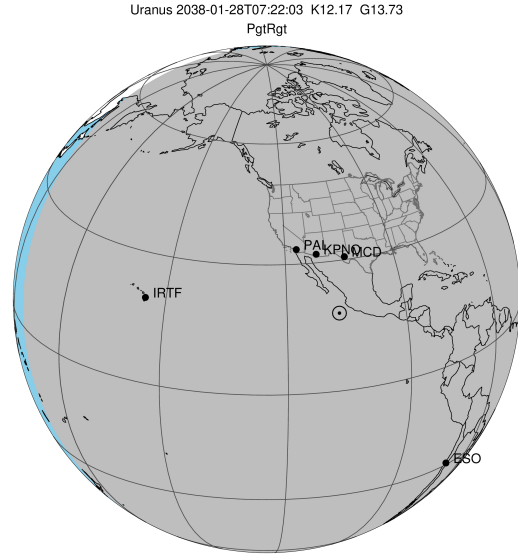


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-28T07:22:03.790  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 866390599772195840  
 2Mass ID (if available) : 07305085+2218094

ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s

RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.169  
 G magnitude : 13.735  
 RP magnitude : 13.208  
 BP magnitude : 14.100  
 DUPflag : 0  
 Distance (au) : 17.757  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.00  
 Sun-Target sep (deg) : 162.99  
 Sun-Moon sep (deg) : 111.95  
 B (ring opening deg) : 55.81  
 PA of pole (deg) : 84.24

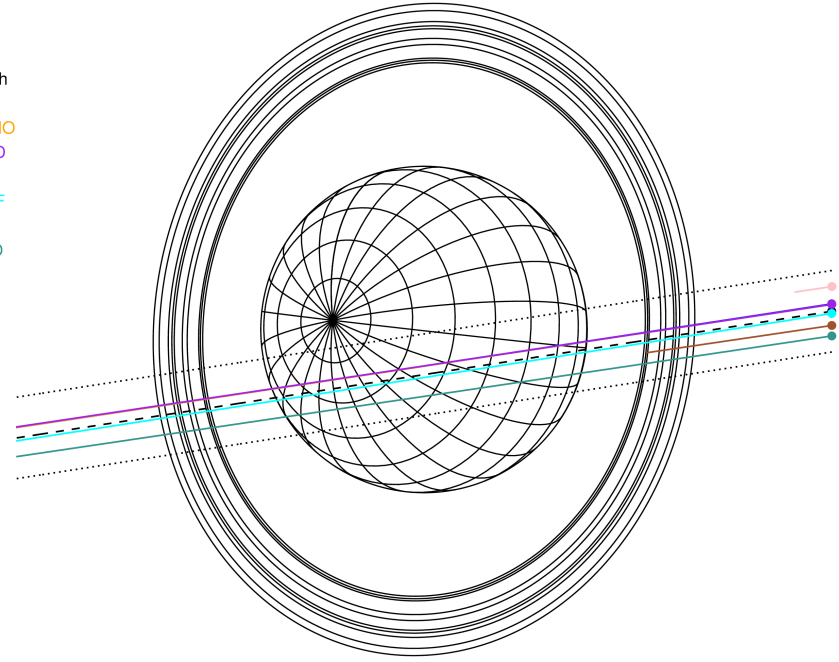
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2038-01-28T07:22:03.7900 α: 07 30 50.8734 δ: +22 18 08.829 C/A 0.534° PA 8.83 deg v\_sky -22.00 km/s D 17.76 AU  
 Credit: Styled after SORA/Lucky Star

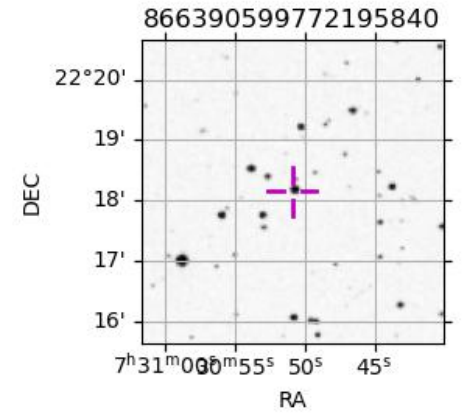
Uranus 2038-01-28T07:22:03 K12.17 G13.73 PgtRgt

Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO



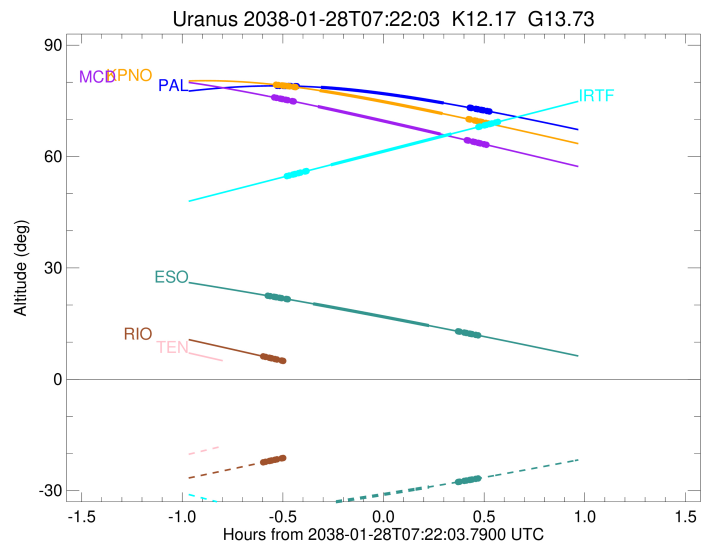
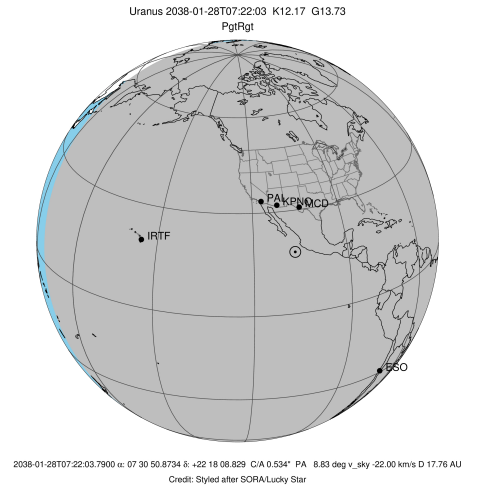
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++	+ +	+++++	JAN 28 06:50 - JAN 28 07:53	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	JAN 28 06:50 - JAN 28 07:53	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	JAN 28 06:49 - JAN 28 07:52	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	JAN 28 06:53 - JAN 28 07:56	PieRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++			JAN 28 06:46 - JAN 28 06:51	PnnRin
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	JAN 28 06:47 - JAN 28 07:50	PieRie
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



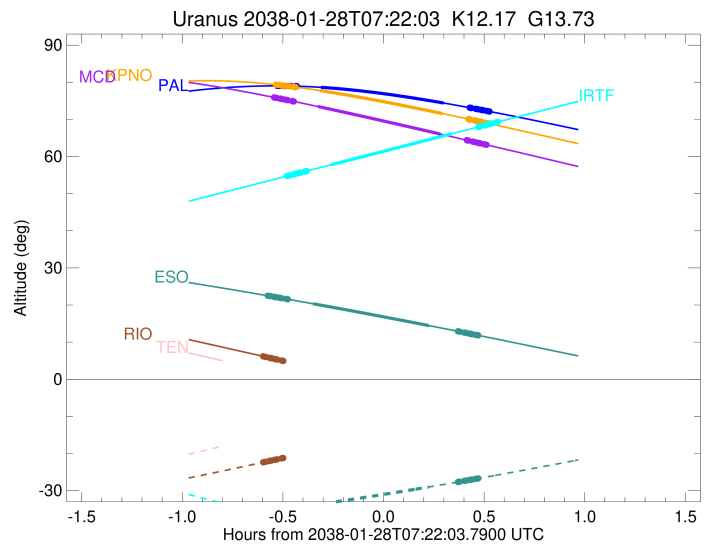
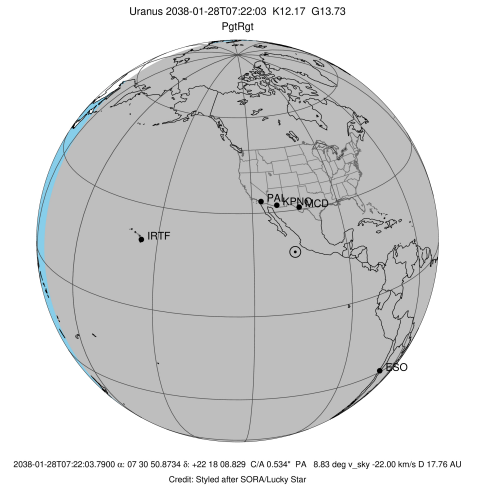
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2038-01-28T07:21:40.360
Event type          : PgtRgt
: 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      : 866390599772195840
2Mass ID (if available) : 07305085+2218094
ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 12.169
G magnitude          : 13.735
RP magnitude         : 13.208
BP magnitude         : 14.100
DUPflag             : 0
Distance (au)       : 17.757
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -22.00
Sun-Target sep (deg) : 162.99
Sun-Moon sep (deg)  : 112.87
B (ring opening deg) : 55.81
PA of pole (deg)    : 84.24
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.439
C/A sky separation (km) : 5653.1
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.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	2038-01-28T06:50:32.472		79.04	-68.32	50906.77	-26.60		
lambda	I	2038-01-28T06:51:05.542		79.04	-68.41	50026.71	-26.61		
delta	I	2038-01-28T06:52:10.438		79.03	-68.58	48300.35	-26.59		
gamma	I	2038-01-28T06:52:35.635		79.02	-68.65	47630.32	-26.59		
eta	I	2038-01-28T06:52:52.718		79.02	-68.70	47176.12	-26.59		
beta	I	2038-01-28T06:53:50.391		79.01	-68.85	45645.58	-26.57		
alpha	I	2038-01-28T06:54:26.345		78.99	-68.94	44686.07	-26.56		
4	I	2038-01-28T06:55:46.989		78.96	-69.15	42538.00	-26.53		
5	I	2038-01-28T06:55:55.107		78.96	-69.17	42312.65	-26.52		
6	I	2038-01-28T06:56:14.113		78.95	-69.22	41856.91	-26.55		
Uranus	I	2038-01-28T07:03:24.787		78.64	-70.29	25159.75		-34.18	-35.41
Uranus	E	2038-01-28T07:40:00.106		74.42	-74.29	25242.04		29.95	31.11
6	E	2038-01-28T07:47:45.459		73.15	-74.70	41828.33	26.53		
5	E	2038-01-28T07:47:59.315		73.12	-74.71	42154.83	26.50		
4	E	2038-01-28T07:48:15.654		73.07	-74.72	42595.14	26.51		
alpha	E	2038-01-28T07:49:36.748		72.84	-74.77	44747.44	26.53		
beta	E	2038-01-28T07:50:11.649		72.74	-74.79	45679.35	26.55		
eta	E	2038-01-28T07:51:08.085		72.58	-74.82	47176.12	26.56		
gamma	E	2038-01-28T07:51:24.854		72.53	-74.83	47621.52	26.56		
delta	E	2038-01-28T07:51:50.407		72.46	-74.84	48300.35	26.57		
lambda	E	2038-01-28T07:52:55.369		72.27	-74.87	50026.71	26.58		
epsilon	E	2038-01-28T07:53:43.613		72.13	-74.89	51309.28	26.57		

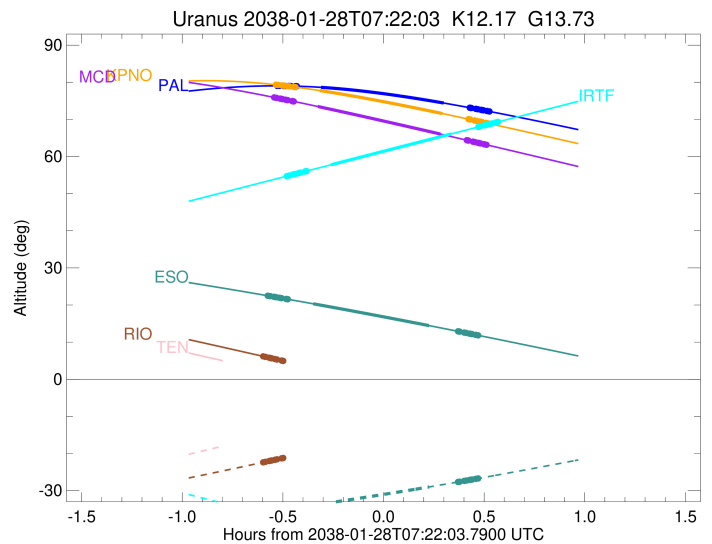
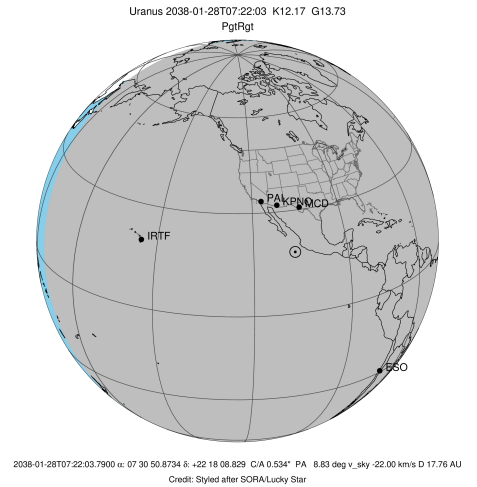
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-28T07:21:17.600  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : KPNO  
 Location : Kitt Peak Natl Obs  
 Latitude (deg) : 31.96333  
 E. Longitude (deg) : 248.40000  
 Altitude (km) : 2.120  
 Gaia source ID : 866390599772195840  
 2Mass ID (if available) : 07305085+2218094  
 ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.169  
 G magnitude : 13.735  
 RP magnitude : 13.208  
 BP magnitude : 14.100  
 DUPflag : 0  
 Distance (au) : 17.757  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.00  
 Sun-Target sep (deg) : 162.99  
 Sun-Moon sep (deg) : 112.89  
 B (ring opening deg) : 55.81  
 PA of pole (deg) : 84.24  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.442  
 C/A sky separation (km) : 5692.1  
 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



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	2038-01-28T06:50:10.061		79.32	-72.43	50906.35	-26.60		
lambda	I	2038-01-28T06:50:43.113		79.27	-72.51	50026.71	-26.61		
delta	I	2038-01-28T06:51:48.006		79.16	-72.66	48300.35	-26.60		
gamma	I	2038-01-28T06:52:13.202		79.11	-72.72	47630.31	-26.59		
eta	I	2038-01-28T06:52:30.284		79.08	-72.76	47176.12	-26.59		
beta	I	2038-01-28T06:53:27.954		78.98	-72.89	45645.60	-26.57		
alpha	I	2038-01-28T06:54:03.909		78.91	-72.97	44686.06	-26.56		
4	I	2038-01-28T06:55:24.554		78.76	-73.15	42537.95	-26.53		
5	I	2038-01-28T06:55:32.671		78.74	-73.17	42312.62	-26.52		
6	I	2038-01-28T06:55:51.675		78.70	-73.21	41856.96	-26.55		
Uranus	I	2038-01-28T07:03:02.374		77.78	-74.10	25159.71		-34.18	-35.42
Uranus	E	2038-01-28T07:39:37.142		71.58	-76.35	25242.36		29.94	31.09
6	E	2038-01-28T07:47:22.826		70.08	-76.22	41828.35	26.52		
5	E	2038-01-28T07:47:36.686		70.04	-76.22	42154.83	26.49		
4	E	2038-01-28T07:47:53.031		69.98	-76.21	42595.12	26.50		
alpha	E	2038-01-28T07:49:14.155		69.72	-76.16	44747.44	26.52		
beta	E	2038-01-28T07:49:49.070		69.60	-76.14	45679.36	26.54		
eta	E	2038-01-28T07:50:45.526		69.42	-76.10	47176.12	26.55		
gamma	E	2038-01-28T07:51:02.302		69.36	-76.09	47621.52	26.55		
delta	E	2038-01-28T07:51:27.864		69.28	-76.07	48300.35	26.56		
lambda	E	2038-01-28T07:52:32.851		69.07	-76.02	50026.71	26.57		
epsilon	E	2038-01-28T07:53:21.108		68.91	-75.98	51309.17	26.56		

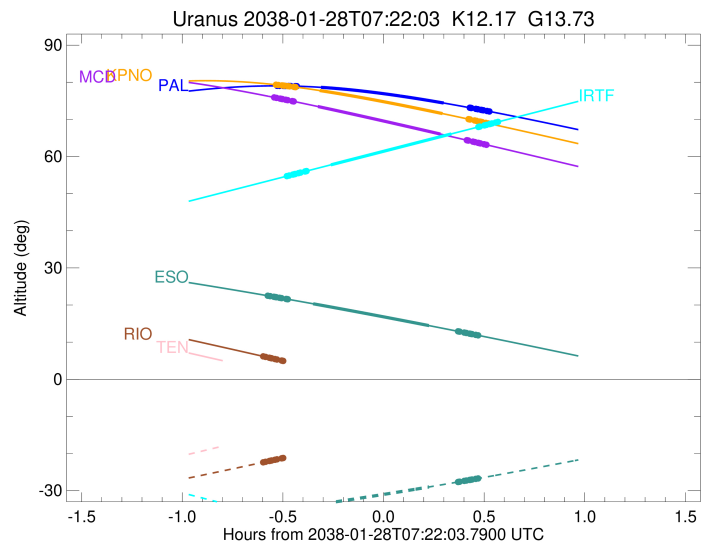
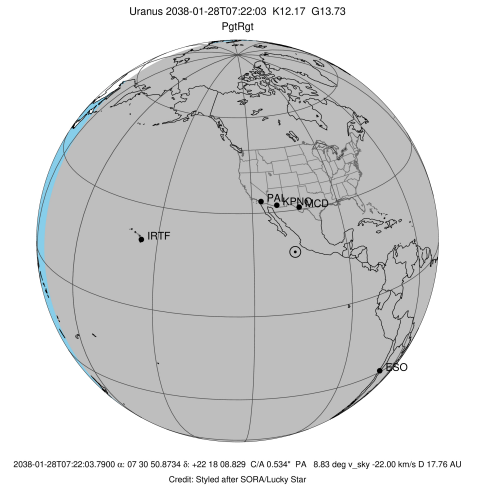
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-28T07:20:45.940  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 866390599772195840  
 2Mass ID (if available) : 07305085+2218094  
 ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.169  
 G magnitude : 13.735  
 RP magnitude : 13.208  
 BP magnitude : 14.100  
 DUPflag : 0  
 Distance (au) : 17.757  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.00  
 Sun-Target sep (deg) : 162.99  
 Sun-Moon sep (deg) : 112.91  
 B (ring opening deg) : 55.81  
 PA of pole (deg) : 84.24  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.438  
 C/A sky separation (km) : 5644.0  
 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



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2038-01-28T06:49:37.327		75.90	-76.89	50906.45	-26.60		
lambda	I	2038-01-28T06:50:10.386		75.80	-76.94	50026.71	-26.61		
delta	I	2038-01-28T06:51:15.284		75.60	-77.01	48300.35	-26.59		
gamma	I	2038-01-28T06:51:40.481		75.52	-77.04	47630.31	-26.59		
eta	I	2038-01-28T06:51:57.565		75.47	-77.06	47176.12	-26.58		
beta	I	2038-01-28T06:52:55.240		75.29	-77.12	45645.59	-26.57		
alpha	I	2038-01-28T06:53:31.198		75.18	-77.16	44686.06	-26.56		
4	I	2038-01-28T06:54:51.848		74.93	-77.24	42537.97	-26.53		
5	I	2038-01-28T06:54:59.966		74.90	-77.25	42312.63	-26.52		
6	I	2038-01-28T06:55:18.973		74.84	-77.27	41856.94	-26.55		
Uranus	I	2038-01-28T07:02:29.703		73.48	-77.56	25159.73		-34.18	-35.41
Uranus	E	2038-01-28T07:39:06.647		66.04	-75.86	25241.49		29.98	31.14
6	E	2038-01-28T07:46:52.170		64.41	-74.93	41828.28	26.50		
5	E	2038-01-28T07:47:06.043		64.36	-74.90	42154.83	26.47		
4	E	2038-01-28T07:47:22.400		64.30	-74.86	42595.19	26.48		
alpha	E	2038-01-28T07:48:43.571		64.02	-74.68	44747.46	26.51		
beta	E	2038-01-28T07:49:18.507		63.89	-74.60	45679.34	26.52		
eta	E	2038-01-28T07:50:15.001		63.69	-74.48	47176.12	26.53		
gamma	E	2038-01-28T07:50:31.787		63.63	-74.44	47621.53	26.54		
delta	E	2038-01-28T07:50:57.366		63.54	-74.38	48300.35	26.54		
lambda	E	2038-01-28T07:52:02.397		63.31	-74.23	50026.71	26.55		
epsilon	E	2038-01-28T07:52:50.711		63.14	-74.11	51309.76	26.54		

```

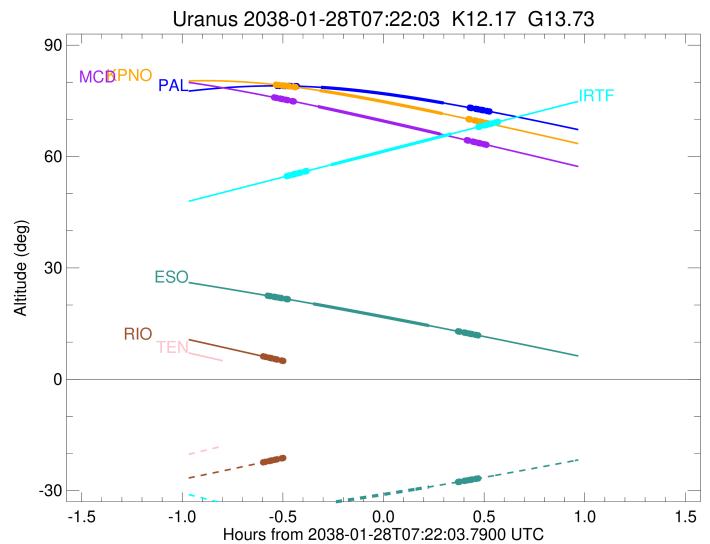
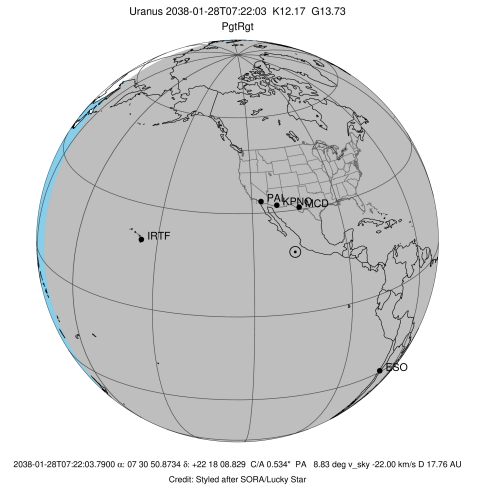
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2038-01-28T07:24:18.420
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 866390599772195840
2Mass ID (if available) : 07305085+2218094
ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 12.169
G magnitude           : 13.735
RP magnitude          : 13.208
BP magnitude          : 14.100
DUPflag              : 0
Distance (au)         : 17.757
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -22.00
Sun-Target sep (deg) : 162.99
Sun-Moon sep (deg)   : 112.56
B (ring opening deg) : 55.81
PA of pole (deg)     : 84.24
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.577
C/A sky separation (km) : 7432.9
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	2038-01-28T06:53:24.904		54.76	-37.88	50896.60	-26.42		
lambda	I	2038-01-28T06:53:57.799		54.89	-38.01	50026.71	-26.44		
delta	I	2038-01-28T06:55:03.121		55.14	-38.27	48300.35	-26.42		
gamma	I	2038-01-28T06:55:28.494		55.24	-38.36	47630.19	-26.41		
eta	I	2038-01-28T06:55:45.690		55.31	-38.43	47176.12	-26.40		
beta	I	2038-01-28T06:56:43.757		55.53	-38.66	45646.04	-26.38		
alpha	I	2038-01-28T06:57:20.016		55.67	-38.80	44685.73	-26.36		
4	I	2038-01-28T06:58:41.289		55.98	-39.11	42536.83	-26.32		
5	I	2038-01-28T06:58:49.449		56.02	-39.14	42311.79	-26.31		
6	I	2038-01-28T06:59:08.544		56.09	-39.22	41858.39	-26.33		
Uranus	I	2038-01-28T07:06:24.183		57.77	-40.91	25160.27		-34.15	-35.39
Uranus	E	2038-01-28T07:42:17.063		66.10	-49.30	25268.15		28.55	29.67
6	E	2038-01-28T07:50:18.286		67.96	-51.18	41830.31	26.38		
5	E	2038-01-28T07:50:32.077		68.01	-51.24	42154.97	26.36		
4	E	2038-01-28T07:50:48.450		68.08	-51.30	42593.32	26.37		
alpha	E	2038-01-28T07:52:10.015		68.39	-51.62	44746.63	26.41		
beta	E	2038-01-28T07:52:45.110		68.53	-51.76	45679.71	26.44		
eta	E	2038-01-28T07:53:41.756		68.75	-51.98	47176.12	26.46		
gamma	E	2038-01-28T07:53:58.585		68.81	-52.05	47621.43	26.46		
delta	E	2038-01-28T07:54:24.234		68.91	-52.15	48300.35	26.47		
lambda	E	2038-01-28T07:55:29.413		69.16	-52.40	50026.71	26.50		
epsilon	E	2038-01-28T07:56:17.244		69.35	-52.59	51294.51	26.48		

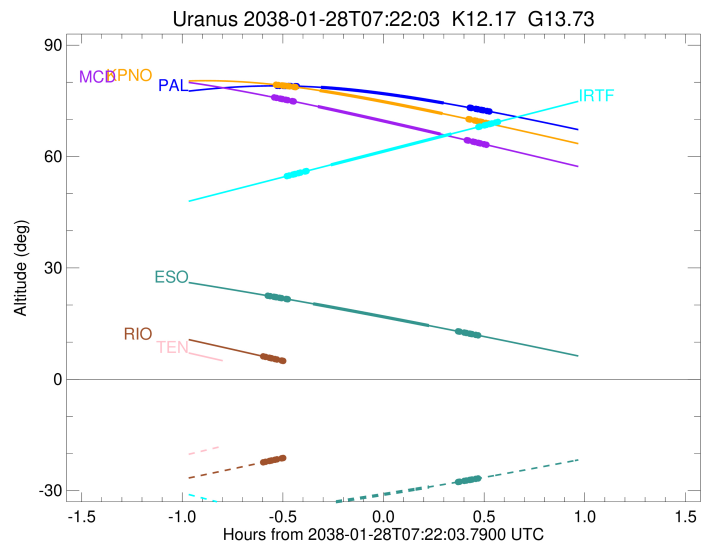
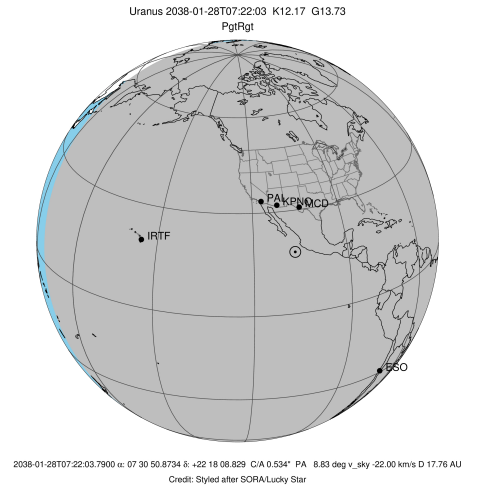


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-28T07:17:27.580  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 866390599772195840  
 2Mass ID (if available) : 07305085+2218094  
 ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.169  
 G magnitude : 13.735  
 RP magnitude : 13.208  
 BP magnitude : 14.100  
 DUPflag : 0  
 Distance (au) : 17.757  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.00  
 Sun-Target sep (deg) : 162.99  
 Sun-Moon sep (deg) : 112.27  
 B (ring opening deg) : 55.81  
 PA of pole (deg) : 84.24  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.675  
 C/A sky separation (km) : 8689.5  
 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	2038-01-28T06:46:22.099		6.14	-22.34	50886.34	-26.03		
lambda	I	2038-01-28T06:46:55.092		6.02	-22.23	50026.71	-26.05		
delta	I	2038-01-28T06:48:01.412		5.80	-22.01	48300.35	-26.01		
gamma	I	2038-01-28T06:48:27.186		5.71	-21.93	47630.07	-26.00		
eta	I	2038-01-28T06:48:44.649		5.65	-21.87	47176.12	-25.99		
beta	I	2038-01-28T06:49:43.633		5.44	-21.68	45646.53	-25.96		
alpha	I	2038-01-28T06:50:20.528		5.32	-21.56	44685.44	-25.93		
4	I	2038-01-28T06:51:43.184		5.03	-21.29	42535.74	-25.87		
5	I	2038-01-28T06:51:51.471		5.00	-21.27	42310.85	-25.85		
6	I	2038-01-28T06:52:10.827		4.94x	-21.20	41859.79	-25.88		
Uranus	I	2038-01-28T06:59:37.109		3.40x	-19.74	25163.86		-33.97	-35.21
Uranus	E	2038-01-28T07:35:25.553		-4.16x	-12.47	25284.04		27.68	28.78
6	E	2038-01-28T07:43:47.024		-5.95x	-10.73	41831.32	25.76		
5	E	2038-01-28T07:44:01.075		-6.00x	-10.68	42155.11	25.74		
4	E	2038-01-28T07:44:17.811		-6.06x	-10.63	42592.38	25.75		
alpha	E	2038-01-28T07:45:41.357		-6.36x	-10.33	44746.20	25.80		
beta	E	2038-01-28T07:46:17.298		-6.49x	-10.21	45679.87	25.83		
eta	E	2038-01-28T07:47:15.259		-6.70x	-10.01	47176.12	25.86		
gamma	E	2038-01-28T07:47:32.476		-6.76x	-9.95	47621.38	25.86		
delta	E	2038-01-28T07:47:58.720		-6.86x	-9.86	48300.35	25.88		
lambda	E	2038-01-28T07:49:05.398		-7.10x	-9.62	50026.71	25.91		
epsilon	E	2038-01-28T07:49:54.050		-7.27x	-9.45	51287.50	25.89		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2038-01-28T07:18:17.310  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 866390599772195840  
 2Mass ID (if available) : 07305085+2218094  
 ICRS Star Coord at Epoch: 07h 30m 50.87337s +22:18:08.82873s  
 RUWE (>1.4 is poor) : 1.03  
 K magnitude : 12.169  
 G magnitude : 13.735  
 RP magnitude : 13.208  
 BP magnitude : 14.100  
 DUPflag : 0  
 Distance (au) : 17.757  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.00  
 Sun-Target sep (deg) : 162.99  
 Sun-Moon sep (deg) : 112.49  
 B (ring opening deg) : 55.81  
 PA of pole (deg) : 84.24  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.805  
 C/A sky separation (km) : 10363.5  
 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	2038-01-28T06:47:44.273		22.47	-35.57	50876.25	-26.05		
lambda	I	2038-01-28T06:48:16.861		22.39	-35.50	50026.71	-26.06		
delta	I	2038-01-28T06:49:23.167		22.21	-35.37	48300.35	-26.01		
gamma	I	2038-01-28T06:49:48.949		22.15	-35.32	47629.94	-25.99		
eta	I	2038-01-28T06:50:06.413		22.10	-35.28	47176.12	-25.98		
beta	I	2038-01-28T06:51:05.416		21.94	-35.16	45647.05	-25.93		
alpha	I	2038-01-28T06:51:42.392		21.85	-35.09	44685.18	-25.90		
4	I	2038-01-28T06:53:05.191		21.63	-34.92	42534.63	-25.81		
5	I	2038-01-28T06:53:13.488		21.61	-34.90	42309.73	-25.79		
6	I	2038-01-28T06:53:32.800		21.55	-34.86	41861.24	-25.81		
Uranus	I	2038-01-28T07:01:05.506		20.34	-33.90	25171.60		-33.58	-34.81
Uranus	E	2038-01-28T07:35:37.255		14.46	-29.01	25311.02		26.15	27.21
6	E	2038-01-28T07:44:14.846		12.92	-27.68	41833.09	25.72		
5	E	2038-01-28T07:44:28.790		12.88	-27.64	42155.46	25.70		
4	E	2038-01-28T07:44:45.488		12.83	-27.60	42590.72	25.72		
alpha	E	2038-01-28T07:46:09.149		12.58	-27.38	44745.42	25.80		
beta	E	2038-01-28T07:46:45.126		12.47	-27.28	45680.13	25.84		
eta	E	2038-01-28T07:47:43.042		12.30	-27.13	47176.12	25.88		
gamma	E	2038-01-28T07:48:00.242		12.24	-27.08	47621.31	25.89		
delta	E	2038-01-28T07:48:26.461		12.16	-27.01	48300.35	25.91		
lambda	E	2038-01-28T07:49:33.043		11.96	-26.84	50026.71	25.95		
epsilon	E	2038-01-28T07:50:21.104		11.82	-26.71	51274.49	25.94		