

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-04-23T00:54:33.850  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3379588445283912320  
 2Mass ID (if available) : 06480780+2321246

Uranus 2036-04-23T00:54:33 K13.22 G14.57 PgtRgt

ICRS Star Coord at Epoch: 06h 48m 07.81074s +23:21:24.24798s

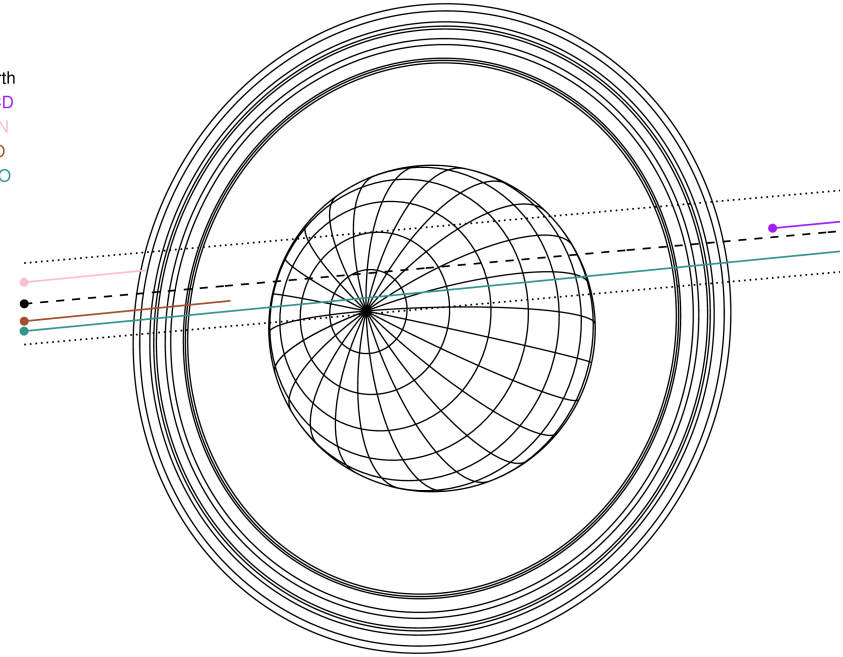
RUWE (>1.4 is poor) : 0.96  
 K magnitude : 13.223  
 G magnitude : 14.571  
 RP magnitude : 14.068  
 BP magnitude : 14.908  
 DUPflag : 0  
 Distance (au) : 19.160  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 17.55  
 Sun-Target sep (deg) : 68.07  
 Sun-Moon sep (deg) : 108.82  
 B (ring opening deg) : 65.31  
 PA of pole (deg) : 75.12

#	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



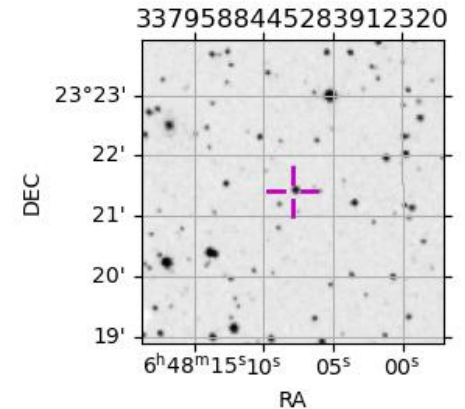
2036-04-23T00:54:33.8500 ex: 06 48 07.8107 s: +23 21 24.248 C/A 0.693° PA 185.09 deg v\_sky +17.55 km/s D 19.16 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 MCD  
 TEN  
 RIO  
 ESO

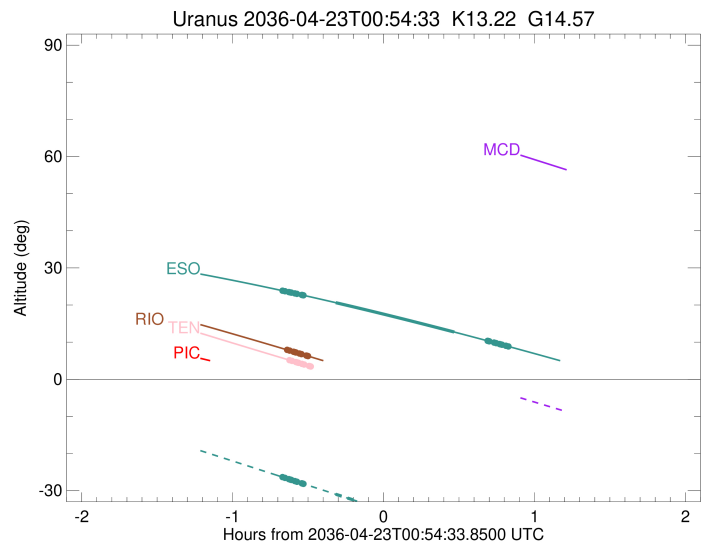
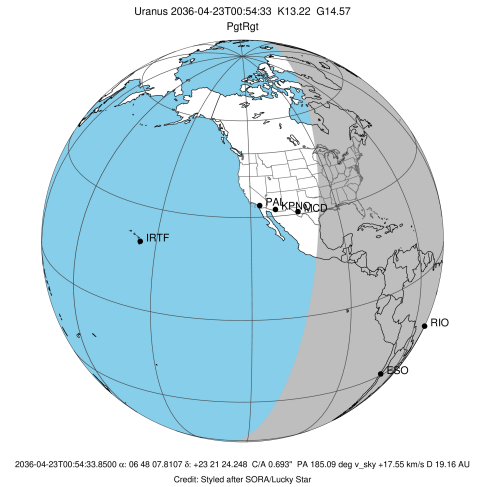


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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					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	+			APR 23 00:17 - APR 23 00:17	PnnRin
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	+++++			APR 23 00:16 - APR 23 00:24	PnnRin
ESO	European Southern Obs	-29.3	289.3	+++++	+ +	+++++	APR 23 00:14 - APR 23 01:44	PieRie
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

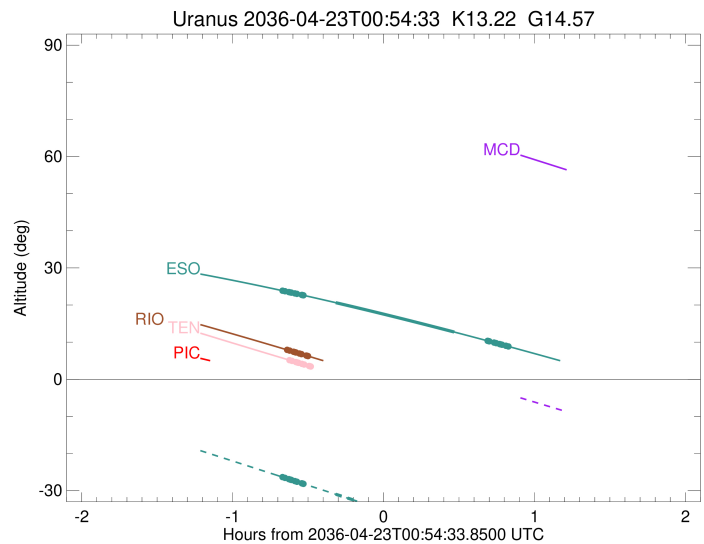
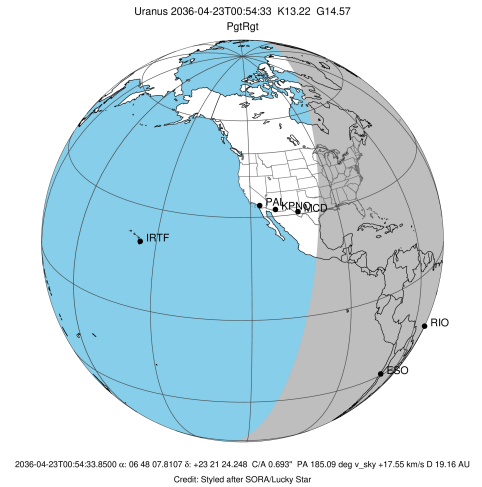


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-04-23T00:59:14.040  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 3379588445283912320  
 2Mass ID (if available) : 06480780+2321246  
 ICRS Star Coord at Epoch: 06h 48m 07.81074s +23:21:24.24798s  
 RUWE (>1.4 is poor) : 0.96  
 K magnitude : 13.223  
 G magnitude : 14.571  
 RP magnitude : 14.068  
 BP magnitude : 14.908  
 DUPflag : 0  
 Distance (au) : 19.160  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 17.55  
 Sun-Target sep (deg) : 68.07  
 Sun-Moon sep (deg) : 108.54  
 B (ring opening deg) : 65.31  
 PA of pole (deg) : 75.12  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.966  
 C/A sky separation (km) : 13419.9  
 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\_itr93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



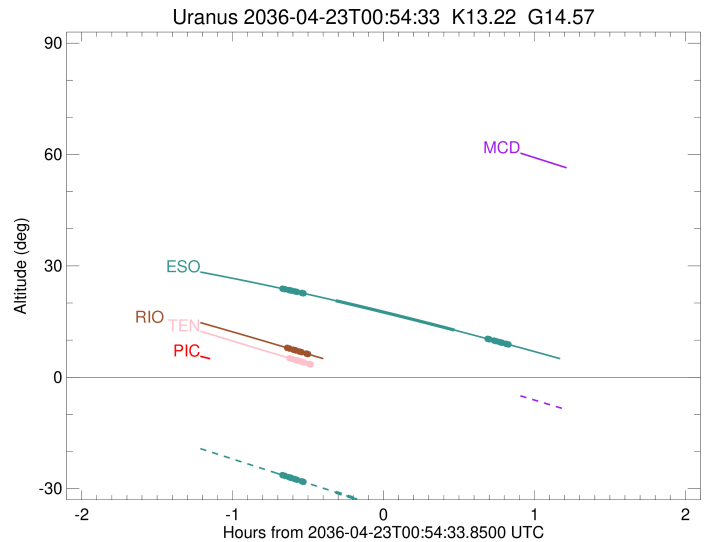
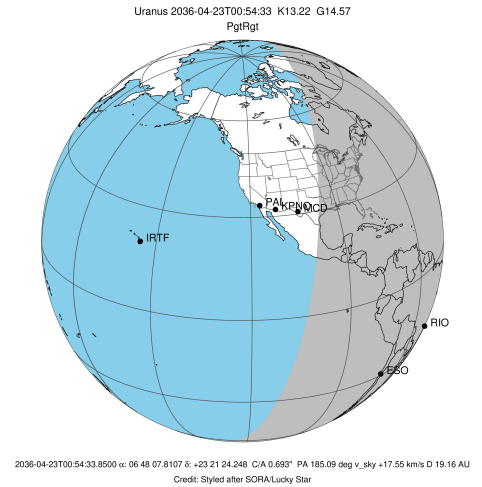
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2036-04-23T00:17:31.776		5.08	-47.67	50782.26	-18.44		
lambda	I	2036-04-23T00:18:12.730		4.94x	-47.72	50026.71	-18.44		
delta	I	2036-04-23T00:19:46.483		4.63x	-47.81	48300.35	-18.39		
gamma	I	2036-04-23T00:20:23.452		4.50x	-47.85	47620.96	-18.37		
eta	I	2036-04-23T00:20:47.682		4.42x	-47.88	47176.12	-18.35		
beta	I	2036-04-23T00:22:11.357		4.14x	-47.96	45641.07	-18.30		
alpha	I	2036-04-23T00:23:00.011		3.98x	-48.01	44749.90	-18.26		
4	I	2036-04-23T00:25:00.400		3.57x	-48.12	42570.80	-18.17		
5	I	2036-04-23T00:25:17.948		3.51x	-48.13	42249.70	-18.17		
6	I	2036-04-23T00:25:43.287		3.43x	-48.16	41802.25	-18.14		
Uranus	I	2036-04-23T00:39:13.528		0.73x	-48.76	25096.11		24.12	25.12
Uranus	E	2036-04-23T01:19:30.465		-7.08x	-49.03	25375.58		-14.78	-15.45
6	E	2036-04-23T01:34:08.372		-9.81x	-48.56	41850.14	18.28		
5	E	2036-04-23T01:34:31.376		-9.88x	-48.54	42270.90	18.32		
4	E	2036-04-23T01:34:46.630		-9.93x	-48.53	42544.25	18.31		
alpha	E	2036-04-23T01:36:43.857		-10.29x	-48.44	44685.47	18.42		
beta	E	2036-04-23T01:37:37.497		-10.45x	-48.40	45677.27	18.46		
eta	E	2036-04-23T01:38:58.489		-10.70x	-48.34	47176.12	18.52		
gamma	E	2036-04-23T01:39:23.025		-10.78x	-48.32	47630.66	18.53		
delta	E	2036-04-23T01:39:59.135		-10.89x	-48.29	48300.35	18.56		
lambda	E	2036-04-23T01:41:32.016		-11.17x	-48.21	50026.71	18.62		
epsilon	E	2036-04-23T01:42:44.283		-11.39x	-48.14	51373.47	18.62		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-04-23T01:00:12.890  
 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 : 3379588445283912320  
 2Mass ID (if available) : 06480780+2321246  
 ICRS Star Coord at Epoch: 06h 48m 07.81074s +23:21:24.24798s  
 RUWE (>1.4 is poor) : 0.96  
 K magnitude : 13.223  
 G magnitude : 14.571  
 RP magnitude : 14.068  
 BP magnitude : 14.908  
 DUPflag : 0  
 Distance (au) : 19.160  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 17.55  
 Sun-Target sep (deg) : 68.07  
 Sun-Moon sep (deg) : 108.55  
 B (ring opening deg) : 65.31  
 PA of pole (deg) : 75.12  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.535  
 C/A sky separation (km) : 7428.4  
 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	2036-04-23T00:16:34.165		7.86	-51.95	50806.18	-18.72		
lambda	I	2036-04-23T00:17:15.776		7.72	-52.11	50026.71	-18.73		
delta	I	2036-04-23T00:18:47.978		7.41	-52.46	48300.35	-18.72		
gamma	I	2036-04-23T00:19:24.279		7.29	-52.60	47621.02	-18.71		
eta	I	2036-04-23T00:19:48.058		7.21	-52.69	47176.12	-18.71		
beta	I	2036-04-23T00:21:10.034		6.93	-53.00	45641.36	-18.69		
alpha	I	2036-04-23T00:21:57.535		6.77	-53.18	44751.39	-18.68		
4	I	2036-04-23T00:23:54.739		6.38	-53.62	42577.52	-18.66		
5	I	2036-04-23T00:24:12.943		6.32	-53.69	42237.78	-18.67		
6	I	2036-04-23T00:24:36.595		6.24	-53.78	41806.28	-18.66		
Uranus	I	2036-04-23T00:37:22.193	3.63x	-56.67	25077.76			24.64	25.66
Uranus	E	2036-04-23T01:23:10.159	-5.97x	-66.79	25253.03			-19.31	-20.15
6	E	2036-04-23T01:36:32.163	-8.83x	-69.60	41855.97	18.82			
5	E	2036-04-23T01:36:53.767	-8.91x	-69.68	42260.06	18.84			
4	E	2036-04-23T01:37:09.406	-8.96x	-69.73	42549.80	18.83			
alpha	E	2036-04-23T01:39:03.384	-9.37x	-70.12	44684.74	18.86			
beta	E	2036-04-23T01:39:55.906	-9.56x	-70.30	45678.74	18.88			
eta	E	2036-04-23T01:41:15.095	-9.85x	-70.57	47176.12	18.90			
gamma	E	2036-04-23T01:41:39.162	-9.93x	-70.65	47631.01	18.90			
delta	E	2036-04-23T01:42:14.562	-10.06x	-70.77	48300.35	18.91			
lambda	E	2036-04-23T01:43:45.795	-10.39x	-71.08	50026.71	18.93			
epsilon	E	2036-04-23T01:44:58.945	-10.65x	-71.32	51412.14	18.93			

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2036-04-23T00:59:05.830  
 Event type : PgtRgt  
 : Uranus occs: geocentric, topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : ESO  
 Location : European Southern Obs. (3.6m)  
 Latitude (deg) : -29.26097  
 E. Longitude (deg) : 289.26831  
 Altitude (km) : 2.400  
 Gaia source ID : 3379588445283912320  
 2Mass ID (if available) : 06480780+2321246  
 ICRS Star Coord at Epoch: 06h 48m 07.81074s +23:21:24.24798s  
 RUWE (>1.4 is poor) : 0.96  
 K magnitude : 13.223  
 G magnitude : 14.571  
 RP magnitude : 14.068  
 BP magnitude : 14.908  
 DUPflag : 0  
 Distance (au) : 19.160  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 17.55  
 Sun-Target sep (deg) : 68.07  
 Sun-Moon sep (deg) : 108.87  
 B (ring opening deg) : 65.31  
 PA of pole (deg) : 75.12  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 0.415  
 C/A sky separation (km) : 5772.1  
 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\_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	2036-04-23T00:14:43.831		23.81	-26.42	50813.19	-18.64		
lambda	I	2036-04-23T00:15:26.010		23.71	-26.57	50026.71	-18.64		
delta	I	2036-04-23T00:16:58.620		23.48	-26.91	48300.35	-18.64		
gamma	I	2036-04-23T00:17:35.071		23.39	-27.04	47621.05	-18.63		
eta	I	2036-04-23T00:17:58.949		23.33	-27.13	47176.12	-18.63		
beta	I	2036-04-23T00:19:21.237		23.13	-27.43	45641.50	-18.62		
alpha	I	2036-04-23T00:20:08.897		23.01	-27.60	44751.68	-18.62		
4	I	2036-04-23T00:22:06.408		22.71	-28.03	42579.24	-18.61		
5	I	2036-04-23T00:22:24.956		22.67	-28.10	42234.67	-18.61		
6	I	2036-04-23T00:22:48.405		22.61	-28.19	41807.44	-18.61		
Uranus	I	2036-04-23T00:35:34.854		20.63	-30.98	25083.47		24.48	25.49
Uranus	E	2036-04-23T01:22:41.598		12.72	-41.22	25221.95		-20.33	-21.21
6	E	2036-04-23T01:35:56.891		10.35	-44.08	41857.53	18.74		
5	E	2036-04-23T01:36:18.381		10.29	-44.15	42256.92	18.75		
4	E	2036-04-23T01:36:34.321		10.24	-44.21	42551.44	18.75		
alpha	E	2036-04-23T01:38:28.775		9.89	-44.62	44684.66	18.77		
beta	E	2036-04-23T01:39:21.600		9.73	-44.81	45679.09	18.78		
eta	E	2036-04-23T01:40:41.212		9.49	-45.09	47176.12	18.79		
gamma	E	2036-04-23T01:41:05.424		9.41	-45.18	47631.09	18.79		
delta	E	2036-04-23T01:41:41.030		9.31	-45.30	48300.35	18.80		
lambda	E	2036-04-23T01:43:12.831		9.03	-45.63	50026.71	18.81		
epsilon	E	2036-04-23T01:44:27.004		8.80	-45.90	51422.43	18.81		