

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-26T20:51:04.580
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427497912117708160
 2Mass ID (if available) : 05523153+2338347

ICRS Star Coord at Epoch: 05h 52m 31.54217s +23:38:34.55104s

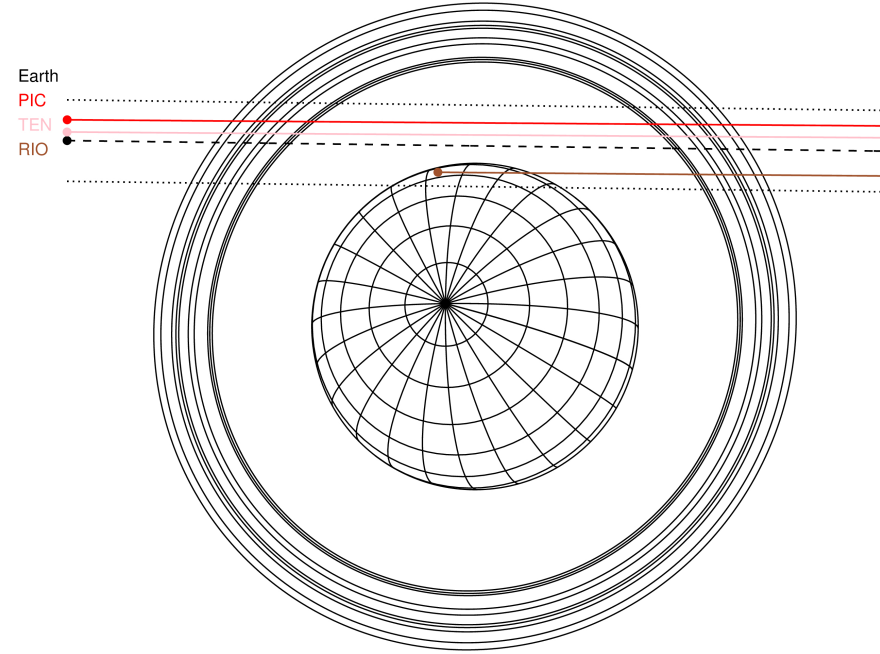
RUWE (>1.4 is poor) : 5.14
 K magnitude : 13.072
 G magnitude : 15.333
 RP magnitude : 14.573
 BP magnitude : 15.832
 DUPflag : 0
 Distance (au) : 19.602
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.77
 Sun-Target sep (deg) : 51.82
 Sun-Moon sep (deg) : 83.08
 B (ring opening deg) : 76.75
 PA of pole (deg) : 52.23

#	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



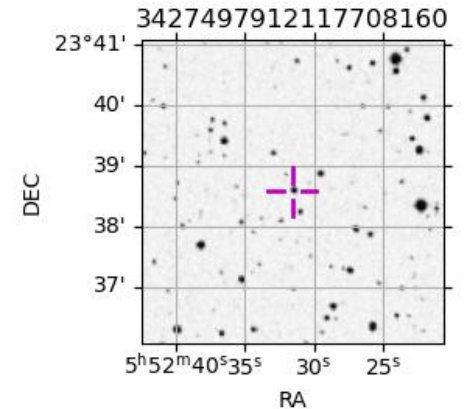
2033-04-26T20:51:04.5800 ex: 05 52 31.5422 s: +23 38 34.551 C/A 1.996° PA 179.26 deg v_sky +24.78 km/s D 19.60 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2033-04-26T20:51:04 K13.07 G15.33 PtRgt

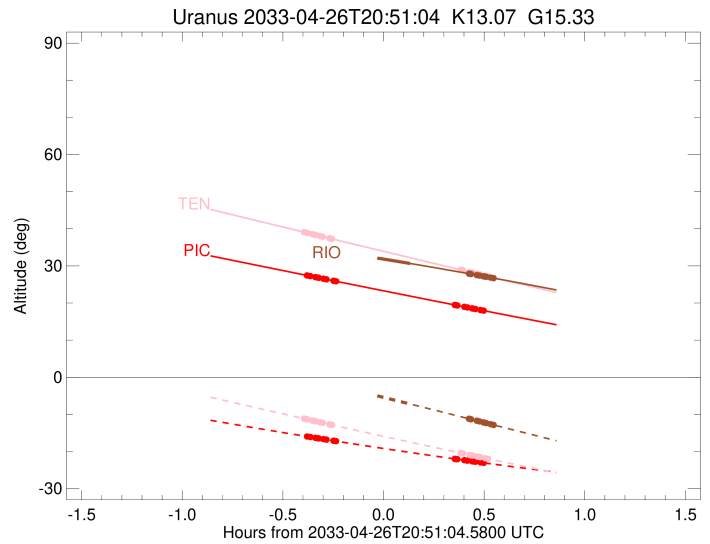
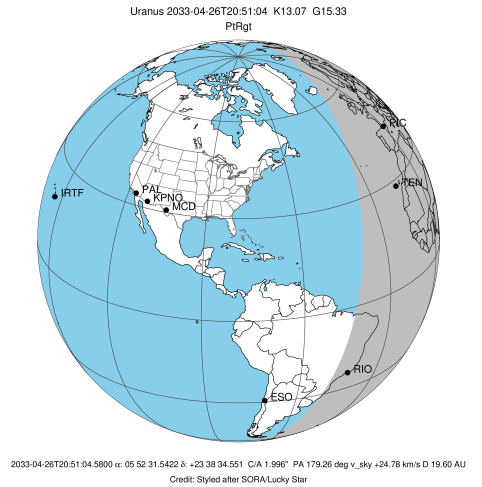


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	APR 26 20:28 - APR 26 21:20	PnnRie
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 26 20:27 - APR 26 21:22	PnnRie
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 26 20:59 - APR 26 21:23	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



target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-26T20:54:05.050
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3427497912117708160
 2Mass ID (if available) : 05523153+2338347
 ICRS Star Coord at Epoch: 05h 52m 31.54217s +23:38:34.55104s
 RUWE (>1.4 is poor) : 5.14
 K magnitude : 13.072
 G magnitude : 15.333
 RP magnitude : 14.573
 BP magnitude : 15.832
 DUPflag : 0
 Distance (au) : 19.602
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.77
 Sun-Target sep (deg) : 51.82
 Sun-Moon sep (deg) : 83.56
 B (ring opening deg) : 76.75
 PA of pole (deg) : 52.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.243
 C/A sky separation (km) : 31886.8
 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

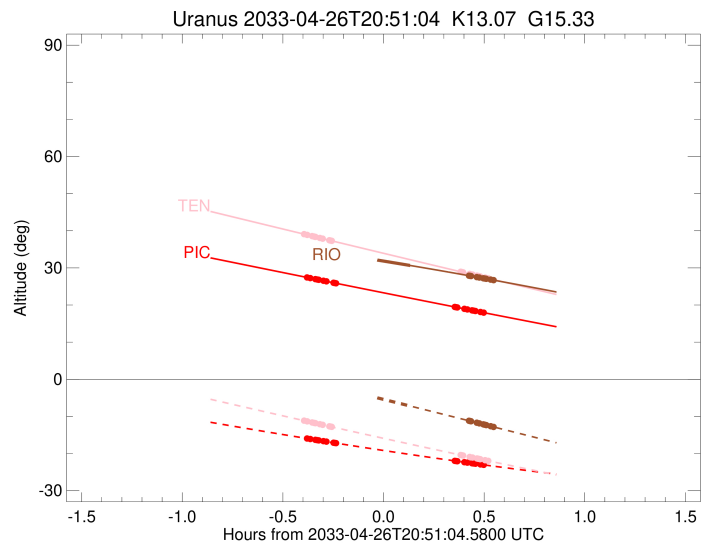
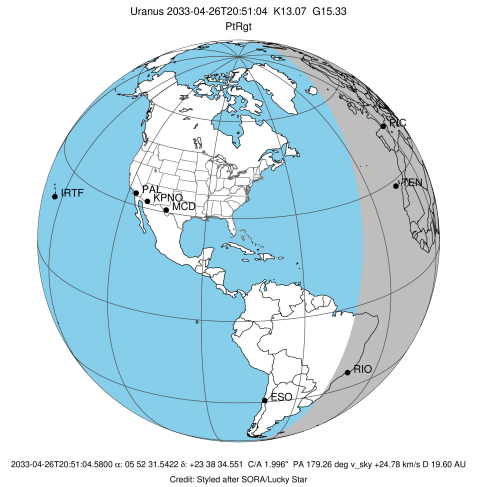


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-26T20:28:30.799		27.39	-15.99	50888.82	-19.33		
lambda	I	2033-04-26T20:29:15.429		27.25	-16.10	50026.71	-19.20		
delta	I	2033-04-26T20:30:46.497		26.98	-16.32	48300.35	-18.70		
gamma	I	2033-04-26T20:31:22.758		26.87	-16.41	47626.04	-18.49		
eta	I	2033-04-26T20:31:47.193		26.79	-16.46	47176.12	-18.34		
beta	I	2033-04-26T20:33:12.007		26.53	-16.67	45644.14	-17.78		
alpha	I	2033-04-26T20:34:06.437		26.37	-16.80	44684.71	-17.40		
4	I	2033-04-26T20:36:14.436		25.98	-17.11	42527.69	-16.38		
5	I	2033-04-26T20:36:31.354		25.93	-17.15	42240.65	-16.28		
6	I	2033-04-26T20:36:54.084		25.86	-17.20	41869.53	-16.03		

No planet occultations

6	E	2033-04-26T21:12:17.450		19.49	-21.98	41816.01	16.07		
5	E	2033-04-26T21:12:48.255		19.40	-22.04	42314.94	16.32		
4	E	2033-04-26T21:13:02.796		19.35	-22.07	42552.46	16.43		
alpha	E	2033-04-26T21:15:10.508		18.97	-22.34	44719.82	17.45		
beta	E	2033-04-26T21:16:03.253		18.82	-22.45	45650.53	17.83		
eta	E	2033-04-26T21:17:27.423		18.57	-22.63	47176.12	18.40		
gamma	E	2033-04-26T21:17:51.506		18.50	-22.67	47621.00	18.55		
delta	E	2033-04-26T21:18:27.918		18.39	-22.75	48300.35	18.77		
lambda	E	2033-04-26T21:19:58.671		18.12	-22.94	50026.71	19.27		
epsilon	E	2033-04-26T21:20:43.335		17.99	-23.03	50892.61	19.40		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-26T20:54:21.390
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3427497912117708160
 2Mass ID (if available) : 05523153+2338347
 ICRS Star Coord at Epoch: 05h 52m 31.54217s +23:38:34.55104s
 RUWE (>1.4 is poor) : 5.14
 K magnitude : 13.072
 G magnitude : 15.333
 RP magnitude : 14.573
 BP magnitude : 15.832
 DUPflag : 0
 Distance (au) : 19.602
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.77
 Sun-Target sep (deg) : 51.82
 Sun-Moon sep (deg) : 83.73
 B (ring opening deg) : 76.75
 PA of pole (deg) : 52.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.110
 C/A sky separation (km) : 29993.2
 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

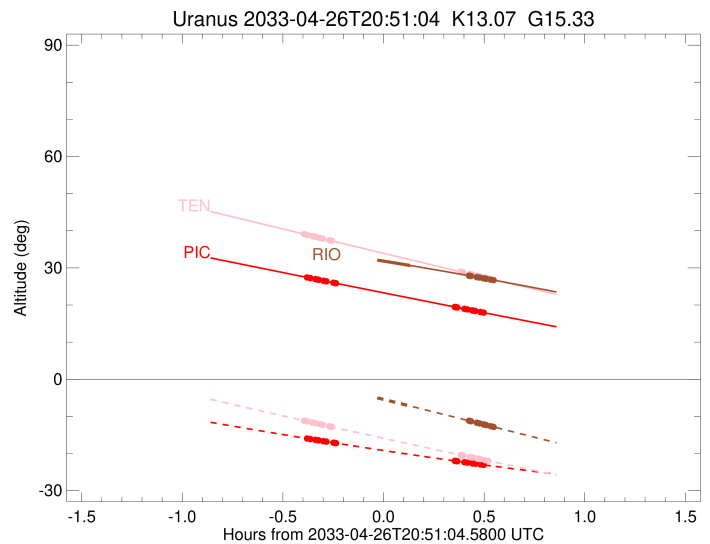
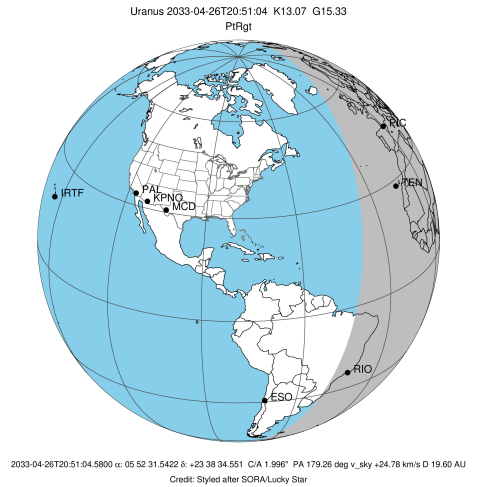


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-04-26T20:27:37.038		39.05	-11.19	50904.04	-19.97		
lambda	I	2033-04-26T20:28:20.980		38.89	-11.34	50026.71	-19.87		
delta	I	2033-04-26T20:29:48.789		38.57	-11.64	48300.35	-19.45		
gamma	I	2033-04-26T20:30:23.611		38.44	-11.76	47626.33	-19.26		
eta	I	2033-04-26T20:30:47.056		38.35	-11.83	47176.12	-19.14		
beta	I	2033-04-26T20:32:08.039		38.06	-12.11	45644.79	-18.67		
alpha	I	2033-04-26T20:32:59.801		37.87	-12.28	44684.62	-18.36		
4	I	2033-04-26T20:35:00.290		37.43	-12.69	42528.63	-17.52		
5	I	2033-04-26T20:35:16.486		37.37	-12.74	42235.23	-17.44		
6	I	2033-04-26T20:35:37.228		37.30	-12.81	41871.36	-17.23		

No planet occultations

6	E	2033-04-26T21:14:02.928		28.97	-20.40	41813.55	17.28		
5	E	2033-04-26T21:14:31.766		28.86	-20.49	42315.23	17.49		
4	E	2033-04-26T21:14:45.523		28.81	-20.54	42555.21	17.57		
alpha	E	2033-04-26T21:16:45.721		28.38	-20.92	44721.82	18.42		
beta	E	2033-04-26T21:17:35.769		28.20	-21.08	45651.51	18.74		
eta	E	2033-04-26T21:18:56.083		27.92	-21.34	47176.12	19.21		
gamma	E	2033-04-26T21:19:19.169		27.83	-21.41	47621.04	19.34		
delta	E	2033-04-26T21:19:54.133		27.71	-21.52	48300.35	19.52		
lambda	E	2033-04-26T21:21:21.599		27.39	-21.80	50026.71	19.95		
epsilon	E	2033-04-26T21:22:05.541		27.24	-21.94	50907.67	20.05		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-04-26T20:53:20.690
 Event type : PtRgt
 : Uranus occs: topocentric, not geocentric
 : 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 : 3427497912117708160
 2Mass ID (if available) : 05523153+2338347
 ICRS Star Coord at Epoch: 05h 52m 31.54217s +23:38:34.55104s
 RUWE (>1.4 is poor) : 5.14
 K magnitude : 13.072
 G magnitude : 15.333
 RP magnitude : 14.573
 BP magnitude : 15.832
 DUPflag : 0
 Distance (au) : 19.602
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : 24.77
 Sun-Target sep (deg) : 51.82
 Sun-Moon sep (deg) : 83.68
 B (ring opening deg) : 76.75
 PA of pole (deg) : 52.23
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 1.695
 C/A sky separation (km) : 24104.6
 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_itrff93_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	2033-04-26T20:23:45.047		35.59	0.70x	50950.40	-21.72		
lambda	I	2033-04-26T20:24:27.537		35.50	0.54x	50026.71	-21.68		
delta	I	2033-04-26T20:25:47.617		35.33	0.24x	48300.35	-21.43		
gamma	I	2033-04-26T20:26:19.104		35.26	0.13x	47627.13	-21.33		
eta	I	2033-04-26T20:26:40.285		35.22	0.05x	47176.12	-21.26		
beta	I	2033-04-26T20:27:52.673		35.06	-0.22x	45646.87	-20.99		
alpha	I	2033-04-26T20:28:38.639		34.96	-0.39x	44685.00	-20.81		
4	I	2033-04-26T20:30:23.519		34.73	-0.78x	42532.10	-20.34		
5	I	2033-04-26T20:30:38.419		34.70	-0.84x	42220.59	-20.30		
6	I	2033-04-26T20:30:55.207		34.66	-0.90x	41875.48	-20.19		
Uranus	I	2033-04-26T20:48:21.244		32.24	-4.81x	25190.45		10.70	11.20
Uranus	E	2033-04-26T20:59:01.508		30.65	-7.21	25503.25		4.11	4.30
6	E	2033-04-26T21:16:31.523		27.91	-11.17	41807.30	20.24		
5	E	2033-04-26T21:16:56.423		27.84	-11.26	42314.16	20.36		
4	E	2033-04-26T21:17:08.761		27.81	-11.31	42563.29	20.40		
alpha	E	2033-04-26T21:18:53.525		27.52	-11.70	44727.50	20.87		
beta	E	2033-04-26T21:19:37.786		27.40	-11.87	45654.54	21.05		
eta	E	2033-04-26T21:20:49.575		27.21	-12.14	47176.12	21.32		
gamma	E	2033-04-26T21:21:10.416		27.15	-12.22	47621.25	21.39		
delta	E	2033-04-26T21:21:42.079		27.06	-12.34	48300.35	21.50		
lambda	E	2033-04-26T21:23:01.901		26.84	-12.64	50026.71	21.75		
epsilon	E	2033-04-26T21:23:44.489		26.73	-12.81	50955.66	21.79		