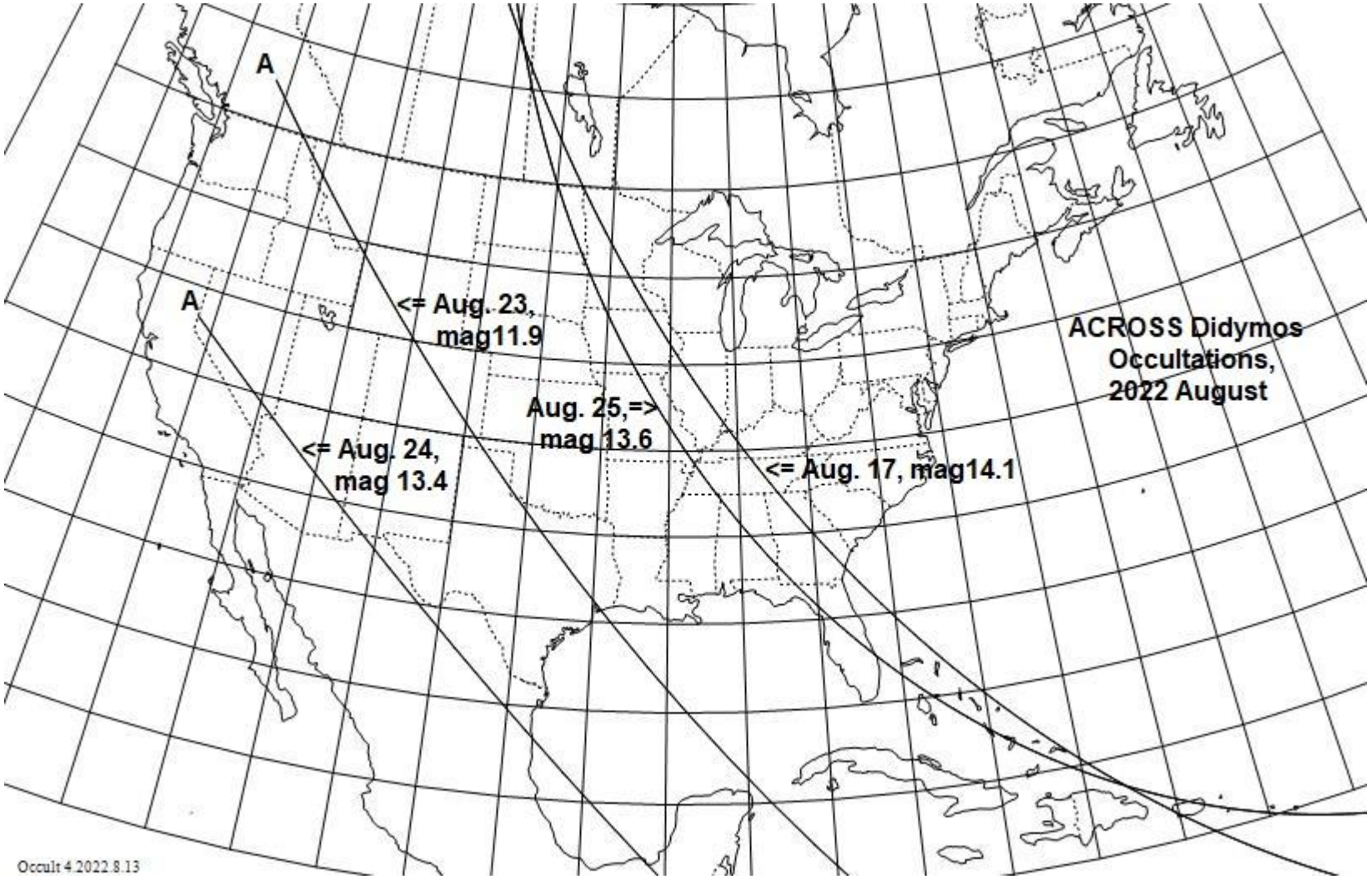
Didymos Occultations during the rest of 2022 and in 2023

David Dunham, IOTA meeting, 2022 Aug. 14



Date			U.T.		Diameter		Durn	Star	Mag-Drop		Elon	%	Star	d Rely	Planet		Min		Moon	
y	m	d	h	m	km	"	sec/m	mag	V	R *	o	Ill	No.	<1.4	No	Name	D	Error	Dist	ill
2022	Aug	17	7	7.1	0.80	0.005	0.21s	14.1	2.3	2.3	155		UCAC4 326-208705	1.10	65803	Didymos	0.70	±0.00	54	69
2022	Aug	23	6	3.5	0.80	0.006	0.20s	11.9	4.0	4.1	155		TYC 6983-01234-1	1.05	65803	Didymos	0.51	±0.00	121	15
2022	Aug	24	5	7.0	0.80	0.006	0.20s	13.4	2.5	2.6	154		UCAC4 315-248868	1.00	65803	Didymos	0.27	±0.00	131	9
2022	Aug	25	7	50.4	0.80	0.006	0.20s	13.6	2.3	2.3	154		UCAC4 313-264410	1.00	65803	Didymos	0.81	±0.00	142	4

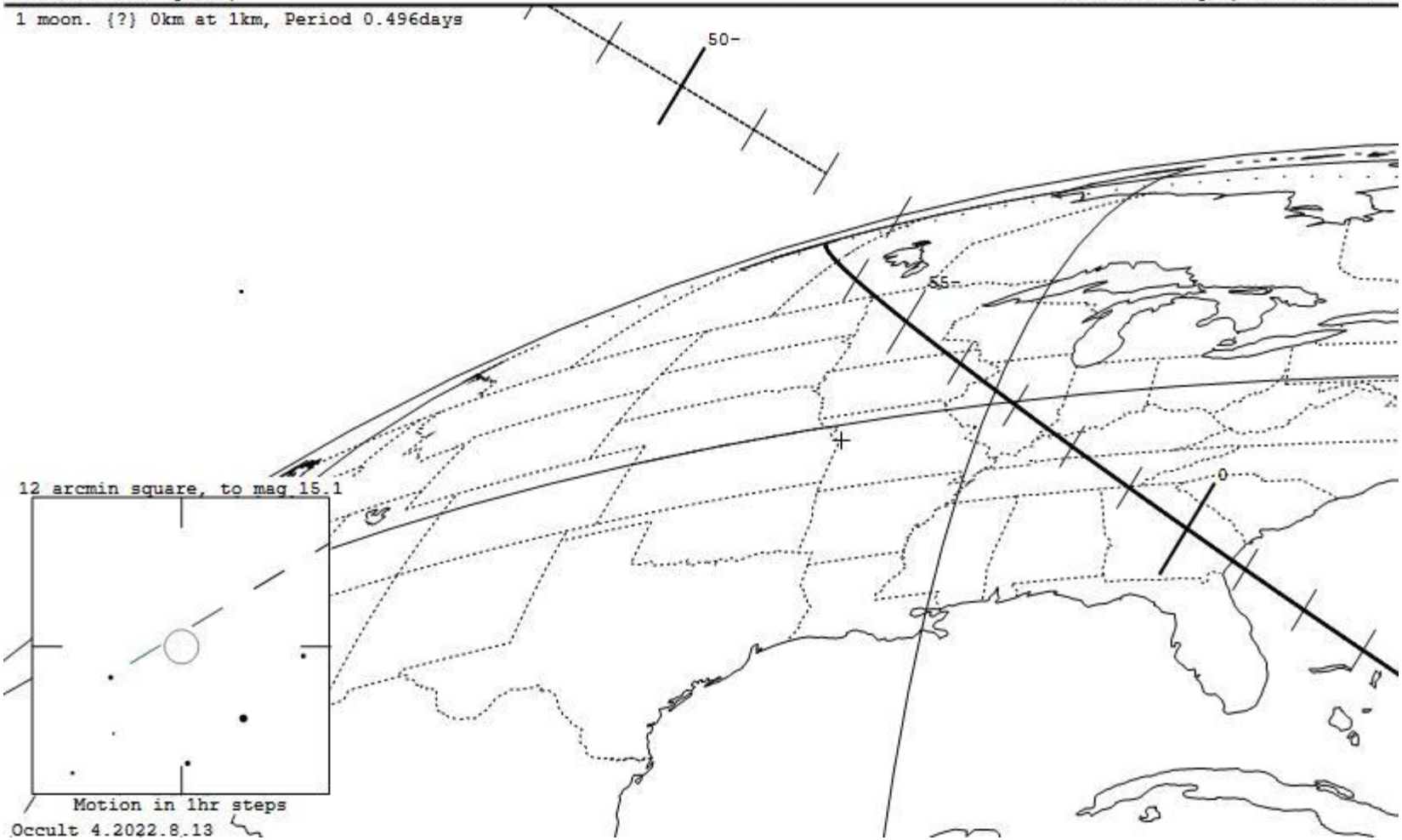
65803 Didymos occults UCAC4 326-208705 on 2022 Aug 17 from 6h 53m to 7h 33m UT

Star: (Dia < 0.1 mas)
Mv 14.1; Mb 14.3; Mr 13.6
RA = 23 19 38.0553 (astrometric)
Dec = -24 50 20.153 ...
[of Date: 23 20 51, -24 42 49]
Prediction of 2022 Aug 9.7
Reliable 1.1 (good),

Durations: Max = 0.21 secs
1km = 0.26 secs, 1mas = 0.041 secs
Mag Drop: 2.3 [88%]v, 2.3 [88%]r
Sun : Dist = 155°
Moon: Dist = 53°, illum = 69%
Error 17.0 x 7.0 mas in PA 85°

Asteroid:
Mag = 16.2
Dia = 0.80 ±0.10km, 5.1 mas
Parallax =40.998"
Hourly dRA = 5.475s
dDec =-44.99"
OrbFit2022Aug17, Known errors

1 moon. {?} 0km at 1km, Period 0.496days



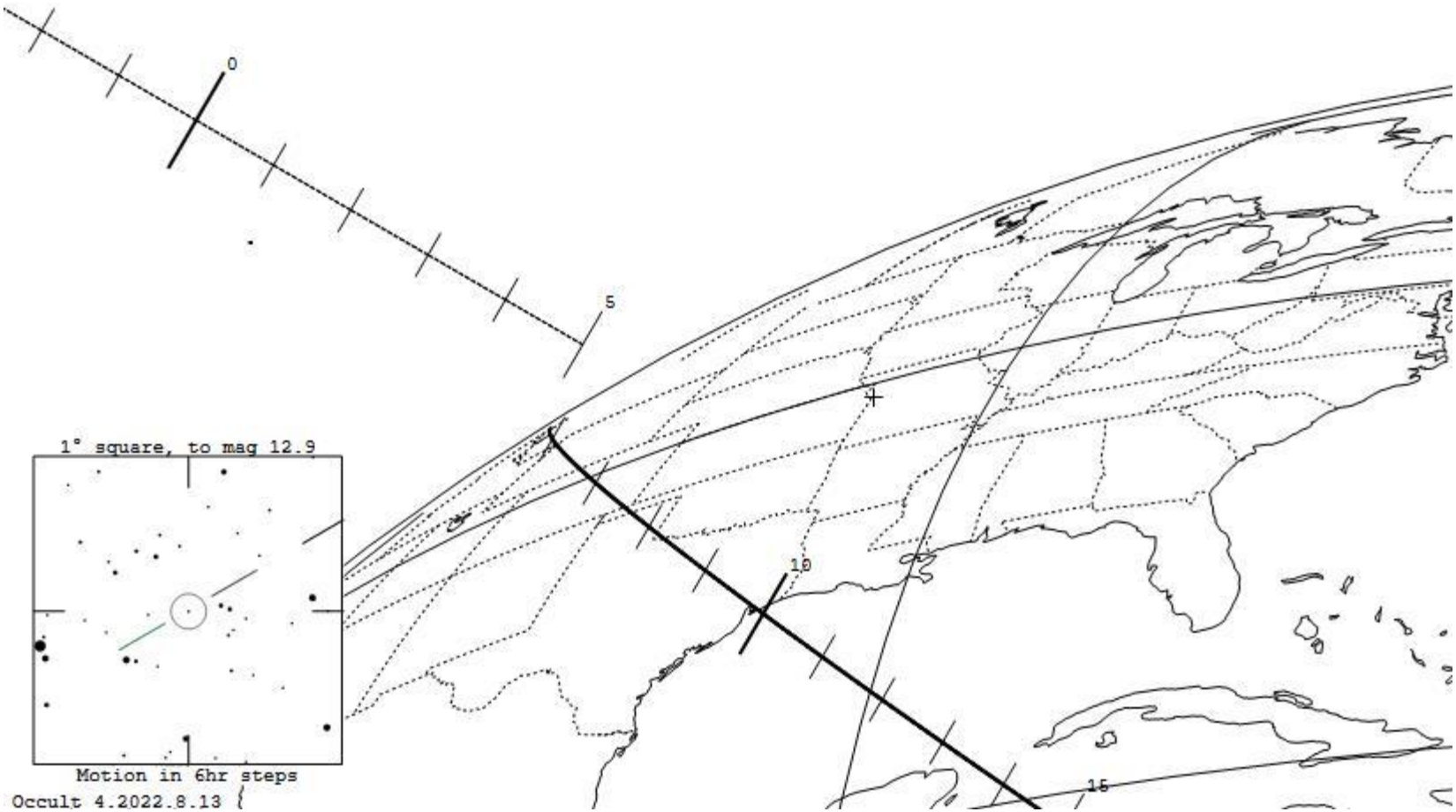
65803 Didymos occults TYC 6983-01234-1 on 2022 Aug 23 from 6h 6m to 6h 54m UT

Star: (Dia < 0.1 mas)
Mv 11.9; Mb 12.3; Mr 11.3
RA = 23 34 0.8067 (astrometric)
Dec = -26 45 57.349 ...
[of Date: 23 35 13, -26 38 22]
Prediction of 2022 Aug 9.7
Reliable 1.1 (good),

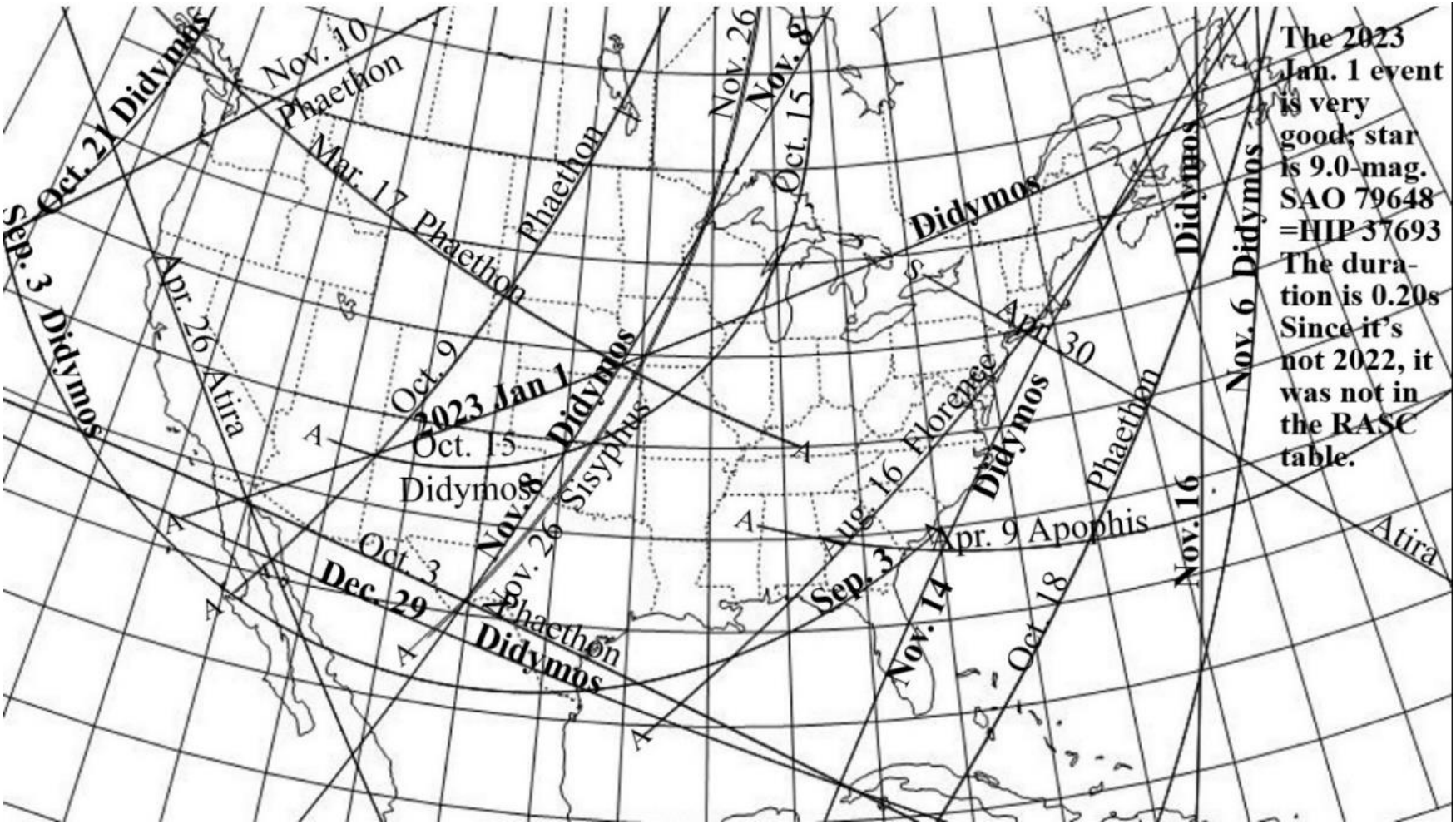
Durations: Max = 0.20 secs
1km = 0.25 secs, 1mas = 0.033 secs
Mag Drop: 4.0 [98%]v, 4.1 [98%]r
Sun : Dist = 155°
Moon: Dist = 121°, illum = 15%
Error 22.0 x 8.0 mas in PA 85°

Asteroid:
Mag = 15.9
Dia = 0.80 ±0.10km, 6.0 mas
Parallax =47.665"
Hourly dRA = 6.651s
dDec =-51.76"
OrbFit2022Aug17, Known errors

1 moon. {?} 0km at 1km, Period 0.496days



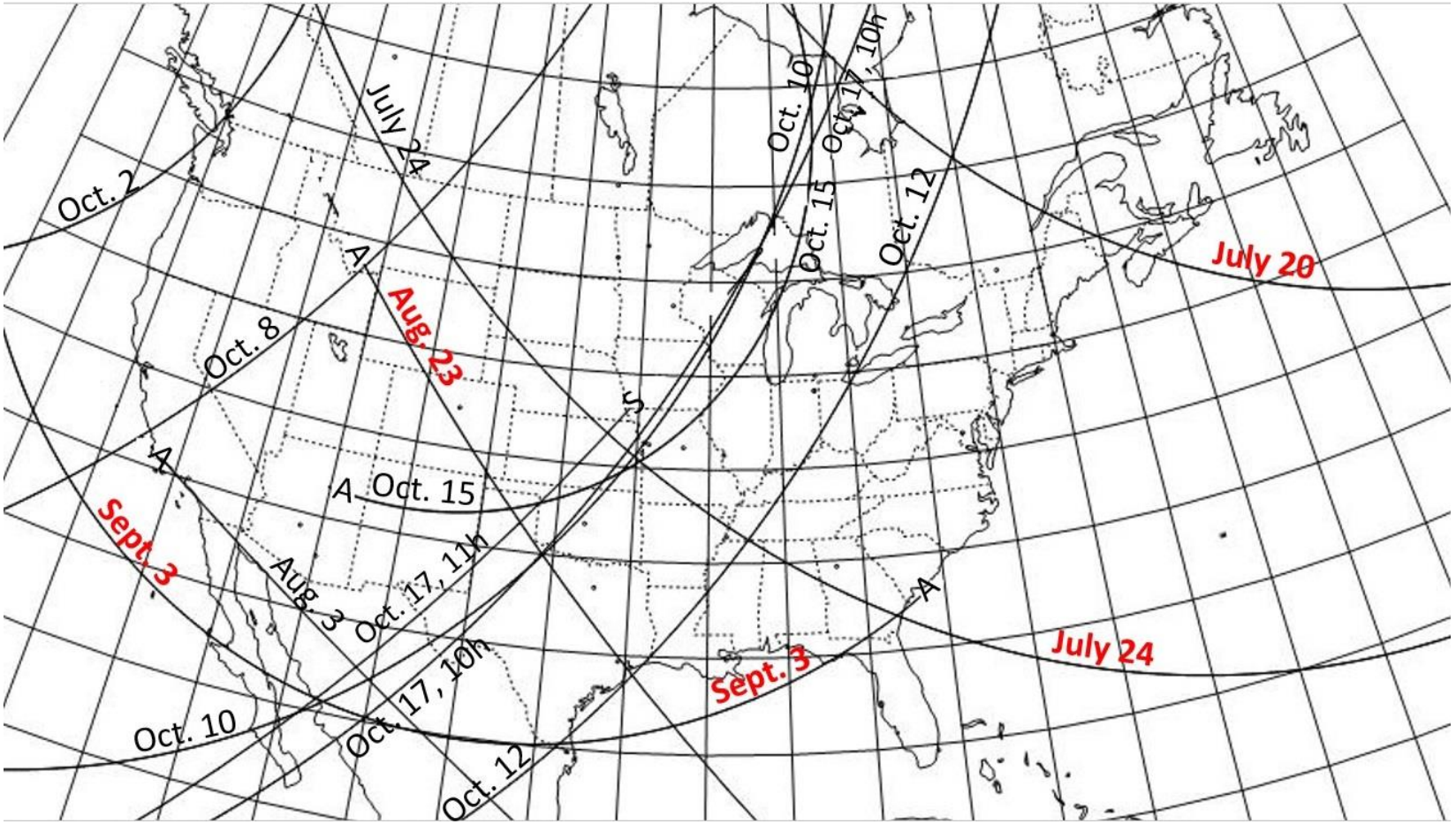
Best 2022 NEA Occns in N. America



Best 2022 NEA Occns in N. America

Date	UT	Occulting Body	Star	Mag.	RA (2000) h m s	Dec ° ′ ″	ΔMag.	Dur. s	Path
Mar.17	03:31	3200 Phaethon	TYC 1219-01612-1	10.1	02 32 41.3	+18 16 41	7.4	0.27	BC-KY
Apr. 9	08:43	99942 Apophis	TYC 5782-01139-1	8.5	21 02 38.3	–14 07 51	11.8	0.02	MS-SC
Apr. 26	04:57	163693 Atira	TYC 3769-00890-1	10.8	06 37 06.1	+54 57 57	7.3	0.11	CA-Baja
Apr. 30	00:24	163693 Atira	TYC 3771-01267-1	10.3	06 56 27.8	+54 55 53	7.9	0.11	ON-NY
Aug.16	08:36	3122 Florence	TYC 2463-00303-1	9.9	07 12 22.4	+37 22 46	7.4	0.11	FL-NL
Sep. 3	10:44	65803 Didymos	TYC 6989-00024-1	10.4	00 11 53.9	–30 58 01	4.8	0.19	Baja-GA
Oct. 3	10:49	3200 Phaethon	TYC 3312-02354-1	11.4	03 26 00.4	+46 18 30	6.3	0.29	Cuba-Baja
Oct. 9	01:58	3200 Phaethon	TYC 3310-01992-1	10.7	03 10 44.9	+46 16 50	6.8	0.26	MB-Baja
Oct. 15	07:05	65803 Didymos	UCAC4 395-013761	10.4	06 28 25.0	–11 02 05	4.9	0.16	AZ-ON
Oct. 18	00:30	3200 Phaethon	UCAC4 678-015381	10.8	02 43 32.7	+45 31 21	6.6	0.23	NL-Cuba
Oct. 21	10:13	65803 Didymos	TYC 4818-00021-1	9.3	07 04 46.4	–03 41 43	6.3	0.18	BC
Nov. 6	07:14	65803 Didymos	TYC 0780-01085-1	10.4	07 59 40.9	+09 07 48	5.7	0.27	DR-NL
Nov. 8	10:44	65803 Didymos	TYC 0785-01766-1	10.5	08 04 12.1	+10 23 02	5.6	0.28	Mex-ON
Nov.10	05:34	3200 Phaethon	UCAC4 647-005831	11.8	01 35 45.5	+39 21 32	5.6	0.22	AB-WA
Nov.14	10:32	65803 Didymos	TYC 0806-00754-1	10.2	08 14 07.4	+13 30 54	6.0	0.33	FL-NL
Nov.16	07:59	65803 Didymos	HIP 40525	9.3	08 16 30.0	+14 24 43	6.9	0.34	DR-NL
Nov.26	07:39	1866 Sisyphus	TYC 3020-00440-1	11.5	12 29 18.8	+41 51 25	5.8	0.29	Mex-ON
Dec.29	06:46	65803 Didymos	UCAC4 595-042049	10.6	07 48 47.5	+28 55 57	5.8	0.25	Cuba-Baja

Occultations by (65803) Didymos in North America to Oct. 17, 2022 to mag. 12.0



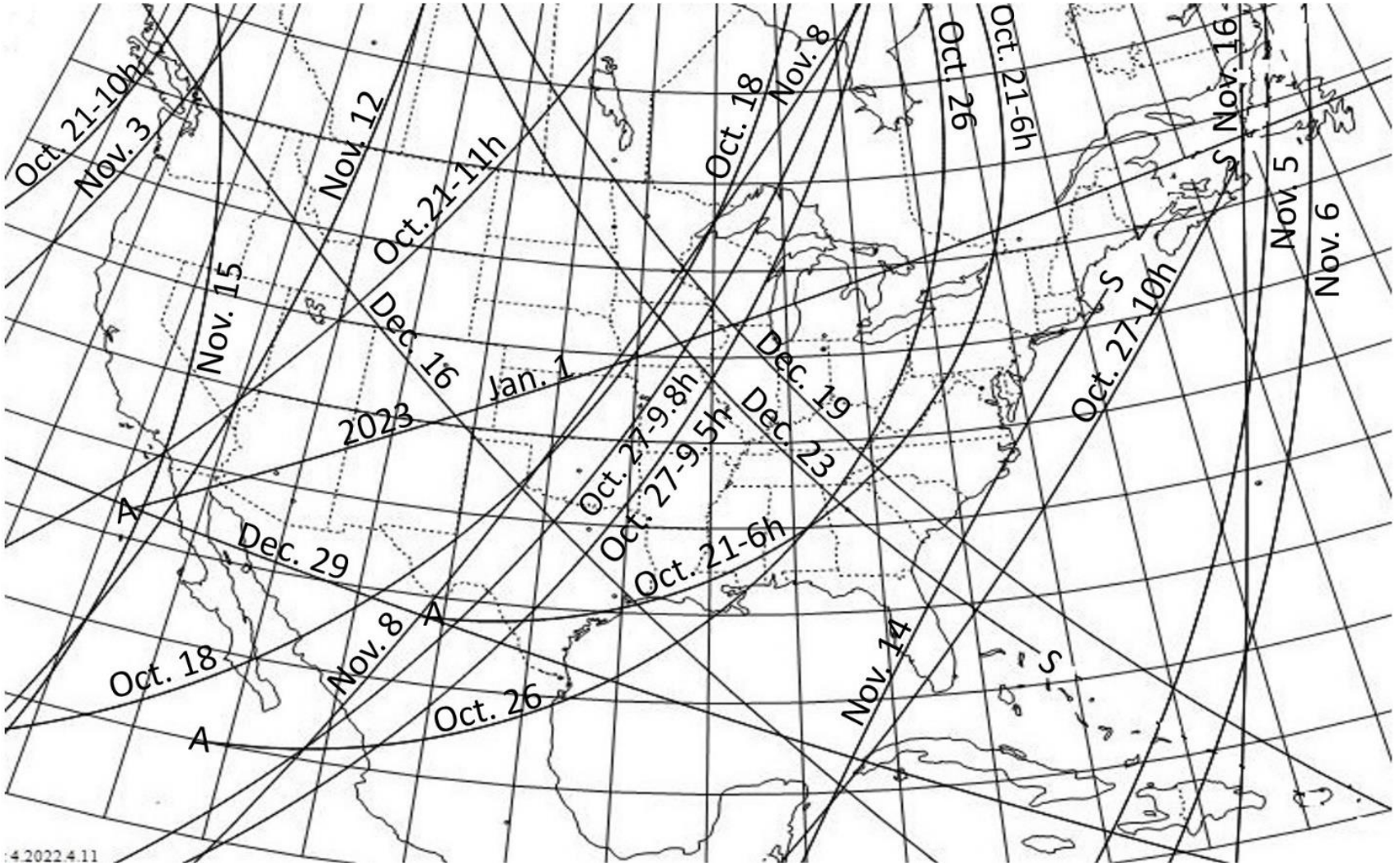
Occultations by (65803) Didymos in North America to Oct. 17, 2022 to mag. 12.0

Occultations by (65803) Didymos (diam. 0.8 km) in 2022 to Oct. 17 and to mag. 12.0

Date	U.T.	Diam.	Durn	Star	dMag	Elon	Star	d	RUWE	Moon		Star R.A. (J2000)			Dec.			
m d	h m	"	sec	mag		o	No.		<1.4	Dist	ill	h	m	s	o	'	"	Path
Jul 20	7 19	0.003	0.18s	11.2	6.8	144	UCAC4 354-192857	W	1.10	52	53	22	31	50.718	-19	19	14.00	ON-NS
Jul 24	8 48	0.003	0.19s	11.7	6.0	146	TYC 6389-01164-1		1.25	100	16	22	37	58.052	-19	47	29.20	AB-GA
Aug 3	5 42	0.004	0.21s	11.5	5.6	151	UCAC4 344-200889		1.15	142	27	22	53	26.421	-21	22	31.71	CA-Mex
Aug 23	6 9	0.006	0.21s	11.9	4.0	155	TYC 6983-01234-1		1.05	121	15	23	34	0.807	-26	45	57.35	MT-TX
Sep 3	10 49	0.008	0.19s	10.4	4.8	150	TYC 6989-00024-1		1.20	100	47	0	11	53.866	-30	58	1.44	Baja-GA
Oct 2	10 56	0.015	0.13s	11.3	3.3	115	TYC 6470-00344-1	D	0.85	119	44	4	28	37.288	-28	32	9.25	WA-BC
Oct 8	12 23	0.015	0.14s	11.3	3.6	107	TYC 5924-00164-1	V	4.90	83	98	5	32	52.757	-20	31	3.36	CA-MB
Oct 10	9 31	0.015	0.14s	11.4	3.6	105	TYC 5922-00731-1		2.00	69	100	5	50	6.221	-17	49	23.11	Baja-ON
Oct 12	9 51	0.015	0.15s	11.9	3.3	103	UCAC4 376-011231		1.05	55	93	6	6	55.894	-14	57	49.89	Mex-QC
Oct 15	7 3	0.014	0.16s	10.4	4.9	101	UCAC4 395-013761		1.20	40	72	6	28	24.994	-11	2	4.64	AZ-ON
Oct 17	10 26	0.013	0.16s	11.7	3.7	100	TYC 5378-02094-1		0.85	37	53	6	42	22.253	- 8	18	7.19	Baja-ON
Oct 17	11 46	0.013	0.16s	11.8	3.6	100	UCAC4 409-017214	s	0.95	37	52	6	42	40.991	- 8	14	2.37	Baja-ON

Times are for a point near the center of the path; they will be a few minutes earlier or later for other locations along the path. Listed diam. is in arc seconds.
RUWE is a measure of the astrometric reliability of the Gaia astrometric data for the star. Values >1.4 means that the astrometric data probably have large errors so the event is unsuitable for mobile efforts.
An entry under "d" indicates probable duplicity or variability of the star. "ill" is the percent of the Moon that is sunlit.

Occultations by (65803) Didymos in North America, Oct. 18, 2022 to Jan. 1, 2023 to mag. 12.0



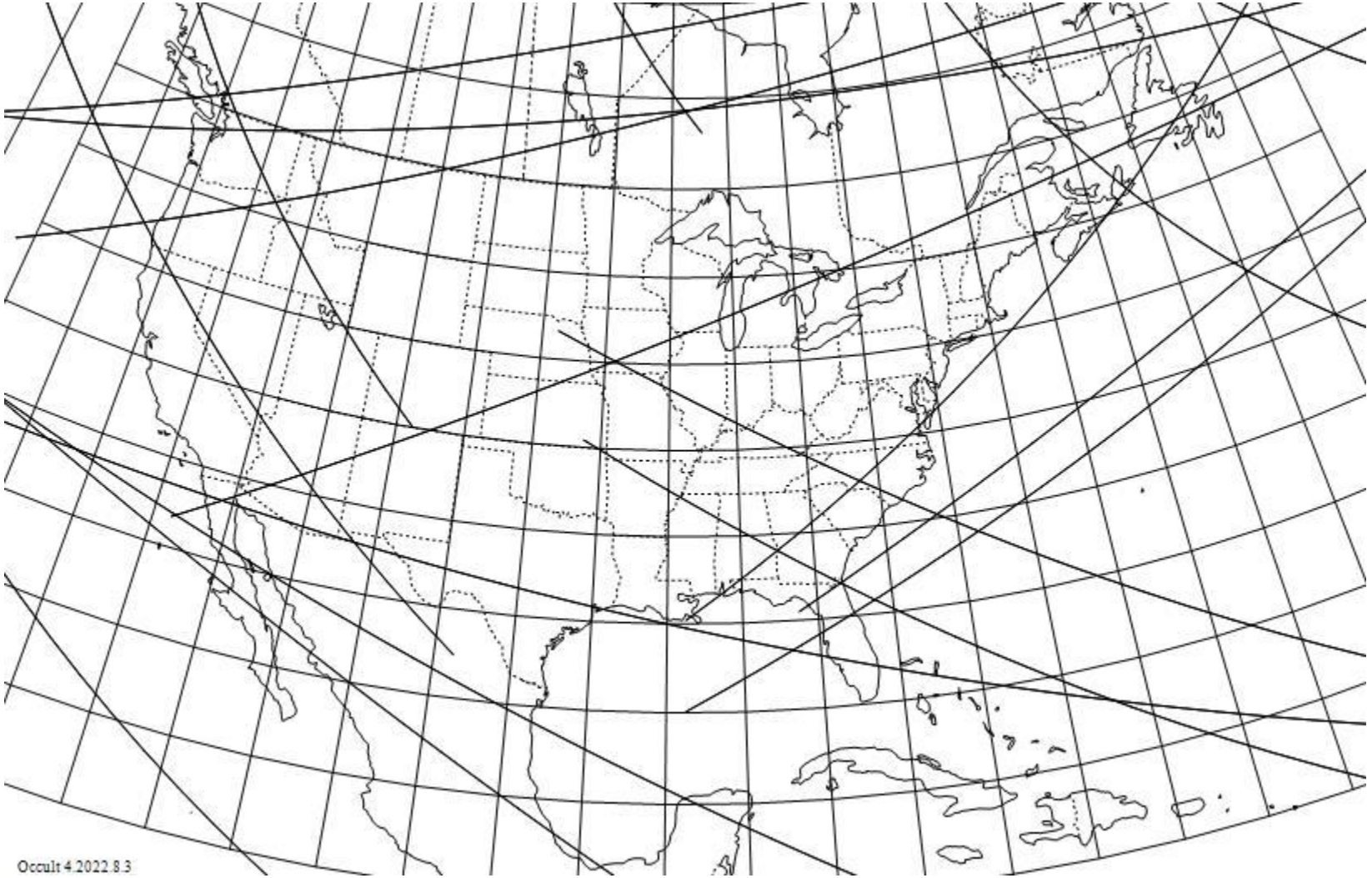
Occultations by (65803) Didymos in North America, Oct. 18, 2022 to Jan. 1, 2023 to mag. 12.0

Occultations by (65803) Didymos (dism. 0.8 km) in 2022, Oct. 18 to Dec. 32 to mag. 12.0

Date	U.T.	Diam.	Durn	Star	dMag	Elon	Star	d	RUWE	Moon		Star R.A. (J2000)			Dec.			
m d	h m	"	sec	mag		o	No.		<1.4	Dist	ill	h	m	s	o	'	"	Path
Oct 18	9 27.8	0.013	0.17s	11.9	3.5	99	UCAC4 415-020209		0.95	39	44	6	48	8.982	- 7	8	40.32	Baja-ON
Oct 21	6 37.3	0.012	0.18s	12.0	3.6	99	UCAC4 431-026642		1.00	57	18	7	3	59.213	- 3	51	45.04	Mex-QC
Oct 21	10 30.7	0.012	0.18s	9.3	6.3	99	TYC 4818-00021-1	s	1.15	58	17	7	4	46.382	- 3	41	42.50	BC
Oct 21	11 50.5	0.012	0.18s	11.9	3.7	99	UCAC4 432-026745	s	1.15	59	17	7	5	1.423	- 3	37	55.77	CA-MB
Oct 26	7 4.7	0.011	0.20s	11.3	4.4	99	TYC 165-01398-1		1.10	109	1	7	26	29.796	1	3	50.37	Mex-QC
Oct 27	9 30.7	0.011	0.21s	11.9	3.9	99	TYC 182-00624-1		2.25	122	5	7	30	40.938	2	1	21.31	Mex-ON
Oct 27	9 49	0.011	0.21s	12.0	3.8	99	UCAC4 461-035669		0.95	122	5	7	30	45.537	2	2	30.00	Mex-ON
Oct 27	10 0	0.011	0.21s	11.1	4.7	99	TYC 182-00434-1		0.90	122	5	7	30	45.053	2	2	52.68	FL-NL
Nov 3	11 29.0	0.010	0.25s	11.1	4.8	102	TYC 193-01404-1		1.15	136	74	7	52	49.408	7	20	7.19	WA-BC
Nov 5	7 19.0	0.009	0.26s	11.8	4.2	103	UCAC4 493-048766		0.95	114	89	7	57	23.462	8	31	10.20	NL
Nov 6	7 13.6	0.009	0.27s	10.4	5.7	103	TYC 780-01085-1	s	1.45	102	95	7	59	40.887	9	7	47.53	NL
Nov 8	11 13.1	0.009	0.28s	10.5	5.6	104	TYC 785-01766-1		0.95	75	100	8	4	12.087	10	23	2.02	Mex-ON
Nov 12	10 37.1	0.008	0.31s	11.5	4.6	107	UCAC4 513-046594		1.05	30	85	8	11	14.366	12	30	29.01	Baja-AB
Nov 14	10 52.5	0.008	0.33s	10.2	6.0	109	TYC 806-00754-1	s	1.05	12	70	8	14	7.432	13	30	54.23	FL-MA
Nov 15	9 14.6	0.008	0.33s	11.6	4.5	110	TYC 806-01489-1	K	1.20	13	61	8	15	22.238	13	57	8.25	CA-BC
Nov 16	8 4.0	0.008	0.34s	9.3	6.9	110	HIP 40525	d	2.80	21	52	8	16	29.987	14	24	42.54	NS-NL
Dec 16	10 10.7	0.005	0.29s	11.8	4.5	145	UCAC4 579-040945		0.95	56	50	8	9	44.215	25	47	14.38	TX-BC
Dec 19	10 41.9	0.005	0.28s	11.7	4.6	149	UCAC4 584-041217		1.00	96	20	8	5	18.268	26	38	58.81	SC-SK
Dec 23	11 40.7	0.005	0.26s	12.0	4.3	154	UCAC4 589-042636		0.90	156	0	7	58	46.695	27	41	24.76	GA-SK
Dec 29	7 6.9	0.004	0.25s	10.6	5.8	162	UCAC4 595-042049		0.80	116	42	7	48	47.541	28	55	57.43	TX-Mex
Jan 1*	1 34.5	0.004	0.25s	9.0	7.4	165	HIP 37693	s	1.25	79	70	7	43	58.987	29	24	21.68	NL-Baja

*Last event is in 2023, UT date Jan. 1 = 2022 Dec. 32; the star is SAO 79648, spec. type K0, path also over Iberia.
Times are for a point near the center of the path; they will be a few minutes earlier or later for other locations along the path. The listed diam. is in arc seconds.
RUWE is a measure of the astrometric reliability of the Gaia astrometric data for the star. Values >1.4 means that the astrometric data probably have large errors so the event is unsuitable for mobile efforts.
An entry under "d" indicates probable duplicity or variability of the star. "ill" is the % of the Moon sunlit.

Occultations by (65803) Didymos in North America, 2023 to mag. 14.0



Occultations by (65803) Didymos in North America, 2023 to mag. 14.0

2023 North American Didymos Occultations to Mag. 14.0

Date			U.T.		Diameter		Durn	Star	Mag-Drop		Elon	%	Star	d	Rely	Planet		Min		Moon	
y	m	d	h	m	km	"	sec/m	mag	V	R *	o	Ill	No.		<1.4	No	Name	D	Error	Dist	ill
2023	Jan	1	1	34.5	0.78	0.004	0.25s	9.0	7.6	7.7	165		HIP 37693	s	1.25	65803	Didymos	0.20	±0.00	79	70
2023	Jan	3	12	34.3	0.80	0.004	0.25s	13.7	2.9	2.9	168		UCAC4 599-041974		1.00	65803	Didymos	0.55	±0.00	47	90
2023	Jan	4	13	4.7	0.80	0.004	0.25s	13.7	2.9	3.0†	169		UCAC4 600-042691		0.95	65803	Didymos	0.69	±0.00	34	95
2023	Jan	5	23	44.5	0.80	0.004	0.26s	11.4	5.2	5.5	170		TYC 2453-00085-1		0.95	65803	Didymos	0.18	±0.00	17	99
2023	Jan	6	8	23.8	0.80	0.004	0.26s	10.8	5.8	5.8	170		TYC 2453-00503-1		1.40	65803	Didymos	0.71	±0.00	12	100
2023	Jan	9	3	5.4	0.80	0.004	0.27s	12.9	3.9	4.1	171		UCAC4 602-041020		1.00	65803	Didymos	0.40	±0.00	22	96
2023	Jan	10	2	57.8	0.80	0.004	0.27s	13.6	3.2	3.2	171		UCAC4 603-042004		1.00	65803	Didymos	0.36	±0.00	34	91
2023	Jan	12	8	47.7	0.80	0.003	0.28s	13.1	3.8	3.9	171		UCAC4 604-040522		0.90	65803	Didymos	0.04	±0.00	62	76
2023	Jan	16	12	53.1	0.80	0.003	0.32s	11.6	5.6	5.9	168		TYC 2452-01843-1		0.90	65803	Didymos	0.82	±0.00	116	35
2023	Jan	18	7	13.3	0.80	0.003	0.34s	13.1	4.2	4.2	167		UCAC4 605-040083		1.00	65803	Didymos	0.01	±0.00	141	18
2023	Jan	21	24	9.3	0.77	0.003	0.41s	9.1	8.5	8.2	163		TYC 2451-01892-1	s	1.10	65803	Didymos	0.25	±0.00	163	0
2023	Jan	23	5	25.0	0.80	0.003	0.44s	12.4	5.2	5.2	162		TYC 2451-02251-1		1.05	65803	Didymos	0.37	±0.00	144	3
2023	Jan	28	24	25.8	0.80	0.003	0.71s	13.4	4.6	4.4	156		UCAC4 604-039160		10.5	65803	Didymos	0.50	±0.00	63	53
2023	Mar	2	6	9.8	0.80	0.001	0.15s	12.1	7.8	8.1	127		UCAC4 593-040703		0.85	65803	Didymos	0.79	±0.00	5	77
2023	Mar	20	4	9.9	0.80	0.001	0.08s	13.7	7.0	7.0	115		UCAC4 585-040450		0.95	65803	Didymos	0.07	±0.00	136	4
2023	Apr	9	2	11.3	0.80	0.001	0.06s	14.0	7.4	7.4	102		UCAC4 573-043875		1.10	65803	Didymos	0.32	±0.00	113	91
2023	Apr	25	2	10.0	0.80	0.001	0.04s	13.7	8.1	8.3	93		UCAC4 563-046290		0.95	65803	Didymos	0.34	±0.00	33	24
2023	May	4	6	15.2	0.80	0.001	0.04s	12.3	9.7	9.7	88		UCAC4 557-046174	K	3.00	65803	Didymos	0.46	±0.00	74	98