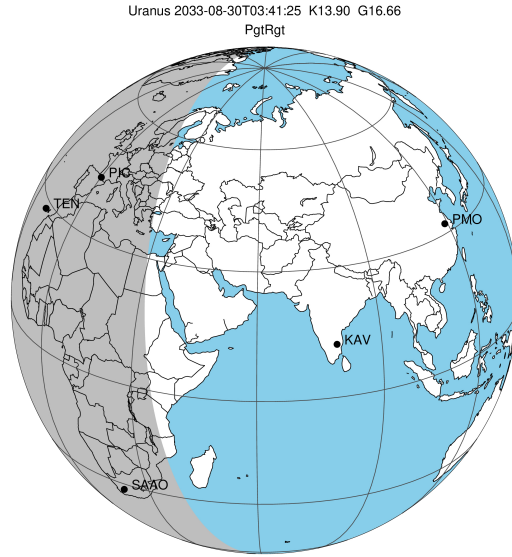


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-08-30T03:41:25.370
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3377487450363302016
 2Mass ID (if available) : 06211341+2335025

ICRS Star Coord at Epoch: 06h 21m 13.42049s +23:35:02.51564s

RUWE (>1.4 is poor) : 1.22
 K magnitude : 13.902
 G magnitude : 16.661
 RP magnitude : 15.806
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 19.431
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.47
 Sun-Target sep (deg) : 61.78
 Sun-Moon sep (deg) : 119.09
 B (ring opening deg) : 71.08
 PA of pole (deg) : 66.87

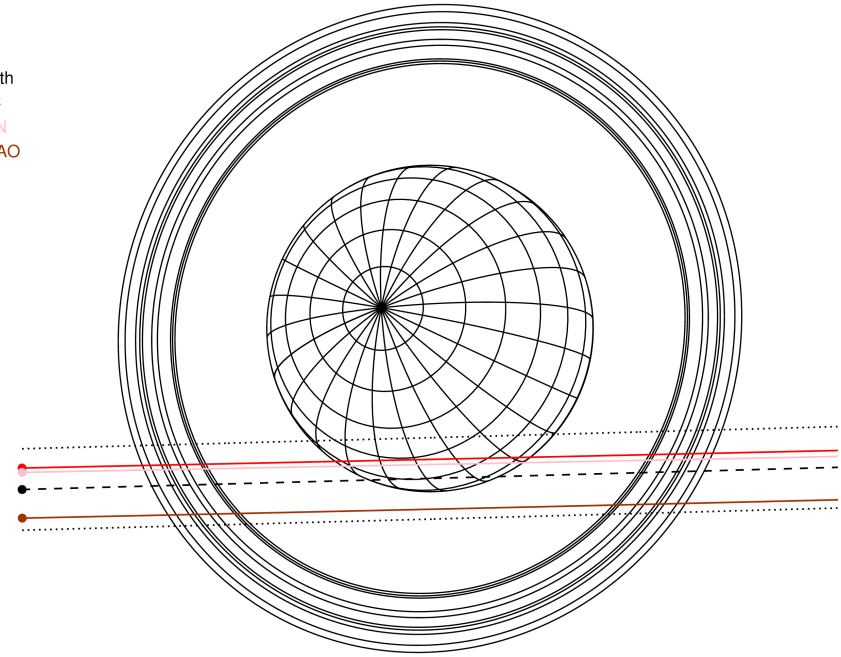
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2033-08-30T03:41:25.3700 α: 06 21 13.4205 δ: +23 35 02.516 C/A 1.661° PA 1.56 deg v_sky +20.47 km/s D 19.43 AU
 Credit: Styled after SORA/Lucky Star

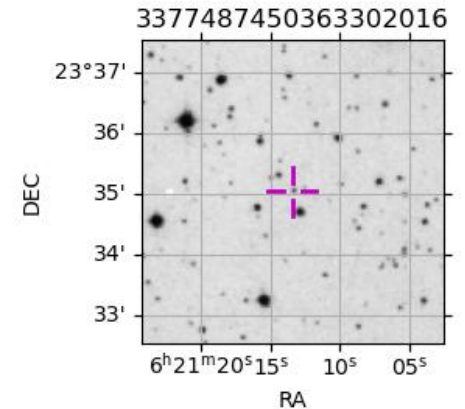
Uranus 2033-08-30T03:41:25 K13.90 G16.66 PgtRgt

Earth
 PIC
 TEN
 SAAO

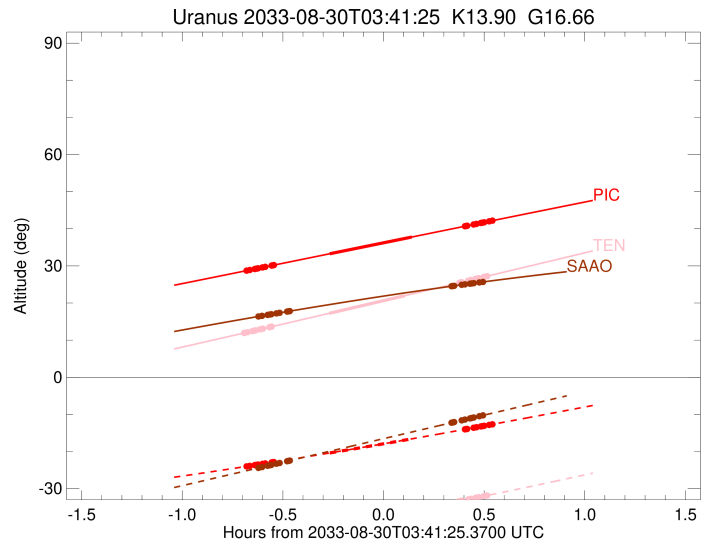
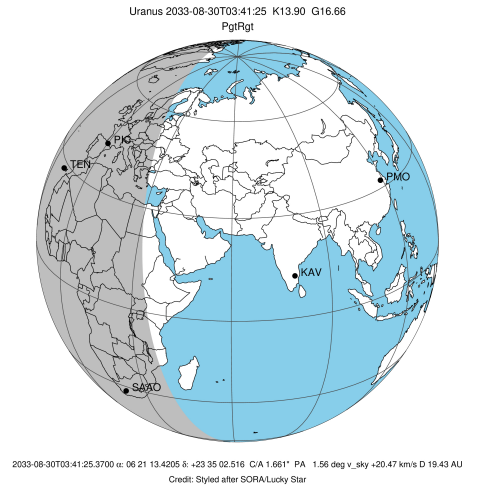


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	AUG 30 03:00 - AUG 30 04:13	PieRie
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	+++++	+ +	+++++	AUG 30 03:00 - AUG 30 04:12	PieRie
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 30 03:04 - AUG 30 04:10	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

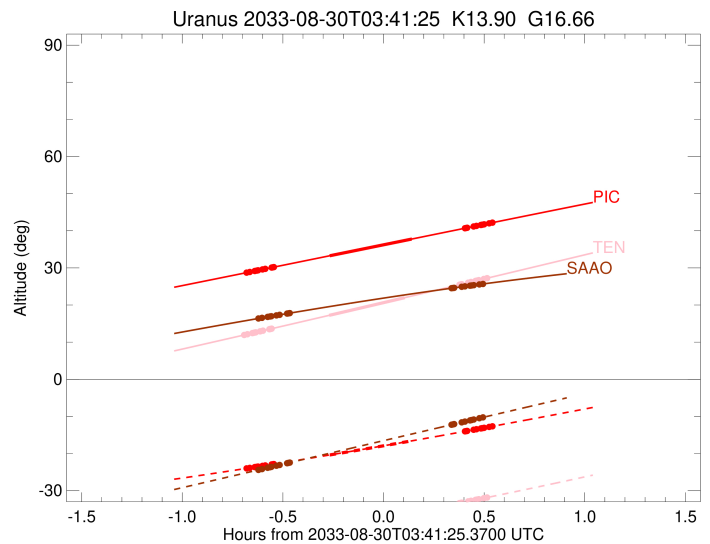
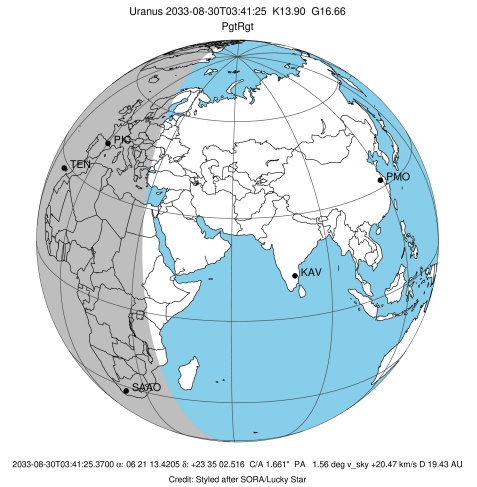


target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-08-30T03:37:52.230
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : PIC
 Location : Pic du Midi
 Latitude (deg) : 42.93656
 E. Longitude (deg) : 0.14231
 Altitude (km) : 2.890
 Gaia source ID : 3377487450363302016
 2Mass ID (if available) : 06211341+2335025
 ICRS Star Coord at Epoch: 06h 21m 13.42049s +23:35:02.51564s
 RUWE (>1.4 is poor) : 1.22
 K magnitude : 13.902
 G magnitude : 16.661
 RP magnitude : 15.806
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 19.431
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.47
 Sun-Target sep (deg) : 61.78
 Sun-Moon sep (deg) : 119.27
 B (ring opening deg) : 71.08
 PA of pole (deg) : 66.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.455
 C/A sky separation (km) : 20499.8
 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	2033-08-30T03:00:47.874		28.76	-23.98	50934.14	-19.43		
lambda	I	2033-08-30T03:01:34.511		28.90	-23.87	50026.71	-19.42		
delta	I	2033-08-30T03:03:03.739		29.17	-23.66	48300.35	-19.27		
gamma	I	2033-08-30T03:03:38.892		29.28	-23.57	47624.00	-19.21		
eta	I	2033-08-30T03:04:02.235		29.35	-23.52	47176.12	-19.16		
beta	I	2033-08-30T03:05:20.712		29.59	-23.33	45678.81	-19.01		
alpha	I	2033-08-30T03:06:09.615		29.74	-23.22	44749.08	-18.91		
4	I	2033-08-30T03:08:04.427		30.09	-22.94	42598.92	-18.64		
5	I	2033-08-30T03:08:28.194		30.16	-22.88	42155.83	-18.57		
6	I	2033-08-30T03:08:43.753		30.21	-22.85	41863.28	-18.52		
Uranus	I	2033-08-30T03:25:22.859		33.27	-20.39	25534.73		3.94	4.13
Uranus	E	2033-08-30T03:49:51.335		37.77	-16.59	25164.61		-16.28	-17.00
6	E	2033-08-30T04:05:40.364		40.68	-14.03	41795.08	18.43		
5	E	2033-08-30T04:06:06.741		40.76	-13.96	42286.85	18.49		
4	E	2033-08-30T04:06:21.999		40.81	-13.92	42587.10	18.56		
alpha	E	2033-08-30T04:08:16.476		41.16	-13.60	44713.10	18.81		
beta	E	2033-08-30T04:09:05.509		41.31	-13.47	45643.02	18.91		
eta	E	2033-08-30T04:10:26.330		41.55	-13.25	47176.12	19.06		
gamma	E	2033-08-30T04:10:49.797		41.63	-13.18	47623.92	19.10		
delta	E	2033-08-30T04:11:25.149		41.73	-13.08	48300.35	19.16		
lambda	E	2033-08-30T04:12:54.889		42.01	-12.84	50026.71	19.31		
epsilon	E	2033-08-30T04:13:46.882		42.17	-12.69	51032.62	19.32		

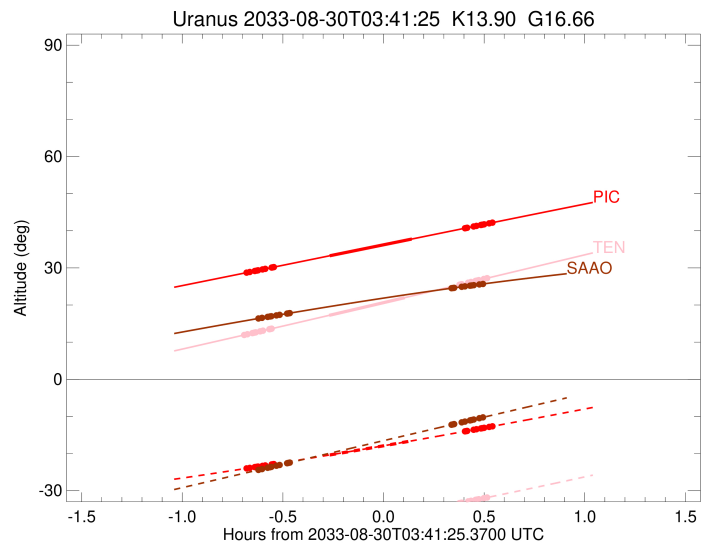
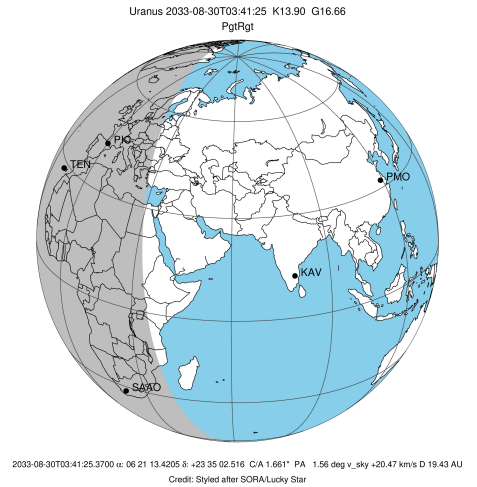
target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-08-30T03:36:43.810
 Event type : PgtRgt
 : Uranus occs: geocentric, topocentric
 : Ring occs: geocentric, topocentric
 Observer code : TEN
 Location : Teide Obs./Tenerife
 Latitude (deg) : 28.30050
 E. Longitude (deg) : 343.48909
 Altitude (km) : 2.395
 Gaia source ID : 3377487450363302016
 2Mass ID (if available) : 06211341+2335025
 ICRS Star Coord at Epoch: 06h 21m 13.42049s +23:35:02.51564s
 RUWE (>1.4 is poor) : 1.22
 K magnitude : 13.902
 G magnitude : 16.661
 RP magnitude : 15.806
 BP magnitude : 17.407
 DUPflag : 0
 Distance (au) : 19.431
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 20.47
 Sun-Target sep (deg) : 61.78
 Sun-Moon sep (deg) : 118.99
 B (ring opening deg) : 71.08
 PA of pole (deg) : 66.87
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.511
 C/A sky separation (km) : 21298.7
 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	2033-08-30T03:00:05.399		11.97	-43.92	50928.85	-19.37		
lambda	I	2033-08-30T03:00:51.914		12.13	-43.81	50026.71	-19.35		
delta	I	2033-08-30T03:02:21.480		12.44	-43.59	48300.35	-19.19		
gamma	I	2033-08-30T03:02:56.790		12.56	-43.51	47623.92	-19.12		
eta	I	2033-08-30T03:03:20.237		12.64	-43.45	47176.12	-19.07		
beta	I	2033-08-30T03:04:39.126		12.92	-43.26	45678.64	-18.90		
alpha	I	2033-08-30T03:05:28.298		13.09	-43.14	44749.35	-18.79		
4	I	2033-08-30T03:07:23.866		13.49	-42.85	42599.63	-18.50		
5	I	2033-08-30T03:07:47.858		13.57	-42.79	42156.10	-18.43		
6	I	2033-08-30T03:08:03.603		13.63	-42.75	41862.59	-18.36		
Uranus	I	2033-08-30T03:25:12.477		17.21	-40.08	25544.98		2.99	3.14
Uranus	E	2033-08-30T03:47:43.966		21.98	-36.29	25191.21		-15.69	-16.39
6	E	2033-08-30T04:04:02.093		25.46	-33.38	41795.22	18.26		
5	E	2033-08-30T04:04:28.633		25.55	-33.30	42285.36	18.32		
4	E	2033-08-30T04:04:44.155		25.61	-33.25	42588.11	18.39		
alpha	E	2033-08-30T04:06:39.541		26.02	-32.90	44713.85	18.67		
beta	E	2033-08-30T04:07:28.896		26.19	-32.75	45643.21	18.78		
eta	E	2033-08-30T04:08:50.229		26.49	-32.50	47176.12	18.95		
gamma	E	2033-08-30T04:09:13.831		26.57	-32.43	47623.82	18.99		
delta	E	2033-08-30T04:09:49.390		26.70	-32.32	48300.35	19.06		
lambda	E	2033-08-30T04:11:19.595		27.02	-32.04	50026.71	19.22		
epsilon	E	2033-08-30T04:12:11.440		27.21	-31.88	51025.10	19.23		

```

target                : Uranus
target radius (km)    : 25559.00
C/A epoch              : 2033-08-30T03:38:30.650
Event type             : PgtRgt
: Uranus occs: geocentric, topocentric
: 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        : 3377487450363302016
2Mass ID (if available) : 06211341+2335025
ICRS Star Coord at Epoch: 06h 21m 13.42049s +23:35:02.51564s
RUWE (>1.4 is poor)  : 1.22
K magnitude           : 13.902
G magnitude           : 16.661
RP magnitude          : 15.806
BP magnitude          : 17.407
DUPflag              : 0
Distance (au)         : 19.431
f0 (km)               : 0.000
g0 (km)               : 0.000
skyplane vel. (km/s)  : 20.47
Sun-Target sep (deg)  : 61.78
Sun-Moon sep (deg)    : 119.14
B (ring opening deg)  : 71.08
PA of pole (deg)      : 66.87
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.008
C/A sky separation (km) : 28303.3
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_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	2033-08-30T03:04:24.644		16.42	-24.36	50876.69	-17.45		
lambda	I	2033-08-30T03:05:13.345		16.55	-24.19	50026.71	-17.38		
delta	I	2033-08-30T03:06:53.548		16.81	-23.84	48300.35	-17.07		
gamma	I	2033-08-30T03:07:33.375		16.91	-23.70	47623.11	-16.94		
eta	I	2033-08-30T03:07:59.838		16.98	-23.61	47176.12	-16.85		
beta	I	2033-08-30T03:09:29.757		17.21	-23.29	45676.48	-16.51		
alpha	I	2033-08-30T03:10:26.057		17.35	-23.09	44751.49	-16.29		
4	I	2033-08-30T03:12:40.292		17.69	-22.62	42606.34	-15.71		
5	I	2033-08-30T03:13:08.876		17.77	-22.52	42160.85	-15.57		
6	I	2033-08-30T03:13:28.457		17.82	-22.45	41854.74	-15.44		

No planet occultations

6	E	2033-08-30T04:01:39.408		24.52	-12.26	41797.45	15.39		
5	E	2033-08-30T04:02:09.856		24.59	-12.15	42271.53	15.51		
4	E	2033-08-30T04:02:29.517		24.63	-12.08	42596.24	15.65		
alpha	E	2033-08-30T04:04:43.509		24.90	-11.61	44720.22	16.22		
beta	E	2033-08-30T04:05:39.863		25.02	-11.41	45645.16	16.44		
eta	E	2033-08-30T04:07:12.119		25.21	-11.08	47176.12	16.77		
gamma	E	2033-08-30T04:07:38.695		25.26	-10.99	47623.05	16.86		
delta	E	2033-08-30T04:08:18.706		25.34	-10.85	48300.35	16.99		
lambda	E	2033-08-30T04:09:59.377		25.54	-10.50	50026.71	17.30		
epsilon	E	2033-08-30T04:10:53.458		25.65	-10.30	50966.38	17.37		