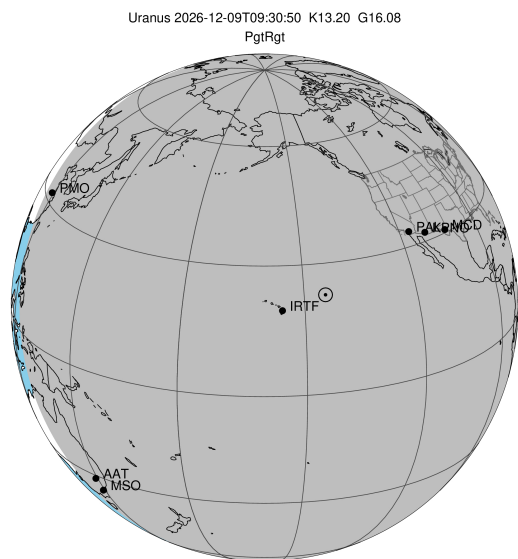


target : Uranus  
target radius (km) : 25559.00  
C/A epoch : 2026-12-09T09:30:50.830  
Event type : PgtRgt  
: Uranus occs: geocentric, topocentric  
: Ring occs: geocentric, topocentric  
Gaia source ID : 52148775651908096  
2Mass ID (if available) : 04024928+2033368

ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s

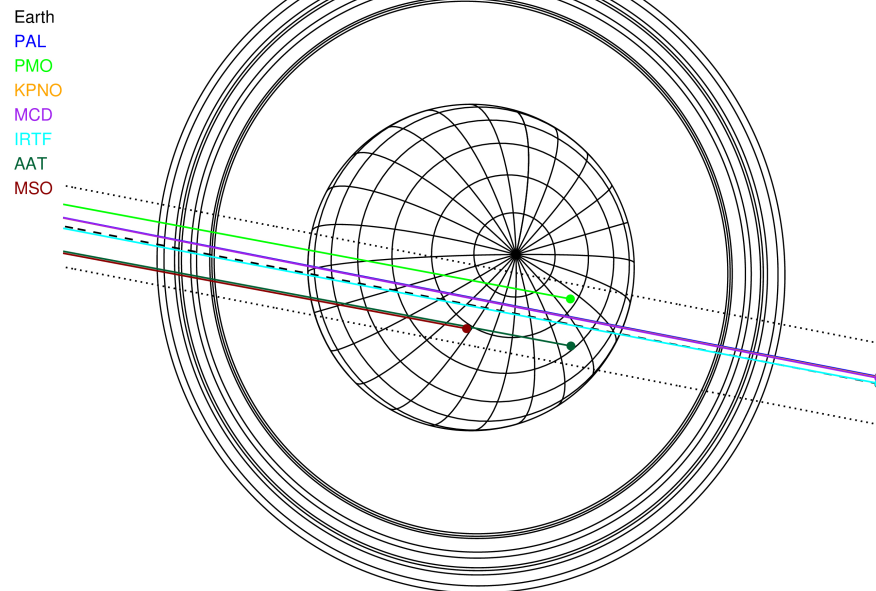
RUWE (>1.4 is poor) : 1.22  
K magnitude : 13.198  
G magnitude : 16.078  
RP magnitude : 15.180  
BP magnitude : 16.886  
DUPflag : 0  
Distance (au) : 18.472  
f0 (km) : 0.000  
g0 (km) : 0.000  
skyplane vel. (km/s) : -22.55  
Sun-Target sep (deg) : 165.79  
Sun-Moon sep (deg) : 161.30  
B (ring opening deg) : 73.32  
PA of pole (deg) : -73.88

#	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



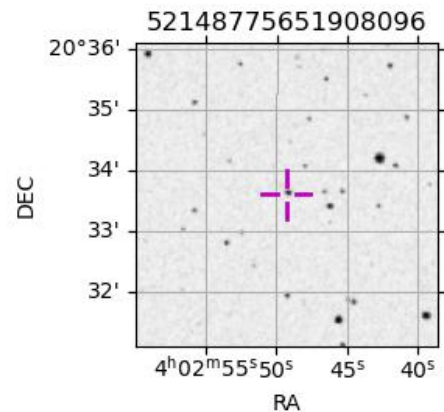
2026-12-09T09:30:50.8300 ex: 04 02 49.2867 s; +20 33 36.259 C/A 0.427'' PA 349.06 deg v\_sky -22.55 km/s D 18.47 AU  
Credit: Styled after SORA/Lucky Star

Uranus 2026-12-09T09:30:50 K13.20 G16.08 PgtRgt

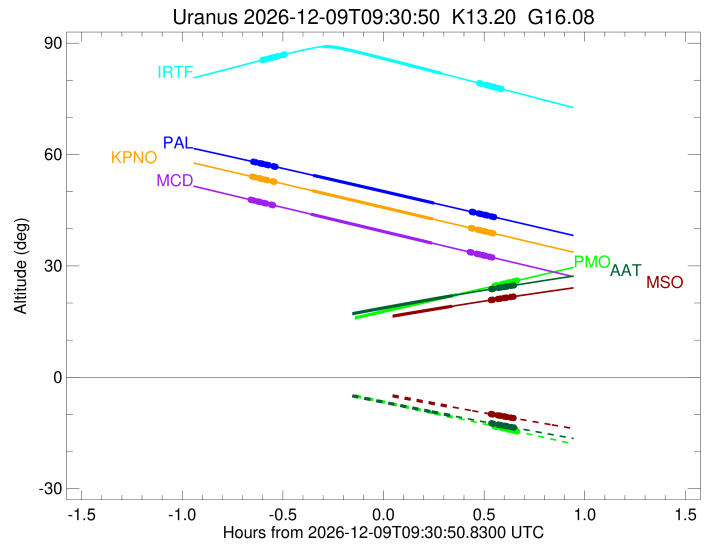
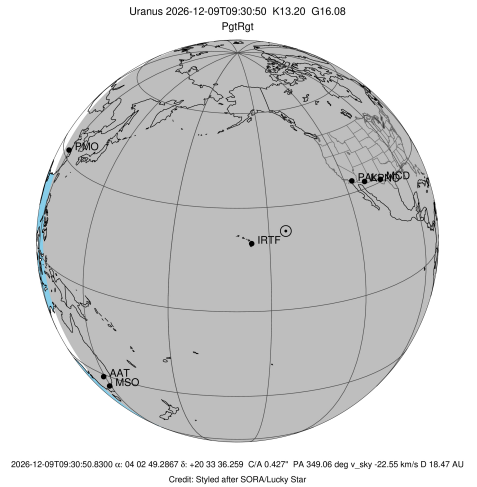


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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	+++++	+ +	+++++	DEC 09 08:51 - DEC 09 10:03	PieRie
PMO	Purple Mtn Obs. Nanki	32.1	118.8		+	+++++	DEC 09 09:52 - DEC 09 10:10	PneRne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++	+ +	+++++	DEC 09 08:51 - DEC 09 10:03	PieRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++	+ +	+++++	DEC 09 08:51 - DEC 09 10:02	PieRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+++++	+ +	+++++	DEC 09 08:54 - DEC 09 10:05	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		+	+++++	DEC 09 09:51 - DEC 09 10:09	PneRne
SAAO	So. Afr. Astro. Obs.	-32.4	20.8					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0		+	+++++	DEC 09 09:51 - DEC 09 10:09	PneRne

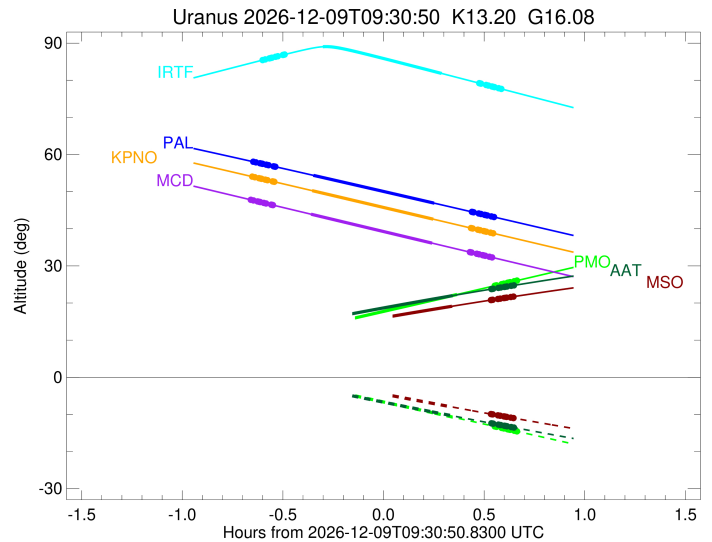
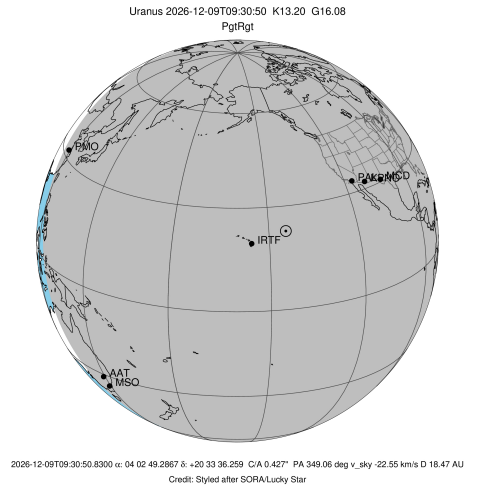


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-12-09T09:27:59.620  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PAL  
 Location : Palomar Mt (200")  
 Latitude (deg) : 33.35622  
 E. Longitude (deg) : 243.13601  
 Altitude (km) : 1.706  
 Gaia source ID : 52148775651908096  
 2Mass ID (if available) : 04024928+2033368  
 ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s  
 RUWE (>1.4 is poor) : 1.22  
 K magnitude : 13.198  
 G magnitude : 16.078  
 RP magnitude : 15.180  
 BP magnitude : 16.886  
 DUPflag : 0  
 Distance (au) : 18.472  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 165.79  
 Sun-Moon sep (deg) : 160.98  
 B (ring opening deg) : 73.32  
 PA of pole (deg) : -73.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.344  
 C/A sky separation (km) : 4602.4  
 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\_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	2026-12-09T08:51:45.589		58.11	-71.08	51525.71	-23.59		
lambda	I	2026-12-09T08:52:49.149		57.90	-70.88	50026.71	-23.58		
delta	I	2026-12-09T08:54:02.375		57.65	-70.66	48300.35	-23.57		
gamma	I	2026-12-09T08:54:31.066		57.55	-70.57	47624.11	-23.57		
eta	I	2026-12-09T08:54:50.076		57.49	-70.51	47176.12	-23.56		
beta	I	2026-12-09T08:55:54.837		57.27	-70.31	45649.95	-23.56		
alpha	I	2026-12-09T08:56:34.443		57.13	-70.18	44719.41	-23.55		
4	I	2026-12-09T08:58:03.856		56.83	-69.91	42616.30	-23.54		
5	I	2026-12-09T08:58:18.402		56.78	-69.86	42280.69	-23.54		
6	I	2026-12-09T08:58:37.993		56.71	-69.80	41804.65	-23.53		
Uranus	I	2026-12-09T09:09:55.124		54.40	-67.64	25218.33		13.14	13.74
Uranus	E	2026-12-09T09:45:58.226		46.90	-60.42	25064.36		-15.97	-16.69
6	E	2026-12-09T09:57:13.226		44.55	-58.12	41874.98	23.46		
5	E	2026-12-09T09:57:26.468		44.50	-58.07	42204.46	23.47		
4	E	2026-12-09T09:57:40.438		44.45	-58.02	42526.19	23.47		
alpha	E	2026-12-09T09:59:14.264		44.13	-57.70	44724.52	23.48		
beta	E	2026-12-09T09:59:54.840		43.98	-57.56	45675.44	23.48		
eta	E	2026-12-09T10:00:58.735		43.76	-57.34	47176.12	23.49		
gamma	E	2026-12-09T10:01:17.951		43.69	-57.27	47627.46	23.49		
delta	E	2026-12-09T10:01:46.597		43.59	-57.18	48300.35	23.49		
lambda	E	2026-12-09T10:03:00.077		43.34	-56.92	50026.71	23.50		
epsilon	E	2026-12-09T10:03:33.188		43.22	-56.81	50804.78	23.51		

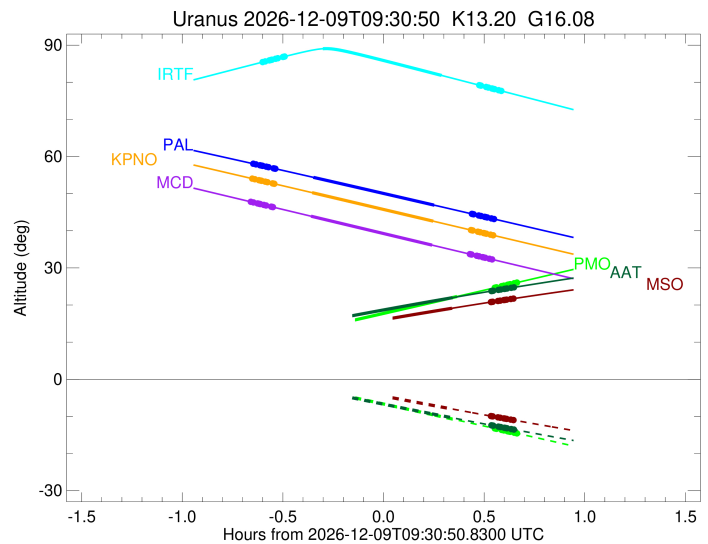
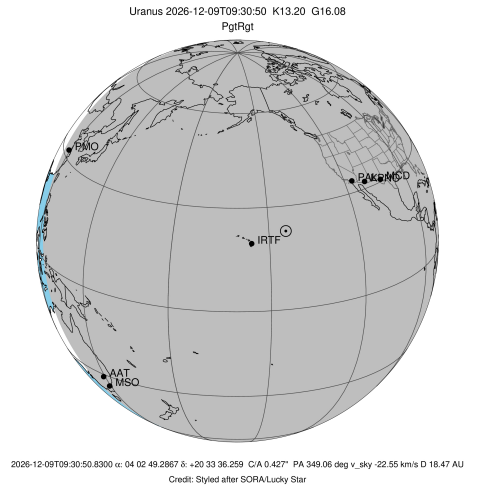
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-12-09T09:34:19.120  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PMO  
 Location : Purple Mtn Obs. Nanking  
 Latitude (deg) : 32.06667  
 E. Longitude (deg) : 118.82089  
 Altitude (km) : 0.364  
 Gaia source ID : 52148775651908096  
 2Mass ID (if available) : 04024928+2033368  
 ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s  
 RUWE (>1.4 is poor) : 1.22  
 K magnitude : 13.198  
 G magnitude : 16.078  
 RP magnitude : 15.180  
 BP magnitude : 16.886  
 DUPflag : 0  
 Distance (au) : 18.472  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 165.79  
 Sun-Moon sep (deg) : 161.86  
 B (ring opening deg) : 73.32  
 PA of pole (deg) : -73.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.148  
 C/A sky separation (km) : 1980.8  
 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	2026-12-09T08:57:32.844		10.92	-0.25x	51516.09	-23.30		
lambda	I	2026-12-09T08:58:36.760		11.13	-0.45x	50026.71	-23.30		
delta	I	2026-12-09T08:59:50.846		11.38	-0.68x	48300.35	-23.30		
gamma	I	2026-12-09T09:00:19.853		11.48	-0.78x	47624.42	-23.30		
eta	I	2026-12-09T09:00:39.091		11.55	-0.84x	47176.12	-23.30		
beta	I	2026-12-09T09:01:44.617		11.77	-1.04x	45648.88	-23.30		
alpha	I	2026-12-09T09:02:24.692		11.90	-1.17x	44717.16	-23.30		
4	I	2026-12-09T09:03:54.944		12.21	-1.46x	42616.53	-23.30		
5	I	2026-12-09T09:04:09.843		12.26	-1.50x	42275.96	-23.31		
6	I	2026-12-09T09:04:29.445		12.33	-1.57x	41802.81	-23.30		
Uranus	I	2026-12-09T09:15:48.038		14.64	-3.73x	25162.75		14.21	14.86
Uranus	E	2026-12-09T09:52:45.792		22.30	-10.99	25096.20		-15.42	-16.11
6	E	2026-12-09T10:04:02.206		24.66	-13.24	41873.84	23.40		
5	E	2026-12-09T10:04:15.394		24.70	-13.28	42200.45	23.41		
4	E	2026-12-09T10:04:29.573		24.75	-13.33	42525.99	23.40		
alpha	E	2026-12-09T10:06:03.574		25.08	-13.65	44722.81	23.41		
beta	E	2026-12-09T10:06:44.318		25.22	-13.78	45674.72	23.41		
eta	E	2026-12-09T10:07:48.437		25.45	-14.00	47176.12	23.41		
gamma	E	2026-12-09T10:08:07.724		25.51	-14.06	47627.70	23.41		
delta	E	2026-12-09T10:08:36.451		25.61	-14.16	48300.35	23.42		
lambda	E	2026-12-09T10:09:50.170		25.87	-14.41	50026.71	23.42		
epsilon	E	2026-12-09T10:10:23.007		25.99	-14.52	50795.78	23.43		

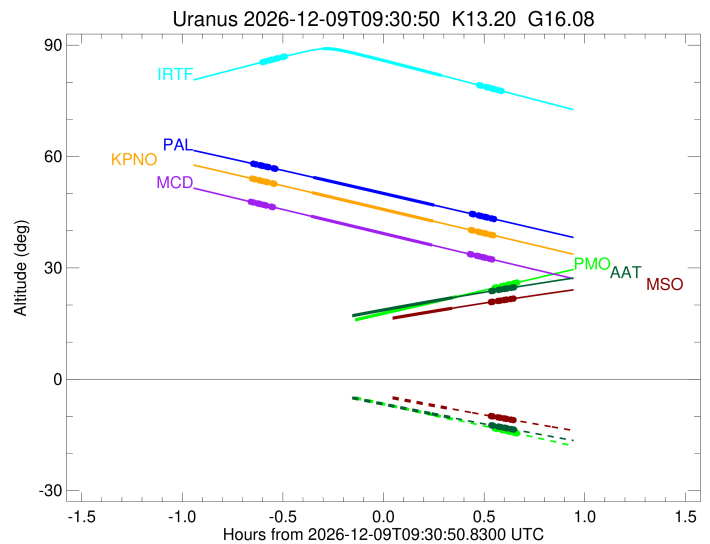
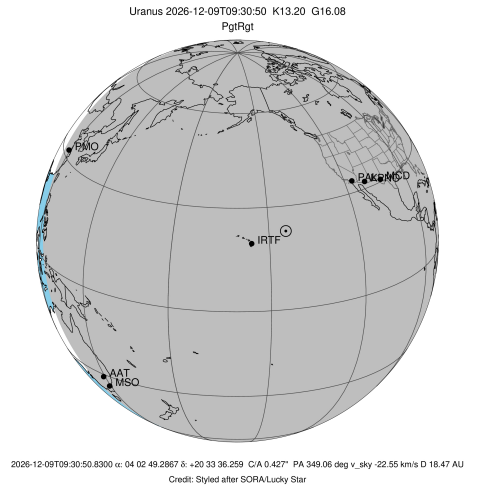
```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2026-12-09T09:27:42.310
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      : 52148775651908096
2Mass ID (if available) : 04024928+2033368
ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s
RUWE (>1.4 is poor) : 1.22
K magnitude          : 13.198
G magnitude          : 16.078
RP magnitude         : 15.180
BP magnitude         : 16.886
DUPflag             : 0
Distance (au)       : 18.472
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -22.55
Sun-Target sep (deg) : 165.79
Sun-Moon sep (deg)  : 160.92
B (ring opening deg) : 73.32
PA of pole (deg)    : -73.88
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.351
C/A sky separation (km) : 4699.5
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	2026-12-09T08:51:26.940		54.10	-67.59	51526.10	-23.58		
lambda	I	2026-12-09T08:52:30.566		53.88	-67.38	50026.71	-23.56		
delta	I	2026-12-09T08:53:43.851		53.62	-67.13	48300.35	-23.55		
gamma	I	2026-12-09T08:54:12.567		53.52	-67.03	47624.09	-23.55		
eta	I	2026-12-09T08:54:31.592		53.46	-66.97	47176.12	-23.55		
beta	I	2026-12-09T08:55:36.405		53.23	-66.75	45649.99	-23.54		
alpha	I	2026-12-09T08:56:16.043		53.09	-66.61	44719.51	-23.53		
4	I	2026-12-09T08:57:45.539		52.77	-66.31	42616.28	-23.51		
5	I	2026-12-09T08:58:00.089		52.72	-66.26	42280.88	-23.52		
6	I	2026-12-09T08:58:19.705		52.65	-66.19	41804.73	-23.50		
Uranus	I	2026-12-09T09:09:37.698		50.26	-63.87	25220.67		13.09	13.69
Uranus	E	2026-12-09T09:45:40.994		42.59	-56.32	25063.41		-15.99	-16.70
6	E	2026-12-09T09:56:56.892		40.19	-53.94	41875.01	23.43		
5	E	2026-12-09T09:57:10.154		40.14	-53.89	42204.59	23.44		
4	E	2026-12-09T09:57:24.136		40.09	-53.84	42526.20	23.44		
alpha	E	2026-12-09T09:58:58.081		39.76	-53.51	44724.58	23.45		
beta	E	2026-12-09T09:59:38.704		39.61	-53.37	45675.46	23.45		
eta	E	2026-12-09T10:00:42.676		39.39	-53.14	47176.12	23.46		
gamma	E	2026-12-09T10:01:01.916		39.32	-53.07	47627.45	23.46		
delta	E	2026-12-09T10:01:30.597		39.22	-52.97	48300.35	23.46		
lambda	E	2026-12-09T10:02:44.166		38.96	-52.71	50026.71	23.47		
epsilon	E	2026-12-09T10:03:17.329		38.84	-52.59	50805.06	23.48		

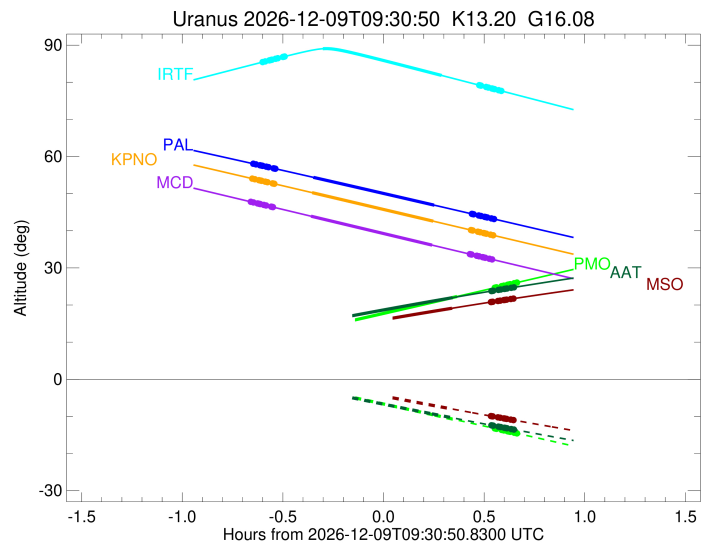
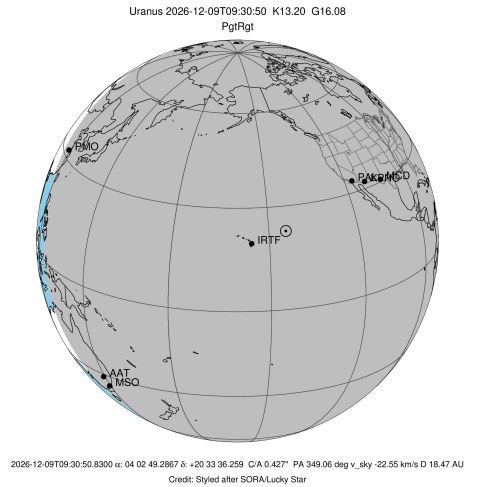
target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-12-09T09:27:19.970  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : MCD  
 Location : McDonald Obs. 2.7m  
 Latitude (deg) : 30.67158  
 E. Longitude (deg) : 255.97844  
 Altitude (km) : 2.075  
 Gaia source ID : 52148775651908096  
 2Mass ID (if available) : 04024928+2033368  
 ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s  
 RUWE (>1.4 is poor) : 1.22  
 K magnitude : 13.198  
 G magnitude : 16.078  
 RP magnitude : 15.180  
 BP magnitude : 16.886  
 DUPflag : 0  
 Distance (au) : 18.472  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 165.79  
 Sun-Moon sep (deg) : 160.83  
 B (ring opening deg) : 73.32  
 PA of pole (deg) : -73.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.353  
 C/A sky separation (km) : 4730.9  
 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\_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	2026-12-09T08:51:01.677		47.86	-61.64	51526.32	-23.55		
lambda	I	2026-12-09T08:52:05.395		47.63	-61.42	50026.71	-23.53		
delta	I	2026-12-09T08:53:18.775		47.37	-61.16	48300.35	-23.52		
gamma	I	2026-12-09T08:53:47.529		47.26	-61.05	47624.09	-23.52		
eta	I	2026-12-09T08:54:06.578		47.19	-60.99	47176.12	-23.51		
beta	I	2026-12-09T08:55:11.476		46.96	-60.76	45650.02	-23.50		
alpha	I	2026-12-09T08:55:51.166		46.82	-60.61	44719.56	-23.50		
4	I	2026-12-09T08:57:20.785		46.50	-60.30	42616.27	-23.48		
5	I	2026-12-09T08:57:35.350		46.44	-60.24	42280.99	-23.49		
6	I	2026-12-09T08:57:54.997		46.37	-60.17	41804.78	-23.47		
Uranus	I	2026-12-09T09:09:14.037		43.93	-57.75	25221.77		13.07	13.67
Uranus	E	2026-12-09T09:45:20.055		36.14	-49.99	25063.29		-15.99	-16.71
6	E	2026-12-09T09:56:37.180		33.71	-47.56	41875.01	23.38		
5	E	2026-12-09T09:56:50.466		33.66	-47.51	42204.58	23.40		
4	E	2026-12-09T09:57:04.474		33.61	-47.46	42526.20	23.39		
alpha	E	2026-12-09T09:58:38.588		33.27	-47.12	44724.57	23.41		
beta	E	2026-12-09T09:59:19.286		33.13	-46.98	45675.46	23.41		
eta	E	2026-12-09T10:00:23.374		32.90	-46.75	47176.12	23.42		
gamma	E	2026-12-09T10:00:42.648		32.83	-46.68	47627.45	23.42		
delta	E	2026-12-09T10:01:11.381		32.73	-46.58	48300.35	23.42		
lambda	E	2026-12-09T10:02:25.084		32.46	-46.31	50026.71	23.43		
epsilon	E	2026-12-09T10:02:58.306		32.34	-46.19	50805.02	23.44		

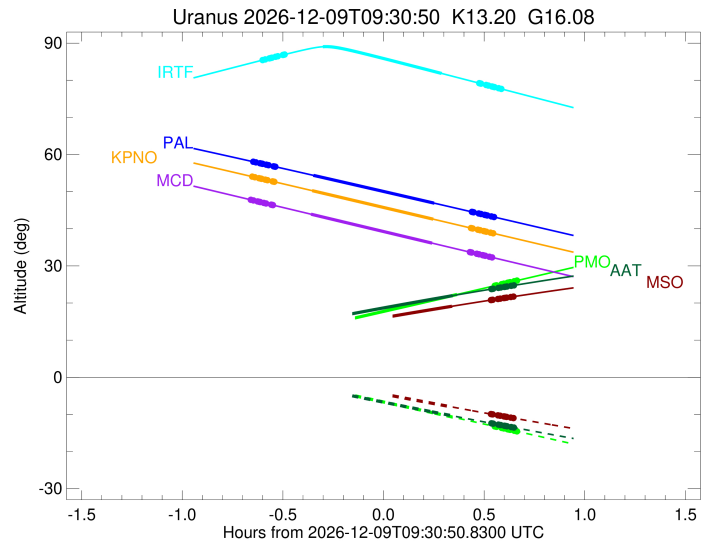
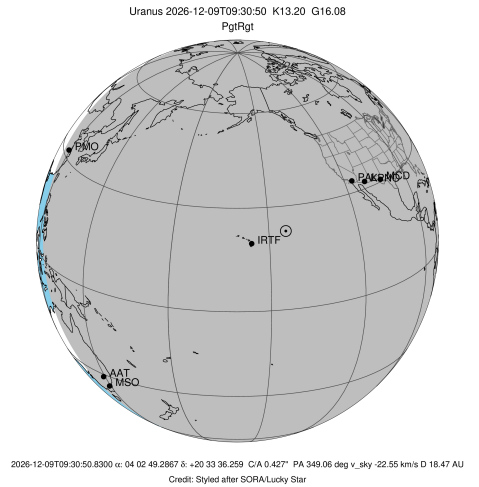
```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch             : 2026-12-09T09:30:31.660
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       : 52148775651908096
2Mass ID (if available) : 04024928+2033368
ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s
RUWE (>1.4 is poor) : 1.22
K magnitude           : 13.198
G magnitude           : 16.078
RP magnitude          : 15.180
BP magnitude          : 16.886
DUPflag              : 0
Distance (au)        : 18.472
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : -22.55
Sun-Target sep (deg) : 165.79
Sun-Moon sep (deg)   : 161.54
B (ring opening deg) : 73.32
PA of pole (deg)     : -73.88
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 0.444
C/A sky separation (km) : 5947.7
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
    
```



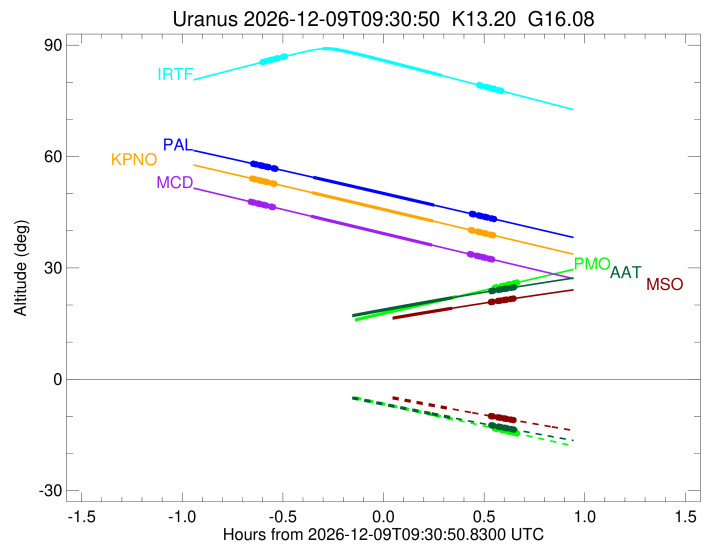
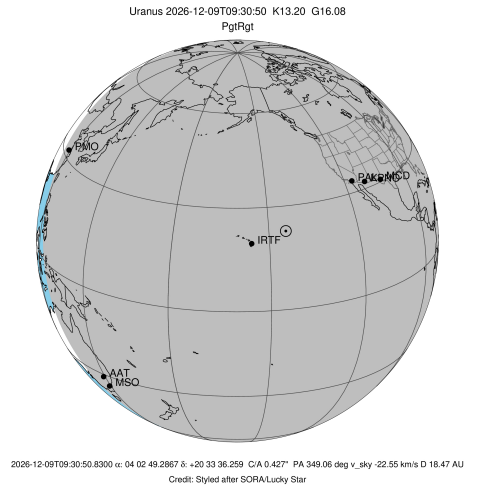
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2026-12-09T08:54:32.343		85.38	-71.20	51528.98	-23.63		
lambda	I	2026-12-09T08:55:35.956		85.63	-71.45	50026.71	-23.61		
delta	I	2026-12-09T08:56:49.092		85.91	-71.72	48300.35	-23.60		
gamma	I	2026-12-09T08:57:17.757		86.02	-71.83	47623.99	-23.59		
eta	I	2026-12-09T08:57:36.742		86.09	-71.91	47176.12	-23.59		
beta	I	2026-12-09T08:58:41.423		86.33	-72.15	45650.37	-23.58		
alpha	I	2026-12-09T08:59:20.981		86.48	-72.30	44720.29	-23.57		
4	I	2026-12-09T09:00:50.376		86.82	-72.64	42616.14	-23.55		
5	I	2026-12-09T09:01:04.833		86.87	-72.70	42282.51	-23.55		
6	I	2026-12-09T09:01:24.485		86.95	-72.77	41805.44	-23.53		
Uranus	I	2026-12-09T09:12:44.233		89.04	-75.36	25244.25		12.61	13.19
Uranus	E	2026-12-09T09:48:10.428		81.85	-83.18	25048.87		-16.23	-16.96
6	E	2026-12-09T09:59:24.749		79.22	-85.35	41875.68	23.53		
5	E	2026-12-09T09:59:38.018		79.17	-85.38	42207.21	23.54		
4	E	2026-12-09T09:59:51.830		79.11	-85.42	42526.39	23.54		
alpha	E	2026-12-09T10:01:25.400		78.75	-85.68	44725.68	23.56		
beta	E	2026-12-09T10:02:05.795		78.59	-85.79	45675.92	23.57		
eta	E	2026-12-09T10:03:09.426		78.34	-85.95	47176.12	23.58		
gamma	E	2026-12-09T10:03:28.558		78.27	-86.00	47627.28	23.58		
delta	E	2026-12-09T10:03:57.094		78.15	-86.06	48300.35	23.59		
lambda	E	2026-12-09T10:05:10.259		77.87	-86.23	50026.71	23.60		
epsilon	E	2026-12-09T10:05:43.512		77.74	-86.30	50811.61	23.62		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-12-09T09:34:26.710  
 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 : 52148775651908096  
 2Mass ID (if available) : 04024928+2033368  
 ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s  
 RUWE (>1.4 is poor) : 1.22  
 K magnitude : 13.198  
 G magnitude : 16.078  
 RP magnitude : 15.180  
 BP magnitude : 16.886  
 DUPflag : 0  
 Distance (au) : 18.472  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 165.79  
 Sun-Moon sep (deg) : 162.15  
 B (ring opening deg) : 73.32  
 PA of pole (deg) : -73.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.688  
 C/A sky separation (km) : 9216.4  
 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\_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	2026-12-09T08:58:22.157		13.11	-0.67x	51537.17	-23.15		
lambda	I	2026-12-09T08:59:27.457		13.30	-0.87x	50026.71	-23.12		
delta	I	2026-12-09T09:00:42.174		13.52	-1.11x	48300.35	-23.09		
gamma	I	2026-12-09T09:01:11.487		13.61	-1.20x	47623.67	-23.08		
eta	I	2026-12-09T09:01:30.883		13.66	-1.26x	47176.12	-23.07		
beta	I	2026-12-09T09:02:36.989		13.86	-1.47x	45651.59	-23.04		
alpha	I	2026-12-09T09:03:17.428		13.98	-1.60x	44722.72	-23.02		
4	I	2026-12-09T09:04:49.112		14.24	-1.89x	42615.55	-22.97		
5	I	2026-12-09T09:05:03.696		14.29	-1.93x	42287.30	-22.97		
6	I	2026-12-09T09:05:24.028		14.35	-2.00x	41807.70	-22.95		
Uranus	I	2026-12-09T09:17:11.327		16.38	-4.20x	25314.50		11.07	11.58
Uranus	E	2026-12-09T09:51:27.485		21.99	-10.39	25025.89		-16.62	-17.36
6	E	2026-12-09T10:03:02.624		23.76	-12.40	41877.06	23.02		
5	E	2026-12-09T10:03:16.357		23.80	-12.44	42213.55	23.05		
4	E	2026-12-09T10:03:30.199		23.83	-12.48	42527.08	23.04		
alpha	E	2026-12-09T10:05:05.811		24.07	-12.76	44728.27	23.10		
beta	E	2026-12-09T10:05:46.914		24.17	-12.87	45676.92	23.12		
eta	E	2026-12-09T10:06:51.702		24.33	-13.06	47176.12	23.15		
gamma	E	2026-12-09T10:07:11.166		24.38	-13.11	47626.90	23.16		
delta	E	2026-12-09T10:07:40.231		24.45	-13.19	48300.35	23.18		
lambda	E	2026-12-09T10:08:54.663		24.63	-13.40	50026.71	23.21		
epsilon	E	2026-12-09T10:09:29.173		24.72	-13.50	50827.94	23.24		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2026-12-09T09:34:21.130  
 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 : 52148775651908096  
 2Mass ID (if available) : 04024928+2033368  
 ICRS Star Coord at Epoch: 04h 02m 49.28674s +20:33:36.25924s  
 RUWE (>1.4 is poor) : 1.22  
 K magnitude : 13.198  
 G magnitude : 16.078  
 RP magnitude : 15.180  
 BP magnitude : 16.886  
 DUPflag : 0  
 Distance (au) : 18.472  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -22.55  
 Sun-Target sep (deg) : 165.79  
 Sun-Moon sep (deg) : 162.13  
 B (ring opening deg) : 73.32  
 PA of pole (deg) : -73.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.712  
 C/A sky separation (km) : 9538.8  
 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	2026-12-09T08:58:17.689		10.76	1.24x	51537.97	-23.12		
lambda	I	2026-12-09T08:59:23.130		10.95	1.05x	50026.71	-23.08		
delta	I	2026-12-09T09:00:37.975		11.16	0.82x	48300.35	-23.05		
gamma	I	2026-12-09T09:01:07.342		11.24	0.73x	47623.64	-23.04		
eta	I	2026-12-09T09:01:26.772		11.29	0.67x	47176.12	-23.03		
beta	I	2026-12-09T09:02:32.996		11.48	0.47x	45651.72	-23.00		
alpha	I	2026-12-09T09:03:13.510		11.59	0.35x	44722.97	-22.98		
4	I	2026-12-09T09:04:45.398		11.84	0.08x	42615.46	-22.92		
5	I	2026-12-09T09:04:59.989		11.88	0.03x	42287.79	-22.92		
6	I	2026-12-09T09:05:20.384		11.94	-0.03x	41807.95	-22.89		
Uranus	I	2026-12-09T09:17:10.573		13.87	-2.14x	25321.94		10.90	11.40
Uranus	E	2026-12-09T09:51:16.633		19.13	-8.00	25024.74		-16.64	-17.38
6	E	2026-12-09T10:02:54.265		20.80	-9.92	41877.18	22.97		
5	E	2026-12-09T10:03:08.048		20.83	-9.96	42214.15	22.99		
4	E	2026-12-09T10:03:21.899		20.86	-9.99	42527.16	22.99		
alpha	E	2026-12-09T10:04:57.737		21.09	-10.25	44728.50	23.05		
beta	E	2026-12-09T10:05:38.920		21.18	-10.36	45677.01	23.07		
eta	E	2026-12-09T10:06:43.838		21.33	-10.54	47176.12	23.11		
gamma	E	2026-12-09T10:07:03.340		21.38	-10.59	47626.86	23.12		
delta	E	2026-12-09T10:07:32.463		21.44	-10.67	48300.35	23.13		
lambda	E	2026-12-09T10:08:47.036		21.61	-10.87	50026.71	23.17		
epsilon	E	2026-12-09T10:09:21.676		21.69	-10.96	50829.48	23.20		