

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T14:56:43.480  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 52121700178528128  
 2Mass ID (if available) : 04062723+2043212

ICRS Star Coord at Epoch: 04h 06m 27.22198s +20:43:21.26724s

RUWE (>1.4 is poor) : 2.51  
 K magnitude : 14.295  
 G magnitude : 18.676  
 RP magnitude : 17.043  
 BP magnitude : 19.899  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.18  
 Sun-Target sep (deg) : 172.31  
 Sun-Moon sep (deg) : 84.86  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.18

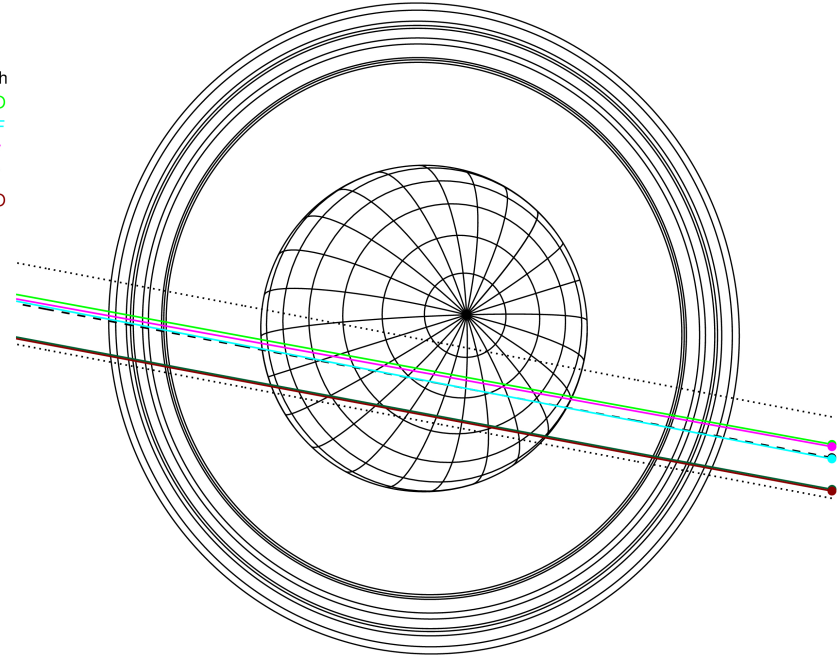
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2026-11-18T14:56:43.4800 cc: 04 06 27.2220 s: +20 43 21.267 C/A 0.595° PA 349.30 deg v\_sky -23.18 km/s D 18.45 AU  
 Credit: Styled after SORA/Lucky Star

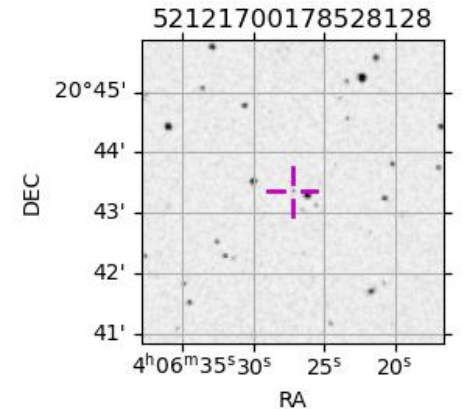
Uranus 2026-11-18T14:56:43 K14.29 G18.68 PgtRgt

Earth  
 PMO  
 IRTF  
 KAV  
 AAT  
 MSO

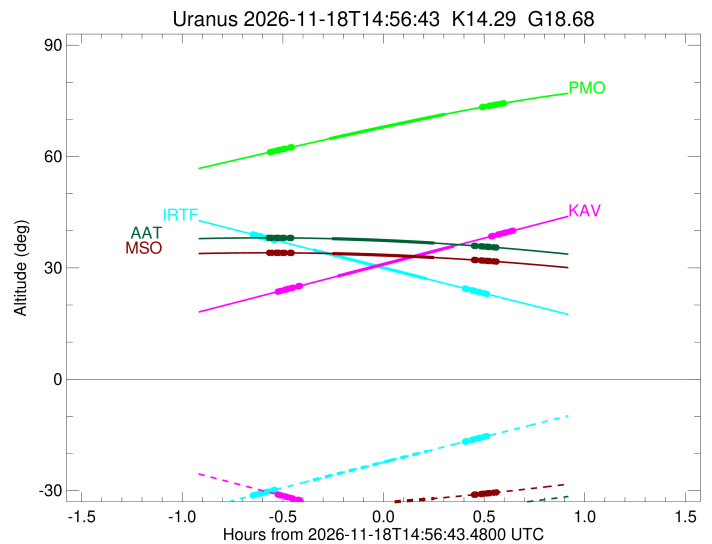
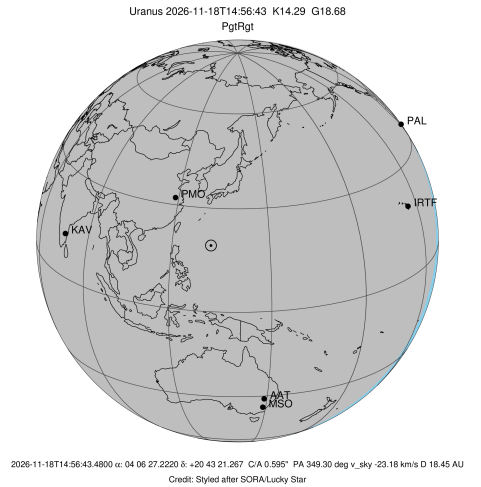


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++	+ +	+++++	NOV 18 14:22 - NOV 18 15:32	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	+++++	+ +	+++++	NOV 18 14:17 - NOV 18 15:27	PieRie
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	NOV 18 14:25 - NOV 18 15:35	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	+++++	+ +	+++++	NOV 18 14:22 - NOV 18 15:30	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	NOV 18 14:22 - NOV 18 15:30	PieRie



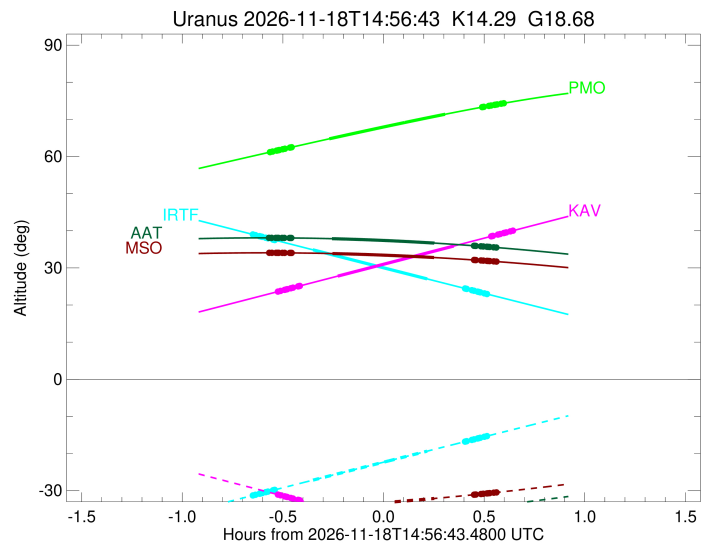
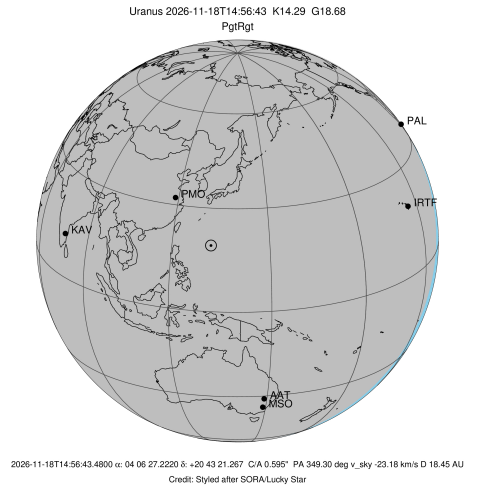
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T14:57:53.800  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 52121700178528128  
 2Mass ID (if available) : 04062723+2043212  
 ICRS Star Coord at Epoch: 04h 06m 27.22198s +20:43:21.26724s  
 RUWE (>1.4 is poor) : 2.51  
 K magnitude : 14.295  
 G magnitude : 18.676  
 RP magnitude : 17.043  
 BP magnitude : 19.899  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.18  
 Sun-Target sep (deg) : 172.31  
 Sun-Moon sep (deg) : 85.71  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.18  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.473  
 C/A sky separation (km) : 6326.1  
 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	2026-11-18T14:22:42.017		61.15	-66.73	51416.63	-24.06		
lambda	I	2026-11-18T14:23:39.845		61.35	-66.91	50026.71	-24.03		
delta	I	2026-11-18T14:24:51.706		61.59	-67.14	48300.35	-24.02		
gamma	I	2026-11-18T14:25:19.736		61.69	-67.23	47627.24	-24.01		
eta	I	2026-11-18T14:25:38.526		61.75	-67.29	47176.12	-24.01		
beta	I	2026-11-18T14:26:42.421		61.97	-67.48	45641.82	-23.99		
alpha	I	2026-11-18T14:27:22.009		62.10	-67.61	44695.87	-23.99		
4	I	2026-11-18T14:28:49.140		62.40	-67.87	42602.92	-23.96		
5	I	2026-11-18T14:29:05.863		62.46	-67.93	42209.31	-23.96		
6	I	2026-11-18T14:29:23.133		62.52	-67.98	41796.25	-23.95		
Uranus	I	2026-11-18T14:40:34.257		64.78	-69.99	25262.52		11.62	12.16
Uranus	E	2026-11-18T15:15:03.299		71.38	-75.19	25046.67		-15.46	-16.16
6	E	2026-11-18T15:26:09.089		73.31	-76.34	41872.99	23.99		
5	E	2026-11-18T15:26:25.918		73.35	-76.37	42281.92	24.01		
4	E	2026-11-18T15:26:37.473		73.39	-76.39	42550.45	24.00		
alpha	E	2026-11-18T15:28:08.827		73.64	-76.51	44747.32	24.03		
beta	E	2026-11-18T15:28:47.847		73.74	-76.57	45681.23	24.04		
eta	E	2026-11-18T15:29:49.977		73.91	-76.65	47176.12	24.05		
gamma	E	2026-11-18T15:30:08.593		73.96	-76.67	47623.95	24.06		
delta	E	2026-11-18T15:30:36.702		74.04	-76.71	48300.35	24.07		
lambda	E	2026-11-18T15:31:48.413		74.23	-76.79	50026.71	24.08		
epsilon	E	2026-11-18T15:32:27.193		74.33	-76.83	50960.73	24.11		

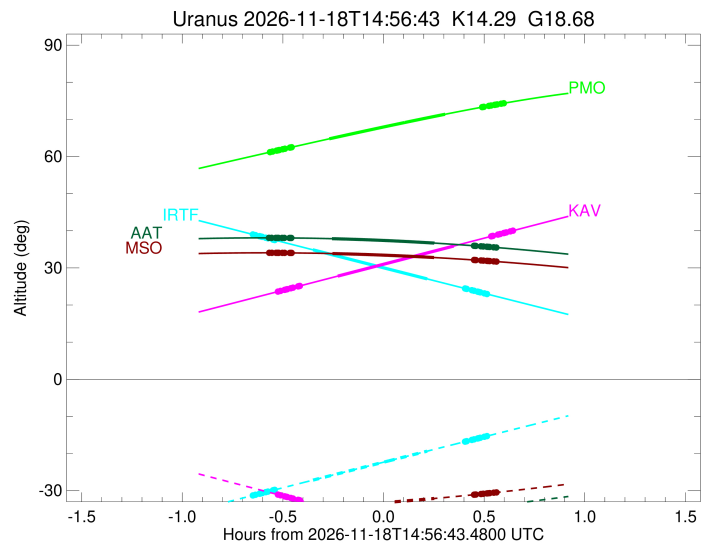
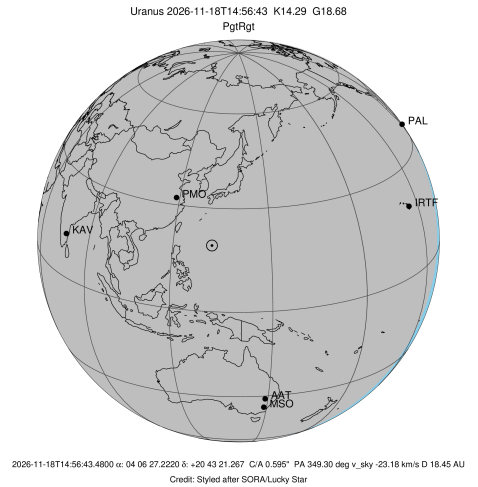
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2026-11-18T14:52:48.890
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: 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       : 52121700178528128
2Mass ID (if available) : 04062723+2043212
ICRS Star Coord at Epoch: 04h 06m 27.22198s +20:43:21.26724s
RUWE (>1.4 is poor) : 2.51
K magnitude           : 14.295
G magnitude           : 18.676
RP magnitude          : 17.043
BP magnitude          : 19.899
DUPflag              : 0
Distance (au)         : 18.452
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.18
Sun-Target sep (deg) : 172.31
Sun-Moon sep (deg)   : 85.39
B (ring opening deg) : 74.08
PA of pole (deg)     : -72.18
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.595
C/A sky separation (km) : 7960.1
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
    
```



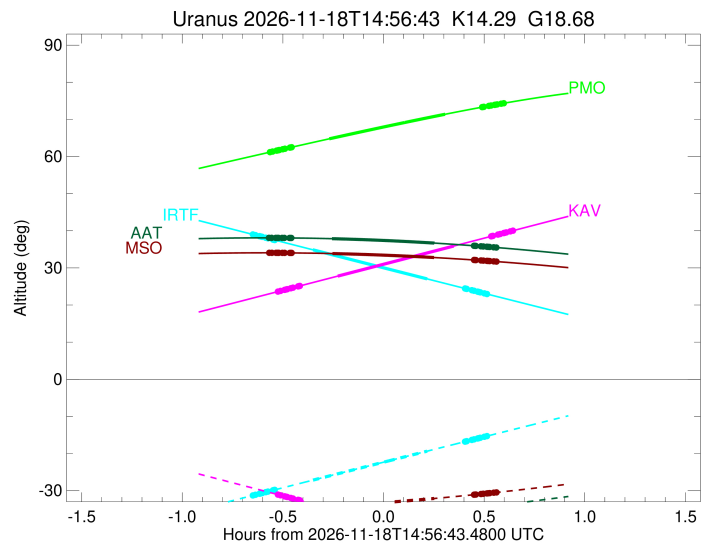
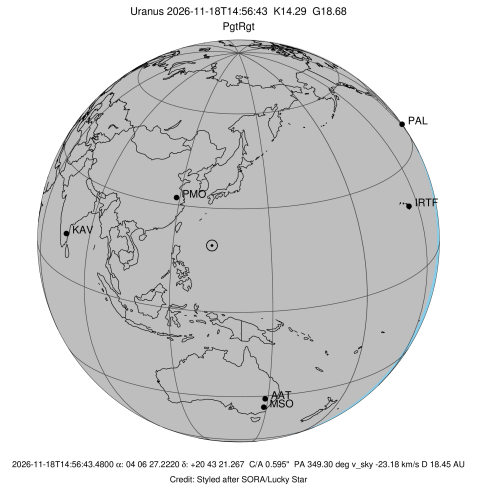
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-11-18T14:17:34.805		39.06	-31.34	51429.06	-23.89		
lambda	I	2026-11-18T14:18:33.575		38.83	-31.11	50026.71	-23.85		
delta	I	2026-11-18T14:19:45.992		38.55	-30.84	48300.35	-23.83		
gamma	I	2026-11-18T14:20:14.258		38.44	-30.73	47627.01	-23.82		
eta	I	2026-11-18T14:20:33.193		38.37	-30.65	47176.12	-23.81		
beta	I	2026-11-18T14:21:37.625		38.12	-30.41	45642.09	-23.78		
alpha	I	2026-11-18T14:22:17.525		37.97	-30.25	44697.06	-23.77		
4	I	2026-11-18T14:23:45.468		37.63	-29.92	42604.44	-23.72		
5	I	2026-11-18T14:24:02.250		37.56	-29.85	42213.02	-23.73		
6	I	2026-11-18T14:24:19.905		37.49	-29.78	41795.75	-23.71		
Uranus	I	2026-11-18T14:35:42.954		34.86	-27.16	25303.67		10.76	11.26
Uranus	E	2026-11-18T15:09:43.844		27.04	-19.37	25034.15		-15.66	-16.36
6	E	2026-11-18T15:21:02.510		24.45	-16.80	41872.26	23.61		
5	E	2026-11-18T15:21:19.695		24.39	-16.73	42283.89	23.63		
4	E	2026-11-18T15:21:31.405		24.34	-16.69	42551.68	23.63		
alpha	E	2026-11-18T15:23:04.153		23.99	-16.34	44747.82	23.67		
beta	E	2026-11-18T15:23:43.742		23.84	-16.19	45681.23	23.68		
eta	E	2026-11-18T15:24:46.800		23.60	-15.95	47176.12	23.70		
gamma	E	2026-11-18T15:25:05.684		23.53	-15.88	47623.83	23.71		
delta	E	2026-11-18T15:25:34.211		23.42	-15.77	48300.35	23.72		
lambda	E	2026-11-18T15:26:46.959		23.14	-15.49	50026.71	23.74		
epsilon	E	2026-11-18T15:27:26.650		22.99	-15.34	50969.24	23.78		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T15:00:29.220  
 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 : 52121700178528128  
 2Mass ID (if available) : 04062723+2043212  
 ICRS Star Coord at Epoch: 04h 06m 27.22198s +20:43:21.26724s  
 RUWE (>1.4 is poor) : 2.51  
 K magnitude : 14.295  
 G magnitude : 18.676  
 RP magnitude : 17.043  
 BP magnitude : 19.899  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.18  
 Sun-Target sep (deg) : 172.31  
 Sun-Moon sep (deg) : 85.28  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.18  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.510  
 C/A sky separation (km) : 6828.1  
 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



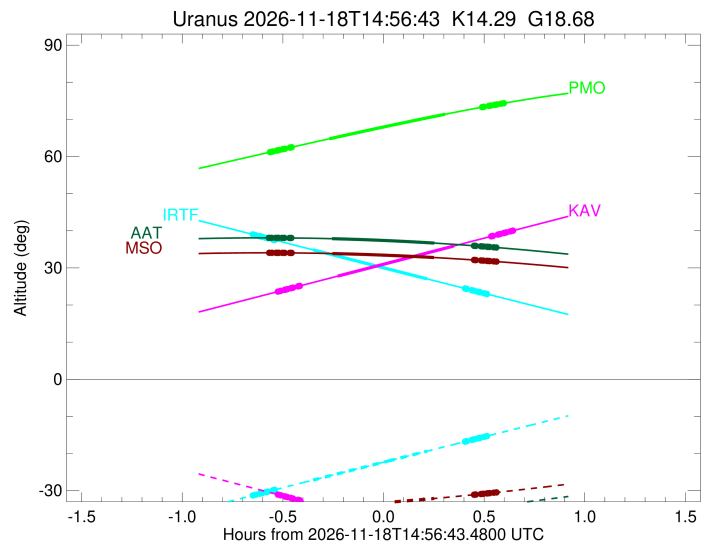
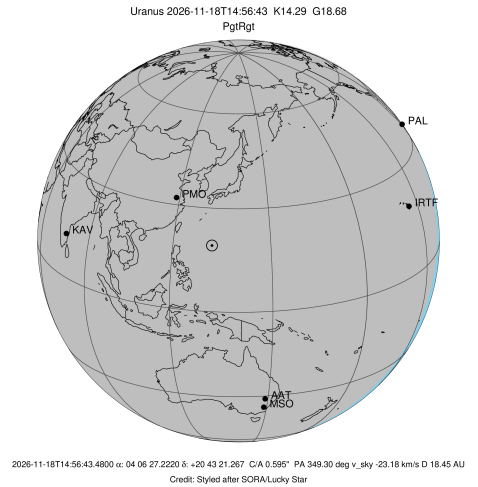
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-11-18T14:25:03.800		23.58	-31.02	51418.97	-23.83		
lambda	I	2026-11-18T14:26:02.274		23.80	-31.25	50026.71	-23.80		
delta	I	2026-11-18T14:27:14.820		24.09	-31.54	48300.35	-23.79		
gamma	I	2026-11-18T14:27:43.120		24.20	-31.65	47627.19	-23.78		
eta	I	2026-11-18T14:28:02.088		24.27	-31.72	47176.12	-23.78		
beta	I	2026-11-18T14:29:06.596		24.52	-31.98	45641.87	-23.76		
alpha	I	2026-11-18T14:29:46.559		24.68	-32.13	44696.10	-23.76		
4	I	2026-11-18T14:31:14.535		25.02	-32.48	42603.23	-23.73		
5	I	2026-11-18T14:31:31.401		25.08	-32.55	42210.06	-23.73		
6	I	2026-11-18T14:31:48.883		25.15	-32.61	41796.14	-23.71		
Uranus	I	2026-11-18T14:43:07.684		27.80	-35.28	25272.19		11.43	11.95
Uranus	E	2026-11-18T15:17:39.121		35.88	-43.42	25041.24		-15.55	-16.25
6	E	2026-11-18T15:28:50.558		38.51	-46.06	41872.65	23.82		
5	E	2026-11-18T15:29:07.551		38.57	-46.13	42282.88	23.83		
4	E	2026-11-18T15:29:19.175		38.62	-46.17	42551.04	23.83		
alpha	E	2026-11-18T15:30:51.160		38.98	-46.54	44747.58	23.87		
beta	E	2026-11-18T15:31:30.435		39.13	-46.69	45681.23	23.88		
eta	E	2026-11-18T15:32:32.983		39.38	-46.94	47176.12	23.90		
gamma	E	2026-11-18T15:32:51.718		39.45	-47.01	47623.89	23.90		
delta	E	2026-11-18T15:33:20.015		39.56	-47.12	48300.35	23.91		
lambda	E	2026-11-18T15:34:32.187		39.84	-47.40	50026.71	23.93		
epsilon	E	2026-11-18T15:35:11.404		39.99	-47.56	50965.35	23.96		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T14:56:45.860  
 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 : 52121700178528128  
 2Mass ID (if available) : 04062723+2043212  
 ICRS Star Coord at Epoch: 04h 06m 27.22198s +20:43:21.26724s  
 RUWE (>1.4 is poor) : 2.51  
 K magnitude : 14.295  
 G magnitude : 18.676  
 RP magnitude : 17.043  
 BP magnitude : 19.899  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.18  
 Sun-Target sep (deg) : 172.31  
 Sun-Moon sep (deg) : 85.43  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.18  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.977  
 C/A sky separation (km) : 13076.7  
 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	2026-11-18T14:22:21.997		38.10	-38.94	51456.18	-23.51		
lambda	I	2026-11-18T14:23:22.935		38.09	-38.91	50026.71	-23.43		
delta	I	2026-11-18T14:24:36.706		38.09	-38.86	48300.35	-23.37		
gamma	I	2026-11-18T14:25:05.559		38.09	-38.84	47626.45	-23.34		
eta	I	2026-11-18T14:25:24.860		38.09	-38.82	47176.12	-23.32		
beta	I	2026-11-18T14:26:30.658		38.08	-38.78	45642.90	-23.26		
alpha	I	2026-11-18T14:27:11.376		38.08	-38.75	44700.15	-23.22		
4	I	2026-11-18T14:28:41.538		38.07	-38.68	42607.87	-23.10		
5	I	2026-11-18T14:28:58.476		38.06	-38.67	42222.42	-23.09		
6	I	2026-11-18T14:29:17.135		38.06	-38.66	41794.94	-23.05		
Uranus	I	2026-11-18T14:41:21.272		37.87	-38.03	25414.92		8.04	8.41
Uranus	E	2026-11-18T15:11:50.873		36.69	-35.79	25019.10		-15.90	-16.61
6	E	2026-11-18T15:23:42.670		35.96	-34.68	41868.73	23.04		
5	E	2026-11-18T15:24:00.655		35.94	-34.65	42291.87	23.08		
4	E	2026-11-18T15:24:12.547		35.93	-34.63	42557.20	23.09		
alpha	E	2026-11-18T15:25:47.188		35.82	-34.47	44749.72	23.21		
beta	E	2026-11-18T15:26:27.442		35.77	-34.40	45681.00	23.25		
eta	E	2026-11-18T15:27:31.626		35.70	-34.29	47176.12	23.31		
gamma	E	2026-11-18T15:27:50.798		35.68	-34.26	47623.29	23.33		
delta	E	2026-11-18T15:28:19.798		35.64	-34.21	48300.35	23.36		
lambda	E	2026-11-18T15:29:33.596		35.55	-34.08	50026.71	23.42		
epsilon	E	2026-11-18T15:30:15.542		35.50	-34.01	51009.97	23.50		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-11-18T14:56:49.750  
 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 : 52121700178528128  
 2Mass ID (if available) : 04062723+2043212  
 ICRS Star Coord at Epoch: 04h 06m 27.22198s +20:43:21.26724s  
 RUWE (>1.4 is poor) : 2.51  
 K magnitude : 14.295  
 G magnitude : 18.676  
 RP magnitude : 17.043  
 BP magnitude : 19.899  
 DUPflag : 0  
 Distance (au) : 18.452  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -23.18  
 Sun-Target sep (deg) : 172.31  
 Sun-Moon sep (deg) : 85.38  
 B (ring opening deg) : 74.08  
 PA of pole (deg) : -72.18  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.996  
 C/A sky separation (km) : 13328.4  
 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\_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	2026-11-18T14:22:26.738		34.06	-34.98	51457.57	-23.46		
lambda	I	2026-11-18T14:23:27.867		34.06	-34.94	50026.71	-23.38		
delta	I	2026-11-18T14:24:41.805		34.06	-34.90	48300.35	-23.31		
gamma	I	2026-11-18T14:25:10.728		34.06	-34.88	47626.42	-23.29		
eta	I	2026-11-18T14:25:30.073		34.06	-34.87	47176.12	-23.27		
beta	I	2026-11-18T14:26:36.031		34.05	-34.83	45642.96	-23.20		
alpha	I	2026-11-18T14:27:16.849		34.05	-34.80	44700.32	-23.16		
4	I	2026-11-18T14:28:47.256		34.04	-34.74	42608.04	-23.04		
5	I	2026-11-18T14:29:04.224		34.04	-34.73	42222.93	-23.03		
6	I	2026-11-18T14:29:22.963		34.03	-34.72	41794.92	-22.98		
Uranus	I	2026-11-18T14:41:30.697		33.86	-34.15	25420.46		7.88	8.25
Uranus	E	2026-11-18T15:11:48.833		32.79	-32.12	25019.84		-15.88	-16.60
6	E	2026-11-18T15:23:43.901		32.13	-31.10	41868.55	22.98		
5	E	2026-11-18T15:24:01.955		32.12	-31.07	42292.22	23.02		
4	E	2026-11-18T15:24:13.877		32.10	-31.05	42557.47	23.03		
alpha	E	2026-11-18T15:25:48.766		32.01	-30.91	44749.80	23.15		
beta	E	2026-11-18T15:26:29.118		31.96	-30.85	45680.98	23.19		
eta	E	2026-11-18T15:27:33.460		31.89	-30.75	47176.12	23.26		
gamma	E	2026-11-18T15:27:52.677		31.87	-30.72	47623.27	23.28		
delta	E	2026-11-18T15:28:21.745		31.84	-30.67	48300.35	23.31		
lambda	E	2026-11-18T15:29:35.709		31.76	-30.55	50026.71	23.37		
epsilon	E	2026-11-18T15:30:17.828		31.71	-30.49	51011.91	23.46		