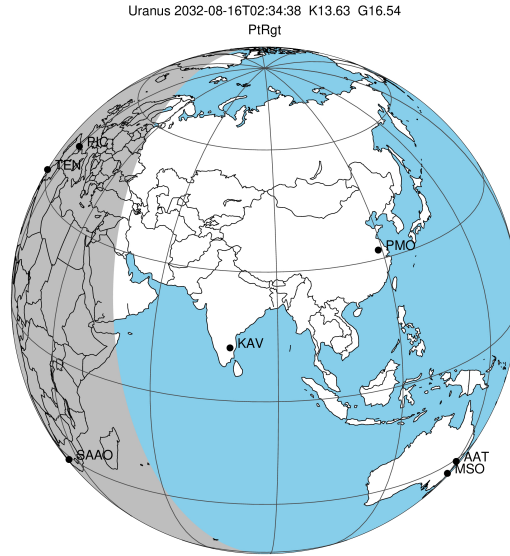


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2032-08-16T02:34:38.820
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3424860424241561216
 2Mass ID (if available) : 06002436+2336580

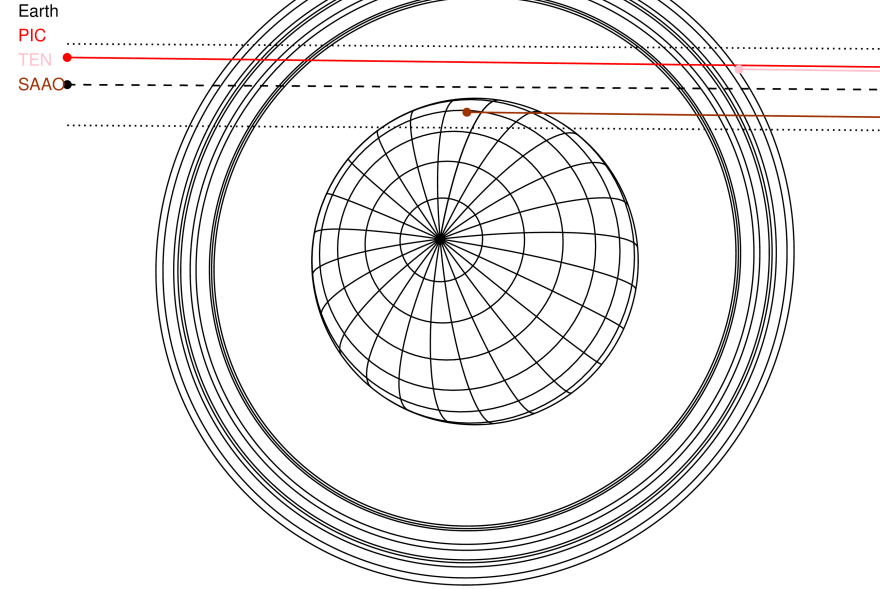
Uranus 2032-08-16T02:34:38 K13.63 G16.54 PtRgt

ICRS Star Coord at Epoch: 06h 00m 24.37506s +23:36:58.05602s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 13.629
 G magnitude : 16.538
 RP magnitude : 15.624
 BP magnitude : 17.376
 DUPflag : 0
 Distance (au) : 19.631
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.17
 Sun-Target sep (deg) : 53.25
 Sun-Moon sep (deg) : 164.63
 B (ring opening deg) : 75.29
 PA of pole (deg) : 57.30



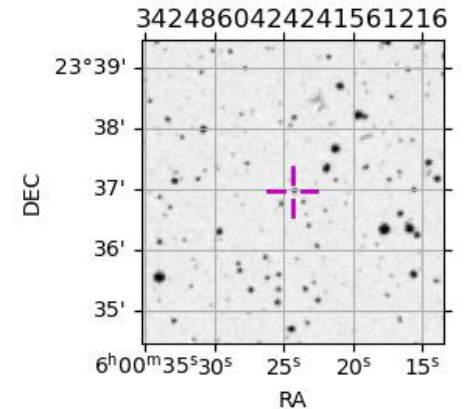
2032-08-16T02:34:38.8200 ex: 06 00 24.3751 s: +23 36 58.056 C/A 1.923° PA 179.65 deg v_sky +24.17 km/s D 19.63 AU
 Credit: Styled after SORA/Lucky Star



#	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

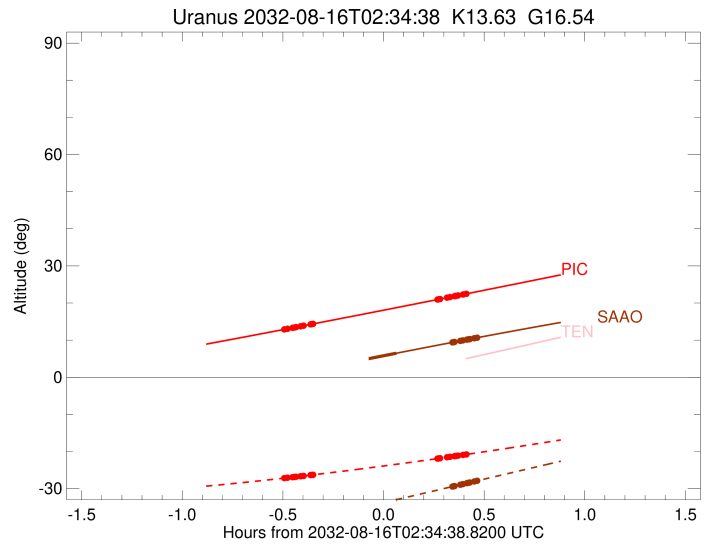
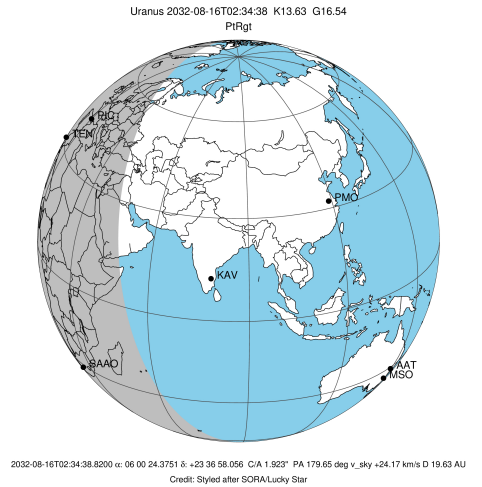
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	AUG 16 02:05 - AUG 16 02:59	PnnRie
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
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					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					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8		+	+++++	AUG 16 02:38 - AUG 16 03:02	PneRne
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-08-16T02:31:33.160
Event type           : PtRgt
: Uranus occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code        : PIC
Location             : Pic du Midi
Latitude (deg)       : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)        : 2.890
Gaia source ID       : 3424860424241561216
2Mass ID (if available) : 06002436+2336580
ICRS Star Coord at Epoch: 06h 00m 24.37506s +23:36:58.05602s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 13.629
G magnitude           : 16.538
RP magnitude          : 15.624
BP magnitude          : 17.376
DUPflag              : 0
Distance (au)        : 19.631
f0 (km)              : 0.000
g0 (km)              : 0.000
skyplane vel. (km/s) : 24.17
Sun-Target sep (deg) : 53.25
Sun-Moon sep (deg)   : 164.16
B (ring opening deg) : 75.29
PA of pole (deg)     : 57.30
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.192
C/A sky separation (km) : 31203.1
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall11.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall11.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
  
```



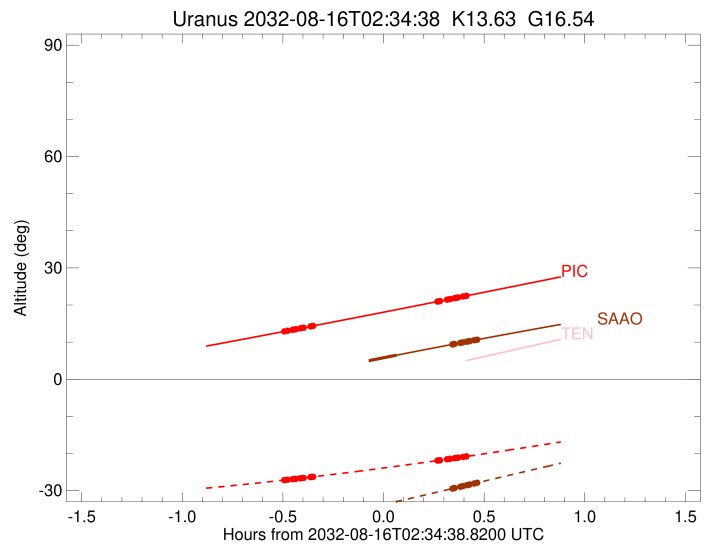
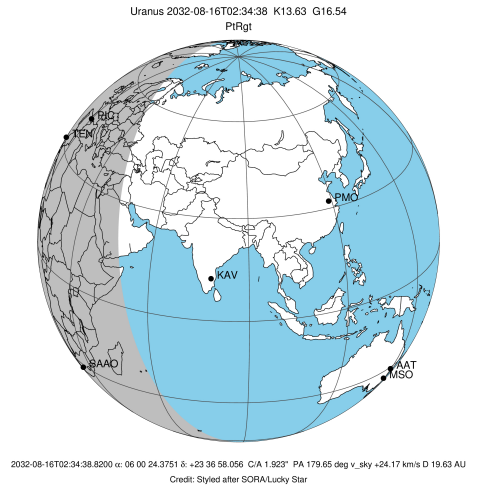
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-08-16T02:05:22.026		12.94	-27.14	50821.38	-19.38		
lambda	I	2032-08-16T02:06:03.079		13.06	-27.07	50026.71	-19.26		
delta	I	2032-08-16T02:07:33.806		13.32	-26.91	48300.35	-18.79		
gamma	I	2032-08-16T02:08:09.590		13.43	-26.85	47631.53	-18.59		
eta	I	2032-08-16T02:08:34.179		13.50	-26.81	47176.12	-18.45		
beta	I	2032-08-16T02:09:56.327		13.73	-26.67	45681.05	-17.95		
alpha	I	2032-08-16T02:10:48.722		13.89	-26.58	44751.86	-17.60		
4	I	2032-08-16T02:12:57.863		14.26	-26.35	42538.73	-16.66		
5	I	2032-08-16T02:13:12.674		14.30	-26.32	42292.32	-16.56		
6	I	2032-08-16T02:13:38.436		14.38	-26.28	41859.00	-16.30		

No planet occultations

6	E	2032-08-16T02:50:41.702		20.93	-21.92	41803.96	16.26		
5	E	2032-08-16T02:51:11.795		21.02	-21.85	42296.94	16.51		
4	E	2032-08-16T02:51:30.262		21.07	-21.81	42599.60	16.61		
alpha	E	2032-08-16T02:53:34.522		21.44	-21.54	44724.39	17.55		
beta	E	2032-08-16T02:54:27.466		21.60	-21.43	45662.87	17.89		
eta	E	2032-08-16T02:55:50.906		21.85	-21.25	47176.12	18.39		
gamma	E	2032-08-16T02:56:15.222		21.92	-21.20	47624.89	18.53		
delta	E	2032-08-16T02:56:51.488		22.03	-21.12	48300.35	18.72		
lambda	E	2032-08-16T02:58:22.547		22.30	-20.92	50026.71	19.19		
epsilon	E	2032-08-16T02:59:12.430		22.45	-20.81	50989.66	19.31		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2032-08-16T02:31:19.020
Event type          : PtRgt
: Uranus occs: topocentric, not geocentric
: Ring occs: geocentric, topocentric
Observer code       : SAAO
Location            : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)      : -32.37953
E. Longitude (deg)  : 20.81070
Altitude (km)       : 1.768
Gaia source ID      : 3424860424241561216
2Mass ID (if available) : 06002436+2336580
ICRS Star Coord at Epoch: 06h 00m 24.37506s +23:36:58.05602s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 13.629
G magnitude          : 16.538
RP magnitude         : 15.624
BP magnitude         : 17.376
DUPflag             : 0
Distance (au)       : 19.631
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : 24.17
Sun-Target sep (deg) : 53.25
Sun-Moon sep (deg)  : 163.82
B (ring opening deg) : 75.29
PA of pole (deg)    : 57.30
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 1.641
C/A sky separation (km) : 23362.9
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	2032-08-16T02:01:19.003	-0.31x	-40.78	50870.91	-21.78			
lambda	I	2032-08-16T02:01:57.728	-0.18x	-40.64	50026.71	-21.75			
delta	I	2032-08-16T02:03:17.524	0.06x	-40.36	48300.35	-21.52			
gamma	I	2032-08-16T02:03:48.675	0.16x	-40.26	47631.57	-21.42			
eta	I	2032-08-16T02:04:09.970	0.23x	-40.18	47176.12	-21.35			
beta	I	2032-08-16T02:05:20.448	0.45x	-39.94	45679.98	-21.11			
alpha	I	2032-08-16T02:06:04.753	0.58x	-39.78	44749.62	-20.95			
4	I	2032-08-16T02:07:51.650	0.91x	-39.41	42532.03	-20.51			
5	I	2032-08-16T02:08:04.276	0.95x	-39.37	42276.75	-20.48			
6	I	2032-08-16T02:08:23.778	1.01x	-39.30	41867.45	-20.35			
Uranus	I	2032-08-16T02:24:46.336	4.02x	-35.86	25196.47			11.85	12.40
Uranus	E	2032-08-16T02:38:29.430	6.48	-32.97	25547.66			2.06	2.16
6	E	2032-08-16T02:55:10.360	9.40	-29.45	41798.38	20.28			
5	E	2032-08-16T02:55:34.067	9.46	-29.36	42282.45	20.41			
4	E	2032-08-16T02:55:50.320	9.51	-29.31	42607.37	20.44			
alpha	E	2032-08-16T02:57:32.342	9.80	-28.95	44716.75	20.87			
beta	E	2032-08-16T02:58:17.253	9.93	-28.79	45658.49	21.03			
eta	E	2032-08-16T02:59:29.050	10.13	-28.54	47176.12	21.26			
gamma	E	2032-08-16T02:59:50.076	10.19	-28.46	47623.87	21.33			
delta	E	2032-08-16T03:00:21.722	10.28	-28.35	48300.35	21.42			
lambda	E	2032-08-16T03:01:41.875	10.51	-28.07	50026.71	21.65			
epsilon	E	2032-08-16T03:02:29.527	10.65	-27.90	51061.26	21.68			