

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-04-21T00:20:37.650  
 Event type : PgRgt  
 : Uranus occs: geocentric, not topocentric  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 3425433716475813376  
 2Mass ID (if available) : 06100342+2341174

ICRS Star Coord at Epoch: 06h 10m 03.43139s +23:41:17.43814s

RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.916  
 G magnitude : 15.806  
 RP magnitude : 15.185  
 BP magnitude : 16.256  
 DUPflag : 0  
 Distance (au) : 19.387  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.47  
 Sun-Target sep (deg) : 61.79  
 Sun-Moon sep (deg) : 30.84  
 B (ring opening deg) : 73.35  
 PA of pole (deg) : 62.02

# a(km) ring

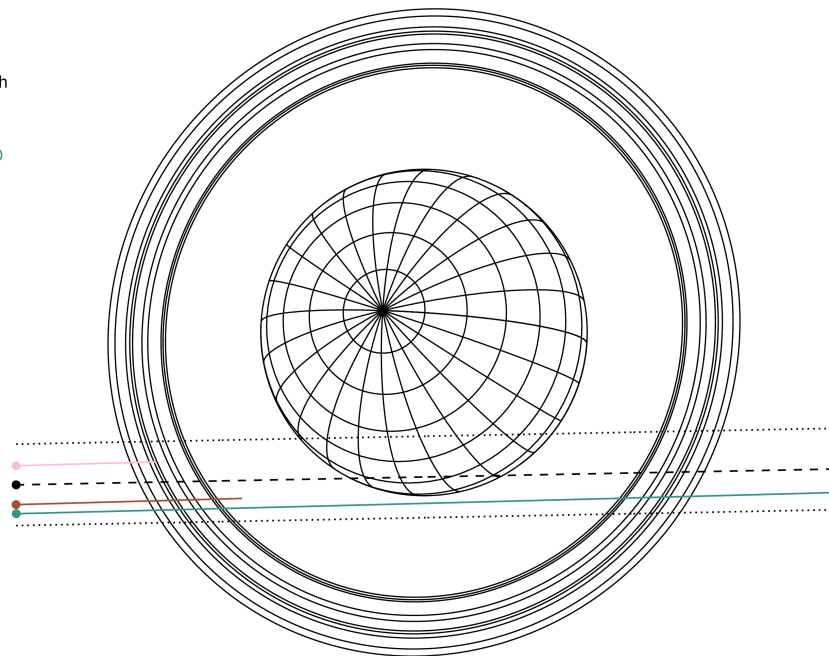
- 1 41837.2 6
- 2 42235.0 5
- 3 42571.2 4
- 4 44718.5 alpha
- 5 45661.1 beta
- 6 47176.1 eta
- 7 47626.3 gamma
- 8 48300.3 delta
- 9 50026.7 lambda
- 10 51149.4 epsilon



2034-04-21T00:20:37.6500 α: 06 10 03.4314 δ: +23 41 17.438 C/A 1.602" PA 1.11 deg v\_sky +20.47 km/s D 19.39 AU  
 Credit: Styled after SORA/Lucky Star

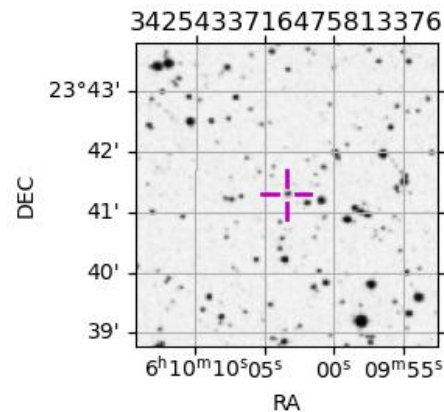
Uranus 2034-04-21T00:20:37 K13.92 G15.81 PgRgt

Earth  
 TEN  
 RIO  
 ESO

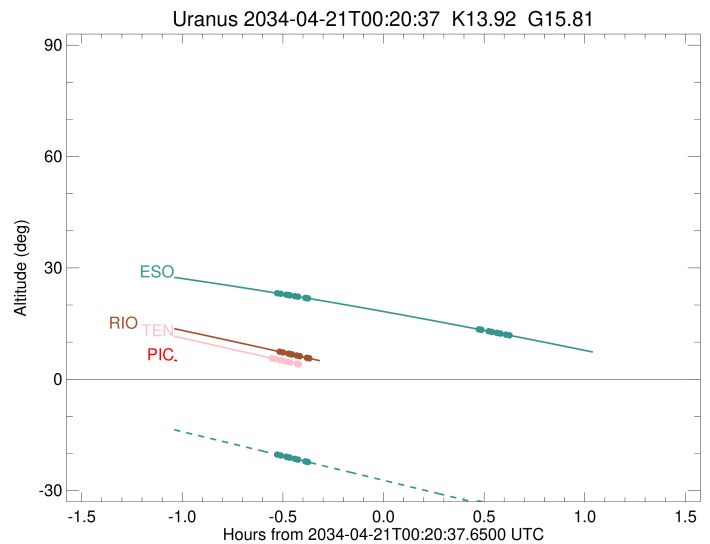
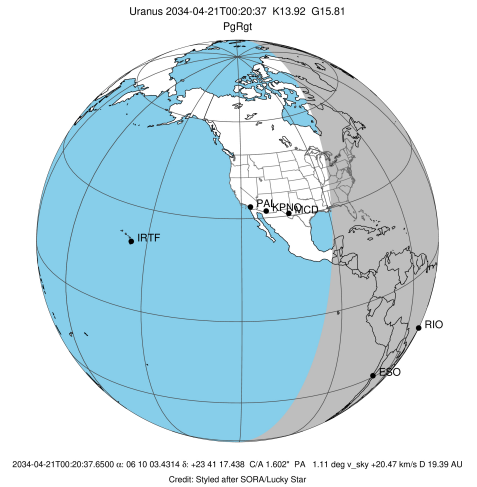


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

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 20 23:47 - APR 20 23:50	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 20 23:50 - APR 20 23:58	PnnRin
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	APR 20 23:49 - APR 21 00:58	PnnRie
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

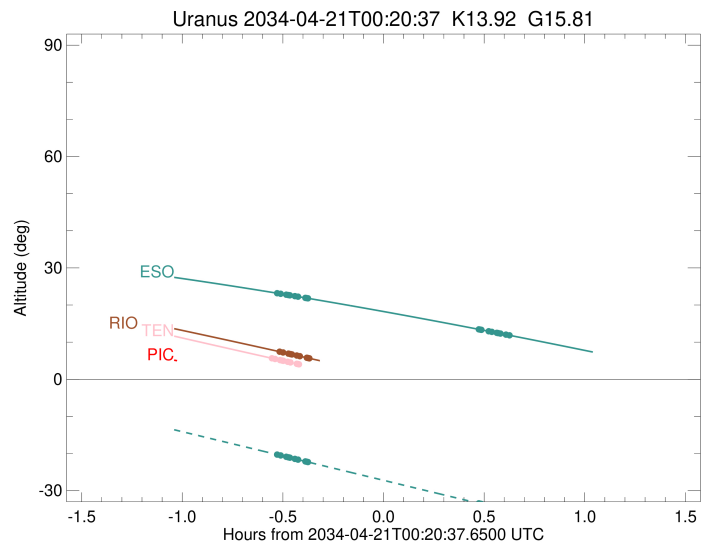
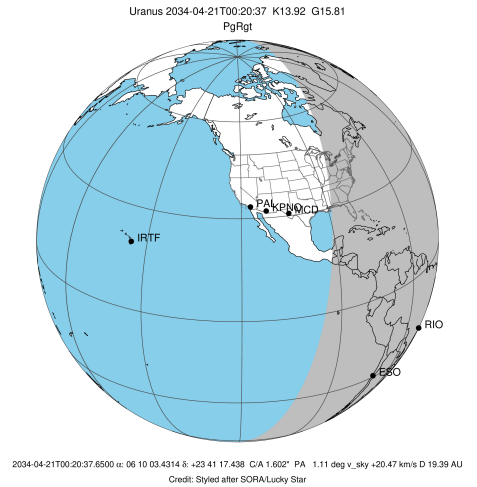


target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-04-21T00:25:05.010  
 Event type : PgRgt  
 : Uranus occs: geocentric, not topocentric  
 : Ring occs: geocentric, topocentric  
 Observer code : TEN  
 Location : Teide Obs./Tenerife  
 Latitude (deg) : 28.30050  
 E. Longitude (deg) : 343.48909  
 Altitude (km) : 2.395  
 Gaia source ID : 3425433716475813376  
 2Mass ID (if available) : 06100342+2341174  
 ICRS Star Coord at Epoch: 06h 10m 03.43139s +23:41:17.43814s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.916  
 G magnitude : 15.806  
 RP magnitude : 15.185  
 BP magnitude : 16.256  
 DUPflag : 0  
 Distance (au) : 19.387  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.47  
 Sun-Target sep (deg) : 61.79  
 Sun-Moon sep (deg) : 31.63  
 B (ring opening deg) : 73.35  
 PA of pole (deg) : 62.02  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.360  
 C/A sky separation (km) : 19129.6  
 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



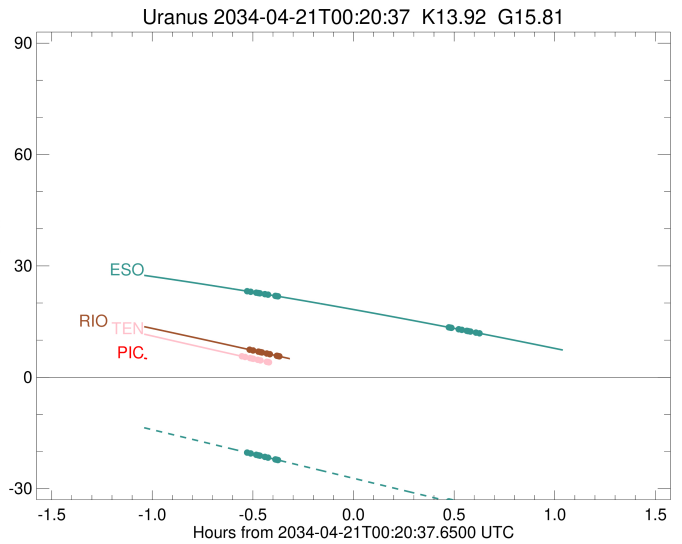
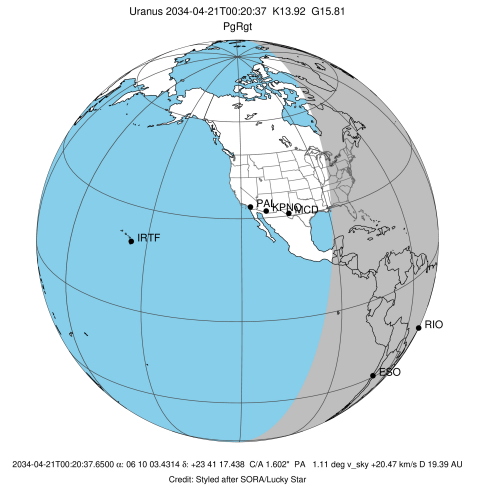
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2034-04-20T23:47:42.041		5.59	-45.92	50761.81	-19.58		
lambda	I	2034-04-20T23:48:19.603		5.46	-45.98	50026.71	-19.55		
delta	I	2034-04-20T23:49:48.199		5.16	-46.13	48300.35	-19.42		
gamma	I	2034-04-20T23:50:22.836		5.05	-46.19	47628.48	-19.37		
eta	I	2034-04-20T23:50:46.210		4.97x	-46.23	47176.12	-19.34		
beta	I	2034-04-20T23:52:04.736		4.71x	-46.36	45662.18	-19.21		
alpha	I	2034-04-20T23:52:55.896		4.53x	-46.44	44684.65	-19.12		
4	I	2034-04-20T23:54:45.863		4.17x	-46.62	42594.28	-18.89		
5	I	2034-04-20T23:55:03.454		4.11x	-46.64	42253.66	-18.87		
6	I	2034-04-20T23:55:26.850		4.03x	-46.68	41812.50	-18.79		
Uranus	I	2034-04-21T00:11:22.988		0.85x	-48.02	25535.22		3.40	3.57
Uranus	E	2034-04-21T00:38:12.467		-4.37x	-49.54	25083.83		-15.61	-16.31
6	E	2034-04-21T00:53:31.872		-7.28x	-49.95	41822.92	18.90		
5	E	2034-04-21T00:53:56.414		-7.36x	-49.96	42287.61	18.98		
4	E	2034-04-21T00:54:08.709		-7.40x	-49.96	42526.12	19.00		
alpha	E	2034-04-21T00:56:04.223		-7.76x	-49.99	44740.94	19.24		
beta	E	2034-04-21T00:56:52.861		-7.91x	-50.00	45675.88	19.33		
eta	E	2034-04-21T00:58:10.187		-8.15x	-50.01	47176.12	19.46		
gamma	E	2034-04-21T00:58:33.031		-8.22x	-50.02	47621.20	19.50		
delta	E	2034-04-21T00:59:07.806		-8.33x	-50.02	48300.35	19.56		
lambda	E	2034-04-21T01:00:35.784		-8.60x	-50.03	50026.71	19.69		
epsilon	E	2034-04-21T01:01:42.213		-8.81x	-50.04	51337.45	19.72		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-04-21T00:25:33.070  
 Event type : PgRgt  
 : Uranus occs: geocentric, not 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 : 3425433716475813376  
 2Mass ID (if available) : 06100342+2341174  
 ICRS Star Coord at Epoch: 06h 10m 03.43139s +23:41:17.43814s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.916  
 G magnitude : 15.806  
 RP magnitude : 15.185  
 BP magnitude : 16.256  
 DUPflag : 0  
 Distance (au) : 19.387  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.47  
 Sun-Target sep (deg) : 61.79  
 Sun-Moon sep (deg) : 31.58  
 B (ring opening deg) : 73.35  
 PA of pole (deg) : 62.02  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.791  
 C/A sky separation (km) : 25188.7  
 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	2034-04-20T23:50:02.096		7.36	-45.47	50749.18	-18.15		
lambda	I	2034-04-20T23:50:41.974		7.22	-45.62	50026.71	-18.07		
delta	I	2034-04-20T23:52:18.094		6.90	-45.99	48300.35	-17.84		
gamma	I	2034-04-20T23:52:55.888		6.77	-46.13	47627.76	-17.75		
eta	I	2034-04-20T23:53:21.385		6.69	-46.23	47176.12	-17.68		
beta	I	2034-04-20T23:54:47.397		6.40	-46.56	45665.25	-17.44		
alpha	I	2034-04-20T23:55:43.996		6.21	-46.77	44685.34	-17.26		
4	I	2034-04-20T23:57:47.014		5.79	-47.24	42587.34	-16.83		
5	I	2034-04-20T23:58:05.701		5.73	-47.31	42266.72	-16.79		
6	I	2034-04-20T23:58:33.179		5.63	-47.42	41806.88	-16.65		
Uranus	I	2034-04-21T00:22:21.586		0.75x	-52.84	25489.62		-5.83	-6.10
Uranus	E	2034-04-21T00:27:59.957		-0.42x	-54.12	25366.29		-9.78	-10.24
6	E	2034-04-21T00:51:00.249		-5.26x	-59.27	41816.25	16.74		
5	E	2034-04-21T00:51:28.871		-5.36x	-59.38	42297.11	16.88		
4	E	2034-04-21T00:51:42.275		-5.41x	-59.43	42526.06	16.93		
alpha	E	2034-04-21T00:53:50.741		-5.86x	-59.90	44736.67	17.37		
beta	E	2034-04-21T00:54:44.772		-6.06x	-60.10	45677.79	17.55		
eta	E	2034-04-21T00:56:09.540		-6.36x	-60.42	47176.12	17.80		
gamma	E	2034-04-21T00:56:34.490		-6.44x	-60.51	47621.02	17.87		
delta	E	2034-04-21T00:57:12.406		-6.58x	-60.65	48300.35	17.97		
lambda	E	2034-04-21T00:58:47.852		-6.92x	-61.00	50026.71	18.20		
epsilon	E	2034-04-21T00:59:56.854		-7.16x	-61.25	51288.25	18.28		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2034-04-21T00:24:23.930  
 Event type : PgRgt  
 : Uranus occs: geocentric, not 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 : 3425433716475813376  
 2Mass ID (if available) : 06100342+2341174  
 ICRS Star Coord at Epoch: 06h 10m 03.43139s +23:41:17.43814s  
 RUWE (>1.4 is poor) : 1.05  
 K magnitude : 13.916  
 G magnitude : 15.806  
 RP magnitude : 15.185  
 BP magnitude : 16.256  
 DUPflag : 0  
 Distance (au) : 19.387  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : 20.47  
 Sun-Target sep (deg) : 61.79  
 Sun-Moon sep (deg) : 31.51  
 B (ring opening deg) : 73.35  
 PA of pole (deg) : 62.02  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 1.903  
 C/A sky separation (km) : 26755.6  
 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	2034-04-20T23:49:18.455		23.13	-20.38	50747.10	-17.62		
lambda	I	2034-04-20T23:49:59.440		23.03	-20.52	50026.71	-17.53		
delta	I	2034-04-20T23:51:38.674		22.78	-20.89	48300.35	-17.26		
gamma	I	2034-04-20T23:52:17.773		22.68	-21.03	47627.56	-17.15		
eta	I	2034-04-20T23:52:44.155		22.62	-21.12	47176.12	-17.07		
beta	I	2034-04-20T23:54:13.298		22.39	-21.45	45666.04	-16.80		
alpha	I	2034-04-20T23:55:12.144		22.25	-21.66	44685.66	-16.59		
4	I	2034-04-20T23:57:20.612		21.92	-22.13	42585.40	-16.09		
5	I	2034-04-20T23:57:39.878		21.87	-22.20	42270.06	-16.04		
6	I	2034-04-20T23:58:08.963		21.80	-22.31	41805.53	-15.88		

No planet occultations

6	E	2034-04-21T00:49:01.115		13.45	-33.42	41814.43	15.95		
5	E	2034-04-21T00:49:31.407		13.37	-33.53	42299.53	16.11		
4	E	2034-04-21T00:49:45.364		13.33	-33.58	42526.29	16.16		
alpha	E	2034-04-21T00:51:59.455		12.93	-34.06	44735.35	16.67		
beta	E	2034-04-21T00:52:55.785		12.77	-34.27	45678.27	16.88		
eta	E	2034-04-21T00:54:23.784		12.51	-34.59	47176.12	17.16		
gamma	E	2034-04-21T00:54:49.648		12.44	-34.68	47620.99	17.24		
delta	E	2034-04-21T00:55:28.921		12.32	-34.82	48300.35	17.36		
lambda	E	2034-04-21T00:57:07.611		12.03	-35.18	50026.71	17.63		
epsilon	E	2034-04-21T00:58:18.011		11.82	-35.43	51273.81	17.72		