

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2033-08-30T01:31:55.610  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3377487446064739456  
 2Mass ID (if available) : 06211261+2335054

ICRS Star Coord at Epoch: 06h 21m 12.60419s +23:35:05.36179s

RUWE (>1.4 is poor) : 0.88  
 K magnitude : 14.916  
 G magnitude : 18.090  
 RP magnitude : 17.145  
 BP magnitude : 19.066  
 DUPflag : 0  
 Distance (au) : 19.432  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.51  
 Sun-Target sep (deg) : 61.69  
 Sun-Moon sep (deg) : 118.04  
 B (ring opening deg) : 71.08  
 PA of pole (deg) : 66.87

# a(km) ring

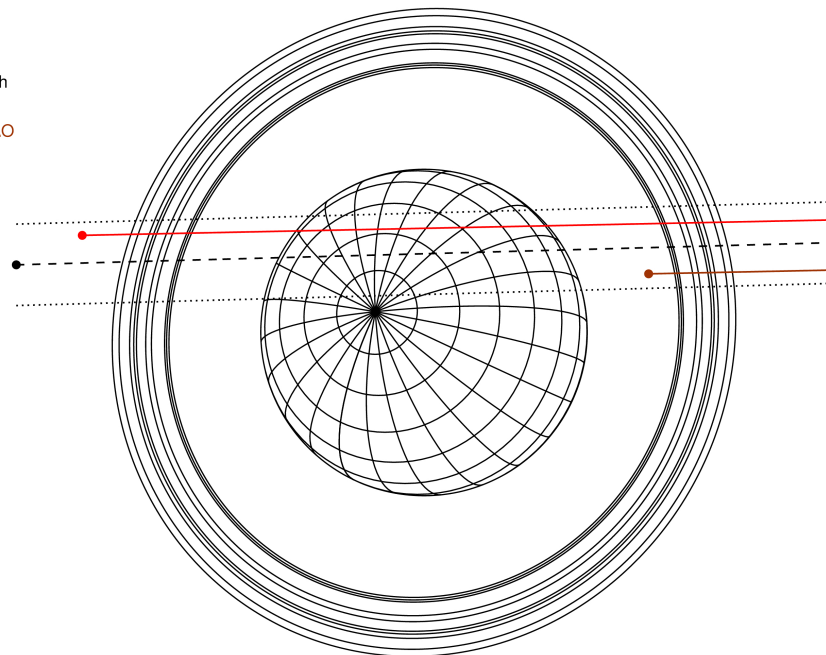
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon



2033-08-30T01:31:55.6100 ex: 06 21 12.6042 s: +23 35 05.362 C/A 0.879° PA 181.56 deg v\_sky +20.51 km/s D 19.43 AU  
 Credit: Styled after SORA/Lucky Star

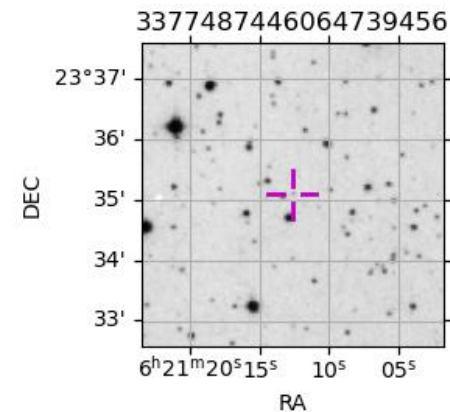
Uranus 2033-08-30T01:31:55 K14.92 G18.09 PgtRgt

Earth  
 PIC  
 SAAO

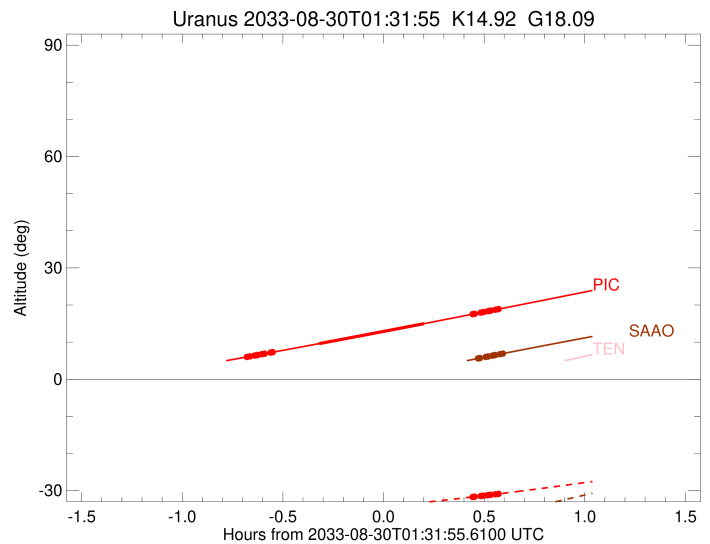
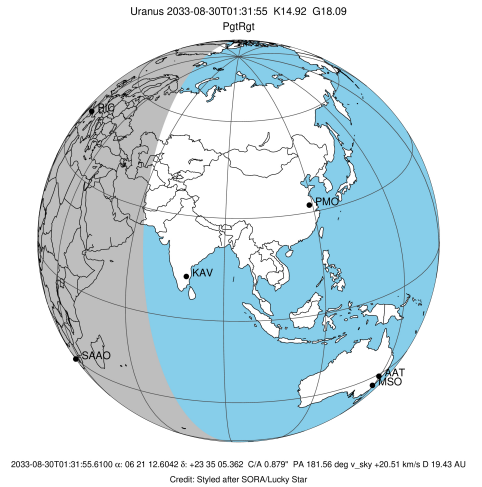


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++	+ +	+++++	AUG 30 00:51 - AUG 30 02:06	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					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 30 02:00 - AUG 30 02:07	PnnRne
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn

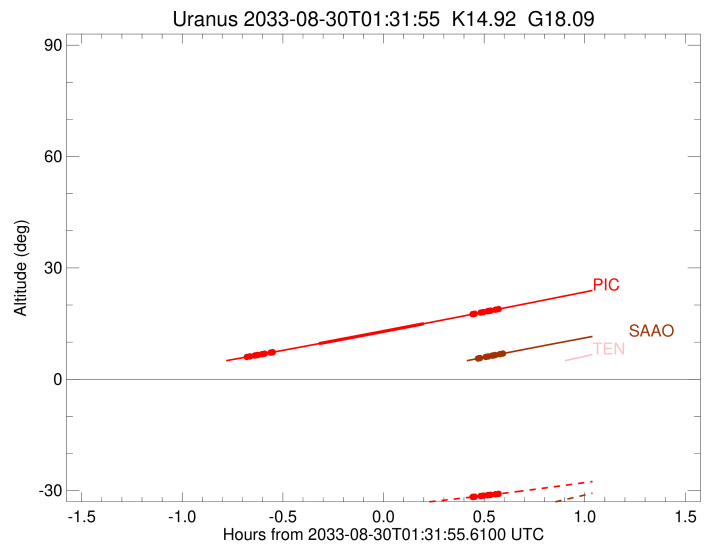
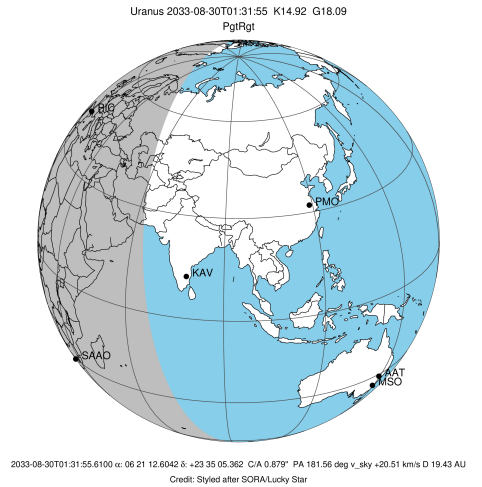


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2033-08-30T01:28:07.560  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : PIC  
 Location : Pic du Midi  
 Latitude (deg) : 42.93656  
 E. Longitude (deg) : 0.14231  
 Altitude (km) : 2.890  
 Gaia source ID : 3377487446064739456  
 2Mass ID (if available) : 06211261+2335054  
 ICRS Star Coord at Epoch: 06h 21m 12.60419s +23:35:05.36179s  
 RUWE (>1.4 is poor) : 0.88  
 K magnitude : 14.916  
 G magnitude : 18.090  
 RP magnitude : 17.145  
 BP magnitude : 19.066  
 DUPflag : 0  
 Distance (au) : 19.432  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.51  
 Sun-Target sep (deg) : 61.69  
 Sun-Moon sep (deg) : 117.90  
 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 (") : 1.157  
 C/A sky separation (km) : 16311.4  
 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	2033-08-30T00:51:08.904		6.01	-37.02	51223.65	-20.48		
lambda	I	2033-08-30T00:52:07.578		6.17	-36.97	50026.71	-20.37		
delta	I	2033-08-30T00:53:32.520		6.40	-36.90	48300.35	-20.28		
gamma	I	2033-08-30T00:54:05.704		6.49	-36.87	47628.13	-20.24		
eta	I	2033-08-30T00:54:28.054		6.55	-36.85	47176.12	-20.21		
beta	I	2033-08-30T00:55:42.319		6.76	-36.78	45680.08	-20.11		
alpha	I	2033-08-30T00:56:29.484		6.89	-36.74	44727.48	-20.04		
4	I	2033-08-30T00:58:18.643		7.19	-36.64	42560.28	-19.87		
5	I	2033-08-30T00:58:37.131		7.24	-36.62	42176.38	-19.86		
6	I	2033-08-30T00:58:51.827		7.28	-36.61	41879.74	-19.82		
Uranus	I	2033-08-30T01:12:40.702		9.60	-35.73	25075.18		18.13	18.93
Uranus	E	2033-08-30T01:44:00.036		14.98	-33.16	25456.95		-8.12	-8.50
6	E	2033-08-30T01:58:27.567		17.52	-31.71	41807.62	19.71		
5	E	2033-08-30T01:58:53.055		17.60	-31.67	42315.16	19.75		
4	E	2033-08-30T01:59:04.677		17.63	-31.65	42547.55	19.77		
alpha	E	2033-08-30T02:00:52.878		17.95	-31.45	44689.61	19.93		
beta	E	2033-08-30T02:01:40.447		18.09	-31.37	45642.61	20.00		
eta	E	2033-08-30T02:02:56.991		18.32	-31.23	47176.12	20.09		
gamma	E	2033-08-30T02:03:19.471		18.38	-31.19	47628.07	20.12		
delta	E	2033-08-30T02:03:52.859		18.48	-31.13	48300.35	20.15		
lambda	E	2033-08-30T02:05:18.327		18.74	-30.98	50026.71	20.24		
epsilon	E	2033-08-30T02:06:22.482		18.93	-30.86	51327.26	20.35		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2033-08-30T01:27:50.870  
 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 : 3377487446064739456  
 2Mass ID (if available) : 06211261+2335054  
 ICRS Star Coord at Epoch: 06h 21m 12.60419s +23:35:05.36179s  
 RUWE (>1.4 is poor) : 0.88  
 K magnitude : 14.916  
 G magnitude : 18.090  
 RP magnitude : 17.145  
 BP magnitude : 19.066  
 DUPflag : 0  
 Distance (au) : 19.432  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.51  
 Sun-Target sep (deg) : 61.69  
 Sun-Moon sep (deg) : 117.70  
 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 (") : 0.602  
 C/A sky separation (km) : 8478.5  
 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\_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	2033-08-30T00:48:52.607	-7.77x	-51.72	51159.72	-21.17			
lambda	I	2033-08-30T00:49:46.214	-7.60x	-51.55	50026.71	-21.13			
delta	I	2033-08-30T00:51:07.975	-7.33x	-51.30	48300.35	-21.10			
gamma	I	2033-08-30T00:51:39.882	-7.23x	-51.21	47627.25	-21.09			
eta	I	2033-08-30T00:52:01.277	-7.16x	-51.14	47176.12	-21.08			
beta	I	2033-08-30T00:53:12.304	-6.93x	-50.92	45680.97	-21.06			
alpha	I	2033-08-30T00:53:57.076	-6.78x	-50.78	44733.31	-21.03			
4	I	2033-08-30T00:55:40.631	-6.45x	-50.46	42568.97	-20.99			
5	I	2033-08-30T00:55:59.125	-6.39x	-50.40	42166.86	-20.98			
6	I	2033-08-30T00:56:12.573	-6.35x	-50.36	41878.97	-20.97			
Uranus	I	2033-08-30T01:08:37.034	-3.95x	-48.01	25038.32			18.86	19.68
Uranus	E	2033-08-30T01:47:19.585	3.29x	-40.37	25282.78			-13.51	-14.13
6	E	2033-08-30T02:00:04.458	5.60	-37.78	41802.18	20.84			
5	E	2033-08-30T02:00:28.760	5.67	-37.69	42314.35	20.86			
4	E	2033-08-30T02:00:40.023	5.70	-37.65	42555.50	20.86			
alpha	E	2033-08-30T02:02:22.823	6.01	-37.30	44693.36	20.90			
beta	E	2033-08-30T02:03:07.975	6.14	-37.15	45641.52	20.92			
eta	E	2033-08-30T02:04:21.360	6.36	-36.90	47176.12	20.94			
gamma	E	2033-08-30T02:04:42.901	6.42	-36.82	47627.18	20.94			
delta	E	2033-08-30T02:05:15.037	6.52	-36.71	48300.35	20.95			
lambda	E	2033-08-30T02:06:37.391	6.76	-36.43	50026.71	20.97			
epsilon	E	2033-08-30T02:07:36.509	6.94	-36.23	51266.99	21.01			