	2027-10-01T18:38:16.469		32.14	-13.31	45647.58	-7.83		
alpha	I	2027-10-01T18:40:18.948		32.06	-12.91	44690.40	-7.81		
4	I	2027-10-01T18:44:49.534		31.85	-12.01	42585.32	-7.75		
5	I	2027-10-01T18:45:25.987		31.82	-11.89	42302.83	-7.74		
6	I	2027-10-01T18:46:20.477		31.78	-11.71	41875.57	-7.73		
Uranus	I	2027-10-01T19:23:38.322		29.32	-4.19x	25544.70		1.74	1.82
Uranus	E	2027-10-01T20:43:29.036		20.48	12.12x	24998.09		-11.15	-11.66
6	E	2027-10-01T21:21:07.358		15.00	19.76x	41822.37	7.66		
5	E	2027-10-01T21:21:50.575		14.89	19.90x	42156.37	7.67		
4	E	2027-10-01T21:22:38.741		14.77	20.06x	42531.47	7.68		
alpha	E	2027-10-01T21:27:26.966		14.02	21.03x	44752.18	7.74		
beta	E	2027-10-01T21:29:24.752		13.71	21.42x	45661.96	7.76		
eta	E	2027-10-01T21:32:39.435		13.20	22.07x	47176.12	7.79		
gamma	E	2027-10-01T21:33:37.443		13.04	22.27x	47628.21	7.80		
delta	E	2027-10-01T21:35:03.570		12.81	22.55x	48300.35	7.81		
lambda	E	2027-10-01T21:38:44.197		12.22	23.29x	50026.71	7.84		
epsilon	E	2027-10-01T21:40:15.579		11.98	23.59x	50743.54	7.85		