

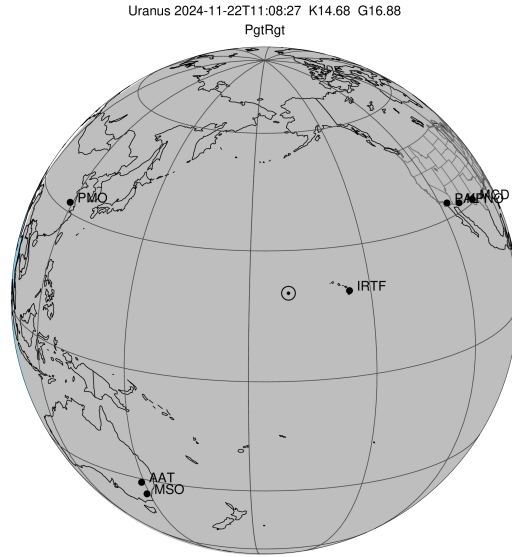
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-22T11:08:27.460
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 57461203519965056
 2Mass ID (if available) : 03292998+1840411

Uranus 2024-11-22T11:08:27 K14.68 G16.88 PgtRgt

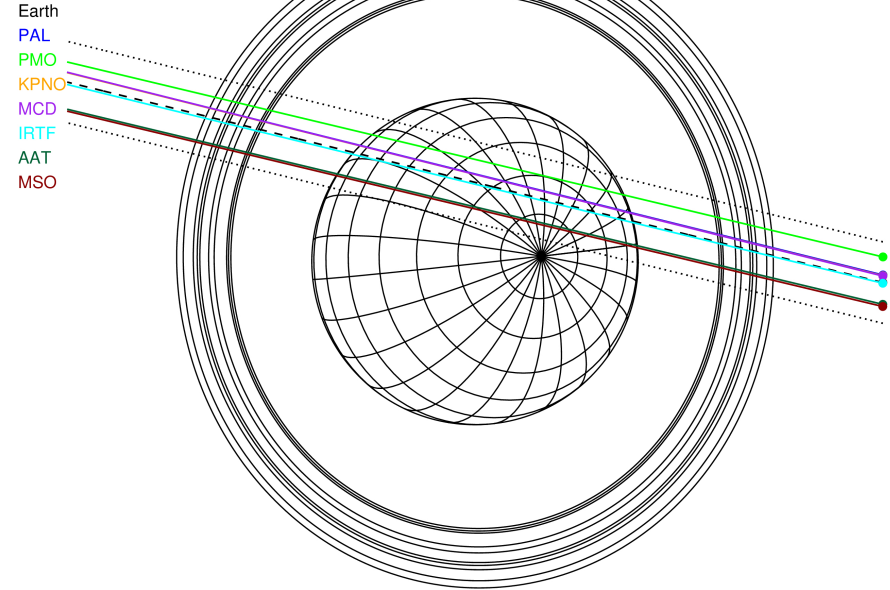
ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.683
 G magnitude : 16.878
 RP magnitude : 16.181
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 18.577
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.29
 Sun-Target sep (deg) : 174.36
 Sun-Moon sep (deg) : 88.94
 B (ring opening deg) : 65.91
 PA of pole (deg) : -85.46

#	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

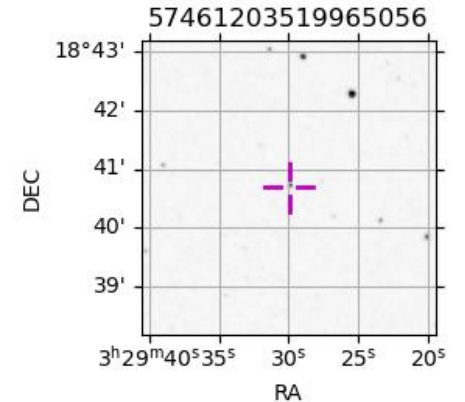


2024-11-22T11:08:27.4600 ra: 03 29 30.0015 s: +18 40 41.097 C/A 0.896° PA 166.19 deg v_sky -23.29 km/s D 18.58 AU
 Credit: Styled after SORA/Lucky Star

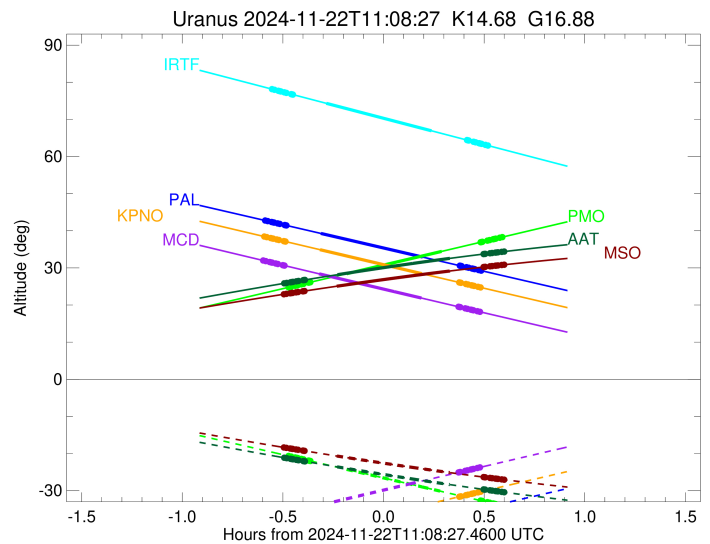
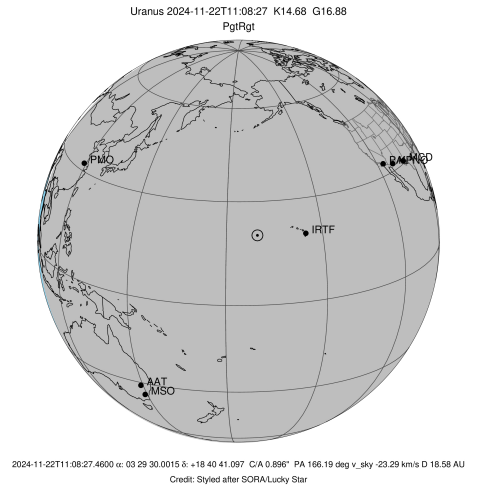


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	NOV 22 10:32 - NOV 22 11:37	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	NOV 22 10:39 - NOV 22 11:43	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	NOV 22 10:32 - NOV 22 11:37	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	NOV 22 10:32 - NOV 22 11:37	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	NOV 22 10:34 - NOV 22 11:39	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	+++++	+ +	+++++	NOV 22 10:38 - NOV 22 11:44	PieRie
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+ +	+++++	NOV 22 10:38 - NOV 22 11:44	PieRie

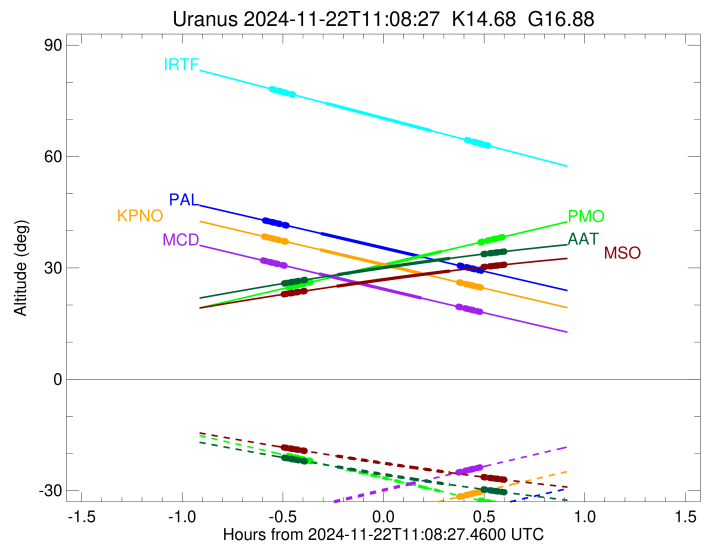
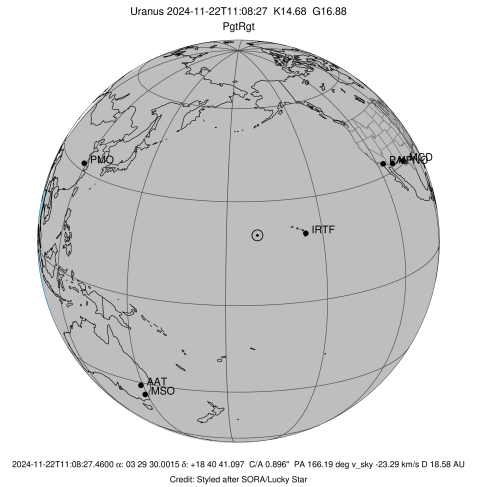


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-22T11:04:51.840
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 57461203519965056
 2Mass ID (if available) : 03292998+1840411
 ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.683
 G magnitude : 16.878
 RP magnitude : 16.181
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 18.577
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.29
 Sun-Target sep (deg) : 174.36
 Sun-Moon sep (deg) : 89.46
 B (ring opening deg) : 65.91
 PA of pole (deg) : -85.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.987
 C/A sky separation (km) : 13303.5
 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



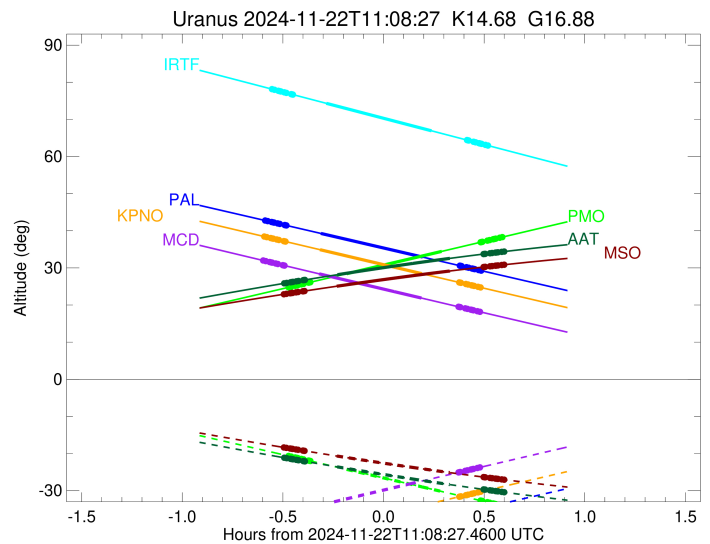
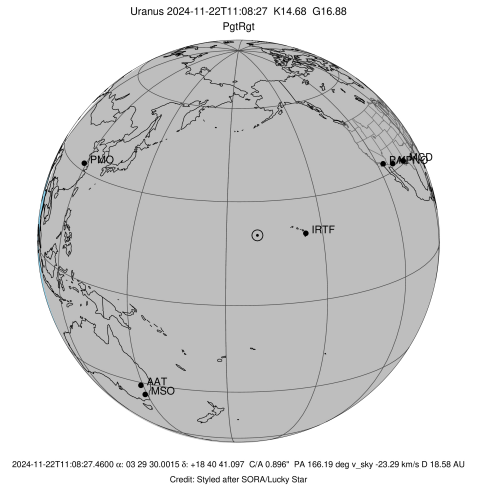
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2024-11-22T10:32:55.497		42.82	-48.30	51531.27	-24.72		
lambda	I	2024-11-22T10:33:56.475		42.60	-48.09	50026.71	-24.64		
delta	I	2024-11-22T10:35:06.626		42.36	-47.85	48300.35	-24.57		
gamma	I	2024-11-22T10:35:34.230		42.26	-47.75	47622.45	-24.54		
eta	I	2024-11-22T10:35:52.423		42.20	-47.69	47176.12	-24.52		
beta	I	2024-11-22T10:36:54.823		41.98	-47.48	45646.57	-24.45		
alpha	I	2024-11-22T10:37:32.030		41.85	-47.35	44737.46	-24.40		
4	I	2024-11-22T10:39:02.465		41.54	-47.03	42528.98	-24.26		
5	I	2024-11-22T10:39:13.967		41.50	-46.99	42242.40	-24.25		
6	I	2024-11-22T10:39:30.353		41.44	-46.94	41853.13	-24.20		
Uranus	I	2024-11-22T10:49:47.385		39.29	-44.79	25097.59		23.38	24.36
Uranus	E	2024-11-22T11:20:10.003		32.91	-38.44	25355.36		-15.17	-15.85
6	E	2024-11-22T11:31:11.444		30.60	-36.14	41800.59	24.13		
5	E	2024-11-22T11:31:31.126		30.53	-36.07	42277.19	24.18		
4	E	2024-11-22T11:31:44.035		30.49	-36.02	42595.18	24.18		
alpha	E	2024-11-22T11:33:11.421		30.18	-35.72	44719.13	24.32		
beta	E	2024-11-22T11:33:50.837		30.05	-35.58	45680.97	24.37		
eta	E	2024-11-22T11:34:52.052		29.83	-35.37	47176.12	24.44		
gamma	E	2024-11-22T11:35:10.515		29.77	-35.31	47627.47	24.46		
delta	E	2024-11-22T11:35:38.012		29.67	-35.21	48300.35	24.49		
lambda	E	2024-11-22T11:36:48.420		29.43	-34.96	50026.71	24.55		
epsilon	E	2024-11-22T11:37:23.453		29.30	-34.84	50887.45	24.62		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-22T11:11:30.110
 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 : 57461203519965056
 2Mass ID (if available) : 03292998+1840411
 ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.683
 G magnitude : 16.878
 RP magnitude : 16.181
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 18.577
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.29
 Sun-Target sep (deg) : 174.36
 Sun-Moon sep (deg) : 89.42
 B (ring opening deg) : 65.91
 PA of pole (deg) : -85.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.154
 C/A sky separation (km) : 15553.1
 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	2024-11-22T10:39:53.830		24.71	-20.61	51538.10	-24.22		
lambda	I	2024-11-22T10:40:56.384		24.93	-20.82	50026.71	-24.12		
delta	I	2024-11-22T10:42:08.086		25.18	-21.07	48300.35	-24.03		
gamma	I	2024-11-22T10:42:36.330		25.28	-21.17	47622.24	-23.99		
eta	I	2024-11-22T10:42:54.938		25.35	-21.24	47176.12	-23.96		
beta	I	2024-11-22T10:43:58.798		25.57	-21.46	45647.42	-23.86		
alpha	I	2024-11-22T10:44:36.908		25.71	-21.59	44739.14	-23.80		
4	I	2024-11-22T10:46:09.829		26.03	-21.91	42528.02	-23.61		
5	I	2024-11-22T10:46:21.396		26.08	-21.95	42247.55	-23.60		
6	I	2024-11-22T10:46:38.601		26.14	-22.01	41850.53	-23.54		
Uranus	I	2024-11-22T10:57:27.487		28.43	-24.27	25128.58		22.51	23.47
Uranus	E	2024-11-22T11:25:46.714		34.44	-30.22	25401.37		-13.29	-13.89
6	E	2024-11-22T11:37:23.193		36.91	-32.68	41799.57	23.62		
5	E	2024-11-22T11:37:43.453		36.98	-32.75	42280.46	23.68		
4	E	2024-11-22T11:37:56.426		37.03	-32.79	42593.30	23.69		
alpha	E	2024-11-22T11:39:25.664		37.35	-33.11	44720.66	23.89		
beta	E	2024-11-22T11:40:05.718		37.49	-33.25	45681.09	23.95		
eta	E	2024-11-22T11:41:07.943		37.71	-33.47	47176.12	24.05		
gamma	E	2024-11-22T11:41:26.687		37.77	-33.53	47627.26	24.08		
delta	E	2024-11-22T11:41:54.612		37.87	-33.63	48300.35	24.12		
lambda	E	2024-11-22T11:43:06.024		38.13	-33.88	50026.71	24.22		
epsilon	E	2024-11-22T11:43:42.011		38.25	-34.01	50899.28	24.32		

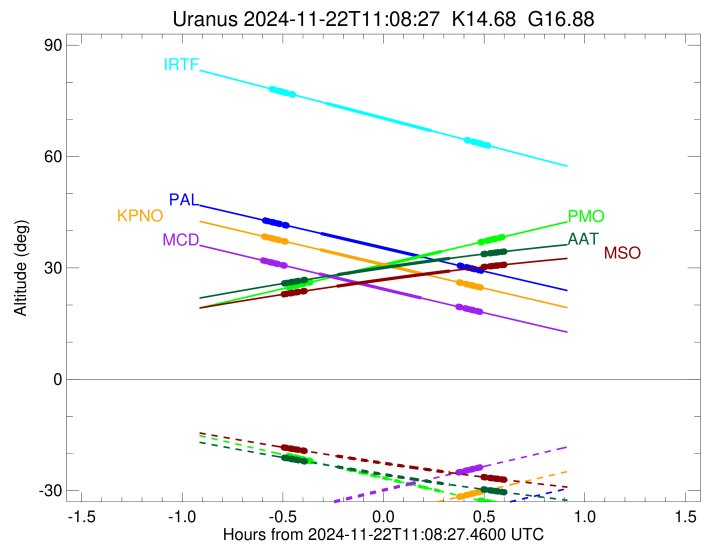
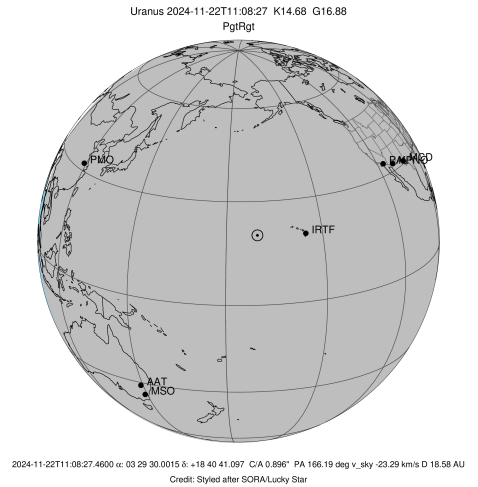
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2024-11-22T11:04:38.610
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 57461203519965056
 2Mass ID (if available) : 03292998+1840411
 ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 14.683
 G magnitude : 16.878
 RP magnitude : 16.181
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 18.577
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.29
 Sun-Target sep (deg) : 174.36
 Sun-Moon sep (deg) : 89.40
 B (ring opening deg) : 65.91
 PA of pole (deg) : -85.46
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.982
 C/A sky separation (km) : 13232.0
 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_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	2024-11-22T10:32:39.402		38.50	-44.03	51530.99	-24.71		
lambda	I	2024-11-22T10:33:40.404		38.28	-43.82	50026.71	-24.63		
delta	I	2024-11-22T10:34:50.593		38.04	-43.57	48300.35	-24.56		
gamma	I	2024-11-22T10:35:18.211		37.94	-43.47	47622.46	-24.53		
eta	I	2024-11-22T10:35:36.414		37.87	-43.41	47176.12	-24.51		
beta	I	2024-11-22T10:36:38.847		37.65	-43.18	45646.54	-24.44		
alpha	I	2024-11-22T10:37:16.072		37.52	-43.05	44737.39	-24.39		
4	I	2024-11-22T10:38:46.542		37.20	-42.73	42529.02	-24.25		
5	I	2024-11-22T10:38:58.058		37.16	-42.69	42242.22	-24.24		
6	I	2024-11-22T10:39:14.438		37.10	-42.63	41853.23	-24.19		
Uranus	I	2024-11-22T10:49:31.344		34.91	-40.45	25096.75		23.40	24.38
Uranus	E	2024-11-22T11:19:59.615		28.43	-33.98	25354.06		-15.22	-15.90
6	E	2024-11-22T11:31:00.927		26.09	-31.65	41800.61	24.12		
5	E	2024-11-22T11:31:20.618		26.02	-31.58	42277.10	24.16		
4	E	2024-11-22T11:31:33.540		25.98	-31.54	42595.23	24.17		
alpha	E	2024-11-22T11:33:00.983		25.67	-31.23	44719.09	24.30		
beta	E	2024-11-22T11:33:40.429		25.53	-31.09	45680.97	24.35		
eta	E	2024-11-22T11:34:41.691		25.31	-30.88	47176.12	24.42		
gamma	E	2024-11-22T11:35:00.169		25.25	-30.81	47627.48	24.44		
delta	E	2024-11-22T11:35:27.688		25.15	-30.71	48300.35	24.47		
lambda	E	2024-11-22T11:36:38.154		24.90	-30.47	50026.71	24.53		
epsilon	E	2024-11-22T11:37:13.206		24.78	-30.34	50887.16	24.60		

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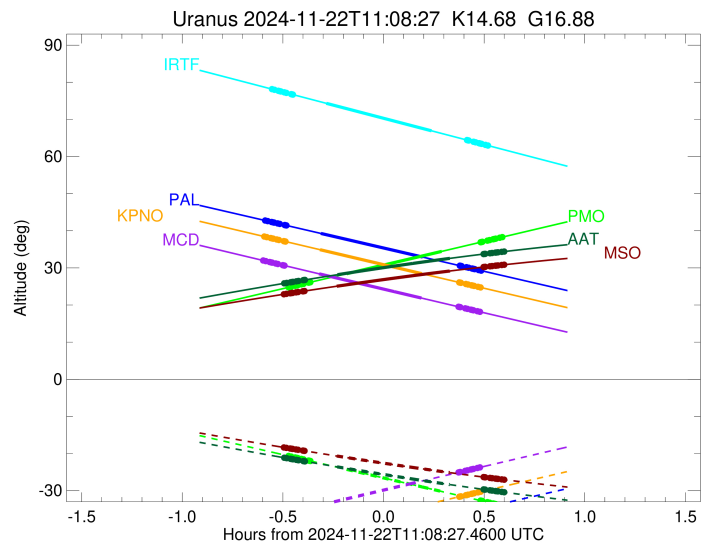
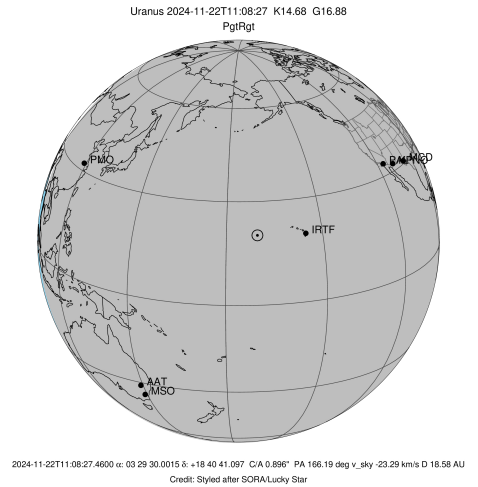
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2024-11-22T11:04:23.000
Event type           : PgtRgt
: Ring occs: geocentric, topocentric
Observer code        : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 57461203519965056
2Mass ID (if available) : 03292998+1840411
ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.683
G magnitude           : 16.878
RP magnitude         : 16.181
BP magnitude         : 17.407
DUPflag              : 0
Distance (au)        : 18.577
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.29
Sun-Target sep (deg) : 174.36
Sun-Moon sep (deg)   : 89.31
B (ring opening deg) : 65.91
PA of pole (deg)     : -85.46
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.982
C/A sky separation (km) : 13236.0
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	2024-11-22T10:32:20.497		32.05	-37.60	51530.90	-24.66		
lambda	I	2024-11-22T10:33:21.599		31.83	-37.38	50026.71	-24.59		
delta	I	2024-11-22T10:34:31.909		31.58	-37.13	48300.35	-24.52		
gamma	I	2024-11-22T10:34:59.575		31.48	-37.03	47622.46	-24.49		
eta	I	2024-11-22T10:35:17.810		31.41	-36.96	47176.12	-24.47		
beta	I	2024-11-22T10:36:20.351		31.19	-36.74	45646.53	-24.39		
alpha	I	2024-11-22T10:36:57.641		31.05	-36.61	44737.37	-24.35		
4	I	2024-11-22T10:38:28.270		30.73	-36.28	42529.03	-24.20		
5	I	2024-11-22T10:38:39.808		30.69	-36.24	42242.17	-24.20		
6	I	2024-11-22T10:38:56.213		30.63	-36.18	41853.25	-24.15		
Uranus	I	2024-11-22T10:49:14.222		28.41	-33.97	25096.62		23.41	24.39
Uranus	E	2024-11-22T11:19:45.649		21.88	-27.45	25354.53		-15.20	-15.88
6	E	2024-11-22T11:30:48.396		19.53	-25.10	41800.59	24.07		
5	E	2024-11-22T11:31:08.129		19.46	-25.03	42277.16	24.11		
4	E	2024-11-22T11:31:21.074		19.42	-24.98	42595.20	24.12		
alpha	E	2024-11-22T11:32:48.699		19.11	-24.67	44719.12	24.25		
beta	E	2024-11-22T11:33:28.225		18.97	-24.53	45680.97	24.30		
eta	E	2024-11-22T11:34:29.612		18.75	-24.32	47176.12	24.37		
gamma	E	2024-11-22T11:34:48.128		18.68	-24.25	47627.47	24.39		
delta	E	2024-11-22T11:35:15.703		18.59	-24.15	48300.35	24.42		
lambda	E	2024-11-22T11:36:26.314		18.34	-23.90	50026.71	24.48		
epsilon	E	2024-11-22T11:37:01.448		18.21	-23.78	50887.41	24.55		

```

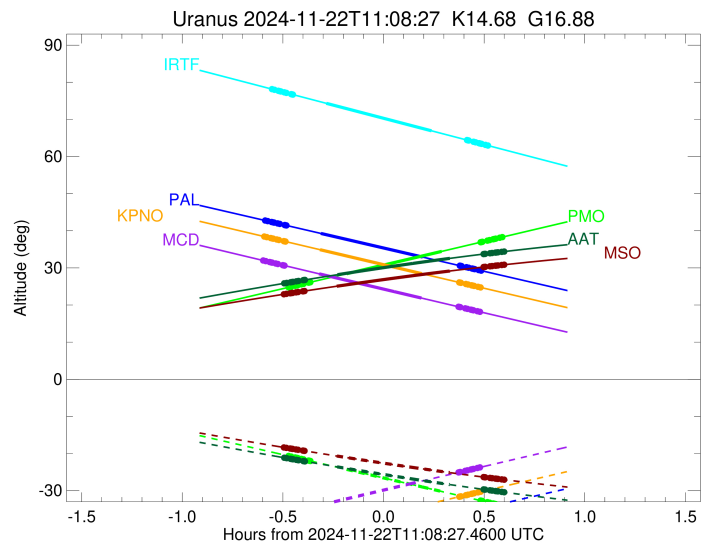
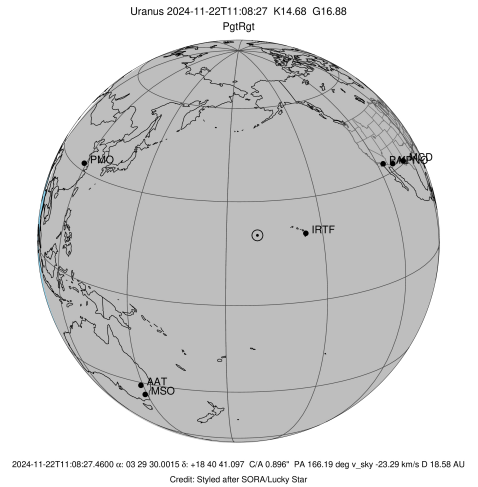
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2024-11-22T11:06:58.590
Event type           : PgtRgt
: Uranus occs: geocentric, topocentric
: Ring occs: geocentric, topocentric
Observer code        : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 57461203519965056
2Mass ID (if available) : 03292998+1840411
ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.683
G magnitude           : 16.878
RP magnitude          : 16.181
BP magnitude          : 17.407
DUPflag               : 0
Distance (au)         : 18.577
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s) : -23.29
Sun-Target sep (deg) : 174.36
Sun-Moon sep (deg)   : 89.81
B (ring opening deg) : 65.91
PA of pole (deg)     : -85.46
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.873
C/A sky separation (km) : 11764.8
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	2024-11-22T10:34:58.014		78.21	-83.67	51527.39	-25.09		
lambda	I	2024-11-22T10:35:57.922		77.98	-83.43	50026.71	-25.03		
delta	I	2024-11-22T10:37:06.975		77.71	-83.17	48300.35	-24.97		
gamma	I	2024-11-22T10:37:34.130		77.60	-83.06	47622.56	-24.95		
eta	I	2024-11-22T10:37:52.030		77.53	-82.99	47176.12	-24.93		
beta	I	2024-11-22T10:38:53.396		77.29	-82.75	45646.14	-24.88		
alpha	I	2024-11-22T10:39:29.967		77.14	-82.61	44736.54	-24.84		
4	I	2024-11-22T10:40:58.689		76.80	-82.26	42529.57	-24.73		
5	I	2024-11-22T10:41:10.104		76.75	-82.22	42239.65	-24.72		
6	I	2024-11-22T10:41:25.989		76.69	-82.15	41854.50	-24.68		
Uranus	I	2024-11-22T10:51:24.215		74.34	-79.82	25085.20		23.72	24.71
Uranus	E	2024-11-22T11:22:44.491		66.94	-72.47	25319.66		-16.49	-17.23
6	E	2024-11-22T11:33:20.215		64.44	-69.99	41801.54	24.65		
5	E	2024-11-22T11:33:39.345		64.37	-69.92	42274.25	24.69		
4	E	2024-11-22T11:33:52.157		64.31	-69.87	42596.79	24.69		
alpha	E	2024-11-22T11:35:17.648		63.98	-69.53	44717.76	24.81		
beta	E	2024-11-22T11:35:56.352		63.83	-69.38	45680.83	24.84		
eta	E	2024-11-22T11:36:56.418		63.59	-69.15	47176.12	24.90		
gamma	E	2024-11-22T11:37:14.549		63.52	-69.07	47627.67	24.91		
delta	E	2024-11-22T11:37:41.537		63.41	-68.97	48300.35	24.94		
lambda	E	2024-11-22T11:38:50.694		63.14	-68.70	50026.71	24.99		
epsilon	E	2024-11-22T11:39:24.690		63.01	-68.57	50876.66	25.05		

```

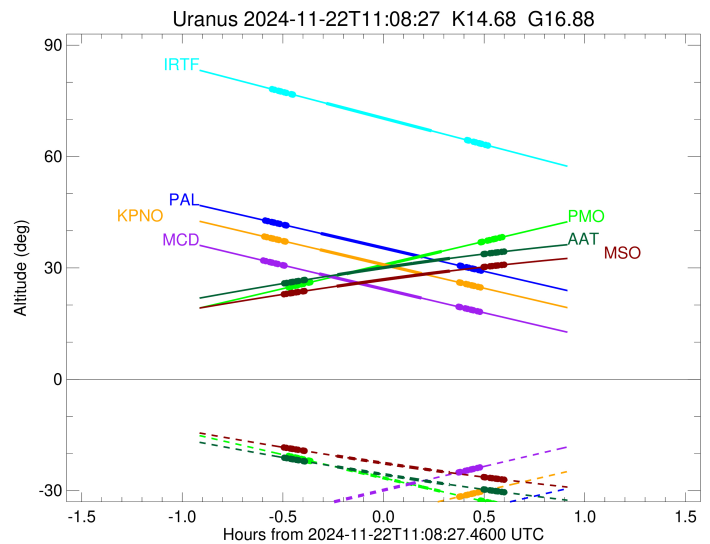
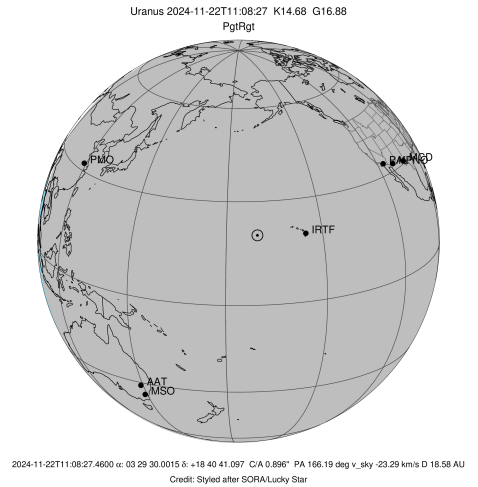
target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2024-11-22T11:11:23.090
Event type           : PgtRgt
: Ring occs: geocentric, topocentric
Observer code        : AAT
Location             : Siding Spring (AAT)
Latitude (deg)       : -31.27703
E. Longitude (deg)   : 149.06608
Altitude (km)        : 1.164
Gaia source ID       : 57461203519965056
2Mass ID (if available) : 03292998+1840411
ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 14.683
G magnitude           : 16.878
RP magnitude          : 16.181
BP magnitude          : 17.407
DUPflag              : 0
Distance (au)        : 18.577
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.29
Sun-Target sep (deg) : 174.36
Sun-Moon sep (deg)   : 89.41
B (ring opening deg) : 65.91
PA of pole (deg)     : -85.46
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.617
C/A sky separation (km) : 8317.3
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	2024-11-22T10:38:37.677		25.81	-21.10	51516.84	-25.27		
lambda	I	2024-11-22T10:39:36.703		25.96	-21.26	50026.71	-25.23		
delta	I	2024-11-22T10:40:45.149		26.13	-21.44	48300.35	-25.21		
gamma	I	2024-11-22T10:41:12.030		26.20	-21.51	47622.84	-25.20		
eta	I	2024-11-22T10:41:29.761		26.24	-21.56	47176.12	-25.19		
beta	I	2024-11-22T10:42:30.498		26.39	-21.72	45645.19	-25.16		
alpha	I	2024-11-22T10:43:06.673		26.48	-21.81	44734.30	-25.15		
4	I	2024-11-22T10:44:34.067		26.70	-22.04	42531.14	-25.09		
5	I	2024-11-22T10:44:45.636		26.73	-22.07	42233.13	-25.09		
6	I	2024-11-22T10:45:00.854		26.76	-22.11	41857.63	-25.07		
Uranus	I	2024-11-22T10:54:40.467		28.16	-23.60	25071.87		24.08	25.08
Uranus	E	2024-11-22T11:28:12.829		32.57	-28.37	25246.72		-18.97	-19.80
6	E	2024-11-22T11:38:16.577		33.73	-29.67	41803.75	25.13		
5	E	2024-11-22T11:38:35.057		33.76	-29.71	42267.89	25.15		
4	E	2024-11-22T11:38:47.996		33.79	-29.73	42599.98	25.15		
alpha	E	2024-11-22T11:40:11.768		33.94	-29.91	44714.93	25.21		
beta	E	2024-11-22T11:40:49.968		34.01	-29.99	45680.44	25.23		
eta	E	2024-11-22T11:41:49.160		34.12	-30.11	47176.12	25.26		
gamma	E	2024-11-22T11:42:07.052		34.15	-30.14	47628.07	25.26		
delta	E	2024-11-22T11:42:33.655		34.20	-30.20	48300.35	25.28		
lambda	E	2024-11-22T11:43:41.916		34.32	-30.34	50026.71	25.30		
epsilon	E	2024-11-22T11:44:14.654		34.38	-30.40	50855.35	25.34		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2024-11-22T11:11:20.320
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       : 57461203519965056
2Mass ID (if available) : 03292998+1840411
ICRS Star Coord at Epoch: 03h 29m 30.00150s +18:40:41.09676s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 14.683
G magnitude          : 16.878
RP magnitude         : 16.181
BP magnitude         : 17.407
DUPflag              : 0
Distance (au)        : 18.577
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -23.29
Sun-Target sep (deg) : 174.36
Sun-Moon sep (deg)   : 89.36
B (ring opening deg) : 65.91
PA of pole (deg)     : -85.46
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.594
C/A sky separation (km) : 8006.5
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	2024-11-22T10:38:31.191		22.87	-18.34	51515.72	-25.28		
lambda	I	2024-11-22T10:39:30.145		23.01	-18.48	50026.71	-25.25		
delta	I	2024-11-22T10:40:38.553		23.17	-18.65	48300.35	-25.22		
gamma	I	2024-11-22T10:41:05.417		23.23	-18.72	47622.87	-25.21		
eta	I	2024-11-22T10:41:23.138		23.27	-18.76	47176.12	-25.21		
beta	I	2024-11-22T10:42:23.836		23.41	-18.91	45645.10	-25.18		
alpha	I	2024-11-22T10:42:59.988		23.50	-19.00	44734.08	-25.17		
4	I	2024-11-22T10:44:27.294		23.70	-19.22	42531.30	-25.11		
5	I	2024-11-22T10:44:38.883		23.73	-19.25	42232.50	-25.11		
6	I	2024-11-22T10:44:54.046		23.76	-19.28	41857.93	-25.09		
Uranus	I	2024-11-22T10:54:32.585		25.06	-20.68	25071.64		24.09	25.09
Uranus	E	2024-11-22T11:28:14.917		29.17	-25.15	25240.85		-19.15	-19.99
6	E	2024-11-22T11:38:16.650		30.23	-26.35	41803.95	25.15		
5	E	2024-11-22T11:38:35.088		30.27	-26.39	42267.35	25.17		
4	E	2024-11-22T11:38:48.047		30.29	-26.41	42600.24	25.17		
alpha	E	2024-11-22T11:40:11.735		30.43	-26.57	44714.69	25.23		
beta	E	2024-11-22T11:40:49.919		30.49	-26.64	45680.40	25.24		
eta	E	2024-11-22T11:41:49.078		30.59	-26.76	47176.12	25.27		
gamma	E	2024-11-22T11:42:06.962		30.62	-26.79	47628.10	25.28		
delta	E	2024-11-22T11:42:33.551		30.67	-26.84	48300.35	25.29		
lambda	E	2024-11-22T11:43:41.782		30.78	-26.97	50026.71	25.31		
epsilon	E	2024-11-22T11:44:14.442		30.83	-27.03	50853.69	25.35		