

Multiple Night Observations

Figure 8 (row 2, column 3). For each of the 10 asteroids, we averaged the distances from all 15 observations, and find the residuals by comparison with NASA JPL Horizons Data

2024 ON

R1: .06328 R2: .04289 Quit About Open... NewObj AddObj ephem Full Herget Vaisa resID Gauss constr Epoch all_perts Undo FilterObs NonGrav

(1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)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 20.05395 ± 0.00664 TT = 1:17:41 (JD 2460573.55395)	MOIDs: Me 0.641602 Ve 0.282746 Ea 0.002932 Ma 0.219488
Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0029 Find_Orb	MOIDs: Ju 1.704310 Sa 5.688648 Ur 14.548517 Ne 26.498665
M 357.01834976 ± 0.023 (J2000 ecliptic)	Find_Orb ver: 2025 May 15
n 0.26973621 ± 0.00199 Peri. 185.37601 ± 0.0043	Tisserand relative to Earth: 2.91771
a 2.37233787 ± 0.0117 Node 172.33539 ± 0.0024	Tisserand relative to Jupiter: 3.28762
e 0.5755265 ± 0.00208 Incl. 7.74510 ± 0.019	Earth encounter velocity 8.6060 km/s
P 3.65397 U 8.6	Barbee-style encounter velocity: 8.8366 km/s
q 1.00699455 ± 8.75e-6 Q 3.73768119 ± 0.0233	Score: 0.303204

From 15 observations 2024 Sept. 5-9; mean residual 0".02

YYYY MM DD,DDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2460558.50000000	269.09732616+05.56962958					807	.02+	.00	.06328	1.0257
C2460558.62500000	269.08861470+05.51091130					807	.00	.01-	.06267	1.0254
C2460559.46875000	269.23005353+05.09007548					807	.00	.00	.05846	1.0234
C2460559.50000000	269.22755277+05.07328913					807	.01+	.03+	.05830	1.0234
C2460559.53125000	269.22516984+05.05626708					807	.02-	.03-	.05815	1.0233
C2460559.56250000	269.22320001+05.03905991					807	.02-	.02+	.05800	1.0232
C2460560.56250000	269.39389474+04.44168868					807	.02-	.01+	.05302	1.0210
C2460560.59375000	269.39346524+04.42085683					807	.01-	.01-	.05287	1.0209
C2460560.62500000	269.39404899+04.39981040					807	.02+	.02-	.05272	1.0209
C2460561.53125000	269.61425063+03.74419563					807	.01-	.00	.04819	1.0190
C2460561.56250000	269.61412676+03.71912812					807	.00	.01-	.04803	1.0190
C2460561.59375000	269.61485960+03.69380962					807	.03+	.01+	.04788	1.0189
C2460562.53125000	269.89763128+02.85944383					807	.00	.01-	.04320	1.0171
C2460562.56250000	269.89897076+02.82831577					807	.02+	.02+	.04305	1.0171
C2460562.59375000	269.90127179+02.79686378					807	.02-	.01-	.04289	1.0170

2024 SJ

RI: .09837 R2: .08958 [Quit](#) [About](#) [Open...](#) [NewObj](#) [AddObj](#) [ephem](#) [Full](#) [Herget](#) [Vaisa](#) [resID](#) [Gauss](#) [constr](#) [Epoch](#) [all_perts](#) [Undo](#) [FilterObs](#) [NonGrav](#)
 (1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)Plu (10)Moo (11)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 9.91029 ± 0.0102 TT = 21:50:48 (JD 2460563.41029)
 Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0686 Ma: 0.0675
 $M = 359.47572771 \pm 0.006$ (J2000 ecliptic) Find_Orb
 $n = 0.57594193 \pm 0.00202$ Peri. 152.11775 ± 0.021 Tisserand relative to Earth: 2.98002
 $a = 1.43070550 \pm 0.00334$ Node 194.53905 ± 0.010 Barbee-style encounter velocity: 5.8432 km/s
 $e = 0.2628997 \pm 0.00155$ Incl. 8.77701 ± 0.040 Score: 0.146206
 $P = 1.711/625.051d$ U 8.6
 $q = 1.05457332 \pm 0.000245$ Q 1.80683768 ± 0.00644

From 15 observations 2024 Sept. 5-9; mean residual 0".01

YYYY MM DD.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2460558.50000000	303.57197984+45.85901935					807	.01+	.02+	.09837	1.0554
C2460558.62500000	303.74852270+45.85199291					807	.01-	.01+	.09809	1.0554
C2460559.46875000	305.16394044+45.77365250					807	.01-	.01-	.09624	1.0551
C2460559.50000000	305.21157808+45.77213974					807	.01-	.00	.09617	1.0551
C2460559.53125000	305.25869855+45.77005927					807	.04+	.03-	.09610	1.0551
C2460559.56250000	305.30545776+45.76738077					807	.02-	.00	.09603	1.0551
C2460560.56250000	307.04203651+45.63393799					807	.02-	.01-	.09386	1.0549
C2460560.59375000	307.09150329+45.62920066					807	.02+	.00	.09379	1.0549
C2460560.62500000	307.14109000+45.62379019					807	.02+	.01-	.09373	1.0548
C2460561.53125000	308.81927315+45.45688085					807	.01-	.01+	.09180	1.0547
C2460561.56250000	308.87166508+45.45124027					807	.01-	.02+	.09173	1.0547
C2460561.59375000	308.92392448+45.44491885					807	.01-	.00	.09167	1.0547
C2460562.53125000	310.73982307+45.22101046					807	.03+	.00	.08972	1.0546
C2460562.56250000	310.79503808+45.21362775					807	.01-	.00	.08965	1.0546
C2460562.59375000	310.85011569+45.20555781					807	.01-	.00	.08958	1.0546

2024 RN15

RI: .11999 R2: .10061 Quit About Open... NewObj AddObj ephem Full Herget Vaisa resID Gauss constr Epoch all_parts Undo FilterObs NonGrav
 (1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)Plu (10)Moo (11)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 1.26529 ± 0.0471 TT = 6:22:00 (JD 2460615.76529)
 Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0109 Ma: 0.0768
 M 332.70144580 ± 0.21 (J2000 ecliptic) Find_Orb
 n 0.51250177 ± 0.00362 Peri. 180.69145 ± 0.14
 a 1.54646157 ± 0.00728 Node 225.37639 ± 0.12
 e 0.3831818 ± 0.00306 Incl. 1.35717 ± 0.008
 P 1.923/702.423d U 9.0
 q 0.95388562 ± 0.000273 Q 2.13903752 ± 0.0148
 From 15 observations 2024 Sept. 5-9; mean residual 0".01

YYYY MM DD.DDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2460558.50000000	340.35091330+04.00368114				807		.03-	.01+	.11999	1.1262
C2460558.62500000	340.35581016+04.05411581				807		.01-	.01-	.11937	1.1255
C2460559.46875000	340.47069457+04.39943357				807		.01+	.00	.11533	1.1212
C2460559.50000000	340.47360259+04.41289818				807		.02+	.01+	.11517	1.1211
C2460559.53125000	340.47586911+04.42636201				807		.02+	.00	.11501	1.1209
C2460559.56250000	340.47756221+04.43983239				807		.02+	.01+	.11486	1.1207
C2460560.56250000	340.61529359+04.87874229				807		.00	.01-	.11010	1.1157
C2460560.59375000	340.61683178+04.89315013				807		.01-	.00	.10994	1.1155
C2460560.62500000	340.61799777+04.90753332				807		.01+	.00	.10979	1.1154
C2460561.53125000	340.76746772+05.33375072				807		.00	.02-	.10555	1.1108
C2460561.56250000	340.76990663+05.34925925				807		.02-	.01+	.10540	1.1107
C2460561.59375000	340.77184448+05.36473532				807		.02-	.01-	.10525	1.1105
C2460562.53125000	340.94121294+05.83880682				807		.01-	.00	.10090	1.1058
C2460562.56250000	340.94415627+05.85553094				807		.02+	.01+	.10076	1.1057
C2460562.59375000	340.94656850+05.87223085				807		.01+	.00	.10061	1.1055

2024 RJ16

R1: .13108 R2: .11286	Quit	About	Open...	NewObj	AddObj	ephem	Full	Herget	Vaisa	resID	Gauss	constr	Epoch	all_parts	Undo	FilterObs	NonGrav	
(1)Mer	(2)Ven	(3)Ear	(4)Mar	(5)Jup	(6)Sat	(7)Ura	(8)Nep	(9)Plu	(10)Moo	(11)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]									MOIDs: Me 0.696909 Ve 0.310405 Ea 0.039330 Ma 0.092364									
Perihelion 2024 Oct 13.71281 ± 0.0154 TT = 17:06:26 (JD 2460597.21281)									MOIDs: Ju 2.056997 Sa 6.244630 Ur 14.980251 Ne 26.913895									
Epoch 2024 Sep 9.0 TT = JDT 2460562.5	Earth	MOID: 0.0393	Ma: 0.0924	Find_Orb ver: 2025 May 15									Tisserand relative to Earth: 2.96736					
M 349.61507122 ± 0.17	(J2000	ecliptic)	Find_Orb	Earth encounter velocity 5.4202 km/s									Barbee-style encounter velocity: 6.5490 km/s					
n 0.29916705 ± 0.00479	Peri.	201.67627 ± 0.025		Score: 0.284420														
a 2.21408117 ± 0.0236	Node	181.72810 ± 0.008																
e 0.5329663 ± 0.00489	Incl.	2.48260 ± 0.016																
P 3.29451	U 9.2																	
q 1.03405036 ± 0.000236	Q 3.39411197 ± 0.0471																	
From 15 observations 2024 Sept. 5-9; mean residual 0".02																		
YYYY MM.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R								
C2460558.50000000	330.53698397	-04.00211549			807		.00	.02-	.13108	1.1361								
C2460558.62500000	330.59433576	-03.99193935			807		.02-	.02+	.13049	1.1355								
C2460559.46875000	331.08219660	-03.91765393			807		.02-	.01+	.12667	1.1314								
C2460559.50000000	331.09899380	-03.91505276			807		.00	.00	.12652	1.1313								
C2460559.53125000	331.11529387	-03.91241901			807		.01+	.00	.12638	1.1311								
C2460559.56250000	331.13118688	-03.90975393			807		.04+	.01-	.12623	1.1310								
C2460560.56250000	331.74780837	-03.81720617			807		.01+	.01+	.12175	1.1262								
C2460560.59375000	331.76495804	-03.81432661			807		.03+	.01-	.12161	1.1261								
C2460560.62500000	331.78188651	-03.81140032			807		.01-	.02-	.12147	1.1259								
C2460561.53125000	332.40211195	-03.72168548			807		.02-	.03-	.11748	1.1217								
C2460561.56250000	332.42133230	-03.71863299			807		.02-	.00	.11734	1.1216								
C2460561.59375000	332.44022382	-03.71553725			807		.01-	.03+	.11720	1.1214								
C2460562.53125000	333.13634657	-03.61635657			807		.04+	.00	.11314	1.1172								
C2460562.56250000	333.15748378	-03.61308044			807		.02-	.00	.11300	1.1170								
C2460562.59375000	333.17831153	-03.60975560			807		.01+	.00	.11286	1.1169								

2024 RO2

R1: .15103 R2: .12699 Quit About Open... NewObj AddObj ephem Full Herget Vaisa resID Gauss constr Epoch all_perts Undo FilterObs NonGr
 (1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)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 1.33435 ± 0.0492 TT = 8:01:27 (JD 2460615.83435)	MOIDs: Me 0.624265 Ve 0.221369 Ea 0.001013 Ma 0.149940
Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0010 Find_Orb	MOIDs: Ju 2.945582 Sa 7.328186 Ur 16.041133 Ne 27.863628
M 336.38319626 ± 0.22 (J2000 ecliptic)	Find_Orb ver: 2025 May 15
n 0.44280663 ± 0.00382 Peri. 216.26460 ± 0.09 Tisserand relative to Earth: 2.90404	Earth encounter velocity 9.2931 km/s
a 1.70474714 ± 0.0098 Node 190.76971 ± 0.06 Barbee-style encounter velocity: 8.8894 km/s	
e 0.4473300 ± 0.00329 Incl. 7.12563 ± 0.038 Score: 0.244030	
P 2.226/812.981d U 9.0	
q 0.94216249 ± 0.000379 Q 2.46733179 ± 0.0198	

From 15 observations 2024 Sept. 5-9; mean residual 0".02

YYYY MM DD.DDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2460558.50000000	332.55388399+17.36795013					807	.03-	.03-	.15103	1.1452
C2460558.62500000	332.54803991+17.39537165					807	.00	.00	.15027	1.1445
C2460559.46875000	332.58434168+17.56549499					807	.00	.01+	.14527	1.1395
C2460559.50000000	332.58413189+17.57271380					807	.02+	.04+	.14508	1.1393
C2460559.53125000	332.58341806+17.57984639					807	.01+	.05+	.14489	1.1391
C2460559.56250000	332.58227857+17.58684784					807	.01+	.00	.14470	1.1389
C2460560.56250000	332.62425472+17.79442210					807	.03+	.02-	.13881	1.1330
C2460560.59375000	332.62300671+17.80140342					807	.02-	.04-	.13862	1.1329
C2460560.62500000	332.62153630+17.80824288					807	.00	.01+	.13843	1.1327
C2460561.53125000	332.67999631+17.99829393					807	.01-	.01-	.13315	1.1274
C2460561.56250000	332.67941279+18.00557524					807	.00	.01-	.13297	1.1272
C2460561.59375000	332.67846971+18.01270099					807	.02-	.01-	.13278	1.1270
C2460562.53125000	332.75014005+18.21391186					807	.02+	.00	.12736	1.1216
C2460562.56250000	332.74991015+18.22138397					807	.00	.02+	.12717	1.1214
C2460562.59375000	332.74932089+18.22868252					807	.02-	.00	.12699	1.1212

2024 SR4

R1: .20310 R2: .17175 Quit About Open... NewObj AddObj ephem Full Herget Vaisa resiD Gauss constr Epoch all_perts Undo FilterObs NonGr
 (1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)Plu (10)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 7.73376 ± 0.204 TT = 17:36:37 (JD 2460622.23376)	MOIDs: Me 0.592154 Ve 0.194442 Ea 0.017946 Ma 0.133015
Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0179 Find_Orb	MOIDs: Ju 2.524902 Sa 7.015059 Ur 15.747781 Ne 27.442112
M 337.50429019 ± 0.7 (J2000 ecliptic)	Find_Orb ver: 2025 May 15
n 0.37659958 ± 0.0115 Peri. 231.81155 ± 0.23 Tisserand relative to Earth: 2.83978	Earth encounter velocity 12.0083 km/s
a 1.89910726 ± 0.0385 Node 185.00247 ± 0.12 Barbee-style encounter velocity: 11.6350 km/s	
e 0.5253066 ± 0.0111 Incl. 9.48144 ± 0.15 Score: 0.279877	
P 2.617/955.904d U 9.7	
q 0.90149360 ± 0.00286 Q 2.89672091 ± 0.0798	

From 15 observations 2024 Sept. 5-9; mean residual 0".02

YYYY MM DD.DDDDD	RA (J2000)	dec	mag	ref	Obs	Xres	Yres	delta	R
C2460558.50000000	339.63627611	+14.52645483		807	.02+	.02-	.20310	1.1993	
C2460558.62500000	339.63394984	+14.52173003		807	.02-	.03+	.20211	1.1983	
C2460559.46875000	339.66769109	+14.47171511		807	.01-	.03+	.19558	1.1921	
C2460559.50000000	339.66805072	+14.47019396		807	.01-	.02-	.19534	1.1919	
C2460559.53125000	339.66802578	+14.46863159		807	.01-	.01-	.19509	1.1917	
C2460559.56250000	339.66766070	+14.46698186		807	.02+	.04-	.19484	1.1914	
C2460560.56250000	339.70580683	+14.39243469		807	.01+	.00	.18715	1.1841	
C2460560.59375000	339.70526606	+14.39014449		807	.02+	.01+	.18691	1.1838	
C2460560.62500000	339.70448641	+14.38774219		807	.00	.03+	.18667	1.1836	
C2460561.53125000	339.75148448	+14.30192100		807	.02-	.00	.17978	1.1770	
C2460561.56250000	339.75139880	+14.29912269		807	.01-	.00	.17953	1.1768	
C2460561.59375000	339.75101049	+14.29621095		807	.01+	.03-	.17929	1.1765	
C2460562.53125000	339.80576147	+14.18881365		807	.01+	.01+	.17223	1.1697	
C2460562.56250000	339.80586686	+14.18535064		807	.01-	.01-	.17199	1.1695	
C2460562.59375000	339.80567712	+14.18178466		807	.01+	.00	.17175	1.1693	

2022 QV1

R1: .49995 R2: .50180 [Quit](#) [About](#) [Open...](#) [NewObj](#) [AddObj](#) [ephem](#) [Full](#) [Herget](#) [Vaisa](#) [resID](#) [Gauss](#) [constr](#) [Epoch](#) [all_perts](#) [Undo](#) [FilterObs](#) [NonGrav](#)
 (1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)Plu (0)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 23.33187 ± 0.55 TT = 7:57:53 (JD 2460606.83187)
 Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.1119 Find_Orb
 M 338.83062305 ± 1.0 (J2000 ecliptic)
 n 0.47752050 ± 0.0173 Peri. 205.51238 ± 0.6
 a 1.62109337 ± 0.0392 Node 157.13569 ± 0.6
 e 0.3166020 ± 0.012 Incl. 7.15469 ± 0.18
 P 2.064/753.880d U 10.0
 q 1.10785195 ± 0.00736 Q 2.13433479 ± 0.0711
 From 15 observations 2024 Sept. 5-9; mean residual 0".02

YYYY	MM	DD.DDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2460558.	50000000	260.81907689	-17.58697472				807		.00	.01-	.49995	1.1904
C2460558.	62500000	260.88264340	-17.62258584				807		.00	.01+	.50003	1.1900
C2460559.	46875000	261.33993528	-17.86706547				807		.03-	.01-	.50042	1.1873
C2460559.	50000000	261.35608136	-17.87604611				807		.00	.00	.50043	1.1872
C2460559.	53125000	261.37226787	-17.88498013				807		.00	.00	.50045	1.1871
C2460559.	56250000	261.38854866	-17.89386397				807		.03+	.01+	.50047	1.1870
C2460560.	56250000	261.94077457	-18.18174042				807		.00	.03+	.50093	1.1840
C2460560.	59375000	261.95760565	-18.19055122				807		.02-	.00	.50094	1.1839
C2460560.	62500000	261.97458321	-18.19931611				807		.02-	.01+	.50096	1.1838
C2460561.	53125000	262.49012607	-18.45956044				807		.02+	.03-	.50135	1.1810
C2460561.	56250000	262.50729924	-18.46834894				807		.03+	.01+	.50136	1.1809
C2460561.	59375000	262.52457689	-18.47711032				807		.00	.01-	.50138	1.1808
C2460562.	53125000	263.07041967	-18.74476372				807		.02-	.00	.50176	1.1780
C2460562.	56250000	263.08804934	-18.75351040				807		.02+	.00	.50178	1.1779
C2460562.	59375000	263.10577095	-18.76221279				807		.02-	.01+	.50180	1.1778

2024 YR4

RI: .63369 R2: .62866 Quit About Open... NewObj AddObj ephem Full Herget Vaisa resid Gauss constr Epoch all_perts Undo FilterObs NonGra
 (1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)Plu (0)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 22.51408 ± 2.45 TT = 12:20:16 (JD 2460637.01408)
 Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0026 Find_Orb
 M 341.89677816 ± 1.9 (J2000 ecliptic)
 n 0.24295034 ± 0.0177 Peri. 134.61067 ± 0.7
 a 2.54365206 ± 0.124 Node 271.34234 ± 1.4
 e 0.6645012 ± 0.0117 Incl. 3.44377 ± 0.16
 P 4.05683 U 10.0
 q 0.85339196 ± 0.0122 Q 4.23391215 ± 0.235

MOIDs: Me 0.536543 Ve 0.141537 Ea 0.002636 Ma 0.105300
 MOIDs: Ju 1.213327 Sa 5.645454 Ur 14.350410 Ne 26.108001
 Find_Orb ver: 2025 May 15
 Tisserand relative to Earth: 2.77250
 Tisserand relative to Jupiter: 3.08869
 Earth encounter velocity 14.3090 km/s
 Barbee-style encounter velocity: 13.8562 km/s
 Score: 0.346771

From 15 observations 2024 Sept. 5-9; mean residual 0".01

YYYY MM DD.DDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R
C2460558.50000000	276.39006341	-17.81580981				807	.02+	.00	.63369	1.3878
C2460558.62500000	276.36394645	-17.81303447				807	.01-	.01+	.63355	1.3866
C2460559.46875000	276.21414702	-17.79626265				807	.02-	.00	.63251	1.3785
C2460559.50000000	276.20800365	-17.79564996				807	.03-	.01+	.63247	1.3782
C2460559.53125000	276.20188043	-17.79500349				807	.01+	.00	.63243	1.3779
C2460559.56250000	276.19578925	-17.79431326				807	.02+	.00	.63240	1.3776
C2460560.56250000	276.02979367	-17.77383034				807	.00	.01+	.63117	1.3680
C2460560.59375000	276.02423592	-17.77310311				807	.01-	.03-	.63114	1.3677
C2460560.62500000	276.01877149	-17.77232484				807	.01-	.01-	.63110	1.3674
C2460561.53125000	275.88405950	-17.75378048				807	.01+	.01-	.62998	1.3587
C2460561.56250000	275.87891531	-17.75306653				807	.02+	.01-	.62994	1.3584
C2460561.59375000	275.87383757	-17.75231314				807	.02+	.01-	.62991	1.3581
C2460562.53125000	275.74777367	-17.73272528				807	.02-	.03+	.62873	1.3492
C2460562.56250000	275.74310748	-17.73201082				807	.00	.02-	.62870	1.3489
C2460562.59375000	275.73850622	-17.73123686				807	.00	.02+	.62866	1.3486

2014 GL1

R1: 0.9994 R2: 1.0110	Quit	About	Open...	NewObj	AddObj	epheM	Full	Herget	Vaisa	resiD	Gauss	constr	Epoch	all_perts	Undo	FilterObs	NonGrav															
(1)Mer (2)Ven (3)Ear (4)Mar (5)Jup (6)Sat (7)Ura (8)Nep (9)Plu (0)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 Dec 6.20000 ± 0.989 TT = 4:48:00 (JD 2460650.70000)																																
Epoch 2024 Sep 9.0 TT = JDT 2460562.5 Earth MOID: 0.0144 Ve: 0.0053																																
M 303.81629193 ± 3.2	Ma: 0.0635	Find_Orb	MOIDs: Me 0.164563 Ve 0.005338 Ea 0.014389 Ma 0.063480																													
n 0.63700349 ± 0.0421	Peri. 60.18552 ± 1.0	MOIDs: Ju 3.124107 Sa 7.809481 Ur 16.600573 Ne 28.101113																														
a 1.33774963 ± 0.0589	Node 12.40807 ± 2.3	Find_Orb ver: 2025 May 15																														
e 0.6471237 ± 0.0096	Incl. 4.81695 ± 0.11	Tisserand relative to Earth: 2.50486																														
P 1.547/565.135d U 10.6	Earth encounter velocity 21.1098 km/s														Barbee-style encounter velocity: 20.5013 km/s																	
q 0.47206008 ± 0.011 Q 2.20343917 ± 0.109 (J2000 ecliptic)	Score: 0.336280																															
From 15 observations 2024 Sept. 5-9; mean residual 0".01																																
YYYY MM DD.DDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R																						
C2460558.50000000	250.44179247	-28.89043737				807	.01+	.01-	0.9994	1.4227																						
C2460558.62500000	250.45260643	-28.88168029				807	.01-	.01+	0.9998	1.4216																						
C2460559.46875000	250.54079423	-28.82775746				807	.02+	.02-	1.0023	1.4140																						
C2460559.50000000	250.54370472	-28.82568733				807	.02+	.02+	1.0024	1.4137																						
C2460559.53125000	250.54664688	-28.82359845				807	.03-	.00	1.0025	1.4134																						
C2460559.56250000	250.54967333	-28.82147488				807	.01-	.00	1.0026	1.4131																						
C2460560.56250000	250.66361344	-28.75857146				807	.01+	.02-	1.0055	1.4040																						
C2460560.59375000	250.66706830	-28.75646347				807	.00	.02+	1.0056	1.4037																						
C2460560.62500000	250.67061710	-28.75435519				807	.01+	.01-	1.0057	1.4034																						
C2460561.53125000	250.78488356	-28.69936134				807	.02-	.01-	1.0082	1.3951																						
C2460561.56250000	250.78862000	-28.69733810				807	.01+	.01-	1.0083	1.3948																						
C2460561.59375000	250.79242563	-28.69528619				807	.01+	.01+	1.0084	1.3945																						
C2460562.53125000	250.92039317	-28.63969480				807	.01-	.00	1.0109	1.3859																						
C2460562.56250000	250.92446715	-28.63771986				807	.01+	.00	1.0109	1.3856																						
C2460562.59375000	250.92861139	-28.63572139				807	.00	.00	1.0110	1.3853																						

Ceres

R1: 2.2869 R2: 2.3347	Quit	About	Open...	NewObj	AddObj	ephem	Full	Herget	Vaisa	resID	Gauss	constr	Epoch	all_perts	Undo	FilterObs	NonGra	
(1)Mer	(2)Ven	(3)Ear	(4)Mar	(5)Jup	(6)Sat	(7)Ura	(8)Nep	(9)Plu	(0)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 2025 Nov 22.98413 ± 320 TT = 23:37:09 (JD 2461002.48413)																		
Epoch 2024 Sep 9.0	TT = JDT 2460562.5												Find_Orb	Find_Orb	ver:	2025 May 15		
M 268.85946998 ± 110														Score:	0.189951			
n 0.20714503 ± 0.103																		
a 2.82891365 ± 0.933																		
e 0.0852777 ± 0.317																		
P 4.75806																		
U 11.2 SR																		
q 2.58767029 ± 0.919																		
Q 3.07015702 ± 6.86																		
From 15 observations 2024 Sept. 5-9; mean residual 0".53																		
YYYY MM.DDDDD	RA (J2000)	dec	-----	mag	ref	Obs	Xres	Yres	delta	R								
C2460558.5000000	278.57360456	-30.89479775				807	1.3-	.17-	2.2869	2.8576								
C2460558.6250000	278.58092537	-30.89355247				807	1.0-	.13-	2.2884	2.8575								
C2460559.46875000	278.63900453	-30.88571235				807	.14+	.03+	2.2981	2.8567								
C2460559.50000000	278.64101980	-30.88542617				807	.23+	.03+	2.2985	2.8567								
C2460559.53125000	278.64302340	-30.88511882				807	.28+	.04+	2.2988	2.8567								
C2460559.56250000	278.64503451	-30.88479524				807	.31+	.04+	2.2992	2.8567								
C2460560.56250000	278.71920349	-30.87471046				807	.84+	.12+	2.3108	2.8558								
C2460560.59375000	278.72143868	-30.87433968				807	.86+	.14+	2.3112	2.8558								
C2460560.62500000	278.72371503	-30.87398301				807	.91+	.05+	2.3116	2.8558								
C2460561.53125000	278.79727970	-30.86434250				807	.47+	.07+	2.3222	2.8550								
C2460561.56250000	278.79969682	-30.86397233				807	.47+	.07+	2.3225	2.8549								
C2460561.59375000	278.80212016	-30.86358687				807	.43+	.06+	2.3229	2.8549								
C2460562.53125000	278.88382019	-30.85298176				807	.82-	.10-	2.3340	2.8541								
C2460562.56250000	278.88642955	-30.85260038				807	.86-	.14-	2.3343	2.8541								
C2460562.59375000	278.88905309	-30.85218302				807	.93-	.11-	2.3347	2.8541								