

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:26:45.720
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Gaia source ID : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069

ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s

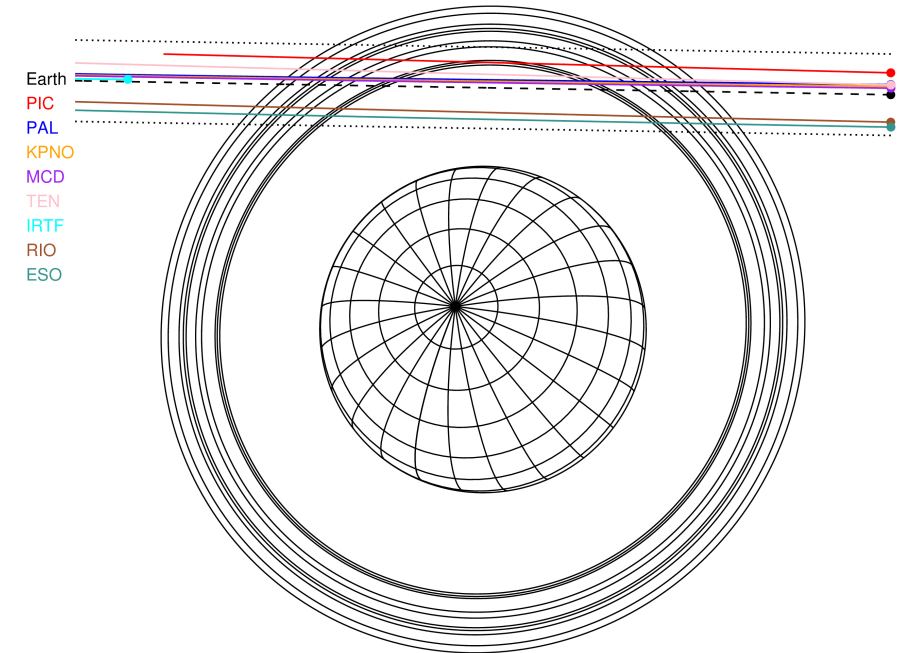
RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 147.86
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20

#	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



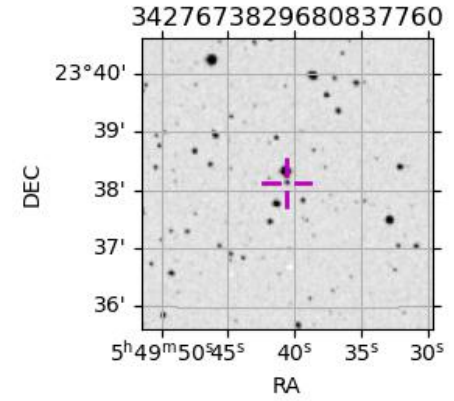
2033-01-30T03:26:45.7200 ra: 05 49 40.56873 lon: +23 38 06.922 C/A 2.863° PA 179.02 deg v_sky -15.63 km/s D 18.27 AU
 Credit: Styled after SORA/Lucky Star

Uranus 2033-01-30T03:26:45 K14.28 G16.41 XRgt

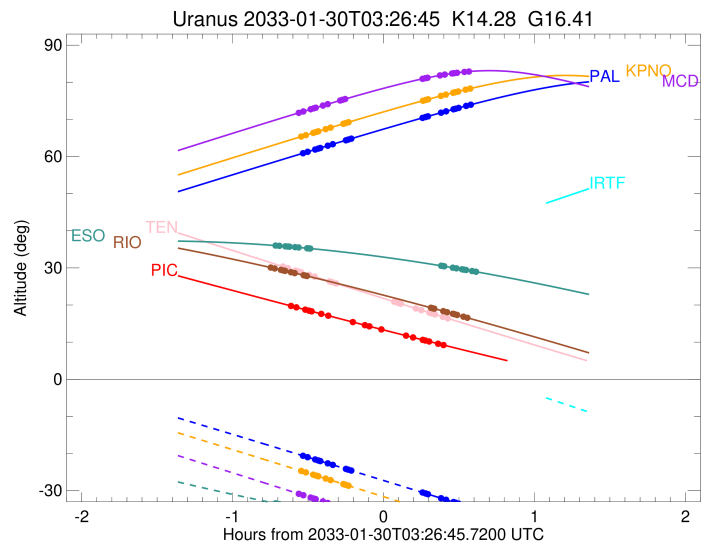
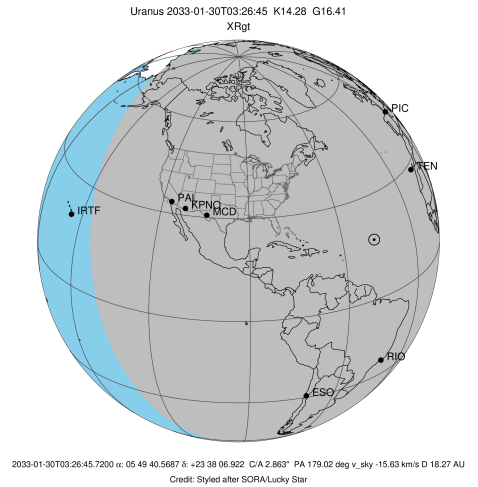


Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 30 02:50 - JAN 30 03:51	PnnRie
PAL	Palomar Mt (200")	33.4	243.1	+++++		+++++	JAN 30 02:54 - JAN 30 04:02	PnnRie
PNO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++++		+++++	JAN 30 02:54 - JAN 30 04:01	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	+++++		+++++	JAN 30 02:53 - JAN 30 04:01	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	JAN 30 02:46 - JAN 30 03:52	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	+++++		+++++	JAN 30 02:42 - JAN 30 04:00	PnnRie
ESO	European Southern Obs	-29.3	289.3	+++++		+++++	JAN 30 02:44 - JAN 30 04:04	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 : 2033-01-30T03:21:19.750
 Event type : XRgt
 : No Uranus occs
 : 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 : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 147.45
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.156
 C/A sky separation (km) : 41829.9
 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_itrf93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

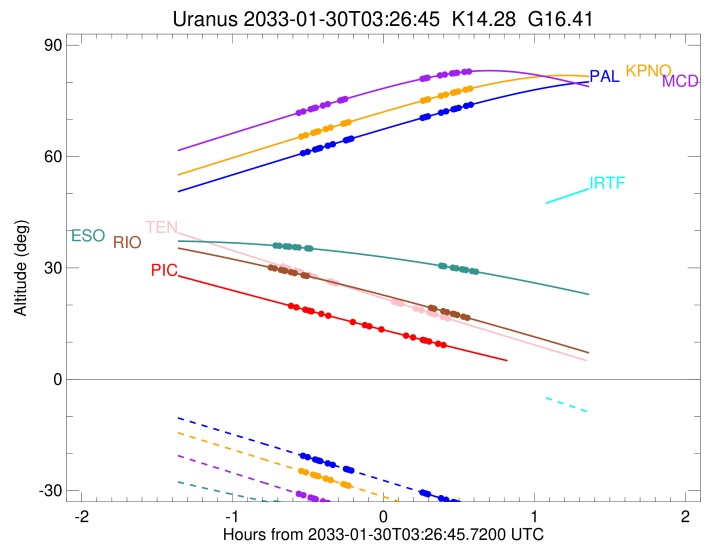
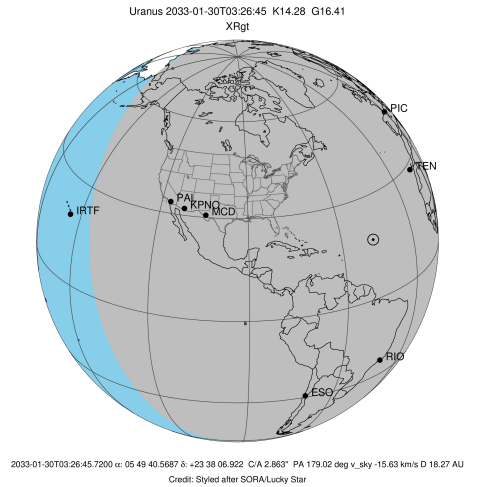


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-30T02:50:06.987		19.73	-48.28	51096.16	-9.06		
lambda	I	2033-01-30T02:52:09.263		19.37	-47.94	50026.71	-8.53		
delta	I	2033-01-30T02:55:41.618		18.74	-47.34	48300.35	-7.72		
gamma	I	2033-01-30T02:57:10.400		18.48	-47.09	47631.37	-7.35		
eta	I	2033-01-30T02:58:13.472		18.29	-46.91	47176.12	-7.08		
beta	I	2033-01-30T03:02:01.530		17.62	-46.27	45676.54	-6.05		
alpha	I	2033-01-30T03:04:48.314		17.13	-45.79	44736.11	-5.24		
4	I	2033-01-30T03:14:21.009		15.45	-44.14	42615.53	-2.09		
5	I	2033-01-30T03:20:04.069		14.45	-43.15	42249.76	0.13		

No planet occultations

5	E	2033-01-30T03:20:14.360		14.42	-43.12	42251.24	-0.24		
4	E	2033-01-30T03:26:08.180		13.40	-42.08	42611.49	2.09		
alpha	E	2033-01-30T03:35:46.182		11.74	-40.37	44750.32	5.22		
beta	E	2033-01-30T03:38:31.941		11.27	-39.88	45681.16	6.03		
eta	E	2033-01-30T03:42:20.245		10.62	-39.20	47176.12	7.05		
gamma	E	2033-01-30T03:43:23.513		10.44	-39.01	47630.41	7.31		
delta	E	2033-01-30T03:44:52.910		10.19	-38.74	48300.35	7.67		
lambda	E	2033-01-30T03:48:26.547		9.58	-38.10	50026.71	8.47		
epsilon	E	2033-01-30T03:51:15.436		9.11	-37.60	51507.10	9.00		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:29:07.170
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : PAL
 Location : Palomar Mt (200")
 Latitude (deg) : 33.35622
 E. Longitude (deg) : 243.13601
 Altitude (km) : 1.706
 Gaia source ID : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 148.65
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.951
 C/A sky separation (km) : 39109.7
 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

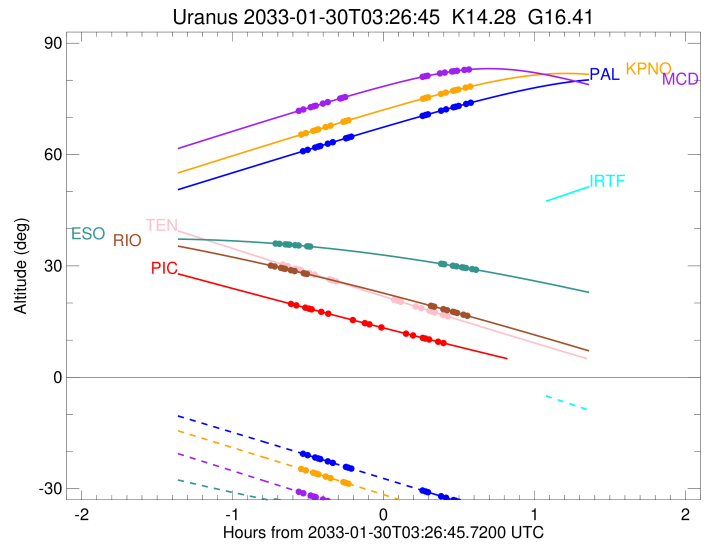
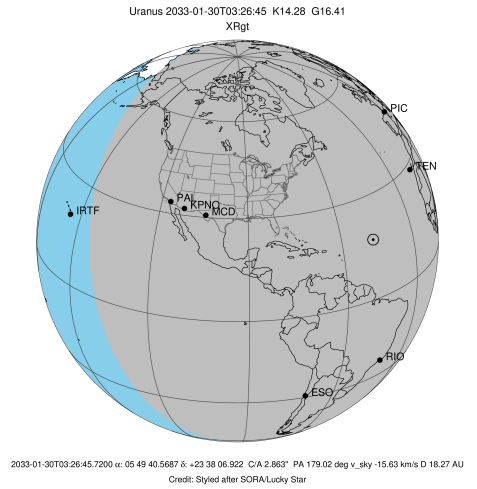


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-30T02:54:55.640		60.93	-20.64	51066.07	-10.38		
lambda	I	2033-01-30T02:56:38.344		61.28	-21.00	50026.71	-9.95		
delta	I	2033-01-30T02:59:37.220		61.89	-21.62	48300.35	-9.34		
gamma	I	2033-01-30T03:00:49.939		62.14	-21.87	47631.19	-9.07		
eta	I	2033-01-30T03:01:40.681		62.31	-22.04	47176.12	-8.87		
beta	I	2033-01-30T03:04:37.004		62.91	-22.65	45674.85	-8.15		
alpha	I	2033-01-30T03:06:36.719		63.32	-23.07	44731.90	-7.62		
4	I	2033-01-30T03:11:44.709		64.37	-24.13	42616.55	-6.09		
5	I	2033-01-30T03:12:52.714		64.60	-24.37	42216.31	-5.74		
6	I	2033-01-30T03:14:06.986		64.85	-24.63	41804.59	-5.30		

No planet occultations

6	E	2033-01-30T03:42:05.801		70.38	-30.46	41794.77	5.30		
5	E	2033-01-30T03:43:31.399		70.65	-30.76	42272.51	5.75		
4	E	2033-01-30T03:44:29.152		70.83	-30.96	42604.65	6.09		
alpha	E	2033-01-30T03:49:40.691		71.81	-32.05	44751.82	7.63		
beta	E	2033-01-30T03:51:38.616		72.18	-32.46	45680.70	8.16		
eta	E	2033-01-30T03:54:33.945		72.72	-33.07	47176.12	8.88		
gamma	E	2033-01-30T03:55:24.476		72.87	-33.25	47629.96	9.08		
delta	E	2033-01-30T03:56:37.216		73.09	-33.50	48300.35	9.35		
lambda	E	2033-01-30T03:59:35.793		73.63	-34.12	50026.71	9.97		
epsilon	E	2033-01-30T04:02:02.531		74.06	-34.64	51524.54	10.40		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:28:38.300
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : KPNO
 Location : Kitt Peak Natl Obs
 Latitude (deg) : 31.96333
 E. Longitude (deg) : 248.40000
 Altitude (km) : 2.120
 Gaia source ID : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 148.60
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.934
 C/A sky separation (km) : 38886.5
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

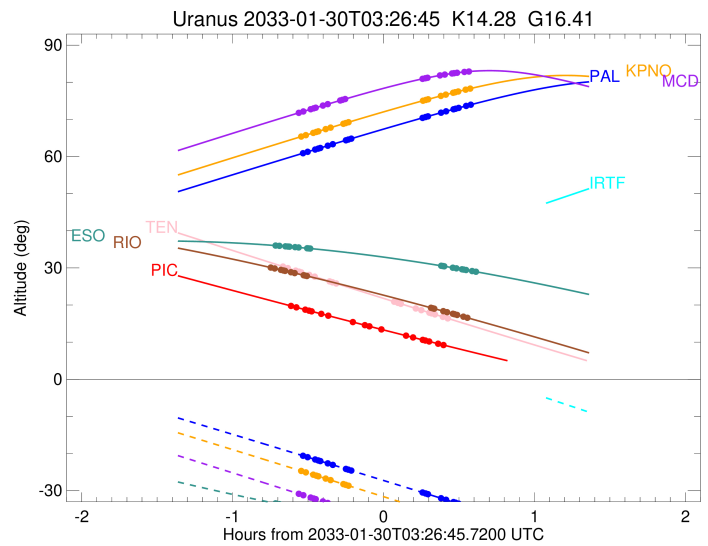
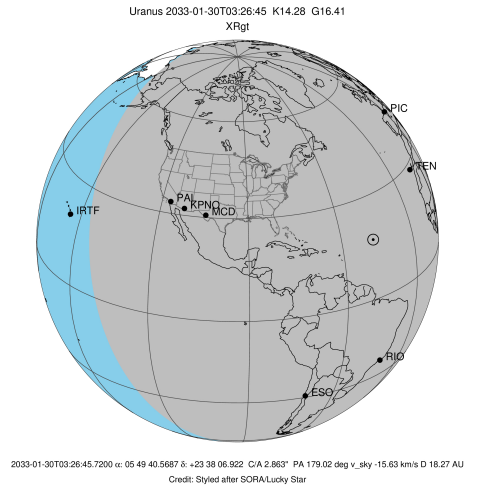


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-30T02:54:13.281		65.41	-24.73	51063.06	-10.48		
lambda	I	2033-01-30T02:55:54.639		65.76	-25.09	50026.71	-10.06		
delta	I	2033-01-30T02:58:51.421		66.37	-25.71	48300.35	-9.46		
gamma	I	2033-01-30T03:00:03.179		66.62	-25.96	47631.18	-9.19		
eta	I	2033-01-30T03:00:53.203		66.79	-26.14	47176.12	-9.00		
beta	I	2033-01-30T03:03:46.705		67.39	-26.75	45674.70	-8.30		
alpha	I	2033-01-30T03:05:44.122		67.79	-27.17	44731.55	-7.78		
4	I	2033-01-30T03:10:43.805		68.81	-28.22	42616.53	-6.30		
5	I	2033-01-30T03:11:49.488		69.03	-28.46	42215.10	-5.98		
6	I	2033-01-30T03:13:00.339		69.27	-28.71	41805.06	-5.55		

No planet occultations

6	E	2033-01-30T03:42:15.656		75.00	-34.91	41794.75	5.55		
5	E	2033-01-30T03:43:37.844		75.25	-35.21	42273.50	5.98		
4	E	2033-01-30T03:44:33.299		75.42	-35.40	42604.25	6.31		
alpha	E	2033-01-30T03:49:36.629		76.34	-36.48	44751.88	7.79		
beta	E	2033-01-30T03:51:32.302		76.68	-36.88	45680.66	8.31		
eta	E	2033-01-30T03:54:24.885		77.17	-37.50	47176.12	9.01		
gamma	E	2033-01-30T03:55:14.721		77.32	-37.67	47629.94	9.20		
delta	E	2033-01-30T03:56:26.535		77.52	-37.93	48300.35	9.47		
lambda	E	2033-01-30T03:59:23.111		78.00	-38.55	50026.71	10.08		
epsilon	E	2033-01-30T04:01:48.535		78.39	-39.06	51525.48	10.49		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:27:52.970
 Event type : XRgt
 : No Uranus occs
 : Ring occs: geocentric, topocentric
 Observer code : MCD
 Location : McDonald Obs. 2.7m
 Latitude (deg) : 30.67158
 E. Longitude (deg) : 255.97844
 Altitude (km) : 2.075
 Gaia source ID : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 148.52
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.918
 C/A sky separation (km) : 38668.2
 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_itr93_040916.bsp
 earth_720101_070426.bpc
 earth_200101_990628_predict.bpc
 pg3f0000r.bsp
 pg490000r.bsp
 naif0012.tls
 earth_flat_IAU.spk

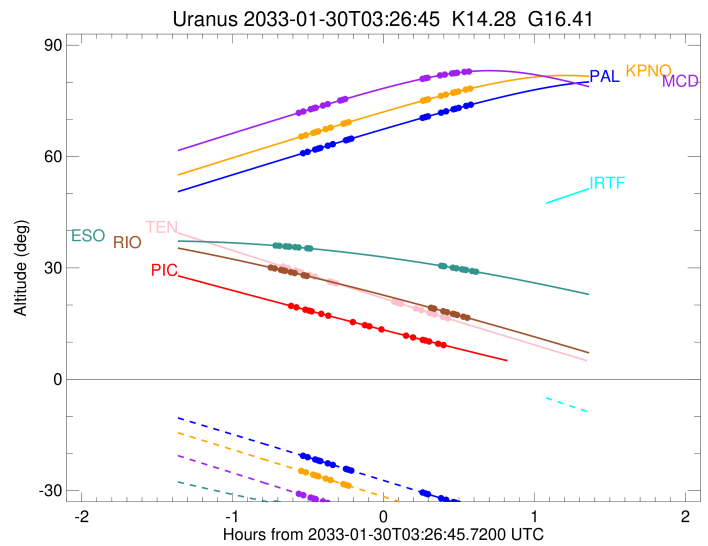
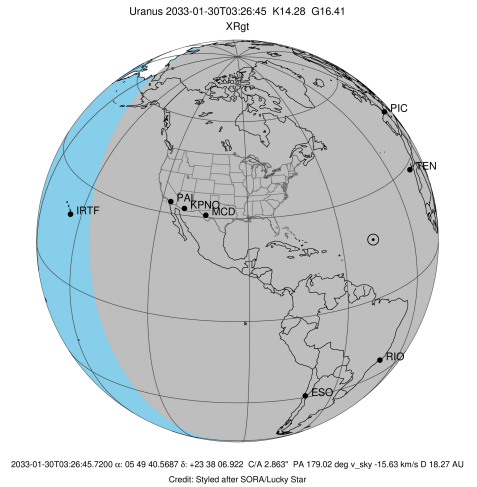


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-30T02:53:15.269		71.81	-30.89	51059.96	-10.58		
lambda	I	2033-01-30T02:54:55.310		72.15	-31.24	50026.71	-10.17		
delta	I	2033-01-30T02:57:50.078		72.75	-31.87	48300.35	-9.58		
gamma	I	2033-01-30T02:59:00.918		72.99	-32.12	47631.16	-9.32		
eta	I	2033-01-30T02:59:50.257		73.15	-32.30	47176.12	-9.13		
beta	I	2033-01-30T03:02:41.097		73.73	-32.91	45674.54	-8.44		
alpha	I	2033-01-30T03:04:36.371		74.12	-33.33	44731.19	-7.94		
4	I	2033-01-30T03:09:28.502		75.09	-34.37	42616.50	-6.51		
5	I	2033-01-30T03:10:32.139		75.30	-34.60	42213.92	-6.20		
6	I	2033-01-30T03:11:40.012		75.52	-34.85	41805.51	-5.79		

No planet occultations

6	E	2033-01-30T03:42:06.376		80.90	-41.40	41794.75	5.79		
5	E	2033-01-30T03:43:25.610		81.09	-41.68	42274.40	6.20		
4	E	2033-01-30T03:44:19.053		81.22	-41.87	42603.87	6.51		
alpha	E	2033-01-30T03:49:14.985		81.86	-42.93	44751.94	7.94		
beta	E	2033-01-30T03:51:08.587		82.08	-43.34	45680.62	8.45		
eta	E	2033-01-30T03:53:58.622		82.37	-43.95	47176.12	9.13		
gamma	E	2033-01-30T03:54:47.811		82.45	-44.12	47629.91	9.32		
delta	E	2033-01-30T03:55:58.761		82.56	-44.38	48300.35	9.58		
lambda	E	2033-01-30T03:58:53.466		82.78	-45.00	50026.71	10.17		
epsilon	E	2033-01-30T04:01:17.652		82.93	-45.52	51526.31	10.58		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:20:30.230
 Event type : XRgt
 : No Uranus occs
 : 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 : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 147.39
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 3.016
 C/A sky separation (km) : 39970.6
 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

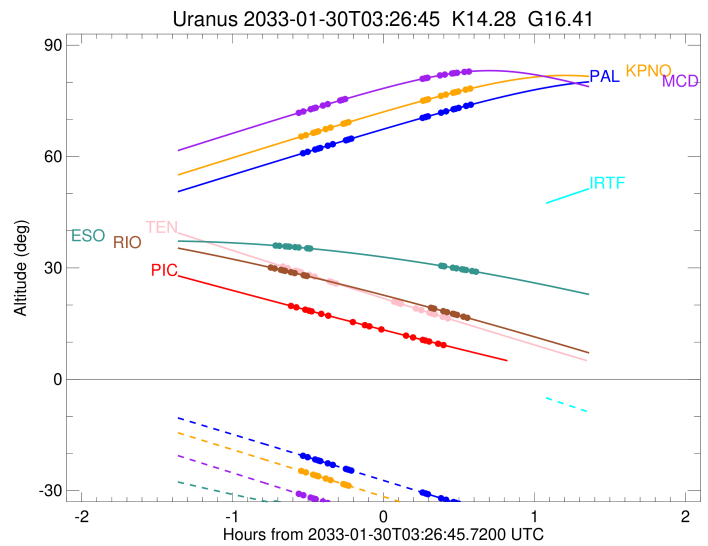
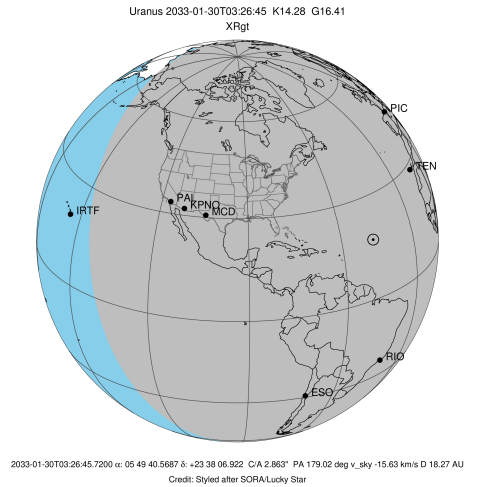


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-30T02:46:57.116		30.33	-67.26	51071.03	-9.94		
lambda	I	2033-01-30T02:48:45.188		29.94	-66.90	50026.71	-9.48		
delta	I	2033-01-30T02:51:53.759		29.26	-66.25	48300.35	-8.81		
gamma	I	2033-01-30T02:53:10.959		28.98	-65.99	47631.23	-8.52		
eta	I	2033-01-30T02:54:05.061		28.79	-65.80	47176.12	-8.30		
beta	I	2033-01-30T02:57:14.754		28.11	-65.15	45675.21	-7.51		
alpha	I	2033-01-30T02:59:25.545		27.64	-64.69	44732.78	-6.92		
4	I	2033-01-30T03:05:15.571		26.39	-63.47	42616.56	-5.14		
5	I	2033-01-30T03:06:36.527		26.10	-63.19	42220.11	-4.72		
6	I	2033-01-30T03:08:10.100		25.76	-62.86	41803.13	-4.15		

No planet occultations

6	E	2033-01-30T03:30:46.362		20.94	-58.04	41795.03	4.14		
5	E	2033-01-30T03:32:31.874		20.57	-57.66	42267.01	4.70		
4	E	2033-01-30T03:33:42.814		20.32	-57.40	42606.75	5.12		
alpha	E	2033-01-30T03:39:38.293		19.07	-56.12	44751.41	6.88		
beta	E	2033-01-30T03:41:48.126		18.61	-55.65	45680.91	7.47		
eta	E	2033-01-30T03:44:58.183		17.94	-54.96	47176.12	8.25		
gamma	E	2033-01-30T03:45:52.515		17.75	-54.76	47630.14	8.46		
delta	E	2033-01-30T03:47:10.380		17.48	-54.48	48300.35	8.75		
lambda	E	2033-01-30T03:50:20.367		16.81	-53.79	50026.71	9.41		
epsilon	E	2033-01-30T03:52:54.807		16.27	-53.23	51518.02	9.85		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:21:48.120
 Event type : XRgt
 : No Uranus occs
 : 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 : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 147.40
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.565
 C/A sky separation (km) : 33992.8
 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

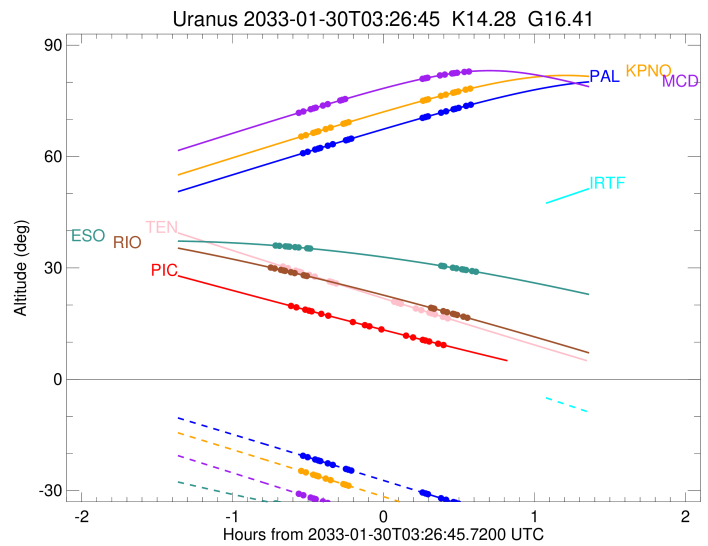
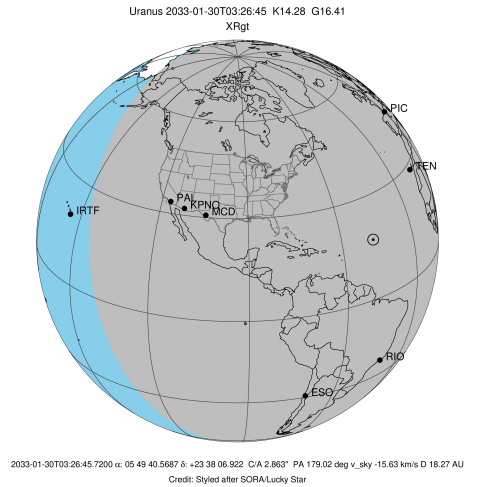


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2033-01-30T02:42:09.763		30.06	-49.23	51004.77	-12.09		
lambda	I	2033-01-30T02:43:31.891		29.85	-49.27	50026.71	-11.81		
delta	I	2033-01-30T02:46:00.514		29.46	-49.35	48300.35	-11.42		
gamma	I	2033-01-30T02:46:59.596		29.31	-49.38	47630.75	-11.25		
eta	I	2033-01-30T02:47:40.225		29.20	-49.40	47176.12	-11.13		
beta	I	2033-01-30T02:49:58.032		28.84	-49.46	45671.56	-10.70		
alpha	I	2033-01-30T02:51:27.761		28.60	-49.49	44724.81	-10.40		
4	I	2033-01-30T02:54:58.555		28.04	-49.56	42614.72	-9.61		
5	I	2033-01-30T02:55:42.550		27.92	-49.57	42196.07	-9.45		
6	I	2033-01-30T02:56:23.461		27.81	-49.58	41813.58	-9.24		

No planet occultations

6	E	2033-01-30T03:45:31.018		19.28	-48.53	41795.87	9.20		
5	E	2033-01-30T03:46:23.704		19.12	-48.48	42288.79	9.40		
4	E	2033-01-30T03:46:57.500		19.01	-48.44	42596.49	9.56		
alpha	E	2033-01-30T03:50:33.500		18.35	-48.22	44752.43	10.34		
beta	E	2033-01-30T03:52:02.108		18.07	-48.13	45679.54	10.64		
eta	E	2033-01-30T03:54:20.064		17.65	-47.98	47176.12	11.05		
gamma	E	2033-01-30T03:55:00.850		17.52	-47.93	47629.30	11.17		
delta	E	2033-01-30T03:56:00.489		17.33	-47.86	48300.35	11.33		
lambda	E	2033-01-30T03:58:30.241		16.86	-47.68	50026.71	11.72		
epsilon	E	2033-01-30T04:00:37.931		16.46	-47.52	51541.89	11.99		

target : Uranus
 target radius (km) : 25559.00
 C/A epoch : 2033-01-30T03:24:28.240
 Event type : XRgt
 : No Uranus occs
 : 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 : 3427673829680837760
 2Mass ID (if available) : 05494057+2338069
 ICRS Star Coord at Epoch: 05h 49m 40.56873s +23:38:06.92241s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 14.279
 G magnitude : 16.406
 RP magnitude : 15.719
 BP magnitude : 16.919
 DUPflag : 0
 Distance (au) : 18.274
 f0 (km) : 0.000
 g0 (km) : 0.000
 skyplane vel. (km/s) : -15.63
 Sun-Target sep (deg) : 137.55
 Sun-Moon sep (deg) : 147.76
 B (ring opening deg) : 77.26
 PA of pole (deg) : 50.20
 Pole direction: RA (deg): 257.31100
 Dec (deg): -15.17500
 C/A sky separation (") : 2.484
 C/A sky separation (km) : 32920.6
 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	2033-01-30T02:44:05.116		36.01	-33.47	50995.89	-12.44		
lambda	I	2033-01-30T02:45:24.115		35.94	-33.65	50026.71	-12.18		
delta	I	2033-01-30T02:47:47.960		35.81	-33.97	48300.35	-11.82		
gamma	I	2033-01-30T02:48:44.983		35.76	-34.09	47630.66	-11.67		
eta	I	2033-01-30T02:49:24.122		35.72	-34.18	47176.12	-11.56		
beta	I	2033-01-30T02:51:36.534		35.59	-34.47	45671.03	-11.17		
alpha	I	2033-01-30T02:53:02.368		35.50	-34.66	44723.73	-10.90		
4	I	2033-01-30T02:56:22.339		35.30	-35.09	42614.21	-10.19		
5	I	2033-01-30T02:57:03.974		35.25	-35.17	42193.42	-10.05		
6	I	2033-01-30T02:57:41.997		35.21	-35.25	41814.99	-9.87		

No planet occultations

6	E	2033-01-30T03:49:34.884		30.58	-40.63	41796.39	9.84		
5	E	2033-01-30T03:50:24.489		30.49	-40.70	42291.51	10.02		
4	E	2033-01-30T03:50:55.832		30.43	-40.74	42594.75	10.16		
alpha	E	2033-01-30T03:54:20.430		30.05	-41.00	44752.39	10.87		
beta	E	2033-01-30T03:55:44.883		29.89	-41.10	45679.21	11.13		
eta	E	2033-01-30T03:57:57.027		29.63	-41.25	47176.12	11.51		
gamma	E	2033-01-30T03:58:36.187		29.55	-41.30	47629.14	11.62		
delta	E	2033-01-30T03:59:33.568		29.44	-41.37	48300.35	11.77		
lambda	E	2033-01-30T04:01:58.014		29.15	-41.53	50026.71	12.12		
epsilon	E	2033-01-30T04:04:01.819		28.90	-41.66	51545.01	12.38		