

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-25T11:47:23.780  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 144666185138539904  
 2Mass ID (if available) : 04285155+2141211

Uranus 2027-10-25T11:47:23 K12.90 G16.29 PgtRgt

ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s

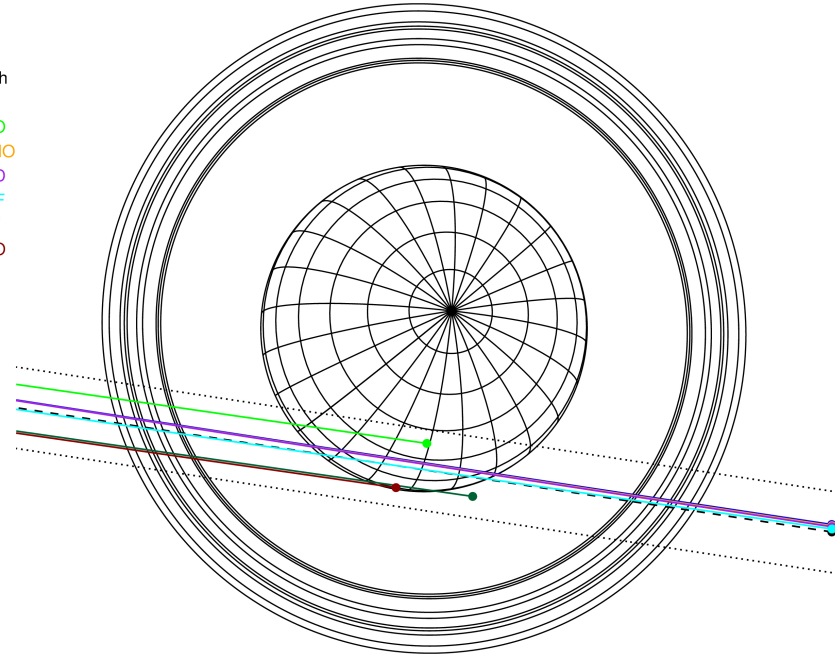
RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.904  
 G magnitude : 16.292  
 RP magnitude : 15.282  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 18.571  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.32  
 Sun-Target sep (deg) : 142.54  
 Sun-Moon sep (deg) : 88.95  
 B (ring opening deg) : 78.42  
 PA of pole (deg) : -57.47

#	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



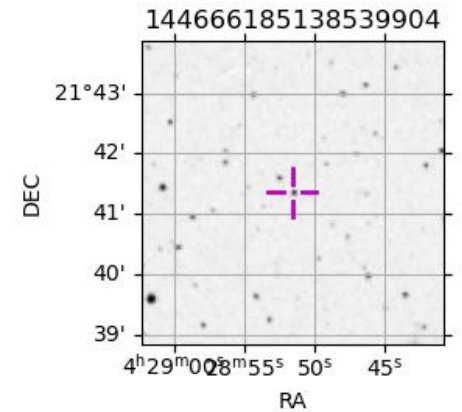
2027-10-25T11:47:23.7800 ra: 04 28 51.5487 s: +21 41 21.432 C/A 1.620° PA 351.34 deg v\_sky -17.32 km/s D 18.57 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 AAT  
 MSO

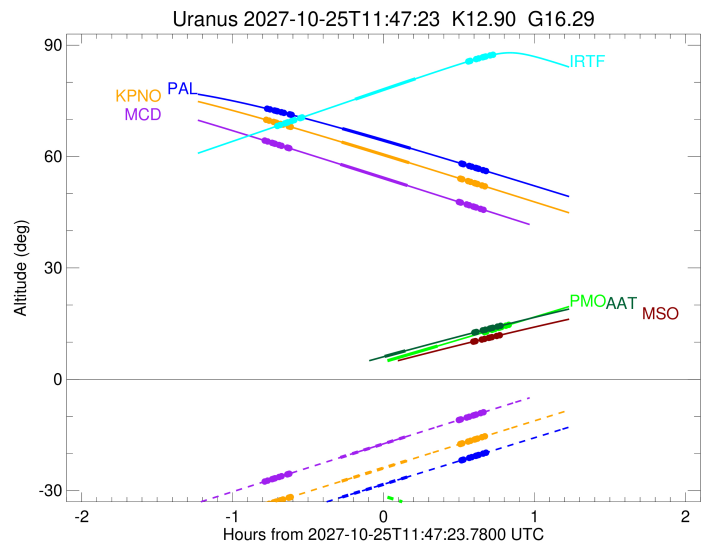
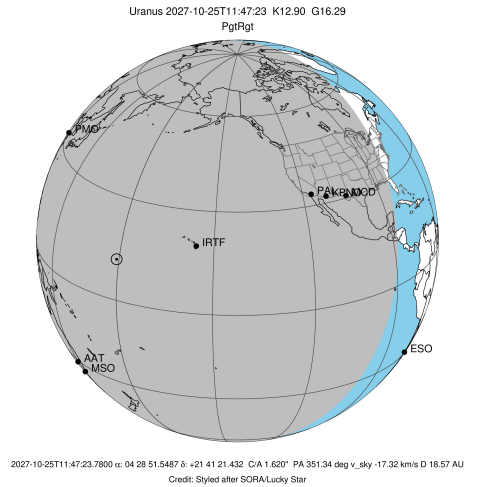


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++	+ +	+++++	OCT 25 11:01 - OCT 25 12:27	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8		+	+++++	OCT 25 12:08 - OCT 25 12:36	PneRne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	OCT 25 11:00 - OCT 25 12:27	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	OCT 25 11:00 - OCT 25 12:26	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	OCT 25 11:05 - OCT 25 12:30	PieRie
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		+ +	+++++	OCT 25 11:47 - OCT 25 12:33	PieRne
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0			+++++	OCT 25 12:23 - OCT 25 12:33	PnnRne

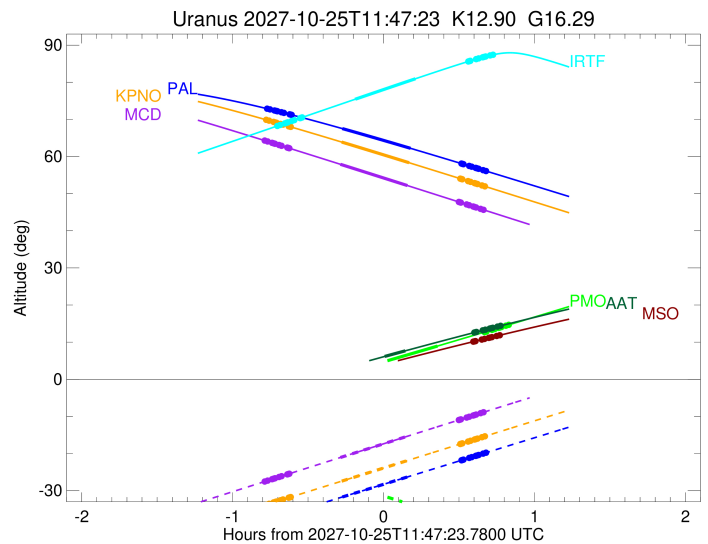
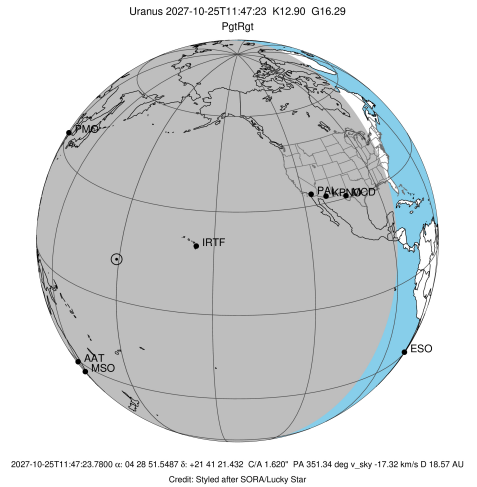


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-25T11:45:01.280  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PAL  
 Location : Palomar Mt (200")  
 Latitude (deg) : 33.35622  
 E. Longitude (deg) : 243.13601  
 Altitude (km) : 1.706  
 Gaia source ID : 144666185138539904  
 2Mass ID (if available) : 04285155+2141211  
 ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.904  
 G magnitude : 16.292  
 RP magnitude : 15.282  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 18.571  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.32  
 Sun-Target sep (deg) : 142.54  
 Sun-Moon sep (deg) : 89.85  
 B (ring opening deg) : 78.42  
 PA of pole (deg) : -57.47  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.543  
 C/A sky separation (km) : 20783.3  
 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	2027-10-25T11:01:02.308		72.90	-37.91	51261.54	-16.26		
lambda	I	2027-10-25T11:02:18.177		72.70	-37.65	50026.71	-16.23		
delta	I	2027-10-25T11:04:04.929		72.40	-37.29	48300.35	-16.11		
gamma	I	2027-10-25T11:04:46.548		72.28	-37.14	47631.08	-16.05		
eta	I	2027-10-25T11:05:14.922		72.20	-37.05	47176.12	-16.02		
beta	I	2027-10-25T11:06:51.141		71.93	-36.72	45641.23	-15.88		
alpha	I	2027-10-25T11:07:49.371		71.76	-36.52	44720.28	-15.80		
4	I	2027-10-25T11:10:08.753		71.36	-36.04	42535.94	-15.55		
5	I	2027-10-25T11:10:29.175		71.30	-35.97	42216.31	-15.50		
6	I	2027-10-25T11:10:51.808		71.23	-35.89	41865.82	-15.47		
Uranus	I	2027-10-25T11:30:59.831		67.54	-31.72	25553.41		-1.13	-1.18
Uranus	E	2027-10-25T11:58:11.259		62.20	-26.05	25032.81		-11.18	-11.70
6	E	2027-10-25T12:18:19.540		58.12	-21.84	41795.72	15.44		
5	E	2027-10-25T12:18:45.142		58.03	-21.75	42177.25	15.47		
4	E	2027-10-25T12:19:09.652		57.94	-21.66	42565.12	15.52		
alpha	E	2027-10-25T12:21:28.879		57.47	-21.18	44745.49	15.77		
beta	E	2027-10-25T12:22:27.774		57.27	-20.97	45674.88	15.85		
eta	E	2027-10-25T12:24:02.024		56.94	-20.64	47176.12	15.99		
gamma	E	2027-10-25T12:24:30.077		56.85	-20.55	47625.07	16.02		
delta	E	2027-10-25T12:25:12.153		56.70	-20.40	48300.35	16.08		
lambda	E	2027-10-25T12:26:59.120		56.33	-20.03	50026.71	16.20		
epsilon	E	2027-10-25T12:27:45.632		56.17	-19.87	50781.43	16.23		

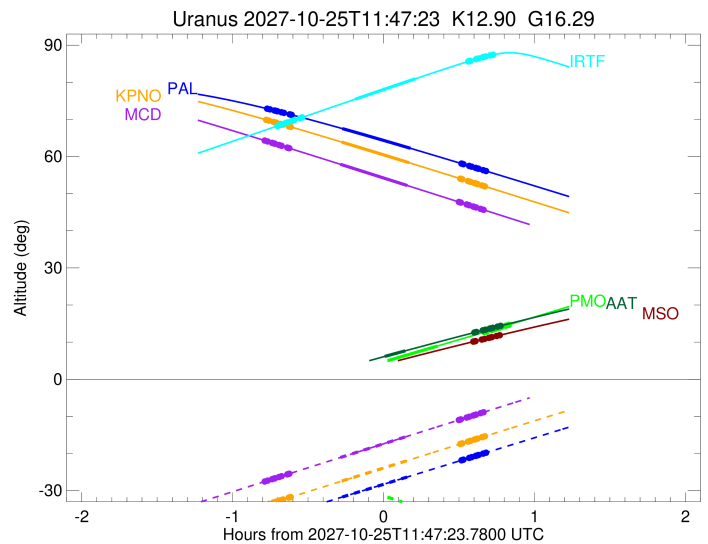
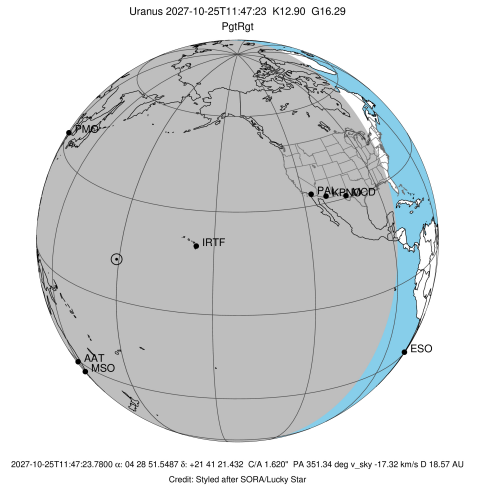
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-25T11:51:53.410  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 144666185138539904  
 2Mass ID (if available) : 04285155+2141211  
 ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.904  
 G magnitude : 16.292  
 RP magnitude : 15.282  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 18.571  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.32  
 Sun-Target sep (deg) : 142.54  
 Sun-Moon sep (deg) : 89.05  
 B (ring opening deg) : 78.42  
 PA of pole (deg) : -57.47  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.318  
 C/A sky separation (km) : 17748.6  
 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\_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	2027-10-25T11:05:33.177	-3.35x	-22.56	51289.32	-16.23			
lambda	I	2027-10-25T11:06:50.902	-3.10x	-22.83	50026.71	-16.22			
delta	I	2027-10-25T11:08:37.632	-2.77x	-23.21	48300.35	-16.13			
gamma	I	2027-10-25T11:09:19.176	-2.64x	-23.36	47630.90	-16.10			
eta	I	2027-10-25T11:09:47.451	-2.55x	-23.46	47176.12	-16.07			
beta	I	2027-10-25T11:11:23.207	-2.25x	-23.80	45641.08	-15.98			
alpha	I	2027-10-25T11:12:21.197	-2.07x	-24.00	44717.46	-15.93			
4	I	2027-10-25T11:14:38.741	-1.63x	-24.49	42538.58	-15.76			
5	I	2027-10-25T11:14:58.555	-1.57x	-24.56	42223.33	-15.72			
6	I	2027-10-25T11:15:21.171	-1.50x	-24.64	41868.53	-15.71			
Uranus	I	2027-10-25T11:34:06.616	2.10x	-28.62	25554.13	1.05	1.10		
Uranus	E	2027-10-25T12:08:53.118	8.95	-35.96	25000.21	-11.54	-12.07		
6	E	2027-10-25T12:27:30.310	12.70	-39.86	41795.16	15.83			
5	E	2027-10-25T12:27:55.541	12.78	-39.95	42181.45	15.85			
4	E	2027-10-25T12:28:19.413	12.86	-40.03	42568.36	15.89			
alpha	E	2027-10-25T12:30:35.500	13.32	-40.50	44744.06	16.06			
beta	E	2027-10-25T12:31:33.517	13.52	-40.70	45675.80	16.12			
eta	E	2027-10-25T12:33:06.246	13.83	-41.02	47176.12	16.22			
gamma	E	2027-10-25T12:33:33.885	13.93	-41.12	47624.75	16.25			
delta	E	2027-10-25T12:34:15.424	14.07	-41.26	48300.35	16.28			
lambda	E	2027-10-25T12:36:01.141	14.43	-41.63	50026.71	16.37			
epsilon	E	2027-10-25T12:36:47.794	14.58	-41.79	50791.53	16.39			

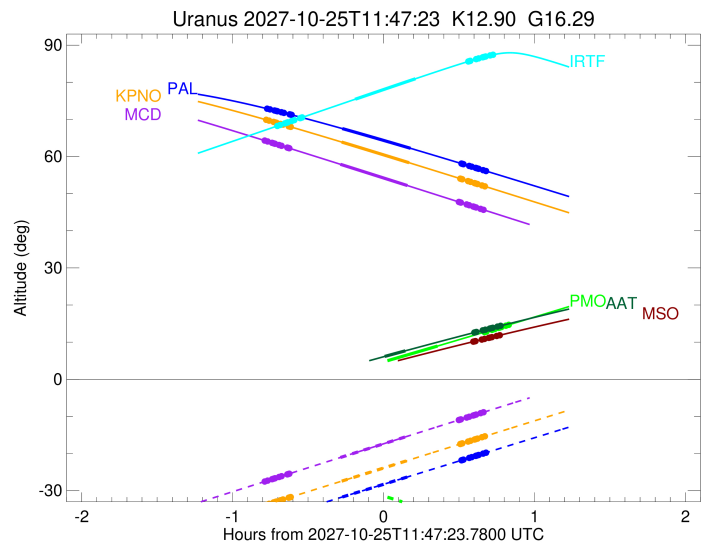
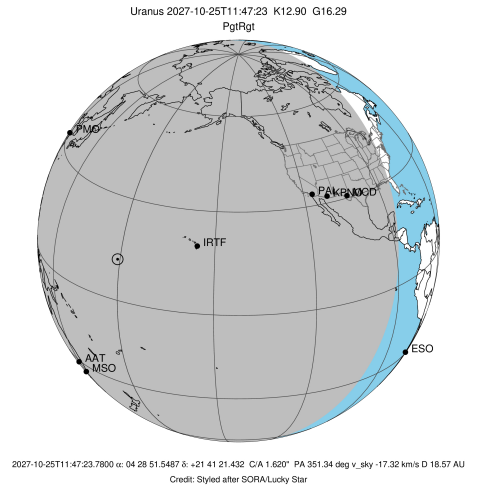
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2027-10-25T11:44:36.140
Event type          : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 144666185138539904
2Mass ID (if available) : 04285155+2141211
ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 12.904
G magnitude          : 16.292
RP magnitude         : 15.282
BP magnitude         : 17.340
DUPflag             : 0
Distance (au)       : 18.571
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -17.32
Sun-Target sep (deg) : 142.54
Sun-Moon sep (deg)  : 89.81
B (ring opening deg) : 78.42
PA of pole (deg)    : -57.47
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.553
C/A sky separation (km) : 20915.4
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_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	2027-10-25T11:00:39.521		69.91	-33.82	51260.12	-16.24		
lambda	I	2027-10-25T11:01:55.416		69.67	-33.55	50026.71	-16.21		
delta	I	2027-10-25T11:03:42.341		69.32	-33.18	48300.35	-16.08		
gamma	I	2027-10-25T11:04:24.032		69.19	-33.03	47631.09	-16.03		
eta	I	2027-10-25T11:04:52.456		69.10	-32.93	47176.12	-15.99		
beta	I	2027-10-25T11:06:28.853		68.78	-32.59	45641.25	-15.85		
alpha	I	2027-10-25T11:07:27.191		68.59	-32.38	44720.42	-15.77		
4	I	2027-10-25T11:09:46.892		68.13	-31.89	42535.81	-15.51		
5	I	2027-10-25T11:10:07.378		68.06	-31.82	42215.97	-15.46		
6	I	2027-10-25T11:10:30.050		67.99	-31.74	41865.68	-15.43		
Uranus	I	2027-10-25T11:30:44.975		63.90	-27.45	25552.24		-1.24	-1.30
Uranus	E	2027-10-25T11:57:35.562		58.33	-21.75	25035.19		-11.16	-11.67
6	E	2027-10-25T12:17:51.249		54.06	-17.45	41795.74	15.39		
5	E	2027-10-25T12:18:16.917		53.97	-17.36	42177.09	15.43		
4	E	2027-10-25T12:18:41.501		53.88	-17.27	42564.99	15.48		
alpha	E	2027-10-25T12:21:01.123		53.39	-16.78	44745.54	15.73		
beta	E	2027-10-25T12:22:00.165		53.18	-16.57	45674.85	15.81		
eta	E	2027-10-25T12:23:34.654		52.84	-16.24	47176.12	15.95		
gamma	E	2027-10-25T12:24:02.776		52.74	-16.14	47625.08	15.98		
delta	E	2027-10-25T12:24:44.951		52.59	-15.99	48300.35	16.04		
lambda	E	2027-10-25T12:26:32.165		52.22	-15.61	50026.71	16.16		
epsilon	E	2027-10-25T12:27:18.758		52.05	-15.45	50781.07	16.19		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-25T11:44:01.680  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 144666185138539904  
 2Mass ID (if available) : 04285155+2141211  
 ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.904  
 G magnitude : 16.292  
 RP magnitude : 15.282  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 18.571  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.32  
 Sun-Target sep (deg) : 142.54  
 Sun-Moon sep (deg) : 89.76  
 B (ring opening deg) : 78.42  
 PA of pole (deg) : -57.47  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.559  
 C/A sky separation (km) : 20997.0  
 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

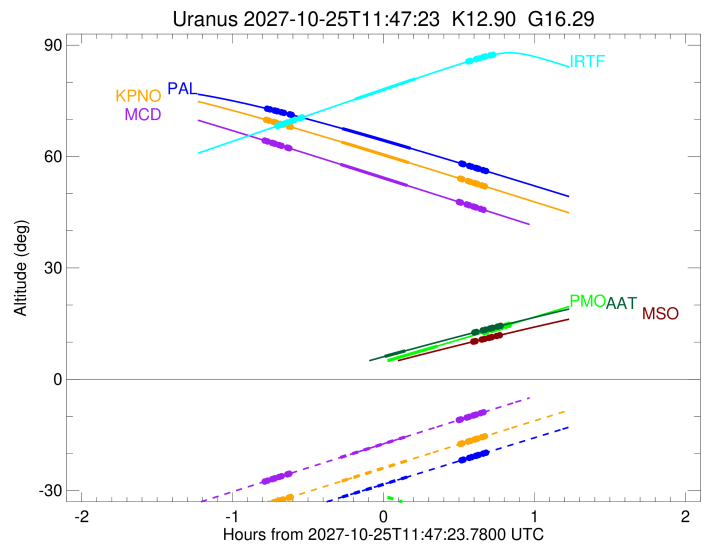
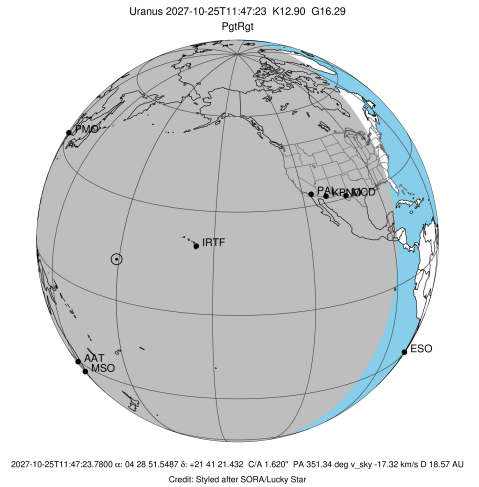


b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-10-25T11:00:04.482		64.32	-27.57	51258.97	-16.21		
lambda	I	2027-10-25T11:01:20.426		64.06	-27.30	50026.71	-16.18		
delta	I	2027-10-25T11:03:07.529		63.68	-26.92	48300.35	-16.05		
gamma	I	2027-10-25T11:03:49.291		63.53	-26.77	47631.10	-16.00		
eta	I	2027-10-25T11:04:17.765		63.43	-26.66	47176.12	-15.96		
beta	I	2027-10-25T11:05:54.339		63.10	-26.32	45641.26	-15.82		
alpha	I	2027-10-25T11:06:52.782		62.89	-26.11	44720.53	-15.73		
4	I	2027-10-25T11:09:12.781		62.40	-25.61	42535.72	-15.48		
5	I	2027-10-25T11:09:33.324		62.32	-25.53	42215.70	-15.43		
6	I	2027-10-25T11:09:56.034		62.24	-25.45	41865.57	-15.39		
Uranus	I	2027-10-25T11:30:16.269		57.91	-21.07	25551.35		-1.32	-1.38
Uranus	E	2027-10-25T11:56:55.181		52.18	-15.35	25036.52		-11.14	-11.66
6	E	2027-10-25T12:17:16.850		47.78	-10.99	41795.76	15.35		
5	E	2027-10-25T12:17:42.590		47.69	-10.90	42177.02	15.38		
4	E	2027-10-25T12:18:07.246		47.60	-10.81	42564.94	15.43		
alpha	E	2027-10-25T12:20:27.272		47.10	-10.32	44745.57	15.68		
beta	E	2027-10-25T12:21:26.475		46.88	-10.10	45674.83	15.77		
eta	E	2027-10-25T12:23:01.221		46.54	-9.77	47176.12	15.90		
gamma	E	2027-10-25T12:23:29.417		46.44	-9.67	47625.09	15.94		
delta	E	2027-10-25T12:24:11.704		46.29	-9.52	48300.35	16.00		
lambda	E	2027-10-25T12:25:59.197		45.90	-9.14	50026.71	16.12		
epsilon	E	2027-10-25T12:26:45.903		45.73	-8.97	50780.96	16.15		

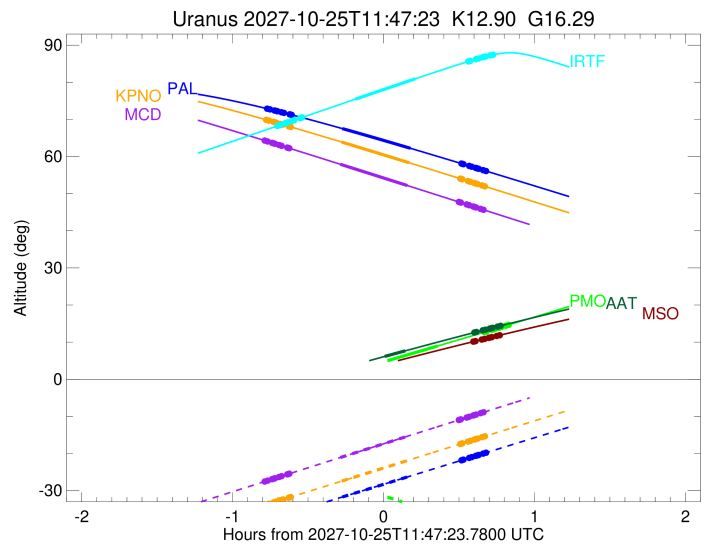
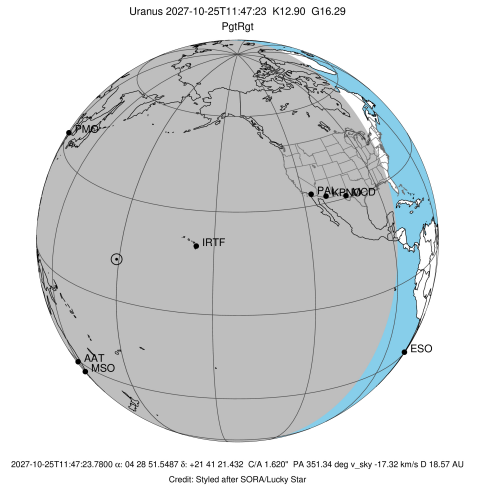
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2027-10-25T11:48:31.560
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       : 144666185138539904
2Mass ID (if available) : 04285155+2141211
ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 12.904
G magnitude          : 16.292
RP magnitude         : 15.282
BP magnitude         : 17.340
DUPflag             : 0
Distance (au)        : 18.571
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -17.32
Sun-Target sep (deg) : 142.54
Sun-Moon sep (deg)  : 89.92
B (ring opening deg) : 78.42
PA of pole (deg)    : -57.47
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.624
C/A sky separation (km) : 21868.3
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
    
```



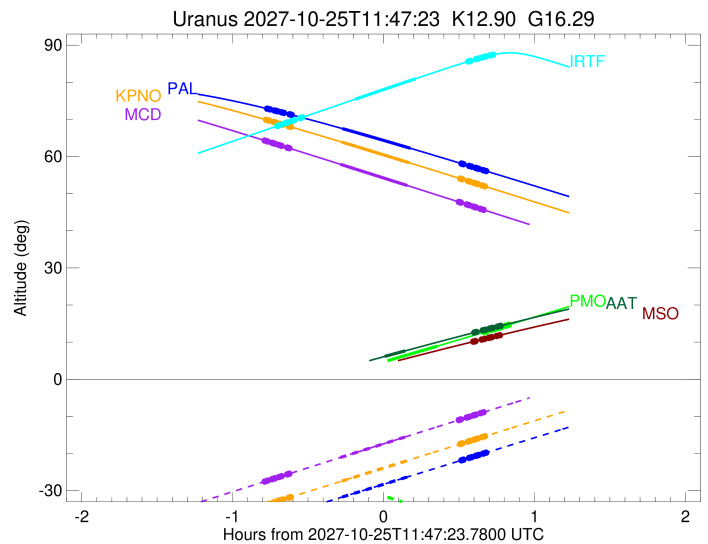
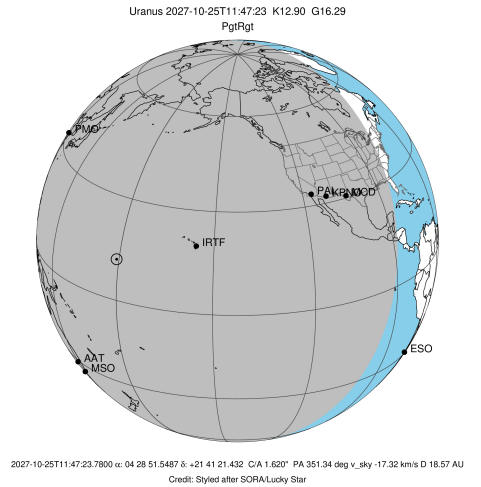
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-10-25T11:05:05.939		68.22	-73.90	51254.61	-16.09		
lambda	I	2027-10-25T11:06:22.165		68.51	-73.63	50026.71	-16.06		
delta	I	2027-10-25T11:08:10.104		68.93	-73.25	48300.35	-15.92		
gamma	I	2027-10-25T11:08:52.212		69.09	-73.10	47631.13	-15.86		
eta	I	2027-10-25T11:09:20.933		69.21	-72.99	47176.12	-15.82		
beta	I	2027-10-25T11:10:58.384		69.58	-72.64	45641.30	-15.67		
alpha	I	2027-10-25T11:11:57.367		69.81	-72.43	44721.03	-15.58		
4	I	2027-10-25T11:14:18.944		70.36	-71.92	42535.26	-15.30		
5	I	2027-10-25T11:14:39.792		70.44	-71.84	42214.42	-15.24		
6	I	2027-10-25T11:15:02.722		70.53	-71.76	41865.03	-15.21		
Uranus	I	2027-10-25T11:36:06.908		75.43	-67.07	25542.33		-1.95	-2.04
Uranus	E	2027-10-25T12:00:01.734		80.94	-61.60	25059.95		-10.88	-11.38
6	E	2027-10-25T12:21:02.716		85.60	-56.72	41796.07	15.25		
5	E	2027-10-25T12:21:28.509		85.68	-56.62	42175.28	15.28		
4	E	2027-10-25T12:21:53.342		85.77	-56.53	42563.52	15.34		
alpha	E	2027-10-25T12:24:14.177		86.24	-55.98	44746.17	15.62		
beta	E	2027-10-25T12:25:13.521		86.43	-55.75	45674.39	15.72		
eta	E	2027-10-25T12:26:48.549		86.73	-55.38	47176.12	15.87		
gamma	E	2027-10-25T12:27:16.812		86.82	-55.27	47625.24	15.91		
delta	E	2027-10-25T12:27:59.160		86.94	-55.10	48300.35	15.97		
lambda	E	2027-10-25T12:29:46.754		87.24	-54.68	50026.71	16.12		
epsilon	E	2027-10-25T12:30:33.198		87.36	-54.50	50776.53	16.15		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-25T11:52:30.160  
 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 : 144666185138539904  
 2Mass ID (if available) : 04285155+2141211  
 ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.904  
 G magnitude : 16.292  
 RP magnitude : 15.282  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 18.571  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.32  
 Sun-Target sep (deg) : 142.54  
 Sun-Moon sep (deg) : 89.07  
 B (ring opening deg) : 78.42  
 PA of pole (deg) : -57.47  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.853  
 C/A sky separation (km) : 24955.1  
 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	2027-10-25T11:09:50.154	-1.10x	-32.52	51228.44	-15.24			
lambda	I	2027-10-25T11:11:08.958	-0.84x	-32.73	50026.71	-15.19			
delta	I	2027-10-25T11:13:03.293	-0.47x	-33.03	48300.35	-15.00			
gamma	I	2027-10-25T11:13:48.001	-0.33x	-33.15	47631.27	-14.93			
eta	I	2027-10-25T11:14:18.551	-0.23x	-33.22	47176.12	-14.87			
beta	I	2027-10-25T11:16:02.422	0.11x	-33.49	45641.59	-14.67			
alpha	I	2027-10-25T11:17:05.336	0.31x	-33.65	44723.70	-14.54			
4	I	2027-10-25T11:19:37.888	0.80x	-34.04	42533.05	-14.17			
5	I	2027-10-25T11:20:00.767	0.88x	-34.10	42207.81	-14.10			
6	I	2027-10-25T11:20:25.285	0.95x	-34.16	41862.12	-14.05			
Uranus	I	2027-10-25T11:47:53.671	6.15	-38.08	25417.17	-5.71		-5.98	
Uranus	E	2027-10-25T11:56:03.896	7.66	-39.13	25232.46	-8.74		-9.14	
6	E	2027-10-25T12:23:25.715	12.58	-42.26	41797.25	14.14			
5	E	2027-10-25T12:23:53.149	12.66	-42.31	42170.57	14.19			
4	E	2027-10-25T12:24:19.934	12.73	-42.35	42559.45	14.27			
alpha	E	2027-10-25T12:26:51.078	13.17	-42.60	44747.76	14.65			
beta	E	2027-10-25T12:27:54.059	13.36	-42.71	45673.08	14.78			
eta	E	2027-10-25T12:29:34.982	13.65	-42.87	47176.12	14.99			
gamma	E	2027-10-25T12:30:04.920	13.73	-42.92	47625.65	15.04			
delta	E	2027-10-25T12:30:49.646	13.86	-42.99	48300.35	15.13			
lambda	E	2027-10-25T12:32:43.043	14.19	-43.16	50026.71	15.32			
epsilon	E	2027-10-25T12:33:31.170	14.33	-43.24	50765.83	15.37			

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2027-10-25T11:52:20.480  
 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 : 144666185138539904  
 2Mass ID (if available) : 04285155+2141211  
 ICRS Star Coord at Epoch: 04h 28m 51.54871s +21:41:21.43167s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.904  
 G magnitude : 16.292  
 RP magnitude : 15.282  
 BP magnitude : 17.340  
 DUPflag : 0  
 Distance (au) : 18.571  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -17.32  
 Sun-Target sep (deg) : 142.54  
 Sun-Moon sep (deg) : 89.04  
 B (ring opening deg) : 78.42  
 PA of pole (deg) : -57.47  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.878  
 C/A sky separation (km) : 25293.5  
 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	2027-10-25T11:09:50.554	-2.83x	-29.72	51225.20	-15.17			
lambda	I	2027-10-25T11:11:09.518	-2.59x	-29.92	50026.71	-15.12			
delta	I	2027-10-25T11:13:04.437	-2.23x	-30.19	48300.35	-14.92			
gamma	I	2027-10-25T11:13:49.387	-2.09x	-30.30	47631.29	-14.84			
eta	I	2027-10-25T11:14:20.111	-2.00x	-30.38	47176.12	-14.79			
beta	I	2027-10-25T11:16:04.599	-1.68x	-30.62	45641.64	-14.58			
alpha	I	2027-10-25T11:17:07.897	-1.48x	-30.78	44724.02	-14.45			
4	I	2027-10-25T11:19:41.578	-1.01x	-31.14	42532.80	-14.07			
5	I	2027-10-25T11:20:04.679	-0.94x	-31.19	42207.02	-13.99			
6	I	2027-10-25T11:20:29.361	-0.86x	-31.25	41861.75	-13.93			
Uranus	I	2027-10-25T11:50:40.699	4.58x	-35.18	25353.28	-6.90	-7.22		
Uranus	E	2027-10-25T11:52:56.708	4.98x	-35.45	25301.36	-7.74	-8.10		
6	E	2027-10-25T12:23:01.770	10.12	-38.63	41797.39	14.02			
5	E	2027-10-25T12:23:29.394	10.20	-38.67	42170.10	14.08			
4	E	2027-10-25T12:23:56.400	10.27	-38.71	42559.03	14.16			
alpha	E	2027-10-25T12:26:28.709	10.69	-38.94	44747.91	14.55			
beta	E	2027-10-25T12:27:32.094	10.87	-39.04	45672.94	14.68			
eta	E	2027-10-25T12:29:13.662	11.14	-39.19	47176.12	14.90			
gamma	E	2027-10-25T12:29:43.782	11.23	-39.23	47625.69	14.96			
delta	E	2027-10-25T12:30:28.765	11.35	-39.29	48300.35	15.04			
lambda	E	2027-10-25T12:32:22.782	11.66	-39.45	50026.71	15.24			
epsilon	E	2027-10-25T12:33:11.094	11.79	-39.52	50764.87	15.30			