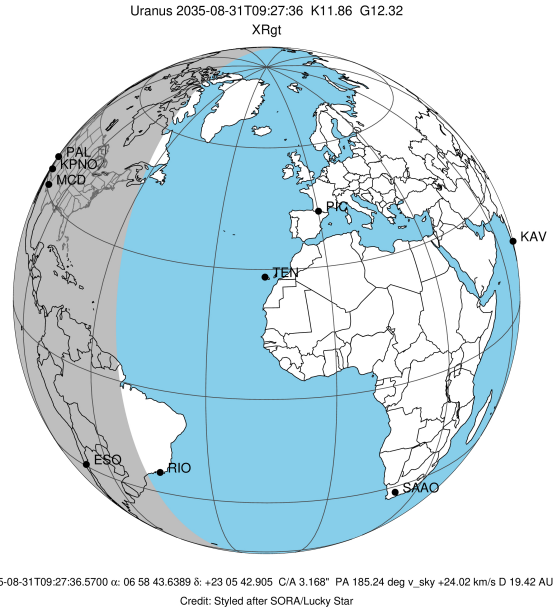
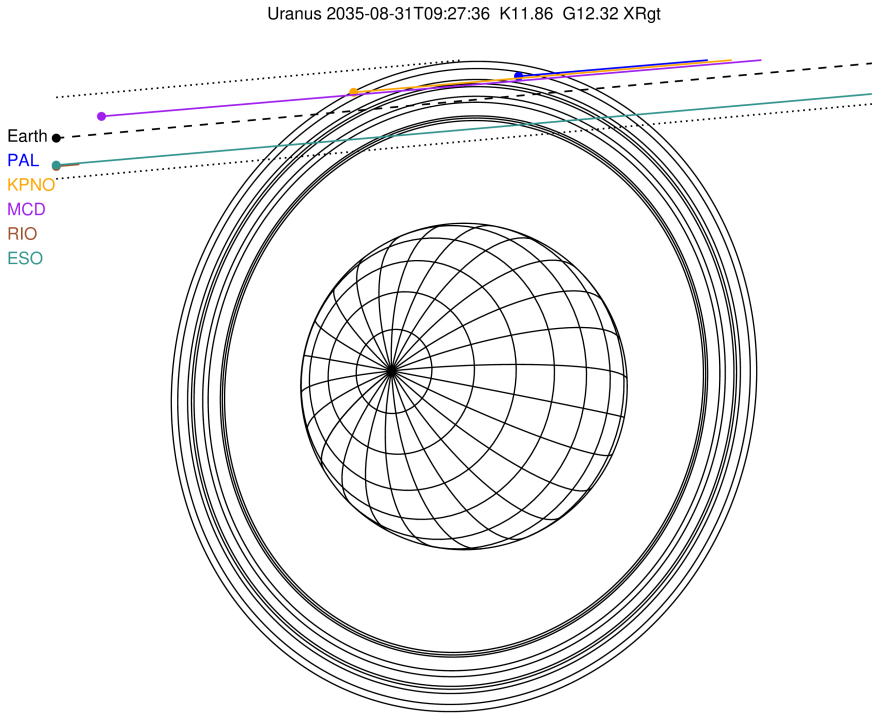
Stellar occultation prediction by rfrench@wellesley.edu Sun Jun 25 01:41:58 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2035-08-31T09:27:36.570
Event type : XRgt
: No Uranus occs
: Ring occs: geocentric, topocentric
Gaia source ID : 3380123082812529664
2Mass ID (if available) : 06584363+2305431

ICRS Star Coord at Epoch: 06h 58m 43.63888s +23:05:42.90464s
RUWE (>1.4 is poor) : 1.12
K magnitude : 11.861
G magnitude : 12.317
RP magnitude : 12.147
BP magnitude : 12.410
DUPflag : 0
Distance (au) : 19.425
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 24.02
Sun-Target sep (deg) : 53.86
Sun-Moon sep (deg) : 31.38
B (ring opening deg) : 63.01
PA of pole (deg) : 77.86

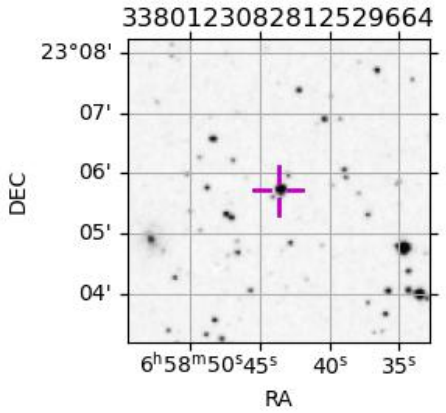
#	a(km)	ring
1	41837.2	6
2	42235.0	5
3	42571.2	4
4	44718.5	alpha
5	45661.1	beta
6	47176.1	eta
7	47626.3	gamma
8	48300.3	delta
9	50026.7	lambda
10	51149.4	epsilon





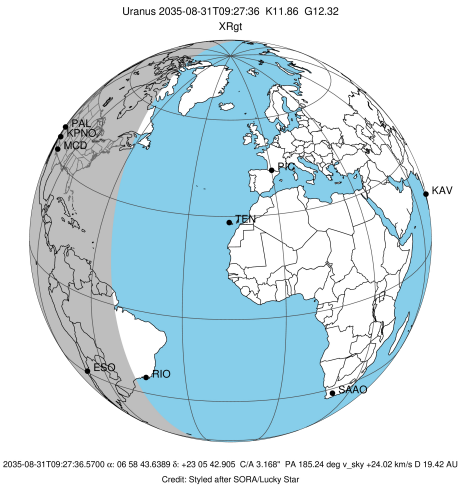
Observable events with sun below -5 deg and altitude above 5 deg unblocked by planet

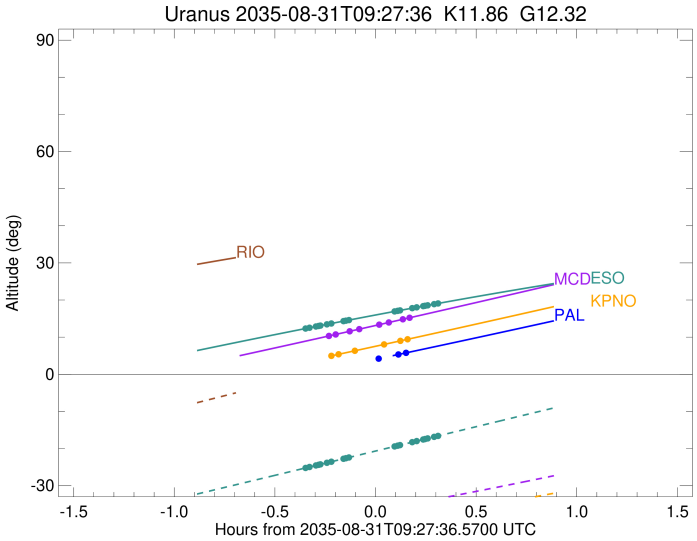
Obs	Location	lat	Elon	Rings I	Planet	Rings E	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1					PnnRnn
PAL	Palomar Mt (200")	33.4	243.1			++	AUG 31 09:34 - AUG 31 09:36	PnnRne
PMO	Purple Mtn Obs. Nanki	32.1	118.8					PnnRnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+++		+++	AUG 31 09:14 - AUG 31 09:37	PnnRie
MCD	McDonald Obs. 2.7m	30.7	256.0	++++		++++	AUG 31 09:14 - AUG 31 09:37	PnnRie
TEN	Teide Obs./Tenerife	28.3	343.5					PnnRnn
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					PnnRnn
ESO	European Southern Obs	-29.3	289.3	++++++++++		++++++++++	AUG 31 09:07 - AUG 31 09:46	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



Uranus_2035-08-31T09_27_36.5700_PAL.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:18:44 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2035-08-31T09:23:58.560
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 : 3380123082812529664
2Mass ID (if available) : 06584363+2305431
ICRS Star Coord at Epoch: 06h 58m 43.63888s +23:05:42.90464s
RUWE (>1.4 is poor) : 1.12
K magnitude : 11.861
G magnitude : 12.317
RP magnitude : 12.147
BP magnitude : 12.410
DUPflag : 0
Distance (au) : 19.425
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 24.02
Sun-Target sep (deg) : 53.86
Sun-Moon sep (deg) : 32.19
B (ring opening deg) : 63.01
PA of pole (deg) : 77.86
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.385
C/A sky separation (km) : 47687.0
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.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

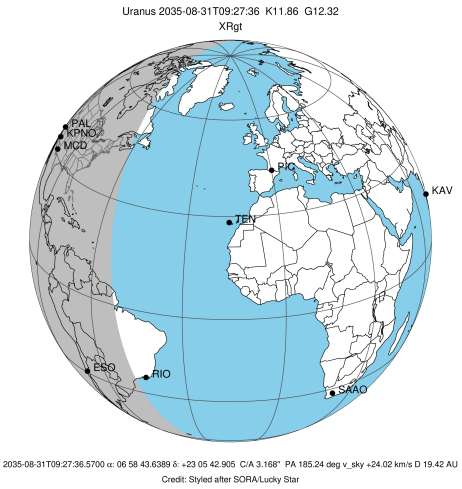
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-08-31T09:15:25.189		1.73x	-43.29	51008.32	-9.05		
lambda	I	2035-08-31T09:17:26.599		2.11x	-43.07	50026.71	-7.29		
delta	I	2035-08-31T09:23:27.732		3.24x	-42.41	48300.35	-2.18		

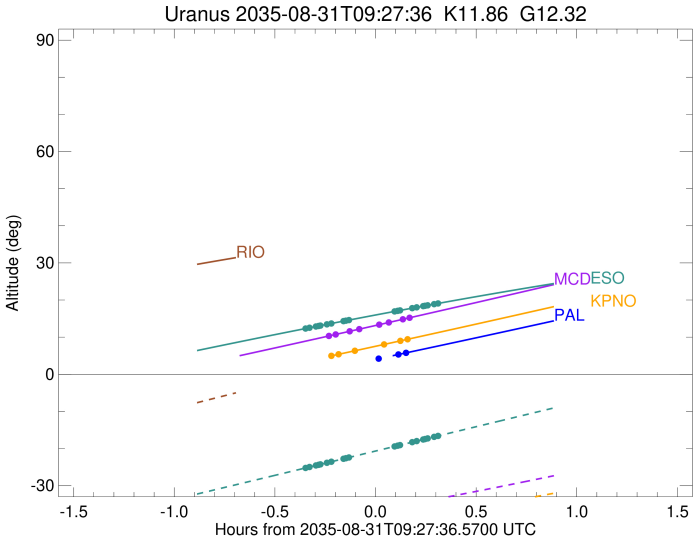
No planet occultations

delta	E	2035-08-31T09:28:21.214		4.17x	-41.84	48300.35	2.18		
lambda	E	2035-08-31T09:34:22.658		5.32	-41.12	50026.71	7.28		
epsilon	E	2035-08-31T09:36:54.599		5.81	-40.81	51282.59	9.04		

Uranus_2035-08-31T09_27_36.5700_KPNO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:23:06 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2035-08-31T09:23:53.170
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 : 3380123082812529664
2Mass ID (if available) : 06584363+2305431
ICRS Star Coord at Epoch: 06h 58m 43.63888s +23:05:42.90464s
RUWE (>1.4 is poor) : 1.12
K magnitude : 11.861
G magnitude : 12.317
RP magnitude : 12.147
BP magnitude : 12.410
DUPflag : 0
Distance (au) : 19.425
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 24.02
Sun-Target sep (deg) : 53.86
Sun-Moon sep (deg) : 32.23
B (ring opening deg) : 63.01
PA of pole (deg) : 77.86
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.362
C/A sky separation (km) : 47368.8
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.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

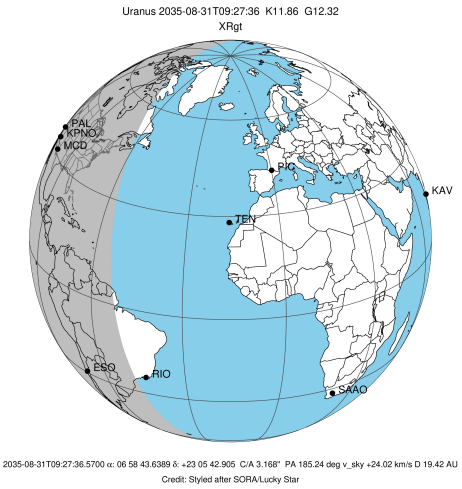
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-08-31T09:14:45.773		5.02	-42.05	51001.46	-9.49		
lambda	I	2035-08-31T09:16:39.197		5.39	-41.81	50026.71	-7.86		
delta	I	2035-08-31T09:21:34.204		6.35	-41.16	48300.35	-3.77		

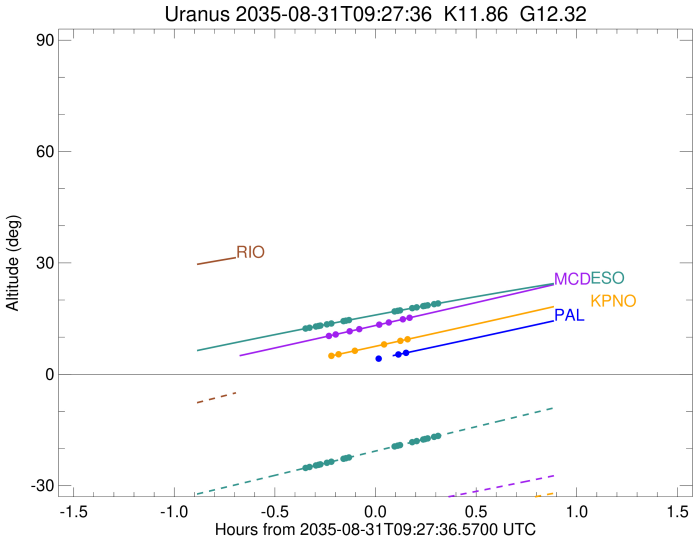
No planet occultations

delta	E	2035-08-31T09:30:02.740		8.01	-40.00	48300.35	3.77		
lambda	E	2035-08-31T09:34:58.067		8.99	-39.30	50026.71	7.85		
epsilon	E	2035-08-31T09:37:22.069		9.46	-38.95	51289.54	9.48		

Uranus_2035-08-31T09_27_36.5700_MCD.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:25:15 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2035-08-31T09:23:50.020
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 : 3380123082812529664
2Mass ID (if available) : 06584363+2305431
ICRS Star Coord at Epoch: 06h 58m 43.63888s +23:05:42.90464s
RUWE (>1.4 is poor) : 1.12
K magnitude : 11.861
G magnitude : 12.317
RP magnitude : 12.147
BP magnitude : 12.410
DUPflag : 0
Distance (au) : 19.425
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 24.02
Sun-Target sep (deg) : 53.86
Sun-Moon sep (deg) : 32.29
B (ring opening deg) : 63.01
PA of pole (deg) : 77.86
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 3.334
C/A sky separation (km) : 46967.6
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.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

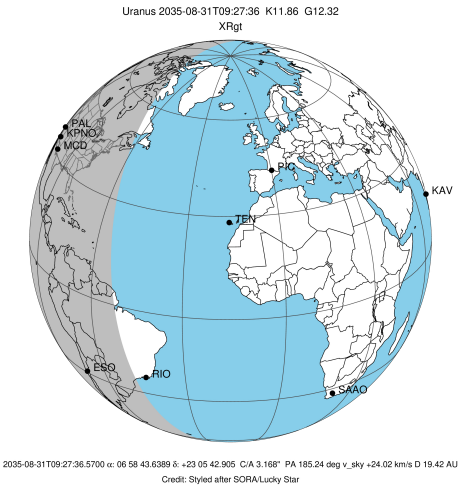
Ring	I/E	UTC	b?	alt	alt-sun	radius	r-dot	lat-geo	lat-geodetic
epsilon	I	2035-08-31T09:14:01.868		10.38	-38.82	50993.28	-10.01		
lambda	I	2035-08-31T09:15:47.131		10.74	-38.54	50026.71	-8.52		
delta	I	2035-08-31T09:19:59.708		11.59	-37.89	48300.35	-5.09		
gamma	I	2035-08-31T09:22:58.602		12.20	-37.41	47621.16	-2.48		

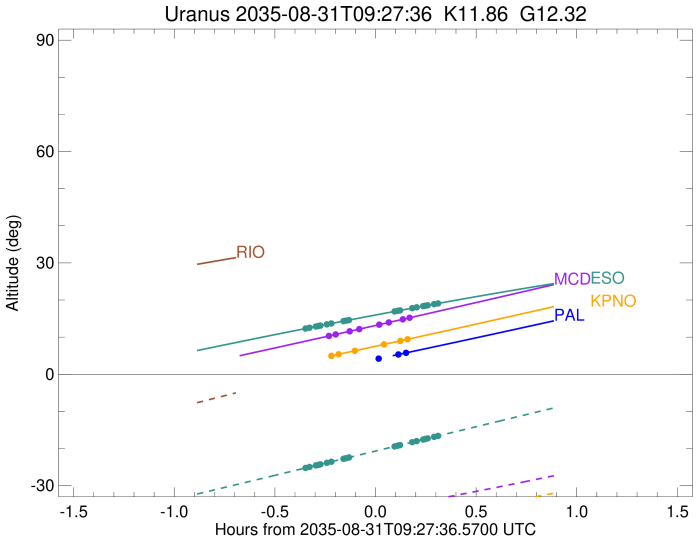
No planet occultations

gamma	E	2035-08-31T09:28:30.718		13.32	-36.52	47621.52	2.48		
delta	E	2035-08-31T09:31:29.594		13.93	-36.03	48300.35	5.09		
lambda	E	2035-08-31T09:35:42.497		14.80	-35.33	50026.71	8.51		
epsilon	E	2035-08-31T09:37:58.406		15.26	-34.95	51297.74	10.00		

Uranus_2035-08-31T09_27_36.5700_ESO.txt
Occultation predictions computed by rfrench@wellesley.edu Sun Jun 11 11:35:54 2023

target : Uranus
target radius (km) : 25559.00
C/A epoch : 2035-08-31T09:24:50.450
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 : 3380123082812529664
2Mass ID (if available) : 06584363+2305431
ICRS Star Coord at Epoch: 06h 58m 43.63888s +23:05:42.90464s
RUWE (>1.4 is poor) : 1.12
K magnitude : 11.861
G magnitude : 12.317
RP magnitude : 12.147
BP magnitude : 12.410
DUPflag : 0
Distance (au) : 19.425
f0 (km) : 0.000
g0 (km) : 0.000
skyplane vel. (km/s) : 24.02
Sun-Target sep (deg) : 53.86
Sun-Moon sep (deg) : 32.03
B (ring opening deg) : 63.01
PA of pole (deg) : 77.86
Pole direction: RA (deg): 257.31100
Dec (deg): -15.17500
C/A sky separation (") : 2.843
C/A sky separation (km) : 40056.6
NAIF SPICE kernels : RAJobs_U111+rgf15.spk
URKALLv1.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	2035-08-31T09:07:02.419		12.37	-25.18	50897.06	-16.21		
lambda	I	2035-08-31T09:07:57.391		12.53	-24.98	50026.71	-15.58		
delta	I	2035-08-31T09:09:52.191		12.87	-24.56	48300.35	-14.47		
gamma	I	2035-08-31T09:10:39.944		13.01	-24.38	47621.05	-13.97		
eta	I	2035-08-31T09:11:12.182		13.11	-24.27	47176.12	-13.63		
beta	I	2035-08-31T09:13:09.583		13.45	-23.84	45655.64	-12.27		
alpha	I	2035-08-31T09:14:28.753		13.69	-23.55	44721.99	-11.31		
4	I	2035-08-31T09:18:10.080		14.33	-22.75	42558.03	-8.25		
5	I	2035-08-31T09:18:47.496		14.44	-22.61	42266.21	-7.63		
6	I	2035-08-31T09:19:47.045		14.61	-22.39	41838.95	-6.78		

No planet occultations

6	E	2035-08-31T09:33:16.995		16.93	-19.44	41859.76	6.77		
5	E	2035-08-31T09:34:07.165		17.07	-19.26	42220.21	7.62		
4	E	2035-08-31T09:34:53.404		17.20	-19.09	42586.29	8.24		
alpha	E	2035-08-31T09:38:33.224		17.81	-18.29	44746.80	11.29		
beta	E	2035-08-31T09:39:49.323		18.02	-18.01	45642.13	12.25		
eta	E	2035-08-31T09:41:47.936		18.35	-17.58	47176.12	13.60		
gamma	E	2035-08-31T09:42:20.389		18.44	-17.46	47623.07	13.94		
delta	E	2035-08-31T09:43:08.106		18.57	-17.29	48300.35	14.44		
lambda	E	2035-08-31T09:45:03.191		18.88	-16.87	50026.71	15.54		
epsilon	E	2035-08-31T09:46:29.053		19.12	-16.56	51393.97	16.16		