

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-01-10T15:09:31.260
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 57075545518885888
 2Mass ID (if available) : 03402783+1922300

ICRS Star Coord at Epoch: 03h 40m 27.83450s +19:22:29.39851s

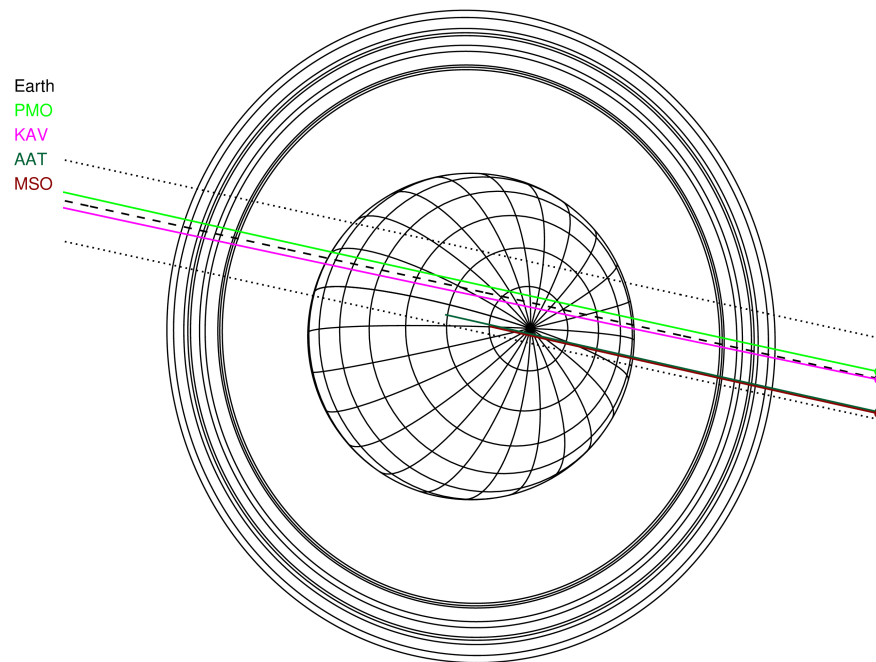
RUWE (>1.4 is poor) : 4.70
 K magnitude : 13.425
 G magnitude : 17.468
 RP magnitude : 16.116
 BP magnitude : 18.969
 DUPflag : 0
 Distance (au) : 18.876
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.73
 Sun-Target sep (deg) : 127.33
 Sun-Moon sep (deg) : 142.23
 B (ring opening deg) : 68.41
 PA of pole (deg) : -82.27

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



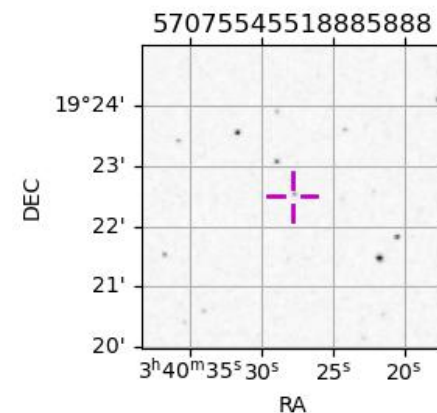
2026-01-10T15:09:31.2600 ex: 03 40 27.8345 s: +19 22 29.399 C/A 0.528° PA 167.67 deg v_sky -11.73 km/s D 18.88 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2026-01-10T15:09:31 K13.43 G17.47 PgtRgt

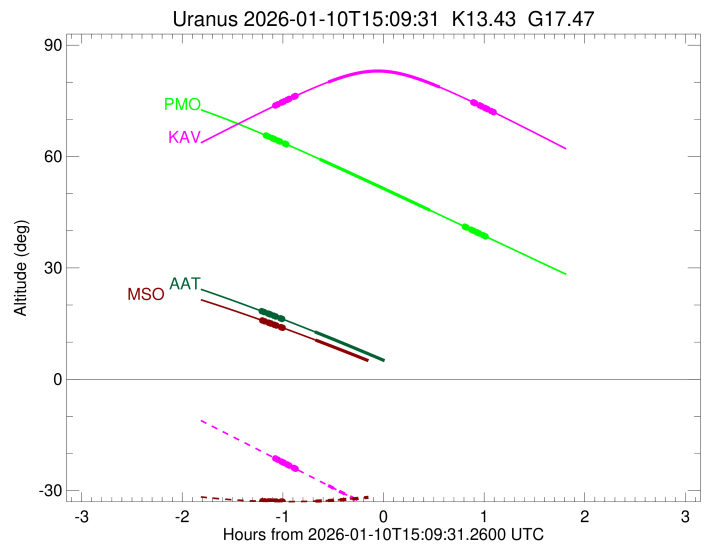
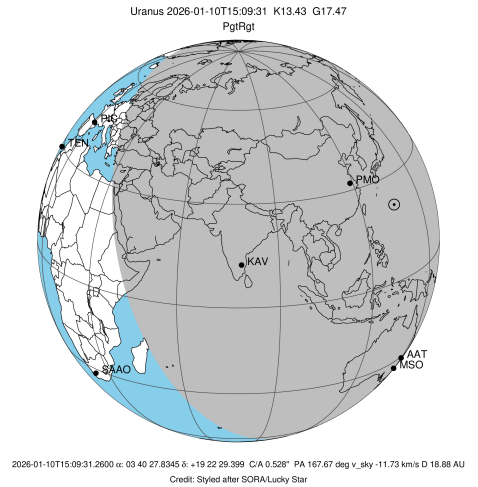


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8	+++++	+ +	+++++	JAN 10 13:59 - JAN 10 16:10	PieRie
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5					PnnRnn
KAV	Kavalur Observatory	12.6	78.8	+++++	+ +	+++++	JAN 10 14:05 - JAN 10 16:15	PieRie
RIO	Rio de Janeiro	-22.9	316.8					PnnRnn
ESO	European Southern Obs	-29.3	289.3					PnnRnn
AAT	Siding Spring (AAT)	-31.3	149.1	+++++	+		JAN 10 13:57 - JAN 10 14:28	PinRin
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0	+++++	+		JAN 10 13:57 - JAN 10 14:29	PinRin

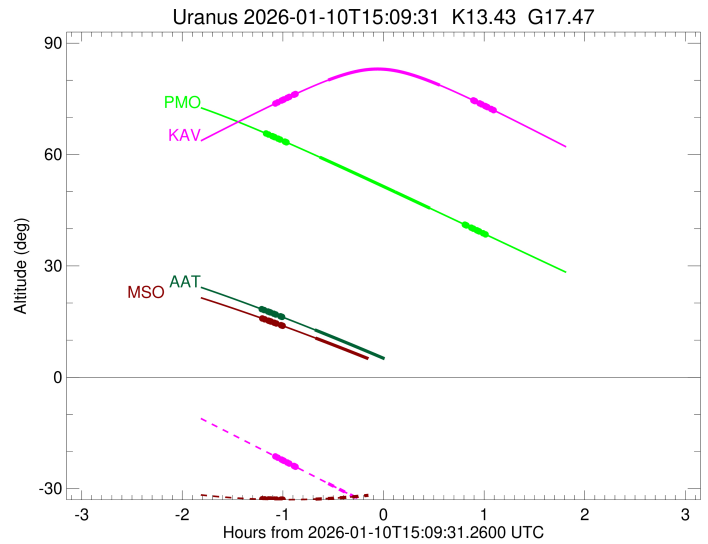
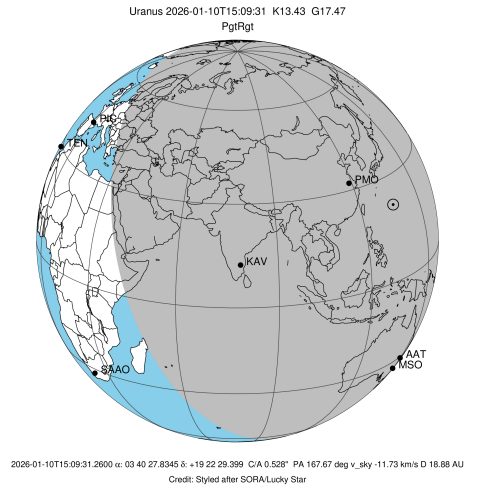


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-01-10T15:04:11.300
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PMO
 Location : Purple Mtn Obs. Nanking
 Latitude (deg) : 32.06667
 E. Longitude (deg) : 118.82089
 Altitude (km) : 0.364
 Gaia source ID : 57075545518885888
 2Mass ID (if available) : 03402783+1922300
 ICRS Star Coord at Epoch: 03h 40m 27.83450s +19:22:29.39851s
 RUWE (>1.4 is poor) : 4.70
 K magnitude : 13.425
 G magnitude : 17.468
 RP magnitude : 16.116
 BP magnitude : 18.969
 DUPflag : 0
 Distance (au) : 18.876
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.73
 Sun-Target sep (deg) : 127.33
 Sun-Moon sep (deg) : 143.09
 B (ring opening deg) : 68.41
 PA of pole (deg) : -82.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.599
 C/A sky separation (km) : 8195.0
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



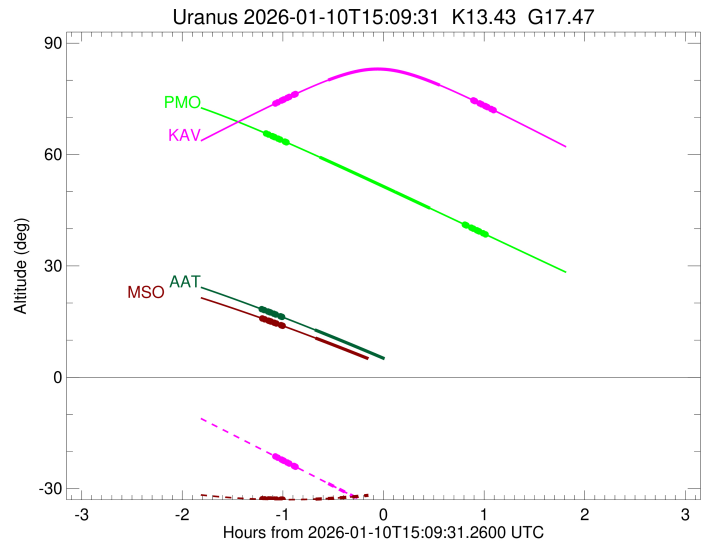
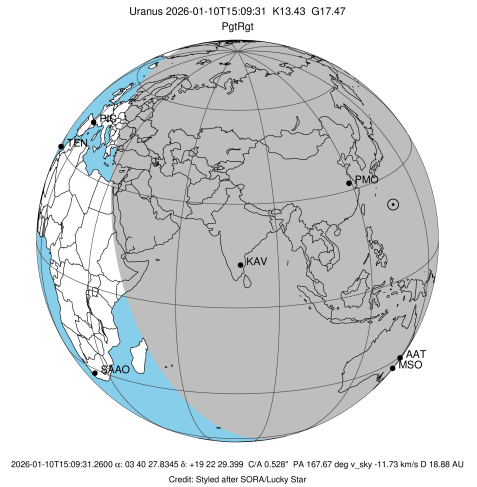
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-01-10T13:59:50.195		65.61	-58.97	50883.19	-12.75		
lambda	I	2026-01-10T14:00:57.347		65.39	-59.21	50026.71	-12.75		
delta	I	2026-01-10T14:03:12.823		64.95	-59.68	48300.35	-12.74		
gamma	I	2026-01-10T14:04:06.006		64.78	-59.86	47623.22	-12.73		
eta	I	2026-01-10T14:04:41.138		64.67	-59.98	47176.12	-12.72		
beta	I	2026-01-10T14:06:40.530		64.28	-60.40	45658.86	-12.71		
alpha	I	2026-01-10T14:07:55.681		64.03	-60.66	44705.34	-12.70		
4	I	2026-01-10T14:10:46.308		63.47	-61.24	42529.73	-12.67		
5	I	2026-01-10T14:11:12.172		63.38	-61.33	42197.77	-12.67		
6	I	2026-01-10T14:11:38.951		63.29	-61.43	41879.70	-12.66		
Uranus	I	2026-01-10T14:31:30.444		59.29	-65.49	25053.28		21.58	22.51
Uranus	E	2026-01-10T15:37:16.340		45.52	-77.32	25251.03		-16.58	-17.32
6	E	2026-01-10T15:57:56.578		41.13	-79.49	41798.93	12.52		
5	E	2026-01-10T15:58:37.511		40.98	-79.54	42296.88	12.52		
4	E	2026-01-10T15:59:01.418		40.90	-79.57	42602.47	12.52		
alpha	E	2026-01-10T16:01:49.436		40.30	-79.72	44719.21	12.54		
beta	E	2026-01-10T16:03:04.311		40.04	-79.78	45656.04	12.55		
eta	E	2026-01-10T16:05:05.409		39.61	-79.86	47176.12	12.56		
gamma	E	2026-01-10T16:05:41.349		39.48	-79.88	47627.61	12.56		
delta	E	2026-01-10T16:06:34.885		39.29	-79.91	48300.35	12.57		
lambda	E	2026-01-10T16:08:52.197		38.80	-79.96	50026.71	12.58		
epsilon	E	2026-01-10T16:10:33.152		38.44	-79.98	51296.74	12.57		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-01-10T15:09:41.100
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : KAV
 Location : Kavalur Observatory
 Latitude (deg) : 12.57556
 E. Longitude (deg) : 78.83167
 Altitude (km) : 0.722
 Gaia source ID : 57075545518885888
 2Mass ID (if available) : 03402783+1922300
 ICRS Star Coord at Epoch: 03h 40m 27.83450s +19:22:29.39851s
 RUWE (>1.4 is poor) : 4.70
 K magnitude : 13.425
 G magnitude : 17.468
 RP magnitude : 16.116
 BP magnitude : 18.969
 DUPflag : 0
 Distance (au) : 18.876
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.73
 Sun-Target sep (deg) : 127.33
 Sun-Moon sep (deg) : 142.78
 B (ring opening deg) : 68.41
 PA of pole (deg) : -82.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.468
 C/A sky separation (km) : 6402.4
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-01-10T14:05:22.141		73.82	-21.40	50891.70	-12.88		
lambda	I	2026-01-10T14:06:29.277		74.06	-21.66	50026.71	-12.88		
delta	I	2026-01-10T14:08:43.325		74.54	-22.18	48300.35	-12.87		
gamma	I	2026-01-10T14:09:35.913		74.73	-22.38	47623.36	-12.87		
eta	I	2026-01-10T14:10:10.662		74.86	-22.51	47176.12	-12.87		
beta	I	2026-01-10T14:12:08.618		75.27	-22.97	45659.50	-12.86		
alpha	I	2026-01-10T14:13:22.841		75.54	-23.25	44706.36	-12.86		
4	I	2026-01-10T14:16:11.305		76.12	-23.90	42530.39	-12.84		
5	I	2026-01-10T14:16:37.046		76.21	-24.00	42195.30	-12.84		
6	I	2026-01-10T14:17:03.247		76.30	-24.10	41879.61	-12.84		
Uranus	I	2026-01-10T14:36:32.630		80.05	-28.61	25056.53		21.51	22.43
Uranus	E	2026-01-10T15:43:03.700		78.68	-44.03	25211.21		-17.68	-18.46
6	E	2026-01-10T16:03:01.726		74.61	-48.64	41798.02	12.81		
5	E	2026-01-10T16:03:41.661		74.47	-48.80	42294.14	12.81		
4	E	2026-01-10T16:04:05.372		74.38	-48.89	42604.12	12.81		
alpha	E	2026-01-10T16:06:49.573		73.79	-49.52	44720.88	12.83		
beta	E	2026-01-10T16:08:02.714		73.52	-49.80	45656.99	12.83		
eta	E	2026-01-10T16:10:01.075		73.09	-50.26	47176.12	12.84		
gamma	E	2026-01-10T16:10:36.247		72.96	-50.39	47627.85	12.84		
delta	E	2026-01-10T16:11:28.598		72.77	-50.59	48300.35	12.85		
lambda	E	2026-01-10T16:13:42.941		72.28	-51.11	50026.71	12.85		
epsilon	E	2026-01-10T16:15:23.024		71.91	-51.49	51313.36	12.85		

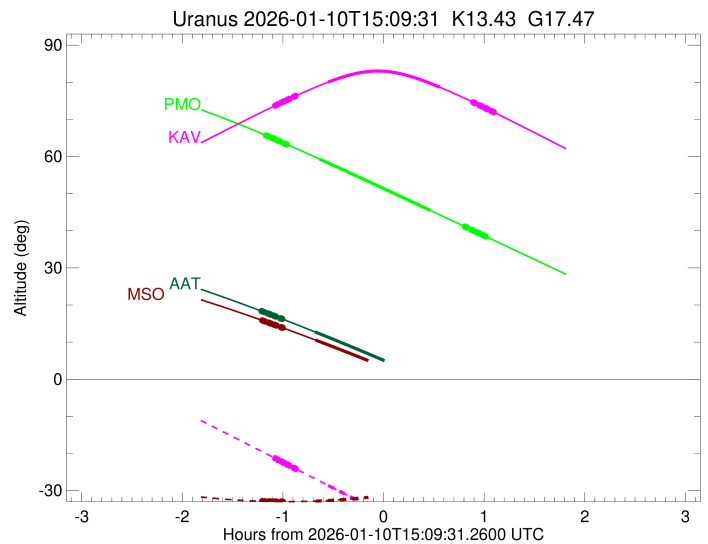
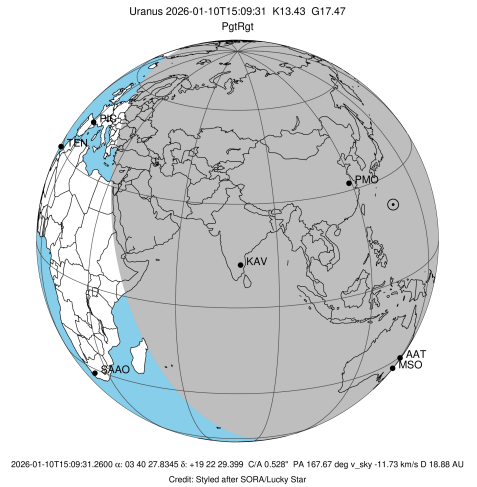
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2026-01-10T15:03:30.960
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : AAT
 Location : Siding Spring (AAT)
 Latitude (deg) : -31.27703
 E. Longitude (deg) : 149.06608
 Altitude (km) : 1.164
 Gaia source ID : 57075545518885888
 2Mass ID (if available) : 03402783+1922300
 ICRS Star Coord at Epoch: 03h 40m 27.83450s +19:22:29.39851s
 RUWE (>1.4 is poor) : 4.70
 K magnitude : 13.425
 G magnitude : 17.468
 RP magnitude : 16.116
 BP magnitude : 18.969
 DUPflag : 0
 Distance (au) : 18.876
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -11.73
 Sun-Target sep (deg) : 127.33
 Sun-Moon sep (deg) : 142.80
 B (ring opening deg) : 68.41
 PA of pole (deg) : -82.27
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 0.179
 C/A sky separation (km) : 2444.0
 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_itrfr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-01-10T13:57:13.073		18.30	-36.89	50921.84	-12.79		
lambda	I	2026-01-10T13:58:23.048		18.10	-36.91	50026.71	-12.79		
delta	I	2026-01-10T14:00:38.045		17.71	-36.94	48300.35	-12.79		
gamma	I	2026-01-10T14:01:30.964		17.56	-36.95	47623.81	-12.78		
eta	I	2026-01-10T14:02:05.987		17.46	-36.95	47176.12	-12.78		
beta	I	2026-01-10T14:04:04.565		17.12	-36.97	45661.55	-12.78		
alpha	I	2026-01-10T14:05:19.210		16.90	-36.98	44709.72	-12.77		
4	I	2026-01-10T14:08:08.785		16.41	-36.99	42532.76	-12.76		
5	I	2026-01-10T14:08:35.384		16.33	-36.99	42187.93	-12.76		
6	I	2026-01-10T14:09:01.092		16.26	-36.99	41878.98	-12.77		
Uranus	I	2026-01-10T14:28:38.240		12.77	-36.84	25085.52		20.83	21.73
Uranus	E	2026-01-10T15:38:40.391		-0.58x	-33.02	25148.89		-19.29	-20.13
6	E	2026-01-10T15:58:41.259		-4.58x	-31.09	41796.81	12.55		
5	E	2026-01-10T15:59:21.902		-4.72x	-31.02	42289.57	12.54		
4	E	2026-01-10T15:59:46.699		-4.80x	-30.97	42606.51	12.54		
alpha	E	2026-01-10T16:02:34.548		-5.36x	-30.68	44723.43	12.54		
beta	E	2026-01-10T16:03:49.277		-5.62x	-30.54	45658.45	12.54		
eta	E	2026-01-10T16:05:50.353		-6.03x	-30.32	47176.12	12.54		
gamma	E	2026-01-10T16:06:26.410		-6.15x	-30.25	47628.20	12.54		
delta	E	2026-01-10T16:07:20.023		-6.33x	-30.16	48300.35	12.54		
lambda	E	2026-01-10T16:09:37.750		-6.79x	-29.90	50026.71	12.53		
epsilon	E	2026-01-10T16:11:22.295		-7.15x	-29.70	51336.82	12.53		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2026-01-10T15:03:56.130
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      : 57075545518885888
2Mass ID (if available) : 03402783+1922300
ICRS Star Coord at Epoch: 03h 40m 27.83450s +19:22:29.39851s
RUWE (>1.4 is poor) : 4.70
K magnitude          : 13.425
G magnitude          : 17.468
RP magnitude         : 16.116
BP magnitude         : 18.969
DUPflag             : 0
Distance (au)       : 18.876
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -11.73
Sun-Target sep (deg) : 127.33
Sun-Moon sep (deg)  : 142.75
B (ring opening deg) : 68.41
PA of pole (deg)    : -82.27
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.159
C/A sky separation (km) : 2176.6
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```



Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-01-10T13:57:32.856		15.79	-32.87	50923.54	-12.78		
lambda	I	2026-01-10T13:58:43.015		15.61	-32.88	50026.71	-12.78		
delta	I	2026-01-10T14:00:58.109		15.24	-32.91	48300.35	-12.78		
gamma	I	2026-01-10T14:01:51.062		15.10	-32.92	47623.83	-12.77		
eta	I	2026-01-10T14:02:26.112		15.01	-32.92	47176.12	-12.77		
beta	I	2026-01-10T14:04:24.759		14.68	-32.94	45661.67	-12.77		
alpha	I	2026-01-10T14:05:39.448		14.48	-32.95	44709.91	-12.77		
4	I	2026-01-10T14:08:29.130		14.02	-32.96	42532.90	-12.76		
5	I	2026-01-10T14:08:55.785		13.94	-32.96	42187.54	-12.75		
6	I	2026-01-10T14:09:21.473		13.87	-32.96	41878.93	-12.76		
Uranus	I	2026-01-10T14:28:59.544		10.56	-32.82	25088.11		20.77	21.66
Uranus	E	2026-01-10T15:39:08.474		-2.16x	-29.31	25144.60		-19.40	-20.24
6	E	2026-01-10T15:59:08.181		-5.99x	-27.53	41796.72	12.55		
5	E	2026-01-10T15:59:48.808		-6.12x	-27.47	42289.17	12.54		
4	E	2026-01-10T16:00:13.652		-6.20x	-27.43	42606.70	12.54		
alpha	E	2026-01-10T16:03:01.496		-6.74x	-27.15	44723.65	12.54		
beta	E	2026-01-10T16:04:16.214		-6.98x	-27.03	45658.57	12.54		
eta	E	2026-01-10T16:06:17.279		-7.37x	-26.82	47176.12	12.54		
gamma	E	2026-01-10T16:06:53.337		-7.49x	-26.76	47628.23	12.54		
delta	E	2026-01-10T16:07:46.947		-7.66x	-26.67	48300.35	12.54		
lambda	E	2026-01-10T16:10:04.672		-8.11x	-26.43	50026.71	12.53		
epsilon	E	2026-01-10T16:11:49.378		-8.45x	-26.25	51338.86	12.53		