

Single Night Observations

Figure 8 (row 1, column 3). For each of the 12 asteroids, we averaged the distances from all six observations, and find the residuals by comparison with NASA JPL Horizons Data.

R1: .05815 R2: .05737 Quit About Open... NewObj AddObj epheM Full Herget Vaiza resiD Gauss constr Epoch all_perts Undo FilterObs NonGravs Ca

(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Sep 19.83543 ± 3.48 TT = 20:03:01 (JD 2460573.33543)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0029 Find_Orb

M 355.99072106 ± 5.7 (J2000 ecliptic)

n 0.25318402 ± 0.309 Peri. 185.42303 ± 0.7

a 2.47463897 ± 2.02 Node 172.12689 ± 3.3

e 0.5930922 ± 0.332 Incl. 7.86262 ± 2.3

P 3.89285 U 12.0

q 1.00694970 ± 0.00076 Q 3.94232823 ± 4.03

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 0".02

MOIDs: Me 0.641454 Ve 0.282661 Ea 0.002889 Ma 0.221216

MOIDs: Ju 1.499623 Sa 5.487058 Ur 14.343757 Ne 26.294196

Find_Orb ver: 2025 May 15

Tisserand relative to Earth: 2.91340

Tisserand relative to Jupiter: 3.20270

Earth encounter velocity 8.8285 km/s

Barbee-style encounter velocity: 9.0615 km/s

Score: 0.318049

YYYY MM DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024 09 05.98819	17 56 54.84	+05 04 46.7	FixMel		807		.01+	.00	.05815	1.0233
C2024 09 06.01944	17 56 54.25	+05 03 45.8	FixMel		807		.01+	.00	.05799	1.0233
C2024 09 06.05069	17 56 53.73	+05 02 44.1	FixMel		807		.03-	.01-	.05784	1.0232
C2024 09 06.08194	17 56 53.35	+05 01 41.7	FixMel		807		.01-	.03+	.05768	1.0231
C2024 09 06.11319	17 56 53.17	+05 00 38.5	FixMel		807		.05+	.02-	.05752	1.0230
C2024 09 06.14444	17 56 53.23	+04 59 34.7	FixMel		807		.02-	.00	.05737	1.0230

R1: .03794 R2: .04121

Quit About Open... NewObj AddObj ephem Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NonGravs C

☐Mer ☐Ven ☐Ear ☐Mar ☐Jup ☐Sat ☐Ura ☐Nep ☐Plu ☐Moo

(a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Aug 31.17306 ± 172673 TT = 4:09:12 (JD 2460553.67306)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0273 Find_Orb

q 1.02362416 ± 1459 (J2000 ecliptic) Peri. 349.89090 ± 300000

z -2.2255529901 ± 3138 Node 342.38511 ± 15000

e 3.2781298 ± 1910 Incl. 61.24197 ± 90000

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 74457".29

MOIDs: Me 0.633903 Ve 0.299306 Ea 0.027282 Ma 0.347773

MOIDs: Ju 3.891462 Sa 8.013444 Ur 15.262614 Ne 24.924627

Find_Orb ver: 2025 May 15

Earth encounter velocity 53.7658 km/s

Barbee-style encounter velocity: 79.1483 km/s

Score: 27061.468663

YYYY MM DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024 09 05.98819	20 20 46.48	+45 46 22.0	FixMe1		807	491'- 30d+	.03794	1.0391		
C2024 09 06.01944	20 20 57.83	+45 46 15.3	FixMe1		807	475'- 29d+	.03857	1.0393		
C2024 09 06.05069	20 21 09.08	+45 46 06.5	FixMe1		807	459'- 28d+	.03921	1.0395		
C2024 09 06.08194	20 21 20.28	+45 45 55.4	FixMe1		807	443'- 27d+	.03986	1.0396		
C2024 09 06.11319	20 21 31.50	+45 45 42.0	FixMe1		807	428'- 26d+	.04053	1.0398		
C2024 09 06.14444	20 21 42.79	+45 45 26.2	FixMe1		807	413'- 25d+	.04121	1.0400		

2024 RN15

R1: .12117	R2: .10844	Quit	About	Open...	NewObj	AddObj	epheM	Full	Herget	Vaisa	resiD	Gauss	constr	Epoch	all	perts	Undo	FilterObs	NonGr
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(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405: covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Sep 14.78037 \pm 3838 TT = 18:43:44 (JD 2460568.28037)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0024 Ju: 0.8618

α 0.71697648 \pm 52.5 Ma: 0.0569 Find Orb

Peri. 45.27682 \pm 33000

z -28.2337740770 ± 25486 Node 343.52401 ± 23000

e	21.2429521 ± 24144	Incl.	16.54999 ± 19000
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From 6 observations 2024 Sept. 5-6 (3.8 hr): mean residual 130564".67

MOIDs: Me 0.404102 Ve 0.132474 Ea 0.002360 Ma 0.056904

MOIDs: Ju 0.861835 Sa 1.854791 Ur 3.525453 Ne 6.046199

Find Orb ver: 2025 May 15

Earth encounter velocity 145.6708 km/s

Barbee-style encounter velocity: 185.6479 km/s

Score: 147457.523860

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	22 41 53.42	+04 24 28.1	FixMel			807	41d+	38d+	.12117	1.0905
C2024	09	06.01944	22 41 54.02	+04 25 16.6	FixMel			807	41d+	38d+	.11861	1.0883
C2024	09	06.05069	22 41 54.48	+04 26 05.1	FixMel			807	41d+	38d+	.11607	1.0861
C2024	09	06.08194	22 41 54.81	+04 26 53.5	FixMel			807	41d+	38d+	.11352	1.0839
C2024	09	06.11319	22 41 55.04	+04 27 41.9	FixMel			807	42d+	38d+	.11098	1.0817
C2024	09	06.14444	22 41 55.20	+04 28 30.3	FixMel			807	42d+	38d+	.10844	1.0796

File

R1: .08953 R2: .07584 Quit About Open... NewObj AddObj ephM Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NonGravs

(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast

Click on an observation to get information about it. Right-click to get

further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Sep 12.12666 ± 5038 TT = 3:02:23 (JD 2460565.62666)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0247 Find_Orb

q 0.90054798 ± 123 (J2000 ecliptic)

z -27.5285485501 ± 113073 Peri. 210.18347 ± 13000

e 25.7907788 ± 107133 Node 166.06717 ± 13000

e 25.7907788 ± 107133 Incl. 101.34052 ± 27000

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 98672".16

MOIDs: Me 0.547086 Ve 0.247892 Ea 0.024654 Ma 0.321521

MOIDs: Ju 3.467681 Sa 7.545031 Ur 16.151233 Ne 25.359458

Find_Orb ver: 2025 May 15

Earth encounter velocity 170.9218 km/s

Barbee-style encounter velocity: 159.4844 km/s

Score: 110111.389231

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	21 48 09.63	+36 44 01.1	FixMel			807	38d-	210'-	.08953	1.0630
C2024	09	06.01944	21 48 08.07	+36 43 56.7	FixMel			807	39d-	171'-	.08675	1.0615
C2024	09	06.05069	21 48 06.37	+36 43 51.2	FixMel			807	39d-	7761-	.08399	1.0599
C2024	09	06.08194	21 48 04.56	+36 43 44.4	FixMel			807	40d-	5056-	.08124	1.0584
C2024	09	06.11319	21 48 02.66	+36 43 36.1	FixMel			807	40d-	2146-	.07853	1.0569
C2024	09	06.14444	21 48 00.72	+36 43 26.3	FixMel			807	41d-	992+	.07584	1.0554

R1: 499829 R2: 187018 Quit About Open... NewObj AddObj ephM Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NO
ToggDn BanObs SaveOrbs ShowFile
(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast
Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.
Version 2025 May 15
Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]
Perihelion 2024 Oct 11.15405 ± 11.3 TT = 3:41:49 (JD 2460594.65405)
Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0001 Ju: 0.1877
q 0.73831242 ± 0.457 Ve: 0.0711 Sa: 0.4545 Find_Orb
z -0.0324302777 ± 0.0131 Peri. 241.84453 ± 36
e 1.0239436 ± 0 Node 163.85853 ± 21
Incl. 11.25897 ± 32
From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 44839".40

MOIDs: Me 0.424487 Ve 0.071058 Ea 0.000115 Ma 0.1489
MOIDs: Ju 0.187713 Sa 0.454534 Ur 1.885016 Ne 2.9211
Find_Orb ver: 2025 May 15
Earth encounter velocity 23.8994 km/s
Barbee-style encounter velocity: 69.0999 km/s
Score: 26134.356217

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	22 04 22.25	-03 54 57.7	FixMel			807	2162+	817'-	499829	1.0112
C2024	09	06.01944	22 04 26.21	-03 54 48.3	FixMel			807	520-	863'-	436206	1.0108
C2024	09	06.05069	22 04 30.05	-03 54 38.7	FixMel			807	4067-	924'-	372907	1.0104
C2024	09	06.08194	22 04 33.81	-03 54 29.1	FixMel			807	9034-	17d-	310066	1.0100
C2024	09	06.11319	22 04 37.51	-03 54 19.2	FixMel			807	276'-	19d-	247927	1.0096
C2024	09	06.14444	22 04 41.18	-03 54 09.2	FixMel			807	489'-	22d-	187018	1.0092

2024 RO2

R1: 792366 R2: 611281
Quit About Open... NewObj AddObj ephM Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NonGrav
(☐)Mer (☐)Ven (☐)Ear (☐)Mar (☐)Jup (☐)Sat (☐)Ura (☐)Nep (☐)Plu (☐)Moo (a)Ast
Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.
Version 2025 May 15
Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]
Perihelion 2024 Oct 10.20281 ± 7349 TT = 4:52:02 (JD 2460593.70281)
Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0011 Ju: 0.4203
M 352.94473834 ± 11000 Ma: 0.0606 Find_Orb
n 0.19488161 ± Peri. 224.68800 ± 7000
a 2.94638033 ± Node 167.64406 ± 17
e 0.7048002 ± 213 Incl. 1.05825 ± 3000
P 5.05747 U 16.4
q 0.86977061 ± 13.4 Q 5.02299005 ± 2759 (J2000 ecliptic)
From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 36717".93

MOIDs: Me 0.541341 Ve 0.147401 Ea 0.001070 Ma 0.060640
MOIDs: Ju 0.420307 Sa 4.731356 Ur 13.435651 Ne 25.299885
Find_Orb ver: 2025 May 15
Tisserand relative to Earth: 2.77438
Tisserand relative to Jupiter: 2.83347
Earth encounter velocity 14.2499 km/s
Barbee-style encounter velocity: 13.9585 km/s
Score: 13509.900068

YYYY MM DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024 09 05.98819	22 10 20.22	+17 34 12.0	FixMel			807	363'+	925'+	792366	1.0130
C2024 09 06.01944	22 10 20.10	+17 34 37.7	FixMel			807	344'+	880'+	755415	1.0128
C2024 09 06.05069	22 10 19.86	+17 35 03.2	FixMel			807	324'+	830'+	718781	1.0125
C2024 09 06.08194	22 10 19.53	+17 35 28.1	FixMel			807	303'+	775'+	682514	1.0123
C2024 09 06.11319	22 10 19.14	+17 35 52.5	FixMel			807	280'+	715'+	646665	1.0121
C2024 09 06.14444	22 10 18.71	+17 36 16.4	FixMel			807	254'+	647'+	611281	1.0118

RL: .43899 R2: .44149 Quit About Open... NewObj AddObj epheM Full Herget Vaisa resid Gauss constr Epoch all_perts Undo FilterObs NonGrav

(o)Mer

(o)Ven

(o)Ear

(o)Mar

(o)Jup

(o)Sat

(o)Ura

(o)Nep

(o)Plu

(o)Moo

(a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Jun 27.43309 ± 667655 TT = 10:23:38 (JD 2460488.93309)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0681 Find_Orb

M 28.91326689 ± 800000 (J2000 ecliptic)

n 0.42167957 ± Peri. 281.60703 ± 800000 Tisserand relative to Earth: 1.87722

a 1.76122296 ± Node 323.44760 ± 70000 Earth encounter velocity 31.7884 km/s

e 0.6363756 ± 17120 Incl. 50.24128 ± 290000 Barbee-style encounter velocity: 32.0662 km/s

P 2.337/853.713d U 19.3 Score: 7225.481088

q 0.64042349 ± 3512 Q 2.88202243 ± 884311

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 7368".80

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	20 02 09.08	+49 30 57.5	FixMel			807	9345+	3704+	.43899	1.2337
C2024	09	06.01944	20 02 10.04	+49 31 04.8	FixMel			807	9387+	3789+	.43949	1.2340
C2024	09	06.05069	20 02 10.95	+49 31 10.8	FixMel			807	9428+	3873+	.43999	1.2343
C2024	09	06.08194	20 02 11.84	+49 31 15.3	FixMel			807	9470+	3955+	.44049	1.2346
C2024	09	06.11319	20 02 12.76	+49 31 18.5	FixMel			807	9511+	4037+	.44099	1.2350
C2024	09	06.14444	20 02 13.72	+49 31 20.2	FixMel			807	9553+	4118+	.44149	1.2353

2024 SR4

R1: .01074 R2: .01395 Quit About Open... NewObj AddObj epheM Full Herget Vaisa resid Gauss constr Epoch all_perts Undo FilterObs NonGravs

(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Aug 26.64504 ± 14332 TT = 15:28:51 (JD 2460549.14504)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0065 Find_Orb

q 0.95705772 ± 39.1 (J2000 ecliptic)

z -2.7671757389 ± 12.6 Peri. 337.89280 ± 28000

e 3.6483469 ± 0 Node 343.23972 ± 7000

Incl. 33.30926 ± 22000

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 20600".89

MOIDs: Me 0.550958 Ve 0.245058 Ea 0.006534 Ma 0.327829

MOIDs: Ju 2.595176 Sa 5.044030 Ur 8.602476 Ne 14.407601

Find_Orb ver: 2025 May 15

Earth encounter velocity 44.9177 km/s

Barbee-style encounter velocity: 90.1143 km/s

Score: 6575.777127

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	22 38 40.31	+14 28 14.8	FixMel			807	40.5-	3108-	.01074	1.0180
C2024	09	06.01944	22 38 40.34	+14 28 09.2	FixMel			807	3146-	215'-	.01134	1.0183
C2024	09	06.05069	22 38 40.28	+14 28 03.4	FixMel			807	5997-	362'-	.01196	1.0187
C2024	09	06.08194	22 38 40.14	+14 27 57.3	FixMel			807	8623-	493'-	.01260	1.0191
C2024	09	06.11319	22 38 39.95	+14 27 50.8	FixMel			807	184'-	611'-	.01327	1.0194
C2024	09	06.14444	22 38 39.71	+14 27 44.0	FixMel			807	222'-	718'-	.01395	1.0198

2024 SD3

R1: .51979 R2: .51738 Quit About Open... NewObj AddObj epheM Full Herget Vaisa resiD Gauss constr Epoch all_parts Undo FilterObs NonGrav

(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Nov 8.05056 ± 44443 TT = 1:12:48 (JD 2460622.55056)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0154 Ju: 0.4521

M 357.50997182 ± 4200 (J2000 ecliptic) Find_Orb

n 0.03827835 ± Peri. 228.24208 ± 44000

a 8.71968055 ± Node 189.32095 ± 60000

e 0.9052020 ± 0 Incl. 39.52012 ± 15000

P 25.74844 U 15.1

q 0.82660773 ± 156 Q 16.6127533 ± 1129

MOIDs: Me 0.542134 Ve 0.195105 Ea 0.015382 Ma 0.359541

MOIDs: Ju 0.452094 Sa 2.161668 Ur 7.644647 Ne 16.965635

Find_Orb ver: 2025 May 15

Tisserand relative to Earth: 2.05080

Tisserand relative to Jupiter: 1.44550

Earth encounter velocity 29.2281 km/s

Barbee-style encounter velocity: 28.7527 km/s

Score: 190505.960517

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 170589".42

YYYY MM DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024 09 05.98819	00 19 55.68	-11 26 20.0	FixMel			807	46d+	59d-	.51979	1.3510
C2024 09 06.01944	00 19 55.85	-11 26 31.2	FixMel			807	46d+	59d-	.51931	1.3506
C2024 09 06.05069	00 19 55.95	-11 26 42.3	FixMel			807	46d+	59d-	.51882	1.3503
C2024 09 06.08194	00 19 55.99	-11 26 53.4	FixMel			807	46d+	59d-	.51834	1.3499
C2024 09 06.11319	00 19 55.98	-11 27 04.5	FixMel			807	46d+	59d-	.51786	1.3495
C2024 09 06.14444	00 19 55.90	-11 27 15.4	FixMel			807	46d+	59d-	.51738	1.3491

Quit About Open... NewObj AddObj ephM Full Herget Vaisa resid Gauss constr Epoch all_parts Undo FilterObs NonGrav

Mer

Ven

Ear

Mar

Jup

Sat

Ura

Nep

Plu

Moo

(a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Aug 16.62992 ± 390563 TT = 15:07:05 (JD 2460539.12992)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0099 Ju: 0.5450

q 0.82590354 ± 1388 Ma: 0.0985 Sa: 0.8428 Find_Orb

Peri. 317.24416 ± 340000

z -4.6508616486 ± 131486 Node 335.11264 ± 32000

e 4.8411631 ± 125259 Incl. 171.95874 ± 80000

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 5709".75

MOIDs: Me 0.484166 Ve 0.105322 Ea 0.009885 Ma 0.098481

MOIDs: Ju 0.545018 Sa 0.842784 Ur 1.790789 Ne 2.321281

Find_Orb ver: 2025 May 15

Earth encounter velocity 103.9252 km/s

Barbee-style encounter velocity: 54.1914 km/s

Score: 9558.976483

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	18 24 50.48	-17 47 45.2	FixMe1			807	3892+	7124+	.34793	1.1793
C2024	09	06.01944	18 24 49.01	-17 47 42.9	FixMe1			807	3912+	7104+	.34977	1.1802
C2024	09	06.05069	18 24 47.54	-17 47 40.5	FixMe1			807	3931+	7083+	.35162	1.1811
C2024	09	06.08194	18 24 46.08	-17 47 37.9	FixMe1			807	3950+	7063+	.35347	1.1821
C2024	09	06.11319	18 24 44.65	-17 47 35.2	FixMe1			807	3969+	7043+	.35531	1.1830
C2024	09	06.14444	18 24 43.24	-17 47 32.4	FixMe1			807	3987+	7023+	.35716	1.1839

R1: .07689 R2: .07582 Quit About Open... NewObj AddObj ephM Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NonGravs
(☉)Mer (☉)Ven (☉)Ear (☉)Mar (☉)Jup (☉)Sat (☉)Ura (☉)Nep (☉)Plu (☉)Moo (a)Ast
Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.
Version 2025 May 15
Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Sep 14.08238 ± 362 TT = 1:58:37 (JD 2460567.58238)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0019 Ju: 0.0488

M 359.97745381 ± 3.4 Ma: 0.0269 Sa: 0.1696 Ur: 0.0685
n 0.00223619 ± 0.00345 Peri. 196.71932 ± 270 Find_Orb
a 57.9156625 ± 5.5 Node 153.57832 ± 22
e 0.9826665 ± 0 Incl. 0.67323 ± 57
P 440.75175 U 9.1
q 1.00387792 ± 0.248 Q 114.827447 ± 10.7 (J2000 ecliptic)

MOIDs: Me 0.629746 Ve 0.280799 Ea 0.001860 Ma 0.026891

MOIDs: Ju 0.048825 Sa 0.169572 Ur 0.068544 Ne 0.333211

Find_Orb ver: 2025 May 15

Tisserand relative to Earth: 2.83867

Tisserand relative to Jupiter: 1.32672

Tisserand relative to Neptune: 1.03371

Earth encounter velocity 12.0497 km/s

Barbee-style encounter velocity: 12.3716 km/s

Score: 15420.108016

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 15594".07

YYYY MM DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024 09 05.98819	16 42 10.22	-28 49 35.3	FixMe1			807	176'-	320'-	.07689	1.0133
C2024 09 06.01944	16 42 10.93	-28 49 27.8	FixMe1			807	176'-	319'-	.07667	1.0132
C2024 09 06.05069	16 42 11.65	-28 49 20.2	FixMe1			807	175'-	319'-	.07646	1.0131
C2024 09 06.08194	16 42 12.38	-28 49 12.5	FixMe1			807	175'-	318'-	.07624	1.0131
C2024 09 06.11319	16 42 13.14	-28 49 04.7	FixMe1			807	174'-	318'-	.07603	1.0130
C2024 09 06.14444	16 42 13.92	-28 48 56.9	FixMe1			807	174'-	317'-	.07582	1.0129

Ceres

RI: .45501 R2: .45423 Quit About Open... NewObj AddObj epheM Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NonGra

(o)Mer (o)Ven (o)Ear (o)Mar (o)Jup (o)Sat (o)Ura (o)Nep (o)Plu (o)Moo (a)Ast

Click on an observation to get information about it. Right-click to get further options. Ctrl-click to select multiple observations.

Version 2025 May 15

Using DE405/DE405; covers years 1599.9 to 2201.1

Orbital elements: [Unnamed]

Perihelion 2024 Oct 19.53718 ± 4546 TT = 12:53:32 (JD 2460603.03718)

Epoch 2024 Sep 4.0 TT = JDT 2460557.5 Earth MOID: 0.0259 Ju: 0.0793

q 1.01634817 ± 2.55 Ma: 0.0106 Sa: 0.1123 Ur: 0.1496

z -0.0057310573 ± 0.0295 Node 352.08852 ± 460

e 1.0058247 ± 0 Incl. 3.59105 ± 53

From 6 observations 2024 Sept. 5-6 (3.8 hr); mean residual 8991".91

MOIDs: Me 0.673449 Ve 0.298109 Ea 0.025866 Ma 0.010606

MOIDs: Ju 0.079283 Sa 0.112292 Ur 0.149597 Ne 0.654611

Find_Orb ver: 2025 May 15

Earth encounter velocity 11.8390 km/s

Barbee-style encounter velocity: 71.4399 km/s

Score: 8910.755029

YYYY	MM	DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2024	09	05.98819	18 34 33.66	-30 53 07.9	FixMel			807	6989+	174'-	.45501	1.2519
C2024	09	06.01944	18 34 34.14	-30 53 06.9	FixMel			807	7002+	174'-	.45485	1.2516
C2024	09	06.05069	18 34 34.62	-30 53 05.7	FixMel			807	7014+	174'-	.45469	1.2513
C2024	09	06.08194	18 34 35.11	-30 53 04.5	FixMel			807	7026+	175'-	.45454	1.2510
C2024	09	06.11319	18 34 35.60	-30 53 03.2	FixMel			807	7038+	175'-	.45438	1.2507
C2024	09	06.14444	18 34 36.10	-30 53 01.9	FixMel			807	7050+	175'-	.45423	1.2504