

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2032-08-22T06:08:28.270  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3424670758484889856  
 2Mass ID (if available) : 06012685+2337016

ICRS Star Coord at Epoch: 06h 01m 26.85951s +23:37:01.42416s

RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.348  
 G magnitude : 17.065  
 RP magnitude : 16.220  
 BP magnitude : 17.812  
 DUPflag : 0  
 Distance (au) : 19.544  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 21.73  
 Sun-Target sep (deg) : 58.93  
 Sun-Moon sep (deg) : 104.12  
 B (ring opening deg) : 75.09  
 PA of pole (deg) : 57.88

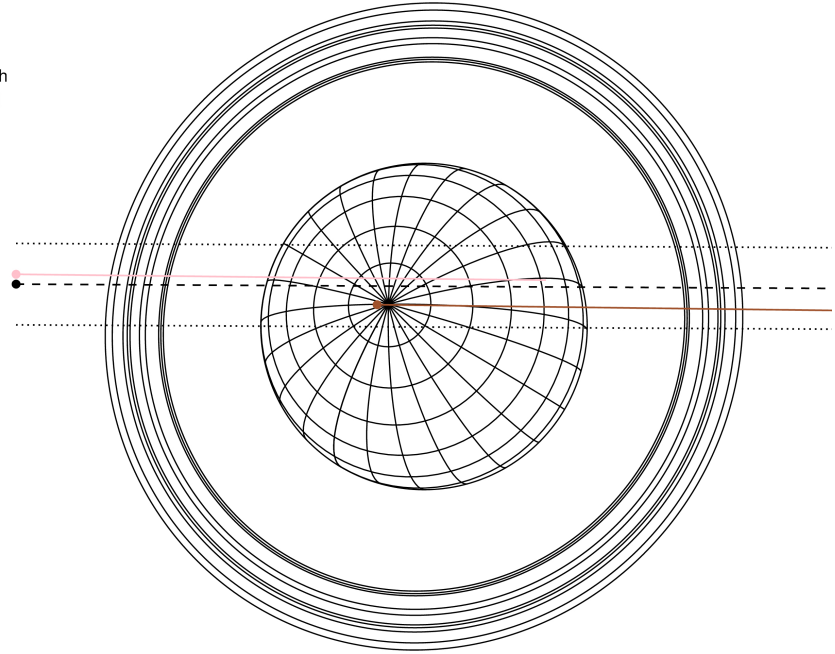
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon



2032-08-22T06:08:28.2700 ex: 06 01 26.8595 s: +23 37 01.424 C/A 0.449° PA 179.70 deg v\_sky +21.73 km/s D 19.54 AU  
 Credit: Styled after SORA/Lucky Star

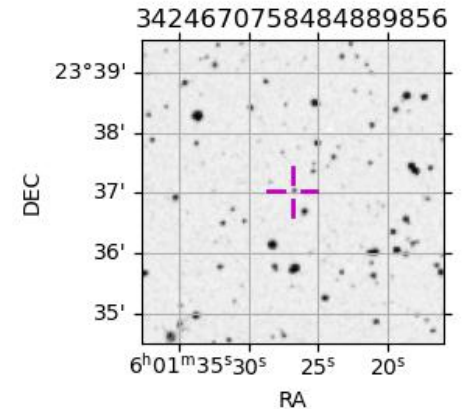
Uranus 2032-08-22T06:08:28 K14.35 G17.07 PgtRgt

Earth  
 TEN  
 RIO



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

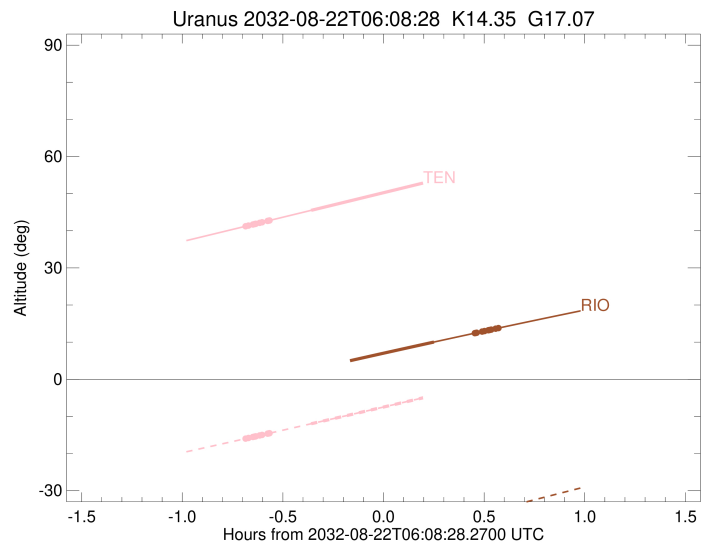
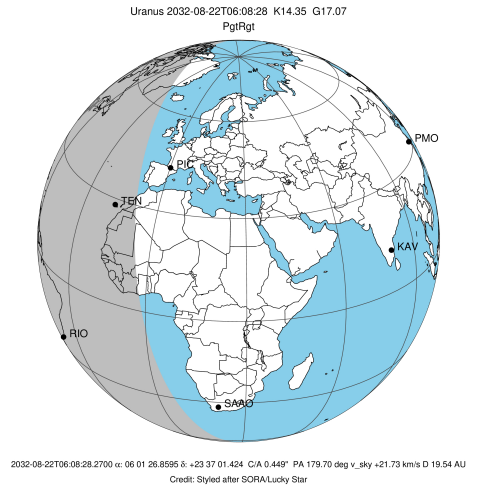
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1					PnnRnn
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4					PnnRnn
MCD	McDonald Obs. 2.7m	30.7	256.0					PnnRnn
TEN	Teide Obs./Tenerife	28.3	343.5	+++++	+		AUG 22 05:27 - AUG 22 05:46	PinRin
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		+	+++++	AUG 22 06:23 - AUG 22 06:42	PneRne
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					PnnRnn
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



3424670758484889856

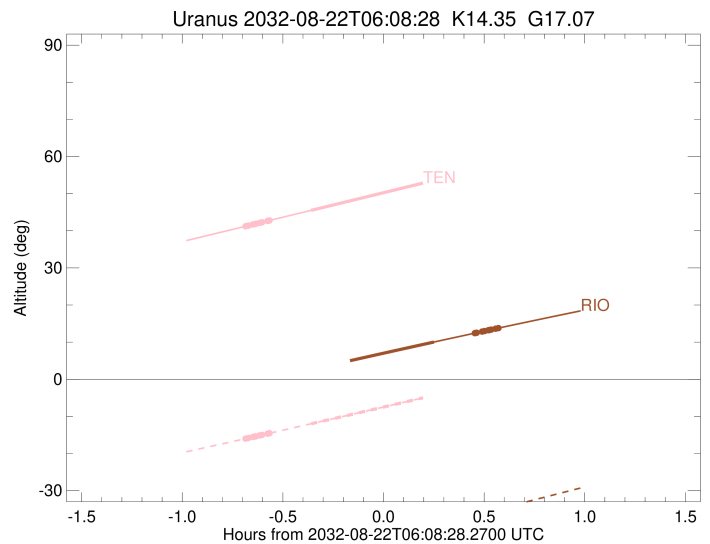
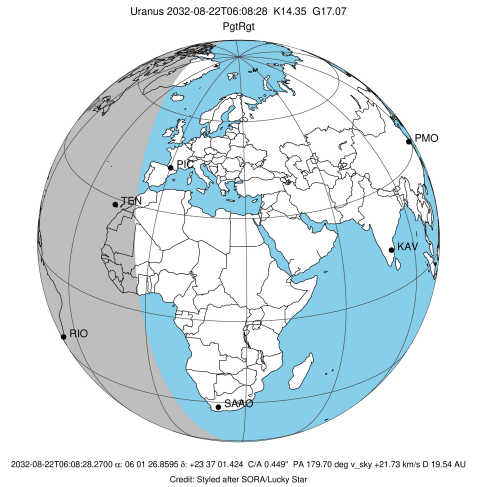
23°39'  
 38'  
 37'  
 36'  
 35'  
 6<sup>h</sup>01<sup>m</sup>35<sup>s</sup>30<sup>s</sup> 25<sup>s</sup> 20<sup>s</sup>  
 RA

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2032-08-22T06:05:27.690  
 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 : 3424670758484889856  
 2Mass ID (if available) : 06012685+2337016  
 ICRS Star Coord at Epoch: 06h 01m 26.85951s +23:37:01.42416s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.348  
 G magnitude : 17.065  
 RP magnitude : 16.220  
 BP magnitude : 17.812  
 DUPflag : 0  
 Distance (au) : 19.544  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 21.73  
 Sun-Target sep (deg) : 58.93  
 Sun-Moon sep (deg) : 105.04  
 B (ring opening deg) : 75.09  
 PA of pole (deg) : 57.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.527  
 C/A sky separation (km) : 7463.1  
 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	2032-08-22T05:27:31.790		41.25	-15.95	50930.28	-21.79		
lambda	I	2032-08-22T05:28:13.233		41.40	-15.81	50026.71	-21.80		
delta	I	2032-08-22T05:29:32.471		41.69	-15.54	48300.35	-21.78		
gamma	I	2032-08-22T05:30:03.196		41.81	-15.44	47631.43	-21.77		
eta	I	2032-08-22T05:30:24.116		41.88	-15.37	47176.12	-21.76		
beta	I	2032-08-22T05:31:33.001		42.13	-15.14	45678.65	-21.74		
alpha	I	2032-08-22T05:32:15.818		42.29	-14.99	44747.24	-21.73		
4	I	2032-08-22T05:33:57.841		42.66	-14.64	42529.41	-21.69		
5	I	2032-08-22T05:34:10.469		42.71	-14.60	42267.83	-21.69		
6	I	2032-08-22T05:34:28.379		42.78	-14.54	41870.84	-21.67		
Uranus	I	2032-08-22T05:46:53.765		45.50	-11.98	25043.96		14.45	15.10
Uranus	E	2032-08-22T06:24:16.429		53.74	-4.14x	25316.13		-9.79	-10.24
6	E	2032-08-22T06:36:48.575		56.51	-1.47x	41796.62	21.58		
5	E	2032-08-22T06:37:08.419		56.59	-1.40x	42229.63	21.59		
4	E	2032-08-22T06:37:26.901		56.65	-1.34x	42616.53	21.59		
alpha	E	2032-08-22T06:39:03.080		57.01	-0.99x	44697.38	21.62		
beta	E	2032-08-22T06:39:46.952		57.17	-0.84x	45647.78	21.63		
eta	E	2032-08-22T06:40:57.612		57.43	-0.58x	47176.12	21.65		
gamma	E	2032-08-22T06:41:18.194		57.51	-0.51x	47621.76	21.65		
delta	E	2032-08-22T06:41:49.526		57.62	-0.40x	48300.35	21.66		
lambda	E	2032-08-22T06:43:09.191		57.91	-0.11x	50026.71	21.68		
epsilon	E	2032-08-22T06:44:05.783		58.12	0.09x	51253.86	21.66		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2032-08-22T06:04:12.060  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : RIO  
 Location : Rio de Janeiro  
 Latitude (deg) : -22.89506  
 E. Longitude (deg) : 316.77708  
 Altitude (km) : 0.033  
 Gaia source ID : 3424670758484889856  
 2Mass ID (if available) : 06012685+2337016  
 ICRS Star Coord at Epoch: 06h 01m 26.85951s +23:37:01.42416s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.348  
 G magnitude : 17.065  
 RP magnitude : 16.220  
 BP magnitude : 17.812  
 DUPflag : 0  
 Distance (au) : 19.544  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 21.73  
 Sun-Target sep (deg) : 58.93  
 Sun-Moon sep (deg) : 104.45  
 B (ring opening deg) : 75.09  
 PA of pole (deg) : 57.88  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.234  
 C/A sky separation (km) : 3317.1  
 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



b: ring blocked by planet x: target alt < 5.0 deg or sun > -5.0 deg

Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2032-08-22T05:26:06.477	-1.70x	-52.50	50958.50	-22.17			
lambda	I	2032-08-22T05:26:48.485	-1.55x	-52.34	50026.71	-22.18			
delta	I	2032-08-22T05:28:06.335	-1.28x	-52.05	48300.35	-22.17			
gamma	I	2032-08-22T05:28:36.512	-1.17x	-51.94	47631.30	-22.17			
eta	I	2032-08-22T05:28:57.045	-1.10x	-51.86	47176.12	-22.17			
beta	I	2032-08-22T05:30:04.689	-0.87x	-51.60	45677.68	-22.16			
alpha	I	2032-08-22T05:30:46.708	-0.72x	-51.44	44745.45	-22.16			
4	I	2032-08-22T05:32:26.672	-0.37x	-51.07	42527.92	-22.14			
5	I	2032-08-22T05:32:39.317	-0.33x	-51.02	42260.50	-22.15			
6	I	2032-08-22T05:32:56.457	-0.27x	-50.95	41873.25	-22.14			
Uranus	I	2032-08-22T05:45:01.527	2.24x	-48.20	25098.78	13.62	14.24		
Uranus	E	2032-08-22T06:23:30.587	10.03	-39.37	25224.07	-11.54	-12.08		
6	E	2032-08-22T06:35:39.101	12.41	-36.58	41798.11	22.01			
5	E	2032-08-22T06:35:58.067	12.47	-36.50	42221.49	22.02			
4	E	2032-08-22T06:36:16.566	12.53	-36.43	42616.11	22.01			
alpha	E	2032-08-22T06:37:50.862	12.84	-36.07	44694.92	22.01			
beta	E	2032-08-22T06:38:34.015	12.98	-35.90	45646.42	22.02			
eta	E	2032-08-22T06:39:43.533	13.21	-35.64	47176.12	22.02			
gamma	E	2032-08-22T06:40:03.762	13.27	-35.56	47621.52	22.02			
delta	E	2032-08-22T06:40:34.593	13.37	-35.44	48300.35	22.02			
lambda	E	2032-08-22T06:41:52.996	13.62	-35.14	50026.71	22.02			
epsilon	E	2032-08-22T06:42:50.215	13.81	-34.92	51286.68	22.01			