

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T07:28:40.780
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 145336779854872448
 2Mass ID (if available) : 04220761+2126354

Uranus 2027-12-05T07:28:40 K14.54 G18.76 PgtRgt

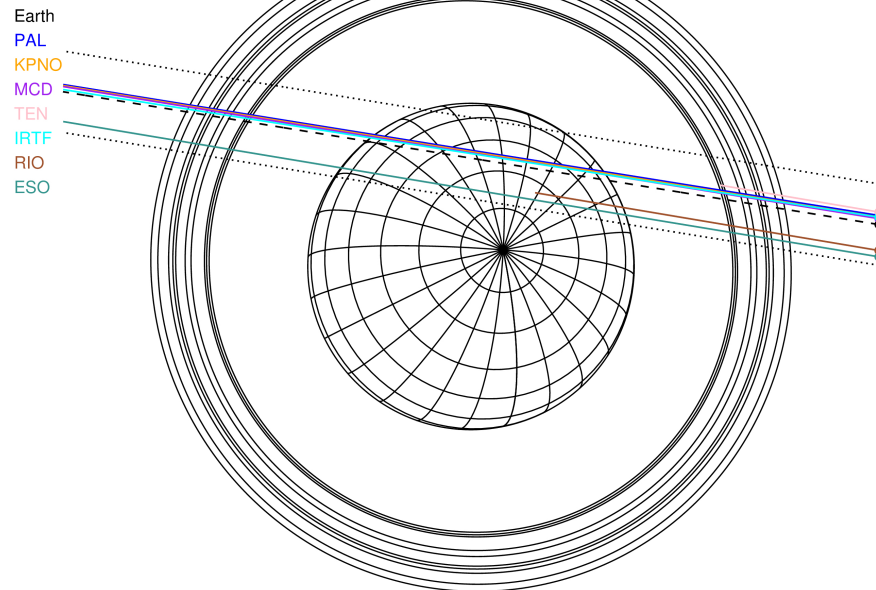
ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s

RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.535
 G magnitude : 18.757
 RP magnitude : 17.560
 BP magnitude : 20.334
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.79
 Sun-Moon sep (deg) : 94.69
 B (ring opening deg) : 77.19
 PA of pole (deg) : -62.69

#	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

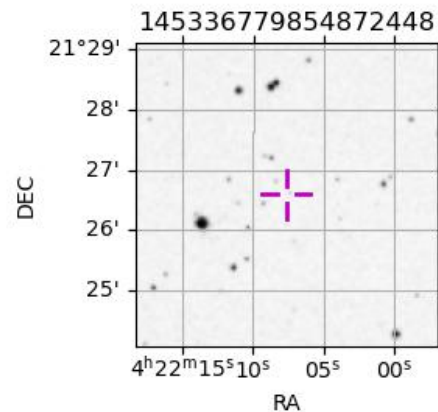


2027-12-05T07:28:40.7800 ra: 04 22 07.6398 ra: +21 26 35.458 C/A 1.2611 PA 170.75 deg v_sky -23.34 km/s D 18.38 AU
 Credit: Styled after SORA/Lucky Star

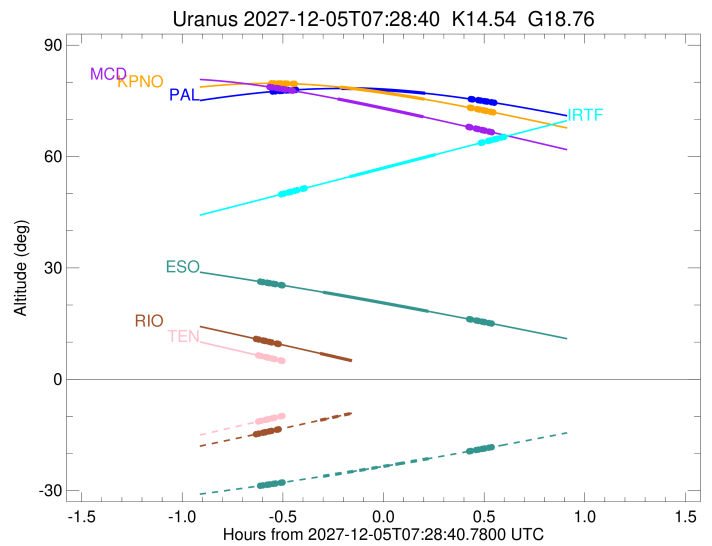
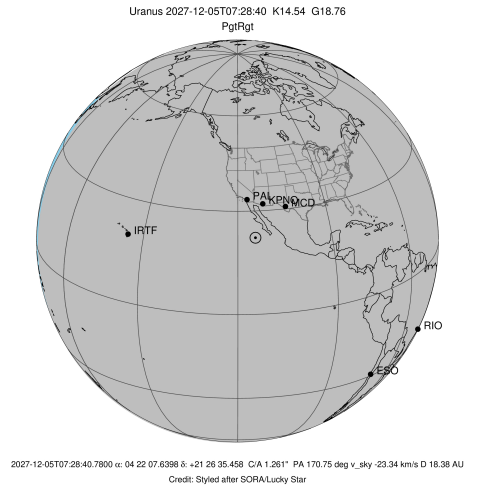


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1	+++++	+ +	+++++	DEC 05 06:55 - DEC 05 08:01	PieRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	DEC 05 06:55 - DEC 05 08:01	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	DEC 05 06:54 - DEC 05 08:01	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++			DEC 05 06:51 - DEC 05 06:58	PnnRin
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	DEC 05 06:58 - DEC 05 08:04	PieRie
KAV	Kavalur Observatory	12.6	78.8					PnnRnn
RIO	Rio de Janeiro	-22.9	316.8	+++++	+		DEC 05 06:50 - DEC 05 07:09	PinRin
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	DEC 05 06:51 - DEC 05 08:01	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



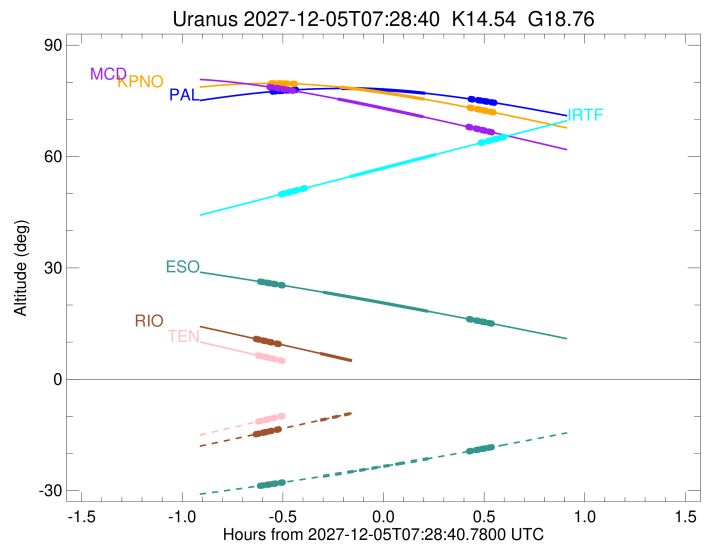
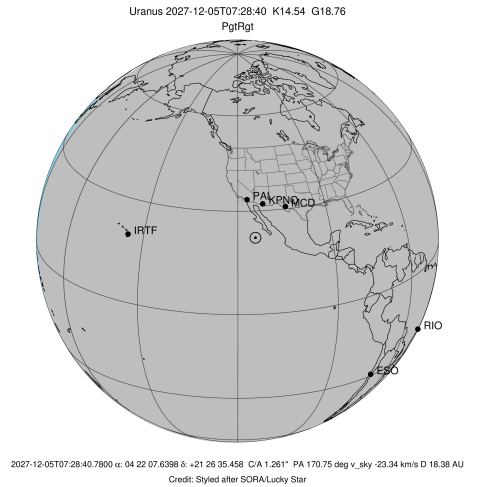
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T07:28:21.340
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 145336779854872448
 2Mass ID (if available) : 04220761+2126354
 ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.535
 G magnitude : 18.757
 RP magnitude : 17.560
 BP magnitude : 20.334
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.79
 Sun-Moon sep (deg) : 95.57
 B (ring opening deg) : 77.19
 PA of pole (deg) : -62.69
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.348
 C/A sky separation (km) : 17975.9
 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	2027-12-05T06:55:35.281		77.50	-75.70	51187.78	-22.61		
lambda	I	2027-12-05T06:56:26.870		77.57	-75.83	50026.71	-22.47		
delta	I	2027-12-05T06:57:43.918		77.66	-76.01	48300.35	-22.34		
gamma	I	2027-12-05T06:58:13.884		77.70	-76.08	47631.57	-22.29		
eta	I	2027-12-05T06:58:34.333		77.72	-76.12	47176.12	-22.25		
beta	I	2027-12-05T06:59:43.319		77.80	-76.28	45645.67	-22.12		
alpha	I	2027-12-05T07:00:24.202		77.84	-76.37	44740.39	-22.03		
4	I	2027-12-05T07:02:05.041		77.94	-76.59	42526.96	-21.80		
5	I	2027-12-05T07:02:22.112		77.96	-76.63	42161.17	-21.77		
6	I	2027-12-05T07:02:37.676		77.97	-76.66	41826.55	-21.73		
Uranus	I	2027-12-05T07:16:07.969		78.33	-78.15	25016.87		12.63	13.21
Uranus	E	2027-12-05T07:41:06.410		77.04	-79.15	25545.43		-1.95	-2.04
6	E	2027-12-05T07:54:43.606		75.47	-78.55	41876.08	21.73		
5	E	2027-12-05T07:55:03.729		75.43	-78.53	42305.81	21.76		
4	E	2027-12-05T07:55:16.810		75.40	-78.51	42591.88	21.80		
alpha	E	2027-12-05T07:56:52.190		75.18	-78.39	44684.63	22.03		
beta	E	2027-12-05T07:57:36.475		75.08	-78.33	45662.33	22.12		
eta	E	2027-12-05T07:58:44.690		74.93	-78.23	47176.12	22.25		
gamma	E	2027-12-05T07:59:04.728		74.88	-78.21	47622.37	22.29		
delta	E	2027-12-05T07:59:35.111		74.81	-78.16	48300.35	22.34		
lambda	E	2027-12-05T08:00:52.166		74.62	-78.04	50026.71	22.47		
epsilon	E	2027-12-05T08:01:52.458		74.48	-77.95	51383.90	22.61		

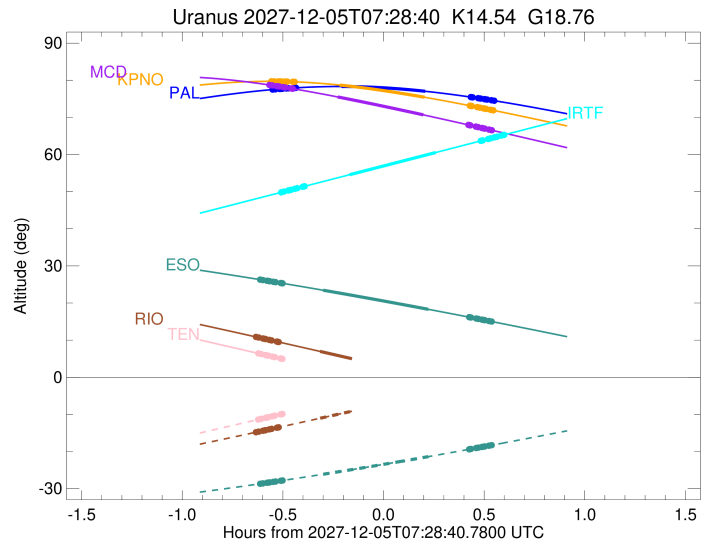
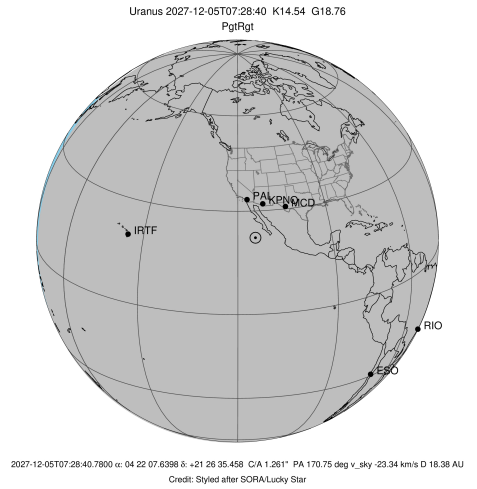
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2027-12-05T07:28:01.010
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        : 145336779854872448
2Mass ID (if available) : 04220761+2126354
ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
RUWE (>1.4 is poor)  : 1.04
K magnitude           : 14.535
G magnitude           : 18.757
RP magnitude          : 17.560
BP magnitude          : 20.334
DUPflag              : 0
Distance (au)         : 18.381
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -23.34
Sun-Target sep (deg)  : 174.79
Sun-Moon sep (deg)    : 95.56
B (ring opening deg)  : 77.19
PA of pole (deg)      : -62.69
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.333
C/A sky separation (km) : 17766.3
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
    
```



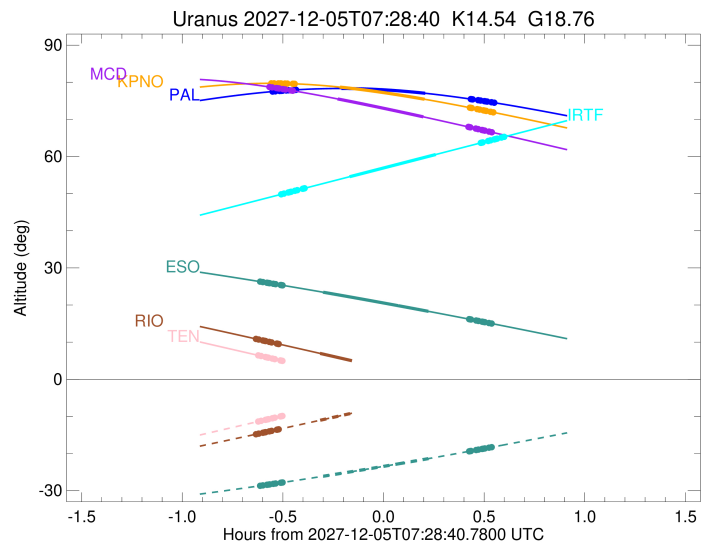
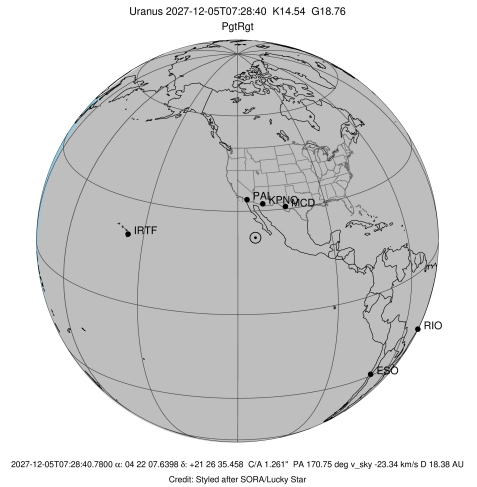
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T06:55:12.114		79.72	-79.40	51185.80	-22.66		
lambda	I	2027-12-05T06:56:03.507		79.71	-79.49	50026.71	-22.52		
delta	I	2027-12-05T06:57:20.384		79.70	-79.61	48300.35	-22.39		
gamma	I	2027-12-05T06:57:50.282		79.69	-79.65	47631.57	-22.34		
eta	I	2027-12-05T06:58:10.683		79.69	-79.68	47176.12	-22.31		
beta	I	2027-12-05T06:59:19.496		79.67	-79.78	45645.74	-22.18		
alpha	I	2027-12-05T07:00:00.270		79.65	-79.84	44740.53	-22.09		
4	I	2027-12-05T07:01:40.833		79.60	-79.97	42527.02	-21.86		
5	I	2027-12-05T07:01:57.863		79.59	-79.99	42160.98	-21.83		
6	I	2027-12-05T07:02:13.388		79.58	-80.01	41826.29	-21.80		
Uranus	I	2027-12-05T07:15:38.927		78.71	-80.55	25014.77		12.66	13.24
Uranus	E	2027-12-05T07:40:54.495		75.44	-79.15	25543.47		-2.09	-2.19
6	E	2027-12-05T07:54:27.092		73.16	-77.39	41875.99	21.79		
5	E	2027-12-05T07:54:47.176		73.10	-77.34	42305.99	21.82		
4	E	2027-12-05T07:55:00.224		73.06	-77.31	42592.08	21.85		
alpha	E	2027-12-05T07:56:35.364		72.78	-77.08	44684.64	22.08		
beta	E	2027-12-05T07:57:19.555		72.65	-76.96	45662.42	22.17		
eta	E	2027-12-05T07:58:27.626		72.44	-76.79	47176.12	22.30		
gamma	E	2027-12-05T07:58:47.624		72.38	-76.74	47622.36	22.33		
delta	E	2027-12-05T07:59:17.949		72.29	-76.66	48300.35	22.38		
lambda	E	2027-12-05T08:00:34.866		72.06	-76.46	50026.71	22.50		
epsilon	E	2027-12-05T08:01:35.001		71.87	-76.29	51382.62	22.64		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T07:27:30.960
 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 : 145336779854872448
 2Mass ID (if available) : 04220761+2126354
 ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.535
 G magnitude : 18.757
 RP magnitude : 17.560
 BP magnitude : 20.334
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.79
 Sun-Moon sep (deg) : 95.53
 B (ring opening deg) : 77.19
 PA of pole (deg) : -62.69
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.318
 C/A sky separation (km) : 17569.2
 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	2027-12-05T06:54:38.978		78.74	-81.64	51183.81	-22.70		
lambda	I	2027-12-05T06:55:30.193		78.62	-81.60	50026.71	-22.56		
delta	I	2027-12-05T06:56:46.927		78.45	-81.52	48300.35	-22.44		
gamma	I	2027-12-05T06:57:16.766		78.37	-81.49	47631.58	-22.39		
eta	I	2027-12-05T06:57:37.126		78.33	-81.47	47176.12	-22.35		
beta	I	2027-12-05T06:58:45.791		78.16	-81.39	45645.81	-22.22		
alpha	I	2027-12-05T06:59:26.473		78.06	-81.34	44740.68	-22.14		
4	I	2027-12-05T07:01:06.801		77.81	-81.21	42527.08	-21.92		
5	I	2027-12-05T07:01:23.796		77.77	-81.19	42160.80	-21.89		
6	I	2027-12-05T07:01:39.289		77.73	-81.17	41826.05	-21.86		
Uranus	I	2027-12-05T07:15:00.666		75.52	-79.65	25012.90		12.68	13.26
Uranus	E	2027-12-05T07:40:32.418		70.70	-75.43	25541.60		-2.21	-2.32
6	E	2027-12-05T07:54:01.108		67.98	-72.86	41875.91	21.84		
5	E	2027-12-05T07:54:21.164		67.91	-72.80	42306.16	21.87		
4	E	2027-12-05T07:54:34.187		67.86	-72.75	42592.26	21.90		
alpha	E	2027-12-05T07:56:09.143		67.54	-72.44	44684.64	22.12		
beta	E	2027-12-05T07:56:53.263		67.39	-72.30	45662.50	22.20		
eta	E	2027-12-05T07:58:01.226		67.15	-72.07	47176.12	22.33		
gamma	E	2027-12-05T07:58:21.195		67.09	-72.01	47622.34	22.36		
delta	E	2027-12-05T07:58:51.479		66.98	-71.90	48300.35	22.41		
lambda	E	2027-12-05T08:00:08.299		66.72	-71.65	50026.71	22.53		
epsilon	E	2027-12-05T08:01:08.317		66.51	-71.45	51381.52	22.67		

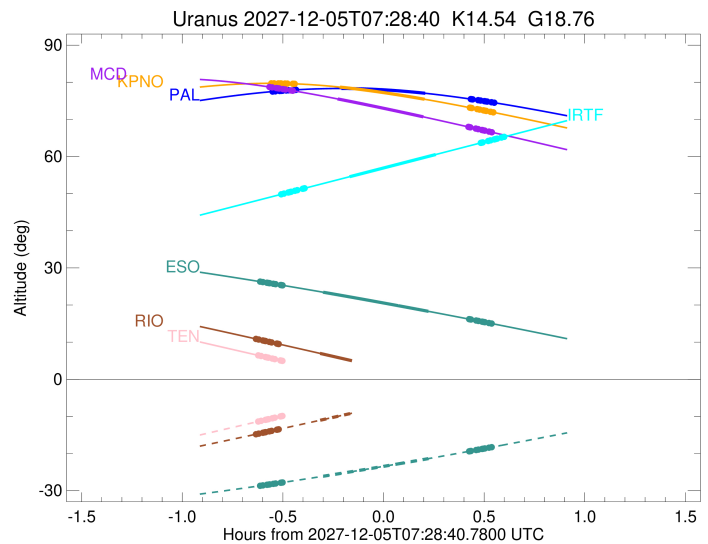
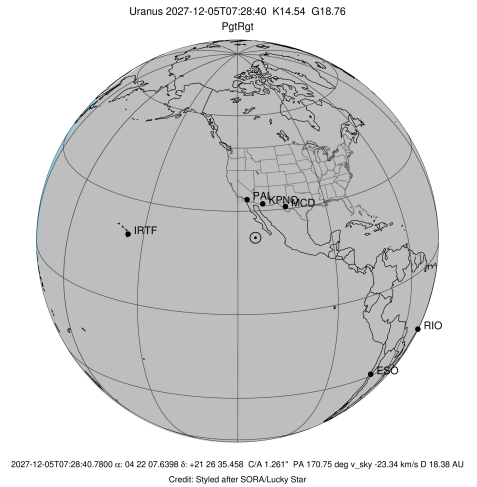
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T07:24:20.970
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 145336779854872448
 2Mass ID (if available) : 04220761+2126354
 ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.535
 G magnitude : 18.757
 RP magnitude : 17.560
 BP magnitude : 20.334
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.79
 Sun-Moon sep (deg) : 94.61
 B (ring opening deg) : 77.19
 PA of pole (deg) : -62.69
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.431
 C/A sky separation (km) : 19082.3
 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	2027-12-05T06:51:18.525		6.44	-11.39	51193.53	-22.04		
lambda	I	2027-12-05T06:52:11.749		6.26	-11.20	50026.71	-21.88		
delta	I	2027-12-05T06:53:30.907		5.99	-10.93	48300.35	-21.74		
gamma	I	2027-12-05T06:54:01.716		5.88	-10.82	47631.57	-21.68		
eta	I	2027-12-05T06:54:22.747		5.81	-10.75	47176.12	-21.64		
beta	I	2027-12-05T06:55:33.751		5.57	-10.50	45645.45	-21.48		
alpha	I	2027-12-05T06:56:15.869		5.42	-10.36	44739.90	-21.38		
4	I	2027-12-05T06:57:59.846		5.07	-10.00	42526.78	-21.12		
5	I	2027-12-05T06:58:17.438		5.01	-9.94	42161.82	-21.08		
6	I	2027-12-05T06:58:33.485		4.95x	-9.88	41827.40	-21.04		
Uranus	I	2027-12-05T07:12:45.392		2.05x	-6.96	25028.35		12.49	13.06
Uranus	E	2027-12-05T07:36:31.698		-2.72x	-2.14x	25555.07		-1.05	-1.10
6	E	2027-12-05T07:50:53.466		-5.55x	0.73x	41876.71	20.96		
5	E	2027-12-05T07:51:14.206		-5.61x	0.79x	42304.31	21.00		
4	E	2027-12-05T07:51:27.756		-5.66x	0.84x	42590.34	21.03		
alpha	E	2027-12-05T07:53:06.604		-5.98x	1.17x	44684.62	21.29		
beta	E	2027-12-05T07:53:52.386		-6.13x	1.32x	45661.62	21.39		
eta	E	2027-12-05T07:55:02.935		-6.36x	1.55x	47176.12	21.54		
gamma	E	2027-12-05T07:55:23.644		-6.42x	1.62x	47622.50	21.58		
delta	E	2027-12-05T07:55:55.020		-6.52x	1.72x	48300.35	21.63		
lambda	E	2027-12-05T07:57:14.567		-6.78x	1.98x	50026.71	21.77		
epsilon	E	2027-12-05T07:58:17.251		-6.98x	2.19x	51394.40	21.92		

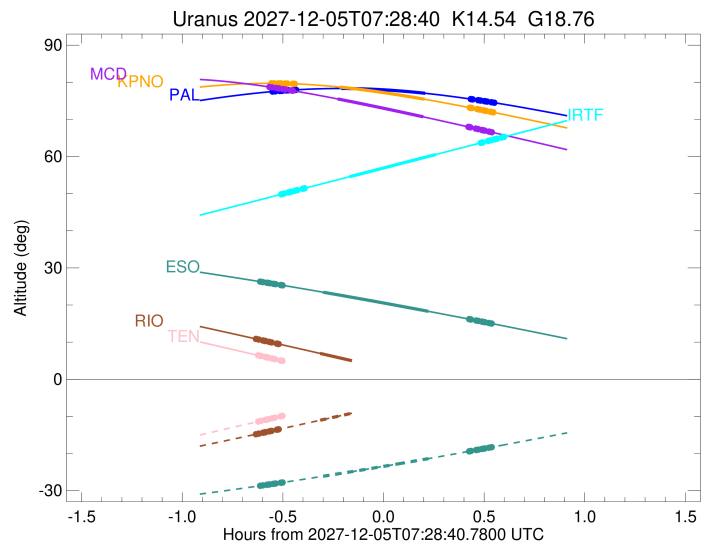
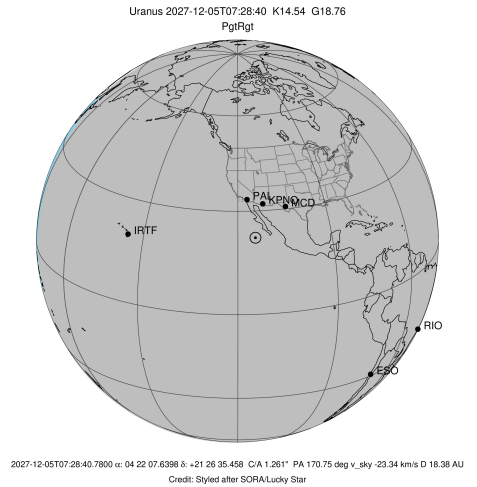
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2027-12-05T07:31:09.010
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        : 145336779854872448
2Mass ID (if available) : 04220761+2126354
ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
RUWE (>1.4 is poor)  : 1.04
K magnitude           : 14.535
G magnitude           : 18.757
RP magnitude          : 17.560
BP magnitude          : 20.334
DUPflag              : 0
Distance (au)         : 18.381
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : -23.34
Sun-Target sep (deg)  : 174.79
Sun-Moon sep (deg)    : 95.49
B (ring opening deg)  : 77.19
PA of pole (deg)      : -62.69
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.311
C/A sky separation (km) : 17477.0
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_itr93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
    
```



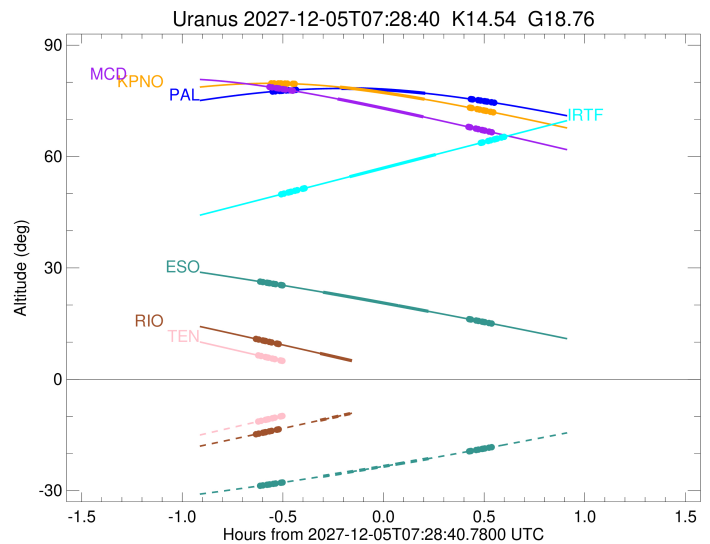
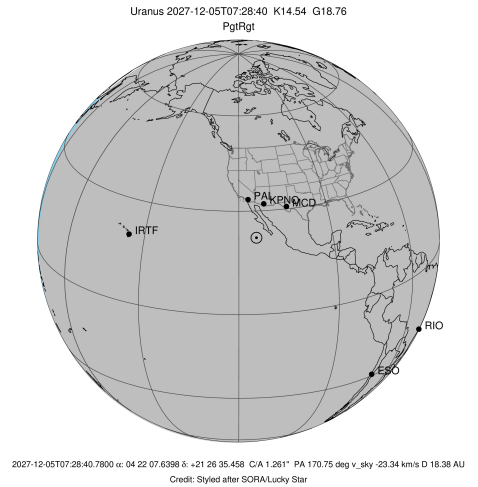
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2027-12-05T06:58:09.543		49.82	-44.81	51185.03	-22.62		
lambda	I	2027-12-05T06:59:00.978		50.02	-45.01	50026.71	-22.48		
delta	I	2027-12-05T07:00:17.952		50.31	-45.30	48300.35	-22.37		
gamma	I	2027-12-05T07:00:47.881		50.43	-45.41	47631.58	-22.32		
eta	I	2027-12-05T07:01:08.301		50.51	-45.49	47176.12	-22.29		
beta	I	2027-12-05T07:02:17.166		50.78	-45.76	45645.78	-22.16		
alpha	I	2027-12-05T07:02:57.961		50.93	-45.91	44740.61	-22.08		
4	I	2027-12-05T07:04:38.548		51.32	-46.30	42527.06	-21.86		
5	I	2027-12-05T07:04:55.581		51.39	-46.36	42160.88	-21.83		
6	I	2027-12-05T07:05:11.108		51.45	-46.42	41826.15	-21.80		
Uranus	I	2027-12-05T07:18:33.082		54.56	-49.50	25012.92		12.68	13.26
Uranus	E	2027-12-05T07:44:15.247		60.54	-55.43	25539.51		-2.34	-2.45
6	E	2027-12-05T07:57:42.426		63.68	-58.54	41875.77	21.86		
5	E	2027-12-05T07:58:02.484		63.76	-58.62	42306.44	21.89		
4	E	2027-12-05T07:58:15.496		63.81	-58.67	42592.57	21.92		
alpha	E	2027-12-05T07:59:50.339		64.18	-59.03	44684.65	22.14		
beta	E	2027-12-05T08:00:34.420		64.35	-59.20	45662.65	22.22		
eta	E	2027-12-05T08:01:42.307		64.61	-59.46	47176.12	22.35		
gamma	E	2027-12-05T08:02:02.254		64.69	-59.54	47622.32	22.39		
delta	E	2027-12-05T08:02:32.508		64.81	-59.66	48300.35	22.44		
lambda	E	2027-12-05T08:03:49.248		65.11	-59.95	50026.71	22.55		
epsilon	E	2027-12-05T08:04:49.094		65.34	-60.18	51379.06	22.69		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T07:24:55.370
 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 : 145336779854872448
 2Mass ID (if available) : 04220761+2126354
 ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.535
 G magnitude : 18.757
 RP magnitude : 17.560
 BP magnitude : 20.334
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.79
 Sun-Moon sep (deg) : 94.68
 B (ring opening deg) : 77.19
 PA of pole (deg) : -62.69
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.980
 C/A sky separation (km) : 13062.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 ura111.bsp
 IAU_URANUS_for_RINGFIT.tpc
 vgr2.ura111.bsp
 ura161.bsp
 vgr2.ura161.bsp
 peph.ura160.bsp
 earthstns_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	2027-12-05T06:50:40.092		10.87	-14.81	51143.41	-23.15		
lambda	I	2027-12-05T06:51:28.481		10.70	-14.65	50026.71	-23.06		
delta	I	2027-12-05T06:52:43.456		10.45	-14.41	48300.35	-22.99		
gamma	I	2027-12-05T06:53:12.560		10.35	-14.31	47631.56	-22.97		
eta	I	2027-12-05T06:53:32.400		10.29	-14.25	47176.12	-22.95		
beta	I	2027-12-05T06:54:39.129		10.06	-14.03	45647.37	-22.88		
alpha	I	2027-12-05T06:55:18.579		9.93	-13.90	44743.48	-22.83		
4	I	2027-12-05T06:56:55.698		9.60	-13.58	42528.63	-22.71		
5	I	2027-12-05T06:57:12.250		9.54	-13.53	42157.65	-22.69		
6	I	2027-12-05T06:57:27.350		9.49	-13.48	41821.08	-22.68		
Uranus	I	2027-12-05T07:09:47.138		6.96	-11.04	25006.88		12.75	13.34
Uranus	E	2027-12-05T07:40:28.088		0.55x	-4.82x	25476.81		-4.82	-5.05
6	E	2027-12-05T07:52:56.065		-2.10x	-2.24x	41873.73	22.59		
5	E	2027-12-05T07:53:15.765		-2.17x	-2.17x	42309.78	22.60		
4	E	2027-12-05T07:53:28.420		-2.22x	-2.12x	42596.47	22.61		
alpha	E	2027-12-05T07:55:00.433		-2.55x	-1.80x	44684.96	22.72		
beta	E	2027-12-05T07:55:43.478		-2.70x	-1.65x	45664.48	22.77		
eta	E	2027-12-05T07:56:49.759		-2.94x	-1.42x	47176.12	22.83		
gamma	E	2027-12-05T07:57:09.280		-3.01x	-1.36x	47622.02	22.85		
delta	E	2027-12-05T07:57:38.946		-3.11x	-1.25x	48300.35	22.88		
lambda	E	2027-12-05T07:58:54.305		-3.38x	-0.99x	50026.71	22.94		
epsilon	E	2027-12-05T07:59:52.020		-3.59x	-0.79x	51351.84	23.02		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2027-12-05T07:26:10.750
 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 : 145336779854872448
 2Mass ID (if available) : 04220761+2126354
 ICRS Star Coord at Epoch: 04h 22m 07.63979s +21:26:35.45837s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.535
 G magnitude : 18.757
 RP magnitude : 17.560
 BP magnitude : 20.334
 DUPflag : 0
 Distance (au) : 18.381
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -23.34
 Sun-Target sep (deg) : 174.79
 Sun-Moon sep (deg) : 94.96
 B (ring opening deg) : 77.19
 PA of pole (deg) : -62.69
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.893
 C/A sky separation (km) : 11906.4
 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_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	2027-12-05T06:51:55.117		26.30	-28.69	51135.04	-23.42		
lambda	I	2027-12-05T06:52:42.571		26.18	-28.59	50026.71	-23.34		
delta	I	2027-12-05T06:53:56.623		26.00	-28.42	48300.35	-23.29		
gamma	I	2027-12-05T06:54:25.358		25.93	-28.36	47631.55	-23.26		
eta	I	2027-12-05T06:54:44.942		25.88	-28.32	47176.12	-23.25		
beta	I	2027-12-05T06:55:50.773		25.72	-28.17	45647.72	-23.19		
alpha	I	2027-12-05T06:56:29.678		25.62	-28.08	44744.03	-23.15		
4	I	2027-12-05T06:58:05.412		25.38	-27.87	42529.04	-23.05		
5	I	2027-12-05T06:58:21.747		25.34	-27.83	42157.12	-23.04		
6	I	2027-12-05T06:58:36.658		25.30	-27.80	41820.05	-23.03		
Uranus	I	2027-12-05T07:10:39.826		23.45	-26.12	25013.34		12.68	13.26
Uranus	E	2027-12-05T07:42:03.632		18.30	-21.38	25453.95		-5.45	-5.71
6	E	2027-12-05T07:54:13.900		16.19	-19.41	41873.01	22.96		
5	E	2027-12-05T07:54:33.358		16.14	-19.35	42310.66	22.97		
4	E	2027-12-05T07:54:45.828		16.10	-19.32	42597.64	22.98		
alpha	E	2027-12-05T07:56:16.358		15.84	-19.07	44685.12	23.07		
beta	E	2027-12-05T07:56:58.773		15.71	-18.95	45665.06	23.11		
eta	E	2027-12-05T07:58:04.063		15.52	-18.77	47176.12	23.17		
gamma	E	2027-12-05T07:58:23.301		15.46	-18.72	47621.94	23.18		
delta	E	2027-12-05T07:58:52.553		15.38	-18.64	48300.35	23.20		
lambda	E	2027-12-05T08:00:06.873		15.16	-18.43	50026.71	23.25		
epsilon	E	2027-12-05T08:01:03.418		14.99	-18.27	51342.57	23.33		