

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
132 Aethra	9.0 ^m	X	99.56440	255.25029	258.38381	24.98357	0.3893081	0.23387747	2.61	1.59	3.62	Mc	7 9.7	13.6
391 Ingeborg	10.8	X	322.74183	146.99062	212.85788	23.20328	0.3058756	0.27889435	2.32	1.61	3.03	Mc	7 16.3	13.2
475 Ocllo	11.5	X	237.98285	305.93807	34.40253	18.94859	0.3791878	0.23588658	2.59	1.61	3.58	Mc	3 24.3	16.6
512 Taurinensis	10.8	X	96.98121	249.24444	107.02703	8.74769	0.2539401	0.30417520	2.19	1.63	2.75	Mc	—	—
699 Hela	11.3	X	64.46843	91.35094	242.54412	15.29465	0.4102190	0.23347553	2.61	1.54	3.68	Mc	—	—
944 Hidalgo	10.7	X	70.56806	56.56572	21.42299	42.55233	0.6606960	0.07181870	5.73	1.94	9.52	Jc	4 19.6	18.8
985 Rosina	12.8	X	128.56455	59.58775	290.29441	4.05725	0.2770995	0.28250509	2.30	1.66	2.94	Mc	—	—
1009 Sirene	13.9	X	335.64753	186.50956	229.29667	15.71141	0.4526209	0.23122107	2.63	1.44	3.82	Mc	—	—
1011 Laodamia	12.7	X	101.14057	353.22734	132.52131	5.49476	0.3506815	0.26639679	2.39	1.55	3.23	Mc	6 7.3	16.3
1065 Amundsenia	12.1	X	59.28644	353.58091	330.31747	8.36428	0.2971918	0.27180742	2.36	1.66	3.06	Mc	—	—
1131 Porzia	12.9	X	219.81512	248.08793	100.67135	3.22981	0.2860192	0.29626957	2.23	1.59	2.87	Mc	3 14.5	16.9
1134 Kepler	14.1	X	320.27295	332.90758	5.77231	15.32317	0.4700013	0.22514521	2.68	1.42	3.93	Mc	5 6.6	17.4
1139 Atami	12.5	X	258.49434	206.66627	213.32183	13.08419	0.2556030	0.36261844	1.95	1.45	2.45	Mc	7 15.6	15.2
1170 Siva	12.2	X	179.33786	59.47725	0.85268	22.16933	0.35014276	0.27807852	2.32	1.62	3.03	Mc	5 2.9	16.8
1198 Atlantis	14.4	X	216.63787	84.59844	259.51030	2.72469	0.3353958	0.29182731	2.25	1.50	3.01	Mc	3 4.0	18.7
1204 Renzia	12.0	X	155.50389	313.73076	7.53661	1.87913	0.2936212	0.28936295	2.26	1.60	2.93	Mc	—	—
1293 Sonja	13.5	X	159.54642	99.78066	236.36483	5.36215	0.2750439	0.29635916	2.23	1.62	2.84	Mc	1 9.3	16.8
1310 Villigera	11.5	X	89.66561	88.90002	357.17991	21.06162	0.3571809	0.26657688	2.39	1.54	3.25	Mc	3 28.9	14.3
1316 Kasan	13.2	X	153.15586	148.70066	238.19983	23.94877	0.3156449	0.26299062	2.41	1.65	3.17	Mc	3 6.2	17.9
1374 Isora	13.3	X	151.96731	61.06675	120.01342	5.29555	0.2776725	0.29182029	2.25	1.63	2.88	Mc	2 6.8	16.6
1468 Zomba	12.8	X	159.44880	23.14608	308.90908	9.94082	0.2711005	0.30283738	2.20	1.60	2.79	Mc	1 4.5	16.0
1474 Beira	12.5	X	325.03303	84.00153	323.39235	26.68167	0.4886530	0.21764301	2.74	1.40	4.07	Mc	8 30.4	14.0
1508 Kemi	12.0	X	292.72955	93.46936	13.85235	28.72396	0.4183509	0.21384317	2.77	1.61	3.93	Mc	10 6.2	14.8
1565 Lemaître	12.6	X	249.09166	116.39358	261.13868	21.49768	0.3485651	0.26645277	2.39	1.56	3.23	Mc	5 4.4	17.2
1593 Fagnes	13.1	X	10.34505	185.35259	120.01342	9.98061	0.2816472	0.29701483	2.22	1.60	2.85	Mc	10 7.3	14.7
1640 Nemo	13.3	X	59.02778	354.79712	355.43243	7.10894	0.3427571	0.28463038	2.29	1.50	3.07	Mc	—	—
1747 Wright	13.6	X	72.10563	340.48543	268.37641	21.41517	0.1103837	0.44105046	1.71	1.52	1.90	Mc	9 20.9	16.0
1922 Zulu	12.4	X	98.99513	31.43974	226.52601	35.44363	0.4820188	0.16950702	3.23	1.67	4.79	Ja	11 15.6	18.5
1951 Lick	14.2	X	342.84485	140.58752	130.74006	39.09434	0.0615016	0.60114851	1.39	1.30	1.48	Mc	5 1.5	16.3
2044 Wirt	13.2	X	69.10684	50.43790	53.62336	23.97156	0.352519	0.26853950	2.38	1.56	3.20	Mc	4 6.1	15.8
2055 Dvořák	12.9	X	134.41659	244.14298	340.40874	21.49509	0.3117788	0.28084898	2.31	1.59	3.03	Mc	10 20.5	17.6
2064 Thomsen	12.6	X	211.42011	2.76226	302.14150	5.69545	0.3297563	0.30642017	2.18	1.46	2.90	Mc	1 13.9	16.6
2074 Shoemaker	13.9	X	94.88728	205.64007	207.26688	30.07401	0.0818902	0.40817404	1.80	1.65	1.95	Mc	—	—
2077 Kiangsu	13.6	X	48.74271	344.22622	69.46052	28.08573	0.2950173	0.27749813	2.33	1.64	3.01	Mc	—	—
2078 Nanking	13.0	X	304.58390	99.42021	286.97596	20.16526	0.3750125	0.27032261	2.37	1.48	3.26	Mc	7 11.9	15.3
2099 Öpik	15.1	X	182.87109	159.37204	218.80425	26.95730	0.3606103	0.28183611	2.30	1.47	3.13	Mc	3 21.6	19.8
2204 Lyyli	12.2	X	320.39179	284.12619	159.94681	2.602397	0.4047842	0.23640063	2.59	1.54	3.64	Mc	12 15.5	13.7
2253 Espinette	12.8	X	268.02320	175.84805	143.91571	3.88039	0.2782003	0.28560569	2.28	1.65	2.92	Mc	3 15.8	16.6
2335 James	13.6	X	357.93360	79.59282	19.90117	36.30699	0.3601609	0.31854003	2.12	1.36	2.89	Mc	—	—
2423 Ibarruri	13.3	X	21.75040	80.53776	264.94711	4.05666	0.2829195	0.30447012	2.19	1.57	2.81	Mc	12 24.2	15.6
2629 Rudra	15.1	X	341.67720	280.72851	343.44195	23.44210	0.2289328	0.42930954	1.74	1.34	2.14	Mc	3 7.8	15.8
2744 Birgitta	14.7	X	37.63615	43.96932	315.53986	6.74455	0.3323194	0.28225780	2.30	1.54	3.07	Mc	—	—
2937 Gibbs	13.4	X	192.05786	71.85475	265.68338	21.75964	0.3027769	0.27880328	2.32	1.62	3.02	Mc	2 1.6	18.0
2968 Iliya	14.9	X	286.14086	34.39510	274.29207	9.15471	0.3114461	0.27081062	2.37	1.63	3.10	Mc	3 10.0	18.8
3040 Kozai	13.8	X	45.90667	290.22181	143.49160	46.65096	0.2002042	0.39463967	1.84	1.47	2.21	Mc	—	—
3163 Randi	14.0	X	276.70882	121.65147	194.01199	3.08939	0.3347232	0.26610762	2.39	1.59	3.20	Mc	3 13.5	18.0
3198 Wallonia	13.1	X	81.73240	40.48618	83.56624	17.96463	0.2389472	0.30619610	2.18	1.66	2.70	Mc	4 28.8	15.6
3255 Tholen	13.4	X	22.49676	79.44184	337.03290	21.36085	0.3621638	0.26956773	2.37	1.51	3.23	Mc	—	—
3267 Glo	12.8	X	169.40382	307.75525	110.45032	24.03458	0.2959051	0.27738313	2.33	1.64	3.02	Mc	5 12.6	17.4
3270 Dudley	14.2	X	199.37025	326.97412	146.90963	27.68732	0.3295815	0.31270118	2.15	1.44	2.86	Mc	7 31.9	18.3
3287 Olmstead	14.2	X	289.60144	95.78975	213.23918	12.07906	0.3005354	0.27092361	2.37	1.65	3.08	Mc	3 16.7	18.1
3343 Nedzel	13.2	X	286.97681	229.75826	43.43620	25.00254	0.3113574	0.27356282	2.35	1.62	3.08	Mc	2 11.2	17.6
3392 Setouchi	13.8	X	64.38546	239.89860	266.77659	26.32903	0.2807221	0.31495279	2.14	1.54	2.74	Mc	4 18.6	16.0
3397 Leyla	13.4	X	230.52112	95.68964	25.64932	21.99391	0.2967089	0.27332935	2.35	1.65	3.05	Mc	9 15.7	17.4
3401 Vanphilos	12.4	X	283.10803	108.56428	322.33335	21.80194	0.3582522	0.27015869	2.37	1.52	3.22	Mc	8 16.4	15.0
3402 Wisdom	15.0	X	305.23436	303.81181	357.83500	4.85280	0.2798023	0.31674238	2.13	1.54	2.73	Mc	3 23.7	17.7
3443 Leetsungdao	13.1	X	144.21110	112.42488	184.57444	12.70886	0.3063435	0.26622521	2.39	1.66	3.13	Mc	—	—
3496 Arioso	15.3	X	263.04376	283.64455	129.41596	29.71350	0.4575643	0.22037456	2.71	1.47	3.96	Mc	6 25.8	20.4
3552 Don Quixote	12.9	X	129.26137	316.56176	349.92866	31.09373	0.7088078	0.11200150	4.26	1.24	7.28	Jc	1 18.4	21.1
3581 Alvarez	12.2	X	249.66998	107.66128	217.42057	28.86314	0.4058485	0.21323306	2.77	1.65	3.90	Mc	2 28.1	18.0
3635 Kreutz	14.9	X	127.30253	249.11485	235.34132	19.22172	0.0845368	0.40999713	1.79	1.64	1.95	Mc	5 25.0	16.4
3674 Erbsbühl	12.1	X	327.28356	98.06471	296.84204	21.02595	0.3753754	0.27172093	2.36	1.47	3.25	Mc	9 20.7	13.7
3688 Navajo	15.1	X	353.38393	137.79145	19.98713	2.55726	0.4776642	0.17015026	3.23	1.68	4.77	Ja	—	—
3737 Beckman	12.5	X	30.84740	85.41333	288.18610	20.13180	0.3961574	0.26396698	2.41	1.45	3.36	Mc	—	—
3800 Karayusuf	15.1	X	226.72574	115.71759	95.44168	14.84726	0.0758039	0.49729931	1.58	1.46	1.70	Mc	—	—
3833 Calingasta	15.3	X	114.08211	174.17473	170.13654	12.01852	0.3893339	0.30293031	2.20	1.34	3.05	Mc	—	—
3858 Dorchester	13.8	X	287.92364	335.35548	347.91469	7.70869	0.2431820	0.30430785	2.19	1.66	2.72	Mc	4 6.7	16.7
3920 Aubignan	13.0	X	212.72275	237.66714	116.35032	9.04133	0.2715587	0.29116463	2.25	1.64	2.87	Mc	3 18.4	17.0
4205 David Hughes	14.5	X	293.86555	109.98753	276.53021	16.48052	0.1492703	0.43441676	1.73	1.47	1.98	Mc	8 8.2	15.5
4276 Clifford	14.7	X	310.85547	3.65561	76.84980	21.01929	0.2033092	0.34593413	2.01	1.60	2.42	Mc	12 31.1	15.5
4435 Holt	13.4	X	349.87673	110.54126	330.75324	21.93867	0.3340332	0.27946741	2.32	1.54	3.09	Mc	—	—
4451 Grieve	12.1	X	269.57682	110.30024	219.33869	27.80387	0.3839312	0.23458282	2.60	1.60	3.60	Mc	3 19.5	17.1
4558 Janesick	12.6	X	29.47732	94.32827	254.83136	12.28323	0.3625125	0.30250480	2.20	1.40	2.99	Mc	—	—
4587 Rees	15.3	X	54.40076	84.02070	180.35253	24.63532	0.5089963	0.22751619	2.66	1.30	4.01	Mc	11 5.7	20.

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Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
5201 Ferraz-Mello	14.9 ^m	X	158.09033	117.31711	15.96378	3.27624	0.4498764	0.15703969	3.40	1.87	4.93	Ja	7 29.6	21.5
5230 Asahina	13.2	X	16.54548	266.43413	195.19753	20.68130	0.3746900	0.26529549	2.40	1.50	3.30	Mc	—	—
5246 Migliorini	14.4	X	228.94434	140.43609	180.91785	5.62560	0.2834403	0.29708425	2.22	1.59	2.85	Mc	2 13.1	18.4
5261 Eureka	16.1	X	113.51277	95.47508	245.03435	20.28038	0.0646875	0.52410758	1.52	1.42	1.62	MT	—	—
5275 Zdislava	13.8	X	259.17453	108.60602	236.07293	6.05736	0.2545025	0.30223270	2.20	1.64	2.76	Mc	4 6.3	17.2
5324 Lyapunov	15.5	X	232.54308	321.10068	352.25145	19.61489	0.6048765	0.19102424	2.99	1.18	4.79	Ja	2 15.3	22.0
5335 Damocles	13.3	X	270.62120	191.19853	314.00503	61.58532	0.8658355	0.02415626	11.85	1.59	22.11	Jc	8 12.0	26.0
5349 Paulharris	13.0	X	349.62056	81.16898	1.32223	28.48587	0.4678660	0.21210540	2.78	1.48	4.09	Mc	—	—
5370 Taranis	15.1	X	255.37881	161.29737	177.79934	19.16266	0.6369964	0.16263521	3.32	1.21	5.44	Jc	3 17.1	21.7
5392 Parker	12.8	X	286.42317	96.72755	56.09314	22.05650	0.3438789	0.27392635	2.35	1.54	3.16	Mc	—	—
5407 1992 AX	14.0	X	220.31733	108.73006	117.74052	11.39065	0.2776563	0.39550725	1.84	1.33	2.35	Mc	—	—
5510 1988 RF ₇	13.5	X	41.10376	234.61747	109.22278	5.68451	0.2443506	0.30401511	2.19	1.66	2.73	Mc	—	—
5585 Parks	14.0	X	318.67203	76.16354	264.82694	28.59373	0.3995557	0.22078224	2.71	1.63	3.79	Mc	5 27.5	17.1
5621 Erb	14.0	X	325.95350	5.28277	278.92783	5.54529	0.3860984	0.28218624	2.30	1.41	3.19	Mc	3 10.8	16.9
5642 Bobbywilliams	14.1	X	266.62077	39.15496	310.07220	24.96145	0.3332377	0.27983810	2.31	1.54	3.09	Mc	3 30.9	18.7
5649 Donnashirley	14.6	X	307.79143	62.57785	3.36542	21.72952	0.3359770	0.28603894	2.28	1.51	3.05	Mc	10 5.3	15.4
5682 Beresford	13.7	X	303.92613	138.58208	212.76720	7.96235	0.2990754	0.28324899	2.30	1.61	2.98	Mc	6 2.5	16.3
5720 Halweaver	13.7	X	299.20215	82.26909	47.74215	23.47005	0.3073686	0.28393284	2.29	1.59	3.00	Mc	—	—
5732 1988 WC	14.7	X	269.85586	253.43684	240.51305	22.44677	0.4049561	0.29767705	2.22	1.32	3.12	Mc	10 18.7	17.4
5738 Billpickering	15.0	X	327.00037	246.34749	239.29475	21.77769	0.4804495	0.21806088	2.73	1.42	4.05	Mc	—	—
5817 Robertfrazier	12.9	X	150.90776	82.78069	340.46872	21.10940	0.3406258	0.26388351	2.41	1.59	3.23	Mc	4 17.6	17.6
5867 1988 RE	15.2	X	161.10561	105.57536	202.13930	35.06940	0.2520768	0.40099475	1.82	1.36	2.28	Mc	—	—
5870 Baltimore	13.3	X	22.19819	272.21655	153.65843	28.96485	0.4196273	0.21129019	2.79	1.62	3.96	Mc	—	—
5892 Milesdavis	13.7	X	269.59652	290.91810	153.65364	4.59143	0.2996752	0.26707709	2.39	1.67	3.10	Mc	8 27.4	16.6
5929 Manzano	13.5	X	332.22720	277.81913	126.31931	20.01849	0.3033439	0.27214508	2.36	1.64	3.07	Mc	12 9.4	15.3
5999 Plescia	14.5	X	5.00220	71.40346	71.13062	23.16963	0.3061081	0.28630085	2.28	1.58	2.98	Mc	—	—
6041 Juterkilian	14.3	X	22.03903	102.56644	199.43737	9.90613	0.3253217	0.25771477	2.45	1.65	3.24	Mc	10 21.9	16.6
6042 Cheshirecat	12.9	X	295.37291	286.15909	88.60790	15.88657	0.4575468	0.18609470	3.04	1.65	4.43	Mc	6 3.8	17.5
6130 Hutton	16.6	X	68.83071	189.61823	139.33565	23.75223	0.5419220	0.19209027	2.97	1.36	4.59	Mc	—	—
6144 Kondojiro	11.6	X	224.25115	96.41298	117.08763	5.88337	0.3599898	0.09468906	4.77	3.05	6.48	Jc	11 27.7	19.2
6170 Levasseur	13.5	X	99.02070	103.69828	11.76966	22.57968	0.3196490	0.27337077	2.35	1.60	3.10	Mc	5 8.3	17.1
6172 Prokofeana	15.2	X	120.92605	194.20177	218.48986	15.88904	0.4384186	0.23929874	2.57	1.44	3.70	Mc	3 31.7	19.7
6183 Viscome	13.8	X	213.15513	116.34754	274.66795	19.68655	0.2892509	0.28158451	2.31	1.64	2.97	Mc	4 24.4	18.4
6261 Chione	14.3	X	112.99966	293.35090	163.74477	21.85309	0.3502043	0.27279560	2.35	1.53	3.18	Mc	5 15.8	18.4
6318 Cronkite	15.8	X	246.13022	12.23632	71.07633	25.83430	0.4609178	0.24692157	2.52	1.36	3.68	Mc	7 17.3	20.8
6322 1991 CQ	16.3	X	225.06094	297.59202	173.71046	28.34472	0.4680481	0.24614312	2.52	1.34	3.70	Mc	8 4.5	21.6
6386 Keithnoll	12.7	X	61.70525	268.05801	119.81268	8.73480	0.3009590	0.28783008	2.27	1.59	2.96	Mc	—	—
6411 Tamaga	13.1	X	351.81272	272.30732	157.22657	28.60206	0.4169898	0.21458083	2.76	1.61	3.92	Mc	—	—
6444 Ryuzin	14.2	X	209.23499	269.15365	98.00496	6.05947	0.3049336	0.29609205	2.23	1.55	2.91	Mc	3 30.9	18.3
6446 Lomborg	15.0	X	223.49474	253.51695	157.02124	23.57980	0.2964767	0.27961936	2.32	1.63	3.00	Mc	6 4.8	19.6
6487 Tonyspear	13.6	X	78.03607	92.89663	187.46308	21.27264	0.3053448	0.27247348	2.36	1.64	3.08	Mc	11 27.2	17.8
6490 1991 NR ₂	14.6	X	323.49106	29.19540	286.49634	17.17882	0.4068535	0.22707196	2.66	1.58	3.74	Mc	4 18.9	18.1
6500 Kodaira	12.7	X	123.38735	255.40587	186.10592	29.32528	0.4174042	0.21563618	2.75	1.60	3.90	Mc	5 10.5	18.0
6523 Clube	15.1	X	355.70714	284.95332	354.75496	26.62951	0.4173818	0.22869049	2.65	1.54	3.75	Mc	5 2.7	17.3
6564 Asher	16.2	X	116.48022	330.50079	194.56593	45.29212	0.2658022	0.38179092	1.88	1.38	2.38	Mc	7 31.2	20.2
6585 O'Keefe	14.4	X	0.63545	60.29096	0.52905	22.36700	0.3575031	0.26986739	2.37	1.52	3.22	Mc	—	—
6847 Kunz-Hallstein	14.3	X	52.63548	53.29807	48.46273	24.57914	0.2895382	0.27871902	2.32	1.65	2.99	Mc	1 8.9	16.1
6874 1994 JO ₁	13.8	X	13.15885	224.21332	78.19504	7.57923	0.2819260	0.29389052	2.24	1.61	2.87	Mc	10 7.3	15.4
6909 Levison	13.8	X	324.41285	75.46302	308.28140	38.01439	0.4670294	0.21919320	2.72	1.45	4.00	Mc	7 31.2	15.5
7002 Bronshten	14.8	X	274.83100	144.11564	193.19276	4.58351	0.3327321	0.27243698	2.36	1.57	3.14	Mc	4 7.9	18.5
7079 Baghdad	14.9	X	32.46110	121.52837	202.67045	3.88607	0.2952749	0.28513039	2.29	1.61	2.96	Mc	12 7.3	17.7
7096 Napier	15.0	X	68.31143	257.98156	146.50263	11.15013	0.2502066	0.21282407	2.78	1.38	4.17	Mc	2 5.2	17.1
7267 Victormeen	13.8	X	266.43339	130.27539	359.27675	22.59797	0.3366920	0.27319277	2.35	1.56	3.14	Mc	10 11.8	17.0
7304 Namiki	13.8	X	121.67701	114.76034	109.39929	9.60421	0.4237883	0.23252487	2.62	1.51	3.73	Mc	10 26.8	19.1
7330 Annelemaître	13.4	X	273.54739	252.96887	191.08968	21.63460	0.3009938	0.27214541	2.36	1.65	3.07	Mc	8 28.1	16.7
7345 Happer	14.7	X	186.41543	281.26885	68.35298	3.67853	0.3221131	0.25661167	2.45	1.66	3.24	Mc	2 25.0	19.2
7369 Gavrilin	13.3	X	302.82764	113.11191	278.24109	21.81067	0.3195441	0.27008553	2.37	1.61	3.13	Mc	7 22.6	15.9
7445 Trajanus	14.8	X	252.51290	109.80299	226.54419	1.18549	0.2435889	0.30263381	2.20	1.66	2.73	Mc	3 23.0	18.3
7467 1989 WQ ₁	15.8	X	271.04952	41.76788	69.07082	15.98814	0.1265453	0.46333002	1.65	1.44	1.86	Mc	—	—
7505 Furusho	12.3	X	316.89456	287.90655	86.49093	6.37596	0.3816187	0.23018885	2.64	1.63	3.64	Mc	7 16.8	14.5
7604 Kridsadaporn	13.3	X	228.83842	266.20229	147.23577	20.44803	0.5738436	0.17952635	3.11	1.33	4.90	Ja	6 2.2	20.0
7723 Luggar	13.9	X	267.38749	267.56575	110.98344	6.06337	0.3020611	0.28358766	2.29	1.60	2.99	Mc	5 27.8	17.3
7747 Michatowski	13.7	X	283.44923	28.65140	289.30106	5.05341	0.2747096	0.28370441	2.29	1.66	2.92	Mc	3 23.9	17.3
7778 Markrobinson	13.2	X	168.14739	97.35918	224.47067	19.54607	0.3288667	0.26778613	2.38	1.60	3.17	Mc	1 4.9	17.6
7816 Hanoi	15.0	X	216.05348	170.88249	222.95391	2.38678	0.2953499	0.28018869	2.31	1.63	3.00	Mc	5 5.3	19.2
7818 Muirhead	13.9	X	177.20444	254.62650	160.46245	21.74897	0.3501010	0.27554638	2.34	1.52	3.16	Mc	5 10.6	18.7
7870 1987 UP ₂	13.8	X	8.31828	156.33427	240.00256	3.50324	0.2724830	0.29374047	2.24	1.63	2.85	Mc	—	—
8251 Isogai	15.3	X	7.42745	233.16517	169.16314	3.21222	0.2633909	0.29135702	2.25	1.66	2.85	Mc	—	—
8256 Shenzhou	13.7	X	49.15018	21.76407	42.17906	6.84500	0.2487656	0.30259039	2.20	1.65	2.74	Mc	—	—
8355 Masuo	14.3	X	329.38135	196.35362	154.14001	7.70492	0.2885784	0.27600603	2.34	1.66	3.01	Mc	7 30.0	15.5
8373 Stephengould	14.1	X	330.21284	55.40706	88.86048	40.78298	0.5545046	0.16582831	3.28	1.46	5.10	Jc	—	—
8444 Popovich	14.0	X	80.04077	347.04442	353.02343	1.94025	0.2691945	0.28871330	2.27	1.66	2.88	Mc	—	—
8651 Alineraynal	14.5	X	78.14519	106.18659	271.42513	2.03545	0.2780080	0.28359252	2.29	1.66	2.93	Mc	—	—
9082 Leonardmartin	14.0	X	348.67826	280.99371	51.44952</									

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
9773 1993 <i>MG</i> ₁	13.7 ^m	X	131.71613	15.55335	277.51875	14.70340	0.3886174	0.22464994	2.68	1.64	3.72	Mc	—	—
9881 1994 <i>SE</i>	15.8	X	172.35034	275.04121	61.05065	8.08064	0.4109958	0.27511128	2.34	1.38	3.30	Mc	2 3.8	20.3
9969 Braille	15.9	X	41.86769	356.21433	241.93655	28.99205	0.4332307	0.27506533	2.34	1.33	3.36	Mc	8 29.2	19.4
9992 1997 <i>TG</i> ₁₉	14.7	X	225.74062	234.86851	42.97403	2.59343	0.2920130	0.30799900	2.17	1.54	2.81	Mc	—	—
10051 Albee	14.6	X	242.88970	242.98147	158.91184	21.85478	0.3447104	0.28410167	2.29	1.50	3.08	Mc	6 5.0	19.1
10295 Hippolyta	16.6	X	328.58056	222.89202	21.65608	19.23884	0.3332886	0.35514765	1.97	1.32	2.63	Mc	1 25.6	19.7
10416 Kottler	14.5	X	219.76883	251.55848	257.54609	20.29925	0.3984490	0.29349907	2.24	1.35	3.14	Mc	9 13.9	19.0
10502 Armaghobos	15.0	X	179.44165	263.21764	170.19503	21.92886	0.3189688	0.28114094	2.31	1.57	3.04	Mc	5 31.8	19.7
10548 1992 <i>PJ</i> ₂	14.5	X	267.70213	83.58143	211.58312	5.60134	0.3223995	0.26316987	2.41	1.63	3.19	Mc	2 10.1	18.8
10578 1995 <i>LH</i>	14.3	X	309.58915	267.81103	48.46072	11.43427	0.4089835	0.22307073	2.69	1.59	3.79	Mc	4 12.6	18.1
10984 Gispén	14.6	X	302.98559	82.63091	202.50516	5.87869	0.3276459	0.30850883	2.17	1.46	2.88	Mc	2 20.8	17.9
11318 1994 <i>XZ</i> ₄	16.7	X	126.74260	343.38942	65.46747	9.88063	0.4312400	0.23549914	2.60	1.48	3.72	Mc	4 6.6	21.4
11466 Katharinaotto	15.1	X	132.82135	30.39076	293.97937	5.87140	0.3147205	0.28631259	2.28	1.56	3.00	Mc	—	—
11836 Eileen	13.7	X	353.20908	289.87385	131.67719	22.48577	0.3501788	0.27423475	2.35	1.52	3.17	Mc	—	—
12008 Kandrup	13.1	X	21.90393	344.96002	263.31923	29.74421	0.3161137	0.34936732	2.00	1.37	2.63	Mc	7 11.5	13.8
12009 1996 <i>UE</i>	15.1	X	244.70712	303.45967	41.96804	4.15574	0.2789919	0.30326134	2.19	1.58	2.81	Mc	3 27.9	18.7
12198 1980 <i>PJ</i> ₁	14.6	X	323.93982	130.32493	278.62205	4.54762	0.2408230	0.31407698	2.14	1.63	2.66	Mc	11 26.6	15.2
12520 1998 <i>HV</i> ₇₈	14.6	X	203.78210	101.87060	252.51977	4.80500	0.2934308	0.29264984	2.25	1.59	2.91	Mc	3 6.5	18.8
13091 1992 <i>PT</i> ₃	15.4	X	232.32751	223.75639	82.68358	2.36575	0.2752369	0.29401840	2.24	1.62	2.86	Mc	1 30.8	19.3
13153 1995 <i>QC</i> ₃	15.4	X	331.06007	345.16194	382.80443	5.63908	0.3672419	0.26251489	2.42	1.53	3.30	Mc	5 23.9	17.4
13551 Gadsden	16.4	X	103.51581	238.19081	317.26716	5.27466	0.4272647	0.24586801	2.52	1.45	3.60	Mc	9 8.6	21.1
13819 1999 <i>SX</i> ₅	13.6	X	51.84672	269.00391	135.97660	23.48337	0.3032156	0.27918527	2.32	1.62	3.02	Mc	—	—
13920 Montecorvino	14.7	X	111.32959	9.53420	308.40631	3.13755	0.2375806	0.30969128	2.16	1.65	2.68	Mc	—	—
14017 1994 <i>NS</i>	14.8	X	163.80986	79.35155	203.50455	6.48683	0.2388923	0.30886399	2.17	1.65	2.69	Mc	—	—
14211 1999 <i>NT</i> ₁	13.9	X	66.66264	91.03255	282.08908	21.35108	0.3189464	0.28141692	2.31	1.57	3.04	Mc	—	—
14222 1999 <i>WS</i> ₁	14.0	X	19.02641	84.88173	229.16083	17.17886	0.5454567	0.18091884	3.10	1.41	4.78	Ja	11 26.5	17.5
14223 Dolby	14.7	X	3.43181	250.21536	105.46101	3.83499	0.3012998	0.26970594	2.37	1.66	3.09	Mc	12 3.9	16.5
14309 Defoy	14.3	X	325.52342	136.96401	174.89097	6.50610	0.4475769	0.23454525	2.60	1.44	3.77	Mc	4 17.9	17.1
14461 1993 <i>FL</i> ₅₄	14.3	X	302.91920	255.71359	10.82412	21.31493	0.3267038	0.27763891	2.33	1.57	3.09	Mc	2 13.6	18.3
14581 1998 <i>RT</i> ₄	14.1	X	358.38083	245.08163	170.23078	31.63881	0.4042294	0.21885065	2.73	1.62	3.83	Mc	—	—
14653 1998 <i>YV</i> ₁₁	14.3	X	331.35832	216.52731	77.74143	9.01355	0.3425262	0.28513899	2.29	1.50	3.07	Mc	4 18.4	16.4
14982 1997 <i>TH</i> ₁₉	14.4	X	274.63572	324.97058	1.01599	3.31398	0.3209076	0.27713541	2.33	1.58	3.08	Mc	3 25.1	18.3
15504 1999 <i>RG</i> ₃₃	12.1	X	287.40624	273.89230	23.43374	34.95344	0.7741840	0.03435747	9.37	2.12	16.63	Jc	3 1.7	23.2
15609 Kosmaczewski	15.4	X	19.77885	163.51648	138.80619	6.73142	0.2900293	0.28806873	2.27	1.61	2.93	Mc	10 20.3	17.4
15673 Chetaev	14.4	X	32.30460	5.22208	319.12934	5.36723	0.2683989	0.30068713	2.21	1.61	2.80	Mc	12 5.2	17.0
15700 1987 <i>QD</i>	14.7	X	132.80702	119.49595	175.44565	26.79232	0.3150398	0.30020936	2.21	1.51	2.90	Mc	—	—
15778 1993 <i>NH</i>	14.8	X	333.93007	81.13993	245.75571	22.26545	0.3123398	0.28177307	2.30	1.58	3.02	Mc	6 20.7	16.3
15790 Keizan	13.6	X	268.86885	293.55755	23.51604	22.86295	0.3169993	0.27187105	2.36	1.61	3.11	Mc	3 19.4	17.8
16142 Leung	14.2	X	230.70401	197.80874	127.80837	8.83800	0.2998509	0.29349552	2.24	1.57	2.91	Mc	2 22.1	18.2
16143 1999 <i>XK</i> ₁₄₂	14.1	X	196.95559	21.83103	311.57360	9.32620	0.3386116	0.28973052	2.26	1.50	3.03	Mc	2 8.1	18.2
16474 1990 <i>QG</i> ₃	16.6	X	70.19275	326.02523	32.32977	1.64936	0.3020084	0.29462098	2.24	1.56	2.91	Mc	—	—
16529 Dangoldin	13.6	X	247.16854	251.23634	191.85570	22.68895	0.3144750	0.27516954	2.34	1.60	3.08	Mc	7 26.3	17.8
16588 Jonghee	15.2	X	356.44726	16.75938	30.42625	8.10324	0.3853709	0.24046302	2.56	1.57	3.55	Mc	—	—
16591 1992 <i>SY</i> ₁₇	14.3	X	143.96335	71.99471	239.53090	8.41232	0.2802716	0.28440367	2.29	1.65	2.93	Mc	—	—
16635 1993 <i>QO</i>	14.3	X	323.76621	77.87167	313.74208	9.21307	0.2851652	0.28278841	2.30	1.64	2.95	Mc	9 16.8	16.1
16695 Terryhandley	17.0	X	191.52696	257.82325	108.67933	4.78435	0.3589772	0.31097304	2.16	1.38	2.93	Mc	3 17.5	21.0
16724 Ullilottzmann	14.1	X	218.85867	276.37368	118.90269	29.82529	0.4396124	0.21147615	2.79	1.56	4.02	Mc	5 18.7	20.1
16851 1997 <i>YU</i> ₁	15.3	X	331.14679	91.23695	192.68965	20.77410	0.3675459	0.28350014	2.29	1.46	3.13	Mc	9 22.3	16.8
16868 1998 <i>AK</i> ₈	16.6	X	258.75996	11.90465	126.78257	48.23458	0.1821908	0.40890265	1.80	1.47	2.13	Mc	—	—
16958 Klaasen	14.9	X	100.73776	53.64985	152.38217	41.95662	0.2887024	0.34623106	2.01	1.43	2.59	Mc	9 18.2	18.3
17435 di Giovanni	14.4	X	184.29587	298.56400	192.14948	22.09635	0.3155325	0.27017147	2.37	1.62	3.12	Mc	8 7.1	19.2
17493 Wildcat	14.6	X	183.45394	174.99611	274.18464	44.36250	0.4415316	0.21764071	2.74	1.53	3.95	Mc	6 22.3	20.2
17555 Kenkennedy	14.8	X	193.79785	251.90848	161.87579	21.59449	0.3265506	0.27013924	2.37	1.60	3.14	Mc	5 19.1	19.6
17640 Mount Stromlo	13.6	X	345.06235	303.76823	85.66167	25.43361	0.3522674	0.27818482	2.32	1.51	3.14	Mc	12 27.3	14.8
17744 Jodiefooster	15.1	X	231.67449	102.15053	240.68642	3.07537	0.3115748	0.26628378	2.39	1.65	3.14	Mc	3 14.4	19.6
18181 2000 <i>QD</i> ₃₄	13.3	X	7.71999	251.95345	330.40323	21.18817	0.2956008	0.27544941	2.34	1.65	3.03	Mc	3 13.7	15.0
18195 2000 <i>QG</i> ₁₁₆	15.9	X	29.32433	259.50050	133.08351	2.01593	0.2609276	0.29125730	2.25	1.67	2.84	Mc	—	—
18284 Tsereteli	14.7	X	185.80789	344.67805	330.89427	4.28334	0.2516454	0.30006176	2.21	1.65	2.77	Mc	1 5.6	18.3
18398 Bregenz	14.9	X	110.51882	102.08842	219.54672	7.83599	0.3094914	0.28116426	2.31	1.59	3.02	Mc	—	—
18499 Showalter	15.8	X	265.38133	193.39463	134.61134	4.28570	0.3498896	0.26652150	2.39	1.55	3.23	Mc	3 20.7	19.9
18514 1996 <i>TE</i> ₁₁	15.8	X	345.19729	263.33054	175.36730	24.92037	0.4717921	0.23938193	2.57	1.36	3.78	Mc	—	—
18620 1998 <i>DS</i> ₁₀	16.2	X	316.32222	347.82003	103.91284	3.01009	0.3289626	0.28574128	2.28	1.53	3.03	Mc	—	—
18726 1998 <i>KC</i> ₂	15.1	X	181.15706	290.89154	219.35957	20.91636	0.3115389	0.27105142	2.36	1.63	3.10	Mc	8 26.5	19.8
18899 2000 <i>JQ</i> ₂	14.9	X	328.54135	110.19519	221.81777	22.66240	0.3748920	0.28271421	2.30	1.44	3.16	Mc	6 1.9	16.8
18916 2000 <i>OG</i> ₄₄	14.4	X	257.52976	98.87789	301.37146	7.39612	0.5836138	0.13021551	3.86	1.61	6.10	Jc	5 26.2	21.4
18919 2000 <i>OJ</i> ₅₂	15.1	X	34.72894	333.60798	345.23844	7.28464	0.4376021	0.23929691	2.57	1.45	3.69	Mc	12 13.7	18.9
19080 Martinfierro	13.9	X	199.11543	281.85420	288.78505	20.56888	0.2826820	0.27975333	2.32	1.66	2.97	Mc	11 29.6	18.0
19127 Olegfremov	15.4	X	214.46127	4.76705	336.80512	5.22709	0.3168914	0.30867200	2.17	1.48	2.86	Mc	2 27.5	19.2
19388 1998 <i>DQ</i> ₃	14.5	X	292.09523	288.10733	157.73507	20.52830	0.3400112	0.28366275	2.29	1.51	3.07	Mc	10 4.9	16.4
19402 1998 <i>EG</i> ₁₄	14.9	X	44.35319	318.07382	121.45232	3.31586	0.2692328	0.29362207	2.24	1.64	2.85	Mc	—	—
19877														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
20860 2000 VS ₃₄	15.6 ^m	X	255.15467	115.26318	227.56030	8.62928	0.4423227	0.22006400	2.72	1.52	3.92	Mc	3 25.2	21.0
20898 Fountainhills	11.5	X	101.66347	236.38191	293.03355	44.93269	0.4691059	0.11096096	4.29	2.28	6.30	Jc	7 28.4	18.8
20958 A900 MA	14.4	X	3.65141	187.86519	97.46663	8.16217	0.2957292	0.27727151	2.33	1.64	3.02	Mc	7 28.8	15.0
21001 Trogrlic	15.2	X	267.43221	293.52025	177.49187	21.56013	0.3193354	0.27725521	2.33	1.59	3.07	Mc	9 29.3	17.9
21028 1989 TO	13.4	X	290.60249	98.69170	340.46454	21.80130	0.2979970	0.27626612	2.33	1.64	3.03	Mc	9 17.1	15.6
21030 1989 TZ ₁₁	14.9	X	296.93131	280.25664	69.23414	8.44798	0.3622125	0.27302834	2.35	1.50	3.21	Mc	5 12.5	18.1
21104 Sveshnikov	13.8	X	338.34491	83.75861	311.45987	21.35473	0.2964219	0.27498736	2.34	1.65	3.04	Mc	12 4.9	15.7
21183 1994 EO ₂	14.2	X	10.12779	77.57599	4.20571	23.08301	0.2840243	0.28321613	2.30	1.64	2.95	Mc	—	—
21228 1995 SC	15.1	X	214.86830	75.70242	317.28728	28.32171	0.4010708	0.21525998	2.76	1.65	3.86	Mc	4 19.3	21.1
21788 1999 SZ ₅	14.1	X	261.71246	239.73730	161.28697	22.59923	0.3208710	0.26055510	2.43	1.65	3.21	Mc	6 20.2	18.5
21893 1999 VL ₄	14.7	X	29.66009	217.66554	95.64454	2.93384	0.3728732	0.27170323	2.36	1.48	3.24	Mc	11 28.6	17.6
22168 Weissflog	15.7	X	294.44064	34.70579	254.92892	2.97423	0.2694118	0.31149658	2.16	1.57	2.74	Mc	2 24.8	19.0
22283 Pytheas	14.8	X	268.02982	195.73188	146.00354	7.97703	0.2469419	0.30442271	2.19	1.65	2.73	Mc	4 16.1	18.1
22385 Fujimoriboshi	14.7	X	273.73327	321.89021	180.90200	23.26671	0.2875267	0.27814971	2.32	1.66	2.99	Mc	12 2.8	17.4
22449 Ottjeff	13.9	X	303.18854	70.41565	2.39066	21.54005	0.3514961	0.27462899	2.34	1.52	3.17	Mc	9 29.4	15.2
22601 1998 HD ₁₂₄	13.4	X	160.94837	210.02720	101.39591	9.29326	0.2798788	0.28084750	2.31	1.66	2.96	Mc	—	—
22807 1998 RK ₇	15.2	X	304.13155	318.33542	15.97008	0.07009	0.2439055	0.30761561	2.17	1.64	2.70	Mc	5 15.2	17.6
22844 1999 RU ₁₁₁	13.5	X	93.21742	269.31489	170.57679	28.40339	0.4362923	0.20156719	2.88	1.62	4.14	Mc	4 19.2	18.2
23250 2000 WQ ₁₈₁	15.0	X	286.00849	315.22669	152.74136	23.52205	0.3062125	0.27766947	2.33	1.61	3.04	Mc	11 6.1	17.5
23621 1996 PA	15.6	X	185.63714	153.38980	143.75753	19.34769	0.2989264	0.37502608	1.90	1.34	2.47	Mc	—	—
23726 1998 HG ₄₈	15.0	X	2.20485	245.04720	87.48436	6.35935	0.2468854	0.30959323	2.16	1.63	2.70	Mc	10 28.2	16.3
23738 1998 JZ ₁	14.5	X	80.57156	246.75457	41.14159	5.81316	0.2912555	0.31141165	2.16	1.53	2.78	Mc	12 9.7	18.1
23983 1999 NS ₁₁	15.1	X	69.88122	232.94173	146.76372	7.08719	0.3081592	0.28241721	2.30	1.59	3.01	Mc	—	—
24029 1999 RT ₁₉₈	13.7	X	354.43027	248.44136	200.61177	21.56028	0.3076734	0.28075808	2.31	1.60	3.02	Mc	—	—
24143 1999 VY ₁₂₄	15.6	X	281.14623	330.49523	9.56813	4.17368	0.2455882	0.30778583	2.17	1.64	2.71	Mc	4 23.1	18.6
24242 1999 XY ₁₀₀	14.6	X	18.98647	14.44430	303.80908	4.72916	0.2648064	0.30829363	2.17	1.60	2.74	Mc	11 6.3	16.6
24447 2000 QY ₁	17.4	X	19.71667	264.80234	152.49392	12.24866	0.2348811	0.43547730	1.72	1.32	2.13	Mc	—	—
24495 Degroff	14.9	X	107.63194	133.11009	75.32129	29.73548	0.3608251	0.30805972	2.17	1.39	2.95	Mc	10 15.8	19.5
24643 MacCreedy	14.1	X	155.41266	114.40264	219.84070	23.29556	0.2955109	0.27846799	2.32	1.64	3.01	Mc	1 4.1	18.2
24682 1990 BH	15.1	X	109.27562	56.32840	125.27905	24.67625	0.3704210	0.29351576	2.24	1.41	3.07	Mc	8 29.1	19.2
24693 1990 SB ₂	13.8	X	60.17057	269.01156	153.72576	20.12397	0.3480129	0.26415716	2.41	1.57	3.24	Mc	—	—
24806 1994 RH ₉	14.8	X	67.53128	341.37556	353.19180	9.91671	0.3484727	0.26346922	2.41	1.57	3.25	Mc	—	—
24814 1994 VW ₁	14.9	X	239.54839	320.26260	109.20906	15.55383	0.2602849	0.35848988	1.96	1.45	2.47	Mc	7 11.5	17.6
24970 1998 FC ₁₂	15.0	X	171.79742	150.90351	157.84451	4.48142	0.2446550	0.32878763	2.08	1.57	2.59	Mc	—	—
25037 1998 QC ₃₇	15.0	X	40.99274	1.65630	177.16937	4.79295	0.2559125	0.30234957	2.20	1.64	2.76	Mc	10 10.2	17.5
25362 1999 TH ₂₄	14.7	X	37.39389	289.14497	186.79798	20.51240	0.3118423	0.28525747	2.29	1.57	3.00	Mc	—	—
25872 2000 MV ₁	17.9	X	289.40810	150.06565	177.15054	5.12252	0.3577191	0.32131988	2.11	1.36	2.87	Mc	4 1.8	21.1
25974 2001 FF ₄₃	15.6	X	220.37064	44.25702	206.26849	1.54482	0.2851785	0.27758389	2.33	1.66	2.99	Mc	—	—
26050 3167 T ₂	16.0	X	190.00604	179.33096	105.83769	2.30627	0.2902947	0.27626503	2.33	1.66	3.01	Mc	—	—
26120 1991 VZ ₂	15.3	X	161.11828	337.16043	23.13056	3.98288	0.3537584	0.27833453	2.32	1.50	3.15	Mc	2 20.1	19.3
26129 1993 DK	13.8	X	166.00695	262.28483	232.15289	20.94449	0.3363245	0.25921868	2.44	1.62	3.26	Mc	7 27.2	18.8
26166 1995 QN ₃	16.8	X	134.13702	62.88918	185.72418	14.78771	0.6448245	0.16444354	3.30	1.17	5.43	Jc	11 26.2	24.0
26189 1997 AX ₁₂	16.8	X	278.57808	328.15838	109.37852	5.76044	0.4152900	0.22993074	2.64	1.54	3.73	Mc	8 10.5	20.6
26209 1997 RD ₁	15.6	X	168.33129	162.39220	169.98620	13.49151	0.3973792	0.22561370	2.67	1.61	3.73	Mc	1 27.8	20.8
26385 1999 RN ₂₀	15.1	X	316.70320	198.93342	173.38158	27.08231	0.2692686	0.31222304	2.15	1.57	2.73	Mc	8 7.8	17.0
26677 2001 EJ ₁₈	16.7	X	209.33637	148.51267	67.51007	27.74544	0.0187749	0.51598657	1.54	1.51	1.57	Mc	—	—
26822 1988 RG ₁₃	14.5	X	30.46259	223.24132	101.13305	8.91866	0.2483588	0.30179113	2.20	1.65	2.75	Mc	12 2.0	17.0
26858 Misterrgers	12.9	X	24.60138	247.86613	203.63831	21.87071	0.3445633	0.27500581	2.34	1.53	3.15	Mc	—	—
26879 Haines	14.3	X	223.27312	95.17929	230.92558	12.32216	0.3483176	0.28047513	2.31	1.51	3.12	Mc	2 9.2	19.2
27057 1998 SP ₃₃	14.4	X	198.58400	100.49661	346.95263	4.87188	0.3033491	0.28997639	2.26	1.57	2.95	Mc	6 29.1	18.5
27089 1998 UE ₁₅	15.7	X	93.12251	208.66257	120.67538	8.85992	0.2356517	0.30868236	2.17	1.66	2.68	Mc	—	—
27234 1999 RC ₂	16.0	X	235.33880	347.90012	330.90789	24.51892	0.1485100	0.47829359	1.62	1.38	1.86	Mc	1 29.1	17.8
27351 2000 DO ₇₃	14.6	X	251.84003	341.66749	1.02564	3.60374	0.2750963	0.28465844	2.29	1.66	2.92	Mc	3 30.1	18.3
27657 Berkhey	15.2	X	290.09452	212.70806	139.59910	23.43162	0.2928788	0.29121232	2.25	1.59	2.91	Mc	5 23.9	18.8
27995 1997 WL ₂	15.1	X	331.90765	232.37207	71.28042	3.46201	0.2725220	0.31878690	2.12	1.54	2.70	Mc	5 11.3	16.4
28017 1997 YV ₁₃	13.6	X	258.44361	131.70330	266.46364	4.98350	0.3889318	0.23571142	2.60	1.59	3.60	Mc	6 5.9	17.9
28085 1998 QO ₉₈	14.6	X	195.64598	275.76482	197.32249	19.85883	0.3132821	0.28946742	2.26	1.55	2.97	Mc	7 24.4	19.2
28203 1998 XL ₄₈	15.5	X	357.84437	0.77932	43.40074	3.70609	0.3082725	0.30263553	2.20	1.52	2.87	Mc	—	—
28565 2000 EO ₅₈	15.0	X	91.79582	150.06045	185.13700	5.33777	0.2849780	0.30650756	2.18	1.56	2.80	Mc	—	—
29180 1990 SW ₁	14.4	X	171.72195	194.83146	194.16010	25.41354	0.2952281	0.27278223	2.35	1.66	3.05	Mc	3 28.9	18.5
29407 1996 UW	15.2	X	349.24452	281.74775	39.26938	5.07816	0.3019278	0.27254039	2.36	1.64	3.07	Mc	8 18.6	15.9
29451 1997 RM ₁	14.7	X	132.60383	290.28580	2.10324	5.07582	0.3469476	0.26147393	2.42	1.58	3.26	Mc	—	—
29566 1998 FK ₅	15.2	X	158.14955	323.23899	21.91897	24.13273	0.1204357	0.41670263	1.78	1.56	1.99	Mc	—	—
29780 1999 CJ ₅₀	15.4	X	258.48199	107.84704	348.56979	6.15025	0.3193073	0.29188592	2.25	1.53	2.97	Mc	8 29.9	18.4
30105 2000 FO ₃	14.3	X	118.14569	255.46827	62.03108	7.31752	0.3109752	0.30689193	2.18	1.50	2.85	Mc	—	—
30512 2001 HO ₈	12.7	X	279.57696	43.28740	128.45927	25.71252	0.3226850	0.13062113	3.85	2.61	5.09	Jc	12 11.8	18.2
30717 1937 UD	14.9	X	98.19019	314.75364	33.05417	8.97060	0.3347860	0.30875681	2.17	1.44	2.89	Mc	—	—
30765 1981 EJ ₄₈	15.7	X	162.10185	75.34843	359.44498	21.79358	0.3650465	0.27598383	2.34	1.48	3.19	Mc	5 11.7	20.5
30767 Chrskraft	14.6	X	199.46837	347.52378	55.79043	26.80778	0.2902431	0.27634002	2.33	1.66	3.01	Mc	5 8.5	18.8
30771 1986 PO ₂	14.7	X	150.75105	235.45026	140.51858	8.29235	0.3422935	0.26798895	2.38	1.57				

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
31415 1999 <i>AK</i> ₂₃	14.7 ^m	X	255.18015	196.68763	158.61735	6.84052	0.2690976	0.28724049	2.27	1.66	2.89	Mc	4 20.5	18.4
31832 2000 <i>AP</i> ₅₉	14.7	X	79.58809	340.96450	309.86517	6.58408	0.2644879	0.30560280	2.18	1.61	2.76	Mc	12 10.1	18.3
31843 2000 <i>CQ</i> ₈₀	15.0	X	51.79931	120.42714	172.83476	20.34147	0.2923038	0.30121905	2.20	1.56	2.85	Mc	11 23.6	18.6
31845 2000 <i>DK</i> ₁₇	16.3	X	212.05854	150.72775	148.84203	2.72401	0.2633462	0.31870298	2.12	1.56	2.68	Mc	1 4.0	19.9
31869 2000 <i>EF</i> ₁₀₁	14.5	X	21.64219	242.25209	39.67067	7.00059	0.2695778	0.28806987	2.27	1.66	2.88	Mc	9 17.2	16.2
31881 2000 <i>FL</i> ₁₅	16.4	X	10.56285	310.50585	198.62361	21.08010	0.1139690	0.41362179	1.78	1.58	1.99	Mc	—	—
31895 2000 <i>FX</i> ₄₄	15.2	X	72.80310	274.23765	59.25323	5.37153	0.2929912	0.30376808	2.19	1.55	2.83	Mc	—	—
31913 2000 <i>GM</i> ₅₆	15.1	X	262.29884	291.59464	29.57335	10.80063	0.3035111	0.27651050	2.33	1.63	3.04	Mc	3 15.2	19.2
32039 2000 <i>JO</i> ₂₃	14.6	X	90.05093	353.28322	303.81790	6.50318	0.2819186	0.29737228	2.22	1.60	2.85	Mc	12 26.6	18.3
32122 2000 <i>LD</i> ₁₀	14.4	X	258.64370	245.38318	87.93838	14.26771	0.3318585	0.27089825	2.37	1.58	3.15	Mc	3 29.4	18.8
32511 2001 <i>NX</i> ₁₇	12.8	X	282.63804	345.60569	285.72341	8.95053	0.4286835	0.08754111	5.02	2.87	7.18	Jc	2 3.8	20.4
32575 2001 <i>QY</i> ₇₈	15.2	X	25.17900	98.25531	229.10212	2.23223	0.3375136	0.29712723	2.22	1.47	2.97	Mc	12 10.9	17.8
32581 2001 <i>QW</i> ₉₈	15.2	X	7.68586	121.09231	177.83770	6.96832	0.2673673	0.29497622	2.24	1.64	2.83	Mc	9 6.3	16.1
32827 1992 <i>DF</i> ₁	15.0	X	256.60083	268.92670	149.58442	21.18914	0.3114452	0.28605327	2.28	1.57	2.99	Mc	7 7.8	18.8
32897 Curtharris	14.0	X	219.00318	129.24019	132.59277	23.86357	0.3024714	0.27555201	2.34	1.63	3.05	Mc	—	—
32910 1994 <i>TE</i> ₁₅	15.0	X	117.52053	131.60837	220.63802	4.79846	0.2545022	0.30564328	2.18	1.63	2.74	Mc	—	—
33060 1997 <i>VY</i>	15.4	X	108.62700	110.26235	251.11819	2.97797	0.3403934	0.25948281	2.43	1.61	3.26	Mc	1 2.0	18.1
33073 1997 <i>WU</i> ₁₆	15.3	X	179.30301	122.53010	243.48581	9.78726	0.3104826	0.26805565	2.38	1.64	3.12	Mc	3 3.9	19.8
33836 2000 <i>FB</i> ₃₉	15.5	X	202.69558	289.36483	29.02976	14.62411	0.3435369	0.26899012	2.38	1.56	3.19	Mc	2 2.5	20.2
33881 2000 <i>JK</i> ₆₆	14.3	X	82.55031	218.84412	123.06715	11.16225	0.2914890	0.29936581	2.21	1.57	2.86	Mc	—	—
34048 2000 <i>OR</i> ₃₅	15.8	X	118.39884	356.27685	358.46187	7.86354	0.2605844	0.29970357	2.21	1.64	2.79	Mc	—	—
34706 2001 <i>OP</i> ₈₃	14.9	X	203.57242	41.86691	66.57348	8.68324	0.3821274	0.29108871	2.25	1.39	3.12	Mc	7 27.9	19.2
34755 2001 <i>QW</i> ₁₂₀	14.4	X	166.76752	264.35105	145.94057	22.08733	0.3264011	0.27981657	2.32	1.56	3.07	Mc	4 28.8	19.0
34759 2001 <i>QL</i> ₁₅₁	13.9	X	133.85459	81.92766	350.81764	28.16145	0.4267817	0.22015284	2.72	1.56	3.88	Mc	4 21.2	19.4
35056 Cullers	14.0	X	209.85534	59.79291	344.17009	23.50562	0.3225846	0.25802798	2.44	1.66	3.23	Mc	5 2.7	19.1
35368 1997 <i>UB</i> ₈	14.6	X	215.52881	221.87431	202.68301	22.72887	0.3139719	0.27694840	2.33	1.60	3.06	Mc	6 10.9	19.2
35709 1999 <i>FR</i> ₂₈	13.8	X	317.23796	300.69973	16.32715	13.62657	0.3024645	0.27145163	2.36	1.65	3.08	Mc	4 29.2	16.4
36282 2000 <i>CT</i> ₉₈	15.3	X	335.61413	358.38075	317.84375	6.90397	0.2603985	0.29520069	2.23	1.65	2.82	Mc	6 18.6	16.6
36779 2000 <i>SW</i> ₁	15.1	X	343.29635	156.95850	155.72932	7.65252	0.3072585	0.28186285	2.30	1.60	3.01	Mc	6 28.9	16.0
37117 Narcissus	13.3	X	49.42377	180.07959	248.48255	13.80583	0.5536969	0.05468522	6.87	3.07	10.68	Jc	3 12.8	20.9
37152 2000 <i>VV</i> ₅₆	13.5	X	98.33842	246.20060	21.74550	7.16099	0.2951909	0.28119762	2.31	1.63	2.99	Mc	11 24.9	17.5
37308 2001 <i>OP</i> ₁₆	16.9	X	164.66920	257.44054	58.86853	5.57783	0.3231409	0.31883303	2.12	1.44	2.81	Mc	—	—
37314 2001 <i>QP</i>	14.7	X	279.23709	254.10735	192.06249	25.79880	0.4435045	0.24012747	2.56	1.43	3.70	Mc	8 13.4	19.0
37329 2001 <i>QW</i> ₁₀₈	16.3	X	253.02894	295.78305	128.76209	29.46074	0.4740226	0.23633829	2.59	1.36	3.82	Mc	6 30.6	21.4
37359 2001 <i>UM</i> ₁₇	16.3	X	10.71768	151.24300	607.21382	4.59711	0.3314400	0.29773427	2.22	1.48	2.96	Mc	—	—
37367 2001 <i>VC</i>	15.3	X	27.11281	299.39604	23.32977	22.79911	0.3364562	0.30286472	2.20	1.46	2.93	Mc	—	—
37384 2001 <i>WU</i> ₁	14.9	X	147.74321	82.88504	62.15868	20.28299	0.5647068	0.17481069	3.17	1.38	4.96	Ja	8 15.5	21.8
37479 1130 <i>T</i> ₁	16.7	X	326.35736	286.01683	196.32335	7.75598	0.2787085	0.34916839	2.00	1.44	2.55	Mc	—	—
37568 1989 <i>TP</i>	15.6	X	105.68173	107.71809	220.82536	22.75629	0.1003569	0.40955866	1.80	1.62	1.98	Mc	—	—
37596 Cotahuasi	14.7	X	276.65403	300.90511	219.54336	21.53120	0.3182718	0.26495950	2.40	1.64	3.16	Mc	12 20.8	17.2
37671 1999 <i>UY</i> ₁₁	14.7	X	59.12053	74.65510	16.68792	21.83246	0.3038727	0.26773448	2.38	1.66	3.11	Mc	2 3.7	16.7
37802 1999 <i>XD</i> ₁₁	15.2	X	173.75424	359.56644	310.74387	6.11590	0.3229254	0.29696826	2.22	1.51	2.94	Mc	—	—
38063 1999 <i>FH</i>	14.4	X	349.71244	108.45009	193.22444	11.88172	0.2936043	0.27500875	2.34	1.65	3.03	Mc	7 1.2	15.8
38066 1999 <i>FO</i> ₁₉	15.4	X	25.56940	344.56696	312.48481	3.67086	0.3526386	0.32196720	2.11	1.36	2.85	Mc	11 4.4	17.4
38074 1999 <i>GX</i> ₁₉	15.1	X	201.49931	113.27790	180.80858	4.74857	0.2655723	0.29800891	2.22	1.63	2.81	Mc	—	—
38181 1999 <i>JG</i> ₁₂₄	14.6	X	120.21012	61.80628	147.50946	23.90191	0.2891735	0.28078239	2.31	1.64	2.98	Mc	10 7.5	18.9
38647 2000 <i>OW</i> ₈	15.4	X	10.29511	191.03245	146.16542	4.24518	0.2827654	0.28363392	2.29	1.65	2.94	Mc	11 20.6	17.4
38683 2000 <i>QW</i> ₇	14.7	X	4.36419	80.05149	281.44718	2.70178	0.2775464	0.28387420	2.29	1.66	2.93	Mc	12 13.7	16.5
39096 2000 <i>WE</i> ₁	15.0	X	281.86320	287.74734	81.71726	8.70057	0.3848254	0.22953203	2.64	1.63	3.66	Mc	5 22.4	19.2
39235 2000 <i>YH</i> ₅₅	14.4	X	27.07191	206.13525	110.14200	14.14824	0.3102216	0.27305332	2.35	1.62	3.08	Mc	11 23.5	17.3
39489 1981 <i>EU</i> ₆	15.1	X	47.38076	71.61681	245.85568	7.96292	0.2907236	0.27956458	2.32	1.64	2.99	Mc	12 13.2	18.2
39557 Gielgud	16.9	X	165.70093	239.94872	58.52069	5.54949	0.4244663	0.28894187	2.27	1.30	3.23	Mc	—	—
39702 1996 <i>TZ</i> ₁₀	15.4	X	300.82569	163.19935	180.54492	7.05116	0.3126341	0.27028669	2.37	1.63	3.11	Mc	5 17.5	18.3
39741 Komm	15.7	X	242.84966	126.25538	225.67038	6.34046	0.3493652	0.30566946	2.18	1.42	2.95	Mc	3 28.3	19.6
39774 1997 <i>GO</i> ₂₇	18.4	X	353.32627	139.35369	188.82577	17.89700	0.0710780	0.58156178	1.42	1.32	1.52	Mc	11 4.8	18.3
40245 1998 <i>WO</i> ₇	16.4	X	107.90427	330.75981	78.23727	45.79224	0.3035167	0.31649464	2.13	1.49	2.78	Mc	3 19.9	20.4
40271 1999 <i>JT</i>	14.7	X	57.32198	253.80474	96.52416	23.84768	0.2747226	0.28366096	2.29	1.66	2.92	Mc	—	—
40310 1999 <i>KU</i> ₄	16.1	X	267.54641	223.39468	76.36247	8.42323	0.4056348	0.30336732	2.19	1.30	3.08	Mc	2 12.0	20.3
40315 1999 <i>LS</i>	16.2	X	333.41699	184.61360	119.62126	27.27793	0.3057074	0.31418127	2.14	1.49	2.80	Mc	5 23.3	18.6
40430 1999 <i>RL</i> ₂₈	16.1	X	44.94146	84.03046	172.43876	20.51624	0.4154724	0.26986669	2.37	1.39	3.36	Mc	10 10.9	19.3
40468 1999 <i>RF</i> ₄₆	14.9	X	95.21860	293.91316	321.42607	22.66402	0.3024917	0.27838788	2.32	1.62	3.03	Mc	10 29.3	19.4
40719 1999 <i>SZ</i> ₂	15.6	X	205.21378	331.61460	356.55014	4.94634	0.2683053	0.29738299	2.22	1.63	2.82	Mc	2 6.8	19.3
41074 1999 <i>VL</i> ₄₀	14.2	X	75.91698	246.58711	265.39467	19.90796	0.3093338	0.28586561	2.28	1.58	2.99	Mc	6 6.7	16.7
41223 1999 <i>XD</i> ₁₆	13.6	X	74.54234	329.59039	30.24831	11.76615	0.3720449	0.22878746	2.65	1.66	3.63	Mc	—	—
41434 2000 <i>GB</i> ₈₂	16.4	X	247.85730	338.53127	33.11014	14.14018	0.0614004	0.47131214	1.64	1.53	1.74	Mc	5 6.3	17.3
41475 2000 <i>PR</i> ₁₃	14.9	X	119.35024	228.68911	303.45794	23.17727	0.2774206	0.28425329	2.29	1.66	2.93	Mc	8 10.6	18.8
41588 2000 <i>SC</i> ₄₆	13.2	X	169.79508	274.80891	247.26592	20.06695	0.3218541	0.27481760	2.34	1.59	3.10	Mc	8 30.6	18.1
42501 1992 <i>YC</i>	14.9	X	121.65914	129.94214	264.68225	24.57534	0.2816178	0.28561867	2.28					

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
45764 2000 <i>LV</i> ₁₇₂	14.8 ^m	X	162.48859	64.97970	277.41857	6.71126	0.3159468	0.26219481	2.42	1.65	3.18	Mc	1 27.2	18.8
46433 2002 <i>JQ</i> ₆₇	15.3	X	176.42231	70.03917	269.02808	5.68567	0.2632492	0.29445985	2.24	1.65	2.83	Mc	1 26.4	18.8
46598 1993 <i>FT</i> ₂	13.9	X	41.71107	91.63389	3.12496	21.05009	0.2865819	0.27709496	2.33	1.66	3.00	Mc	—	—
46771 1998 <i>HM</i> ₇	14.6	X	130.68317	280.65581	56.47400	23.55198	0.2992477	0.28106401	2.31	1.62	3.00	Mc	—	—
46773 1998 <i>HZ</i> ₁₂	15.1	X	257.97752	160.09388	107.23697	5.76474	0.2758338	0.29134356	2.25	1.63	2.88	Mc	1 2.4	19.0
46780 1998 <i>HH</i> ₅₂	14.5	X	346.51564	327.61693	35.61893	7.11829	0.2383568	0.31143535	2.16	1.64	2.67	Mc	11 6.2	15.3
46818 1998 <i>MZ</i> ₂₄	14.2	X	106.41689	100.17315	260.84100	21.51134	0.3313644	0.27606670	2.34	1.56	3.11	Mc	—	—
47035 1998 <i>WS</i>	12.8	X	72.69788	94.68931	8.96525	27.49610	0.3948524	0.22782619	2.66	1.61	3.70	Mc	4 7.8	15.8
47199 1999 <i>TY</i> ₂₀₄	15.7	X	8.48226	321.59541	4.24975	4.07506	0.2356648	0.31174614	2.15	1.65	2.66	Mc	10 24.8	17.0
47343 1999 <i>XL</i> ₄₅	15.3	X	258.69526	250.25932	68.20566	6.40430	0.2663348	0.29770901	2.22	1.63	2.81	Mc	3 8.7	19.0
47576 2000 <i>AW</i> ₁₇₂	17.3	X	199.00078	184.26003	215.78859	5.49317	0.3265728	0.29697701	2.22	1.50	2.95	Mc	4 30.3	21.3
47581 2000 <i>AN</i> ₁₇₈	15.4	X	294.11987	146.43774	197.83116	7.15869	0.2674348	0.30087520	2.21	1.62	2.80	Mc	5 14.1	18.2
47588 2000 <i>AM</i> ₂₀₁	14.8	X	48.92297	286.18113	142.10055	23.30251	0.2960961	0.27872372	2.32	1.63	3.01	Mc	—	—
47648 2000 <i>CA</i> ₄₀	15.2	X	52.20155	226.33649	160.89479	22.10411	0.3044841	0.27181007	2.36	1.64	3.08	Mc	—	—
47834 2000 <i>EN</i> ₁₁₄	13.8	X	25.12648	47.29583	18.15372	23.63600	0.3131207	0.26806257	2.38	1.64	3.13	Mc	—	—
48338 2002 <i>PV</i> ₂₇	16.0	X	140.77444	271.42076	158.03437	6.37741	0.3856381	0.23884549	2.57	1.58	3.56	Mc	5 4.6	20.8
48450 1991 <i>NA</i>	15.5	X	36.70065	40.91809	277.58362	11.72673	0.3298315	0.26756266	2.39	1.60	3.17	Mc	12 6.1	18.7
48468 1991 <i>SS</i> ₁	16.5	X	42.01764	353.98838	37.67344	5.73790	0.3673654	0.26980267	2.37	1.50	3.24	Mc	—	—
48570 1991 <i>EA</i> ₂	15.9	X	134.86385	326.60773	183.76562	7.99457	0.3002980	0.30098237	2.21	1.54	2.87	Mc	7 30.6	19.8
48621 1995 <i>OC</i>	15.9	X	310.55782	168.03442	171.57360	2.87214	0.2755913	0.30117545	2.20	1.60	2.81	Mc	5 29.8	17.9
48864 1998 <i>HK</i> ₄₃	15.6	X	277.43285	78.98725	182.54748	6.33122	0.2856925	0.29088368	2.26	1.61	2.90	Mc	1 8.5	19.5
49385 1998 <i>AX</i> ₁₂	13.5	X	119.28729	89.51991	274.95096	20.67601	0.3139972	0.27093503	2.37	1.62	3.11	Mc	1 10.9	16.5
49952 1999 <i>XH</i> ₂₁₂	15.7	X	336.60891	218.02602	119.80785	3.64567	0.2326751	0.30981167	2.16	1.66	2.67	Mc	8 11.8	16.4
50143 2000 <i>AB</i> ₁₃₂	15.6	X	182.90230	271.49255	76.30637	6.62099	0.2798152	0.28755060	2.27	1.64	2.91	Mc	2 16.7	19.5
50354 2000 <i>CX</i> ₇₀	15.7	X	179.57541	213.50789	213.60492	5.37806	0.2649572	0.29183385	2.25	1.65	2.85	Mc	5 20.3	19.5
50867 2000 <i>GM</i> ₄	15.0	X	114.42854	280.17738	189.36437	22.34555	0.2805163	0.28545606	2.28	1.64	2.93	Mc	5 22.3	18.7
51075 2000 <i>GG</i> ₁₆₂	15.1	X	38.64555	294.19137	217.49466	21.83142	0.3172131	0.27668011	2.33	1.59	3.07	Mc	2 13.8	16.9
51157 2000 <i>HB</i> ₅₇	15.9	X	150.92154	325.88474	160.61747	3.92923	0.3056026	0.29096338	2.26	1.57	2.94	Mc	7 13.6	20.0
51773 2001 <i>MV</i>	14.2	X	213.88652	95.84832	249.89969	22.16875	0.2965095	0.28482986	2.29	1.61	2.97	Mc	2 23.6	18.9
52007 2002 <i>EQ</i> ₄₇	13.4	X	177.02473	53.35383	348.40931	15.16874	0.2230434	0.11177876	4.27	3.32	5.22	Jc	4 19.2	20.4
52297 1991 <i>CH</i> ₂	14.5	X	86.05280	284.83691	315.25938	27.87972	0.3606650	0.23786112	2.58	1.65	3.51	Mc	9 28.5	19.5
52310 1991 <i>VJ</i>	15.0	X	119.50171	261.86920	71.85731	22.90185	0.3394829	0.27509900	2.34	1.55	3.14	Mc	—	—
52317 1992 <i>BC</i> ₁	14.3	X	51.47049	273.39085	135.43675	22.84940	0.3321369	0.26862906	2.38	1.59	3.17	Mc	—	—
52453 1994 <i>WC</i>	15.0	X	61.75166	304.92014	38.23023	11.47368	0.3324976	0.26203545	2.42	1.61	3.22	Mc	—	—
52730 1998 <i>HN</i> ₄	16.1	X	0.15804	266.86685	53.08186	8.25750	0.2959634	0.30676704	2.18	1.53	2.82	Mc	10 9.4	17.0
52800 1998 <i>QT</i> ₆₀	13.5	X	331.44891	127.26947	298.72563	21.90071	0.3447093	0.25699683	2.45	1.61	3.29	Mc	—	—
54697 2001 <i>FA</i> ₇₀	14.9	X	116.86078	129.34834	168.45062	13.09344	0.3317003	0.26800800	2.38	1.59	3.17	Mc	—	—
54718 2001 <i>HB</i> ₆₁	15.2	X	161.99458	239.09025	112.83558	13.38273	0.3400650	0.27845010	2.32	1.53	3.11	Mc	2 9.9	19.2
54754 2001 <i>KJ</i> ₅₆	14.1	X	19.33477	290.14886	106.41268	22.84808	0.3548679	0.26371878	2.41	1.55	3.26	Mc	—	—
55043 2001 <i>QL</i> ₅₉	14.8	X	128.28876	212.61164	217.59657	5.23248	0.3034852	0.26875208	2.38	1.66	3.10	Mc	—	—
55333 2001 <i>SZ</i> ₁₁₇	15.1	X	148.91162	233.35492	256.95882	5.27788	0.3612926	0.23346614	2.61	1.67	3.56	Mc	7 17.9	20.0
55380 2001 <i>SB</i> ₂₆₄	14.7	X	348.42500	259.42346	287.36494	21.34069	0.3030310	0.27115236	2.36	1.65	3.08	Mc	—	—
55401 2001 <i>SX</i> ₃₁₆	13.9	X	274.39479	268.44980	283.56074	21.24039	0.3150432	0.26486010	2.40	1.64	3.16	Mc	—	—
55757 1991 <i>XN</i>	15.4	X	132.32109	17.94254	64.69185	8.59725	0.2893466	0.27913743	2.32	1.65	2.99	Mc	5 4.8	19.1
55760 1992 <i>BL</i> ₁	13.3	X	55.75064	287.33020	137.96577	23.10447	0.3441892	0.26923846	2.38	1.56	3.19	Mc	—	—
55825 1995 <i>SD</i> ₄	16.0	X	60.06676	142.90249	218.64967	3.93758	0.2262197	0.31199566	2.15	1.67	2.64	Mc	—	—
56950 2000 <i>SA</i> ₂	14.5	X	23.21121	266.63542	23.14303	22.07753	0.2812775	0.28248381	2.30	1.65	2.95	Mc	10 5.8	16.5
57004 2000 <i>SP</i> ₃₄₉	15.1	X	254.31677	235.66315	50.41418	7.75291	0.3192642	0.26670281	2.39	1.63	3.15	Mc	1 25.2	19.6
57047 2001 <i>LG</i> ₁	14.9	X	214.12924	78.56092	257.44979	8.86247	0.3209474	0.28019048	2.31	1.57	3.06	Mc	2 19.2	19.4
57878 2001 <i>YZ</i> ₁₄₈	15.2	X	198.09575	174.25669	201.90510	7.77716	0.2968569	0.27140328	2.36	1.66	3.06	Mc	4 1.1	19.5
57924 2002 <i>FO</i> ₂₈	15.0	X	182.29610	334.83368	63.47708	6.99511	0.3067012	0.26663316	2.39	1.66	3.12	Mc	4 20.1	19.3
58023 2002 <i>VR</i> ₄₀	15.0	X	105.11216	246.83089	107.94102	11.51501	0.2962243	0.27413395	2.35	1.65	3.04	Mc	—	—
58046 2002 <i>XA</i> ₁₄	15.0	X	177.72741	259.26581	114.96392	21.28627	0.2945530	0.28351699	2.29	1.62	2.97	Mc	3 23.2	19.4
58050 2002 <i>YA</i>	14.3	X	200.73698	64.40367	309.82974	28.76277	0.3755750	0.23213206	2.62	1.64	3.61	Mc	3 17.7	19.9
58070 1034 <i>T</i> ₂	16.4	X	58.05571	251.99795	189.90182	6.13477	0.3018434	0.27433287	2.35	1.64	3.05	Mc	—	—
58141 1981 <i>UW</i> ₂₂	15.6	X	39.22922	218.73427	107.57799	5.15120	0.2556209	0.29747193	2.22	1.65	2.79	Mc	12 14.7	18.3
58149 1987 <i>SX</i> ₁₁	15.1	X	249.96925	236.85049	172.91772	26.13287	0.3801445	0.22651261	2.67	1.65	3.68	Mc	6 16.3	20.3
58175 1990 <i>SE</i> ₁₅	15.8	X	75.70955	86.68993	234.76528	5.96943	0.2597060	0.29312411	2.24	1.66	2.83	Mc	—	—
58285 1993 <i>YN</i>	14.9	X	175.59999	107.98692	218.99381	7.38477	0.3142373	0.26052153	2.43	1.66	3.19	Mc	1 18.2	19.2
58325 1994 <i>RE</i> ₁₁	16.3	X	226.21631	209.09438	172.29537	14.33202	0.3731009	0.24546625	2.53	1.58	3.47	Mc	4 29.1	21.2
58683 1998 <i>AJ</i> ₁₀	15.4	X	28.81185	257.61569	99.67307	4.51094	0.2842956	0.29148917	2.25	1.61	2.89	Mc	—	—
58980 1998 <i>RG</i> ₄₇	15.5	X	352.25339	107.52439	215.24669	5.49762	0.2660090	0.29940158	2.21	1.62	2.80	Mc	8 31.3	16.3
59490 1999 <i>JD</i> ₄	14.3	X	347.55194	76.94039	236.40913	22.37117	0.3034537	0.27232898	2.36	1.64	3.07	Mc	7 9.2	16.0
59836 1999 <i>RN</i> ₄₄	15.8	X	65.94799	126.91523	193.07120	12.65339	0.2907617	0.27704801	2.33	1.65	3.01	Mc	—	—
60187 1999 <i>VL</i> ₂₃	14.9	X	111.84292	211.59109	222.00176	23.57955	0.2646920	0.28936896	2.26	1.66	2.86	Mc	3 22.1	18.2
60216 1999 <i>VG</i> ₈₂	16.4	X	41.59823	96.31232	216.22977	4.34006	0.3148721	0.27251665	2.36	1.61	3.10	Mc	12 3.1	19.5
60689 2000 <i>GG</i> ₃₇	16.0	X	179.05628	159.40740	130.76119	8.43635	0.2618472	0.30936799	2.17	1.60	2.73	Mc	—	—
60733 2000 <i>GL</i> ₈₀	15.3	X	323.42132	299.47690	35.48052	12.30950	0.3003699	0.28825704	2.					

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
63160 2000 YN ₈	15.9 ^m	X	240.30996	206.93356	112.04874	7.76626	0.2550666	0.30519256	2.18	1.63	2.74	Mc	2 21.4	19.6
63164 2000 YU ₁₄	15.8	X	84.76014	315.66761	22.15361	3.33024	0.3066020	0.28773004	2.27	1.58	2.97	Mc	—	—
63341 2001 FD ₇₇	14.2	X	214.72726	274.45158	27.81393	27.95338	0.3859510	0.23133422	2.63	1.61	3.64	Mc	1 30.8	19.9
63583 2001 QP ₃₁	15.2	X	254.64492	186.04035	158.77148	10.78921	0.2834136	0.28225042	2.30	1.65	2.95	Mc	4 6.6	19.1
65335 2002 LR ₅₈	14.9	X	175.85450	188.72605	178.53520	20.09414	0.3868888	0.24459540	2.53	1.55	3.51	Mc	3 11.5	19.8
65407 2002 RP ₁₂₀	12.3	X	17.19087	357.71832	39.06732	119.28233	0.9540849	0.00250703	53.67	2.46	104.87	Jc	5 20.5	27.7
65425 2002 TL ₁₂₉	16.6	X	356.90315	20.61047	293.24055	4.88375	0.2395202	0.30964536	2.16	1.65	2.68	Mc	8 28.9	17.4
65433 2002 TX ₂₃₈	15.5	X	125.24487	297.80660	68.29975	7.87458	0.3302190	0.27713203	2.33	1.56	3.10	Mc	1 25.5	18.7
65682 1990 QU ₂	16.0	X	137.66374	177.28187	164.24521	7.60743	0.2475765	0.29961694	2.21	1.66	2.76	Mc	—	—
65742 1993 TY ₁₈	16.5	X	101.07931	137.46087	185.48405	5.08134	0.2945079	0.29120171	2.25	1.59	2.92	Mc	—	—
65776 1995 SW ₃	15.5	X	61.42653	16.06324	336.92930	6.73729	0.3390806	0.27375235	2.35	1.55	3.15	Mc	—	—
65784 Naderayama	15.4	X	241.17218	339.89151	27.97681	4.97634	0.2888068	0.29253788	2.25	1.60	2.90	Mc	4 21.0	19.2
65808 1996 LO ₁	15.5	X	349.12824	73.31962	252.60945	20.74477	0.3254482	0.27826467	2.32	1.57	3.08	Mc	8 8.2	17.1
65817 1996 TC ₃₃	16.1	X	60.27789	48.31231	248.51398	4.28412	0.2792045	0.28103774	2.31	1.66	2.95	Mc	11 28.8	19.5
65999 1998 ND	15.4	X	221.83335	79.58555	276.49985	22.45574	0.3365505	0.28589752	2.28	1.51	3.05	Mc	3 10.7	20.2
66269 1999 JN ₃	14.4	X	20.37976	112.89168	222.53059	20.59887	0.2852293	0.28174310	2.30	1.65	2.96	Mc	12 3.3	17.1
66294 1999 JS ₂₇	15.3	X	263.16740	161.86061	131.06153	1.15043	0.3373600	0.25967451	2.43	1.61	3.25	Mc	2 5.9	19.5
66358 1999 JW ₈₇	15.6	X	45.84541	159.63868	153.69442	7.46761	0.3135110	0.27985532	2.31	1.59	3.04	Mc	12 10.2	19.0
66419 1999 NR ₁₃	14.2	X	96.38216	248.88873	282.16765	20.21670	0.3390590	0.27040312	2.37	1.57	3.17	Mc	7 25.9	18.0
67473 2000 RH ₆	16.7	X	176.26133	157.86413	194.02310	4.16827	0.2427489	0.30559160	2.18	1.65	2.71	Mc	2 8.2	20.1
67502 2000 RE ₄₄	15.5	X	318.44649	100.39972	259.08172	5.14084	0.3304322	0.27825578	2.32	1.56	3.09	Mc	7 6.4	17.0
67522 2000 RF ₇₉	16.4	X	228.22527	141.62100	142.21842	3.67601	0.3073131	0.30691192	2.18	1.51	2.85	Mc	—	—
67729 2000 UQ ₂₃	16.8	X	173.99448	199.32323	141.95955	3.67395	0.2497160	0.30393580	2.19	1.64	2.74	Mc	1 25.8	20.3
67865 2000 WG ₂₃	15.9	X	225.26548	225.73188	101.60222	7.28893	0.2355764	0.30825581	2.17	1.66	2.68	Mc	2 20.3	19.5
67943 2000 WP ₁₅₁	16.3	X	257.89424	314.19475	41.57827	4.82516	0.2791213	0.31454039	2.14	1.54	2.74	Mc	4 19.2	19.6
68134 2001 AT ₁₈	14.2	X	58.51585	119.76968	279.35265	26.60008	0.2838498	0.28644435	2.28	1.63	2.93	Mc	—	—
68569 2001 YE ₃	14.9	X	350.78124	252.41780	280.64011	22.05569	0.2930361	0.31005538	2.16	1.53	2.80	Mc	—	—
69045 2002 XN ₅₉	14.1	X	210.62954	72.02885	294.41538	21.04075	0.3351638	0.28391529	2.29	1.52	3.06	Mc	3 16.5	18.9
69117 2003 EX ₂	15.6	X	132.40176	281.49666	93.46522	5.01506	0.3339709	0.27416878	2.35	1.56	3.13	Mc	2 13.6	19.1
69239 1978 XT	15.7	X	124.54344	147.08873	236.90025	4.22063	0.3764939	0.23828551	2.58	1.61	3.55	Mc	2 23.0	19.9
69260 Tonyjudt	15.0	X	103.84216	274.80577	99.39267	2.17824	0.3842110	0.23571346	2.60	1.60	3.59	Mc	1 25.1	18.4
69274 1999 UZ ₁	15.4	X	99.92894	122.43440	237.22974	9.06211	0.3201309	0.28663977	2.28	1.55	3.01	Mc	—	—
69311 Russ	15.3	X	321.36163	305.24977	29.41734	22.65837	0.3340583	0.26957247	2.37	1.58	3.17	Mc	5 23.8	18.0
69466 1996 VZ ₅	15.0	X	189.86071	62.03713	74.57768	22.09374	0.3268577	0.26471207	2.40	1.62	3.19	Mc	8 31.7	19.9
69701 1998 HP ₄₉	15.9	X	312.25792	147.93362	237.15124	20.18095	0.1104600	0.43854240	1.72	1.53	1.91	Mc	10 5.6	16.9
70055 1999 JN ₆	14.8	X	326.04376	148.20878	219.20049	24.04173	0.2998211	0.27483796	2.34	1.64	3.05	Mc	8 7.8	17.2
70056 1999 JJ ₈	15.1	X	95.38418	89.04119	209.19800	21.00725	0.2987003	0.28280692	2.30	1.61	2.99	Mc	12 27.7	19.6
70111 1999 LM ₇	15.8	X	328.40290	199.45251	129.62670	7.92156	0.3179764	0.26703506	2.39	1.63	3.15	Mc	6 12.6	17.7
71997 2000 WD ₁₇₈	15.9	X	42.18868	263.95004	82.56536	7.23244	0.2995928	0.28396768	2.29	1.61	2.98	Mc	—	—
72044 2000 YH ₅	16.0	X	66.34280	285.61993	76.82259	6.18841	0.2660237	0.28802655	2.27	1.67	2.87	Mc	—	—
72204 2000 YV ₁₃₃	15.7	X	352.33879	262.14186	88.76741	5.15447	0.2958718	0.27521363	2.34	1.65	3.03	Mc	10 31.9	16.9
72569 2001 EC ₁₃	14.2	X	346.14467	317.05144	71.45264	24.73981	0.2957396	0.27387836	2.35	1.65	3.04	Mc	12 14.0	15.6
73534 Liviaavioli	16.7	X	156.46024	181.21097	152.94369	6.63273	0.2708431	0.30073640	2.21	1.61	2.80	Mc	1 3.2	19.9
73575 4789 P-L	17.3	X	195.54493	269.09363	25.05713	1.05928	0.2850388	0.29872654	2.22	1.58	2.85	Mc	—	—
73673 1986 RX ₁	14.7	X	204.37810	2.21186	310.41940	7.03605	0.3624398	0.24126595	2.56	1.63	3.48	Mc	1 25.7	19.7
73681 1989 TL ₁₈	16.0	X	63.51501	314.86644	20.05254	11.19504	0.2976904	0.28351710	2.29	1.61	2.98	Mc	—	—
73735 1993 QE ₃	16.6	X	315.27930	197.53298	139.79398	3.18381	0.2382119	0.31400092	2.14	1.63	2.65	Mc	6 10.7	18.3
73865 1997 AW	15.8	X	191.38251	203.50768	2.37167	1.73013	0.3680243	0.26886362	2.38	1.50	3.25	Mc	11 11.7	20.3
74217 1998 RB ₇₃	14.7	X	55.93943	301.64643	0.05939	7.41768	0.3388855	0.26220209	2.42	1.60	3.24	Mc	12 3.3	18.5
74523 1999 GA ₆	16.8	X	123.41739	357.24209	13.12049	9.62530	0.1754117	0.34773602	2.00	1.65	2.35	Mc	—	—
74558 1999 LT ₁₃	15.8	X	286.12623	205.84582	118.59181	8.53825	0.2490012	0.30845674	2.17	1.63	2.71	Mc	4 12.2	18.9
74561 1999 LE ₁₈	15.6	X	231.95086	253.92263	65.48732	7.67323	0.2595103	0.30170850	2.20	1.63	2.77	Mc	2 17.2	19.5
74564 1999 NY ₁	15.7	X	87.67671	128.59513	185.17016	10.03305	0.3101010	0.28178397	2.30	1.59	3.02	Mc	—	—
74576 1999 NG ₂₅	16.2	X	65.52368	205.01900	85.82464	6.29035	0.3201397	0.27717391	2.33	1.58	3.08	Mc	11 30.3	19.9
74644 1999 RK ₆₃	16.1	X	298.15773	76.86019	286.82690	3.20632	0.3106577	0.26477723	2.40	1.66	3.15	Mc	6 10.1	18.9
74721 1999 RH ₁₆₇	16.2	X	347.21759	328.05084	44.95815	3.50751	0.3089791	0.27128053	2.36	1.63	3.09	Mc	11 23.3	17.1
74779 1999 RF ₂₄₁	14.5	X	303.80497	45.30021	71.14640	23.86512	0.3095205	0.27325292	2.35	1.62	3.08	Mc	—	—
74789 1999 SY ₅	14.4	X	38.49385	272.44902	130.33373	23.23538	0.3194591	0.27731542	2.33	1.58	3.07	Mc	—	—
74823 1999 TD ₁₅	14.9	X	316.72394	231.98008	213.31379	22.72014	0.2950897	0.27240211	2.36	1.66	3.05	Mc	12 20.3	16.6
74839 1999 TZ ₃₄	15.4	X	76.28724	314.25515	10.40221	12.85590	0.2885833	0.27723367	2.33	1.66	3.00	Mc	—	—
74998 1999 TV ₂₇₆	15.2	X	201.77499	255.77446	281.84907	1.99786	0.3072779	0.27017667	2.37	1.64	3.10	Mc	10 19.6	19.3
75015 1999 UW ₄	16.3	X	203.35005	3.07315	345.81372	2.92368	0.2506792	0.29845521	2.22	1.66	2.77	Mc	2 28.8	20.0
75017 1999 UE ₅	15.4	X	10.30794	98.73910	347.01316	22.65489	0.2909464	0.27628664	2.33	1.66	3.01	Mc	—	—
75079 1999 VN ₂₄	13.8	X	22.32256	287.03453	176.15894	23.00827	0.2945082	0.27956780	2.32	1.63	3.00	Mc	—	—
75303 1999 XQ ₃₅	15.1	X	11.96062	85.08220	78.40730	28.35163	0.3687703	0.23150945	2.63	1.66	3.60	Mc	—	—
75409 1999 XR ₁₀₄	15.1	X	25.35961	317.53272	80.97096	25.06564	0.2941402	0.27542170	2.34	1.65	3.03	Mc	—	—
75412 1999 XJ ₁₀₈	15.3	X	106.97995	245.56216	70.71375	7.64779	0.2867666	0.27913125	2.32	1.65	2.98	Mc	—	—
75567 2000 AK ₁	15.2	X	89.61996	248.81002	145.54344	23.31827	0.3428560	0.28291394	2.30	1.51	3.09	Mc	1 9.4	17.2
75933 2000 CB ₇₅	14.9	X	154.50031	235.64785	152.52566	33.36527	0.3679318	0.24126238	2.56	1.62	3.50	Mc	3 26.0	19.8
76828 2000 SL ₁₆₁	16.3	X	203.65334	28.12010	245.30296	11.69366								

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
79611 1998 <i>RC</i> ₅₂	15.4 ^m	X	133.22512	308.21472	23.17246	5.82153	0.3005334	0.27394717	2.35	1.64	3.05	Mc	—	—
79721 1998 <i>SE</i> ₁₁₂	16.0	X	325.74550	189.67960	122.07834	2.32026	0.2717560	0.29489713	2.24	1.63	2.84	Mc	5 15.0	17.9
80098 1999 <i>MV</i> ₁	16.3	X	281.41690	254.99659	89.83624	1.44147	0.2999361	0.30667023	2.18	1.52	2.83	Mc	4 24.9	19.5
80107 1999 <i>RG</i> ₂₉	15.7	X	292.84961	227.74655	160.30253	25.07342	0.2567676	0.31268107	2.15	1.60	2.70	Mc	7 17.8	18.4
80250 1999 <i>WW</i> ₉	15.6	X	81.75815	291.00598	104.14473	3.96842	0.2923982	0.28115954	2.31	1.63	2.98	Mc	—	—
80356 1999 <i>XM</i> ₁₂₄	15.8	X	299.65132	31.26447	318.06702	4.68079	0.2458686	0.30594218	2.18	1.64	2.72	Mc	5 30.7	18.2
80366 1999 <i>XA</i> ₁₄₂	14.8	X	54.32391	79.43212	61.19195	23.16650	0.2860267	0.28592425	2.28	1.63	2.93	Mc	4 14.1	16.8
80593 2000 <i>AG</i> ₁₄₄	14.0	X	172.83159	59.03331	320.42906	24.33577	0.3282402	0.28501299	2.29	1.54	3.04	Mc	3 9.0	18.4
82105 2001 <i>FG</i> ₂₆	15.3	X	357.46165	288.55932	16.20840	6.49566	0.2600814	0.30188290	2.20	1.63	2.77	Mc	8 19.4	16.0
82124 2001 <i>FO</i> ₇₈	15.7	X	345.55317	236.85635	46.85401	8.61849	0.2688314	0.29619070	2.23	1.63	2.83	Mc	5 12.9	16.9
82233 2001 <i>IF</i> ₁	16.0	X	308.44735	320.81185	31.76109	5.20134	0.2876916	0.30022153	2.21	1.57	2.84	Mc	6 12.2	18.2
82474 2001 <i>OB</i> ₂₃	15.7	X	248.72020	284.82573	49.07617	12.88285	0.3035332	0.28177556	2.30	1.60	3.00	Mc	3 22.3	19.9
82676 2001 <i>PV</i> ₂₃	15.1	X	188.94813	324.91336	1.59144	7.69396	0.3109559	0.27405373	2.35	1.62	3.08	Mc	1 29.4	19.3
82913 2001 <i>QN</i> ₁₀₃	15.0	X	186.55276	308.73069	347.23111	4.16847	0.3368807	0.27155576	2.36	1.57	3.16	Mc	—	—
83120 2001 <i>QP</i> ₂₄₆	16.4	X	256.65995	317.59949	349.27896	3.61602	0.3038058	0.27983891	2.31	1.61	3.02	Mc	2 18.1	20.4
83988 2002 <i>LC</i> ₃₄	16.3	X	278.90997	230.49961	133.51459	7.27531	0.2463506	0.31068557	2.16	1.63	2.69	Mc	5 26.8	19.2
83992 2002 <i>MG</i> ₃	15.7	X	177.35464	354.21716	333.96246	7.92190	0.3169470	0.28585783	2.28	1.56	3.01	Mc	1 21.4	19.6
84667 2002 <i>VO</i> ₈₂	16.0	X	199.49762	169.18847	179.55543	4.69926	0.2892339	0.28643569	2.28	1.62	2.94	Mc	2 26.9	19.9
85118 1971 <i>UU</i>	15.4	X	301.23184	141.08005	128.96583	2.21180	0.3913509	0.23458749	2.60	1.58	3.62	Mc	5 28.6	18.7
85158 Phyllistrapp	15.7	X	254.09232	42.33158	297.77012	6.02416	0.3163484	0.28257851	2.30	1.57	3.03	Mc	3 23.6	19.9
85165 1988 <i>TV</i> ₂	15.3	X	0.00527	109.85550	273.68677	4.30714	0.3578305	0.24057348	2.56	1.64	3.48	Mc	—	—
85185 Lederman	16.4	X	109.49039	63.95154	230.63925	5.04797	0.2849878	0.30707320	2.18	1.56	2.80	Mc	—	—
85274 1994 <i>GH</i>	17.0	X	148.30736	140.22095	163.46874	5.80223	0.2464747	0.31271778	2.15	1.62	2.68	Mc	—	—
85372 1996 <i>EO</i> ₁₂	15.5	X	16.36862	78.98067	302.52538	7.46306	0.2499407	0.30009946	2.21	1.66	2.76	Mc	—	—
85383 1996 <i>MS</i>	15.9	X	343.54692	222.31435	127.18628	6.88245	0.3673259	0.23706402	2.59	1.64	3.54	Mc	9 16.7	16.5
85490 1997 <i>SE</i> ₅	14.6	X	113.86715	94.01867	247.73665	2.57518	0.6609897	0.13510434	3.76	1.28	6.25	Jc	2 3.2	21.5
85546 1997 <i>XH</i> ₁	16.0	X	223.52627	349.15629	6.49576	3.04832	0.3204177	0.26980520	2.37	1.61	3.13	Mc	3 25.2	20.4
85762 1998 <i>TH</i> ₄	16.6	X	77.02116	90.78558	213.26248	4.40322	0.2812175	0.30672110	2.18	1.57	2.79	Mc	12 25.7	20.1
85848 1998 <i>YP</i> ₂₉	17.1	X	47.06277	55.23428	302.70917	6.86096	0.2786136	0.30223538	2.20	1.59	2.81	Mc	—	—
86025 1999 <i> LX</i> ₃	16.0	X	124.44022	273.47963	255.54191	25.84889	0.1285317	0.40974083	1.80	1.56	2.03	Mc	7 26.9	18.7
86212 1999 <i>TG</i> ₂₁	15.0	X	42.04902	37.56730	35.90166	25.33514	0.3098427	0.27943731	2.32	1.60	3.04	Mc	—	—
86401 2000 <i>AF</i> ₁₄₃	14.6	X	314.51052	316.63468	270.13199	5.40086	0.2919537	0.27634310	2.33	1.65	3.02	Mc	—	—
86534 2000 <i>DT</i> ₉₈	16.1	X	123.69243	260.67472	29.78209	5.72890	0.32383783	0.30789257	2.17	1.65	2.69	Mc	—	—
86608 2000 <i>EK</i> ₈₅	15.6	X	54.59867	110.54532	129.11439	8.58998	0.2799896	0.28927236	2.26	1.63	2.90	Mc	9 10.9	18.2
86626 2000 <i>EV</i> ₁₂₄	15.8	X	157.10493	143.74256	152.19801	7.34858	0.2647790	0.31015092	2.16	1.59	2.73	Mc	—	—
86730 2000 <i>GY</i> ₃₇	16.4	X	343.43818	130.55123	189.21800	7.21030	0.3038972	0.28808455	2.27	1.58	2.96	Mc	7 14.6	17.3
86964 2000 <i>JV</i> ₂	15.9	X	234.97736	173.03421	118.24855	7.68504	0.3254479	0.26860432	2.38	1.60	3.15	Mc	1 16.6	20.1
87005 2000 <i>JT</i> ₅₂	15.4	X	322.28030	313.47629	35.17066	8.09379	0.3181653	0.28427996	2.29	1.56	3.02	Mc	6 30.5	17.1
87035 2000 <i>KE</i> ₂	14.3	X	73.85187	301.66446	131.63992	22.92697	0.3426312	0.27322406	2.35	1.55	3.16	Mc	2 7.8	15.5
88191 2000 <i>YK</i> ₂₁	16.7	X	29.17734	309.04582	238.17345	9.22386	0.2117304	0.34520999	2.01	1.59	2.44	Mc	3 3.4	17.7
88412 2001 <i>QN</i> ₂₈	16.5	X	153.89946	297.04716	3.89927	4.04108	0.2951132	0.31408812	2.14	1.51	2.78	Mc	—	—
88424 2001 <i>QC</i> ₆₁	15.2	X	18.07728	281.12844	119.90567	22.49003	0.2883252	0.30396600	2.19	1.56	2.82	Mc	—	—
88453 2001 <i>QF</i> ₉₁	15.8	X	281.65549	91.51368	328.84989	23.18386	0.2941302	0.29062561	2.26	1.59	2.92	Mc	8 14.6	18.2
88609 2001 <i>QP</i> ₂₉₆	16.0	X	130.33482	278.19300	31.99846	3.95338	0.2622175	0.31108604	2.16	1.59	2.72	Mc	—	—
88938 2001 <i>TR</i> ₃₃	16.8	X	63.54953	62.74917	281.16396	5.96556	0.2458476	0.30359029	2.19	1.65	2.73	Mc	—	—
88954 2001 <i>TE</i> ₄₂	15.1	X	293.30485	64.32735	299.42186	6.89310	0.3079646	0.28571143	2.28	1.58	2.99	Mc	6 2.6	18.1
89137 2001 <i>UD</i> ₁₇	16.3	X	112.88574	55.35101	210.32806	7.46451	0.2507615	0.30237683	2.20	1.65	2.75	Mc	12 5.4	20.0
89454 2001 <i>XG</i>	14.9	X	230.08869	284.35791	57.28534	22.23298	0.3188674	0.28164745	2.30	1.57	3.04	Mc	3 24.8	19.5
89486 2001 <i>XL</i> ₃₁	15.0	X	246.38226	57.84456	282.51935	19.97848	0.3474453	0.27338283	2.35	1.53	3.17	Mc	3 9.6	19.8
89566 2001 <i>XZ</i> ₁₀₃	15.6	X	298.84356	50.18749	310.28145	2.60583	0.2867928	0.28546548	2.28	1.63	2.94	Mc	6 9.7	18.1
89766 2002 <i>AO</i> ₆₂	15.9	X	294.75515	240.64057	147.05075	5.56338	0.2843951	0.28389669	2.29	1.64	2.94	Mc	7 14.7	18.5
89776 2002 <i>AL</i> ₉₀	14.7	X	180.35975	294.59301	145.99792	20.39230	0.3127593	0.27445056	2.35	1.61	3.08	Mc	6 10.9	19.4
90281 2003 <i>DQ</i> ₁₅	15.9	X	112.60669	272.93644	117.15821	1.47662	0.3138771	0.27102720	2.36	1.62	3.11	Mc	2 8.2	18.7
90791 1994 <i>PG</i> ₃₂	16.5	X	120.47271	318.08640	308.75378	5.12166	0.3109849	0.30202931	2.20	1.52	2.88	Mc	12 12.7	20.4
90916 1997 <i>LR</i>	16.4	X	85.37115	204.71555	123.33862	7.36979	0.2848408	0.30202903	2.20	1.57	2.83	Mc	—	—
90943 1997 <i>UX</i> ₂	15.7	X	21.60839	90.94230	214.81120	10.21327	0.2688683	0.28708054	2.28	1.66	2.89	Mc	10 20.7	17.7
91210 1998 <i>XS</i> ₉₆	16.9	X	43.79050	304.03217	110.38807	2.27148	0.2764923	0.30780790	2.17	1.57	2.77	Mc	—	—
91227 1999 <i>BG</i> ₉	16.2	X	233.08142	358.58410	172.47503	1.33660	0.2831482	0.29478572	2.24	1.60	2.87	Mc	11 14.8	19.0
92278 2000 <i>CB</i> ₁₁₀	17.4	X	88.46102	326.12676	319.26438	7.10112	0.2435539	0.30345266	2.19	1.66	2.73	Mc	12 8.9	21.0
92359 2000 <i>HC</i> ₂₄	15.9	X	87.72216	287.92764	38.94648	7.66431	0.3081220	0.30115983	2.20	1.53	2.88	Mc	—	—
92383 2000 <i>HE</i> ₇₅	15.3	X	247.74407	252.40873	53.27453	23.18359	0.2949002	0.27186384	2.36	1.66	3.06	Mc	2 22.3	20.0
93038 2000 <i>RL</i> ₁₀₄	14.8	X	251.54883	279.35787	223.19651	21.90129	0.2876562	0.28345305	2.30	1.63	2.96	Mc	10 25.9	17.7
93040 2000 <i>SG</i>	14.0	X	140.93424	99.86262	333.57405	20.42110	0.3767445	0.25851490	2.44	1.52	3.36	Mc	4 26.2	18.8
93751 2000 <i>WH</i> ₁	15.1	X	242.99172	318.34372	55.27166	25.68281	0.3192032	0.27037234	2.37	1.61	3.12	Mc	5 3.7	19.4
93768 2000 <i>WN</i> ₂₂	14.2	X	168.04148	126.29010	62.00214	24.74295	0.3167277	0.27750397	2.33	1.59	3.07	Mc	10 21.1	18.8
94210 2001 <i>BK</i> ₃₃	15.8	X	30.21229	114.56125	314.15487	5.18304	0.3802718	0.24089329	2.56	1.59	3.53	Mc	—	—
94396 2001 <i>SN</i> ₂₁₃	16.4	X	101.50790	193.94733	75.69565	5.08955	0.2460837	0.30416728	2.19	1.65	2.73	Mc	12 1.1	20.0
94623 2001 <i>WD</i> ₂	15.1	X	229.09354	250.56572	244.56342	23.08677	0.2738858	0.						

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
97514 2000 <i>DL</i> ₁	13.9 ^m	X	175.48964	119.06934	4.26461	35.35764	0.2721372	0.34385840	2.02	1.47	2.57	Mc	8 19.9	18.0
97679 2000 <i>GG</i> ₂	16.6	X	180.28841	138.38507	196.32677	50.81167	0.1319591	0.50067314	1.57	1.36	1.78	Mc	—	—
97834 2000 <i>PN</i> ₆	15.2	X	310.71050	280.70867	148.47699	22.85309	0.2845898	0.28206360	2.30	1.65	2.96	Mc	11 15.2	17.2
97886 2000 <i>QK</i> ₅₄	16.5	X	318.44868	25.50610	347.58290	6.06186	0.3230317	0.28050123	2.31	1.56	3.06	Mc	8 5.3	17.7
98039 2000 <i>RC</i> ₂₂	15.1	X	278.81633	282.21057	181.38190	22.81973	0.2799882	0.28316058	2.30	1.65	2.94	Mc	10 16.0	17.3
98117 2000 <i>SP</i> ₂	15.0	X	302.97875	225.70634	63.80561	27.22844	0.3029637	0.27045835	2.37	1.65	3.09	Mc	3 26.3	19.0
98129 2000 <i>SD</i> ₂₅	14.5	X	261.51568	137.13932	227.81749	23.10562	0.3096430	0.27084613	2.37	1.63	3.10	Mc	5 3.3	18.5
98302 2000 <i>SX</i> ₂₃₇	15.0	X	141.24596	228.68032	78.91181	7.66975	0.2654864	0.29774569	2.22	1.63	2.81	Mc	—	—
98333 2000 <i>SC</i> ₂₉₅	15.8	X	300.78733	75.48383	315.61791	4.77314	0.2118674	0.27680393	2.33	1.60	3.06	Mc	7 26.2	17.7
98554 2000 <i>WP</i> ₆	16.2	X	275.65014	276.49059	75.80196	4.04306	0.3429316	0.27463128	2.34	1.54	3.15	Mc	4 27.4	19.8
98889 2001 <i>BL</i> ₃₈	14.0	X	241.80691	273.83803	320.82539	25.90297	0.4218832	0.23284376	2.62	1.51	3.72	Mc	—	—
98891 2001 <i>BK</i> ₄₁	15.6	X	167.90455	345.48642	237.94097	7.58493	0.3886083	0.27865777	2.32	1.42	3.22	Mc	11 18.3	20.1
99297 2001 <i>RU</i> ₁₄	15.1	X	5.28830	4.46334	224.95403	20.30762	0.3677564	0.28573786	2.28	1.44	3.12	Mc	2 28.3	17.0
99321 2001 <i>TT</i> ₁₁₃	16.9	X	163.57015	32.28207	356.82819	2.41947	0.2118947	0.32217335	2.11	1.66	2.55	Mc	3 13.3	19.9
99761 2002 <i>JK</i> ₁₀₁	15.7	X	191.06411	15.61975	119.60609	24.95327	0.2962280	0.27283892	2.35	1.66	3.05	Mc	8 25.2	20.1
99795 2002 <i>KM</i> ₆	14.7	X	167.31698	356.76533	280.97365	9.52554	0.4054276	0.22965881	2.64	1.57	3.71	Mc	—	—
99869 2002 <i>PF</i> ₄₆	15.3	X	324.52928	45.49332	194.56278	2.76293	0.4034300	0.24796925	2.51	1.50	3.52	Mc	1 16.9	18.8
99913 1997 <i>CZ</i> ₅	13.5	X	14.61279	169.55678	287.95132	24.95018	0.3980646	0.28394302	2.29	1.38	3.21	Mc	—	—
99915 1997 <i>TR</i> ₆	14.9	X	139.49818	218.29000	140.21077	3.02395	0.4034984	0.22260198	2.70	1.61	3.78	Mc	2 10.6	19.6
99967 1979 <i>OG</i> ₈	15.5	X	71.95544	247.08191	125.50193	21.98554	0.3371344	0.26569894	2.40	1.59	3.20	Mc	—	—
100006 1987 <i>DA</i> ₇	15.8	X	283.14280	210.86513	309.66574	4.21841	0.3049569	0.33837981	2.04	1.42	2.66	Mc	—	—
100008 1988 <i>QZ</i>	15.6	X	325.16599	9.57547	335.81532	12.49291	0.3383586	0.26700411	2.39	1.58	3.20	Mc	6 29.7	17.6
100015 1989 <i>SR</i> ₇	15.8	X	272.86705	88.79439	269.29662	4.38907	0.3000213	0.27114386	2.36	1.65	3.07	Mc	5 4.7	19.6
100107 1989 <i>TN</i> ₂	16.6	X	13.48812	224.72215	174.96312	8.06314	0.2945661	0.28145331	2.31	1.63	2.99	Mc	—	—
100045 1991 <i>TK</i> ₁	14.3	X	48.72449	115.70631	336.40469	22.03568	0.2941471	0.27395721	2.35	1.66	3.04	Mc	—	—
100088 1993 <i>DC</i>	16.0	X	254.35800	4.76711	69.86326	10.09533	0.4277749	0.26625019	2.39	1.37	3.42	Mc	7 15.6	20.1
100276 1994 <i>XV</i>	15.8	X	355.51131	220.02059	61.42910	21.04461	0.3718115	0.25982873	2.43	1.53	3.34	Mc	—	—
100316 1995 <i>MM</i> ₂	16.2	X	293.95991	175.63449	174.68022	4.84719	0.2499852	0.29967544	2.21	1.66	2.76	Mc	5 25.5	18.9
100333 1995 <i>SN</i> ₅	15.7	X	181.76753	261.35955	14.47803	24.14755	0.3114000	0.28258718	2.30	1.58	3.02	Mc	—	—
100341 1995 <i>ST</i> ₄₄	16.1	X	47.84338	175.57972	193.15801	3.98948	0.3077716	0.27273518	2.35	1.63	3.08	Mc	—	—
100438 1996 <i>PC</i> ₃	15.3	X	290.62973	98.43806	329.37638	25.95767	0.3621924	0.23554077	2.60	1.66	3.54	Mc	8 21.2	18.4
100446 1996 <i>RC</i> ₄	16.9	X	1.74592	259.01811	179.45593	29.49769	0.2267782	0.44337476	1.70	1.32	2.09	Mc	—	—
100452 1996 <i>RY</i> ₂₇	17.6	X	314.41820	100.90245	242.28893	0.94007	0.3178962	0.31239552	2.15	1.47	2.83	Mc	6 1.7	19.4
100480 1996 <i>UK</i>	16.1	X	232.66093	136.27581	209.49395	10.83881	0.4594445	0.22339023	2.69	1.45	3.93	Mc	3 16.2	21.7
100485 Russelldavies	16.2	X	96.46776	137.80713	45.60716	5.91772	0.2934512	0.34301493	2.02	1.43	2.61	Mc	8 16.1	19.1
100493 1996 <i>VK</i> ₃₇	17.1	X	219.34012	94.51700	200.48219	2.38295	0.2675966	0.29467818	2.24	1.64	2.83	Mc	1 7.0	20.9
100553 Dariofo	16.6	X	54.77065	165.30191	33.08138	9.80416	0.1629643	0.41344494	1.78	1.49	2.08	Mc	6 4.8	17.2
100681 1997 <i>YD</i> ₁	15.4	X	259.45959	251.70081	287.27625	22.71019	0.2922871	0.28689949	2.28	1.61	2.94	Mc	12 31.1	17.6
100743 1998 <i>DC</i> ₃₀	16.2	X	286.99976	93.16756	185.33052	6.96585	0.2584205	0.30036669	2.21	1.64	2.78	Mc	2 6.0	19.6
100754 1998 <i>FP</i> ₂	16.5	X	155.89932	104.78321	184.56044	23.62981	0.0851104	0.41027435	1.79	1.64	1.95	Mc	—	—
100766 1998 <i>FX</i> ₂₄	15.6	X	258.36147	120.81100	328.39770	6.48614	0.3837898	0.23628351	2.59	1.60	3.59	Mc	8 9.7	19.7
100908 1998 <i>KH</i> ₁₇	16.0	X	147.44998	71.58884	129.97490	22.37093	0.4261529	0.27470605	2.34	1.34	3.34	Mc	—	—
100922 1998 <i>KR</i> ₆₁	15.4	X	227.85548	122.01754	128.04590	11.86935	0.2795000	0.28282620	2.30	1.66	2.94	Mc	—	—
100933 1998 <i>MK</i> ₃₀	15.6	X	313.68645	156.20110	203.00593	5.50325	0.4378355	0.25472236	2.46	1.39	3.54	Mc	6 5.2	18.2
100935 1998 <i>MA</i> ₄₂	15.4	X	197.01653	60.72587	282.17119	4.40730	0.3159780	0.28519981	2.29	1.56	3.01	Mc	2 18.2	19.5
100952 1998 <i>QR</i> ₅	15.8	X	135.09485	99.99405	318.26032	18.47355	0.3045677	0.28009844	2.31	1.61	3.02	Mc	3 26.6	19.9
101027 1998 <i>QL</i> ₇₁	15.6	X	169.96499	197.18186	201.75532	7.00839	0.2904747	0.28345158	2.30	1.63	2.96	Mc	4 8.3	19.4
101037 1998 <i>QX</i> ₉₀	16.2	X	166.86913	183.69334	156.70099	7.28346	0.2874831	0.27814428	2.32	1.66	2.99	Mc	1 24.6	20.1
101058 1998 <i>RN</i> ₃	15.4	X	0.43520	84.45756	348.20458	21.19694	0.5157249	0.17766826	3.13	1.52	4.75	Ja	—	—
101158 1998 <i>RA</i> ₇₇	16.4	X	234.38881	272.32808	33.01968	4.76930	0.2852306	0.28374631	2.29	1.64	2.95	Mc	2 2.1	20.5
101258 1998 <i>SF</i> ₉₇	15.8	X	175.32959	335.60761	29.13212	3.68429	0.2821093	0.28073793	2.31	1.66	2.96	Mc	3 3.1	19.7
101328 1998 <i>SJ</i> ₁₆₂	16.4	X	72.64460	190.77032	206.91759	4.87125	0.3187164	0.26956781	2.37	1.62	3.13	Mc	—	—
101363 1998 <i>UQ</i>	15.7	X	153.70332	303.83628	37.15912	9.92265	0.3339939	0.27721733	2.33	1.55	3.11	Mc	1 22.2	19.6
101402 1998 <i>VG</i> ₁	15.8	X	211.26265	274.09358	61.72717	8.42138	0.2993346	0.28178411	2.30	1.61	2.99	Mc	2 24.8	20.1
101429 1998 <i>VF</i> ₃₁	17.2	X	268.99082	310.56366	221.29679	31.29550	0.1004385	0.52381751	1.52	1.37	1.68	MT	—	—
101430 1998 <i>VE</i> ₃₂	15.4	X	22.31904	100.41319	237.56559	26.97995	0.2899877	0.38953210	1.86	1.32	2.40	Mc	12 27.9	18.0
101465 1998 <i>WL</i> ₁₂	16.0	X	230.52387	86.81280	263.94858	3.13022	0.3018753	0.28478892	2.29	1.60	2.98	Mc	3 21.8	20.1
101487 1998 <i>WB</i> ₄₀	16.0	X	140.30215	267.58525	60.85598	22.89480	0.3402752	0.27238244	2.36	1.55	3.16	Mc	—	—
101496 1998 <i>XM</i> ₃	15.0	X	231.09159	338.95241	32.84928	8.68545	0.3982926	0.24244935	2.55	1.53	3.56	Mc	4 17.6	19.8
101554 1999 <i>AL</i> ₄	15.9	X	110.41434	86.12628	310.14626	21.86485	0.3331039	0.27417983	2.35	1.56	3.13	Mc	2 11.6	18.9
101610 1999 <i>CW</i> ₇	16.2	X	47.33766	125.30731	344.85430	14.60737	0.2875345	0.39954257	1.83	1.30	2.35	Mc	—	—
101742 1999 <i>FO</i> ₇	14.7	X	74.50250	88.20251	349.42083	23.22214	0.3436758	0.26752479	2.39	1.57	3.21	Mc	2 24.9	16.5
101795 1999 <i>HX</i> ₂	15.0	X	304.77481	156.56761	135.57295	19.45713	0.5487535	0.17686367	3.14	1.42	4.87	Mc	2 25.1	20.3
101811 1999 <i>JQ</i> ₆	14.8	X	50.11046	95.90997	21.28812	22.20634	0.3219451	0.27143832	2.36	1.60	3.12	Mc	2 25.4	16.5
101818 1999 <i>JD</i> ₁₃	16.6	X	308.97808	54.44402	219.94712	5.67400	0.2670242	0.30381025	2.19	1.61	2.78	Mc	2 20.3	19.7
101901 1999 <i>QD</i> ₂	17.2	X	46.23587	122.97492	154.02273	23.28761	0.0609339	0.45024938	1.69	1.58	1.79	Mc	10 12.2	18.7
101931 1999 <i>RZ</i> ₂₀	16.7	X	355.70237	2.54579	343.27719	6.61382	0.3129383	0.27008031	2.37	1.63	3.11	Mc	10 27.7	18.0
101952 1999 <i>RY</i> ₃₁	16.2	X	218.06625	209.91612	5									

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
102910 1999 XT ₁₉	15.6 ^m	X	169.75201	102.14528	228.55176	5.01538	0.2838755	0.29007486	2.26	1.62	2.90	Mc	1 13.1	19.3
102935 1999 XK ₄₃	15.3	X	84.41246	270.62272	40.55045	4.15626	0.3320794	0.27573897	2.34	1.56	3.11	Mc	—	—
102997 1999 XF ₉₄	15.0	X	149.72232	276.19915	104.58429	22.96717	0.2983731	0.28658634	2.28	1.60	2.96	Mc	3 9.4	19.1
103066 1999 XO ₁₄₁	17.8	X	143.79399	192.49570	111.29220	2.93721	0.1744593	0.45651387	1.67	1.38	1.96	Mc	—	—
103161 1999 XF ₂₂₅	16.5	X	153.09551	239.91789	100.33088	7.52337	0.2781421	0.28151457	2.31	1.66	2.95	Mc	1 12.3	19.9
103173 1999 XS ₂₃₃	16.0	X	100.66944	196.78444	137.85301	4.54758	0.2830849	0.27993822	2.31	1.66	2.97	Mc	—	—
103276 2000 AT ₃₃	16.7	X	28.55100	240.23337	122.57571	5.82228	0.2753341	0.31570579	2.14	1.55	2.72	Mc	—	—
103358 2000 AE ₉₃	15.8	X	219.64099	252.14148	85.02264	8.87416	0.2941441	0.29084193	2.26	1.59	2.92	Mc	3 3.3	20.0
103501 2000 AT ₂₄₅	15.3	X	137.02637	106.48666	3.92754	22.50228	0.2869365	0.28706113	2.28	1.62	2.93	Mc	6 7.2	19.6
103506 2000 BD ₁	15.8	X	300.90579	286.56043	170.53113	27.11422	0.2661203	0.35675616	1.97	1.44	2.49	Mc	—	—
103522 2000 BQ ₆	16.5	X	222.75725	224.78813	80.62207	12.47798	0.1776366	0.41913123	1.77	1.45	2.90	Mc	—	—
103732 2000 CO ₁₀₃	15.1	X	191.01454	92.39036	300.93346	22.46870	0.2836597	0.29015453	2.26	1.62	2.98	Mc	4 3.4	19.7
104444 2000 GR ₃	15.3	X	154.01046	249.46119	208.72985	20.31514	0.3156435	0.28877191	2.27	1.55	2.98	Mc	6 10.2	19.6
105106 2000 LS ₁₄	16.0	X	260.34138	9.91992	306.94126	6.19306	0.3803646	0.27049787	2.37	1.47	3.27	Mc	2 26.9	20.4
105158 2000 OL	13.5	X	308.23404	333.56744	312.90094	14.76788	0.4856377	0.22753840	2.66	1.37	3.95	Mc	2 18.2	17.9
105175 2000 OO ₂₂	15.6	X	29.58509	250.52698	142.12362	3.71113	0.2719772	0.28940021	2.26	1.65	2.88	Mc	—	—
105208 2000 AO ₄₈	17.4	X	259.60361	318.77503	21.50625	2.11940	0.2564563	0.31745648	2.13	1.58	2.67	Mc	4 1.7	20.7
105406 2000 QN ₁₅₀	16.4	X	204.75491	8.45934	333.59321	5.17220	0.2467001	0.30909900	2.17	1.63	2.70	Mc	2 20.3	20.0
105674 2000 SQ ₄₂	15.5	X	327.73065	238.29912	183.81777	22.31426	0.3392245	0.28236834	2.30	1.52	3.08	Mc	12 30.5	17.2
105943 2000 SY ₂₃₃	16.5	X	32.34559	245.74793	84.83876	5.41577	0.3024930	0.28670863	2.28	1.59	2.97	Mc	12 16.6	19.3
106239 2000 UM ₄₆	15.9	X	50.15153	106.84009	253.55110	2.48364	0.2746688	0.28922289	2.26	1.64	2.89	Mc	—	—
106521 2000 WC ₅₁	15.3	X	338.40652	211.76666	221.79415	24.49511	0.2804737	0.28815181	2.27	1.63	2.91	Mc	—	—
106577 2000 WB ₉₅	16.5	X	54.85369	301.48329	78.59038	3.55762	0.2723434	0.29020741	2.26	1.64	2.87	Mc	—	—
106628 2000 WH ₁₂₆	15.0	X	355.39505	294.72279	84.21819	23.28624	0.3430928	0.27991454	2.31	1.52	3.11	Mc	—	—
106848 2000 YP ₁₆	16.8	X	48.95669	232.27768	266.22308	3.32964	0.3318079	0.34305168	2.02	1.35	2.69	Mc	1 24.3	16.1
106988 2000 YE ₁₀₁	14.7	X	102.84336	268.77999	83.24598	18.10416	0.3790680	0.24126303	2.56	1.59	3.52	Mc	—	—
107150 2001 BW ₁₀	16.0	X	36.43963	297.18038	304.68020	20.26105	0.3194055	0.30489352	2.19	1.49	2.88	Mc	8 14.9	17.7
107225 2001 BF ₅₁	15.9	X	339.67912	275.57873	305.51873	20.41885	0.2920528	0.29250359	2.25	1.59	2.90	Mc	1 19.4	18.4
107673 2001 FV ₆	15.6	X	130.48424	252.07605	29.54131	5.19013	0.3493328	0.27073423	2.37	1.54	3.19	Mc	—	—
107888 2001 FY ₉₂	16.2	X	213.74023	167.24219	52.42833	6.60122	0.3086766	0.27546817	2.34	1.62	3.06	Mc	12 20.5	19.9
108182 2001 HY ₁₃	16.2	X	9.64520	302.71593	25.01521	7.18961	0.2648612	0.30829188	2.17	1.60	2.74	Mc	11 4.3	17.6
108297 2001 HK ₆₅	16.1	X	20.03654	281.32508	10.11072	5.59543	0.2482780	0.30199366	2.20	1.65	2.75	Mc	9 24.4	17.4
108376 2001 KB ₂₀	15.4	X	231.08595	259.13905	86.51365	23.77566	0.2854928	0.28553138	2.28	1.63	2.94	Mc	3 31.4	20.0
108410 2001 KG ₃₂	16.4	X	288.03451	301.42111	49.09557	7.34276	0.2771943	0.29783274	2.22	1.61	2.84	Mc	5 12.7	19.3
108516 2001 KR ₇₅	14.6	X	203.99186	72.46997	296.18384	22.18540	0.3299437	0.27875574	2.32	1.56	3.09	Mc	3 14.5	19.5
108522 2001 LQ	13.9	X	175.84942	278.60653	91.72618	28.94576	0.3882152	0.23528512	2.60	1.59	3.61	Mc	3 31.2	19.5
108573 2001 MN ₄	15.6	X	169.47403	310.25762	54.92392	23.77129	0.2890663	0.28018117	2.31	1.64	2.98	Mc	3 12.4	20.1
109077 2001 QR ₂₅	15.5	X	208.33612	248.96374	131.43061	4.94329	0.2989575	0.27933564	2.32	1.62	3.01	Mc	4 15.5	19.8
109226 2001 QH ₉₁	16.1	X	225.77586	202.37969	220.76729	6.13397	0.3850416	0.23160168	2.63	1.61	3.64	Mc	6 14.6	21.2
109346 2001 QK ₁₅₀	15.8	X	44.09942	276.95946	108.78466	7.06371	0.3660760	0.25572323	2.46	1.56	3.36	Mc	—	—
110083 2001 SV ₁₁₅	15.7	X	14.22348	268.96422	3.93264	27.16008	0.3501070	0.24226262	2.55	1.66	3.44	Mc	9 2.4	17.8
110325 2001 SZ ₂₈₅	14.5	X	305.06993	242.62863	65.03153	17.90107	0.3644719	0.23720239	2.58	1.64	3.53	Mc	4 7.6	18.5
111245 2001 XE ₃	14.5	X	259.98373	76.13609	49.27612	23.44398	0.3638035	0.23834068	2.58	1.64	3.51	Mc	10 9.6	18.5
111346 2001 XS ₁₀₃	16.6	X	172.11451	154.45331	197.39891	3.03612	0.2600533	0.31617305	2.13	1.58	2.69	Mc	2 4.9	20.0
111811 2002 CN ₂₈₃	15.0	X	66.51549	78.69042	356.68165	24.16118	0.2900570	0.30290985	2.20	1.56	2.83	Mc	—	—
112127 2002 JW ₄₇	16.9	X	287.26598	275.17873	10.83896	5.36308	0.2696666	0.30324791	2.19	1.60	2.79	Mc	2 17.9	20.2
112380 2002 NN ₂₇	17.5	X	155.34247	173.83068	146.78691	3.84205	0.3184290	0.28220147	2.30	1.57	3.03	Mc	—	—
112464 2002 OQ ₁₃	16.9	X	212.42461	145.95207	225.22973	6.32844	0.2971100	0.29617737	2.23	1.57	2.89	Mc	4 2.4	21.0
112493 2002 PR ₆	15.6	X	294.57729	310.91773	142.61743	13.41871	0.3378932	0.31991840	2.12	1.40	2.83	Mc	11 10.9	16.6
112495 2002 PQ ₁₀	16.6	X	245.91256	153.37509	191.05365	3.15405	0.2706792	0.29830271	2.22	1.62	2.82	Mc	3 26.9	20.4
112548 2002 PL ₄₂	16.5	X	278.36889	332.01650	23.04950	4.89295	0.3449208	0.30145108	2.20	1.66	2.74	Mc	5 11.2	19.5
112661 2002 PR ₈₇	16.5	X	218.93225	128.10820	115.63654	8.75549	0.2231340	0.28528934	2.29	1.53	3.04	Mc	—	—
112828 2002 QE ₁₀	16.4	X	138.45364	208.52775	91.87133	8.08149	0.2953856	0.27686015	2.33	1.64	3.02	Mc	—	—
112891 2002 QG ₄₇	16.9	X	23.69787	248.84024	57.99311	6.22002	0.2775004	0.31421338	2.14	1.55	2.74	Mc	11 3.7	18.7
113071 2002 RK ₆₂	16.5	X	133.61474	167.75237	144.80315	4.82854	0.3004843	0.27646456	2.33	1.63	3.03	Mc	—	—
113681 2002 TL ₁₁₀	16.3	X	9.75955	192.06960	116.44217	8.61385	0.3265180	0.31182139	2.15	1.45	2.86	Mc	10 24.1	17.9
114249 2002 WO ₁₁	15.2	X	51.26892	100.34004	258.15029	11.48535	0.3026734	0.26700226	2.39	1.67	3.11	Mc	—	—
114319 2002 XD ₅₈	15.6	X	249.25335	92.66292	242.49457	6.83389	0.2746145	0.29074592	2.26	1.64	2.88	Mc	3 15.5	19.7
114326 2002 XB ₅₉	15.2	X	122.87211	286.88890	131.09372	21.98622	0.3296091	0.27917455	2.32	1.55	3.08	Mc	4 4.9	19.1
114507 2003 AX ₈₀	16.0	X	134.15352	277.41480	196.38214	21.86122	0.2749702	0.28461758	2.29	1.66	2.92	Mc	6 12.4	20.2
114534 2003 BT ₁₉	13.6	X	47.73191	304.79848	81.90598	13.58799	0.4650570	0.21076742	2.80	1.50	4.10	Mc	—	—
114553 2003 BH ₄₂	15.0	X	5.62308	273.68079	192.45737	21.81062	0.3291689	0.26346535	2.41	1.62	3.20	Mc	—	—
114575 2003 BH ₇₁	15.1	X	47.02120	1.54628	12.73143	8.43957	0.3204746	0.26015355	2.43	1.65	3.21	Mc	—	—
114800 2003 NM ₇	16.3	X	115.17350	162.45335	195.10194	6.77543	0.3376902	0.29275270	2.25	1.49	3.00	Mc	—	—
114824 2003 OB ₁₇	16.7	X	70.96114	204.19414	183.81661	3.43860	0.2708015	0.29223238	2.25	1.64	2.86	Mc	—	—
114924 2003 QL ₄₁	15.6	X	356.64978	12.41168	343.77071	10.93150	0.2990830	0.27646445	2.33	1.64	3.03	Mc	11 15.4	17.4
115916 2003 WB ₈	14.1	X	330.26086	352.00854	124.97908	20.31450	0.5571842	0.16960086	3.23	1.43	5.03	Mc	—	—
117898 3029 P-L	16.6	X	201.23060	113.53900	252.72098	5.83083	0.3302786	0.28481132	2.29	1.53	3.04	Mc	3 19.6	20.9
118108 2398 T-3	15.9	X	195.23790	60.78731	352.36656	4.84088	0.3145264	0.26170322	2.42	1.66	3.18	Mc	5 13.6	20.5
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ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
118624 2000 <i>HR</i> ₂₄	13.0 ^m	X	332.05290	354.02521	223.29806	15.54078	0.1750524	0.08982758	4.94	4.07	5.80	Jc	2 26.8	19.2
119039 2001 <i>FZ</i> ₉₁	13.5	X	49.80544	186.05684	27.65949	11.77299	0.2410500	0.10810551	4.36	3.31	5.42	Jc	7 14.3	19.1
119044 2001 <i>HV</i> ₇	16.7	X	55.09552	264.61232	48.84168	2.00014	0.2563364	0.31244081	2.15	1.60	2.70	Mc	12 17.1	19.7
119147 2001 <i>PF</i> ₄₇	15.4	X	222.07060	126.67771	319.31149	24.65594	0.2646827	0.28962588	2.26	1.66	2.86	Mc	7 22.2	19.3
119866 2002 <i>CL</i> ₁₄₂	15.7	X	204.38385	272.47340	221.96798	5.84580	0.3755065	0.22901666	2.65	1.65	3.64	Mc	8 23.5	20.9
119905 2002 <i>EH</i> ₁₀	15.2	X	293.44010	274.07265	163.64635	22.71374	0.3788218	0.24003853	2.56	1.59	3.54	Mc	9 5.6	17.7
120352 2002 Gordonwong	16.2	X	231.68036	199.36284	109.39002	6.16680	0.2826476	0.28632199	2.28	1.64	2.92	Mc	2 3.1	20.3
120414 4880 <i>P-L</i>	16.5	X	128.46400	286.28889	10.06026	11.01593	0.3219027	0.26340760	2.41	1.63	3.19	Mc	—	—
120450 1982 <i>SV</i>	15.9	X	74.12649	244.82704	188.94902	21.82289	0.3677293	0.26206296	2.42	1.53	3.31	Mc	2 13.3	18.1
120482 1992 <i>TA</i>	16.8	X	108.55594	80.72837	355.21485	25.99908	0.2892913	0.39167254	1.85	1.31	2.39	Mc	3 15.0	17.9
120644 1996 <i>RM</i> ₃	15.2	X	293.66213	34.07758	358.00166	6.91015	0.3693469	0.23328731	2.61	1.65	3.58	Mc	7 5.9	18.6
120708 1997 <i>MA</i> ₂	16.6	X	181.82516	214.23256	135.88729	3.57293	0.3053104	0.27404522	2.35	1.63	3.06	Mc	2 18.9	20.7
120900 1998 <i>SP</i> ₂₅	16.5	X	53.04043	279.11114	56.71625	4.56164	0.2381295	0.30671814	2.18	1.66	2.70	Mc	—	—
120942 1998 Rendafuzhong	17.4	X	140.81373	162.83314	164.27208	2.39174	0.2339921	0.31655206	2.13	1.63	2.63	Mc	—	—
120966 1998 <i>VT</i> ₂₉	16.1	X	201.46845	142.41560	297.83883	3.37206	0.2876232	0.28736512	2.27	1.62	2.93	Mc	6 22.1	20.1
121007 1999 <i>AT</i> ₉	15.8	X	250.56204	292.52043	113.95019	11.00974	0.3309995	0.28708128	2.28	1.52	3.03	Mc	6 15.2	19.5
121032 1999 Wadesisler	16.6	X	327.89603	119.54350	115.92913	40.01358	0.2181840	0.39963124	1.83	1.43	2.22	Mc	1 12.2	18.6
121210 1999 <i>QG</i> ₂	15.8	X	17.25978	157.75227	108.15705	8.39323	0.3336350	0.26765354	2.38	1.59	3.18	Mc	8 15.9	17.0
121514 1999 <i>UJ</i> ₇	17.2	X	197.09219	48.46812	347.35023	16.74964	0.0392937	0.52365369	1.52	1.46	1.58	MT	3 17.0	17.5
121745 1999 <i>XN</i> ₂₀₇	15.2	X	205.58759	268.49404	84.51658	23.75466	0.2836859	0.28975391	2.26	1.62	2.90	Mc	3 21.3	19.8
121863 2000 <i>CO</i> ₇₅	16.2	X	229.85037	206.42245	181.18609	8.74977	0.2860762	0.29635005	2.23	1.59	2.87	Mc	5 9.2	20.1
122106 2000 <i>HC</i> ₈₆	16.1	X	183.50487	218.07890	94.66509	7.58957	0.3170023	0.26340175	2.41	1.65	3.17	Mc	1 9.0	20.3
122119 2000 <i>JP</i> ₁₄	16.4	X	175.44508	267.57407	52.64402	4.13356	0.2490257	0.31000385	2.16	1.62	2.70	Mc	—	—
122159 2000 <i>JM</i> ₈₁	16.1	X	110.12884	74.60807	254.84633	5.07700	0.3409721	0.25539157	2.46	1.62	3.30	Mc	—	—
122180 2000 <i>KV</i> ₄₃	17.4	X	177.98883	247.75178	246.97657	10.17889	0.1953794	0.47814823	1.62	1.30	1.94	Mc	8 16.7	19.4
122258 2000 <i>OD</i> ₄₄	15.6	X	298.20817	2.76087	285.44747	8.39374	0.3395502	0.27227134	2.36	1.56	3.16	Mc	2 21.8	19.5
122259 2000 <i>OH</i> ₄₄	15.8	X	357.81848	182.24237	172.53051	6.67181	0.2792600	0.28430791	2.29	1.65	2.93	Mc	11 21.8	17.4
122358 2000 <i>QM</i> ₄₉	16.7	X	345.77438	176.73805	134.84918	1.42307	0.3230744	0.28021354	2.31	1.57	3.06	Mc	7 4.6	17.3
122421 2000 <i>QZ</i> ₁₀₁	15.8	X	184.00127	205.75470	56.68446	6.48135	0.2586296	0.29983378	2.21	1.64	2.78	Mc	—	—
122463 2000 <i>QP</i> ₁₄₈	15.4	X	195.26225	158.11836	156.61459	8.71572	0.3213787	0.30983581	2.16	1.47	2.86	Mc	1 14.3	19.3
124120 2001 <i>KR</i> ₂	16.7	X	289.30666	227.78260	86.10351	5.78941	0.2717182	0.29159215	2.25	1.64	2.86	Mc	3 30.2	19.9
124136 2001 <i>LT</i> ₂	16.5	X	313.09721	229.51481	80.82922	5.14287	0.2708231	0.29267527	2.25	1.64	2.86	Mc	4 22.4	19.0
124146 2001 <i>MQ</i> ₁₂	16.7	X	279.95414	99.55321	218.63988	0.45332	0.2729224	0.28569864	2.28	1.66	2.91	Mc	3 23.6	20.2
124158 2001 <i>OV</i> ₂	16.2	X	227.13643	47.46431	287.97541	6.00183	0.3373491	0.27950724	2.32	1.54	3.10	Mc	2 28.2	20.6
124162 2001 <i>OQ</i> ₁₃	16.6	X	294.80289	224.14740	123.03197	7.21070	0.2717057	0.28905233	2.27	1.65	2.88	Mc	5 20.4	19.5
124165 2001 <i>ON</i> ₁₆	15.9	X	231.10002	289.36077	74.29249	7.99850	0.3419436	0.28152216	2.31	1.52	3.09	Mc	4 10.9	20.2
124172 2001 <i>OY</i> ₂₃	16.3	X	257.38097	254.36308	106.22182	6.71546	0.2902396	0.28692584	2.28	1.62	2.94	Mc	4 28.2	20.0
124192 2001 Moletai	16.5	X	139.61953	1.96200	251.50242	5.82278	0.2835905	0.31126606	2.16	1.54	2.77	Mc	12 10.9	20.3
124200 2001 <i>OM</i> ₈₁	15.2	X	21.56230	260.29977	150.45800	8.73630	0.3597844	0.25317569	2.47	1.58	3.37	Mc	—	—
124311 2001 <i>QO</i> ₇₃	16.2	X	327.54557	114.75974	248.14757	2.82408	0.2571905	0.29584556	2.23	1.66	2.80	Mc	8 25.5	17.0
124329 2001 <i>QU</i> ₉₈	16.0	X	204.78713	192.59988	165.51232	6.52463	0.2943847	0.27830535	2.32	1.64	3.01	Mc	3 15.6	20.2
124357 2001 <i>QH</i> ₁₂₉	15.6	X	123.25205	258.79844	162.10502	21.97579	0.2956937	0.27299286	2.35	1.66	3.05	Mc	4 1.1	19.2
124499 2001 <i>RK</i> ₄₆	16.0	X	264.30114	313.07529	26.29838	3.61254	0.3094157	0.28242137	2.30	1.59	3.01	Mc	4 3.5	19.9
124812 2001 <i>SB</i> ₂₈₄	16.5	X	120.17712	293.99708	177.82391	22.38867	0.2951432	0.27723531	2.33	1.64	3.02	Mc	6 2.0	20.7
124834 2001 <i>TH</i>	15.3	X	247.07608	305.15218	84.76537	22.80914	0.2926151	0.28460721	2.29	1.62	2.96	Mc	5 27.9	19.2
125072 2001 <i>UG</i>	15.8	X	284.88627	63.02580	80.36102	7.04995	0.3506315	0.30188854	2.20	1.43	2.97	Mc	12 30.5	16.2
125458 2001 <i>WR</i> ₄	15.2	X	342.77800	249.17567	96.28228	14.50879	0.3501507	0.24137376	2.55	1.66	3.45	Mc	9 12.6	16.5
125472 2001 <i>WM</i> ₁₄	15.7	X	15.01231	357.73221	318.68603	4.76652	0.2616802	0.29226726	2.25	1.66	2.84	Mc	10 22.0	17.6
125475 2001 <i>WA</i> ₁₅	16.8	X	86.20439	184.23559	159.52257	5.48776	0.2469984	0.30560530	2.18	1.64	2.72	Mc	—	—
126398 2002 <i>BP</i> ₉	16.1	X	64.23159	87.71430	136.78422	3.89887	0.3273476	0.26954722	2.37	1.60	3.15	Mc	9 5.8	19.1
126410 2002 <i>BU</i> ₁₈	14.8	X	314.43628	233.83572	147.12472	17.67560	0.3837891	0.23529807	2.60	1.60	3.60	Mc	7 19.9	17.4
127521 2002 <i>VK</i> ₁₄	15.0	X	12.09596	239.67459	241.44312	23.21362	0.2359588	0.26890008	2.38	1.60	3.16	Mc	—	—
127535 2002 <i>XL</i> ₁₄	16.4	X	29.84550	246.66755	81.21004	6.40642	0.2569302	0.31100981	2.16	1.60	2.71	Mc	12 8.0	18.8
127552 2002 <i>YF</i> ₅	15.7	X	157.96572	326.07354	30.21000	24.03403	0.2956987	0.27421008	2.35	1.65	3.04	Mc	2 20.6	20.1
127688 2003 <i>EC</i> ₁₆	15.6	X	219.33158	59.55098	329.85120	23.02434	0.2839257	0.28531831	2.29	1.64	2.93	Mc	4 19.6	20.2
127938 2003 <i>HN</i> ₂	16.6	X	250.02452	72.81663	149.39014	26.63741	0.2801234	0.30738712	2.17	1.57	2.78	Mc	—	—
128353 2004 <i>GK</i> ₃₉	16.0	X	39.98923	261.76456	80.53927	2.73794	0.2357645	0.30792168	2.17	1.66	2.68	Mc	—	—
128451 2004 <i>NC</i> ₂₅	16.0	X	280.30705	3.46945	356.72901	7.94002	0.2967225	0.28004119	2.31	1.63	3.00	Mc	5 13.2	19.5
128472 2004 <i>PS</i>	16.1	X	194.91611	40.82678	306.90410	4.83185	0.3104849	0.26597352	2.39	1.65	3.14	Mc	2 24.3	20.6
129248 2005 <i>QV</i> ₃₃	17.5	X	244.38853	356.38537	328.30609	1.59626	0.2649163	0.28990918	2.26	1.66	2.86	Mc	3 2.4	21.3
129322 2005 <i>TN</i> ₄₅	16.5	X	269.36769	269.03144	17.16963	11.36869	0.2726419	0.28556662	2.28	1.66	2.91	Mc	2 7.8	20.5
129470 1993 <i>KC</i>	16.0	X	193.10070	37.82311	228.32247	25.28125	0.3566487	0.30059701	2.21	1.42	2.99	Mc	—	—
129493 1995 <i>BM</i> ₂	15.4	X	166.29323	268.29416	247.90275	20.66203	0.3068144	0.27948555	2.32	1.61	3.03	Mc	8 20.9	20.2
129541 1996 <i>PQ</i> ₉	14.8	X	36.29431	97.73402	328.13218	19.62917	0.3008444	0.28733122	2.27	1.59	2.96	Mc	—	—
129558 1996 <i>XQ</i> ₈	17.1	X	13.42672	286.13676	40.07429	14.18519	0.3411224	0.27601752	2.34	1.54	3.13	Mc	11 15.7	19.1
129737 1999 <i>AA</i> ₉	16.6	X	155.96976	334.97754	95.54969	4.43875	0.2661679	0.32492824	2.10	1.54	2.65	Mc	5 5.3	20.0
129813 1999 <i>NJ</i>	16.8	X	46.04751	199.27617	104.23924	6.40350	0.2937584	0.27546074	2.34	1.65	3.03	Mc	11 25.1	19.9
129989 19														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
131905 2002 BQ ₉	15.6 ^m	X	147.23882	121.53763	129.11243	9.17259	0.2905627	0.28521112	2.29	1.62	2.95	Mc	12 11.0	19.9
132124 2002 CW ₂₃₇	14.7	X	162.63725	121.46475	31.22706	23.32348	0.2961353	0.27432170	2.35	1.65	3.04	Mc	9 6.1	19.4
132720 2002 PK ₁	15.8	X	171.01845	131.24627	219.16485	2.44521	0.3715804	0.23234665	2.62	1.65	3.59	Mc	2 17.6	20.7
133027 2002 XJ ₄	17.3	X	75.19550	262.88746	51.00197	15.09965	0.2022294	0.41854451	1.77	1.41	2.13	Mc	—	—
133039 2003 AJ ₃₄	18.0	X	196.52871	292.20205	171.35780	3.54312	0.2090360	0.34957420	2.00	1.58	2.41	Mc	7 20.6	21.0
133043 2003 BC ₄₃	17.3	X	36.26831	255.42832	84.74932	10.07277	0.1526694	0.41110743	1.79	1.52	2.06	Mc	—	—
133048 2003 CG ₁₅	15.4	X	179.83818	227.22934	6.57346	27.25009	0.2476621	0.30246837	2.20	1.65	2.74	Mc	12 14.2	19.6
133059 2003 EC ₅₈	15.4	X	122.18666	116.02652	73.09228	23.92086	0.2827708	0.28588263	2.28	1.64	2.93	Mc	9 23.0	19.9
133090 2003 MS ₉	16.0	X	346.24763	137.90909	223.61506	2.30452	0.3837490	0.27392208	2.35	1.45	3.25	Mc	11 15.6	16.2
133249 2003 RS ₆	16.4	X	138.36308	150.56227	121.64785	8.47526	0.2816197	0.29016686	2.26	1.62	2.90	Mc	12 29.9	20.5
133531 2003 TJ ₅	16.4	X	51.50473	272.54152	33.40875	22.20375	0.2936124	0.27980186	2.32	1.64	2.99	Mc	11 27.5	20.0
133554 2003 UN ₅	15.7	X	358.30236	139.67459	215.32094	5.13572	0.3315144	0.27915705	2.32	1.55	3.09	Mc	11 30.8	17.2
133577 2003 UB ₅₀	16.3	X	242.66891	198.83647	113.80478	6.17263	0.2383359	0.30660985	2.18	1.66	2.70	Mc	2 14.9	20.0
133620 2003 UU ₁₁₉	15.8	X	298.62267	263.40628	92.03189	14.25674	0.3334569	0.26610718	2.39	1.60	3.19	Mc	5 28.8	18.9
133819 2003 XS	16.1	X	31.75107	331.03034	2.98541	6.23683	0.3687164	0.27599477	2.34	1.47	3.20	Mc	12 27.6	19.4
134341 1979 MA	15.2	X	42.25701	288.12249	284.35612	21.29151	0.3263336	0.25797716	2.44	1.65	3.24	Mc	7 12.7	17.2
134371 1995 RH	15.7	X	11.97809	260.50161	98.25834	23.59396	0.3106540	0.26812938	2.38	1.64	3.12	Mc	12 24.9	18.1
134509 1999 FC ₈	16.7	X	218.25836	83.80595	187.23064	5.69709	0.2483716	0.29978507	2.21	1.66	2.76	Mc	—	—
134681 1999 XC ₂₅	15.6	X	2.28793	257.22082	70.75477	8.29604	0.3123162	0.26709335	2.39	1.64	3.13	Mc	10 22.1	17.1
134705 1999 XA ₁₈₆	15.4	X	29.24814	33.50466	283.40964	12.43226	0.3030132	0.26716051	2.39	1.66	3.11	Mc	11 18.7	18.4
134863 2000 PX ₅	17.6	X	302.68338	341.41961	11.78309	4.56011	0.3581735	0.32385729	2.10	1.35	2.85	Mc	5 19.9	19.9
134896 2000 WH ₁₃	17.0	X	250.86437	239.75600	103.47605	5.12447	0.2255438	0.31326704	2.15	1.66	2.63	Mc	4 2.9	20.4
134928 2001 AG ₂	16.5	X	110.01624	288.26977	69.19705	2.62309	0.22630605	0.28995607	2.26	1.67	2.86	Mc	—	—
134970 2001 EZ ₉	14.6	X	249.43341	296.54890	0.02235	29.66774	0.3660703	0.23824164	2.58	1.63	3.52	Mc	2 15.6	19.9
136146 2003 SA ₂₉₄	17.0	X	208.06435	215.74887	102.60617	4.17845	0.2451718	0.30250514	2.20	1.66	2.74	Mc	1 25.9	20.8
136149 2003 SR ₃₁₃	16.8	X	213.22351	257.80622	68.86333	7.91003	0.2896268	0.30570310	2.18	1.55	2.81	Mc	2 11.9	20.7
136568 1980 XB	14.4	X	232.85919	41.66813	70.51167	23.76030	0.3697967	0.25860841	2.44	1.54	3.34	Mc	8 30.1	19.1
136620 1994 JC	14.9	X	154.50212	138.26182	37.11403	31.25862	0.5206969	0.16135410	3.34	1.60	5.08	Jc	9 28.8	22.0
136698 1995 SO ₆₃	17.1	X	80.91885	119.55761	206.31487	1.33467	0.3396272	0.27393899	2.35	1.55	3.15	Mc	—	—
136864 1998 FB ₄₁	16.3	X	164.76518	72.88255	177.75418	4.70530	0.2886566	0.27840882	2.32	1.65	2.99	Mc	12 21.3	20.5
136926 1998 MY	16.1	X	25.54049	91.12115	220.00922	7.82235	0.3437280	0.26295912	2.41	1.58	3.24	Mc	11 13.9	18.6
137069 1998 WQ ₁₅	16.1	X	221.33086	331.41369	77.50983	9.52277	0.3577711	0.24454971	2.53	1.63	3.44	Mc	5 27.2	20.7
137173 1999 JY ₄	16.6	X	253.52527	248.79676	29.62841	8.92879	0.2446801	0.30183596	2.20	1.66	2.74	Mc	1 13.7	20.5
137176 1999 JZ ₁₁	16.2	X	238.51310	204.81128	124.28662	4.38545	0.2634146	0.30558292	2.18	1.61	2.76	Mc	3 3.4	19.9
137184 1999 JG ₆₃	14.1	X	102.70039	248.17749	50.24068	8.01702	0.5579071	0.19362660	2.96	1.31	4.61	Mc	—	—
137201 1999 KF ₁₃	17.3	X	287.30839	149.17107	132.36018	3.76529	0.2620532	0.30557480	2.18	1.61	2.76	Mc	2 11.1	20.6
137206 1999 LJ ₂₅	16.6	X	223.29357	201.48734	102.17451	7.04982	0.2809009	0.29871348	2.22	1.59	2.84	Mc	1 20.6	20.5
137208 1999 MC ₂	16.3	X	163.75251	199.99174	116.76544	7.77503	0.2865754	0.28975989	2.26	1.61	2.91	Mc	—	—
137230 1999 RG ₂₂	15.4	X	350.26615	75.38395	355.39058	22.39691	0.2968442	0.27543809	2.34	1.65	3.03	Mc	—	—
137238 1999 RN ₂₉	15.6	X	28.18387	254.64284	185.20055	21.68461	0.3559538	0.28247709	2.30	1.48	3.12	Mc	—	—
137284 1999 RZ ₁₈₂	17.2	X	177.25622	129.60297	167.88375	6.43106	0.2845417	0.28926559	2.26	1.62	2.91	Mc	—	—
137304 1999 SK ₁₂	16.5	X	173.00280	348.86772	330.94882	4.71044	0.2808189	0.29098626	2.26	1.62	2.89	Mc	1 3.8	20.1
137444 1999 TE ₂₄₅	14.4	X	122.63110	115.34303	272.36033	20.24284	0.2863302	0.28278892	2.30	1.64	2.96	Mc	2 2.4	17.8
137504 1999 VO ₂₁	16.6	X	82.45692	115.07899	223.91900	11.09928	0.3186242	0.27900633	2.32	1.58	3.06	Mc	—	—
137722 1999 XN ₁₀₄	16.0	X	135.11902	119.65368	264.85990	23.56112	0.3031038	0.28730298	2.27	1.59	2.96	Mc	2 9.4	19.9
138131 2000 ES ₂₀	16.1	X	252.60057	248.57579	177.81563	22.73266	0.3392481	0.25654707	2.45	1.62	3.29	Mc	7 9.5	20.6
138402 2000 HN ₁₄	16.4	X	266.39602	287.53784	130.84671	7.15186	0.1538664	0.38708887	1.86	1.58	2.15	Mc	8 17.3	17.6
138843 2000 VF ₃₉	18.2	X	244.95073	220.69040	46.54065	33.79055	0.1649948	0.49273884	1.59	1.33	1.85	Mc	—	—
138868 2000 XR ₁₅	17.2	X	178.72364	340.44808	330.81503	11.09770	0.1059644	0.48795207	1.60	1.43	1.77	Mc	—	—
138970 2001 CV ₁₉	16.7	X	244.74046	264.45565	266.02404	21.06409	0.0525673	0.47305360	1.63	1.55	1.72	Mc	—	—
138977 2001 CY ₃₁	17.4	X	42.19403	139.95727	32.94117	25.71463	0.0410454	0.44413493	1.70	1.63	1.77	Mc	3 18.2	19.1
138978 2001 CD ₃₂	16.1	X	154.98127	125.59978	322.73144	50.32648	0.2549869	0.40503011	1.81	1.35	2.27	Mc	—	—
139092 2001 FU ₃₂	15.4	X	0.57455	244.44584	223.97006	22.01188	0.3030355	0.28258165	2.30	1.60	3.00	Mc	—	—
139359 2001 ME ₁	16.4	X	222.12393	302.28893	84.63498	5.95131	0.8699487	0.23058652	2.63	0.34	4.93	Ja	4 22.6	23.0
140265 2001 SL ₂₇₀	15.5	X	296.61282	226.00269	109.79813	14.73867	0.3564152	0.23848057	2.58	1.66	3.49	Mc	5 2.7	19.5
141535 2002 GG ₅	16.5	X	209.26857	98.11176	187.03283	2.33287	0.2788419	0.29401860	2.24	1.62	2.86	Mc	—	—
141690 2002 JM ₁₄₃	17.2	X	203.24069	69.29584	234.06394	2.84786	0.2886128	0.29404365	2.24	1.59	2.89	Mc	1 6.2	21.0
141742 2002 LT ₃₆	16.1	X	169.80196	78.30826	255.36001	6.65550	0.3148768	0.28583570	2.28	1.56	3.00	Mc	1 19.3	19.9
141753 2002 LL ₅₃	16.4	X	120.52585	221.50060	120.75314	10.47874	0.2810734	0.28465928	2.29	1.65	2.93	Mc	—	—
141756 2002 LP ₅₈	16.2	X	205.33605	197.99155	94.66888	5.59528	0.2809457	0.28781595	2.27	1.63	2.91	Mc	—	—
141776 2002 NY ₈	16.3	X	79.31444	242.24679	117.84017	6.31810	0.2863276	0.27680089	2.33	1.66	3.00	Mc	—	—
141808 2002 NV ₃₈	16.1	X	191.52129	59.74824	284.15605	4.24969	0.3114163	0.28728146	2.27	1.57	2.98	Mc	2 15.6	20.1
141988 2002 PB ₁₃₉	16.4	X	1.34936	185.70675	212.69575	4.47490	0.3219089	0.26598151	2.39	1.62	3.17	Mc	—	—
142030 2002 QG ₆	15.0	X	27.88764	90.22971	295.68083	22.61957	0.3147422	0.26571671	2.40	1.64	3.15	Mc	—	—
142803 2002 UM ₂₇	16.3	X	169.37916	36.99697	245.19837	4.46777	0.2908704	0.27635590	2.33	1.66	3.01	Mc	—	—
142944 2002 VT ₆₉	15.0	X	116.41019	14.67693	23.91012	12.00898	0.2975535	0.28389419	2.29	1.61	2.98	Mc	2 25.0	18.1
142989 2002 VK ₉₀	16.2	X	69.45545	249.00176	99.40153	11.85321	0.3260165	0.26916882	2.38	1.60	3.15	Mc	—	—
143081 2002 XC ₅	15.9	X	125.93558	240.47985	117.61367	9.08021	0.3490305	0.27729976	2.33	1.52	3.14	Mc	1 16.7	18.8
143243 2002 YA ₂₆	13.9	X	111.06149	233.75178	107.05710	19.06070	0.4450539	0.16455609	3.30	1.83	4.77	Ja	1 11.7	19.1
14325														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
145963 1999 YC ₇	15.8 ^m	X	339.00704	245.76743	321.85957	20.75897	0.2882885	0.28191194	2.30	1.64	2.97	Mc	1 6.6	18.9
146134 2000 SE ₁	16.0	X	170.69899	315.44629	289.66575	28.49372	0.2706644	0.39056558	1.85	1.35	2.36	Mc	—	—
147057 2002 RY ₁₀₆	15.4	X	158.93443	110.89669	237.40029	4.33983	0.2812015	0.28137460	2.31	1.66	2.96	Mc	1 26.2	19.0
147083 2002 SA ₃₇	16.8	X	294.05104	300.61074	5.43123	2.58118	0.2518302	0.29900813	2.21	1.66	2.77	Mc	3 23.2	19.8
147431 2003 JA	17.8	X	177.29521	5.74638	91.67431	9.97335	0.0830756	0.44142993	1.71	1.57	1.85	Mc	6 21.6	19.2
147719 2005 LL ₄₈	16.0	X	119.49796	2.61836	325.35124	5.25659	0.3161577	0.26952377	2.37	1.62	3.12	Mc	—	—
147874 2006 QP ₃₉	16.4	X	355.51557	162.86509	192.21029	5.57281	0.3212691	0.26467838	2.40	1.63	3.17	Mc	11 17.3	17.8
147988 1995 YS ₁	17.8	X	199.19988	124.51399	240.01968	2.02357	0.3239119	0.36172983	1.95	1.32	2.58	Mc	3 12.3	21.1
147997 1996 RH ₂₆	16.7	X	12.56065	322.45691	3.03048	4.25357	0.2286244	0.31728167	2.13	1.64	2.62	Mc	11 1.4	18.4
148433 2000 XW	16.3	X	351.03370	75.61163	85.42889	24.49823	0.1902892	0.34541317	2.01	1.63	2.39	Mc	—	—
148480 2001 FE ₁₅₅	17.1	X	66.87298	73.76123	139.57656	2.37494	0.2607614	0.30197920	2.20	1.63	2.77	Mc	8 15.5	19.4
149193 2002 LO ₂₇	15.5	X	134.67538	48.45763	300.15999	10.72270	0.2788967	0.28338352	2.30	1.66	2.94	Mc	1 4.3	18.5
149223 2002 RM ₆₅	16.0	X	91.62168	278.68715	65.38530	8.41526	0.3328144	0.27146254	2.36	1.58	3.15	Mc	—	—
149537 2003 GE ₄₂	14.6	X	92.60974	101.29799	165.64450	27.85975	0.3752758	0.23070270	2.63	1.64	3.62	Mc	11 25.1	19.9
149592 2004 CU ₅₁	16.0	X	89.49402	234.00335	147.50722	21.91580	0.3041124	0.28186485	2.30	1.60	3.00	Mc	—	—
149639 2004 FU ₂	16.6	X	207.94827	269.54245	157.12539	3.62737	0.2818768	0.30428921	2.19	1.57	2.81	Mc	6 9.8	20.4
150165 1997 UG ₉	15.7	X	180.98658	13.80774	34.10636	8.04814	0.3806733	0.22987525	2.64	1.63	3.64	Mc	5 1.2	20.8
150340 1999 XH ₃₁	16.1	X	193.10171	123.67675	246.99748	3.74340	0.3198595	0.29229365	2.25	1.53	2.97	Mc	3 19.9	20.2
151364 2002 DN ₃	17.1	X	313.13828	211.67731	21.39484	16.49377	0.1313030	0.41131777	1.79	1.56	2.03	Mc	—	—
151517 2002 PQ ₁₁₃	15.2	X	78.37603	90.99003	318.25944	20.98335	0.3274348	0.27436993	2.35	1.58	3.11	Mc	1 11.1	16.8
151525 2002 RA ₅₀	17.4	X	9.70913	177.87961	136.29064	3.69892	0.2292637	0.31206802	2.15	1.66	2.65	Mc	10 9.8	18.7
151703 2003 BU ₂₁	15.8	X	327.72087	156.82905	246.31453	7.45457	0.3323787	0.25470242	2.46	1.65	3.28	Mc	10 30.9	16.6
151723 2003 BX ₆₃	15.9	X	255.06878	283.54418	153.09963	12.10835	0.3464609	0.24424310	2.53	1.66	3.41	Mc	7 24.4	20.2
151888 2003 YV ₁₁₇	15.6	X	182.55209	351.43061	153.78009	28.04526	0.3370517	0.30824952	2.17	1.44	2.90	Mc	8 29.1	19.5
152603 1995 VF ₂	17.8	X	43.52109	262.31911	54.60612	3.87280	0.3000982	0.30565008	2.18	1.53	2.84	Mc	12 13.8	20.6
152627 1997 DF	18.1	X	335.40822	268.58256	145.78669	18.67283	0.1465886	0.51489353	1.54	1.32	1.77	Mc	—	—
152667 1998 FR ₁₁	16.3	X	317.47343	158.59581	129.87160	6.66721	0.7064905	0.20908826	2.81	0.83	4.80	Ja	2 9.6	21.3
152704 1998 SD ₄	18.5	X	109.20347	144.12763	181.78166	13.67262	0.1252752	0.52865405	1.51	1.33	1.70	Mc	—	—
152739 1998 WC ₃₂	16.6	X	355.61951	318.39467	34.20814	6.65275	0.2499797	0.29942062	2.21	1.66	2.77	Mc	11 9.1	17.9
152741 1998 WT ₄₂	16.6	X	115.81239	45.29670	301.74985	2.38823	0.3046136	0.27063758	2.37	1.65	3.09	Mc	—	—
152748 1998 YF ₂₇	17.2	X	228.13468	32.66695	119.60312	46.29341	0.1966069	0.38072424	1.89	1.51	2.26	Mc	12 3.8	20.4
152771 1999 RB ₃₄	15.3	X	69.33910	104.54752	183.80330	27.77370	0.3875880	0.23192089	2.62	1.61	3.64	Mc	12 2.0	20.3
152858 1999 XN ₃₅	15.5	X	234.03230	307.45999	54.90598	23.29166	0.3249557	0.29619428	2.23	1.50	2.95	Mc	4 16.7	19.8
152864 1999 XT ₁₄₃	16.7	X	268.11646	257.16318	100.48404	2.74146	0.3612359	0.30032252	2.21	1.41	3.01	Mc	4 24.8	20.4
152948 2000 FP ₃₂	16.9	X	79.74676	82.44434	50.68562	2.59747	0.2790470	0.28431450	2.29	1.65	2.93	Mc	5 9.7	19.1
153011 2000 JN ₇₈	17.0	X	54.55913	119.42396	111.43785	17.92934	0.2225133	0.42857151	1.74	1.35	2.13	Mc	9 3.0	18.7
153305 2001 HV ₆₂	16.8	X	91.64246	244.79859	75.78727	2.03860	0.2505312	0.31446289	2.14	1.61	2.68	Mc	—	—
153309 2001 KB ₆₈	15.2	X	284.47182	125.90148	104.09150	24.32201	0.2811936	0.27990824	2.31	1.66	2.97	Mc	—	—
153344 2001 OR ₁₀₆	16.0	X	316.50899	349.81778	302.71772	8.08748	0.2759058	0.28768111	2.27	1.65	2.90	Mc	3 25.2	19.0
153452 2001 QQ ₂₈₆	16.0	X	263.06779	248.72213	183.57624	26.45553	0.3562332	0.24227237	2.55	1.64	3.46	Mc	7 22.9	20.6
153474 2001 RK ₄₃	16.2	X	85.43930	233.78946	49.66920	9.39955	0.3743455	0.30500790	2.19	1.37	3.00	Mc	12 11.6	20.3
153542 2001 SS ₁₀₇	15.4	X	189.22086	253.84127	227.47292	20.47946	0.5053656	0.17836801	3.13	1.55	4.71	Mc	7 23.7	22.1
153692 2001 US ₁₇	17.6	X	254.93182	261.00404	251.35701	17.88073	0.2068839	0.44936365	1.69	1.34	2.04	Mc	—	—
154331 2002 VF ₉₅	17.4	X	30.32757	158.97981	186.31399	4.68359	0.2670036	0.31500993	2.14	1.57	2.71	Mc	—	—
154661 2004 FL ₃₂	15.3	X	269.87363	338.83783	97.03989	28.68896	0.3662772	0.31102677	1.16	1.37	2.95	Mc	8 10.9	18.6
154783 2004 PA ₄₄	13.6	X	115.60631	72.93771	212.52607	3.27994	0.7596976	0.01835801	14.23	3.42	25.04	Jc	12 23.7	27.2
155002 2005 NN ₁₀₂	16.2	X	92.61298	191.99133	150.92993	2.70126	0.3469611	0.26364032	2.41	1.57	3.24	Mc	—	—
155287 2005 XK ₁	16.9	X	86.51573	178.32710	166.84977	2.34399	0.2687225	0.32061269	2.11	1.55	2.68	Mc	—	—
155370 1988 TX	16.3	X	44.95167	137.02370	207.03316	4.78865	0.3150955	0.30343071	2.19	1.50	2.88	Mc	—	—
155390 1994 PP ₂₉	16.8	X	346.07897	118.71069	197.03202	4.03901	0.2922815	0.29115442	2.25	1.60	2.91	Mc	7 19.2	17.3
155455 1998 ML ₂₄	16.7	X	77.59992	221.22304	98.03373	6.93480	0.2873675	0.31079374	2.16	1.54	2.78	Mc	—	—
155684 2000 JT ₅₄	16.9	X	276.47172	105.48023	199.78765	4.37436	0.3363533	0.27418247	2.35	1.56	3.14	Mc	2 27.2	20.8
155725 2000 RO ₈	16.9	X	105.10078	234.47218	180.14372	17.93542	0.3440653	0.34921190	2.00	1.31	2.68	Mc	2 18.3	18.6
155785 2000 SS ₃₅₁	16.3	X	184.99133	232.93057	103.65707	11.60928	0.3459659	0.25963401	2.43	1.59	3.28	Mc	2 9.9	20.9
155928 2001 PO ₄₃	16.6	X	333.21354	283.93250	49.17420	4.84766	0.3065924	0.29415335	2.24	1.55	2.93	Mc	7 6.2	17.4
155958 2001 QL ₁₀₆	15.8	X	88.30606	300.66880	23.76347	22.59990	0.3317396	0.30635151	2.18	1.46	2.90	Mc	—	—
156015 2001 RX ₈₁	16.2	X	227.01705	329.65288	38.88575	7.68763	0.3071417	0.27877263	2.32	1.61	3.03	Mc	4 12.9	20.4
156032 2001 RP ₁₄₂	16.3	X	172.16212	313.53046	83.90824	5.93036	0.3038017	0.27483940	2.34	1.63	3.05	Mc	4 12.1	20.5
156716 2002 RK ₂₇	17.3	X	17.08982	131.93663	128.19120	3.72023	0.1526248	0.35807368	1.96	1.66	2.26	Mc	7 5.9	17.8
156720 2002 TY ₆₆	16.3	X	53.93633	270.23114	202.41679	21.06590	0.3550888	0.27879667	2.32	1.50	3.14	Mc	2 2.5	17.8
157111 2004 LU ₂₃	16.4	X	259.32796	132.34756	220.79830	3.65081	0.3142197	0.27648080	2.33	1.60	3.07	Mc	4 15.8	20.5
157120 2004 NH ₄	16.6	X	318.44685	245.74714	88.46381	4.92458	0.2860803	0.28553347	2.28	1.63	2.94	Mc	6 3.6	18.7
157185 2004 PX ₈₉	16.8	X	1.78541	300.10647	5.00323	3.60886	0.3377230	0.28876104	2.27	1.50	3.03	Mc	9 13.5	17.0
157287 2004 RS ₂₉₂	16.5	X	34.80925	213.02827	89.13132	11.79285	0.2884955	0.29478209	2.24	1.59	2.88	Mc	11 14.4	19.2
157780 7620 P-L	16.4	X	276.22038	269.79002	31.98586	5.51580	0.3100827	0.27050414	2.37	1.63	3.10	Mc	2 28.8	20.3
157995 2000 LF ₂₆	16.1	X	325.96502	139.64312	173.20100	11.11519	0.2963097	0.28013301	2.31	1.63	3.00	Mc	5 15.9	18.4
158091 2000 WH ₅₆	14.7	X	234.15432	69.37792	303.04883	20.61028	0.3503667	0.26205637	2.42	1.57	3.27	Mc	4 9.7	19.7
158105 2000 YH ₁₂	15.3	X	343.15610	229.83789	96.06548	24.32255	0.2988116	0.27927564	2.32	1.63	3.01	Mc	8 2.3	16.5
158153 2001 KE ₄₉	17.4	X	191.76513	85.87134	224.86975	1.62075	0.2253719	0.32574686	2.09	1.6				

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
159477 2000 <i>SE</i> ₁₆₆	16.5	X	231.80335	135.88984	210.94709	6.54510	0.3608242	0.26742333	2.39	1.53	3.25	Mc	3 17.6	21.0
159482 2000 <i>SF</i> ₁₆₆	15.7	X	343.83331	84.52869	237.54464	6.61887	0.2854283	0.27902725	2.32	1.66	2.98	Mc	7 22.6	16.7
159490 2000 <i>TM</i> ₂₉	16.2	X	306.96521	7.38035	319.91986	7.74775	0.2954482	0.27287432	2.35	1.66	3.05	Mc	4 29.7	19.2
159493 2000 <i>UA</i>	14.3	X	290.80098	96.91799	322.40467	21.84427	0.3377620	0.27720452	2.33	1.54	3.12	Mc	8 15.7	16.4
159542 2001 <i>QN</i> ₂₉₄	17.0	X	216.86348	348.68179	264.07636	3.26260	0.2342139	0.32062129	2.11	1.62	2.61	Mc	—	—
159571 2001 <i>VM</i> ₄	16.8	X	111.84958	88.97271	245.46158	2.51685	0.2320192	0.30901126	2.17	1.66	2.67	Mc	—	—
159612 2002 <i>AV</i> ₁₇	16.1	X	334.72094	235.23054	118.40050	9.15889	0.3138623	0.28772286	2.27	1.56	2.99	Mc	8 31.6	16.5
159781 2003 <i>MZ</i> ₇	15.5	X	218.32904	136.31054	235.93919	10.81394	0.3549268	0.25914006	2.44	1.57	3.30	Mc	4 7.9	20.2
159793 2003 <i>QJ</i> ₆₄	15.8	X	110.96093	230.00873	117.02992	5.69341	0.3624584	0.23585537	2.59	1.65	3.53	Mc	—	—
159859 2004 <i>LE</i> ₂₃	15.7	X	309.98086	241.40266	108.05208	24.98618	0.3011049	0.28693057	2.28	1.59	2.96	Mc	6 13.3	18.3
159882 2004 <i>RQ</i> ₂₈₉	16.6	X	79.58410	197.01724	131.06463	9.43758	0.2654695	0.30125399	2.20	1.62	2.79	Mc	—	—
159889 2004 <i>TR</i> ₁₄	16.0	X	94.63284	92.62144	54.91133	40.01959	0.2308780	0.43642044	1.72	1.32	2.12	Mc	5 27.6	17.4
159898 2004 <i>TO</i> ₂₁₆	16.8	X	125.54279	11.65824	291.09602	2.43178	0.2711755	0.30581568	2.18	1.59	2.77	Mc	—	—
159927 2005 <i>CL</i> ₅₇	15.2	X	74.38052	125.57629	235.35761	3.69046	0.3652610	0.23746668	2.58	1.64	3.53	Mc	—	—
160085 2000 <i>LJ</i> ₆	15.6	X	32.75996	120.81284	211.58949	22.72418	0.2956201	0.29006290	2.26	1.59	2.93	Mc	12 17.1	19.0
160092 2000 <i>PL</i> ₆	14.8	X	232.47315	67.30894	323.01289	21.69252	0.3574191	0.26899456	2.38	1.53	3.23	Mc	4 30.9	19.7
160137 2001 <i>BU</i> ₄₁	15.1	X	255.17644	85.15119	308.29491	20.48321	0.3292913	0.26605926	2.39	1.61	3.18	Mc	5 31.9	19.5
160361 2003 <i>YD</i> ₆₆	15.9	X	111.56507	233.98160	148.03133	6.79684	0.3622640	0.23724503	2.58	1.65	3.52	Mc	2 8.6	19.4
160510 1990 <i>RG</i> ₁	15.9	X	358.51243	27.96882	359.47660	6.58567	0.2676669	0.28969647	2.26	1.66	2.87	Mc	—	—
160519 1995 <i>CS</i> ₃	16.5	X	29.33516	93.41293	246.36286	1.94221	0.3359130	0.28742744	2.27	1.51	3.04	Mc	12 29.8	19.5
160541 1997 <i>WM</i> ₅₈	15.8	X	325.19053	303.52504	114.02813	7.89326	0.2692278	0.28848715	2.27	1.66	2.88	Mc	12 9.4	16.7
160707 2000 <i>QP</i> ₁₀	16.5	X	340.42648	36.00114	316.93522	3.56432	0.2941425	0.28298152	2.30	1.62	2.97	Mc	9 18.1	17.0
160761 2000 <i>SE</i> ₁₀₅	16.6	X	336.05516	286.01366	39.24850	5.16742	0.2957917	0.27795176	2.33	1.64	3.01	Mc	7 1.9	17.8
160895 2001 <i>SN</i> ₁₀₇	16.6	X	115.72735	2.37099	337.45165	6.65274	0.2420293	0.31037072	2.16	1.64	2.68	Mc	—	—
161001 2002 <i>CG</i> ₃₁₀	16.2	X	355.47822	78.31408	297.55095	3.56741	0.2706039	0.28928616	2.26	1.65	2.88	Mc	12 18.8	17.9
161081 2002 <i>NR</i> ₂	16.1	X	62.94176	105.97102	258.29155	9.11539	0.3124965	0.27739881	2.33	1.60	3.06	Mc	—	—
161291 2003 <i>HV</i> ₂₉	16.1	X	278.18313	92.40444	218.93949	4.46363	0.3138359	0.26641076	2.39	1.64	3.14	Mc	3 10.1	20.0
161513 2004 <i>RK</i> ₁₉₅	16.7	X	160.53988	335.52117	313.70007	4.37457	0.2302584	0.31053410	2.16	1.66	2.66	Mc	—	—
161551 2004 <i>OX</i> ₇₂	16.4	X	4.65253	316.86749	35.41533	4.97621	0.2769109	0.28608781	2.28	1.65	2.91	Mc	11 29.9	18.3
161634 2005 <i>YN</i> ₂₇₇	16.6	X	269.89660	69.04993	281.01125	2.17814	0.2701038	0.28861522	2.27	1.66	2.88	Mc	4 23.6	20.1
161775 2006 <i>TG</i> ₁₀₈	15.9	X	112.60385	282.88521	104.92774	22.75820	0.2811786	0.28642573	2.28	1.64	2.92	Mc	1 28.6	18.6
161972 2007 <i>JJ</i> ₄₀	17.0	X	342.76529	149.42174	174.81214	9.83953	0.2781005	0.28523657	2.29	1.65	2.92	Mc	7 24.6	18.2
162438 2000 <i>GF</i> ₃	16.6	X	144.99039	294.71739	21.16349	6.56378	0.2847383	0.30827498	2.17	1.55	2.79	Mc	—	—
162473 2000 <i>LA</i> ₁₆	17.3	X	67.36180	182.40105	150.93640	5.69581	0.2968821	0.29670299	2.23	1.57	2.89	Mc	—	—
162551 2000 <i>QS</i> ₂₂₆	15.9	X	327.62267	253.84380	170.61248	23.08664	0.3194830	0.28720787	2.28	1.55	3.00	Mc	—	—
162780 2000 <i>XJ</i> ₃₈	15.5	X	266.75457	86.45252	326.46223	21.59225	0.3236321	0.27110275	2.36	1.60	3.13	Mc	7 14.2	19.3
162785 2000 <i>YA</i> ₁₇	15.6	X	295.63211	267.53276	112.12270	22.51590	0.2966881	0.27686505	2.33	1.64	3.02	Mc	7 2.9	18.4
162789 2000 <i>YF</i> ₃₃	16.0	X	285.27480	247.05008	127.69656	7.00873	0.3301475	0.27027117	2.37	1.65	3.09	Mc	6 10.8	19.2
162793 2000 <i>YY</i> ₄₃	16.5	X	276.86536	282.87786	123.62105	2.58996	0.2939631	0.27284698	2.35	1.66	3.05	Mc	7 15.3	19.3
162819 2001 <i>BD</i> ₃₄	15.3	X	248.32312	96.94458	324.24595	22.14175	0.3117597	0.26781429	2.38	1.64	3.13	Mc	7 8.5	19.5
162926 2001 <i>QJ</i> ₃₆	16.9	X	315.02719	289.08451	113.00813	42.66619	0.6179752	0.19524527	2.94	1.12	4.76	Ja	7 6.8	20.4
162991 2001 <i>SY</i> ₆₉	16.6	X	168.86673	253.51118	79.69968	6.68943	0.2232323	0.31704153	2.13	1.65	2.61	Mc	1 6.9	19.5
163070 2002 <i>AO</i> ₇	18.3	X	307.07516	240.61139	278.04786	14.53565	0.6350189	0.19844781	2.91	1.06	4.76	Ja	11 26.8	20.0
163242 2002 <i>FE</i>	15.2	X	253.80069	98.79040	358.84512	21.80012	0.3345300	0.28219590	2.30	1.53	3.07	Mc	8 30.7	18.7
163251 2002 <i>GX</i> ₄	15.8	X	280.80713	281.98699	169.02324	22.33235	0.3708141	0.28526704	2.29	1.44	3.13	Mc	9 10.7	18.3
163327 2002 <i>JR</i> ₁₃₁	16.3	X	124.07784	106.64676	211.18543	4.55794	0.3724701	0.23231674	2.62	1.64	3.60	Mc	—	—
163799 2003 <i>QR</i> ₆₉	15.5	X	141.52037	32.26733	329.96701	6.68680	0.3518818	0.23995637	2.56	1.66	3.47	Mc	2 10.8	19.8
164220 2004 <i>QW</i> ₁₆	16.3	X	7.63861	194.75163	191.12202	27.69293	0.2798202	0.35835501	1.96	1.41	2.51	Mc	—	—
164269 2004 <i>WS</i> ₈	16.6	X	163.92696	344.33368	341.28552	5.64312	0.2766778	0.31156590	2.15	1.56	2.75	Mc	—	—
164273 2004 <i>OX</i> ₁₆	15.2	X	281.03418	118.94172	307.85325	24.03617	0.2890136	0.27819662	2.32	1.65	3.00	Mc	8 14.7	18.0
164295 2004 <i>XA</i> ₁₃₁	13.5	X	335.20087	81.38873	145.51205	32.72632	0.2866830	0.12045300	4.06	2.90	5.22	Jc	2 28.7	18.3
164457 2006 <i>DN</i> ₈₉	16.6	X	262.40291	145.49410	172.42352	13.40128	0.3158881	0.26101340	2.42	1.66	3.19	Mc	3 7.3	20.7
164466 2006 <i>DS</i> ₁₅₆	16.1	X	312.23036	318.56849	357.00858	7.55400	0.3005969	0.27081688	2.37	1.65	3.08	Mc	4 20.9	19.0
164670 1996 <i>XM</i> ₆	16.1	X	319.57373	290.29155	86.62177	6.12901	0.3364143	0.27298435	2.35	1.56	3.15	Mc	8 12.8	17.4
164714 1998 <i>FN</i> ₉₁	17.0	X	5.76166	134.69052	31.54416	9.76065	0.1520292	0.38080803	1.89	1.60	2.17	Mc	—	—
164725 1998 <i>QF</i> ₉₈	15.5	X	70.36574	196.84601	161.39734	11.81158	0.3874339	0.22423091	2.68	1.64	3.72	Mc	—	—
165117 2000 <i>JB</i> ₆₁	16.8	X	116.40296	44.17463	238.61383	5.87956	0.2722261	0.29838157	2.22	1.61	2.82	Mc	12 27.7	20.7
165139 2000 <i>NJ</i> ₁₀	16.6	X	65.54200	167.04826	166.22429	2.73555	0.3074927	0.29214917	2.25	1.56	2.94	Mc	—	—
165144 2000 <i>QO</i> ₇	16.3	X	56.60222	123.46286	173.01078	23.29946	0.2775771	0.28710424	2.28	1.64	2.91	Mc	11 28.6	20.1
165213 2000 <i>SJ</i> ₁₂	16.6	X	115.45591	289.23508	30.07906	3.14379	0.2551099	0.29826440	2.22	1.65	2.78	Mc	—	—
165222 2000 <i>SA</i> ₄₅	16.0	X	114.73371	1.12026	254.58701	11.64783	0.3125848	0.28842986	2.27	1.56	2.98	Mc	11 24.4	20.0
165383 2000 <i>WA</i> ₁₇₃	15.5	X	84.75956	261.70780	99.05537	22.52261	0.2652789	0.28943501	2.26	1.66	2.86	Mc	—	—
165394 2000 <i>XC</i> ₁₅	15.1	X	238.58593	97.52376	68.65296	22.19906	0.2959533	0.27648802	2.33	1.64	3.02	Mc	11 14.2	18.4
165464 2001 <i>AY</i> ₁₉	16.3	X	254.99006	291.85628	100.73491	6.25170	0.3209090	0.26859822	2.38	1.62	3.14	Mc	6 2.1	20.3
165494 2001 <i>BD</i> ₄₂	16.1	X	194.66853	304.20379	166.03702	22.77242	0.3047362	0.26569915	2.40	1.67	3.13	Mc	7 22.9	20.8
165765 2001 <i>QW</i> ₂₃₆	17.6	X	189.97109	131.88361	171.37467	7.58834	0.2545465	0.32043838	2.11	1.58	2.65	Mc	—	—
166044 2002 <i>CE</i> ₁₄	16.2	X	78.92276	56.78095	330.20444	25.13627	0.2664441	0.30217779	2.20	1.61	2.79	Mc	—	

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
168828 2000 SY ₃₂₀	15.9 ^m	X	302.68192	136.13012	267.86528	23.07715	0.3117980	0.27400765	2.35	1.62	3.08	Mc	8 6.2	18.6
168870 2000 WN ₆	15.5	X	316.04365	33.83633	82.48335	27.00423	0.3372570	0.28102156	2.31	1.53	3.09	Mc	—	—
168881 2000 WN ₄₈	16.8	X	256.82326	319.52432	118.03271	4.26656	0.2988710	0.27232122	2.36	1.65	3.06	Mc	8 3.8	20.4
168889 2000 WM ₉₅	16.3	X	62.83126	88.90598	275.27446	3.69038	0.2771697	0.28982110	2.26	1.63	2.89	Mc	—	—
168956 2001 AC ₄₇	15.9	X	200.66621	95.78210	45.65251	22.26403	0.3108212	0.26866036	2.38	1.64	3.12	Mc	9 18.2	20.5
168981 2001 CT ₃	15.6	X	16.61578	261.70728	111.28269	7.64880	0.3061417	0.27807833	2.32	1.61	3.04	Mc	—	—
169516 2002 EQ	16.5	X	29.41714	83.69494	172.91918	3.44799	0.3295166	0.26644198	2.39	1.60	3.18	Mc	8 28.1	18.3
169660 2002 JG ₆₆	16.5	X	303.59732	162.14562	77.39300	6.20572	0.2590031	0.30053701	2.21	1.64	2.78	Mc	1 5.2	19.9
170013 2002 UO ₃	17.7	X	217.89283	329.38576	184.63240	24.60560	0.7977615	0.19245295	2.97	0.60	5.34	Jc	9 4.4	24.5
170172 2003 HV ₇	16.6	X	185.17387	287.29281	29.85476	1.27639	0.2515238	0.30938955	2.17	1.62	2.71	Mc	1 5.3	20.0
170176 2003 MU ₁	16.7	X	61.58601	213.50954	70.23766	3.41264	0.3025273	0.28245278	2.30	1.60	3.00	Mc	11 16.7	20.0
170178 2003 MR ₂	16.7	X	10.32580	350.03403	311.00841	2.87034	0.2905733	0.27548412	2.34	1.66	3.02	Mc	9 18.1	18.0
170405 2003 UK ₄	16.0	X	222.95226	247.57522	340.50139	20.44153	0.3422078	0.26719547	2.39	1.57	3.20	Mc	8 24.8	20.6
170648 2003 YA ₁₁₄	17.0	X	117.79838	52.33623	243.83454	6.06844	0.3656658	0.23963590	2.57	1.63	3.51	Mc	3 4.4	20.9
170880 2004 PH ₈₅	16.8	X	66.62959	193.47058	148.98575	4.73966	0.2623998	0.30188845	2.20	1.62	2.78	Mc	—	—
170908 2004 XK ₆₁	16.5	X	110.61591	30.52605	313.93163	5.64572	0.3105709	0.30361453	2.19	1.51	2.87	Mc	—	—
171465 Evamaria	14.7	X	303.15283	212.92258	159.97877	10.94468	0.2200894	0.12768698	3.91	3.05	4.77	Ja	7 15.2	19.8
171522 1999 CY ₅	16.6	X	112.04925	98.98762	121.34208	20.40658	0.1492803	0.41862714	1.77	1.51	2.03	Mc	10 25.5	19.4
171665 2000 KK ₂₃	17.1	X	160.49874	230.37989	75.47356	4.60212	0.2651984	0.30565271	2.18	1.60	2.76	Mc	—	—
171671 2000 PF ₃₂	17.1	X	72.10665	231.28832	90.28865	7.00862	0.3106009	0.29158714	2.25	1.55	2.95	Mc	—	—
171673 2000 QB ₃₃	16.8	X	199.63549	216.26057	73.06056	6.50973	0.2392888	0.30560316	2.18	1.66	2.71	Mc	—	—
171730 2000 WX ₅₀	17.2	X	282.09045	137.05626	282.66055	12.88334	0.1939165	0.41700725	1.77	1.43	2.12	Mc	9 4.4	18.4
171784 2001 BV ₆₇	16.6	X	249.76640	186.84003	331.29023	7.35925	0.3417851	0.27622825	2.34	1.54	3.13	Mc	11 2.2	19.8
172425 Taliajacob	15.4	X	301.16912	79.11612	356.45513	21.35488	0.3566343	0.27107972	2.36	1.52	3.21	Mc	9 25.5	16.8
172451 2003 QV ₇₉	16.7	X	225.87412	212.69456	36.99818	9.12843	0.2739004	0.30270372	2.20	1.60	2.80	Mc	—	—
173154 1996 ME	16.6	X	173.05782	208.74689	121.69695	7.68212	0.3051860	0.29955668	2.21	1.54	2.89	Mc	1 16.8	20.0
173245 1999 LY ₇	16.7	X	147.89992	168.93581	105.24673	6.15164	0.2734401	0.28834523	2.27	1.65	2.89	Mc	—	—
173274 1999 SS ₇	16.0	X	169.92675	253.45971	41.45547	7.05317	0.3149952	0.28924826	2.26	1.55	2.98	Mc	—	—
173309 1999 VK ₂₂	16.1	X	264.65385	133.23121	242.98503	7.67890	0.3206176	0.26008223	2.43	1.65	3.21	Mc	5 19.9	19.9
173444 2000 LG ₃	15.4	X	126.81357	25.56218	297.47030	25.29687	0.2725292	0.29970221	2.21	1.61	2.81	Mc	—	—
173457 2000 QG ₄₅	17.3	X	218.04758	186.35175	151.33356	1.84601	0.2347329	0.31252143	2.15	1.65	2.66	Mc	2 24.7	20.9
173458 2000 QV ₈₂	16.5	X	102.42096	205.44084	174.74317	6.99085	0.2485203	0.29960523	2.21	1.66	2.76	Mc	—	—
173474 2000 RH ₁₀₄	15.9	X	145.47280	110.62717	255.34796	7.11952	0.2498808	0.30342792	2.19	1.65	2.74	Mc	1 28.1	18.9
173475 2000 SA ₁	15.6	X	5.10028	67.75877	329.32586	23.22723	0.2964822	0.28556165	2.28	1.61	2.96	Mc	—	—
173530 2000 WF ₁₃	16.9	X	36.75859	278.38044	61.91032	7.25140	0.2816145	0.28430731	2.29	1.65	2.94	Mc	12 30.9	20.0
173549 2000 XF ₄₇	15.2	X	329.68881	78.24133	4.83368	22.76961	0.2869583	0.28253651	2.30	1.64	2.96	Mc	—	—
174287 2002 SX ₃₇	15.7	X	252.86829	221.90844	78.99289	9.78775	0.3618456	0.24001883	2.56	1.64	3.49	Mc	2 12.2	20.6
174599 2003 QM ₇₀	15.4	X	334.37670	63.53377	9.78818	22.67435	0.3234219	0.27512051	2.34	1.58	3.10	Mc	—	—
174756 2003 VN	16.3	X	109.85098	234.69467	97.91851	8.29722	0.2805947	0.28787078	2.27	1.63	2.91	Mc	—	—
174784 2003 WN ₉₈	15.7	X	220.43088	237.07550	773.78940	20.66492	0.3303908	0.26932382	2.37	1.59	3.16	Mc	9 18.9	20.3
175168 2005 EQ ₁₁₈	16.5	X	291.57439	272.29507	277.77851	4.27174	0.2814802	0.29240155	2.25	1.62	2.88	Mc	—	—
175519 2006 SR ₅₄	17.1	X	293.66940	223.12990	56.26797	5.11021	0.3236248	0.30953175	2.16	1.66	2.67	Mc	2 18.9	20.2
175622 2006 XX ₄	14.8	X	134.36517	272.80447	116.44234	29.13821	0.3694353	0.23183449	2.62	1.65	3.59	Mc	3 19.2	19.8
175717 1997 CX ₅	18.1	X	68.69117	162.41841	312.78734	19.28071	0.1207547	0.45047201	1.69	1.48	1.89	Mc	—	—
175764 1998 US ₃	16.4	X	212.36712	199.85323	175.05972	6.46341	0.3489824	0.24374070	2.54	1.65	3.42	Mc	4 12.0	21.2
175786 1999 PT ₃	16.4	X	320.94960	340.25206	310.73760	9.06747	0.3647700	0.30931116	2.17	1.38	2.96	Mc	3 12.3	19.2
175816 1999 RZ ₂₃₀	16.9	X	34.42337	285.90529	66.94681	6.62292	0.3039911	0.27537935	2.34	1.63	3.05	Mc	—	—
175943 2000 GE ₁	15.9	X	138.04130	129.27222	156.77641	24.16519	0.3360010	0.34799093	2.00	1.33	2.67	Mc	—	—
176069 2000 WG ₆₈	16.8	X	275.19188	62.71090	248.09061	5.12119	0.3267317	0.31200309	2.15	1.64	2.66	Mc	3 7.9	20.0
176102 2001 BB ₆₁	15.9	X	334.52329	260.16247	153.19460	22.24708	0.2868953	0.27953384	2.32	1.65	2.98	Mc	12 29.8	17.9
176123 2001 DG ₈₇	16.6	X	274.29789	121.48657	135.65181	4.16833	0.3054633	0.28692005	2.28	1.58	2.97	Mc	1 1.1	20.6
176425 2001 VJ ₆₇	17.7	X	288.93636	60.45752	38.13724	8.19789	0.1993469	0.34576683	2.01	1.61	2.41	Mc	11 30.0	18.6
176611 2002 FC ₂₉	16.7	X	359.58981	178.77890	114.89883	6.47701	0.2565252	0.31779268	2.13	1.58	2.67	Mc	7 30.8	16.9
176612 2002 FO ₃₀	17.2	X	324.45727	153.99130	118.79882	8.57709	0.3271651	0.30748694	2.17	1.46	2.89	Mc	3 4.7	19.8
176616 2002 GS ₆₅	15.7	X	62.10244	288.54509	45.17014	6.32103	0.3052426	0.27963255	2.32	1.61	3.02	Mc	—	—
176871 2002 UP ₃	15.2	X	162.88358	276.23519	71.16673	11.36586	0.3712805	0.23406574	2.61	1.64	3.58	Mc	2 13.9	20.1
177266 2003 WK ₈₈	16.6	X	289.35131	17.88907	285.69196	5.18541	0.2361293	0.31102845	2.16	1.65	2.67	Mc	3 12.5	19.7
177279 2003 WD ₁₄₂	16.5	X	106.47505	343.08101	73.27990	6.49355	0.3589087	0.23881279	2.57	1.65	3.50	Mc	3 21.2	20.3
177287 2003 WF ₁₆₆	16.6	X	179.64678	19.41385	332.40566	4.95322	0.2849449	0.29993641	2.21	1.58	2.84	Mc	2 15.7	20.1
177953 2006 MQ ₆	16.6	X	9.78100	164.93869	177.62862	5.40120	0.3254868	0.26881700	2.38	1.60	3.15	Mc	12 1.4	18.8
178287 1981 UW ₂₇	16.3	X	60.01443	4.31926	17.37096	5.44577	0.3024017	0.27698490	2.33	1.63	3.04	Mc	—	—
178293 1990 SN	17.1	X	171.11791	10.84607	0.51194	6.21494	0.3160626	0.30368001	2.19	1.50	2.88	Mc	3 7.2	20.7
178516 1999 TT ₂₀₀	17.0	X	293.36758	22.05139	309.59871	4.50205	0.2351807	0.30784650	2.17	1.66	2.68	Mc	4 25.9	19.9
178758 2000 VL ₄₅	17.1	X	141.94448	30.26939	130.42216	5.05518	0.2693425	0.29903072	2.21	1.62	2.81	Mc	—	—
178783 2001 BY ₂	15.8	X	62.12760	284.43767	131.21077	23.83192	0.2781098	0.28908798	2.27	1.64	2.90	Mc	—	—
178805 2001 FS ₄₁	16.8	X	278.33638	102.14313	150.55899	2.28913	0.2876736	0.28593527	2.28	1.63	2.94	Mc	—	—
178833 2001 HN ₁₂	15.7	X	39.77114	264.13904	49.38034	7.93034	0.3404298	0.25715086	2.45	1.62	3.28	Mc	12 2.2	19.0
178856 2001 KY ₁₉	16.0	X	178.28990	158.97739	116.55033	7.18579	0.3074892	0.27120560	2.36	1.64	3.09	Mc	—	—
179586 2002 KD ₁₅	17.2	X	305.18623	323.74848	335.17684	5.76686	0.2464955	0.30398196	2.19	1.65	2.73	Mc	3 24.7	20.1
179587 2002 LS ₂	16.9	X	330.46113	52.17961	23									

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
181771 1997 <i>GG</i> ₃	16.2 ^m	X	319.06409	303.24251	18.77503	3.48820	0.3629520	0.33040890	2.07	1.32	2.82	Mc	4 25.4	18.4
181797 1998 <i>MR</i> ₂	15.8	X	117.04190	240.74258	106.44220	27.94509	0.4616263	0.23297680	2.62	1.41	3.82	Mc	1 15.7	19.8
181826 1998 <i>SP</i> ₄₉	16.8	X	195.89495	123.80555	188.51670	4.98102	0.3372014	0.27934550	2.32	1.54	3.10	Mc	1 14.7	21.2
181882 1999 <i>RF</i> ₁₄	14.5	X	35.15683	91.37705	344.99575	20.82805	0.2819603	0.28317278	2.30	1.65	2.94	Mc	—	—
181898 1999 <i>RS</i> ₁₆₈	16.8	X	139.37556	184.38658	170.07715	6.42175	0.2664956	0.28892809	2.27	1.66	2.87	Mc	1 12.6	19.9
181958 1999 <i>UL</i> ₇	15.2	X	293.48735	92.83777	324.44050	20.40921	0.3414343	0.26340669	2.41	1.59	3.23	Mc	8 16.1	17.4
182002 1999 <i>XV</i> ₇	16.4	X	137.66699	359.54708	15.18871	6.40514	0.2735427	0.28695102	2.28	1.65	2.90	Mc	2 10.5	19.6
182127 2000 <i>RJ</i> ₇₀	16.1	X	313.89767	144.23367	130.82972	5.11694	0.4208708	0.22528400	2.67	1.55	3.80	Mc	2 20.7	20.1
182231 2001 <i>CZ</i> ₂₀	17.3	X	247.19423	319.82333	195.15636	4.50218	0.3284372	0.27510963	2.34	1.57	3.11	Mc	10 31.8	20.5
182260 2001 <i>GA</i> ₃	16.4	X	249.12402	121.88580	141.90997	22.71170	0.2819619	0.28284209	2.30	1.65	2.95	Mc	—	—
182263 2001 <i>HQ</i> ₈	16.4	X	247.06314	123.37691	158.12687	22.74816	0.3004199	0.28133530	2.31	1.61	3.00	Mc	1 11.7	20.9
182274 2001 <i>KY</i> ₁	14.5	X	289.34070	43.91852	294.68334	8.50132	0.4989758	0.19359230	2.96	1.48	4.44	Mc	4 5.9	19.8
182328 2001 <i>PS</i> ₁₃	16.9	X	81.57239	196.10742	130.41232	3.48788	0.3795094	0.26027489	2.43	1.51	3.35	Mc	—	—
182974 2002 <i>NT</i> ₂₃	16.1	X	88.98582	228.87566	133.58543	8.80721	0.2914246	0.27719351	2.33	1.65	3.01	Mc	—	—
182977 2002 <i>NU</i> ₃₈	17.3	X	348.23000	101.83003	210.37977	5.65768	0.3352763	0.30887412	2.17	1.44	2.89	Mc	7 16.3	17.2
183020 2002 <i>PF</i> ₉₇	16.5	X	214.72377	188.54233	129.74070	8.96016	0.2774486	0.29125370	2.25	1.63	2.88	Mc	2 1.4	20.5
183023 2002 <i>PG</i> ₁₁₃	17.3	X	334.93392	291.17480	2.85454	6.86525	0.2898912	0.30723533	2.18	1.54	2.81	Mc	4 25.6	19.1
183069 2002 <i>RR</i> ₁₃	17.2	X	217.42292	243.44891	81.01075	0.35937	0.2865619	0.29131519	2.25	1.61	2.90	Mc	2 10.7	21.2
183182 Weinheim	16.4	X	320.54254	100.65482	312.77888	6.90118	0.3189807	0.25996300	2.43	1.66	3.21	Mc	10 21.6	17.6
183220 2002 <i>TJ</i> ₃₉	16.3	X	212.00833	105.05043	223.61283	6.66925	0.2794332	0.28797875	2.27	1.64	2.91	Mc	2 9.5	20.4
183230 2002 <i>TC</i> ₅₈	14.6	X	67.43869	204.87504	129.44486	18.72243	0.4256388	0.22044263	2.71	1.56	3.87	Mc	—	—
183581 2003 <i>SY</i> ₈₄	15.2	X	153.39547	99.53030	195.92841	26.68544	0.4124445	0.23752409	2.58	1.52	3.65	Mc	—	—
183592 2003 <i>SJ</i> ₃₁₃	17.5	X	222.74121	171.76432	167.00821	3.73162	0.2457688	0.30830371	2.17	1.64	2.70	Mc	3 1.9	21.1
184061 2004 <i>FM</i> ₁₄₈	16.6	X	237.34327	69.70892	48.33498	19.97305	0.3341229	0.25937624	2.44	1.62	3.25	Mc	9 14.2	21.0
184341 2005 <i>GX</i> ₁₇₆	17.5	X	291.28145	284.10281	11.15072	7.33912	0.2556082	0.30265793	2.20	1.64	2.76	Mc	3 7.2	20.6
184346 2005 <i>HF</i> ₆	15.9	X	192.05372	205.07658	166.12396	8.01656	0.3870120	0.23122344	2.63	1.61	3.65	Mc	3 27.7	21.0
184423 2005 <i>NY</i> ₆	16.6	X	123.16440	320.93076	8.83348	4.63604	0.3215212	0.27039930	2.37	1.61	3.13	Mc	—	—
184449 2005 <i>NL</i> ₅₅	17.0	X	204.96063	285.42939	27.35586	5.09561	0.2863491	0.28426262	2.29	1.63	2.95	Mc	1 21.3	21.1
184830 2005 <i>UQ</i> ₆	16.3	X	165.06169	273.75030	55.19035	5.40030	0.3351539	0.27230146	2.36	1.57	3.15	Mc	1 15.6	20.4
185290 2006 <i>UB</i> ₂₁₉	13.8	X	139.23488	42.54775	84.27855	7.13046	0.1329477	0.11085993	4.29	3.72	4.86	Ja	6 25.6	20.1
185493 2007 <i>PO</i> ₄₂	16.6	X	60.35382	155.99001	215.99657	2.59220	0.2671605	0.29771488	2.22	1.63	2.81	Mc	—	—
185643 2040 <i>P-L</i>	16.8	X	262.91005	343.29093	0.82014	4.81275	0.2440702	0.30324492	2.19	1.66	2.73	Mc	4 10.6	20.1
185726 1998 <i>PS</i> ₁₄₀	16.9	X	207.11568	110.84826	206.12248	7.45111	0.3345575	0.28094558	2.31	1.54	3.08	Mc	1 25.7	21.4
185731 1998 <i>VO</i> ₅	16.1	X	100.27360	292.72815	49.69083	8.61532	0.3247895	0.26855569	2.38	1.61	3.15	Mc	—	—
185734 1998 <i>WQ</i> ₃₂	16.3	X	129.63664	276.89345	57.69939	12.17526	0.2984008	0.27115836	2.36	1.66	3.07	Mc	—	—
185746 1999 <i>LO</i> ₁	17.2	X	240.09181	305.94014	68.49691	3.97069	0.3310285	0.30981332	2.16	1.45	2.88	Mc	4 26.6	20.9
185854 2000 <i>EU</i> ₁₀₆	15.4	X	231.24809	100.40876	198.36360	21.32652	0.3735405	0.27358079	2.35	1.47	3.23	Mc	1 18.1	20.4
185978 2001 <i>MO</i> ₉	16.1	X	197.89092	110.65089	186.63186	5.37034	0.3033496	0.27224598	2.36	1.64	3.07	Mc	—	—
186024 2001 <i>QG</i> ₂₀₇	14.5	X	65.02556	233.70238	133.62573	3.23832	0.2514579	0.11134057	4.28	3.20	5.36	Jc	—	—
186393 2002 <i>NR</i> ₃₉	17.2	X	184.19378	348.33120	345.44691	0.59325	0.3221559	0.28671244	2.28	1.54	3.01	Mc	1 31.6	21.2
186418 2002 <i>RA</i>	16.5	X	183.44351	44.54429	318.50200	4.53084	0.2881303	0.29095511	2.26	1.61	2.91	Mc	3 3.9	20.4
186448 2002 <i>SK</i> ₄₀	14.4	X	121.88764	229.04234	137.20556	4.21813	0.2357057	0.12240340	4.02	3.07	4.96	Jc	2 2.2	20.5
186471 2002 <i>TN</i> ₄₉	16.4	X	297.21460	104.14652	209.90818	6.07970	0.2617980	0.29883538	2.22	1.64	2.80	Mc	4 4.5	19.4
186475 2002 <i>TO</i> ₆₅	16.9	X	344.41661	357.46264	293.69213	8.09074	0.2954357	0.30466012	2.19	1.54	2.83	Mc	5 14.7	18.3
186737 2004 <i>CP</i> ₂₆	16.2	X	274.07594	242.38920	141.03978	8.01305	0.2833760	0.31109208	2.16	1.55	2.77	Mc	6 11.7	19.2
187041 2005 <i>IS</i> ₁₂₇	17.2	X	38.86503	113.50307	186.40961	4.30773	0.2457052	0.31873112	2.12	1.60	2.64	Mc	11 11.3	19.6
187043 2005 <i>KE</i> ₁₂	16.9	X	312.11588	214.68964	94.31060	6.95059	0.2761974	0.30072744	2.21	1.60	2.82	Mc	4 18.7	19.4
187044 2005 <i>LF</i> ₁₅	17.8	X	250.71031	127.64479	189.93743	7.10461	0.3432351	0.29102597	2.26	1.48	3.03	Mc	2 21.8	22.0
187065 2005 <i>MU</i> ₄₀	16.9	X	198.43673	138.07635	223.55125	7.30827	0.3089508	0.28692669	2.28	1.57	2.98	Mc	3 13.2	21.1
187737 2153 <i>P-L</i>	17.7	X	302.90003	39.90698	296.07216	1.27795	0.2608754	0.30485039	2.19	1.62	2.76	Mc	5 13.2	20.2
187746 1976 <i>DC</i>	16.3	X	308.33231	223.92111	317.40574	22.46656	0.3442007	0.27986110	2.31	1.52	3.11	Mc	—	—
187776 1998 <i>SH</i> ₅₅	16.7	X	228.71204	331.28583	353.71096	5.04693	0.2978308	0.28488713	2.29	1.61	2.97	Mc	2 20.4	20.8
187799 1999 <i>FK</i> ₁₆	14.2	X	208.59989	4.42297	195.49256	17.38613	0.2833836	0.11140725	4.28	3.07	5.49	Jc	11 9.4	21.2
187828 1999 <i>VX</i> ₂₁	17.1	X	280.19534	161.59434	208.92813	3.56396	0.2478224	0.30544575	2.18	1.64	2.72	Mc	6 5.1	19.7
187852 2000 <i>AA</i> ₁₇₀	17.2	X	180.74200	253.82063	138.27941	7.87141	0.2877111	0.29436324	2.24	1.59	2.88	Mc	4 10.3	21.2
188228 2002 <i>TH</i> ₂₆₇	16.5	X	353.79015	86.33483	234.02633	6.83545	0.2885709	0.30866646	2.17	1.54	2.79	Mc	9 4.0	17.1
188236 2002 <i>VY</i>	16.4	X	255.17686	250.81025	73.37751	8.89813	0.2610315	0.29389345	2.24	1.66	2.83	Mc	3 15.1	20.2
188272 2003 <i>AO</i> ₄₂	15.9	X	115.23233	237.28695	280.82265	5.29376	0.3868321	0.23179247	2.62	1.61	3.64	Mc	7 30.9	20.7
188349 2003 <i>TS</i> ₉	16.3	X	223.59917	155.47827	240.30167	68.98324	0.2706167	0.36789209	1.93	1.41	2.45	Mc	5 15.6	19.7
188717 2005 <i>TU</i> ₁₇₁	17.1	X	229.85035	1.32194	318.66725	7.41709	0.3108462	0.28399286	2.29	1.58	3.00	Mc	2 13.8	21.4
189012 1998 <i>FO</i> ₉₈	17.1	X	343.68225	298.55036	284.54248	5.09883	0.3126705	0.29692655	2.23	1.53	2.92	Mc	1 21.4	19.5
189013 1998 <i>QD</i> ₃	17.0	X	337.61634	307.80187	335.10751	8.78629	0.2744739	0.29588167	2.23	1.62	2.84	Mc	4 15.1	19.1
189015 1998 <i>QH</i> ₈₃	17.2	X	274.07608	117.05869	235.29093	5.86051	0.2650826	0.29286526	2.25	1.65	2.84	Mc	5 1.4	20.5
189054 2000 <i>SW</i> ₂₇₈	15.2	X	56.11898	269.47298	44.78954	17.08282	0.3669713	0.23873170	2.57	1.63	3.52	Mc	12 17.5	19.5
189080 2001 <i>MO</i> ₆	16.6	X	189.36163	114.57732	249.32374	5.55087	0.2944024	0.27582343	2.34	1.65	3.03	Mc	3 8.9	20.8
189083 2001 <i>OV</i> ₄₆	16.3	X	201.32420	229.90399	153.47504	6.39842	0.2836460	0.28122697	2.31	1.65	2.96	Mc	4 14.1	20.5
189118 2001 <i>VD</i> ₄₇	15.2	X	351.90213	94.92705	270.02938	9.79644	0.3513571	0.24357198	2.54	1.65				

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
190451 2000 AX ₁₄₆	16.4	X	316.80347	317.83858	125.42177	24.43352	0.2294802	0.31239788	2.15	1.66	2.64	Mc	—	—
190543 2000 RM ₈₀	17.3	X	46.94000	37.60133	313.44684	6.18326	0.3613927	0.24307103	2.54	1.62	3.46	Mc	—	—
190677 2001 BQ ₆₁	15.0	X	311.91759	282.82787	178.82306	28.05709	0.3699786	0.23175500	2.62	1.65	3.60	Mc	12 7.7	17.3
190716 2001 KH ₃₂	16.7	X	344.63680	218.81760	122.32831	3.42943	0.2706363	0.30145446	2.20	1.61	2.80	Mc	9 18.7	17.1
190736 2001 PM ₄₃	16.0	X	201.21427	117.90021	312.21946	23.89984	0.2822401	0.28628027	2.28	1.64	2.92	Mc	6 10.2	20.5
190866 2001 TX ₄₅	16.4	X	266.67418	101.79282	202.13288	5.69426	0.2976785	0.27839118	2.32	1.63	3.01	Mc	2 19.9	20.4
191035 2002 CR ₉	16.0	X	126.74881	248.29845	206.39451	21.49361	0.3059104	0.26759849	2.38	1.66	3.11	Mc	5 16.9	20.0
191589 2004 FQ ₅	15.8	X	349.02706	181.54695	151.46766	21.73847	0.2731426	0.30558320	2.18	1.59	2.78	Mc	9 22.4	16.5
191600 2004 FW ₁₄₆	16.4	X	266.61481	108.11958	184.74022	8.49555	0.3128482	0.27777123	2.33	1.60	3.05	Mc	2 5.7	20.5
191759 2004 TA ₁₂	15.9	X	93.31855	124.81775	182.37584	18.22490	0.3858652	0.24324871	2.54	1.56	3.52	Mc	—	—
191935 2005 UY ₂	16.7	X	22.22334	123.59223	171.62939	7.86730	0.3237578	0.30526947	2.18	1.48	2.89	Mc	10 22.7	18.5
191964 2005 VF ₇	16.4	X	230.59588	94.63535	317.27577	22.34216	0.3012749	0.28999495	2.26	1.58	2.94	Mc	6 7.2	20.7
192486 1998 HP ₇	15.6	X	142.55527	75.88822	67.64693	21.43344	0.3328325	0.26661644	2.39	1.60	3.19	Mc	8 3.8	20.3
192497 1998 HJ ₈₉	17.4	X	167.66161	26.72204	205.18389	6.06260	0.2450762	0.31862233	2.12	1.60	2.64	Mc	12 8.3	20.8
192507 1998 MQ ₃₇	16.4	X	290.04772	43.66511	297.63805	5.92088	0.2904533	0.29481603	2.24	1.59	2.89	Mc	4 28.2	19.5
192547 1998 TW ₆	17.8	X	13.06927	259.36018	20.39500	5.29677	0.3387180	0.29702620	2.22	1.47	2.98	Mc	9 5.5	18.5
192686 Aljura	15.4	X	6.92706	76.73795	255.13871	11.28003	0.3809286	0.22587588	2.67	1.65	3.69	Mc	11 5.0	17.6
192952 2000 BZ ₁₈	16.5	X	138.52690	211.62247	356.69327	5.45943	0.3014173	0.29951907	2.21	1.55	2.88	Mc	10 14.4	20.4
193235 2000 SE ₂	16.0	X	145.25224	29.84786	28.89554	9.53092	0.3586724	0.26171896	2.42	1.55	3.29	Mc	4 19.9	20.2
193331 2000 TN ₂₉	16.1	X	62.29101	121.32836	233.01110	25.15405	0.3645938	0.24332302	2.54	1.61	3.47	Mc	—	—
193749 2001 KG	16.4	X	335.85564	260.31437	55.48426	7.82485	0.3086926	0.29728140	2.22	1.54	2.91	Mc	6 6.6	17.3
193764 2001 LG ₁₃	17.1	X	353.92853	193.91535	121.30679	6.30399	0.3208293	0.29826870	2.22	1.55	2.89	Mc	8 31.5	17.3
193822 2001 QD ₂₀	17.0	X	300.46211	194.57939	141.36846	3.98829	0.2749379	0.28930584	2.26	1.64	2.89	Mc	5 10.6	19.7
193828 2001 QC ₃₅	17.3	X	266.39479	32.95291	315.45821	4.29289	0.2889024	0.28716919	2.28	1.62	2.93	Mc	4 15.4	21.1
193846 2001 QZ ₁₀₃	16.2	X	310.15295	141.20752	249.09427	7.41259	0.3419230	0.29629596	2.23	1.47	2.99	Mc	8 4.9	17.7
193948 2001 RQ ₄₇	16.1	X	335.60178	246.13654	10.62279	22.68515	0.2912506	0.28580279	2.28	1.62	2.95	Mc	3 13.1	18.6
194175 2001 TB ₅₁	17.2	X	294.60844	130.68887	196.99915	4.45466	0.2773121	0.28677304	2.28	1.65	2.91	Mc	4 20.3	20.1
194212 2001 TH ₁₁₄	17.1	X	249.65992	38.13853	334.23049	3.77270	0.2929474	0.28290738	2.30	1.62	2.97	Mc	5 2.4	21.0
194263 2001 UL	16.3	X	227.19015	249.05054	190.10418	21.13394	0.3000873	0.28331950	2.30	1.61	2.98	Mc	7 7.2	20.7
194264 2001 UY	16.3	X	155.00703	245.65754	213.69626	23.85811	0.3213600	0.27876692	2.32	1.64	3.00	Mc	6 10.7	20.7
194459 2001 WE ₂	16.6	X	78.30023	158.25729	313.76008	4.11022	0.3730599	0.26373487	2.41	1.51	3.31	Mc	4 23.2	19.3
194513 2001 XR ₂	15.1	X	272.12941	69.29530	304.96502	20.88866	0.3142146	0.28356105	2.29	1.57	3.02	Mc	5 20.7	19.1
194515 2001 XV ₆	15.5	X	66.24283	116.88630	70.88035	22.75439	0.3311988	0.26965934	2.37	1.59	3.16	Mc	7 20.2	18.8
195009 2002 CK ₁₃	15.8	X	70.20937	309.93575	174.22503	23.47193	0.3335835	0.26114234	2.42	1.62	3.23	Mc	4 26.9	18.6
195208 2002 DZ ₃	15.1	X	218.76357	345.22237	87.93457	25.81652	0.3022434	0.27478119	2.34	1.63	3.05	Mc	6 24.8	19.7
195807 2002 QF ₁₇	18.6	X	118.82678	308.84327	57.63176	4.82520	0.3375676	0.33213559	2.07	1.37	2.76	Mc	1 4.7	20.3
196174 2002 WQ ₁₁	16.2	X	33.95853	283.31719	64.97495	25.28797	0.2978859	0.31301539	2.15	1.51	2.79	Mc	—	—
196256 2003 EH ₁	16.2	X	117.12501	171.33816	282.98833	70.83192	0.6185411	0.17854924	3.12	1.19	5.06	Jc	6 24.9	22.9
197564 2004 GG ₂	16.4	X	224.60557	78.34024	247.59695	20.98818	0.3184319	0.28087525	2.31	1.57	3.04	Mc	2 8.8	21.2
197594 2004 HD ₄₉	17.5	X	304.16748	274.48249	45.97899	3.52129	0.2653226	0.29095603	2.26	1.66	2.85	Mc	4 23.6	20.2
197595 2004 HH ₆₀	17.4	X	341.73583	42.82499	240.66085	3.84392	0.2673149	0.28956076	2.26	1.66	2.87	Mc	5 3.2	18.9
197615 2004 JQ ₂₆	17.3	X	353.94944	230.86706	51.42579	7.52780	0.2655714	0.29087142	2.26	1.66	2.86	Mc	6 8.2	18.1
197710 2004 PU ₂	15.8	X	202.59941	278.81238	39.68996	22.03081	0.3463420	0.26417011	2.41	1.57	3.24	Mc	2 6.1	20.8
197964 2004 RF ₁₀₃	16.6	X	4.61554	348.40672	286.56898	6.97081	0.2961036	0.28619451	2.28	1.61	2.96	Mc	7 7.4	16.7
197970 2004 RZ ₁₀₉	16.3	X	304.57527	77.79259	350.59903	27.24757	0.3889397	0.22723171	2.66	1.63	3.69	Mc	9 11.2	18.7
197994 2004 RG ₁₆₅	16.3	X	138.04398	243.71397	200.50463	21.96413	0.3256336	0.26726879	2.39	1.61	3.16	Mc	5 14.9	20.6
198558 2004 XE ₁₄₈	15.5	X	30.20761	252.97683	101.05914	6.78560	0.3917525	0.23233580	2.62	1.59	3.65	Mc	—	—
198888 2005 TY ₇₇	16.9	X	290.73433	335.41152	16.58221	6.03601	0.2830710	0.29673273	2.23	1.60	2.86	Mc	5 15.9	20.0
200073 2190 T ₋₂	16.7	X	258.68988	169.16961	193.19180	7.00237	0.2787135	0.28305120	2.30	1.66	2.94	Mc	4 30.9	20.3
200175 1999 JH ₁₄	16.0	X	168.17591	87.92296	63.95720	21.52384	0.2933926	0.28065709	2.31	1.63	2.99	Mc	9 7.9	20.6
200182 1999 OT ₃	18.5	X	130.62822	94.82837	253.59797	7.33994	0.3307814	0.33286104	2.06	1.38	2.74	Mc	—	—
200589 2001 RQ ₁₂	18.0	X	358.91806	98.14814	208.39429	5.46603	0.2545536	0.29563350	2.23	1.66	2.80	Mc	8 19.1	18.9
200597 2001 RA ₇₇	16.3	X	287.56079	308.77691	89.24670	4.69876	0.2731843	0.28949103	2.26	1.64	2.88	Mc	7 22.4	18.8
200607 2001 RW ₁₄₅	16.9	X	29.33011	257.23600	41.35029	7.11481	0.3463397	0.29852571	2.22	1.46	2.98	Mc	11 7.7	19.2
200648 2001 TU ₁	17.4	X	325.58758	315.90438	16.36103	3.65687	0.2869466	0.29250772	2.25	1.60	2.89	Mc	6 15.1	18.8
200689 2001 UY ₁	17.0	X	49.53952	29.40648	265.51844	6.35904	0.2884436	0.29899702	2.21	1.58	2.85	Mc	11 18.5	20.0
200701 2001 UN ₇₉	17.1	X	216.92106	78.89334	36.63301	23.07144	0.3309167	0.28620100	2.28	1.53	3.04	Mc	8 28.6	21.6
200740 2001 VG ₉₅	16.3	X	238.68758	193.13001	171.08214	11.26341	0.3185936	0.27959467	2.32	1.58	3.05	Mc	4 16.4	20.5
200765 2001 XW ₃	16.0	X	283.03064	274.69708	65.30638	22.23233	0.2818976	0.28038581	2.31	1.66	2.96	Mc	5 1.0	19.6
201456 2003 FX ₇₉	16.3	X	140.74975	169.99267	124.19164	2.70160	0.3998773	0.24508398	2.53	1.52	3.54	Mc	—	—
202079 2004 SR ₃₉	16.7	X	224.14566	130.85997	237.81720	0.49949	0.2998737	0.27049462	2.37	1.66	3.08	Mc	4 10.4	20.9
202914 1997 PA	16.3	X	338.57974	23.54089	317.21201	8.78156	0.2848465	0.28835442	2.27	1.62	2.92	Mc	8 15.9	16.6
203117 2000 SN ₂₁₈	16.5	X	280.43589	200.25778	136.63672	7.28554	0.3194933	0.27148870	2.36	1.61	3.12	Mc	4 16.6	20.2
203269 2001 QP ₂₈₀	17.1	X	349.11685	266.33595	99.77113	5.99688	0.2541649	0.29800174	2.22	1.66	2.78	Mc	11 19.3	18.3
203272 2001 RL ₆	17.1	X	315.43624	39.25263	350.16841	5.35168	0.2668979	0.29450681	2.24	1.64	2.83	Mc	9 9.1	18.1
203387 2001 XK ₁₀₃	16.4	X	311.11727	315.04509	19.78538	8.13174	0.2900965	0.28482821	2.29	1.62	2.95	Mc	5 18.7	18.8
203467 2001 YR ₁₅₁	16.3	X	331.75648	4.10652	339.18031	5.91357	0.2799294	0.28756199	2.27	1.64	2.91	Mc	7 29.4	17.2
203727 2002 QM ₄₇	15.9	X	216.73466	176.38764	107.78973	8.39766	0.3619997	0.23641574	2.59	1.65	3.53	Mc	1 1.2	20.9
204309 2004 RQ ₃	16.1	X	102.75120	295.39060										

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
206342 2003 PQ ₆	17.3	X	176.33056	103.81462	314.28687	15.32743	0.0679634	0.42469692	1.75	1.63	1.87	Mc	4 2.9	19.4
206913 2004 PH ₂₀	16.2	X	239.79931	271.53889	134.20324	20.63162	0.3337446	0.27654686	2.33	1.55	3.11	Mc	6 8.9	20.6
206918 2004 PT ₈₉	17.2	X	47.98243	198.08610	137.65445	2.78633	0.2514935	0.29902120	2.21	1.66	2.77	Mc	—	—
206921 2004 PU ₁₀₀	16.7	X	45.51811	155.02488	184.77551	3.10034	0.2629981	0.29837480	2.22	1.63	2.80	Mc	—	—
206924 2004 PP ₁₀₂	17.0	X	51.11061	43.19049	303.42512	5.11945	0.2518418	0.30103943	2.20	1.65	2.76	Mc	—	—
206999 2004 TJ ₂₂₀	16.7	X	276.68334	331.55554	51.81445	9.24974	0.2976056	0.28243337	2.30	1.62	2.99	Mc	6 11.4	20.0
207020 2004 VX ₁₄	16.9	X	232.71764	342.91850	316.87340	5.27109	0.2449244	0.32138529	2.11	1.59	2.63	Mc	1 19.9	20.3
207027 2004 VD ₅₉	17.2	X	105.03381	54.27787	264.35274	5.43784	0.2984473	0.30368440	2.19	1.54	2.85	Mc	—	—
207408 2006 BY ₁₇₂	17.3	X	183.80062	6.05389	284.26915	3.88485	0.2348997	0.31477724	2.14	1.64	2.64	Mc	—	—
207648 2007 LP ₁₈	16.5	X	198.25986	157.12406	159.09503	2.06777	0.3602380	0.25143709	2.49	1.59	3.38	Mc	1 24.7	21.3
207943 1979 MN ₄	16.6	X	299.08816	98.12242	253.87973	5.30956	0.3656884	0.27958866	2.32	1.47	3.16	Mc	5 15.8	19.8
207974 1996 RM ₁	16.7	X	30.90583	133.48902	156.93849	10.50081	0.3617822	0.27925448	2.32	1.48	3.16	Mc	11 2.2	19.5
208027 1999 JQ ₇₇	16.8	X	127.46754	180.41219	102.23028	5.92415	0.3175104	0.28594037	2.28	1.56	3.01	Mc	—	—
208226 2000 SO ₂₂₆	17.0	X	259.87755	232.03237	120.97412	6.45015	0.3107686	0.26908614	2.38	1.64	3.11	Mc	4 20.2	21.0
208563 2002 CL ₄	16.9	X	74.52553	245.99942	127.64255	5.97878	0.2453744	0.30114402	2.20	1.66	2.75	Mc	—	—
208661 2002 GE ₄	17.2	X	178.24320	108.21606	54.58240	22.65198	0.3005460	0.27858103	2.32	1.62	3.02	Mc	9 29.5	21.8
208823 2002 RJ ₂₇	17.8	X	258.58061	287.41599	155.86230	5.18136	0.2561525	0.36234120	1.95	1.45	2.45	Mc	8 24.1	19.4
208879 2002 TF ₅₈	16.4	X	260.94709	209.03785	6.32105	30.88664	0.2808029	0.38506594	1.87	1.35	2.40	Mc	—	—
209035 2003 NJ ₁	16.3	X	257.69211	279.98217	67.96057	9.17500	0.3366647	0.26322255	2.41	1.60	3.22	Mc	4 11.7	20.6
209519 2004 RQ ₃₂₆	16.3	X	192.75358	88.91599	23.21037	22.19473	0.2930435	0.27247161	2.36	1.67	3.05	Mc	8 4.1	21.0
209949 2006 FH ₁₂	17.1	X	53.35278	151.35175	204.23179	3.31988	0.2707640	0.29682441	2.23	1.62	2.83	Mc	—	—
210389 2007 VA ₁₄₉	17.6	X	167.17339	106.94351	208.02453	1.84330	0.2341691	0.30719067	2.18	1.67	2.68	Mc	—	—
210482 1996 RW ₁	16.8	X	54.85321	322.67474	354.56821	6.11232	0.3036872	0.28292887	2.30	1.60	3.00	Mc	12 22.1	20.3
210635 2000 GQ ₇	16.1	X	185.67294	118.09382	200.07795	4.71414	0.3856418	0.31130572	2.16	1.32	2.99	Mc	1 13.8	20.1
210669 2000 QK ₁₁₇	16.2	X	192.68445	287.06598	144.44987	21.49175	0.3344318	0.26752747	2.39	1.59	3.18	Mc	6 8.7	21.1
210705 2000 SY ₁₅₅	16.4	X	355.43882	355.65267	49.69926	6.18563	0.2772164	0.28547037	2.28	1.65	2.92	Mc	—	—
210718 2000 ST ₂₅₂	15.2	X	313.96337	15.33558	74.37975	7.47712	0.3922814	0.14379728	3.61	2.19	5.02	Jc	10 18.5	18.8
210744 2000 UE ₇₅	16.4	X	86.76176	235.39240	94.07573	5.51171	0.2813810	0.29134822	2.25	1.62	2.89	Mc	—	—
210764 2000 WZ ₁₃₄	16.7	X	133.18311	339.31667	343.25236	6.15398	0.2701095	0.29638650	2.23	1.63	2.83	Mc	—	—
210806 2001 HN ₄₀	16.1	X	312.66576	166.52705	112.21669	8.53375	0.3732630	0.24150954	2.55	1.60	3.51	Mc	3 1.9	19.8
211042 2002 CL ₂₅	15.9	X	299.14993	59.82344	2.94205	23.96993	0.3219638	0.28593860	2.28	1.55	3.02	Mc	9 17.1	17.5
211078 2002 EG ₃	16.8	X	146.50044	96.14284	174.38155	23.26685	0.2756310	0.28543270	2.28	1.65	2.91	Mc	—	—
211206 2002 OM ₂₄	17.0	X	258.38453	203.96230	229.84400	10.42591	0.2826307	0.36294420	1.95	1.40	2.50	Mc	7 31.8	19.7
211397 2002 VD ₁₄	17.3	X	246.48752	290.27126	50.03626	7.42276	0.2649946	0.29382853	2.24	1.65	2.83	Mc	3 26.3	21.2
211583 2003 SA ₁₈₃	16.9	X	223.49830	297.43212	349.50264	3.75828	0.2615518	0.30350188	2.19	1.62	2.77	Mc	—	—
212188 2005 GX ₉₄	16.3	X	6.69496	129.68913	196.65562	14.05315	0.3557544	0.25732473	2.45	1.58	3.32	Mc	11 3.7	18.1
212748 2007 TB ₂	17.5	X	72.48583	329.43420	7.38612	3.07375	0.2653388	0.29621455	2.23	1.64	2.82	Mc	—	—
213050 1998 TS ₃	17.7	X	110.20872	339.52557	198.27951	34.49366	0.1224892	0.42313007	1.76	1.54	1.97	Mc	7 26.8	20.7
213084 1999 TN ₁₆₉	17.2	X	88.67750	89.06974	214.25833	5.54574	0.2880896	0.27742021	2.33	1.66	3.00	Mc	12 29.9	21.3
213152 2000 NO ₁₄	17.6	X	239.38018	189.41328	127.87171	2.00508	0.2464787	0.31395369	2.14	1.62	2.67	Mc	2 16.1	20.9
213158 2000 QE ₅₅	17.3	X	283.76192	295.50681	357.46071	5.90470	0.2746341	0.31769952	2.13	1.54	2.71	Mc	2 20.9	20.5
213177 2000 SW ₁₂₅	16.5	X	209.36093	48.19183	35.21020	24.16983	0.3205073	0.26909612	2.38	1.61	3.14	Mc	6 29.8	21.3
213332 2001 SV ₁₄₈	17.0	X	317.11474	72.27290	231.08569	4.58303	0.2833922	0.28834366	2.27	1.63	2.91	Mc	4 13.0	19.6
213548 2002 JV ₁₁₅	17.4	X	86.90593	136.49848	177.19517	5.59709	0.3907731	0.27569146	2.34	1.42	3.25	Mc	—	—
213640 2002 RA ₆₂	16.4	X	16.38314	30.88363	19.69300	10.27181	0.3233143	0.26200442	2.42	1.64	3.20	Mc	11 19.6	18.9
213812 2003 NE	16.9	X	167.79111	231.24751	117.49782	7.80787	0.3262790	0.30214771	2.20	1.48	2.92	Mc	2 5.9	20.4
213849 2003 SF ₅₅	16.5	X	219.81922	237.50485	186.33358	21.55769	0.3369247	0.26091131	2.43	1.61	3.24	Mc	6 13.5	21.4
213895 2003 TF ₆	16.8	X	203.33406	198.10142	98.17399	6.98088	0.2613353	0.30170002	2.20	1.63	2.78	Mc	—	—
213948 2003 WL ₁₂₆	16.4	X	358.49784	92.19503	351.25839	3.75955	0.3887857	0.22433393	2.68	1.64	3.73	Mc	—	—
214088 2004 JN ₁₃	15.3	X	133.18082	279.14089	85.11066	13.33926	0.6900053	0.20039028	2.89	0.90	4.89	Ja	3 11.2	21.5
214529 2006 KU ₄₁	16.8	X	190.42056	304.14337	50.11133	3.03115	0.2452451	0.31372788	2.15	1.62	2.67	Mc	2 24.9	20.3
214607 2006 RF ₂₂	16.2	X	66.53136	264.93819	38.70987	5.40914	0.3074402	0.27116108	2.36	1.64	3.09	Mc	12 13.8	19.9
215120 1999 JG ₄	16.7	X	209.21086	34.12304	252.62406	7.82682	0.2842036	0.29694192	2.23	1.59	2.86	Mc	—	—
215121 1999 JB ₁₁	18.4	X	302.18165	30.91563	216.47472	37.09607	0.2545997	0.39415591	1.84	1.37	2.31	Mc	—	—
215122 1999 LG ₄	16.1	X	247.46245	79.86585	248.22956	24.36697	0.2593472	0.30377405	2.19	1.62	2.76	Mc	2 24.3	20.5
215144 1999 UV ₅₁	16.3	X	84.29670	281.92445	62.90464	22.81173	0.2861874	0.27895343	2.32	1.66	2.98	Mc	—	—
215189 2000 NK ₁₀	17.4	X	243.03276	217.14932	113.59865	4.06868	0.2685176	0.31537261	2.14	1.56	2.71	Mc	3 8.1	20.9
215197 2000 SN ₄₂	18.4	X	141.32037	284.48621	173.69504	4.37274	0.1185646	0.40913745	1.80	1.58	2.01	Mc	5 8.9	20.0
215250 2001 KS ₆₂	15.5	X	35.26392	188.89919	124.16382	11.12189	0.3365142	0.25510482	2.46	1.63	3.29	Mc	11 29.1	18.9
215263 2001 OW ₂₃	15.7	X	165.86048	88.14809	293.88511	21.34594	0.3213226	0.27412944	2.35	1.59	3.10	Mc	3 6.3	20.3
215278 2001 QW ₈₂	16.5	X	345.71805	138.54907	186.63303	19.66063	0.3542657	0.24421959	2.53	1.64	3.43	Mc	7 24.4	18.3
215476 2002 RP ₁₃₄	17.1	X	45.24621	255.39593	61.60450	6.90190	0.3468080	0.26601527	2.39	1.56	3.22	Mc	12 14.7	20.5
215489 2002 TG ₅₇	17.0	X	74.49952	261.15773	19.36742	3.84377	0.3212534	0.26503158	2.40	1.63	3.17	Mc	11 22.6	20.8
215528 2002 VQ ₉₁	16.6	X	339.69458	267.56917	77.13982	13.09362	0.3374140	0.25530158	2.46	1.63	3.29	Mc	8 30.1	17.9
215664 2003 UL ₂₁₄	16.8	X	291.19679	40.95090	237.50754	4.57126	0.2546887	0.31028350	2.16	1.61	2.71	Mc	2 8.6	20.1
216265 2006 WD ₆₀	17.4	X	120.79109	156.51431	175.23113	5.20932	0.3025741	0.28335697	2.30	1.60	2.99	Mc	—	—
216464 1974 PB	17.3	X	98.46149	190.80530	146.28267	6.58506	0.3430461	0.27933554	2.32	1.52	3.11	Mc	—	—
216519 2001 FP ₂₄	16.9	X	58.68902	358.11111	218.00072	8.24595	0.3278861	0.25357554	2.47	1.66	3.28	Mc	8 13.0	20.2
216556 2001 VF ₁₆	19.1	X	120.23818	327.76616	275.33891	9.33109	0.0652442	0.59678528	1.40	1.31	1.49	Mc	—	—

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
217105 2001 <i>XS</i> ₉₅	16.3 ^m	X	288.48197	74.58116	261.51719	4.56404	0.3728416	0.23417824	2.61	1.63	3.58	Mc	4 14.9	20.6
217145 2002 <i>ML</i> ₂	17.0	X	156.48707	44.05791	280.81519	5.51648	0.2744041	0.28427424	2.29	1.66	2.92	Mc	—	—
217160 2002 <i>PB</i> ₈₄	16.8	X	97.63954	49.60417	336.28531	5.51195	0.2963204	0.27947330	2.32	1.63	3.00	Mc	1 5.6	18.8
217251 2003 <i>UM</i> ₂₅	16.5	X	308.07018	69.15111	240.01473	7.02646	0.2694805	0.31566364	2.14	1.56	2.71	Mc	4 6.4	19.0
217257 Valemangano	17.8	X	267.41512	101.85699	213.44314	5.41040	0.3669855	0.31208468	2.15	1.36	2.94	Mc	2 26.7	21.6
217262 2003 <i>YN</i> ₃	17.0	X	201.65890	82.74058	291.92097	6.29616	0.3029884	0.30415355	2.19	1.53	2.85	Mc	3 27.9	21.0
217517 2006 <i>UZ</i> ₁₄₃	17.2	X	210.16132	30.35920	304.83846	1.64647	0.2720148	0.29890514	2.22	1.61	2.82	Mc	2 17.1	20.9
217647 1998 <i>OR</i> ₁₁	16.3	X	74.79646	67.22068	315.37380	22.33838	0.2950995	0.27116158	2.36	1.67	3.06	Mc	—	—
217683 1999 <i>RP</i> ₃₆	18.8	X	191.90865	321.71121	57.88078	5.48431	0.4161987	0.29647258	2.23	1.30	3.15	Mc	4 4.3	23.2
217686 1999 <i>RY</i> ₉₀	16.8	X	193.10288	352.83546	11.20108	6.51991	0.2754759	0.29600000	2.23	1.62	2.84	Mc	3 13.6	20.6
217716 1999 <i>VB</i> ₈₀	17.3	X	196.59015	106.78649	226.16777	4.78067	0.3271170	0.29314690	2.24	1.51	2.98	Mc	2 5.6	21.4
217726 1999 <i>WN</i>	16.7	X	167.37067	265.90681	90.37527	4.12811	0.2638551	0.29054897	2.26	1.66	2.85	Mc	2 12.1	20.3
217756 2000 <i>QW</i> ₈	17.6	X	12.20099	131.02068	174.45897	4.47205	0.2946099	0.32990003	2.07	1.46	2.69	Mc	10 17.4	18.6
218053 2002 <i>DT</i> ₁	17.4	X	328.48702	30.43671	266.89109	1.93552	0.2453463	0.31891165	2.12	1.60	2.64	Mc	4 27.1	18.9
218082 2002 <i>GU</i> ₁₁₈	17.0	X	224.98645	211.88968	71.08233	4.07247	0.3168692	0.29589665	2.23	1.52	2.94	Mc	—	—
218098 2002 <i>MG</i>	15.7	X	129.03760	130.43247	224.90575	23.78874	0.2769062	0.28266563	2.30	1.66	2.94	Mc	—	—
218116 2002 <i>PG</i> ₆₈	17.7	X	178.47878	107.67146	149.29405	4.41724	0.2932932	0.28127883	2.31	1.63	2.98	Mc	—	—
218144 2002 <i>RL</i> ₆₆	15.0	X	101.88749	74.94932	23.94596	22.72639	0.3418721	0.28172656	2.30	1.52	3.09	Mc	4 26.4	18.2
218251 2003 <i>AE</i> ₁	15.9	X	70.67736	285.77738	106.51868	22.82841	0.3530074	0.27370532	2.35	1.52	3.18	Mc	—	—
218271 2003 <i>ED</i> ₄	15.7	X	3.46497	255.89329	163.38240	2.57687	0.3794666	0.25900538	2.44	1.51	3.36	Mc	—	—
218323 2003 <i>YM</i> ₁₁₇	17.0	X	259.11712	277.12187	95.45441	5.85870	0.2703860	0.31076414	2.16	1.57	2.74	Mc	5 14.4	20.4
218340 2004 <i>BU</i> ₁₂₉	16.7	X	160.47218	40.71327	291.29048	7.78070	0.3103914	0.28756563	2.27	1.57	2.98	Mc	1 10.7	20.2
218597 2005 <i>MY</i> ₅₂	16.6	X	114.98548	144.91280	193.52749	5.90729	0.3059880	0.27004637	2.37	1.65	3.10	Mc	—	—
218609 2005 <i>OZ</i> ₃	15.9	X	358.36422	272.91669	115.79587	12.00264	0.3603142	0.25357588	2.47	1.58	3.36	Mc	—	—
218813 2006 <i>SO</i> ₁₄	17.5	X	265.43798	46.30768	248.70994	3.41303	0.2587768	0.30801722	2.17	1.61	2.73	Mc	2 7.7	21.0
218818 2006 <i>SA</i> ₂₆₃	17.3	X	290.36590	120.04929	176.97840	2.82680	0.2341559	0.30919690	2.17	1.66	2.67	Mc	3 7.9	20.1
219093 1998 <i>RK</i> ₇₄	16.1	X	127.77230	131.87997	200.31580	6.84959	0.3254490	0.27296475	2.35	1.59	3.12	Mc	—	—
219253 1999 <i>XU</i> ₂₃₈	17.1	X	213.65127	67.26714	290.30419	3.73261	0.2585714	0.29618066	2.23	1.65	2.81	Mc	3 17.4	20.9
219275 2000 <i>BL</i> ₁₁	17.2	X	141.39855	79.49784	289.50273	5.64539	0.2783669	0.28472761	2.29	1.65	2.93	Mc	2 4.2	20.6
219315 2000 <i>ET</i> ₁₁₈	15.3	X	63.59577	92.93724	355.27185	3.39619	0.2946707	0.28047320	2.31	1.63	2.99	Mc	2 4.7	17.1
219319 2000 <i>FH</i> ₁₀	18.2	X	189.56312	355.04061	7.12775	9.84196	0.1140045	0.46306404	1.65	1.47	1.84	Mc	2 4.2	19.6
219330 2000 <i>KO</i> ₁	15.8	X	300.68571	109.76925	192.85759	30.43686	0.3892607	0.22854387	2.65	1.62	3.68	Mc	3 14.5	20.2
219481 2001 <i>DF</i> ₁₅	15.7	X	143.51179	240.04943	341.40650	22.51860	0.3228709	0.26448861	2.40	1.63	3.18	Mc	10 21.2	20.6
219522 2001 <i>QH</i> ₈₃	16.3	X	108.55162	59.57495	285.70215	4.73377	0.3307216	0.26224709	2.42	1.62	3.22	Mc	—	—
219523 2001 <i>QS</i> ₈₄	15.0	X	184.96386	89.05438	21.60544	27.92418	0.3683970	0.23010072	2.64	1.67	3.61	Mc	7 26.4	20.6
219778 2002 <i>AQ</i> ₈	15.9	X	250.90229	118.11049	328.65732	27.35075	0.3805904	0.23332994	2.61	1.62	3.61	Mc	8 6.0	20.4
219844 2002 <i>CQ</i> ₁₄₈	13.3	X	348.44369	170.18554	233.59528	2.36996	0.0795713	0.08717145	5.04	4.64	5.44	Jc	11 5.2	19.6
219914 2002 <i>GX</i> ₇	17.2	X	276.54170	237.26060	49.08389	7.52084	0.2925298	0.30268382	2.20	1.55	2.84	Mc	2 8.8	20.9
220003 2002 <i>PG</i> ₄₅	16.5	X	187.46281	322.87680	37.10972	3.81092	0.2853823	0.28847216	2.27	1.62	2.92	Mc	3 5.9	20.5
220006 2002 <i>PS</i> ₈₇	16.0	X	264.96099	245.76760	326.97565	23.62392	0.2792214	0.28801574	2.27	1.64	2.90	Mc	—	—
220021 2002 <i>BC</i> ₁₆	16.3	X	165.82964	116.96668	225.13826	20.79867	0.3059459	0.28589516	2.28	1.58	2.98	Mc	1 20.6	20.5
220038 2002 <i>RW</i> ₄₀	17.5	X	134.46142	6.07918	13.33969	1.82980	0.2825516	0.28429087	2.29	1.64	2.94	Mc	2 12.8	20.7
220091 2002 <i>ST</i> ₃₃	16.9	X	146.70049	87.37617	217.90426	5.93748	0.2952217	0.27813931	2.32	1.64	3.01	Mc	—	—
220095 2002 <i>SU</i> ₄₁	17.7	X	248.68091	117.42266	357.74386	5.41766	0.0992203	0.41750916	1.77	1.60	1.95	Mc	11 6.6	18.7
220159 2002 <i>TV</i> ₂₄₇	17.3	X	163.89718	102.92796	203.02052	11.12185	0.2931799	0.27984489	2.31	1.64	2.99	Mc	—	—
220169 2002 <i>TY</i> ₂₈₃	17.4	X	132.09534	7.32705	359.95793	5.45674	0.2962317	0.28057326	2.31	1.63	3.00	Mc	1 29.2	20.5
220219 2002 <i>VM</i> ₉₉	15.9	X	338.93657	113.54073	10.35458	22.13752	0.3353148	0.26622128	2.39	1.59	3.20	Mc	—	—
220240 2002 <i>XF</i> ₂₃	16.7	X	123.31961	41.18290	306.86584	7.12848	0.2900482	0.27643498	2.33	1.66	3.01	Mc	—	—
220428 2003 <i>UJ</i> ₃	18.2	X	335.33393	150.81301	157.17647	2.30627	0.2249287	0.31922854	2.12	1.64	2.60	Mc	6 7.4	19.2
220452 2003 <i>YN</i> ₁₁₇	17.2	X	256.14393	7.63901	4.00796	6.80824	0.2940348	0.31176752	2.15	1.52	2.79	Mc	5 4.7	20.8
220906 2005 <i>BC</i> ₇	17.8	X	241.54056	71.87098	130.86421	3.44156	0.1658930	0.34990801	1.99	1.66	2.33	Mc	—	—
220911 2005 <i>EY</i> ₁₃₉	16.4	X	183.30832	197.00165	84.75323	8.93218	0.2646882	0.28397294	2.29	1.62	2.97	Mc	—	—
220921 2005 <i>GS</i> ₂₁	17.3	X	315.07965	113.50404	157.75226	5.15980	0.2384769	0.30474422	2.19	1.67	2.71	Mc	3 1.9	19.9
221580 2006 <i>VX</i> ₉₅	17.7	X	195.50972	323.79978	44.08391	7.62699	0.2552977	0.29958956	2.21	1.65	2.78	Mc	3 21.3	21.5
221674 2007 <i>DY</i> ₁	16.6	X	93.49223	30.00408	44.72474	8.23856	0.3246965	0.28438556	2.29	1.55	3.03	Mc	3 18.7	19.1
221963 1995 <i>SY</i> ₃₅	18.0	X	164.70624	155.35365	176.04725	6.28759	0.2752337	0.28356335	2.29	1.66	2.93	Mc	1 10.1	21.7
222079 1999 <i>NE</i> ₄₃	17.0	X	266.86414	182.07272	120.44254	10.36398	0.3553051	0.30383637	2.19	1.41	2.97	Mc	2 15.9	20.9
222205 2000 <i>DA</i> ₁₁₇	16.6	X	114.46620	57.13477	346.49343	7.63894	0.2934444	0.28025669	2.31	1.63	2.99	Mc	2 24.5	19.5
222389 2001 <i>DV</i> ₇₇	18.0	X	350.69051	268.32175	172.15946	22.71535	0.2051211	0.42826699	1.74	1.39	2.10	Mc	—	—
222497 2001 <i>SJ</i> ₂₈₂	16.0	X	230.96489	86.65217	345.66459	27.38354	0.3755995	0.23270108	2.62	1.63	3.60	Mc	7 5.8	21.3
222753 2002 <i>CY</i> ₂₅	14.9	X	298.90598	37.37054	50.04558	13.02228	0.3682260	0.24017501	2.56	1.62	3.51	Mc	10 9.7	17.2
222931 2002 <i>NQ</i> ₇	17.6	X	167.44223	143.92290	212.87121	4.83657	0.3847204	0.28750299	2.27	1.40	3.15	Mc	2 17.9	21.7
222956 2002 <i>PF</i> ₁₂₉	17.1	X	264.28357	235.20684	31.18793	8.48278	0.2819729	0.29320843	2.24	1.61	2.88	Mc	1 6.3	21.1
223042 2002 <i>TN</i> ₅₆	16.4	X	142.55070	186.78365	217.84496	8.21656	0.3024315	0.28584259	2.28	1.59	2.97	Mc	3 23.4	20.1
223050 2002 <i>TS</i> ₉₁	17.1	X	168.81138	44.84478	304.12816	3.01556	0.2945607	0.28501190	2.29	1.61	2.96	Mc	2 5.7	20.7
223074 2002 <i>TB</i> ₂₅₆	17.7	X	155.03838	118.66662	224.57619	2.89254	0.3367390	0.28297657	2.30	1.52	3.07	Mc	1 22.0	21.4
223145 2002 <i>WX</i> ₈	15.8	X	134.95138	281.54689	87.60355	22.41862	0.3438671	0.28032167	2.31	1.52	3.11	Mc	2 12.5	19.7
2231														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
226131 2002 <i>RA</i> ₄₄	16.9 ^m	X	232.82334	327.91424	5.23458	4.82403	0.2564312	0.29469697	2.24	1.66	2.81	Mc	3 4.9	20.8
226201 2002 <i>UH</i> ₃₈	16.8	X	117.69197	281.89141	174.15318	21.94752	0.3117871	0.28687462	2.28	1.57	2.99	Mc	5 12.9	20.6
226213 2002 <i>VR</i> ₅₁	17.3	X	157.74656	357.56801	85.99035	5.55232	0.2688097	0.29079195	2.26	1.65	2.86	Mc	5 24.5	21.1
226237 2002 <i>XQ</i> ₁₄	16.6	X	125.30531	49.05756	312.51133	9.43071	0.3189816	0.27681700	2.33	1.59	3.08	Mc	1 17.4	19.5
227124 2005 <i>OE</i> ₂	16.9	X	62.24451	268.82582	81.19863	5.40681	0.3150533	0.26207231	2.42	1.66	3.18	Mc	—	—
227126 2005 <i>OP</i> ₄	16.7	X	155.46572	305.58289	57.37030	5.95650	0.2879883	0.27842640	2.32	1.65	2.99	Mc	2 15.0	20.5
227764 2006 <i>SU</i> ₅₉	17.4	X	234.49189	5.89074	321.87186	10.15571	0.2265829	0.30578926	1.94	1.56	2.81	Mc	2 23.9	21.3
228231 1998 <i>QT</i> ₁₀₁	17.3	X	112.28515	241.04103	108.46153	2.48317	0.3030853	0.27266041	2.36	1.64	3.07	Mc	—	—
228267 1999 <i>TC</i> ₂₀₀	16.2	X	65.38667	265.73084	236.73274	19.68798	0.3105872	0.29016521	2.26	1.56	2.96	Mc	5 2.3	18.0
228283 2000 <i>AO</i> ₆₀	17.2	X	59.73148	254.44069	297.22232	5.08952	0.3621066	0.28704887	2.28	1.45	3.10	Mc	7 20.9	19.6
228404 2001 <i>EQ</i> ₁₇	16.7	X	121.74416	107.07897	49.95760	24.71144	0.2460700	0.30546493	2.18	1.65	2.72	Mc	8 3.6	20.7
228572 2001 <i>YY</i> ₄	17.6	X	77.34589	110.88823	8.82644	10.15571	0.2265829	0.36578766	1.94	1.50	2.38	Mc	3 19.5	18.0
228695 2002 <i>PU</i> ₉₂	17.9	X	232.54184	76.96424	251.01237	1.56768	0.3234809	0.29393730	2.24	1.52	2.96	Mc	2 23.6	22.1
228810 2003 <i>BZ</i> ₂	16.5	X	155.58945	294.35569	108.74288	23.83046	0.3052319	0.28262644	2.30	1.60	3.00	Mc	4 15.6	21.0
228862 2003 <i>GX</i> ₃₁	14.3	X	339.58923	136.00108	48.93758	10.73341	0.2258433	0.10380779	4.48	3.47	5.50	Jc	2 1.0	19.8
229378 2005 <i>SN</i> ₈	17.2	X	11.36261	289.89769	3.54326	3.50167	0.2404763	0.30410129	2.19	1.66	2.72	Mc	9 5.3	18.1
229835 2009 <i>QA</i> ₃₁	17.1	X	181.75299	299.26136	22.38552	12.30855	0.2746409	0.28787537	2.27	1.65	2.90	Mc	1 15.2	21.1
229958 1999 <i>RD</i> ₄₃	17.3	X	296.88695	264.54342	81.12480	8.15228	0.3530819	0.30729784	2.17	1.41	2.94	Mc	5 7.4	20.1
229986 1999 <i>XZ</i> ₁₂₁	17.5	X	256.60693	45.90353	324.23193	4.88808	0.2922612	0.30324744	2.19	1.55	2.84	Mc	5 3.8	21.2
230136 2001 <i>PH</i> ₁₀	16.6	X	138.30144	238.68939	148.60957	5.09254	0.2947789	0.27221661	2.36	1.66	3.05	Mc	3 1.2	20.1
230508 2002 <i>VP</i> ₁₇	17.1	X	223.13646	226.76222	164.22803	6.28240	0.2651708	0.29479548	2.24	1.64	2.83	Mc	5 9.2	20.9
231700 1998 <i>SO</i> ₁₂	16.4	X	140.97308	251.59152	156.21778	20.74011	0.3013637	0.27876625	2.32	1.62	3.02	Mc	4 1.4	20.3
231707 1998 <i>TP</i>	15.6	X	171.67564	69.58978	44.77238	22.98568	0.2634127	0.28975292	2.26	1.67	2.86	Mc	7 15.8	20.0
231716 1999 <i>BT</i> ₂	15.5	X	14.16036	144.74689	322.37316	23.85419	0.3407716	0.26408328	2.41	1.59	3.23	Mc	—	—
231801 2000 <i>EB</i> ₂₀	15.7	X	64.76108	85.84230	177.11097	23.11461	0.2943957	0.29217351	2.25	1.59	2.91	Mc	10 27.4	19.2
232397 2003 <i>CX</i> ₃	15.5	X	173.74173	241.42143	139.70769	23.25814	0.2870477	0.27852041	2.32	1.66	2.99	Mc	3 25.9	19.8
232757 2004 <i>NJ</i> ₇	16.8	X	41.45398	31.48168	237.55875	4.31456	0.3071380	0.29197305	2.25	1.56	2.94	Mc	10 5.1	19.2
232772 2004 <i>PG</i> ₆₁	15.8	X	274.27128	317.89142	4.96477	11.44424	0.2890614	0.27613449	2.34	1.66	3.01	Mc	3 24.1	19.6
233080 2005 <i>PG</i>	16.2	X	180.49085	294.65777	72.98535	3.55132	0.3468239	0.27971003	2.32	1.51	3.12	Mc	3 13.4	20.5
233393 2006 <i>FP</i> ₁₇	16.5	X	304.94780	106.95499	193.87500	11.85185	0.3255935	0.25919894	2.44	1.64	3.23	Mc	3 21.9	19.9
233949 2009 <i>WC</i> ₂₁₆	16.8	X	133.19720	314.43360	115.58366	25.96778	0.3008151	0.28832197	2.27	1.59	2.95	Mc	4 30.9	21.1
233972 1992 <i>PZ</i> ₅	16.8	X	134.52228	311.46286	342.61524	6.28366	0.3565505	0.31842017	2.12	1.37	2.88	Mc	—	—
234037 1998 <i>VG</i> ₅₇	17.8	X	85.94398	60.29845	46.00694	2.49766	0.3894741	0.27499643	2.34	1.43	3.25	Mc	4 29.8	20.5
234148 2000 <i>FF</i> ₁	16.3	X	55.30303	100.74095	93.75506	25.50262	0.2761490	0.28575202	2.28	1.65	2.91	Mc	6 30.7	18.2
234167 2000 <i>KV</i> ₆₉	17.2	X	2.34080	80.77126	226.76399	1.09656	0.2897186	0.28479964	2.29	1.63	2.95	Mc	9 8.2	17.9
234197 2000 <i>QE</i> ₁₈₀	15.9	X	309.97041	79.39597	352.00270	27.92354	0.3710592	0.23481612	2.60	1.64	3.57	Mc	9 25.7	17.8
234225 2000 <i>SQ</i> ₁₆₈	16.9	X	322.09446	163.96427	265.72864	6.24087	0.3635701	0.23504777	2.60	1.65	3.55	Mc	11 17.8	17.7
234242 2000 <i>SC</i> ₃₄₀	16.3	X	7.41806	262.00089	33.05089	5.62473	0.3283176	0.28273215	2.30	1.54	3.05	Mc	9 12.6	17.2
234302 2001 <i>AA</i>	16.5	X	269.20804	287.95985	154.69131	15.05818	0.3900907	0.22743841	2.66	1.62	3.69	Mc	8 8.7	20.6
234312 2001 <i>BV</i> ₁	17.5	X	148.92009	247.07890	144.13093	33.14783	0.0543372	0.44085278	1.71	1.62	1.80	Mc	1 11.1	19.4
234330 2001 <i>EF</i>	15.5	X	167.80176	181.31941	89.85210	29.06819	0.3911392	0.22193065	2.70	1.65	3.76	Mc	—	—
234360 2001 <i>MV</i> ₂₅	16.9	X	53.03494	209.51205	116.38479	8.19533	0.2708091	0.30595756	2.18	1.59	2.77	Mc	12 31.4	20.2
234382 2001 <i>QC</i> ₆₇	16.9	X	72.19905	315.82355	2.54382	4.99124	0.2555632	0.30579486	2.18	1.62	2.74	Mc	—	—
234405 2001 <i>RX</i> ₁₆	15.9	X	87.24977	57.28181	0.78674	22.91896	0.3084063	0.26524707	2.40	1.66	3.14	Mc	2 19.7	18.6
234458 2001 <i>SJ</i> ₁₈₁	17.5	X	145.85787	42.98267	355.19423	1.36591	0.2940948	0.27345789	2.35	1.66	3.04	Mc	3 20.6	21.2
235041 2003 <i>FA</i> ₅₅	16.2	X	90.54782	77.91181	37.38474	21.45559	0.3073892	0.27592876	2.34	1.62	3.05	Mc	5 3.3	19.1
235124 2003 <i>QS</i> ₃₃	16.8	X	244.70714	315.01448	311.97241	2.74323	0.3261313	0.25357173	2.47	1.67	3.28	Mc	—	—
235601 2004 <i>PW</i> ₅₆	16.9	X	282.66987	141.99452	195.02955	2.82026	0.2870047	0.28067621	2.31	1.65	2.97	Mc	4 19.0	20.2
235779 2004 <i>VO</i> ₇₅	16.7	X	285.28648	353.46548	356.67772	6.74528	0.2827243	0.27744284	2.33	1.66	3.00	Mc	5 6.7	20.0
236095 2005 <i>NB</i>	15.6	X	171.19044	110.29260	234.54848	21.25758	0.3297641	0.28034779	2.31	1.55	3.07	Mc	1 28.8	20.1
236104 2005 <i>QJ</i> ₇₁	17.2	X	245.44543	239.38495	168.99588	23.45646	0.2735300	0.29700223	2.22	1.62	2.83	Mc	6 18.6	21.3
236184 2005 <i>WX</i> ₃	16.4	X	349.57035	290.98429	36.50528	23.74235	0.2535669	0.30172372	2.20	1.64	2.76	Mc	9 25.0	18.1
236393 2006 <i>DH</i> ₃₇	15.8	X	121.25245	322.92311	355.84003	12.10933	0.3906486	0.23299313	2.62	1.59	3.64	Mc	—	—
236978 2008 <i>OG</i> ₃	16.7	X	115.59083	222.00952	146.18128	5.30104	0.3168506	0.25896960	2.44	1.67	3.21	Mc	1 16.3	19.7
237088 2008 <i>TW</i> ₂	16.3	X	215.89370	302.23359	39.70925	10.43951	0.2964900	0.27317987	2.35	1.65	3.05	Mc	3 8.8	20.7
237353 1207 <i>T</i> ₂	16.7	X	338.59251	314.09613	9.28452	5.71850	0.2939792	0.28645425	2.28	1.61	2.95	Mc	7 8.5	17.6
237465 1999 <i>YG</i> ₁₉	18.4	X	163.07345	160.42595	116.21645	2.20754	0.2334630	0.31493860	2.14	1.64	2.64	Mc	—	—
237486 2000 <i>KM</i> ₂	16.1	X	47.57282	148.52111	164.85831	25.66725	0.2996641	0.29147422	2.25	1.58	2.93	Mc	12 13.9	20.0
237495 2000 <i>QF</i> ₅₆	16.8	X	54.68073	92.22349	145.34948	10.52258	0.2763259	0.28263345	2.30	1.66	2.94	Mc	9 5.4	19.4
237566 2001 <i>BW</i> ₁	15.1	X	252.97122	256.96368	294.13048	26.53745	0.3810413	0.22949426	2.64	1.64	3.65	Mc	12 10.1	19.2
237610 2001 <i>QB</i> ₁₄₂	16.9	X	152.94090	19.50173	27.03840	6.14180	0.3117931	0.27245802	2.36	1.62	3.09	Mc	4 7.6	20.8
237616 2001 <i>RN</i> ₄	17.5	X	95.28117	128.15750	205.27147	3.07043	0.2356296	0.31077914	2.16	1.65	2.67	Mc	—	—
237709 2001 <i>UN</i> ₁₆₁	16.9	X	50.98191	105.42205	225.30609	3.70875	0.2531431	0.29992343	2.21	1.65	2.77	Mc	—	—
237838 2002 <i>EV</i> ₇₁	14.9	X	96.10959	132.06102	353.95980	10.95396	0.3129259	0.11167261	4.27	2.93	5.61	Jc	5 31.2	21.4
237881 2002 <i>LN</i> ₃	15.9	X	205.29217	122.10040	187.75570	15.45757	0.3590519	0.23942899	2.57	1.65	3.49	Mc	1 20.4	21.1
238072 2003 <i>FW</i> ₇	16.3	X	10.38674	247.86286	42.55983	8.74210	0.2941399	0.28232129	2.30	1.62	2.98	Mc	9 8.8	17.6
238453 2004 <i>QF</i>	17.3	X	81.15518	229.95390	179.25387	46.18127	0.1468964	0.42955867	1.74	1.48	2			

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
239881 2000 QW ₅₅	16.9 ^m	X	312.33500	354.98196	357.53151	5.48392	0.2837847	0.27835477	2.32	1.66	2.98	Mc	6 21.7	19.1
240292 2003 EB ₅₄	16.9	X	59.89185	304.61039	205.10612	22.76467	0.3008862	0.27643469	2.33	1.63	3.04	Mc	5 4.7	18.7
240313 2003 GO ₃₅	17.3	X	37.02894	250.51405	34.06925	22.98203	0.3100368	0.28380860	2.29	1.58	3.00	Mc	10 23.6	19.7
240565 2004 SD ₅	16.3	X	251.01015	308.21284	91.12615	24.43461	0.2985665	0.27875879	2.32	1.63	3.01	Mc	6 10.4	20.1
240570 2004 TZ ₉	17.4	X	112.17283	254.39927	51.14650	6.45827	0.2551841	0.30501566	2.19	1.63	2.74	Mc	—	—
240871 MOSS	16.4	X	358.16509	234.94163	348.80429	21.65208	0.3297963	0.26237385	2.42	1.62	3.21	Mc	3 1.2	18.1
241109 2007 MB ₁₀	17.3	X	108.86613	168.19172	107.93465	4.14453	0.2559789	0.30101406	2.21	1.64	2.77	Mc	12 14.7	20.9
241112 2007 OF ₂	17.1	X	113.88031	185.15917	130.61709	6.07439	0.3199215	0.30484370	2.19	1.49	2.89	Mc	—	—
241281 2007 UF ₂	16.7	X	345.67881	260.09625	67.99240	12.40111	0.3126965	0.27912220	2.32	1.59	3.04	Mc	8 27.0	17.8
241649 2000 EC ₁₄₀	16.7	X	147.92442	182.96819	95.53232	8.13434	0.2387089	0.30665618	2.18	1.66	2.70	Mc	—	—
241661 2000 JA ₇₂	17.5	X	96.37465	224.30173	66.00886	7.23914	0.2948632	0.29706962	2.22	1.57	2.88	Mc	12 23.1	21.3
241673 2000 QG ₇₀	15.7	X	356.11077	284.91821	145.85032	26.96162	0.3883319	0.24056406	2.56	1.57	3.55	Mc	—	—
241676 2000 QW ₁₅₈	16.8	X	337.18467	174.17237	199.75122	6.97822	0.3221256	0.28309179	2.30	1.56	3.04	Mc	10 27.5	16.9
242188 2003 MO ₂	16.9	X	345.86636	159.13631	147.67606	6.94459	0.2947781	0.27207398	2.36	1.66	3.05	Mc	6 28.7	17.9
242196 2003 PT ₉	15.9	X	355.33178	239.85151	149.52654	23.66693	0.3234867	0.27731851	2.33	1.58	3.08	Mc	—	—
242464 2004 RB ₂₃₆	17.6	X	145.17630	332.03335	315.79911	2.09373	0.2436547	0.30873183	2.17	1.64	2.70	Mc	—	—
242823 2006 BW ₂₇₅	16.8	X	320.99907	318.86275	343.82897	5.46261	0.3203325	0.27752829	2.33	1.58	3.07	Mc	4 11.7	19.4
243100 2007 RQ ₃₁	17.9	X	112.74396	87.86351	214.56627	6.54450	0.2636942	0.30251889	2.20	1.62	2.78	Mc	—	—
243127 2007 RY ₂₅₈	16.5	X	129.92189	208.08706	98.31677	6.66313	0.2456160	0.30567813	2.18	1.65	2.72	Mc	—	—
243587 1998 DU ₉	18.2	X	320.63891	278.11884	250.05395	4.94276	0.3361084	0.33327541	2.06	1.37	2.75	Mc	—	—
243618 1999 JU ₆₁	16.0	X	270.79091	53.45991	238.05675	7.77579	0.3610409	0.25928945	2.44	1.56	3.32	Mc	2 5.1	20.5
243732 2000 KV ₁₃	17.6	X	217.19738	42.40373	230.86401	3.90933	0.2758962	0.31082303	2.16	1.63	2.69	Mc	—	—
243775 2000 RA ₁₀₁	16.8	X	69.46354	77.59491	208.97133	21.67684	0.2738845	0.28728839	2.27	1.65	2.90	Mc	11 25.4	20.5
243927 2001 OR ₃₃	17.3	X	112.54038	212.65132	95.07171	7.20840	0.2474653	0.31195410	2.15	1.62	2.69	Mc	—	—
244049 2001 TL ₁₃	17.2	X	108.60693	90.38124	227.93365	5.33678	0.3420688	0.31011950	2.16	1.42	2.90	Mc	—	—
244115 2001 VG ₄	16.0	X	347.95130	73.78390	243.52688	21.11885	0.3749301	0.29069564	2.26	1.41	3.10	Mc	7 11.9	16.8
244456 2002 RS ₁₄₁	17.8	X	185.22075	123.01500	255.72038	2.31980	0.2780349	0.29113277	2.25	1.63	2.88	Mc	3 23.8	21.8
244679 2003 OC ₈	17.1	X	305.48145	6.88995	319.36343	2.20942	0.3215879	0.26813939	2.38	1.62	3.15	Mc	4 25.2	20.3
244689 2003 PW ₅	17.2	X	63.98967	53.65194	238.95081	3.17821	0.2890626	0.28247227	2.30	1.64	2.97	Mc	11 28.3	20.7
244694 2003 QK ₅	17.0	X	9.34653	143.13083	167.18632	11.21857	0.3154591	0.27548892	2.34	1.60	3.08	Mc	10 11.9	18.5
244739 2003 SY ₂₇	17.2	X	12.71060	138.83741	205.73027	4.66408	0.3196485	0.27776303	2.33	1.58	3.07	Mc	12 9.9	19.5
244790 2003 SQ ₂₁₀	17.3	X	59.78675	23.80309	241.57197	5.74178	0.3455120	0.28008217	2.31	1.51	3.11	Mc	10 25.9	20.6
245115 2004 QY ₁₂	17.5	X	110.74751	201.20886	104.52937	9.19795	0.2519642	0.30747985	2.17	1.63	2.72	Mc	—	—
245215 2004 WW ₉	16.1	X	272.59996	313.93757	58.78529	24.12553	0.3008042	0.28136103	2.31	1.61	3.00	Mc	5 23.3	19.6
245236 2004 XL ₁₃₀	16.2	X	92.77905	75.78725	299.17127	22.65386	0.2813651	0.30204795	2.20	1.58	2.82	Mc	—	—
246162 2007 QR	15.8	X	250.62182	351.41037	0.70787	11.59992	0.3106401	0.26446028	2.40	1.66	3.15	Mc	4 7.1	20.0
246336 2007 TW ₂₄₄	17.4	X	149.61857	339.92990	333.64655	5.66408	0.2913621	0.30801354	2.17	1.54	2.80	Mc	—	—
246911 1998 QY ₉₆	15.1	X	173.33735	114.87631	321.76839	29.75547	0.3576460	0.24258836	2.55	1.64	3.46	Mc	5 26.4	20.5
247056 2000 QW ₁	16.0	X	102.13892	102.44320	268.40782	22.66299	0.2676402	0.29811133	2.22	1.63	2.81	Mc	—	—
247062 2000 QN ₁₁₅	17.8	X	50.23567	84.76394	280.65986	1.88172	0.2680173	0.29211747	2.25	1.65	2.85	Mc	—	—
247087 2000 SC ₁₄₅	17.3	X	77.98993	90.00746	228.09872	2.28981	0.2846533	0.29084324	2.26	1.61	2.90	Mc	—	—
247179 2001 DC ₉	16.3	X	338.75264	70.99050	344.59179	22.89223	0.2943661	0.27836073	2.32	1.64	3.01	Mc	—	—
247429 2002 CK ₂₉₂	16.5	X	69.68325	49.64572	318.51518	7.43465	0.2634873	0.29891916	2.22	1.63	2.80	Mc	—	—
247665 2002 XY ₈₉	16.6	X	240.46893	209.68222	153.96089	5.86664	0.3659549	0.24277411	2.54	1.61	3.48	Mc	4 16.4	21.3
247740 2003 LY ₃	16.0	X	354.63432	57.59845	255.73245	20.70449	0.2887403	0.27712873	2.33	1.66	3.00	Mc	8 4.5	17.7
247743 2003 MX ₇	16.0	X	65.28485	29.48355	315.69823	27.02521	0.2975302	0.28672596	2.28	1.60	2.96	Mc	—	—
247745 2003 NX ₈	16.5	X	102.85623	131.17863	181.56121	21.84572	0.2876807	0.28889926	2.27	1.61	2.92	Mc	—	—
247748 2003 OL ₁₆	15.8	X	340.41848	68.55213	328.35941	22.61437	0.3261127	0.27524815	2.34	1.58	3.10	Mc	12 26.4	17.8
247760 2003 QN ₅	16.1	X	313.82652	105.93014	287.13319	20.92663	0.3137043	0.27264075	2.36	1.62	3.09	Mc	8 15.6	18.2
247779 2003 RU	17.0	X	16.01659	92.38675	299.74942	21.35392	0.3015530	0.28422747	2.29	1.60	2.98	Mc	—	—
247822 2003 SH ₁₈₀	17.4	X	1.46886	23.66233	351.01737	4.78761	0.2982018	0.28019197	2.31	1.62	3.00	Mc	12 31.4	19.5
247827 2003 SN ₁₉₈	16.5	X	39.25754	123.33317	235.35632	6.73453	0.2777489	0.28236872	2.30	1.66	2.94	Mc	—	—
247858 2003 UA ₃₈	17.2	X	1.38488	268.63598	95.92366	8.46643	0.2859880	0.27807663	2.32	1.66	2.99	Mc	12 12.9	19.0
247877 2003 UY ₁₅₂	16.2	X	323.59819	300.34641	69.36879	21.26684	0.3388456	0.26989214	2.37	1.57	3.17	Mc	8 21.9	18.2
247908 2003 VS	16.0	X	312.93703	120.63564	351.89067	23.38432	0.3117527	0.27730809	2.33	1.60	3.06	Mc	—	—
247925 2003 WD ₈₇	15.8	X	170.51714	41.36932	333.41588	11.79478	0.3573439	0.24577797	2.52	1.62	3.43	Mc	3 13.8	20.6
248083 2004 QU ₂₄	16.0	X	262.87438	272.05552	187.85677	23.30394	0.6152301	0.16260015	3.32	1.28	5.37	Jc	7 29.9	22.5
248107 2004 RA ₁₀₉	17.4	X	86.53490	337.09579	346.28525	6.03623	0.2625058	0.30298631	2.20	1.62	2.77	Mc	—	—
248298 2005 LX ₁₉	16.2	X	87.32047	27.96223	305.49530	38.25647	0.3683409	0.26634234	2.39	1.51	3.27	Mc	—	—
248590 2006 CS	16.5	X	20.91146	346.39866	172.40999	52.30989	0.6979055	0.19818553	2.91	0.88	4.95	Ja	—	—
248918 2006 VU ₁₂₃	16.5	X	190.60388	287.17436	92.88735	5.63850	0.3967946	0.23410861	2.61	1.57	3.64	Mc	4 7.5	21.7
248920 2006 VS ₁₃₃	16.4	X	153.67151	339.93039	54.71631	7.92911	0.3818609	0.22855376	2.65	1.64	3.66	Mc	4 3.3	21.4
249006 2007 PR ₁₆	17.0	X	300.03462	218.50162	126.93310	16.8749	0.2980979	0.27281311	2.35	1.65	3.06	Mc	5 21.9	20.0
249047 2007 TC ₉₁	13.9	X	14.79899	5.32843	202.57907	7.07437	0.0924195	0.10829308	4.36	3.96	4.76	Ja	4 28.1	19.4
249091 2007 VV ₉₃	16.5	X	24.32394	86.65682	236.96279	23.08855	0.3195198	0.28462907	2.29	1.56	3.02	Mc	11 29.1	19.0
249103 2007 VO ₂₄₄	17.3	X	124.36234	79.84441	237.21221	6.15034	0.2591378	0.30014656	2.21	1.64	2.78	Mc	—	—
249230 2008 GZ ₂₁	18.0	X	261.40640	289.67147	217.86003	20.55636	0.1661002	0.41813592	1.77	1.48	2.07	Mc	—	—
249685 1999 YD ₄	15.6	X	4.73972	41.71671	3.06451	23.32554	0.2980381	0.27120043	2.36	1.66	3.07	Mc	—	—
249687 2000 AY ₄₂	15.2	X	243.05833	228.86336	269.93676	22.34648	0.3797944	0.26283637	2.41	1.50	3.33	Mc	9 16.5	19.7
249708 2000 OC ₄₇	16.7	X	139.07192											

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
250706 2005 <i>RR</i> ₆	18.5 ^m	X	25.86755	59.95925	27.29507	6.93146	0.7001394	0.19356834	2.96	0.89	5.03	Jc	—	—
250968 2006 <i>GM</i> ₂₆	16.8	X	148.51460	301.30174	40.87205	7.22738	0.2647375	0.30450879	2.19	1.61	2.77	Mc	1 5.0	19.8
251365 2007 <i>TQ</i> ₄₄₇	17.8	X	163.16058	164.21059	148.29785	5.33849	0.2454055	0.31059155	2.16	1.63	2.69	Mc	—	—
251398 2007 <i>XB</i> ₂₄	17.1	X	127.07875	257.36348	103.72028	1.86780	0.2785943	0.30586443	2.18	1.57	2.79	Mc	1 5.6	19.5
251428 2008 <i>BD</i> ₁₆	17.3	X	37.10043	247.12419	146.77459	3.77428	0.2896759	0.28808719	2.27	1.61	2.93	Mc	—	—
251568 2009 <i>EL</i> ₁₅	17.3	X	154.19248	308.04906	14.54766	3.05070	0.2940303	0.30522535	2.18	1.54	2.83	Mc	—	—
251705 1996 <i>UJ</i>	17.0	X	17.47601	74.08831	19.49753	21.05334	0.3500660	0.28538332	2.28	1.48	3.08	Mc	—	—
251774 1999 <i>RG</i> ₁₀	14.6	X	77.47382	85.11930	334.38045	22.35659	0.3277875	0.28750433	2.27	1.53	3.02	Mc	1 23.9	16.2
251816 1999 <i>TO</i> ₈₁	18.2	X	329.45907	82.45419	342.42156	2.31285	0.3005187	0.27207895	2.36	1.65	3.07	Mc	12 31.5	19.2
251964 1999 <i>YL</i> ₆	17.1	X	324.22403	112.15057	15.70704	9.06569	0.2998938	0.27357538	2.35	1.65	3.05	Mc	—	—
251966 2000 <i>AJ</i> ₁	15.5	X	356.58841	162.85952	276.08628	26.78319	0.3153374	0.27525832	2.34	1.60	3.08	Mc	—	—
252050 2000 <i>SZ</i> ₁₀	17.7	X	64.51211	158.82034	198.72067	22.73260	0.2875438	0.29345315	2.24	1.60	2.89	Mc	—	—
252068 2000 <i>SR</i> ₁₄₉	17.0	X	150.00908	115.01178	198.49102	7.17441	0.2665607	0.29923211	2.21	1.62	2.80	Mc	—	—
252073 2000 <i>SW</i> ₂₃₆	17.2	X	172.16557	288.98827	9.48509	4.75705	0.2614058	0.30096908	2.21	1.63	2.78	Mc	—	—
252087 2000 <i>UK</i> ₃	16.6	X	125.89248	268.12717	56.65684	9.43556	0.2867654	0.29631429	2.23	1.59	2.87	Mc	—	—
252089 2000 <i>UQ</i> ₂₉	16.3	X	342.08563	248.17190	223.83558	22.70425	0.2723189	0.28824511	2.27	1.65	2.89	Mc	—	—
252192 2001 <i>FJ</i> ₁	15.9	X	312.27119	264.27491	186.26697	20.62657	0.3660459	0.27761318	2.33	1.48	3.18	Mc	12 19.6	17.2
252244 2001 <i>QZ</i> ₆₀	16.2	X	211.86577	331.77873	358.70762	8.67899	0.3878562	0.22738716	2.66	1.63	3.69	Mc	2 21.8	21.5
252881 2002 <i>JF</i> ₆₃	17.4	X	93.57170	64.80274	225.43325	4.78861	0.2939784	0.27521774	2.34	1.65	3.03	Mc	12 18.5	21.5
252882 2002 <i>JM</i> ₆₈	16.6	X	50.67906	81.89064	50.12451	22.58914	0.2411645	0.30558085	2.18	1.66	2.71	Mc	3 6.8	18.6
252902 2002 <i>JX</i> ₁₂₇	16.8	X	79.43708	220.51229	90.04148	7.49257	0.2884986	0.27621999	2.34	1.66	3.01	Mc	12 31.9	20.8
253069 2002 <i>TG</i> ₁₁₀	17.9	X	248.36154	296.97024	54.90161	10.33772	0.3515875	0.24527842	2.53	1.64	3.42	Mc	4 9.9	22.5
253387 2003 <i>KA</i> ₁₄	16.8	X	182.16277	265.54120	64.82217	6.11513	0.2620127	0.30828928	2.17	1.60	2.74	Mc	1 20.9	20.3
253444 2003 <i>RA</i> ₆	17.4	X	32.77436	162.55449	245.36956	4.54329	0.3251346	0.28511383	2.29	1.54	3.03	Mc	—	—
253446 2003 <i>RU</i> ₁₀	16.2	X	133.12036	94.68448	226.03465	21.49672	0.2592350	0.29396348	2.24	1.66	2.82	Mc	—	—
253449 2003 <i>RX</i> ₁₈	17.3	X	100.19663	298.65993	0.99459	2.93172	0.2716683	0.28711779	2.28	1.66	2.89	Mc	—	—
253692 2003 <i>UH</i> ₂₆₀	16.3	X	302.21456	326.21547	94.11517	12.69503	0.3226444	0.26836387	2.38	1.61	3.15	Mc	9 20.8	18.4
253822 2003 <i>YT</i> ₅₇	15.6	X	312.35620	280.51033	88.71900	12.66715	0.3094994	0.26645001	2.39	1.65	3.13	Mc	7 14.4	17.8
253898 2004 <i>BY</i> ₁₀₂	15.7	X	357.14344	42.97354	72.74209	24.84613	0.3487398	0.27809363	2.32	1.51	3.14	Mc	—	—
255527 2006 <i>ET</i> ₄₄	18.9	X	121.00035	40.19509	169.84275	12.80504	0.1012994	0.54131395	1.49	1.34	1.64	Mc	10 29.1	19.9
255535 2006 <i>HS</i> ₅₆	17.3	X	90.29835	225.99341	62.58811	8.78203	0.2890255	0.28363474	2.29	1.63	2.96	Mc	12 14.5	21.1
255550 2006 <i>JB</i> ₂₆	17.5	X	93.79725	298.55902	345.79458	3.66316	0.2788356	0.28345210	2.30	1.66	2.94	Mc	12 11.6	21.5
255587 Gardenia	17.6	X	295.18084	247.63584	153.64372	6.92169	0.3815482	0.26116792	2.42	1.50	3.35	Mc	7 17.2	20.4
255591 2006 <i>OB</i> ₆	17.0	X	0.81464	30.66462	320.38794	3.28119	0.3284571	0.26876648	2.38	1.60	3.16	Mc	11 24.6	18.6
256155 2006 <i>VO</i> ₄₄	15.7	X	233.84496	278.38514	61.53691	17.60187	0.3803655	0.23702214	2.59	1.60	3.57	Mc	3 23.2	21.0
256460 2007 <i>DL</i>	16.0	X	164.27071	285.34216	172.08082	28.34115	0.3752801	0.23190133	2.62	1.64	3.61	Mc	6 20.4	21.6
256686 2007 <i>YZ</i> ₅₄	16.6	X	37.85668	341.80187	17.63994	8.67427	0.3396556	0.28536101	2.28	1.51	3.06	Mc	—	—
257471 1994 <i>SA</i>	19.2	X	37.74706	201.98050	52.67392	1.64016	0.0577285	0.43479509	1.73	1.63	1.83	Mc	8 3.4	19.9
257536 1998 <i>EU</i> ₃	17.9	X	257.57784	103.63505	48.37910	4.64922	0.2402807	0.36690920	1.93	1.47	2.40	Mc	12 21.0	18.8
257581 1999 <i>FE</i> ₈	16.8	X	210.48832	269.91762	180.08659	27.00320	0.3761434	0.24091026	2.56	1.60	3.52	Mc	7 6.2	22.2
257594 1999 <i>RA</i> ₃₁	15.6	X	50.53438	74.05072	349.98172	23.11674	0.3064716	0.28172934	2.30	1.60	3.01	Mc	—	—
257610 1999 <i>RM</i> ₂₁₅	16.0	X	63.05440	49.38451	278.94807	8.53311	0.2987141	0.27575628	2.34	1.64	3.04	Mc	—	—
257737 2000 <i>AY</i> ₄₈	16.4	X	350.71817	306.03006	95.72563	22.48667	0.3087322	0.27089797	2.37	1.64	3.10	Mc	—	—
257803 2000 <i>EC</i> ₇₅	15.8	X	13.84171	89.60430	347.61427	20.41084	0.3314473	0.27282332	2.35	1.57	3.13	Mc	—	—
257851 2000 <i>OA</i> ₁₃	17.4	X	175.23798	215.80168	115.50808	3.76946	0.2450541	0.30751581	2.17	1.64	2.71	Mc	1 13.8	20.7
257924 2000 <i>WH</i> ₆₈	17.9	X	144.95882	74.95794	239.49545	3.42874	0.2966920	0.29573733	2.23	1.57	2.89	Mc	—	—
257926 2000 <i>WY</i> ₇₂	16.8	X	124.71735	95.97490	264.00132	6.67153	0.2580170	0.29900910	2.21	1.64	2.79	Mc	—	—
258123 2001 <i>QK</i> ₂₉₃	16.0	X	199.66806	103.13684	330.55701	28.25266	0.3757327	0.23255427	2.62	1.63	3.60	Mc	6 12.5	21.6
258695 2002 <i>GT</i> ₃	18.8	X	210.79029	74.10832	9.17792	1.52495	0.1707923	0.42637414	1.75	1.45	2.05	Mc	7 9.6	20.6
259068 2002 <i>UD</i> ₃₅	16.4	X	116.76560	287.74188	204.11913	27.95706	0.3763253	0.23509598	2.60	1.62	3.58	Mc	6 26.4	21.5
259101 2002 <i>WS</i>	16.5	X	129.31371	111.85116	6.29850	29.37893	0.3872060	0.23397464	2.61	1.60	3.62	Mc	6 22.2	21.9
259145 2002 <i>XM</i> ₈₂	17.6	X	230.09368	136.56458	292.52478	7.36216	0.1707977	0.35141082	1.99	1.65	2.33	Mc	7 9.9	20.1
259146 2002 <i>XF</i> ₈₄	16.4	X	122.31806	102.75100	46.83812	28.36551	0.3906347	0.23215987	2.62	1.60	3.65	Mc	8 3.9	21.8
259353 2003 <i>GT</i> ₄₁	17.2	X	219.29941	194.73250	101.90672	9.89948	0.3086475	0.30872896	1.17	1.34	2.99	Mc	1 9.7	21.3
259430 2003 <i>SN</i> ₆	17.5	X	13.29411	147.83021	211.86791	7.54061	0.3250727	0.27940043	2.32	1.56	3.07	Mc	—	—
259461 2003 <i>SN</i> ₁₀₁	17.3	X	129.95131	59.67154	260.72769	6.81822	0.2805170	0.29366476	2.24	1.61	2.87	Mc	—	—
259464 2003 <i>SN</i> ₁₁₇	17.1	X	15.71143	268.85836	1.82612	4.11655	0.3003195	0.26868416	2.38	1.66	3.09	Mc	8 12.6	18.3
259485 2003 <i>SS</i> ₂₁₅	17.3	X	115.01134	275.03202	110.70962	7.53148	0.2644049	0.29679670	2.23	1.64	2.81	Mc	1 23.3	19.6
259490 2003 <i>SW</i> ₂₂₈	16.9	X	113.53322	304.34613	23.89294	6.06482	0.2675425	0.28962847	2.26	1.66	2.87	Mc	—	—
259517 2003 <i>TM</i> ₁₃	17.0	X	122.90493	276.72295	42.22988	9.25039	0.2709318	0.29019042	2.26	1.65	2.87	Mc	—	—
259555 2003 <i>UL</i> ₁₄₇	17.3	X	348.50793	285.23856	65.95200	5.00821	0.3029349	0.27214220	2.36	1.64	3.07	Mc	10 19.4	18.1
259601 2003 <i>UF</i> ₂₇₄	17.5	X	50.86079	105.17127	269.69645	3.31603	0.2936922	0.28518257	2.29	1.61	2.96	Mc	—	—
259691 2003 <i>YV</i> ₂	16.4	X	208.48559	104.94032	48.51134	21.60752	0.3275803	0.25900531	2.44	1.64	3.24	Mc	10 4.7	21.0
259698 2003 <i>YJ</i> ₂₃	17.5	X	13.89827	338.74045	135.69219	2.56321	0.3100772	0.28596871	2.28	1.57	2.99	Mc	—	—
259753 2004 <i>AY</i>	16.3	X	15.92423	87.51170	39.20363	23.06504	0.2801937	0.28603942	2.28	1.64	2.92	Mc	—	—
259776 2004 <i>BA</i> ₂₇	16.3	X	65.29273	303.34850	130.19219	23.09357	0.2744041	0.28776994	2.27	1.65	2.90	Mc	—	—
259871 2004 <i>DP</i> ₁	17.5	X	346.95378	42.86041	22.82659	0.69904	0.3707091	0.27368445	2.35	1.48	3.22	Mc	—	—
260513 2005 <i>ET</i> ₇₁	17.1	X	269.18498	191.39168	33.26752	5.26844	0.2623746	0.29343856</						

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
264341 1999 <i>XF</i> ₁₇	15.7 ^m	X	18.59171	131.67555	268.67325	21.81964	0.2970770	0.27268312	2.36	1.66	3.05	Mc	—	—
264431 2000 <i>SP</i> ₇₄	17.5	X	152.35025	311.38842	83.21157	2.76884	0.2379201	0.30657134	2.18	1.66	2.70	Mc	3 15.2	20.7
264791 2002 <i>NG</i> ₉	17.2	X	169.34816	14.14442	290.68816	10.84862	0.3103457	0.28502740	2.29	1.58	3.00	Mc	—	—
264932 2002 <i>VV</i> ₃₄	15.9	X	275.30174	53.07142	65.76870	23.99927	0.3395426	0.25582836	2.46	1.62	3.29	Mc	10 26.2	19.0
265139 2003 <i>UV</i> ₂₈₃	17.4	X	106.83515	61.46639	358.50390	3.58629	0.2589512	0.29636159	2.23	1.65	2.80	Mc	2 28.3	19.6
265176 2003 <i>YV</i> ₈	16.9	X	92.92546	275.53842	107.56914	5.98226	0.2906098	0.28791223	2.27	1.61	2.93	Mc	—	—
265549 2005 <i>OZ</i> ₁₄	17.4	X	239.61153	291.37770	7.36868	5.34486	0.2712792	0.28805317	2.27	1.65	2.89	Mc	1 28.6	21.4
266053 2006 <i>QJ</i> ₂₇	16.6	X	163.05038	305.06915	19.59945	6.56872	0.2811812	0.29284020	2.25	1.61	2.88	Mc	—	—
266084 2006 <i>SN</i> ₆	16.9	X	10.65655	303.09790	72.27698	2.38083	0.3113486	0.26784048	2.38	1.64	3.13	Mc	—	—
266691 2009 <i>PB</i>	16.1	X	67.43714	107.12405	246.88632	6.74453	0.3671193	0.26553342	2.40	1.52	3.28	Mc	—	—
267004 1981 <i>UA</i>	15.9	X	65.20724	21.57921	17.39832	26.98085	0.3300846	0.27731666	2.33	1.56	3.10	Mc	—	—
267046 1998 <i>RU</i> ₁₇	17.0	X	216.64651	345.86070	323.12304	6.60475	0.3038360	0.28312665	2.30	1.60	2.99	Mc	1 24.6	21.2
267494 2002 <i>JB</i> ₉	15.9	X	77.62134	277.92002	70.31714	46.74886	0.2799483	0.21992102	2.72	0.59	4.85	Ja	2 1.3	20.4
267504 2002 <i>KJ</i> ₉	17.2	X	22.59401	204.16701	80.45165	6.56973	0.3374173	0.31304223	2.15	1.42	2.87	Mc	10 12.6	18.9
267523 2002 <i>OA</i> ₁₆	17.1	X	183.86106	179.60100	161.91160	5.58547	0.2986550	0.29003857	2.26	1.59	2.94	Mc	2 7.2	20.9
267671 2002 <i>TZ</i> ₂₈₉	16.6	X	79.69441	26.04577	3.45565	5.93292	0.3010980	0.27368710	2.35	1.64	3.06	Mc	—	—
267821 2003 <i>UB</i> ₃₅	17.6	X	219.92482	306.04717	27.84788	1.19914	0.2538335	0.30569880	2.18	1.63	2.74	Mc	2 22.7	21.3
267871 2003 <i>WV</i> ₁₅₂	16.3	X	28.12822	265.35828	192.62518	22.15055	0.2914582	0.28399372	2.29	1.62	2.96	Mc	—	—
267878 2003 <i>YY</i> ₁₇	15.8	X	98.56966	110.50353	288.63027	23.00979	0.2924843	0.29028644	2.26	1.60	2.92	Mc	1 19.2	17.7
268251 2005 <i>MF</i> ₂₄	17.8	X	54.39636	106.06807	176.70044	4.15757	0.2799483	0.31134541	2.16	1.55	2.76	Mc	9 3.9	20.0
268747 2006 <i>QK</i> ₄₈	16.9	X	341.64732	77.97266	348.95665	21.30286	0.3034815	0.26980168	2.37	1.65	3.09	Mc	—	—
268782 2006 <i>TB</i> ₄₉	17.7	X	64.78043	85.57300	302.81358	3.34892	0.2843548	0.27955660	2.32	1.66	2.98	Mc	—	—
268812 2006 <i>VS</i> ₂₇	17.2	X	288.42057	88.99671	234.41914	3.65524	0.2406404	0.31117407	2.16	1.64	2.68	Mc	4 8.5	20.0
269631 2011 <i>AG</i> ₂₉	17.6	X	223.36160	89.92192	116.91122	9.84700	0.1603586	0.35437271	1.98	1.66	2.29	Mc	—	—
269719 1998 <i>HF</i> ₅₆	17.7	X	215.88008	266.15408	176.42890	32.22567	0.0308054	0.51035481	1.55	1.50	1.60	Mc	7 30.4	19.6
269745 1998 <i>WU</i> ₈	16.1	X	193.16582	248.66123	112.93960	8.37581	0.2875692	0.28085545	2.31	1.65	2.97	Mc	3 14.3	20.3
269780 1999 <i>TF</i> ₁₄₅	17.5	X	31.21941	318.35616	353.89982	3.11317	0.2700526	0.31677452	2.13	1.56	2.71	Mc	11 20.1	19.9
269806 1999 <i>VM</i> ₉₅	15.3	X	92.14297	81.40590	210.38271	27.67790	0.3698321	0.23196342	2.62	1.65	3.59	Mc	12 16.0	20.5
269881 2000 <i>GF</i> ₁₅	16.7	X	206.04363	248.89133	36.57333	5.34738	0.3123897	0.26574875	2.40	1.65	3.14	Mc	—	—
269902 2000 <i>HU</i> ₃	17.3	X	187.73182	251.37543	66.44738	0.70453	0.3185519	0.26662394	2.39	1.63	3.15	Mc	1 17.4	21.4
269927 2000 <i>OM</i> ₂₂	16.2	X	13.75969	20.77475	341.31413	12.74822	0.3821950	0.23902297	2.57	1.59	3.55	Mc	—	—
269993 2000 <i>WJ</i> ₆₇	17.6	X	212.66221	250.08278	93.26967	6.84573	0.3337893	0.30911705	2.17	1.44	2.89	Mc	3 3.6	21.6
270037 2001 <i>KR</i> ₅₇	17.1	X	236.94046	100.08222	213.36170	7.15922	0.3064708	0.28217657	2.30	1.60	3.01	Mc	2 8.9	21.4
270038 2001 <i>KW</i> ₆₅	16.9	X	280.52508	184.30981	120.29544	11.59746	0.2712792	0.28900004	2.27	1.65	2.88	Mc	3 10.7	20.5
270044 2001 <i>ML</i> ₃	16.8	X	188.79403	158.74589	172.01001	3.76362	0.3057631	0.27364505	2.35	1.63	3.07	Mc	1 31.0	21.0
270073 2001 <i>PR</i> ₄₉	18.2	X	258.96328	172.85312	224.15711	13.77245	0.1453509	0.43971835	1.71	1.46	1.96	Mc	6 28.1	19.9
270085 2001 <i>QQ</i> ₉₈	17.3	X	242.35522	51.11266	264.76082	2.19501	0.2861830	0.28075303	2.31	1.65	2.97	Mc	2 17.8	21.3
270147 2001 <i>SL</i> ₆₂	17.0	X	183.75374	314.76774	12.52632	8.08937	0.2998236	0.27109075	2.36	1.66	3.07	Mc	1 26.7	21.2
270201 2001 <i>TS</i> ₃₂	16.3	X	141.94202	72.38297	276.99654	4.65785	0.3528297	0.26616912	2.39	1.55	3.24	Mc	1 22.6	20.1
270303 2001 <i>WB</i> ₂	16.6	X	272.26714	121.74971	209.78920	21.04975	0.3095480	0.28102800	2.31	1.59	3.02	Mc	3 28.6	20.5
270588 2002 <i>LA</i> ₆	17.0	X	109.02737	28.55811	292.46881	6.10343	0.3535696	0.27646746	2.33	1.51	3.16	Mc	—	—
270659 2002 <i>PU</i> ₁₇₈	18.0	X	335.68349	234.77499	78.10418	6.15393	0.2476052	0.30858740	2.17	1.63	2.71	Mc	6 13.7	19.1
270893 2002 <i>TO</i> ₂₄₇	17.7	X	345.72928	266.27527	53.24040	6.47234	0.2429240	0.30787119	2.17	1.64	2.70	Mc	8 7.0	18.5
271073 2003 <i>KU</i> ₁₃	16.1	X	87.62599	283.00490	34.75546	17.42348	0.3651130	0.23915664	2.57	1.63	3.51	Mc	—	—
271271 2003 <i>UW</i> ₁₉₀	17.7	X	253.57673	155.00973	184.36361	3.95564	0.2428248	0.31209794	2.15	1.63	2.68	Mc	3 27.5	20.8
271366 2003 <i>YE</i>	17.6	X	136.12044	256.90043	203.30802	23.33428	0.3227990	0.30377854	2.19	1.48	2.90	Mc	5 31.1	21.6
271368 2003 <i>YU</i> ₁₇	17.3	X	134.60518	269.08393	92.61849	5.83784	0.3043144	0.29488412	2.24	1.56	2.92	Mc	1 22.3	20.2
271518 2004 <i>GT</i> ₂₈	17.1	X	357.31200	79.42607	40.42574	21.83407	0.3015369	0.27695356	2.33	1.63	3.03	Mc	—	—
271519 2004 <i>GL</i> ₃₉	16.7	X	229.45119	257.11248	39.38646	8.13946	0.3126672	0.27269588	2.36	1.62	3.09	Mc	1 20.7	21.1
271533 2004 <i>HY</i> ₃₂	17.0	X	250.89902	249.90896	58.14508	11.93643	0.2844703	0.27964374	2.32	1.66	2.97	Mc	2 21.2	21.3
271774 2004 <i>TO</i> ₁₂	18.8	X	349.00725	352.08134	294.18350	1.55695	0.1481023	0.39859435	1.83	1.56	2.10	Mc	6 7.3	18.9
272148 2005 <i>NP</i> ₂₇	16.9	X	332.84222	67.80537	230.03700	7.28292	0.2538952	0.30195017	2.20	1.64	2.76	Mc	5 8.6	18.3
272191 2005 <i>QR</i> ₃	17.3	X	193.61305	290.48405	344.15163	1.83580	0.2905559	0.27547731	2.34	1.66	3.02	Mc	—	—
272254 2005 <i>QJ</i> ₁₄₅	16.8	X	25.87939	150.24740	128.65449	6.52776	0.2804940	0.30788509	2.17	1.56	2.78	Mc	9 26.1	18.5
272287 2005 <i>ST</i> ₉	16.7	X	120.23192	299.26228	20.53140	14.93551	0.3351352	0.26565852	2.40	1.59	3.20	Mc	—	—
272354 2005 <i>SH</i> ₁₆₄	16.5	X	137.40092	289.93411	53.22233	5.67492	0.3026820	0.27052124	2.37	1.65	3.08	Mc	1 5.6	19.9
272373 2005 <i>SA</i> ₂₁₇	17.3	X	284.06071	239.01921	72.10699	2.86759	0.3014977	0.29255190	2.25	1.57	2.92	Mc	3 16.6	20.9
272475 2005 <i>UU</i> ₈₀	16.5	X	298.85106	238.73122	87.28408	6.31463	0.3230499	0.29587725	2.23	1.51	2.95	Mc	4 18.4	19.5
272499 2005 <i>UJ</i> ₁₅₇	16.5	X	251.39103	339.76637	317.26723	5.91923	0.2809180	0.28314160	2.30	1.65	2.94	Mc	2 2.8	20.6
272560 2005 <i>UC</i> ₄₆₉	17.0	X	252.19136	34.48177	283.96289	3.06141	0.2843559	0.28564511	2.28	1.63	2.93	Mc	2 27.2	20.9
273264 2006 <i>LW</i>	18.5	X	245.37876	226.91437	93.19069	3.32932	0.2470105	0.31040964	2.16	1.63	2.69	Mc	2 25.8	22.0
273290 2006 <i>SN</i> ₁₂	17.5	X	123.36149	239.85962	119.65266	6.81131	0.2719226	0.28796503	2.27	1.65	2.89	Mc	1 1.7	20.0
273292 2006 <i>SP</i> ₃₆	17.0	X	256.73598	203.29244	106.55695	8.30231	0.2565605	0.30825964	2.17	1.61	2.73	Mc	2 23.0	20.6
273314 2006 <i>SS</i> ₃₅₅	18.4	X	86.92267	262.60132	164.73912	5.07382	0.2673954	0.28846550	2.27	1.66	2.88	Mc	2 6.6	20.0
273364 2006 <i>UU</i> ₂₁₀	17.7	X	359.10189	9.41032	292.55027	3.74575	0.2727383	0.32184769	2.11	1.53	2.68	Mc	8 18.0	17.8
273419 2006 <i>WX</i> ₂₁	17.8	X	341.54123	297.74727	145.42972	2.64207	0.3027701	0.26802335	2.38	1.66	3.10	Mc	—	—
274069 2007 <i>VU</i> ₁₈₈	17.4	X	142.45876	186.23489	155.88673	3.78546	0.2367998	0.30731952	2.17	1.66	2.69	Mc	—	—
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ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
275736 2001 <i>FJ</i> ₁₄₁	17.5	X	325.29777	249.49829	26.77278	5.59100	0.2741956	0.29497164	2.24	1.62	2.85	Mc	3 20.5	19.8
275740 2001 <i>HS</i> ₃	18.6	X	143.64461	56.28982	40.28501	16.18308	0.0848675	0.49320789	1.59	1.45	1.72	Mc	4 25.4	19.3
275742 2001 <i>HL</i> ₁₈	16.3	X	261.50492	71.57562	53.44152	22.13497	0.3114569	0.27121994	2.36	1.63	3.10	Mc	10 19.7	19.5
275749 2001 <i>OL</i> ₉	17.1	X	276.94514	249.90459	81.47280	4.68436	0.2812029	0.28704280	2.28	1.64	2.92	Mc	4 8.3	20.5
275778 2001 <i>QD</i> ₇	17.5	X	278.17201	355.97679	321.94778	5.93507	0.2716202	0.28566642	2.28	1.66	2.90	Mc	3 19.7	21.0
275820 2001 <i>RX</i> ₄₈	16.4	X	245.25767	39.64293	41.36889	33.56136	0.4295983	0.23756435	2.58	1.47	3.69	Mc	7 20.8	21.7
275842 2001 <i>SC</i> ₅	15.9	X	291.25517	267.41513	20.04986	22.24439	0.3113280	0.28074996	2.31	1.59	3.03	Mc	3 3.3	19.9
275847 2001 <i>SM</i> ₆₁	15.8	X	210.64954	291.26240	194.67544	23.40808	0.4088995	0.23657263	2.59	1.53	3.65	Mc	8 13.9	21.2
276109 2002 <i>GL</i> ₅	16.4	X	56.32118	297.54362	8.51289	3.63171	0.2993598	0.32649554	2.09	1.46	2.71	Mc	12 15.1	19.4
276295 2002 <i>TV</i> ₉₅	17.3	X	318.63293	97.70559	230.97078	6.79236	0.2548887	0.30552771	2.18	1.63	2.74	Mc	5 30.8	19.0
276297 2002 <i>TZ</i> ₉₆	17.5	X	295.18366	257.77164	84.49296	8.27916	0.2787230	0.30314645	2.19	1.58	2.81	Mc	5 11.7	20.2
276331 2002 <i>TL</i> ₂₅₅	16.6	X	35.35185	245.94448	208.70613	21.09018	0.3853422	0.27313119	2.35	1.45	3.26	Mc	—	—
276400 2002 <i>UX</i> ₄₅	16.4	X	320.56104	300.98232	44.29270	5.63386	0.2798474	0.30336248	2.19	1.58	2.81	Mc	6 28.0	17.8
276620 2003 <i>UV</i> ₁₁₆	18.1	X	219.94143	182.07118	179.74670	5.02743	0.2462354	0.30976362	2.16	1.63	2.70	Mc	3 28.8	21.5
276741 2004 <i>EM</i> ₆₆	16.5	X	327.13701	200.49659	40.68663	12.76989	0.4020043	0.28392270	2.29	1.37	3.21	Mc	1 18.6	20.0
276785 2004 <i>KA</i> ₁	18.2	X	48.25590	258.08177	85.30460	14.49488	0.1527563	0.42519008	1.75	1.48	2.02	Mc	—	—
276825 2004 <i>PM</i> ₁₀₁	17.1	X	79.37931	323.67518	335.62750	9.33667	0.2815311	0.29957667	2.21	1.59	2.83	Mc	12 21.3	20.9
276888 2004 <i>RM</i> ₃₂₃	17.3	X	86.03089	49.90358	255.34580	5.56442	0.3899580	0.24432224	2.53	1.55	3.52	Mc	12 31.9	22.1
277162 2005 <i>NM</i> ₂₀	16.1	X	300.91615	47.29134	320.40976	25.79371	0.3641834	0.23821860	2.58	1.64	3.52	Mc	6 13.6	20.0
277172 2005 <i>OB</i>	17.4	X	33.68269	13.76690	297.83895	6.61264	0.3584301	0.31343518	2.15	1.38	2.92	Mc	12 5.0	20.2
277175 2005 <i>OS</i> ₁₄	17.4	X	305.25108	354.08318	330.83308	5.33319	0.2593903	0.29935439	2.21	1.64	2.79	Mc	4 28.7	20.0
277238 2005 <i>RD</i> ₈	16.8	X	188.36662	231.95972	170.25698	9.18462	0.3849759	0.22344494	2.69	1.65	3.73	Mc	5 6.2	22.1
277307 2005 <i>ST</i> ₁₆₄	16.7	X	131.31490	215.40513	153.90978	6.46564	0.3010867	0.27142048	2.36	1.65	3.07	Mc	1 30.7	20.0
277353 2005 <i>TE</i> ₁₀₅	16.9	X	308.42949	28.58176	298.89890	3.86640	0.2780559	0.29769677	2.22	1.60	2.84	Mc	5 5.1	19.5
277371 2005 <i>UJ</i> ₉	17.3	X	338.69892	151.78304	171.42808	6.14332	0.2465860	0.30298274	2.20	1.65	2.74	Mc	7 13.8	18.4
277423 2005 <i>UC</i> ₃₁₄	17.2	X	355.84168	275.58216	49.38666	23.17777	0.2630307	0.30651102	2.18	1.61	2.75	Mc	10 11.1	18.8
277529 2005 <i>XL</i> ₆₆	16.7	X	304.64091	250.00165	104.00926	9.60085	0.3486981	0.29869079	2.22	1.44	2.99	Mc	5 30.2	19.2
277530 2005 <i>XM</i> ₆₆	16.4	X	236.65520	293.13195	89.24489	27.39363	0.2995050	0.28946608	2.26	1.59	2.94	Mc	5 15.7	20.7
277572 2005 <i>YR</i> ₁₈₆	17.9	X	100.62221	254.84653	102.54656	15.55984	0.1677791	0.44507313	1.70	1.41	1.98	Mc	—	—
278454 2007 <i>TN</i> ₈₄	17.5	X	144.43560	327.42234	3.26663	6.19631	0.26567007	0.30791829	2.17	1.60	2.75	Mc	—	—
278462 2007 <i>TD</i> ₁₆₀	16.0	X	332.13401	89.00307	225.48444	10.16297	0.3055418	0.27211981	2.36	1.64	3.08	Mc	5 29.1	17.6
278471 2007 <i>TF</i> ₂₄₂	16.1	X	106.82341	81.88707	212.02930	25.42072	0.3963596	0.22965681	2.64	1.59	3.69	Mc	12 26.8	21.6
278576 2008 <i>HS</i> ₃₇	17.8	X	329.35680	1.96423	251.27359	3.38331	0.2920438	0.29602192	2.23	1.58	2.88	Mc	2 14.9	20.6
278592 2008 <i>NG</i> ₅	17.0	X	270.01880	274.81143	60.34327	7.65095	0.2994066	0.28798173	2.27	1.59	2.95	Mc	4 6.1	20.7
278635 2008 <i>RQ</i> ₁	17.3	X	158.04333	98.68544	238.40476	5.98551	0.3124101	0.26231690	2.42	1.66	3.17	Mc	1 17.1	21.3
279120 2009 <i>ON</i> ₁₀	16.7	X	65.65586	352.31074	359.20030	10.04741	0.3601196	0.26860382	2.38	1.52	3.24	Mc	—	—
279577 2011 <i>DY</i> ₂₂	16.3	X	176.22950	339.13372	17.28004	6.96072	0.2794556	0.28394443	2.29	1.65	2.93	Mc	2 22.4	20.2
279712 2011 <i>GY</i> ₄₆	15.5	X	80.06588	312.80699	23.80354	14.03795	0.3563683	0.23771445	2.58	1.66	3.50	Mc	—	—
279718 1579 <i>T</i> ₂	17.8	X	80.29272	149.90452	191.53635	5.03864	0.2762180	0.29282653	2.25	1.63	2.87	Mc	—	—
279768 1999 <i>RH</i> ₁₀₄	19.1	X	76.67626	95.23457	219.77255	3.67976	0.3545240	0.32391144	2.10	1.36	2.84	Mc	—	—
279776 1999 <i>TA</i> ₁₂₂	17.6	X	55.27950	55.24045	270.57875	1.63729	0.2767103	0.32067433	2.11	1.53	2.70	Mc	—	—
279815 2000 <i>JT</i> ₃	16.1	X	261.51667	137.40530	176.93692	14.71472	0.3232640	0.27385006	2.35	1.59	3.11	Mc	2 27.9	20.3
279823 2000 <i>RD</i> ₈	15.9	X	346.10859	111.81100	323.58627	23.35706	0.2908789	0.28984023	2.26	1.60	2.92	Mc	—	—
279860 2001 <i>FU</i> ₆	18.8	X	32.77462	188.96931	66.89891	2.08253	0.2848234	0.30270314	2.20	1.57	2.82	Mc	8 30.9	20.4
279893 2001 <i>QZ</i> ₁₃₆	16.6	X	206.50283	149.76562	221.93030	7.11762	0.3042967	0.27742380	2.33	1.62	3.04	Mc	3 31.1	20.9
279976 2001 <i>TQ</i> ₁₀₃	18.0	X	242.19677	262.63608	91.47673	6.58848	0.3148391	0.28228529	2.30	1.58	3.03	Mc	4 7.6	22.1
280017 2001 <i>WC</i> ₂	15.0	X	151.49523	249.36022	263.16717	27.34636	0.3951072	0.22475732	2.68	1.62	3.74	Mc	8 4.5	20.7
280042 2002 <i>AB</i>	16.3	X	222.51235	63.21009	64.36942	30.09249	0.3698831	0.23402293	2.61	1.64	3.57	Mc	9 16.9	21.6
280252 2002 <i>XK</i> ₁₄	17.0	X	353.12862	203.49761	146.51309	6.43387	0.2643291	0.30842702	2.17	1.60	2.74	Mc	11 7.9	18.1
280366 2003 <i>TE</i>	15.8	X	97.71108	268.77388	67.56184	28.57339	0.3958467	0.23290476	2.62	1.58	3.65	Mc	—	—
280481 2004 <i>HL</i> ₄₈	16.1	X	87.16525	264.37666	234.32222	19.91472	0.3212014	0.29422802	2.24	1.52	2.96	Mc	6 3.7	18.9
280488 2004 <i>LL</i> ₃₁	16.4	X	318.07397	120.17781	227.18023	6.40069	0.2819396	0.28652859	2.28	1.64	2.92	Mc	6 24.9	18.4
280742 2005 <i>LY</i> ₄₂	18.6	X	44.14792	333.33136	339.08806	2.00372	0.3556841	0.31355159	2.15	1.38	2.91	Mc	12 16.4	21.7
280853 2005 <i>UY</i> ₂₈₂	18.0	X	50.72744	182.63665	128.74041	2.17320	0.2424583	0.31309944	2.15	1.63	2.67	Mc	12 8.8	20.9
281396 2008 <i>QN</i> ₄₈	16.7	X	214.24529	77.57765	267.47956	3.40161	0.3144212	0.27196774	2.36	1.62	3.10	Mc	3 4.9	21.2
281464 2008 <i>ST</i> ₁₆₇	16.8	X	193.75065	186.41102	184.44414	7.15051	0.3201587	0.27228093	2.36	1.60	3.11	Mc	3 23.7	21.2
282042 1998 <i>SP</i> ₂	16.4	X	91.27480	197.55557	155.59911	9.83478	0.3781645	0.22729107	2.66	1.65	3.66	Mc	—	—
282044 1998 <i>SF</i> ₁₀₇	17.5	X	281.55620	178.97203	191.06793	7.77525	0.2633251	0.29376856	2.24	1.65	2.83	Mc	6 4.7	20.6
282052 1999 <i>SO</i> ₂	15.3	X	101.92684	92.92727	335.62800	21.85989	0.3710637	0.24200592	2.55	1.60	3.50	Mc	3 20.9	19.1
282126 2001 <i>MV</i> ₁	16.4	X	302.92104	65.57232	259.43870	23.30758	0.3047166	0.28888458	2.27	1.58	2.96	Mc	4 15.6	20.0
282128 2001 <i>NT</i> ₁₂	17.3	X	27.52484	125.73947	172.34213	8.19781	0.2477273	0.29987126	2.21	1.66	2.76	Mc	10 20.7	19.4
282137 2001 <i>QE</i> ₁₅₃	17.9	X	23.97418	164.76943	152.27451	3.07183	0.2535859	0.30052968	2.21	1.65	2.77	Mc	11 12.4	20.0
282141 2001 <i>QD</i> ₁₇₀	18.3	X	18.98649	139.14354	171.76321	1.64134	0.3056380	0.29866135	2.22	1.54	2.89	Mc	11 3.5	20.0
282195 2001 <i>UD</i> ₇	17.3	X	335.52368	116.94559	198.93122	6.40476	0.3195314	0.29006259	2.26	1.54	2.98	Mc	6 5.6	18.4
282226 2002 <i>AU</i> ₁₇	17.0	X	279.23310	83.54495	290.65353	7.03208	0.3643129	0.28342593	2.30	1.46	3.13	Mc	5 24.1	20.6
282347 2003 <i>AZ</i> ₂₂	15.6	X	320.97091	251.03834	310.29655	21.36169	0.2994139	0.26983458	2.37	1.66	3.08	Mc	—	—
282443 2003 <i>YT</i> ₉₀	16.4	X	100.85555	197.70832	190.73996	5.72006	0.3705005	0.23606						

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
283389 2000 QV ₂₀₂	17.0	X	269.07084	283.00277	8.46072	7.23682	0.3480190	0.26891432	2.38	1.55	3.20	Mc	2 9.1	21.3
283393 2000 RO ₄₉	16.4	X	143.17303	262.14166	185.08703	20.02521	0.3902676	0.26057959	2.43	1.48	3.38	Mc	5 26.9	21.2
283438 2000 VB ₅₄	17.4	X	204.31380	47.44030	319.07520	3.86833	0.3346534	0.26274984	2.41	1.61	3.22	Mc	3 24.6	22.0
283450 2001 AW ₁	15.3	X	95.54155	198.71871	344.60960	32.84056	0.3663725	0.30511644	2.19	1.38	2.99	Mc	8 26.4	19.0
283461 Leacipa _{QM}	17.9	X	314.07571	35.36777	316.51486	6.48833	0.2899858	0.29289512	2.25	1.59	2.90	Mc	6 22.9	19.9
283470 2001 QM ₁₅₃	16.2	X	325.13721	87.38105	323.78360	22.05754	0.3890368	0.29487807	2.24	1.37	3.11	Mc	12 19.1	17.2
283557 2001 VV ₂	16.3	X	287.26529	261.06559	79.19892	10.60057	0.2913964	0.28416558	2.29	1.62	2.96	Mc	4 30.8	19.6
283626 2002 CK ₂₁₀	16.5	X	256.63783	43.01249	348.88200	3.27103	0.3041317	0.27811085	2.32	1.62	3.03	Mc	6 2.6	20.3
283773 2003 NE ₅	15.5	X	126.15705	56.55418	278.50003	29.01076	0.3944834	0.23825879	2.58	1.56	3.59	Mc	—	—
283887 2004 BZ ₆₈	16.2	X	74.15544	280.17428	182.50537	27.45268	0.3884710	0.23495467	2.60	1.59	3.61	Mc	4 14.1	19.2
283889 2004 BL ₈₉	16.6	X	12.91846	287.58553	282.57273	7.17233	0.2649625	0.29166941	2.25	1.66	2.85	Mc	3 11.9	17.9
283948 2004 PU ₈₅	17.3	X	279.59461	210.84264	146.11423	5.86547	0.2949616	0.27878462	2.32	1.64	3.01	Mc	5 13.2	20.8
284152 2005 XC ₄	15.0	X	194.06458	258.73326	308.87723	26.55074	0.3661864	0.23175034	2.62	1.66	3.59	Mc	11 3.8	20.4
284423 2007 AR ₁₇	16.4	X	83.21603	60.79044	125.88302	25.08049	0.2721835	0.29288445	2.25	1.63	2.86	Mc	7 30.2	19.3
284456 2007 FM ₂₈	17.0	X	33.30117	343.44585	348.14025	8.84461	0.2335382	0.31004167	2.16	1.66	2.67	Mc	12 12.8	19.7
284711 2008 TL ₁₂₀	17.7	X	331.73432	301.18363	66.25083	3.58620	0.2430917	0.30243085	2.20	1.66	2.73	Mc	9 27.4	18.4
284752 2008 VF ₂	18.2	X	287.55513	67.02256	325.17530	2.72690	0.2624089	0.29344572	2.24	1.65	2.83	Mc	7 15.3	20.4
284763 2008 WL ₆₈	18.0	X	359.88531	160.56588	203.04914	1.63233	0.2528177	0.30370384	2.19	1.64	2.75	Mc	12 9.9	19.6
285085 1992 UM ₇	17.7	X	46.15368	121.94752	202.63120	5.61804	0.2356724	0.30967110	2.16	1.65	2.67	Mc	12 19.5	20.6
285093 1994 HC	17.8	X	205.08228	270.43309	154.4366	5.91008	0.3363435	0.31603687	2.13	1.42	2.85	Mc	1 5.8	21.7
285160 1995 WP ₆	18.1	X	176.90564	160.24309	141.78490	4.12694	0.2574783	0.31711104	2.13	1.58	2.68	Mc	—	—
285265 1999 QS ₁₅	17.7	X	316.11679	111.34457	164.92944	27.97555	0.2704499	0.37932651	1.89	1.38	2.40	Mc	2 20.5	20.1
285290 1998 SS ₁₄₀	17.2	X	113.46101	114.45555	252.48844	3.64160	0.3450031	0.27375960	2.35	1.54	3.16	Mc	1 12.9	19.9
285574 2000 QG ₂₀	17.7	X	314.20105	163.24695	169.97328	1.06346	0.2982221	0.27714646	2.33	1.64	3.02	Mc	5 23.1	20.1
285594 2000 QC ₁₁₄	17.2	X	1.11052	210.76715	154.61174	1.52405	0.2995992	0.28534753	2.29	1.60	2.97	Mc	12 19.0	19.4
285602 2000 QG ₁₆₃	16.8	X	248.19875	160.23214	223.33052	7.22993	0.2938399	0.27371154	2.35	1.66	3.04	Mc	5 17.6	20.6
285618 2000 RN ₈	16.2	X	198.22702	95.36398	341.42997	22.13681	0.2936026	0.26789138	2.38	1.45	3.32	Mc	6 13.3	21.3
285631 2000 RB ₈₄	16.7	X	251.85867	171.32817	209.40271	5.90618	0.2935481	0.27359639	2.35	1.66	3.04	Mc	5 17.3	20.5
285732 2000 SU ₃₄₅	17.8	X	157.07081	283.41704	356.08575	7.35158	0.2568896	0.29784670	2.22	1.65	2.79	Mc	—	—
285786 2000 WR ₆₄	17.9	X	97.25600	282.64434	44.61127	2.13790	0.2780387	0.29234027	2.25	1.62	2.87	Mc	—	—
285872 2001 NR ₅	17.5	X	26.00417	200.26962	104.07136	6.21277	0.2629991	0.30024903	2.21	1.63	2.79	Mc	10 31.5	19.7
285902 2001 QS ₉₉	16.4	X	159.02668	291.80724	125.09732	23.45560	0.2933257	0.27997267	2.31	1.64	2.99	Mc	5 2.8	20.9
286101 2001 TM ₇₅	17.8	X	64.96301	139.35068	210.77197	4.05313	0.2385187	0.30632313	2.18	1.66	2.70	Mc	—	—
286168 2001 UY ₁₁	17.1	X	333.65805	117.21783	223.73624	8.11690	0.3074136	0.29054380	2.26	1.56	2.95	Mc	7 20.4	18.2
286273 2001 VA ₇₇	16.4	X	326.58708	244.28033	101.36123	12.41296	0.2807330	0.28908365	2.27	1.63	2.90	Mc	7 14.8	17.7
286811 2002 KH ₉	18.1	X	48.50388	129.36006	155.70907	17.53501	0.1570090	0.42284776	1.76	1.48	2.03	Mc	11 11.1	20.2
286889 2002 PO ₂₁	17.6	X	122.51340	244.71025	138.67616	6.73452	0.2739267	0.28439037	2.29	1.66	2.92	Mc	2 2.7	20.5
287396 2002 VU ₈₅	16.9	X	231.61884	40.14104	280.47395	4.53317	0.2862934	0.28962189	2.26	1.61	2.91	Mc	2 14.5	21.1
287400 2002 VG ₉₅	17.4	X	125.71396	17.09259	336.49576	1.99242	0.3512522	0.27789466	2.33	1.51	3.14	Mc	1 11.2	20.4
287646 2003 KD ₇	17.8	X	153.50751	154.19429	156.69224	8.06568	0.2669556	0.30162494	2.20	1.61	2.79	Mc	—	—
287662 2003 NW ₆	17.2	X	0.85747	230.22033	94.62083	7.72486	0.3032549	0.27652551	2.33	1.63	3.04	Mc	10 15.3	18.7
288132 2003 WO ₈₄	17.9	X	129.12820	154.06735	287.53854	6.63790	0.1771359	0.35837005	1.96	1.62	2.31	Mc	4 4.2	20.2
288324 2004 BS ₅₈	16.9	X	146.64989	252.30639	135.66481	20.86460	0.2699253	0.34975785	2.00	1.46	2.53	Mc	2 27.8	19.6
288638 2004 PJ ₃₂	17.4	X	289.47655	351.39706	352.67418	3.97945	0.2908392	0.28184495	2.30	1.63	2.97	Mc	5 3.4	20.7
288768 2004 RD ₉₅	17.0	X	250.64608	198.16976	208.37165	7.11508	0.3292277	0.28194303	2.30	1.55	3.06	Mc	6 14.7	21.0
288783 2004 RL ₁₀₈	18.1	X	247.50536	77.85060	319.02001	9.15270	0.2837524	0.27952754	2.32	1.66	2.97	Mc	6 2.2	22.1
288860 2004 RQ ₂₂₂	16.4	X	236.89651	255.64521	184.50862	23.75993	0.2735757	0.28354077	2.29	1.67	2.92	Mc	7 18.4	20.6
289022 2004 TN ₁₁₅	15.7	X	244.07917	263.17398	60.54858	21.21757	0.3396845	0.26705340	2.39	1.58	3.20	Mc	3 12.4	20.5
289034 2004 TJ ₁₃₃	16.6	X	28.69198	144.77529	194.96431	6.28059	0.2739593	0.29393395	2.24	1.63	2.85	Mc	12 21.5	19.4
289282 2004 XB ₁₆₇	16.9	X	251.74048	288.24709	107.98824	8.94009	0.3102532	0.27631457	2.33	1.61	3.06	Mc	6 5.2	20.7
289618 2005 GE ₃₂	17.9	X	298.77144	70.38995	175.37939	10.22979	0.1511809	0.35932003	1.96	1.66	2.26	Mc	1 7.2	20.5
290070 2005 QG ₇₁	17.4	X	349.58670	334.17179	356.63693	7.11210	0.3312045	0.30695446	2.18	1.46	2.90	Mc	9 22.8	17.2
290074 Donasado _{QC}	16.9	X	261.62520	310.70179	153.94114	24.01507	0.2443291	0.31186145	2.15	1.63	2.68	Mc	10 2.4	19.5
290124 2005 QJ ₁₄₂	17.1	X	252.13318	256.14235	183.10446	20.23944	0.2738099	0.30167781	2.20	1.60	2.80	Mc	8 1.2	20.7
291005 2005 XR ₉₂	16.6	X	49.68854	321.06717	25.28856	6.42808	0.2374288	0.31122853	2.16	1.64	2.67	Mc	—	—
291252 2006 BP ₅₄	16.8	X	325.74070	274.06018	334.51039	6.31636	0.3635533	0.25973151	2.43	1.55	3.32	Mc	2 2.8	20.1
291542 2006 EK ₄₇	17.0	X	295.61047	26.49889	349.71287	22.62684	0.3070851	0.28819978	2.27	1.57	2.97	Mc	6 28.5	20.2
291877 2006 PB ₁₈	17.4	X	153.02198	177.92530	139.96572	4.27894	0.2707386	0.29194732	2.25	1.64	2.86	Mc	—	—
291907 2006 QU ₁₀	18.2	X	236.38920	178.95548	168.92980	7.42843	0.2314899	0.31135159	2.16	1.66	2.66	Mc	3 25.3	21.7
291919 2006 QU ₂₀	17.1	X	180.18535	201.86416	174.65116	6.44040	0.2638470	0.30161025	2.20	1.62	2.78	Mc	3 17.0	20.5
292227 2006 ST ₅₉	16.4	X	181.70744	92.66949	243.99561	7.65158	0.2724137	0.29702411	2.22	1.62	2.83	Mc	1 26.8	20.1
292819 2006 UG ₂₆₁	17.1	X	113.46876	183.29829	141.18967	8.83389	0.3018739	0.28027441	2.31	1.61	3.01	Mc	—	—
293553 2007 HJ ₃₆	17.9	X	106.48179	290.41350	34.69527	4.24175	0.2263376	0.31294611	2.15	1.66	2.63	Mc	—	—
293648 2007 PX ₂	17.6	X	84.84172	229.66274	94.69843	2.52211	0.2682507	0.30108363	2.20	1.61	2.80	Mc	—	—
293940 2007 TX ₁₂	17.0	X	114.92713	293.76337	25.34764	7.76639	0.2493725	0.30099128	2.21	1.66	2.76	Mc	—	—
293965 2007 TG ₄₅	16.7	X	321.00183	121.91400	200.08165	11.98329	0.3143550	0.27173387	2.36	1.62	3.10	Mc	5 16.6	19.0
294169 2007 TD ₃₇₄	15.4	X	308.61021	281.28485	119.52523	22.41761	0.3125814	0.26822622	2.38	1.64	3.13	Mc	9 2.3	17.5
294349 2007 VC ₉₂	17.3	X	122.35855	280.19101	10.17197	7.60144	0.2699249	0.29698401	2.22	1.62	2.83	Mc	—	—
294698 2008 BJ ₂	17.5	X	67.90572	271.26302										

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
297530 2001 <i>FH</i> ₃₁	18.0 ^m	X	341.74303	301.96643	183.71911	28.27378	0.0901722	0.42801355	1.74	1.59	1.90	Mc	—	—
297535 2001 <i>HN</i> ₅₅	17.0	X	73.65516	179.95410	77.08663	8.76615	0.2376545	0.30566786	2.18	1.66	2.70	Mc	10 24.2	20.1
297539 2001 <i>OY</i> ₅₁	18.0	X	18.79033	295.29392	61.44987	2.08201	0.2642594	0.30345754	2.19	1.61	2.77	Mc	—	—
297612 2001 <i>SQ</i> ₃₂₈	18.0	X	356.43592	317.33350	355.16708	5.96439	0.2613287	0.29493069	2.24	1.65	2.82	Mc	8 28.9	18.6
297695 2001 <i>VK</i> ₃₄	17.3	X	339.41384	299.79504	74.86619	2.73563	0.3166842	0.29478250	2.24	1.53	2.94	Mc	11 12.9	17.5
297837 2002 <i>BX</i>	16.8	X	264.65209	85.71469	314.31454	22.02073	0.3244160	0.28240023	2.30	1.55	3.05	Mc	6 22.1	20.7
297839 2002 <i>BE</i> ₁₇	15.9	X	188.43045	76.22620	157.49200	28.78817	0.3665914	0.23504702	2.60	1.65	3.55	Mc	12 13.1	21.3
297847 2002 <i>CH</i> ₇	16.8	X	249.12676	63.62005	11.45483	23.12395	0.2886281	0.28494696	2.29	1.63	2.95	Mc	8 4.9	20.8
298615 2004 <i>AE</i> ₈	17.1	X	133.40985	281.07947	129.26978	13.94224	0.3473448	0.24340346	2.54	1.66	3.42	Mc	4 6.9	21.6
298680 2004 <i>DJ</i> ₂₅	18.1	X	112.91704	251.99545	184.63216	6.73910	0.2688135	0.34952992	2.00	1.46	2.53	Mc	3 25.8	20.1
298737 2004 <i>GQ</i> ₃₅	17.2	X	84.24367	342.11829	263.50476	5.83416	0.2618681	0.30321481	2.19	1.62	2.77	Mc	10 15.7	20.5
298747 2004 <i>GU</i> ₇₆	17.1	X	56.83289	208.43599	100.39879	28.78817	0.3024849	0.30618857	2.18	1.52	2.84	Mc	12 16.9	20.3
298767 2004 <i>NS</i> ₃	17.2	X	27.92049	273.63000	23.08093	8.33309	0.2762412	0.29436362	2.24	1.62	2.86	Mc	10 20.9	19.3
298791 2004 <i>PZ</i> ₁₀₁	16.7	X	302.84157	13.75919	313.47979	3.45258	0.2980227	0.27951162	2.32	1.63	3.01	Mc	4 25.2	19.8
298824 2004 <i>RB</i> ₈₀	17.4	X	33.38363	292.39185	336.06550	1.57534	0.3737766	0.29091589	2.26	1.41	3.10	Mc	10 5.0	19.5
299198 2005 <i>GQ</i> ₁₇₂	16.3	X	182.97436	47.77643	37.28390	12.54298	0.3413710	0.25970412	2.43	1.60	3.26	Mc	6 13.6	21.1
299346 2005 <i>SG</i> ₁₇₇	17.9	X	86.95383	310.76101	336.16093	4.08609	0.2384975	0.31755983	2.13	1.62	2.64	Mc	12 11.2	21.3
300281 2007 <i>ME</i> ₅	16.9	X	261.73197	160.77512	200.77300	11.53014	0.3137530	0.27500954	2.34	1.61	3.08	Mc	4 29.9	20.7
301583 2010 <i>BR</i> ₂	15.7	X	52.90407	276.16397	294.51375	21.33456	0.3021923	0.27910636	2.32	1.62	3.02	Mc	7 25.3	17.9
301846 1993 <i>OV</i> ₁	17.0	X	301.54087	324.46906	310.43382	11.25511	0.3469714	0.27548513	2.34	1.32	3.36	Mc	2 1.9	21.1
301894 1998 <i>RX</i> ₂₈	17.4	X	133.94796	183.76880	156.74694	9.12362	0.3678981	0.23147752	2.63	1.66	3.59	Mc	1 11.7	21.7
301907 1998 <i>XB</i> ₉	16.1	X	27.98971	108.32005	318.89835	13.54500	0.4783211	0.22162847	2.70	1.41	4.00	Mc	—	—
301910 1998 <i>YM</i> ₈	15.3	X	347.12500	94.46953	333.20425	29.00504	0.4047083	0.21590370	2.75	1.64	3.87	Mc	—	—
301917 1999 <i>SK</i> ₂	16.4	X	1.00913	234.39455	355.40333	4.65425	0.4533784	0.26301538	2.41	1.32	3.51	Mc	2 15.8	17.6
301925 1999 <i>XZ</i> ₆₉	15.7	X	340.04406	111.20434	81.58323	8.97106	0.4396257	0.23400142	2.61	1.46	3.75	Mc	—	—
301936 2000 <i>AH</i> ₉₇	15.2	X	30.16249	103.93612	326.20188	27.58764	0.3896866	0.22914970	2.64	1.61	3.68	Mc	—	—
301962 2000 <i>ET</i> ₂₆	15.5	X	74.21684	74.47227	5.80001	26.43281	0.4376679	0.23405772	2.61	1.47	3.75	Mc	3 23.0	18.1
301964 2000 <i>EJ</i> ₃₇	13.4	X	13.69736	115.73974	178.37759	10.06932	0.7060593	0.09904610	4.63	1.36	7.89	Jc	11 9.1	17.7
301965 2000 <i>EN</i> ₁₇₂	16.3	X	32.04956	85.60601	58.31333	28.01770	0.3732277	0.23196104	2.62	1.64	3.60	Mc	3 10.1	18.6
301968 2000 <i>FX</i> ₂	14.6	X	48.89438	80.47115	19.88725	24.73604	0.4112756	0.23338365	2.61	1.54	3.69	Mc	2 26.4	16.5
301982 2000 <i>KT</i> ₄	16.5	X	2.39334	67.95277	234.81217	21.10547	0.2754026	0.28487694	2.29	1.66	2.92	Mc	8 12.6	18.5
301988 2000 <i>NN</i> ₁₀	15.5	X	313.38160	118.47159	249.35042	21.13252	0.2909691	0.28097423	2.31	1.64	2.98	Mc	7 11.2	17.9
301991 2000 <i>PM</i> ₁	17.3	X	273.41258	277.72851	68.36436	6.52460	0.3468890	0.27255680	2.36	1.54	3.17	Mc	4 18.6	21.1
302024 2000 <i>SM</i> ₁₃₄	17.3	X	359.95472	38.62134	257.86829	7.24325	0.2838646	0.27995153	2.31	1.66	2.97	Mc	8 1.0	18.2
302098 2001 <i>FG</i> ₃₁	16.1	X	223.64145	296.37292	202.62644	23.06311	0.4859639	0.17501698	3.17	1.63	4.70	Mc	8 30.8	22.5
302100 2001 <i>FA</i> ₉₇	16.2	X	143.11427	205.50922	32.69969	11.02706	0.4127285	0.21586945	2.75	1.62	3.89	Mc	11 15.6	21.7
302111 2001 <i>MM</i> ₃	14.4	X	146.55780	88.56415	224.86465	29.13134	0.4069989	0.21599969	2.75	1.63	3.87	Mc	—	—
302119 2001 <i>PF</i> ₄₃	17.8	X	354.96878	226.37072	98.57748	7.47542	0.2552753	0.29651849	2.23	1.66	2.80	Mc	9 23.1	19.0
302129 2001 <i>QY</i> ₁₉₃	17.0	X	24.25317	85.69334	244.70706	6.00911	0.2599381	0.29977174	2.21	1.64	2.79	Mc	12 1.9	19.4
302132 2001 <i>QD</i> ₂₄₃	18.5	X	358.09165	152.83915	170.07580	7.01839	0.3198022	0.29593063	2.23	1.52	2.94	Mc	10 7.3	19.0
302141 2001 <i>SD</i> ₅	18.2	X	43.22636	268.04951	8.98078	1.37522	0.3825035	0.29822223	2.22	1.37	3.07	Mc	10 31.9	21.1
302162 2001 <i>SL</i> ₃₃₃	17.5	X	43.54808	258.79124	57.46772	4.73683	0.2500826	0.30076181	2.21	1.65	2.76	Mc	12 5.6	20.2
302193 2001 <i>UA</i>	17.5	X	24.79313	282.50533	53.73169	7.18350	0.2677561	0.30018193	2.21	1.62	2.80	Mc	12 7.3	19.9
302366 2002 <i>CJ</i> ₁₀	15.6	X	277.92661	250.84762	124.56324	22.51428	0.4065405	0.28093288	2.31	1.37	3.25	Mc	5 27.9	19.7
302530 2002 <i>LC</i> ₅₈	15.1	X	70.11274	112.26787	228.30772	29.15559	0.4241742	0.21674654	2.74	1.58	3.91	Mc	—	—
302531 2002 <i>LL</i> ₅₈	15.7	X	86.93726	295.95335	43.12897	5.31697	0.4076501	0.22266434	2.70	1.60	3.79	Mc	—	—
302578 2002 <i>PC</i> ₁₁₀	16.5	X	78.30273	69.03810	330.45063	13.06685	0.4393346	0.22488511	2.68	1.50	3.85	Mc	2 4.0	19.1
302785 2002 <i>XR</i> ₄₀	15.3	X	70.84441	95.95243	319.71883	29.34255	0.4020086	0.21717757	2.74	1.64	3.84	Mc	2 6.2	17.5
302874 2003 <i>HM</i> ₃₇	16.9	X	311.98011	77.82434	227.68968	21.57645	0.2989521	0.27080333	2.37	1.66	3.07	Mc	4 5.8	20.3
302898 2003 <i>QU</i> ₁₀	18.8	X	164.69899	13.34962	349.57570	1.26521	0.4120800	0.24745774	2.51	1.48	3.55	Mc	3 1.8	23.5
302992 2003 <i>WH</i> ₂₆	16.0	X	160.28167	256.35198	71.86280	28.40984	0.4140060	0.23941859	2.57	1.51	3.63	Mc	1 21.0	21.1
303079 2004 <i>AB</i>	16.0	X	326.61099	2.18230	196.60770	15.40783	0.4326053	0.22329344	2.69	1.53	3.85	Mc	—	—
303142 2004 <i>DU</i> ₂₄	15.9	X	122.91869	24.05041	45.69004	3.89918	0.4733716	0.23909124	2.57	1.35	3.79	Mc	4 27.8	20.4
303226 2004 <i>NY</i> ₃₀	14.6	X	247.57384	287.93487	114.21909	20.53156	0.4563272	0.16340571	3.31	1.80	4.83	Ja	6 4.4	20.9
303244 2004 <i>QQ</i> ₄	17.0	X	348.03474	29.12094	294.72246	6.44689	0.3019281	0.28732514	2.27	1.59	2.96	Mc	8 15.4	17.3
303946 2005 <i>XR</i> ₂₈	16.6	X	303.96645	353.68173	104.35549	25.72620	0.2608990	0.30584140	2.18	1.61	2.75	Mc	12 25.8	17.3
303959 2005 <i>YW</i> ₁₉₅	16.9	X	232.55719	144.33744	345.02850	27.88995	0.2981992	0.29513930	2.23	1.57	2.90	Mc	9 14.4	20.3
304093 2006 <i>HM</i> ₂₉	16.6	X	101.19507	107.35257	176.53279	9.10768	0.4162243	0.21802572	2.73	1.60	3.87	Mc	12 16.3	22.0
304292 2006 <i>SK</i> ₇₇	15.2	X	137.51215	10.54555	260.95314	19.90116	0.4601997	0.21835752	2.73	1.47	3.99	Mc	12 20.7	20.9
304782 2007 <i>MX</i> ₃	16.6	X	233.46837	75.89882	248.27522	8.37972	0.3177560	0.25878520	2.44	1.66	3.21	Mc	2 19.8	21.3
304908 2007 <i>RM</i> ₂₈₁	16.8	X	155.50680	280.61913	102.27752	12.43532	0.3512457	0.24476750	2.53	1.64	3.42	Mc	3 21.7	21.5
304936 2007 <i>SG</i> ₂	17.2	X	116.60551	268.76923	179.21748	32.18881	0.4144726	0.24539328	2.53	1.48	3.57	Mc	5 12.7	22.0
306173 2010 <i>NK</i> ₈₃	13.6	X	252.86527	341.94003	103.17701	11.32499	0.5823598	0.06873921	5.90	2.46	9.34	Jc	7 13.7	22.6
306288 2011 <i>SM</i> ₂₈	16.8	X	25.82510	4.91198	321.65102	8.67370	0.2962144	0.30347117	2.19	1.54	2.84	Mc	12 4.2	19.4
306375 1980 <i>RG</i> ₁	16.5	X	168.28495	113.43951	236.23292	4.51540	0.4666346	0.22809547	2.65	1.41	3.89	Mc	2 18.6	21.8
306376 1983 <i>TA</i>	16.7	X	197.21917	58.00950	5.90450	29.08438	0.4715879	0.22485428	2.68	1.42	3.94	Mc	5 17.7	22.7
306381 1993 <i>RR</i> ₂	15.8	X	158.30531	161.92074	154.86148	11.36558	0.4864							

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
306477 1999 SY ₂	16.0 ^m	X	145.74935	120.08952	228.97968	23.19369	0.2994549	0.28901582	2.27	1.59	2.94	Mc	1 10.8	19.8
306478 1999 SP ₃	14.8	X	23.80710	100.48579	295.17987	26.73715	0.4040869	0.22868587	2.65	1.58	3.72	Mc	—	—
306479 1999 SE ₁₆	16.7	X	134.19162	184.50921	215.26621	14.93636	0.3503534	0.24631155	2.52	1.64	3.40	Mc	3 16.9	21.2
306490 1999 TR ₂₃₂	16.6	X	214.38259	220.49659	88.52938	7.80602	0.3912688	0.24948438	2.50	1.52	3.48	Mc	1 27.6	21.5
306514 1999 VX ₁₇₈	15.9	X	8.27318	119.10497	202.11770	23.17878	0.4955487	0.17920185	3.12	1.57	4.66	Mc	11 6.4	18.4
306517 1999 WY	14.5	X	56.29352	95.55396	285.56967	26.19450	0.4237241	0.23069563	2.63	1.52	3.75	Mc	—	—
306522 1999 XZ ₁₄	15.8	X	79.58428	273.78633	89.29206	23.73150	0.3271437	0.27881538	2.32	1.56	3.08	Mc	—	—
306540 1999 YB ₆	14.7	X	28.62563	84.79385	321.13300	26.75416	0.3988060	0.23210432	2.62	1.58	3.67	Mc	—	—
306587 2000 FL ₂₄	15.8	X	201.06722	191.68217	93.89325	11.99742	0.4171570	0.21685158	2.74	1.60	3.89	Mc	—	—
306590 2000 GL ₃	16.1	X	41.65898	255.88287	202.19853	24.47094	0.4707762	0.23150088	2.63	1.39	3.86	Mc	—	—
306600 2000 HO ₂₇	15.8	X	273.90403	4.33441	234.46314	10.48243	0.4626623	0.22321880	2.69	1.45	3.94	Mc	—	—
306605 2000 LV ₂₅	14.9	X	184.40640	109.49865	239.55429	30.38991	0.4349458	0.21449105	2.76	1.56	3.97	Mc	2 15.7	21.0
306606 2000 LU ₃₆	14.5	X	266.02452	219.42449	140.63707	9.61365	0.4072628	0.22600447	2.67	1.58	3.76	Mc	4 28.8	19.3
306607 2000 OD ₂	17.1	X	301.11099	183.90839	162.98474	7.00631	0.3109454	0.27726225	2.33	1.60	3.05	Mc	5 22.4	20.0
306613 2000 QX ₁	14.6	X	187.11792	84.71913	297.62426	27.91491	0.4093772	0.21486368	2.76	1.63	3.89	Mc	3 21.4	20.6
306614 2000 QL ₂	16.0	X	237.17565	118.39458	294.62171	22.00211	0.3108901	0.27204299	2.36	1.63	3.09	Mc	6 15.4	20.2
306642 2000 SP ₄₂	16.2	X	336.44584	26.20168	53.67346	10.21613	0.4599311	0.23680878	2.59	1.40	3.78	Mc	—	—
306659 2000 ST ₂₁₆	16.1	X	103.26555	316.56760	142.42063	7.64847	0.4210341	0.25621506	2.46	1.42	3.49	Mc	5 15.8	20.1
306664 2000 SO ₂₆₆	17.7	X	306.60480	185.29572	143.94308	4.44232	0.3126763	0.27453527	2.34	1.61	3.08	Mc	5 4.7	20.6
306665 2000 SO ₂₇₇	16.8	X	20.47356	5.71839	279.77169	6.38930	0.4105319	0.28115654	2.31	1.36	3.26	Mc	10 11.1	18.8
306678 2000 UK	15.7	X	135.70009	94.53634	347.87238	28.71998	0.4097302	0.21114989	2.79	1.65	3.94	Mc	5 3.2	21.4
306679 2000 UO ₁₁	16.6	X	252.47984	276.81518	60.86033	13.31166	0.3108057	0.26881208	2.38	1.64	3.12	Mc	3 30.5	20.9
306695 2000 VL ₁	15.4	X	251.58525	54.62115	93.14443	30.62079	0.4537342	0.22760555	2.66	1.45	3.86	Mc	10 23.7	20.3
306703 2000 WT	16.4	X	272.81742	92.89661	327.02775	20.90773	0.2953141	0.27479466	2.34	1.65	3.04	Mc	8 2.5	19.6
306715 2000 WY ₅₀	14.5	X	111.88008	293.35828	240.19519	27.75513	0.4305477	0.21386076	2.77	1.58	3.96	Mc	8 7.8	20.2
306722 2000 WF ₁₀₇	15.9	X	38.75277	276.69423	108.55819	27.35929	0.3964521	0.24250622	2.55	1.54	3.56	Mc	—	—
306749 2000 YS ₂	17.8	X	264.57155	73.99220	44.14054	5.94954	0.2527133	0.32490794	2.10	1.57	2.63	Mc	10 24.7	19.3
306769 2001 BX ₂	16.3	X	49.12309	336.73276	29.72618	10.75296	0.4052287	0.28617370	2.28	1.36	3.20	Mc	—	—
306772 2001 CY ₁	15.6	X	53.25568	48.14917	0.94925	5.06927	0.3526896	0.24118917	2.56	1.65	3.46	Mc	—	—
306778 2001 DF ₉₂	16.1	X	245.11000	87.35210	350.77410	22.22361	0.4164839	0.22036572	2.71	1.58	3.85	Mc	7 20.3	21.3
306787 2001 HS ₈	15.8	X	64.05517	12.11853	216.43006	22.96558	0.4518892	0.20475772	2.85	1.56	4.14	Mc	9 16.4	20.6
306788 2001 HV ₂₄	17.6	X	169.47187	236.79259	60.94424	3.68273	0.2540099	0.32320151	2.10	1.57	2.64	Mc	—	—
306790 2001 KB ₁	14.7	X	208.12071	88.10930	245.70996	26.41050	0.4088268	0.23037579	2.64	1.56	3.71	Mc	2 10.1	20.5
306795 2001 OQ ₅₀	15.3	X	199.24091	59.08137	316.07733	16.45103	0.4039169	0.22740641	2.66	1.58	3.73	Mc	3 27.1	20.8
306798 2001 OW ₉₄	16.4	X	220.89911	9.23112	16.90789	9.10966	0.4102099	0.22928976	2.64	1.56	3.73	Mc	4 26.7	21.6
306805 2001 QO ₆₅	15.1	X	209.55734	248.80218	166.61654	28.13725	0.4185693	0.23220542	2.62	1.52	3.72	Mc	5 29.8	20.8
306811 2001 QV ₁₄₇	15.2	X	179.32601	181.37513	125.58385	15.02522	0.4118130	0.21914767	2.72	1.60	3.85	Mc	1 8.8	20.5
306819 2001 QM ₂₃₇	17.7	X	10.62103	33.01554	357.81915	4.43992	0.2918585	0.30271819	2.20	1.56	2.84	Mc	—	—
306826 2001 RZ ₁₇	16.0	X	248.25157	93.98215	333.14245	27.93538	0.4115036	0.24080565	2.56	1.51	3.61	Mc	7 10.3	21.0
306839 2001 SG ₃₅	17.8	X	352.27743	264.08681	123.40268	2.24546	0.2848092	0.29940314	2.21	1.58	2.84	Mc	—	—
306857 2001 SP ₁₆₉	15.8	X	276.32965	265.77985	12.38614	26.97841	0.4228142	0.23350036	2.61	1.51	3.72	Mc	2 7.5	21.1
306865 2001 SS ₂₆₃	15.6	X	181.07031	83.33784	341.92676	15.45002	0.4251667	0.22389467	2.69	1.54	3.83	Mc	5 17.8	21.2
306866 2001 SN ₂₆₈	15.6	X	75.05984	129.53666	321.39937	8.39966	0.4219549	0.22007585	2.72	1.57	3.86	Mc	3 31.9	18.9
306869 2001 SH ₂₈₈	17.7	X	68.81500	224.97686	91.35621	8.10235	0.3027354	0.30514475	2.19	1.52	2.85	Mc	—	—
306876 2001 TE	16.0	X	93.93706	322.57607	25.33203	9.23899	0.4428602	0.26304628	2.41	1.34	3.48	Mc	—	—
306886 2001 TC ₆₃	17.9	X	28.57294	233.56315	114.59706	1.61421	0.2480848	0.30054251	2.21	1.66	2.75	Mc	12 30.3	20.6
306895 2001 TT ₁₂₇	16.4	X	161.15416	247.29093	243.21182	19.08021	0.2875685	0.28152714	2.31	1.64	2.97	Mc	7 20.0	20.9
306917 2001 UW ₄	18.8	X	242.26371	159.78400	333.71010	3.38920	0.0660361	0.49749494	1.58	1.47	1.68	Mc	—	—
306918 2001 UQ ₁₁	17.1	X	233.85763	234.93434	55.83723	3.87188	0.5078723	0.22589285	2.67	1.31	4.03	Mc	1 17.6	22.7
306919 2001 UU ₁₇	16.0	X	171.94010	284.19289	183.79182	27.81104	0.4010332	0.23294876	2.62	1.57	3.67	Mc	7 4.8	21.7
307005 2001 XP ₁	18.0	X	334.74667	246.34933	268.05121	39.20823	0.7552575	0.20042062	2.89	0.72	5.07	Jc	—	—
307006 2001 XQ ₁	14.9	X	261.53291	34.09412	10.22963	33.54638	0.4044488	0.23318955	2.61	1.56	3.67	Mc	6 5.7	20.1
307009 2001 XC ₄₀	17.3	X	354.46228	40.60233	316.56983	10.10674	0.3467626	0.24448393	2.53	1.65	3.41	Mc	11 8.7	17.4
307064 2002 AR ₅	15.6	X	351.96610	173.57080	120.12449	23.20465	0.1444512	0.47941854	1.62	1.38	1.85	Mc	7 6.6	16.9
307067 2002 AJ ₁₀	15.1	X	358.40011	67.70660	327.65297	27.81379	0.3833714	0.24350660	2.54	1.57	3.51	Mc	—	—
307068 2002 AX ₁₄	18.1	X	358.34355	256.75045	258.38784	21.61210	0.0748900	0.51225470	1.55	1.43	1.66	Mc	—	—
307143 2002 CQ ₂₁₉	18.2	X	283.15073	201.22247	348.43519	7.36338	0.3479293	0.24513811	2.53	1.65	3.41	Mc	—	—
307162 2002 DM ₉	14.2	X	336.65773	272.70109	359.16195	28.69677	0.4206556	0.21279086	2.78	1.61	3.95	Mc	3 18.9	16.9
307190 2002 EK ₁₃₀	15.9	X	128.94285	327.38355	292.30819	10.80145	0.4302449	0.22876031	2.65	1.51	3.79	Mc	12 4.3	21.3
307197 2002 FZ ₁	17.6	X	81.40047	262.50464	19.13826	22.97589	0.2216052	0.43203657	1.73	1.35	2.12	Mc	12 9.7	20.5
307198 2002 FJ ₃	16.0	X	248.14155	265.59664	189.79045	26.80171	0.4360031	0.23383600	2.61	1.47	3.75	Mc	7 30.6	21.2
307227 2002 GE ₁₂₃	17.6	X	90.86982	289.42855	185.84620	4.57640	0.2721019	0.31273932	2.15	1.56	2.73	Mc	4 27.1	19.6
307240 2002 HJ ₆₇	16.1	X	197.99812	304.60724	236.39691	23.14243	0.3646341	0.28170073	2.30	1.46	3.15	Mc	10 16.1	20.5
307263 2002 JT ₂₆	16.1	X	330.34937	116.30377	144.76691	13.89173	0.4305941	0.19972487	2.90	1.65	4.15	Mc	2 24.2	19.8
307286 2002 PA ₉₆	15.2	X	20.00241	69.47623	318.94310	23.04916	0.4887347	0.16185160	3.33	1.70	4.96	Jc	—	—
307298 2002 QV ₆	16.7	X	287.42319	281.98067	333.61624	26.65466	0.4136534	0.24388817	2.54	1.49	3.59	Mc	1 14.5	21.7
307378 2002 SF ₅₂	17.1	X	177.85943	215.46231	81.08312	7.64167	0.3889224	0.23156416	2.63	1.60	3.65	Mc	—	—
307419 2002 TN ₂₃₇	14.9	X	310.37015	267.10499	232.97695	27.83870	0.4074087	0.21226617	2.78	1.65	3.92	Mc	—	—
307457 2002 VE ₆₆	15.7	X	169.16378	89.62673	56.18904	26.84762	0.3854966	0.24358369	2.54	1.56	3.52	Mc		

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
307877 2004 BG ₆₉	15.8 ^m	X	316.51283	276.89444	164.53011	9.95420	0.4152236	0.21289808	2.78	1.62	3.93	Mc	10 31.7	17.3
307971 2004 LG ₆	15.3	X	313.02404	94.11025	100.28489	14.51367	0.4707451	0.21881504	2.73	1.44	4.01	Mc	—	—
307984 2004 QV ₁₃	16.0	X	323.19707	86.41551	292.91228	23.45006	0.3066148	0.28525166	2.29	1.58	2.99	Mc	8 19.3	17.7
307986 2004 QT ₂₆	16.1	X	79.70958	6.90289	331.06918	13.31123	0.3538039	0.24357399	2.54	1.64	3.44	Mc	—	—
308004 2004 RT ₁₁₀	16.0	X	311.81807	119.68789	314.78017	22.13914	0.3062658	0.28772123	2.27	1.58	2.97	Mc	11 4.9	17.9
308014 2004 RH ₁₉₇	17.6	X	84.28844	91.99201	197.77873	5.88229	0.2495777	0.29967213	2.21	1.66	2.76	Mc	12 11.6	21.2
308020 2004 RM ₂₂₂	15.2	X	151.18910	54.10246	16.01642	13.99941	0.4428794	0.20074771	2.89	1.61	4.17	Mc	5 9.9	20.9
308084 2004 UF ₁	17.2	X	259.20717	259.40445	216.00364	22.48360	0.3317056	0.28533601	2.29	1.53	3.04	Mc	9 17.6	20.7
308108 2004 XB	16.9	X	290.97591	61.53794	292.45657	11.77303	0.0985164	0.39433321	1.84	1.66	2.02	Mc	6 19.3	18.3
308117 2004 XD ₆₁	15.7	X	108.50802	0.53117	348.86428	17.96734	0.3528193	0.24686142	2.52	1.63	3.40	Mc	—	—
308128 2004 XK ₁₃₃	16.6	X	324.23117	315.26818	41.79758	8.76626	0.2743637	0.28446277	2.29	1.66	2.92	Mc	8 5.5	18.1
308195 2005 EW ₁₂	17.3	X	44.59542	73.27113	17.09890	3.44398	0.4533833	0.24458854	2.53	1.38	3.68	Mc	—	—
308198 2005 EK ₂₉	19.0	X	6.28417	336.84261	171.76766	15.04561	0.1800184	0.48093404	1.61	1.32	1.90	Mc	—	—
308273 2005 GL ₁₅₆	16.1	X	12.70618	213.25877	113.26996	1.55382	0.4287277	0.25597643	2.46	1.40	3.51	Mc	11 28.9	18.4
308306 Dainere	16.2	X	303.73416	250.19933	84.96424	23.08429	0.5549425	0.17707260	3.14	1.40	4.88	Ja	4 23.1	21.5
308604 2005 VX ₁₁₂	19.8	X	47.84521	225.72034	228.98293	5.23237	0.3270105	0.32805911	2.08	1.40	2.76	Mc	—	—
308607 2005 WY ₃	13.5	X	278.23943	309.08825	190.11752	29.39996	0.7337415	0.05645923	6.73	1.79	11.67	Jc	9 7.4	23.0
308698 2006 FZ ₉	16.2	X	172.67942	275.40220	203.44610	29.09875	0.4008825	0.21974480	2.72	1.63	3.81	Mc	7 14.2	22.1
308771 2006 OK ₁₃	17.8	X	204.41269	296.63850	19.35447	1.40746	0.2741349	0.30069910	2.21	1.60	2.81	Mc	1 21.5	21.5
309166 2007 BA ₈	16.3	X	195.92300	57.65478	35.71419	27.54542	0.4200010	0.23665172	2.59	1.50	3.68	Mc	7 1.1	21.9
309215 2007 LN ₁₈	15.9	X	310.86679	38.65404	272.78876	23.89782	0.3133718	0.27328656	2.35	1.61	3.09	Mc	4 1.6	19.7
309273 2007 RD ₁₂₈	18.0	X	161.21448	278.55128	166.88386	3.45949	0.3801828	0.25425163	2.47	1.53	3.41	Mc	6 3.4	22.8
309319 2007 SO	15.5	X	353.77265	128.48025	305.00974	7.78261	0.4448792	0.21865038	2.73	1.51	3.94	Mc	—	—
310024 2009 TA	15.7	X	187.90727	37.06734	354.23750	19.48391	0.4154092	0.21331403	2.77	1.62	3.93	Mc	4 10.9	21.4
310379 1994 NZ	16.6	X	21.35778	293.21513	289.02578	10.37630	0.4943745	0.21868011	2.73	1.38	4.08	Mc	7 10.3	17.2
310395 1998 TM ₁₅	17.8	X	190.99403	299.16780	287.66539	2.19393	0.1064991	0.39512415	1.84	1.64	2.04	Mc	—	—
310404 1999 RL ₁	17.5	X	237.17679	24.96428	342.23634	5.49349	0.3272931	0.25579738	2.46	1.63	3.29	Mc	4 15.2	22.2
310429 1999 XP ₁₉	15.7	X	203.89709	48.91743	35.63289	5.66939	0.4281221	0.25587218	2.46	1.41	3.51	Mc	6 25.9	20.6
310434 2000 AP ₁₄₆	15.2	X	41.59971	307.61970	281.59110	23.50875	0.4173594	0.24236534	2.55	1.48	3.61	Mc	8 12.9	18.3
310435 2000 AJ ₁₅₆	16.5	X	262.60948	279.91635	92.78316	7.49156	0.3289927	0.25736083	2.45	1.64	3.25	Mc	5 15.0	20.7
310451 2000 PT ₂₇	15.7	X	6.62489	80.09850	276.02025	21.05515	0.2888290	0.28439307	2.29	1.63	2.95	Mc	12 13.1	17.8
310458 2000 QA ₁₈₀	15.9	X	334.71982	95.84933	354.63994	23.31139	0.3040353	0.28986029	2.26	1.57	2.95	Mc	—	—
310464 2000 SF	15.1	X	291.96977	57.63959	340.00888	22.39099	0.3149588	0.27608312	2.34	1.60	3.07	Mc	7 28.9	18.0
310522 2000 YS ₆₆	16.4	X	253.56078	281.86464	111.60790	8.05740	0.3498297	0.26809980	2.38	1.55	3.22	Mc	5 31.3	20.5
310535 2001 BJ ₄₃	17.5	X	182.95584	155.09371	284.18368	7.51112	0.2328372	0.35770595	1.97	1.51	2.42	Mc	6 4.7	20.7
310574 2001 SH ₂₆₂	17.0	X	12.19913	298.54832	147.63198	3.62751	0.5137003	0.20796726	2.82	1.37	4.27	Mc	—	—
310582 2001 TP ₂₃₅	17.6	X	80.24914	256.93457	84.23084	7.50797	0.2582077	0.30706325	2.18	1.61	2.74	Mc	—	—
310616 2002 AX	17.6	X	352.58983	317.69222	74.88375	8.38764	0.3869705	0.29653965	2.23	1.37	3.09	Mc	—	—
310728 2002 PD ₄₈	15.9	X	121.21028	257.46044	169.47145	28.25765	0.3971402	0.23319882	2.61	1.58	3.65	Mc	4 20.8	20.7
310770 2002 RO ₂₅₁	15.5	X	148.20564	276.47222	79.21235	5.15689	0.4212658	0.12738240	3.91	3.05	4.78	Ja	2 12.3	21.8
310777 2002 ST ₁₉	16.4	X	126.75711	277.67637	165.09151	27.60998	0.4322331	0.23349910	2.61	1.48	3.74	Mc	5 17.4	21.7
310879 2003 ON ₁₂	16.3	X	255.19498	87.35994	287.65009	20.20130	0.3079474	0.26469317	2.40	1.66	3.14	Mc	5 6.9	20.7
310991 2003 WH ₈₄	16.9	X	204.11511	143.35729	268.41896	7.23990	0.3372303	0.25588220	2.46	1.63	3.29	Mc	5 18.4	21.5
311116 2004 NZ ₂₃	17.6	X	72.46292	78.43760	234.48793	3.81376	0.2439657	0.30223011	2.20	1.66	2.74	Mc	12 29.4	21.0
311143 2004 RL ₂₂₆	17.1	X	286.75728	264.61254	180.35619	27.71337	0.3397950	0.28828259	2.27	1.50	3.04	Mc	9 17.6	19.1
311151 2004 SK ₂₆	16.2	X	22.60964	279.76876	65.43548	23.39727	0.2810680	0.29442895	2.24	1.61	2.87	Mc	12 19.7	18.9
311154 2004 TF ₃	17.5	X	140.90319	7.47449	310.43158	8.43598	0.3141209	0.31155099	2.16	1.48	2.83	Mc	—	—
311221 2005 AS ₂₈	16.9	X	77.12138	144.18737	82.10961	5.97164	0.3693371	0.26332443	2.41	1.52	3.30	Mc	9 27.8	20.8
311999 2007 NS ₂	18.1	X	357.36726	177.09030	282.47043	16.62111	0.0540450	0.52401072	1.52	1.44	1.61	MT	—	—
312004 2007 PW ₂₇	15.9	X	308.00019	294.31089	125.18517	23.05860	0.2935192	0.28608073	2.28	1.61	2.95	Mc	10 22.5	18.0
312958 1997 QP ₂	17.2	X	189.50565	52.26377	329.43794	28.40380	0.0834286	0.43974721	1.71	1.57	1.86	Mc	2 26.2	18.6
312974 1999 CU ₈	17.2	X	222.28441	102.34331	109.17131	29.33574	0.2847324	0.38572542	1.87	1.34	2.40	Mc	—	—
312978 1999 JG ₂₉	14.9	X	155.65962	327.11259	221.35963	19.71445	0.4105499	0.15133686	3.49	2.06	4.92	Ja	9 22.2	21.7
312979 1999 KT ₄	17.7	X	254.11884	127.67317	111.46979	2.29091	0.3669897	0.29926606	2.21	1.40	3.03	Mc	—	—
313041 2000 QN ₇₀	16.7	X	266.71483	251.51816	156.73055	22.99574	0.3049188	0.27524308	2.34	1.63	3.05	Mc	7 5.2	20.5
313056 2000 SZ ₂₈	17.8	X	305.03231	165.15568	214.70103	9.21539	0.3171418	0.27791718	2.33	1.59	3.06	Mc	7 12.4	20.3
313085 2000 TB ₄₅	17.8	X	331.87817	308.13952	66.06243	5.34134	0.2795535	0.28175549	2.30	1.66	2.95	Mc	10 5.9	18.5
313087 2000 UD ₁₂	17.4	X	8.39105	243.09981	117.54345	10.02769	0.2797042	0.28534284	2.29	1.65	2.92	Mc	12 21.0	19.7
313088 2000 UQ ₂₁	17.7	X	340.00233	177.17288	177.26776	4.50332	0.2905042	0.28012054	2.31	1.64	2.99	Mc	9 21.1	18.3
313181 2001 OD ₇₄	17.8	X	110.75550	20.86046	321.22665	7.73428	0.2856404	0.31249588	2.15	1.54	2.76	Mc	—	—
313309 2002 EH ₈	17.5	X	219.62882	96.77758	152.78465	5.23989	0.3643585	0.29046657	2.26	1.44	3.08	Mc	—	—
313329 2002 FH ₅	16.9	X	260.16907	110.55162	107.98633	8.30969	0.3340879	0.29401463	2.24	1.49	2.99	Mc	—	—
313441 2002 RJ ₁₀₅	16.9	X	161.58929	348.40814	6.76166	7.81671	0.3807449	0.23198522	2.62	1.62	3.62	Mc	2 21.0	21.8
313477 2002 TA ₁₈₀	16.1	X	47.07325	326.07391	12.70790	17.50034	0.4043813	0.21352128	2.77	1.65	3.89	Mc	—	—
313591 2003 MB ₇	16.3	X	309.45629	32.12343	312.09153	11.88559	0.4228142	0.26810498	2.38	1.37	3.39	Mc	5 5.3	19.8
313593 2003 NQ ₄	16.7	X	73.21088	41.33719	260.51588	11.06703	0.2767335	0.28481545	2.29	1.65	2.92	Mc	12 16.7	20.3
313594 2003 NB ₇	17.4	X	1.54271	272.49607	49.59250	4.36776	0.3025369	0.27683092	2.33	1.63	3.04	Mc	10 7.7	18.4
313607 2003 QL ₃₀	16.9	X	237.94170	318.49623	70.58350	7.15578	0.4041424	0.26164412	2.42	1.44	3.40	Mc	5 11.6	21.5
313621 2003 QP ₁₀₉	17.1	X	26.30021	201.29153	117.10501	6.92871	0.2847655	0.27811200	2.32	1.66	2.99	Mc	11 19.9	

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
316651 1990 <i>OL</i> ₂₄	15.8 ^m	X	5.46868	156.84695	150.31328	15.00127	0.4537323	0.22354133	2.69	1.47	3.91	Mc	10 15.6	17.7
316687 1996 <i>BX</i> ₁₂	17.2	X	118.83895	42.90245	335.66065	25.15609	0.2392323	0.31253955	2.15	1.64	2.66	Mc	1 19.4	19.9
316720 1998 <i>BE</i> ₇	14.6	X	125.17172	303.15368	99.52226	15.00010	0.5157782	0.18338142	3.07	1.49	4.65	Mc	4 10.5	20.6
316781 1999 <i>TJ</i> ₁₅₀	17.8	X	296.33330	143.38029	191.77682	3.95000	0.2428693	0.30614429	2.18	1.65	2.71	Mc	5 6.9	20.2
316829 1999 <i>YS</i>	14.6	X	54.53812	249.47728	261.02265	27.40053	0.3997718	0.23755062	2.58	1.55	3.61	Mc	5 18.5	17.2
316855 2000 <i>JK</i> ₇₂	15.3	X	330.60553	278.39811	65.37582	26.69826	0.4184256	0.23785791	2.58	1.50	3.66	Mc	6 16.9	17.3
316857 2000 <i>NH</i> ₁₀	17.1	X	32.30922	127.59986	242.15355	2.12204	0.3971429	0.28990672	2.26	1.36	3.16	Mc	—	—
316866 2000 <i>QD</i> ₁₂₄	17.2	X	132.04944	3.59517	320.32203	3.15661	0.2533166	0.29898156	2.21	1.65	2.78	Mc	—	—
316870 2000 <i>QE</i> ₁₇₄	17.4	X	26.89219	65.84440	308.91630	5.19167	0.2744517	0.29027237	2.26	1.64	2.88	Mc	—	—
316876 2000 <i>RF</i> ₄₃	15.5	X	346.34391	190.98000	206.36129	9.90535	0.4483643	0.18785801	3.02	1.67	4.37	Mc	12 16.5	17.1
316883 2000 <i>SA</i> ₂₄	15.9	X	22.12985	265.14325	6.69988	27.45746	0.3988296	0.23328631	2.61	1.57	3.66	Mc	9 21.7	18.1
316922 2000 <i>WB</i> ₁₆₅	14.9	X	176.02961	43.56822	101.16289	15.39506	0.4510264	0.21859153	2.73	1.50	3.96	Mc	8 24.2	20.6
316934 2001 <i>AA</i> ₅₂	16.7	X	317.95828	62.37515	349.76084	9.12977	0.2865822	0.27833141	2.32	1.66	2.99	Mc	10 20.4	17.8
317096 2001 <i>TD</i> ₃₆	17.5	X	51.08186	20.87564	8.84155	7.21498	0.2670590	0.30577035	2.18	1.60	2.76	Mc	—	—
317189 2001 <i>YG</i> ₂	17.5	X	36.82158	288.75495	133.16901	7.19030	0.3088522	0.30772658	2.17	1.50	2.84	Mc	—	—
317207 2002 <i>CH</i> ₁₀	17.1	X	24.26625	35.63438	31.71025	7.79181	0.2711707	0.30161827	2.20	1.60	2.80	Mc	—	—
317350 2002 <i>LV</i> ₃₈	17.0	X	137.70513	98.08939	198.47804	4.68872	0.2895878	0.27981063	2.32	1.64	2.99	Mc	—	—
317379 2002 <i>OW</i> ₂₂	15.9	X	29.49198	161.84788	189.19119	26.75734	0.3615398	0.26778904	2.38	1.52	3.25	Mc	—	—
317404 2002 <i>PT</i> ₁₃₂	17.8	X	150.73064	128.62510	135.75959	2.04619	0.3022301	0.27834387	2.32	1.62	3.03	Mc	12 27.2	22.0
317638 2003 <i>EQ</i> ₁₁	16.8	X	8.45723	62.08370	178.67259	10.58259	0.3988011	0.22129662	2.71	1.63	3.79	Mc	5 17.8	17.7
317683 2003 <i>MS</i>	17.3	X	181.11761	359.63840	306.76226	4.59711	0.3048602	0.30183394	2.20	1.53	2.87	Mc	—	—
317699 2003 <i>PP</i> ₉	17.7	X	194.73331	132.20939	166.13834	15.73010	0.1877205	0.41428572	1.78	1.45	2.12	Mc	—	—
317766 2003 <i>SD</i> ₉₆	17.6	X	216.62059	303.56916	347.38035	2.03048	0.2450625	0.30369062	2.19	1.65	2.73	Mc	—	—
317958 2003 <i>XG</i>	15.2	X	90.94319	55.13561	307.23435	7.11364	0.5126395	0.17586183	3.16	1.54	4.77	Ja	1 25.1	19.7
317984 2004 <i>BC</i> ₁₁	15.4	X	72.48580	106.71848	300.16784	25.83607	0.4934319	0.23005920	2.64	1.34	3.94	Mc	2 4.2	17.7
318572 2005 <i>GL</i> ₁₄₁	18.2	X	125.19703	83.27723	176.66385	2.39867	0.3167991	0.26843299	2.38	1.63	3.13	Mc	12 4.9	22.5
318580 2005 <i>GL</i> ₁₆₂	17.3	X	105.16577	93.86296	172.99850	5.90828	0.3622939	0.26465190	2.40	1.53	3.27	Mc	12 1.9	21.9
318690 2005 <i>QV</i> ₆₂	18.4	X	257.05083	15.65848	29.94558	1.25022	0.2181438	0.36300026	1.95	1.52	2.37	Mc	7 1.1	20.7
318875 2005 <i>TS</i> ₁₀₀	13.7	X	31.61995	52.85725	23.46641	8.52924	0.1664904	0.07481396	5.58	4.65	6.51	Jc	1 2.6	20.2
318902 2005 <i>UR</i> ₅	17.2	X	155.11336	278.05688	167.52567	18.56867	0.2002176	0.34555710	2.01	1.61	2.41	Mc	5 21.7	20.5
319421 2006 <i>HR</i> ₇₇	17.7	X	299.03236	129.06651	166.60007	0.93130	0.2349148	0.32515228	2.09	1.60	2.59	Mc	3 13.7	20.4
319458 2006 <i>LY</i> ₄	17.9	X	223.56702	109.33652	181.55001	5.03353	0.2802663	0.30291997	2.20	1.58	2.81	Mc	1 4.1	21.9
319477 2006 <i>PC</i> ₂₇	17.0	X	234.37431	174.13209	120.64205	9.19868	0.2508352	0.30356362	2.19	1.64	2.74	Mc	1 16.8	20.5
319495 2006 <i>QW</i> ₅₉	17.5	X	191.36221	83.45101	229.40389	4.24801	0.2716258	0.29789688	2.22	1.62	2.82	Mc	1 7.2	21.1
319591 2006 <i>SU</i> ₁₆₂	18.1	X	221.20080	93.50551	188.08654	5.87508	0.3517310	0.29699047	2.22	1.44	3.01	Mc	—	—
320276 2007 <i>RL</i> ₉₅	18.2	X	266.05398	281.70383	174.39240	2.41412	0.2983675	0.27440072	2.35	1.65	3.05	Mc	9 8.4	21.1
321025 2008 <i>ME</i> ₁	15.7	X	357.97131	290.63143	330.03189	27.52693	0.4874666	0.22287154	2.69	1.38	4.01	Mc	3 18.1	17.8
321356 2009 <i>MF</i> ₆₂	16.9	X	166.83404	26.39427	306.03790	8.54465	0.3512769	0.28008273	2.31	1.50	3.13	Mc	11 30.0	21.3
321950 2010 <i>TJ</i> ₁₇₀	17.4	X	176.60714	47.93168	267.08046	4.45223	0.2466350	0.30834958	2.17	1.63	2.71	Mc	—	—
322574 Werckmeister	16.5	X	189.37797	216.76544	147.29046	6.66233	0.3748119	0.24131924	2.56	1.60	3.51	Mc	3 17.5	21.4
322629 1997 <i>TQ</i> ₁₇	18.1	X	270.61502	296.31882	343.09189	6.33104	0.3004108	0.31423872	2.14	1.50	2.79	Mc	1 23.5	21.8
322651 1999 <i>JP</i> ₅	17.3	X	221.65152	241.58199	58.25590	9.37064	0.2875486	0.29903400	2.21	1.58	2.85	Mc	1 15.8	21.4
322713 2000 <i>KD</i> ₄₁	16.7	X	122.60926	155.70629	150.62780	5.45922	0.5839428	0.15764008	3.39	1.41	5.38	Jc	—	—
322762 2001 <i>FM</i>	16.2	X	244.97964	58.27136	33.57674	22.15809	0.3217511	0.26779446	2.38	1.62	3.15	Mc	8 20.1	20.5
323048 2002 <i>RP</i> ₁₄₃	18.2	X	186.04060	113.18578	180.58663	5.14619	0.2889413	0.28410314	2.29	1.63	2.95	Mc	—	—
323089 2002 <i>VT</i> ₂₀	17.6	X	128.52354	102.93982	317.71573	6.17694	0.3822798	0.23134594	2.63	1.62	3.63	Mc	4 10.9	22.2
323095 2002 <i>VP</i> ₈₂	16.7	X	147.67716	303.60377	87.43003	8.03081	0.3726342	0.23101372	2.63	1.65	3.61	Mc	3 26.6	21.6
323137 2003 <i>BM</i> ₈₀	15.3	X	347.41600	217.61845	9.29530	5.81132	0.1888178	0.11281103	4.24	3.44	5.04	Jc	4 2.7	—
323182 2003 <i>MQ</i> ₅	16.2	X	18.16703	242.95158	129.04414	22.02867	0.2765372	0.28322832	2.30	1.66	2.93	Mc	—	—
323296 2003 <i>UV</i> ₅	17.6	X	279.08806	353.56821	64.17874	6.99572	0.3093611	0.26734789	2.39	1.65	3.12	Mc	8 2.9	20.7
323308 2003 <i>UH</i> ₈₁	17.5	X	290.87960	234.08529	169.01473	5.64916	0.3247056	0.26848436	2.38	1.58	3.18	Mc	7 21.7	20.4
323471 2004 <i>LY</i> ₁	16.1	X	264.88239	182.34144	141.13135	13.28501	0.4426875	0.22064069	2.71	1.56	3.86	Mc	3 14.8	21.2
323498 2004 <i>QE</i> ₁	17.2	X	17.92423	104.92504	171.44654	27.81674	0.3861359	0.23178002	2.62	1.61	3.64	Mc	9 9.1	19.0
323686 2005 <i>GW</i> ₂₀	16.8	X	287.43894	264.70699	215.22606	20.16588	0.2949708	0.28567776	2.28	1.61	2.96	Mc	11 26.8	18.4
324322 2006 <i>HB</i> ₆₂	17.6	X	191.20819	178.04035	165.99275	4.87043	0.2286759	0.31337851	2.15	1.66	2.64	Mc	2 9.8	21.0
324331 2006 <i>OE</i> ₁₂	17.7	X	145.35181	223.93031	100.42738	1.49667	0.2684719	0.29065103	2.26	1.65	2.86	Mc	—	—
324366 2006 <i>QC</i> ₁₃₄	16.9	X	56.21676	74.66614	279.83704	2.04923	0.3511352	0.27461609	2.34	1.52	3.17	Mc	—	—
324387 2006 <i>RR</i> ₉₆	16.5	X	101.50135	112.44953	9.08238	6.46865	0.4084701	0.22933193	2.64	1.56	3.72	Mc	6 7.8	20.9
324524 2006 <i>VZ</i> ₁₀₈	17.4	X	111.56062	59.78214	268.40399	4.30943	0.2917554	0.27976538	2.32	1.64	2.99	Mc	—	—
324582 2006 <i>XK</i>	15.8	X	143.39071	60.78812	325.02171	28.07318	0.4434362	0.22501390	2.68	1.49	3.86	Mc	3 8.1	21.1
325152 2008 <i>EC</i> ₁₆₉	15.8	X	265.30293	194.37023	176.78331	18.83987	0.3593313	0.24234061	2.55	1.63	3.46	Mc	5 14.5	20.4
325620 2009 <i>SV</i> ₂₄₂	16.7	X	117.26128	73.42737	244.11434	7.75007	0.2975753	0.27064589	2.37	1.66	3.07	Mc	—	—
325766 2010 <i>JX</i> ₁₄₀	17.0	X	38.65538	122.52734	241.77033	7.85678	0.2702879	0.28585915	2.28	1.67	2.90	Mc	—	—
326113 2011 <i>UG</i> ₁₀₈	17.3	X	23.23890	217.14596	93.03391	7.67540	0.2714979	0.29639257	2.23	1.62	2.83	Mc	11 5.5	19.5
326268 1993 <i>TT</i> ₂	18.0	X	242.86958	56.89080	242.01726	3.00226	0.2523374	0.30253055	2.20	1.64	2.75	Mc	1 27.4	21.6
326306 1998 <i>XY</i> ₄	16.9	X	119.03998	60.72894	58.07488	30.22421	0.3743795	0.23432132	2.61	1.63	3.58	Mc	6 10.6	21.7
326317 1999 <i>VN</i> ₂₃	16.1	X	238.92960	309.61313	58.18017	6.79813	0.4892959	0.21087844	2.80	1.43	4.16	Mc	4 16.5	21.7
326318 1999 <i>VK</i> ₈₅	15.8													

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
326769 2003 <i>SE</i> ₁₉₂	16.8 ^m	X	273.39032	6.27020	293.75946	4.39922	0.3073229	0.31204032	2.15	1.49	2.81	Mc	2 16.8	20.3
326887 2003 <i>WJ</i> ₇	17.7	X	201.08751	48.45377	282.59262	5.41256	0.2988497	0.30273858	2.20	1.54	2.85	Mc	2 4.9	21.7
327087 2004 <i>XH</i> ₁	16.8	X	359.24177	312.58256	12.11615	12.00007	0.4738217	0.23026706	2.64	1.39	3.89	Mc	10 23.5	17.8
327172 2005 <i>JC</i> ₈₉	17.7	X	178.51332	208.72695	63.04780	5.82282	0.3092957	0.27847359	2.32	1.60	3.04	Mc	—	—
327659 2006 <i>QJ</i> ₆₂	17.3	X	245.66077	167.14547	142.15868	9.01421	0.2484952	0.30618610	2.18	1.64	2.72	Mc	2 11.8	21.0
327710 2006 <i>SM</i> ₇₇	16.9	X	138.76319	142.80850	212.99723	25.88512	0.2621937	0.29124721	2.25	1.66	2.85	Mc	1 7.5	20.6
327718 2006 <i>ST</i> ₁₃₈	18.1	X	221.30913	267.18077	51.52117	6.82646	0.2518761	0.30387031	2.19	1.64	2.74	Mc	2 7.6	21.9
327745 2006 <i>TD</i> ₂₉	17.7	X	171.56428	270.71728	49.40662	2.17046	0.2715579	0.29160956	2.25	1.64	2.86	Mc	1 1.7	21.2
327794 2006 <i>UB</i> ₂₆₆	15.4	X	75.42762	264.55656	241.22055	24.18448	0.4249406	0.22532073	2.67	1.54	3.81	Mc	6 15.3	19.3
328078 2007 <i>XR</i> ₃₁	17.7	X	332.62420	318.42280	139.68372	5.42434	0.3040064	0.28496535	2.29	1.59	2.98	Mc	—	—
328485 2009 <i>MO</i> ₅	18.3	X	270.86717	161.69500	130.20826	3.16877	0.2520272	0.30731826	2.17	1.63	2.72	Mc	2 10.4	21.7
328508 2009 <i>QH</i> ₉	17.9	X	102.74599	358.03611	346.00196	1.74957	0.3053692	0.27370516	2.35	1.63	3.07	Mc	—	—
328563 Mosplanetarium	16.8	X	78.12121	71.93536	245.10892	8.45286	0.3219486	0.26199138	2.42	1.64	3.20	Mc	—	—
328734 2009 <i>UA</i> ₁	17.2	X	181.73367	59.01825	212.11778	3.95233	0.3092172	0.27676232	2.33	1.61	3.05	Mc	—	—
328969 2010 <i>VH</i> ₁₇₃	17.6	X	185.55544	267.32314	78.68077	2.42468	0.2431138	0.31212257	2.15	1.63	2.68	Mc	2 10.1	21.0
328979 2010 <i>VB</i> ₂₀₀	17.4	X	114.95050	220.01321	132.78048	5.92393	0.2534801	0.29737938	2.22	1.66	2.79	Mc	—	—
329144 2011 <i>UZ</i> ₁₉₂	16.9	X	121.27766	261.61143	222.76787	12.58888	0.4287659	0.23817859	2.58	1.47	3.68	Mc	6 26.5	21.8
329244 1992 <i>UA</i>	18.4	X	178.05940	196.54973	28.47879	7.77664	0.1225664	0.37984994	1.89	1.66	2.12	Mc	12 31.4	20.6
329261 1998 <i>SW</i> ₁₂₃	17.2	X	57.57755	197.98931	175.05838	2.85202	0.3025069	0.26668391	2.39	1.67	3.11	Mc	—	—
329282 1999 <i>WZ</i> ₅	16.1	X	65.60681	295.82170	103.37812	27.54430	0.3404329	0.28063506	2.31	1.52	3.10	Mc	—	—
329301 2000 <i>RM</i> ₇₇	15.5	X	353.56134	290.41449	44.90753	29.63586	0.3785918	0.23192153	2.62	1.63	3.62	Mc	10 18.7	17.2
329342 2001 <i>OL</i> ₁₀₀	17.5	X	80.96612	221.84544	116.16609	4.36376	0.3339294	0.26023066	2.43	1.62	3.24	Mc	—	—
329374 2001 <i>WK</i> ₅	16.4	X	121.64053	94.48037	244.61152	7.51499	0.3450437	0.26048545	2.43	1.59	3.27	Mc	—	—
329436 2002 <i>OC</i> ₂₀	18.2	X	155.95931	102.11111	219.34270	0.36192	0.2754073	0.28349610	2.29	1.66	2.93	Mc	—	—
329502 2002 <i>RM</i> ₁₃₇	16.4	X	42.20244	241.02678	157.09170	22.57282	0.3146028	0.27015492	2.37	1.62	3.12	Mc	—	—
329555 2002 <i>UB</i> ₃	16.2	X	71.43670	297.69916	87.95850	22.76804	0.3184336	0.27302380	2.35	1.60	3.10	Mc	—	—
329556 2002 <i>UA</i> ₁₂	16.1	X	199.62446	92.92333	257.02780	22.29305	0.2848461	0.29000453	2.26	1.62	2.90	Mc	2 17.5	20.6
329615 2003 <i>LV</i> ₁	18.6	X	71.75040	105.24722	75.33004	34.08683	0.0525117	0.54653658	1.48	1.40	1.56	Mc	5 19.2	19.2
329619 2003 <i>OS</i> ₂₂	15.7	X	180.48765	205.44767	158.35013	8.73640	0.4516888	0.19509366	2.94	1.61	4.27	Mc	3 16.4	21.6
329774 2004 <i>LE</i>	16.7	X	324.66909	185.20942	211.55152	40.39452	0.38369334	0.22890426	2.65	0.43	4.86	Ja	5 27.3	21.0
329838 2004 <i>SM</i> ₅₈	17.2	X	23.69985	76.62510	230.25350	4.14620	0.3699293	0.23316745	2.61	1.65	3.58	Mc	11 3.3	19.8
329923 2005 <i>NK</i> ₂₀	16.5	X	186.08768	73.25656	275.68687	21.24856	0.3110832	0.28165258	2.30	1.59	3.02	Mc	2 10.4	21.0
330250 2006 <i>RF</i> ₁₉	16.5	X	186.04527	295.14894	35.47891	8.22348	0.2785613	0.29698303	2.22	1.61	2.84	Mc	1 28.4	20.3
330260 2006 <i>SB</i> ₇	16.9	X	318.38198	249.57968	4.23474	21.47170	0.3940494	0.31172300	2.15	1.31	3.00	Mc	1 29.3	20.6
330263 2006 <i>MU</i> ₂₂	18.1	X	264.01946	198.65183	121.81019	6.00934	0.2426912	0.31113818	2.16	1.63	2.68	Mc	3 14.8	21.5
330759 2008 <i>SO</i> ₂₁₈	12.8	X	179.51517	354.56822	348.45498	170.34433	0.5622993	0.04256226	8.12	3.56	12.69	Jc	3 16.7	23.8
330848 2009 <i>PT</i> ₅	17.3	X	213.66967	334.53424	332.27777	4.51418	0.2654935	0.29420550	2.24	1.64	2.83	Mc	1 18.1	21.1
331484 1998 <i>UX</i>	16.2	X	156.20521	120.75643	254.33098	21.31075	0.2926816	0.27864722	2.32	1.64	3.00	Mc	2 17.5	20.5
331495 1999 <i>RY</i> ₂₂₁	17.4	X	244.55868	53.62821	278.76670	4.23111	0.2594756	0.29979195	2.21	1.64	2.78	Mc	3 9.3	21.1
331506 1999 <i>VC</i> ₁₂	16.2	X	348.27881	109.96945	268.87709	4.85462	0.4048674	0.22460885	2.68	1.60	3.77	Mc	12 4.2	17.3
331521 2000 <i>QY</i> ₄₀	17.6	X	331.41295	44.91558	307.07776	2.34160	0.2941574	0.28118828	2.31	1.63	2.99	Mc	8 10.2	18.4
331522 2000 <i>QD</i> ₇₀	17.0	X	48.53272	160.98685	167.42625	12.47933	0.3742472	0.24216982	2.55	1.60	3.50	Mc	12 30.7	21.3
331548 2000 <i>VO</i> ₄₇	15.2	X	348.61784	105.27256	281.41711	27.32190	0.3783687	0.23178754	2.62	1.63	3.62	Mc	12 19.7	17.0
331551 2000 <i>WL</i> ₅₄	16.1	X	297.31943	271.14825	284.40055	22.98194	0.3166384	0.28662904	2.28	1.56	3.00	Mc	—	—
331587 2001 <i>TW</i>	15.7	X	216.37437	281.25041	58.04403	22.35925	0.4970193	0.17926820	3.12	1.57	4.66	Mc	3 17.5	22.4
331614 2001 <i>YA</i> ₁₃₇	15.7	X	143.65315	80.60494	279.58537	20.89536	0.3160401	0.26655243	2.39	1.64	3.15	Mc	1 28.2	19.6
331699 2002 <i>RT</i> ₄₅	17.2	X	98.53919	312.83944	48.23753	1.98727	0.2999855	0.27721137	2.33	1.63	3.03	Mc	—	—
331722 2002 <i>TR</i> ₁₀	16.8	X	20.84067	258.09189	179.36500	21.33142	0.3313734	0.27148233	2.36	1.58	3.14	Mc	—	—
331785 Sumners	16.4	X	87.20507	277.20170	239.72813	25.39791	0.4313854	0.22623258	2.67	1.52	3.82	Mc	7 6.9	21.1
331811 2003 <i>SU</i> ₉₉	15.9	X	3.34387	116.39662	208.07094	13.78970	0.4131097	0.21944721	2.72	1.60	3.85	Mc	10 21.3	17.4
331848 2003 <i>UB</i> ₂₆₂	17.7	X	185.51563	136.53058	243.46996	5.04313	0.2703259	0.30508282	2.19	1.59	2.78	Mc	3 23.2	21.5
331857 2003 <i>WN</i> ₇	15.2	X	288.58027	280.11276	106.81919	30.49082	0.4049892	0.21101865	2.79	1.66	3.93	Mc	6 20.5	19.5
331984 2005 <i>EM</i> ₇₆	17.5	X	260.49163	139.34061	175.21954	6.99539	0.2590007	0.30532852	2.18	1.62	2.75	Mc	2 28.8	21.0
331991 2005 <i>FD</i> ₃	16.2	X	241.30374	120.53937	111.34273	39.59946	0.2846477	0.28449644	2.29	1.64	2.94	Mc	—	—
332026 2005 <i>PH</i>	16.8	X	145.91196	69.75173	243.42986	10.72019	0.3299469	0.27066007	2.37	1.59	3.15	Mc	—	—
332027 2005 <i>PE</i> ₃	17.3	X	195.26942	186.12094	143.84595	7.28540	0.2893519	0.28073726	2.31	1.64	2.98	Mc	2 2.6	21.4
332033 2005 <i>PL</i> ₂₃	16.7	X	134.05831	227.44724	107.45230	10.08010	0.3311898	0.27037826	2.37	1.58	3.15	Mc	—	—
332056 2005 <i>RM</i> ₄₄	16.8	X	144.36073	188.37599	124.25479	11.12643	0.3217611	0.26908250	2.38	1.61	3.14	Mc	—	—
332079 2005 <i>TZ</i> ₂₇	18.0	X	277.01933	253.96130	202.70809	3.92226	0.2491748	0.36829758	1.93	1.45	2.41	Mc	10 24.4	18.3
332136 2005 <i>WT</i> ₁₁₀	17.5	X	285.19923	83.94494	241.71696	6.33553	0.3454833	0.29173668	2.25	1.47	3.03	Mc	3 27.6	21.1
332285 2006 <i>SL</i> ₄₁₁	17.6	X	185.71911	234.91164	111.44927	12.11220	0.2557210	0.29598213	2.23	1.66	2.80	Mc	2 14.5	21.4
332663 2008 <i>WA</i> ₅₅	18.4	X	270.94377	259.07472	256.68005	5.62393	0.2006793	0.38562301	1.87	1.49	2.24	Mc	—	—
332687 2009 <i>OV</i> ₂	16.3	X	120.81449	262.58183	115.66538	23.04045	0.3586418	0.27990748	2.31	1.48	3.14	Mc	2 8.4	19.5
332715 2009 <i>SX</i> ₁₃₈	17.8	X	152.53418	132.98425	207.00788	5.07320	0.2831140	0.27979239	2.32	1.66	2.97	Mc	1 11.1	21.3
333270 2146 <i>P-L</i>	16.0	X	357.53786	143.42107	198.70657	8.42071	0.4197641	0.22703970	2.66	1.54	3.78	Mc	11 7.9	17.3
333305 2000 <i>VB</i> ₃₅	16.3	X	345.98437	193.02379	227.81144	7.57207	0.3608229	0.23628739	2.59	1.66	3.53	Mc	—	—
333309 2001 <i>FR</i> ₁₁₆	17.4	X	226.76066	91.26748	147.57517	7.41733	0.2838611	0.27786512	2.33	1.67	2.99	Mc	—	—
333312 2001 <i>MR</i> ₁₈	16.													

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
334042 2001 <i>EC</i> ₁₈	18.2	X	109.19387	274.83778	347.43485	16.35215	0.2067609	0.46230939	1.66	1.31	2.00	Mc	12 18.3	20.7
334044 2001 <i>FS</i> ₁₁₆	14.8	X	314.89668	269.27351	186.75061	26.99793	0.4188828	0.23273542	2.62	1.52	3.71	Mc	12 2.9	16.6
334055 2001 <i>OK</i> ₂₁	16.9	X	114.22464	9.20222	314.89917	7.13267	0.3334741	0.26278754	2.41	1.61	3.22	Mc	—	—
334057 2001 <i>OR</i> ₄₇	16.7	X	128.74124	34.57409	293.92381	7.21291	0.3065559	0.26577931	2.40	1.66	3.13	Mc	—	—
334073 2001 <i>PL</i> ₅₉	15.8	X	124.70811	71.96397	4.94669	22.67859	0.4053595	0.27178906	2.36	1.40	3.32	Mc	4 22.2	20.1
334139 2001 <i>RN</i> ₅₆	17.8	X	89.54000	5.10412	47.06105	1.51110	0.3240562	0.26554850	2.40	1.62	3.17	Mc	2 7.8	19.8
334256 2001 <i>TS</i> ₂₂₇	16.8	X	107.54558	289.94825	106.78508	5.37045	0.3203886	0.26635659	2.39	1.63	3.16	Mc	2 13.5	19.7
334346 2001 <i>YA</i> ₄	16.5	X	106.37006	73.74142	314.32743	19.50946	0.3412473	0.26086587	2.43	1.60	3.25	Mc	2 3.4	19.4
334352 2001 <i>YF</i> ₅₂	15.5	X	73.36843	282.97855	271.28071	13.95672	0.4367047	0.21958665	2.72	1.53	3.91	Mc	8 11.8	20.0
334384 2002 <i>BL</i> ₂₆	15.5	X	141.90082	206.66643	331.55179	38.55047	0.3947584	0.22781095	2.66	1.61	3.70	Mc	9 2.1	20.9
334457 2002 <i>OH</i> ₂₁	17.3	X	260.58853	311.55749	17.32437	5.27763	0.3557850	0.29939538	2.21	1.43	3.00	Mc	3 15.3	21.3
334464 2002 <i>PG</i> ₆₅	17.5	X	284.64402	315.58669	357.90345	5.73920	0.2703898	0.30238472	2.20	1.60	2.79	Mc	3 20.6	20.6
334469 2002 <i>PO</i> ₁₅₂	17.9	X	280.48479	117.55005	137.79348	5.42595	0.2572405	0.29550190	2.23	1.66	2.81	Mc	1 5.2	21.7
334527 2002 <i>RG</i> ₁₈₉	17.3	X	238.09031	213.99380	130.48641	7.14256	0.3590969	0.29496342	2.24	1.43	3.04	Mc	3 20.9	21.5
334625 2002 <i>VL</i> ₁₅	16.2	X	202.67023	271.51980	49.80274	28.22409	0.4007967	0.23265427	2.62	1.57	3.67	Mc	2 16.6	21.9
334626 2002 <i>VF</i> ₃₉	17.5	X	199.74174	283.37632	75.43542	9.23478	0.2803568	0.28971990	2.26	1.63	2.90	Mc	3 16.3	21.6
334631 2002 <i>VS</i> ₉₉	16.1	X	119.12390	93.81051	338.03675	22.59222	0.2983226	0.28191535	2.30	1.62	2.99	Mc	3 27.9	19.7
334703 2003 <i>EN</i> ₄₃	15.5	X	97.57447	66.93432	183.71772	22.79875	0.4926237	0.18232110	3.08	1.56	4.60	Mc	11 10.9	21.6
334736 2003 <i>OJ</i> ₂₀	16.2	X	335.02273	30.95648	333.88109	17.35144	0.4363608	0.21840001	2.73	1.54	3.92	Mc	8 18.3	16.9
334947 2004 <i>CB</i> ₂₇	16.6	X	101.92647	5.07614	338.43332	6.60678	0.3403658	0.27888893	2.32	1.53	3.11	Mc	—	—
334955 2004 <i>CY</i> ₁₀₄	18.2	X	141.18211	25.22103	166.77696	7.36471	0.2097190	0.36585023	1.94	1.53	2.34	Mc	10 2.1	21.1
335016 2004 <i>KJ</i> ₆	16.4	X	114.76617	263.62795	72.52601	7.80268	0.3293636	0.25756629	2.45	1.64	3.25	Mc	—	—
335024 2004 <i>PD</i> ₂₀	17.9	X	100.41744	312.80209	16.05028	7.80509	0.3041616	0.36547008	1.94	1.35	2.53	Mc	—	—
335052 2004 <i>RA</i> ₁₁₀	16.0	X	7.00233	74.27290	305.02197	27.31738	0.4080867	0.23310021	2.61	1.55	3.68	Mc	—	—
335071 2004 <i>RB</i> ₂₉₀	16.3	X	343.65497	11.16826	23.67435	5.49074	0.3917698	0.23013189	2.64	1.60	3.67	Mc	12 16.2	17.5
335220 2005 <i>GB</i> ₂₇	17.9	X	314.90646	60.60625	158.43256	7.29626	0.3335802	0.29654353	2.23	1.48	2.97	Mc	—	—
335271 2005 <i>NC</i> ₁₇	17.3	X	227.81598	303.94724	20.58311	5.86988	0.2784071	0.28788992	2.27	1.64	2.90	Mc	2 20.5	21.3
335283 2005 <i>OJ</i> ₉	17.5	X	224.13270	327.34289	316.20786	8.90590	0.3042353	0.28334175	2.30	1.60	2.99	Mc	—	—
335323 2005 <i>QV</i> ₁₀₈	17.2	X	96.06609	261.30848	166.31130	22.21305	0.3212617	0.27362262	2.35	1.59	3.10	Mc	3 9.7	19.6
335451 2005 <i>UR</i> ₄₅₄	17.0	X	166.52854	281.98468	64.02775	8.25506	0.2952616	0.27511162	2.34	1.65	3.03	Mc	2 4.5	21.0
335772 2007 <i>EA</i> ₁₆₆	17.9	X	229.50500	181.64677	222.09159	1.94250	0.3479277	0.30498918	2.19	1.43	2.95	Mc	5 24.5	21.9
336053 2008 <i>CU</i> ₁₉₉	16.9	X	248.47431	341.65821	358.26525	9.56676	0.2505764	0.30290312	2.20	1.65	2.75	Mc	3 23.6	20.5
336661 2009 <i>XJ</i> ₂₄	17.5	X	248.37601	208.17040	158.53641	6.16397	0.3098177	0.30469031	2.19	1.51	2.86	Mc	4 25.4	21.3
337066 1998 <i>BM</i> ₁₀	16.1	X	68.99169	44.91999	122.68463	24.12649	0.3671805	0.26173385	2.42	1.53	3.31	Mc	7 1.4	19.3
337074 1998 <i>HU</i> ₁₀₈	16.8	X	28.62203	195.97238	63.03184	9.27694	0.5138684	0.21740785	2.74	1.33	4.15	Mc	10 5.4	19.9
337078 1998 <i>RZ</i> ₁₃	18.1	X	214.52343	157.57052	172.82619	4.22918	0.2750523	0.28414151	2.29	1.66	2.92	Mc	2 15.5	22.0
337087 1998 <i>SG</i> ₁₇₁	17.9	X	203.86129	349.97648	342.98801	3.75615	0.3061939	0.28250145	2.30	1.60	3.00	Mc	2 13.1	22.1
337091 1998 <i>US</i> ₁	17.9	X	201.66488	65.68445	212.04239	8.77533	0.3757249	0.27600801	2.34	1.46	3.21	Mc	—	—
337096 1998 <i>WE</i> ₆	16.6	X	203.39088	300.69274	57.75819	10.60507	0.3011704	0.28191482	2.30	1.61	3.00	Mc	3 19.8	20.9
337103 1999 <i>JA</i> ₅	16.4	X	131.33994	57.58172	231.56494	18.50457	0.3642328	0.24252266	2.55	1.62	3.47	Mc	—	—
337104 1999 <i>NN</i> ₂₂	16.2	X	35.66685	75.56414	293.43222	27.48201	0.3846213	0.23308333	2.61	1.61	3.62	Mc	—	—
337110 1999 <i>RE</i> ₁₁₀	17.4	X	276.43163	26.27673	308.99165	6.68864	0.2519758	0.30388066	2.19	1.64	2.74	Mc	4 8.5	20.7
337144 1999 <i>TQ</i> ₂₃₁	17.7	X	273.98253	210.38172	124.90950	5.47430	0.2797794	0.30403196	2.19	1.58	2.80	Mc	4 9.7	21.0
337157 1999 <i>UA</i> ₅	16.3	X	305.28044	86.14083	23.23314	5.77636	0.4756463	0.22642099	2.67	1.40	3.93	Mc	10 26.6	17.7
337214 2000 <i>BV</i>	16.6	X	11.89051	80.90090	336.94198	26.76581	0.4111372	0.22887475	2.65	1.56	3.74	Mc	—	—
337228 2000 <i>FL</i> ₁	15.4	X	291.58257	7.85825	78.73242	43.35494	0.5239873	0.21657823	2.75	1.31	4.19	Mc	9 7.2	20.0
337283 2000 <i>WR</i> ₆₇	17.7	X	3.42924	235.10667	236.83115	7.07132	0.4102367	0.24156816	2.55	1.51	3.60	Mc	—	—
337328 2001 <i>DU</i> ₄₀	16.5	X	26.39292	295.16341	143.99254	9.71927	0.3762724	0.24089831	2.56	1.60	3.52	Mc	—	—
337371 2001 <i>QL</i> ₃	17.2	X	175.95753	204.78199	137.91015	6.91523	0.3047549	0.27352387	2.35	1.63	3.07	Mc	2 5.7	21.1
337372 2001 <i>QO</i> ₄₀	17.1	X	168.44419	232.89574	149.20568	4.72810	0.3055440	0.27600836	2.34	1.62	3.05	Mc	3 20.2	21.1
337555 2001 <i>SM</i> ₂₆₁	17.5	X	164.75781	100.88396	207.02791	5.91866	0.3210163	0.26691749	2.39	1.62	3.16	Mc	—	—
337589 2001 <i>SS</i> ₃₄₂	17.4	X	128.84300	301.14067	81.06650	7.06580	0.3076724	0.26779414	2.38	1.65	3.12	Mc	2 18.9	20.9
337607 2001 <i>TB</i> ₁₃	16.9	X	100.14749	279.35441	172.65203	23.16060	0.3667371	0.26753694	2.39	1.51	3.26	Mc	4 28.0	20.6
337841 2001 <i>VA</i> ₇₆	18.0	X	345.19341	123.31778	21.42421	6.94460	0.2704294	0.36029206	1.96	1.43	2.48	Mc	—	—
338057 2002 <i>NN</i> ₇₈	17.4	X	279.66095	267.34890	77.35928	6.18925	0.2426929	0.30362513	2.19	1.66	2.72	Mc	5 1.4	20.4
338065 2002 <i>OJ</i> ₃₆	18.0	X	318.52708	281.89646	16.06745	5.52420	0.2448165	0.30574051	2.18	1.65	2.72	Mc	4 12.6	20.3
338084 2002 <i>PP</i> ₁₃₅	17.9	X	275.17872	209.22416	108.41996	3.30473	0.2571763	0.30050873	2.21	1.64	2.78	Mc	3 20.4	21.2
338085 2002 <i>PH</i> ₁₄₁	17.1	X	222.20717	79.18272	288.79503	5.67058	0.2582485	0.29578306	2.23	1.65	2.81	Mc	4 4.8	21.1
338101 2002 <i>PD</i> ₁₉₆	17.6	X	258.45320	293.63609	41.77081	5.53873	0.2833184	0.29915389	2.21	1.59	2.84	Mc	3 26.9	21.4
338159 2002 <i>RY</i>	17.8	X	254.34620	115.13564	215.07148	8.56003	0.3095371	0.29779936	2.22	1.53	2.91	Mc	3 11.4	21.8
338214 2002 <i>SO</i> ₅₉	17.3	X	225.17495	283.72185	71.40316	7.15315	0.2612661	0.29512780	2.23	1.65	2.82	Mc	3 28.7	21.2
338238 2002 <i>TN</i> ₁₀₅	17.9	X	177.73472	151.17935	231.61405	6.00282	0.2654072	0.29054043	2.26	1.66	2.86	Mc	3 21.6	21.8
338254 2002 <i>TZ</i> ₂₀₆	17.4	X	249.80636	113.81134	224.59609	4.85361	0.2839201	0.29575858	2.23	1.60	2.86	Mc	3 20.5	21.2
338293 2002 <i>UZ</i> ₃₅	18.0	X	148.01499	95.81230	3.77495	7.80979	0.3428935	0.29123866	2.25	1.48	3.03	Mc	6 7.7	22.1
338336 2002 <i>WB</i> ₁	17.2	X	173.99004	75.29097	15.11609	7.68292	0.3338395	0.29035012	2.26	1.50	3.01	Mc	6 14.7	21.5
338445 2003 <i>ET</i> ₄₇	16.7	X	86.45023	275.15172	337.75913	26.79261	0.4265348	0.23323668	2.61	1.50	3.73	Mc	10 21.3	22.0
338523 2003 <i>QR</i> ₈₉	16.2	X	55.04140	304.82481	309.98166	17.69862	0.4089565	0.22275851	2.70	1.59				

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
339700 2005 <i>RY</i> ₅	17.7	X	253.76194	111.04902	176.13145	5.62764	0.2994325	0.28723365	2.27	1.59	2.96	Mc	1 21.5	21.8
339705 2005 <i>RB</i> ₂₂	17.3	X	223.09812	320.16615	45.50311	10.09279	0.3126558	0.29052518	2.26	1.55	2.96	Mc	4 7.7	21.4
339713 2005 <i>SG</i> ₁	17.3	X	213.54122	326.27230	15.78296	6.66277	0.2995928	0.28592350	2.28	1.60	2.97	Mc	3 3.5	21.4
339739 2005 <i>SU</i> ₅₀	18.3	X	212.41388	139.89674	196.55244	5.91876	0.3009479	0.28331970	2.30	1.60	2.99	Mc	2 20.6	22.5
339745 2005 <i>SG</i> ₅₆	17.8	X	187.65781	215.59404	178.52812	5.37922	0.2782155	0.28450177	2.29	1.65	2.93	Mc	4 16.1	21.7
339847 2005 <i>TK</i> ₂₃	17.1	X	137.30567	20.40646	51.40895	4.78350	0.2933021	0.27795613	2.33	1.64	3.01	Mc	4 24.9	20.9
340014 2005 <i>UF</i> ₃₄₄	17.5	X	197.17832	330.50734	338.70869	3.08441	0.2957242	0.27590820	2.34	1.65	3.03	Mc	1 12.2	21.6
340093 2005 <i>WR</i> ₅₆	17.0	X	312.33902	272.59895	90.17351	4.74816	0.2524328	0.29958916	2.21	1.65	2.77	Mc	7 16.1	18.4
340795 2006 <i>TT</i> ₄₄	18.2	X	317.59932	108.51441	221.22249	0.81643	0.2286479	0.31835258	2.12	1.64	2.61	Mc	6 3.8	19.9
340836 2006 <i>VO</i> ₁₃	17.3	X	313.07940	281.90735	45.90146	5.78883	0.3283925	0.31736274	2.13	1.43	2.83	Mc	5 3.6	19.5
340844 2006 <i>WK</i> ₁₃₉	18.5	X	310.98245	211.82957	127.20273	1.49086	0.2210248	0.31629435	2.13	1.66	2.60	Mc	6 8.2	20.2
343223 2009 <i>WD</i> ₈₂	17.3	X	284.44225	359.74859	330.67780	4.75047	0.2387199	0.30702588	2.18	1.66	2.70	Mc	4 13.2	20.4
343225 2009 <i>WX</i> ₈₃	17.4	X	308.99253	285.62687	26.28728	7.20642	0.2467226	0.30856021	2.17	1.63	2.70	Mc	4 18.5	19.6
344065 1995 <i>UB</i> ₄	17.0	X	25.99504	18.87003	32.18131	9.08190	0.4068748	0.23329811	2.61	1.55	3.68	Mc	—	—
344072 1997 <i>CY</i> ₁	18.0	X	222.44528	317.00887	332.52069	24.34116	0.2830363	0.40229585	1.82	1.30	2.33	Mc	—	—
344077 1998 <i>HG</i> ₈	17.6	X	290.57819	156.26030	154.66117	5.17677	0.2639411	0.29890759	2.22	1.63	2.80	Mc	3 25.8	20.8
344093 1999 <i>RB</i> ₁₉	17.5	X	334.12295	79.64738	237.78793	4.66112	0.3209582	0.31188381	2.15	1.46	2.84	Mc	6 1.3	18.4
344112 1999 <i>VD</i> ₄	16.7	X	18.05199	355.34414	54.02011	5.95779	0.3752484	0.23053305	2.63	1.65	3.62	Mc	—	—
344132 1999 <i>YP</i> ₁₃	15.4	X	33.02697	286.22446	121.52414	29.12452	0.3825523	0.23210773	2.62	1.62	3.63	Mc	—	—
344146 2000 <i>NP</i> ₁₁	15.0	X	276.30022	103.26586	116.14657	30.62678	0.4290170	0.21839975	2.73	1.56	3.90	Mc	—	—
344147 2000 <i>PK</i> ₈	17.8	X	92.12556	51.90671	319.49016	15.77136	0.4566715	0.24936976	2.50	1.36	3.64	Mc	1 16.9	20.4
344150 2000 <i>QV</i> ₁₅₉	17.9	X	41.07987	177.55103	182.52940	10.53393	0.3466030	0.24314786	2.54	1.66	3.42	Mc	—	—
344151 2000 <i>SV</i> ₄	18.0	X	238.12990	273.76119	46.96144	10.23229	0.1606862	0.40738526	1.80	1.51	2.09	Mc	2 13.6	20.5
344161 2000 <i>YK</i> ₁₈	16.3	X	65.31510	225.04002	222.22426	6.63668	0.3446547	0.24745326	2.51	1.65	3.38	Mc	2 14.3	18.1
344184 2001 <i>DT</i> ₁₀₅	16.5	X	329.03867	255.95533	167.61842	6.36591	0.3801629	0.23224963	2.62	1.62	3.62	Mc	12 10.1	17.3
344191 2001 <i>KB</i> ₁₈	17.4	X	163.27422	36.54575	255.85144	5.01178	0.3200231	0.27034876	2.37	1.61	3.13	Mc	—	—
344202 2001 <i>QJ</i> ₁₁₁	17.1	X	196.99293	214.67050	114.75955	10.81947	0.2972617	0.27566344	2.34	1.64	3.03	Mc	2 5.3	21.2
344236 2001 <i>SC</i> ₁₂₇	18.4	X	162.15969	138.49533	186.08233	5.70126	0.3164030	0.26928523	2.37	1.62	3.13	Mc	1 5.6	22.4
344332 2001 <i>VL</i> ₇₅	15.8	X	128.00536	268.03499	252.43367	19.54294	0.3176774	0.28168946	2.30	1.57	3.04	Mc	8 1.7	20.2
344342 2001 <i>DZ</i> ₁₅	15.5	X	208.07763	81.20643	279.08922	21.83245	0.3018147	0.27498844	2.34	1.64	3.05	Mc	3 7.9	20.3
344474 2002 <i>PN</i> ₁₁₃	15.0	X	318.18219	128.79229	254.58795	13.93765	0.4296474	0.20360789	2.86	1.63	4.09	Mc	7 17.8	17.9
344520 2002 <i>SF</i> ₂	18.4	X	258.42065	155.84906	168.08525	5.51827	0.2676707	0.29678160	2.23	1.63	2.82	Mc	3 11.9	22.0
344532 2002 <i>TH</i> ₂₃₇	17.8	X	159.38737	121.41223	272.80984	6.39858	0.3111162	0.28712086	2.28	1.57	2.98	Mc	3 23.3	21.8
344551 2002 <i>VJ</i> ₁₂₂	17.4	X	131.91225	238.51967	247.75970	20.60500	0.3640773	0.28932197	2.26	1.44	3.09	Mc	6 30.0	21.6
344631 2003 <i>LY</i> ₂	16.1	X	73.51012	37.62464	257.92471	34.96284	0.4510091	0.23043607	2.63	1.45	3.82	Mc	12 15.2	20.9
344806 2004 <i>BK</i> ₄₁	17.2	X	340.43274	80.13992	275.11575	26.18354	0.0518258	0.42754745	1.75	1.65	1.84	Mc	9 23.2	19.5
344861 2004 <i>HP</i> ₃₈	17.2	X	198.54024	135.61529	126.59590	6.58618	0.3408242	0.26375619	2.41	1.59	3.23	Mc	—	—
345053 2005 <i>GD</i> ₁₀₃	17.4	X	275.90516	285.32497	27.48476	7.12071	0.3012071	0.30047734	2.21	1.54	2.87	Mc	3 12.1	20.9
345097 2005 <i>NH</i> ₁	17.7	X	248.81742	241.24546	91.42025	2.76625	0.3585468	0.29076707	2.26	1.45	3.07	Mc	3 12.8	21.8
345106 2005 <i>OS</i> ₄	17.3	X	260.96959	239.73121	97.54494	6.40920	0.2674248	0.29429279	2.24	1.64	2.84	Mc	4 3.4	21.0
345124 2005 <i>QR</i> ₁₄₈	17.9	X	272.66905	239.36623	79.28999	5.80781	0.2606682	0.29430829	2.24	1.65	2.82	Mc	3 21.3	21.4
345130 2005 <i>RS</i> ₂₉	18.2	X	279.65274	176.91656	192.94661	27.75974	0.1205400	0.42482168	1.75	1.54	1.96	Mc	6 19.8	20.4
345131 2005 <i>SC</i> ₁	18.2	X	282.64302	226.67679	69.26767	2.46452	0.3260462	0.29139026	2.25	1.52	2.99	Mc	2 22.1	21.9
346281 2008 <i>JV</i> ₄	17.7	X	290.78450	271.01655	31.91742	10.04483	0.3350862	0.29530560	2.23	1.48	2.98	Mc	3 11.4	21.3
346479 2008 <i>UG</i>	17.0	X	180.59446	346.95796	359.45801	13.88519	0.3749731	0.27064882	2.37	1.48	3.25	Mc	2 20.7	21.5
346763 2009 <i>BZ</i> ₇₃	17.0	X	18.22722	39.98531	23.55706	7.72147	0.3784538	0.23605136	2.59	1.61	3.57	Mc	—	—
346892 2009 <i>RY</i> ₄₂	18.1	X	179.31428	205.40114	213.33539	5.56636	0.2730683	0.29972690	2.21	1.61	2.82	Mc	5 9.2	21.8
346931 2010 <i>AR</i> ₃₅	16.7	X	218.37298	202.83575	145.68250	7.07686	0.2816912	0.28192257	2.30	1.65	2.95	Mc	3 14.2	20.8
346961 2010 <i>CU</i> ₁	17.7	X	251.14532	270.13207	138.34444	4.37916	0.3162788	0.30737955	2.17	1.49	2.86	Mc	6 18.6	21.1
347149 2011 <i>CB</i> ₇₆	16.8	X	12.60454	251.05952	0.17629	23.31046	0.2556404	0.30539743	2.18	1.63	2.74	Mc	5 31.8	18.6
347375 2012 <i>RL</i> ₁₂	17.6	X	285.17560	309.01811	10.62449	7.21428	0.2835974	0.30759642	2.17	1.56	2.79	Mc	3 27.7	20.5
347449 2012 <i>TW</i> ₂₃₆	12.3	X	118.14677	326.62372	179.23809	11.99129	0.5866299	0.05358409	6.97	3.01	10.93	Jc	7 25.6	22.2
347499 1998 <i>SV</i> ₂	16.8	X	232.68020	45.31915	310.52895	24.76921	0.3115656	0.28720339	2.28	1.57	2.98	Mc	3 16.2	21.5
347505 1999 <i>CM</i> ₄	16.4	X	98.94425	90.95308	126.58343	22.77336	0.3148777	0.28031135	2.31	1.58	3.04	Mc	10 5.8	20.8
347509 1999 <i>RA</i> ₁₀₄	18.4	X	338.45690	102.11766	203.37331	7.08072	0.3674883	0.31134824	2.16	1.36	2.95	Mc	5 10.4	19.3
347514 1999 <i>SP</i> ₁₄	17.2	X	95.02413	69.82557	239.39410	12.82765	0.4042172	0.23648797	2.59	1.54	3.64	Mc	—	—
347538 2000 <i>AP</i> ₁	17.0	X	185.91335	59.45641	89.88733	20.65061	0.2864746	0.30044789	2.21	1.58	2.84	Mc	9 16.9	21.3
347548 2000 <i>QA</i> ₅₀	17.8	X	188.52798	167.55218	148.30088	6.52686	0.3244833	0.25987067	2.43	1.64	3.22	Mc	1 16.0	22.2
347558 2000 <i>UP</i> ₁₈	16.4	X	84.06770	56.15473	282.10454	7.25228	0.2898704	0.29155115	2.25	1.60	2.91	Mc	—	—
347567 2000 <i>WQ</i> ₂₈	16.9	X	208.54992	36.11456	61.27657	24.61708	0.3413826	0.26999817	2.37	1.56	3.18	Mc	7 18.3	21.7
347584 2001 <i>EH</i> ₁₈	15.6	X	359.42048	100.91696	88.30778	34.03015	0.3629922	0.24158146	2.55	1.63	3.48	Mc	1 4.0	18.2
347593 2001 <i>PX</i> ₂₁	16.6	X	147.17783	260.63864	149.94815	22.31658	0.3152105	0.27506812	2.34	1.60	3.08	Mc	4 13.3	20.9
347622 2001 <i>SU</i> ₁₂₂	17.5	X	83.48082	176.57458	227.64455	5.41235	0.3198389	0.26444992	2.40	1.64	3.17	Mc	1 11.8	19.3
347635 2001 <i>SQ</i> ₂₇₇	17.6	X	169.85241	54.68444	315.33538	6.45106	0.2968360	0.27174585	2.36	1.66	3.06	Mc	3 3.8	21.7
347803 2002 <i>JY</i> ₅₅	16.8	X	32.08152	78.84078	229.23071	14.27548	0.4350556	0.21622424	2.75	1.55	3.95	Mc	11 24.5	20.3
347812 2002 <i>MW</i> ₃	16.1	X	59.96076	174.34395	127.45202	11.37475	0.4397533	0.21642446	2.75	1.54	3.96	Mc	12 13.4	20.9
347861 2002 <i>RT</i> ₁₉₀	17.6	X	134.06055	305.69421	14.79323	7.16								

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
349930 2009 <i>XH</i> ₁₇	18.0	X	282.63327	72.55478	297.00077	2.02107	0.2669213	0.30778021	2.17	1.59	2.75	Mc	6 3.2	20.8
350243 2012 <i>TZ</i> ₇₈	17.4	X	353.86626	162.53948	135.15029	3.83701	0.2368452	0.31473699	2.14	1.63	2.65	Mc	7 15.1	17.7
350518 2000 <i>CH</i> ₇₂	17.1	X	300.14747	77.15935	79.78711	6.12371	0.4035851	0.22235049	2.70	1.61	3.79	Mc	—	—
350524 2000 <i>EA</i> ₁₃₇	17.4	X	350.04108	107.75077	14.95614	6.46845	0.3839687	0.22678584	2.66	1.64	3.69	Mc	—	—
350535 2000 <i>QY</i> ₄₄	17.1	X	157.20287	241.99278	142.42113	3.51573	0.3308888	0.26023516	2.43	1.63	3.23	Mc	3 17.5	21.2
350587 2001 <i>QR</i> ₁₅	17.3	X	203.70884	243.04307	118.57699	6.05441	0.3103820	0.27823555	2.32	1.60	3.05	Mc	3 21.3	21.6
350594 2001 <i>QU</i> ₂₆₁	18.0	X	223.80369	60.93677	304.81822	5.92686	0.2821389	0.28009370	2.31	1.66	2.97	Mc	4 3.6	22.3
350872 2002 <i>PG</i> ₄₃	18.2	X	314.63566	5.55317	346.93386	6.92146	0.4022814	0.30748430	2.17	1.30	3.05	Mc	5 29.1	20.3
350973 2003 <i>EN</i> ₃₁	17.1	X	116.20277	268.42396	302.74307	6.58111	0.3364683	0.29053550	2.26	1.50	3.02	Mc	10 1.1	21.3
351009 2003 <i>PQ</i> ₁	16.8	X	67.68535	105.28642	148.68563	9.71903	0.2918754	0.27959711	2.32	1.64	2.99	Mc	10 17.3	20.2
351016 2003 <i>QM</i> ₇₈	16.6	X	8.81527	51.08455	355.62798	28.15247	0.3770689	0.22502731	2.68	1.67	3.69	Mc	—	—
351068 2003 <i>TS</i> ₁₃	15.8	X	71.96160	140.05719	233.26604	7.89549	0.3940228	0.23273816	2.62	1.59	3.65	Mc	—	—
351192 2004 <i>CN</i> ₇₀	18.9	X	255.03609	193.63413	332.00265	5.35702	0.2118141	0.32614943	2.09	1.65	2.53	Mc	12 29.7	20.5
351223 2004 <i>PG</i> ₇	17.3	X	347.56790	335.77198	320.17238	7.72416	0.2735927	0.28717924	2.28	1.65	2.90	Mc	6 14.2	18.5
351237 2004 <i>QL</i> ₁₂	16.8	X	291.46798	301.97796	12.61352	12.89366	0.2930797	0.27935642	2.32	1.64	3.00	Mc	3 29.4	20.0
351370 2005 <i>EY</i>	17.1	X	16.14304	185.76040	62.39989	17.22551	0.8907834	0.24689144	2.52	0.27	4.76	Ja	11 9.4	21.0
351549 2005 <i>TJ</i> ₇₃	18.0	X	244.62969	200.47313	146.32291	7.25679	0.2935461	0.28956162	2.26	1.60	2.93	Mc	3 30.8	21.9
351615 2005 <i>WU</i> ₅₅	17.0	X	353.95658	60.83516	260.60850	3.97175	0.2529963	0.30178760	2.20	1.64	2.76	Mc	9 3.3	17.7
351621 2005 <i>WA</i> ₁₇₄	17.0	X	249.29059	258.22955	121.18495	4.62866	0.2857647	0.29100152	2.26	1.61	2.90	Mc	5 14.2	20.8
351664 2006 <i>AP</i> ₂	17.1	X	189.32407	188.67457	203.37951	5.41371	0.2890219	0.27980502	2.32	1.65	2.98	Mc	4 14.3	21.3
352735 2008 <i>SQ</i> ₃₀₁	17.6	X	82.23052	230.24887	69.91063	4.04659	0.2245607	0.31611134	2.13	1.65	2.61	Mc	12 22.9	20.7
353959 1999 <i>UC</i> ₂₃	17.7	X	19.38673	252.62517	133.60920	9.55116	0.3934522	0.23433352	2.61	1.58	3.63	Mc	—	—
353967 1999 <i>XM</i> ₁₃₆	15.7	X	50.15436	87.62791	317.16607	26.47057	0.4203054	0.23134475	2.63	1.52	3.73	Mc	—	—
353982 2000 <i>EZ</i> ₁₃	16.6	X	259.80017	321.20846	342.25264	52.62801	0.1352710	0.37399547	1.91	1.65	2.17	Mc	2 26.8	19.3
353985 2000 <i>JW</i> ₆₀	17.9	X	109.58404	343.93708	271.84939	1.90375	0.3029997	0.29556752	2.23	1.56	2.91	Mc	11 21.4	21.9
353987 2000 <i>OQ</i> ₁₉	17.2	X	322.22197	168.14870	139.64310	7.98746	0.3025391	0.27804649	2.32	1.62	3.03	Mc	4 30.6	19.6
354062 2001 <i>TU</i> ₁₁₅	17.2	X	248.49349	12.38333	5.93032	3.67596	0.3170322	0.28317401	2.30	1.57	3.02	Mc	5 7.7	21.0
354112 2002 <i>AS</i> ₁₇	16.4	X	206.67795	88.67777	296.64138	20.69672	0.3025309	0.27392723	2.35	1.64	3.06	Mc	4 7.6	21.2
354365 2003 <i>LX</i> ₂	17.4	X	71.10737	106.73439	172.97161	6.33072	0.4149952	0.28415745	2.29	1.34	3.24	Mc	11 30.4	21.5
354368 2003 <i>QS</i> ₄	18.0	X	55.58797	51.85445	204.25873	4.35543	0.2966852	0.27744627	2.33	1.64	3.02	Mc	10 3.3	20.8
354374 2003 <i>RR</i> ₈	17.0	X	82.00759	76.73991	281.17246	7.64859	0.4259286	0.23322474	2.61	1.50	3.73	Mc	—	—
354408 2003 <i>UR</i> ₂₀₅	16.4	X	53.60858	159.56435	232.19233	9.24659	0.3967614	0.22996164	2.64	1.59	3.69	Mc	—	—
354503 2004 <i>PN</i> ₁₆	17.1	X	201.80158	34.23896	340.35544	6.33453	0.3007952	0.26960413	2.37	1.66	3.09	Mc	3 31.6	21.5
354525 2004 <i>RZ</i> ₉₀	17.6	X	125.03467	76.27897	228.57238	5.77998	0.2465730	0.30999218	2.16	1.63	2.70	Mc	—	—
354558 2004 <i>TK</i> ₇₀	17.7	X	124.37423	276.80993	157.63093	2.40165	0.3678572	0.26205485	2.42	1.53	3.31	Mc	4 25.2	21.7
354683 2005 <i>PM</i> ₄	16.5	X	283.17013	195.92111	60.02270	10.22881	0.4063083	0.23085107	2.63	1.56	3.70	Mc	1 7.2	21.4
354820 2005 <i>WR</i> ₉₇	17.4	X	49.73520	248.39691	67.12610	5.26641	0.2566298	0.30967402	2.16	1.61	2.72	Mc	12 13.8	20.2
355256 2007 <i>KN</i> ₄	16.8	X	115.80104	51.23052	232.43875	12.53308	0.6309415	0.16120433	3.34	1.23	5.45	Jc	12 23.9	23.8
355797 2008 <i>ST</i> ₁₄₁	17.4	X	155.16206	353.79216	49.27499	6.11602	0.3358178	0.26700554	2.39	1.59	3.19	Mc	4 8.1	21.6
355873 2008 <i>VK</i> ₂	17.1	X	13.37382	83.13843	253.66141	5.55771	0.2975754	0.30473337	2.19	1.54	2.84	Mc	12 2.1	18.8
356453 2011 <i>LT</i> ₂₆	17.0	X	45.98255	75.60709	251.29587	6.47211	0.3193342	0.30564648	2.18	1.49	2.88	Mc	12 30.8	20.3
356520 2011 <i>SV</i> ₈₇	17.6	X	62.86829	34.96018	269.52916	2.82039	0.2438362	0.30745023	2.17	1.64	2.70	Mc	12 11.1	20.8
356948 2012 <i>VE</i> ₅	18.5	X	230.02352	237.53846	181.1915	2.36584	0.4112559	0.29653221	2.23	1.31	3.14	Mc	2 19.7	22.9
356971 1991 <i>TK</i> ₂	15.6	X	196.86201	139.09356	194.29038	12.43442	0.4814738	0.21585878	2.75	1.43	4.08	Mc	2 14.2	21.5
357023 1999 <i>YZ</i> ₃	16.2	X	10.44427	75.00321	48.69673	28.58654	0.3700341	0.23164674	2.63	1.65	3.60	Mc	—	—
357035 2000 <i>LD</i> ₁₅	17.8	X	17.08618	144.93280	154.21350	4.96600	0.3007783	0.28442521	2.29	1.60	2.98	Mc	10 9.5	19.4
357037 2000 <i>NU</i> ₂₃	17.1	X	266.40424	38.20197	308.05046	8.56578	0.3424196	0.27227127	2.36	1.55	3.16	Mc	4 6.9	21.2
357060 2001 <i>OC</i> ₉₉	16.5	X	263.79424	255.46263	133.86031	21.64086	0.2846561	0.28958219	2.26	1.62	2.91	Mc	6 12.5	20.3
357063 2001 <i>PO</i> ₅₉	17.6	X	347.67394	1.41121	335.37343	6.34255	0.3036493	0.29523496	2.23	1.56	2.91	Mc	9 17.6	17.8
357094 2001 <i>TM</i>	17.4	X	283.74590	6.96044	26.80198	7.46649	0.3289483	0.29121618	2.25	1.51	3.00	Mc	7 1.1	20.4
357117 2001 <i>WG</i> ₂₃	16.3	X	225.47798	53.31597	20.21815	24.86471	0.4855692	0.18157374	3.09	1.59	4.59	Mc	6 20.4	22.7
357126 2001 <i>XR</i> ₂₄₆	17.4	X	299.32625	70.31620	279.57445	4.75275	0.2794029	0.28614623	2.28	1.64	2.92	Mc	5 26.6	19.9
357129 2001 <i>XU</i> ₂₆	17.4	X	210.98658	241.51690	163.86685	22.59687	0.3622767	0.28582192	2.28	1.46	3.11	Mc	5 18.9	22.2
357152 2002 <i>CO</i> ₁₅	17.3	X	49.24164	240.89622	168.48669	31.31608	0.3068383	0.35321503	1.98	1.37	2.59	Mc	—	—
357153 2002 <i>CO</i> ₂₃	16.9	X	226.89431	180.80734	206.62496	5.01465	0.3414779	0.27808862	2.32	1.53	3.12	Mc	5 4.0	21.2
357319 2003 <i>GR</i> ₈	17.4	X	137.81212	203.00833	14.17429	6.44535	0.3154000	0.29227313	2.25	1.54	2.96	Mc	10 24.6	21.4
357333 2003 <i>NJ</i> ₇	17.6	X	130.60597	326.07431	30.18104	9.35866	0.3014136	0.35255553	1.98	1.39	2.58	Mc	—	—
357355 2003 <i>RV</i> ₈	16.7	X	31.72218	119.11437	195.53860	21.51101	0.3252779	0.27788996	2.33	1.57	3.08	Mc	11 27.7	19.9
357406 2003 <i>VB</i> ₃	19.4	X	331.07748	305.01803	191.60000	1.03772	0.3386508	0.33920926	2.04	1.35	2.73	Mc	—	—
357430 2003 <i>YP</i> ₁₃₅	16.1	X	51.07770	328.63262	86.28094	14.58564	0.3902296	0.22720766	2.66	1.62	3.70	Mc	—	—
357510 2004 <i>RD</i> ₁₀	17.8	X	158.18109	52.65930	213.05397	1.76117	0.2433647	0.30977644	2.16	1.64	2.69	Mc	—	—
357635 2005 <i>GW</i> ₈	16.6	X	5.58042	260.58705	216.06041	27.51875	0.3706029	0.23388880	2.61	1.64	3.58	Mc	—	—
357956 2006 <i>AN</i> ₁₁	16.7	X	196.47503	122.18717	359.89350	25.71164	0.2859994	0.28784043	2.27	1.62	2.92	Mc	8 22.2	21.0
358046 2006 <i>GR</i> ₃₅	17.1	X	93.72093	239.88833	21.40457	22.01351	0.2979127	0.28211928	2.30	1.62	2.99	Mc	11 9.0	21.2
358060 2006 <i>HR</i> ₄₉	17.8	X	98.33904	153.81758	121.79242	5.73820	0.4202224	0.28189317	2.30	1.34	3.27	Mc	12 11.3	22.4
358109 2006 <i>KZ</i> ₁₂₃	16.0	X	346.08506	295.44109	30.18442	21.89308	0.3196789	0.26273148	2.41	1.64	3.19	Mc	8 31.3	17.8
358438 2007 <i>DZ</i> ₈₂	17.6	X	283.98452	326.94244	173.70074	23.74930	0.2075345	0.32441240	2.10	1.66	2.53			

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
360249 2000 GQ ₁₂₇	16.5 ^m	X	133.45729	300.87840	16.62220	46.45194	0.3949326	0.30530235	2.18	1.32	3.05	Mc	—	—
360280 2000 UH ₁₆	15.9	X	0.87408	301.68028	61.40546	24.22060	0.3141776	0.28371494	2.29	1.57	3.01	Mc	12 12.9	17.9
360337 2001 UR ₁	15.5	X	256.79991	267.68693	59.71984	27.41929	0.4101283	0.22986463	2.64	1.56	3.72	Mc	3 28.3	21.0
360361 2002 AQ ₄	16.9	X	199.30743	330.92518	115.52050	25.63779	0.3013781	0.28051126	2.31	1.61	3.01	Mc	6 29.6	21.2
360436 2002 JE ₇₀	17.6	X	41.28468	174.69548	106.86754	6.50191	0.3791321	0.26696943	2.39	1.48	3.29	Mc	11 3.3	20.8
360491 2002 VB ₉₂	17.0	X	262.98871	258.97285	224.40705	36.87663	0.3399600	0.31037369	2.16	1.43	2.89	Mc	10 7.4	20.0
360509 2003 OD ₃	17.1	X	41.36903	188.64055	151.86379	11.48500	0.2894126	0.28210506	2.30	1.64	2.97	Mc	—	—
360521 2003 QD ₆₂	17.1	X	322.04365	308.00770	40.03367	4.52955	0.3319123	0.26961107	2.37	1.59	3.16	Mc	6 25.5	18.7
360557 2003 SW ₃₈₆	18.0	X	67.68170	121.50497	153.47701	5.34680	0.2969725	0.27864284	2.32	1.63	3.01	Mc	11 11.8	21.6
360563 2003 UM ₁₂	18.7	X	72.91901	296.26414	13.27089	1.20079	0.4122559	0.28341163	2.30	1.35	3.24	Mc	—	—
360642 2004 HM ₅₀	17.0	X	264.43486	104.08061	181.41178	6.85740	0.4482703	0.21660008	2.75	1.52	3.98	Mc	1 26.4	22.3
360643 2004 HY ₅₃	16.9	X	129.05843	334.12345	353.98458	6.32636	0.2457373	0.31991376	2.12	1.60	2.64	Mc	—	—
360658 2004 RS ₅₄	17.7	X	108.29709	174.67773	154.70598	5.72320	0.2678349	0.30865543	2.17	1.59	2.75	Mc	—	—
360690 2004 SV ₂₀	17.5	X	167.28836	290.22670	6.85314	6.77954	0.2523456	0.31384833	2.14	1.60	2.69	Mc	—	—
360698 2004 TP ₁₂	17.7	X	50.32336	96.83096	224.58464	24.78432	0.1587762	0.41173864	1.79	1.51	2.07	Mc	12 25.7	20.3
360829 2005 LD ₃₁	16.3	X	233.00510	118.34596	186.70449	16.40961	0.3992555	0.22263824	2.70	1.62	3.77	Mc	1 31.1	21.9
361094 2006 CJ ₆₀	18.8	X	284.84678	328.22083	164.63950	5.15564	0.1284583	0.43232764	1.73	1.51	1.95	Mc	—	—
361537 2007 JH ₁₆	18.1	X	59.09181	200.43027	115.11501	29.17550	0.1204052	0.51367835	1.54	1.36	1.73	Mc	—	—
361539 2007 KN ₃	17.8	X	54.64339	229.67524	107.81656	6.00893	0.3267856	0.30719750	2.18	1.46	2.89	Mc	—	—
361548 2007 PS ₄₂	17.8	X	70.97152	179.58025	147.47457	6.57929	0.2771188	0.29707740	2.22	1.61	2.84	Mc	—	—
361565 2007 RB ₅₅	16.9	X	39.25311	285.39100	188.55914	28.32517	0.3616566	0.23586355	2.59	1.66	3.53	Mc	1 3.7	19.2
361586 2007 RB ₂₄₀	17.5	X	59.75991	271.96357	54.43043	8.00882	0.4260409	0.29402566	2.24	1.66	2.82	Mc	—	—
361809 2008 CD ₄₈	16.7	X	332.83462	313.65873	166.31942	13.95647	0.4287755	0.21374396	2.77	1.58	3.96	Mc	—	—
361861 2008 ED ₆₉	17.0	X	226.59262	173.26029	149.52192	36.35604	0.7394937	0.19826364	2.91	0.76	5.07	Jc	2 15.7	23.6
362047 2009 BG ₁₄	16.7	X	130.55147	294.87679	263.24213	22.44829	0.3041922	0.28357193	2.29	1.60	2.99	Mc	9 15.2	21.3
362352 2010 MW ₈₇	17.9	X	50.65591	229.80512	89.67226	4.45658	0.3200432	0.28004494	2.31	1.57	3.05	Mc	12 22.3	21.1
362483 2010 SE ₃₄	16.9	X	86.67280	270.23865	9.90749	6.76140	0.2835244	0.27913146	2.32	1.66	2.98	Mc	11 29.8	20.9
362925 2012 DX ₃₀	17.1	X	123.69771	274.41103	187.29508	27.45415	0.3965328	0.23452736	2.60	1.57	3.64	Mc	5 31.8	22.2
363012 1998 PH ₄	16.6	X	301.47877	162.56421	180.08566	9.45882	0.4467368	0.23613767	2.59	1.43	3.75	Mc	4 30.0	20.4
363019 1996 TD ₈	16.1	X	192.35522	171.78472	212.33430	15.06527	0.3943165	0.22130347	2.71	1.64	3.77	Mc	4 10.1	21.4
363080 2000 QY ₁₂₉	16.1	X	52.87445	148.16192	155.63155	17.47151	0.4368275	0.19617569	2.93	1.65	4.21	Mc	12 8.9	21.1
363088 2000 SC ₂₆	17.9	X	53.10939	119.43868	225.12275	8.84993	0.2631007	0.29109753	2.25	1.66	2.85	Mc	—	—
363091 2000 SF ₁₀₂	18.0	X	47.08206	109.31956	228.84497	1.39405	0.3243183	0.28913955	2.26	1.53	3.00	Mc	—	—
363135 2001 QQ ₁₉₉	12.7	X	210.44376	193.40024	133.00212	42.56063	0.4275486	0.08019735	5.33	3.05	7.60	Jc	5 17.3	21.4
363193 2001 UC ₁₀	18.5	X	167.63110	214.78419	95.74612	1.77226	0.2372399	0.31509063	2.14	1.63	2.65	Mc	—	—
363205 2001 US ₁₅₁	17.0	X	266.86564	133.01044	221.59056	4.39299	0.3676114	0.23421349	2.61	1.65	3.56	Mc	4 21.8	21.5
363218 2001 VM ₇₅	16.4	X	206.21040	227.79149	231.99622	22.88513	0.3386088	0.28115147	2.31	1.53	3.09	Mc	7 12.1	21.1
363221 2001 VX ₈₁	17.0	X	145.04786	275.62763	239.17664	20.41994	0.3599970	0.27855999	2.32	1.49	3.16	Mc	8 7.4	21.8
363223 2001 VO ₁₁₂	18.1	X	46.17025	55.41977	308.43708	2.63264	0.3026396	0.30335652	2.19	1.53	2.86	Mc	—	—
363226 2001 WQ ₁	18.5	X	115.53925	273.72381	52.68144	2.32856	0.2702013	0.30897670	2.17	1.58	2.75	Mc	—	—
363237 2001 YX	16.3	X	290.42816	83.42735	289.32325	27.25160	0.3627778	0.23473793	2.60	1.66	3.55	Mc	6 7.9	20.3
363300 2002 LF ₄₀	17.3	X	74.86904	184.47815	119.31548	9.48379	0.2965613	0.27292914	2.35	1.66	3.05	Mc	12 20.9	21.3
363368 2002 TJ ₅₂	16.9	X	215.37997	131.67407	231.54027	5.79548	0.3654852	0.23969362	2.57	1.63	3.50	Mc	3 28.3	21.8
363369 2002 TU ₅₃	16.7	X	308.59292	134.41414	225.73541	11.26522	0.3425896	0.25255704	2.48	1.63	3.33	Mc	6 15.5	19.4
363402 2003 MF ₃	15.8	X	177.80441	244.61993	83.43452	15.23228	0.4400324	0.19409630	2.95	1.65	4.25	Mc	2 6.1	21.8
363403 2003 OY ₇	17.9	X	44.32013	147.08976	192.24975	3.94946	0.2798300	0.28398762	2.29	1.65	2.93	Mc	—	—
363407 2003 QY ₁	18.2	X	85.94238	136.98818	163.15322	3.63984	0.3034710	0.28600084	2.28	1.59	2.97	Mc	12 26.5	22.1
363421 2003 RG ₈	17.1	X	96.95324	99.74047	213.20053	20.26884	0.3199222	0.28777872	2.27	1.55	3.00	Mc	—	—
363438 2003 SY ₁₀₅	17.4	X	51.27645	355.04053	321.39324	2.99242	0.2807226	0.28038725	2.31	1.66	2.96	Mc	12 14.6	20.6
363491 2003 TP	17.8	X	63.71841	120.42712	214.61698	24.10690	0.3226096	0.28353925	2.29	1.55	3.04	Mc	—	—
363548 2003 WA ₁₃	17.4	X	40.84452	291.77628	47.17236	6.50580	0.2868185	0.27776346	2.33	1.66	2.99	Mc	—	—
363560 2003 YC	16.7	X	30.69048	301.15886	132.61604	24.58640	0.3166003	0.28565675	2.28	1.56	3.01	Mc	—	—
363630 2004 RO ₁₃₉	18.4	X	125.83907	188.03202	147.62281	2.27195	0.2383753	0.31225324	2.15	1.64	2.66	Mc	—	—
363714 2004 VT ₁₆	18.4	X	127.85552	68.25534	260.97170	4.33355	0.3812672	0.30949631	2.16	1.34	2.99	Mc	—	—
363792 2005 JN ₁₂₁	18.9	X	288.48385	220.86254	95.02261	4.48733	0.2175436	0.36396828	1.94	1.52	2.37	Mc	3 30.2	21.2
363802 2005 LT ₁₂	17.3	X	45.81592	56.58676	213.71532	21.42780	0.2746957	0.37525096	1.90	1.38	2.43	Mc	10 19.8	19.3
363829 2005 PQ ₆	16.1	X	272.03641	239.34889	116.02129	31.63446	0.3779024	0.23524587	2.60	1.62	3.58	Mc	5 10.3	21.1
363864 2005 RT ₂₄	16.7	X	235.10837	286.04188	84.42839	8.83217	0.4746696	0.22764705	2.66	1.40	3.92	Mc	4 19.3	22.1
364067 2005 XK ₆₆	16.1	X	301.88736	235.29375	124.79778	14.75431	0.3922614	0.23613280	2.59	1.58	3.61	Mc	6 1.6	19.8
364071 2005 YX ₁	15.6	X	296.90071	272.23184	74.45623	27.41971	0.4719565	0.23280323	2.62	1.38	3.85	Mc	5 6.2	20.0
364141 2006 DC ₄₂	18.6	X	342.90906	160.36327	276.45509	5.96408	0.0984556	0.43316002	1.73	1.56	1.90	Mc	—	—
364142 2006 DN ₆₂	17.6	X	162.14819	43.97490	189.62139	7.34073	0.2981508	0.29410058	2.24	1.57	2.91	Mc	12 1.6	21.7
364205 2006 QQ ₁₀₄	17.3	X	116.64923	43.29985	207.39489	8.33327	0.3412688	0.27852853	2.32	1.53	3.11	Mc	11 20.8	21.7
364273 2006 TW ₄₈	18.1	X	15.44307	109.48846	214.46231	9.32733	0.3282366	0.26329606	2.41	1.62	3.20	Mc	11 13.2	20.2
364566 2007 PM ₈	18.1	X	103.29275	109.46627	210.05082	6.39665	0.2507750	0.30450062	2.19	1.64	2.74	Mc	—	—
364639 2007 TY ₁₀₉	17.4	X	126.28572	263.30709	58.18640	7.31672	0.2528192	0.30362985	2.19	1.64	2.75	Mc	—	—
365179 2009 FP ₄	16.7	X	21.96006	73.48973	35.15162	28.17330	0.3868845	0.23354426	2.61	1.60	3.62	Mc	—	—
365224 2009 HC ₈₈	16.1	X	294.90857	170.05710	166.15647	23.81024	0.4732924	0.23282721	2.62	1.38	3.86	Mc	4 15.2	20.6
365246 2009 NE	15.9	X	244.69251	198.87583	230.41274	35.01759	0.8645157	0.22524181	2.68	0.36	4.99	Jc	6 6.2	22.4
365426 2010														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
366431 2001 VB ₉₉	16.0	X	258.34808	287.78971	111.90243	29.28450	0.3999819	0.23405774	2.61	1.56	3.65	Mc	6 12.6	20.9
366450 2002 AU ₁₁	15.8	X	266.98330	92.11754	298.25417	26.78064	0.4074215	0.23339874	2.61	1.55	3.68	Mc	6 1.9	20.7
366451 2002 AN ₁₈	16.6	X	274.51462	283.24997	133.47855	25.21850	0.4280064	0.23580695	2.59	1.48	3.71	Mc	7 9.4	20.9
366455 2002 AZ ₁₂₆	16.7	X	277.81680	105.23179	270.62057	4.26787	0.3667121	0.23382841	2.61	1.65	3.57	Mc	5 27.2	20.7
366597 2002 VU ₁₀₇	17.8	X	0.03257	99.18707	278.48991	5.53316	0.3163669	0.26146116	2.42	1.66	3.19	Mc	12 29.8	19.9
366599 2002 XL ₈	17.0	X	61.91212	80.55862	301.30073	4.82998	0.3288536	0.27110656	2.36	1.59	3.14	Mc	—	—
366616 2003 NP ₄	16.5	X	93.16747	85.28776	253.88720	20.82427	0.3056073	0.28931137	2.26	1.57	2.96	Mc	—	—
366617 2003 OS ₆	17.7	X	193.52797	21.05717	187.35751	5.76129	0.4059048	0.29633658	2.23	1.32	3.13	Mc	11 17.7	21.8
366686 2003 US ₂₇₅	17.9	X	96.09714	315.12458	20.24271	3.64239	0.2704332	0.28741319	2.27	1.66	2.89	Mc	—	—
366709 2003 WV ₁₃₆	16.1	X	159.73038	245.08094	104.20085	2.58345	0.4542400	0.18617859	3.04	1.66	4.42	Mc	2 18.8	21.9
366736 2004 EH ₃₇	16.1	X	77.86182	40.10726	68.16242	11.23727	0.3912680	0.23341369	2.61	1.59	3.63	Mc	4 29.1	19.3
366795 2004 VA ₆₁	18.2	X	167.61748	130.71440	199.68443	5.43097	0.3158073	0.31511879	2.14	1.46	2.81	Mc	1 10.1	21.6
366839 2005 PF	17.2	X	317.95129	248.50355	101.62393	11.32540	0.4615127	0.24104595	2.56	1.38	3.74	Mc	5 27.9	20.0
366945 2005 VL ₁₁₈	16.8	X	299.68213	92.54060	287.86255	26.50474	0.4109732	0.23776539	2.58	1.52	3.64	Mc	6 22.5	20.3
366949 2005 WP ₁	17.0	X	280.14424	97.74032	291.77710	26.73262	0.4024121	0.23558135	2.60	1.55	3.64	Mc	6 14.5	21.4
367073 2006 PZ ₁₉	17.0	X	17.83933	221.75215	142.70101	9.40790	0.2980578	0.27159771	2.36	1.66	3.07	Mc	—	—
367251 2007 PN ₄₉	18.9	X	214.17972	66.96879	240.65716	1.78063	0.2685343	0.32371363	2.10	1.54	2.66	Mc	1 14.8	22.5
367341 2008 DJ ₆	17.1	X	90.50781	251.61409	144.62191	25.77502	0.2731179	0.29784885	2.22	1.61	2.83	Mc	—	—
367676 2010 JV ₈₁	17.5	X	126.24259	145.58798	169.36802	7.41137	0.2604022	0.30064787	2.21	1.63	2.78	Mc	—	—
367708 2010 TV ₁₈	17.8	X	127.79030	5.33383	340.79338	0.62412	0.2537588	0.30144638	2.20	1.64	2.76	Mc	—	—
368150 1992 DC	17.1	X	181.20897	155.31228	350.53601	10.47912	0.4577761	0.25157447	2.49	1.35	3.62	Mc	8 26.8	22.1
368153 1995 UX ₁	17.3	X	334.82719	15.38675	141.01553	15.17096	0.4420555	0.22716736	2.66	1.48	3.84	Mc	10 16.8	17.1
368157 1998 RM ₄₄	18.2	X	200.36221	346.22250	13.92558	6.44679	0.3441474	0.28385591	2.29	1.50	3.08	Mc	3 16.1	22.6
368160 1999 HW ₂	16.1	X	76.36880	86.16748	180.01592	27.15965	0.4041904	0.23332150	2.61	1.56	3.67	Mc	11 14.3	21.1
368163 1999 RE ₁₉₈	18.0	X	189.72298	133.55890	215.38804	8.31300	0.3002604	0.29514445	2.23	1.56	2.90	Mc	2 17.5	22.0
368188 2000 SZ ₇₂	17.6	X	159.41917	320.53823	31.68067	4.89109	0.2696896	0.30425533	2.19	1.60	2.78	Mc	1 30.3	20.9
368194 2000 WO ₄	17.5	X	142.17226	48.61867	292.41636	6.49696	0.2848487	0.30003990	2.21	1.58	2.84	Mc	—	—
368231 2001 UR ₁₆	16.6	X	279.04188	79.64821	235.03272	26.85858	0.4082667	0.23187581	2.62	1.55	3.70	Mc	3 2.1	21.8
368254 2001 XE ₁₀₃	15.7	X	302.66771	63.68247	264.10281	28.06760	0.3977478	0.23417993	2.61	1.57	3.64	Mc	4 7.8	20.2
368282 2002 NH ₇	17.4	X	76.67524	138.67926	205.52329	5.51868	0.3111906	0.27406710	2.35	1.62	3.08	Mc	—	—
368284 2002 NH ₃₁	17.0	X	43.09050	92.75532	261.49084	8.85087	0.3006067	0.26973064	2.37	1.66	3.09	Mc	—	—
368455 2003 QA ₄₆	17.3	X	154.38476	0.23716	340.31016	4.92149	0.2814606	0.30050768	2.21	1.59	2.83	Mc	1 11.8	20.5
368475 2003 SY ₂₂₃	16.4	X	85.62623	53.43116	27.54656	18.66249	0.3275758	0.29217968	2.25	1.51	2.99	Mc	3 18.8	18.7
368477 2003 SX ₂₅₃	16.9	X	142.71727	104.55007	216.88327	3.24422	0.3248052	0.29447244	2.24	1.51	2.96	Mc	—	—
368481 2003 SG ₂₉₁	16.9	X	158.50545	95.98601	112.31984	6.51721	0.2748457	0.29429264	2.24	1.62	2.85	Mc	—	—
368531 2003 WN ₈₂	17.3	X	86.04338	189.91446	182.92005	10.57544	0.3875931	0.28964021	2.26	1.39	3.14	Mc	—	—
368599 2004 RA ₁₆₀	16.1	X	226.12245	61.14578	321.30674	8.46325	0.4193756	0.21433475	2.77	1.61	3.92	Mc	4 23.5	21.7
368810 2005 YE ₁₈₁	16.7	X	266.82476	93.90785	319.35694	25.67739	0.4012737	0.23313605	2.61	1.57	3.66	Mc	7 6.1	21.3
368812 2006 AA ₁₁	16.2	X	301.80168	14.04444	24.33580	6.79792	0.3757087	0.23524158	2.60	1.62	3.58	Mc	7 27.1	19.1
368818 2006 BK ₁₂	16.4	X	249.88948	142.86346	267.79574	7.42396	0.4194684	0.22851402	2.65	1.54	3.76	Mc	6 12.9	21.3
368856 2006 HG ₁₁₉	17.6	X	144.18488	179.38515	174.81413	5.69828	0.2589775	0.30550222	2.18	1.62	2.75	Mc	1 13.4	20.5
368866 2006 QL ₂₅	17.1	X	92.30856	276.18935	343.55646	11.63694	0.3169755	0.27347312	2.35	1.61	3.10	Mc	11 8.3	21.4
369272 2009 QA ₇	17.3	X	292.84544	319.45238	333.34966	8.74984	0.3654246	0.31089778	2.16	1.37	2.95	Mc	2 19.9	20.8
369295 2009 SH ₁₈	17.4	X	302.09799	294.18022	345.71508	8.42542	0.3613269	0.30913624	2.17	1.38	2.95	Mc	2 13.5	20.9
369406 2009 WO ₂₅	16.7	X	240.24654	79.08069	353.09976	10.42129	0.4452077	0.22630136	2.67	1.48	3.85	Mc	7 2.2	21.9
369461 2010 RC ₆₈	18.2	X	223.94441	36.33520	240.59707	4.20334	0.2570252	0.31841927	2.12	1.58	2.67	Mc	—	—
369463 2010 RA ₁₁₂	18.1	X	201.34960	277.17044	12.48620	5.12539	0.2375736	0.31247848	2.15	1.64	2.66	Mc	—	—
369486 2010 UQ ₉	18.2	X	203.65559	276.99138	33.40209	2.29843	0.2691807	0.31436703	2.14	1.57	2.72	Mc	1 12.3	21.8
369499 2010 VY ₁₆	18.2	X	153.41272	37.60874	300.97093	3.78200	0.2362897	0.30731054	2.17	1.66	2.69	Mc	—	—
369539 2011 AP ₅	16.6	X	76.86337	106.61281	295.72566	22.50780	0.2725858	0.28993070	2.26	1.64	2.88	Mc	—	—
369550 2011 AZ ₄₇	17.2	X	38.41947	286.73201	135.56410	22.75901	0.2906253	0.28342297	2.30	1.63	2.96	Mc	—	—
369566 2011 BH ₁₉	16.7	X	84.95557	51.62079	345.10426	24.08594	0.2704926	0.28969736	2.26	1.65	2.87	Mc	—	—
369883 2012 QR ₁₈	17.5	X	219.92648	211.34633	125.05561	8.72187	0.2764568	0.29059075	2.26	1.63	2.88	Mc	2 28.6	21.5
369955 2013 MK ₃	17.1	X	109.12367	230.83864	82.93443	6.34805	0.2936023	0.28568611	2.28	1.61	2.95	Mc	—	—
369993 1999 RO ₃₇	17.5	X	229.48816	269.31192	144.24467	20.04159	0.3145316	0.34939551	2.00	1.37	2.62	Mc	6 10.3	21.3
369994 1999 RQ ₅₅	17.5	X	89.45148	18.15127	349.09760	5.55591	0.3270109	0.28404314	2.29	1.54	3.04	Mc	—	—
369995 1999 RV ₁₉₅	15.7	X	250.72700	124.28374	253.03556	8.10679	0.4016977	0.21429952	2.77	1.65	3.88	Mc	5 5.3	20.9
370027 2000 PK ₂₉	18.1	X	190.67600	253.14320	31.75359	4.21791	0.2983331	0.30529571	2.18	1.53	2.84	Mc	—	—
370123 2001 VP ₂	16.2	X	276.19511	284.77112	168.48195	27.60130	0.3473496	0.24076411	2.56	1.67	3.45	Mc	9 6.9	19.5
370178 2002 CO ₁₂	16.8	X	260.43398	293.73468	138.42295	26.97650	0.3885065	0.23526869	2.60	1.59	3.61	Mc	7 20.2	21.3
370181 2002 CX ₄₆	16.7	X	284.62520	109.66081	338.66454	28.03093	0.4055052	0.23840442	2.58	1.53	3.62	Mc	9 1.8	20.0
370199 2002 DG ₂	15.9	X	295.38941	64.65340	344.04084	29.10855	0.3648829	0.23443736	2.60	1.65	3.56	Mc	8 12.5	19.3
370212 2002 GG ₁₄₈	17.2	X	255.12775	101.15158	12.98786	28.42431	0.3959553	0.23596314	2.59	1.57	3.62	Mc	9 16.1	21.5
370482 2003 QA ₂₇	17.9	X	169.40785	94.80607	227.25782	1.97905	0.2451320	0.30079557	2.21	1.67	2.75	Mc	—	—
370491 2003 SE	17.5	X	182.19809	104.81246	169.65696	5.77943	0.2829240	0.29497240	2.24	1.60	2.87	Mc	—	—
370577 2003 UG ₂₇₀	16.4	X	59.82991	94.26271	323.98345	20.57830	0.3065907	0.28747257	2.27	1.58	2.97	Mc	—	—
370633 2003 YK ₁₂₃	17.8	X	71.59684	96.25459	299.94016	2.55645	0.2757143	0.28611058	2.28	1.65	2.91	Mc	—	—
370651 2004 BX ₁₀₂	16.2	X	32.01289	85.79091	354.14117	19.36850	0.4117478	0.28272621	2.30	1.35	3.25	Mc	—	—
370723 2004 RC ₅₇	18.1	X	310.71928	167.76538	138.75272	5.95185	0.2836814	0.28088323	2.31	1.65	2.96	Mc	4 13.2	20.9
370785 2004 SS _{55</}														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
372325 2009 AV ₁₅	17.7	X	87.75610	173.26563	341.99849	7.01577	0.1917911	0.34258233	2.02	1.63	2.41	Mc	6 4.5	19.8
372342 2009 DF ₉₇	17.3	X	93.27110	262.43583	0.51457	9.29774	0.3653153	0.27280564	2.35	1.49	3.21	Mc	11 17.3	21.7
372369 2009 LC	16.0	X	13.63712	103.19360	264.13697	20.65239	0.3195633	0.25736444	2.45	1.67	3.23	Mc	—	—
372789 2010 PK ₂₆	17.6	X	223.10284	241.28494	158.48681	8.33159	0.1964950	0.34302865	2.02	1.62	2.42	Mc	5 21.9	20.7
372858 2010 VB ₁₇₁	17.7	X	185.46282	297.98875	57.30459	4.78663	0.2272116	0.31459187	2.14	1.65	2.63	Mc	2 21.9	21.1
372876 2010 WG ₆₀	16.9	X	122.34255	88.80922	294.03784	20.78495	0.2893739	0.30106322	2.20	1.57	2.84	Mc	1 28.4	19.5
373416 1998 QG ₁	17.7	X	122.17577	54.96110	196.80715	6.40588	0.4428365	0.26908453	2.38	1.32	3.43	Mc	11 26.6	22.5
373425 1999 MU ₁	17.2	X	140.30356	27.49870	267.85489	13.66503	0.3448542	0.28633854	2.28	1.49	3.07	Mc	—	—
373456 2000 EE ₆₂	16.4	X	39.35282	251.57847	357.81648	28.78855	0.3771267	0.24068816	2.56	1.59	3.52	Mc	9 15.4	19.2
373463 2000 PK ₁₇	18.0	X	153.43895	33.85532	317.27772	4.83562	0.2573683	0.30569025	2.18	1.62	2.74	Mc	1 20.4	21.0
373469 2000 SO ₄₂	16.9	X	336.03218	109.34515	172.28200	10.80954	0.4366614	0.22838643	2.65	1.49	3.81	Mc	3 26.1	19.7
373618 2002 FM	16.2	X	147.14777	245.13306	353.40025	22.60569	0.4709565	0.17812913	3.13	1.66	4.60	Mc	11 8.7	22.8
373825 2002 XD ₁₂	17.6	X	257.62435	145.52592	273.99999	9.36695	0.2004166	0.35534221	1.97	1.58	2.37	Mc	7 23.7	20.0
373834 2002 XD ₁₁₃	17.9	X	12.90532	40.74513	51.80481	2.96174	0.3167904	0.26814100	2.38	1.63	3.14	Mc	—	—
373883 2003 SB ₂₃₄	17.7	X	181.15304	176.48348	112.40752	3.60954	0.2723524	0.29734312	2.22	1.62	2.83	Mc	—	—
373907 2003 UE ₆₃	17.9	X	134.61022	244.34659	87.57303	4.99695	0.3179592	0.29491252	2.24	1.52	2.95	Mc	—	—
374684 2006 QD ₆₄	17.6	X	158.75640	142.80267	168.33052	8.64291	0.2676514	0.29149797	2.25	1.65	2.86	Mc	—	—
374777 2006 TZ ₁	18.0	X	17.38623	91.00539	13.00143	7.99567	0.2880863	0.28017296	2.31	1.65	2.98	Mc	—	—
374849 2006 VO ₁	17.8	X	45.98938	213.30409	199.34371	4.18074	0.3105840	0.27702153	2.33	1.61	3.05	Mc	—	—
374907 2006 XE ₁	17.6	X	98.84094	336.36708	58.52529	21.15626	0.1447128	0.41656198	1.78	1.52	2.03	Mc	—	—
375129 2007 VM ₂₅₀	18.3	X	174.38164	29.83114	299.28428	5.96332	0.2364631	0.31272006	2.15	1.64	2.66	Mc	1 8.9	21.3
376070 2010 NA ₄₀	18.3	X	235.80213	327.88565	309.05639	2.86480	0.2631832	0.31789089	2.13	1.57	2.69	Mc	—	—
376246 2011 ES ₇₇	16.8	X	199.69920	348.83199	144.59940	12.60183	0.3764634	0.23684443	2.59	1.61	3.56	Mc	8 22.3	21.8
376571 2013 PA ₁₄	18.0	X	123.22633	70.34314	303.75223	3.66328	0.2503766	0.30066716	2.21	1.65	2.76	Mc	1 15.2	20.4
376713 1995 WQ ₅	16.7	X	62.70682	283.94327	88.69567	21.09003	0.4134367	0.27392556	2.35	1.38	3.32	Mc	—	—
376720 1997 CO ₅	17.0	X	288.70873	124.37638	317.39535	19.12605	0.4791992	0.23159399	2.63	1.37	3.88	Mc	8 15.8	20.3
376721 1997 GR ₃₀	18.0	X	252.70591	89.12115	191.42266	4.79623	0.2688100	0.31983080	2.12	1.55	2.69	Mc	1 10.1	21.6
376763 1999 XB ₉	17.0	X	119.45510	312.74385	82.17158	23.66048	0.2905699	0.28691412	2.28	1.60	2.95	Mc	2 27.2	20.6
376764 1999 XS ₁₆	15.4	X	62.81248	99.23254	77.34209	10.07460	0.5359219	0.19521601	2.94	1.37	4.52	Mc	7 30.4	19.9
376771 2000 DH ₁₇	17.3	X	40.23961	67.03418	158.06657	11.05806	0.3959796	0.28662595	2.28	1.58	2.98	Mc	7 25.7	21.1
376779 2000 LU ₂₅	15.8	X	332.03606	94.23715	238.41670	32.87187	0.4409563	0.23373648	2.61	1.46	3.76	Mc	5 30.4	17.8
376784 2000 QW ₁₄₄	18.0	X	37.53560	334.94645	6.45141	5.85313	0.2927832	0.28821394	2.27	1.61	2.93	Mc	—	—
376786 2000 QO ₁₉₄	16.6	X	17.07978	293.66191	132.45095	10.53908	0.5006912	0.19711399	2.92	1.46	4.93	Mc	—	—
376789 2000 RP ₄₀	17.6	X	170.69551	38.75390	286.92180	6.13404	0.2544403	0.30397550	2.19	1.63	2.75	Mc	1 4.2	20.9
376794 2000 SN ₁₂₅	17.9	X	44.78577	316.80162	56.74628	5.60134	0.3310129	0.29030140	2.26	1.51	3.01	Mc	—	—
376811 2000 WU ₁₂₄	16.6	X	262.65919	64.95081	63.60523	29.32947	0.3865957	0.23011937	2.64	1.62	3.66	Mc	10 17.9	20.9
376817 2001 AT ₄₃	16.4	X	165.14483	105.90024	284.50787	21.58868	0.2958686	0.30328762	2.19	1.54	2.84	Mc	3 11.2	20.6
376818 2001 AG ₅₄	17.6	X	39.90764	6.11773	103.02358	8.56554	0.2765769	0.29294793	2.25	1.62	2.87	Mc	—	—
376830 2001 MJ ₁₁	17.7	X	25.43471	217.91976	94.62868	8.64905	0.2671770	0.30079336	2.21	1.62	2.80	Mc	11 12.5	20.0
376833 2001 OM ₂₅	18.2	X	108.23062	175.79189	144.71508	4.90692	0.2417662	0.31264395	2.15	1.63	2.67	Mc	—	—
376836 2001 QD ₆₁	16.5	X	242.45287	253.65913	134.85385	29.40878	0.3721469	0.23419351	2.61	1.64	3.58	Mc	5 24.6	21.9
376837 2001 QA ₁₁₄	16.6	X	213.95520	284.64469	125.80971	28.48473	0.4196097	0.23097662	2.63	1.53	3.73	Mc	5 30.9	22.3
376842 2001 QM ₂₅₉	16.7	X	338.72860	281.36684	337.77952	23.48097	0.2892248	0.28641312	2.28	1.62	2.94	Mc	3 8.9	18.9
376861 2001 TH ₇	17.2	X	295.84877	285.10790	62.97914	7.64022	0.3555307	0.24016778	2.56	1.65	3.47	Mc	5 11.9	20.8
376876 2001 VC ₅₆	17.7	X	232.22049	84.63704	283.88289	4.09744	0.2826528	0.28028498	2.31	1.66	2.97	Mc	4 14.3	21.9
376891 2001 XF ₁₀₄	16.2	X	212.06637	265.30268	260.65137	10.06705	0.3702758	0.24016946	2.56	1.61	3.51	Mc	10 3.4	21.0
376944 2002 DP ₃	16.5	X	279.79565	355.39011	67.51901	10.67807	0.4899214	0.23622773	2.59	1.32	3.86	Mc	7 14.4	20.7
376950 2002 ER ₉₇	17.3	X	148.69784	53.12033	73.44805	2.89486	0.3895499	0.22262357	2.70	1.65	3.75	Mc	7 15.4	22.4
376955 2002 GR ₃	16.6	X	273.18690	288.28572	204.50314	27.62483	0.4339222	0.23951829	2.57	1.45	3.68	Mc	10 11.9	20.1
376964 2002 HD	16.9	X	260.80447	83.76647	51.60902	28.42196	0.3899848	0.23705074	2.59	1.58	3.59	Mc	10 20.1	20.9
376968 2002 JJ ₁₀₁	17.2	X	121.70769	140.97359	156.37876	14.12558	0.3174647	0.27928728	2.32	1.58	3.05	Mc	—	—
376971 2002 KA ₁	17.6	X	354.79265	330.58790	335.78593	5.34597	0.3106527	0.31477011	2.14	1.48	2.81	Mc	8 15.2	17.1
376995 2002 PP ₁₃₈	17.4	X	163.14270	73.40457	245.34328	8.56350	0.2777273	0.28423830	2.29	1.65	2.93	Mc	—	—
377021 2002 RW ₉₈	16.5	X	104.92313	358.48827	5.43182	11.06804	0.3887907	0.22474399	2.68	1.64	3.72	Mc	1 19.3	20.3
377052 2002 TB ₁₄₂	16.5	X	102.28875	312.23143	94.04560	11.38187	0.3775682	0.22688768	2.66	1.66	3.67	Mc	3 9.9	20.5
377114 2002 XL ₂₉	15.9	X	301.16198	87.18735	82.79583	22.40552	0.3161362	0.26537669	2.40	1.64	3.16	Mc	—	—
377127 2003 EV ₅₂	17.3	X	133.66978	241.63296	5.13525	29.18556	0.3645623	0.24121840	2.56	1.62	3.49	Mc	11 10.7	22.7
377134 2003 JJ ₁₆	16.9	X	219.46058	66.63060	240.46530	22.55829	0.3241229	0.31104474	2.16	1.46	2.86	Mc	1 14.2	21.3
377145 2003 QM ₉₉	17.2	X	12.39405	258.66532	155.36709	20.78129	0.3214056	0.28254662	2.30	1.56	3.04	Mc	—	—
377172 2003 US ₅	17.6	X	38.80702	68.91872	328.64979	5.02307	0.2807277	0.28437632	2.29	1.65	2.93	Mc	—	—
377173 2003 UE ₇	17.6	X	203.61498	250.26494	89.98197	7.48058	0.3230273	0.30696000	2.18	1.47	2.88	Mc	2 21.9	21.6
377204 2003 WM ₁₄₁	16.3	X	37.64832	75.14446	79.05910	21.88038	0.3755250	0.29155419	2.25	1.41	3.10	Mc	3 20.7	17.6
377331 2004 OF ₁₀	17.8	X	289.98665	259.86736	86.26540	6.18577	0.2833909	0.28327061	2.30	1.65	2.95	Mc	5 10.9	20.8
377463 2004 XE ₄₅	16.7	X	201.32560	59.95625	81.19846	12.10070	0.4412404	0.21779360	2.74	1.53	3.94	Mc	9 3.5	22.3
377470 2004 XX ₁₆₁	15.8	X	275.70932	330.96459	41.68633	10.18165	0.3919369	0.21931509	2.72	1.66	3.79	Mc	5 18.3	20.2
377603 2005 QW ₁₆₀	18.3	X	336.58968	307.59526	100.96011	2.81993	0.3675257	0.24907106	2.50	1.58	3.42	Mc	12 22.9	18.9
377608 2005 RB ₃₄	18.7	X	41.82109	151.56441	136.69948	9.82581	0.3948005	0.31268540	2.15	1.30	3.00	Mc	11 20.9	21.8
377789 2006 AV ₁₁	17.2	X	330.54292	67.33309	276.72549	3.62107	0.3631595	0.23570028	2.60	1.65	3.54	Mc	7 5.1	18.5
377939 2006 HP ₅₈	18.4	X	226.74847	302.33247	221.37374	19.44627	0.1222978	0.42319759	1.76	1.54	1.97</			

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
378532 2008 <i>AP</i> ₂₈	16.5 ^m	X	18.04598	220.18142	151.55886	26.46142	0.4035901	0.27707146	2.33	1.39	3.27	Mc	—	—
378701 2008 <i>NJ</i> ₁	18.1	X	24.50349	107.48009	279.07741	21.67247	0.2772416	0.39615043	1.84	1.33	2.35	Mc	—	—
378747 2008 <i>RM</i> ₇₇	17.4	X	171.76806	359.34115	353.00137	6.09616	0.3517101	0.26650012	2.39	1.55	3.23	Mc	2 18.6	21.7
378810 2008 <i>SG</i> ₂₀₉	18.7	X	79.40256	130.46912	167.83112	3.71260	0.2513946	0.31675776	2.13	1.60	2.67	Mc	12 20.2	22.1
378959 2008 <i>UY</i> ₁₉₀	18.2	X	72.71798	261.83070	55.07588	5.93733	0.2533918	0.31545670	2.14	1.60	2.68	Mc	—	—
379139 2009 <i>DS</i> ₁₂₄	17.6	X	200.48561	309.84260	351.77973	8.24695	0.2791474	0.30575352	2.18	1.57	2.79	Mc	1 1.5	21.4
379156 2009 <i>QN</i> ₈	17.0	X	61.57445	129.42736	184.04013	11.36688	0.3514703	0.25944312	2.43	1.58	3.29	Mc	12 24.0	21.2
379317 2009 <i>WM</i> ₂₅	16.6	X	169.56714	285.14375	90.25933	23.67256	0.3014097	0.28804542	2.27	1.59	2.96	Mc	3 22.9	21.1
379520 2010 <i>OS</i> ₂₃	16.9	X	194.12157	206.81901	81.21032	13.71857	0.4990332	0.22338233	2.69	1.35	4.03	Mc	—	—
379772 2011 <i>HK</i> ₂₈	18.3	X	25.55558	109.12418	162.76993	8.00001	0.2580859	0.30511140	2.19	1.62	2.75	Mc	9 4.7	19.5
379841 2011 <i>UV</i> ₁₇₃	17.7	X	6.27308	250.41966	119.34752	7.53557	0.2531372	0.30104406	2.20	1.65	2.76	Mc	12 29.9	19.8
380008 2013 <i>NT</i> ₆	16.5	X	92.27974	311.96585	16.96385	12.26693	0.3240565	0.28438974	2.29	1.55	3.03	Mc	—	—
380091 2013 <i>SH</i> ₅₇	17.8	X	148.23888	90.28621	252.85192	6.40611	0.2541294	0.30086910	2.21	1.65	2.77	Mc	1 4.0	20.8
380125 1996 <i>UC</i> ₁	18.2	X	10.58113	341.68624	26.28948	6.77953	0.3684195	0.27949828	2.32	1.46	3.17	Mc	—	—
380133 1998 <i>UX</i> ₂₄	20.0	X	33.99835	16.56139	25.50451	14.11118	0.2856540	0.39627368	1.84	1.31	2.36	Mc	—	—
380152 1999 <i>YO</i> ₄	16.5	X	79.53574	66.11146	343.01107	23.13533	0.3039097	0.28247260	2.30	1.60	3.00	Mc	1 8.1	18.6
380161 2000 <i>LD</i> ₁₆	16.8	X	348.66335	59.97556	255.61629	5.95074	0.4696790	0.23405866	2.61	1.38	3.83	Mc	6 29.1	16.5
380163 2000 <i>QG</i> ₅₉	16.9	X	336.56044	357.12334	7.85229	6.50055	0.3695367	0.23519303	2.60	1.64	3.56	Mc	9 12.3	17.6
380187 2000 <i>WH</i> ₂	16.5	X	317.52104	65.20651	319.59182	28.40653	0.3767320	0.23131712	2.63	1.64	3.62	Mc	8 7.6	18.4
380198 2000 <i>YZ</i> ₂₇	16.5	X	252.80971	93.83600	52.01045	27.40841	0.4255161	0.23035910	2.64	1.51	3.76	Mc	10 19.7	21.0
380199 2000 <i>YZ</i> ₂₉	15.9	X	215.34382	106.73352	116.47244	13.88705	0.5075305	0.22405616	2.68	1.32	4.05	Mc	12 6.1	21.1
380223 2001 <i>RQ</i> ₆₃	18.1	X	34.79626	109.24406	234.98348	5.98184	0.3286951	0.25307563	2.48	1.66	3.29	Mc	—	—
380240 2001 <i>UA</i> ₂	18.1	X	6.39428	150.87055	215.73256	12.79461	0.3639581	0.25009322	2.49	1.59	3.40	Mc	12 28.9	20.8
380282 2002 <i>AO</i> ₁₄₈	12.9	X	143.65047	207.82291	328.54870	19.19667	0.2671218	0.07261492	5.69	4.17	7.21	Jc	8 28.6	21.2
380363 2002 <i>TJ</i> ₁₁₈	17.6	X	70.04311	108.74052	296.94162	4.28621	0.3098511	0.27511369	2.34	1.62	3.07	Mc	—	—
380393 2002 <i>XL</i> ₆₃	17.7	X	49.60573	233.34071	164.33728	3.39157	0.3475695	0.26944282	2.37	1.55	3.20	Mc	—	—
380410 2003 <i>AD</i> ₅₄	15.6	X	71.77433	268.83232	302.62972	25.98781	0.3727732	0.23162689	2.63	1.65	3.60	Mc	8 20.5	19.8
380431 2003 <i>QC</i> ₅₇	18.0	X	187.52591	164.35673	146.17283	4.97627	0.2829642	0.30197338	2.20	1.58	2.82	Mc	1 1.9	21.6
380434 2003 <i>QV</i> ₁₁₄	18.1	X	66.23293	237.55019	85.17499	7.06061	0.3408150	0.28445008	2.29	1.51	3.07	Mc	—	—
380472 2003 <i>WR</i> ₂₄	16.8	X	206.60142	48.60450	259.02610	7.92065	0.3217678	0.29930097	2.21	1.50	2.93	Mc	1 13.1	20.9
380509 2004 <i>FY</i> ₅	17.5	X	44.70166	14.21485	119.36017	12.54264	0.3516730	0.29148219	2.25	1.46	3.05	Mc	2 6.2	17.3
380546 2004 <i>NB</i> ₂₅	17.0	X	320.28078	194.37211	147.62234	7.34844	0.3894439	0.22775524	2.66	1.62	3.69	Mc	6 3.1	19.9
380665 2005 <i>EF</i> ₂₂₄	16.1	X	28.89837	45.12293	12.45065	23.21251	0.3973370	0.29525501	2.23	1.35	3.12	Mc	—	—
380710 2005 <i>MN</i> ₃₂	16.1	X	313.12384	282.98485	307.32766	26.77456	0.3674128	0.23272846	2.62	1.66	3.58	Mc	1 6.5	20.3
380729 2005 <i>RX</i> ₃₀	16.7	X	49.41742	110.44060	284.49988	7.91855	0.3246031	0.26019347	2.43	1.64	3.22	Mc	—	—
380785 2005 <i>VW</i> ₅	18.3	X	53.77824	140.02466	176.91560	3.70412	0.3289548	0.31372689	2.15	1.44	2.85	Mc	12 27.6	21.6
380846 2006 <i>BN</i> ₇	16.7	X	253.68647	60.81946	85.78989	30.03705	0.3750896	0.23657725	2.59	1.62	3.56	Mc	11 1.8	21.1
380928 2006 <i>HJ</i> ₃	18.0	X	252.74730	256.71394	54.50589	6.64679	0.2813402	0.31688958	2.13	1.53	2.73	Mc	2 20.3	21.7
380954 2006 <i>KR</i> ₁₂₄	16.7	X	242.03945	73.15583	122.28611	6.79116	0.4558003	0.23259301	2.62	1.43	3.81	Mc	11 26.1	21.0
380963 2006 <i>QV</i> ₅₉	17.7	X	213.02035	86.58748	203.30195	6.48725	0.2703655	0.29939462	2.21	1.61	2.81	Mc	—	—
380980 2006 <i>SN</i> ₁₁₀	17.7	X	252.75850	331.71679	90.87037	7.41523	0.4173060	0.25113537	2.49	1.45	3.53	Mc	6 29.4	22.0
381050 2006 <i>WR</i> ₃	15.7	X	49.34081	154.78413	275.14972	48.77786	0.4377238	0.14327293	3.62	2.03	5.20	Jc	1 16.5	19.6
381147 2007 <i>GX</i> ₁	16.8	X	357.14512	121.61756	37.89411	22.32606	0.3164376	0.27253260	2.36	1.61	3.10	Mc	—	—
381783 2009 <i>TS</i> ₂	17.2	X	49.01859	305.34623	79.73220	4.75624	0.3251518	0.26362870	2.41	1.63	3.19	Mc	—	—
381823 2009 <i>VZ</i> ₈₀	16.9	X	81.66261	294.26410	56.85278	22.69999	0.3186355	0.26761134	2.38	1.62	3.14	Mc	—	—
381844 2009 <i>VW</i> ₁₆₃	17.5	X	336.59390	309.63202	58.00318	6.53749	0.3479569	0.24159678	2.55	1.66	3.44	Mc	9 25.9	18.4
381946 2010 <i>DP</i> ₂₀	17.7	X	76.73362	168.19113	302.99327	24.62424	0.0689369	0.44078659	1.71	1.59	1.83	Mc	1 14.4	18.4
381960 2010 <i>EV</i> ₈₇	16.7	X	260.16710	273.20038	181.82592	27.36446	0.3919636	0.22955825	2.64	1.61	3.68	Mc	8 13.8	21.4
382388 2013 <i>TP</i> ₁₂₇	17.3	X	241.11485	247.60683	200.01249	22.85783	0.4277718	0.21951696	2.72	1.56	3.89	Mc	7 16.8	22.7
382394 3549 <i>P-L</i>	16.1	X	1.34810	142.64305	220.14574	11.74475	0.3504078	0.24349703	2.54	1.65	3.43	Mc	12 10.9	18.3
382418 1998 <i>QN</i>	16.6	X	121.89605	45.13276	314.85183	12.19211	0.3138698	0.27506581	2.34	1.61	3.08	Mc	1 11.7	19.5
382438 1999 <i>TK</i> ₂₇₁	17.1	X	168.43738	351.89417	347.57235	4.80468	0.3143764	0.29026920	2.26	1.55	2.97	Mc	1 27.2	20.8
382456 2000 <i>QV</i> ₈₄	16.3	X	351.59368	196.75368	175.86580	10.58676	0.3634713	0.23757031	2.58	1.64	3.52	Mc	12 4.1	18.2
382486 2001 <i>CX</i> ₁₉	16.0	X	212.96033	277.01274	323.48709	26.54154	0.3809495	0.22931976	2.64	1.64	3.65	Mc	—	—
382492 2001 <i>OQ</i> ₁₆	17.0	X	104.30810	252.37613	78.23017	15.44851	0.3622137	0.26195645	2.42	1.54	3.30	Mc	—	—
382529 2001 <i>SE</i> ₃₁₃	18.8	X	359.24390	288.11070	113.10647	4.02193	0.3878357	0.25077286	2.49	1.52	3.46	Mc	—	—
382582 2002 <i>CX</i> ₁₅₂	17.0	X	325.21616	87.94831	319.01495	25.34483	0.3568207	0.24132380	2.56	1.64	3.47	Mc	9 25.2	19.1
382586 2002 <i>CC</i> ₂₁₄	18.3	X	340.75987	307.85793	138.28977	5.12762	0.3731753	0.24745899	2.51	1.57	3.45	Mc	—	—
382615 2002 <i>NM</i> ₇₁	17.5	X	71.56271	113.27193	283.24500	21.00999	0.3003132	0.27905997	2.32	1.62	3.02	Mc	—	—
382669 2002 <i>TA</i> ₁₂₆	17.4	X	116.71211	111.60827	211.56214	9.35397	0.3011661	0.27637005	2.33	1.63	3.04	Mc	—	—
382674 2002 <i>TH</i> ₂₂₄	18.4	X	300.25084	229.01792	210.02024	9.70652	0.2273986	0.36452762	1.94	1.50	2.38	Mc	12 5.5	18.6
382760 2003 <i>NY</i>	16.6	X	278.82249	283.35519	283.12009	7.14243	0.4323303	0.25463396	2.47	1.40	3.53	Mc	—	—
382778 2003 <i>SM</i> ₁₁₉	17.9	X	240.47546	246.94316	64.27897	3.48536	0.2331918	0.30966148	2.16	1.66	2.67	Mc	2 11.5	21.5
382820 2003 <i>WB</i> ₉	18.0	X	195.20960	73.37518	271.25446	7.01768	0.2945705	0.30356869	2.19	1.55	2.84	Mc	2 15.4	21.9
382838 2004 <i>BG</i> ₈₃	17.8	X	39.04562	93.29407	104.45059	6.72659	0.3692655	0.29239642	2.25	1.42	3.08	Mc	6 19.2	18.6
382893 2004 <i>PC</i> ₈₈	16.3	X	290.62453	109.02441	327.54230	28.21179	0.4296576	0.23076829	2.63	1.50	3.76	Mc	8 20.7	19.6
383006 2005 <i>LE</i> ₁₉	17.7	X	69.26778	154.51976	181.96035	5.91261	0.3672078	0.26455760	2.40	1.52	3.29	Mc	—	—
383165 2005 <i>VJ</i> ₅														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
385203 1999 <i>SO</i> ₁₅	17.6	X	202.25241	3.55468	343.55131	8.54894	0.2966690	0.29575532	2.23	1.57	2.89	Mc	2 27.3	21.4
385240 2000 <i>SW</i> ₃₆₃	17.0	X	22.67528	305.86989	45.04639	6.02718	0.3540928	0.24040783	2.56	1.65	3.47	Mc	12 29.4	20.2
385245 2000 <i>WK</i> ₂	16.6	X	313.02955	108.49285	305.07301	28.25529	0.3670617	0.23178514	2.62	1.66	3.59	Mc	8 26.3	19.3
385247 2000 <i>YD</i> ₆₇	16.3	X	167.25601	147.86619	272.38654	24.80738	0.2646988	0.30572206	2.18	1.60	2.76	Mc	4 24.7	20.5
385250 2001 <i>DH</i> ₄₇	18.8	X	290.29436	17.59639	147.39941	24.40357	0.0347899	0.52399270	1.52	1.47	1.58	Mc	—	—
385268 2001 <i>RC</i> ₁₂	15.7	X	149.74640	185.47745	208.90543	27.38805	0.6421450	0.17106458	3.21	1.15	5.28	Jc	4 10.6	22.5
385325 2002 <i>CK</i> ₂₅	20.0	X	249.51428	185.10011	319.76340	26.82713	0.0570185	0.49340386	1.59	1.50	1.68	Mc	—	—
385342 2002 <i>LL</i>	16.2	X	205.19967	111.15293	156.28853	28.92591	0.3764765	0.23532179	2.60	1.62	3.58	Mc	—	—
385354 2002 <i>PM</i> ₈₀	16.6	X	123.82322	33.00292	335.70358	24.35358	0.3077114	0.28156952	2.31	1.60	3.01	Mc	1 29.2	19.9
385355 2002 <i>PQ</i> ₈₇	16.7	X	201.89560	119.79924	146.20542	30.12201	0.3627981	0.23419057	2.61	1.66	3.55	Mc	—	—
385368 2002 <i>PF</i> ₁₇₉	16.8	X	166.90915	289.53312	320.33497	14.41515	0.3910243	0.22689123	2.66	1.62	3.70	Mc	12 13.2	22.2
385371 2002 <i>QS</i> ₁₆	18.0	X	123.16029	109.47976	287.44133	6.50781	0.2810790	0.28425515	2.29	1.65	2.93	Mc	2 19.9	21.1
385377 2002 <i>RJ</i> ₈	17.2	X	111.33089	255.37476	165.57367	23.29079	0.2854419	0.28483407	2.29	1.63	2.94	Mc	3 13.9	20.0
385381 2002 <i>RT</i> ₁₂₅	16.8	X	96.81252	87.82183	326.75877	21.74892	0.2794512	0.28109165	2.31	1.66	2.95	Mc	2 12.3	19.0
385395 2002 <i>VO</i> ₁₄	16.9	X	61.46595	163.42055	241.40882	27.83302	0.3501862	0.27184671	2.36	1.53	3.19	Mc	—	—
385408 2002 <i>XW</i> ₆₄	16.8	X	125.15562	288.94330	85.42123	23.31709	0.3115131	0.27649485	2.33	1.61	3.06	Mc	2 4.6	20.3
385538 2004 <i>RJ</i> ₆₃	17.7	X	300.53238	242.48258	171.13501	7.85526	0.4028874	0.22868248	2.65	1.58	3.72	Mc	8 6.6	20.6
385571 Otrera	8.8	X	8.31956	358.81449	34.74645	1.42743	0.0297695	0.00593085	30.23	29.33	31.13	NT	11 5.6	23.4
385636 2005 <i>QS</i> ₇₅	16.9	X	95.19970	288.96443	79.14036	6.68381	0.3230771	0.26574644	2.40	1.62	3.17	Mc	—	—
385695 Clete	8.3	X	296.75497	301.21875	169.29571	5.24636	0.0514041	0.00593591	30.21	28.66	31.76	NT	11 6.3	23.0
385875 2006 <i>RJ</i> ₁₀₁	16.7	X	83.56359	298.83207	66.44672	24.76034	0.2766156	0.28335139	2.30	1.66	2.93	Mc	—	—
385884 2006 <i>SO</i> ₁₃₁	19.5	X	148.21079	286.74582	149.12993	6.84546	0.1964203	0.43824061	1.72	1.38	2.05	Mc	4 21.8	21.2
386621 2009 <i>RL</i> ₅₉	17.6	X	59.10905	281.18061	86.37807	0.62672	0.3104578	0.26394853	2.41	1.66	3.15	Mc	—	—
386655 2009 <i>TA</i> ₇	17.1	X	205.76808	1.38556	340.59879	6.70140	0.2659615	0.29359811	2.24	1.65	2.84	Mc	2 23.2	21.0
386687 2009 <i>VX</i> ₈₄	17.4	X	183.30712	216.91117	126.10762	8.12071	0.3200038	0.29090533	2.26	1.53	2.98	Mc	2 10.9	21.4
387487 4169 <i>T</i> ₃	17.6	X	129.79654	294.28408	85.94303	3.55317	0.3012952	0.27855475	2.32	1.62	3.02	Mc	2 12.8	20.9
387514 1999 <i>RM</i> ₁₉₀	18.0	X	358.78117	252.46597	74.07571	1.57932	0.2447156	0.31461120	2.14	1.62	2.66	Mc	10 6.3	18.7
387541 2000 <i>VN</i> ₆₁	16.6	X	323.44743	64.45871	16.65919	29.01390	0.3639806	0.23454425	2.60	1.66	3.55	Mc	12 5.3	18.7
387554 2001 <i>QT</i> ₆₉	17.8	X	312.88426	48.16626	247.87170	3.41189	0.3376070	0.28839005	2.27	1.50	3.03	Mc	3 18.7	20.7
387607 2002 <i>DD</i> ₄	17.7	X	128.40899	251.74148	149.12219	25.67304	0.3218761	0.41199264	1.79	1.37	2.20	Mc	1 31.5	18.9
387632 2002 <i>PD</i> ₄₀	15.5	X	229.96120	79.63509	169.54678	26.72014	0.4658587	0.23583883	2.59	1.39	3.80	Mc	—	—
387814 2004 <i>FK</i> ₁	16.5	X	306.02475	96.22780	166.27206	21.52810	0.3145973	0.27961415	2.32	1.59	3.04	Mc	1 31.4	20.3
387826 2004 <i>GD</i> ₃₉	17.6	X	40.24877	201.58842	65.97050	7.12749	0.2525231	0.29893489	2.22	1.66	2.77	Mc	9 28.5	19.9
387845 2004 <i>NE</i> ₂₅	17.1	X	240.74871	357.35120	327.45563	4.15894	0.3045926	0.27087904	2.37	1.65	3.09	Mc	2 27.9	21.3
387848 2004 <i>OR</i> ₁₀	16.4	X	310.75092	302.07743	115.11155	24.25850	0.3437651	0.28041402	2.31	1.52	3.11	Mc	3 18.4	19.3
387975 2005 <i>LN</i> ₆	17.1	X	126.15799	233.45681	114.10926	13.85846	0.3686010	0.27191613	2.36	1.49	3.23	Mc	1 7.2	20.1
388034 2005 <i>SN</i> ₁₂₄	17.9	X	13.98219	131.23786	169.21292	5.73027	0.2816733	0.30797164	2.17	1.56	2.78	Mc	10 4.9	19.0
388259 2006 <i>QF</i> ₁	18.2	X	180.51790	58.08992	319.35569	0.42055	0.3683158	0.30088668	2.21	1.39	3.02	Mc	3 22.4	22.3
388508 2007 <i>EM</i> ₁₆₇	17.4	X	68.61101	91.08639	17.47781	22.33547	0.2917199	0.27913416	2.32	1.64	3.00	Mc	3 21.5	19.2
388839 2008 <i>ES</i> ₇	18.9	X	329.52946	77.52256	356.63723	24.47164	0.0900150	0.49211785	1.59	1.45	1.73	Mc	—	—
389361 2009 <i>VS</i> ₁	17.2	X	78.83213	269.80387	177.89141	20.41735	0.3031499	0.27568385	2.34	1.63	3.05	Mc	3 3.6	19.2
389820 2011 <i>WU</i> ₉₂	12.9	X	108.63694	22.39971	101.18055	6.45238	0.3694775	0.03748812	8.84	5.57	12.11	Ja	6 16.2	23.0
390521 1995 <i>YU</i> ₃	18.7	X	128.85222	23.63322	115.07191	10.92769	0.1403545	0.44074869	1.71	1.47	1.95	Mc	6 28.2	20.1
390540 1999 <i>TE</i> ₁₆₅	17.8	X	13.35099	349.39414	319.74148	3.65509	0.2764563	0.31423771	2.14	1.55	2.74	Mc	10 15.1	19.1
390546 2000 <i>EL</i> ₅₀	17.7	X	38.85285	53.79134	136.92703	24.61223	0.3099983	0.28348644	2.29	1.58	3.01	Mc	5 31.7	19.9
390553 2000 <i>SL</i> ₁₆₄	17.2	X	169.89611	38.87506	33.63397	25.61513	0.2667246	0.31161715	2.15	1.58	2.73	Mc	5 12.4	21.0
390572 2001 <i>HJ</i> ₂₁	17.9	X	22.59329	83.69153	194.09927	3.90029	0.2557418	0.30125995	2.20	1.64	2.77	Mc	9 5.9	19.3
390578 2001 <i>PF</i> ₁₆	18.0	X	263.06984	338.17512	3.08066	3.36451	0.2809302	0.28580939	2.28	1.64	2.92	Mc	4 5.9	21.8
390636 2002 <i>JY</i> ₈	16.7	X	181.91056	116.91181	159.79918	28.82561	0.3692217	0.23431111	2.61	1.64	3.57	Mc	—	—
390638 2002 <i>LZ</i> ₆₂	18.5	X	54.69652	282.28287	14.15180	4.63421	0.2810814	0.31974783	2.12	1.52	2.71	Mc	11 27.7	21.5
390646 2002 <i>PN</i> ₅₆	17.8	X	327.83429	141.75422	157.26763	7.09756	0.2540985	0.30605258	2.18	1.63	2.73	Mc	5 2.5	19.7
390662 2002 <i>RM</i> ₇₆	18.0	X	14.28294	288.43614	349.81192	6.10544	0.2557204	0.31002249	2.16	1.61	2.71	Mc	8 19.8	18.8
390689 2002 <i>VS</i> ₉₁	18.7	X	300.97147	276.42098	182.01905	5.61176	0.2754907	0.36595154	1.94	1.40	2.47	Mc	—	—
390695 2003 <i>AY</i> ₃	16.4	X	41.43168	281.99826	207.10437	22.58313	0.3190153	0.27557592	2.34	1.59	3.08	Mc	1 12.3	18.2
390733 2003 <i>OS</i>	17.0	X	67.64364	183.54503	144.24009	35.29092	0.2032875	0.34555147	2.01	1.60	2.42	Mc	—	—
390774 2003 <i>UJ</i> ₁₈₈	15.8	X	265.01993	84.66026	77.06802	29.30132	0.4101100	0.21376371	2.77	1.63	3.91	Mc	10 4.4	20.3
390802 2004 <i>GS</i> ₁₉	16.5	X	323.91156	210.01661	75.96543	26.01263	0.2694189	0.28783654	2.27	1.66	2.88	Mc	4 19.2	19.5
390808 2004 <i>HK</i> ₅₂	18.9	X	280.66203	128.71543	77.08468	9.25549	0.2592547	0.38726003	1.86	1.38	2.35	Mc	—	—
390812 2004 <i>JK</i> ₆	15.8	X	93.40176	286.13513	31.58615	13.86816	0.4631965	0.19330257	2.96	1.59	4.33	Mc	—	—
390819 2004 <i>LE</i> ₂	18.0	X	328.56660	252.06682	55.40080	6.49561	0.3946575	0.28611016	2.28	1.38	3.18	Mc	4 20.2	20.0
390872 2004 <i>TL</i> ₁₃₀	17.7	X	303.67213	154.58940	161.13122	7.83367	0.2994466	0.27971011	2.32	1.62	3.01	Mc	4 14.2	20.8
390927 2005 <i>FO</i>	16.5	X	301.20557	78.83604	8.06995	9.25571	0.4704698	0.22292985	2.69	1.43	3.96	Mc	9 14.8	18.9
391000 2005 <i>SC</i> ₉₉	16.9	X	44.82387	253.37031	204.30708	21.58167	0.3143490	0.26643508	2.39	1.64	3.14	Mc	—	—
391151 2005 <i>YY</i> ₉₃	17.1	X	245.39736	311.75214	296.68700	24.17475	0.8829828	0.23776067	2.58	0.30	4.86	Ja	12 19.2	22.6
391399 2007 <i>BH</i> ₂₀	17.7	X	52.95607	213.91126	343.14551	4.77919	0.2819318	0.29111901	2.25	1.62	2.89	Mc	7 2.6	19.6
391523 2007 <i>RH</i> ₁₉₂	17.2	X	279.76709	94.80712	212.07131	12.00462	0.3070327	0.26554578	2.40	1.66	3.13	Mc	3 4.7	21.4
391595 2007 <i>UR</i> ₂	19.5	X	92.23156	356.38698	40.68120	8.26199	0.0609611	0.52311541	1.53	1.43	1.62	Mc	—	—

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
393413 2001 <i>QL</i> ₁₀₂	18.1	X	304.52801	334.52575	7.08283	1.37676	0.2743479	0.29195869	2.25	1.63	2.87	Mc	5 22.8	20.6
393417 2001 <i>QB</i> ₁₇₉	17.3	X	291.22077	322.41548	17.13103	7.32491	0.3215734	0.28695455	2.28	1.54	3.01	Mc	4 24.9	20.7
393446 2001 <i>TC</i> ₂₃₁	17.3	X	318.63440	173.52517	135.37902	7.69174	0.2869532	0.28890186	2.27	1.62	2.92	Mc	4 27.9	19.7
393458 2001 <i>WE</i> ₁	17.1	X	295.56337	262.71250	69.02034	10.77167	0.3133928	0.28518502	2.29	1.57	3.00	Mc	4 25.4	20.4
393483 2002 <i>PW</i> ₄₂	17.0	X	169.16540	179.37744	152.47189	8.95516	0.4086503	0.23273962	2.62	1.55	3.69	Mc	1 28.5	22.0
393504 2002 <i>RC</i> ₁₃₉	18.0	X	341.41637	293.97218	62.88681	7.35308	0.2319312	0.31189868	2.15	1.65	2.65	Mc	10 13.5	18.9
393641 2004 <i>PG</i> ₁₈	18.1	X	296.57048	87.15667	220.70861	2.27180	0.2833955	0.27998627	2.31	1.66	2.97	Mc	3 25.7	21.5
393657 2004 <i>RS</i> ₉	18.0	X	306.81646	102.21077	220.13928	20.24707	0.2815221	0.28214834	2.30	1.65	2.95	Mc	4 27.5	20.5
393804 2005 <i>QH</i> ₇₁	17.5	X	307.99253	160.55478	179.00112	3.98990	0.3154777	0.30045036	2.21	1.51	2.90	Mc	5 18.4	19.8
393822 2005 <i>SX</i> ₃₅	18.2	X	357.39808	85.51675	246.27940	2.83638	0.2651303	0.30796010	2.17	1.60	2.75	Mc	10 11.7	19.1
393858 2005 <i>ST</i> ₂₂₀	17.2	X	267.29775	68.01228	277.66006	5.66500	0.2691128	0.29318954	2.24	1.64	2.85	Mc	4 13.5	20.9
393859 2005 <i>SN</i> ₂₂₅	16.7	X	44.55488	237.67360	231.11997	20.59737	0.3160967	0.26471733	2.40	1.64	3.16	Mc	—	—
393907 2005 <i>UR</i> ₂	18.2	X	19.28317	76.30509	232.97019	4.86681	0.3030928	0.30728515	2.17	1.52	2.83	Mc	11 1.8	20.1
394000 2005 <i>UG</i> ₅₁₂	18.1	X	337.90576	261.60638	82.19707	2.97907	0.2483702	0.30258114	2.20	1.65	2.74	Mc	8 28.9	18.7
394013 2005 <i>VY</i> ₅₉	17.9	X	316.48830	297.15251	62.16466	6.19286	0.2463225	0.30301859	2.20	1.65	2.74	Mc	7 22.7	19.4
394066 2005 <i>XU</i> ₇₇	15.1	X	353.27949	283.20699	98.77133	19.28577	0.4680891	0.18101512	3.09	1.59	4.60	Mc	12 22.2	16.9
394130 2006 <i>HY</i> ₅₁	17.1	X	209.45822	341.95539	40.60964	33.52260	0.9865139	0.23664101	2.59	0.08	5.10	Jc	4 19.8	24.0
394141 2006 <i>KV</i> ₃₈	16.7	X	218.90113	247.30198	62.21015	30.62316	0.4197815	0.23851112	2.58	1.49	3.66	Mc	2 6.9	22.4
394420 2007 <i>HH</i> ₆₉	18.7	X	16.04228	61.96928	196.57906	7.99992	0.3082921	0.28493922	2.29	1.58	2.99	Mc	7 17.5	19.7
394438 2007 <i>PJ</i> ₃₅	17.2	X	254.03582	5.73066	333.34316	3.64846	0.3128514	0.26263727	2.41	1.66	3.17	Mc	3 25.9	21.5
394474 2007 <i>TT</i> ₂₃	17.0	X	305.29873	90.57996	212.34239	6.46587	0.3514491	0.26693630	2.39	1.55	3.23	Mc	3 20.1	20.4
394794 2008 <i>QV</i> ₇	17.7	X	337.28201	346.78359	332.71358	3.64443	0.2745291	0.30051862	2.21	1.60	2.81	Mc	6 27.9	18.5
394804 2008 <i>RS</i> ₆₈	18.2	X	292.40167	220.85742	136.64042	4.69467	0.2611965	0.29323219	2.24	1.66	2.83	Mc	6 1.3	20.9
394823 2008 <i>SY</i> ₁₀₇	18.1	X	346.42672	79.60641	226.92341	5.66155	0.2520654	0.29731300	2.22	1.66	2.78	Mc	7 4.6	19.1
394837 2008 <i>SF</i> ₁₈₀	17.6	X	337.63573	265.50915	77.14461	5.68649	0.2663934	0.29964165	2.21	1.62	2.80	Mc	8 25.7	18.3
394935 2008 <i>WA</i> ₁₃₃	16.9	X	282.72660	192.94599	133.50864	8.98142	0.2887451	0.28123177	2.31	1.64	2.97	Mc	4 8.6	20.5
394938 2008 <i>XY</i> ₁	16.6	X	42.53660	107.42877	248.90454	23.00098	0.3035877	0.31020930	2.16	1.51	2.82	Mc	—	—
395182 2010 <i>EP</i> ₁₁₁	17.0	X	298.08430	80.61507	18.28460	27.51818	0.4114806	0.23344532	2.61	1.54	3.69	Mc	10 9.9	19.2
395339 2011 <i>QS</i> ₃₃	18.1	X	308.43694	183.32282	158.06829	2.65217	0.2780156	0.28624996	2.28	1.65	2.91	Mc	5 29.4	20.4
395365 2011 <i>RN</i> ₁₁	17.8	X	342.20721	134.02986	168.33491	5.14849	0.2895607	0.28801081	2.27	1.61	2.93	Mc	6 7.1	18.9
395402 2011 <i>SP</i> ₁₂₁	18.4	X	5.95409	105.92470	185.00995	5.70263	0.2933921	0.29088544	2.26	1.59	2.92	Mc	8 17.4	19.1
396436 2014 <i>EO</i> ₄₅	17.6	X	336.95938	217.99268	17.45410	7.03244	0.3327137	0.26821425	2.38	1.59	3.17	Mc	2 4.5	20.5
396568 2000 <i>AZ</i> ₁₀₁	16.8	X	303.49820	325.53213	113.47297	4.09445	0.3934284	0.22137159	2.71	1.64	3.77	Mc	9 24.1	19.1
396578 2000 <i>QG</i> ₁₀₂	17.3	X	235.40536	235.45687	131.87036	7.74342	0.3072074	0.26847996	2.38	1.65	3.11	Mc	4 20.0	21.6
396605 2001 <i>RC</i> ₁₈	16.6	X	276.83372	299.04544	24.17519	30.15525	0.3843641	0.23463915	2.60	1.60	3.60	Mc	3 30.4	21.2
396614 2001 <i>SR</i> ₁₁₅	18.4	X	66.38556	88.29351	203.21642	7.40210	0.3824255	0.30511222	2.19	1.35	3.02	Mc	12 10.2	22.2
396618 2001 <i>SW</i> ₃₂₅	18.1	X	311.22754	223.51472	136.40605	3.96342	0.2786710	0.29126475	2.25	1.63	2.88	Mc	7 2.4	20.0
396626 2001 <i>TX</i> ₂₃₆	18.4	X	338.64482	254.00688	86.50380	3.00247	0.2662172	0.29428755	2.24	1.64	2.83	Mc	8 21.3	19.0
396638 2001 <i>WR</i> ₂	17.3	X	257.51971	119.01908	229.23863	23.91759	0.2805088	0.28064508	2.31	1.66	2.96	Mc	4 7.6	21.4
396656 2002 <i>MZ</i> ₃	16.6	X	197.29834	108.38840	233.68337	10.11644	0.3697226	0.23833371	2.58	1.62	3.53	Mc	2 19.7	21.8
396661 2002 <i>OS</i> ₃₃	19.2	X	97.76797	95.82879	187.22244	3.90866	0.2488987	0.32409919	2.10	1.58	2.62	Mc	12 17.2	22.6
396675 2002 <i>RH</i> ₁₇₆	19.1	X	48.41839	141.73008	195.52452	4.55024	0.2735630	0.32046837	2.11	1.54	2.69	Mc	—	—
396680 2002 <i>ST</i> ₅₁	16.7	X	180.03301	91.40078	291.40392	26.86128	0.3780498	0.23561732	2.60	1.61	3.58	Mc	3 17.1	22.2
396686 2002 <i>TJ</i> ₅₁	17.4	X	151.20167	337.53931	22.94098	5.00550	0.3949570	0.23006991	2.64	1.60	3.68	Mc	2 21.1	22.2
396707 2002 <i>UU</i> ₃₆	19.7	X	144.73026	211.38323	31.18749	4.03622	0.0304347	0.47405828	1.63	1.58	1.68	Mc	—	—
396708 2002 <i>UM</i> ₇₄	18.4	X	357.49535	275.62636	65.55907	4.69746	0.2466637	0.31078925	2.16	1.63	2.69	Mc	10 30.1	19.5
396723 2003 <i>AE</i> ₂₃	18.7	X	316.56228	230.94803	253.44405	2.51514	0.3269645	0.36700281	1.93	1.30	2.56	Mc	—	—
396795 2004 <i>NJ</i> ₈	16.2	X	342.58633	74.45285	280.37018	22.39589	0.3204154	0.28845946	2.27	1.54	3.00	Mc	9 12.1	18.0
396810 2004 <i>PS</i> ₁₀₀	17.6	X	346.57771	44.16550	315.81969	7.38524	0.3275631	0.29113491	2.25	1.52	2.99	Mc	11 4.1	18.5
396815 2004 <i>QG</i> ₂₄	16.1	X	258.99408	135.15275	247.21289	22.53720	0.3062841	0.27761092	2.33	1.61	3.04	Mc	5 23.7	19.9
396853 2004 <i>SG</i> ₁₇₆	17.7	X	268.80373	124.01557	226.41337	23.31224	0.3052439	0.27784936	2.33	1.62	3.04	Mc	4 19.9	21.5
396948 2005 <i>IQ</i> ₁₇₆	18.3	X	172.68551	196.67051	111.02288	13.88244	0.4173240	0.21699875	2.74	1.60	3.89	Mc	1 6.5	23.4
396967 2005 <i>RZ</i> ₅₁	19.1	X	57.28745	29.18170	274.61082	2.08868	0.3432906	0.31792365	2.13	1.40	2.86	Mc	12 16.2	22.3
397131 2005 <i>WS</i> ₅₆	16.7	X	345.58282	92.63953	261.20397	5.46578	0.2645273	0.30372417	2.19	1.61	2.77	Mc	10 13.9	17.5
397195 2006 <i>BO</i> ₁₄₉	16.9	X	156.72985	294.00792	154.57364	22.97520	0.3121962	0.27754858	2.33	1.60	3.05	Mc	6 4.9	21.6
397236 2006 <i>KS</i> ₁₀₅	16.6	X	69.14211	256.21560	258.78657	19.52403	0.3365436	0.26602861	2.39	1.59	3.20	Mc	6 6.4	19.0
397237 2006 <i>KZ</i> ₁₁₂	16.7	X	289.92388	358.17611	166.30436	37.82339	0.8871095	0.24580847	2.52	0.28	4.76	Ja	10 3.2	20.9
397241 2006 <i>OE</i> ₁₃	17.1	X	154.90408	201.01064	172.26647	7.69133	0.4189785	0.23092122	2.63	1.53	3.73	Mc	3 9.1	22.0
397254 2006 <i>QG</i> ₉₉	17.5	X	240.55259	134.60127	154.78428	7.33032	0.3645867	0.23863612	2.57	1.64	3.51	Mc	1 19.3	22.5
397262 2006 <i>RN</i> ₁₆	14.2	X	219.16445	89.71626	245.69316	12.78816	0.4001850	0.10534702	4.44	2.66	6.22	Jc	3 3.4	22.0
397287 2006 <i>SG</i> ₅₄	16.7	X	171.53129	80.75719	231.67853	11.80873	0.3806776	0.22755403	2.66	1.65	3.67	Mc	1 6.3	21.8
397339 2006 <i>TS</i> ₈₈	17.5	X	255.79903	271.26510	23.87948	11.25380	0.3913315	0.23770585	2.58	1.57	3.59	Mc	2 7.7	22.6
397360 2006 <i>UZ</i> ₁₂₄	17.5	X	137.59555	255.76094	217.58336	23.99141	0.2972656	0.30360957	2.19	1.54	2.84	Mc	6 14.2	21.5
397441 2007 <i>EH</i> ₁	16.8	X	90.15384	306.95854	229.01294	24.05054	0.2625959	0.29293124	2.25	1.66	2.84	Mc	7 14.1	20.5
397472 2007 <i>MV</i> ₉	16.9	X	238.91559	178.41174	187.62592	3.40765	0.3189904	0.26608869	2.39	1.63	3.16	Mc	4 17.7	21.0
397473 2007 <i>OB</i> ₂	17.2	X	218.78105	191.34563	147.43581	3.70493	0.3882634	0.25589066	2.46	1.50	3.41	Mc	3 3.2	22.0
397798 2008 <i>PD</i> <														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
399587 2003 <i>TW</i> ₉	16.8 ^m	X	259.81772	105.46275	293.40820	20.73890	0.3535134	0.26417417	2.41	1.56	3.26	Mc	6 11.8	21.0
399613 2004 <i>BQ</i> ₆₅	16.9	X	182.58810	267.50600	113.52657	6.15732	0.3469402	0.24519632	2.53	1.65	3.41	Mc	4 2.8	21.7
399621 2004 <i>GC</i> ₂₆	18.1	X	83.47577	176.51056	69.71190	2.91152	0.2676153	0.30320289	2.19	1.61	2.78	Mc	10 19.8	21.4
399628 2004 <i>NM</i> ₂₃	17.9	X	335.64258	91.42676	247.77271	4.17970	0.2773597	0.28967859	2.26	1.63	2.89	Mc	7 31.2	18.8
399630 2004 <i>OH</i> ₃	17.6	X	42.71997	34.96165	302.33836	7.64404	0.2711585	0.30070944	2.21	1.61	2.80	Mc	—	—
399632 2004 <i>PL</i> ₂	18.5	X	324.86957	280.03057	74.32437	6.55136	0.3591900	0.28814832	2.27	1.45	3.09	Mc	7 8.9	19.5
399637 2004 <i>PQ</i> ₆₈	17.8	X	299.17073	201.38757	167.82087	9.27708	0.2872500	0.28590163	2.28	1.63	2.94	Mc	6 23.6	20.5
399640 2004 <i>QL</i> ₁₀	18.1	X	310.67657	251.91848	104.44318	7.08225	0.2755141	0.28594816	2.28	1.65	2.91	Mc	6 26.3	19.9
399655 2004 <i>RR</i> ₁₇₅	18.1	X	354.92729	151.11202	204.99577	6.63879	0.2990082	0.29310823	2.24	1.57	2.92	Mc	11 23.1	19.3
399714 2004 <i>VK</i> ₂₇	17.1	X	49.44174	43.40514	258.06880	4.75824	0.2928106	0.29269340	2.25	1.59	2.90	Mc	11 27.0	20.1
399735 2005 <i>DD</i> ₁	16.7	X	320.93686	84.90323	93.46325	28.41300	0.3748185	0.23543691	2.60	1.62	3.57	Mc	—	—
399814 2005 <i>SE</i> ₁₃₃	18.7	X	66.34729	122.24710	209.13155	2.32986	0.2195026	0.31863358	2.12	1.66	2.59	Mc	—	—
399891 2005 <i>WX</i> ₅₅	17.3	X	327.84627	290.85844	81.57360	23.85421	0.3774649	0.30371683	2.19	1.36	3.02	Mc	10 12.8	18.6
399905 2005 <i>XA</i> ₁	18.4	X	44.41130	211.95165	148.23177	6.50294	0.3842021	0.31812156	2.13	1.31	2.94	Mc	—	—
400103 2006 <i>TQ</i> ₅₈	16.8	X	195.33408	91.76978	252.35308	10.94971	0.3993537	0.23371213	2.61	1.57	3.65	Mc	2 20.9	22.2
400152 2006 <i>VO</i> ₁₂	16.5	X	228.11375	83.85182	274.52585	27.03439	0.3876487	0.24173665	2.55	1.56	3.54	Mc	3 17.3	22.0
400196 2006 <i>YL</i> ₁₃	16.7	X	185.15820	91.41711	327.87853	27.06787	0.4008054	0.23489975	2.60	1.56	3.64	Mc	5 6.6	22.4
400242 2007 <i>NZ</i> ₄	17.3	X	338.36142	254.44593	107.29538	5.37872	0.2767938	0.28555367	2.28	1.65	2.92	Mc	10 6.7	18.1
400513 2008 <i>SP</i> ₃	17.7	X	61.09466	157.06103	152.33436	4.97650	0.2501257	0.31467789	2.14	1.61	2.68	Mc	12 17.7	20.8
400525 2008 <i>SU</i> ₂₆₆	18.4	X	83.61290	264.23017	33.42063	4.20037	0.2706677	0.31577300	2.14	1.56	2.71	Mc	12 23.8	21.8
400542 2008 <i>UX</i> ₂₂₆	18.6	X	60.91806	33.28250	310.26177	1.82162	0.3290551	0.31641016	2.13	1.43	2.83	Mc	—	—
400549 2008 <i>UF</i> ₃₀₈	16.8	X	80.61067	354.73618	239.98553	24.95459	0.2777387	0.29199356	2.25	1.63	2.88	Mc	9 22.8	20.8
400554 2008 <i>VA</i> ₅₈	18.0	X	356.80404	247.48340	136.98898	5.55122	0.2337428	0.30727789	2.17	1.67	2.68	Mc	—	—
400559 2008 <i>WN</i> ₆₆	17.3	X	300.81054	261.27744	64.20983	23.96488	0.2933380	0.28576837	2.28	1.61	2.95	Mc	4 30.6	20.5
400596 2009 <i>BC</i> ₂	15.9	X	307.75779	280.55129	277.49216	26.72413	0.3673672	0.23310371	2.61	1.65	3.58	Mc	—	—
400684 2009 <i>QN</i> ₄	16.4	X	76.27159	252.17597	147.26858	15.58629	0.4958444	0.18875547	3.01	1.52	4.50	Mc	2 16.9	19.8
400980 2010 <i>XJ</i> ₅₆	18.3	X	263.82081	12.40940	85.05355	19.23431	0.1231132	0.44822460	1.69	1.48	1.90	Mc	11 20.4	19.1
401000 2011 <i>QV</i> ₁₃	18.3	X	314.22278	206.22705	148.80661	3.29637	0.3148766	0.28982363	2.26	1.55	2.97	Mc	6 22.9	20.2
401009 2011 <i>RM</i> ₃	17.9	X	351.42564	314.28184	4.46224	7.96887	0.2739365	0.29258397	2.25	1.63	2.86	Mc	8 26.2	18.5
401023 2011 <i>SC</i> ₅₁	17.9	X	333.93295	44.70184	311.00100	6.02244	0.2641825	0.29248362	2.25	1.65	2.84	Mc	8 31.6	18.7
401099 2011 <i>UZ</i> ₁₈₉	18.4	X	5.81536	258.93953	62.66733	6.86528	0.2881265	0.29031292	2.26	1.61	2.91	Mc	10 20.7	19.8
401146 2011 <i>VD</i> ₉	16.8	X	283.60080	140.84832	227.25715	23.98332	0.2946664	0.27624544	2.33	1.65	3.02	Mc	5 30.3	20.1
401809 3195 <i>T</i> ₂	17.8	X	309.99973	262.11229	54.06022	2.77408	0.4108117	0.26456790	2.40	1.42	3.39	Mc	4 6.2	20.9
401824 1998 <i>QG</i> ₇₁	17.4	X	69.77400	7.00647	300.20472	7.06105	0.2512671	0.30826544	2.17	1.62	2.72	Mc	12 21.9	20.8
401840 1999 <i>UH</i> ₅₆	17.9	X	288.32213	169.30428	203.19894	1.65759	0.3126920	0.26255037	2.42	1.66	3.17	Mc	6 9.5	21.0
401847 1999 <i>WW</i> ₁₉	16.8	X	47.35024	77.24656	357.92477	7.66829	0.4793097	0.18842085	3.01	1.57	4.46	Mc	1 29.8	18.1
401857 2000 <i>PG</i> ₃	16.0	X	116.27092	141.23268	323.58142	22.02528	0.8552496	0.20760843	2.82	0.41	5.24	Jc	6 29.4	22.7
401858 2000 <i>QJ</i> ₅₄	17.3	X	346.94233	356.91141	350.62173	8.27182	0.2893915	0.28254606	2.30	1.63	2.97	Mc	10 2.2	18.1
401868 2000 <i>VS</i> ₄₁	18.0	X	319.94101	31.92034	345.78289	3.68152	0.2829921	0.27923468	2.32	1.66	2.97	Mc	8 25.8	18.9
401871 2000 <i>WA</i> ₄₄	17.6	X	297.97642	312.86273	87.56273	7.87352	0.3238234	0.27688768	2.33	1.58	3.09	Mc	8 3.9	20.0
401892 2001 <i>SA</i> ₅	16.3	X	239.10607	272.39752	27.62399	23.32219	0.3963821	0.22643098	2.67	1.61	3.72	Mc	2 10.8	21.9
401921 2001 <i>XL</i> ₆	15.9	X	145.53320	88.13717	303.80634	28.78243	0.4247555	0.21742978	2.74	1.58	3.90	Mc	3 9.7	21.5
401968 2002 <i>TE</i> ₁₃₈	18.7	X	240.28445	35.71216	338.31053	5.92956	0.4300663	0.24550142	2.53	1.44	3.61	Mc	4 21.3	23.7
401979 2002 <i>UC</i> ₃₂	18.7	X	236.35438	32.96757	343.27719	5.85793	0.3754144	0.24504035	2.53	1.58	3.48	Mc	4 24.1	23.6
401994 2003 <i>BS</i> ₂₇	16.6	X	199.95259	271.74746	151.94080	11.80614	0.3980673	0.23770091	2.58	1.55	3.61	Mc	6 1.8	21.9
402010 2003 <i>QP</i> ₁₀₄	16.8	X	182.44076	80.32573	353.15931	12.97248	0.3823938	0.25528133	2.46	1.52	3.40	Mc	5 29.1	21.8
402064 2003 <i>TW</i> ₆	17.4	X	305.39748	275.06431	54.00200	11.31240	0.3076336	0.26606758	2.39	1.66	3.13	Mc	5 3.8	20.4
402103 2003 <i>WM</i> ₁₀₉	18.1	X	237.97390	138.05377	266.99971	5.74020	0.3190084	0.26020855	2.43	1.65	3.21	Mc	6 3.8	22.4
402138 2004 <i>PC</i> ₉₇	17.2	X	142.13697	338.63335	7.25132	23.05154	0.5298848	0.19639662	2.93	1.38	4.48	Mc	2 18.3	23.1
402139 2004 <i>QN</i> ₃	17.6	X	53.11244	186.29196	179.26950	8.01406	0.3160406	0.30307541	2.20	1.50	2.89	Mc	—	—
402159 2004 <i>RM</i> ₂₁₆	17.1	X	257.63715	101.78817	342.02421	21.04178	0.3352029	0.28339376	2.30	1.53	3.06	Mc	8 14.5	20.6
402267 2005 <i>QE</i> ₁₆₆	17.0	X	149.78936	234.36964	188.83909	12.95718	0.5290156	0.21625426	2.75	1.29	4.20	Jc	5 9.7	22.7
402290 2005 <i>SC</i> ₁₉₇	19.3	X	126.52281	142.01697	153.31856	1.54584	0.2494576	0.32660731	2.09	1.57	2.61	Mc	—	—
402308 2005 <i>TS</i> ₅₀	17.2	X	125.65263	76.29959	333.03052	10.32169	0.4254900	0.21195621	2.79	1.60	3.97	Mc	3 30.3	22.2
402362 2005 <i>WL</i> ₁₇	18.8	X	67.00701	283.45700	74.66074	3.88801	0.3135694	0.32094573	2.11	1.45	2.78	Mc	—	—
402447 2006 <i>BK</i> ₅₅	17.9	X	235.96742	299.41996	149.32429	45.47615	0.2014720	0.41721029	1.77	1.42	2.13	Mc	8 14.9	19.7
402756 2006 <i>YC</i> ₃₄	17.2	X	170.50111	328.49862	81.31345	9.36629	0.3957281	0.23134332	2.63	1.59	3.67	Mc	5 1.1	22.4
402864 2007 <i>RM</i> ₁₃₆	18.2	X	236.18733	55.45218	9.22993	2.38538	0.3306938	0.26884039	2.38	1.59	3.16	Mc	6 26.4	22.2
402867 2007 <i>RT</i> ₁₄₉	17.8	X	294.37683	273.84924	102.61470	7.60873	0.3519291	0.27400704	2.35	1.52	3.17	Mc	6 16.5	20.6
402901 2007 <i>TF</i> ₃₆	17.2	X	306.61225	79.95291	343.27922	21.57519	0.2944185	0.28533844	2.29	1.61	2.96	Mc	9 28.1	18.8
402946 2007 <i>TN</i> ₃₄₈	18.1	X	339.19849	248.89201	135.14899	2.38989	0.2794529	0.28692318	2.28	1.64	2.91	Mc	11 21.7	19.0
403049 2008 <i>AY</i> ₃₆	17.6	X	309.22491	199.99501	234.57043	4.81941	0.3220699	0.27783553	2.33	1.58	3.08	Mc	11 1.7	18.5
403198 2008 <i>RV</i> ₂₄	16.8	X	68.48952	279.51775	359.18393	30.71227	0.2985452	0.31278135	2.15	1.51	2.79	Mc	11 3.3	20.7
403227 2008 <i>UH</i> ₂₂₉	17.9	X	70.17321	244.22039	98.09552	2.62193	0.2370930	0.31619286	2.13	1.63	2.64	Mc	—	—
403242 2008 <i>WD</i> ₃₁	17.9	X	35.44303	258.71264	49.23605	4.36153	0.2634065	0.29948350	2.21	1.63	2.80	Mc	11 16.3	20.3
403779 2011 <i>QX</i> ₆₈	19.5	X	72.52026	194.76204	138.58340	3.12929	0.2619922	0.31924784	2.12	1.56	2.68	Mc	—	—
404151 2013 <i>CQ</i> ₃	16.1	X	150.27082	248.81629	341.19435	22.2								

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
405199 2003 <i>DW</i> ₂₁	16.3 ^m	X	179.60586	75.97541	12.85756	27.77612	0.4127883	0.23566675	2.60	1.52	3.67	Mc	6 13.9	22.0
405200 2003 <i>EE</i> ₅₀	18.0	X	179.60089	50.43909	8.82004	11.14364	0.2339338	0.39039276	1.85	1.42	2.29	Mc	4 30.4	20.8
405216 2003 <i>QL</i> ₅₉	16.4	X	268.03100	73.61994	358.35742	11.14067	0.3671066	0.26847010	2.38	1.51	3.25	Mc	8 2.8	20.0
405352 2003 <i>WM</i> ₂₇	17.5	X	312.28259	340.28731	348.49508	4.01523	0.3470858	0.26491926	2.40	1.57	3.23	Mc	5 3.6	20.4
405371 2003 <i>YK</i> ₁₂₁	15.4	X	66.57032	114.83560	319.40517	23.17953	0.4783821	0.17692021	3.14	1.64	4.65	Mc	3 7.8	19.3
405397 2004 <i>LB</i> ₁₂	18.7	X	315.36921	170.04558	145.83509	1.32354	0.2482665	0.40118180	1.82	1.37	2.27	Mc	4 24.7	20.1
405398 2004 <i>LJ</i> ₂₈	18.6	X	27.34795	144.51929	177.93586	5.41403	0.2778832	0.29679986	2.23	1.61	2.84	Mc	11 28.5	21.1
405399 2004 <i>OJ</i>	18.3	X	27.46232	238.76783	111.42784	5.03861	0.2917446	0.29922429	2.21	1.57	2.86	Mc	—	—
405401 2004 <i>PH</i> ₃₅	17.4	X	47.58622	290.58817	327.37397	23.59448	0.2786204	0.29219241	2.25	1.62	2.88	Mc	9 14.0	20.2
405403 2004 <i>PJ</i> ₅₀	18.1	X	22.62727	341.69678	339.31411	9.27466	0.2691062	0.29514689	2.23	1.63	2.84	Mc	11 12.6	20.5
405421 2004 <i>RB</i> ₃₂₁	17.7	X	23.70169	102.24196	239.73392	5.91120	0.2628792	0.29653878	2.23	1.64	2.81	Mc	12 16.9	20.1
405471 2004 <i>VQ</i> ₃₆	17.9	X	24.99089	301.05576	43.81019	3.33564	0.2725928	0.29377452	2.24	1.63	2.85	Mc	12 23.6	20.4
405508 2005 <i>BG</i> ₂	16.4	X	313.19099	68.86042	345.60752	23.35245	0.3449223	0.28519706	2.29	1.50	3.07	Jc	9 23.9	17.4
405571 2005 <i>QE</i> ₈₇	18.3	X	211.54680	233.24526	157.90135	21.49072	0.1394457	0.41372834	1.78	1.53	2.03	Mc	4 28.6	21.0
405587 2005 <i>SY</i> ₁₄	17.6	X	135.12613	249.29093	206.33724	5.63895	0.3919096	0.21887120	2.73	1.66	3.80	Mc	5 31.7	22.6
405776 2006 <i>AP</i>	16.7	X	251.68626	16.67670	114.25709	23.68310	0.2668817	0.29903715	2.21	1.62	2.81	Mc	10 29.0	20.0
405793 2006 <i>AU</i> ₈₀	18.6	X	7.62496	267.44442	112.32824	6.05600	0.2780554	0.30725960	2.18	1.57	2.78	Mc	—	—
405895 2006 <i>GJ</i> ₄₀	17.0	X	8.30911	84.45635	30.07399	22.95026	0.2779682	0.31467587	2.14	1.55	2.74	Mc	—	—
406186 2006 <i>WQ</i> ₁₁₇	17.1	X	199.94384	132.01917	286.70244	15.10839	0.4027360	0.23841243	2.58	1.54	3.61	Mc	5 23.4	22.4
406221 2007 <i>BO</i> ₂₀	17.5	X	128.00406	323.52166	119.06983	5.06254	0.4751231	0.22519364	2.68	1.40	3.95	Mc	5 17.7	22.6
406235 2007 <i>BF</i> ₇₃	16.8	X	172.84265	97.18418	2.35126	28.32197	0.3671603	0.23476823	2.60	1.65	3.56	Mc	6 29.2	22.4
406420 2007 <i>TF</i> ₁₇₀	17.4	X	338.41523	346.82415	355.29018	5.48307	0.3116248	0.27683510	2.33	1.61	3.06	Mc	8 16.9	17.8
406562 2007 <i>YQ</i> ₆₁	16.7	X	320.34282	242.82914	185.01881	21.32021	0.2964547	0.28071906	2.31	1.63	2.99	Mc	12 9.6	18.4
406803 2008 <i>UX</i> ₆₄	16.4	X	12.96076	182.52904	239.04917	8.84344	0.4970437	0.16372855	3.31	1.66	4.95	Jc	—	—
406813 2008 <i>VA</i> ₅₇	19.9	X	85.75077	230.30288	129.94232	2.29790	0.2993539	0.32422762	2.10	1.47	2.73	Mc	—	—
407286 2010 <i>GW</i> ₁₄₀	17.8	X	355.52199	56.74307	227.14093	4.93450	0.3165966	0.27352974	2.35	1.61	3.09	Mc	6 15.2	18.2
407740 2011 <i>UX</i> ₄₀₁	18.6	X	82.25540	340.55965	316.53304	1.31899	0.2897315	0.30809305	2.17	1.54	2.80	Mc	12 22.2	22.0
407826 2012 <i>BG</i> ₁₃	16.3	X	246.39658	265.31903	128.95775	21.91235	0.3375325	0.26269496	2.41	1.60	3.23	Mc	6 1.3	20.9
408742 2014 <i>OF</i> ₁₁₂	16.9	X	315.20072	351.98961	339.52688	11.09628	0.3137705	0.26241801	2.42	1.66	3.17	Mc	5 15.6	19.9
408768 1998 <i>SQ</i> ₄₉	17.9	X	86.28446	257.51022	41.92916	8.55511	0.3799232	0.30899219	2.17	1.34	2.99	Mc	—	—
408794 2000 <i>GG</i> ₁₈₆	17.5	X	34.15188	282.80213	41.52130	7.73284	0.2986815	0.29267661	2.25	1.58	2.92	Mc	12 10.1	20.4
408795 2000 <i>JH</i> ₇₅	17.4	X	133.97686	352.73476	217.69436	2.74284	0.2569726	0.29662750	2.23	1.65	2.80	Mc	10 12.2	21.4
408799 2000 <i>SL</i> ₅₅	18.4	X	9.35509	325.94288	358.62496	2.14749	0.2891844	0.28317710	2.30	1.63	2.96	Mc	10 28.6	20.0
408825 2001 <i>OF</i> ₈₄	16.5	X	196.13943	348.25188	329.34195	25.27425	0.5137528	0.22354448	2.69	1.31	4.07	Mc	2 3.9	22.3
408875 2001 <i>TQ</i> ₁₂₃	18.1	X	23.36396	98.49637	257.20592	7.46422	0.2533816	0.30135820	2.20	1.65	2.76	Mc	—	—
408876 2001 <i>TZ</i> ₁₃₅	16.4	X	191.39069	200.79238	261.04443	7.74676	0.4128226	0.23142457	2.63	1.54	3.71	Mc	7 9.1	21.6
409034 2003 <i>MA</i> ₂	17.9	X	278.61767	47.44516	280.64571	15.67603	0.3341659	0.26326945	2.41	1.61	3.22	Mc	3 22.4	22.3
409214 2003 <i>WV</i> ₈₇	17.2	X	287.09521	39.15012	103.72786	4.59542	0.3947421	0.27217626	2.36	1.43	3.29	Mc	12 8.9	18.3
409224 2003 <i>YK</i> ₃₄	17.0	X	8.95527	227.96345	226.50997	2.69372	0.4783047	0.17060405	3.22	1.68	4.76	Ja	—	—
409263 2004 <i>PN</i> ₈₇	17.8	X	40.97195	339.48188	13.69789	5.18041	0.2622707	0.29971631	2.21	1.63	2.79	Mc	—	—
409267 2004 <i>RL</i> ₁₇	17.8	X	355.95214	1.27555	21.36866	7.08190	0.2565256	0.29572070	2.23	1.66	2.80	Mc	12 30.4	19.8
409296 2004 <i>SV</i> ₅₁	17.5	X	40.04165	306.01336	53.61978	5.66538	0.2898329	0.29820975	2.22	1.58	2.86	Mc	—	—
409442 2005 <i>QD</i> ₅	16.2	X	245.25947	13.06461	327.09774	18.09295	0.3857129	0.23015033	2.64	1.62	3.65	Mc	3 14.7	21.5
409800 2006 <i>HP</i> ₂₉	16.9	X	333.75711	50.00391	215.56470	31.77833	0.3325112	0.25864959	2.44	1.63	3.25	Mc	3 5.1	20.5
409829 2006 <i>OX</i> ₂₁	17.6	X	282.15484	270.73520	77.75629	5.86543	0.3339942	0.25346786	2.47	1.65	3.30	Mc	5 1.2	21.4
409959 2006 <i>UF</i> ₂₇₁	18.0	X	248.63586	121.75625	230.32354	15.14484	0.3518618	0.24328933	2.54	1.65	3.44	Mc	4 3.7	22.9
409995 2006 <i>WV</i> ₃	17.7	X	140.52714	357.26631	107.08381	12.85653	0.3219959	0.36501150	1.94	1.31	2.56	Mc	6 8.9	20.8
410002 2006 <i>WV</i> ₂₉	16.4	X	164.11868	243.62092	210.03527	28.88832	0.3693788	0.23525082	2.60	1.64	3.56	Mc	6 11.9	21.8
410128 2007 <i>GG</i> ₁₁	17.8	X	106.75038	246.48765	183.02650	24.86778	0.1764737	0.34723058	2.00	1.65	2.36	Mc	2 11.6	20.0
410186 2007 <i>RH</i> ₁₀₃	17.7	X	47.98651	123.30793	191.90826	3.79047	0.3144369	0.29051964	2.26	1.55	2.97	Mc	12 15.7	20.9
410248 2007 <i>TY</i> ₇₂	17.9	X	276.68089	219.75025	233.95148	7.55456	0.4252519	0.27374002	2.35	1.35	3.35	Mc	8 26.0	21.1
410302 2007 <i>TR</i> ₃₆₁	17.2	X	345.31409	295.84049	46.90390	6.97284	0.32370589	0.27823453	2.32	1.54	3.11	Mc	9 26.4	17.5
410318 2007 <i>TY</i> ₄₃₄	18.3	X	282.21827	20.19971	116.69011	7.97439	0.3862830	0.27611575	2.34	1.43	3.24	Mc	8 8.9	21.3
410326 2007 <i>UQ</i> ₁₁	17.1	X	60.91575	245.11065	40.30947	4.45477	0.3167752	0.29558885	2.23	1.52	2.94	Mc	—	—
410352 2007 <i>VC</i> ₁₁	17.4	X	336.16015	57.90731	283.67268	5.13651	0.2969965	0.27506344	2.34	1.65	3.04	Mc	8 3.4	18.4
410685 2008 <i>WA</i> ₅₉	18.4	X	52.54093	112.86051	185.39742	5.71552	0.2468262	0.30531749	2.18	1.65	2.72	Mc	11 23.6	21.3
410778 2009 <i>FG</i> ₁₉	18.0	X	139.40948	120.39676	187.53702	54.49995	0.7198517	0.19846132	2.91	0.82	5.01	Jc	1 6.8	24.8
411170 2010 <i>EW</i> ₈₀	18.0	X	101.58819	124.70928	161.48164	6.96896	0.2474020	0.30617315	2.18	1.64	2.72	Mc	12 21.7	21.8
411199 2010 <i>KW</i> ₁₁₇	17.4	X	356.89790	195.82074	97.96208	6.91171	0.3282071	0.27126371	2.36	1.59	3.14	Mc	7 16.9	17.5
411315 2010 <i>TJ</i> ₁₆₂	16.9	X	155.91039	270.95469	188.60222	27.53377	0.3721141	0.23134907	2.63	1.65	3.61	Mc	6 16.1	22.4
411381 2010 <i>VK</i> ₆₅	16.6	X	158.20888	276.77419	201.50116	26.99471	0.3964749	0.23283032	2.62	1.58	3.65	Mc	7 6.7	22.2
412512 2014 <i>LY</i> ₂₆	17.3	X	15.64195	262.53795	83.88916	4.67172	0.2624043	0.29262341	2.25	1.66	2.84	Mc	12 10.6	19.6
412550 2014 <i>NL</i> ₂₅	17.4	X	94.89424	127.80028	136.63395	5.87870	0.2517722	0.31283642	2.15	1.61	2.69	Mc	11 22.1	20.9
412575 2014 <i>OK</i> ₆	16.4	X	308.09384	61.43173	164.88859	8.26449	0.4406808	0.24226175	2.55	1.43	3.67	Mc	—	—
412708 2014 <i>OV</i> ₂₉₄	18.3	X	89.83462	105.50172	166.48330	7.36339	0.2437719	0.30271738	2.20	1.66	2.73	Mc	11 25.5	21.8
412869 2014 <i>QP</i> ₂	17.8	X	35.71218	347.67223	275.43049	1.94898	0.2989469	0.28267194	2.30	1.61	2.99	Mc	9 14.9	19.8
412961 2014 <i>QS</i> ₂₉₀	17.4	X	40.39989	200.53172	108.72363</									

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
414032 2007 <i>PJ</i> ₃₄	17.5 ^m	X	42.38658	212.95065	107.30568	7.33486	0.2662920	0.29248791	2.25	1.65	2.85	Mc	12 11.2	20.5
414287 2008 <i>OB</i> ₉	17.7	X	56.58324	238.57403	202.69826	13.49699	0.7586940	0.17172597	3.21	0.77	5.64	Jc	5 1.2	22.1
414586 2009 <i>UV</i> ₁₈	16.0	X	9.87270	62.63957	86.78301	8.34062	0.6326858	0.17415171	3.18	1.17	5.19	Jc	—	—
414751 2010 <i>FV</i> ₉₇	18.7	X	123.06300	273.22516	14.22094	5.76512	0.2279102	0.31353912	2.15	1.66	2.63	Mc	—	—
414993 2011 <i>EA</i> ₇₈	17.0	X	166.01351	293.31689	188.35906	28.20837	0.3875450	0.22827594	2.65	1.62	3.68	Mc	7 16.0	22.7
415025 2011 <i>QJ</i> ₈₀	18.4	X	115.43974	205.49502	218.05970	9.59159	0.1754835	0.34746341	2.00	1.65	2.36	Mc	2 16.5	20.4
415135 2012 <i>DO</i> ₅₄	18.4	X	336.08844	255.71007	161.90983	10.67497	0.3363198	0.28824780	2.27	1.51	3.03	Mc	—	—
415473 2014 <i>OC</i> ₁₁₂	16.9	X	324.96064	197.45465	129.38857	10.43118	0.3075321	0.26772360	2.38	1.65	3.12	Mc	6 4.1	19.2
415690 1992 <i>UB</i>	16.5	X	114.34711	294.58497	70.56380	16.24201	0.5678926	0.18015532	3.10	1.34	4.87	Ja	2 25.9	22.3
415729 1999 <i>VL</i> ₄₆	16.9	X	146.91396	165.18637	235.33947	14.02339	0.4262404	0.20072076	2.89	1.66	4.12	Mc	4 3.6	22.5
415752 2000 <i>OB</i> ₂₂	16.9	X	189.85058	195.24592	154.50713	17.32567	0.5310725	0.21261364	2.78	1.30	4.26	Mc	3 5.4	22.8
415754 2000 <i>QU</i> ₁₂₂	17.1	X	322.82726	343.12505	337.78236	7.66910	0.2899150	0.27646543	2.33	1.66	3.01	Mc	5 18.2	19.4
415760 2000 <i>RD</i> ₁₀₃	17.1	X	317.71342	104.14457	242.39782	5.84798	0.2981361	0.27789879	2.33	1.63	3.02	Mc	6 19.9	19.0
415761 2000 <i>SF</i> ₂₃	17.9	X	21.24382	312.88601	15.92751	13.25940	0.3854066	0.28497681	2.29	1.40	3.18	Mc	12 11.1	20.9
415776 2000 <i>VQ</i> ₁	17.7	X	320.25541	74.20801	48.79351	5.66775	0.3355358	0.28724064	2.27	1.51	3.04	Mc	—	—
415780 2000 <i>WO</i> ₁₀	17.7	X	286.33151	356.15895	84.52671	15.17338	0.4226512	0.27688917	2.33	1.35	3.32	Mc	9 1.4	20.6
415794 2001 <i>BR</i> ₃₂	16.1	X	238.48420	78.43685	138.62628	27.03463	0.4737503	0.22871751	2.65	1.39	3.90	Mc	12 18.9	20.9
415802 2001 <i>JT</i> ₂	17.3	X	93.12663	231.78984	58.90436	43.38342	0.3320785	0.31061200	2.16	1.44	2.88	Mc	12 14.1	21.6
415811 2001 <i>PK</i> ₄₉	17.7	X	261.21155	99.49330	22.33669	14.95991	0.4049692	0.23294772	2.62	1.56	3.68	Mc	3 3.6	22.9
415818 2001 <i>QX</i> ₁₅₁	16.3	X	245.08626	82.10118	312.65510	27.67625	0.3624770	0.23426737	2.61	1.66	3.55	Mc	5 20.9	21.6
415841 2001 <i>RS</i> ₁₅₀	18.2	X	103.13795	156.38708	164.15131	8.75413	0.2786450	0.30983808	2.16	1.56	2.77	Mc	—	—
415870 2001 <i>SA</i> ₂₇₆	16.8	X	232.37999	103.15944	65.66794	28.39976	0.3635518	0.23486756	2.60	1.66	3.55	Mc	7 3.6	22.0
415872 2001 <i>SN</i> ₂₈₂	18.0	X	102.01486	298.79444	46.33704	3.18241	0.2299582	0.31176172	2.15	1.66	2.65	Mc	—	—
415884 2001 <i>TU</i>	16.7	X	245.56894	114.00903	236.10417	27.88991	0.4005839	0.23237191	2.62	1.57	3.67	Mc	3 25.7	22.2
415913 2001 <i>UQ</i> ₆₃	18.2	X	88.28365	5.79719	333.19827	1.61945	0.2369369	0.30780916	2.17	1.66	2.69	Mc	—	—
415975 2001 <i>YS</i> ₂	17.1	X	268.93360	272.63443	249.11012	21.78216	0.2591039	0.29776883	2.22	1.65	2.80	Mc	12 28.9	19.0
415980 2001 <i>YZ</i> ₉₀	17.5	X	321.86600	55.00376	89.94961	6.24933	0.3007608	0.30092449	2.21	1.54	2.87	Mc	—	—
415996 2002 <i>AT</i> ₆₉	16.3	X	284.88378	83.42659	275.80745	11.63132	0.3811792	0.23711751	2.59	1.60	3.57	Mc	5 8.9	20.5
416187 2002 <i>TP</i> ₆₅	16.5	X	229.61275	284.60466	71.82723	28.09428	0.3767710	0.24164509	2.55	1.59	3.51	Mc	4 14.7	21.9
416211 2002 <i>UB</i> ₃₁	16.4	X	235.39797	268.09393	81.50953	27.71318	0.3827299	0.24074234	2.56	1.58	3.54	Mc	4 10.3	21.8
416223 2002 <i>XJ</i> ₆₉	18.7	X	33.74112	191.32510	275.98523	25.17064	0.3174721	0.32450684	2.10	1.43	2.76	Mc	—	—
416261 2003 <i>FD</i> ₅	17.4	X	162.22278	85.41837	67.26491	8.01588	0.3807790	0.23828859	2.58	1.60	3.56	Mc	9 5.9	23.0
416282 2003 <i>KE</i> ₃₁	18.3	X	8.59420	150.03906	150.38492	28.28284	0.2881764	0.27844093	2.32	1.65	2.99	Mc	9 15.8	19.4
416286 2003 <i>PR</i> ₁₁	17.3	X	120.44264	89.88177	295.63269	12.02396	0.5237969	0.18702640	3.03	1.44	4.61	Mc	3 7.7	22.9
416294 2003 <i>QJ</i> ₉₉	17.1	X	58.97906	308.89355	3.24634	23.85574	0.2787214	0.28264291	2.30	1.66	2.94	Mc	12 13.9	21.2
416296 2003 <i>RM</i> ₁	17.8	X	7.75412	41.87042	338.61320	6.05269	0.2835314	0.27987804	2.31	1.66	2.97	Mc	—	—
416301 2003 <i>RL</i> ₂₆	17.1	X	46.43825	83.43158	218.38946	21.54634	0.2951328	0.27925252	2.32	1.63	3.00	Mc	11 23.1	20.4
416386 2003 <i>UW</i> ₁₉	16.8	X	341.20033	261.81978	82.96375	22.53579	0.3371964	0.26937974	2.37	1.57	3.18	Mc	9 25.6	18.6
416404 2003 <i>US</i> ₁₃₁	17.6	X	23.35353	110.22564	255.09678	6.52483	0.3442651	0.27982062	2.31	1.52	3.11	Mc	—	—
416451 2003 <i>VM</i> ₁₂	17.8	X	348.24257	287.18779	90.65955	7.83244	0.3124118	0.27413344	2.35	1.61	3.08	Mc	12 7.8	19.0
416470 2003 <i>WD</i> ₈₂	16.3	X	123.02143	88.40394	277.78327	9.49918	0.4675497	0.18347859	3.07	1.63	4.50	Mc	2 13.8	21.8
416491 2003 <i>WE</i> ₁₅₈	18.9	X	212.43226	257.64584	80.51244	4.50615	0.2785805	0.36006897	1.96	1.41	2.50	Mc	2 18.5	22.1
416501 2003 <i>YU</i> ₁	18.6	X	102.46809	76.28635	287.33338	7.79683	0.2145418	0.45491638	1.67	1.32	2.03	Mc	—	—
416567 2004 <i>EB</i>	16.9	X	22.18548	238.36628	21.11219	21.10503	0.6586266	0.17900281	3.12	1.06	5.17	Jc	10 13.7	20.2
416588 2004 <i>JS</i> ₃₁	17.5	X	115.14691	50.25205	268.70582	4.93893	0.3032278	0.31510873	2.14	1.49	2.79	Mc	—	—
416595 2004 <i>NZ</i> ₈	16.2	X	204.01875	302.76935	84.61739	8.05386	0.5180226	0.21344588	2.77	1.34	4.21	Mc	4 23.4	22.1
416597 2004 <i>OS</i> ₄	18.0	X	83.16926	29.55711	298.62894	5.16982	0.2473953	0.30684733	2.18	1.64	2.72	Mc	—	—
416676 2004 <i>XO</i> ₅	17.0	X	77.26353	101.75706	270.02104	21.93994	0.3103046	0.30210548	2.20	1.52	2.88	Mc	—	—
416678 2004 <i>XT</i> ₅	16.4	X	318.94502	151.88481	241.43769	26.32018	0.2893207	0.28583702	2.28	1.62	2.94	Mc	9 4.2	18.8
416694 2004 <i>YR</i> ₃₂	17.6	X	23.90665	88.55716	90.34729	20.51535	0.7002031	0.18393452	3.06	0.92	5.21	Jc	7 6.9	19.3
416707 2005 <i>AL</i> ₆₉	18.5	X	335.63482	69.97313	24.95175	1.24671	0.3258946	0.29308654	2.24	1.51	2.98	Mc	—	—
416741 2005 <i>EX</i> ₆₉	17.7	X	81.71060	60.31317	98.09111	10.61607	0.4527972	0.19419814	2.95	1.62	4.29	Mc	7 12.9	22.4
416803 2005 <i>GZ</i> ₁₂₇	17.7	X	291.00800	293.32186	193.00020	21.83755	0.3111220	0.28467763	2.29	1.58	3.00	Mc	12 14.9	19.6
416837 2005 <i>JU</i> ₁₃₄	17.3	X	251.20929	119.11390	229.35061	28.41277	0.3983980	0.23693377	2.59	1.56	3.62	Mc	3 28.5	22.5
416843 2005 <i>LA</i> ₂₀	17.3	X	299.65583	168.23528	136.04968	13.09079	0.3529129	0.23958219	2.57	1.66	3.47	Mc	3 24.6	21.3
417204 2005 <i>XS</i> ₃₉	15.8	X	114.64236	253.13760	282.16707	13.99718	0.4021130	0.21630161	2.75	1.64	3.85	Mc	8 16.4	21.0
417422 2006 <i>KZ</i> ₄₂	17.4	X	355.53070	77.90943	241.67457	12.02173	0.3025248	0.26786246	2.38	1.66	3.10	Mc	8 27.6	18.8
417444 2006 <i>OE</i> ₂	18.4	X	126.02242	108.76158	114.25356	42.04196	0.1911773	0.40802688	1.80	1.46	2.14	Mc	11 24.0	22.1
417462 2006 <i>QH</i> ₅₅	17.1	X	312.42936	73.39869	332.71413	12.13533	0.4071377	0.26344606	2.41	1.43	3.39	Mc	8 24.7	18.0
417527 2006 <i>TD</i> ₃₁	15.7	X	1.00670	295.69585	38.12271	3.35571	0.2829195	0.12711613	3.92	2.81	5.03	Jc	9 17.2	19.5
417894 2007 <i>RW</i> ₄₀	18.3	X	30.22584	322.92870	26.83382	3.55739	0.2629517	0.29085475	2.26	1.66	2.85	Mc	—	—
417966 2007 <i>TX</i> ₁₁₉	17.6	X	136.90514	276.65554	53.57839	5.98867	0.2544757	0.30614550	2.18	1.63	2.74	Mc	—	—
417999 2007 <i>VT</i> ₄₀₀	17.6	X	46.31466	211.07569	117.57995	7.79151	0.3273619	0.29050307	2.26	1.52	3.00	Mc	—	—
418073 2007 <i>TG</i> ₂₂₆	17.3	X	11.01525	88.05933	246.42451	11.60281	0.2990049	0.28287900	2.30	1.61	2.99	Mc	11 18.8	19.2
418083 2007 <i>VV</i> ₃₀₇	16.3	X	176.23796	267.39528	249.00730	20.07795	0.3152281	0.26331529	2.41	1.65	3.17	Mc	8 27.4	21.2
418111 2007 <i>YD</i> ₂	18.5	X	13.23431	87.19337	313.59591	25.24991	0.2015625	0.43063980	1.74	1.39	2.09	Mc	—	—
418217 2008 <i>CO</i> ₁₆₆	18.2	X	275.23457	139.05980	356.97145	20.05975	0.0698788	0.42450397	1.75	1.63	1.88	Mc	—</	

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
422667 1999 <i>TB</i> ₂₈₉	17.6	X	30.76295	216.23361	133.82251	2.30252	0.3095890	0.27353336	2.35	1.62	3.08	Mc	—	—
422669 1999 <i>UF</i> ₄₃	17.9	X	9.01819	41.98509	329.86785	4.89642	0.2947467	0.27255329	2.36	1.66	3.05	Mc	—	—
422679 1999 <i>VU</i> ₂₂₅	17.0	X	0.50487	254.50455	97.10581	7.91183	0.3614322	0.26961067	2.37	1.52	3.23	Mc	12 4.0	18.7
422707 2000 <i>SX</i> ₁₂₈	16.4	X	16.42466	177.77071	252.92356	22.23889	0.2838208	0.29247074	2.25	1.61	2.89	Mc	—	—
422715 2000 <i>WE</i> ₆	17.0	X	219.40935	274.09076	71.72486	11.44604	0.4830220	0.21526775	2.76	1.43	4.09	Mc	3 18.0	22.9
422716 2000 <i>WA</i> ₁₀₆	17.6	X	52.20767	114.07192	240.72568	2.77485	0.2708655	0.28813937	2.27	1.66	2.89	Mc	—	—
422717 2000 <i>YA</i> ₂₈	18.3	X	345.88888	284.05255	154.11228	7.32507	0.3675016	0.28552125	2.28	1.44	3.12	Mc	—	—
422719 2001 <i>AU</i> ₁	17.4	X	28.42179	118.87515	278.19483	8.16515	0.3574581	0.28680089	2.28	1.46	3.09	Mc	—	—
422724 2001 <i>FK</i> ₅₈	17.5	X	230.64972	163.29767	76.72676	4.73734	0.3986879	0.27622804	2.34	1.40	3.27	Mc	—	—
422729 2001 <i>NC</i> ₁₅	16.8	X	321.29814	11.78658	335.94089	8.56621	0.3554714	0.24519024	2.53	1.63	3.43	Mc	6 18.8	19.2
422743 2001 <i>SU</i> ₁₁₁	17.3	X	226.59041	120.99929	236.68654	6.60056	0.4546481	0.22967534	2.64	1.44	3.84	Mc	3 26.4	22.8
422757 2001 <i>TL</i> ₇	17.1	X	281.31302	145.77917	232.75841	11.40433	0.3546964	0.24005741	2.56	1.65	3.47	Mc	6 4.7	21.1
422988 2003 <i>SE</i> ₄₁	17.9	X	135.63377	109.43887	329.21624	6.60510	0.3507618	0.27536843	2.34	1.52	3.16	Mc	12 5.6	18.3
423162 2004 <i>FD</i> ₁	17.8	X	131.78406	1.97775	354.84522	26.62452	0.0489683	0.44680939	1.69	1.61	1.78	Mc	—	—
423190 2004 <i>NM</i> ₁₈	16.7	X	226.44354	158.11780	206.66808	4.06805	0.4090494	0.21669273	2.75	1.62	3.87	Mc	4 7.1	21.9
423399 2005 <i>LX</i> ₉	17.3	X	224.28525	117.73054	113.45015	7.36159	0.3038601	0.28144058	2.31	1.61	3.01	Mc	—	—
423422 2005 <i>PG</i> ₁₀	17.8	X	215.79485	150.50154	108.81138	6.63766	0.2954347	0.27867730	2.32	1.64	3.01	Mc	—	—
423487 2005 <i>TM</i> ₅₅	18.3	X	187.70332	86.39302	311.83715	10.13644	0.2473256	0.34921296	2.00	1.50	2.49	Mc	4 9.9	21.7
423829 2006 <i>ME</i> ₁₀	18.0	X	94.40890	28.02161	286.71536	8.21437	0.2935654	0.28232131	2.30	1.63	2.98	Mc	—	—
424003 2006 <i>WD</i> ₃	16.5	X	8.94729	96.21914	263.62033	19.86256	0.3817029	0.26614001	2.39	1.48	3.31	Mc	12 31.2	19.1
424206 2007 <i>PB</i> ₃₃	18.3	X	34.43627	242.87787	134.29283	4.02281	0.3236058	0.29563244	2.23	1.51	2.95	Mc	—	—
424207 2007 <i>PL</i> ₄₂	19.3	X	212.75216	330.77827	319.45902	4.53512	0.1655223	0.46249751	1.66	1.38	1.93	Mc	—	—
424214 2007 <i>RF</i> ₃₆	17.7	X	58.88113	32.46045	336.54235	4.34992	0.2609191	0.29851508	2.22	1.64	2.80	Mc	—	—
424271 2007 <i>TE</i> ₃₆	17.2	X	71.10887	39.61224	346.62885	6.73401	0.2707709	0.30123496	2.20	1.61	2.80	Mc	—	—
424313 2007 <i>TH</i> ₃₇₀	16.7	X	105.73984	38.55245	289.20186	7.81726	0.2623350	0.29937467	2.21	1.63	2.79	Mc	—	—
424355 2007 <i>VU</i> ₁₄₅	17.7	X	112.09384	24.86526	301.58050	3.04935	0.2704147	0.29877145	2.22	1.62	2.82	Mc	—	—
424377 2007 <i>WF</i> ₄	17.3	X	115.57631	74.41642	261.06533	6.05177	0.2897112	0.30122325	2.20	1.57	2.84	Mc	—	—
424460 2008 <i>CC</i> ₁₂₁	18.2	X	309.31658	155.22117	359.75916	9.51250	0.2842541	0.28482360	2.29	1.64	2.94	Mc	—	—
425528 2010 <i>OJ</i>	16.9	X	43.56594	265.23863	88.45085	23.28125	0.3112209	0.28197088	2.30	1.59	3.02	Mc	—	—
425537 2010 <i>PE</i> ₄₅	17.0	X	38.23666	15.62988	318.62080	5.65740	0.2939876	0.27630714	2.33	1.65	3.02	Mc	12 25.1	20.2
425665 2010 <i>XT</i> ₄₉	17.8	X	133.44121	18.21053	293.83287	2.91566	0.2795015	0.29089282	2.26	1.63	2.89	Mc	—	—
425711 2011 <i>BZ</i> ₂₂	16.4	X	112.78075	285.87761	310.77479	27.30357	0.3662093	0.23306812	2.62	1.66	3.57	Mc	10 15.1	21.8
426031 2011 <i>KL</i> ₁₂	17.8	X	9.43053	63.93887	308.23716	14.17775	0.0832229	0.41145652	1.79	1.64	1.94	Mc	—	—
426057 2012 <i>BH</i> ₆₂	18.5	X	156.44342	272.07789	132.76193	12.16198	0.2890156	0.34449509	2.02	1.43	2.60	Mc	4 5.7	21.8
426255 2012 <i>QU</i> ₂	16.4	X	173.44430	309.96020	28.57732	24.41207	0.3294540	0.27334341	2.35	1.58	3.13	Mc	2 12.4	21.1
426362 2013 <i>ND</i> ₁₁	17.7	X	147.19332	260.12270	35.10993	9.03127	0.3112583	0.29166375	2.25	1.55	2.95	Mc	—	—
426386 2013 <i>PC</i> ₂₁	16.6	X	245.18231	235.41990	127.13853	11.79206	0.3978038	0.21588596	2.75	1.66	3.85	Mc	4 20.7	21.9
426481 2013 <i>RY</i> ₁₆	16.3	X	83.89650	31.84833	352.96202	25.73845	0.2787391	0.28206692	2.30	1.66	2.94	Mc	—	—
426534 2013 <i>RV</i> ₆₇	17.8	X	171.15387	248.16903	67.70389	7.35742	0.2665120	0.30369220	2.19	1.61	2.78	Mc	—	—
427494 2002 <i>BK</i> ₂₆	18.0	X	81.90656	82.03580	329.12929	24.31006	0.1440901	0.45877910	1.66	1.43	1.90	Mc	—	—
427521 2002 <i>JK</i> ₂₀	16.2	X	91.13014	212.29765	79.55926	11.59527	0.4102316	0.22413097	2.68	1.58	3.79	Mc	12 19.1	21.3
427580 2003 <i>QC</i> ₂₉	17.7	X	113.28782	83.91595	163.06745	8.67142	0.4471468	0.23170368	2.63	1.45	3.80	Mc	11 15.8	23.0
427583 2003 <i>KU</i> ₁₀₃	17.6	X	23.11990	225.96819	139.22945	10.75228	0.2821091	0.28145439	2.31	1.66	2.96	Mc	—	—
427584 2003 <i>RK</i> ₁₁	17.9	X	70.82159	45.25502	317.92456	9.63181	0.2797596	0.28869920	2.27	1.63	2.90	Mc	—	—
427602 2003 <i>SF</i> ₂₁₉	17.5	X	18.59259	247.47762	177.26152	22.49181	0.3211436	0.28525402	2.29	1.55	3.02	Mc	—	—
427624 2003 <i>UN</i> ₈₁	17.2	X	46.44634	285.55735	80.96223	8.00799	0.2843935	0.28330004	2.30	1.64	2.95	Mc	—	—
427639 2003 <i>UU</i> ₂₅₇	17.9	X	27.89399	303.32514	64.27477	8.12604	0.2815518	0.28000101	2.31	1.66	2.97	Mc	—	—
427861 2005 <i>OV</i> ₃₁	17.5	X	177.98177	254.13989	32.92081	9.93684	0.3013803	0.27616031	2.34	1.63	3.04	Mc	—	—
427885 2005 <i>SR</i> ₂₁₈	17.3	X	240.12802	347.30106	67.70807	8.52492	0.4038779	0.23143771	2.63	1.57	3.69	Mc	6 12.5	22.2
427914 2005 <i>UF</i> ₃₁₄	17.5	X	319.30654	113.54179	225.38763	11.66934	0.1751526	0.36513553	1.94	1.60	2.28	Mc	7 2.1	18.9
428088 2006 <i>OQ</i> ₉	17.7	X	201.61455	10.27797	309.19836	10.34884	0.2534066	0.30129953	2.20	1.65	2.76	Mc	1 22.8	21.4
428090 2006 <i>PU</i> ₃₂	17.3	X	227.73726	317.44214	356.96124	25.46125	0.2515128	0.30536037	2.18	1.63	2.73	Mc	2 14.9	21.4
428116 2006 <i>RZ</i> ₈₇	17.8	X	257.56155	113.95094	179.74461	6.54236	0.2728553	0.30608797	2.18	1.59	2.78	Mc	1 30.5	21.6
428223 2006 <i>WW</i>	16.1	X	138.17024	197.91844	88.24911	32.76622	0.8681878	0.22472937	2.68	0.35	5.01	Jc	—	—
428507 2007 <i>XQ</i> ₅₆	18.0	X	50.97121	46.08951	5.97100	7.24901	0.2587168	0.29638085	2.23	1.65	2.80	Mc	—	—
428519 2008 <i>AQ</i> ₈	18.6	X	40.34457	112.34560	299.38337	2.77803	0.2650057	0.29155623	2.25	1.66	2.85	Mc	—	—
428601 2008 <i>ET</i> ₉₂	17.3	X	275.94676	68.80021	106.17085	21.73402	0.3111053	0.27698339	2.33	1.61	3.06	Mc	—	—
428658 2008 <i>GJ</i> ₈₂	17.3	X	174.54653	147.87275	153.33276	6.48846	0.3314690	0.27148176	2.36	1.58	3.15	Mc	—	—
429192 2009 <i>WM</i> ₅₃	17.2	X	232.69444	305.55561	94.43452	10.04717	0.4210167	0.22258616	2.70	1.56	3.83	Mc	5 22.7	22.5
429405 2010 <i>TE</i> ₄₈	17.6	X	356.84740	210.00508	176.19632	7.03213	0.2901619	0.27440591	2.35	1.66	3.03	Mc	—	—
429463 2010 <i>WY</i> ₃₉	17.2	X	22.58667	245.86260	119.10822	6.72269	0.3078387	0.27584506	2.34	1.62	3.06	Mc	—	—
429845 2012 <i>QX</i> ₄₀	17.0	X	129.99688	295.08422	5.25265	11.13959	0.3547471	0.25767381	2.45	1.58	3.31	Mc	—	—
430305 2013 <i>WX</i> ₁₀₆	17.0	X	316.17696	237.81959	127.67677	6.92221	0.3981720	0.23508874	2.60	1.56	3.64	Mc	6 27.2	19.4
430478 2001 <i>SQ</i> ₁₁₅	17.9	X	102.56299	70.60604	327.16004	5.19708	0.3625907	0.31481550	2.14	1.36	2.92	Mc	2 18.5	19.7
430551 2002 <i>GO</i> ₁₇₁	18.5	X	28.37204	46.96273	191.26131	10.47225	0.2160890	0.36668200	1.93	1.52	2.35	Mc	6 30.6	19.4
430559 2002 <i>LE</i> ₆₃	17.9	X	220.73362	335.67541	339.25040	5.46402	0.2600117	0.29355058	2.24	1.66	2.83	Mc	2 2.2	21.8
430560 2002 <i>NC</i> ₃₂	16.4	X	352.63652	124.06697	260.56886	22.42871	0.3482489	0.26441699	2.40	1.57	3.24	Mc	12 29.7	18.3
430587 2002 <i>RL</i> ₁₃₇	19.2	X	264.08129	275.54333	337.88858	19.26213	0.1676839	0.44622022	1.70	1.41	1			

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
431321 2006 WL ₁₃₀	16.9	X	289.33369	82.34780	82.53824	18.41563	0.3132883	0.26815771	2.38	1.64	3.13	Mc	—	—
431625 2007 WX ₃	19.1	X	281.90644	255.74261	27.64545	11.11236	0.1472348	0.46583920	1.65	1.41	1.89	Mc	1 27.9	21.0
431686 2008 DP ₃₄	17.4	X	263.01464	271.88382	335.86372	21.33625	0.2801035	0.28633839	2.28	1.64	2.92	Mc	—	—
431704 2008 EF ₆₉	19.6	X	290.51213	101.99398	18.33524	25.01931	0.1800327	0.42208031	1.76	1.44	2.08	Mc	—	—
431714 2008 ED ₁₃₁	17.0	X	29.80988	267.44610	136.99318	5.78433	0.2985710	0.28204509	2.30	1.62	2.99	Mc	—	—
431821 2008 RL ₁₀₇	17.5	X	173.08717	165.65493	147.98588	10.31496	0.3837797	0.26295933	2.41	1.49	3.34	Mc	1 6.4	21.9
432036 2008 WR ₆₁	16.0	X	59.89308	78.51195	252.71220	16.13870	0.3752498	0.23637409	2.59	1.62	3.56	Mc	—	—
432037 2008 WS ₆₃	16.1	X	332.28954	248.99083	75.30404	13.60197	0.3888073	0.21980935	2.72	1.66	3.78	Mc	6 1.5	18.3
432308 2009 TQ ₃	17.2	X	138.17200	335.81684	2.08390	8.02864	0.2927692	0.27686080	2.33	1.65	3.01	Mc	—	—
432589 2010 RC ₁₀₃	18.8	X	296.23136	103.60928	324.69984	1.29537	0.3316554	0.26551711	2.40	1.60	3.19	Mc	9 8.8	20.8
432616 2010 UQ ₉₂	17.4	X	25.83066	3.64931	68.83295	10.78050	0.2859930	0.28729759	2.27	1.62	2.93	Mc	—	—
433018 2012 RM ₃₂	17.8	X	155.06695	251.53792	41.35102	5.68022	0.3474841	0.26179880	2.42	1.58	3.26	Mc	—	—
433873 2015 BQ ₃₁₁	12.0	X	261.57127	221.55655	117.04106	24.48537	0.2929332	0.05206854	7.10	5.02	9.18	Jc	4 26.8	21.1
433940 1995 QX ₉	17.0	X	92.18355	229.27765	107.14757	8.32357	0.4395801	0.23886318	2.57	1.44	3.70	Mc	—	—
433959 1999 FQ ₁₉	16.9	X	95.35341	251.59488	296.08801	8.33740	0.4612225	0.18744231	3.02	1.63	4.42	Mc	8 24.4	22.3
433961 1999 RL ₄₁	17.0	X	10.53127	308.79643	11.95775	18.01796	0.5523676	0.18148717	3.09	1.38	4.80	Mc	11 15.9	20.1
433965 1999 SD ₁₀	17.2	X	29.40917	228.35516	90.98845	6.00569	0.5449484	0.18442294	3.06	1.39	4.72	Mc	12 15.1	21.4
433986 1999 XB ₂₃₆	18.7	X	55.94772	338.83235	58.06480	12.33416	0.1999163	0.41631840	1.78	1.42	2.13	Mc	—	—
433997 2000 SH ₅₂	18.5	X	64.26638	40.94285	318.66321	2.63043	0.2646827	0.29328323	2.24	1.65	2.84	Mc	—	—
434013 2001 PF ₂₀	18.1	X	165.65067	298.14818	43.58502	3.18320	0.3026037	0.27205999	2.36	1.65	3.07	Mc	1 28.9	22.0
434019 2001 RG ₉	17.8	X	354.44042	106.23440	231.30479	13.75765	0.2794356	0.34610366	2.01	1.45	2.57	Mc	10 29.9	18.4
434052 2001 UP ₁₇	17.3	X	173.72421	83.63604	232.29908	12.08475	0.4400074	0.26750765	2.39	1.34	3.44	Mc	—	—
434080 2002 AE ₂	16.1	X	257.32916	315.02963	141.46405	33.51112	0.4206895	0.23551147	2.60	1.50	3.69	Mc	8 13.4	20.5
434084 2002 CA ₁₉	17.1	X	218.99897	297.37902	211.87095	29.00394	0.3594092	0.23769318	2.58	1.65	3.51	Mc	9 19.3	22.1
434110 2002 OX ₂₂	15.9	X	55.65857	113.96178	230.21478	29.48521	0.4046855	0.21851281	2.73	1.63	3.83	Mc	—	—
434113 2002 PV ₆₈	17.5	X	324.55892	339.09642	265.89144	8.39416	0.3236314	0.30016286	2.21	1.49	2.92	Mc	1 23.3	20.6
434147 2002 RH ₁₅₆	18.2	X	218.50130	23.93254	264.76018	1.85514	0.2871276	0.28833875	2.27	1.62	2.92	Mc	—	—
434165 2002 TP ₅₁	17.6	X	177.41403	308.49830	41.83097	7.14802	0.3484975	0.28581220	2.28	1.49	3.08	Mc	2 20.0	21.8
434167 2002 TQ ₆₅	15.9	X	134.52407	42.84686	46.70445	26.53972	0.4960250	0.17827428	3.13	1.58	4.68	Mc	5 25.6	22.1
434176 2002 UA	17.8	X	238.84710	292.78444	53.40347	22.51544	0.3376080	0.29539206	2.23	1.48	2.99	Mc	4 2.4	22.2
434177 2002 UP ₂₁	17.2	X	261.08094	267.00671	67.80311	3.68375	0.2538179	0.29645299	2.23	1.66	2.79	Mc	3 30.5	20.7
434187 2003 AN ₂	17.6	X	91.58779	224.17750	124.38777	26.65538	0.0933939	0.42195621	1.76	1.60	1.92	Mc	—	—
434197 2003 HH ₄₉	18.2	X	287.39341	148.79402	173.11358	3.47951	0.2444698	0.32561688	2.09	1.58	2.60	Mc	4 5.2	21.1
434231 2003 SR ₂₈₀	18.0	X	152.27393	88.79326	198.77265	6.05308	0.3591779	0.23960549	2.57	1.65	3.49	Mc	—	—
434242 2003 UA ₂₀	18.6	X	274.54587	250.40354	221.28122	31.42372	0.1100754	0.55263455	1.47	1.31	1.63	Mc	—	—
434273 2003 WR ₄₆	17.9	X	335.21199	79.88814	45.00630	21.63153	0.2780025	0.28338107	2.30	1.66	2.93	Mc	—	—
434380 2004 UX ₅	17.5	X	80.25814	73.92851	34.92641	23.61074	0.2688323	0.31540701	2.14	1.56	2.71	Mc	4 5.6	19.4
434419 2005 MH ₄	18.1	X	229.78536	214.32567	84.19345	6.81062	0.2953923	0.28847696	2.27	1.60	2.94	Mc	1 20.5	22.2
434431 2005 NC ₇	16.1	X	342.50684	201.50787	164.30306	13.96079	0.5120938	0.18931090	3.00	1.47	4.54	Mc	9 16.8	15.7
434432 2005 NG ₇	18.8	X	57.06221	3.55313	127.77387	19.95801	0.1336503	0.47528401	1.63	1.41	1.84	Mc	—	—
434451 2005 PV ₆	18.1	X	214.23002	269.33788	61.43142	7.10728	0.2737505	0.28548722	2.28	1.66	2.91	Mc	2 19.5	22.2
434620 2005 VD	14.1	X	320.54865	178.15800	173.36266	172.87276	0.2505478	0.05726379	6.67	5.00	8.34	Jc	11 8.2	21.3
434640 2005 WE ₁₄₄	17.8	X	174.55485	194.72211	171.82180	5.30384	0.2866007	0.27706161	2.33	1.66	3.00	Mc	3 3.4	21.8
434707 2006 CH ₄₉	14.7	X	243.41202	270.78783	283.40356	7.66466	0.2790286	0.11145997	4.28	3.08	5.47	Jc	11 27.1	21.2
434762 2006 HA ₁₅₃	14.3	X	189.69566	187.25495	61.58116	17.28665	0.0711906	0.10185253	4.54	4.22	4.86	Ja	12 23.4	20.9
434783 2006 MT ₁₄	17.7	X	91.62939	84.57836	214.35341	7.52254	0.4651714	0.21426387	2.77	1.48	4.05	Mc	12 28.5	23.2
434828 2006 SX ₃₀	18.9	X	280.96508	101.06732	199.68712	5.14644	0.2295398	0.31338143	2.15	1.65	2.64	Mc	3 2.1	22.1
434834 2006 SX ₅₆	18.2	X	217.34496	274.21952	61.58352	7.08331	0.2436359	0.30358679	2.19	1.66	2.73	Mc	2 26.3	22.0
434882 2006 SM ₃₅₆	18.3	X	262.17244	204.13386	132.92132	2.69509	0.2401054	0.31075761	2.16	1.64	2.68	Mc	4 2.7	21.6
434911 2006 TD ₆₃	17.7	X	359.69247	85.25765	5.29251	8.47095	0.3236921	0.27508213	2.34	1.58	3.10	Mc	—	—
435185 2007 RU ₃₀	17.2	X	86.68847	122.82053	239.61312	3.70646	0.3741517	0.23231901	2.62	1.64	3.60	Mc	—	—
435246 2007 TV ₂₄	17.9	X	11.76349	97.63357	215.71798	26.80380	0.3306127	0.35182914	1.99	1.33	2.64	Mc	11 11.2	19.2
435323 2007 VB ₅	17.2	X	117.49811	104.76206	210.69016	27.38361	0.3923602	0.23410368	2.61	1.58	3.63	Mc	—	—
435324 2007 VZ ₈	16.9	X	105.08288	277.57333	65.31720	24.75497	0.4093032	0.23152787	2.63	1.55	3.70	Mc	—	—
435541 2008 OF ₃	17.7	X	218.24104	156.45170	140.98487	7.15363	0.3013701	0.27320697	2.35	1.64	3.06	Mc	1 12.1	22.0
435608 2008 SL ₆₆	17.7	X	212.34621	64.74112	230.38639	1.32932	0.3633256	0.26900419	2.38	1.51	3.24	Mc	1 7.5	22.1
436036 2009 MK ₇	16.8	X	243.49198	96.61376	244.70142	26.02956	0.3430108	0.30334405	2.19	1.44	2.95	Mc	3 7.5	21.4
436063 2009 RG ₇₀	17.4	X	258.32598	333.50389	343.06325	7.25041	0.2549624	0.30327944	2.19	1.63	2.75	Mc	3 2.8	21.0
436073 2009 ST ₁₀₀	17.6	X	214.33362	62.57784	283.39427	6.64819	0.3020074	0.29637673	2.23	1.56	2.90	Mc	3 2.6	21.7
436163 2009 VO ₆₀	16.8	X	296.31917	2.53294	56.33692	24.61338	0.4038410	0.23728532	2.58	1.54	3.63	Mc	8 22.4	20.4
436384 2010 TD ₁₉	17.3	X	306.15369	257.21205	99.71768	31.63174	0.2777971	0.35044311	1.99	1.44	2.55	Mc	6 19.6	19.0
436616 2011 LC ₁	17.3	X	129.23654	90.18721	194.25868	10.57711	0.3706675	0.23421828	2.61	1.64	3.57	Mc	12 31.1	22.6
436776 2012 MK	19.4	X	338.43985	98.07065	167.41438	3.71872	0.2911647	0.31992131	2.12	1.50	2.73	Mc	3 16.7	21.3
436777 2012 MQ ₂	18.0	X	189.74574	302.31488	11.73339	4.55297	0.2882856	0.28036624	2.31	1.65	2.98	Mc	1 12.1	22.0
436802 2012 QA ₃₅	18.4	X	265.89067	27.57747	253.52084	3.10971	0.2823445	0.29321171	2.24	1.61	2.88	Mc	1 23.3	22.3
436869 2012 TJ ₁₄	17.5	X	250.64663	244.89206	66.37176	8.55752	0.2935123	0.29062493	2.26	1.59	2.92	Mc	2 21.7	21.6
436924 2012 TW ₁₀₂	18.9	X	228.90527	93.65085	212.31155	6.88088	0.2779164	0.28322027	2.30	1.66	2.93	Mc	1 26.5	23.0
436947 2012 TK ₁₄₀	17.5	X	233.50735	246.06045	66.22025	25.04377	0.2988863	0.28472594	2.29	1.60	2.97	Mc	2 16.9	22.2
436997 2012 TL ₂₁₉	17.6	X	246.83894	148.67595	179.10580	8.13858	0.2951130	0.29318611	2.24	1.58	2.91	Mc	3 5.9	21.6

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
438096 2005 CX ₂₃	17.6	X	249.65801	102.38621	143.33646	30.94765	0.2223980	0.41443001	1.78	1.39	2.18	Mc	—	—
438165 2005 SQ ₂₈₀	17.5	X	246.62941	142.69454	168.77861	9.94202	0.2799383	0.28545859	2.28	1.64	2.92	Mc	2 15.0	21.4
438238 2005 VW ₂₉	18.0	X	206.81183	293.41975	82.40494	3.41243	0.2802284	0.28414162	2.29	1.65	2.93	Mc	4 8.1	22.0
438319 2006 JX ₄₈	17.2	X	153.18666	134.38039	140.69450	11.74083	0.3952801	0.22744399	2.66	1.61	3.71	Mc	—	—
438342 2006 QQ ₁₆₉	19.1	X	327.61707	197.02609	111.85239	1.66027	0.2793909	0.32261270	2.11	1.52	2.69	Mc	5 9.0	20.4
438530 2007 TV ₆₅	16.7	X	103.07877	144.58202	262.11139	6.96010	0.4595464	0.23613303	2.59	1.40	3.78	Mc	3 11.6	20.7
438693 2008 PL ₁₅	16.8	X	107.17179	176.21697	202.28923	5.80585	0.3289968	0.25862229	2.44	1.64	3.24	Mc	1 19.8	19.7
438889 2009 SA ₃₁₃	18.8	X	270.02762	177.86915	161.12132	3.77910	0.2348919	0.30895795	2.17	1.66	2.68	Mc	4 13.3	22.0
439007 2010 XV ₆₉	18.2	X	348.99844	316.85630	173.32149	6.43645	0.3688951	0.28363685	2.29	1.45	3.14	Mc	—	—
439832 1995 OO ₅	18.8	X	279.71495	197.97942	129.44835	1.20505	0.2961211	0.29618809	2.23	1.57	2.89	Mc	4 1.7	22.2
439845 1998 RJ ₅₄	17.7	X	237.79597	189.31489	195.24575	7.35693	0.3004566	0.28981389	2.26	1.58	2.94	Mc	5 10.3	21.6
439848 1998 SF ₁₁₀	17.4	X	153.84035	349.24774	351.32758	6.87382	0.3759057	0.23296616	2.62	1.63	3.60	Mc	1 29.5	22.0
439880 1999 XV ₂₂₃	17.7	X	112.85192	300.91937	97.93745	7.36646	0.3587681	0.23936949	2.57	1.65	3.49	Mc	3 5.4	21.5
439885 2000 CD ₃₂	17.7	X	329.69213	29.82274	139.38484	24.47866	0.3239185	0.41127370	1.79	1.37	2.21	Mc	—	—
439887 2000 MO ₆	17.2	X	222.99611	353.21855	313.62907	4.81911	0.3162730	0.26503664	2.40	1.64	3.16	Mc	1 27.6	21.5
439890 2000 QA ₁₃₃	18.0	X	167.66867	230.68175	138.58050	4.47831	0.3700085	0.26047769	2.43	1.53	3.33	Mc	3 8.8	22.4
439906 2000 WB ₁₉₂	17.7	X	212.12742	235.98404	154.04143	8.28335	0.3173843	0.26605141	2.39	1.63	3.15	Mc	4 30.8	22.2
439914 2001 OF ₃₀	18.1	X	244.83681	335.51944	10.01932	3.49209	0.2968613	0.28424935	2.29	1.61	2.97	Mc	3 27.5	21.8
439915 2001 OT ₇₇	18.0	X	267.07654	334.89164	321.35379	5.90273	0.2804046	0.28338143	2.30	1.65	2.94	Mc	2 13.2	21.9
439919 2001 QF ₁₃₂	18.3	X	225.97857	68.27550	284.43972	4.17194	0.2883065	0.28054619	2.31	1.64	2.98	Mc	3 21.0	22.5
439928 2001 RH ₁₂	18.4	X	224.55251	7.14309	1.78225	2.29031	0.3065816	0.28163057	2.31	1.60	3.01	Mc	4 9.9	22.5
439931 2001 RT ₄₆	17.6	X	335.34148	268.05216	151.80778	23.27148	0.3152847	0.34943826	2.00	1.37	2.63	Mc	—	—
439936 2001 SS ₃₇	17.6	X	250.34424	333.17564	19.97740	11.22262	0.2794916	0.28269376	2.30	1.66	2.94	Mc	4 10.9	21.4
439953 2001 TV ₅₄	18.4	X	235.37735	148.76204	210.44961	4.42826	0.2790784	0.28156357	2.31	1.66	2.95	Mc	4 6.7	22.2
439974 2001 WH ₁₅	16.7	X	226.68483	92.95076	262.98829	20.86205	0.3413042	0.27627173	2.33	1.54	3.13	Mc	3 16.6	21.7
439994 2002 AK ₂	16.9	X	136.01251	316.38538	152.70928	24.63862	0.3807441	0.27361360	2.35	1.46	3.24	Mc	6 18.5	21.7
439998 2002 CM ₄	16.4	X	215.35162	243.71763	330.70473	26.69679	0.4339447	0.23726663	2.58	1.46	3.71	Mc	11 24.5	21.6
439999 2002 CX ₁₁	16.9	X	200.86740	22.09967	167.68127	14.73273	0.4389105	0.23283371	2.62	1.47	3.77	Mc	10 27.3	22.1
440009 2002 JP ₂	16.4	X	190.40626	103.21986	153.18025	28.48854	0.3605183	0.23452907	2.60	1.67	3.54	Mc	—	—
440017 2002 NP ₇	16.4	X	141.79919	86.68255	267.88743	26.31442	0.4289355	0.23226564	2.62	1.50	3.75	Mc	1 29.6	21.4
440022 2002 OZ ₁₆	17.3	X	121.90067	105.91197	264.76999	8.43767	0.4086267	0.22941935	2.64	1.56	3.72	Mc	2 8.3	21.6
440043 2002 QF ₂₄	17.3	X	278.87706	46.79858	320.88177	27.81632	0.2701394	0.30635925	2.18	1.59	2.77	Mc	5 19.8	21.1
440074 2002 SZ ₁₉	18.8	X	238.37905	171.03826	180.09727	8.81796	0.2743354	0.29639033	2.23	1.62	2.84	Mc	3 30.2	22.5
440135 2003 UJ	17.8	X	124.21033	303.45306	78.89316	9.22291	0.3564865	0.24149795	2.55	1.64	3.46	Mc	2 24.2	21.9
440174 2003 YF ₁₃₆	18.3	X	256.86056	99.26231	265.32134	3.51263	0.2811392	0.31185979	2.15	1.55	2.76	Mc	4 28.1	21.6
440179 2004 BF ₄₁	16.5	X	83.62975	113.19207	330.31540	26.75959	0.4119335	0.23475765	2.60	1.53	3.67	Mc	3 20.3	20.1
440242 2004 RX ₉	18.0	X	171.35605	59.30027	5.13220	5.88195	0.4221372	0.26888725	2.38	1.37	3.38	Mc	5 13.7	22.8
440243 2004 RF ₁₀	17.2	X	131.64359	291.71124	85.23018	6.62661	0.3532782	0.25715304	2.45	1.58	3.31	Mc	2 21.7	21.2
440254 2004 RV ₆₈	17.3	X	152.21910	239.09208	175.14551	8.43847	0.3214298	0.26451438	2.40	1.63	3.18	Mc	4 18.7	21.5
440289 2004 RY ₂₁₇	16.8	X	157.20601	107.32227	344.75283	20.31807	0.3716061	0.26714841	2.39	1.50	3.27	Mc	6 5.0	21.7
440623 2005 WH ₂₇	18.5	X	265.37782	318.57465	40.52572	2.57764	0.2921774	0.29224415	2.25	1.59	2.91	Mc	4 29.8	21.9
440633 2005 WC ₇₁	17.9	X	239.61380	58.68454	301.94270	3.80878	0.2990299	0.28853625	2.27	1.59	2.95	Mc	4 8.8	21.9
440680 2005 YW ₃₆	17.9	X	45.77105	208.23017	188.64743	22.81434	0.5312134	0.19809900	2.91	1.37	4.46	Mc	—	—
440760 2006 EX ₄₁	16.4	X	200.06864	265.62127	347.83545	26.81058	0.3970293	0.23494756	2.60	1.57	3.63	Mc	—	—
440799 2006 PZ ₉	19.9	X	6.09609	173.34510	134.70142	4.45955	0.2897045	0.33057906	2.07	1.47	2.67	Mc	10 7.0	20.6
440904 2006 VA	18.8	X	350.00905	14.14259	287.21381	4.11247	0.3546145	0.32325966	2.10	1.36	2.85	Mc	6 21.4	18.1
440940 2006 YG ₂₅	18.2	X	224.93309	290.31832	82.08043	6.52227	0.2518694	0.30263692	2.20	1.64	2.75	Mc	4 18.0	21.9
441144 2007 TV ₁₈₀	17.9	X	148.09678	283.37968	63.59744	6.47425	0.3485204	0.24127174	2.56	1.66	3.45	Mc	1 29.8	22.2
441266 2007 VE ₃₂₃	17.0	X	44.19206	130.79615	308.48902	5.83283	0.3846767	0.22721596	2.66	1.64	3.68	Mc	—	—
441344 2008 CD ₁₉₁	17.9	X	1.71843	137.83556	139.51394	7.44738	0.2571425	0.31585054	2.14	1.59	2.68	Mc	6 28.6	18.4
441525 2008 SK ₂₂₀	15.3	X	234.48012	195.66635	205.91287	8.21985	0.2420402	0.13157985	3.83	2.90	4.75	Ja	6 5.7	21.5
441531 2008 SH ₂₈₂	18.0	X	218.18975	272.21592	61.41433	9.17831	0.3221879	0.27012391	2.37	1.61	3.13	Mc	2 28.3	22.5
441600 2008 UC ₂₀₁	17.7	X	261.76903	57.44750	276.82448	4.88243	0.2838124	0.28174402	2.30	1.65	2.96	Mc	3 24.9	21.7
441622 2008 UP ₃₆₆	17.7	X	238.35721	283.18073	67.73311	5.50232	0.2914949	0.27646516	2.33	1.65	3.01	Mc	3 29.2	21.7
441875 2010 AX ₁₂₈	16.1	X	166.79126	272.66010	332.42244	21.66862	0.3941396	0.21984022	2.72	1.65	3.79	Mc	12 5.1	21.8
441952 2010 LR ₆₈	18.3	X	359.16595	299.68508	109.07459	4.71189	0.5868038	0.18104207	3.09	1.28	4.91	Ja	—	—
442037 2010 PR ₆₆	19.3	X	73.96624	319.52823	292.74763	17.58871	0.6869693	0.19675662	2.93	0.92	4.94	Ja	11 7.9	25.4
442148 2010 VC ₆₂	18.7	X	350.97426	104.55627	261.71303	4.71292	0.2180710	0.36029496	1.96	1.53	2.38	Mc	12 7.1	19.6
442253 2011 PR ₁	18.9	X	146.66008	41.69240	270.87204	7.28667	0.3928601	0.23932069	2.57	1.56	3.58	Mc	—	—
442442 2011 UD ₁₆₉	17.1	X	160.21943	149.44743	169.80156	5.89628	0.4511822	0.23477825	2.60	1.43	3.78	Mc	1 11.6	22.1
442586 2012 BX ₁₅₀	16.8	X	123.21534	29.23301	68.28826	13.95292	0.3651592	0.23944165	2.57	1.63	3.51	Mc	5 23.4	21.2
442628 2012 SH ₅₀	17.9	X	351.26240	50.57885	231.44424	2.28091	0.2587567	0.31614569	2.13	1.58	2.69	Mc	5 27.9	18.2
442649 2012 TU ₁₂₄	18.0	X	323.73392	228.93258	78.01882	5.28056	0.2611955	0.31058631	2.16	1.60	2.72	Mc	5 4.2	19.9
442715 2012 UQ ₁₆₆	17.9	X	302.08316	56.60309	262.49655	10.45590	0.2468910	0.30684435	2.18	1.64	2.71	Mc	4 17.1	20.6
442721 2012 VB ₃₁	18.0	X	263.21583	315.28462	80.10348	6.05496	0.2453984	0.30832908	2.17	1.64	2.70	Mc	6 20.2	20.9
442939 2013 CO ₇₄	17.5	X	206.54819	272.73710	148.19346	22.46390	0.2875431	0.28489325	2.29	1.63	2.95	Mc	6 5.9	22.0
443158 2014 CX ₉	17.9	X	231.81613	128.07296	2.81346	8.31029	0.1892675	0.34990614	1.99	1.62	2.37	Mc	10 7.6	20.1
443668 2015 HX	17.7	X	214.69015	190.98385	96.64516	7.05316	0.2937735	0.28283090	2.30	1.62	2.97	Mc	—	—
443674 2015 HN ₁₇₀	18.9	X	301.88552	249.926										

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
443950 2002 XZ ₃₉	18.2	X	173.14675	10.47807	82.29220	3.23868	0.4171667	0.29085336	2.26	1.31	3.20	Mc	6 18.9	22.6
443952 2003 BJ ₇₃	16.7	X	43.78428	145.56726	332.53836	9.10394	0.4088811	0.22188334	2.70	1.60	3.81	Mc	2 23.1	17.5
443962 2003 QR ₄₂	18.2	X	192.48229	252.44413	66.30879	0.22658	0.3541369	0.24885297	2.50	1.62	3.39	Mc	1 24.6	23.0
443992 2003 WT ₁₇₁	17.5	X	151.30808	184.97542	202.80829	15.83631	0.3446526	0.24512418	2.53	1.66	3.40	Mc	3 15.9	22.2
443995 2003 XT ₁₂	17.4	X	136.55727	72.01904	333.14680	10.41313	0.3508335	0.24275683	2.55	1.65	3.44	Mc	3 25.4	21.9
444031 2004 PQ ₁₆	17.1	X	259.37975	251.89846	77.94831	5.93515	0.2950022	0.27695779	2.33	1.64	3.02	Mc	3 23.0	21.1
444163 2005 GU ₁₇₃	18.0	X	4.33303	220.24714	49.82986	7.99050	0.2461611	0.31103243	2.16	1.63	2.69	Mc	6 21.5	18.6
444326 2005 WL ₃₅	18.0	X	278.91783	332.75019	9.65911	0.21071	0.2771703	0.29174418	2.25	1.63	2.88	Mc	4 22.3	21.3
444657 2007 CY ₁₂	17.7	X	197.39042	215.68695	239.81333	4.44240	0.3098894	0.30666974	2.18	1.50	2.85	Mc	7 7.3	21.5
444929 2008 AD ₁₃₈	17.4	X	69.48929	279.35496	149.38318	7.46060	0.3922202	0.23063202	2.63	1.60	3.67	Mc	2 14.7	19.5
445024 2008 NT	17.9	X	276.48814	66.33129	287.07577	4.79085	0.2840428	0.29225960	2.25	1.61	2.89	Mc	5 1.9	21.3
445132 2008 VD ₆₄	17.5	X	230.76838	30.77985	304.78876	11.54101	0.3147434	0.27665165	2.33	1.60	3.07	Mc	3 1.5	21.9
445269 2009 SU ₃₂₅	18.9	X	343.51398	243.43418	71.89604	5.74861	0.3158753	0.32334422	2.10	1.44	2.77	Mc	7 5.0	18.7
445279 2009 WZ ₄₉	17.0	X	186.29973	245.83117	315.25377	11.74703	0.4312710	0.22232574	2.70	1.53	3.86	Mc	10 23.8	22.5
445628 2011 SO ₂₂₉	18.3	X	158.05948	274.71313	93.61451	13.74161	0.3632100	0.24440458	2.53	1.61	3.45	Mc	3 7.1	23.1
445657 2011 UZ ₇₀	17.4	X	79.49208	31.63670	68.84116	15.72842	0.3774080	0.22965898	2.64	1.64	3.64	Mc	4 22.2	20.9
445777 2011 YU ₁₅	17.6	X	57.30726	89.17437	40.17045	5.65603	0.4834528	0.22484263	2.68	1.38	3.97	Mc	5 10.6	20.1
445900 2012 VH ₈₂	17.7	X	320.43239	61.87569	276.22787	6.47027	0.2940408	0.31381648	2.14	1.51	2.78	Mc	6 10.7	19.1
446010 2013 CB ₄₀	16.6	X	220.56483	26.55357	331.43077	23.77317	0.2943022	0.27421927	2.35	1.66	3.04	Mc	3 16.8	21.2
446742 2015 PH	17.5	X	250.92558	234.57141	136.93014	23.48897	0.2429151	0.31169780	2.15	1.63	2.68	Mc	5 14.7	21.4
446816 2000 EE ₃₈	17.4	X	342.01792	285.13157	199.58622	2.70491	0.5146432	0.18178804	3.09	1.50	4.67	Mc	—	—
446819 2000 YB ₅₃	16.4	X	307.57927	85.21569	317.51723	26.36628	0.4037907	0.23206767	2.62	1.49	3.75	Mc	8 2.6	19.1
446825 2001 OM ₅₀	17.9	X	274.74810	291.63627	46.84181	6.48564	0.3258419	0.28604871	2.28	1.54	3.02	Mc	4 10.5	21.5
446855 2001 UC ₇₂	17.7	X	272.54228	221.05473	125.70528	8.17835	0.2811292	0.28481331	2.29	1.64	2.93	Mc	4 25.6	21.4
446876 2002 AB ₃₀	17.6	X	214.13847	300.30877	127.75038	8.20893	0.3131801	0.28016885	2.31	1.59	3.04	Mc	6 15.8	21.8
446889 2002 JW ₈₂	16.8	X	182.64563	251.69070	52.85796	29.54743	0.3663678	0.23760036	2.58	1.64	3.53	Mc	1 2.2	22.0
446895 2002 PQ ₆₃	17.2	X	144.23642	245.74532	138.56602	7.99916	0.4445370	0.23263350	2.62	1.45	3.78	Mc	3 19.2	22.1
446987 2003 XY	16.4	X	76.41976	104.87662	49.35487	27.82046	0.4477531	0.23766651	2.58	1.43	3.74	Mc	6 29.2	20.7
447022 2004 NO	18.4	X	264.19221	197.27676	105.99396	8.00913	0.3577492	0.27529009	2.34	1.50	3.18	Mc	2 18.0	22.6
447146 2005 GZ ₂₅	18.3	X	132.37395	338.55980	19.76760	18.23611	0.0877940	0.41213572	1.79	1.63	1.95	Mc	—	—
447172 2005 NQ ₇₆	18.6	X	347.02032	172.22856	145.67908	5.10558	0.2338116	0.30809177	2.17	1.66	2.68	Mc	8 3.7	19.4
447175 2005 QZ ₅₀	18.3	X	334.20812	140.62434	151.05858	7.41884	0.2969331	0.30117280	2.20	1.55	2.86	Mc	4 25.7	20.2
447281 2005 VJ ₁₃	17.6	X	282.26014	194.28602	161.97812	4.76573	0.2762725	0.29641267	2.23	1.61	2.84	Mc	5 15.9	20.8
447334 2005 YA ₄₇	18.2	X	244.23172	77.00145	307.56778	5.45467	0.2781769	0.28735885	2.27	1.64	2.91	Mc	5 14.2	22.1
447335 2005 YR ₄₉	16.6	X	131.75994	245.01664	274.27649	20.48237	0.3432832	0.28558177	2.28	1.50	3.07	Mc	8 4.7	21.0
447562 2006 TM	18.1	X	19.05829	31.72696	224.21029	24.75990	0.1266536	0.45197452	1.68	1.47	1.89	Mc	6 21.4	19.1
447926 2008 AO ₄	17.7	X	130.18567	106.62485	309.01844	5.93832	0.3911280	0.23963819	2.57	1.56	3.57	Mc	4 6.3	22.2
447945 2008 AR ₁₀₈	17.3	X	149.65683	255.97392	135.54291	5.90010	0.3695861	0.24020491	2.56	1.62	3.51	Mc	3 25.6	22.0
447976 2008 CT ₁₁₆	16.8	X	123.74232	267.40417	153.90587	27.73498	0.4211774	0.23461063	2.60	1.51	3.70	Mc	4 20.0	21.8
448077 2008 GF ₁₃₈	18.9	X	342.55131	113.57800	176.37421	3.85688	0.2413082	0.30437516	2.19	1.66	2.72	Mc	5 22.5	20.1
448109 2008 NZ ₁	17.8	X	347.20535	174.34711	108.74944	11.59000	0.2941533	0.29955992	2.21	1.56	2.86	Mc	5 17.4	19.0
448110 2008 NF ₅	17.2	X	284.36630	86.64493	259.09846	5.54920	0.2754912	0.29141183	2.25	1.63	2.87	Mc	5 1.5	20.4
448120 2008 RF ₈₀	16.9	X	230.30438	268.86047	93.27917	22.58229	0.3652231	0.28207579	2.30	1.46	3.14	Mc	4 16.3	21.7
448142 2008 SG ₁₃₇	18.0	X	297.97754	334.18740	19.91417	6.38649	0.2887166	0.29126863	2.25	1.60	2.90	Mc	5 28.1	20.6
448182 2008 UO ₄	17.8	X	219.07867	142.68801	227.05428	31.33672	0.2163571	0.43158715	1.73	1.36	2.11	Mc	3 21.4	21.8
448225 2008 VP ₃	17.8	X	235.71942	316.14753	49.24484	12.25450	0.2895478	0.27934785	2.32	1.65	2.99	Mc	4 17.7	21.8
448443 2009 YL ₂₄	18.4	X	208.48033	120.19012	305.35705	4.77174	0.2561474	0.30051700	2.21	1.64	2.77	Mc	6 8.9	22.1
448562 2010 RZ ₁₄₃	18.5	X	209.15242	138.23300	186.75383	18.34248	0.1490492	0.41099948	1.79	1.52	2.06	Mc	1 10.6	21.1
448768 2011 SR ₃₃	17.2	X	178.54013	326.86710	96.59549	7.67157	0.3827774	0.25754132	2.45	1.51	3.38	Mc	5 19.4	22.0
449086 2012 RY ₁₆	18.9	X	320.04338	300.68964	3.91066	4.51664	0.3033819	0.31545392	2.14	1.49	2.79	Mc	4 12.5	21.1
449120 2012 YP ₁	16.8	X	172.26232	308.00783	141.01189	24.95522	0.3167728	0.28386756	2.29	1.57	3.02	Mc	6 16.4	21.4
449465 2013 LT ₃₃	17.9	X	57.04145	79.41322	236.45857	3.89827	0.2915708	0.27646824	2.33	1.65	3.01	Mc	12 20.0	21.5
449968 2015 PU ₁₂	18.0	X	261.00744	71.92928	236.81374	9.25924	0.2820557	0.28349372	2.29	1.65	2.94	Mc	2 19.6	22.1
450003 2015 PT ₂₉₁	19.7	X	337.36335	156.91420	176.84199	4.83055	0.3185333	0.32449379	2.10	1.43	2.77	Mc	7 21.7	19.8
450096 2015 RB ₉₃	18.4	X	293.58188	122.30116	176.12464	23.19130	0.2810828	0.29537442	2.23	1.61	2.86	Mc	3 8.7	21.6
450138 1998 BO ₂₆	17.2	X	128.71540	198.76364	326.58742	4.39562	0.3890897	0.26751519	2.39	1.46	3.31	Mc	8 19.3	21.7
450154 2000 AM ₄₉	17.9	X	68.34431	113.15827	283.08898	19.00720	0.3201583	0.36989684	1.92	1.31	2.54	Mc	—	—
450158 2000 DW ₉₈	15.8	X	173.29893	53.16889	356.55853	12.36710	0.3477297	0.24527776	2.53	1.65	3.41	Mc	4 23.7	20.7
450161 2000 YE ₂₉	17.0	X	348.48043	48.60749	109.15061	14.39374	0.5213630	0.19267719	2.97	1.42	4.52	Mc	—	—
450196 2002 CZ ₂₈₈	17.0	X	220.60292	99.64149	328.50829	21.77950	0.3297841	0.28106078	2.31	1.55	3.07	Mc	6 21.5	21.6
450205 2002 OP ₂	16.7	X	161.32810	93.51150	285.27400	10.45582	0.3847644	0.23495091	2.60	1.60	3.60	Mc	3 12.2	21.8
450257 2003 WA	19.9	X	145.19126	190.55139	232.53558	11.83199	0.4219397	0.24737885	2.51	1.45	3.57	Mc	4 28.8	24.6
450274 2004 BQ ₁₀₂	16.6	X	76.61217	53.05768	96.97641	26.89934	0.4023737	0.23683374	2.59	1.55	3.63	Mc	6 21.7	20.2
450292 2004 KU	16.2	X	71.23274	101.49660	93.85144	29.16727	0.3735276	0.23560236	2.60	1.63	3.57	Mc	8 13.4	20.4
450302 2004 QF ₂₄	17.0	X	227.71941	99.79240	260.20674	20.67824	0.3240863	0.27179761	2.36	1.60	3.13	Mc	3 23.9	21.9
450356 2004 VB ₈₀	18.1	X	143.30240	189.80319	269.20199	6.21933	0.3275364	0.26466760	2.40	1.62	3.19	Mc	6 4.9	22.4
450368 2005 CK ₆₂	17.9	X	140.46617	134.96929	348.14777	5.42284	0.3221712	0.26236575	2.42	1.64	3.20	Mc	7 3.5	22.3
450405 2005 SW ₂₆₅	18.3	X	263.96054	218.31589	152.85892	6.39063	0.2682773	0.29633266	2.23	1.63	2.83	Mc	5 18.4	21.7
450563 2006 FN ₃₆														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
451574 2012 <i>AU</i>	17.0 ^m	X	113.94510	81.63842	56.11908	29.94208	0.3567381	0.24300379	2.54	1.64	3.45	Mc	6 30.4	21.8
451896 2014 <i>JN</i> ₅₄	17.0	X	265.32489	284.88796	66.30012	24.67315	0.3105400	0.27759075	2.33	1.60	3.05	Mc	4 28.4	21.1
452140 2015 <i>QR</i> ₉	17.9	X	153.37756	311.35480	72.76857	7.85124	0.3509102	0.24196252	2.55	1.66	3.45	Mc	3 20.2	22.5
452327 2000 <i>SX</i> ₁₆₂	17.9	X	203.33004	74.89090	8.69997	6.33006	0.4502135	0.26953743	2.37	1.30	3.44	Mc	6 23.9	22.9
452337 2001 <i>RB</i> ₂₂	18.4	X	271.32622	182.52446	173.35926	4.03602	0.2916504	0.28709607	2.28	1.61	2.94	Mc	5 2.6	21.9
452362 2001 <i>VH</i> ₁₂₅	18.5	X	32.21047	328.31601	98.10320	7.63063	0.2217732	0.35689220	1.97	1.53	2.40	Mc	—	—
452384 2002 <i>EV</i> ₈	18.5	X	348.04278	329.21758	346.52333	15.05770	0.1592183	0.47789364	1.62	1.36	1.88	Mc	9 1.9	17.7
452391 2002 <i>NB</i> ₆₇	18.2	X	348.88493	338.57038	2.80075	0.48602	0.2466590	0.31410756	2.14	1.61	2.67	Mc	10 3.9	18.5
452407 2002 <i>SW</i>	16.4	X	165.51049	76.98005	314.20509	26.96591	0.4099616	0.23384887	2.61	1.54	3.68	Mc	3 19.8	21.9
452415 2002 <i>TL</i> ₁₈₁	18.2	X	339.49666	123.89668	214.78892	2.82575	0.2369999	0.30965420	2.16	1.65	2.68	Mc	8 20.9	18.9
452419 2002 <i>VQ</i> ₈₅	15.4	X	190.07314	102.65543	267.44705	27.19925	0.3839718	0.23274457	2.62	1.61	3.62	Mc	3 10.4	21.1
452435 2003 <i>GB</i>	16.2	X	133.43603	36.92360	188.35625	30.76553	0.4569575	0.18497778	3.05	1.66	4.44	Mc	10 29.6	22.4
452561 2005 <i>AB</i>	17.5	X	294.20992	63.75421	126.22250	8.15345	0.6546638	0.17056707	3.22	1.11	5.33	Jc	12 3.8	21.3
452592 2005 <i>JJ</i> ₁₇₇	18.1	X	10.99253	195.37189	102.16962	9.86035	0.3611212	0.31224963	2.15	1.37	2.93	Mc	10 17.3	19.6
452651 2005 <i>UP</i> ₂₃₁	19.1	X	319.46809	120.40493	211.31337	1.41863	0.2674291	0.29954514	2.21	1.62	2.80	Mc	6 4.3	21.0
452658 2005 <i>UN</i> ₄₇₂	18.6	X	338.05288	86.28294	234.34993	5.45619	0.2503926	0.29990071	2.21	1.66	2.76	Mc	7 5.8	19.5
452666 2005 <i>WP</i> ₅₄	16.6	X	118.05786	227.62392	265.84168	22.53048	0.3119605	0.28119162	2.31	1.59	3.03	Mc	6 26.5	20.3
452691 2005 <i>YW</i> ₃	15.2	X	258.86202	66.34261	115.97870	22.51018	0.5390366	0.17949397	3.11	1.43	4.79	Ja	11 16.3	20.7
452773 2006 <i>DM</i> ₁₄	17.0	X	67.63529	110.83012	316.82556	11.83857	0.5244149	0.19887339	2.91	1.38	4.43	Mc	3 10.9	20.3
453012 2007 <i>PG</i> ₂₄	18.1	X	285.08498	104.79943	190.46598	5.33546	0.3078157	0.26555975	2.40	1.66	3.14	Mc	2 25.2	21.9
453207 2008 <i>GO</i> ₁₁₅	17.5	X	72.29860	256.96322	224.39678	5.91896	0.4687152	0.23253038	2.62	1.39	3.85	Mc	5 19.0	20.7
453235 2008 <i>PU</i> ₃	18.7	X	316.65314	99.69404	247.98446	5.62938	0.2576711	0.29858514	2.22	1.65	2.79	Mc	6 27.4	20.2
453242 2008 <i>RG</i> ₁₀₆	19.0	X	319.41032	152.77679	168.15311	6.95946	0.2706506	0.29612064	2.23	1.63	2.83	Mc	5 18.9	21.1
453270 2008 <i>TJ</i> ₂₉₀	18.7	X	246.98940	200.27966	164.42013	6.55600	0.2787245	0.28338473	2.30	1.66	2.94	Mc	4 24.9	22.6
453292 2008 <i>SM</i> ₁₇₉	17.9	X	240.04700	267.88944	57.11130	14.57549	0.3257427	0.27758584	2.33	1.57	3.09	Mc	3 6.7	22.4
453319 2008 <i>VM</i> ₇₇	17.5	X	187.89749	88.14470	72.95428	23.00115	0.2678558	0.28988843	2.26	1.66	2.87	Mc	10 7.0	21.9
453775 2011 <i>HQ</i> ₅	17.6	X	66.03584	158.77579	99.51736	8.47195	0.3253785	0.31220338	2.15	1.45	2.85	Mc	10 28.9	20.9
453780 2011 <i>KH</i> ₆	18.7	X	335.32251	122.05847	192.22317	1.64163	0.2501087	0.29960041	2.21	1.66	2.77	Mc	6 15.7	19.6
453807 2011 <i>SM</i> ₆₅	17.4	X	236.59020	120.99190	229.05341	5.14709	0.3130406	0.26595587	2.39	1.65	3.14	Mc	3 25.9	21.9
454075 2012 <i>UJ</i> ₁₅₃	18.3	X	291.18878	294.74604	220.62270	5.54301	0.3104696	0.34146184	2.03	1.40	2.66	Mc	—	—
454225 2013 <i>JQ</i> ₂₈	18.4	X	147.94375	95.98195	82.15124	22.99767	0.3679298	0.28169853	2.30	1.46	3.15	Mc	9 28.0	23.3
454958 2015 <i>TJ</i> ₁₉₈	18.4	X	338.18291	242.54494	56.28078	7.52823	0.2696337	0.31057584	2.16	1.58	2.74	Mc	5 19.2	19.3
455127 2015 <i>VY</i> ₇₂	18.4	X	151.70703	107.44577	337.55799	2.31435	0.3192814	0.25958430	2.43	1.66	3.21	Mc	5 23.9	22.8
455149 1995 <i>LF</i>	20.6	X	162.99995	77.45453	130.24413	4.45384	0.4350972	0.28060535	2.31	1.31	3.32	Mc	10 29.7	25.3
455157 1997 <i>YM</i> ₃	17.1	X	11.05995	77.95746	299.64376	3.85473	0.6584602	0.16414482	3.30	1.13	5.48	Jc	—	—
455165 1999 <i>AL</i> ₁₀	17.0	X	128.86701	92.40114	335.77731	27.27484	0.3949133	0.23363188	2.61	1.58	3.64	Mc	4 8.6	22.1
455169 1999 <i>KQ</i> ₆	16.9	X	27.66839	111.89223	132.07082	10.83211	0.4064939	0.22615040	2.67	1.58	3.75	Mc	8 17.3	18.8
455170 1999 <i>ND</i> ₅	18.0	X	331.89664	234.72270	105.78536	6.67287	0.3614568	0.31250088	2.15	1.37	2.93	Mc	7 2.8	18.4
455172 1999 <i>QJ</i>	17.4	X	267.44979	15.66701	344.06416	31.87157	0.4386194	0.26007303	2.43	1.36	3.50	Mc	4 4.7	22.5
455174 1999 <i>TD</i> ₂₀₇	17.2	X	58.67656	76.16905	336.26017	18.20587	0.4480332	0.19071238	2.99	1.65	4.33	Mc	1 26.9	19.6
455185 2000 <i>EB</i> ₁₀₇	17.3	X	359.12645	43.54664	177.39391	25.21560	0.5826190	0.18608722	3.04	1.27	4.81	Ja	1 21.8	20.5
455189 2000 <i>QM</i> ₇	17.0	X	259.64081	237.67159	170.03957	22.74115	0.3562696	0.27459289	2.34	1.51	3.18	Mc	6 22.2	21.4
455190 2000 <i>QE</i> ₂₅	16.8	X	239.96579	237.98363	164.81281	11.44315	0.4469468	0.27056067	2.37	1.31	3.43	Mc	5 28.0	21.5
455195 2000 <i>SR</i> ₁₇₈	17.3	X	268.75601	120.73906	217.59127	11.35151	0.4035090	0.22278117	2.69	1.61	3.78	Mc	3 31.1	22.2
455204 2001 <i>FY</i> ₆	17.6	X	97.79467	78.23771	178.98993	7.30224	0.4152837	0.25976900	2.43	1.42	3.44	Mc	11 19.0	22.3
455211 2001 <i>MS</i> ₁₈	17.8	X	303.75461	97.97399	238.93956	3.73931	0.3096906	0.29075901	2.26	1.56	2.96	Mc	5 8.8	20.3
455215 2001 <i>PM</i> ₃₅	16.8	X	122.80110	104.45562	290.64531	28.14346	0.4424093	0.21916324	2.72	1.52	3.93	Mc	2 28.6	22.0
455217 2001 <i>QD</i> ₁₅₄	17.7	X	278.77108	253.25898	167.19176	7.67047	0.3831851	0.29213414	2.25	1.39	3.11	Mc	7 22.9	20.8
455222 2001 <i>RY</i> ₂₉	18.6	X	298.56241	196.11266	175.86702	4.91275	0.2797424	0.29187043	2.25	1.62	2.88	Mc	6 27.9	20.9
455224 2001 <i>RW</i> ₄₇	17.6	X	268.61729	292.75105	104.08139	6.00999	0.4163958	0.28742691	2.27	1.33	3.22	Mc	6 9.1	21.3
455231 2001 <i>SX</i> ₁₁₁	17.4	X	28.13761	340.30348	358.20757	11.22752	0.3445524	0.29932686	2.21	1.45	2.98	Mc	12 31.7	20.6
455236 2001 <i>SG</i> ₁₄₉	17.7	X	257.02095	14.69244	343.52878	6.83192	0.3008700	0.28431235	2.29	1.60	2.98	Mc	4 18.6	21.6
455263 2001 <i>UM</i> ₂₂₁	17.8	X	202.13481	69.08526	53.89395	20.06471	0.2919747	0.28427054	2.29	1.62	2.96	Mc	8 25.9	22.2
455265 2001 <i>VS</i> ₄	17.1	X	348.21063	73.96625	270.15542	5.51037	0.3091550	0.29382001	2.24	1.55	2.93	Mc	10 4.9	17.7
455308 2002 <i>FF</i>	17.6	X	127.65941	177.45793	39.94542	8.51784	0.3614747	0.27583246	2.34	1.49	3.18	Mc	10 20.3	22.0
455311 2002 <i>GO</i> ₄	18.6	X	160.59347	236.51340	320.67864	1.74512	0.3630755	0.27918538	2.32	1.48	3.16	Mc	10 14.5	22.9
455350 2002 <i>RL</i> ₁₁₅	18.0	X	157.04350	165.34615	222.25207	4.50619	0.3689265	0.23545180	2.60	1.64	3.56	Mc	3 22.8	22.8
455376 2002 <i>UE</i> ₁₇	17.3	X	172.78615	327.22290	63.31505	8.78442	0.3716994	0.23654441	2.59	1.63	3.55	Mc	4 9.6	22.3
455390 2002 <i>WK</i>	16.6	X	150.99984	110.01261	279.46121	27.53336	0.4354903	0.23306632	2.62	1.48	3.75	Mc	3 10.9	22.1
455394 2002 <i>YP</i> ₁₅	16.4	X	171.83221	92.16022	321.38850	27.21791	0.3643110	0.23279358	2.62	1.66	3.57	Mc	4 17.9	21.9
455396 2003 <i>AB</i> ₂₀	17.9	X	134.76154	228.46058	213.39158	7.28952	0.3667340	0.23230433	2.62	1.66	3.58	Mc	5 12.9	22.6
455398 2003 <i>AW</i> ₇₂	15.0	X	119.39930	64.86560	69.17636	29.38872	0.3799577	0.22900092	2.65	1.64	3.65	Mc	7 2.2	20.0
455426 2003 <i>MT</i> ₉	18.6	X	153.29805	200.73288	233.33705	6.82805	0.9220952	0.24455485	2.53	0.20	4.87	Ja	6 1.1	25.0
455428 2003 <i>QW</i> ₁₀	18.5	X	222.42942	26.68704	351.01738	10.82943	0.2350234	0.42455322	1.75	1.34	2.17	Mc	4 8.2	21.0
455513 2003 <i>WP</i> ₉₇	18.3	X	157.76238	349.81250	69.67783	10.43808	0.3391985	0.24902492	2.50	1.65	3.35	Mc	5 1.6	22.9
455514 2003 <i>WF</i> ₉₈	18.1	X	139.52467	89.81972	270.73263	24.20439	0.1026408	0.45830684	1.67	1.50	1.84	Mc	—	—
455547 2004 <i>HR</i> ₄₃	18.2	X	170.51872	311.1										

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
457499 2008 <i>VD</i> ₄	18.2	X	2.02813	326.23040	25.32545	3.38378	0.2450037	0.30520555	2.18	1.65	2.72	Mc	11 23.1	19.6
458012 2009 <i>WW</i> ₁₀₅	17.9	X	217.52625	242.84214	266.62752	14.64554	0.3879627	0.30799415	2.17	1.33	3.01	Mc	9 16.5	22.1
458145 2010 <i>JH</i> ₁	16.8	X	208.48331	154.82671	183.38741	13.55275	0.4436370	0.23303258	2.62	1.46	3.78	Mc	2 24.4	22.3
458734 2011 <i>OC</i> ₃	17.7	X	77.53855	155.20782	132.61378	6.52693	0.2291252	0.31441109	2.14	1.65	2.63	Mc	12 4.5	20.9
459156 2012 <i>CY</i> ₅₄	17.7	X	110.06013	58.97382	166.20676	5.16399	0.3856042	0.25619699	2.46	1.51	3.40	Mc	10 18.6	22.3
459190 2012 <i>DJ</i> ₄₇	17.1	X	147.06233	66.04522	329.50960	27.68280	0.4364234	0.23604765	2.59	1.46	3.72	Mc	3 18.3	22.3
459491 2013 <i>CC</i> ₁₂₈	18.6	X	212.16414	154.68473	81.25293	2.99465	0.2317227	0.32933377	2.08	1.60	2.56	Mc	—	—
459561 2013 <i>GM</i> ₉₂	18.0	X	129.42291	32.26209	235.72757	2.74157	0.3047349	0.29341650	2.24	1.56	2.93	Mc	12 19.1	22.1
459899 2014 <i>MP</i> ₂	16.0	X	189.85067	301.33135	58.32122	7.67089	0.3511812	0.24052290	2.56	1.66	3.46	Mc	3 14.7	20.9
459915 2014 <i>MC</i> ₂₇	17.4	X	265.77190	263.90918	127.96036	22.07000	0.2995674	0.28362725	2.29	1.61	2.98	Mc	6 15.9	21.2
461363 2000 <i>GQ</i> ₁₄₈	13.2	X	182.74963	126.87315	351.74578	16.62195	0.1342238	0.07094238	5.78	5.00	6.55	Jc	7 29.8	21.3
461367 2000 <i>QX</i> ₁₆₀	17.7	X	350.73395	78.02699	258.18449	4.22274	0.3009512	0.28222095	2.30	1.61	2.99	Mc	9 23.3	18.4
461369 2000 <i>SK</i> ₉	17.4	X	248.29060	236.94210	200.07145	22.64940	0.2945065	0.27570161	2.34	1.65	3.03	Mc	7 20.8	21.6
461371 2000 <i>SN</i> ₁₇₁	17.5	X	29.02446	327.47446	11.48877	9.64891	0.3569552	0.28604282	2.28	1.47	3.10	Mc	12 31.9	20.8
461374 2000 <i>WS</i> ₂₁	17.9	X	237.77988	303.01471	107.33212	6.66207	0.3899863	0.27144627	2.36	1.44	3.28	Mc	6 6.5	22.2
461377 2001 <i>FR</i> ₁₂₇	19.0	X	7.65862	277.12802	190.91857	28.33442	0.1103915	0.52630810	1.52	1.35	1.69	Mc	—	—
461419 2001 <i>UH</i> ₁	17.0	X	253.34001	89.46051	40.09227	22.64969	0.3024013	0.29341648	2.24	1.56	2.92	Mc	10 16.9	19.9
461432 2001 <i>WT</i> ₁₅	15.8	X	243.52690	112.48786	271.67123	26.65264	0.4432113	0.23365667	2.61	1.45	3.77	Mc	5 3.6	21.3
461506 2003 <i>QE</i> ₂₉	17.0	X	5.62765	346.81932	350.92391	13.42668	0.2932621	0.27719995	2.33	1.65	3.01	Mc	11 3.5	19.0
461576 2004 <i>PA</i> ₃	17.9	X	113.51344	356.48728	328.92692	6.61667	0.2466040	0.31088197	2.16	1.63	2.69	Mc	—	—
461579 2004 <i>PR</i> ₂₆	17.7	X	83.82696	328.43628	5.22311	6.48656	0.3137833	0.30515301	2.19	1.50	2.87	Mc	—	—
461585 2004 <i>RU</i> ₁₁₀	16.8	X	35.87936	93.83475	216.01457	26.65823	0.4150662	0.23634936	2.59	1.52	3.67	Mc	11 29.8	20.6
461590 2004 <i>RS</i> ₂₅₁	18.2	X	237.11052	96.55958	351.01802	22.55868	0.3034725	0.28296858	2.30	1.60	3.00	Mc	8 6.9	22.2
461625 2005 <i>EM</i> ₃₆	17.7	X	230.54198	282.79904	179.15682	21.42605	0.2965343	0.27418593	2.35	1.65	3.04	Mc	8 7.9	21.9
461634 2005 <i>EF</i> ₁₆₉	16.6	X	140.88134	129.42324	168.83082	59.26724	0.3663608	0.28190102	2.30	1.46	3.15	Mc	—	—
461747 2005 <i>UV</i> ₁₅₅	17.0	X	85.46838	285.93377	181.12400	9.66298	0.4160663	0.20842388	2.82	1.65	3.99	Mc	5 10.7	21.2
461769 2005 <i>UN</i> ₃₂₂	17.1	X	214.01680	290.89183	85.69854	24.54760	0.2805307	0.28135453	2.31	1.66	2.95	Mc	4 25.5	21.7
461836 2006 <i>CH</i>	17.7	X	225.21615	84.85438	354.38050	23.14736	0.3119037	0.28889593	2.27	1.56	2.97	Mc	7 14.5	22.1
461907 2006 <i>QF</i> ₂	17.4	X	10.42988	346.75073	331.45255	6.36863	0.3167862	0.26579088	2.40	1.64	3.15	Mc	10 18.9	19.2
461909 2006 <i>FL</i> ₅₃	17.7	X	33.53973	320.89845	336.98297	5.33904	0.3173606	0.26726191	2.39	1.63	3.14	Mc	10 31.7	20.6
461911 2006 <i>QS</i> ₁₂₃	17.2	X	204.14424	213.83653	169.06913	8.84029	0.4021750	0.23882757	2.57	1.54	3.61	Mc	4 17.2	22.3
461918 2006 <i>RJ</i> ₁₀₈	18.9	X	349.76222	34.94267	188.86703	5.38295	0.2294784	0.37459044	1.91	1.47	2.34	Mc	1 26.2	20.4
461962 2006 <i>UF</i> ₆₄	17.3	X	153.42347	213.32523	223.58527	7.83826	0.4271206	0.23181552	2.62	1.50	3.75	Mc	5 21.7	22.4
462097 2007 <i>KQ</i> ₂	16.7	X	89.30967	5.82288	163.66080	13.74359	0.4033631	0.22083818	2.71	1.62	3.80	Mc	7 26.1	21.3
462102 2007 <i>PN</i> ₂₄	17.7	X	109.56562	345.61996	312.38092	9.68510	0.3272171	0.30238752	2.20	1.48	2.92	Mc	—	—
462107 2007 <i>RH</i> ₁₁	16.8	X	83.16531	307.89861	16.78334	28.98385	0.3065020	0.29752693	2.22	1.54	2.90	Mc	—	—
462801 2010 <i>PX</i> ₆₂	16.9	X	142.11755	188.19025	155.29405	6.36554	0.4356735	0.22338949	2.69	1.52	3.86	Mc	4 5.9	22.0
462802 2010 <i>PR</i> ₇₄	18.0	X	101.04932	148.73010	210.33622	6.17439	0.3229624	0.29316786	2.24	1.52	2.97	Mc	—	—
462811 2010 <i>RY</i> ₇₁	17.9	X	119.90701	124.07062	176.44196	2.07562	0.2663785	0.29479604	2.24	1.64	2.83	Mc	—	—
463013 2011 <i>GZ</i> ₂₇	18.9	X	319.31598	113.41936	136.16076	11.24275	0.1337685	0.38449421	1.87	1.62	2.12	Mc	2 5.8	20.3
463089 2011 <i>SZ</i> ₂₁₆	18.2	X	201.96511	113.66330	348.68828	23.70809	0.3341945	0.27699500	2.33	1.55	3.11	Mc	7 27.8	22.9
463240 2012 <i>FO</i>	17.1	X	34.53764	74.32128	180.58582	26.63275	0.4152439	0.22858712	2.65	1.55	3.75	Mc	9 16.7	19.9
463293 2012 <i>HC</i> ₄₀	16.1	X	58.30576	283.74355	255.67771	26.40373	0.3907165	0.22934437	2.64	1.61	3.68	Mc	6 30.9	19.4
463480 2013 <i>PC</i> ₇₄	17.3	X	106.88114	340.53791	293.91499	8.40458	0.3093925	0.27413067	2.35	1.62	3.07	Mc	12 9.7	21.6
463666 2014 <i>LH</i> ₂₆	18.4	X	36.90508	29.18745	165.41800	24.04546	0.0755750	0.41170963	1.79	1.65	1.92	Mc	4 8.0	19.6
463671 2014 <i>OJ</i> ₂	18.3	X	44.02964	200.89527	147.51987	6.67340	0.2453461	0.30795109	2.17	1.64	2.70	Mc	—	—
464271 2015 <i>TO</i> ₆₇	18.0	X	332.39003	331.87895	4.64323	5.89774	0.2402882	0.31408676	2.14	1.63	2.66	Mc	7 26.9	18.9
464508 2016 <i>BR</i> ₇₇	17.0	X	103.90421	291.04982	330.21148	22.11401	0.2857403	0.28052053	2.31	1.65	2.97	Mc	11 14.2	21.5
464633 1999 <i>TB</i> ₄₆	17.8	X	91.32746	119.81253	211.15132	8.86639	0.2814799	0.27933627	2.32	1.67	2.97	Mc	—	—
464644 2000 <i>RO</i> ₃₈	16.8	X	9.36209	333.66840	352.74135	17.33400	0.4457216	0.23682330	2.59	1.43	3.74	Mc	11 13.1	19.5
464652 2001 <i>GE</i> ₄	17.9	X	189.25713	24.24995	88.59299	5.88205	0.4245970	0.26114200	2.42	1.39	3.45	Mc	7 22.4	22.8
464655 2001 <i>QA</i> ₅₉	18.3	X	110.46717	169.25134	179.78253	4.54469	0.2366956	0.31378911	2.14	1.64	2.65	Mc	—	—
464742 2003 <i>PB</i>	17.6	X	131.87251	87.63719	206.62477	5.96173	0.2736885	0.29367443	2.24	1.63	2.86	Mc	—	—
464743 Stanislavkomárek	18.4	X	171.34264	335.54490	294.08283	7.60571	0.2675766	0.29723917	2.22	1.63	2.82	Mc	—	—
464755 2003 <i>SA</i> ₂₂₀	17.4	X	197.59997	176.48679	225.93127	17.92996	0.4504175	0.25401554	2.47	1.36	3.58	Mc	5 3.5	22.5
464764 2003 <i>US</i> ₂₀	17.4	X	105.73749	278.81066	34.97420	9.03615	0.2732179	0.28654245	2.28	1.66	2.90	Mc	—	—
464815 2004 <i>RV</i> ₂₅₇	17.5	X	327.83025	191.89427	187.51222	9.40977	0.2696463	0.28871444	2.27	1.66	2.88	Mc	9 29.8	18.2
464817 2004 <i>SK</i> ₂₉	17.8	X	105.15367	342.55428	356.53092	7.21471	0.2324440	0.30831933	2.17	1.67	2.67	Mc	—	—
464831 2005 <i>AR</i> ₂₀	18.2	X	265.25181	311.31563	118.96979	6.26927	0.2862783	0.27883562	2.32	1.66	2.98	Mc	8 5.3	21.1
464941 2005 <i>UT</i> ₃₉₇	17.1	X	207.55564	346.17867	53.56207	9.63600	0.3957501	0.22431839	2.68	1.62	3.74	Mc	5 7.7	22.2
464984 2006 <i>AA</i> ₉₇	18.5	X	297.38461	307.62679	147.37286	5.48554	0.2787953	0.30536176	2.18	1.58	2.79	Mc	11 23.8	19.3
465040 2006 <i>QN</i> ₆₂	18.3	X	105.96739	183.37804	130.16260	4.42221	0.3246238	0.28261434	2.30	1.55	3.05	Mc	—	—
465098 2006 <i>UQ</i> ₂₁₇	16.5	X	326.76843	240.28448	84.59821	22.22770	0.5903761	0.19077107	2.99	1.22	4.75	Ja	4 26.5	20.6
465210 2007 <i>QF</i> ₁₀	18.8	X	144.48192	346.23973	315.94913	1.62443	0.2434817	0.30912769	2.17	1.64	2.69	Mc	—	—
465271 2007 <i>TF</i> ₁₀₇	17.7	X	250.63114	92.30440	0.06386	21.69316	0.2963635	0.27592303	2.34	1.64	3.03	Mc	8 26.1	21.4
465293 2007 <i>TR</i> ₃₃₀	15.9	X	329.93100	227.77142	229.43103	11.39609	0.4078981	0.14370101	3.61	2.14	5.08	Jc	12 10.6	18.5
465307 2007 <i>UQ</i> ₃	17.8	X	318.33283	290.82115	50.36524	34.96182	0.2237644	0.41484075	1.78	1.38	2.1			

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
467462 2006 <i>KK</i> ₁₃	18.6 ^m	X	173.12284	115.56223	167.14168	8.78213	0.3134769	0.29681575	2.23	1.53	2.92	Mc	—	—
467471 2006 <i>QN</i> ₁₁₃	18.4	X	94.58829	284.62289	33.66414	4.99320	0.2854040	0.28103833	2.31	1.65	2.97	Mc	—	—
467488 2006 <i>TR</i> ₄₈	18.3	X	80.86181	288.11826	39.03207	7.60459	0.2882485	0.27532320	2.34	1.67	3.01	Mc	—	—
467496 2006 <i>VM</i> ₆₃	18.0	X	77.91568	280.05412	64.25458	0.37251	0.3514238	0.27633191	2.33	1.51	3.15	Mc	—	—
467550 2007 <i>TY</i> ₉₂	18.2	X	64.75236	171.39437	188.47817	7.33214	0.2651179	0.29708777	2.22	1.63	2.81	Mc	—	—
467833 2010 <i>RN</i> ₉₀	18.3	X	161.30259	34.64602	271.96638	4.02796	0.2743575	0.30601151	2.18	1.58	2.78	Mc	—	—
467845 2010 <i>VR</i> ₁₄	16.8	X	79.57339	275.16966	52.58366	22.97145	0.2920142	0.28502920	2.29	1.62	2.95	Mc	—	—
467923 2011 <i>YU</i> ₂₈	17.4	X	307.37618	291.36670	115.23680	24.24382	0.3124269	0.28623545	2.28	1.57	2.99	Mc	9 18.1	19.5
467984 2012 <i>RM</i> ₄₂	17.0	X	32.60625	226.90049	101.14281	7.47432	0.4296926	0.23029964	2.64	1.50	3.77	Mc	12 20.9	20.8
468025 2013 <i>MN</i> ₆	17.2	X	101.57082	38.47281	290.73145	11.29615	0.2990650	0.28603752	2.28	1.60	2.96	Mc	—	—
468045 2013 <i>QB</i> ₈₅	17.9	X	85.94495	159.79695	182.30589	4.81957	0.2761996	0.28581631	2.28	1.65	2.91	Mc	—	—
468305 2015 <i>YA</i> ₈	16.8	X	86.12945	57.43792	161.47472	15.81926	0.4723743	0.23554536	2.60	1.37	3.82	Mc	10 1.9	21.6
468436 2001 <i>WO</i> ₄	18.5	X	13.87869	269.56952	243.32105	9.25181	0.2088755	0.36350681	1.94	1.54	2.35	Mc	—	—
468441 2002 <i>ON</i> ₂₄	17.6	X	126.86024	77.13235	301.27182	20.43658	0.3928613	0.28167629	2.30	1.40	3.21	Mc	2 11.4	21.2
468449 2003 <i>MF</i> ₁	18.1	X	177.31366	28.58730	262.82804	5.39157	0.3706282	0.30057625	2.21	1.39	3.03	Mc	—	—
468450 2003 <i>OW</i> ₁₆	16.7	X	151.17606	106.98696	237.32687	21.24147	0.3758330	0.29832268	2.22	1.38	3.05	Mc	1 16.1	20.7
468494 2005 <i>GY</i> ₁₂₈	18.0	X	212.92358	110.48928	89.49174	22.91542	0.3079392	0.27866520	2.32	1.61	3.04	Mc	11 30.4	21.9
468507 2005 <i>NB</i> ₆	16.3	X	87.19449	69.81417	285.12511	20.52174	0.3053132	0.26724892	2.39	1.66	3.12	Mc	—	—
468647 2008 <i>UC</i> ₄	16.3	X	32.23656	267.69402	75.73018	28.38689	0.4195528	0.23397584	2.61	1.51	3.70	Mc	—	—
468739 2010 <i>UJ</i> ₇	17.9	X	203.20779	10.06399	288.40667	5.65813	0.3622961	0.31154476	2.16	1.37	2.94	Mc	1 1.9	21.8
468804 2012 <i>HF</i> ₅₂	17.3	X	29.50419	124.63008	195.36159	17.27276	0.36811557	0.24152416	2.55	1.61	3.49	Mc	12 1.7	20.8
468821 2012 <i>TL</i> ₁₅	16.6	X	30.46313	335.52179	46.94338	8.55685	0.3611254	0.23508109	2.60	1.66	3.54	Mc	—	—
468826 2012 <i>TL</i> ₇₈	16.5	X	52.34236	72.63344	270.60992	16.20564	0.3802119	0.23450054	2.60	1.61	3.59	Mc	—	—
468864 2013 <i>PM</i> ₅	18.3	X	174.89504	29.33906	227.83650	2.20596	0.2611183	0.29278745	2.25	1.66	2.83	Mc	—	—
468917 2014 <i>VS</i> ₁	16.9	X	165.20977	287.57484	179.12645	28.71702	0.3791727	0.23042829	2.63	1.64	3.63	Mc	6 23.5	22.6
469046 2015 <i>AB</i> ₂₆₀	16.9	X	344.68098	280.31419	139.67073	20.83349	0.3167520	0.27856678	2.32	1.59	3.06	Mc	—	—
469191 2016 <i>GU</i> ₁₃₄	17.9	X	268.67913	275.43493	185.41302	19.72962	0.2803458	0.29114142	2.25	1.62	2.89	Mc	9 23.1	20.2
469234 2016 <i>JG</i> ₅	17.6	X	121.25133	204.91352	111.17472	10.73695	0.2857274	0.28920125	2.26	1.62	2.91	Mc	—	—
469276 1993 <i>RQ</i>	18.0	X	161.72132	0.09106	336.01070	9.85959	0.3252828	0.29874401	2.22	1.50	2.94	Mc	1 18.5	21.6
469307 1999 <i>RD</i> ₃₆	17.7	X	33.17206	193.83124	179.94123	7.22125	0.3658583	0.23152057	2.63	1.67	3.59	Mc	—	—
469308 1999 <i>RU</i> ₁₀₃	17.6	X	25.08367	75.99958	292.98762	4.60653	0.3933794	0.22995900	2.64	1.60	3.68	Mc	—	—
469329 1999 <i>YJ</i> ₅	16.9	X	63.64185	108.50529	314.72002	22.90676	0.3512899	0.28188817	2.30	1.49	3.11	Mc	—	—
469338 2000 <i>SF</i> ₁₃₇	17.6	X	28.51845	47.44553	296.10788	6.09852	0.3752247	0.23976981	2.57	1.60	3.53	Mc	12 30.1	21.1
469341 2000 <i>SD</i> ₂₉₁	18.3	X	231.84417	93.18817	231.77629	2.99890	0.2447209	0.31177115	2.15	1.63	2.68	Mc	2 18.4	21.9
469346 2000 <i>TN</i> ₆₄	18.5	X	210.81955	303.01400	336.92901	4.65867	0.3686516	0.30606124	2.18	1.38	2.98	Mc	—	—
469359 2001 <i>HX</i> ₁₃	18.5	X	150.62500	85.48654	195.30833	3.19466	0.3651886	0.27006137	2.37	1.50	3.24	Mc	—	—
469366 Watkins	18.1	X	335.06093	220.47291	148.77102	11.11458	0.5447063	0.19630105	2.93	1.33	4.53	Mc	7 17.7	19.5
469369 2001 <i>QO</i> ₁₄₆	18.1	X	131.04465	133.86247	142.05313	5.58217	0.3116580	0.26239013	2.42	1.66	3.17	Mc	12 25.9	22.6
469393 2001 <i>TZ</i> ₉₀	17.2	X	10.47780	88.96516	211.72404	12.83684	0.4868276	0.19831531	2.91	1.49	4.33	Mc	10 13.5	19.1
469441 2002 <i>TP</i> ₁₂₆	18.2	X	42.41290	259.93141	10.40203	6.05029	0.4677459	0.21444515	2.76	1.47	4.06	Mc	10 23.3	22.0
469446 2002 <i>NL</i> ₈	17.7	X	151.85976	49.25765	279.36562	7.00995	0.3255839	0.28339556	2.30	1.53	3.06	Mc	1 1.9	21.2
469449 2002 <i>OW</i> ₁₉	17.0	X	107.40479	100.18545	303.02009	19.47174	0.3824681	0.28186167	2.30	1.42	3.18	Mc	2 19.9	20.1
469457 2002 <i>QE</i> ₄₄	18.0	X	145.95690	244.49708	101.28198	5.14926	0.2783945	0.28387493	2.29	1.65	2.93	Mc	1 11.9	21.2
469478 2002 <i>TU</i> ₂	17.8	X	131.80653	312.25685	10.18777	4.69217	0.2858721	0.27768592	2.33	1.66	2.99	Mc	—	—
469483 2002 <i>TP</i> ₁₅₃	18.2	X	140.32775	302.54026	8.17611	5.47699	0.3037340	0.27812960	2.32	1.62	3.03	Mc	—	—
469493 2002 <i>XG</i> ₁₀	18.1	X	117.54584	302.20214	72.95934	8.97236	0.2945989	0.27843897	2.32	1.64	3.01	Mc	1 22.6	20.9
469502 2003 <i>BZ</i> ₂₀	19.0	X	340.17669	117.13053	126.66681	29.31213	0.0527978	0.54824100	1.48	1.40	1.56	Mc	2 5.1	19.1
469503 2003 <i>DY</i> ₉	17.2	X	1.69144	110.17014	10.27008	22.39955	0.3112957	0.26735628	2.39	1.64	3.13	Mc	—	—
469510 2003 <i>MJ</i> ₉	16.5	X	23.66888	101.66415	242.67826	11.91905	0.3891046	0.22428347	2.68	1.64	3.73	Mc	12 23.2	19.9
469516 2003 <i>RZ</i> ₂₃	18.3	X	179.55182	96.65615	226.00225	5.64950	0.2467185	0.30173352	2.20	1.66	2.74	Mc	1 6.9	21.7
469565 2003 <i>VC</i> ₃	15.5	X	8.18419	95.77197	264.18479	26.85159	0.4674000	0.21823496	2.73	1.46	4.01	Mc	12 30.9	18.5
469640 2004 <i>TC</i> ₁₉	17.8	X	61.96280	77.17331	281.81780	14.81914	0.3559306	0.24424849	2.53	1.63	3.44	Mc	—	—
469672 2004 <i>XE</i> ₂	17.2	X	340.81291	136.84940	294.50132	5.37491	0.3730448	0.23423707	2.61	1.63	3.58	Mc	—	—
469676 2004 <i>XW</i> ₄₉	16.0	X	34.31349	72.75256	262.27343	27.56992	0.4147779	0.23461981	2.60	1.52	3.68	Mc	12 27.3	19.8
469696 2005 <i>CO</i> ₆₂	16.1	X	17.67904	70.47000	325.62022	27.89028	0.3747503	0.23374038	2.61	1.63	3.59	Mc	—	—
469699 2005 <i>EP</i> ₆₈	16.6	X	342.69971	276.56946	178.06447	27.09512	0.4162281	0.23279163	2.62	1.53	3.71	Mc	—	—
469796 2005 <i>SD</i>	16.1	X	294.73516	91.04899	313.73543	21.11007	0.4939949	0.17696516	3.14	1.59	4.69	Mc	7 7.8	20.8
469834 2005 <i>SL</i> ₂₄₃	17.6	X	51.71433	258.44326	147.70517	15.00208	0.3629594	0.26103451	2.42	1.54	3.30	Mc	—	—
470007 2006 <i>OQ</i> ₂₁	17.8	X	148.73997	5.99937	352.11742	7.45532	0.2944377	0.29155082	2.25	1.59	2.92	Mc	2 1.6	21.2
470010 2006 <i>QV</i> ₁₃₀	18.3	X	158.36869	240.60782	93.49275	7.18431	0.2814870	0.29444741	2.24	1.61	2.87	Mc	1 7.7	21.5
470068 2006 <i>SQ</i> ₂₇₃	17.7	X	132.00450	5.69461	36.96111	5.94923	0.2713824	0.29266576	2.25	1.64	2.86	Mc	3 11.8	20.8
470069 2006 <i>ST</i> ₂₇₈	17.4	X	188.87986	83.18578	248.28217	7.76445	0.2726564	0.29749072	2.22	1.62	2.83	Mc	1 26.1	21.2
470070 2006 <i>SD</i> ₂₈₁	17.6	X	159.22284	243.70268	83.82404	6.01251	0.2914678	0.29066933	2.26	1.60	2.91	Mc	1 1.9	21.0
470092 2006 <i>SM</i> ₄₀₆	18.4	X	167.51353	192.81229	121.70979	1.19925	0.2848944	0.29170209	2.25	1.61	2.89	Mc	—	—
470215 2006 <i>WP</i> ₂₉	17.2	X	73.20096	295.84080	126.41617	22.77313	0.3787202	0.28439823	2.29	1.42	3.16	Mc	1 18.4	17.7
470258 2006 <i>YV</i> ₅₅	17.7	X	93.42505	4.95997	39.11158	6.25998	0.2889514	0.28210026	2.30	1.64	2.97	Mc	1 24.0	19.7
470283 2007 <i>DJ</i> ₈₆	17.9	X	82.47638	100.08477	353.38868	21.80197	0.3007537	0.28292916	2.30	1.61	2.99	Mc	3 17.7	19.8
470317 2007 <i>PJ</i> ₂₁	16.8	X	60.64895	305.26133	337.34997	12.12016	0							

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
471545 2012 <i>KC</i> ₁₃	17.7	X	141.95552	217.23822	85.45109	3.34003	0.3010686	0.27135781	2.36	1.65	3.07	Mc	—	—
471612 2012 <i>SR</i> ₄₅	17.9	X	8.93630	87.36278	351.00798	27.07892	0.4194838	0.23623314	2.59	1.50	3.68	Mc	—	—
472253 2014 <i>NA</i>	19.1	X	61.10637	245.26505	282.87225	14.86380	0.0576706	0.54374971	1.49	1.40	1.57	Mc	2 15.1	19.4
472261 2014 <i>QH</i> ₃₆₄	19.0	X	164.16835	1.09914	155.70971	23.83921	0.0833166	0.42569797	1.75	1.60	1.90	Mc	9 12.5	20.6
473458 2015 <i>XA</i> ₅₅	17.2	X	182.77496	58.91615	310.31689	10.64844	0.3838335	0.24413213	2.54	1.56	3.51	Mc	3 13.9	22.3
474129 1995 <i>SM</i> ₃₀	17.6	X	31.33262	100.11840	347.97064	32.62536	0.4350526	0.23825684	2.58	1.46	3.70	Mc	—	—
474156 1998 <i>XQ</i> ₁₆	18.1	X	48.35330	152.05688	315.06790	9.04476	0.4317016	0.26963015	2.37	1.35	3.40	Mc	1 13.1	17.3
474171 1999 <i>TY</i> ₁₉₃	17.4	X	10.06726	86.80793	17.10355	7.12662	0.4286346	0.23249836	2.62	1.50	3.74	Mc	—	—
474181 1999 <i>VP</i> ₇₉	17.3	X	80.94116	113.78712	219.50283	28.15291	0.3797110	0.23384012	2.61	1.62	3.60	Mc	—	—
474189 1999 <i>XW</i> ₈	16.2	X	45.70268	285.37521	70.71608	28.75500	0.4124006	0.23055064	2.63	1.55	3.72	Mc	—	—
474190 1999 <i>XX</i> ₁₄	16.9	X	81.33590	51.08882	87.56276	24.82867	0.3329872	0.28867686	2.27	1.51	3.02	Mc	6 2.3	19.7
474202 2000 <i>KO</i> ₆	18.1	X	240.33651	78.41989	215.41354	4.38074	0.3433565	0.31437078	2.14	1.41	2.88	Mc	1 16.9	22.0
474203 2000 <i>QR</i> ₁₉₉	18.3	X	208.35074	200.03152	148.40884	3.54922	0.2492621	0.31183346	2.15	1.62	2.69	Mc	3 3.0	21.9
474204 2000 <i>QE</i> ₂₀₃	18.4	X	207.62739	162.85406	146.18776	6.07127	0.3123347	0.30873769	2.17	1.49	2.85	Mc	1 14.8	22.4
474205 2000 <i>SJ</i> ₃₅	18.5	X	234.87833	173.69962	149.95399	2.94891	0.2493074	0.31267431	2.15	1.61	2.69	Mc	2 20.3	22.1
474225 2001 <i>DB</i> ₄	16.8	X	63.41336	77.00700	334.33353	26.03197	0.3787387	0.24356634	2.54	1.58	3.50	Mc	—	—
474263 2001 <i>TO</i> ₄₆	16.8	X	92.05870	303.96749	138.62704	23.15882	0.3613392	0.26575465	2.40	1.53	3.26	Mc	4 9.1	20.3
474277 2001 <i>UD</i> ₁	15.8	X	49.64766	123.59614	327.50422	21.83980	0.3547043	0.26346118	2.41	1.56	3.26	Mc	—	—
474278 2001 <i>UT</i> ₁₇	18.7	X	329.14198	342.16452	48.17772	30.39902	0.2525858	0.39635655	1.84	1.37	2.30	Mc	12 7.8	19.5
474295 2001 <i>XX</i> ₁₀	18.0	X	198.85586	345.64322	88.80745	38.36378	0.0090473	0.53006057	1.51	1.50	1.53	Mc	6 15.4	18.0
474348 2002 <i>QR</i> ₃	18.4	X	161.04166	43.78215	286.74221	5.02672	0.2790610	0.28445072	2.29	1.65	2.93	Mc	1 6.9	21.7
474350 2002 <i>KQ</i> ₅₂	19.0	X	168.74957	167.61016	148.97423	6.44494	0.2746379	0.28442487	2.29	1.66	2.92	Mc	—	—
474366 2002 <i>RO</i> ₈₅	17.8	X	146.26914	358.54572	356.21342	5.64906	0.2941917	0.28305433	2.30	1.62	2.97	Mc	1 26.8	21.2
474370 2002 <i>RT</i> ₁₅₇	17.6	X	326.58827	78.78894	344.37933	6.88018	0.4335557	0.20781041	2.82	1.60	4.05	Mc	10 28.8	18.5
474392 2002 <i>TF</i> ₁₅₇	17.7	X	109.45074	272.98121	116.38464	7.59634	0.2821191	0.27966964	2.32	1.66	2.97	Mc	1 27.2	20.0
474401 2002 <i>UY</i> ₁₃	18.9	X	119.60172	341.38208	61.57370	9.81615	0.2831480	0.28205268	2.30	1.65	2.95	Mc	3 4.5	22.1
474412 2002 <i>WT</i>	16.6	X	113.42839	94.28316	311.18912	23.06407	0.3007139	0.27936562	2.32	1.62	3.01	Mc	2 18.9	19.7
474424 2002 <i>YZ</i> ₁	17.2	X	89.93264	82.29835	27.79856	21.62906	0.2945065	0.28009323	2.31	1.63	2.99	Mc	4 22.6	19.8
474436 2003 <i>GF</i> ₅₃	16.8	X	78.84893	103.55153	202.68597	27.50127	0.3946159	0.23552225	2.60	1.57	3.62	Mc	12 25.3	22.0
474440 2003 <i>NH</i> ₅	18.4	X	268.22446	80.90145	195.92273	4.89118	0.2748316	0.31443452	2.14	1.55	2.73	Mc	1 17.3	22.0
474441 2003 <i>OE</i> ₁₃	17.1	X	84.49804	353.29937	312.35884	5.83127	0.4354350	0.23216918	2.62	1.48	3.76	Mc	—	—
474442 2003 <i>PQ</i> ₉	17.6	X	28.31554	215.51409	154.78788	9.19693	0.4287612	0.22707083	2.66	1.52	3.80	Mc	—	—
474443 2003 <i>QJ</i> ₅	17.0	X	89.94013	120.96545	184.12140	28.28988	0.3963374	0.23316086	2.61	1.58	3.65	Mc	—	—
474518 2003 <i>UD</i> ₂₁₀	18.0	X	172.87592	302.85214	21.71546	3.87874	0.2616885	0.29979297	2.21	1.63	2.79	Mc	1 29.5	21.4
474536 2003 <i>WS</i> ₁₂	18.2	X	187.08785	302.21376	49.93336	8.54090	0.3292555	0.30312835	2.19	1.47	2.92	Mc	2 27.2	22.2
474538 2003 <i>WT</i> ₂₁	16.6	X	199.92860	103.09568	241.45613	38.86177	0.2494606	0.30345570	2.19	1.65	2.74	Mc	2 2.1	21.3
474560 2004 <i>BT</i> ₁	15.2	X	192.76638	211.43904	240.65169	14.57592	0.4939242	0.14053433	3.66	1.85	5.47	Jc	6 27.1	22.4
474634 2004 <i>UY</i>	17.2	X	349.91763	232.86469	128.62610	30.54142	0.3737045	0.23867762	2.57	1.61	3.54	Mc	—	—
474674 2005 <i>CZ</i> ₆	19.1	X	31.59507	104.68179	326.93625	26.64543	0.4913892	0.24157421	2.55	1.30	3.81	Mc	—	—
474724 2005 <i>LM</i> ₄₈	18.2	X	162.08474	55.86774	280.25539	5.98437	0.3093573	0.27802338	2.32	1.61	3.04	Mc	1 17.7	21.9
474748 2005 <i>PB</i> ₄	17.5	X	166.52477	337.28330	328.79128	3.37134	0.3366826	0.27570027	2.34	1.55	3.13	Mc	—	—
474763 2005 <i>QQ</i> ₇₅	17.1	X	129.10125	9.36142	2.07213	6.68961	0.4373902	0.27391456	2.35	1.32	3.38	Mc	2 17.8	20.8
475134 2005 <i>UH</i> ₃₃₂	17.4	X	159.62886	245.63933	64.55306	14.95781	0.3060198	0.26840834	2.38	1.65	3.11	Mc	—	—
475198 2005 <i>VC</i> ₁	17.3	X	126.70426	90.93432	246.71754	19.60294	0.3696297	0.26777955	2.38	1.50	3.27	Mc	—	—
475297 2005 <i>XS</i> ₄₈	17.2	X	114.85890	136.88308	272.51831	10.25885	0.3746529	0.27113934	2.36	1.48	3.25	Mc	3 9.9	20.8
475305 2005 <i>XZ</i> ₇₉	17.8	X	208.63542	344.93996	121.62492	22.30033	0.2832114	0.35340368	1.98	1.42	2.54	Mc	8 2.1	21.0
475390 2006 <i>HN</i> ₇	18.5	X	243.78609	104.62505	142.50508	0.98424	0.2680466	0.30781390	2.17	1.59	2.75	Mc	—	—
475391 2006 <i>HE</i> ₃₀	17.9	X	137.82021	208.27758	65.69346	25.59388	0.1284992	0.42284610	1.76	1.53	1.98	Mc	—	—
475484 2006 <i>SW</i> ₂₁₅	17.9	X	212.49308	157.53115	174.14651	7.21097	0.2515095	0.30172833	2.20	1.65	2.76	Mc	2 13.0	21.8
475513 2006 <i>SS</i> ₃₅₁	19.2	X	116.20493	87.30424	17.98923	4.93650	0.2975175	0.30012705	2.21	1.55	2.87	Mc	5 16.5	22.3
475561 2006 <i>TK</i> ₉₆	17.5	X	195.64441	4.71244	334.44861	5.83434	0.2633477	0.29859065	2.22	1.63	2.80	Mc	2 11.9	21.3
475937 2007 <i>EQ</i> ₁₂₂	18.1	X	3.82121	217.03369	348.08921	8.80808	0.2533163	0.34822781	2.00	1.49	2.51	Mc	1 29.3	19.4
475967 2007 <i>JF</i> ₂₂	16.2	X	220.47713	125.38803	47.70885	25.36270	0.5864248	0.18316790	3.07	1.27	4.87	Ja	10 15.1	22.6
475979 2007 <i>PM</i> ₄	17.4	X	70.51037	256.71599	55.94477	27.98226	0.4029399	0.22512023	2.68	1.60	3.75	Mc	12 26.3	22.5
475981 2007 <i>PR</i> ₁₈	17.4	X	40.95732	213.44523	152.34100	8.41978	0.3854860	0.22441523	2.68	1.65	3.72	Mc	—	—
475987 2007 <i>PC</i> ₃₆	16.7	X	35.11525	233.16544	155.58422	9.64384	0.3776605	0.22511310	2.68	1.67	3.69	Mc	—	—
476003 2007 <i>RP</i> ₅₆	17.0	X	133.61479	107.69025	189.73070	15.60274	0.3884429	0.23418700	2.61	1.59	3.62	Mc	—	—
476559 2008 <i>OC</i> ₁₀	17.2	X	99.68505	87.29027	162.13470	14.17700	0.3312016	0.25967310	2.43	1.63	3.24	Mc	2 18.7	20.0
476703 2008 <i>TQ</i> ₁₄₅	16.1	X	201.74234	255.67813	368.75991	3.12495	0.2367569	0.12777514	3.90	2.98	4.83	Ja	6 7.2	22.5
476807 2008 <i>UP</i> ₁₈₈	16.9	X	87.64721	266.34392	50.85689	16.83452	0.3662415	0.24061970	2.56	1.62	3.50	Mc	—	—
477164 2009 <i>EW</i> ₁₄	18.1	X	167.19233	293.99530	165.57839	25.21248	0.2274991	0.34724456	2.00	1.55	2.46	Mc	6 20.9	21.9
477227 2009 <i>QB</i> ₁₂	18.3	X	192.26674	325.38215	10.74350	1.37093	0.2706286	0.29337591	2.24	1.64	2.85	Mc	2 6.4	21.9
477230 2009 <i>RW</i> ₆	17.8	X	175.63077	99.07284	233.10180	3.36480	0.2855920	0.28821300	2.27	1.62	2.92	Mc	1 20.2	21.5
477326 2009 <i>TQ</i> ₇	17.8	X	156.00906	111.43572	214.93079	11.19190	0.3007604	0.28021924	2.31	1.62	3.01	Mc	—	—
477330 2009 <i>TV</i> ₂₁	18.6	X	217.71766	286.40134	199.14746	21.13228	0.0849105	0.40882294	1.80	1.65	1.95	Mc	10 3.9	20.0
477386 2009 <i>VU</i> ₂₅	18.5	X	238.36868	246.55286	232.28184	24.89358	0.0744944	0.40876177	1.80	1.66	1.93	Mc	10 28.6	20.0
477587 2010 <i>JT</i> ₈₆	15.3	X	315.47691	331.71639	26.67941	26.40979	0.4882356	0.17191359	3.20	1.64	4.77	Ja	5 23.4	19.8
477599 2010 <i>KT</i> ₇														

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
479030 2013 <i>AD</i> ₂₀	16.6 ^m	X	28.89779	87.34645	355.20450	27.30243	0.3969630	0.23351864	2.61	1.57	3.65	Mc	—	—
479127 2013 <i>BA</i> ₂₇	17.3	X	20.84371	264.96863	157.06034	27.94672	0.3885902	0.22886203	2.65	1.62	3.68	Mc	—	—
479288 2013 <i>GE</i> ₆₉	18.6	X	19.35060	225.71275	359.72413	4.56897	0.2613814	0.36869188	1.93	1.42	2.43	Mc	4 18.2	18.1
479314 2013 <i>OQ</i> ₃	18.3	X	136.44381	352.52234	153.78007	34.38580	0.2644269	0.36444919	1.94	1.43	2.45	Mc	7 28.3	21.7
480195 2015 <i>FZ</i> ₃₃₉	15.9	X	330.04688	352.22693	301.56242	15.94600	0.4882479	0.16387404	3.31	1.69	4.92	Ja	3 23.1	20.3
480819 1998 <i>SJ</i> ₈₄	18.2	X	146.96394	211.12327	150.11895	3.20495	0.2872786	0.27724767	2.33	1.66	3.00	Mc	2 2.7	21.8
480821 1998 <i>WA</i> ₄	17.4	X	41.11792	289.86308	132.54212	12.49421	0.4829323	0.22364729	2.69	1.39	3.99	Mc	—	—
480827 1999 <i>TK</i> ₁₃₃	18.2	X	200.29086	330.52535	359.88357	2.55763	0.2655022	0.29397056	2.24	1.65	2.83	Mc	2 5.5	21.9
480833 1999 <i>VC</i> ₁	17.4	X	73.04526	237.97969	151.51383	2.68584	0.3754300	0.23620539	2.59	1.62	3.56	Mc	—	—
480838 1999 <i>VE</i> ₁₉₉	17.8	X	159.72296	28.37832	8.85161	5.91113	0.2603588	0.29456799	2.24	1.65	2.82	Mc	3 26.8	21.5
480845 2000 <i>QV</i> ₂₂₉	18.5	X	198.51088	224.45963	148.44763	8.29236	0.2876033	0.31183373	2.15	1.53	2.77	Mc	3 28.5	22.2
480854 2001 <i>AO</i> ₂	18.1	X	277.84520	77.64728	104.06184	19.87922	0.6105251	0.18413858	3.06	1.19	4.93	Ja	11 20.6	22.9
480875 2001 <i>UM</i> ₅₂	17.9	X	335.91914	29.03341	40.69369	18.94857	0.4469059	0.19737425	2.92	1.62	4.23	Mc	—	—
480876 2001 <i>VV</i> ₁₁₃	17.9	X	120.54529	27.18883	11.39881	0.78380	0.3096094	0.26616843	2.39	1.65	3.13	Mc	2 28.3	21.1
480880 2001 <i>XA</i> ₂₀	17.7	X	112.44800	82.27640	321.48798	4.50833	0.3326951	0.26446739	2.40	1.60	3.20	Mc	2 28.5	20.9
480881 2001 <i>XT</i> ₁₀₂	17.1	X	50.40096	240.12542	260.10271	22.09052	0.3778454	0.26249407	2.42	1.50	3.33	Mc	3 26.4	19.1
480897 2002 <i>QA</i> ₇	18.1	X	174.18583	114.92560	267.54242	5.42907	0.3029134	0.28973265	2.26	1.58	2.95	Mc	3 19.7	22.1
480904 2002 <i>RQ</i> ₂₄₂	17.9	X	157.04777	86.42660	339.06546	21.91449	0.2908024	0.29217848	2.25	1.60	2.90	Mc	4 19.6	22.2
480918 2002 <i>VF</i> ₁₁₈	17.1	X	172.54750	80.44411	295.21670	23.90690	0.3332657	0.28675342	2.28	1.52	3.04	Mc	3 1.8	21.6
480924 2002 <i>XA</i> ₅₃	16.5	X	74.16725	55.87838	91.97890	23.32177	0.3236385	0.28094618	2.31	1.56	3.06	Mc	6 4.2	19.2
480960 2003 <i>UU</i> ₃₀	18.7	X	229.15753	36.55207	291.15375	3.62831	0.2340079	0.30886296	2.17	1.66	2.67	Mc	2 20.3	22.3
480962 2003 <i>UP</i> ₈₇	17.0	X	25.08755	100.83973	348.74600	27.73842	0.3863120	0.23220956	2.62	1.61	3.63	Mc	—	—
480990 2004 <i>BV</i> ₁₁₄	17.8	X	5.50240	358.12733	135.60348	10.59207	0.3856109	0.22547793	2.67	1.64	3.70	Mc	—	—
480997 2004 <i>DT</i> ₃₉	16.9	X	26.38560	265.26194	167.56489	28.72309	0.4805764	0.22394776	2.69	1.39	3.98	Mc	—	—
481032 2004 <i>YJ</i> ₂₃	15.1	X	203.69831	300.84989	253.04487	56.14102	0.6767678	0.15571355	3.42	1.11	5.74	Jc	10 15.7	22.8
481044 2005 <i>EG</i> ₂₂₅	16.9	X	329.37635	82.12729	80.52681	28.00423	0.4076954	0.23373819	2.61	1.55	3.67	Mc	—	—
481050 2005 <i>GV</i> ₃₂	18.3	X	358.04189	354.66529	191.11577	5.17425	0.3749897	0.24067076	2.56	1.60	3.52	Mc	—	—
481063 2005 <i>OC</i> ₃	17.7	X	158.75109	230.93563	90.50269	9.59034	0.3606952	0.27483758	2.34	1.50	3.19	Mc	1 2.9	21.6
481085 2005 <i>SA</i> ₁₃₅	16.9	X	118.20584	98.92594	340.48599	21.80117	0.2997173	0.27668585	2.33	1.63	3.03	Mc	4 5.9	20.7
481090 2005 <i>SY</i> ₁₇₃	18.1	X	135.85374	154.42050	210.02032	2.97394	0.3861886	0.27393390	2.35	1.56	3.14	Mc	2 1.4	21.6
481102 2005 <i>TG</i> ₃	17.9	X	151.35359	190.95992	191.89062	12.58625	0.2912361	0.27617857	2.34	1.66	3.02	Mc	3 3.6	21.8
481315 2006 <i>AO</i> ₂₃	17.3	X	23.70995	249.22369	317.95917	3.81557	0.3102916	0.26547141	2.40	1.65	3.14	Mc	4 26.8	18.0
481358 2006 <i>ES</i> ₆₉	17.1	X	56.12247	78.05835	52.14912	23.96008	0.3231109	0.26263575	2.41	1.63	3.20	Mc	4 12.3	19.2
481385 2006 <i>QG</i> ₄₃	18.2	X	248.36803	352.48281	342.89186	6.22124	0.2665606	0.31083656	2.16	1.58	2.73	Mc	3 16.0	21.9
481467 2007 <i>AN</i> ₉	18.5	X	57.26433	242.69301	265.06925	2.90178	0.2684983	0.28691334	2.28	1.67	2.89	Mc	4 13.0	19.9
481482 2007 <i>CA</i> ₁₉	17.6	X	4.69504	102.53488	170.00658	9.59620	0.3123226	0.20927654	2.81	0.50	5.12	Jc	2 8.1*	19.8
481755 2008 <i>JM</i> ₃	18.4	X	298.52013	54.54474	39.14282	22.31300	0.0907935	0.41296782	1.79	1.62	1.95	Mc	—	—
481765 2008 <i>ON</i> ₃	17.3	X	117.54917	165.04361	209.65204	6.49152	0.3811840	0.25897253	2.44	1.51	3.37	Mc	2 2.9	20.9
481773 2008 <i>SO</i> ₄	17.3	X	141.75557	3.71683	29.72148	5.80185	0.3257332	0.26485130	2.40	1.62	3.18	Mc	3 16.9	21.3
481836 2008 <i>VW</i> ₇₈	16.1	X	108.12711	73.49048	273.24587	15.85807	0.3495140	0.24328590	2.54	1.65	3.43	Mc	—	—
481844 2008 <i>WH</i> ₉₄	16.0	X	336.82590	243.36989	263.01134	27.40650	0.4017663	0.23383937	2.61	1.56	3.66	Mc	—	—
482023 2009 <i>VY</i> ₇	18.6	X	15.63136	37.72447	53.17090	28.41276	0.0484312	0.43588462	1.72	1.64	1.81	Mc	—	—
482039 2009 <i>WH</i> ₇₈	17.7	X	128.65106	331.87375	22.84718	3.47452	0.2945318	0.27462921	2.34	1.65	3.03	Mc	1 9.1	20.7
482048 2009 <i>WT</i> ₂₅₉	17.5	X	149.02596	268.06830	73.98875	3.61149	0.3154783	0.27699020	2.33	1.60	3.07	Mc	1 15.7	21.1
482084 2010 <i>FL</i> ₆	18.4	X	73.50322	74.53101	67.43818	7.81804	0.2958454	0.27490910	2.34	1.65	3.04	Mc	5 17.4	20.6
482252 2011 <i>NO</i> ₃	16.1	X	87.69950	53.28191	297.97863	23.86080	0.3852549	0.22562213	2.67	1.64	3.70	Mc	—	—
482554 2012 <i>VW</i> ₃₆	18.6	X	103.09084	219.05687	257.45327	20.70409	0.0351915	0.50904897	1.55	1.50	1.61	Mc	2 7.5	20.0
482575 2012 <i>WY</i> ₃₂	16.2	X	95.47677	67.95032	280.55976	10.43133	0.3694349	0.24287551	2.54	1.60	3.48	Mc	—	—
482802 2013 <i>TL</i> ₁₁₄	19.2	X	203.39951	234.98470	224.09669	4.58707	0.2533733	0.34151612	2.03	1.51	2.54	Mc	7 18.3	22.4
482888 2014 <i>FH</i> ₃₈	18.8	X	151.22813	78.87358	36.30912	3.36155	0.3012057	0.30908248	2.17	1.51	2.82	Mc	6 29.8	22.5
483406 1999 <i>RK</i> ₃₀	17.2	X	52.07277	76.64280	337.16234	27.36715	0.4006920	0.23549925	2.60	1.56	3.64	Mc	—	—
483416 1999 <i>YD</i> ₆	16.8	X	320.37587	75.75227	343.11953	15.10785	0.4764647	0.17541266	3.16	1.65	4.67	Mc	9 6.4	19.1
483420 2000 <i>CX</i> ₃₉	17.0	X	71.83202	294.49184	142.74487	29.71773	0.3735426	0.23596770	2.59	1.62	3.56	Mc	3 1.1	19.4
483429 2000 <i>LN</i> ₂₉	17.8	X	356.44596	343.16703	281.82477	8.74361	0.4133454	0.27957864	2.32	1.36	3.27	Mc	4 3.8	19.2
483430 2000 <i>QC</i> ₃₃	18.1	X	282.22743	264.23336	85.71298	5.83332	0.2475875	0.32158583	2.11	1.59	2.63	Mc	5 9.5	20.8
483483 2002 <i>RR</i> ₂₈	17.0	X	31.74511	323.46081	1.50586	25.32121	0.2810414	0.31525035	2.14	1.54	2.74	Mc	12 3.8	20.3
483493 2002 <i>TY</i> ₁₈₈	18.1	X	187.35486	152.51190	227.50627	4.53501	0.3090542	0.28952504	2.26	1.56	2.96	Mc	3 27.7	22.1
483498 2002 <i>UL</i> ₃	16.6	X	17.66043	72.62392	347.76713	28.24139	0.4304150	0.21480146	2.76	1.57	3.95	Mc	—	—
483502 2002 <i>VF</i> ₉₈	17.7	X	177.97806	132.31277	269.85676	21.76553	0.3029323	0.28971877	2.26	1.58	2.95	Mc	4 10.5	22.2
483533 2003 <i>UQ</i> ₂₄	16.1	X	46.46616	68.48213	56.68677	28.45322	0.4264183	0.23245087	2.62	1.50	3.74	Mc	4 12.3	18.3
483535 2003 <i>UM</i> ₈₆	18.2	X	232.59714	247.79313	131.16230	2.87912	0.2730243	0.31316867	2.15	1.56	2.73	Mc	4 29.4	21.7
483555 2003 <i>YP</i> ₁₀	16.8	X	91.50605	341.10168	16.90366	7.95274	0.4282399	0.23220917	2.62	1.50	3.74	Mc	—	—
483558 2003 <i>YD</i> ₁₀₈	16.5	X	113.27294	250.67100	122.49040	29.69613	0.3970659	0.23206675	2.62	1.58	3.66	Mc	2 5.5	20.4
483591 2004 <i>JZ</i> ₃₁	19.5	X	194.78172	32.80664	203.21257	7.04094	0.2621183	0.37567336	1.90	1.40	2.40	Mc	—	—
483603 2004 <i>RR</i> ₇₇	16.8	X	339.02442	300.37033	10.38964	23.88282	0.2978067	0.28521816	2.29	1.60	2.97	Mc	5 31.3	19.0
483668 2005 <i>GH</i> ₉₇	16.5	X	178.42297	248.75663	343.17842	14.96364	0.4027431	0.15337481	3.46	2.06	4.85	Ja	11 19.6	23.3
483680 2005 <i>NM</i> ₂	17.8	X	297.58881	130.45384	119.81963	10.15889	0.3803622	0.23253346	2.62	1.62	3.62	Mc	1	

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
484616 2008 SY ₁₀₅	17.6	X	136.63973	244.55565	165.84856	5.72702	0.3257335	0.26476539	2.40	1.62	3.18	Mc	4 1.7	21.5
484861 2009 KL ₇	16.6	X	344.27102	260.65462	302.05914	26.38012	0.3919132	0.23535434	2.60	1.58	3.62	Mc	1 1.5	20.0
485116 2010 JE ₁₂₄	17.7	X	18.62344	341.98628	261.71702	5.75223	0.3689576	0.27328421	2.35	1.48	3.22	Mc	7 9.5	18.0
485379 2011 FO ₅₆	18.5	X	59.49210	356.56608	246.64350	4.50307	0.2418163	0.31203194	2.15	1.63	2.67	Mc	9 13.3	21.0
485512 2011 TB ₁₀	17.0	X	59.66711	287.81187	184.34133	28.03755	0.4179188	0.23818934	2.58	1.50	3.65	Mc	4 4.9	18.9
485652 2011 WO ₄₁	16.5	X	285.26703	125.22232	112.16038	20.05363	0.7314387	0.18835292	3.01	0.81	5.22	Jc	—	—
485712 2012 AO ₇	18.9	X	235.99690	294.95590	284.64391	8.57414	0.2606866	0.40484684	1.81	1.34	2.28	Mc	—	—
485717 2012 BH ₁	18.1	X	7.34829	317.68743	130.94606	33.66087	0.1587577	0.41290730	1.79	1.50	2.07	Mc	—	—
485938 2012 HR ₂₀	19.6	X	70.51310	85.13049	140.28292	24.80930	0.0538591	0.56131796	1.46	1.38	1.53	Mc	8 23.8	19.3
486006 2012 PD ₁₉	17.2	X	211.62033	140.26752	205.55680	9.12871	0.3297493	0.28797720	2.27	1.52	3.02	Mc	3 1.9	21.5
486015 2012 RN ₄₀	18.1	X	204.73416	354.23702	355.20368	5.99975	0.2704233	0.28679791	2.28	1.66	2.89	Mc	3 4.5	22.1
486042 2012 TW ₁₃₁	17.5	X	98.80232	52.67429	25.09222	14.55638	0.3605230	0.26417063	2.41	1.54	3.27	Mc	4 5.2	20.7
486171 2012 YB ₃	18.8	X	200.52200	312.35567	114.22038	23.08952	0.1208633	0.51939450	1.53	1.35	1.72	Mc	6 5.7	20.5
486173 2013 AY ₃	18.3	X	60.80472	148.87714	334.88931	5.73176	0.3641559	0.25323887	2.47	1.57	3.38	Mc	4 7.1	20.1
486220 2013 AB ₁₀₃	17.3	X	120.82048	54.78522	315.52079	9.68112	0.3502940	0.25004383	2.50	1.62	3.37	Mc	1 31.8	20.8
486527 2013 HO ₇	16.4	X	321.59695	258.28411	2.77980	28.24739	0.3559800	0.23742124	2.58	1.66	3.50	Mc	3 1.2	20.1
486725 2014 ED ₁₇	18.9	X	209.73602	118.97681	20.18684	9.23775	0.2961773	0.34642385	2.01	1.41	2.60	Mc	9 17.3	22.0
486744 2014 EK ₃₉	17.8	X	321.93552	173.50263	117.30151	6.62958	0.2708852	0.28774849	2.27	1.66	2.89	Mc	4 9.3	20.3
486813 2014 JL ₁₅	17.4	X	316.25582	166.49748	118.65766	8.27015	0.3005357	0.27361200	2.35	1.64	3.06	Mc	3 21.3	20.4
486858 2014 KK ₁	19.0	X	57.57934	125.95933	142.26151	6.06081	0.2392094	0.30755479	2.17	1.65	2.69	Mc	10 20.2	21.8
487496 2014 SE ₂₈₈	14.7	X	197.27474	214.96759	155.93076	8.47182	0.3703375	0.07865456	5.39	3.40	7.39	Jc	4 7.9	23.2
487594 2015 KT ₄₀	17.3	X	107.97221	276.96006	78.14315	7.28257	0.3523912	0.24156881	2.55	1.65	3.45	Mc	—	—
487613 2015 MB ₆₀	17.1	X	222.39729	95.00892	275.19038	21.59867	0.2852919	0.30081712	2.21	1.58	2.84	Mc	3 30.1	21.5
487740 2015 RX ₁₀₇	18.4	X	320.37406	319.36339	8.65937	6.15657	0.2535765	0.31203770	2.15	1.61	2.70	Mc	5 31.1	20.2
487897 2015 TH ₁₆₆	17.7	X	291.72985	128.23123	196.83775	9.37833	0.2728355	0.29318318	2.24	1.63	2.86	Mc	4 13.5	20.8
488267 2016 SM ₆	17.4	X	34.85840	84.16650	326.42885	27.27325	0.3821683	0.23851519	2.58	1.59	3.56	Mc	—	—
488278 2016 TN ₅₅	17.2	X	87.42468	316.58649	75.16728	25.31056	0.3232445	0.25668127	2.45	1.66	3.24	Mc	1 4.7	19.5
488462 1996 TD ₁	16.8	X	321.30525	116.59114	191.51453	24.48596	0.4332687	0.23218426	2.62	1.49	3.76	Mc	4 8.8	19.9
488476 1999 RN ₂₃₉	17.3	X	14.57141	356.89068	314.16380	10.51910	0.3939267	0.27010990	2.37	1.44	3.30	Mc	10 31.6	19.6
488498 2000 QJ ₁₁₇	16.9	X	275.03784	193.84670	147.74019	19.54066	0.3990129	0.22486289	2.68	1.61	3.75	Mc	4 15.9	21.8
488510 2000 UE ₁₆	17.4	X	325.76821	87.01645	240.16326	9.02679	0.3433760	0.27615286	2.34	1.53	3.14	Mc	5 26.6	18.9
488524 2001 QV ₃₂₇	16.7	X	322.24192	251.89164	66.85890	12.11440	0.3579131	0.24030911	2.56	1.65	3.48	Mc	5 9.2	19.3
488582 2002 LD ₃₅	17.1	X	263.99112	199.53832	98.21369	15.40657	0.4945155	0.19306281	2.96	1.50	4.43	Mc	2 12.3	23.0
488587 2002 PH ₁₃₀	18.3	X	155.14414	22.03640	326.39444	7.16574	0.2719359	0.28554813	2.28	1.66	2.91	Mc	1 23.9	21.8
488595 2002 QT ₉₂	18.9	X	159.56588	289.92758	68.62639	2.54817	0.2803130	0.28629527	2.28	1.64	2.92	Mc	2 9.9	22.5
488602 2002 RV ₄₉	17.9	X	354.05288	326.92888	3.21849	7.06777	0.2668981	0.31158286	2.15	1.58	2.73	Mc	9 30.0	18.4
488621 2002 TR ₂₅₉	17.7	X	31.02182	250.45245	196.58115	12.70728	0.4190018	0.21917347	2.72	1.58	3.87	Mc	—	—
488646 2003 KQ ₄₇	18.7	X	168.06437	332.05584	331.96562	24.61906	0.1804777	0.40912838	1.80	1.47	2.12	Mc	—	—
488658 2003 SZ ₂₉₀	18.1	X	57.56279	157.51662	199.15564	10.76110	0.2926649	0.28437033	2.29	1.62	2.96	Mc	—	—
488697 2003 XE ₇	17.1	X	27.09651	74.11324	69.02439	29.07102	0.3718054	0.23351342	2.61	1.64	3.58	Mc	1 11.5	19.0
488702 2003 YU ₁₁₇	18.0	X	146.70959	21.38532	111.80358	26.22029	0.3529787	0.30473770	2.19	1.42	2.96	Mc	7 21.3	22.0
488726 2004 PZ ₁₀₄	17.8	X	86.40567	189.21207	184.66280	7.61484	0.3437299	0.30839696	2.17	1.42	2.92	Mc	—	—
488729 2004 RU ₁₆	18.4	X	6.27828	276.75321	38.06788	2.83687	0.2785842	0.29108172	2.25	1.63	2.88	Mc	10 5.8	19.4
488736 2004 RG ₁₁₂	17.2	X	332.74506	140.78178	116.95254	23.09489	0.2890035	0.28837065	2.27	1.61	2.92	Mc	8 17.1	19.2
488738 2004 RM ₁₆₂	18.2	X	40.70837	30.17954	273.72530	6.30198	0.2920545	0.29537390	2.23	1.58	2.89	Mc	11 20.2	21.1
488749 2004 SH ₉	18.5	X	37.84349	120.69728	199.43805	22.09797	0.4020549	0.29595919	2.23	1.33	3.13	Mc	12 21.4	22.3
488788 2004 XF ₄₂	18.0	X	57.91538	307.32384	72.10483	7.68111	0.2806521	0.30301694	2.20	1.58	2.81	Mc	—	—
488799 2005 EE ₃₈	17.8	X	299.64971	349.80651	166.90595	3.317014	0.2462295	0.41161868	1.79	1.35	2.23	Mc	—	—
488801 2005 ES ₁₅₆	18.3	X	69.38070	108.11632	38.51124	5.90478	0.3397111	0.25210208	2.48	1.64	3.32	Mc	5 25.8	21.1
488873 2005 SR ₁₃₇	17.4	X	148.20092	273.28378	201.49310	22.44473	0.2832281	0.28629112	2.28	1.63	2.93	Mc	6 23.9	21.8
488883 2005 SK ₂₂₂	17.5	X	244.39971	215.37510	158.18572	7.76122	0.2827569	0.29203342	2.25	1.61	2.89	Mc	5 3.8	21.4
488894 2005 TY ₄₁	18.8	X	293.58918	161.16901	204.37729	4.40121	0.2463683	0.30054264	2.21	1.66	2.75	Mc	6 16.4	21.1
488901 2005 TQ ₇₈	18.0	X	42.48683	89.33589	209.31054	5.00649	0.2576283	0.30963244	2.16	1.61	2.72	Mc	11 14.1	20.4
488943 2005 UL ₁₄₇	17.7	X	353.78921	302.08175	31.82302	7.91158	0.2740016	0.30591723	2.18	1.58	2.78	Mc	10 9.3	18.3
489002 2005 VB	18.1	X	173.24637	304.29174	34.11384	4.26345	0.3677145	0.27607656	2.34	1.48	3.19	Mc	2 3.6	22.4
489053 2005 YK ₉₃	18.1	X	43.52645	175.51714	291.66442	11.64358	0.4037756	0.26179726	2.42	1.44	3.40	Mc	—	—
489152 2006 DC ₂₁₇	18.1	X	130.63314	85.02401	4.28159	20.92318	0.3533413	0.27165340	2.36	1.53	3.20	Mc	5 7.7	22.5
489216 2006 KR ₂₀	19.4	X	343.58149	45.84735	227.63422	3.67150	0.3341178	0.32575864	2.09	1.39	2.79	Mc	3 27.8	20.6
489231 2006 OC ₄	18.9	X	279.57195	1.24395	326.81608	4.82597	0.2424318	0.31474576	2.14	1.62	2.66	Mc	4 3.6	22.1
489233 2006 QP ₂₇	18.8	X	153.45240	47.56333	324.57468	6.18154	0.2796464	0.29665590	2.23	1.60	2.85	Mc	2 18.8	22.1
489251 2006 RD ₆₂	19.0	X	96.31112	123.57112	200.11393	4.00933	0.3102253	0.28126398	2.31	1.59	3.02	Mc	—	—
489298 2006 SF ₂₅₅	18.5	X	145.76659	317.21921	59.29656	4.58626	0.2768314	0.29479469	2.24	1.62	2.85	Mc	2 19.7	21.8
489398 2006 VE ₂	18.2	X	327.41855	268.53246	236.91819	21.22930	0.1297346	0.41338016	1.78	1.55	2.02	Mc	—	—
489429 2006 WM	18.3	X	267.38281	328.86722	19.83258	5.23505	0.2283535	0.31241775	2.15	1.66	2.64	Mc	4 22.2	21.4
489508 2007 OL ₁₀	18.8	X	17.88426	290.25336	6.34511	6.02450	0.3845694	0.28489350	2.29	1.41	3.17	Mc	10 21.2	20.6
489510 2007 PS ₈	17.3	X	79.69846	249.54487	141.49119	7.53890	0.4813365	0.23091362	2.63	1.36	3.90	Mc	1 29.7	19.6
489512 2007 PT ₂₂	17.7	X	341.28050	321.41768	0.55002	13.57832	0.3274932	0.27796459	2.33	1.56	3.09	Mc	7 14.2	19.0
489532 2007 RX ₁₂₇	18.8	X	127.07939	2.15864	14.84826	3.61208	0.3649197	0.24036812	2.56	1.63	3.50	Mc	2 18.5	22.8
489541 2007 RL ₂₀₄	16.9	X	43.40711	276.53401	190.99473	27.46604	0.							

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
490718 2010 <i>RL</i> ₈₂	19.2	X	200.63077	283.93762	145.40423	19.88838	0.0993894	0.52538124	1.52	1.37	1.67	Mc	6 8.8	20.9
491015 2011 <i>LS</i> ₁₄	19.0	X	84.57289	309.52612	350.25591	6.21420	0.3747346	0.31972942	2.12	1.32	2.91	Mc	—	—
491037 2011 <i>QW</i> ₁₁	18.6	X	223.63871	76.57402	275.48195	1.08508	0.3785270	0.26270048	2.41	1.50	3.33	Mc	3 19.8	23.2
491090 2011 <i>SL</i> ₁₂	19.4	X	123.88563	194.07634	190.14896	28.06066	0.0556336	0.44375978	1.70	1.61	1.80	Mc	—	—
491234 2011 <i>UW</i> ₁₉₂	18.0	X	355.36502	165.93749	151.07080	4.60955	0.3167829	0.28544220	2.28	1.56	3.01	Mc	9 7.7	18.2
491240 2011 <i>UU</i> ₂₀₄	17.8	X	338.65310	177.68154	171.51364	9.43510	0.3045649	0.29198285	2.25	1.56	2.94	Mc	9 4.9	17.9
491353 2011 <i>YJ</i> ₇₀	17.7	X	332.76905	109.48979	52.94795	8.65096	0.4832727	0.20451534	2.85	1.47	4.23	Mc	—	—
491585 2012 <i>SL</i> ₆	17.0	X	4.56594	73.60402	327.36536	5.07802	0.4282487	0.22728478	2.66	1.52	3.80	Mc	—	—
491653 2012 <i>TT</i> ₂₅₄	18.0	X	114.43342	241.48613	225.78075	21.86482	0.3109185	0.27674960	2.33	1.61	3.06	Mc	5 21.3	21.5
491734 2012 <i>VS</i> ₁₀	17.6	X	101.20709	242.07973	233.03635	21.58576	0.3064662	0.27128511	2.36	1.64	3.09	Mc	5 17.8	20.7
491755 2012 <i>VE</i> ₈₀	18.2	X	8.79298	100.56214	323.64234	4.81242	0.3890146	0.23182515	2.62	1.60	3.65	Mc	—	—
491765 2012 <i>VU</i> ₁₁₀	18.7	X	204.87191	106.06219	303.83358	4.14893	0.2656175	0.29352041	2.24	1.65	2.84	Mc	5 16.1	22.5
491770 2012 <i>WP</i> ₉	17.3	X	33.83530	310.01670	74.73906	6.31098	0.3664439	0.23240320	2.62	1.66	3.58	Mc	—	—
491973 2013 <i>EN</i> ₁₁	16.8	X	94.19734	230.37099	180.32449	31.96072	0.4086908	0.24348480	2.54	1.50	3.58	Mc	3 1.4	20.2
492344 2014 <i>GE</i> ₅₀	17.9	X	16.41617	166.31503	89.15975	4.14220	0.2877117	0.27937197	2.32	1.65	2.98	Mc	7 11.6	18.6
492410 2014 <i>KN</i> ₄₀	18.3	X	32.15094	280.09630	30.99621	6.95931	0.2623771	0.30919768	2.17	1.60	2.73	Mc	11 16.8	20.6
492429 2014 <i>MY</i> ₁₄	18.5	X	55.25262	149.36112	118.51119	7.39429	0.2814528	0.29799317	2.22	1.60	2.84	Mc	10 23.3	21.5
492815 2014 <i>QS</i> ₂₆₉	16.0	X	307.01343	259.74892	162.03073	20.38516	0.3201254	0.13781886	3.71	2.52	4.90	Ja	9 6.9	20.3
492912 2014 <i>RX</i> ₁	18.4	X	20.18675	283.43300	30.47810	4.71888	0.2969991	0.29042411	2.26	1.59	2.93	Mc	11 5.6	20.3
493045 2014 <i>SA</i> ₂₆₃	17.5	X	313.19001	329.84402	355.30005	12.82850	0.3579322	0.26343403	2.41	1.55	3.27	Mc	4 24.2	20.7
493555 2015 <i>JH</i> ₉	18.2	X	276.06127	268.42996	34.76079	5.49723	0.2480346	0.30193935	2.20	1.65	2.75	Mc	3 4.3	21.6
494219 2016 <i>LN</i> ₈	12.7	X	221.19738	20.75327	87.53371	43.34125	0.0591107	0.07236181	5.70	5.38	6.02	Jc	9 1.7	20.7
494231 2016 <i>NA</i> ₄₇	17.9	X	5.15234	267.82085	140.44516	2.53012	0.4119399	0.22098453	2.71	1.59	3.83	Mc	—	—
494545 2017 <i>AL</i> ₂₀	17.5	X	39.57671	100.78335	14.86747	27.91280	0.4016803	0.23625211	2.59	1.55	3.63	Mc	2 9.8	19.4
494661 2001 <i>RO</i> ₇₅	17.2	X	219.03002	0.14970	28.27624	8.86531	0.3923696	0.23056359	2.63	1.60	3.67	Mc	4 29.4	22.3
494667 2001 <i>WX</i> ₁	15.8	X	235.98666	46.22707	304.14692	23.23022	0.5706850	0.13285943	3.80	1.63	5.97	Jc	3 13.9	23.5
494670 2002 <i>MQ</i> ₁	18.2	X	321.16893	113.60295	202.55100	19.60873	0.3389844	0.30658293	2.18	1.44	2.92	Mc	4 28.8	20.2
494677 2003 <i>SJ</i> ₁₁₁	18.5	X	197.46975	111.02506	189.12311	6.74539	0.2511659	0.30136530	2.20	1.65	2.76	Mc	—	—
494703 2004 <i>XN</i> ₆₂	17.0	X	343.66805	262.76778	101.76072	22.74779	0.3451833	0.28620778	2.28	1.49	3.07	Mc	11 21.7	18.5
494726 2005 <i>TF</i> ₃	17.1	X	286.85982	177.9768	183.24649	7.07658	0.3980155	0.23640594	2.59	1.56	3.62	Mc	5 14.9	21.2
494836 2007 <i>UR</i> ₉	18.2	X	354.38722	175.15902	168.09559	7.16476	0.3032245	0.28193058	2.30	1.60	3.00	Mc	10 27.9	19.3
494838 2007 <i>UU</i> ₁₀₄	17.9	X	323.16271	291.18322	68.71249	8.94623	0.3305495	0.27524297	2.34	1.57	3.11	Mc	7 22.9	19.4
494888 2008 <i>SC</i> ₁₈₀	18.4	X	29.04147	297.78881	55.02839	6.09502	0.2478780	0.31220939	2.15	1.62	2.69	Mc	—	—
494904 2008 <i>UT</i> ₂₆₆	17.8	X	135.44923	255.20247	224.65349	21.28314	0.2994420	0.27276614	2.35	1.65	3.06	Mc	6 21.1	22.1
494997 2010 <i>HY</i> ₁₁₃	18.3	X	68.62251	26.71112	222.30005	5.23697	0.3364782	0.28955563	2.26	1.50	3.02	Mc	10 13.5	21.6
495089 2011 <i>SA</i> ₂₉	18.6	X	53.80057	315.41382	350.20613	2.02263	0.2464106	0.30676288	2.18	1.64	2.71	Mc	12 3.3	21.4
495123 2011 <i>WM</i> ₂₁	18.3	X	28.30206	254.11839	63.00390	8.77461	0.2585624	0.29342519	2.24	1.66	2.82	Mc	11 17.9	20.6
495153 2012 <i>FY</i>	19.0	X	72.00082	244.40214	178.02200	30.03816	0.1045121	0.41620907	1.78	1.59	1.96	Mc	—	—
495195 2013 <i>BX</i> ₂₂	17.0	X	94.88076	252.09407	251.43122	20.76266	0.3070915	0.26694339	2.39	1.66	3.12	Mc	6 17.4	20.4
495398 2014 <i>QY</i> ₃₁₀	18.8	X	357.87906	14.83421	318.48264	0.53538	0.2751707	0.28403181	2.29	1.66	2.92	Mc	10 11.9	19.9
495552 2014 <i>WS</i> ₂₀₀	17.2	X	19.93497	335.72952	12.76446	10.26233	0.2948338	0.28167545	2.30	1.63	2.98	Mc	12 22.3	20.0
495760 2017 <i>CL</i> ₁₂	17.1	X	48.56308	319.29365	303.35907	5.45656	0.2753510	0.28979242	2.26	1.64	2.88	Mc	9 28.9	19.8
495831 2000 <i>AW</i> ₉₃	18.8	X	165.05059	61.35391	113.12180	27.32127	0.0894617	0.53244151	1.51	1.37	1.64	Mc	11 14.0	20.8
495832 2000 <i>JV</i> ₆₀	17.8	X	272.36282	319.97311	242.45079	8.21353	0.5096738	0.17372546	3.18	1.56	4.80	Ja	12 15.1	22.2
495851 2002 <i>TL</i> ₆₈	17.5	X	25.05794	97.56803	208.29440	20.12924	0.3704368	0.26272013	2.41	1.52	3.31	Mc	11 11.2	20.2
495856 2003 <i>KM</i> ₁₁	19.5	X	44.81583	117.85683	206.90831	6.99143	0.4291206	0.28369608	2.29	1.31	3.28	Mc	—	—
495861 2003 <i>UR</i> ₆₅	18.0	X	26.38061	217.98983	122.87286	6.55744	0.3119521	0.27883847	2.32	1.60	3.04	Mc	12 22.9	20.8
495863 2003 <i>XV</i> ₄	17.7	X	345.72248	116.08691	240.91038	9.21182	0.3166041	0.27196702	2.36	1.61	3.11	Mc	10 15.9	18.6
495866 2004 <i>MU</i> ₂	16.5	X	268.04794	96.77138	267.97003	7.79338	0.4675101	0.22055524	2.71	1.44	3.98	Mc	4 25.6	21.7
495871 2004 <i>RP</i> ₅₂	18.5	X	75.03459	158.13928	152.64254	2.34012	0.2916048	0.30180166	2.20	1.56	2.84	Mc	—	—
495954 2007 <i>BZ</i> ₇₂	17.5	X	87.65293	294.93960	151.21047	12.64517	0.4708554	0.21795592	2.73	1.45	4.02	Mc	4 25.5	21.7
495966 2007 <i>RC</i> ₁₄₃	18.5	X	113.72239	101.48360	171.96486	2.94246	0.2460997	0.30484491	2.19	1.65	2.72	Mc	—	—
495973 2007 <i>TC</i> ₁₃	18.4	X	38.54238	141.77164	189.49467	2.33907	0.2971356	0.28945740	2.26	1.59	2.94	Mc	12 24.0	21.4
495987 2007 <i>TP</i> ₄₂₆	18.1	X	102.12437	78.36322	239.18641	9.19361	0.2523592	0.29723234	2.22	1.66	2.78	Mc	—	—
495997 2007 <i>VH</i> ₉₆	16.9	X	22.82694	24.88661	50.30561	15.28439	0.4358445	0.22084924	2.71	1.53	3.89	Mc	—	—
496114 2009 <i>WF</i> ₁₈₅	16.3	X	298.14488	115.56304	271.40006	28.48503	0.3755391	0.23227766	2.62	1.64	3.61	Mc	6 30.9	19.6
496124 2010 <i>EK</i> ₁₂	17.6	X	105.93441	275.20619	300.03142	14.87420	0.4245849	0.29048778	2.26	1.30	3.22	Mc	9 28.9	22.2
496127 2010 <i>GN</i> ₁₄₅	17.6	X	75.78820	240.44754	52.31466	8.47337	0.2643014	0.29766183	2.22	1.63	2.81	Mc	12 7.8	21.1
496164 2010 <i>WL</i> ₄₀	18.4	X	23.09348	67.42629	276.35263	5.40395	0.3036213	0.27224799	2.36	1.64	3.07	Mc	12 19.7	21.2
496177 2011 <i>CA</i> ₆₆	15.7	X	299.31836	286.09570	287.42034	21.25060	0.4684922	0.17786281	3.13	1.66	4.60	Mc	—	—
496214 2011 <i>US</i> ₂₄₆	18.5	X	48.22724	298.87011	60.53629	1.70449	0.2435543	0.31060039	2.16	1.63	2.69	Mc	—	—
496316 2013 <i>HQ</i> ₁₁	17.5	X	150.48345	349.90602	327.62021	4.40561	0.2321156	0.32319881	2.10	1.61	2.59	Mc	—	—
496324 2013 <i>KU</i> ₁	16.8	X	252.54097	118.28525	233.49973	10.22042	0.4118663	0.21460694	2.76	1.62	3.90	Mc	4 4.8	22.2
496334 2013 <i>PL</i> ₃	17.3	X	239.11823	113.67283	262.48412	5.51256	0.4035211	0.21392385	2.77	1.65	3.89	Mc	4 26.4	22.5
496392 2013 <i>TU</i> ₅₁	18.2	X	321.11024	350.12266	354.79670	3.21237	0.3615035	0.23713650	2.59	1.65	3.52	Mc	6 12.6	20.7
496436 2014 <i>LZ</i> ₂₆	17.3	X	83.53532	25.03585	278.42087	7.46496	0.3794064	0.30915876	2.17	1.34	2.99	Mc	—	—
496457 2014 <i>QN</i> ₂₉₇	18.6	X	105.09749	23.61249	284.54824	4.33191	0.2526566	0.32212079	2.11	1.58				

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
496970 2002 QV ₅	17.7	X	28.57519	329.42757	359.77512	5.61962	0.3423863	0.26585070	2.40	1.58	3.22	Mc	12 11.4	20.8
497004 2002 VN ₁₄	18.7	X	199.97489	294.37664	36.75327	25.40420	0.2531380	0.39188791	1.85	1.38	2.32	Mc	2 3.6	22.1
497006 2002 YE ₁₂	18.2	X	117.55432	335.63206	102.88962	37.49607	0.0701917	0.44034205	1.71	1.59	1.83	Mc	2 8.1	20.0
497009 2003 BU ₃₅	16.4	X	210.72888	213.73639	261.05473	12.70333	0.5753281	0.14297533	3.62	1.54	5.71	Jc	7 26.3	23.7
497019 2003 GN ₅₁	19.6	X	64.70283	228.74681	172.51743	19.55368	0.0466750	0.58117717	1.42	1.36	1.49	Mc	—	—
497026 2003 QP ₄₉	18.6	X	10.06814	243.79534	145.71125	6.30732	0.3594301	0.28138260	2.31	1.48	3.14	Mc	—	—
497032 2003 SG	18.6	X	40.61295	156.97632	206.02852	7.45010	0.3085979	0.28415602	2.29	1.58	3.00	Mc	—	—
497036 2003 SA ₃₂	18.6	X	13.45217	31.90430	343.93229	8.91657	0.3194605	0.28083769	2.31	1.57	3.05	Mc	—	—
497049 2003 SW ₃₂₄	18.8	X	46.57363	307.09559	7.01502	4.26862	0.3093509	0.28086171	2.31	1.59	3.02	Mc	12 10.1	22.1
497084 2003 WC ₈₃	17.7	X	34.80984	288.61566	76.61099	23.39760	0.2885060	0.28102455	2.31	1.64	2.97	Mc	—	—
497091 2003 YO ₆	18.5	X	318.98629	80.08018	0.48818	5.12786	0.3160942	0.27296642	2.35	1.61	3.10	Mc	12 25.4	19.2
497093 2003 YP ₁₄₆	17.6	X	298.41003	75.20871	39.77538	6.22556	0.3753515	0.27171480	2.36	1.47	3.25	Mc	11 27.9	18.3
497099 2004 BB ₈₅	17.0	X	311.48306	301.22727	126.70056	28.91680	0.4205639	0.27183148	2.36	1.37	3.35	Mc	10 24.9	18.9
497112 2004 EH	17.2	X	4.10869	101.20540	155.10985	27.21826	0.4486807	0.23210985	2.62	1.45	3.80	Mc	5 29.7	18.9
497130 2004 PC ₆₇	17.2	X	328.01421	62.25815	315.39610	27.69957	0.4253036	0.23256058	2.62	1.51	3.73	Mc	8 11.8	18.4
497133 2004 PV ₉₇	18.1	X	80.65457	301.87517	17.27460	6.22781	0.2445862	0.30489064	2.19	1.65	2.72	Mc	—	—
497138 2004 RE ₁₀	17.5	X	308.14735	276.50327	102.35706	8.65799	0.4021108	0.22770188	2.66	1.59	3.72	Mc	7 1.8	20.5
497164 2004 RR ₃₂₄	17.7	X	279.91881	127.14640	284.42935	6.19758	0.4008440	0.22452827	2.68	1.61	3.76	Mc	7 10.1	21.7
497168 2004 SG ₅	18.1	X	47.63420	347.02424	39.34009	8.20903	0.3412570	0.30303956	2.20	1.45	2.94	Mc	—	—
497205 2004 TD ₃₂₈	18.1	X	79.64822	239.26772	93.92303	8.12868	0.2554362	0.30297837	2.20	1.63	2.76	Mc	—	—
497230 2005 CU ₂₅	18.0	X	63.93753	122.29002	93.58286	8.80572	0.4640520	0.25815561	2.44	1.31	3.58	Mc	9 14.6	21.9
497257 2005 JY	16.2	X	279.56252	101.38048	212.32707	21.52589	0.4200482	0.17589911	3.15	1.60	4.71	Mc	3 3.7	22.2
497483 2005 YE ₂₇₇	17.3	X	307.67749	128.22294	255.55869	4.54773	0.3627097	0.23583229	2.59	1.65	3.54	Mc	7 15.1	19.8
497503 2006 BL ₆	16.8	X	298.76660	77.77387	335.21946	26.78177	0.4354009	0.23531821	2.60	1.47	3.73	Mc	8 7.4	20.0
497504 2006 BG ₉	17.0	X	294.21264	89.58488	329.05473	26.82708	0.4057898	0.23543786	2.60	1.54	3.63	Mc	8 10.5	20.2
497578 2006 FA ₄₇	17.8	X	79.58083	129.25661	134.01168	8.91010	0.3851986	0.27915226	2.32	1.43	3.21	Mc	11 15.9	22.0
497586 2006 HS ₆₁	16.7	X	296.55992	63.55824	25.76720	28.90602	0.4059862	0.23575436	2.60	1.53	3.66	Mc	10 3.0	19.3
497614 2006 QQ ₇	17.7	X	13.27021	351.49041	352.15051	5.97745	0.3500089	0.26788531	2.38	1.55	3.22	Mc	12 11.4	20.2
497616 2006 QF ₁₃	17.9	X	54.91923	238.86698	94.71478	5.49306	0.2915691	0.27572198	2.34	1.66	3.02	Mc	—	—
497676 2006 SR ₂	17.6	X	50.29928	102.65476	201.99679	20.50010	0.3432403	0.27135033	2.36	1.55	3.17	Mc	12 5.2	21.5
497887 2006 UM ₂₆₆	17.8	X	24.36382	287.84243	44.75177	8.41184	0.3182165	0.26621887	2.39	1.63	3.15	Mc	12 6.4	20.6
498046 2007 PT ₂₇	18.0	X	79.60055	146.61936	178.35811	3.41970	0.2982574	0.30028890	2.21	1.55	2.87	Mc	—	—
498047 2007 PR ₃₀	18.2	X	43.92410	102.76348	243.74136	4.47445	0.2616161	0.29521660	2.23	1.65	2.82	Mc	—	—
498062 2007 RU ₁₀₄	18.1	X	53.01340	12.87322	354.33259	5.49727	0.2492932	0.29818521	2.22	1.67	2.77	Mc	—	—
498144 2007 TR ₇₃	17.7	X	75.47656	359.94551	317.71331	11.98360	0.3519051	0.29514337	2.23	1.45	3.02	Mc	—	—
498152 2007 TK ₁₁₁	17.6	X	58.94945	324.27990	341.79354	6.98013	0.3009804	0.29068973	2.26	1.58	2.94	Mc	12 12.2	21.1
498344 2007 VX ₂₅₈	17.9	X	269.21135	262.45084	81.69049	10.04115	0.4970567	0.19501940	2.94	1.48	4.41	Mc	4 8.6	23.5
498422 2008 AZ ₄₁	17.1	X	49.35101	251.76566	311.00750	27.25921	0.3655137	0.23726891	2.58	1.64	3.53	Mc	7 24.1	20.0
498541 2008 GA ₂₆	18.6	X	301.87902	78.11813	42.32885	7.02834	0.3424351	0.27754735	2.33	1.53	3.12	Mc	—	—
498664 2008 SZ ₁₃₆	17.9	X	289.50655	168.42607	217.93850	4.12047	0.4220314	0.21719609	2.74	1.58	3.90	Mc	6 14.9	22.1
498677 2008 SS ₂₀₇	17.4	X	299.18803	177.00074	204.64635	18.45721	0.4716910	0.22095471	2.71	1.43	3.99	Mc	6 11.6	21.6
498761 2008 UH ₃₃	18.8	X	98.82639	146.51041	181.70594	3.83806	0.2365105	0.32166935	2.11	1.61	2.61	Mc	—	—
498901 2009 AU ₁	14.4	X	114.23118	269.76357	133.64142	26.17419	0.4972591	0.10038073	4.59	2.31	6.87	Jc	4 8.4	22.2
499116 2009 HF ₇₈	18.4	X	67.70545	77.71431	177.88093	3.51288	0.3181322	0.26330772	2.41	1.64	3.18	Mc	10 18.1	21.9
499140 2009 RL ₁	17.9	X	308.11269	72.37925	254.12242	5.02354	0.3812531	0.23580999	2.59	1.61	3.58	Mc	4 22.1	21.5
499442 2010 DG ₇₈	18.8	X	308.56383	263.65843	329.50160	13.64156	0.2409838	0.43106646	1.74	1.32	2.15	Mc	—	—
499517 2010 PX ₂₄	18.0	X	49.60310	151.69285	154.77001	6.72079	0.2881625	0.28116787	2.31	1.64	2.97	Mc	12 2.7	21.3
499825 2011 DB ₂₂	17.2	X	288.67181	120.71158	353.18547	21.94516	0.3169493	0.26138012	2.42	1.65	3.19	Mc	10 24.8	19.8
500026 2011 SS ₂₁	19.0	X	108.95946	279.58567	4.72352	3.25192	0.3164222	0.31870839	2.12	1.45	2.79	Mc	12 28.1	22.8
500638 2012 VS ₁	17.7	X	170.52259	10.78405	8.17897	14.75542	0.2697270	0.39956567	1.83	1.33	2.32	Mc	3 7.1	20.2
500749 2013 AP ₆₀	16.9	X	285.39495	49.20758	251.06467	21.89021	0.7502417	0.20269356	2.87	0.72	5.02	Jc	1 30.1	23.4
500769 2013 CX ₄₅	17.7	X	116.72799	284.39740	298.62594	7.31628	0.3134421	0.28778075	2.27	1.56	2.98	Mc	10 14.4	21.8
500787 2013 EJ ₁₀₇	17.2	X	112.21850	233.02408	38.32073	22.87770	0.3568503	0.29098767	2.26	1.45	3.06	Mc	12 8.2	21.7
500788 2013 EP ₁₀₉	17.4	X	118.50437	148.38650	72.56805	10.99693	0.2891717	0.28584645	2.28	1.62	2.94	Mc	10 20.2	21.5
500791 2013 EQ ₁₂₃	18.2	X	104.28378	242.29187	34.68547	6.59490	0.2632329	0.29186137	2.25	1.66	2.84	Mc	12 10.5	22.1
500815 2013 GU ₈₇	18.0	X	117.84675	159.85672	154.08679	6.81383	0.2574043	0.30259925	2.20	1.63	2.76	Mc	—	—
500912 2013 OL ₅	18.2	X	340.36817	91.07522	280.48092	13.76395	0.4183338	0.24884602	2.50	1.46	3.55	Mc	10 16.4	19.0
501115 2013 TU ₁₂	17.0	X	349.08627	111.99082	222.12560	24.85035	0.4022493	0.24109610	2.56	1.53	3.59	Mc	8 22.5	18.8
501216 2013 UW	17.3	X	279.03781	80.54383	19.89708	28.01506	0.3661043	0.23294986	2.62	1.66	3.57	Mc	9 26.8	20.8
501575 2014 OB ₂₃₂	19.7	X	106.16144	78.19628	287.68680	1.44101	0.2176735	0.33524420	2.05	1.61	2.50	Mc	—	—
501585 2014 QA ₄₃	11.4	X	28.27615	247.95190	118.39006	37.21295	0.5072939	0.03276851	9.67	4.77	14.58	Jc	12 30.9	19.9
501606 2014 QC ₃₆₉	18.6	X	50.16587	215.99800	139.23035	5.78816	0.2345562	0.30977910	2.16	1.66	2.67	Mc	—	—
501612 2014 RE	17.8	X	351.62250	186.72560	226.72501	6.03518	0.3440147	0.29252964	2.25	1.47	3.02	Mc	—	—
501621 2014 SG ₁₄₄	18.5	X	112.94116	139.55053	133.43976	3.78270	0.2441077	0.30924312	2.17	1.64	2.69	Mc	12 14.8	22.0
501646 2014 SC ₂₂₃	18.3	X	70.81790	290.98866	40.24689	8.55827	0.2666663	0.30771064	2.17	1.59	2.75	Mc	—	—
501665 2014 SD ₃₄₃	19.0	X	72.68482	66.62869	281.20145	0.57111	0.2467989	0.31462772	2.14	1.61	2.67	Mc	—	—
501691 2014 TJ ₇₄	17.8	X	73.58884	233.31823	79.19774	7.74293	0.2522936	0.29889526	2.22	1.66	2.77	Mc	12 30.3	21.3
501731 2014 UG ₈₄	18.3	X	50.10810	276.08417	56.95316	2.13545	0.2664677	0.29571891	2.23	1.64	2.83	Mc	—	—
501743 2014 UM ₁₁₆	18.2	X	71.61569	23.24374	285.53786	5.57719	0.2580139	0.29648644	2.23	1.65	2.80	Mc	12 24.2	21.5

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
503874 2000 <i>SH</i> ₂₇₂	18.6 ^m	X	60.36762	41.02846	298.55829	1.51073	0.2904036	0.29053604	2.26	1.60	2.91	Mc	—	—
503879 2000 <i>UJ</i> ₃	17.5	X	341.06483	39.79056	45.44052	27.44759	0.3318532	0.28576637	2.28	1.53	3.04	Mc	—	—
503881 2001 <i>BZ</i> ₂	16.8	X	298.30381	307.24703	128.49166	32.46062	0.4727667	0.22874558	2.65	1.40	3.90	Mc	8 24.8	20.0
503886 2001 <i>SM</i> ₂₄₃	17.3	X	293.96309	120.14507	192.09006	22.06287	0.4705540	0.18784843	3.02	1.60	4.44	Mc	3 15.6	22.6
503928 2003 <i>EL</i> ₃₅	19.5	X	137.36529	172.66755	343.84558	8.92022	0.2008480	0.44897110	1.69	1.35	2.03	Mc	8 13.9	21.5
503984 2004 <i>TT</i> ₉₉	18.8	X	98.44774	157.31087	166.29678	2.07323	0.2761221	0.30491936	2.19	1.58	2.79	Mc	—	—
503985 2004 <i>TU</i> ₁₀₈	18.4	X	113.44124	107.97171	197.46135	5.05303	0.2704706	0.30589157	2.18	1.59	2.77	Mc	—	—
504012 2005 <i>JC</i> ₄₆	16.5	X	314.82620	204.65017	69.23358	38.62482	0.5028790	0.17672667	3.14	1.56	4.73	Mc	3 6.4	22.0
504024 2005 <i>QA</i> ₁₈₁	18.7	X	78.86123	127.81985	346.11728	24.03122	0.0864804	0.40828777	1.80	1.64	1.96	Mc	2 13.8	20.0
504034 2005 <i>UJ</i> ₁₅₉	17.6	X	192.60311	95.50024	80.67226	35.48363	0.8315189	0.16142411	3.34	0.56	6.12	Jc	10 13.2	25.6
504090 2006 <i>DW</i>	17.9	X	297.90238	86.25044	354.42962	25.79281	0.4544845	0.23781964	2.58	1.41	3.75	Mc	9 7.9	20.5
504315 2007 <i>RF</i> ₂₄	18.5	X	69.38681	62.61951	269.24644	3.39893	0.2667729	0.29750460	2.22	1.63	2.82	Mc	—	—
504322 2007 <i>RL</i> ₁₉₂	18.3	X	53.41301	213.65522	132.28223	3.43135	0.2761887	0.29549014	2.23	1.62	2.85	Mc	—	—
504568 2008 <i>TO</i> ₂₆	19.9	X	26.27245	330.07774	37.96842	19.84514	0.0849473	0.54545588	1.48	1.36	1.61	Mc	—	—
504819 2010 <i>GL</i> ₆₇	17.2	X	275.00115	288.55759	208.90858	28.03864	0.3655212	0.23510299	2.60	1.65	3.55	Mc	11 1.1	20.3
504848 2010 <i>SG</i> ₃	18.9	X	46.39591	25.05755	318.88806	2.50726	0.3202448	0.28188245	2.30	1.57	3.04	Mc	—	—
504857 2010 <i>TY</i> ₁₄₈	17.7	X	18.10275	342.09534	6.59210	5.87721	0.2898724	0.27500008	2.34	1.66	3.02	Mc	12 17.5	20.3
504869 2010 <i>VQ</i> ₂₅	17.9	X	14.80580	307.93423	53.52904	9.56905	0.3080544	0.27405707	2.35	1.62	3.07	Mc	—	—
504901 2011 <i>AJ</i> ₁₁	17.5	X	302.75177	73.62386	73.84428	21.69235	0.3440431	0.27216526	2.36	1.55	3.17	Mc	—	—
505001 2011 <i>KO</i> ₁₅	16.7	X	330.15188	326.45360	258.81630	24.68081	0.5039895	0.18668328	3.03	1.50	4.56	Mc	—	—
505335 2013 <i>AH</i> ₂₇	19.0	X	75.84803	295.08477	209.52041	2.77195	0.2881412	0.37663780	1.90	1.35	2.45	Mc	5 14.7	19.9
505348 2013 <i>BL</i> ₇₀	18.7	X	55.75691	201.83382	277.78230	8.80114	0.2198727	0.36601976	1.94	1.51	2.36	Mc	1 1.0	18.7
505370 2013 <i>HN</i> ₃₇	17.7	X	49.33190	335.78363	16.43669	26.78727	0.2940647	0.29716292	2.22	1.57	2.88	Mc	—	—
505416 2013 <i>RT</i> ₁₆	17.2	X	6.00714	234.10437	188.58934	20.15637	0.3373962	0.26404190	2.41	1.59	3.22	Mc	—	—
505461 2013 <i>TZ</i> ₈₀	17.7	X	301.50099	15.83452	99.81854	3.72563	0.3601915	0.25424398	2.47	1.58	3.36	Mc	12 6.2	18.5
505463 2013 <i>TV</i> ₉₂	18.4	X	335.80745	47.50393	30.92768	4.54285	0.3945251	0.25375752	2.47	1.50	3.45	Mc	—	—
505590 2014 <i>CA</i> ₅	17.7	X	295.29252	96.08111	350.88420	27.33030	0.4247293	0.23659191	2.59	1.49	3.69	Mc	9 13.3	20.0
505655 2014 <i>SZ</i> ₃₀₇	18.7	X	79.30444	129.11055	205.41250	6.24608	0.2665810	0.31138341	2.16	1.58	2.73	Mc	—	—
505728 2015 <i>AN</i> ₂₆₆	17.9	X	48.66459	246.50327	113.17337	9.31168	0.2888295	0.29308999	2.24	1.60	2.89	Mc	—	—
505831 2015 <i>CA</i>	17.8	X	348.30410	235.68651	185.81823	24.49333	0.3456656	0.28135611	2.31	1.51	3.10	Mc	—	—
505977 2015 <i>FY</i> ₃₄₄	17.0	X	16.68921	67.48697	22.88435	23.92981	0.3539168	0.28204173	2.30	1.49	3.12	Mc	—	—
506119 2016 <i>BQ</i> ₆₁	18.6	X	145.30714	169.90246	309.32821	19.63962	0.1362229	0.42940551	1.74	1.50	1.98	Mc	6 20.2	20.8
506297 2017 <i>MS</i> ₆	17.6	X	332.89371	217.41411	102.41812	7.62889	0.4201997	0.23059482	2.63	1.53	3.74	Mc	5 20.4	19.8
506298 2017 <i>ME</i> ₈	18.1	X	25.68654	247.42586	98.51662	3.34831	0.3032396	0.27797178	2.33	1.62	3.03	Mc	12 27.1	20.9
506348 2017 <i>OK</i> ₅₂	17.2	X	34.25174	356.88919	337.39079	4.91342	0.2934658	0.28430556	2.29	1.62	2.96	Mc	12 21.9	20.3
506355 2017 <i>PB</i> ₂₅	17.2	X	343.36303	67.04388	289.47454	10.79993	0.3518643	0.23989117	2.57	1.66	3.47	Mc	9 17.5	18.5
506409 2017 <i>SF</i> ₁₃	18.3	X	102.85619	139.83656	150.05133	6.11368	0.2725578	0.29519236	2.23	1.63	2.84	Mc	12 26.4	22.2
506420 1999 <i>VW</i> ₂₉	18.2	X	25.10002	152.73881	236.09260	7.11154	0.2919353	0.27465389	2.34	1.66	3.03	Mc	—	—
506425 2000 <i>DQ</i> ₁₁₀	16.6	X	189.67692	95.45725	347.81934	58.27155	0.6295746	0.16009398	3.36	1.24	5.47	Jc	—	—
506427 2000 <i>RE</i> ₃₄	17.5	X	337.87393	72.77884	268.37028	4.34891	0.3760127	0.23355083	2.61	1.63	3.59	Mc	7 22.5	18.6
506428 2000 <i>SJ</i> ₁₀₀	17.6	X	61.92091	77.76824	288.57466	6.80730	0.2678387	0.29218809	2.25	1.65	2.85	Mc	—	—
506437 2000 <i>WL</i> ₁₀	18.0	X	255.30886	115.21302	252.04402	10.25789	0.7177135	0.17722048	3.14	0.89	5.39	Jc	4 9.4	24.8
506441 2001 <i>AV</i> ₁₉	15.9	X	255.85349	80.06613	93.01513	28.22444	0.3745902	0.23273585	2.62	1.64	3.60	Mc	11 27.9	19.8
506442 2001 <i>AW</i> ₁₉	17.6	X	30.44448	112.69488	291.29677	22.48179	0.3188659	0.28713562	2.28	1.55	3.00	Mc	—	—
506443 2001 <i>CM</i> ₃₅	17.7	X	227.48832	93.67570	85.58671	8.48958	0.4134846	0.22555999	2.67	1.57	3.78	Mc	11 1.3	22.5
506446 2001 <i>RD</i> ₁₄₂	16.5	X	280.07118	282.22793	102.13515	14.61066	0.4612371	0.18901988	3.01	1.62	4.39	Mc	6 2.3	21.6
506448 2001 <i>SN</i> ₃₅₅	18.4	X	107.11012	198.17939	131.17376	4.90823	0.2415146	0.31053198	2.16	1.64	2.68	Mc	—	—
506480 2003 <i>QV</i> ₅₂	18.3	X	91.10899	321.96205	352.55384	8.29185	0.2794062	0.28857046	2.27	1.63	2.90	Mc	—	—
506490 2003 <i>UO</i> ₂₇	16.8	X	316.98945	332.86298	61.41056	14.84621	0.4505183	0.21713317	2.74	1.51	3.98	Mc	8 6.8	19.4
506504 2004 <i>BT</i> ₆₈	18.0	X	323.45573	252.19181	289.87674	22.25442	0.3438132	0.28077104	2.31	1.52	3.10	Mc	—	—
506515 2004 <i>RG</i> ₁₇₄	18.9	X	92.22211	135.26517	200.38126	3.98822	0.2481642	0.30741055	2.17	1.63	2.71	Mc	—	—
506601 2006 <i>AD</i> ₁₀₄	18.0	X	333.77780	88.60961	332.34033	5.48545	0.4186067	0.24247835	2.55	1.48	3.61	Mc	—	—
506782 2007 <i>AN</i> ₁₀	17.4	X	50.54294	274.08508	104.91273	22.36394	0.3312147	0.27026459	2.37	1.58	3.15	Mc	—	—
506808 2007 <i>MG</i> ₆	17.2	X	356.11501	74.01711	229.21575	15.10199	0.4707847	0.21268967	2.78	1.47	4.09	Mc	7 20.8	18.0
506810 2007 <i>RH</i> ₃₂	17.9	X	117.50920	259.37641	72.32799	5.22677	0.2373294	0.30670674	2.18	1.66	2.69	Mc	—	—
506813 2007 <i>RQ</i> ₅₆	18.3	X	131.99364	87.21710	216.09674	4.44668	0.2568534	0.30479001	2.19	1.63	2.75	Mc	—	—
506847 2007 <i>US</i> ₉	18.6	X	68.32090	309.40654	59.33781	6.49048	0.2501348	0.29946721	2.21	1.66	2.77	Mc	—	—
507013 2008 <i>TP</i> ₁₆₅	15.6	X	181.72539	22.28136	45.88796	14.31220	0.2995148	0.12038533	4.06	2.85	5.28	Jc	5 26.3	22.5
507119 2009 <i>SR</i> ₁₄₃	16.5	X	215.91504	121.01042	194.30639	5.91641	0.5262876	0.12963932	3.87	1.83	5.90	Jc	2 8.9	24.0
507156 2009 <i>YE</i>	15.8	X	217.96609	110.42424	82.43866	29.56376	0.3811225	0.22863581	2.65	1.64	3.66	Mc	11 18.9	20.8
507261 2011 <i>CO</i> ₄₆	18.2	X	128.30595	216.67798	321.46702	12.60087	0.2530289	0.41560199	1.78	1.33	2.23	Mc	9 1.5	20.8
507366 2011 <i>XO</i> ₃	16.8	X	207.48343	209.80154	321.31182	23.90210	0.6614587	0.16932245	3.24	1.10	5.38	Jc	9 15.8	23.9
507411 2012 <i>MQ</i> ₆	16.7	X	26.66979	264.79606	85.41357	28.71914	0.3621741	0.23408066	2.61	1.66	3.55	Mc	12 31.4	20.2
507414 2012 <i>PE</i>	18.3	X	157.98168	228.41591	287.49444	20.62864	0.0389256	0.44279512	1.70	1.64	1.77	Mc	8 20.0	20.2
507639 2013 <i>LU</i> ₃₄	18.2	X	86.89530	66.78973	240.22199	21.43003	0.3090247	0.28416055	2.29	1.58	3.00	Mc	12 31.7	22.5
507799 2014 <i>BV</i> ₅₇	17.1	X	312.28422	73.52733	348.12469	28.33333	0.3772447	0.23447194	2.60	1.62	3.59	Mc	9 17.4	18.9
508341 2015 <i>XB</i> ₁	18.7	X	302.27202	83.53343	237.68871	28.61065	0.1617130	0.45324858	1.68	1.41	1.95	Mc	4 18.4	20.4
508428 2016 <i>JU</i> ₃₆	18.2	X	175.48280	115.10265										

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
508818 2001 <i>DC</i> ₁	16.6 ^m	X	268.02849	78.73440	143.87067	28.83078	0.3624307	0.23414938	2.61	1.66	3.55	Mc	—	—
508825 2001 <i>SK</i> ₁₆₉	17.4	X	259.48083	264.58444	177.14633	20.10663	0.5634031	0.18768907	3.02	1.32	4.72	Mc	7 13.3	23.4
508858 2002 <i>PQ</i> ₈₈	18.2	X	39.53084	276.25045	116.30796	5.52375	0.3080313	0.27121226	2.36	1.64	3.09	Mc	—	—
508861 2002 <i>RN</i> ₃₈	17.3	X	182.22674	118.60767	296.15549	4.16045	0.6729722	0.13218895	3.82	1.25	6.39	Jc	5 13.4	25.2
508881 2003 <i>SZ</i> ₁₂₁	17.9	X	35.70807	196.87144	201.17407	4.90237	0.3374903	0.28602084	2.28	1.51	3.05	Mc	—	—
508907 2003 <i>XH</i> ₁₄	16.8	X	82.91091	95.72133	293.78372	20.57663	0.3528199	0.28972531	2.26	1.46	3.06	Mc	—	—
508932 2004 <i>JY</i> ₁₁	17.6	X	321.40897	78.18067	117.46349	22.54795	0.3083842	0.27708847	2.33	1.61	3.05	Mc	—	—
508940 2004 <i>RQ</i> ₁₆₅	17.8	X	358.01750	42.86458	353.14257	4.18079	0.3625164	0.23578737	2.59	1.65	3.54	Mc	—	—
508951 2004 <i>TC</i> ₂₀	17.5	X	3.36804	267.75556	95.65063	28.37640	0.4166076	0.23644366	2.59	1.51	3.67	Mc	12 26.7	19.8
508985 2005 <i>EH</i> ₇₀	17.2	X	262.20297	328.25143	189.30567	8.03802	0.4219292	0.22482694	2.68	1.55	3.81	Mc	11 1.8	21.1
508987 2005 <i>ER</i> ₁₃₃	17.7	X	34.01116	88.75519	357.14612	22.86935	0.3120098	0.30028474	2.21	1.52	2.90	Mc	—	—
509018 2005 <i>NE</i> ₁	17.5	X	251.41156	234.63291	339.04602	3.18425	0.4239230	0.22217932	2.70	1.56	3.84	Mc	12 27.1	21.3
509024 2005 <i>PZ</i> ₁	16.9	X	26.75175	22.07655	356.34953	18.28516	0.4073363	0.25558894	2.46	1.46	3.46	Mc	—	—
509025 2005 <i>PR</i> ₄	17.3	X	68.92782	310.19165	67.61082	10.48253	0.3372077	0.26556606	2.40	1.59	3.21	Mc	—	—
509193 2006 <i>OX</i> ₁₉	17.4	X	90.86366	159.57813	161.90322	12.40561	0.3751725	0.28266862	2.30	1.44	3.16	Mc	—	—
509280 2006 <i>VQ</i> ₄	17.3	X	19.57537	344.35618	48.13920	7.49069	0.2961184	0.27076963	2.37	1.67	3.07	Mc	—	—
509529 2007 <i>YG</i> ₁	18.3	X	259.53098	48.41439	301.96874	13.92422	0.2659415	0.39964111	1.83	1.34	2.31	Mc	3 29.9	21.3
509563 2008 <i>CG</i> ₂₁	18.4	X	45.63158	106.56964	353.13301	7.67469	0.3658337	0.29960261	2.21	1.40	3.02	Mc	—	—
509594 2008 <i>DA</i> ₃₈	17.5	X	205.23468	31.77614	179.78775	5.95026	0.4420272	0.19366678	2.96	1.65	4.27	Mc	11 18.3	23.2
509608 2008 <i>ES</i> ₉₁	17.3	X	269.96473	88.95196	111.05896	22.21211	0.2886331	0.27876611	2.32	1.65	2.99	Mc	—	—
509806 2008 <i>VA</i>	19.1	X	245.47704	160.21985	223.10973	28.29993	0.0727032	0.44070856	1.71	1.59	1.83	Mc	5 26.3	20.7
509871 2009 <i>BX</i> ₂	17.0	X	337.82583	269.18420	122.40200	14.13541	0.4117466	0.22630408	2.67	1.57	3.76	Mc	11 22.2	18.2
509895 2009 <i>BT</i> ₁₇₈	16.9	X	262.65818	246.99308	334.15856	27.30445	0.4276895	0.22569681	2.67	1.53	3.81	Mc	—	—
509981 2009 <i>TH</i> ₂₃	17.6	X	72.01236	131.05834	220.66030	6.43261	0.3323294	0.26399227	2.41	1.61	3.21	Mc	—	—
509985 2009 <i>UE</i> ₅₁	18.6	X	145.17975	227.08245	222.12703	11.91245	0.1665999	0.37996482	1.89	1.57	2.20	Mc	5 7.1	20.5
510013 2009 <i>YZ</i> ₁	17.3	X	320.03392	273.24438	104.23357	28.48013	0.4012777	0.23697183	2.59	1.55	3.62	Mc	7 24.6	19.4
510137 2010 <i>UK</i> ₇₀	18.3	X	73.91083	297.59704	70.50140	2.64053	0.2681617	0.29010603	2.26	1.65	2.87	Mc	—	—
510156 2010 <i>WO</i> ₅₅	16.9	X	308.02831	257.63901	273.88389	20.70275	0.3135413	0.27759145	2.33	1.60	3.06	Mc	—	—
510178 2011 <i>BC</i> ₄₃	17.6	X	286.87486	186.35753	44.73829	7.94213	0.3477704	0.27884768	2.32	1.51	3.13	Mc	—	—
510189 2011 <i>CZ</i> ₄	17.7	X	319.25692	269.76580	325.15416	21.09635	0.3847393	0.28852043	2.27	1.40	3.14	Mc	1 6.9	21.5
510410 2011 <i>UT</i> ₁₉₂	19.4	X	94.18839	57.81140	219.09060	25.79776	0.1141460	0.50766801	1.56	1.38	1.73	Mc	12 27.8	21.5
510421 2011 <i>UX</i> ₂₈₀	17.1	X	74.08882	108.09973	209.17479	8.31772	0.4473260	0.21355670	2.77	1.53	4.01	Mc	—	—
510996 2013 <i>KA</i> ₃	18.8	X	340.92260	53.94466	282.41099	21.75860	0.1580647	0.49135293	1.59	1.34	1.84	Mc	9 3.8	19.8
511006 2013 <i>OZ</i> ₇	18.2	X	101.10036	87.61403	226.39660	3.95809	0.2824236	0.28420995	2.29	1.64	2.94	Mc	—	—
511019 2013 <i>CJ</i> ₆	17.3	X	71.24159	230.65524	133.45652	24.12975	0.2880550	0.28082036	2.31	1.64	2.97	Mc	—	—
511061 2013 <i>SM</i> ₈₄	17.8	X	77.72391	97.31861	223.45286	20.70249	0.2957345	0.27170515	2.36	1.66	3.06	Mc	—	—
511067 2013 <i>TS</i> ₁₀	17.9	X	80.26284	224.73590	132.60118	6.45405	0.3130262	0.27823616	2.32	1.60	3.05	Mc	—	—
511075 2013 <i>TD</i> ₄₈	17.6	X	101.48841	63.19458	272.22669	7.67037	0.2858801	0.28024612	2.31	1.65	2.97	Mc	—	—
511096 2013 <i>TO</i> ₁₃₉	16.8	X	285.02255	318.23598	56.57796	10.72306	0.3931948	0.22551503	2.67	1.62	3.72	Mc	5 29.4	20.8
511108 2013 <i>WE</i>	17.8	X	33.85795	287.54250	112.88360	22.83707	0.3276335	0.26900318	2.38	1.60	3.16	Mc	—	—
511114 2013 <i>WX</i> ₂₄	17.7	X	328.47345	316.38960	180.22216	7.40120	0.4657180	0.25870125	2.44	1.30	3.58	Mc	—	—
511140 2013 <i>YJ</i> ₂	17.3	X	253.83083	267.47067	234.78092	26.05388	0.4045935	0.23343528	2.61	1.56	3.67	Mc	10 2.1	21.9
511434 2014 <i>JA</i>	18.4	X	283.18896	271.60205	54.47458	23.88852	0.0791865	0.41710616	1.77	1.63	1.91	Mc	4 27.3	20.0
511548 2014 <i>UO</i> ₁₁₇	18.7	X	13.73996	243.87200	7.85680	8.99304	0.1163280	0.39051844	1.85	1.64	2.07	Mc	6 2.0	19.7
511787 2015 <i>EF</i> ₆₃	17.7	X	249.91626	215.49451	39.96149	8.32925	0.2722473	0.28462407	2.29	1.67	2.91	Mc	—	—
511795 2015 <i>FR</i> ₃₅	18.5	X	35.38399	206.93622	253.13689	6.09584	0.2587306	0.30402577	2.19	1.62	2.76	Mc	—	—
512979 2017 <i>UA</i> ₁₀	17.7	X	67.89807	13.12067	323.59384	7.36648	0.2612435	0.29348023	2.24	1.66	2.83	Mc	—	—
513022 2017 <i>VD</i> ₁	18.1	X	128.12616	328.48605	2.08403	6.19565	0.2285116	0.32228768	2.11	1.63	2.59	Mc	—	—
513080 2017 <i>WJ</i> ₂₁	17.1	X	3.47086	93.47955	227.51056	15.94947	0.3954357	0.23787091	2.58	1.56	3.60	Mc	10 14.5	18.7
513132 2000 <i>SH</i> ₁₃₆	18.1	X	123.80611	42.26266	324.43158	3.66502	0.3193187	0.30093866	2.21	1.50	2.91	Mc	1 17.1	20.5
513135 2001 <i>BF</i> ₂₁	16.8	X	20.07629	70.03204	308.72422	27.93162	0.3719135	0.23570857	2.60	1.63	3.56	Mc	—	—
513145 2002 <i>XY</i> ₆₉	17.7	X	324.66722	102.51878	8.58918	22.05633	0.3689053	0.26224645	2.42	1.53	3.31	Mc	—	—
513233 2005 <i>WE</i> ₂	18.4	X	285.27510	280.84777	79.20684	23.98607	0.1518609	0.42067387	1.76	1.50	2.03	Mc	6 7.7	19.4
513343 2007 <i>RN</i> ₃₆	18.2	X	87.70494	154.66242	186.85598	2.95916	0.2546875	0.30090820	2.21	1.64	2.77	Mc	—	—
513479 2009 <i>DK</i> ₃₉	17.2	X	339.43708	73.64244	349.84688	27.51588	0.3784779	0.22460484	2.68	1.67	3.69	Mc	—	—
513492 2009 <i>FA</i> ₁₄	18.0	X	267.48292	21.41312	126.90139	17.43912	0.3988235	0.21829097	2.73	1.64	3.82	Mc	11 4.3	22.1
514031 2014 <i>KY</i> ₇₅	16.7	X	192.90383	263.91759	6.79729	27.04246	0.4051490	0.23337356	2.61	1.55	3.67	Mc	—	—
514102 2015 <i>AT</i> ₄₄	18.2	X	208.22578	257.75866	97.96619	13.12238	0.2539361	0.35025663	1.99	1.49	2.50	Mc	3 14.4	21.7
514105 2015 <i>BT</i> ₉₂	19.1	X	164.24882	38.48894	261.86282	8.96307	0.0728881	0.45122682	1.68	1.56	1.81	Mc	—	—
514313 2016 <i>CX</i> ₂₉	18.3	X	238.45056	221.70181	134.92471	23.27611	0.1147600	0.41083980	1.79	1.59	2.00	Mc	4 12.3	20.9
514560 2017 <i>XP</i>	17.4	X	344.11922	53.06524	48.26219	24.54266	0.2963220	0.27540975	2.34	1.65	3.03	Mc	—	—
514561 2017 <i>XE</i> ₃	16.3	X	0.12731	56.66659	300.53799	16.17041	0.4139305	0.22853775	2.65	1.55	3.75	Mc	12 7.2	18.6
514572 1997 <i>SU</i> ₂₁	18.8	X	95.45378	51.72036	347.59305	5.80899	0.2530716	0.30303194	2.20	1.64	2.75	Mc	1 5.1	20.4
514609 2003 <i>TY</i> ₇	18.8	X	329.76782	2.90453	24.11158	50.07898	0.0840183	0.44060303	1.71	1.57	1.85	Mc	10 28.2	20.4
514702 2006 <i>MP</i> ₆	18.7	X	302.78166	26.66903	269.99546	7.11337	0.3178621	0.31852235	2.12	1.45	2.80	Mc	3 5.5	22.0
514756 2007 <i>EK</i> ₃₉	19.0	X	109.91158	80.42115	178.66532	27.60615	0.0752465	0.44893351	1.69	1.56	1.82	Mc	12 14.4	21.6
514897 2008 <i>SB</i> ₇	16.8	X	7.09067	48.34109	12.22837	31.80401	0.3708497	0.23652993	2.59	1.63	3.55	Mc	—	—
515013 2009 <i>SN</i> ₆₉	18.0	X	78.86625	207.40193	142.56758	3.29622	0.3084036	0.26618184	2.39	1.66	3.13</			

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
516476 2005 <i>TS</i> ₈₆	19.7	X	246.12769	251.65478	195.98546	8.43875	0.1930898	0.42774787	1.74	1.41	2.08	Mc	8 26.0	21.2
516541 2006 <i>SX</i> ₂₉₄	18.3	X	253.42280	125.93329	194.24633	5.19800	0.2433991	0.30863983	2.17	1.64	2.70	Mc	3 2.0	21.8
516647 2008 <i>HP</i> ₄₆	18.3	X	304.84963	226.32522	63.28554	9.85747	0.2839401	0.29538707	2.23	1.60	2.87	Mc	3 15.2	21.5
516725 2009 <i>DK</i> ₁₂	15.3	X	103.09308	223.19248	62.57980	45.40853	0.4357252	0.10866967	4.35	2.45	6.24	Jc	12 4.2	22.7
516783 2009 <i>XD</i> ₈	17.5	X	301.23329	62.86733	280.65191	22.69060	0.2671510	0.39484807	1.84	1.35	2.33	Mc	5 10.8	19.9
516795 2010 <i>GZ</i> ₆₂	17.2	X	215.23201	54.87683	222.03618	14.99231	0.3995175	0.23024369	2.64	1.58	3.69	Mc	—	—
516869 2011 <i>HD</i> ₈	18.0	X	26.45549	286.80276	202.36774	21.20752	0.3505570	0.28296931	2.30	1.49	3.10	Mc	—	—
517005 2012 <i>TV</i> ₁₂₃	17.5	X	314.65099	342.00988	111.61102	15.43598	0.4250726	0.22012994	2.72	1.56	3.87	Mc	11 21.6	19.0
517035 2012 <i>XS</i> ₁₁₉	18.8	X	155.50389	77.64795	86.61970	14.81794	0.1132245	0.41216744	1.79	1.59	1.99	Mc	9 19.1	21.2
517064 2013 <i>CM</i> ₃₆	17.5	X	309.05753	78.34444	28.54246	28.71710	0.4447080	0.21581838	2.75	1.53	3.98	Mc	11 1.4	19.4
517179 2013 <i>RY</i> ₃	17.2	X	350.10990	307.29872	181.35951	24.14364	0.2816245	0.28146755	2.31	1.66	2.96	Mc	—	—
517362 2014 <i>KC</i> ₄	17.4	X	224.11736	97.40108	199.65470	27.67462	0.3735387	0.23659136	2.59	1.62	3.56	Mc	1 14.9	23.0
517532 2014 <i>SW</i>	16.3	X	190.01464	255.65526	60.63014	30.95970	0.4051844	0.21157554	2.79	1.66	3.92	Mc	1 30.6	22.2
517542 2014 <i>SY</i> ₂₂₃	18.8	X	53.37276	100.54562	194.16739	16.50979	0.2059334	0.43524308	1.72	1.37	2.08	Mc	12 5.6	21.1
517594 2014 <i>WX</i> ₁₉₉	14.4	X	335.69070	311.61606	30.21400	17.16994	0.1083802	0.09619913	4.72	4.21	5.23	Jc	8 16.2	20.6
517714 2015 <i>JF</i> ₃	17.5	X	283.83286	98.67708	187.22586	20.62967	0.3164400	0.28741407	2.27	1.55	2.99	Mc	2 7.3	21.6
517726 2015 <i>LZ</i> ₂₂	18.3	X	301.89880	196.26117	94.23692	3.48002	0.2926171	0.30703764	2.18	1.54	2.81	Mc	3 6.6	21.4
517735 2015 <i>MN</i> ₅₁	18.3	X	261.82973	205.15174	95.17274	4.63360	0.2757598	0.28768996	2.27	1.65	2.90	Mc	2 15.5	22.1
517739 2015 <i>MS</i> ₁₀₄	17.9	X	239.37762	278.62187	37.07101	2.41749	0.3029104	0.27480926	2.34	1.63	3.05	Mc	2 17.5	22.0
518422 1998 <i>WH</i> ₃₀	17.5	X	327.54094	87.37804	235.68969	24.83399	0.4105287	0.29550468	2.23	1.32	3.15	Mc	5 5.9	19.7
518434 2003 <i>PB</i> ₈	17.1	X	206.86246	226.96403	142.70336	9.45080	0.3290728	0.25638718	2.45	1.65	3.26	Mc	4 3.8	21.8
518441 2004 <i>FC</i> ₆	17.8	X	347.61264	179.52568	16.55177	8.97749	0.3153339	0.28374124	2.29	1.57	3.02	Mc	—	—
518452 2005 <i>ES</i> ₂₆₇	17.4	X	86.05110	312.72162	144.51396	20.05925	0.2350250	0.31127278	2.16	1.65	2.66	Mc	3 17.8	19.4
518482 2005 <i>TZ</i> ₄₂	17.6	X	280.96261	172.93194	160.92258	9.14943	0.2973310	0.29439877	2.24	1.57	2.90	Mc	4 13.2	21.0
518509 2006 <i>FZ</i> ₅₁	16.9	X	180.72015	322.82383	304.76145	5.05875	0.5031447	0.16452959	3.30	1.64	4.96	Jc	12 31.3	23.5
518528 2006 <i>SE</i> ₂₈₅	16.5	X	186.82782	129.92484	229.27263	27.84762	0.4065080	0.23268087	2.62	1.55	3.68	Mc	3 2.1	22.2
518542 2006 <i>VA</i> ₇₆	18.5	X	260.29385	102.72206	252.52255	0.88365	0.2364213	0.31208827	2.15	1.64	2.66	Mc	4 23.6	21.8
518568 2007 <i>HO</i> ₆₇	18.1	X	276.62618	104.99527	196.31659	13.25523	0.3561558	0.27201338	2.36	1.52	3.20	Mc	2 19.4	22.4
518635 2008 <i>HO</i> ₃	18.1	X	202.98542	128.89034	206.06788	14.07004	0.6505747	0.19773039	2.92	1.02	4.82	Ja	2 19.2	24.8
518645 2008 <i>PL</i> ₁₂	18.8	X	279.65060	186.52729	125.79661	0.72311	0.2841227	0.28757701	2.27	1.63	2.92	Mc	3 15.1	22.4
518717 2009 <i>DH</i> ₃₂	17.4	X	296.44136	131.98564	8.71661	3.01880	0.4354055	0.22324908	2.69	1.52	3.86	Mc	11 29.9	19.3
519198 2010 <i>PZ</i> ₇₇	17.0	X	208.11359	102.83493	229.85152	25.56166	0.3719827	0.22881455	2.65	1.66	3.63	Mc	2 10.9	22.7
519610 2012 <i>UN</i> ₆₈	18.2	X	300.88399	36.29314	270.59757	2.34847	0.3720153	0.30474186	2.19	1.37	3.00	Mc	3 14.8	21.6
519783 2013 <i>FP</i> ₂₁	16.9	X	210.79606	94.09121	191.37893	16.85695	0.4546121	0.20222148	2.87	1.57	4.18	Mc	1 1.8	23.0
520399 2014 <i>JQ</i> ₅₄	18.2	X	272.07039	84.53378	199.54263	7.62085	0.4239227	0.24005897	2.56	1.48	3.65	Mc	—	—
521938 2015 <i>VT</i> ₁	17.9	X	265.98671	181.09584	144.79178	9.48174	0.3077068	0.27777444	2.33	1.61	3.04	Mc	3 21.6	21.8
523581 2018 <i>FL</i> ₅	17.1	X	255.51259	101.27435	163.98114	27.72341	0.4079656	0.23610981	2.59	1.53	3.65	Mc	1 1.4	22.6
523589 2001 <i>HA</i> ₄	17.7	X	226.71877	95.64832	354.07068	17.17924	0.7935297	0.22373489	2.69	0.55	4.82	Ja	7 2.8	24.3
523592 2001 <i>SK</i> ₂₇₆	17.5	X	159.29972	119.40677	297.68763	20.74373	0.5932240	0.17312969	3.19	1.30	5.08	Jc	5 1.9	24.5
523612 2006 <i>BH</i>	18.2	X	221.54508	249.19618	306.09913	31.08023	0.6445850	0.16914268	3.24	1.15	5.33	Jc	10 11.0	25.4
523630 2009 <i>OG</i>	16.2	X	231.85987	114.15867	309.40151	48.38798	0.8584613	0.22165860	2.70	0.38	5.03	Jc	6 7.9	23.3
523649 2010 <i>XZ</i> ₇₈	13.2	X	158.13785	228.40883	252.31063	39.17950	0.2922459	0.04649790	7.66	5.42	9.90	Jc	7 1.7	23.2
523806 2002 <i>WV</i> ₁₇	17.4	X	165.72799	91.50787	71.20142	18.30450	0.6519427	0.18656940	3.03	1.06	5.01	Jc	9 13.5	24.4
523822 2012 <i>DG</i> ₆₁	18.2	X	190.39158	186.17582	69.99906	15.32314	0.3735380	0.16795028	3.25	0.85	5.65	Jc	12 16.2	25.3
523915 1997 <i>VM</i> ₄	18.2	X	183.00368	124.90345	45.41347	14.21245	0.8137835	0.23242316	2.62	0.49	4.75	Ja	9 22.9	24.7
524093 2000 <i>PF</i> ₄	17.8	X	234.30346	31.71223	313.14871	6.94099	0.4277007	0.22067094	2.71	1.55	3.87	Mc	3 16.7	23.3
524095 2000 <i>QP</i> ₃₀	17.9	X	277.16902	21.97615	316.07030	5.93148	0.4033709	0.27211661	2.36	1.41	3.31	Mc	4 1.6	22.1
524098 2000 <i>QV</i> ₃₈	17.9	X	187.16977	195.17428	155.73562	5.28406	0.2544838	0.30965899	2.16	1.61	2.71	Mc	2 17.3	21.3
524114 2000 <i>SB</i> ₁	15.1	X	133.43930	145.04554	276.99601	22.18086	0.5407820	0.16148359	3.34	1.53	5.15	Jc	4 26.1	21.8
524115 2000 <i>SY</i> ₉	17.8	X	243.44630	213.12727	204.12531	22.54827	0.3269630	0.27279891	2.35	1.58	3.12	Mc	6 20.8	22.3
524120 2000 <i>SR</i> ₉₄	17.9	X	272.62316	47.63752	335.19976	7.17407	0.2904042	0.27483255	2.34	1.66	3.02	Mc	6 7.5	21.4
524136 2000 <i>SD</i> ₃₇₂	18.1	X	287.62156	101.07565	276.80495	8.30391	0.2949649	0.27607949	2.34	1.65	3.02	Mc	6 18.5	20.9
524185 2001 <i>KF</i> ₁₈	17.4	X	276.29415	91.35379	192.45966	27.47521	0.3800170	0.23582973	2.59	1.61	3.58	Mc	1 30.6	22.6
524187 2001 <i>OJ</i> ₇₈	18.3	X	316.13933	302.37793	36.26169	3.84235	0.2624058	0.29276690	2.25	1.66	2.84	Mc	6 9.9	20.2
524198 2001 <i>QC</i> ₃₃₃	18.3	X	315.50882	290.57154	27.56244	4.44976	0.2638831	0.29103509	2.26	1.66	2.85	Mc	5 6.3	20.3
524201 2001 <i>RH</i> ₃₃	18.5	X	321.53789	79.72865	274.67500	3.28975	0.2960778	0.29425206	2.24	1.58	2.90	Mc	7 13.7	19.8
524203 2001 <i>RA</i> ₄₂	17.8	X	189.16663	73.55297	351.10519	21.37348	0.5192462	0.17891669	3.12	1.50	4.74	Mc	5 20.2	24.5
524204 2001 <i>RD</i> ₄₇	17.3	X	230.32654	75.72212	350.49081	27.90825	0.3820093	0.23653957	2.59	1.60	3.58	Mc	6 23.1	22.7
524207 2001 <i>RP</i> ₈₂	17.7	X	259.92308	198.35080	198.90661	7.37371	0.3959873	0.23778849	2.58	1.56	3.60	Mc	6 5.9	22.2
524238 2001 <i>SQ</i> ₂₁₇	16.7	X	207.66311	81.37459	12.34166	26.82880	0.4450914	0.23332243	2.61	1.45	3.78	Mc	7 14.4	22.4
524339 2001 <i>XN</i> ₁	16.9	X	238.70205	78.97840	345.70085	27.48115	0.3881349	0.23262578	2.62	1.60	3.63	Mc	6 28.9	22.2
524369 2001 <i>YB</i> ₄	17.2	X	201.72153	79.50098	84.79596	28.63002	0.3875894	0.23456841	2.60	1.59	3.61	Mc	10 14.2	22.7
524395 2002 <i>AW</i> ₁₇	16.4	X	237.42515	240.91819	145.22292	22.87725	0.3751506	0.28007088	2.31	1.45	3.18	Mc	5 14.2	21.2
524421 2002 <i>CN</i> ₁₂	17.0	X	242.48680	99.54302	12.96659	27.7906	0.4251092	0.23480869	2.60	1.50	3.71	Mc	9 5.6	21.9
524443 2002 <i>DA</i> ₄	17.4	X	237.13683	76.45563	27.23131	26.86626	0.4338360	0.23334804	2.61	1.48	3.75	Mc	8 21.1	22.7
524477 2002 <i>LV</i> ₆	18.1	X	342.67395	40.07493	241.68391	9.09767	0.3738909	0.30881835	2.17	1.36	2.98	Mc	3 31.9	19.9
524481 2002 <i>PZ</i> ₁₀	16.6	X	169											

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
524801 2003 <i>WN</i> ₁₅₆	17.8	X	179.72416	332.96563	156.00083	9.93003	0.4789115	0.19684043	2.93	1.53	4.33	Mc	8 2.7	23.9
524810 2003 <i>WU</i> ₁₉₄	18.4	X	144.27708	308.94240	5.77111	5.81013	0.2571732	0.29530360	2.23	1.66	2.81	Mc	—	—
524818 2003 <i>YK</i> ₃	17.1	X	317.45469	86.55619	312.37505	20.75623	0.3035586	0.26897081	2.38	1.66	3.10	Mc	9 7.1	19.0
524819 2003 <i>YM</i> ₈	17.1	X	198.32903	59.09155	89.96836	25.23258	0.3182313	0.26061187	2.43	1.65	3.20	Mc	9 25.1	22.0
524900 2004 <i>FB</i> ₃₂	17.2	X	172.74779	137.74473	86.39065	14.46564	0.4930951	0.20295869	2.87	1.45	4.28	Mc	11 17.2	23.2
524943 2004 <i>HY</i> ₂₆	18.5	X	175.85329	238.73477	45.16215	11.70923	0.4532093	0.26159519	2.42	1.32	3.52	Mc	—	—
524968 2004 <i>NZ</i> ₁₉	18.3	X	292.16810	165.72310	167.23413	4.32331	0.2998641	0.28255373	2.30	1.61	2.99	Mc	4 22.9	21.5
524990 2004 <i>PP</i> ₁₁₁	18.2	X	302.30463	342.63971	358.22057	5.81378	0.3014155	0.28342252	2.30	1.60	2.99	Mc	5 12.6	21.1
525009 2004 <i>RK</i> ₁₁₂	17.0	X	231.37840	102.31129	329.95346	20.71971	0.3422739	0.27722224	2.33	1.53	3.13	Mc	7 5.9	21.4
525033 2004 <i>RN</i> ₁₉₃	18.0	X	194.14215	98.94667	207.86095	13.89312	0.4510308	0.26272058	2.41	1.33	3.50	Mc	1 11.1	23.1
525095 2004 <i>TX</i> ₁₀	17.9	X	279.18053	193.33671	218.75894	27.99263	0.2853375	0.28526970	2.29	1.63	2.94	Mc	7 18.6	21.6
525098 2004 <i>TJ</i> ₁₉	17.2	X	263.96431	184.04296	132.43207	13.96594	0.4769922	0.21485141	2.76	1.44	4.08	Mc	3 3.6	22.6
525217 2004 <i>TK</i> ₃₄₅	17.8	X	340.40838	357.92121	70.31819	28.05378	0.3973891	0.29455766	2.24	1.35	3.13	Mc	—	—
525338 2005 <i>AU</i> ₂₈	17.6	X	249.28313	102.97653	351.94926	22.03510	0.3445527	0.27770954	2.33	1.53	3.13	Mc	8 21.5	21.4
525395 2005 <i>EU</i> ₇₈	18.3	X	202.22937	228.49112	10.95295	5.71859	0.2816317	0.28248462	2.30	1.65	2.95	Mc	—	—
525399 2005 <i>ET</i> ₈₇	17.6	X	253.96662	83.35772	359.46756	21.20266	0.3573812	0.27444754	2.35	1.51	3.18	Mc	8 10.4	21.6
525421 2005 <i>ED</i> ₁₆₉	18.9	X	214.97580	177.52298	180.28427	22.12952	0.1085971	0.42908214	1.74	1.55	1.93	Mc	3 1.8	20.9
525422 2005 <i>EQ</i> ₁₆₉	17.1	X	171.49018	93.60353	136.68793	23.61260	0.2967234	0.27486021	2.34	1.65	3.04	Mc	12 6.6	21.7
525500 2005 <i>GL</i> ₆₃	18.2	X	204.61157	180.99311	48.70607	10.73876	0.2992221	0.28148337	2.31	1.62	3.00	Mc	12 26.5	21.9
525511 2005 <i>GY</i> ₁₁₉	17.8	X	234.13078	256.05320	213.02259	20.74932	0.3121736	0.27068725	2.37	1.63	3.11	Mc	8 15.1	22.1
525783 2005 <i>SU</i> ₁₆₄	17.6	X	350.74154	289.08781	56.15388	8.87747	0.2784187	0.30725620	2.18	1.57	2.78	Mc	10 24.8	18.3
525824 2005 <i>TH</i> ₇	17.1	X	251.54416	336.88812	353.18270	17.18176	0.3775971	0.22755969	2.66	1.65	3.66	Mc	3 13.8	22.1
525933 2005 <i>UE</i> ₉₀	16.9	X	194.16695	292.23765	231.23436	22.87893	0.4123041	0.23597678	2.59	1.52	3.66	Mc	9 14.9	22.4
526111 2005 <i>UJ</i> ₄₅₆	18.0	X	334.49660	46.14712	278.79808	4.10072	0.3054409	0.30255386	2.20	1.53	2.87	Mc	6 22.6	18.8
526174 2005 <i>WJ</i> ₃₀	18.6	X	300.77489	105.66112	265.92730	4.16469	0.2907089	0.29964183	2.21	1.57	2.85	Mc	6 29.0	20.6
526181 2005 <i>WM</i> ₅₂	16.5	X	181.73706	26.29653	75.66090	36.98915	0.3817171	0.22506463	2.68	1.65	3.70	Mc	6 30.4	22.0
526255 2005 <i>YP</i> ₁₂₈	16.6	X	196.91552	272.19431	251.14592	26.57024	0.3777333	0.23480485	2.60	1.62	3.59	Mc	9 13.3	22.1
526336 2006 <i>CP</i>	17.8	X	259.57620	3.14510	132.97037	26.13447	0.3343676	0.30285081	2.20	1.46	2.93	Mc	11 4.4	21.0
526401 2006 <i>HR</i> ₅₂	18.0	X	162.14825	155.20839	81.11692	8.95122	0.2903401	0.29126004	2.25	1.60	2.91	Mc	12 4.3	21.8
526565 2006 <i>SF</i> ₄₀₀	19.7	X	240.21710	64.85838	9.47181	2.65447	0.4132619	0.24933234	2.50	1.47	3.53	Mc	7 5.9	24.2
526708 2006 <i>VJ</i> ₇₇	17.8	X	165.16754	264.61818	59.05198	23.62436	0.3837415	0.29125989	2.25	1.39	3.12	Mc	1 10.2	22.0
526774 2006 <i>XT</i> ₃	18.4	X	107.20187	134.15401	279.71113	19.38251	0.1097014	0.42140053	1.76	1.57	1.96	Mc	—	—
526788 2006 <i>YZ</i> ₁	17.1	X	204.80973	113.37980	290.70518	28.24181	0.3978185	0.23579471	2.59	1.56	3.63	Mc	5 4.3	22.8
526802 2007 <i>BC</i>	16.6	X	144.64133	93.25717	63.27288	28.31583	0.3765003	0.23169117	2.63	1.64	3.61	Mc	8 30.2	22.2
526937 2007 <i>OR</i>	17.9	X	218.81063	291.46164	321.56379	26.05222	0.3175372	0.31735235	2.13	1.46	2.80	Mc	—	—
526940 2007 <i>PR</i>	16.6	X	209.66265	50.28891	317.95835	12.74685	0.5346919	0.18667331	3.03	1.41	4.65	Mc	3 27.8	23.1
526947 2007 <i>PH</i> ₄₉	17.7	X	152.24978	120.95122	150.46908	29.52115	0.3752125	0.23806130	2.58	1.61	3.55	Mc	—	—
526964 2007 <i>RE</i> ₃₃	17.1	X	261.44527	167.55030	228.06432	8.53825	0.2990881	0.27066183	2.37	1.66	3.07	Mc	6 13.1	20.9
527141 2007 <i>TV</i> ₆₂	18.0	X	163.41534	294.14121	18.21270	4.95588	0.2640107	0.31036406	2.16	1.59	2.73	Mc	—	—
527188 2007 <i>TD</i> ₁₄₀	16.8	X	141.87625	82.32974	229.62523	27.16272	0.3796950	0.23496982	2.60	1.61	3.59	Mc	—	—
527305 2007 <i>TG</i> ₃₈₅	18.0	X	30.28932	300.93655	25.80684	7.77157	0.2650770	0.28906583	2.27	1.66	2.87	Mc	12 2.3	20.7
527311 2007 <i>TA</i> ₃₉₄	18.4	X	160.00055	88.40688	242.93543	3.43522	0.2269728	0.31222847	2.15	1.66	2.64	Mc	—	—
527601 2007 <i>VY</i> ₂₉₇	18.2	X	317.68524	235.51352	142.03906	8.37657	0.2865549	0.27747680	2.33	1.66	3.00	Mc	8 17.1	19.3
527604 2007 <i>VL</i> ₃₀₅	8.1	X	20.79920	214.86441	188.51628	28.09542	0.0640543	0.00599039	30.03	28.10	31.95	NT	12 1.1	22.7
527714 2007 <i>YG</i> ₅₅	19.2	X	351.99838	46.50911	108.06246	22.98409	0.1549136	0.44264536	1.71	1.44	1.97	Mc	—	—
528184 2008 <i>HD</i> ₅₈	18.7	X	197.57698	40.69112	212.41828	6.21077	0.3098827	0.27003499	2.37	1.64	3.11	Mc	—	—
528201 2008 <i>JB</i> ₃₁	17.5	X	205.68350	189.48277	20.49584	15.17675	0.3519431	0.26875934	2.38	1.54	3.22	Mc	11 23.9	21.8
528205 2008 <i>JS</i> ₃₆	18.6	X	10.63374	79.16195	207.22127	3.44061	0.2696377	0.30818549	2.17	1.59	2.76	Mc	8 23.1	19.5
528231 2008 <i>OL</i> ₂₂	17.8	X	302.09675	32.86204	288.68642	7.32260	0.3545884	0.29153949	2.25	1.45	3.05	Mc	4 4.8	21.2
528235 2008 <i>QA</i> ₂₁	18.0	X	357.81530	47.92691	280.17593	5.74835	0.2463748	0.30530920	2.18	1.65	2.72	Mc	9 28.2	19.2
528351 2008 <i>SX</i> ₂₃₅	18.3	X	14.94525	135.87148	227.51247	3.72432	0.2343786	0.30720811	2.18	1.67	2.69	Mc	—	—
528436 2008 <i>TQ</i> ₁₁₆	18.2	X	346.10621	13.95262	322.56229	7.15828	0.2578435	0.30091889	2.21	1.64	2.77	Mc	9 7.5	18.8
528476 2008 <i>UD</i> ₄	18.3	X	1.60221	305.09619	54.75711	7.45631	0.2661271	0.30751616	2.17	1.60	2.75	Mc	12 10.3	20.0
528497 2008 <i>UE</i> ₇₂	18.6	X	191.73673	101.04505	3.47521	6.01281	0.4482332	0.20049904	2.89	1.60	4.19	Mc	7 13.8	24.5
528569 2008 <i>UY</i> ₂₇₄	18.7	X	339.06568	322.52702	27.59403	0.47806	0.2489186	0.29886227	2.22	1.66	2.77	Mc	9 13.2	19.0
528736 2008 <i>YS</i> ₁₂₆	17.2	X	213.43080	283.33424	294.94808	23.26228	0.2686719	0.29968262	2.21	1.62	2.81	Mc	12 29.8	20.4
528792 2009 <i>BO</i> ₃₇	17.4	X	303.50162	74.48359	314.63381	22.53149	0.3287480	0.29016521	2.26	1.52	3.00	Mc	7 28.2	19.3
528808 2009 <i>BW</i> ₇₁	17.9	X	335.62800	255.52984	149.58955	24.95132	0.3648767	0.29975845	2.21	1.40	3.02	Mc	—	—
528858 2009 <i>CB</i> ₂	19.1	X	292.76461	81.37970	138.97291	40.44591	0.1642636	0.39663410	1.83	1.53	2.14	Mc	—	—
528972 2009 <i>HM</i> ₁₅	14.8	X	72.60685	169.55181	24.14658	14.19148	0.2510235	0.09671231	4.70	3.52	5.88	Jc	7 23.2	21.3
528991 2009 <i>HE</i> ₈₂	18.7	X	179.51716	144.17037	227.24422	30.50145	0.1032197	0.55468550	1.47	1.32	1.62	Mc	—	—
529015 2009 <i>KA</i> ₉	18.8	X	195.20578	29.61111	223.59261	5.21437	0.2757433	0.28984109	2.26	1.64	2.88	Mc	—	—
529030 2009 <i>ME</i> ₈	17.7	X	157.51467	163.60701	128.35134	6.38895	0.2856851	0.28491924	2.29	1.63	2.94	Mc	—	—
529050 2009 <i>PY</i> ₂	17.1	X	257.70834	243.86448	93.33962	29.32369	0.4684387	0.22524046	2.68	1.42	3.93	Mc	4 11.5	22.8
529189 2009 <i>SA</i> ₂₀₉	17.5	X	229.94180	278.19054	196.00907	27.37297	0.3691852	0.23329689	2.61	1.65	3.58	Mc	8 14.0	22.6
529262 2009 <i>UG</i> ₂₅	18.0	X	155.78221	110.22038	209.69845	4.40071	0.3067838	0.27774666	2.33	1.61	3.04	Mc	—	—
529382 2009 <i>WL</i> ₆₉	17.3	X	278.97492	249.97583	128.10123	6.88412	0.3908834	0.23103553	2.63	1.6				

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
530121 2011 AV ₂	18.1 ^m	X	232.98423	60.34022	317.29520	5.25533	0.3580383	0.23698958	2.59	1.66	3.51	Mc	4 24.6	23.1
530336 2011 EZ ₉	16.9	X	207.07358	294.12170	177.52324	29.22768	0.3780002	0.23537194	2.60	1.62	3.58	Mc	7 29.1	22.3
530351 2011 EE ₄₅	16.9	X	194.61870	97.26795	44.46281	24.62490	0.3598525	0.23857166	2.57	1.65	3.50	Mc	9 12.8	22.2
530484 2011 JG ₈	18.8	X	193.06956	256.18168	54.28264	34.46630	0.0542962	0.46142866	1.66	1.57	1.75	Mc	—	—
530509 2011 KO ₄	17.1	X	191.89013	105.73491	56.50814	28.80918	0.3753279	0.23590625	2.59	1.62	3.57	Mc	10 6.9	22.5
530535 2011 OR ₁₈	18.1	X	332.27149	110.89766	219.00122	9.02564	0.2814328	0.29046244	2.26	1.62	2.89	Mc	6 29.7	19.5
530540 2011 OY ₃₉	18.2	X	319.41595	191.70394	157.13639	5.24975	0.2843941	0.29001907	2.26	1.62	2.90	Mc	6 30.4	19.9
530554 2011 QS ₁₁	16.9	X	310.78109	94.52027	221.74162	23.22843	0.3114575	0.28393659	2.29	1.58	3.01	Mc	4 18.1	19.7
530558 2011 QF ₂₁	18.0	X	310.48812	343.04994	17.50481	7.21341	0.3058010	0.28953551	2.26	1.57	2.95	Mc	6 26.7	20.1
530573 2011 QG ₉₅	18.1	X	34.40507	40.83889	312.04323	5.82007	0.2429732	0.31100802	2.16	1.63	2.68	Mc	—	—
530664 2011 SO ₂₇₇	7.6	X	146.37889	136.24568	113.39566	9.64210	0.0099390	0.00592153	30.26	29.96	30.56	NT	11 3.2	22.4
530682 2011 UN ₃	18.1	X	310.71018	121.03856	208.93854	24.03250	0.2879776	0.28054019	2.31	1.65	2.98	Mc	5 14.6	20.8
530706 2011 UV ₆₂	17.7	X	256.81133	127.64912	259.61936	22.59036	0.3462315	0.27443540	2.35	1.53	3.16	Mc	5 24.7	21.8
530723 2011 UY ₈₉	18.2	X	30.95580	356.11228	51.00570	21.06096	0.0760395	0.41488024	1.78	1.65	1.92	Mc	—	—
530747 2011 UO ₁₃₈	18.2	X	276.91239	39.30396	323.45617	4.03689	0.3079042	0.27678747	2.33	1.61	3.05	Mc	5 13.2	21.8
530766 2011 UG ₁₈₈	18.2	X	342.25772	331.12603	355.92803	4.13969	0.2776946	0.29122841	2.25	1.63	2.88	Mc	8 3.9	18.9
530863 2011 VT ₁₀	17.5	X	213.87421	44.35222	63.85793	24.72120	0.3053058	0.27203704	2.36	1.64	3.08	Mc	8 12.9	22.1
530930 2011 WG ₁₅₇	7.2	X	215.19964	219.17109	352.01028	22.28254	0.0265127	0.00598971	30.03	29.23	30.82	NT	11 21.7	22.1
530980 2012 BW ₂₃	17.5	X	311.42379	88.73430	340.07830	25.31865	0.2812029	0.28714453	2.28	1.64	2.92	Mc	10 17.2	19.5
530990 2012 BW ₈₅	17.7	X	216.17950	329.66416	235.85293	4.46013	0.3572630	0.27763820	2.33	1.50	3.16	Mc	12 1.2	21.6
530991 2012 BD ₈₆	19.3	X	38.65320	54.81681	307.75775	11.59582	0.2035070	0.39823302	1.83	1.46	2.20	Mc	—	—
531071 2012 DD ₉₀	18.6	X	209.54023	111.23456	110.13826	4.89721	0.3471191	0.28177289	2.30	1.50	3.10	Mc	12 16.5	22.3
531105 2012 EC ₁₅	18.4	X	206.48415	291.78037	302.35729	3.72498	0.3257516	0.27900243	2.32	1.56	3.08	Mc	12 31.0	22.2
531126 2012 FG ₃₈	16.9	X	290.64360	58.93536	35.48492	24.69429	0.3186862	0.27647135	2.33	1.59	3.08	Mc	10 19.4	18.7
531150 2012 GF	19.0	X	6.06527	323.99620	138.23309	16.35983	0.2158600	0.40952224	1.80	1.41	2.18	Mc	—	—
531178 2012 GD ₄₀	18.2	X	213.73230	113.66063	129.92969	22.12889	0.2908798	0.28371952	2.29	1.63	2.96	Mc	—	—
531221 2012 HL ₈₂	17.9	X	173.31771	250.96044	55.17439	23.00077	0.3319519	0.28110222	2.31	1.54	3.07	Mc	—	—
531357 2012 RE ₂₀	18.6	X	28.94886	230.21118	180.52705	10.27683	0.2191731	0.35811136	1.96	1.53	2.39	Mc	—	—
531471 2012 TY ₇₈	18.5	X	338.16863	71.32539	230.32155	4.47411	0.3888173	0.31404636	2.14	1.31	2.98	Mc	4 24.6	19.9
531895 2013 BP ₇	17.4	X	294.19443	75.74989	127.91555	30.95278	0.2775324	0.34246354	2.02	1.46	2.58	Mc	—	—
532057 2013 GR ₆₈	18.2	X	210.32418	202.43569	43.99509	6.21776	0.3068745	0.31565471	2.14	1.48	2.79	Mc	—	—
532112 2013 LW ₁	18.3	X	346.23888	337.87264	260.11202	16.39925	0.1933155	0.48052028	1.61	1.30	1.93	Mc	1 19.6	19.7
532233 2013 PT ₆₉	19.3	X	217.79118	159.65764	133.39026	5.70458	0.3448842	0.32032032	2.12	1.39	2.85	Mc	1 2.4	23.2
532281 2013 QD ₂₈	18.3	X	168.88703	133.08652	156.73914	8.55255	0.2660130	0.30053316	2.21	1.62	2.79	Mc	—	—
532359 2013 RX ₅₁	17.0	X	251.04422	74.85997	9.07634	27.24734	0.4052599	0.22543680	2.67	1.59	3.76	Mc	8 7.4	22.1
532430 2013 SL	18.0	X	182.84915	288.80485	15.48038	23.65813	0.2391930	0.30754337	2.17	1.65	2.69	Mc	—	—
532546 2013 TN ₁₀₀	17.8	X	85.47161	30.90779	317.00395	8.83084	0.2876254	0.27694928	2.33	1.66	3.00	Mc	—	—
532777 2013 WL ₆₄	16.7	X	262.65568	83.49402	285.99851	27.00046	0.4304095	0.21419550	2.77	1.58	3.96	Mc	4 25.3	22.3
532841 2013 XS ₁₂	18.9	X	337.61639	163.41016	297.38103	9.62760	0.2398837	0.38505274	1.87	1.42	2.32	Mc	—	—
533321 2014 FV ₆	18.9	X	327.72870	71.97243	70.33412	10.35336	0.2399687	0.38509096	1.87	1.42	2.32	Mc	—	—
533495 2014 HU ₁₇₇	18.0	X	353.34376	176.67016	135.54856	6.79833	0.2480019	0.29949008	2.21	1.66	2.76	Mc	8 14.9	18.4
533544 2014 JK ₅₇	17.8	X	24.62356	209.81826	67.85504	9.61978	0.2973372	0.28700522	2.28	1.60	2.95	Mc	9 25.0	19.9
533609 2014 KS ₃₈	18.0	X	313.17916	102.87756	199.07533	21.30474	0.2990123	0.27480929	2.34	1.64	3.04	Mc	4 4.9	21.0
533671 2014 LJ ₂₁	16.1	X	170.43857	302.80761	126.65374	24.25278	0.8952275	0.20069076	2.89	0.30	5.48	Jc	6 3.3	23.5
533711 2014 NA ₃	18.2	X	343.97010	289.77214	59.25621	9.06338	0.3421040	0.28391588	2.29	1.51	3.08	Mc	10 10.2	18.6
533726 2014 NK ₅₉	17.9	X	356.64427	266.48368	105.05087	6.11520	0.2537430	0.29645130	2.23	1.66	2.79	Mc	12 13.9	19.5
533736 2014 OG ₃	17.2	X	296.35785	95.79415	285.66654	22.19442	0.2938277	0.27508430	2.34	1.65	3.03	Mc	7 6.8	19.5
533744 2014 OA ₄₀	17.8	X	332.49527	40.77655	323.36179	4.91067	0.2820552	0.28623322	2.28	1.64	2.92	Mc	9 11.1	18.5
533849 2014 OH ₃₃₈	17.0	X	225.31270	182.88181	200.46207	7.82251	0.3728685	0.23499079	2.60	1.63	3.57	Mc	4 29.1	21.9
533850 2014 OD ₃₃₉	19.1	X	256.91169	56.98016	339.11668	7.37543	0.4575287	0.25223676	2.48	1.35	3.62	Mc	5 26.1	23.7
533967 2014 QV ₁₆₈	17.6	X	358.35202	213.73487	157.85893	10.64619	0.3949931	0.28935687	2.26	1.37	3.16	Mc	—	—
534181 2014 SW ₁	17.7	X	256.00505	298.24777	134.57892	20.30112	0.3515029	0.26790006	2.38	1.55	3.22	Mc	7 21.0	21.6
534245 2014 SK ₂₁₉	17.1	X	282.65385	124.26855	196.89660	17.90346	0.3818608	0.24144044	2.55	1.58	3.53	Mc	3 21.7	21.5
534391 2014 TF ₆₆	16.9	X	189.69830	63.28527	28.74849	29.26421	0.4072764	0.23438908	2.61	1.54	3.67	Mc	6 24.7	22.6
534607 2014 UB ₂₀₃	17.2	X	230.92722	18.66663	341.88557	5.24725	0.3691327	0.23450355	2.60	1.64	3.57	Mc	4 3.8	22.3
534674 2014 VX ₁	17.3	X	212.79021	106.74272	348.72339	28.85762	0.3793258	0.23663012	2.59	1.61	3.57	Mc	7 27.0	22.6
534678 2014 VW ₆	17.3	X	196.07219	82.14108	21.69980	28.22282	0.3722514	0.23426566	2.61	1.64	3.58	Mc	7 24.3	22.9
534685 2014 VY ₉	16.7	X	128.51633	283.66943	233.86240	27.06082	0.3629457	0.23465615	2.60	1.66	3.55	Mc	7 28.5	22.0
534750 2014 WD ₂₄	17.5	X	239.43052	66.68116	290.26165	4.61957	0.4018565	0.23598047	2.59	1.55	3.64	Mc	4 2.6	22.6
534917 2014 WV ₃₆₆	18.8	X	210.59003	252.64927	207.02202	4.33758	0.4331692	0.23849709	2.58	1.46	3.69	Mc	7 16.4	23.9
535149 2014 XJ ₈	17.9	X	228.29116	146.88262	32.24444	6.56943	0.3708233	0.27561230	2.34	1.47	3.21	Mc	11 6.7	21.6
535203 2014 YJ ₁₅	16.0	X	250.97784	132.51549	243.46159	28.98389	0.3571179	0.23807422	2.58	1.66	3.50	Mc	5 6.4	20.7
537562 2015 OX ₇₇	17.8	X	322.10593	71.56772	278.30837	16.70762	0.2923666	0.32049868	2.11	1.50	2.73	Mc	7 6.9	18.5
537698 2015 TW	19.1	X	234.97145	157.12543	138.11369	15.52341	0.1041552	0.42192919	1.76	1.58	1.94	Mc	—	—
537702 2015 TE ₂₁	18.1	X	354.06453	185.05695	123.28374	7.93011	0.3678697	0.32029061	2.12	1.34	2.89	Mc	9 1.6	17.3
537703 2015 TH ₂₁	18.0	X	340.67909	291.81234	32.04133	29.34088	0.3289768	0.31592644	2.14	1.43	2.84	Mc	8 20.4	19.9
537721 2015 TO ₂₃₄	18.1	X	316.37436	18.30331	324.94134	7.12018	0.2894172	0.31274914	2.15	1.53	2.77	Mc	6 11.4	19.9
537725 2015 TX ₂₄₃	18.6	X	309.91931	87.69380	265.34982	4.87956	0.2460110	0.30957271	2.16	1.63	2.70	Mc	6 24.7	20.5
537733 2015 TX ₃₀₅	18.7	X	315.69476	125.35569	219.08560	6.56								

ELEMENTS AND OPPOSITION DATES OF SOME UNUSUAL MINOR PLANETS

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	ω	Ω	<i>i</i>	<i>e</i>	μ	<i>a</i>	<i>q</i>	<i>Q</i>	<i>T</i>	Oppos.	<i>V</i>
539946 2017 <i>HB</i> ₅	18.8 ^m	X	80.21847	304.71694	182.73647	22.95609	0.0649470	0.46088355	1.66	1.55	1.77	Mc	2 7.7	20.0
540205 2017 <i>RS</i> ₁₇	14.5	X	73.87809	295.91827	135.85650	42.69485	0.4478814	0.06421034	6.18	3.41	8.94	Jc	4 9.3	22.7
540599 2017 <i>UY</i> ₆	16.7	X	254.17522	282.59748	177.23915	29.84414	0.4007272	0.21624464	2.75	1.65	3.85	Mc	8 14.0	21.6
541067 2018 <i>LX</i> ₄	18.7	X	275.19737	324.38162	2.46741	14.15074	0.3596508	0.26140970	2.42	1.55	3.29	Mc	3 24.5	22.9
541071 2018 <i>NB</i> ₁₅	18.4	X	325.29740	262.17940	54.78246	7.25490	0.2988685	0.30267968	2.20	1.54	2.85	Mc	5 15.3	20.2
541073 2018 <i>PK</i> ₂₃	16.3	X	224.41933	26.27182	324.54187	11.58838	0.4000370	0.21465211	2.76	1.66	3.87	Mc	3 17.8	21.8
541093 2018 <i>RJ</i> ₄	17.5	X	262.80792	226.42704	163.03872	23.64977	0.3353402	0.26350741	2.41	1.60	3.22	Mc	6 6.3	21.9
541193 2011 <i>BA</i> ₈₄	18.0	X	293.64084	125.07913	83.09680	4.39062	0.2979203	0.27883847	2.32	1.63	3.01	Mc	—	—
541555 2011 <i>SX</i> ₉₆	17.6	X	226.96541	334.41644	8.75649	1.86035	0.3327581	0.26067868	2.43	1.62	3.23	Mc	3 13.3	22.1
541811 2012 <i>AV</i>	18.1	X	104.10178	86.14490	13.12064	27.64642	0.4163349	0.23543718	2.60	1.52	3.68	Mc	5 3.8	22.7
541852 2012 <i>BF</i> ₆₁	17.0	X	151.52889	117.80993	300.70245	28.42118	0.3655383	0.24130722	2.56	1.62	3.49	Mc	4 10.8	22.3
541912 2012 <i>DV</i> ₃	17.1	X	104.67933	102.70287	10.03495	28.53792	0.3655177	0.23372109	2.61	1.66	3.56	Mc	5 14.6	21.8
541958 2012 <i>FL</i>	17.2	X	99.71185	278.03029	208.07364	27.51924	0.3696874	0.23394084	2.61	1.64	3.57	Mc	6 7.1	21.8
541995 2012 <i>HE</i> ₈	19.0	X	173.17887	330.29515	165.02032	2.04430	0.3374506	0.35643241	1.97	1.31	2.63	Mc	8 11.2	22.5
542044 2012 <i>KH</i> ₄	18.6	X	212.84006	227.24607	121.15653	7.53880	0.2836401	0.30815020	2.17	1.56	2.79	Mc	3 9.0	22.4
542069 2012 <i>LK</i> ₇	18.1	X	241.07901	186.95753	118.07648	8.49258	0.2555420	0.29954624	2.21	1.65	2.78	Mc	2 4.3	21.9
542143 2012 <i>XS</i> ₅₄	18.1	X	175.04475	44.31223	302.31833	6.65433	0.4004434	0.27059383	2.37	1.42	3.32	Mc	2 13.6	22.7
542192 2013 <i>AY</i> ₅₀	17.7	X	182.41750	290.56957	99.74894	22.48198	0.3209410	0.27478025	2.34	1.59	3.10	Mc	4 20.0	22.5
542627 2013 <i>GK</i> ₃₇	17.8	X	137.74913	59.90192	32.20269	22.41675	0.3448974	0.26331096	2.41	1.58	3.24	Mc	5 18.9	22.2
542675 2013 <i>GN</i> ₉₂	18.1	X	93.79515	2.44033	197.08885	3.15145	0.3008625	0.26893769	2.38	1.66	3.09	Mc	8 28.7	21.8
543013 2013 <i>RE</i> ₁	18.8	X	202.82793	133.14136	175.92590	2.18291	0.2582870	0.31435378	2.14	1.59	2.70	Mc	1 8.8	22.2
543201 2013 <i>TD</i> ₁₂₄	18.6	X	227.04529	350.03711	342.44941	2.27636	0.2164966	0.32383266	2.10	1.65	2.55	Mc	2 24.4	22.0
543244 2013 <i>VC</i> ₂	18.4	X	172.71913	252.35311	247.57240	14.55004	0.2178566	0.34579289	2.01	1.57	2.45	Mc	8 11.2	21.9
543248 2013 <i>VG</i> ₉	18.1	X	181.10616	208.79347	105.73627	7.59869	0.2479773	0.29913414	2.21	1.67	2.76	Mc	—	—
543508 2014 <i>MG</i> ₁	18.2	X	8.74043	44.08167	239.13906	4.82341	0.2697691	0.29155923	2.25	1.64	2.86	Mc	8 6.4	19.1
543523 2014 <i>MD</i> ₂₇	18.6	X	337.44750	193.05156	131.15778	26.09186	0.1570927	0.43211163	1.73	1.46	2.00	Mc	8 2.1	18.4
543554 2014 <i>NT</i> ₂	16.6	X	187.34947	146.46184	220.28630	33.77272	0.3844213	0.24387610	2.54	1.56	3.51	Mc	3 12.4	22.0
544235 2014 <i>TB</i> ₃₄	18.4	X	217.91487	234.01246	245.06665	22.80578	0.1914045	0.41222903	1.79	1.45	2.13	Mc	8 26.7	21.3
544324 2014 <i>UM</i> ₉₃	18.6	X	145.71132	324.57351	227.05059	21.02412	0.1079953	0.41022990	1.79	1.60	1.99	Mc	10 4.5	20.9