

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2029-01-03T00:08:48.990  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Gaia source ID : 144912059129429632  
 2Mass ID (if available) : 04360279+2200383

ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s

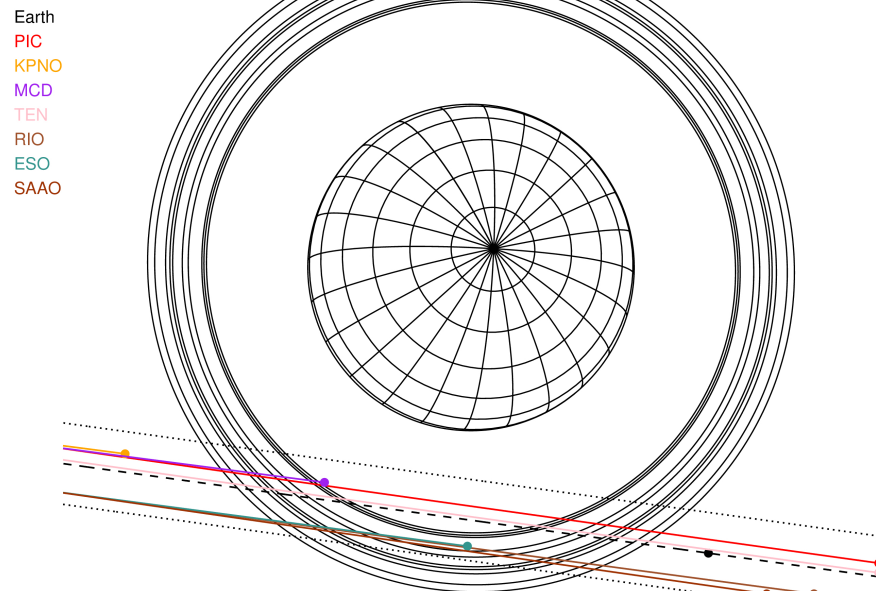
RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.565  
 G magnitude : 18.576  
 RP magnitude : 17.326  
 BP magnitude : 20.363  
 DUPflag : 0  
 Distance (au) : 18.446  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 148.11  
 Sun-Moon sep (deg) : 61.65  
 B (ring opening deg) : 79.58  
 PA of pole (deg) : -50.41

#	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



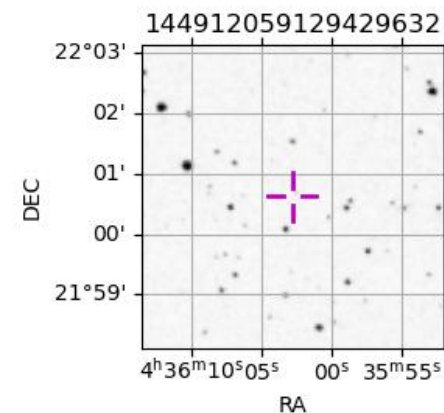
2029-01-03T00:08:48.9900 α: 04 36 02.8286 δ: +22 00 37.166 C/A 2.925° PA 352.10 deg v\_sky -18.96 km/s D 18.45 AU  
 Credit: Styled after SORA/Lucky Star

Uranus 2029-01-03T00:08:48 K14.56 G18.58 XRgt



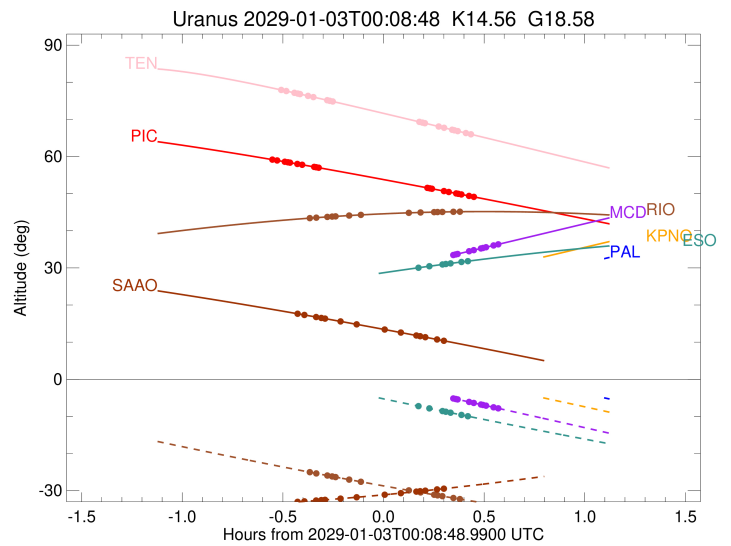
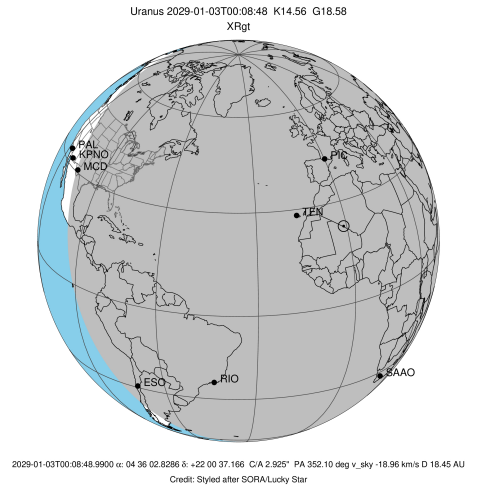
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+++++		+++++	JAN 02 23:35 - JAN 03 00:36	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			+++++	JAN 03 00:29 - JAN 03 00:43	PnnRne
TEN	Teide Obs./Tenerife	28.3	343.5	+++++		+++++	JAN 02 23:37 - JAN 03 00:35	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 02 23:46 - JAN 03 00:32	PnnRie
ESO	European Southern Obs	-29.3	289.3			+++++	JAN 03 00:19 - JAN 03 00:34	PnnRne
AAT	Siding Spring (AAT)	-31.3	149.1					PnnRnn
SAAO	So. Afr. Astro. Obs.	-32.4	20.8	+++++		+++++	JAN 02 23:42 - JAN 03 00:27	PnnRie
MSO	Mt. Stromlo Observato	-35.3	149.0					PnnRnn



```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2029-01-03T00:06:13.560
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      : 144912059129429632
2Mass ID (if available) : 04360279+2200383
ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 14.565
G magnitude         : 18.576
RP magnitude        : 17.326
BP magnitude        : 20.363
DUPflag            : 0
Distance (au)       : 18.446
f0 (km)             : 0.000
g0 (km)             : 0.000
skyplane vel. (km/s) : -18.96
Sun-Target sep (deg) : 148.11
Sun-Moon sep (deg)  : 62.14
B (ring opening deg) : 79.58
PA of pole (deg)    : -50.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.767
C/A sky separation (km) : 37018.6
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

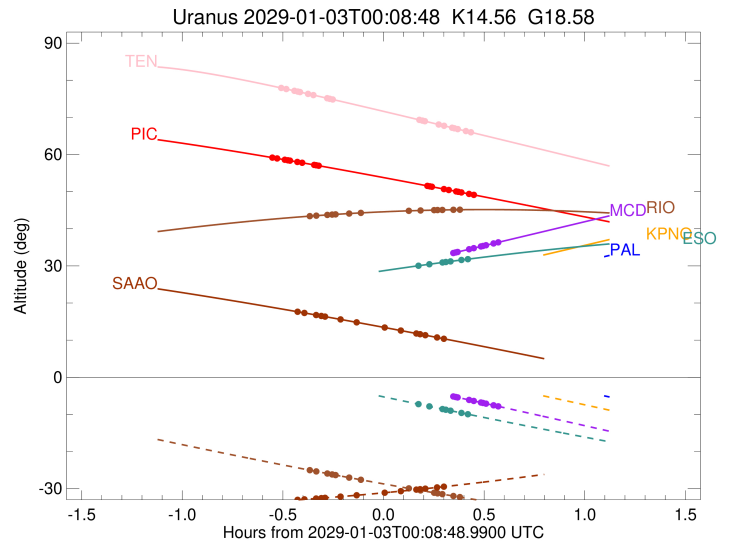
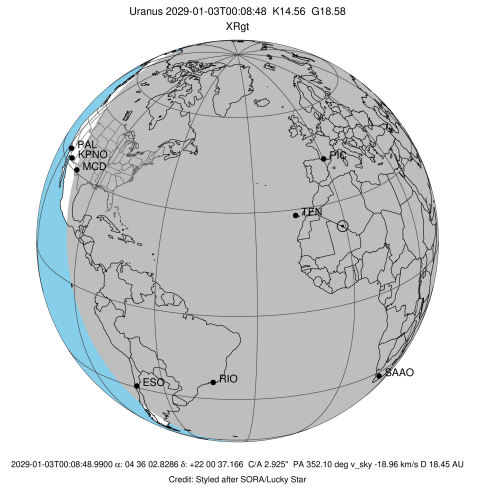


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-01-02T23:35:15.447		59.23	-69.20	51498.97	-13.42		
lambda	I	2029-01-02T23:37:07.529		58.95	-69.31	50026.71	-12.91		
delta	I	2029-01-02T23:39:24.466		58.59	-69.43	48300.35	-12.30		
gamma	I	2029-01-02T23:40:19.552		58.45	-69.48	47630.13	-12.03		
eta	I	2029-01-02T23:40:57.574		58.35	-69.51	47176.12	-11.85		
beta	I	2029-01-02T23:43:07.560		58.01	-69.61	45680.06	-11.16		
alpha	I	2029-01-02T23:44:38.890		57.77	-69.67	44684.83	-10.64		
4	I	2029-01-02T23:48:13.973		57.19	-69.81	42538.95	-9.28		
5	I	2029-01-02T23:48:54.395		57.09	-69.83	42173.11	-9.01		
6	I	2029-01-02T23:49:36.205		56.97	-69.85	41798.39	-8.70		

No planet occultations

6	E	2029-01-03T00:21:51.221		51.57	-69.72	41827.90	8.69		
5	E	2029-01-03T00:22:37.441		51.43	-69.69	42241.91	8.99		
4	E	2029-01-03T00:23:15.087		51.32	-69.66	42580.54	9.27		
alpha	E	2029-01-03T00:26:47.211		50.71	-69.50	44701.64	10.61		
beta	E	2029-01-03T00:28:15.532		50.45	-69.43	45661.15	11.13		
eta	E	2029-01-03T00:30:27.589		50.07	-69.31	47176.12	11.82		
gamma	E	2029-01-03T00:31:05.165		49.96	-69.28	47623.60	12.00		
delta	E	2029-01-03T00:32:00.942		49.79	-69.22	48300.35	12.26		
lambda	E	2029-01-03T00:34:18.264		49.39	-69.09	50026.71	12.87		
epsilon	E	2029-01-03T00:36:01.023		49.09	-68.97	51370.46	13.37		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2029-01-03T00:12:42.380  
 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 : 144912059129429632  
 2Mass ID (if available) : 04360279+2200383  
 ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.565  
 G magnitude : 18.576  
 RP magnitude : 17.326  
 BP magnitude : 20.363  
 DUPflag : 0  
 Distance (au) : 18.446  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 148.11  
 Sun-Moon sep (deg) : 62.42  
 B (ring opening deg) : 79.58  
 PA of pole (deg) : -50.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 2.716  
 C/A sky separation (km) : 36337.1  
 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



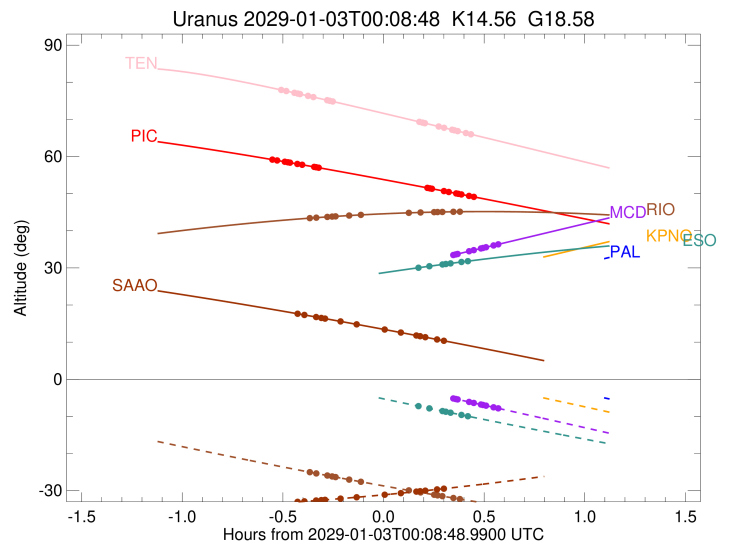
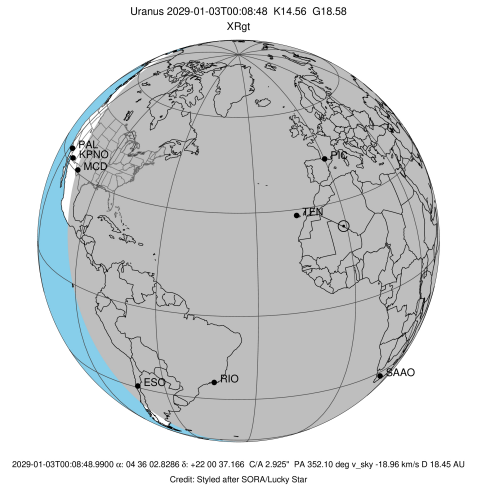
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-01-02T23:40:50.569		23.11	4.22x	51492.83	-13.53		
lambda	I	2029-01-02T23:42:41.059		23.50	3.88x	50026.71	-13.06		
delta	I	2029-01-02T23:44:56.127		23.97	3.46x	48300.35	-12.50		
gamma	I	2029-01-02T23:45:50.277		24.16	3.29x	47630.24	-12.25		
eta	I	2029-01-02T23:46:27.603		24.29	3.17x	47176.12	-12.08		
beta	I	2029-01-02T23:48:34.688		24.74	2.77x	45680.29	-11.45		
alpha	I	2029-01-02T23:50:03.477		25.05	2.49x	44685.00	-10.97		
4	I	2029-01-02T23:53:30.476		25.78	1.83x	42537.62	-9.75		
5	I	2029-01-02T23:54:08.932		25.92	1.71x	42170.93	-9.50		
6	I	2029-01-02T23:54:48.371		26.06	1.59x	41797.65	-9.23		

No planet occultations

6	E	2029-01-03T00:29:35.218		33.46	-5.16	41828.97	9.25		
5	E	2029-01-03T00:30:18.880		33.62	-5.31	42243.83	9.52		
4	E	2029-01-03T00:30:54.399		33.75	-5.42	42581.56	9.77		
alpha	E	2029-01-03T00:34:17.363		34.47	-6.09	44702.16	11.01		
beta	E	2029-01-03T00:35:42.674		34.78	-6.38	45660.83	11.49		
eta	E	2029-01-03T00:37:51.047		35.24	-6.80	47176.12	12.13		
gamma	E	2029-01-03T00:38:27.686		35.37	-6.92	47623.54	12.30		
delta	E	2029-01-03T00:39:22.169		35.56	-7.10	48300.35	12.55		
lambda	E	2029-01-03T00:41:36.676		36.04	-7.55	50026.71	13.11		
epsilon	E	2029-01-03T00:43:17.394		36.40	-7.89	51367.37	13.60		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2029-01-03T00:07:08.620
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      : 144912059129429632
2Mass ID (if available) : 04360279+2200383
ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 14.565
G magnitude         : 18.576
RP magnitude        : 17.326
BP magnitude        : 20.363
DUPflag            : 0
Distance (au)       : 18.446
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -18.96
Sun-Target sep (deg) : 148.11
Sun-Moon sep (deg)  : 62.34
B (ring opening deg) : 79.58
PA of pole (deg)    : -50.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.890
C/A sky separation (km) : 38667.8
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
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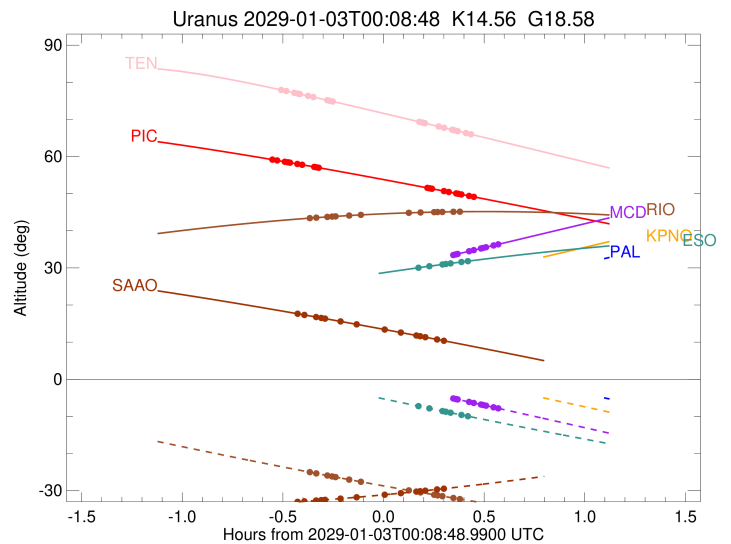
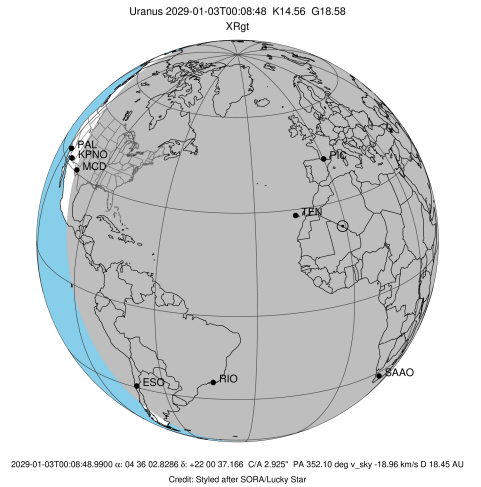


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-01-02T23:37:52.072		78.03	-68.49	51508.12	-12.78		
lambda	I	2029-01-02T23:39:50.880		77.64	-68.92	50026.71	-12.20		
delta	I	2029-01-02T23:42:16.547		77.16	-69.45	48300.35	-11.49		
gamma	I	2029-01-02T23:43:15.696		76.96	-69.66	47629.91	-11.18		
eta	I	2029-01-02T23:43:56.701		76.82	-69.81	47176.12	-10.95		
beta	I	2029-01-02T23:46:18.552		76.34	-70.32	45679.59	-10.13		
alpha	I	2029-01-02T23:47:59.980		76.00	-70.69	44684.64	-9.49		
4	I	2029-01-02T23:52:07.614		75.15	-71.58	42541.84	-7.77		
5	I	2029-01-02T23:52:56.198		74.98	-71.75	42178.02	-7.41		
6	I	2029-01-02T23:53:47.934		74.80	-71.94	41800.23	-6.99		

No planet occultations

6	E	2029-01-03T00:19:26.769		69.35	-77.34	41823.79	6.99		
5	E	2029-01-03T00:20:22.868		69.15	-77.53	42234.28	7.40		
4	E	2029-01-03T00:21:08.689		68.98	-77.68	42576.47	7.76		
alpha	E	2029-01-03T00:25:13.225		68.10	-78.51	44699.52	9.48		
beta	E	2029-01-03T00:26:51.612		67.74	-78.83	45662.53	10.11		
eta	E	2029-01-03T00:29:15.425		67.22	-79.30	47176.12	10.94		
gamma	E	2029-01-03T00:29:55.957		67.08	-79.44	47623.88	11.16		
delta	E	2029-01-03T00:30:55.748		66.86	-79.63	48300.35	11.47		
lambda	E	2029-01-03T00:33:21.682		66.33	-80.09	50026.71	12.18		
epsilon	E	2029-01-03T00:35:11.197		65.93	-80.44	51387.27	12.76		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2029-01-03T00:09:50.590  
 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 : 144912059129429632  
 2Mass ID (if available) : 04360279+2200383  
 ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.565  
 G magnitude : 18.576  
 RP magnitude : 17.326  
 BP magnitude : 20.363  
 DUPflag : 0  
 Distance (au) : 18.446  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 148.11  
 Sun-Moon sep (deg) : 62.35  
 B (ring opening deg) : 79.58  
 PA of pole (deg) : -50.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.254  
 C/A sky separation (km) : 43538.2  
 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\_itrf93\_040916.bsp  
 earth\_720101\_070426.bpc  
 earth\_200101\_990628\_predict.bpc  
 pg3f0000r.bsp  
 pg490000r.bsp  
 naif0012.tls  
 earth\_flat\_IAU.spk



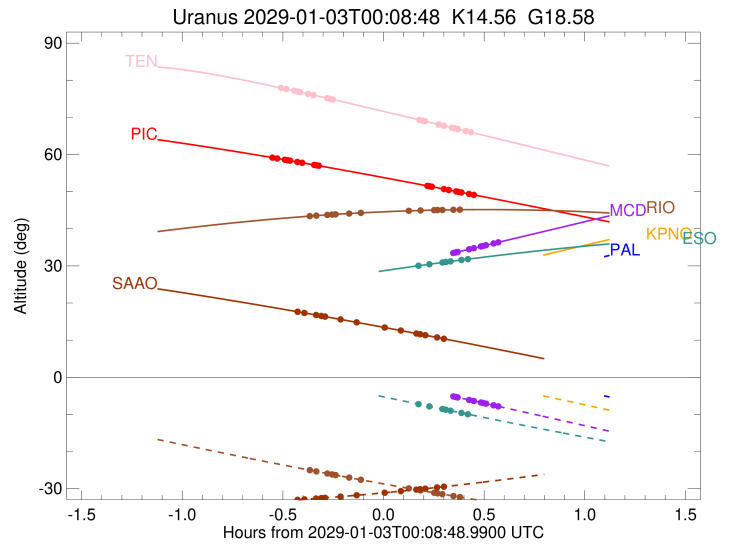
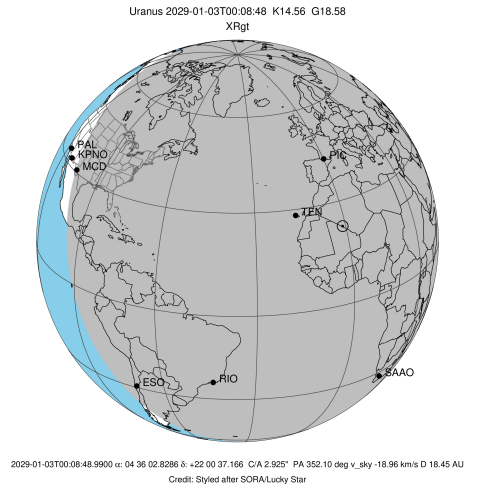
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-01-02T23:46:13.964		43.36	-24.92	51533.65	-10.24		
lambda	I	2029-01-02T23:48:48.260		43.53	-25.37	50026.71	-9.33		
delta	I	2029-01-02T23:52:06.146		43.74	-25.93	48300.35	-8.10		
gamma	I	2029-01-02T23:53:32.040		43.82	-26.18	47629.02	-7.53		
eta	I	2029-01-02T23:54:33.958		43.88	-26.35	47176.12	-7.10		
beta	I	2029-01-02T23:58:34.732		44.10	-27.03	45676.83	-5.32		
alpha	I	2029-01-03T00:02:18.091		44.29	-27.65	44685.93	-3.54		

No planet occultations

alpha	E	2029-01-03T00:16:09.831		44.83	-29.90	44691.44	3.54		
beta	E	2029-01-03T00:19:50.020		44.93	-30.48	45667.90	5.32		
eta	E	2029-01-03T00:23:52.505		45.02	-31.11	47176.12	7.10		
gamma	E	2029-01-03T00:24:53.874		45.04	-31.26	47624.97	7.53		
delta	E	2029-01-03T00:26:20.293		45.07	-31.48	48300.35	8.10		
lambda	E	2029-01-03T00:29:38.140		45.12	-31.98	50026.71	9.33		
epsilon	E	2029-01-03T00:32:03.043		45.14	-32.34	51438.48	10.24		

```

target                : Uranus
target radius (km)   : 25559.00
C/A epoch            : 2029-01-03T00:11:50.270
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      : 144912059129429632
2Mass ID (if available) : 04360279+2200383
ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 14.565
G magnitude         : 18.576
RP magnitude        : 17.326
BP magnitude        : 20.363
DUPflag            : 0
Distance (au)       : 18.446
f0 (km)            : 0.000
g0 (km)            : 0.000
skyplane vel. (km/s) : -18.96
Sun-Target sep (deg) : 148.11
Sun-Moon sep (deg)  : 62.33
B (ring opening deg) : 79.58
PA of pole (deg)    : -50.41
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.240
C/A sky separation (km) : 43341.6
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLvl1.spk
urall1.bsp
IAU_URANUS_for_RINGFIT.tpc
vgr2.urall1.bsp
ural61.bsp
vgr2.ural61.bsp
peph.ural60.bsp
earthstns_itrf93_040916.bsp
earth_720101_070426.bpc
earth_200101_990628_predict.bpc
pg3f0000r.bsp
pg490000r.bsp
naif0012.tls
earth_flat_IAU.spk
  
```

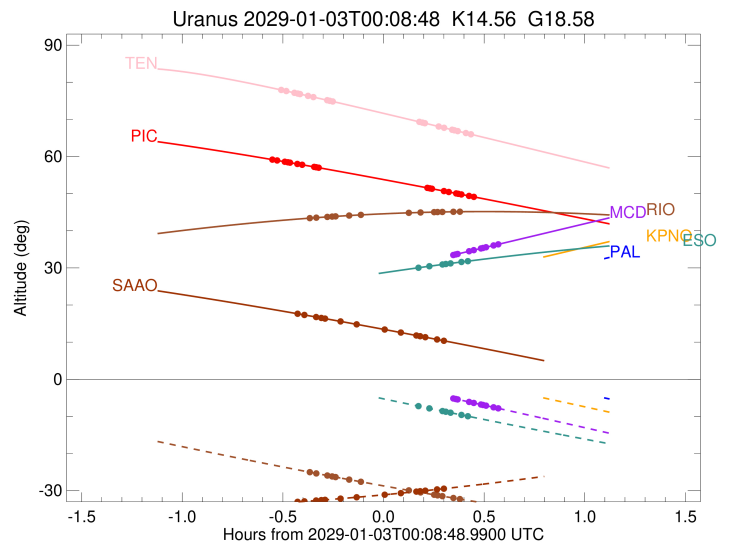
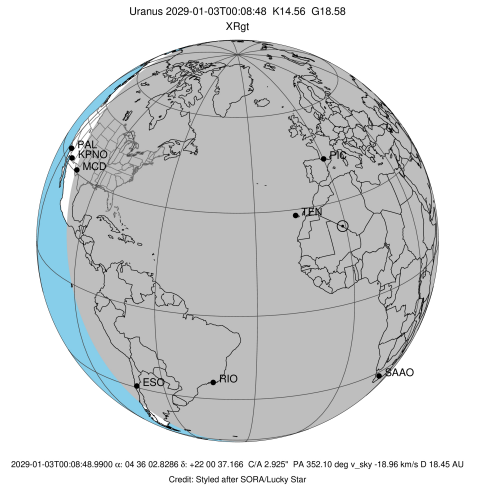


Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2029-01-02T23:47:49.813		25.76	-1.24x	51532.32	-10.30		
lambda	I	2029-01-02T23:50:22.774		26.13	-1.74x	50026.71	-9.42		
delta	I	2029-01-02T23:53:38.207		26.60	-2.37x	48300.35	-8.23		
gamma	I	2029-01-02T23:55:02.573		26.80	-2.64x	47629.08	-7.68		
eta	I	2029-01-02T23:56:03.169		26.94	-2.83x	47176.12	-7.27		
beta	I	2029-01-02T23:59:55.833		27.49	-3.58x	45677.06	-5.58		
alpha	I	2029-01-03T00:03:23.247		27.96	-4.24x	44685.70	-3.97		

No planet occultations

alpha	E	2029-01-03T00:19:03.847		30.02	-7.20	44691.86	3.97		
beta	E	2029-01-03T00:22:27.940		30.44	-7.83	45667.66	5.59		
eta	E	2029-01-03T00:26:22.087		30.92	-8.56	47176.12	7.28		
gamma	E	2029-01-03T00:27:22.060		31.04	-8.74	47624.92	7.69		
delta	E	2029-01-03T00:28:46.845		31.21	-9.00	48300.35	8.24		
lambda	E	2029-01-03T00:32:01.956		31.59	-9.60	50026.71	9.43		
epsilon	E	2029-01-03T00:34:25.346		31.87	-10.04	51437.17	10.32		

target : Uranus  
 target radius (km) : 25559.00  
 C/A epoch : 2029-01-03T00:05:37.700  
 Event type : XRgt  
 : No Uranus occs  
 : Ring occs: geocentric, topocentric  
 Observer code : SAAO  
 Location : So. Afr. Astro. Obs. (Sutherland)  
 Latitude (deg) : -32.37953  
 E. Longitude (deg) : 20.81070  
 Altitude (km) : 1.768  
 Gaia source ID : 144912059129429632  
 2Mass ID (if available) : 04360279+2200383  
 ICRS Star Coord at Epoch: 04h 36m 02.82861s +22:00:37.16629s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 14.565  
 G magnitude : 18.576  
 RP magnitude : 17.326  
 BP magnitude : 20.363  
 DUPflag : 0  
 Distance (au) : 18.446  
 f0 (km) : 0.000  
 g0 (km) : 0.000  
 skyplane vel. (km/s) : -18.96  
 Sun-Target sep (deg) : 148.11  
 Sun-Moon sep (deg) : 61.55  
 B (ring opening deg) : 79.58  
 PA of pole (deg) : -50.41  
 Pole direction: RA (deg): 257.31100  
 Dec (deg): -15.17500  
 C/A sky separation (") : 3.293  
 C/A sky separation (km) : 44054.3  
 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	2029-01-02T23:42:33.725		17.75	-33.06	51537.25	-9.83		
lambda	I	2029-01-02T23:45:15.515		17.32	-32.89	50026.71	-8.87		
delta	I	2029-01-02T23:48:45.432		16.76	-32.66	48300.35	-7.55		
gamma	I	2029-01-02T23:50:18.109		16.51	-32.56	47628.85	-6.93		
eta	I	2029-01-02T23:51:25.707		16.33	-32.48	47176.12	-6.46		
beta	I	2029-01-02T23:56:00.702		15.59	-32.15	45676.12	-4.41		
alpha	I	2029-01-03T00:01:13.339		14.73	-31.75	44686.95	-1.90		

No planet occultations

alpha	E	2029-01-03T00:08:47.447		13.46	-31.14	44689.98	1.90		
beta	E	2029-01-03T00:13:57.184		12.59	-30.69	45668.61	4.40		
eta	E	2029-01-03T00:18:34.450		11.80	-30.26	47176.12	6.45		
gamma	E	2029-01-03T00:19:41.657		11.61	-30.16	47625.08	6.91		
delta	E	2029-01-03T00:21:15.110		11.34	-30.01	48300.35	7.54		
lambda	E	2029-01-03T00:24:45.635		10.73	-29.67	50026.71	8.84		
epsilon	E	2029-01-03T00:27:18.152		10.28	-29.42	51441.71	9.79		