

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1 Ceres	3.34	0.12	248.40799	73.73768	80.26763	10.58820	0.0783942	0.21429254	2.7656551	21	11 27.8	7.1
2 Pallas	4.13	0.11	230.07778	310.44123	172.91972	34.89866	0.2297622	0.21335178	2.7737791	21	9 9.4	8.7
3 Juno	5.33	0.32	215.99869	247.99832	169.85219	12.99149	0.2569650	0.22614576	2.6681511	21	6 8.4	10.1
4 Vesta	3.20	0.32	312.77625	151.01769	103.80607	7.14154	0.0883491	0.27156941	2.3616497	21	3 8.4	6.0
5 Astraea	6.9	X	113.33403	358.66055	141.57086	5.36759	0.1906142	0.23867674	2.5739256	21	6 20.3	10.7
6 Hebe	5.71	0.24	295.25633	239.60296	138.64186	14.73993	0.2032400	0.26092422	2.4254544	21	7 15.9	8.4
7 Iris	5.6	X	354.19587	145.31245	259.52643	5.51808	0.2294011	0.26738988	2.3861958	21	—	—
8 Flora	6.49	0.28	75.94885	285.53222	110.87607	5.88901	0.1559638	0.30169244	2.2017082	21	—	—
9 Metis	6.28	0.17	130.99759	6.21760	68.90066	5.57657	0.1234317	0.26748073	2.3856554	21	4 7.0	9.5
10 Hygiea	5.5	X	293.54863	312.45437	283.19409	3.83112	0.1118138	0.17693114	3.1424367	21	1 28.3	9.9
11 Parthenope	6.5	X	124.21483	195.50804	125.52825	4.63184	0.0996806	0.25656855	2.4528281	21	—	—
12 Victoria	7.24	0.22	354.41659	69.71973	235.39271	8.37250	0.2207064	0.27640940	2.3340000	21	7 26.8	8.7
13 Egeria	6.8	X	18.50684	80.23237	43.21253	16.53325	0.0854273	0.23827688	2.5768043	21	—	—
14 Irene	6.5	X	354.61094	97.73977	86.12016	9.12040	0.1660513	0.23693665	2.5865124	21	1 26.8	9.3
15 Eunomia	5.28	0.23	106.67358	98.62116	292.93365	11.75272	0.1864603	0.22921172	2.6443047	21	1 21.3	8.6
16 Psyche	5.90	0.20	85.79198	229.15272	150.03293	3.09669	0.1338469	0.19711204	2.9241116	21	—	—
17 Thetis	7.7	X	146.79020	135.81730	125.54128	5.59293	0.1330873	0.25387932	2.4701187	21	12 20.9	11.6
18 Melpomene	6.51	0.25	133.73533	228.10736	150.36190	10.13239	0.2177373	0.28328529	2.2960783	21	2 1.1	9.5
19 Fortuna	7.13	0.10	43.51982	182.40371	211.05618	1.57276	0.1569143	0.25820991	2.4424224	21	—	—
20 Massalia	6.50	0.25	327.76563	257.56077	205.98586	0.70884	0.1428739	0.26372382	2.4082587	21	—	—
21 Lutetia	7.35	0.11	191.58288	250.09397	80.86013	3.06359	0.1634741	0.25930822	2.4355209	21	1 30.4	11.1
22 Kalliope	6.45	0.21	353.82463	357.54080	65.99507	13.70186	0.0981616	0.19860667	2.9094227	21	12 30.5	10.1
23 Thalia	7.0	X	161.00670	60.82445	66.81627	10.10557	0.2338528	0.23140763	2.6275496	21	7 22.1	11.6
24 Themis	7.08	0.19	136.84280	107.35828	35.91738	0.75156	0.1236742	0.17727336	3.1383911	21	7 12.4	12.0
25 Phocaea	7.8	X	24.96463	90.28931	21.10400	21.60688	0.2551021	0.26508415	2.4000127	21	10 17.4	10.2
26 Proserpina	7.5	X	287.79140	193.61344	45.76613	3.56240	0.0895356	0.22776564	2.6554854	21	1 21.2	11.2
27 Euterpe	7.0	X	194.82562	356.33448	94.78758	1.58361	0.1727049	0.27415034	2.3468042	21	7 3.5	10.7
28 Bellona	7.2	X	84.13076	343.89057	144.28848	9.43059	0.1515904	0.21319658	2.7751251	21	4 28.2	10.9
29 Amphitrite	5.85	0.20	117.52768	63.16650	356.32897	6.08256	0.0731932	0.24137414	2.5547136	21	2 23.4	9.2
30 Urania	7.5	X	246.10796	87.20055	307.46933	2.09597	0.1278400	0.27098696	2.3650325	21	6 14.6	10.9
31 Euphrosyne	6.8	X	227.69546	61.62215	30.96553	26.26226	0.2185970	0.17530499	3.1618398	21	8 12.9	12.5
32 Pomona	7.6	X	222.08590	338.83092	220.38016	5.52197	0.0817651	0.23690323	2.5867556	21	12 24.8	11.1
33 Polhymnia	8.55	0.33	143.73544	338.46853	8.44754	1.85286	0.3316350	0.20222222	2.8746400	21	1 28.5	13.3
34 Circe	8.6	X	306.19049	330.30480	184.33776	5.49674	0.1064767	0.22378191	2.6869076	21	—	—
35 Leukothea	8.6	X	7.38068	213.44976	353.71488	7.93348	0.2249756	0.19033959	2.9930683	21	3 28.6	11.3
36 Atalante	8.6	X	112.90074	47.79129	358.19927	18.37222	0.3053407	0.21646367	2.7471310	21	3 9.7	12.6
37 Fides	7.29	0.24	165.35030	62.65673	7.25901	3.07134	0.1757982	0.22962247	2.6411504	21	5 10.3	11.5
38 Leda	8.5	X	178.95126	169.26216	295.72642	6.97001	0.1540202	0.21729594	2.7401120	21	7 6.9	12.8
39 Laetitia	6.1	X	112.33328	209.47377	156.94027	10.37047	0.1116871	0.21379445	2.7699489	21	—	—
40 Harmonia	7.1	X	339.49587	268.70840	94.17740	4.25588	0.0468448	0.28860621	2.2677696	21	10 4.5	9.5
41 Daphne	7.12	0.10	306.16041	45.92168	178.05623	15.78873	0.2747274	0.21474873	2.7617370	21	—	—
42 Isis	7.5	X	50.21002	237.14770	84.18624	8.51273	0.2228265	0.25832926	2.4416701	21	12 9.2	10.9
43 Ariadne	7.93	0.11	18.92272	16.39165	264.80292	3.47082	0.1687072	0.30132602	2.2034927	21	8 17.4	9.5
44 Nysa	7.03	0.46	290.69243	344.20070	131.49814	3.71172	0.1487284	0.26141112	2.4224418	21	12 10.9	9.3
45 Eugenia	7.46	0.07	214.60251	87.76098	147.59530	6.60547	0.0837683	0.21968516	2.7202088	21	—	—
46 Hestia	8.36	0.06	266.42682	177.39425	181.07985	2.35051	0.1726543	0.24571239	2.5245541	21	5 16.4	11.9
47 Aglaja	7.84	0.16	213.11309	314.97477	3.05410	4.97533	0.1300407	0.20143254	2.8821481	21	2 11.3	12.5
48 Doris	7.1	X	213.72246	252.56330	183.52219	6.54745	0.0714552	0.17954248	3.1118924	21	7 7.5	11.8
49 Pales	7.8	X	24.29737	113.06049	285.05515	3.20169	0.2213585	0.18082739	3.0971333	21	—	—
50 Virginia	9.2	X	341.51490	199.89050	173.46976	2.83891	0.2854790	0.22835649	2.6509028	21	10 17.4	10.6
51 Nemausa	7.35	0.08	313.41594	1.99787	175.95638	9.97853	0.0676418	0.27087106	2.3657071	21	—	—
52 Europa	6.31	0.18	22.41336	343.20907	128.59896	7.47860	0.1106861	0.18098348	3.0953523	21	—	—
53 Kalyppo	8.9	X	249.70299	313.83981	143.45848	5.18053	0.2028216	0.23219634	2.6215962	21	9 1.8	12.7
54 Alexandra	7.8	X	194.80087	345.14692	313.24522	11.79832	0.1971103	0.22070550	2.7118185	21	1 2.2	12.4
55 Pandora	7.7	X	172.95083	5.38239	10.36049	7.18094	0.1436023	0.21497296	2.7598162	21	3 13.5	12.1
56 Melete	8.5	X	75.17695	104.90525	192.95137	8.08216	0.2381195	0.23569418	2.5955943	21	12 4.3	12.6
57 Mnemosyne	7.0	X	284.55300	210.18358	198.96664	15.20775	0.1107992	0.17551515	3.1593153	21	8 19.2	11.6
58 Concordia	9.0	X	114.30142	32.69937	161.07072	5.06813	0.0429210	0.22184797	2.7025003	21	8 13.0	12.8
59 Elpis	8.0	X	336.03919	210.62937	169.92848	8.64831	0.1176722	0.22045754	2.7138515	21	10 12.9	11.0
60 Echo	8.21	0.27	61.56662	271.15919	191.53719	3.60065	0.1849755	0.26635009	2.3924020	21	1 31.6	10.1
61 Danaë	7.6	X	65.05485	12.55906	333.57178	18.21128	0.1647814	0.19124921	2.9835704	21	—	—
62 Erato	8.7	X	21.35584	277.29198	125.12294	2.23663	0.1677504	0.17811322	3.1285177	21	—	—
63 Ausonia	7.55	0.25	352.02006	296.19056	337.72171	5.77681	0.1270152	0.26595271	2.3947845	21	6 2.1	9.9
64 Angelina	7.67	0.48	216.54560	180.19234	309.07528	1.30724	0.1251574	0.22415138	2.6839542	21	9 13.9	11.5
65 Cybele	6.62	0.01	25.04424	103.01886	155.60321	3.56445	0.1128469	0.15530026	3.4278457	21	7 13.7	11.1
66 Maja	9.5	X	202.53418	43.79995	7.49521	3.04636	0.1732328	0.22916064	2.6446977	21	5 20.5	13.8
67 Asia	8.3	X	127.84670	106.96408	202.40531	6.02838	0.1849614	0.26152850	2.4217169	21	—	—
68 Leto	6.78	0.05	71.42484	304.52635	44.07506	7.96120	0.1850178	0.21237602	2.7822687	21	—	—
69 Hesperia	7.05	0.19	94.81141	288.98016	184.98440	8.59269	0.1701305	0.19202369	2.9755426	21	4 26.5	11.2
70 Panopaea	8.11	0.14	256.54747	255.59070	47.67146	11.59319	0.1805860	0.23295423	2.6159071	21	3 3.5	12.4
71 Niobe	7.30	0.40	76.02544	267.27264	316.00239	23.26475	0.1739918	0.21513461	2.7584336	21	8 19.0	11.1
72 Feronia	9.1	X	237.70851	103.03461	207.94378	5.41576	0.1205213	0.28886271	2.2664270	21	2 10.9	12.5
73 Klytia	9.0	X	335.05568	55.27175	6.85047	2.37017	0.0416191	0.22670809	2.6637372	21	12 4.5	12.3
74 Galatea	8.7	X	84.63931	174.61446	197.13234	4.07036	0.2360745	0.21247809	2.7813775	21	—	—
75 Eurydike	8.96	0.23	142.05926	339.41000	359.32650	4.99182	0.3036110	0.22530011	2.6748234	21	1 12.7	13.2
76 Freia	8.0	X	49.30461	252.19641	204.28069	2.12144	0.1662011	0.15619827	3.4146949	21	1 30.8	12.0
77 Frigga	8.52	0.16	104.33330	61.72050	1.13817	2.42290	0.1327881	0.22605838	2.6688886	21	2 21.3	11.9
78 Diana	8.09	0.08	144.27887	152.80512	333.39223	8.70216	0.2066545	0.23245704	2.6196358	21	7 4.9	12.6
79 Eurynome	7.96	0.25	74.59989	201.54122	206.52441	4.61222	0.1902147	0.25774994	2.4453273	21	—	—
80 Sappho	8.0	X	324.14519	139.51940	218.67268	8.67497	0.2004561	0.28327970	2.2961085	21	8 9.9	10.0

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Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
81 Terpsichore	8.6	X	150.88346	51.54622	0.94745	7.80489	0.2111564	0.20456788	2.8526233	21	4 9.1	13.3
82 Alkmene	8.40	0.28	347.51497	111.08000	25.43991	2.82616	0.2204195	0.21449054	2.7639528	21	—	—
83 Beatrix	8.8	X	77.33128	168.81828	27.71930	4.96376	0.0811889	0.25984468	2.4321676	21	7 5.9	11.8
84 Klio	9.4	X	324.57703	15.10873	327.51522	9.31764	0.2364519	0.27147317	2.3622079	21	7 14.5	11.4
85 Io	7.7	X	43.47630	122.79269	203.06157	11.96160	0.1943143	0.22820291	2.6520921	21	11 28.2	11.3
86 Semele	8.7	X	135.86448	308.86617	86.08665	4.82027	0.2154838	0.17999410	3.1066849	21	3 12.6	13.7
87 Sylvia	6.8	X	213.92508	263.76672	73.02305	10.87582	0.0938051	0.15177371	3.4807408	21	3 16.6	12.3
88 Thisbe	7.04	0.14	219.90911	36.45320	276.45181	5.21308	0.1618117	0.21379729	2.7699245	21	2 6.5	11.6
89 Julia	6.60	0.15	331.37922	45.10484	311.55229	16.13004	0.1850915	0.24187070	2.5512159	21	8 22.2	9.0
90 Antiope	8.1	X	286.06844	245.10457	69.95115	2.20692	0.1667602	0.17652807	3.1472183	21	4 19.4	12.5
91 Aegina	8.9	X	355.87560	74.37527	10.43986	2.10337	0.1066418	0.23653303	2.5894539	21	—	—
92 Undina	6.7	X	318.88211	238.65519	101.58206	9.92959	0.1053324	0.17315365	3.1879754	21	7 15.1	10.6
93 Minerva	7.9	X	289.14697	275.09079	4.02237	8.55813	0.1390264	0.21546425	2.7556194	21	3 9.4	11.7
94 Aurora	7.6	X	89.56202	60.27466	2.55367	7.97033	0.0945518	0.17562267	3.1580258	21	2 7.7	11.9
95 Arethusa	8.0	X	221.34444	153.70490	243.01533	12.99745	0.1531028	0.18383318	3.0632806	21	5 23.0	12.9
96 Aegle	7.7	X	252.71882	208.33617	321.49076	15.98259	0.1413276	0.18517456	3.0484693	21	12 6.1	12.2
97 Klotho	7.8	X	131.94866	268.59338	159.61993	11.77927	0.2574714	0.22614812	2.6681325	21	4 18.5	12.2
98 Ianthe	8.9	X	304.90037	158.54335	353.90145	15.57623	0.1873363	0.22374844	2.6871756	21	—	—
99 Dike	9.5	X	65.42665	195.82936	41.47186	13.84540	0.1955716	0.22633919	2.6666307	21	9 8.7	13.3
100 Hekate	7.6	X	32.22911	183.94552	127.17457	6.43338	0.1693938	0.18152955	3.0891417	21	10 14.7	11.5
101 Helena	8.33	0.35	303.15604	348.41324	343.38449	10.19762	0.1408740	0.23746333	2.5826865	21	5 30.9	11.6
102 Miriam	9.3	X	72.67989	147.09632	120.79063	5.17263	0.2510503	0.22686979	2.6624713	21	—	—
103 Hera	7.6	X	172.15520	188.94150	136.07626	5.41865	0.0792173	0.22179606	2.7029219	21	1 3.3	11.6
104 Klymene	8.4	X	59.72868	31.72677	41.66634	2.78947	0.1611824	0.17653688	3.1471136	21	1 14.5	12.1
105 Artemis	8.57	0.10	21.89562	57.12661	188.23786	21.44177	0.1772633	0.26953396	2.3735245	21	6 23.1	11.3
106 Dione	7.5	X	2.57622	331.25282	62.00090	4.57637	0.1591728	0.17389178	3.1789475	21	12 5.3	11.2
107 Camilla	7.08	0.08	88.03322	305.94952	172.58416	10.00384	0.0649332	0.15125395	3.4887102	21	4 12.9	12.0
108 Hecuba	8.0	X	107.24458	208.50747	349.90377	4.22282	0.0564434	0.16858049	3.2453722	21	8 11.2	12.7
109 Felicitas	8.75	0.04	70.08722	57.60342	2.76174	7.84512	0.2993957	0.22275202	2.6951831	21	1 22.3	11.2
110 Lydia	7.80	0.20	22.56244	282.05219	56.78274	5.95971	0.0804849	0.21823019	2.7322860	21	10 28.3	11.1
111 Ate	8.2	X	253.56955	167.93078	305.69663	4.93246	0.1023984	0.23593015	2.5938633	21	10 9.6	11.7
112 Iphigenia	9.8	X	276.54423	17.37954	323.40811	2.59960	0.1282822	0.25970647	2.4330304	21	5 8.1	13.0
113 Amalthea	8.74	0.35	351.33114	78.64550	123.44589	5.04306	0.0863644	0.26908463	3.2437166	21	2 18.6	11.2
114 Cassandra	8.3	X	241.34071	352.77635	164.06762	4.94468	0.1378682	0.22521657	2.6754848	21	11 16.3	12.0
115 Thyra	7.51	0.12	231.78089	96.98424	308.79681	11.59417	0.1932800	0.26861367	2.3789427	21	6 7.6	11.4
116 Sirona	7.8	X	33.71224	94.34164	63.70278	3.56382	0.1416234	0.21418540	2.7665773	21	3 12.5	10.7
117 Lomia	8.0	X	302.99473	49.75286	348.63376	14.92300	0.0249896	0.19024858	2.9940228	21	9 15.4	12.0
118 Peitho	8.9	X	157.65181	33.22161	47.67363	7.74621	0.1646699	0.25919831	2.4362094	21	5 15.4	12.7
119 Althaea	8.3	X	181.04560	171.39177	203.63359	5.78648	0.0810656	0.23764488	2.5813709	21	3 12.0	12.1
120 Lachesis	7.8	X	16.93646	234.18317	341.16491	6.96384	0.0516122	0.17908642	3.1171733	21	4 28.9	12.0
121 Hermione	7.3	X	342.54683	296.74368	72.91613	7.56503	0.1271873	0.15330085	3.4575861	21	9 30.9	11.6
122 Gerda	7.7	X	110.58661	321.05578	178.12709	1.64080	0.0309604	0.17039188	3.2223308	21	5 28.4	12.2
123 Brunhild	8.9	X	138.33831	125.50316	307.72387	6.41437	0.1207788	0.22286680	2.6942577	21	4 11.2	13.0
124 Alkeste	8.11	0.19	38.67450	62.40323	187.95609	2.95753	0.0759328	0.23094963	2.6310223	21	7 21.4	11.3
125 Liberatrix	9.04	0.33	337.35633	110.26178	168.98330	4.66478	0.0779956	0.21696542	2.7428941	21	5 24.6	12.4
126 Velleda	9.2	X	48.54175	327.88026	23.24374	2.92373	0.1054762	0.25881673	2.4386033	21	12 29.4	12.4
127 Johanna	8.6	X	97.09483	93.25072	31.13875	8.24527	0.0665918	0.21560060	2.7544575	21	4 23.6	12.3
128 Nemesis	7.7	X	245.19815	303.56486	76.23344	6.24565	0.1279911	0.21631592	2.7483818	21	5 26.9	11.6
129 Antigone	7.07	0.33	102.44684	110.91868	135.66493	12.27161	0.2128931	0.20295820	2.8676863	21	10 26.5	11.8
130 Elektra	7.2	X	88.47018	237.58866	145.00871	22.78182	0.2092284	0.17827484	3.1266265	21	1 2.3	11.5
131 Vala	9.9	X	36.87296	160.83675	65.65162	4.96089	0.0672645	0.25993880	2.4315805	21	6 12.8	12.6
132 Aethra	9.0	X	99.56440	255.25029	258.38381	24.98357	0.3893081	0.23387747	2.6090183	21	7 9.7	13.6
133 Cyrene	7.98	0.13	286.43729	290.19983	319.00326	7.21395	0.1349677	0.18372457	3.0644877	21	2 2.3	12.5
134 Sophrosyne	8.76	0.28	301.59961	85.21176	345.85854	11.61242	0.1146798	0.24011574	2.5636317	21	10 20.1	11.8
135 Hertha	8.2	X	186.32181	340.26722	343.56658	2.30399	0.2069236	0.26038364	2.4288102	21	1 18.9	12.0
136 Austria	9.7	X	85.40297	132.43781	186.41011	9.58045	0.0848421	0.28509390	2.2863573	21	—	—
137 Meliboea	8.2	X	181.76048	107.48538	202.18886	13.42750	0.2117853	0.17837466	3.1254600	21	1 7.9	13.7
138 Tolosa	8.8	X	91.59383	260.50157	54.73365	3.20246	0.1624443	0.25724223	2.4485438	21	—	—
139 Juewa	8.0	X	82.64318	165.65053	1.81485	10.90991	0.1742801	0.21247572	2.7813982	21	6 17.2	11.9
140 Siwa	8.4	X	232.81217	196.89388	107.17565	3.18539	0.2141499	0.21795476	2.7345874	21	2 7.1	13.0
141 Lumen	8.5	X	340.70880	57.62287	318.47337	11.89956	0.2139067	0.22637364	2.6663602	21	10 8.0	11.1
142 Polana	10.3	X	252.88343	291.77060	291.22561	2.23934	0.1347183	0.26201107	2.4187425	21	—	—
143 Adria	9.1	X	253.15357	252.24422	332.97436	11.44442	0.0737271	0.21475995	2.7616408	21	—	—
144 Vibia	7.91	0.17	189.57810	294.61611	76.18168	4.81410	0.2351409	0.22787094	2.6546672	21	3 24.8	12.6
145 Adeona	8.2	X	278.21873	45.24737	77.33719	12.62066	0.1462437	0.22574712	2.6712912	21	11 21.7	11.5
146 Lucina	8.20	0.11	235.34185	145.65553	83.94842	13.09927	0.0666207	0.21990220	2.7184186	21	—	—
147 Protogeneia	8.7	X	51.68574	101.20118	248.25225	1.93334	0.0231565	0.17761382	3.1343793	21	12 2.8	12.9
148 Gallia	7.6	X	175.07142	252.65216	145.00384	25.29420	0.1876116	0.21372934	2.7705114	21	4 18.5	12.6
149 Medusa	10.5	X	113.14357	251.29640	159.59330	0.93962	0.0651780	0.30730536	2.1748166	21	1 19.8	12.7
150 Nuwa	8.4	X	120.03206	153.67041	206.12403	2.20081	0.1235622	0.19111670	2.9849493	21	—	—
151 Abundantia	9.2	X	204.49476	133.41406	38.74243	6.43157	0.0350975	0.23629489	2.5911934	21	11 4.9	12.6
152 Atala	8.3	X	12.25386	59.01859	39.89229	12.12155	0.0813486	0.17719870	3.1392725	21	—	—
153 Hilda	7.6	X	274.45810	39.24212	228.10425	7.82505	0.1401292	0.12423519	3.9777697	21	2 15.7	13.5
154 Bertha	7.7	X	74.36407	160.85447	36.71660	20.97108	0.0766541	0.17250270	3.1959902	21	7 1.8	12.5
155 Scylla	11.2	X	260.73672	46.38161	40.64810	11.35086	0.2735091	0.21453400	2.7635795	21	8 26.8	15.5
156 Xanthippe	8.6	X	296.78057	338.28223	241.82376	9.77789	0.2264755	0.21866321	2.7286777	21	—	—
157 Dejanira	11.2	X	19.75423	46.44778	62.04175	12.16039	0.1975294	0.23775042	2.5806069	21	—	—
158 Koronis	9.2	X	16.37478	146.48707	277.71055	1.00557	0.0524052	0.20286799	2.8685364	21	—	—
159 Aemilia	8.3	X	178.71112	333.28560	134.10979	6.13147	0.1057099	0.18015739	3.1048073	21	7 8.9	13.1
160 Una	9.1	X	179.40067	51.85873	8.58655	3.82470	0.0672630	0.21894831	2.7263084	21	5 8.9	13.0

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
161 Athor	9.15	0.13	112.50500	294.71711	18.55938	9.05747	0.1372651	0.26854947	2.3793218	21	—	—
162 Laurentia	8.9	X	279.06988	115.84649	35.45383	6.09189	0.1817573	0.18829226	3.0147253	21	12 14.2	12.6
163 Erigone	9.47	-0.04	46.75485	298.70105	160.04216	4.81608	0.1921400	0.27068611	2.3667846	21	—	—
164 Eva	8.8	X	274.97615	284.04651	76.80596	24.47643	0.3471489	0.23096915	2.6308741	21	5 14.7	13.3
165 Loreley	7.9	X	89.20793	345.06636	302.44714	11.23847	0.0846282	0.17855905	3.1233080	21	11 7.1	12.7
166 Rhodope	9.9	X	278.71187	264.14368	128.91480	12.02974	0.2116690	0.22391960	2.6858060	21	7 11.0	13.6
167 Urda	9.2	X	48.93801	129.70171	166.09662	2.21654	0.0380296	0.20438097	2.8543622	21	9 30.2	13.0
168 Sibylla	8.1	X	96.03335	175.60683	205.94025	4.66866	0.0744274	0.15893841	3.3753344	21	—	—
169 Zelia	9.5	X	19.72224	334.73523	354.72714	5.50126	0.1311022	0.27215903	2.3582376	21	10 24.4	11.9
170 Maria	9.4	X	164.08120	158.05653	301.29710	14.37862	0.0633163	0.24161128	2.5530417	21	6 11.5	13.2
171 Ophelia	8.6	X	332.61580	55.78050	100.47730	2.54660	0.1320321	0.17785897	3.1314984	21	—	—
172 Baucis	8.7	X	298.14484	359.77178	331.91850	10.02090	0.1145995	0.26856200	2.3792478	21	5 25.4	11.9
173 Ino	7.66	0.01	207.68733	228.81382	148.17224	14.19972	0.2093790	0.21708579	2.7418800	21	4 18.0	12.6
174 Phaedra	8.3	X	336.58793	289.65611	327.65820	12.12423	0.1409972	0.20369886	2.8607307	21	4 9.3	12.0
175 Andromache	8.4	X	348.58060	319.89119	21.28151	3.21813	0.2335936	0.17319820	3.1874286	21	9 2.9	11.5
176 Iduna	8.2	X	117.23431	188.58083	200.47332	22.67224	0.1711982	0.17360491	3.1824485	21	2 3.8	13.3
177 Irma	9.6	X	65.75861	39.41027	346.97729	1.38226	0.2338620	0.21358430	2.7717656	21	—	—
178 Belisana	9.4	X	220.49495	211.53182	51.08922	1.89344	0.0425407	0.25532525	2.4607842	21	—	—
179 Klytaemnestra	8.1	X	64.82650	103.87849	251.86524	7.81780	0.1101160	0.19233660	2.9723145	21	—	—
180 Garumna	10.2	X	336.90470	176.07963	311.87290	0.86778	0.1675917	0.21949605	2.7217710	21	—	—
181 Eucharis	7.9	X	353.34741	318.88650	143.01817	18.89342	0.2071196	0.17835284	3.1257148	21	—	—
182 Elsa	9.1	X	132.12640	310.78006	107.18283	2.00542	0.1866916	0.26250724	2.4156937	21	3 23.6	12.5
183 Istria	9.6	X	315.36448	263.92162	141.87736	26.39968	0.3487270	0.21089297	2.7952971	21	9 9.4	12.1
184 Dejopeja	8.4	X	70.17574	210.48109	331.56220	1.14333	0.0655952	0.17331976	3.1859381	21	6 4.5	12.8
185 Eunike	7.7	X	359.52077	223.52468	153.75956	23.25573	0.1274531	0.21756104	2.7378856	21	11 22.8	11.5
186 Celuta	9.1	X	44.30451	315.38421	14.72152	13.18675	0.1500179	0.27160791	2.3614266	21	12 2.3	12.3
187 Lamberta	8.3	X	251.48751	196.78769	21.68239	10.58206	0.2408686	0.21872190	2.7281896	21	—	—
188 Menippe	9.3	X	13.43569	70.02294	240.85976	11.69994	0.1798538	0.21466833	2.7624265	21	9 8.6	12.5
189 Phthia	9.3	X	78.95892	168.55980	203.35300	5.17465	0.0357419	0.25693675	2.4504842	21	—	—
190 Ismene	7.7	X	358.42039	271.04914	175.44604	6.17592	0.1672305	0.12368350	3.9895893	21	—	—
191 Kolga	9.0	X	327.45973	225.95642	159.18629	11.52287	0.0884655	0.19992493	2.8966193	21	10 2.9	12.6
192 Nausikaa	7.13	0.03	209.83707	30.66313	343.10072	6.79948	0.2456386	0.26465078	2.4026320	21	4 5.5	11.5
193 Ambrosia	9.8	X	33.28396	82.52824	349.51045	11.99412	0.2973506	0.23507946	2.6001172	21	—	—
194 Prokne	7.8	X	101.97591	163.05492	159.26445	18.51145	0.2378811	0.23296689	2.6158123	21	—	—
195 Eurykleia	9.2	X	118.27366	117.95348	6.97427	6.97150	0.0431510	0.20206531	2.8761280	21	5 17.5	13.3
196 Philomela	6.5	X	232.97868	202.01028	72.31550	7.26099	0.0154641	0.17925569	3.1152107	21	1 17.4	10.9
197 Arete	9.4	X	52.45560	245.83525	81.58482	8.79122	0.1637242	0.21754150	2.7380496	21	12 4.2	13.1
198 Ampella	8.5	X	230.53293	89.17865	268.24705	9.32099	0.2275229	0.25568163	2.4584971	21	3 31.6	12.9
199 Byblis	8.5	X	41.29502	180.28318	88.55163	15.46833	0.1817069	0.17469732	3.1691677	21	9 8.9	12.8
200 Dynamene	8.4	X	40.45548	86.82383	324.26957	6.89979	0.1323262	0.21757075	2.7378042	21	—	—
201 Penelope	8.43	0.24	124.13848	180.85006	156.91702	5.75602	0.1792953	0.22474174	2.6792520	21	—	—
202 Chryseis	7.5	X	342.32896	0.01127	136.72271	8.85063	0.1040418	0.18317342	3.0706318	21	—	—
203 Pompeja	8.8	X	76.55125	59.90976	347.71782	3.17219	0.0590309	0.21757252	2.7377893	21	—	—
204 Kallisto	8.9	X	277.00901	55.37311	205.08440	8.28561	0.1738779	0.22572802	2.6714419	21	1 23.6	13.2
205 Martha	9.5	X	222.94580	176.07952	211.77532	10.69707	0.0366968	0.21308111	2.7761276	21	5 20.7	13.4
206 Hersilia	8.7	X	16.92204	302.76589	145.03947	3.77973	0.0390536	0.21719906	2.7409267	21	—	—
207 Hedda	10.1	X	189.02515	192.90851	29.14752	3.80251	0.0298413	0.28564216	2.2834307	21	12 31.4	13.0
208 Lacrimosa	9.2	X	203.59815	115.00668	4.16585	1.74569	0.0104130	0.19986364	2.8972114	21	8 26.2	13.1
209 Dido	8.2	X	268.13965	249.65209	0.64004	7.16956	0.0557771	0.17639289	3.1488260	21	1 26.8	12.8
210 Isabella	9.5	X	188.85062	14.68107	32.56524	5.26079	0.1240715	0.21963596	2.7206150	21	5 3.6	13.8
211 Isolda	7.89	0.12	234.88751	173.18269	263.60048	3.87919	0.1583149	0.18529517	3.0471464	21	7 23.6	12.7
212 Medea	8.3	X	346.39548	105.03382	312.92306	4.27900	0.1024462	0.17927722	3.1149612	21	12 7.4	12.2
213 Lilaea	8.9	X	227.84983	162.34032	122.02781	6.80128	0.1444984	0.21565545	2.7539904	21	1 12.4	13.4
214 Aschera	9.3	X	224.90867	134.06346	341.92875	3.43791	0.0300484	0.23336427	2.6128420	21	9 18.0	12.8
215 Oenone	9.5	X	115.35971	317.07667	24.90306	1.68175	0.0339466	0.21416246	2.7667749	21	—	—
216 Kleopatra	7.30	0.29	239.80092	179.93345	215.34735	13.11625	0.2512989	0.21121004	2.7924989	21	5 30.8	12.0
217 Eudora	9.9	X	354.72242	155.28527	162.56829	10.52238	0.3108380	0.20297298	2.8675472	21	8 16.8	11.7
218 Bianca	8.60	0.32	217.96494	62.59792	170.57026	15.19815	0.1170552	0.22628935	2.6670222	21	—	—
219 Thusnelda	9.2	X	9.40932	142.62925	200.78278	10.86413	0.2235042	0.27288273	2.3540662	21	11 14.6	11.3
220 Stephania	11.2	X	262.27385	78.67451	257.86820	7.59435	0.2576220	0.27392593	2.3480858	21	3 30.0	15.1
221 Eos	7.67	0.13	47.46157	192.25899	141.73265	10.89324	0.1023953	0.18875937	3.0097496	21	11 24.7	12.0
222 Lucia	9.6	X	307.02543	181.59080	80.12829	2.14897	0.1310674	0.17698541	3.1417943	21	3 15.7	14.0
223 Rosa	9.8	X	271.65965	65.23689	47.53878	1.92367	0.1195439	0.18138652	3.0907655	21	10 25.2	13.8
224 Oceana	8.7	X	53.90740	284.17662	352.74909	5.84496	0.0450174	0.22888096	2.6468517	21	9 15.3	12.0
225 Henrietta	8.8	X	83.75551	103.76624	197.04583	20.85495	0.2632721	0.15780478	3.3914801	21	12 6.7	14.5
226 Weringia	9.9	X	52.13608	153.97670	134.94601	15.97253	0.2043424	0.22070368	2.7118333	21	10 28.7	13.9
227 Philosophia	9.1	X	26.06826	267.48776	326.20741	9.15480	0.1908003	0.17526756	3.1622899	21	6 19.7	12.7
228 Agathe	12.3	X	182.33888	19.08651	313.29919	2.53662	0.2418730	0.30168545	2.2017422	21	1 22.1	15.7
229 Adelinda	9.2	X	0.05375	309.54174	27.84246	2.07652	0.1386685	0.15527647	3.4281958	21	9 16.0	13.2
230 Athamantis	7.35	0.27	237.88706	139.92222	239.84214	9.45103	0.0620790	0.26815979	2.3816263	21	5 22.2	10.5
231 Vindobona	9.6	X	7.01836	269.13456	350.49850	5.10220	0.1517084	0.19727970	2.9224547	21	6 14.7	12.9
232 Russia	10.4	X	289.02814	51.92185	152.20136	6.06588	0.1745547	0.24160384	2.5530941	21	—	—
233 Asterope	8.3	X	186.32154	126.26541	221.95210	7.68990	0.0994231	0.22709401	2.6607185	21	2 13.1	12.5
234 Barbara	9.1	X	138.60738	192.26379	144.50036	15.37624	0.2450999	0.26740473	2.3861075	21	—	—
235 Carolina	8.9	X	182.13624	207.98958	66.01001	9.03005	0.0616055	0.20146010	2.8818853	21	—	—
236 Honoria	8.18	-0.02	314.12080	174.45724	185.82492	7.69547	0.1912563	0.21049046	2.7988596	21	7 21.9	11.6
237 Coelestina	9.1	X	278.33901	200.38224	84.23542	9.74681	0.0711007	0.21460862	2.7629389	21	3 16.5	13.2
238 Hypatia	8.1	X	168.18278	210.55967	183.86275	12.41432	0.0901779	0.19894534	2.9061199	21	3 29.1	12.4
239Adrastea	10.5	X	221.13262	209.90253	180.62526	6.17709	0.2358252	0.19306302	2.9648541	21	5 12.2	15.6
240 Vanadis	9.1	X	107.37214	300.95537	115.06785	2.10559	0.2080448	0.22664013	2.6642697	21	2 27.7	12.5

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
241 Germania	7.8	X	251.26942	80.51809	270.33526	5.50538	0.1036259	0.18526665	3.0474591	21	4 29.4	12.4
242 Kriemhild	9.3	X	357.98371	279.16691	206.89996	11.34964	0.1218574	0.20353699	2.8622472	21	—	—
243 Ida	9.9	X	42.42635	113.94019	323.63414	1.13018	0.0436721	0.20355845	2.8620461	21	—	—
244 Sita	11.9	X	239.24175	166.40543	208.95959	2.84562	0.1374578	0.30747402	2.1740212	21	5 8.7	14.7
245 Vera	7.8	X	83.77231	331.64484	61.05894	5.17785	0.1970214	0.18076195	3.0978808	21	1 4.7	11.7
246 Asporina	8.4	X	214.13715	96.21422	162.27952	15.62108	0.1091465	0.22282074	2.6946289	21	—	—
247 Eukrate	8.2	X	106.28071	55.35429	0.05000	24.95487	0.2454473	0.21716974	2.7411734	21	3 9.0	12.1
248 Lameia	10.3	X	0.31446	11.47283	246.78058	4.06088	0.0657449	0.25385028	2.4703071	21	5 29.5	12.9
249 Ilse	11.3	X	348.31220	42.04841	334.69020	9.62257	0.2173464	0.26884456	2.3775804	21	11 13.0	13.3
250 Bettina	7.4	X	15.79380	75.88990	23.81628	12.81775	0.1356376	0.17672649	3.1448622	21	—	—
251 Sophia	9.9	X	263.24803	287.73720	155.87199	10.54831	0.0941462	0.18033972	3.1027143	21	9 12.1	14.3
252 Clementina	9.7	X	83.12055	159.38433	201.93980	10.03414	0.0663484	0.17539064	3.1608104	21	—	—
253 Mathilde	10.3	X	221.44638	157.77194	179.53020	6.74088	0.2634182	0.22863507	2.6487491	21	3 5.7	15.1
254 Augusta	11.7	X	166.64370	233.09140	28.43457	4.51212	0.1218281	0.30318481	2.1944773	21	—	—
255 Oppavia	10.3	X	291.92487	155.16368	13.58943	9.46332	0.0789197	0.21659922	2.7459847	21	—	—
256 Walpurga	9.9	X	332.62049	47.46705	182.90866	13.32740	0.0655535	0.18970709	2.9997174	21	3 16.2	14.0
257 Silesia	9.4	X	348.26276	31.59894	34.05760	3.61326	0.1117008	0.17905320	3.1175588	21	12 20.7	13.3
258 Tyche	8.50	0.23	216.52626	155.63155	207.54129	14.32567	0.2047551	0.23311771	2.6146840	21	4 1.7	12.9
259 Aletheia	7.8	X	103.09525	167.03383	86.79867	10.80927	0.1298493	0.17786136	3.1314704	21	10 25.7	12.7
260 Huberta	9.1	X	28.88035	179.88028	164.94309	6.42012	0.1084335	0.15395758	3.4477466	21	11 7.1	13.7
261 Prymno	9.44	0.19	173.30090	66.55129	96.61059	3.63395	0.0890062	0.27663275	2.3327435	21	9 20.0	12.7
262 Valda	11.3	X	342.80738	26.09455	38.28953	7.66915	0.2112288	0.24170578	2.5523762	21	—	—
263 Dresda	10.2	X	180.04903	162.64020	216.14030	1.32064	0.0782579	0.20100796	2.8862053	21	3 20.8	14.5
264 Libussa	8.3	X	274.87526	340.20110	49.57922	10.42197	0.1369890	0.21057809	2.7980330	21	7 14.6	12.3
265 Anna	11.9	X	196.23881	151.57295	335.52771	25.64978	0.2673328	0.26190848	2.4193740	21	12 17.9	16.4
266 Aline	8.7	X	69.33497	151.71716	235.83873	13.39852	0.1540150	0.20971138	2.8057871	21	—	—
267 Tirza	10.2	X	350.96965	197.00036	73.73796	6.00303	0.0988301	0.21332691	2.7739947	21	6 1.7	13.4
268 Adorea	8.4	X	269.60077	68.55771	120.85420	2.44045	0.1367843	0.18121833	3.0926775	21	—	—
269 Justitia	9.7	X	278.69057	119.67960	156.71193	5.47838	0.2129738	0.23286968	2.6165402	21	2 10.3	13.8
270 Anahita	8.8	X	43.60178	80.47349	254.32652	3.67659	0.1503368	0.30245458	2.1980080	21	12 17.2	11.4
271 Penthesilea	9.9	X	225.35759	57.64873	335.35071	3.53984	0.1043552	0.18943723	3.0025655	21	5 24.5	14.6
272 Antonia	10.6	X	326.16178	69.02031	37.31469	4.43246	0.0284506	0.21295685	2.7772074	21	—	—
273 Atropos	10.5	X	246.43906	121.13639	158.91155	20.45080	0.1599392	0.26578875	2.3957692	21	1 15.0	14.7
274 Philagoria	10.0	X	18.89481	119.91625	92.78981	3.67750	0.1188660	0.18563453	3.0434316	21	5 3.5	13.6
275 Sapientia	8.9	X	326.24777	39.49980	134.04119	4.76413	0.1635427	0.21362108	2.7714474	21	—	—
276 Adelheid	8.7	X	167.40174	265.17046	211.13432	21.60948	0.0664107	0.17905793	3.1175039	21	7 4.0	13.8
277 Elvira	9.9	X	269.17456	136.90961	231.24399	1.16277	0.0925326	0.20125770	2.8838171	21	6 13.8	14.0
278 Paulina	9.4	X	72.09017	140.03933	61.98580	7.81554	0.1315859	0.21536678	2.7564508	21	7 14.3	13.1
279 Thule	8.5	X	278.25767	26.07047	71.88638	2.33451	0.0435172	0.11182225	4.2669468	21	10 17.3	14.3
280 Philia	11.0	X	44.95464	89.34436	9.85320	7.43940	0.1101733	0.19524422	2.9427312	21	1 15.5	14.6
281 Lucretia	12.02	0.28	350.21142	16.72678	31.34388	5.30219	0.1315323	0.30462294	2.1875650	21	—	—
282 Clorinde	11.0	X	52.24209	296.92547	144.88272	9.03674	0.0810855	0.27545223	2.3394038	21	—	—
283 Emma	8.6	X	98.73555	55.40858	303.90218	7.98919	0.1443411	0.18506230	3.0497020	21	—	—
284 Amalia	10.05	0.11	129.93022	57.97986	233.69822	8.05526	0.2219013	0.27210193	2.3585675	21	—	—
285 Regina	10.7	X	104.84593	14.34859	311.22913	17.61629	0.2045980	0.18173211	3.0868458	21	—	—
286 Iclea	9.0	X	3.76932	209.66362	148.93109	17.94297	0.0248465	0.17269273	3.1936453	21	10 19.6	13.6
287 Nephthys	8.30	0.22	258.88938	119.43613	142.31978	10.03557	0.0228181	0.27302271	2.3532615	21	1 11.6	11.4
288 Glauke	9.8	X	203.26823	84.60185	120.10474	4.33836	0.2058475	0.21507178	2.7589707	21	11 25.6	14.2
289 Nenetia	9.5	X	106.48358	190.51779	181.93123	6.67929	0.2015365	0.20200504	2.8767001	21	1 5.3	13.5
290 Bruna	12.0	X	307.70822	105.50272	10.33617	22.33677	0.2576905	0.27590759	2.3368291	21	—	—
291 Alice	11.5	X	290.17674	332.27894	161.58943	1.85706	0.0928609	0.29764870	2.2216044	21	—	—
292 Ludovica	10.0	X	108.98879	285.78519	43.48806	14.88615	0.0330989	0.24498944	2.5295182	21	—	—
293 Brasilia	10.2	X	114.61501	86.90577	61.29657	15.58076	0.1055367	0.20373024	2.8604370	21	6 21.2	14.5
294 Felicia	10.2	X	170.41625	186.15103	135.70813	6.26525	0.2332317	0.17575358	3.1564574	21	1 16.1	15.4
295 Theresia	9.9	X	286.16842	147.95419	275.95902	2.70095	0.1680924	0.21037195	2.7999106	21	9 6.7	13.4
296 Phaëtusa	12.6	X	85.74676	252.55719	121.56241	1.74802	0.1598076	0.29614472	2.2291197	21	—	—
297 Caecilia	9.1	X	72.63214	353.41068	331.88853	7.55368	0.1398509	0.17504864	3.1649259	21	12 12.9	13.8
298 Baptistina	11.2	X	10.59427	134.99400	8.15075	6.28558	0.0965071	0.28935722	2.2638440	21	—	—
299 Thora	11.3	X	146.63523	152.07611	241.46513	1.60612	0.0622506	0.25953313	2.4341136	21	2 19.6	14.5
300 Geraldina	9.8	X	263.12062	324.50800	42.64700	0.73191	0.0577272	0.17189847	3.2034753	21	6 10.6	14.4
301 Bavaria	10.3	X	151.92056	124.01343	142.29847	4.89827	0.0668258	0.21920156	2.7242082	21	12 27.2	14.3
302 Clarissa	11.1	X	328.85592	54.97651	7.73271	3.41366	0.1099079	0.26417089	2.4055409	21	12 6.7	13.5
303 Josephina	9.0	X	315.92348	66.68835	343.64399	6.88713	0.0567715	0.17856735	3.1232112	21	10 12.4	13.3
304 Olga	9.74	0.07	179.83291	172.42762	159.01613	15.84825	0.2215739	0.26444495	2.4038786	21	1 21.2	13.9
305 Gordonia	8.8	X	10.25636	260.72064	207.46697	4.44929	0.1959669	0.18142569	3.0903205	21	—	—
306 Unitas	8.8	X	218.95230	167.98839	141.85730	7.27801	0.1507279	0.27211859	2.3584712	21	1 26.1	12.3
307 Nike	10.1	X	169.10525	324.23285	100.95223	6.12612	0.1437038	0.19900033	2.9055846	21	5 10.8	14.8
308 Polyxo	8.17	0.21	102.83169	112.30580	181.60009	4.36274	0.0397018	0.21633263	2.7482403	21	12 5.7	12.0
309 Fraternitas	10.7	X	237.43952	310.96552	356.50530	3.71441	0.1136555	0.22648780	2.6654641	21	2 18.2	14.7
310 Margarita	10.1	X	163.88552	325.12270	229.06762	3.17021	0.1158894	0.21481977	2.7611281	21	10 10.9	14.5
311 Claudia	10.0	X	226.63766	84.47338	80.97205	3.22452	0.0052311	0.19999742	2.8959193	21	11 22.2	13.8
312 Pierretta	8.8	X	64.81340	262.53836	6.20103	9.03413	0.1604297	0.21232193	2.7827412	21	10 4.2	12.5
313 Chaldaea	9.0	X	27.07376	315.95067	176.57364	11.65144	0.1820948	0.26927403	2.3750517	21	—	—
314 Rosalia	9.9	X	71.65717	191.54829	169.97084	12.51500	0.1714113	0.17558037	3.1585329	21	—	—
315 Constantia	12.6	X	255.16018	172.97371	161.62724	2.42918	0.1683771	0.29376841	2.2411245	21	3 30.4	15.8
316 Goberta	10.1	X	266.32425	316.33536	123.80146	2.34713	0.1289462	0.17299983	3.1898647	21	9 5.8	14.5
317 Roxane	9.8	X	192.27886	187.05315	151.34186	1.76600	0.0851448	0.28500365	2.2868399	21	1 31.0	12.9
318 Magdalena	9.4	X	110.20031	295.76405	161.49113	10.65754	0.0846031	0.17270567	3.1934857	21	4 15.3	14.1
319 Leona	10.2	X	241.59990	227.94077	184.91310	10.56152	0.2161684	0.15680186	3.4059262	21	6 25.7	15.8
320 Katharina	10.8	X	296.27125	149.22699	219.88879	9.37576	0.1172870	0.18853221	3.0121667	21	7 15.6	14.9

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
321 Florentina	10.1	X	124.79013	35.51855	40.20554	2.58715	0.0469523	0.20116086	2.8847426	21	3 26.9	14.2
322 Phaeo	9.1	X	5.74964	114.66206	252.32164	8.04621	0.2448700	0.21235189	2.7824794	21	11 27.4	11.8
323 Brucia	9.5	X	121.44161	291.53385	97.30978	24.25297	0.2992288	0.26796279	2.3827934	21	2 21.1	13.2
324 Bamberga	6.82	0.09	269.59140	44.22701	327.85931	11.10475	0.3413219	0.22463482	2.6801021	21	5 14.9	11.6
325 Heidelberga	8.8	X	313.24425	70.43633	344.20695	8.57454	0.1516639	0.17082053	3.2169379	21	10 4.1	12.6
326 Tamara	9.4	X	169.15401	238.51940	32.18205	23.72374	0.1900847	0.27937995	2.3174261	21	—	—
327 Columbia	9.9	X	235.32717	307.66781	354.75078	7.14139	0.0609896	0.21302316	2.7766310	21	2 15.4	13.9
328 Gudrun	8.9	X	285.56269	107.04749	351.88840	16.13482	0.1068672	0.17991608	3.1075830	21	10 21.5	13.3
329 Svea	9.6	X	18.07671	55.0513	178.46463	15.88102	0.0242002	0.25293806	2.4762430	21	5 25.3	13.0
330 Adalberta	12.4	X	330.82184	258.98986	137.10155	6.75936	0.2519603	0.25400415	2.4693094	21	11 3.8	14.0
331 Etheridgea	9.7	X	65.13026	333.60259	21.85995	6.03657	0.0960805	0.18732087	3.0251386	21	—	—
332 Siri	9.7	X	208.82378	297.77368	31.54485	2.84483	0.0882444	0.21333759	2.7739021	21	2 18.8	13.9
333 Badenia	9.4	X	91.08999	22.90117	353.15581	3.73933	0.1598007	0.17780077	3.1321818	21	—	—
334 Chicago	7.7	X	339.03078	150.70199	130.16985	4.64354	0.0239518	0.12856110	3.8880306	21	6 6.3	13.0
335 Roberta	9.1	X	91.18796	139.81899	148.42395	5.10296	0.1728631	0.25319094	2.4745939	21	12 4.2	12.9
336 Lacadiara	9.8	X	129.36462	31.02303	235.00249	5.65229	0.0957785	0.29180447	2.2511690	21	12 15.7	12.9
337 DeVosa	8.74	0.19	291.03660	99.37106	355.34327	7.85994	0.1360927	0.26789078	2.3832204	21	11 10.2	11.3
338 Budrosa	8.5	X	302.54908	107.26677	287.38330	6.04101	0.0197481	0.19798183	2.9155411	21	9 9.0	12.6
339 Dorothea	9.4	X	250.71329	164.56557	173.48798	9.96662	0.0985136	0.18864308	3.0109822	21	4 16.9	13.9
340 Eduarda	9.9	X	51.81248	43.14018	26.95724	4.66769	0.1165620	0.21650091	2.7468160	21	—	—
341 California	11.3	X	199.59771	293.81496	29.01566	5.66628	0.1940519	0.30209384	2.1997575	21	1 23.9	14.8
342 Endymion	10.3	X	46.35779	125.0602	232.65824	7.35151	0.1298123	0.23940801	2.5686815	21	—	—
343 Ostara	11.7	X	129.35253	10.25534	38.57995	3.25942	0.2294114	0.26315923	2.4117020	21	3 14.2	15.1
344 Desiderata	8.3	X	4.87542	237.62318	48.01858	18.34559	0.3139136	0.23554355	2.5967008	21	8 11.4	10.4
345 Tercidina	8.71	0.10	67.98715	231.25787	212.59046	9.74331	0.0617124	0.27792737	2.3254937	21	1 2.4	11.5
346 Hermentaria	7.3	X	208.32120	291.89358	91.93350	8.75242	0.1025711	0.21094186	2.7948652	21	4 28.6	11.7
347 Pariana	9.0	X	68.62769	86.14925	85.51013	11.68070	0.1659288	0.23361849	2.6109461	21	6 2.0	12.1
348 May	9.4	X	8.32170	13.62557	89.91620	9.57773	0.0709397	0.19261327	2.9694675	21	—	—
349 Dembowska	5.93	0.37	303.34752	344.73411	32.26483	8.24196	0.0911276	0.19683293	2.9268752	21	8 16.1	9.7
350 Ornamenta	8.5	X	141.12399	337.83572	90.08658	24.89288	0.1596714	0.17980847	3.1088227	21	4 30.1	13.8
351 Yrsa	9.0	X	305.05937	31.86379	99.19906	9.20703	0.1555739	0.21441990	2.7645598	21	—	—
352 Gisela	10.1	X	260.21563	144.50965	247.27481	3.38448	0.1499007	0.30330773	2.1938844	21	6 24.5	13.0
353 Ruperto-Carola	10.9	X	178.01716	321.28977	102.46751	5.70846	0.3278146	0.21802678	2.7339851	21	5 19.3	16.0
354 Eleonora	6.44	0.37	142.29320	5.96260	140.34746	18.40243	0.1131161	0.21032888	2.8002928	21	7 20.9	10.7
355 Gabriella	10.2	X	288.20618	107.07704	351.65248	4.28723	0.1056199	0.24388975	2.5371162	21	11 11.1	13.2
356 Liguria	8.3	X	55.64004	79.40105	354.50447	8.20463	0.2407927	0.21538808	2.7562691	21	1 1.7	10.8
357 Ninia	8.8	X	100.26583	255.48986	137.64366	15.05539	0.0770781	0.17612496	3.1520186	21	1 11.2	13.2
358 Apollonia	9.2	X	183.58186	252.84028	172.15224	3.55479	0.1530685	0.20219355	2.8749117	21	5 23.0	13.9
359 Georgia	9.3	X	358.33552	337.92604	6.00344	6.77339	0.1574390	0.21861808	2.7290532	21	10 1.4	12.1
360 Carlota	8.5	X	329.07239	289.81246	132.19702	11.74346	0.1734157	0.18937252	3.0032495	21	11 20.6	12.0
361 Bononia	8.4	X	194.58538	68.44564	18.81758	12.61246	0.2110802	0.12492115	3.9631947	21	6 28.6	15.0
362 Havnia	9.1	X	108.96749	31.56413	27.30965	8.06321	0.0441578	0.23795642	2.5791173	21	2 9.8	12.5
363 Padua	9.1	X	222.59123	296.23150	64.73076	5.94689	0.0717095	0.21650969	2.7467417	21	4 14.4	13.2
364 Isara	9.9	X	18.84758	313.10007	105.52666	6.00464	0.1485927	0.29784732	2.2206166	21	—	—
365 Corduba	9.3	X	252.70222	215.93432	185.17294	12.79256	0.1572397	0.21016730	2.8017278	21	6 27.6	13.7
366 Vincentina	8.7	X	240.61579	333.29837	346.69662	10.58007	0.0565134	0.17676272	3.1444324	21	3 16.8	13.5
367 Amicitia	10.7	X	0.23983	55.63489	83.44535	2.94119	0.0963588	0.29808253	2.1194483	21	—	—
368 Haidea	9.9	X	238.85906	95.34096	226.29914	7.79639	0.2012887	0.18289458	3.0737520	21	3 4.9	15.2
369 Aeria	8.6	X	164.45480	269.72402	94.15556	12.71586	0.0968248	0.22853133	2.6495506	21	2 15.6	12.7
370 Modestia	10.7	X	350.38502	68.22794	290.90928	7.86307	0.0912053	0.27806095	2.3247489	21	10 10.1	13.3
371 Bohemia	8.7	X	178.66854	342.18565	283.39525	7.40247	0.0637936	0.21895841	2.7622245	21	—	—
372 Palma	7.5	X	233.08715	115.50260	327.28193	23.83597	0.2559975	0.17563348	3.1578962	21	7 27.1	12.9
373 Melusina	9.1	X	88.33593	348.79904	3.63881	15.37798	0.1380010	0.17877417	3.1208020	21	—	—
374 Burgundia	8.8	X	317.52770	25.68935	218.99181	8.99298	0.0792370	0.21265590	2.7798269	21	3 5.8	12.7
375 Ursula	7.47	0.27	79.67592	341.32169	336.40534	15.94657	0.1037742	0.17848466	3.1241757	21	12 6.6	12.3
376 Geometria	9.5	X	55.45450	316.89761	301.98496	5.43216	0.1725614	0.28460529	2.2889733	21	9 15.8	12.2
377 Campania	9.0	X	315.52666	195.88397	209.94082	6.67591	0.0756663	0.22329219	2.6908347	21	10 13.2	12.0
378 Holmia	9.8	X	236.00250	157.36275	232.43850	7.00703	0.1307059	0.21322109	2.7749124	21	5 29.7	14.0
379 Huenna	8.9	X	83.95029	180.62875	171.87293	1.67006	0.1799545	0.17698748	3.1417697	21	—	—
380 Fiducia	9.5	X	156.04059	239.92899	95.04355	6.16148	0.1127777	0.22472616	2.6793758	21	1 1.0	13.3
381 Myrrha	8.4	X	296.13816	143.87697	125.07542	12.55850	0.0900457	0.17028698	3.2236539	21	3 21.0	13.1
382 Dodona	8.8	X	327.63190	270.37777	313.47114	7.39144	0.1711561	0.17867476	3.1219593	21	2 16.3	12.7
383 Janina	9.9	X	32.99813	324.51661	92.78075	2.65946	0.1679148	0.17721748	3.1390508	21	—	—
384 Burdigala	9.5	X	224.62178	34.70043	47.79231	5.58701	0.1472785	0.22807061	2.6531176	21	7 24.3	13.7
385 Ilmatar	7.6	X	174.04990	188.96577	344.85494	13.58077	0.1246672	0.20484584	2.8500422	21	9 22.9	12.3
386 Siegena	7.43	0.16	65.16059	220.72108	166.64031	20.21797	0.1688951	0.19973239	2.8984805	21	—	—
387 Aquitania	7.6	X	274.75787	157.39496	128.21882	18.11577	0.2350242	0.21718798	2.7410200	21	2 19.9	12.0
388 Charybdis	8.57	0.07	353.39989	331.25830	354.20473	6.44851	0.0665818	0.18890377	3.0082156	21	8 22.9	12.5
389 Industria	7.8	X	50.16761	264.93146	282.28053	8.12179	0.0666137	0.23409131	2.6074292	21	5 7.5	11.0
390 Alma	10.1	X	186.87895	191.05800	305.19583	12.15672	0.1307893	0.22782695	2.6550089	21	8 20.6	14.4
391 Ingeborg	10.8	X	322.74183	146.99062	212.85788	23.20328	0.3058756	0.27889435	2.3201153	21	7 16.3	13.2
392 Wilhelmina	9.8	X	325.12096	173.39079	209.67256	14.31280	0.1396913	0.20103681	2.8859291	21	9 16.9	13.2
393 Lampetia	8.4	X	196.14247	90.78925	212.41314	14.87305	0.3303176	0.21256426	2.7806258	21	1 9.6	13.8
394 Arduina	9.7	X	256.91659	271.26453	66.88560	6.21976	0.2274351	0.21467239	2.7623917	21	4 9.6	14.2
395 Delia	10.4	X	235.18677	11.06790	259.27449	3.35358	0.0846769	0.21199243	2.7856239	21	1 4.8	14.7
396 Aeolia	10.1	X	113.15777	21.41920	249.89616	2.55018	0.1602682	0.21729936	2.7400832	21	11 27.5	14.5
397 Vienna	9.4	X	257.11333	140.08362	227.90890	12.86637	0.2480777	0.23062024	2.6335270	21	5 11.3	13.6
398 Admete	10.4	X	343.71448	160.53167	279.81758	9.55428	0.2234772	0.21763410	2.7372728	21	—	—
399 Persephone	9.0	X	228.92939	193.14940	346.19733	13.11567	0.0762538	0.18509274	3.0493677	21	11 26.4	13.7
400 Ducrosa	10.6	X	256.20210	237.42683	327.02781	10.52658	0.1158644	0.17819964	3.1275061	21	—	—

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
401 Ottilia	9.2	X	96.95706	300.33803	36.05688	5.96308	0.0318226	0.16114513	3.3444491	21	—	—
402 Chloë	9.0	X	336.99962	17.40208	129.34100	11.83302	0.1123002	0.24076380	2.5590293	21	—	—
403 Cyane	8.9	X	7.88338	254.60243	244.35303	9.15660	0.0981024	0.20920179	2.8103416	21	1 1.5	12.4
404 Arsinoë	9.2	X	105.74683	120.73301	92.55638	14.09461	0.1995632	0.23576817	2.5950512	21	9 23.2	13.6
405 Thia	8.6	X	194.34846	308.75993	255.20322	11.93921	0.2433688	0.23727839	2.5840283	21	11 15.4	13.0
406 Erna	10.4	X	85.61951	37.57723	315.47954	4.19318	0.1783276	0.19778366	2.9174882	21	—	—
407 Arachne	9.1	X	211.86706	82.39968	294.57736	7.52160	0.0703528	0.23185934	2.6241359	21	4 15.6	13.2
408 Fama	9.3	X	103.89140	108.57434	297.13014	9.08562	0.1452959	0.17492161	3.1664580	21	2 7.9	13.7
409 Aspasia	7.62	0.29	329.71597	353.51004	242.13873	11.26654	0.0720909	0.23844948	2.5755607	21	3 5.3	11.1
410 Chloris	8.3	X	160.68850	172.81515	96.93486	10.96657	0.2416895	0.21925828	2.7237383	21	—	—
411 Xanthe	9.3	X	163.51356	181.28302	107.38352	15.35311	0.1153869	0.19606013	2.9345613	21	—	—
412 Elisabetha	9.2	X	27.28047	91.84087	106.43890	13.76882	0.0420820	0.21470782	2.7620878	21	4 27.4	13.0
413 Edburga	9.9	X	150.16081	252.85268	103.71020	18.72496	0.3414768	0.23705426	2.5856568	21	2 12.5	14.5
414 Liriope	9.6	X	91.04012	318.52080	110.56819	9.55640	0.0729599	0.15001081	3.5079576	21	2 18.2	14.5
415 Palatia	9.4	X	12.69898	299.07949	126.33789	8.21883	0.2998404	0.21127250	2.7919485	21	—	—
416 Vaticana	7.89	0.20	288.16650	198.25231	158.06880	12.85866	0.2177498	0.21123822	2.7922505	21	2 2.3	12.4
417 Suevia	9.5	X	283.54409	348.64675	199.49534	6.64687	0.1355888	0.21041238	2.7995519	21	—	—
418 Alemannia	9.8	X	298.30110	126.06864	248.80977	6.81507	0.1197974	0.23596092	2.5936378	21	7 27.7	13.0
419 Aurelia	8.6	X	1.36782	44.62593	229.10259	3.92623	0.2509968	0.23555267	2.5966337	21	6 22.4	10.3
420 Bertholda	8.4	X	142.16746	235.00262	242.63941	6.68948	0.0293071	0.15631108	3.4130518	21	6 8.9	13.3
421 Zähringia	11.6	X	278.54377	209.02964	187.37422	7.78559	0.2834143	0.24333887	2.5409438	21	7 3.9	15.3
422 Berolina	10.6	X	202.74851	335.40484	9.03405	4.99541	0.2142731	0.29627014	2.2284906	21	2 23.6	14.3
423 Diotima	7.3	X	208.30114	199.38726	69.37415	11.24102	0.0352612	0.18334078	3.0687629	21	—	—
424 Gratia	9.6	X	12.09079	373.78994	99.15049	8.22216	0.1086794	0.21336907	2.7736292	21	—	—
425 Cornelia	9.8	X	67.05944	121.68974	61.05610	4.04751	0.0590474	0.20111251	2.8852048	21	5 29.9	13.5
426 Hippo	8.6	X	249.51234	221.94444	311.32418	19.50060	0.1057623	0.20091605	2.8870854	21	12 17.0	12.9
427 Galene	10.2	X	77.68611	11.13238	297.36689	5.12847	0.1199270	0.19254846	2.9701338	21	11 28.8	14.6
428 Monachia	12.0	X	113.11619	15.89261	17.53717	6.19101	0.1778989	0.28103287	2.3083304	21	1 22.2	14.6
429 Lotis	10.0	X	149.21886	169.15404	219.92322	9.54190	0.1233741	0.23409562	2.6073972	21	2 25.0	13.9
430 Hybris	11.1	X	282.62063	179.09425	249.28245	14.54263	0.2059627	0.20463419	2.8520070	21	8 18.7	15.2
431 Nephelē	9.0	X	188.38157	217.13874	117.18637	1.82788	0.1705317	0.17710343	3.1403984	21	2 11.0	14.2
432 Pythia	8.9	X	131.04907	173.87663	88.73966	12.12011	0.1463764	0.27041574	2.3683619	21	12 10.6	12.6
433 Eros	11.16	0.46	135.00891	178.86351	304.29884	10.83051	0.2229095	0.55976995	1.4581303	21	6 17.8	11.9
434 Hungaria	11.2	X	155.48794	123.87236	175.30030	22.51095	0.0735866	0.36355686	1.9442606	21	—	—
435 Ella	10.4	X	8.69843	333.23118	23.13590	1.81645	0.1552076	0.25708728	2.4495275	21	11 15.6	12.8
436 Patricia	10.0	X	131.96346	41.03935	351.30614	18.50694	0.0691693	0.17203797	3.2017433	21	2 21.0	14.7
437 Rhodia	10.4	X	116.87966	61.90033	263.20995	7.34432	0.2486551	0.26739947	2.3861387	21	—	—
438 Zeuxo	10.0	X	159.12202	210.41176	49.10006	7.36792	0.0684168	0.24155877	2.5534117	21	12 31.1	13.8
439 Ohio	9.8	X	352.41372	244.46191	201.45080	19.12929	0.0660768	0.17781636	3.1319988	21	—	—
440 Theodora	11.5	X	44.20707	179.39261	292.05569	1.59715	0.1080004	0.29993371	2.2103066	21	—	—
441 Bathilde	8.5	X	4.14910	202.95231	253.52452	8.15786	0.0810414	0.20965249	2.8063125	21	—	—
442 Eichsfeldia	10.0	X	320.41621	84.54088	134.88838	6.06982	0.0704787	0.27436793	2.3455633	21	1 28.4	12.7
443 Photographica	10.1	X	27.58800	348.85758	175.40555	4.23521	0.0405673	0.29889538	2.2154226	21	2 17.8	12.3
444 Gypsis	7.83	0.22	37.29706	154.49155	195.61518	10.27394	0.1743596	0.21381680	2.7697559	21	12 14.4	11.6
445 Edna	9.2	X	140.04794	81.63381	292.00942	21.30807	0.1972851	0.17231500	3.1983108	21	2 9.7	14.5
446 Aeternitas	8.8	X	105.30121	278.95529	42.03866	10.61621	0.1257136	0.21183304	2.7870211	21	—	—
447 Valantine	9.1	X	203.46826	321.46507	71.81850	4.79447	0.0450141	0.19119303	2.9841548	21	5 5.5	13.5
448 Natalie	10.2	X	348.47323	293.68543	37.23081	12.72208	0.1885252	0.17747959	3.1359594	21	8 25.9	13.8
449 Hamburga	9.9	X	206.31951	48.16583	85.83884	3.07919	0.1723011	0.24149393	2.5538687	21	9 8.9	13.9
450 Brigitta	10.2	X	101.19011	359.01635	14.35920	10.13161	0.0975071	0.18796506	3.0182228	21	—	—
451 Patientia	6.65	0.19	251.63166	335.92277	89.21540	15.21683	0.0726439	0.18352183	3.0667442	21	8 10.8	11.2
452 Hamiltionia	11.8	X	26.76889	61.72345	92.46966	3.22448	0.0142037	0.20516767	2.8470609	21	2 23.8	15.7
453 Tea	10.5	X	148.59684	220.49404	11.67317	5.55175	0.1095103	0.30564190	2.1827004	21	11 22.9	13.5
454 Mathesis	9.3	X	154.25951	177.54309	32.17238	6.29202	0.1111360	0.23146744	2.6270970	21	10 23.1	13.1
455 Bruchsalia	8.9	X	269.60896	273.50748	76.09727	12.01613	0.2949657	0.22783118	2.6549760	21	4 29.2	13.3
456 Abnoba	9.2	X	22.26723	7.01448	229.19100	14.43809	0.1786574	0.21173270	2.7879015	21	6 12.1	12.1
457 Alleghenia	11.1	X	67.31767	130.73176	249.43921	12.97194	0.1710828	0.18092477	3.0960219	21	—	—
458 Hercynia	9.7	X	84.47548	277.16661	134.13619	12.65456	0.2422360	0.19023666	2.9941478	21	2 2.1	13.4
459 Signe	10.3	X	148.13411	19.50552	29.46521	10.30051	0.2109713	0.23243854	2.6197748	21	4 3.5	14.5
460 Scania	10.8	X	354.74024	161.47088	205.08048	4.63604	0.1047803	0.22000992	2.7175312	21	10 23.8	13.6
461 Saskia	10.5	X	282.86627	308.46011	156.51908	1.47171	0.1447791	0.17916177	3.1162993	21	10 27.0	14.5
462 Eriphyla	9.4	X	306.01119	250.58970	105.27721	3.19229	0.0885010	0.20231064	2.8738023	21	7 19.1	13.0
463 Lola	11.7	X	192.33549	329.62703	36.49452	13.53909	0.2195988	0.26533894	2.3984761	21	3 21.1	15.8
464 Megaira	9.7	X	337.75027	257.88985	102.36063	10.16538	0.2054594	0.21001825	2.8030533	21	9 16.4	12.5
465 Alekto	9.8	X	333.87238	284.09497	300.57085	4.64848	0.2055988	0.18109455	3.0940866	21	2 20.7	13.6
466 Tisiphone	8.5	X	124.56551	252.67765	290.82367	19.07438	0.0928321	0.15966704	3.3650578	21	8 9.5	13.7
467 Laura	10.8	X	353.65701	93.95868	322.11503	6.44958	0.1062101	0.19513874	2.9437915	21	12 20.9	14.5
468 Lina	9.7	X	349.35720	332.31993	21.46641	0.43670	0.1969851	0.17749109	3.1358240	21	9 22.1	13.0
469 Argentina	8.7	X	104.75952	210.68718	333.41323	11.59920	0.1587634	0.17334347	3.1856476	21	8 4.1	13.5
470 Kilia	10.0	X	74.38593	47.69071	173.20947	7.22807	0.0941473	0.26414149	2.4057194	21	8 5.9	13.0
471 Papagena	6.73	0.37	45.99393	315.59626	83.80732	15.01520	0.2285997	0.20062240	2.8899019	21	—	—
472 Roma	8.9	X	90.29385	296.56364	127.06233	15.80979	0.0948798	0.24288851	2.5440837	21	1 23.5	11.9
473 Noli	11.8	X	276.31071	153.72604	332.07909	12.93719	0.1073489	0.22706022	2.6609825	21	11 23.5	15.3
474 Prudentia	11.0	X	318.29413	156.17663	161.80000	8.79735	0.2106519	0.25661549	2.4525289	21	5 27.1	13.7
475 Oculo	11.5	X	237.98285	305.93807	34.40253	18.94859	0.3791878	0.23588658	2.5941827	21	3 24.3	16.6
476 Hedwig	8.6	X	327.41589	1.35619	286.33865	10.92692	0.0727586	0.22853811	2.6494982	21	5 17.4	12.0
477 Italia	10.3	X	336.57359	322.61460	10.64847	5.28858	0.1883803	0.26250432	2.4157116	21	8 4.3	12.2
478 Tergeste	8.0	X	213.31520	241.31081	233.65632	13.15023	0.0805994	0.18747415	3.0234894	21	8 19.6	12.8
479 Caprera	9.8	X	237.17844	269.60260	136.02570	8.68336	0.2189609	0.21977483	2.7194688	21	6 13.0	14.4
480 Hansa	8.3	X	139.00314	213.40879	237.17047	21.30716	0.0462217	0.22933683	2.6433430	21	4 27.3	12.0

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
481 Erita	8.8	X	172.54037	349.44435	66.72809	9.84515	0.1577772	0.21741097	2.7391454	21	5 2.7	13.2
482 Petrina	8.9	X	267.73438	87.63329	179.36989	14.47187	0.0969841	0.18966937	3.0001151	21	2 3.9	13.6
483 Seppina	8.3	X	127.27255	162.72346	173.91651	18.75215	0.0512326	0.15545193	3.4256156	21	—	—
484 Pittsburghia	9.8	X	33.46186	189.86283	127.24926	12.51560	0.0581598	0.22619427	2.6677696	21	10 18.0	13.4
485 Genua	8.3	X	147.64973	272.23831	193.42746	13.86741	0.1920939	0.21638530	2.7477943	21	6 10.6	13.0
486 Cremona	11.1	X	23.30461	124.63142	94.21845	11.09219	0.1616013	0.27320298	2.3522262	21	5 15.5	13.2
487 Venetia	8.3	X	9.24361	281.04818	114.77356	10.25346	0.0859774	0.22600555	2.6692545	21	12 24.0	11.6
488 Kreusa	8.0	X	150.21268	73.18127	84.07500	11.47575	0.1574855	0.17385565	3.1793878	21	8 16.4	13.3
489 Comacina	8.4	X	242.10288	9.54156	166.70160	12.99361	0.0492244	0.17630334	3.1498922	21	12 14.5	13.1
490 Veritas	8.6	X	346.29572	193.21716	178.03427	9.29179	0.0903491	0.17429377	3.1740576	21	10 9.2	12.6
491 Carina	9.1	X	248.06865	232.30530	175.38472	18.86452	0.0867279	0.17286353	3.1915413	21	7 8.7	14.1
492 Gismonda	10.0	X	230.32846	296.73807	46.18561	1.61849	0.1789443	0.17946958	3.1127350	21	3 27.4	15.0
493 Griseldis	10.9	X	155.93218	46.82308	357.33855	15.17884	0.1762591	0.17916223	3.1162939	21	4 1.9	16.0
494 Virtus	9.1	X	129.57705	215.75921	38.07847	7.07925	0.0648292	0.19124969	2.9835653	21	11 13.4	13.4
495 Eulalia	11.1	X	96.78060	207.84866	186.39629	2.27848	0.1287625	0.25116710	2.4878692	21	—	—
496 Gryphia	11.8	X	91.22111	258.73488	207.58081	3.79147	0.0796888	0.30232096	2.1986556	21	3 9.8	14.0
497 Iva	10.02	0.11	250.82494	3.53046	6.30921	4.82250	0.3011407	0.20490345	2.8495079	21	5 3.7	15.0
498 Tokio	8.9	X	228.69768	241.83874	97.20338	9.49629	0.2230778	0.22828048	2.6514912	21	3 19.5	13.6
499 Venusia	9.5	X	10.68329	174.78654	256.24944	2.09219	0.2166238	0.12276287	4.0095106	21	—	—
500 Selinur	9.3	X	102.81178	74.87569	289.83011	9.78053	0.1439076	0.23325691	2.6136647	21	—	—
501 Urhixidur	9.4	X	155.06647	356.21990	357.23177	20.83780	0.1414409	0.17512401	3.1640178	21	2 9.8	14.6
502 Sigune	10.8	X	34.15874	18.99675	132.96034	25.03510	0.1798009	0.26806086	2.3822122	21	2 17.9	12.7
503 Evelyn	9.3	X	133.50472	41.68718	68.89229	5.01027	0.1760066	0.21946030	2.7220665	21	6 1.5	13.5
504 Cora	10.0	X	137.58678	248.31880	104.47402	12.89687	0.2152406	0.21930663	2.7233380	21	1 16.1	14.0
505 Cava	8.61	-0.03	263.31557	336.86664	90.85494	9.82823	0.2436706	0.22368432	2.6876891	21	8 4.9	12.6
506 Marion	8.9	X	153.31972	145.74728	312.93504	17.00624	0.1471790	0.18607767	3.0385977	21	6 4.0	14.1
507 Laodica	9.2	X	146.26217	100.41849	293.42565	9.49775	0.1010329	0.17596119	3.1539741	21	3 4.5	14.1
508 Princesonia	8.4	X	329.75326	205.94041	44.19386	13.33666	0.0079041	0.17537730	3.1609706	21	4 17.7	12.8
509 Iolanda	8.4	X	221.25790	157.41517	217.51988	15.41278	0.0962284	0.18397345	3.0617233	21	4 29.6	13.0
510 Mabella	9.8	X	330.41678	91.18445	202.69186	9.53618	0.1906288	0.23375164	2.6099545	21	5 17.7	12.5
511 Davida	6.22	0.16	114.27030	337.21732	107.59056	15.93892	0.1882355	0.17518441	3.1632906	21	4 22.5	11.3
512 Taurinensis	10.8	X	96.98121	249.24444	107.02703	8.74769	0.2539401	0.30417520	2.1897112	21	—	—
513 Centesima	9.5	X	126.43520	225.83406	184.42449	9.73361	0.0844593	0.18834866	3.0141234	21	3 1.7	13.9
514 Armida	9.2	X	22.79008	110.45904	268.53564	3.88169	0.0372884	0.18547425	3.0451846	21	12 5.9	13.3
515 Athalia	10.8	X	68.91137	300.28592	121.09000	2.03858	0.1760349	0.17868676	3.1218196	21	1 14.8	14.6
516 Amherstia	8.2	X	69.99394	258.25688	328.79560	12.96109	0.2725331	0.22429381	2.6828179	21	9 2.2	12.1
517 Edith	9.5	X	356.92569	143.50701	273.81866	3.22832	0.1791871	0.17599430	3.1535785	21	12 29.2	13.1
518 Halawe	11.0	X	101.74881	117.35589	203.91663	6.72643	0.2281619	0.24457146	2.5323994	21	—	—
519 Sylvania	9.0	X	124.05847	302.69840	44.70250	11.00987	0.1830589	0.21128761	2.7918154	21	—	—
520 Franziska	10.6	X	197.00651	21.19551	34.27904	10.96145	0.1104518	0.18942039	3.0027435	21	5 22.1	15.4
521 Brixia	8.31	-0.06	339.67892	316.00377	89.61094	10.58311	0.2783620	0.21694474	2.7430684	21	11 30.7	10.5
522 Helga	9.0	X	95.19808	248.55177	116.57041	4.42002	0.0866649	0.14270143	3.6267462	21	—	—
523 Ada	9.9	X	18.20455	189.93057	260.62091	4.31247	0.1788826	0.19288399	2.9666883	21	—	—
524 Fidelio	9.9	X	250.90403	79.53869	326.68116	8.22910	0.1282869	0.23038749	2.6353003	21	7 7.8	13.7
525 Adelaide	12.0	X	119.14285	264.12049	203.39029	5.99521	0.1030719	0.29307346	2.2446660	21	4 29.3	14.6
526 Jena	10.1	X	136.31369	357.56742	137.75705	2.17391	0.1329132	0.17862991	3.1224819	21	7 2.5	15.0
527 Euryanthe	10.4	X	278.83977	204.09779	120.50345	9.66155	0.1507772	0.21911156	2.7249541	21	4 25.1	14.5
528 Rezia	9.0	X	48.50947	350.24862	49.53205	12.70516	0.0216734	0.15748486	3.3960717	21	—	—
529 Preziosa	10.0	X	278.95976	332.28289	65.15707	11.01238	0.0953326	0.18782278	3.0197468	21	8 7.1	14.3
530 Turandot	9.3	X	44.76055	199.42035	129.10732	8.56623	0.2182668	0.17325630	3.1867159	21	11 27.6	13.7
531 Zerlina	12.0	X	40.54000	58.02039	197.69129	33.99471	0.1975759	0.21191122	2.7863355	21	8 12.8	16.1
532 Herculina	5.81	0.26	154.45715	76.59489	107.48861	16.29970	0.1777741	0.21342265	2.7731650	21	9 28.2	10.6
533 Sara	9.7	X	278.38239	32.51381	180.29996	6.55554	0.0446109	0.19154529	2.9804950	21	—	—
534 Nassovia	9.6	X	106.07338	338.51099	94.08772	3.27491	0.0589756	0.20124177	2.8839693	21	3 2.1	13.5
535 Montague	9.4	X	231.75440	68.64942	84.76815	6.77353	0.0252144	0.23943421	2.5684942	21	11 18.4	12.8
536 Merapi	8.2	X	213.64527	295.57804	59.19976	19.42603	0.0871710	0.15069729	3.4972962	21	4 9.7	13.8
537 Pauly	8.8	X	265.51024	187.52362	120.16922	9.87433	0.2291379	0.18284700	3.0742852	21	3 15.7	13.9
538 Friederike	9.6	X	231.52389	227.51630	141.16519	6.52226	0.1705726	0.17575740	3.1564116	21	4 30.4	14.7
539 Pamina	10.1	X	248.10563	97.43487	274.27971	6.79965	0.2138860	0.21770104	2.7367117	21	5 9.8	14.5
540 Rosamunde	10.7	X	261.90324	337.73025	202.11308	5.58269	0.0904511	0.29826633	2.2185364	21	—	—
541 Deborah	10.1	X	321.72074	359.26966	267.62010	6.00246	0.0497705	0.20875234	2.8143740	21	4 14.9	14.0
542 Susanna	9.4	X	194.81251	216.78522	152.94810	12.07715	0.1419460	0.19900875	2.9055026	21	3 29.2	14.1
543 Charlotte	9.5	X	263.70409	108.81930	294.97199	8.47690	0.1534288	0.18408015	3.0605401	21	7 14.9	14.0
544 Jetta	10.0	X	70.83260	343.14271	298.29593	8.37125	0.1533401	0.23627774	2.5913188	21	10 26.3	13.8
545 Messalina	8.8	X	254.51729	331.08798	333.59952	11.20624	0.1700099	0.17204096	3.2017062	21	3 3.9	13.9
546 Herodias	9.8	X	212.15877	109.68140	21.60723	14.85775	0.1148937	0.23518606	2.5993315	21	9 19.1	13.7
547 Praxedis	9.8	X	99.23185	196.50879	193.05894	16.85905	0.2352006	0.21320594	2.7750439	21	1 17.1	13.7
548 Kressida	11.3	X	282.97794	320.14319	108.41685	3.87156	0.1843112	0.28569615	2.2831431	21	9 17.7	13.5
549 Jessonda	10.9	X	173.25688	157.93635	291.40755	3.96034	0.2579945	0.22424032	2.6832445	21	6 13.3	15.7
550 Senta	9.3	X	83.83008	45.06620	270.69239	10.10977	0.2230479	0.23676751	2.5877440	21	12 30.9	13.5
551 Ortrud	9.7	X	291.33888	70.21688	5.69096	0.39516	0.1187509	0.19268135	2.9687680	21	10 7.2	13.4
552 Sigelinde	9.7	X	114.12945	346.56455	266.87387	7.69406	0.0900525	0.17647171	3.1478883	21	10 25.9	14.5
553 Kundry	12.2	X	3.01178	354.91265	72.34755	5.38635	0.1093305	0.29583499	2.2306753	21	—	—
554 Peraga	9.1	X	340.07095	127.65978	295.38827	2.93510	0.1517588	0.26933755	2.3746783	21	—	—
555 Norma	10.8	X	221.77599	359.99603	130.19715	2.66821	0.1516724	0.17326774	2.3186575	21	9 15.4	15.7
556 Phyllis	9.5	X	39.13201	177.92176	286.04097	5.24609	0.1042629	0.25474231	2.4645369	21	—	—
557 Violetta	12.2	X	184.47215	195.28168	292.79050	2.48778	0.0984853	0.25788145	2.4444959	21	8 12.3	15.8
558 Carmen	9.1	X	215.09216	311.34102	143.68950	8.37896	0.0406612	0.19841903	2.9112567	21	8 5.6	13.1
559 Nanon	9.5	X	326.27614	128.89094	112.06231	9.30172	0.0653269	0.22075797	2.7113888	21	3 21.5	13.1
560 Delila	11.1	X	215.73714	4.32605	105.31555	8.45766	0.1584546	0.21539947	2.7561719	21	8 18.3	15.4

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
561 Ingwelde	11.3	X	277.55190	318.26392	159.14283	1.54913	0.1219434	0.17474658	3.1685721	21	11 6.6	15.5
562 Salome	10.0	X	292.21792	263.68649	70.58817	11.10532	0.1019189	0.18808072	3.0169853	21	5 29.7	14.0
563 Suleika	8.4	X	141.60021	336.81997	85.17673	10.24305	0.2361828	0.22070480	2.7118242	21	4 19.3	12.9
564 Dudu	10.3	X	136.70512	214.90056	70.76396	17.98866	0.2771560	0.21656016	2.7463149	21	—	—
565 Marbachia	10.9	X	216.74414	292.32950	225.67261	10.99184	0.1308265	0.25817825	2.4426221	21	10 23.3	14.3
566 Stereoskopia	8.1	X	101.95813	299.67809	79.54822	4.89364	0.1200923	0.15868429	3.3789370	21	1 7.0	12.7
567 Eleutheria	9.2	X	20.48990	133.72074	58.25241	9.25491	0.0897752	0.17770695	3.1332841	21	4 11.2	13.2
568 Cheruskia	9.6	X	167.22343	173.96619	249.77258	18.39569	0.1684508	0.20158831	2.8806632	21	5 4.8	14.5
569 Misa	10.2	X	181.73401	142.60128	301.69082	1.29151	0.1809433	0.22762403	2.6565866	21	6 13.0	14.6
570 Kythera	8.7	X	39.66730	161.53898	223.34083	1.81667	0.1186133	0.15589421	3.4191335	21	—	—
571 Dulcinea	11.7	X	319.82534	27.38633	3.13729	5.22827	0.2433229	0.26335705	2.4104942	21	9 21.4	13.3
572 Rebekka	10.8	X	29.92523	192.04081	194.47145	10.57564	0.1563416	0.26500672	2.4040802	21	—	—
573 Recha	9.4	X	34.11750	29.56984	342.65950	9.83084	0.1099726	0.18840626	3.0135090	21	12 22.9	13.6
574 Reginhild	12.3	X	54.12895	77.12697	336.65029	5.68512	0.2385531	0.29143486	2.2530719	21	—	—
575 Renate	10.8	X	155.10694	333.86479	349.60171	15.00366	0.1268712	0.24125961	2.5552221	21	—	—
576 Emanuela	9.4	X	170.88170	27.18200	299.60836	10.20322	0.1919284	0.19061147	2.9902216	21	1 18.1	14.2
577 Rhea	9.4	X	69.49809	329.86436	328.48517	5.30168	0.1549457	0.17971727	3.1098744	21	11 8.9	14.0
578 Happelia	9.4	X	229.24816	261.41053	29.37551	6.14858	0.1921766	0.21590915	2.7518327	21	1 21.9	14.1
579 Sidonia	7.9	X	140.43709	228.72039	82.65163	11.01743	0.0774724	0.18845640	3.0129744	21	—	—
580 Selene	10.2	X	346.61559	338.62551	98.91340	3.67123	0.0869647	0.17002484	2.4329666	21	12 29.3	14.3
581 Tauntonia	9.8	X	335.99873	25.48666	102.45546	21.89562	0.0341705	0.17115051	3.2128017	21	—	—
582 Olympia	9.0	X	148.36799	310.27032	155.70323	30.03350	0.2222027	0.23379918	2.6096007	21	6 16.8	14.0
583 Klotilde	9.2	X	42.97532	252.10661	257.84582	8.24333	0.1600965	0.17444264	3.1722515	21	3 21.1	13.1
584 Semiramis	8.71	0.24	291.30478	85.35923	282.03614	10.72371	0.2339563	0.26957871	2.3732619	21	6 18.9	11.5
585 Bilkis	10.5	X	168.10229	329.46997	180.20676	7.57149	0.1277478	0.25972325	2.4329256	21	8 22.1	14.3
586 Thekla	9.4	X	290.16756	253.35703	228.33783	1.62771	0.0640265	0.18602036	3.0392218	21	12 8.1	13.4
587 Hypsipyle	11.9	X	112.70989	188.47670	324.56078	24.99248	0.1666444	0.27617833	2.3353016	21	7 10.5	15.6
588 Achilles	8.3	X	304.86831	133.40913	316.53688	10.31995	0.1477323	0.08290201	5.2090596	21	10 19.0	14.9
589 Croatia	9.1	X	46.57577	227.83927	177.45208	10.79629	0.0398408	0.17757528	3.1348328	21	—	—
590 Tomyris	10.0	X	149.17786	338.77137	106.14010	11.17364	0.0803096	0.18990556	2.9976270	21	5 13.5	14.6
591 Irmgard	10.7	X	87.34813	217.58390	334.25604	12.48811	0.2065310	0.22445882	2.6815029	21	8 2.7	14.6
592 Bathseba	9.6	X	69.39213	257.52297	167.81311	10.17505	0.1336974	0.18748446	3.0233786	21	1 11.9	13.5
593 Titania	9.28	0.06	46.76580	30.95870	75.94337	16.90030	0.1679709	0.22228190	2.6989820	21	1 27.2	12.1
594 Mireille	12.1	X	354.91707	76.81751	155.08903	32.58825	0.3526233	0.23137840	2.6277709	21	3 8.9	14.1
595 Polyxena	7.9	X	303.20857	279.88834	23.88120	17.83131	0.0637029	0.17166184	3.2064185	21	5 7.2	12.4
596 Scheila	8.9	X	296.22886	175.45902	70.59122	14.65720	0.1628120	0.19659654	2.9292210	21	2 7.7	13.4
597 Bandusia	9.2	X	24.27823	307.03730	36.46450	12.79950	0.1445458	0.22576337	2.6711631	21	11 13.4	12.3
598 Octavia	9.7	X	190.23164	292.09553	91.51487	12.22821	0.2506210	0.21493174	2.7601690	21	4 14.1	14.8
599 Luisa	8.7	X	256.14898	294.33979	44.14921	16.71132	0.2925459	0.21352510	2.7722779	21	4 7.4	13.5
600 Misa	10.1	X	198.10049	113.12607	139.21988	10.20432	0.0556066	0.22723552	2.6596138	21	—	—
601 Nerthus	9.7	X	224.51699	160.32839	169.54229	16.14844	0.1042178	0.17762080	3.1342971	21	3 9.9	14.5
602 Marianna	8.5	X	203.40117	45.78442	331.48023	15.11198	0.2508358	0.18208290	3.0828799	21	4 5.5	14.2
603 Timandra	11.9	X	165.27803	160.23813	343.39774	8.02862	0.1730036	0.24325644	2.5415177	21	8 14.2	16.0
604 Tekmessia	9.5	X	309.44693	28.43707	11.83545	4.41624	0.1938168	0.17568291	3.1573038	21	9 7.8	13.1
605 Juvisia	10.1	X	74.17105	15.10711	342.65102	19.63762	0.1365460	0.18955743	3.0012961	21	—	—
606 Brangäne	10.3	X	200.79468	58.35679	318.46996	8.60092	0.2207953	0.23694166	2.5864759	21	4 2.4	14.9
607 Jenny	10.0	X	83.14665	291.73435	285.24310	10.10379	0.0740571	0.20421477	2.8559106	21	8 5.7	13.9
608 Adolfine	10.9	X	298.08779	70.68770	293.85227	9.38049	0.1252645	0.18755414	3.0226297	21	7 13.4	14.9
609 Fulvia	10.3	X	146.46808	108.79392	165.18194	4.18724	0.0395405	0.18190642	3.0848735	21	12 23.8	14.8
610 Valeska	12.4	X	61.85500	1.53896	20.07943	12.59943	0.2517928	0.18102620	3.0948653	21	—	—
611 Valeria	9.3	X	57.17787	256.65635	189.38767	13.44472	0.1229893	0.19168894	2.9790058	21	1 15.6	13.2
612 Veronika	10.8	X	219.13361	122.45604	202.86117	20.95182	0.2591952	0.17593435	3.1542949	21	2 19.3	16.7
613 Ginevra	9.7	X	326.98970	65.53256	354.51712	7.67093	0.0560735	0.19759547	2.9193403	21	11 12.4	13.5
614 Pia	11.0	X	307.55335	209.69216	217.06429	7.01881	0.1082757	0.22288461	2.6941142	21	10 26.6	14.0
615 Roswitha	10.3	X	73.24180	247.32281	13.39535	2.76256	0.1105148	0.23074497	2.6325778	21	9 29.8	13.9
616 Elly	10.6	X	331.68462	109.34886	355.98502	14.95871	0.0597193	0.24165850	2.5527092	21	—	—
617 Patroclus	8.2	X	270.07555	307.96474	44.35027	22.05797	0.1395451	0.08281914	5.2125339	21	5 21.5	15.3
618 Elfriede	8.3	X	92.03525	229.48198	110.84437	17.05854	0.0695537	0.17298755	3.1900157	21	—	—
619 Triberga	9.9	X	272.35476	178.35199	187.46709	13.80112	0.0755542	0.24644160	2.5195716	21	6 16.4	13.5
620 Drakonia	11.0	X	115.20541	336.26833	359.94177	7.73650	0.1343982	0.25924912	2.4358910	21	—	—
621 Werdandi	11.0	X	256.14955	35.92885	66.68650	2.29700	0.1362029	0.17806668	3.1290628	21	9 21.3	15.5
622 Esther	10.3	X	206.11184	257.07362	141.91330	8.63842	0.2436333	0.26286399	2.4135075	21	5 9.1	14.6
623 Chimaera	10.8	X	285.49438	124.44270	308.30851	14.12654	0.1113260	0.25509815	2.4622445	21	9 25.1	14.0
624 Hektor	7.3	X	236.87780	182.56889	342.78457	18.15522	0.0225576	0.08157397	5.2654437	21	11 6.0	14.5
625 Xenia	9.9	X	26.50565	200.44527	127.52889	12.08082	0.2283179	0.22918261	2.6445287	21	11 16.2	13.2
626 Notburga	9.2	X	347.13349	43.39645	341.59037	25.37941	0.2419496	0.23865426	2.5740872	21	11 4.8	12.1
627 Charis	9.9	X	237.38532	177.54640	142.46254	6.47394	0.0585643	0.19953915	2.9003515	21	3 12.9	14.1
628 Christine	9.3	X	34.71109	205.47899	112.09952	11.52492	0.0439468	0.23757964	2.5818434	21	10 20.3	12.8
629 Bernardina	10.0	X	248.46825	37.98047	86.36750	9.23396	0.1594276	0.17782965	3.1318426	21	10 9.6	14.7
630 Euphemia	11.1	X	331.24449	39.88345	105.36910	13.86639	0.1125138	0.23187886	2.6239886	21	—	—
631 Philippina	8.7	X	236.22847	279.38882	224.54795	18.89862	0.0836877	0.21128989	2.7917953	21	10 28.2	12.7
632 Pyrrha	11.4	X	81.77782	252.89870	356.44173	2.21593	0.1910399	0.22669573	2.6638340	21	10 4.9	15.2
633 Zelma	10.0	X	191.10247	190.27271	147.27356	10.90331	0.0839400	0.18784583	3.0194998	21	2 12.9	14.7
634 Ute	9.7	X	69.78684	220.69721	133.20186	12.29369	0.1813329	0.18515919	3.0486300	21	—	—
635 Vundtia	9.1	X	34.94396	228.06272	182.86670	11.00584	0.0780002	0.17695949	3.1421010	21	—	—
636 Erika	9.6	X	178.57524	298.63661	34.57882	7.92805	0.1693477	0.19821045	2.9132988	21	2 1.3	14.4
637 Chrysothemis	11.6	X	116.06480	173.62173	353.46885	0.27063	0.1235000	0.17407610	3.1767030	21	7 20.1	16.4
638 Moira	10.0	X	86.41686	128.97674	103.16964	7.70879	0.1602914	0.21769601	2.7367539	21	9 17.6	14.0
639 Latona	8.3	X	232.32834	70.75730	279.82658	8.55553	0.1074872	0.18818404	3.0158809	21	4 6.0	13.1
640 Brambilla	9.2	X	153.68419	29.35957	234.89390	13.37348	0.0794566	0.17559543	3.1583523	21	12 18.2	14.1



ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
641 Agnes	12.4	X	91.87898	18.29168	40.97048	1.70959	0.1283841	0.29795227	2.2200951	21	1 9.8	14.3
642 Clara	10.0	X	255.89957	120.72631	5.26491	8.16809	0.1275093	0.17339893	3.1849682	21	10 17.6	14.5
643 Scheherezade	9.8	X	91.41969	229.77356	252.16319	13.76968	0.0566941	0.16003704	3.3598693	21	4 13.5	14.8
644 Cosima	10.7	X	60.63686	268.85176	109.97425	1.04108	0.1535016	0.23514656	2.5996226	21	—	—
645 Agrippina	9.9	X	266.78543	87.84025	359.23331	7.06522	0.1396685	0.17058873	3.2198513	21	9 13.2	14.3
646 Kastalia	12.6	X	47.07651	37.94082	302.80245	6.90272	0.2131194	0.27809242	2.3245735	21	—	—
647 Adelgunde	11.2	X	239.74170	175.53217	254.66662	7.32663	0.1938944	0.25816008	2.4427367	21	7 17.1	14.9
648 Pippa	9.6	X	274.05970	180.61195	290.81464	9.87567	0.2202614	0.17257993	3.1950368	21	10 7.9	14.2
649 Josefa	12.7	X	350.73833	349.41707	357.00423	12.71871	0.0794189	0.24254009	2.5465196	21	9 30.0	14.2
650 Amalasintha	12.6	X	184.21693	178.96765	215.51246	2.56353	0.1845582	0.25583796	2.4574955	21	4 12.1	16.6
651 Antikleia	10.1	X	231.11328	354.21495	38.00206	10.76087	0.1013836	0.18772461	3.0207996	21	5 29.1	14.7
652 Jubilatatrix	11.0	X	338.87466	276.49330	86.16895	15.73436	0.1270725	0.24120665	2.5558961	21	10 4.2	14.1
653 Berenike	9.3	X	130.09583	60.42520	132.82370	11.29597	0.0411226	0.18775224	3.0205032	21	9 1.1	13.7
654 Zelinda	8.6	X	201.13390	214.27927	278.40657	18.10130	0.2305120	0.28275170	2.2989661	21	8 21.3	12.8
655 Briseis	10.0	X	348.57207	281.30898	129.84834	6.51344	0.0834739	0.19076649	2.9886014	21	12 5.3	13.8
656 Beagle	10.1	X	53.00559	330.58361	184.27058	0.51683	0.1332037	0.17637411	3.1490496	21	4 14.4	14.0
657 Gunlöd	11.2	X	267.87780	244.86848	297.54011	10.23838	0.1133831	0.23364012	2.6107849	21	—	—
658 Asteria	10.5	X	249.26314	59.57181	350.97484	1.50590	0.0647198	0.20432331	2.8548991	21	7 18.7	14.4
659 Nestor	8.7	X	48.29442	343.70865	350.73827	4.52245	0.1172893	0.08396043	5.1651898	21	11 6.8	15.3
660 Crescentia	9.0	X	265.63947	105.86080	156.92569	15.20060	0.1075491	0.24434367	2.5339730	21	1 18.9	12.9
661 Cloelia	9.7	X	224.39605	184.03381	335.58627	9.24861	0.0376385	0.18839786	3.0135986	21	11 2.1	14.1
662 Newtonia	10.3	X	199.69770	165.51321	133.69517	4.12044	0.2160343	0.24145975	2.5541097	21	1 3.3	14.7
663 Gerlinde	9.2	X	105.09278	311.83231	232.79478	17.80835	0.1454801	0.18308279	3.0716450	21	7 26.5	14.2
664 Judith	9.9	X	338.31152	102.49481	170.91649	8.58117	0.2307749	0.17271709	3.1933449	21	5 5.4	13.5
665 Sabine	8.6	X	108.92268	318.27601	298.39674	14.75362	0.1726083	0.17705693	3.1409667	21	10 27.8	13.9
666 Desdemona	10.7	X	327.92992	173.85038	215.31648	7.58048	0.2369428	0.23582177	2.5946580	21	10 3.6	12.5
667 Denise	9.4	X	158.48154	305.56922	153.24339	25.40250	0.1900541	0.17362402	3.1822149	21	6 15.5	15.1
668 Dora	12.0	X	43.09234	112.93785	214.39545	6.84160	0.2353890	0.21114060	2.7931111	21	12 1.9	15.8
669 Kypria	10.1	X	255.71521	116.13453	170.72191	10.79296	0.0759955	0.18845574	3.0129816	21	2 18.2	14.6
670 Ottegebe	9.4	X	352.36905	194.74987	174.57848	7.53896	0.1926614	0.20995460	2.8036198	21	10 29.3	12.2
671 Carnegia	10.2	X	176.52038	90.20781	0.49736	8.02874	0.0663009	0.18129870	3.0917634	21	6 15.3	14.9
672 Astarte	11.5	X	273.03857	309.06658	343.87759	11.11614	0.1342935	0.24119094	2.5660071	21	3 4.4	15.3
673 Edda	10.0	X	213.43614	237.61949	226.58522	2.87459	0.0906133	0.20833988	2.8180873	21	8 18.2	13.9
674 Rachele	7.6	X	143.09563	41.69219	58.12990	13.51043	0.1951372	0.19743783	2.9208941	21	5 29.6	12.3
675 Ludmilla	8.1	X	123.62664	152.65012	263.01509	9.80393	0.2041067	0.21392718	2.7688031	21	3 13.0	12.5
676 Melitta	9.5	X	180.07859	184.82110	150.23347	12.84072	0.1219084	0.18377441	3.0639336	21	1 31.9	14.4
677 Aaltje	9.6	X	339.63249	275.42768	272.70686	8.48568	0.0498803	0.19397501	2.9555537	21	1 31.2	13.7
678 Fregundis	9.2	X	142.61827	121.19430	281.10846	6.09400	0.2197189	0.23885756	2.5726264	21	3 16.2	13.4
679 Pax	9.1	X	99.50702	267.00006	112.11620	24.40563	0.3093265	0.23676258	2.5877800	21	1 13.4	12.1
680 Genoveva	9.5	X	341.38123	245.93080	38.00463	17.50054	0.2945770	0.17689032	3.1429201	21	5 11.9	12.6
681 Gorgo	10.7	X	111.20042	115.83423	177.84226	12.57273	0.1013723	0.18007740	3.1057267	21	12 13.5	15.7
682 Hagar	12.2	X	316.66367	105.20482	190.77982	11.50901	0.1722992	0.22813131	2.6526469	21	5 1.0	15.4
683 Lanzia	8.7	X	244.09332	281.28005	259.66452	18.53012	0.0582587	0.17941372	3.1133811	21	12 20.1	13.1
684 Hildburg	10.8	X	226.48369	290.69771	336.35367	5.52249	0.0348626	0.25979759	2.4324614	21	—	—
685 Hermia	12.0	X	174.82925	80.77408	235.19310	3.64595	0.1962246	0.29469348	2.2364320	21	—	—
686 Gersuind	9.6	X	301.61176	89.15967	243.04466	15.68750	0.2683257	0.23665415	2.5885703	21	5 9.6	12.9
687 Tinette	11.7	X	296.30954	52.60039	334.32874	14.88092	0.2725293	0.21939854	2.7225773	21	7 21.7	15.2
688 Melanie	10.8	X	109.57700	139.03288	170.83356	10.24472	0.1390483	0.22246298	2.6975172	21	—	—
689 Zita	12.2	X	260.17600	188.52894	168.12531	5.74210	0.2296028	0.27976056	2.3153237	21	4 30.2	15.7
690 Wratislavia	8.0	X	11.65434	114.29336	253.06257	11.24720	0.1769713	0.17641398	3.1485751	21	11 19.6	11.8
691 Liphig	9.3	X	169.13318	304.23046	87.97047	13.01254	0.1234609	0.18869210	3.0104649	21	4 5.7	14.2
692 Hippodamia	9.0	X	72.50598	53.86606	63.45718	26.07527	0.1686126	0.15827971	3.3846925	21	4 16.4	13.9
693 Zerbinetta	9.5	X	136.61032	284.40720	351.71501	14.19186	0.0309713	0.19527294	2.9424427	21	12 17.3	14.0
694 Ekard	9.2	X	246.77799	111.84479	229.97382	15.89112	0.2328676	0.22581782	2.6707337	21	3 22.9	14.3
695 Bella	9.1	X	261.69827	80.03275	275.52528	13.84774	0.1602330	0.24362741	2.5389371	21	5 5.1	13.2
696 Leonora	9.5	X	262.50660	103.70312	299.51000	13.03575	0.2498923	0.17449618	3.1716027	21	7 1.7	14.5
697 Galilea	9.5	X	65.79744	332.97650	15.42354	15.12286	0.1541550	0.20153881	2.8811349	21	—	—
698 Ernestina	10.9	X	351.29962	98.49519	40.62129	11.53011	0.1109761	0.20292494	2.8679997	21	—	—
699 Hela	11.3	X	64.46843	91.35094	242.54412	15.29465	0.4102190	0.23347553	2.6120118	21	—	—
700 Auravictrix	11.1	X	175.16219	101.97052	96.79716	6.78790	0.1045133	0.29615327	2.2290768	21	11 10.2	14.3
701 Oriola	9.2	X	152.80582	326.07030	243.56298	7.12996	0.0367794	0.18844845	3.0130592	21	10 13.7	13.6
702 Alauda	7.3	X	189.84022	353.06903	289.74485	20.60027	0.0167342	0.17259028	3.1949090	21	—	—
703 Noëmi	12.5	X	177.29949	174.90525	213.74090	2.45832	0.1376845	0.30733240	2.1746890	21	3 21.6	15.5
704 Interamnia	5.94	-0.02	248.30913	94.84282	280.28270	17.31066	0.1553941	0.18449262	3.0559767	21	5 21.3	11.0
705 Erminia	8.4	X	342.68167	102.45476	2.78719	25.01696	0.0505622	0.19721411	2.9231026	21	—	—
706 Hirundo	11.0	X	211.92006	31.11611	325.34486	14.43252	0.1948391	0.21867851	2.7285504	21	3 18.1	15.7
707 Steina	12.1	X	185.91146	90.90231	281.89773	4.27311	0.1082470	0.30615245	2.1802731	21	3 6.5	15.2
708 Raphaela	10.6	X	55.53488	197.24881	355.17321	3.49006	0.0854508	0.22596993	2.6695349	21	5 27.8	13.8
709 Fringilla	9.1	X	211.02983	19.37674	324.37801	16.26340	0.1130193	0.19799630	2.9153989	21	3 6.4	13.9
710 Gertrud	11.1	X	263.24088	99.65486	140.16536	1.75102	0.1323398	0.17782504	3.1318968	21	—	—
711 Marmulla	11.7	X	235.23831	300.31722	357.04496	6.08998	0.1951427	0.29444659	2.2376820	21	1 23.9	15.4
712 Boliviana	8.32	0.03	288.70469	181.29085	230.74165	12.75117	0.1856621	0.23820877	2.5772955	21	8 19.9	11.9
713 Luscinia	8.9	X	55.80644	138.26958	217.48331	10.34325	0.1553906	0.15735868	3.3978869	21	12 28.1	13.9
714 Ulula	9.1	X	208.34680	231.71755	233.79072	14.26189	0.0558591	0.24394975	2.5367001	21	8 6.1	13.0
715 Transvaalia	10.1	X	216.17402	301.14779	46.06061	13.81936	0.0834666	0.21404856	2.7677563	21	3 25.4	14.4
716 Berkeley	10.7	X	220.06443	56.60125	145.88555	8.48744	0.0866589	0.20902055	2.8119660	21	12 20.9	14.9
717 Wisibada	10.9	X	221.72685	24.41346	343.55478	1.64644	0.2638231	0.17736472	3.1373134	21	4 14.1	16.5
718 Erida	9.7	X	336.85980	174.56602	38.51664	6.92648	0.1985525	0.18438266	3.0571917	21	2 15.5	13.5
719 Albert	15.5	X	232.21737	156.20767	183.85483	11.57332	0.5468705	0.23003109	2.6380217	21	3 8.6	21.1
720 Bohlinia	9.6	X	359.15496	111.39976	35.68232	2.35355	0.0185576	0.2008				

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
721 Tabora	9.3	X	124.23279	352.56473	38.37968	8.32059	0.1172793	0.14712164	3.5537348	21	2 19.6	14.6
722 Frieda	12.3	X	170.91588	257.33155	45.66323	5.63636	0.1445109	0.30785945	2.1722062	21	—	—
723 Hammonia	10.0	X	49.42407	250.55240	163.17635	4.98998	0.0554169	0.19025871	2.9939165	21	—	—
724 Hapag	13.8	X	174.59962	205.78917	204.23475	11.71533	0.2511646	0.25642203	2.4537623	21	4 26.4	17.9
725 Amanda	11.8	X	210.15746	323.32068	68.67123	3.79059	0.2219731	0.23903638	2.5713432	21	5 2.9	16.2
726 Joëlla	10.5	X	274.99050	113.23941	241.96724	15.43792	0.2854562	0.23996837	2.5646812	21	5 6.7	14.4
727 Nipponia	9.6	X	283.06888	274.11117	133.05091	15.06193	0.1047933	0.23940382	2.5687115	21	8 25.7	12.7
728 Leonisis	12.9	X	122.33773	54.93334	82.63919	4.25704	0.0877832	0.29135431	2.2534971	21	6 13.3	15.8
729 Watsonia	9.4	X	250.88695	87.62493	124.32793	18.05064	0.0970515	0.21498076	2.7597495	21	—	—
730 Athanasia	13.7	X	169.91335	123.41603	95.06234	4.23431	0.1782049	0.29346328	2.2426777	21	11 24.1	17.0
731 Sorga	9.7	X	277.31428	288.73428	46.12982	10.69085	0.1415360	0.19100049	2.9861599	21	5 5.5	14.1
732 Tjilaki	10.5	X	102.27220	64.78338	173.29903	11.00120	0.0445334	0.25593094	2.4569003	21	10 1.1	13.8
733 Mocia	9.2	X	342.18683	189.43480	340.97555	20.28742	0.0583622	0.15717196	3.4005774	21	1 28.1	14.0
734 Benda	9.9	X	122.65511	66.02589	3.13042	5.80607	0.1002002	0.17655634	3.1468824	21	3 25.2	14.5
735 Marghanna	9.7	X	74.11143	309.81836	42.94665	16.86486	0.3209640	0.21851057	2.7299483	21	—	—
736 Harvard	11.2	X	149.28241	200.61118	135.90300	4.37686	0.1651327	0.30155881	2.2023586	21	—	—
737 Areqipa	9.0	X	90.71983	134.15264	184.62570	12.36756	0.2449188	0.23645341	2.5900352	21	—	—
738 Alagasta	10.0	X	119.42528	44.19145	132.09014	3.53546	0.0541096	0.18597075	3.0397623	21	7 27.9	14.3
739 Mandeville	8.7	X	308.93526	45.04316	136.55072	20.66142	0.1435421	0.21752562	2.7381828	21	—	—
740 Cantabia	9.2	X	106.14422	48.35029	116.07705	10.84532	0.1091751	0.18480721	3.0525078	21	7 3.9	13.7
741 Botolphia	10.1	X	45.18845	61.64257	100.70346	8.41364	0.0699353	0.21983462	2.7189757	21	4 4.5	13.6
742 Edisona	9.5	X	45.36763	283.50112	64.15450	11.20398	0.1154090	0.18861639	3.0112705	21	12 7.2	13.6
743 Eugenis	10.3	X	169.14470	186.32328	228.95364	4.83503	0.0598231	0.21127345	2.7919401	21	4 21.2	14.4
744 Aguntina	10.3	X	41.18306	28.70522	142.64081	7.71515	0.1167591	0.17454775	3.1709779	21	4 18.7	14.3
745 Mauritia	10.5	X	165.95482	31.84525	125.66359	13.32049	0.0396393	0.16656366	3.2715173	21	8 27.9	15.3
746 Marlu	9.8	X	132.10916	306.91753	1.92507	17.47847	0.2367556	0.17962604	3.1109272	21	—	—
747 Winchester	7.8	X	38.39322	277.44030	129.10332	18.21784	0.3392203	0.18961314	3.0007081	21	—	—
748 Simeisa	9.0	X	14.44353	177.65936	265.46836	2.25816	0.1886765	0.12555133	3.9499219	21	—	—
749 Malzovia	11.6	X	46.37023	129.06314	109.75722	5.39426	0.1730228	0.29320185	2.2440106	21	8 5.9	13.6
750 Oskar	12.3	X	177.62868	72.68126	69.64601	3.94703	0.1277818	0.25751406	2.4468204	21	8 25.6	16.0
751 Faina	8.66	0.08	30.00294	302.43224	78.83459	15.59761	0.1509950	0.24194223	2.5507130	21	—	—
752 Sulamitis	10.3	X	96.56329	23.29336	85.11419	5.96179	0.0746609	0.25510712	2.4621868	21	4 1.6	13.4
753 Tiflis	10.1	X	126.00120	202.96806	61.33072	10.08830	0.2214959	0.27742320	3.3283103	21	12 9.2	14.1
754 Malabar	9.2	X	309.35473	303.31076	179.92161	24.54383	0.0503158	0.19095409	2.9866436	21	—	—
755 Quintilla	9.7	X	3.53148	44.05901	176.67221	3.24303	0.1369274	0.17381888	3.1798362	21	4 18.2	13.3
756 Lilliana	9.9	X	232.58226	4.40754	208.06183	20.34897	0.1480650	0.17249755	3.1960540	21	12 28.9	15.0
757 Portlandia	10.1	X	259.36840	43.67126	22.45732	8.16799	0.1086486	0.26938606	2.3743932	21	8 21.9	13.2
758 Mancunia	8.4	X	213.13078	314.43458	106.18993	5.61039	0.1503770	0.17315384	3.1879730	21	6 14.2	13.6
759 Vinifera	10.6	X	172.41762	1.02432	318.34561	19.90552	0.2053835	0.23250249	2.6192944	21	11 9.0	15.0
760 Massinga	7.9	X	247.53719	200.48295	331.54804	12.53951	0.2335013	0.17659263	3.1464512	21	11 16.4	12.8
761 Brendelia	10.7	X	121.42634	297.87556	23.72398	2.15542	0.0627253	0.20345098	2.8630539	21	—	—
762 Pulcova	8.0	X	306.09975	188.89063	305.54371	13.10053	0.1064653	0.17604421	3.1529824	21	—	—
763 Cupido	12.6	X	37.02460	88.93247	289.81265	4.08246	0.1656172	0.29387324	2.2405915	21	—	—
764 Gedania	9.7	X	309.94519	158.23367	258.78339	9.99956	0.0929367	0.17266502	3.1939869	21	10 6.5	14.0
765 Mattiaca	12.3	X	163.93594	71.84989	326.29598	5.53396	0.2851633	0.24280308	2.5446805	21	4 3.2	16.9
766 Moguntia	9.9	X	133.51091	70.87037	7.82031	10.09005	0.0967302	0.18793983	3.0184929	21	4 14.6	14.5
767 Bondia	10.2	X	208.51101	269.15387	79.31259	2.41176	0.1826533	0.17876072	3.1209584	21	3 16.3	15.5
768 Struveana	10.2	X	98.43150	16.66203	38.88685	16.27209	0.2123074	0.17726481	3.1384921	21	3 4.6	14.8
769 Tatjana	9.0	X	45.87594	253.47992	38.37699	7.36738	0.1872992	0.17471079	3.1690049	21	10 10.4	13.2
770 Bali	10.9	X	175.81627	18.19310	44.67951	4.38375	0.1513485	0.29789794	2.2203651	21	5 7.2	14.0
771 Libera	10.3	X	317.65235	228.56326	217.86564	14.89086	0.2468814	0.22826850	2.6515840	21	12 6.8	12.5
772 Tanete	8.4	X	145.09877	146.08464	63.73765	28.82895	0.0940886	0.18975256	2.9992382	21	10 23.4	13.5
773 Irmित्रा	9.1	X	226.40319	332.75988	322.29982	16.66735	0.0786178	0.20385789	2.8592428	21	1 29.2	13.4
774 Armor	8.8	X	213.84284	28.60634	250.10795	5.56393	0.1668841	0.18507226	3.0495927	21	—	—
775 Lumière	10.3	X	213.49899	168.18467	297.72950	9.28029	0.0678196	0.18790487	3.0188673	21	8 13.3	14.9
776 Berbericia	7.68	0.34	229.65985	306.78858	79.71215	18.23844	0.1656859	0.19657909	2.9293943	21	5 20.3	12.4
777 Gutemberg	9.8	X	146.82631	264.54469	283.15936	12.90551	0.1130209	0.17017020	3.2251287	21	9 6.9	15.1
778 Theobalda	9.7	X	336.12690	135.04665	321.23736	13.71335	0.2556594	0.17394034	3.1783558	21	—	—
779 Nina	7.9	X	32.26861	48.98377	283.72881	14.57896	0.2274485	0.22674341	2.6634605	21	11 24.6	11.4
780 Armenia	9.0	X	310.70243	213.13757	144.82991	19.09254	0.0978265	0.17918968	3.1159756	21	7 26.3	13.1
781 Kartvelia	9.5	X	9.87021	155.96708	138.08418	19.15825	0.1183507	0.17050572	3.2208963	21	8 5.8	13.3
782 Montefiore	11.3	X	142.28366	81.70895	80.46451	5.25999	0.0383724	0.30610798	2.1804842	21	8 12.1	14.0
783 Nora	11.1	X	246.78333	154.76545	142.08338	9.34202	0.2296711	0.27483816	2.3428871	21	2 1.4	15.1
784 Pickeringia	9.3	X	169.70487	238.05347	14.91068	12.28096	0.2418798	0.18086249	3.0967327	21	12 16.4	14.9
785 Zwetana	9.5	X	339.19299	131.43617	71.86488	12.76844	0.2100211	0.23927430	2.5696384	21	1 21.3	12.7
786 Bredichina	8.9	X	337.11047	133.67903	89.75792	14.51688	0.1595963	0.17413053	3.1760410	21	3 12.7	13.1
787 Moskva	9.7	X	97.62743	125.70397	183.82978	14.85231	0.1300106	0.24371075	2.5383583	21	12 29.9	13.9
788 Hohensteina	8.7	X	134.09839	47.97689	177.67701	14.35649	0.1353676	0.17865917	3.1221409	21	10 20.2	13.7
789 Lena	11.3	X	108.76075	43.61412	232.58187	10.77786	0.1478659	0.22406262	2.6846630	21	11 29.7	15.5
790 Pretoria	8.1	X	8.97465	68.61335	252.01519	20.52150	0.1536169	0.15639741	3.4117956	21	7 24.4	12.5
791 Ani	9.2	X	104.36518	201.63037	129.81176	16.38103	0.1929482	0.17854720	3.1234462	21	—	—
792 Metcalfia	10.2	X	13.05522	227.41549	265.06882	8.62386	0.1315648	0.23204272	2.6227532	21	—	—
793 Arizona	10.0	X	28.83871	308.16381	35.96212	15.77852	0.1242273	0.21091488	2.7951036	21	11 14.3	13.5
794 Irenaea	11.3	X	102.41209	131.31390	160.39874	5.41914	0.2963116	0.17813185	3.1282995	21	12 15.6	16.8
795 Fini	10.0	X	293.22318	190.06033	17.36275	19.04928	0.1021022	0.271615321	2.7497608	21	—	—
796 Sarita	9.1	X	356.11774	329.47103	33.15298	19.04811	0.3201919	0.23042298	2.6350297	21	11 12.8	11.0
797 Montana	10.4	X	309.02334	354.78900	238.31271	4.51207	0.0603730	0.24414559	2.5353434	21	2 6.3	13.7
798 Ruth	9.6	X	303.69548	44.13047	214.24091	9.23893	0.0354256	0.18831990	3.0144302	21	3 15.7	14.0
799 Gudula	10.3	X	211.02664	237.12129	164.85616	5.28279	0.0229294	0.24335233	2.5408501	21	5 24.1	13.8
800 Kressmannia	11.4	X	142.50655	347.53384	325.15041	4.26333	0.2014938	0.30350204	2.1929479	21	—	—

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
801 Helwerthia	11.6	X	109.77778	335.04131	185.95215	14.12901	0.0771246	0.23447372	2.6045934	21	6 28.4	15.5
802 Epyaxa	12.8	X	285.11042	116.55198	7.74981	5.20353	0.0789935	0.30292622	2.1957260	21	—	—
803 Picka	9.4	X	48.92275	57.43278	250.82684	8.65848	0.0641969	0.17236225	3.1977262	21	10 12.2	14.0
804 Hispania	7.84	0.18	288.46942	344.76158	347.58894	15.39889	0.1409111	0.20627359	2.8368756	21	5 8.5	12.0
805 Hormuthia	9.8	X	84.08304	131.77261	166.34448	15.73138	0.1868141	0.17282556	3.1920087	21	11 30.7	15.0
806 Gyldenja	10.2	X	193.02333	121.27674	43.63014	14.20798	0.0797581	0.17158567	3.2073674	21	10 7.5	15.1
807 Ceraskia	10.6	X	166.77614	337.19306	132.20346	11.31974	0.0645778	0.18805134	3.0172996	21	6 28.7	15.2
808 Merxia	9.8	X	40.69428	274.67969	180.98417	4.72191	0.1291641	0.21665260	2.7455337	21	—	—
809 Lundia	12.1	X	230.73661	196.44006	154.51068	7.14608	0.1923193	0.28574999	2.2828563	21	3 28.9	15.7
810 Atossa	12.5	X	320.98386	195.78123	152.68896	2.61240	0.1807401	0.30645042	2.1788595	21	7 24.3	14.1
811 Nauheima	10.7	X	195.18886	178.76874	130.80649	3.13727	0.0710529	0.19976172	2.8981968	21	1 12.8	15.1
812 Adele	11.8	X	137.51034	353.19220	7.24486	13.29845	0.1648666	0.22709411	2.6607177	21	1 21.8	15.9
813 Baumeia	11.5	X	346.29415	314.61102	51.89571	6.29520	0.0257281	0.29728876	2.2233972	21	10 20.4	13.9
814 Tauris	8.8	X	317.75611	296.26142	88.77150	21.79920	0.3060371	0.17543982	3.1602196	21	8 21.8	12.5
815 Coppelja	10.8	X	125.25666	58.22526	57.04857	13.86785	0.0757776	0.22748808	2.6576449	21	5 18.2	14.4
816 Juliana	10.4	X	85.18766	20.84091	127.84313	14.32832	0.1083287	0.18953782	3.0015031	21	5 22.6	14.8
817 Annika	10.6	X	155.73955	285.09563	125.46956	11.33598	0.1805706	0.23656263	2.5892379	21	4 12.9	14.9
818 Kapteynia	9.3	X	354.22589	291.50288	70.69159	15.62978	0.0912901	0.17448000	3.1717987	21	10 16.6	13.5
819 Barnardiana	11.9	X	7.48063	306.51558	333.11825	4.89655	0.1419853	0.30252216	2.1976807	21	7 18.5	13.4
820 Adriana	10.4	X	243.50892	194.39291	118.44458	5.93406	0.0505234	0.17797690	3.1301150	21	3 15.2	15.0
821 Fanny	11.8	X	235.80781	32.87834	209.74169	5.39735	0.2118246	0.21345477	2.7728868	21	—	—
822 Lalage	12.1	X	98.71969	247.13405	210.09699	0.71731	0.1557038	0.29103174	2.2551520	21	3 24.2	14.5
823 Sisigambis	11.2	X	351.82686	219.19714	254.99996	3.64529	0.0905421	0.29771141	2.2212924	21	—	—
824 Anastasia	10.2	X	105.93801	141.41401	141.34879	8.13202	0.1375031	0.21130627	2.7916510	21	12 3.6	14.6
825 Tanina	11.4	X	231.88696	111.28320	101.40597	3.39979	0.0754093	0.29683830	2.2256460	21	—	—
826 Henrika	11.6	X	140.30093	36.67929	230.21567	7.10430	0.2057099	0.22072003	2.7116994	21	12 16.6	16.2
827 Wolfiana	13.1	X	187.10093	195.67121	172.86014	3.42215	0.1564702	0.28732329	2.2745151	21	3 9.2	16.4
828 Lindemannia	10.3	X	202.02074	295.55332	1.81762	1.12522	0.0277568	0.17277539	3.1926266	21	1 9.9	14.9
829 Academia	11.0	X	60.46814	42.22133	352.34046	8.27844	0.0984928	0.23781312	2.5801533	21	—	—
830 Petropolitana	9.1	X	5.97781	90.92408	340.27688	8.30271	0.0653456	0.17139579	3.2097357	21	—	—
831 Stateira	13.0	X	270.46117	224.93480	178.04729	4.83691	0.1461748	0.29946509	2.2126119	21	7 24.8	15.7
832 Karin	11.2	X	206.40980	122.13374	253.88721	1.00572	0.0815690	0.20343072	2.8632440	21	4 14.0	15.6
833 Monica	11.2	X	0.66828	36.74668	352.82912	9.78721	0.1168266	0.18873738	3.0099834	21	11 24.4	15.0
834 Burnhamia	9.5	X	276.94681	91.42959	182.66027	3.97903	0.2010509	0.17345728	3.1842539	21	2 14.7	14.6
835 Olivia	11.5	X	69.96571	67.19213	308.48642	3.69967	0.0878876	0.17057748	3.2199930	21	—	—
836 Jole	13.2	X	102.02644	179.84898	199.74683	4.84477	0.1760044	0.30402982	2.1904093	21	—	—
837 Schwarzschilda	12.3	X	11.72594	172.29138	199.97214	6.73783	0.0404641	0.28295782	2.2978495	21	12 3.6	14.9
838 Seraphina	10.1	X	94.95974	117.26920	240.05077	10.42040	0.1310772	0.19962019	2.8995665	21	—	—
839 Valborg	10.6	X	322.27334	339.88003	338.18027	12.60646	0.1525743	0.23317026	2.6142911	21	6 11.5	13.8
840 Zenobia	10.1	X	33.59169	10.05042	272.72663	9.97649	0.1024617	0.17757671	3.1348159	21	8 23.4	14.4
841 Arabella	12.7	X	234.82633	120.64103	354.66837	3.79112	0.0689335	0.29091605	2.2557498	21	9 30.9	15.5
842 Kerstin	10.7	X	58.00731	352.65738	5.39801	14.49563	0.1164727	0.16922330	3.2371484	21	—	—
843 Nicolaia	13.8	X	186.97720	317.10152	4.04504	7.99807	0.2095303	0.28635895	2.2796187	21	1 14.0	17.5
844 Leontina	9.6	X	160.66360	353.47458	348.67743	8.77705	0.0694652	0.17180676	3.2046152	21	1 22.2	14.4
845 Naëma	10.2	X	344.95571	293.66985	43.06548	12.60233	0.0704465	0.19534935	2.9416753	21	8 30.9	14.1
846 Lipperta	10.3	X	347.64133	129.97463	260.71665	0.26485	0.1755526	0.17788518	3.1311909	21	11 7.5	13.7
847 Agnia	10.2	X	231.17485	129.61618	270.91670	2.48185	0.0960194	0.21249796	2.7812042	21	6 10.0	14.3
848 Inna	11.3	X	128.25102	125.56120	207.79180	1.05347	0.1627580	0.17957712	3.1114922	21	—	—
849 Ara	8.2	X	34.02879	63.17782	228.29968	19.52399	0.2013954	0.17648203	3.1477656	21	9 16.5	12.4
850 Altona	9.7	X	34.44821	135.07893	121.13242	15.54421	0.1260918	0.18950509	3.0018486	21	7 28.8	13.2
851 Zeissia	11.5	X	274.26299	7.79992	141.16776	2.39375	0.0905675	0.29640326	2.2278232	21	—	—
852 Wladilena	10.0	X	276.07505	282.36059	27.27137	23.01596	0.2743927	0.27143609	2.3624229	21	3 20.7	14.0
853 Nansenia	11.6	X	301.51256	59.77225	182.82760	9.21487	0.1051446	0.28023184	2.3127171	21	1 26.5	14.7
854 Frostia	11.9	X	255.27935	84.29149	190.56569	6.08656	0.1735342	0.27028683	2.3691129	21	1 15.1	15.8
855 Newcambia	11.7	X	320.12320	234.05173	17.10560	10.88191	0.1784831	0.27150007	2.3620518	21	2 28.5	14.6
856 Backlunda	10.7	X	241.65492	72.86275	125.54040	14.32784	0.1193805	0.25941258	2.4348677	21	—	—
857 Glasenappia	11.6	X	60.39414	238.69674	82.90054	5.29963	0.0885366	0.30411962	2.1899780	21	12 12.0	14.0
858 El Djezair	10.3	X	119.25425	178.46549	67.12149	8.86737	0.1036749	0.20927750	2.8096638	21	10 31.3	14.6
859 Bouzaréah	9.7	X	23.97866	21.77749	35.68085	13.50184	0.1096260	0.17018032	3.2250008	21	—	—
860 Ursina	9.9	X	266.74864	21.87378	309.35037	13.29911	0.1071069	0.21084654	2.7957075	21	4 14.3	14.3
861 Aïda	9.7	X	85.25558	192.22668	114.94688	8.05870	0.1006276	0.17727471	3.1383752	21	12 2.7	14.4
862 Franzia	9.8	X	138.05570	120.75526	300.00766	13.88690	0.0825072	0.21002940	2.8029541	21	3 18.7	14.1
863 Benkoela	9.1	X	0.47242	97.80545	116.92220	25.41670	0.0284981	0.17213791	3.2005039	21	4 21.3	14.0
864 Aase	12.8	X	148.30425	193.99275	163.09231	5.45008	0.1902422	0.30025887	2.2087106	21	1 14.0	15.7
865 Zubaida	11.7	X	296.54265	302.26001	176.89063	13.35473	0.1948079	0.26245013	2.4160441	21	12 23.5	14.0
866 Fatme	9.5	X	105.42134	263.69117	91.06250	8.66039	0.0524734	0.17837695	3.1254333	21	—	—
867 Kovacia	11.5	X	186.67691	70.64963	46.71082	5.96610	0.1255268	0.18301452	3.0724089	21	7 31.1	16.4
868 Lová	10.3	X	313.13600	286.57358	115.77101	5.83743	0.1468410	0.22151905	2.7051748	21	10 1.4	13.3
869 Mellena	11.9	X	179.74366	107.14362	154.87163	7.83826	0.2198073	0.22344590	2.6896005	21	—	—
870 Manto	11.7	X	95.30078	196.90458	120.79779	6.19294	0.2648642	0.27859098	2.3217993	21	—	—
871 Amneris	12.6	X	155.83880	66.37471	157.99094	4.25313	0.1205434	0.29768273	2.2214350	21	11 21.4	15.9
872 Holda	11.1	X	40.51781	18.17142	194.71887	7.37521	0.0783935	0.21838675	2.7309800	21	6 3.1	13.5
873 Mechthild	10.4	X	141.05389	109.83908	149.99687	5.27704	0.1492081	0.23157313	2.6262976	21	12 10.9	15.7
874 Rotraut	10.1	X	242.48985	9.23742	190.62434	11.13899	0.0797201	0.17605322	3.1528749	21	—	—
875 Nymphe	11.2	X	118.62265	117.11223	196.04293	14.56901	0.1512917	0.24161503	2.5530153	21	—	—
876 Scott	10.9	X	251.15666	211.34953	150.95416	11.36371	0.1145056	0.18898763	3.0073257	21	5 17.0	15.6
877 Walküre	10.9	X	323.41852	275.60829	116.37080	4.25519	0.1595079	0.25120292	2.4876327	21	10 10.1	13.1
878 Mildred	14.7	X	328.12930	190.07982	172.81548	2.06592	0.2268239	0.27166866	2.3610745	21	8 28.8	16.1
879 Ricarda	11.0	X	247.46622	96.94968	269.84905	13.68168	0.1552970	0.24484353	2.5305231	21	5 5.4	15.1
880 Herba	11.3	X	323.24681	100.81672	262.61563	15.14218	0.3236812	0.18979031	2.9988405	21	7 20.1	14.4

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
881 Athene	11.8	X	214.49341	41.39217	277.02654	14.18883	0.2056521	0.23325402	2.6136652	21	2 3.0	16.5
882 Svetlana	10.7	X	223.16454	126.43471	256.28899	6.12678	0.2673174	0.17863364	3.1224385	21	5 1.4	16.2
883 Matteredania	12.6	X	21.43824	42.35461	285.47739	4.71466	0.1989100	0.29435773	2.2381323	21	11 10.4	14.9
884 Priamus	8.7	X	358.02418	335.69065	301.56302	8.91484	0.1241707	0.08341234	5.1877915	21	6 25.8	14.9
885 Ulrike	10.7	X	30.68945	203.83158	148.89051	3.30761	0.1839496	0.18102847	3.0948394	21	12 3.5	14.6
886 Washingtonia	9.3	X	171.57822	302.19370	58.86326	16.86482	0.2707930	0.17467103	3.1694857	21	3 12.4	15.1
887 Alinda	13.4	-0.12	35.91308	350.50721	110.43283	9.39376	0.5704582	0.25333470	2.4736577	21	—	—
888 Parysatis	9.4	X	102.77162	298.05658	123.94372	13.84979	0.1945229	0.22102883	2.7091732	21	3 2.9	13.1
889 Erynia	11.0	X	85.61433	278.52296	132.53190	8.10658	0.2031724	0.25747839	2.4470464	21	1 9.6	13.3
890 Waltraut	10.5	X	154.80719	87.82605	160.53048	10.87755	0.0601184	0.18778302	3.0201731	21	12 5.2	15.2
891 Gunhild	10.0	X	313.14717	293.07845	105.82704	13.54786	0.0270198	0.20365333	2.8611571	21	10 9.1	14.1
892 Seeligeria	9.7	X	30.78320	286.17665	175.88831	21.32806	0.1044925	0.16993059	3.2281597	21	1 1.1	14.2
893 Leopoldina	9.6	X	5.77253	222.45262	144.91817	17.03984	0.1465623	0.18495615	3.0508688	21	11 14.4	13.6
894 Erda	9.7	X	221.55761	116.50694	190.59130	12.73500	0.1104536	0.17888275	3.1195390	21	2 5.5	14.8
895 Helio	8.4	X	191.33419	177.67263	264.68845	26.07463	0.1444689	0.17202942	3.2018494	21	6 19.9	13.5
896 Sphinx	11.6	X	325.72466	2.04964	254.17047	8.18980	0.1630506	0.28527784	2.2853744	21	3 6.3	14.5
897 Lysistrata	10.3	X	166.35656	23.86428	257.96793	14.32806	0.0942516	0.24324140	2.5416225	21	—	—
898 Hildegard	11.7	X	304.85922	49.93762	241.52804	10.08640	0.3714341	0.21854112	2.7296938	21	3 5.3	16.1
899 Jokaste	10.1	X	228.18354	127.50721	252.40850	12.46953	0.2015085	0.19906755	2.9049305	21	5 3.8	15.1
900 Rosalinde	11.6	X	174.69587	121.91351	182.24486	11.55845	0.1626394	0.25327920	2.4740190	21	—	—
901 Brunsis	11.5	X	5.51905	68.27393	265.06665	3.44599	0.2211583	0.29709707	2.2243535	21	10 24.0	13.0
902 Probitas	12.1	X	294.01962	28.28051	353.04730	6.34726	0.1800647	0.25751561	2.4468105	21	7 25.0	14.8
903 Nealley	10.1	X	175.21399	233.93452	159.38246	11.78223	0.0456130	0.16916641	3.2378742	21	4 7.4	14.9
904 Rockefelleria	10.4	X	253.13505	252.66892	197.82283	15.16431	0.0854166	0.18987697	2.9979280	21	9 6.3	14.8
905 Universitas	11.6	X	58.29059	343.20753	37.12933	5.32253	0.1527870	0.29877130	2.2160359	21	—	—
906 Repsolda	9.4	X	1.82080	293.78751	40.09671	11.77772	0.0865593	0.20002009	2.8957005	21	9 22.2	13.1
907 Rhoda	9.7	X	267.59749	88.50904	42.93093	19.53222	0.1631194	0.21052123	2.7985868	21	11 9.4	13.4
908 Buda	10.8	X	98.89687	23.41380	85.54455	13.41508	0.1479058	0.25352213	2.4724383	21	4 21.1	14.2
909 Ulla	8.8	X	239.58119	232.56614	146.35596	18.79755	0.0909854	0.14788538	3.5414889	21	5 30.3	14.4
910 Anneliese	10.5	X	59.77255	208.42809	49.85332	9.20521	0.1551935	0.19672186	2.9279768	21	9 17.1	14.5
911 Agamemnon	7.9	X	333.76473	80.86399	338.00434	21.76209	0.0670027	0.08125454	5.2792346	21	10 23.4	14.8
912 Maritima	9.4	X	240.09610	90.86498	33.45915	18.29659	0.1783768	0.17779875	3.1322055	21	9 30.2	14.3
913 Otila	12.0	X	90.60393	188.52847	94.92061	5.80526	0.1708727	0.30266994	2.1969652	21	12 4.4	15.1
914 Palisana	9.2	X	171.77743	49.01819	255.79244	25.20525	0.2145131	0.25570882	2.4583228	21	—	—
915 Cosette	11.6	X	333.35856	39.47989	9.26780	5.54669	0.1390006	0.29643795	2.2276494	21	12 5.1	13.4
916 America	11.5	X	13.84376	41.53414	329.75492	11.09666	0.2365916	0.27110022	2.3643738	21	—	—
917 Lyka	11.6	X	289.20002	359.93024	343.38621	5.12685	0.2009297	0.26831328	2.3807179	21	5 15.8	14.9
918 Itha	10.6	X	355.07669	15.25284	330.43915	12.07321	0.1898897	0.20317543	2.8656419	21	9 22.0	13.7
919 Ilsebill	11.4	X	100.09970	156.17344	229.82180	8.16411	0.0837241	0.21343631	2.7730467	21	—	—
920 Rogeria	11.3	X	254.17260	269.82684	192.62151	11.58972	0.1045610	0.23199107	2.6231425	21	9 26.7	14.7
921 Jovita	10.0	X	41.08639	70.85332	204.82513	16.33884	0.1854891	0.17444397	3.1722354	21	9 6.7	14.2
922 Schlutia	12.1	X	43.85047	126.46052	205.12186	7.30135	0.1937380	0.22366433	2.6878492	21	12 4.6	15.7
923 Herluga	11.5	X	1.51507	201.31855	197.46167	14.46456	0.1942818	0.23306695	2.6150636	21	12 30.7	14.7
924 Toni	9.4	X	74.06396	220.08370	150.18972	8.98719	0.1532155	0.19556573	2.9395051	21	—	—
925 Alphonsina	8.4	X	290.47441	201.89866	299.52976	21.10137	0.0806661	0.22222451	2.6994466	21	—	—
926 Imhilde	10.5	X	174.01882	173.67613	48.96618	16.32575	0.1825193	0.19157881	2.9801473	21	11 18.5	15.5
927 Ratisbona	9.3	X	155.19397	172.17397	7.40104	14.61725	0.0892766	0.17004165	3.2267539	21	9 14.3	14.3
928 Hildrun	10.0	X	80.38218	21.82420	129.83476	17.65352	0.1480080	0.17767709	3.1336352	21	5 27.4	14.6
929 Algunde	11.7	X	6.82185	23.12705	231.37429	3.91300	0.1130167	0.29426607	2.2385970	21	6 1.3	13.5
930 Westphalia	11.3	X	136.30441	330.09006	340.93804	15.33632	0.1430722	0.25995131	2.4315025	21	—	—
931 Whittemora	9.3	X	50.43073	315.44072	110.99966	11.48340	0.2329532	0.17459594	3.1703944	21	—	—
932 Hoovertia	10.1	X	76.18280	50.00916	14.94729	8.11349	0.0908866	0.26179683	2.4200618	21	—	—
933 Susi	12.4	X	315.65187	13.08841	141.42205	5.54266	0.1666495	0.27051247	2.3677973	21	—	—
934 Thüringia	10.1	X	0.27067	64.23824	325.38188	14.08433	0.2158240	0.21630544	2.7484706	21	12 15.5	13.2
935 Clivia	12.8	X	135.16612	58.53786	346.38641	4.02279	0.1461329	0.29821581	2.2187870	21	2 26.9	15.3
936 Kunigunde	10.4	X	79.90818	253.51188	62.15547	2.36605	0.1758293	0.17787848	3.1312694	21	12 13.9	15.1
937 Bethgea	11.8	X	108.30151	72.42491	243.55956	3.69593	0.2173260	0.29565934	2.2315587	21	—	—
938 Chlosinde	11.3	X	336.72706	225.52665	119.06295	2.66982	0.1961323	0.17609260	3.1524047	21	8 13.1	14.7
939 Isberga	12.0	X	355.68675	6.15427	327.05404	2.58410	0.1771963	0.29256848	2.2472481	21	9 23.2	13.3
940 Kordula	9.3	X	105.00331	283.66954	66.31537	6.24126	0.1700667	0.15948959	3.3675533	21	—	—
941 Murray	11.5	X	244.47028	334.88121	52.30606	6.62649	0.1967969	0.21238163	2.7822197	21	5 28.4	15.8
942 Romilda	11.0	X	328.05838	319.39398	71.19276	10.53814	0.1665032	0.17510647	3.1642291	21	10 6.3	14.7
943 Begonia	9.8	X	22.27703	4.04923	113.76749	12.10785	0.2135135	0.17905397	3.1175499	21	1 1.5	13.0
944 Hidalgo	10.7	X	70.56806	56.56572	21.42299	42.55233	0.6606960	0.07181870	5.7320640	21	4 19.6	18.8
945 Barcelona	10.0	X	170.05513	162.06293	318.28397	32.89278	0.1620655	0.23017833	2.6368966	21	7 25.5	14.5
946 Poësia	10.6	X	101.93688	37.75793	69.65508	1.43125	0.1432411	0.17915850	3.1163371	21	4 23.1	15.1
947 Monterosa	9.9	X	88.34962	339.22425	48.27296	6.69517	0.2471103	0.21563721	2.7541457	21	1 2.9	13.0
948 Jucunda	11.5	X	352.59311	163.17828	357.08783	8.65389	0.1634316	0.18662762	3.0326255	21	1 6.7	15.3
949 Hel	9.8	X	73.67675	249.83488	321.16389	10.70154	0.1928958	0.18905748	3.0065849	21	8 6.0	13.8
950 Ahrensa	11.2	X	178.18898	348.60615	181.72561	23.49442	0.1585165	0.26975952	2.7220121	21	9 29.9	14.9
951 Gaspra	11.5	X	293.14237	129.78462	253.04496	4.10592	0.1738179	0.30000620	2.2099506	21	7 25.2	13.5
952 Caia	9.3	X	104.14636	356.55834	18.40391	9.99059	0.2438935	0.19040402	2.9923931	21	1 17.4	13.5
953 Painleva	10.1	X	128.54179	259.65306	36.39763	8.66048	0.1899861	0.21188920	2.7865286	21	—	—
954 Li	10.2	X	355.19105	151.20970	163.20154	1.17013	0.1743354	0.17782778	3.1318646	21	8 8.9	13.5
955 Alstede	10.8	X	358.13221	282.67279	351.44369	10.68949	0.2876507	0.23568446	2.5956657	21	6 8.9	12.7
956 Elisa	12.1	X	249.25668	125.44592	192.62473	5.96383	0.2047331	0.28291808	2.2980647	21	2 28.5	15.8
957 Camelia	9.9	X	276.95177	225.79659	232.64989	14.75945	0.0812258	0.19757818	2.9195106	21	10 19.7	13.9
958 Asplinda	10.4	X	202.70199	92.79100	343.10434	5.62879	0.1839568	0.12380809	3.9869125	21	6 22.4	16.8
959 Arne	10.8	X	156.56726	333.52807	58.50469	4.49729	0.2216386	0.17404680	3.1770595	21	3 27.2	16.1
960 Birgit	12.5	X	240.47289	88.11817	249.14039	3.02597	0.1655054	0.29238431	2.2481917	21	3 17.6	15.8

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
961 Gunnie	11.5	X	270.87727	285.49551	26.06631	10.99365	0.0912650	0.22304650	2.6928104	21	4 4.2	15.4
962 Aslög	11.3	X	65.60688	224.31078	145.44426	2.60467	0.0967541	0.19894784	2.9060956	21	—	—
963 Iduberga	12.2	X	183.75280	5.44043	62.46238	7.98415	0.1382016	0.29261218	2.2470244	21	5 22.2	15.5
964 Subamara	10.8	X	243.51034	9.42780	30.67460	9.04976	0.1201322	0.18515607	3.0486723	21	6 20.9	15.5
965 Angelica	10.2	X	232.93578	47.03334	41.28495	21.39580	0.2791802	0.17528029	3.1621369	21	8 1.8	15.9
966 Muschi	9.9	X	251.87241	177.99791	72.40974	14.41171	0.1306470	0.21982556	2.7190504	21	—	—
967 Helionape	11.8	X	93.35414	231.81369	82.34554	5.41221	0.1683919	0.29691911	2.2252422	21	—	—
968 Petunia	10.2	X	97.15722	297.49233	208.84044	11.59858	0.1363317	0.20324923	2.8649482	21	6 3.6	14.4
969 Leocadia	12.8	X	301.77708	91.15781	287.76244	2.29205	0.2062488	0.25500457	2.4628468	21	7 27.8	15.2
970 Primula	12.3	X	113.75598	95.54207	310.77223	5.03301	0.2719003	0.24064989	2.5598367	21	2 27.7	15.8
971 Alsatia	10.1	X	47.82480	6.51489	83.49273	13.79084	0.1628401	0.22969493	2.6405949	21	—	—
972 Cohnia	9.6	X	266.58682	93.55977	281.52144	8.37230	0.2357535	0.18457611	3.0550552	21	5 31.9	14.4
973 Aralia	10.1	X	132.37464	87.61754	348.44118	15.83125	0.1121944	0.17134284	3.2103970	21	4 9.3	15.1
974 Lioba	10.4	X	345.90263	301.91897	86.64717	5.45316	0.1097923	0.24441307	2.5334933	21	11 14.9	13.0
975 Perseverantia	10.5	X	14.94609	58.82819	38.67256	2.55522	0.0334918	0.20657824	2.8340858	21	—	—
976 Benjamina	9.3	X	111.36432	320.80659	243.49009	7.69180	0.1039126	0.17162496	3.2068799	21	8 24.2	14.2
977 Philippa	9.9	X	67.58550	72.04317	75.72766	15.17456	0.0256888	0.17915829	3.1163396	21	4 19.8	14.4
978 Aidamina	9.6	X	35.15882	132.51752	216.53768	21.60897	0.2314650	0.17202026	3.2019631	21	12 8.9	14.0
979 Ilsewa	9.7	X	193.61393	115.49773	230.59251	10.11073	0.1382316	0.17563804	3.1578415	21	2 24.1	15.0
980 Anacostia	7.85	0.06	349.26254	69.62384	69.62384	15.90110	0.2029619	0.21720985	2.7408360	21	9 20.5	11.0
981 Martina	10.9	X	21.95983	297.80875	45.99227	2.06282	0.2022369	0.18095847	3.0956376	21	11 11.2	14.6
982 Franklina	10.0	X	108.85052	350.85117	299.15359	13.65654	0.2342119	0.18356459	3.0662680	21	12 15.7	15.3
983 Gunila	9.4	X	279.47283	348.45098	250.68285	14.86431	0.0915390	0.17535175	3.1612777	21	1 16.5	14.2
984 Gretia	9.5	X	359.74079	55.00710	314.16335	9.09702	0.1957213	0.20992027	2.8039255	21	11 7.5	12.6
985 Rosina	12.8	X	128.56455	59.58775	290.29441	4.05725	0.2770995	0.28250509	2.3003038	21	—	—
986 Amelia	9.4	X	281.99503	265.50655	92.59830	14.81477	0.2032979	0.17785642	3.1315284	21	6 3.3	14.0
987 Wallia	9.5	X	281.11465	16.22804	322.65967	8.91306	0.2368548	0.17737402	3.1372036	21	4 29.4	14.3
988 Appella	11.6	X	231.94734	337.06960	41.70116	1.57504	0.2368092	0.17715097	3.1398364	21	5 6.2	16.7
989 Schwassmannia	11.8	X	265.95584	165.54139	243.38446	14.69143	0.2504074	0.22714556	2.6603159	21	7 8.6	15.9
990 Yerkes	11.8	X	263.85486	9.55738	353.94397	8.78861	0.2180071	0.22628039	2.6670927	21	5 12.3	16.1
991 McDonalda	11.2	X	310.00689	254.78356	63.23402	2.06953	0.1594099	0.17719053	3.1393691	21	5 25.1	15.3
992 Swasey	10.6	X	107.86669	347.23615	212.09689	10.83928	0.0855934	0.18659878	3.0329379	21	8 12.6	15.3
993 Moultona	11.5	X	157.78583	248.37489	184.24337	1.78043	0.0487480	0.20381582	2.8596362	21	5 1.0	15.6
994 Otthild	10.2	X	352.65505	342.08409	2.31167	15.41521	0.1166007	0.24487428	2.5303112	21	9 23.6	12.5
995 Sternberga	10.2	X	6.04730	122.02668	221.68413	13.05096	0.1687147	0.23303086	2.6153336	21	10 18.9	12.9
996 Hilaritas	11.2	X	61.01466	146.74088	347.37823	0.65883	0.1395893	0.18155007	3.0889089	21	3 30.9	14.9
997 Priska	12.6	X	163.55743	51.33854	247.09415	10.50562	0.1824039	0.22598131	2.6694454	21	—	—
998 Bodea	11.5	X	232.59926	72.05953	301.18180	15.50730	0.2137856	0.17917898	3.1160997	21	4 25.3	17.1
999 Zachia	10.9	X	52.78041	127.70016	214.92115	9.75602	0.2165499	0.23353280	2.6115847	21	12 31.7	14.9
1000 Piazzia	10.7	X	127.90492	280.61860	323.70645	20.58840	0.2584815	0.17477786	3.1681940	21	10 30.3	16.6
1001 Gaussia	9.7	X	357.27998	145.62912	259.12987	9.31759	0.1219476	0.17148380	3.2086375	21	12 7.4	13.6
1002 Olbersia	10.9	X	1.87273	354.93101	343.70710	10.77387	0.1548919	0.21177330	2.7875452	21	9 26.5	13.9
1003 Lilofee	10.8	X	99.64638	316.96976	139.44119	1.84038	0.1597884	0.17714811	3.1398703	21	4 9.6	15.2
1004 Belopolskya	9.8	X	214.23742	214.72296	153.52556	2.97987	0.0886909	0.15721893	3.3999001	21	4 17.7	14.9
1005 Arago	10.0	X	91.34007	60.66025	349.14101	19.06030	0.1187893	0.17486636	3.1671250	21	2 1.6	14.5
1006 Lagrangea	11.3	X	170.86023	86.18648	294.58037	10.91821	0.3579229	0.17699239	3.1417117	21	3 22.5	17.3
1007 Pawlowia	11.3	X	335.74928	76.52015	307.08422	2.54225	0.1097125	0.22115858	2.7081135	21	10 13.5	14.2
1008 La Paz	10.9	X	324.29975	15.13640	20.21125	8.92946	0.0736931	0.18108582	3.0941860	21	10 7.7	14.5
1009 Sirene	13.6	X	335.64753	186.50956	229.29667	15.71141	0.4526209	0.23122107	2.6289628	21	—	—
1010 Marlene	10.7	X	180.98388	279.62243	98.73655	3.90694	0.1043499	0.19646212	2.9305570	21	3 25.2	15.3
1011 Laodamia	12.7	X	101.14057	353.22734	132.52131	5.49476	0.3506815	0.26639679	2.3921234	21	6 7.3	16.3
1012 Sarema	12.4	X	347.80735	25.72507	73.15995	4.02918	0.1356509	0.25247446	2.4792734	21	—	—
1013 Tombecka	10.2	X	49.32308	99.69219	27.22966	11.89909	0.2091827	0.22422266	2.6833854	21	3 5.7	12.8
1014 Semphyra	11.9	X	264.96725	234.50816	251.49334	2.26459	0.2032263	0.21043454	2.7993554	21	10 23.9	15.5
1015 Christa	9.2	X	78.11572	286.63728	120.14575	9.44611	0.0882577	0.17159908	3.2072003	21	1 1.6	13.5
1016 Anitra	11.9	X	233.69621	53.08808	8.83103	6.03475	0.1281652	0.29809036	2.2194094	21	7 8.9	14.9
1017 Jacqueline	11.1	X	26.58893	68.12407	118.93993	7.92805	0.0779735	0.23441875	2.6050006	21	4 6.6	14.2
1018 Arnolda	11.1	X	184.61216	343.18971	359.60898	7.63421	0.2443203	0.24318576	2.5420102	21	2 14.7	15.6
1019 Strackea	12.5	X	192.89726	121.86218	144.39692	26.98227	0.0711956	0.37292130	1.9115746	21	—	—
1020 Arcadia	12.1	X	273.22851	36.55874	180.67214	4.05908	0.0434266	0.21146120	2.7902873	21	—	—
1021 Flammario	9.1	X	272.42680	286.71636	115.44114	15.86915	0.2850446	0.21757430	2.7377744	21	7 5.4	13.1
1022 Olympiada	10.2	X	262.23702	124.75880	111.95966	21.05580	0.1738569	0.20967719	2.8060922	21	—	—
1023 Thomana	10.0	X	350.28136	195.42449	193.91715	10.06240	0.0964286	0.17470901	3.1690264	21	11 7.9	14.0
1024 Hale	10.8	X	57.05661	307.93449	58.81612	16.06721	0.2215032	0.20285042	2.8687021	21	—	—
1025 Riema	12.5	X	237.29336	349.67823	163.36099	26.87119	0.0394597	0.35406430	1.9788580	21	12 19.5	15.3
1026 Ingrid	12.7	X	340.07840	212.48137	104.57619	5.40009	0.1819381	0.29120035	2.2542814	21	7 14.9	14.3
1027 Aesculapia	10.9	X	43.42476	131.99258	29.34079	1.25302	0.1289665	0.17608231	3.1525276	21	4 7.1	14.5
1028 Lydina	9.3	X	175.44471	24.24192	62.82581	9.39392	0.1054727	0.15689212	3.4046198	21	6 10.8	14.6
1029 La Plata	10.9	X	330.61629	140.47857	29.88097	2.42453	0.0277881	0.20053511	2.8907405	21	1 1.7	14.8
1030 Vitja	10.3	X	254.46939	5.56527	187.81588	14.77602	0.1227829	0.17887445	3.1196354	21	—	—
1031 Arctica	9.5	X	176.39963	309.78382	218.65660	17.61844	0.0580832	0.18507729	3.0495374	21	9 16.7	14.3
1032 Pafuri	10.1	X	171.29063	189.02352	76.31759	9.48234	0.1419943	0.17809324	3.1287517	21	—	—
1033 Simona	11.2	X	173.95115	217.49545	188.93633	10.66669	0.1184731	0.18968057	2.9999970	21	4 21.7	15.9
1034 Mozartia	12.1	X	340.50908	18.88079	304.48721	3.97204	0.2637082	0.28395302	2.2924773	21	7 19.1	12.9
1035 Amata	10.3	X	163.25691	324.84235	1.86885	18.00349	0.1897627	0.17601167	3.1533711	21	1 18.6	15.7
1036 Ganymed	9.45	0.30	95.39639	132.40004	215.53251	26.67568	0.5331300	0.22647652	2.6655526	21	—	—
1037 Davidweilla	13.6	X	219.50220	169.79963	200.65288	5.90100	0.1910640	0.29115226	2.2545296	21	4 10.5	17.1
1038 Tuckia	10.6	X	154.45137	304.99238	57.72938	9.18240	0.2216385	0.12399562	3.9828915	21	2 27.6	17.1
1039 Sonneberga	11.5	X	236.54259	326.74267	221.66807	4.55306	0.0610035	0.22473761	2.6792848	21	12 29.3	15.2
1040 Klumpkea	10.5	X	219.83319	157.77037	280.17551	16.68055	0.1904958	0.17924931				

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1041 Asta	10.1	X	99.64517	344.14004	59.99042	13.93300	0.1447593	0.18295109	3.0731191	21	2 5.6	14.5
1042 Amazone	9.9	X	96.02433	298.35532	52.41375	20.70856	0.0877987	0.16935806	3.2354310	21	—	—
1043 Beate	9.6	X	145.87361	157.52090	159.17903	8.92190	0.0385150	0.18111811	3.0938182	21	—	—
1044 Teutonia	10.8	X	121.58965	228.07627	59.93978	4.24953	0.1442258	0.23850853	2.5751356	21	12 27.3	14.9
1045 Michela	13.0	X	226.84237	166.72960	267.67784	0.26443	0.1592569	0.27203454	2.3589570	21	7 14.0	16.6
1046 Edwin	10.7	X	283.22941	47.95814	10.49598	7.90372	0.0613973	0.19082187	2.9880231	21	9 12.8	14.8
1047 Geisha	12.0	X	308.57993	300.16634	78.21341	5.66545	0.1928693	0.29372187	2.2413613	21	8 17.9	13.8
1048 Feodosia	9.7	X	341.31284	183.58047	52.74754	15.80627	0.1801413	0.21825586	2.7320718	21	3 27.3	13.0
1049 Gottho	10.4	X	188.80687	40.99718	342.84241	15.11258	0.1369612	0.18124919	3.0923264	21	4 2.9	15.6
1050 Meta	12.2	X	151.27432	66.22474	342.30983	12.49897	0.1780062	0.23178963	2.6246620	21	3 28.5	16.4
1051 Merope	10.1	X	230.38627	153.21050	180.69067	23.51274	0.1003479	0.17109994	3.2134347	21	3 21.4	15.0
1052 Belgica	11.9	X	231.95839	297.80035	99.57439	4.69709	0.1438858	0.29486440	2.2355677	21	5 31.5	15.1
1053 Vigdis	12.3	X	200.43824	42.04528	17.57685	8.34100	0.0969065	0.23323800	2.6137849	21	5 29.6	16.3
1054 Forsytia	10.4	X	79.50297	295.64802	85.77348	10.87033	0.1341397	0.19723954	2.9228514	21	—	—
1055 Tynka	12.1	X	192.66459	176.63058	147.11757	5.27838	0.2079530	0.30228519	2.1988290	21	1 17.4	15.4
1056 Azalea	11.6	X	280.45097	212.55350	104.13439	5.42773	0.1781206	0.29603106	2.2296902	21	4 3.9	14.7
1057 Wanda	11.0	X	143.72748	114.72107	257.87697	3.53974	0.2470219	0.20015987	2.8943522	21	2 18.2	15.7
1058 Grubba	11.7	X	152.94422	94.42856	221.72436	3.69181	0.1873553	0.30272722	2.1966881	21	—	—
1059 Mussorgskia	10.9	X	132.47437	87.89016	200.33227	10.09373	0.1879424	0.22962841	2.6411048	21	—	—
1060 Magnolia	12.6	X	244.45943	84.79614	221.10887	5.91798	0.2019893	0.29437878	2.2380256	21	2 7.2	16.2
1061 Paeonia	11.9	X	103.58504	306.37474	90.91859	2.49921	0.2166882	0.17842012	3.1249291	21	2 9.2	16.2
1062 Ljuba	9.8	X	86.45204	100.73090	341.37920	5.59575	0.0703106	0.18909358	3.0062022	21	2 19.4	13.8
1063 Aquilegia	11.2	X	276.43723	106.50253	95.32002	5.97392	0.0402132	0.27996118	2.3142175	21	—	—
1064 Aethusa	10.7	X	146.10476	20.33291	280.56143	9.50396	0.1767907	0.24301787	2.5431809	21	—	—
1065 Amundsenia	12.1	X	59.28644	353.58091	330.31747	8.36428	0.2971918	0.27180742	2.3602709	21	—	—
1066 Lobelia	12.3	X	156.66752	17.22093	345.01972	4.81841	0.2082182	0.26457127	2.4031134	21	2 8.2	15.8
1067 Lunaria	10.7	X	146.70765	114.94442	289.57348	10.54959	0.1925716	0.20269840	2.8701361	21	3 21.4	15.5
1068 Nofretete	10.8	X	169.71995	266.39832	318.60155	5.49063	0.0976119	0.19900630	2.9055265	21	11 20.5	15.4
1069 Planckia	9.4	X	326.35824	31.36849	142.36321	13.56121	0.1096420	0.17806577	3.1290735	21	—	—
1070 Tunica	10.8	X	136.17741	190.66291	165.28228	16.96251	0.0799660	0.16950401	3.2335735	21	1 10.3	15.8
1071 Brita	10.4	X	352.37316	29.14881	52.48526	5.36113	0.1102794	0.21033486	2.8002397	21	—	—
1072 Malva	10.8	X	240.75793	25.75806	37.03611	8.01654	0.2396541	0.17486529	3.1671379	21	7 5.9	16.0
1073 Gellivara	11.7	X	130.08563	289.62711	39.53914	1.59846	0.1876899	0.17338710	3.1851131	21	—	—
1074 Beljawska	10.2	X	118.31202	22.58029	38.11713	0.80025	0.1798018	0.17622807	3.1507891	21	3 20.3	14.8
1075 Helina	10.3	X	60.32220	250.52676	100.72834	11.53442	0.1096746	0.18845633	3.0129752	21	12 29.2	14.6
1076 Viola	12.2	X	64.72772	304.54025	143.60239	3.32081	0.1463903	0.25330359	2.4738602	21	1 17.8	14.4
1077 Campanula	12.3	X	230.88020	13.92659	346.11640	5.39233	0.1975765	0.26643599	2.3918877	21	4 7.4	16.1
1078 Mentha	11.4	X	185.19767	43.87706	93.82549	7.36638	0.1373062	0.28793275	2.2713044	21	8 29.9	14.8
1079 Mimosa	11.1	X	177.92763	105.02607	329.33572	1.17633	0.0486259	0.20250028	2.8720079	21	5 26.3	15.1
1080 Orchis	12.3	X	285.46101	56.85815	1.97157	4.58704	0.2575238	0.26160795	2.4212265	21	8 21.6	15.0
1081 Reseda	11.0	X	58.65203	9.20377	30.30894	4.18882	0.1481918	0.18093225	3.0959366	21	—	—
1082 Pirola	10.4	X	21.72451	186.44351	147.93713	1.85475	0.1803818	0.17865597	3.1221783	21	10 26.9	14.0
1083 Salvia	12.1	X	120.12183	32.38420	80.80521	5.13230	0.1831861	0.27747554	2.3280175	21	5 20.8	15.3
1084 Tamariwa	10.8	X	76.06428	109.34532	186.80433	3.89698	0.1327802	0.22373952	2.6872470	21	11 19.9	14.7
1085 Amaryllis	9.8	X	281.22939	129.22352	139.96092	6.64002	0.0419507	0.17336199	3.1854206	21	3 6.5	14.4
1086 Nata	9.6	X	122.80408	157.69654	313.21803	8.35986	0.0537340	0.17538317	3.1609001	21	5 7.1	14.3
1087 Arabis	9.8	X	277.39091	25.09985	30.21134	10.05122	0.0910779	0.18779141	3.0200831	21	8 30.3	14.0
1088 Mitaka	11.3	X	263.18012	319.63917	54.48158	7.65246	0.1960043	0.30181891	2.2010931	21	5 27.2	14.1
1089 Tama	11.7	X	141.28253	354.65398	71.47325	3.72656	0.1277713	0.29927196	2.2135637	21	4 3.5	14.6
1090 Sumida	12.5	X	291.65492	338.17435	147.95418	21.53840	0.2205221	0.27210487	2.3585504	21	12 26.5	14.8
1091 Spiraea	10.8	X	328.07963	12.51651	80.82409	1.15237	0.0697732	0.15620508	3.4145956	21	12 18.6	15.3
1092 Liliium	10.9	X	121.49055	315.03488	307.43447	5.39370	0.0849826	0.19973049	2.8984989	21	11 16.8	15.3
1093 Freda	9.0	X	65.21500	251.16947	55.60932	25.20214	0.2711490	0.17800335	3.1298048	21	11 27.8	13.8
1094 Siberia	11.7	X	201.20728	310.11034	149.11658	14.02925	0.1322667	0.24256783	2.5463255	21	7 20.8	15.8
1095 Tulipa	10.4	X	84.22489	342.49003	178.51850	10.03095	0.0209243	0.18748188	3.0234063	21	5 21.9	14.7
1096 Reunerta	10.7	X	34.45839	247.64088	81.32875	9.46865	0.1941807	0.23505317	2.6003111	21	11 21.9	14.0
1097 Vicia	12.0	X	234.80874	176.66858	133.83425	1.53365	0.2925308	0.22927722	2.6438011	21	2 12.1	16.8
1098 Hakone	10.5	X	326.40164	81.09455	328.89099	13.39312	0.1161664	0.22357884	2.6885343	21	10 28.6	13.8
1099 Figneria	10.2	X	143.76180	347.96289	22.20384	11.83808	0.2785330	0.17388612	3.1790164	21	2 26.9	15.6
1100 Arnica	10.9	X	327.39802	23.72240	304.10526	1.03445	0.0701919	0.19970907	2.8987061	21	7 15.5	14.3
1101 Clematis	10.6	X	30.17982	106.19129	201.82222	21.42474	0.0793050	0.16957122	3.2327190	21	9 18.4	15.1
1102 Pepita	9.4	X	163.47469	117.45203	216.56294	15.82363	0.1108351	0.18318673	3.0704831	21	1 11.6	14.4
1103 Sequoia	12.1	X	220.09743	77.92574	267.63598	17.90029	0.0945324	0.36657583	1.9335712	21	2 18.6	15.0
1104 Syringa	12.3	X	269.52931	277.31137	128.65166	6.44199	0.3433730	0.23104198	2.6303212	21	6 29.8	16.4
1105 Fragaria	10.2	X	338.12391	224.00479	116.90676	10.96670	0.1068525	0.18842925	3.0132639	21	8 18.5	13.8
1106 Cydonia	11.7	X	354.23707	230.18037	328.24445	13.06452	0.1257539	0.23554738	2.5966726	21	2 19.1	14.5
1107 Lictoria	9.5	X	161.00479	351.05048	110.84058	7.07442	0.1235158	0.17357965	3.1827571	21	6 15.8	14.5
1108 Demeter	11.9	X	92.43885	78.03168	234.24146	24.90991	0.2570176	0.26061840	2.1273515	21	—	—
1109 Tata	10.0	X	300.31410	0.03375	268.05900	4.12033	0.0985253	0.17016454	3.2252001	21	3 17.4	14.5
1110 Jaroslawa	11.4	X	43.80541	78.52759	241.72406	5.85529	0.2414582	0.29837323	2.2180065	21	12 9.9	14.3
1111 Reinmuthia	10.6	X	235.85609	235.91994	132.43252	3.89254	0.1019749	0.19051916	2.9911873	21	5 7.3	15.1
1112 Polonia	10.0	X	192.42013	87.04158	302.84633	8.99250	0.1078961	0.18798631	3.0179954	21	4 13.8	15.0
1113 Katja	9.3	X	233.56265	119.00667	324.47845	13.28784	0.1383753	0.17894493	3.1188163	21	8 3.8	14.2
1114 Lorraine	10.0	X	28.16101	207.41651	195.32864	10.71967	0.0714164	0.18113836	3.0935877	21	—	—
1115 Sabauda	9.7	X	311.86285	56.73024	71.64960	15.28601	0.1734816	0.18074956	3.0880224	21	—	—
1116 Catriona	9.8	X	264.02015	82.93811	356.23576	16.53631	0.2254030	0.19641794	2.9309963	21	8 25.1	14.1
1117 Reginita	11.7	X	294.98243	151.18956	147.09975	4.34470	0.1980588	0.29251453	2.2475244	21	3 22.9	14.6
1118 Hanskya	9.9	X	184.40228	336.90854	318.71372	13.95477	0.0437178	0.17111402	3.2132585	21	—	—
1119 Euboea	11.3	X	157.76157	229.89613	57.36948	7.85437	0.1552867	0.23357859	2.6112434	21	—	—
1120 Cannonia	12.0	X	32.39258	219.62404	158.62073	4.05077	0.155					

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1121 Natascha	11.5	X	265.35276	49.94602	357.87671	6.16475	0.1580199	0.24236298	2.5477600	21	7 24.4	15.1
1122 Neith	11.8	X	358.73322	328.83430	63.33116	4.73097	0.2549116	0.23417102	2.6068375	21	12 27.9	14.2
1123 Shapleya	11.6	X	323.13073	317.32138	79.86385	6.41822	0.1563960	0.29688420	2.2254166	21	10 29.2	13.2
1124 Stroobantia	10.8	X	262.24388	267.01238	22.22099	7.79213	0.0302490	0.19680683	2.9271340	21	3 8.1	14.9
1125 China	11.6	X	104.75498	10.44023	97.16011	3.04067	0.2175044	0.17828685	3.1264861	21	5 6.9	16.2
1126 Otero	11.9	X	333.84019	136.30235	0.99334	6.50453	0.1477143	0.28783729	2.2718065	21	—	—
1127 Mimi	10.6	X	91.61138	282.71734	128.35001	14.76724	0.2649599	0.23585673	2.5944015	21	2 6.5	13.4
1128 Astrid	10.9	X	184.76820	234.29209	59.42996	1.01252	0.0446245	0.21173962	2.7878408	21	—	—
1129 Neujmina	10.2	X	107.65108	139.68191	269.20998	8.61825	0.0836049	0.18752528	3.0229398	21	2 4.4	14.6
1130 Skuld	12.0	X	227.92733	113.88052	216.10338	2.16799	0.1977378	0.29620332	2.2288257	21	2 24.2	15.7
1131 Porzia	12.9	X	219.81512	248.08793	100.67135	3.22981	0.2860192	0.29626957	2.2284934	21	3 14.5	16.9
1132 Hollandia	11.1	X	333.48476	270.69804	29.59098	7.22215	0.2751630	0.22390989	2.6858837	21	5 17.6	13.5
1133 Lugduna	12.2	X	134.06046	306.75864	58.21439	5.37358	0.1870645	0.30486257	2.1864186	21	1 6.6	14.6
1134 Kepler	14.1	X	320.27295	332.90758	5.77231	15.32317	0.4700013	0.22514521	2.6760501	21	5 6.6	17.4
1135 Colchis	10.6	X	45.44760	3.21762	350.61937	4.54195	0.1143608	0.22653755	2.6650738	21	12 23.2	14.2
1136 Mercedes	11.2	X	146.84902	148.69797	209.47795	8.97525	0.2535351	0.23959956	2.5673123	21	1 29.3	15.4
1137 Raissa	10.6	X	137.97541	277.36536	78.44141	4.31571	0.0964813	0.26110365	2.4243431	21	—	—
1138 Attica	11.5	X	172.86656	106.42017	283.47750	13.97010	0.0757898	0.17666489	3.1455931	21	3 22.1	16.6
1139 Atami	12.5	X	258.49434	206.66627	213.32183	13.08419	0.2556030	0.36261844	1.9476136	21	7 15.6	15.2
1140 Crimea	9.7	X	3.33786	309.99442	72.08166	14.11790	0.1102666	0.21358342	2.7717732	21	11 27.4	13.0
1141 Bohmia	13.3	X	328.63247	275.81641	105.51750	4.27466	0.1652366	0.28799582	2.2709728	21	10 12.8	15.0
1142 Aetolia	10.3	X	332.10110	97.26653	139.32527	2.11011	0.0803526	0.17347554	3.1840304	21	3 25.4	14.6
1143 Odysseus	8.3	X	282.39697	236.71184	221.23035	3.13856	0.0914047	0.08209449	5.2431633	21	10 11.2	15.2
1144 Oda	9.9	X	324.18233	217.27160	156.13949	9.79833	0.0859405	0.13446690	3.7733388	21	9 3.5	14.7
1145 Robelmonte	11.3	X	73.39175	267.75281	346.78273	6.20890	0.1194792	0.26110340	2.4243447	21	9 25.0	14.3
1146 Biarmia	9.8	X	84.42527	63.64791	213.83969	17.06565	0.2556471	0.18567205	3.0430216	21	11 13.9	14.7
1147 Stavropolis	11.5	X	314.25469	15.87691	265.18438	3.88122	0.2317081	0.28802786	2.2708043	21	3 15.6	14.4
1148 Rarahu	10.2	X	180.64219	175.68634	145.37001	10.82924	0.1085023	0.18792170	3.0186871	21	1 15.1	15.0
1149 Volga	10.5	X	178.28296	116.35237	261.42086	11.74923	0.0960480	0.19975450	2.8982666	21	3 13.1	15.2
1150 Achaia	12.7	X	114.43594	139.47004	206.50697	2.39210	0.2043219	0.30386409	2.1912229	21	—	—
1151 Ithaka	13.1	X	222.05243	122.53792	225.38816	6.56486	0.2759702	0.26408724	2.4060488	21	3 13.8	17.5
1152 Pawona	11.1	X	2.31378	217.30276	331.83659	5.07903	0.0414441	0.26069571	2.4268716	21	2 23.0	14.0
1153 Wallenbergia	12.1	X	301.34537	28.97813	280.49165	3.33565	0.1605676	0.30296632	2.1955322	21	4 17.5	14.6
1154 Astronomia	10.4	X	242.18986	204.84173	82.49525	4.53135	0.0709734	0.15768017	3.3932667	21	2 12.2	15.5
1155 Aëna	12.0	X	347.72830	195.53624	39.10461	6.59195	0.1637139	0.25487009	2.4637131	21	3 25.4	14.5
1156 Kira	12.4	X	17.72482	355.06806	91.13086	1.39730	0.0466001	0.29457576	2.2370278	21	—	—
1157 Arabia	10.0	X	80.00983	312.40237	336.07934	9.55355	0.1443249	0.17372318	3.1810039	21	11 4.6	14.9
1158 Luda	10.8	X	79.03619	57.31515	344.58698	14.82468	0.1124973	0.23997380	2.5646424	21	—	—
1159 Granada	11.6	X	51.68440	312.69763	347.84447	13.03635	0.0590507	0.26849726	2.3796303	21	10 16.1	14.7
1160 Illyria	11.5	X	142.22962	5.45596	3.70221	14.94653	0.1173160	0.24044305	2.5613046	21	1 31.0	15.3
1161 Thessalia	11.2	X	96.39106	310.34144	72.55898	9.39454	0.0883741	0.17455477	3.1708929	21	—	—
1162 Larissa	9.5	X	134.81703	206.87283	39.65510	1.87480	0.1057429	0.12675493	3.9248779	21	11 4.7	15.4
1163 Saga	10.7	X	113.59375	200.39068	127.51467	9.02438	0.0426328	0.17073443	3.2180192	21	—	—
1164 Kobolda	12.8	X	49.99121	341.06732	156.91677	25.19071	0.1963210	0.28150365	3.2057561	21	2 28.6	14.1
1165 Imprinetta	10.7	X	111.93747	96.62099	203.73325	12.79842	0.2116497	0.17830368	3.1262894	21	12 26.4	16.1
1166 Sakuntala	10.4	X	159.33127	189.82223	106.67818	18.92687	0.2088454	0.24409811	2.5356722	21	—	—
1167 Dubiago	9.7	X	171.64365	72.61742	223.38049	5.74540	0.0686234	0.15613568	3.4156074	21	—	—
1168 Brandia	12.5	X	99.20095	122.77307	218.62054	12.72480	0.2176758	0.24171721	2.5522958	21	—	—
1169 Alwine	12.8	X	187.07222	177.10227	255.06755	4.05393	0.1554157	0.27935959	3.2175387	21	5 31.9	16.3
1170 Siva	12.2	X	179.33786	59.47725	0.85268	22.16933	0.3014276	0.27807852	2.3246510	21	5 2.9	16.8
1171 Rsthawelia	9.8	X	22.84798	292.26058	121.51094	3.08580	0.1942513	0.17428828	3.1741243	21	—	—
1172 Aneās	8.2	X	337.95407	50.67194	247.32523	16.65962	0.1057716	0.08255784	5.2235269	21	6 19.9	14.7
1173 Anchises	8.9	X	281.32870	40.88487	283.92351	6.92204	0.1392385	0.08111662	5.2852171	21	5 3.9	16.0
1174 Marmara	11.4	X	128.45261	353.36383	0.89838	10.06269	0.1099109	0.18731814	3.0251680	21	1 2.1	15.9
1175 Margo	10.0	X	301.29282	102.22626	237.17654	16.30730	0.0690967	0.17104988	3.2140617	21	6 21.6	14.5
1176 Lucidor	11.4	X	177.80520	155.90577	272.22429	6.64669	0.1435941	0.22330384	2.6907411	21	5 18.8	15.7
1177 Gonnessia	9.5	X	199.06152	252.07149	251.85123	15.00036	0.0327853	0.16048302	3.3536416	21	9 8.4	14.7
1178 Irmela	12.0	X	208.84057	357.60926	169.93984	6.96591	0.1851160	0.22491285	2.6778929	21	10 20.8	16.3
1179 Mally	12.8	X	69.68580	234.47906	6.74994	8.70857	0.1723377	0.23242521	2.6198749	21	9 10.6	16.3
1180 Rita	9.2	X	49.57691	206.10524	88.18505	7.18490	0.1559635	0.12364276	3.9904658	21	10 9.2	14.6
1181 Lilith	11.3	X	309.93513	156.18661	260.60931	5.59097	0.1934296	0.22649205	2.6654308	21	10 5.4	14.0
1182 Ilona	11.6	X	14.21602	63.08503	336.31333	9.39249	0.1167100	0.29022088	2.2593505	21	—	—
1183 Jutta	12.4	X	258.98486	205.29830	15.09089	2.79989	0.1301092	0.26782701	2.3835987	21	—	—
1184 Gaea	11.1	X	316.14847	311.86211	355.72570	11.31585	0.0711337	0.22622958	2.6674920	21	5 27.2	14.7
1185 Nikko	11.9	X	332.64232	2.45501	71.86584	5.69735	0.1047818	0.29453743	2.2372219	21	—	—
1186 Turnera	9.8	X	153.61625	296.16858	42.96716	10.74778	0.1011221	0.18750322	3.0231769	21	1 10.6	14.5
1187 Afra	11.5	X	143.96962	74.90514	327.16533	10.69817	0.2230328	0.22979520	2.6398267	21	3 18.0	15.7
1188 Gothlandia	11.6	X	0.63247	6.92796	5.40957	4.81741	0.1802912	0.30403220	2.1903978	21	12 10.9	13.6
1189 Terentia	10.0	X	18.70382	95.32016	275.18910	9.86659	0.1188888	0.19643402	2.9308364	21	11 30.8	13.8
1190 Pelagia	12.8	X	288.83320	41.24235	26.36520	3.16854	0.1304591	0.25977864	2.4325797	21	9 30.5	15.4
1191 Alfaterna	10.8	X	96.97423	55.00783	134.70746	18.49484	0.0464722	0.20027562	2.8932369	21	7 16.7	14.9
1192 Prisma	12.6	X	316.75309	131.61657	1.24686	23.91077	0.2590230	0.27101312	2.3648803	21	—	—
1193 Africa	11.8	X	329.27572	184.16177	49.52197	14.13781	0.1224936	0.22894153	2.6463848	21	3 10.4	15.3
1194 Aletta	10.7	X	95.31428	243.71241	291.29600	10.86926	0.0908938	0.19817962	2.9136009	21	7 2.3	14.8
1195 Orangia	13.2	X	197.34911	328.20455	281.25500	7.19240	0.2007865	0.29057536	2.2535126	21	—	—
1196 Sheba	10.2	X	202.83963	262.64405	100.75060	17.66639	0.1798663	0.22810925	2.6528179	21	4 1.5	15.0
1197 Rhodesia	10.2	X	204.41786	277.05194	255.63257	12.97502	0.2336142	0.20138389	2.8826122	21	10 11.4	15.3
1198 Atlantis	14.4	X	216.63787	84.59844	259.51030	7.22469	0.3353958	0.29182731	2.2510515	21	3 4.0	18.7
1199 Geldonia	10.2	X	227.12582	291.67114	235.51768	8.78119	0.0317947	0.18814521	3.0162958	21	11 19.1	14.5
1200 Imperatrix	10.9	X	11.46388	52.20455	204.74800	4.59405	0.1054587	0.18381545				

ELEMENTS AND OPPOSITION DATES IN 2021  
ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	H	G	M	$\omega$	$\Omega$	$i$	$e$	$\mu$	$a$	TE	Oppos.	V
1201	Strenua	11.4	X	87.78380	165.80976	203.07165	7.00002	0.0388115	0.22231994	2.6986741	21	—
1202	Marina	10.0	X	158.55309	307.47381	49.84426	3.33277	0.1673925	0.12322692	3.9994381	21	2 19.2 16.2
1203	Nanna	11.6	X	97.69065	177.22284	224.51108	5.99360	0.2498018	0.20111356	2.8851948	21	2 5.0 15.4
1204	Renzia	12.0	X	155.50389	313.73076	7.53661	1.87913	0.2936212	0.28936295	2.2638141	21	—
1205	Ebella	13.5	X	85.31858	349.36038	22.99356	8.84529	0.2716158	0.24387325	2.5372306	21	—
1206	Numerowia	11.5	X	321.46777	278.42660	324.42114	13.00287	0.0527283	0.20316406	2.8657489	21	3 12.7 15.5
1207	Ostenia	10.8	X	26.51647	46.25251	19.99521	10.33797	0.0877286	0.18765736	3.0215212	21	—
1208	Troilus	8.9	X	288.38059	295.31499	48.54914	33.54140	0.0923267	0.08185469	5.2533986	21	6 3.3 16.0
1209	Pumma	10.7	X	187.48556	176.85206	89.76485	6.93800	0.1279202	0.17460786	3.1702501	21	—
1210	Morosovia	10.0	X	68.87452	167.22147	106.59083	11.26486	0.0623129	0.18862063	3.0112253	21	10 5.1 14.4
1211	Bressole	11.1	X	24.07548	211.20578	129.72836	12.76976	0.1600717	0.19672861	2.9279098	21	11 12.8 15.0
1212	Francette	9.6	X	98.66662	348.20122	149.56365	7.59207	0.1899945	0.12564111	3.9480400	21	6 5.2 15.4
1213	Algeria	11.1	X	90.19494	110.34798	271.29296	13.10701	0.1282794	0.17736391	3.1373228	21	—
1214	Richilde	11.2	X	156.17447	32.66103	285.84411	9.84066	0.1172169	0.22074690	2.7114794	21	—
1215	Boyer	11.0	X	298.89817	265.34774	123.72753	15.91578	0.1326332	0.23784406	2.5799295	21	8 20.7 14.0
1216	Askania	12.2	X	188.17802	144.56557	121.58793	7.60209	0.1791538	0.29548025	2.2324603	21	—
1217	Maximiliana	12.6	X	218.94155	91.30861	148.39660	5.15492	0.1542100	0.27310426	2.3527931	21	—
1218	Aster	13.2	X	102.54271	68.90848	63.81301	3.15705	0.1096207	0.28961775	2.2624862	21	5 13.7 15.9
1219	Britta	11.7	X	130.02274	24.00766	42.51321	4.41105	0.1248355	0.29942885	2.2127905	21	3 20.5 14.3
1220	Crocus	11.72	0.23	110.10247	332.51747	113.32823	11.36423	0.0740409	0.18937915	3.0031794	21	3 31.4 16.1
1221	Amor	17.5	X	186.84947	26.65502	171.31854	11.88295	0.4357365	0.37083024	1.9187539	21	11 7.0 21.1
1222	Tina	11.2	X	8.73595	59.91397	245.77378	19.58586	0.2505586	0.21098940	2.7944454	21	8 23.8 14.4
1223	Neckar	10.5	X	118.86538	15.01201	40.79666	2.54426	0.0603544	0.20275877	2.8695664	21	2 24.8 14.6
1224	Fantasia	11.5	X	273.62911	129.36235	258.07450	7.88834	0.1992769	0.28185073	2.3038628	21	6 28.2 14.4
1225	Ariane	12.1	X	203.91631	100.60016	12.34218	3.07371	0.0739461	0.29512201	2.2342666	21	8 19.4 14.9
1226	Golia	12.1	X	30.46843	139.21705	17.45931	9.84437	0.1121000	0.23748239	2.5825483	21	3 1.1 14.9
1227	Geranium	10.8	X	262.24340	303.12479	0.65612	16.49477	0.1924505	0.17072173	3.2181789	21	3 11.5 15.9
1228	Scabiosa	11.5	X	25.68101	208.41393	307.90171	3.28039	0.0415439	0.21394810	2.7686226	21	2 21.3 15.1
1229	Tilia	11.3	X	162.06379	166.63638	197.32860	1.03955	0.1662418	0.17012113	3.2257488	21	2 22.5 16.5
1230	Riceia	13.0	X	263.62225	184.99593	200.53643	10.51560	0.1800039	0.23898324	2.5717243	21	6 16.9 16.8
1231	Auricula	12.2	X	351.84828	245.83967	342.02659	11.48475	0.0856682	0.22613639	2.6682248	21	3 30.2 15.5
1232	Cortusa	10.3	X	57.79866	340.86791	261.17114	10.34942	0.1361780	0.17324362	3.1868715	21	8 10.6 14.7
1233	Kobresia	11.5	X	95.84706	334.08372	291.40101	5.60202	0.0566350	0.24132279	2.5550760	21	10 25.2 15.1
1234	Elyna	10.8	X	49.53225	90.08306	304.35275	8.52914	0.0867102	0.18837416	3.0138513	21	—
1235	Schorria	13.1	X	332.47317	43.76859	12.91941	25.00130	0.1543239	0.37333671	1.9101564	21	—
1236	Thais	11.9	X	272.31446	306.18087	48.59202	13.17677	0.2421347	0.26024463	2.4296751	21	5 8.2 15.3
1237	Geneviève	10.8	X	134.75220	307.06087	57.84446	9.73340	0.0763653	0.23335345	2.6129227	21	1 7.6 14.4
1238	Predappia	12.1	X	181.77603	92.91963	51.76649	12.13814	0.1401643	0.22594080	2.6697644	21	9 4.5 16.5
1239	Queteleta	12.4	X	228.65520	36.12821	73.04598	1.65749	0.2305812	0.22637772	2.6663281	21	8 23.2 16.8
1240	Centenaria	10.1	X	285.80653	24.10930	323.71772	10.17121	0.1757428	0.20320441	2.8653695	21	5 24.5 14.4
1241	Dysona	9.5	X	172.10288	320.55893	322.17767	23.51991	0.1008933	0.17304245	3.1893409	21	—
1242	Zambesia	10.5	X	83.11231	54.07061	349.73234	10.14247	0.1900506	0.21771042	2.7366331	21	1 8.1 13.7
1243	Pamela	9.7	X	62.74493	52.53657	245.54690	13.26392	0.0464669	0.18089668	3.0963424	21	10 15.3 14.2
1244	Deira	11.5	X	0.45233	260.92461	277.08784	8.69801	0.0983654	0.27476277	2.3433156	21	1 24.3 14.1
1245	Calvinia	10.0	X	298.36710	207.65399	151.70910	2.89425	0.0828903	0.20031171	2.8928894	21	7 12.9 13.8
1246	Chaka	10.9	X	314.97056	54.83085	250.52505	16.00437	0.3110167	0.23252708	2.6191097	21	6 12.5 13.9
1247	Memoria	10.6	X	19.77288	139.18051	161.66849	1.77986	0.1765342	0.17765027	3.1339506	21	9 7.7 14.1
1248	Jugurtha	9.9	X	210.99522	343.49510	79.37619	9.13786	0.1644511	0.21956099	2.7212343	21	6 21.3 13.6
1249	Rutherfordia	11.4	X	205.83708	223.61663	258.96077	4.87176	0.0757505	0.29688571	2.2254090	21	8 31.5 14.4
1250	Galanthus	12.4	X	227.71049	217.53753	291.95849	15.17155	0.2752717	0.24224286	2.5486022	21	9 29.1 16.9
1251	Hedera	10.8	X	4.65112	216.88460	140.61298	6.05301	0.1568235	0.22007008	2.7170360	21	11 4.8 13.8
1252	Celestia	10.8	X	315.42740	63.51468	140.89588	33.83743	0.2069705	0.22268679	2.6957094	21	—
1253	Frisia	12.1	X	323.39129	354.89845	39.78913	1.34114	0.2054239	0.17444758	3.1721916	21	9 24.1 15.3
1254	Erfordia	10.6	X	71.17732	240.37866	287.97601	7.07192	0.0306400	0.17678141	3.1335843	21	5 12.7 15.0
1255	Schilowa	10.3	X	264.55259	133.39173	237.61320	8.54858	0.1741811	0.17694730	3.1422453	21	6 1.9 15.0
1256	Normannia	9.7	X	184.48565	101.43513	236.89881	4.17268	0.0793934	0.12815456	3.8962488	21	2 13.9 15.7
1257	Móra	12.1	X	326.55353	18.97749	213.92008	3.92309	0.0822499	0.25110945	2.4882500	21	2 25.4 15.1
1258	Sicilia	10.8	X	188.02046	77.26288	299.58937	7.70236	0.0441171	0.17341356	3.1847891	21	3 25.5 15.7
1259	Ogyalla	10.6	X	346.29380	150.29259	74.98982	2.38063	0.1270361	0.18030631	3.1030976	21	3 26.3 14.5
1260	Wáhhalla	12.4	X	136.42801	19.54479	304.52926	8.01682	0.0375663	0.23321206	2.6139787	21	—
1261	Legia	11.2	X	306.34517	104.22763	67.28583	2.42678	0.1783025	0.17723782	3.1388106	21	—
1262	Sniadeckia	10.3	X	239.20837	159.40070	124.27069	13.13128	0.0044565	0.18937506	3.0032226	21	2 3.2 14.6
1263	Varsavia	10.2	X	171.20969	287.19539	158.47305	29.27316	0.1885665	0.22663292	2.6643262	21	6 10.2 15.3
1264	Letaba	9.7	X	36.45626	31.81011	235.01717	24.94731	0.1560196	0.20307461	2.8665903	21	8 8.7 13.8
1265	Schweikarda	11.2	X	270.94841	110.78563	314.26269	9.51358	0.0709901	0.18675970	3.0311954	21	8 29.9 15.4
1266	Tone	9.4	X	325.46470	299.62079	320.59666	17.18775	0.0510321	0.16023532	3.3570969	21	4 9.6 14.3
1267	Geertruida	12.1	X	132.61642	268.03433	24.34783	4.78104	0.1793893	0.25411470	2.4685932	21	—
1268	Libya	9.1	X	332.52838	118.66401	350.98645	4.42594	0.1024565	0.12421136	3.9782785	21	—
1269	Rollandia	8.7	X	95.30270	19.44750	134.71076	2.75883	0.0986997	0.12797967	3.8997975	21	6 8.4 14.2
1270	Datura	12.5	X	116.44166	258.93871	97.79194	5.98614	0.2078556	0.29496445	2.2350621	21	—
1271	Isergina	10.4	X	46.18159	271.90186	126.84208	6.68334	0.1206862	0.17712202	3.1401786	21	—
1272	Gefion	12.9	X	152.05974	3.93900	321.40885	8.41598	0.1505176	0.21201618	2.7854159	21	—
1273	Helma	12.9	X	351.91601	48.81326	296.49227	5.40292	0.1620954	0.26604724	2.3942172	21	9 25.6 15.0
1274	Delportia	11.8	X	87.35069	245.02421	327.07157	4.39703	0.1127948	0.29594788	2.2301080	21	8 17.8 14.4
1275	Cimbria	10.7	X	97.25808	197.89817	188.42883	12.85446	0.1671525	0.22449041	2.6812513	21	—
1276	Ucclia	10.9	X	265.08421	337.41137	114.35092	23.28923	0.0909358	0.17384885	3.1794708	21	10 3.4 15.8
1277	Dolores	11.2	X	265.97917	47.24921	247.01653	6.96703	0.2372580	0.22210824	2.7003886	21	2 16.9 15.7
1278	Kenya	10.8	X	176.83679	238.57721	90.28248	10.85387	0.2628891	0.26418241	2.4054710	21	1 20.5 14.8
1279	Uganda	12.2	X	41.03948	297.78110	335.40318	5.72495	0.2114195	0.27014047	2.3699706	21	9 20.9 14.8
1280	Baillauda	10.1	X	284.64049	94.80907	293.05738	6.45310	0.0480218	0.15559074	3.4235780	21	8 3.5 15.0</



ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1281 Jeanne	11.6 <sup>m</sup>	X	210.11899	72.72945	210.07980	7.44364	0.2079179	0.24102807	2.5571585	21	—	—
1282 Utopia	10.3	X	275.71226	78.21399	324.28062	18.04756	0.1226803	0.17867611	3.1219436	21	8 3.9	14.7
1283 Komsomolia	10.4	X	228.40221	234.77637	157.73331	8.91137	0.2217429	0.17380999	3.1799447	21	5 22.7	15.8
1284 Latvia	10.3	X	84.34058	115.40288	302.71437	10.88638	0.1717485	0.22906901	2.6454029	21	1 21.5	13.2
1285 Julietta	10.9	X	308.58353	68.43339	317.85365	5.69454	0.0509811	0.18999242	2.9967134	21	9 4.1	14.8
1286 Banachiewiczza	11.0	X	291.52706	108.09070	200.43803	9.75075	0.0897782	0.18759107	3.0222329	21	4 28.1	15.1
1287 Lorcja	11.1	X	178.52492	267.74624	202.48051	9.81867	0.0616410	0.18851461	3.0123543	21	7 10.9	15.8
1288 Santa	11.4	X	324.20146	53.49596	198.95964	7.57054	0.0661520	0.20090465	2.8871946	21	8 12.2	15.1
1289 Kutaïssi	10.6	X	81.82971	115.31939	293.05528	1.61675	0.0624354	0.20392329	2.8586314	21	11 29.2	14.7
1290 Albertine	12.8	X	15.06278	78.80657	307.34819	5.58728	0.1530716	0.27078943	2.3661825	21	—	—
1291 Phryne	10.4	X	293.12972	118.81587	215.35812	9.10789	0.0955064	0.18863099	3.0111151	21	6 1.1	14.5
1292 Luce	11.4	X	88.39167	242.09353	271.15162	2.15113	0.0584442	0.24329731	2.5412331	21	5 17.0	14.4
1293 Sonja	13.5	X	159.54642	99.78066	236.36483	5.36215	0.2750439	0.29635916	2.2280443	21	1 9.3	16.8
1294 Antwerpia	10.7	X	329.79950	312.90373	81.09531	8.71645	0.2320524	0.22359117	2.6884355	21	10 20.5	13.0
1295 Deflotte	10.7	X	353.71900	274.89129	185.04444	2.88540	0.1237415	0.15795649	3.3893082	21	—	—
1296 Andrée	11.7	X	81.34732	236.70750	226.97360	4.10892	0.1437807	0.26227612	2.4171126	21	3 6.8	14.4
1297 Quæda	10.9	X	292.23141	124.51181	295.87134	8.99860	0.0677628	0.18746245	3.0237292	21	9 19.6	15.1
1298 Nocturna	11.0	X	40.72252	58.67296	299.75922	5.49925	0.1449819	0.17817429	3.1278027	21	12 17.0	15.2
1299 Mertona	11.5	X	263.22192	260.17360	165.49887	7.87987	0.1869782	0.20970769	2.8058200	21	8 6.3	15.5
1300 Marcelle	11.4	X	7.58351	349.49801	82.91548	9.55109	0.0663841	0.21247912	2.7813685	21	—	—
1301 Yvonne	11.4	X	36.51443	302.14785	161.50402	34.03749	0.2703591	0.21411477	2.7671856	21	—	—
1302 Werra	11.0	X	143.54912	354.22726	90.13177	2.59584	0.1750353	0.17956848	3.1115920	21	5 11.9	16.0
1303 Luthera	9.5	X	75.60020	100.65325	72.03654	19.49253	0.1037161	0.16999810	3.2273050	21	6 5.3	13.7
1304 Arosa	9.2	X	88.21869	148.45474	86.49388	18.95972	0.1199815	0.17216847	3.2001252	21	9 20.6	14.2
1305 Pongola	10.6	X	352.52272	147.42354	82.94547	2.31686	0.0724240	0.18845743	3.0129635	21	3 20.2	14.4
1306 Scythia	9.7	X	27.53280	141.47804	274.07612	14.98674	0.0961687	0.17686059	3.1432722	21	—	—
1307 Cimberia	12.3	X	264.59705	207.23616	233.78242	3.94804	0.0961011	0.29177330	2.2513292	21	9 18.4	14.9
1308 Halleria	10.9	X	92.13570	163.27203	354.11702	5.57669	0.1018914	0.19878045	3.2077269	21	5 21.9	15.0
1309 Hyperborea	10.4	X	173.14726	244.57614	206.06689	10.27967	0.1494243	0.17178587	3.2048749	21	6 13.9	15.7
1310 Villigera	11.5	X	89.66561	88.90002	357.17991	21.06162	0.3571809	0.26657688	2.3910449	21	3 28.9	14.3
1311 Knopfia	12.5	X	173.59121	241.99130	245.11919	2.83141	0.0431785	0.26054911	2.4277818	21	7 29.7	15.7
1312 Vassar	10.7	X	357.87212	261.56895	129.23145	21.94046	0.2107183	0.18089373	3.0963761	21	12 6.7	14.5
1313 Berna	11.6	X	63.29322	100.13934	298.12591	12.55539	0.2060907	0.22754053	2.6572365	21	—	—
1314 Paula	12.8	X	48.70482	144.18476	264.61918	5.24003	0.1736385	0.28333952	2.2957854	21	—	—
1315 Bronislawa	10.0	X	190.71216	21.48724	236.48135	7.08103	0.0749377	0.17155930	3.2076960	21	—	—
1316 Kasan	13.2	X	153.15586	148.70066	238.19983	23.94877	0.3156449	0.26299062	2.4127327	21	3 6.2	17.9
1317 Silvretta	9.9	X	19.44622	33.94256	6.16654	20.41179	0.2349961	0.17192991	3.2030848	21	—	—
1318 Nerina	12.2	X	323.77199	196.07071	358.29664	24.65876	0.2036996	0.28113778	2.3077561	21	—	—
1319 Disa	10.6	X	308.33859	316.29368	256.08439	2.79968	0.2055457	0.19081864	2.9880568	21	1 2.9	15.0
1320 Impala	10.9	X	297.23289	206.00866	71.87954	19.79697	0.2290812	0.19048280	2.9915679	21	3 18.4	15.6
1321 Majuba	10.1	X	46.62087	345.13093	317.68607	9.51472	0.1703763	0.19560914	2.9300702	21	10 19.1	14.2
1322 Copernicus	12.3	X	15.99989	29.55028	253.17297	23.35694	0.2349215	0.26139769	2.4225247	21	8 6.0	14.9
1323 Tugela	9.9	X	111.27842	137.13889	45.13451	18.76831	0.1481232	0.16946588	3.2340585	21	8 13.1	15.2
1324 Knysna	13.0	X	335.16022	330.28071	304.33791	4.51977	0.1633974	0.30521032	2.1847575	21	4 18.5	14.9
1325 Inanda	12.2	X	145.28219	336.92248	14.31805	7.40869	0.2539260	0.24308714	2.5426977	21	1 24.0	16.2
1326 Losaka	11.0	X	298.19903	278.36808	101.69710	15.98359	0.2254367	0.22632224	2.6667639	21	7 19.6	14.1
1327 Namaqua	12.1	X	261.48409	270.10816	57.74873	5.81933	0.1609920	0.21255469	2.7807093	21	4 7.3	16.3
1328 Devota	10.1	X	224.95488	174.06584	222.67982	5.76768	0.1351045	0.15045768	3.5010083	21	5 29.2	15.5
1329 Eliane	10.8	X	203.88022	164.96861	132.00255	14.46938	0.1725235	0.23268007	2.6179615	21	1 4.2	15.2
1330 Spiridonia	10.1	X	348.96969	3.90232	158.79778	15.95407	0.0746532	0.17439826	3.1727897	21	1 15.2	14.6
1331 Solvejg	10.6	X	39.31011	184.62528	121.32789	3.10187	0.1907875	0.18067405	3.0988855	21	10 20.1	14.6
1332 Marconia	10.6	X	223.14459	348.88438	13.62166	2.45723	0.1329634	0.18406632	3.0606934	21	4 14.2	15.5
1333 Cevenola	11.5	X	213.42817	335.80971	115.08805	14.63660	0.1330653	0.23050305	2.6344195	21	7 23.4	15.6
1334 Lundmarka	10.4	X	203.86922	129.32302	133.13139	11.45502	0.0934387	0.19804330	2.9149377	21	—	—
1335 Demoulina	12.9	X	307.38010	198.69036	172.59310	2.54774	0.1544446	0.29383195	2.2408014	21	8 6.3	14.7
1336 Zeelandia	10.6	X	46.07995	217.83229	97.39965	3.19604	0.0645551	0.20489217	2.8496125	21	10 26.2	14.3
1337 Gerarda	11.2	X	175.23844	202.18651	160.25785	17.98170	0.0993491	0.19839096	2.9115313	21	2 25.7	15.5
1338 Duponta	12.6	X	147.89918	110.75024	325.53562	4.81738	0.1130016	0.28945408	2.2633390	21	4 20.3	15.7
1339 Désagneauxa	10.8	X	164.45243	161.19706	290.97936	8.69184	0.0569012	0.18793277	3.0185685	21	6 3.2	15.4
1340 Yvette	11.2	X	5.94640	224.64883	345.59979	0.41558	0.1273675	0.17352988	3.1833657	21	4 7.9	14.8
1341 Edmée	10.5	X	242.87784	140.64568	107.48348	13.09027	0.0787124	0.21700838	2.7425321	21	—	—
1342 Brabantia	11.3	X	320.34597	229.38362	312.95351	20.93082	0.2034585	0.28461887	2.2889006	21	—	—
1343 Nicole	11.1	X	262.30159	234.42869	41.22847	6.03403	0.1132680	0.23933889	2.5691761	21	2 4.1	15.0
1344 Caubeta	12.8	X	220.30348	133.54823	60.01684	5.65655	0.1208539	0.29259844	2.2470947	21	12 21.6	15.7
1345 Potomac	9.9	X	130.82369	332.90193	137.43311	11.40257	0.1811943	0.12401278	3.9825243	21	6 4.2	16.2
1346 Gotha	11.4	X	331.87717	250.42634	165.95355	13.86373	0.1756790	0.23136241	2.6278920	21	11 29.4	14.2
1347 Patria	11.3	X	248.22035	200.96748	229.14383	11.86104	0.0674163	0.23880930	2.5297370	21	8 8.0	15.1
1348 Michel	11.0	X	25.72752	17.99689	87.53809	6.58793	0.1376215	0.21117481	2.7928094	21	—	—
1349 Bechuana	10.5	X	240.39950	305.49902	307.08194	10.05115	0.1554338	0.18827316	3.0149291	21	—	—
1350 Rosselia	10.7	X	351.65383	236.97437	139.46856	2.94369	0.0867829	0.20402762	2.8576568	21	10 29.3	14.1
1351 Uzbekistania	9.9	X	15.39336	64.11336	9.32944	9.64283	0.0681605	0.17250102	3.1960111	21	—	—
1352 Wawel	11.2	X	332.10794	212.15564	185.95203	3.76035	0.0636830	0.21288691	2.7778156	21	10 28.4	14.6
1353 Maartje	9.9	X	39.73315	97.20361	211.63444	9.20100	0.0964751	0.18870423	3.0103360	21	10 9.3	13.9
1354 Botha	11.0	X	145.61040	250.17668	28.67668	5.95127	0.2161103	0.17835409	3.1257003	21	12 29.0	16.5
1355 Magoeba	13.0	X	72.79051	340.28720	225.24175	22.82407	0.0445803	0.39057204	1.8535400	21	6 29.6	15.2
1356 Nyanza	10.3	X	203.25737	301.84970	69.60519	7.94598	0.0510424	0.18217828	3.0818038	21	4 11.3	14.9
1357 Khama	10.9	X	344.76308	282.86694	83.66370	13.95737	0.1555890	0.17316812	3.1877967	21	10 7.7	14.8
1358 Gaika	12.5	X	19.82361	287.13304	21.72947	2.17245	0.1664033	0.25277679	2.4772961	21	9 28.6	14.9
1359 Prieska	10.4	X	123.50929	342.64332	64.01521	11.10263	0.0691635	0.17888509	3.1195117	21	2 28.4	15.0
1360 Tarka	11.5	X	67.71456	288.05298	331.39065							

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1361 Leuschneria	11.0	X	308.73622	173.12735	164.70945	21.59934	0.1303704	0.18232413	3.0801600	21	6 23.8	15.5
1362 Griqua	11.3	X	221.94454	261.69986	121.34002	24.23020	0.3725535	0.17112369	3.2131374	21	5 7.9	17.7
1363 Herberta	11.3	X	142.24950	109.71800	214.67146	1.10547	0.0661561	0.19920681	2.9035764	21	—	—
1364 Safara	10.7	X	271.47657	221.38068	63.96422	11.48608	0.0663246	0.18843565	3.0131957	21	3 14.5	15.2
1365 Henyey	11.8	X	288.20606	337.10148	258.54225	5.07585	0.1225152	0.29221360	2.2490672	21	—	—
1366 Piccolo	10.3	X	168.11310	282.83731	24.09927	9.46437	0.1394825	0.20213688	2.8754491	21	—	—
1367 Nongoma	12.1	X	97.33719	347.93337	270.79701	22.48024	0.1316101	0.27473883	2.3434518	21	10 27.1	16.0
1368 Numidia	10.9	X	131.16185	263.39908	18.06128	14.81972	0.0623086	0.24584684	2.5236335	21	12 29.0	14.8
1369 Ostanina	10.7	X	253.05531	128.01674	180.42390	14.37059	0.2110184	0.17895762	3.1186688	21	3 2.9	15.9
1370 Hella	13.6	X	179.32448	3.92881	306.01792	4.80528	0.1702730	0.29185067	2.2509314	21	—	—
1371 Resi	11.8	X	14.78638	103.32443	185.10362	16.43047	0.1200360	0.17178040	3.2049430	21	8 3.6	16.1
1372 Haremari	11.1	X	184.14900	88.13087	327.43655	16.45117	0.1488412	0.21432761	2.7653533	21	5 3.5	16.0
1373 Cincinnati	11.5	X	222.91619	99.03170	297.47165	38.93870	0.3149517	0.15593933	3.4184739	21	5 12.9	18.1
1374 Isora	13.3	X	151.96731	61.06675	302.47555	5.29555	0.2776725	0.29182029	2.2510876	21	2 6.8	16.6
1375 Alfreða	11.4	X	99.09355	32.58620	52.75236	5.81951	0.0712735	0.25744685	2.4472462	21	3 3.5	14.4
1376 Michelle	12.5	X	330.88942	156.20492	163.43759	3.55164	0.2155832	0.29642023	2.2277382	21	6 20.5	14.0
1377 Robberbauxa	13.0	X	342.83127	356.63579	223.19817	6.02451	0.0925969	0.29004460	2.2602659	21	2 21.1	15.6
1378 Leonce	12.3	X	55.38967	202.51745	43.53841	3.59024	0.1501459	0.26921146	2.3754197	21	8 27.6	15.0
1379 Lomonosowa	10.9	X	72.41065	31.82872	169.85883	15.60615	0.0908829	0.24573197	2.5244200	21	7 6.0	14.4
1380 Volodia	11.8	X	45.07875	248.15980	359.01027	10.41038	0.1035493	0.17593227	3.1543197	21	8 2.2	16.0
1381 Danubia	12.3	X	21.34503	29.08886	351.78899	4.69767	0.1803432	0.25111338	2.4882240	21	—	—
1382 Gerti	12.1	X	315.87665	246.87823	352.99629	1.56148	0.1311934	0.29795173	2.2200978	21	2 5.5	14.5
1383 Limburgia	12.0	X	13.95230	164.58166	193.34933	0.05359	0.1878763	0.18237336	3.0796057	21	11 14.6	15.4
1384 Knietje	11.7	X	243.71285	275.86513	152.82823	11.86028	0.1813481	0.22489579	2.6780283	21	7 20.6	15.9
1385 Gelria	10.8	X	234.55080	260.54827	114.93461	6.92214	0.1078903	0.21736551	2.7395272	21	5 13.6	15.0
1386 Storeria	13.4	X	222.55033	153.02905	161.45473	11.82353	0.2865921	0.27097214	2.3651188	21	2 3.1	17.8
1387 Kama	13.3	X	116.91679	125.84602	202.99702	5.53667	0.2085814	0.29035986	2.2586295	21	—	—
1388 Aphrodite	11.0	X	184.80844	257.51707	54.34758	11.18830	0.0896163	0.18770174	3.0210449	21	1 8.9	15.7
1389 Onnie	11.5	X	151.68920	294.22088	174.55518	2.04847	0.0153807	0.20327656	2.8646914	21	6 6.7	15.4
1390 Abastumani	9.2	X	178.35898	332.42199	28.88550	19.92907	0.0360273	0.15464887	3.4374644	21	3 11.8	14.5
1391 Carelia	11.8	X	325.13418	85.77670	103.33102	7.59563	0.1646274	0.24226102	2.5484749	21	—	—
1392 Pierre	11.9	X	212.32131	44.11013	358.23290	12.26575	0.2033015	0.23422783	2.6064159	21	5 13.4	16.5
1393 Sofala	12.1	X	150.48102	183.20913	56.65579	5.84560	0.1100204	0.25974341	2.4327997	21	11 28.9	15.8
1394 Algoa	11.6	X	97.78825	113.32326	178.76227	2.67587	0.0766429	0.25887930	2.4382103	21	12 8.2	15.0
1395 Aribeda	11.5	X	241.60092	109.86127	244.85110	8.64606	0.0626424	0.17218479	3.1999229	21	4 28.9	16.2
1396 Outeniqua	11.9	X	103.18330	266.48817	359.49120	4.49426	0.1654453	0.29256802	2.2472505	21	11 20.8	15.4
1397 Umtata	11.4	X	127.93468	206.41216	177.43590	3.51022	0.2552164	0.22457895	2.6805466	21	12 28.0	16.2
1398 Donnera	10.3	X	27.67831	72.24037	296.89764	11.85260	0.0999531	0.17556303	3.1587409	21	12 5.7	14.6
1399 Teneriffa	13.5	X	220.49353	224.04950	161.59738	6.50829	0.1660250	0.29886303	2.2155825	21	5 3.8	16.9
1400 Tirela	11.4	X	206.23753	111.89306	210.05854	15.62859	0.2326975	0.17826476	3.1267444	21	2 6.7	17.1
1401 Lavonne	12.0	X	316.90789	71.08353	277.49228	7.29047	0.1798562	0.29662116	2.2267321	21	7 14.6	13.9
1402 Eri	12.8	X	129.63448	11.64848	266.96540	14.29793	0.1554704	0.22425147	2.6831555	21	12 21.3	17.2
1403 Idelsonia	11.6	X	324.44606	192.35804	156.97546	10.18290	0.2951535	0.22015497	2.7163375	21	7 10.5	14.2
1404 Ajax	9.3	X	343.03606	61.20185	332.88231	18.03080	0.1144316	0.08103680	5.2886870	21	10 8.5	15.9
1405 Sibelius	12.5	X	0.61938	95.86752	312.04549	7.03322	0.1451981	0.29173615	2.2515204	21	—	—
1406 Komppa	11.4	X	13.50623	86.18296	333.04548	12.42761	0.0963549	0.22267101	2.6958368	21	—	—
1407 Lindelöf	10.9	X	171.58310	111.24341	268.35093	5.81997	0.2833164	0.21461259	2.7629048	21	3 19.1	15.9
1408 Trusanda	11.2	X	193.07307	187.31296	201.48253	8.35704	0.0951487	0.17997240	3.1069346	21	4 18.5	15.9
1409 Isko	11.1	X	206.35066	207.42946	177.53920	6.71002	0.0570443	0.22522127	2.6754476	21	4 25.9	15.0
1410 Margret	11.1	X	111.92785	233.38676	170.88866	10.35235	0.1062589	0.18775700	3.0204521	21	2 8.4	15.4
1411 Brauna	11.0	X	191.49521	94.21356	284.57409	8.03909	0.0577955	0.18944020	3.0025341	21	3 29.9	15.6
1412 Lagrula	12.4	X	264.24049	13.89733	66.07212	4.71489	0.1119199	0.29887342	2.2155311	21	9 19.4	14.8
1413 Roucarie	11.3	X	42.87199	299.33957	178.72236	10.23399	0.0653507	0.18767335	3.0213496	21	2 1.4	15.4
1414 Jérôme	13.1	X	47.34582	2.37079	143.74013	8.85550	0.1606994	0.21213298	2.7843934	21	3 23.9	16.1
1415 Malautra	12.1	X	109.19963	241.24256	329.18328	3.42466	0.0866257	0.29703857	2.2246455	21	9 8.6	14.9
1416 Renauxa	10.7	X	97.57631	65.98782	352.56288	10.03252	0.1077763	0.18795994	3.0182777	21	2 12.4	14.8
1417 Walinskia	11.0	X	110.16795	164.60912	95.98687	8.27110	0.0786454	0.19247941	2.9708441	21	11 5.6	15.5
1418 Fayeta	12.0	X	62.86370	324.23388	355.08351	7.19544	0.2033739	0.29374299	2.2412538	21	12 23.8	15.3
1419 Danzig	11.3	X	90.47454	233.01006	213.49302	5.72415	0.1475896	0.28395156	2.2924852	21	2 20.7	13.7
1420 Radcliffe	12.0	X	277.99919	74.33891	260.89108	3.48574	0.0770022	0.21638807	2.7477708	21	5 13.6	15.8
1421 Esperanto	10.4	X	223.70001	162.56221	42.57943	9.80170	0.0842723	0.18160529	3.0882828	21	12 22.3	14.9
1422 Strömgrenia	13.3	X	39.54551	170.94115	201.54952	2.68038	0.1671391	0.29258423	2.2471675	21	—	—
1423 Jose	10.9	X	176.59924	321.59923	58.45171	2.90686	0.0805834	0.20378846	2.8598922	21	3 20.3	15.1
1424 Sundmania	9.9	X	76.63648	303.18244	42.91334	9.16140	0.0566867	0.17309605	3.1886825	21	12 31.9	14.7
1425 Tuorla	11.3	X	7.84384	341.59242	185.95517	12.97145	0.1006974	0.23349306	2.6118810	21	1 30.7	14.6
1426 Riviera	10.9	X	84.36099	275.10025	334.99798	9.06809	0.1609081	0.23767128	2.5811797	21	10 3.0	14.7
1427 Ruvuma	11.2	X	108.58338	241.56670	78.43792	9.34434	0.2111056	0.21611277	2.7501038	21	—	—
1428 Mombasa	10.3	X	238.73816	252.47816	115.70815	17.30664	0.1415048	0.20938062	2.8087412	21	5 11.1	15.0
1429 Pemba	12.3	X	185.06571	297.89999	47.66812	7.74629	0.3335520	0.24115034	2.5562940	21	2 23.0	17.1
1430 Somalia	12.2	X	161.41984	351.42727	327.15984	3.28736	0.1975992	0.24050410	2.5608711	21	—	—
1431 Luanda	11.7	X	258.82229	224.32060	117.71445	13.98948	0.1837697	0.23254403	2.6189825	21	4 22.7	16.0
1432 Ethiopia	12.1	X	281.67355	218.62013	123.22569	8.27163	0.2261433	0.26825112	2.3810856	21	5 6.1	15.5
1433 Geramitina	11.6	X	313.78168	94.29005	321.43933	8.24754	0.1676633	0.21054577	2.7983694	21	10 9.9	14.8
1434 Margot	10.3	X	349.79644	147.88746	152.39393	10.83607	0.0667497	0.18796707	3.0182013	21	7 11.9	14.3
1435 Garlanda	13.2	X	220.35631	268.92638	189.03306	4.03904	0.2481781	0.22869583	2.6482799	21	7 29.7	17.7
1436 Salonta	10.3	X	214.21667	30.98829	260.40944	13.88661	0.0619705	0.17645073	3.1481379	21	1 12.8	15.2
1437 Diomedes	8.2	X	336.30721	128.76480	315.77754	20.47574	0.0445190	0.08288943	5.2095869	21	12 3.5	15.1
1438 Wendeline	11.6	X	286.08102	129.37209	238.34330	2.04152	0.2380024	0.17566266	3.1575464	21	6 13.9	16.1
1439 Vogtia	10.6	X	88.23032	101.51264	35.54998	4.20398	0.1163369	0.12340759	3.9955337	21	5 12.5	16.2
1440 Rostia	12.4	X										

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1441 Bolyai	13.2 <sup>m</sup>	X	250.51287	115.95530	254.00432	13.91962	0.2396261	0.23107366	2.6300808	21	5 6.9	17.5
1442 Corvina	11.4	X	160.55900	128.20374	220.70195	1.26097	0.0763644	0.20205195	2.8762548	21	1 22.8	15.6
1443 Ruppina	11.1	X	336.83569	161.62956	174.81579	1.93095	0.0653797	0.19549379	2.9402262	21	8 10.5	14.8
1444 Pannonia	11.5	X	190.83696	310.53062	303.22178	17.76394	0.1379571	0.17599308	3.1535930	21	—	—
1445 Konkolya	11.8	X	163.99029	274.34134	88.91279	2.28050	0.1829769	0.17890876	3.1192366	21	2 24.6	17.0
1446 Sillanpää	12.6	X	206.76310	196.24370	17.49175	5.25678	0.1020423	0.29299158	2.2450842	21	—	—
1447 Utra	11.7	X	264.99652	66.59386	35.39303	4.78434	0.0403983	0.24422555	2.5347900	21	10 23.2	14.7
1448 Lindbladia	12.8	X	304.10935	75.34739	44.77262	5.81247	0.1853673	0.26977752	2.3720957	21	—	—
1449 Virtanen	12.1	X	345.46495	132.18288	110.75739	6.64208	0.1413491	0.29748051	2.2224417	21	3 30.6	14.2
1450 Raimonda	12.3	X	316.78314	14.74303	74.84875	4.85467	0.1706569	0.23362824	2.6108735	21	12 13.9	14.5
1451 Granö	13.2	X	122.59719	52.07119	175.24236	5.11130	0.1180320	0.30138918	2.2031849	21	10 22.2	16.3
1452 Hunnia	12.2	X	86.55365	94.17887	21.34124	14.20985	0.2020012	0.17970327	3.1100359	21	4 20.7	16.4
1453 Fennia	12.6	X	241.25568	254.52565	7.05878	23.67302	0.0280763	0.37718620	1.8971377	21	—	—
1454 Kallevala	12.7	X	189.48472	134.90238	352.49772	5.09130	0.1419749	0.27069345	2.3667418	21	8 17.6	16.2
1455 Mitchellia	12.8	X	10.85045	100.63732	128.30503	7.75566	0.1240808	0.29269002	2.2466260	21	5 1.6	14.8
1456 Saldanha	11.1	X	192.85319	65.26284	282.43878	10.43633	0.2209720	0.17174666	3.2053628	21	2 26.3	16.7
1457 Ankara	10.8	X	58.68364	296.83884	296.28028	6.09051	0.1549078	0.22235195	2.6984151	21	8 8.8	14.1
1458 Mineura	11.3	X	302.53278	100.22199	181.62734	12.54005	0.1797136	0.23152991	2.6266245	21	3 19.4	14.7
1459 Magnya	10.3	X	8.92522	328.50856	41.39695	16.89700	0.2291857	0.17638240	3.1489509	21	11 22.6	13.8
1460 Haltia	12.7	X	226.40600	357.94220	74.17469	6.68337	0.1872944	0.24299606	2.5433330	21	7 8.4	16.7
1461 Jean-Jacques	10.1	X	74.20255	334.41467	104.63314	15.31311	0.0488329	0.17825166	3.1268976	21	1 30.8	14.4
1462 Zamenhof	11.2	X	254.78481	187.02174	24.75184	0.96447	0.1083150	0.17641412	3.1485734	21	—	—
1463 Nordenmarkia	10.6	X	55.41515	79.92008	329.13463	7.25978	0.1939504	0.17613951	3.1518450	21	—	—
1464 Armisticia	11.0	X	167.75100	55.45659	86.86071	11.54924	0.0446532	0.18880916	3.0092205	21	8 13.1	15.5
1465 Autonoma	11.7	X	253.22202	50.61528	166.93535	9.92100	0.1875999	0.18711866	3.0273176	21	—	—
1466 Mündleria	12.2	X	264.31757	74.59047	154.96687	13.14736	0.1565470	0.26884704	2.3775658	21	—	—
1467 Mashona	8.7	X	116.23377	350.27585	326.32055	21.90637	0.1280975	0.15821893	3.3855592	21	—	—
1468 Zomba	12.8	X	159.44880	23.14608	308.90908	9.94082	0.2711005	0.30283738	2.1961554	21	1 4.5	16.0
1469 Linzia	9.9	X	303.92916	205.85452	188.71267	13.40747	0.0636820	0.17811289	3.1285215	21	9 5.0	14.1
1470 Carla	11.1	X	282.40426	341.65742	358.40292	3.21319	0.0702978	0.17572379	3.1568141	21	5 28.7	15.5
1471 Tornio	11.1	X	136.17294	93.90441	321.93669	13.60722	0.1189423	0.22016237	2.7162766	21	3 15.7	15.3
1472 Muonio	12.4	X	300.43401	318.95145	45.18068	4.56698	0.1988554	0.29517803	2.2339839	21	7 5.1	14.5
1473 Quonos	11.8	X	42.04860	129.14848	216.47800	13.64565	0.2374153	0.23868157	2.5738909	21	12 27.0	15.6
1474 Beira	12.5	X	325.03303	84.00153	323.39235	26.68167	0.4886530	0.21764301	2.7371982	21	8 30.4	14.0
1475 Yalta	12.8	X	272.56779	201.36575	200.13959	4.50396	0.1686797	0.27368714	2.3494513	21	7 21.1	15.8
1476 Cox	12.9	X	240.60912	350.06835	330.50326	6.32691	0.1899291	0.28607366	2.2811340	21	2 25.3	16.3
1477 Bonsdorffia	11.5	X	308.56082	105.00071	319.85860	15.81495	0.2663575	0.17141694	3.2094718	21	9 19.1	15.4
1478 Vihuri	12.3	X	212.00806	161.65583	318.54473	7.83317	0.0886724	0.25414367	2.4684056	21	9 1.3	15.9
1479 Inkeri	11.9	X	46.48189	79.95978	18.02399	7.29601	0.1942927	0.22524578	2.6752535	21	1 9.5	14.4
1480 Aunus	13.1	X	205.34791	65.21673	63.62394	4.85876	0.1084196	0.30134446	2.2034028	21	9 11.6	16.1
1481 Tübingia	10.4	X	184.92381	314.42223	353.66115	3.50837	0.0421177	0.18794307	3.0184583	21	1 1.4	14.8
1482 Sebastiana	11.1	X	283.63320	215.36815	71.00901	2.97230	0.0357033	0.20250616	2.8719523	21	3 27.8	15.0
1483 Hakoila	11.9	X	220.87263	88.46392	71.78211	4.48904	0.1795379	0.22020362	2.7159373	21	10 23.3	16.0
1484 Pastrorema	10.9	X	138.38980	127.00175	72.65812	17.28500	0.2051873	0.21750544	2.7383522	21	10 6.5	15.8
1485 Isa	11.8	X	253.48788	47.18651	297.52574	8.92440	0.1163136	0.18740297	3.0242550	21	4 20.3	16.5
1486 Marilyn	12.8	X	156.96094	350.19676	332.98404	0.07515	0.1242147	0.30230258	2.1987447	21	—	—
1487 Boda	11.1	X	181.31949	107.28959	97.03877	2.46752	0.1236469	0.17772479	3.1330744	21	11 5.9	16.0
1488 Aura	10.3	X	214.06424	113.00567	354.30412	10.54424	0.1158528	0.18523928	3.0477593	21	8 16.7	15.0
1489 Attila	11.6	X	160.26878	26.41565	154.54491	2.46984	0.1494285	0.17270976	3.1934354	21	9 19.5	16.8
1490 Limpopo	12.1	X	140.89881	90.75291	254.25899	10.01926	0.1544511	0.27303076	2.3532153	21	—	—
1491 Balduinus	11.4	X	216.57260	157.37722	313.77826	3.66856	0.1301110	0.16797753	3.2531337	21	8 18.3	16.4
1492 Oppolzer	12.9	X	333.55064	81.21303	137.37437	6.05869	0.1161675	0.30765800	2.1731544	21	1 31.6	15.2
1493 Sigríd	12.1	X	322.44750	1.71976	330.56188	2.57786	0.2017729	0.26029756	2.4293457	21	6 26.2	14.2
1494 Savo	12.3	X	179.53464	184.71658	194.98514	2.45587	0.1311142	0.30410227	2.1900613	21	3 12.2	15.3
1495 Helsinki	11.4	X	177.59641	268.43339	13.07170	12.72433	0.1554295	0.22994785	2.6386582	21	—	—
1496 Turku	12.6	X	151.89640	0.80252	294.36585	2.50137	0.1619262	0.30083998	2.2058654	21	—	—
1497 Tampere	11.5	X	322.56582	29.72687	300.19857	1.06062	0.0830153	0.20009421	2.8949853	21	7 9.6	15.1
1498 Lahti	11.8	X	60.14454	96.66443	265.10661	12.66209	0.2354727	0.18028301	3.1033650	21	—	—
1499 Pori	11.4	X	37.27914	74.64465	239.57451	12.17686	0.1869694	0.22596502	2.6695736	21	10 31.8	14.8
1500 Jyväskylä	12.5	X	223.75735	17.23378	19.89196	7.43358	0.1903222	0.29362857	2.2418360	21	5 17.4	16.0
1501 Baade	12.0	X	124.37852	14.16793	16.87799	7.29940	0.2400736	0.24268858	2.5454808	21	2 19.9	15.6
1502 Arenda	11.5	X	64.29668	273.95586	204.33104	4.09490	0.0886765	0.21829293	2.7317625	21	3 1.5	14.8
1503 Kuopio	10.5	X	119.60961	177.64531	316.96083	12.36854	0.1038767	0.23175478	2.6249251	21	6 9.1	14.4
1504 Lappeenranta	11.7	X	79.63691	50.74121	94.85595	11.05110	0.1576040	0.26528712	2.3987884	21	5 12.0	14.6
1505 Koranna	11.4	X	333.81670	342.66153	248.26251	14.46925	0.1328391	0.22723821	2.6595928	21	2 24.2	15.1
1506 Xosa	12.0	X	312.34871	45.37941	234.50665	12.54827	0.2595316	0.23885915	2.5726150	21	3 11.2	15.7
1507 Vaasa	13.6	X	1.52467	50.39167	292.80241	9.22537	0.2448889	0.27682780	2.3316476	21	10 26.6	15.6
1508 Kemi	12.0	X	292.72955	93.46936	13.85235	28.72396	0.4183509	0.21384317	2.7695282	21	10 6.2	14.8
1509 Esclangona	12.6	X	46.58438	267.54774	283.51217	22.32426	0.0321302	0.38663701	1.8660951	21	4 3.2	15.1
1510 Charlois	11.5	X	332.82001	165.09992	331.36916	11.82529	0.1889757	0.22571491	2.6715454	21	—	—
1511 Daléra	12.8	X	256.82498	97.37303	81.71833	4.06797	0.1096061	0.27237204	2.3570079	21	—	—
1512 Oulu	9.5	X	149.29155	237.87697	10.04961	6.46907	0.1430183	0.12509800	3.9594585	21	11 18.7	15.8
1513 Mätra	13.2	X	29.94069	26.77672	136.18660	3.97816	0.0989741	0.30359476	2.1925013	21	2 17.6	14.9
1514 Ricoux	12.7	X	93.57811	179.23274	145.82943	4.53648	0.1995487	0.29392162	2.2403457	21	—	—
1515 Perrotin	12.9	X	202.59705	350.59302	49.17954	10.68138	0.2363661	0.23925392	2.5697843	21	5 5.9	17.5
1516 Henry	12.0	X	182.13581	94.22875	125.82052	8.74964	0.1861007	0.23227421	2.6210102	21	11 29.8	16.4
1517 Beograd	11.2	X	109.68854	229.44089	63.84710	5.27310	0.0446585	0.22023091	2.7157129	21	12 13.2	14.9
1518 Rovaniemi	12.4	X	302.22065	37.08681	27.72080	6.71217	0.1424928	0.29679883	2.2258433	21	10 25.8	14.0
1519 Kajaani	11.6	X	344.12045	338.99107	15.78941	12.60396	0.2412198	0.17820926	3.1273935	21	9 15.7	14.5
1520 Imatra	10.4	X	69.02278	118.87118	253.30925	15.2748						

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1521 Seinäjoki	11.9	X	48.99056	49.86190	12.44195	15.02984	0.1388008	0.20476660	2.8507774	21	—	—
1522 Kokkola	12.4	X	215.60722	30.06996	60.59356	5.34994	0.0718070	0.27029426	2.3690715	21	8 2.3	15.7
1523 Pieksämäki	12.3	X	181.35094	188.19135	327.75980	5.14166	0.0928789	0.29339698	2.2430156	21	9 17.1	15.3
1524 Joensuu	10.7	X	341.66925	1.55775	347.63608	12.69607	0.1221990	0.17943447	3.1131411	21	9 2.9	14.5
1525 Savonlinna	12.9	X	186.51857	65.19491	278.92803	5.86633	0.2629363	0.22240723	2.6979679	21	2 16.2	17.7
1526 Mikkeli	13.2	X	53.43771	72.91048	336.87893	6.20652	0.1867692	0.27974757	2.3153954	21	—	—
1527 Malmquista	12.0	X	258.90984	304.59599	16.09965	5.19134	0.1982625	0.29651683	2.2272543	21	3 14.1	15.4
1528 Conrada	11.7	X	198.42147	59.37811	139.35321	8.51945	0.1450921	0.26291066	2.4132218	21	11 26.8	15.4
1529 Oterma	10.0	X	224.18646	294.68373	100.59951	9.06006	0.2011653	0.12381412	3.9867829	21	5 25.0	16.4
1530 Rantaseppä	13.3	X	188.25863	85.00582	285.77667	4.42142	0.1986077	0.29231023	2.2485715	21	3 12.2	16.9
1531 Hartmut	11.6	X	110.50917	143.29025	278.86257	12.41175	0.1536193	0.23143981	2.6273061	21	2 23.7	15.4
1532 Inari	10.8	X	229.81113	123.65230	330.56165	8.78485	0.0485955	0.18863526	3.0110697	21	8 21.7	15.2
1533 Saimaa	10.7	X	252.49488	9.06751	156.55085	10.71470	0.0402086	0.18876768	3.0096613	21	12 17.5	15.1
1534 Näsi	11.9	X	120.43674	42.61502	62.12642	9.79399	0.2518202	0.21874810	2.7279716	21	5 20.1	16.1
1535 Päijänne	11.4	X	267.74066	40.20333	264.76480	6.05651	0.1924672	0.17510046	3.1643015	21	3 12.3	16.5
1536 Pielinen	12.7	X	357.79558	170.55867	195.64212	1.53465	0.1952717	0.30119540	2.2041298	21	11 28.6	14.4
1537 Transylvania	12.3	X	41.49342	148.44981	229.92042	3.85460	0.2936398	0.18425106	3.0586472	21	—	—
1538 Detre	14.3	X	85.79341	13.69017	343.18796	9.44288	0.2181887	0.27140708	2.3625913	21	—	—
1539 Borrelly	11.2	X	155.90730	250.34859	142.96309	1.73250	0.1909020	0.17679992	3.1439913	21	3 24.7	16.4
1540 Kevola	10.8	X	325.54468	112.42870	52.45981	11.96897	0.0854529	0.20494356	2.8491361	21	—	—
1541 Estonia	11.4	X	287.26082	191.44346	1.36860	4.87045	0.0694892	0.21394583	2.7686421	21	—	—
1542 Schalén	10.6	X	215.12922	163.77943	211.63469	2.76732	0.1171389	0.18131521	3.0915757	21	4 23.2	15.5
1543 Bourgeois	12.0	X	269.84454	25.96217	287.92820	11.02362	0.3239885	0.23078885	2.6322441	21	3 5.3	16.8
1544 Vinterhansenia	11.9	X	269.35610	355.94246	59.94048	3.33236	0.1046628	0.26936033	2.3745444	21	8 19.9	14.7
1545 Thernöe	11.8	X	24.56739	90.27958	51.79397	2.95342	0.2381884	0.21374060	2.7704142	21	1 27.2	14.0
1546 Izsák	10.7	X	321.65241	280.81330	190.31151	16.12002	0.1266138	0.17449469	3.1716206	21	—	—
1547 Nele	10.7	X	206.90026	154.78489	291.33078	11.74048	0.2531141	0.22917002	2.6466255	21	7 5.3	15.2
1548 Palomaa	11.6	X	175.22230	88.08312	116.90596	16.55545	0.0812594	0.21192643	2.7862022	21	11 12.2	16.1
1549 Mikko	12.3	X	188.85274	6.25155	85.28328	5.54787	0.0840988	0.29582357	2.2307327	21	6 29.5	15.2
1550 Tito	11.9	X	236.52646	311.17199	64.48216	8.88232	0.3142864	0.24309980	2.5426094	21	4 30.5	16.4
1551 Argelander	12.2	X	0.98785	232.78963	107.22819	3.76075	0.0667418	0.26588749	2.3951761	21	10 3.4	14.8
1552 Bessel	11.4	X	89.20338	39.94588	9.92917	9.83317	0.0995755	0.18865584	3.0108506	21	1 20.6	15.5
1553 Bauersfelda	11.6	X	154.71008	21.02349	110.96373	3.23485	0.0993421	0.19879891	2.9075468	21	7 15.4	15.8
1554 Yugoslavia	11.2	X	28.22144	131.25887	217.06311	12.14633	0.2019016	0.23261408	2.6184566	21	12 7.9	14.5
1555 Dejan	11.6	X	24.94184	47.57857	318.03072	6.02202	0.2755119	0.22343179	2.6897138	21	—	—
1556 Wingolfia	10.5	X	318.93666	267.52600	91.57689	15.72931	0.1087798	0.15488338	3.4339938	21	8 10.9	15.1
1557 Roehla	11.5	X	191.40054	3.66701	355.18844	10.30107	0.1051076	0.18865291	3.0108818	21	3 11.5	16.1
1558 Järnefelt	10.3	X	333.84964	300.70750	110.77894	10.51329	0.0279725	0.17049374	3.2210472	21	11 12.9	14.8
1559 Kustaanheimo	12.0	X	132.23602	217.12125	327.89677	3.19080	0.1337632	0.26639611	2.3921264	21	9 2.4	15.6
1560 Strattonia	11.6	X	339.42045	94.29136	289.10776	6.28298	0.2123884	0.22398244	2.6853036	21	10 19.8	14.1
1561 Fricke	11.4	X	312.23359	41.66401	230.64034	4.31960	0.1266471	0.17245046	3.1966356	21	4 3.6	15.8
1562 Gondolatsch	12.0	X	170.31213	83.17902	129.46613	4.88516	0.0788481	0.29680568	2.2258091	21	11 24.0	14.9
1563 Noël	12.4	X	53.37779	115.92494	53.63752	5.98209	0.0856255	0.30386722	2.1911905	21	4 14.8	14.4
1564 Srbija	10.8	X	23.49020	232.63066	176.97613	10.95811	0.1979127	0.17470650	3.1690567	21	—	—
1565 Lemaître	12.6	X	249.09166	116.39358	261.13868	21.49768	0.3485651	0.26645277	2.3917873	21	5 4.4	17.2
1566 Icarus	16.9	X	184.25112	31.41939	87.98006	22.81166	0.8270001	0.88045323	1.0781152	21	7 27.7	19.1
1567 Alikoski	9.7	X	15.06458	110.54207	51.43501	17.27449	0.0825011	0.17120228	3.2121540	21	3 3.1	14.2
1568 Aisleen	11.7	X	244.20687	229.11590	146.14313	24.87353	0.2546550	0.27334249	2.3514258	21	5 13.8	16.1
1569 Evita	11.2	X	343.96722	248.50247	99.49176	12.25594	0.1336851	0.17617443	3.1514286	21	9 9.0	15.1
1570 Brunonia	12.0	X	26.26692	227.37575	190.00661	1.66616	0.0558443	0.20553743	2.8436454	21	—	—
1571 Cesco	11.6	X	18.52119	141.06191	292.35869	14.59589	0.1143985	0.17701837	3.1414042	21	—	—
1572 Posnania	10.2	X	30.16317	354.10370	5.88699	13.27375	0.2041405	0.17982001	3.1086897	21	12 12.2	14.4
1573 Väisälä	12.3	X	242.94402	174.00909	202.35852	24.55573	0.2316492	0.27014505	2.3699438	21	5 9.5	16.3
1574 Meyer	9.9	X	346.08076	260.41124	245.63176	14.47269	0.0341434	0.14788551	3.5414868	21	1 1.0	14.9
1575 Winifred	12.1	X	175.63399	348.52197	206.77163	24.83215	0.1794473	0.26955439	2.3734046	21	10 28.3	15.8
1576 Fabiola	11.1	X	14.36755	246.72435	166.59914	0.95422	0.1673054	0.17687909	3.1430531	21	—	—
1577 Reiss	12.7	X	327.39544	266.22447	123.54095	4.35599	0.1662108	0.29583602	2.2306701	21	10 26.0	14.2
1578 Kirkwood	10.2	X	12.95617	1.70450	73.98715	0.80807	0.2405356	0.12668278	3.9263679	21	—	—
1579 Herrick	10.6	X	100.83454	279.60677	184.12071	8.76325	0.1258274	0.15471892	3.4364268	21	4 17.9	15.5
1580 Betulia	14.7	X	316.11299	159.51050	62.29475	52.07909	0.4871867	0.30257509	2.1974244	21	—	—
1581 Abanderada	11.0	X	286.69266	89.81508	104.81070	2.53897	0.1229465	0.17557913	3.1585478	21	—	—
1582 Martir	11.3	X	275.73482	128.16447	93.90904	11.60615	0.1263476	0.17567742	3.1573696	21	—	—
1583 Antiochus	8.6	X	359.37571	186.60613	221.38902	28.50002	0.0532732	0.08461719	5.1384286	21	11 22.7	15.3
1584 Fuji	11.0	X	275.15655	189.11873	305.35396	26.64003	0.1952055	0.26922388	2.3753466	21	12 4.9	14.0
1585 Union	10.4	X	220.08630	264.35550	150.09476	26.19049	0.3091667	0.19684557	2.9267499	21	6 9.0	16.1
1586 Thiele	12.1	X	253.51135	30.42397	125.84904	4.05864	0.1057816	0.26038300	2.4288142	21	12 12.4	14.9
1587 Kahrstedt	11.4	X	335.59756	98.40421	357.35891	7.83415	0.1544625	0.24294087	2.5437181	21	—	—
1588 Descamisada	11.3	X	45.71475	222.59863	98.55593	11.26434	0.0713326	0.18709749	3.0275460	21	11 3.7	15.6
1589 Fanatica	11.9	X	276.49389	289.27429	90.31727	5.26243	0.0935799	0.26227145	2.4171413	21	7 8.7	14.8
1590 Tsiolkovskaja	11.7	X	156.95387	52.54937	226.51988	4.35071	0.1569792	0.29595441	2.2300752	21	—	—
1591 Baize	11.4	X	336.59376	163.64541	90.52334	24.82182	0.1757041	0.26650750	2.3914599	21	4 13.6	14.6
1592 Mathieu	12.0	X	64.11465	177.98213	106.12860	13.53607	0.3056148	0.21435025	2.7651586	21	11 15.6	16.4
1593 Fagnes	13.1	X	10.34505	185.35259	120.01342	9.98061	0.2816472	0.29701483	2.2247641	21	10 7.3	14.7
1594 Danjon	11.9	X	82.72382	222.15016	69.39640	8.94442	0.1954224	0.28846651	2.2658017	21	12 6.2	15.2
1595 Tanga	11.9	X	36.89130	189.94349	112.18181	4.16377	0.1118470	0.22906409	2.6454408	21	10 7.4	15.1
1596 Itzigsohn	10.7	X	224.39867	160.26478	249.08375	13.28224	0.1304989	0.20076253	2.8885570	21	6 11.5	15.2
1597 Laugier	11.7	X	354.88231	52.35161	158.60452	11.81175	0.0896077	0.20535192	2.8453577	21	3 20.9	15.1
1598 Paloque	12.8	X	274.80730	300.67783	298.02817	7.53719	0.0807166	0.27670007	2.3323651	21	—	—
1599 Giomus	11.1	X	260.22566	355.88715	43.40482	6.08752	0.1430971	0.17798520	3.1300176	21	7 6.9	15.7
1600 Vyssotsky	12.6	X	27.90729	50.90302	60.58565	21.16707						

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1601 Patry	12.2	X	223.58525	196.58900	74.66454	4.93897	0.1291720	0.29510009	2.2343772	21	—	—
1602 Indiana	12.3	X	107.97962	73.04563	75.12811	4.16192	0.1042024	0.29313496	2.2443520	21	6 11.6	15.0
1603 Neva	10.9	X	262.45921	256.74520	130.00307	8.55877	0.0956258	0.21560305	2.7544366	21	6 29.2	14.8
1604 Tombaugh	10.5	X	261.91498	38.17724	309.08095	9.39676	0.1028736	0.18767092	3.0213756	21	5 4.9	15.2
1605 Milankovitch	10.3	X	215.03923	275.86004	173.66531	10.56520	0.0752970	0.18815524	3.0161886	21	7 24.9	15.0
1606 Jekhovskiy	12.0	X	17.11483	142.83197	190.30909	7.72086	0.3189636	0.22368724	2.6876656	21	11 18.8	14.8
1607 Mavis	11.4	X	137.26652	236.13277	122.38952	8.58088	0.3029594	0.24177835	2.5518654	21	1 28.7	15.2
1608 Muñoz	12.7	X	91.77497	316.33447	356.93296	3.94414	0.1695621	0.29924577	2.2136929	21	—	—
1609 Brenda	10.6	X	281.09118	229.23713	105.22226	18.63098	0.2489752	0.23736591	2.5833931	21	4 30.7	14.8
1610 Mirmaya	13.4	X	129.61873	14.89485	359.64198	2.19780	0.1984364	0.30144956	2.2028907	21	1 16.5	15.7
1611 Beyer	11.8	X	35.53541	74.90739	237.42240	4.27713	0.1609847	0.17424710	3.1746244	21	10 14.6	15.8
1612 Hirose	10.8	X	335.09338	244.13969	319.47910	16.83768	0.0930729	0.18039174	3.1021178	21	2 12.2	14.9
1613 Smiley	11.7	X	173.54403	126.89751	320.77517	7.98624	0.2615216	0.21808516	2.7334972	21	6 11.4	16.7
1614 Goldschmidt	10.8	X	173.71248	345.45910	162.26386	14.09554	0.0686361	0.18933073	3.0036914	21	8 22.7	15.4
1615 Bardwell	11.4	X	59.08128	254.04301	152.43441	1.69086	0.1827117	0.17895050	3.1187514	21	—	—
1616 Filipoff	11.2	X	262.45157	9.77884	48.16113	8.47323	0.0178998	0.19808604	2.9145184	21	8 25.0	15.3
1617 Alschmitt	10.9	X	48.77341	24.30727	154.93467	13.26550	0.1265192	0.17230810	3.1983961	21	5 13.3	15.1
1618 Dawn	11.2	X	9.36958	183.08169	102.92889	3.22436	0.0284982	0.20268359	2.8702760	21	7 22.8	15.0
1619 Ueta	12.2	X	57.16380	328.22725	61.46976	6.20964	0.1753152	0.29373260	2.2413067	21	—	—
1620 Geographos	15.3	X	158.69924	276.95241	337.18541	13.33762	0.3354476	0.70898543	1.2455978	21	—	—
1621 Druzhba	11.8	X	126.89947	238.70841	181.82892	3.17226	0.1192690	0.29598043	2.2299445	21	3 5.2	14.5
1622 Chacornac	12.2	X	199.66223	256.47021	4.32354	6.46020	0.1630113	0.29506771	2.2345406	21	—	—
1623 Vivian	11.3	X	315.09640	320.70921	115.35251	2.50303	0.1540563	0.17704898	3.1410421	21	11 8.6	14.9
1624 Rabe	11.4	X	164.48228	25.18637	133.34624	1.99407	0.0899673	0.17181726	3.2044846	21	8 26.7	16.2
1625 The NORC	10.4	X	29.64280	286.53011	320.75158	15.55984	0.2298328	0.17290248	3.1910620	21	7 23.5	14.0
1626 Sadeya	11.2	X	30.08200	149.29184	279.48255	25.31093	0.2731089	0.27114402	2.3641192	21	—	—
1627 Ivar	13.2	0.60	51.52353	167.79383	133.11924	8.45212	0.3968444	0.38756169	1.8631257	21	12 21.9	16.0
1628 Strobel	10.3	X	149.03697	288.51777	181.17420	19.38887	0.0666847	0.18868665	3.0105228	21	6 9.9	15.1
1629 Pecker	12.4	X	178.99171	106.63304	132.68511	9.70269	0.1552929	0.29444606	2.2375935	21	12 30.3	15.8
1630 Milet	11.6	X	45.14454	95.25743	54.44807	4.53677	0.1683274	0.18697188	3.0289017	21	3 29.6	14.9
1631 Kopff	12.2	X	160.13360	315.07426	16.78639	7.49098	0.2133787	0.29483203	2.2357313	21	—	—
1632 Sieböhme	11.8	X	28.25294	126.66286	199.72074	5.71830	0.1374596	0.22780890	2.6551491	21	10 29.2	14.9
1633 Chimay	10.7	X	117.41242	67.14625	114.07385	2.67584	0.1239042	0.17209414	3.2010466	21	8 8.3	15.5
1634 Ndola	12.8	X	212.58474	190.99669	90.72094	7.59736	0.1615766	0.29275640	2.2462863	21	—	—
1635 Bohrmann	11.0	X	282.80885	136.64682	184.33591	1.82280	0.0585137	0.20458033	2.8525075	21	5 5.7	15.0
1636 Porter	12.2	X	216.52240	239.45754	168.34415	4.43508	0.1280693	0.29515170	2.2341167	21	5 30.3	15.4
1637 Swings	10.4	X	18.55384	237.52248	21.25911	14.06829	0.0452139	0.18316037	3.0707776	21	6 30.6	14.7
1638 Ruanda	11.6	X	290.33822	86.58992	200.51516	0.29293	0.1876206	0.21615645	2.7497334	21	3 12.7	15.6
1639 Bower	11.1	X	281.32694	106.31739	324.14661	8.44369	0.1482448	0.23857927	2.5746265	21	9 13.3	14.1
1640 Nemo	13.3	X	59.02778	354.79712	355.43243	7.10894	0.3427571	0.28463038	2.2888388	21	—	—
1641 Tana	10.5	X	122.94215	0.37495	331.39594	9.32215	0.0984950	0.18778055	3.0201996	21	—	—
1642 Hill	10.8	X	333.34196	149.57355	339.04063	10.80346	0.0669019	0.21592124	2.7517299	21	—	—
1643 Brown	12.5	X	258.92473	90.19399	287.91451	3.51492	0.2027700	0.25114430	2.4880198	21	5 29.3	16.1
1644 Rafita	11.4	X	352.33642	197.62722	270.85220	7.02753	0.1568962	0.24237525	2.5476741	21	—	—
1645 Waterfield	11.0	X	113.33218	106.36364	265.39719	1.02587	0.1098805	0.18392253	3.0622885	21	1 4.8	15.3
1646 Rosseland	12.0	X	341.50570	279.63428	119.96577	8.38051	0.1184740	0.27180868	2.3602636	21	12 1.2	14.4
1647 Menelaus	10.5	X	204.97793	294.74565	240.30418	5.65051	0.0213070	0.08285987	5.2108258	21	10 19.9	17.5
1648 Shajna	12.1	X	303.59259	134.74991	130.39780	4.57262	0.2060702	0.29478742	2.2359568	21	2 14.4	15.2
1649 Fabre	12.1	X	144.10460	13.26452	145.43489	10.82382	0.0437094	0.18728252	3.0255515	21	8 2.4	16.6
1650 Heckmann	11.6	X	120.74807	56.83389	199.70400	2.75084	0.1633380	0.25948087	2.4344404	21	11 22.6	15.3
1651 Behrens	12.1	X	215.99867	339.84161	187.44057	5.07767	0.0665808	0.30635397	2.1793168	21	11 21.9	14.8
1652 Hergé	12.3	X	83.36572	13.18280	251.67825	3.19825	0.1503994	0.29182980	2.2510387	21	10 28.9	15.4
1653 Yakhontovia	11.7	X	292.07426	88.71651	303.98903	4.07013	0.3233362	0.23362751	3.6108789	21	7 11.3	15.0
1654 Bojeva	10.7	X	63.13212	332.77468	25.16958	10.42506	0.0865733	0.18814621	2.0162852	21	—	—
1655 Comas Solá	11.1	X	261.45380	323.37978	111.12021	9.59350	0.2322842	0.21192813	2.7861873	21	8 12.3	15.2
1656 Suomi	12.8	X	350.88144	287.61601	175.52940	25.07158	0.1233773	0.38311374	1.8775185	21	—	—
1657 Roemera	12.8	X	276.73502	54.40811	105.30637	23.38294	0.2374012	0.27403997	2.3474343	21	—	—
1658 Innes	11.4	X	224.30696	188.74393	95.41332	9.09490	0.1835575	0.24065605	2.5597931	21	1 5.2	15.7
1659 Punkaharju	9.9	X	180.50379	36.40050	338.21375	16.43041	0.2598552	0.21217336	2.7840401	21	3 17.9	14.9
1660 Wood	11.7	X	194.62182	276.94178	212.78490	20.56317	0.3003781	0.26549032	2.3975642	21	8 11.2	16.5
1661 Granule	12.9	X	188.85754	327.93740	261.67217	3.03516	0.0912693	0.30553768	2.1831967	21	—	—
1662 Hoffmann	11.7	X	163.28152	63.70523	330.53636	4.22972	0.1730179	0.21704212	2.7422478	21	3 25.7	16.2
1663 van den Bos	11.9	X	84.99054	275.07581	83.19167	5.36065	0.1796679	0.29402324	2.2398294	21	—	—
1664 Felix	12.6	X	297.37873	107.71211	43.99365	6.11568	0.2257050	0.27578848	2.3375019	21	—	—
1665 Gaby	11.8	X	174.02837	5.73351	91.53963	10.83437	0.2071888	0.26279583	2.4139248	21	6 22.6	15.8
1666 van Gent	12.6	X	21.81843	83.52469	263.09292	2.68706	0.1823743	0.30510554	2.1852577	21	12 9.4	14.9
1667 Pels	11.9	X	59.03225	196.06337	80.84785	4.61639	0.1563627	0.30411821	2.1899848	21	10 21.4	14.5
1668 Hanna	12.2	X	228.44064	191.20305	160.95721	4.74112	0.2152088	0.20962015	2.8066012	21	4 2.1	16.9
1669 Dagmar	10.8	X	14.24127	178.44292	18.95443	0.94019	0.1095022	0.17719719	3.1392904	21	4 4.9	14.7
1670 Minnaert	11.2	X	136.93978	19.73167	59.10858	10.50889	0.1047614	0.19963562	2.8994171	21	4 23.1	15.5
1671 Chaika	12.2	X	269.74155	250.22990	177.05150	3.96688	0.2549271	0.23632188	2.5909961	21	8 7.9	15.7
1672 Gezelle	11.5	X	68.29463	255.02945	181.27902	1.06741	0.2775053	0.17442584	3.1724553	21	2 17.3	15.0
1673 van Houten	12.2	X	94.57335	209.14397	208.00783	3.59032	0.1819584	0.18050603	3.1008082	21	2 14.9	16.5
1674 Groneweld	11.3	X	287.77182	4.17867	95.56034	2.66437	0.1264372	0.17287774	3.1913664	21	10 29.4	15.4
1675 Simonida	11.8	X	71.68299	50.70445	30.08569	6.79065	0.2513999	0.29530499	2.2333435	21	1 5.5	13.8
1676 Kariba	12.7	X	193.93415	204.61354	54.54951	6.12786	0.1871144	0.29484032	2.2356894	21	—	—
1677 Tycho Brahe	11.7	X	64.33081	317.82018	337.87518	14.86186	0.1078218	0.24471895	2.5313818	21	10 28.4	15.4
1678 Hveen	11.0	X	107.90198	121.04448	351.57607	10.19724	0.1099819	0.17573258	3.1567089	21	4 28.1	15.7
1679 Nevanlinna	10.6	X	127.70703	89.79309	177.41356	17.97407	0.1534260	0.17925170	3.1152569	21	12 2.2	15.9
1680 Per Brahe	11.1	X	165.27440	158.34180	83.33674	4.26070	0.1824161	0.2192426				

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1681 Steinmetz	11.4	X	121.08240	1.38774	94.36461	7.20647	0.2049108	0.22262107	2.6962400	21	5 6.4	15.5
1682 Karel	12.8	X	158.47891	9.88280	325.72863	4.02810	0.1915583	0.29414941	2.2391889	21	—	—
1683 Castafiore	11.6	X	275.69122	347.12921	326.63533	12.47887	0.1763597	0.21783474	2.7355918	21	3 25.8	16.0
1684 Iguassú	11.0	X	6.02021	154.77992	105.39560	3.66724	0.1254555	0.18094671	3.0957716	21	6 14.4	14.7
1685 Toro	14.3	X	176.77624	127.21608	274.23736	9.38266	0.4359195	0.61635420	1.3674637	21	3 28.5	15.9
1686 De Sitter	11.1	X	143.41316	294.58007	6.31852	0.61688	0.1598049	0.17512129	3.1640505	21	—	—
1687 Glarona	10.7	X	307.73561	316.68608	93.49517	2.63075	0.1693430	0.17480949	3.1678118	21	9 21.5	14.5
1688 Wilkens	12.7	X	125.04547	42.27906	245.76235	11.76062	0.2422864	0.23279698	2.6170849	21	12 30.4	17.4
1689 Floris-Jan	11.8	X	218.91466	265.15228	123.16734	6.37804	0.2067538	0.25723340	2.4485998	21	5 6.9	15.9
1690 Mayrhofer	11.1	X	286.08063	155.29023	230.40277	13.03886	0.0979145	0.18588596	3.0406866	21	7 24.1	15.5
1691 Oort	10.9	X	125.73763	232.50269	174.52699	1.08645	0.1759647	0.17522164	3.1628424	21	3 11.1	15.6
1692 Subbotina	11.3	X	99.51418	111.66600	199.58803	2.42658	0.1374960	0.21192404	2.7862232	21	12 29.5	15.7
1693 Hertzsprung	11.2	X	99.54516	234.76648	69.98467	11.93807	0.2735402	0.21081751	2.7959642	21	12 30.3	16.2
1694 Kaiser	12.6	X	137.06597	356.36442	13.33794	11.08613	0.2570165	0.26570347	2.3962818	21	2 6.8	16.2
1695 Walbeck	12.5	X	78.80148	139.34867	218.40380	16.68118	0.2892620	0.21210094	2.7846738	21	—	—
1696 Nurmela	12.9	X	64.53730	164.79104	21.02093	6.03667	0.0977477	0.28979319	2.2615729	21	5 30.4	15.3
1697 Koskenniemi	12.9	X	337.02288	91.68422	331.59952	5.66217	0.1161872	0.26946255	2.3739438	21	12 25.3	15.2
1698 Christophe	11.3	X	185.86414	132.20758	26.69550	1.49477	0.1060583	0.17486713	3.1671156	21	9 17.7	16.2
1699 Honkasalo	12.4	X	116.40745	51.58706	273.53244	1.97136	0.1655072	0.29970476	2.2114322	21	—	—
1700 Zvezdara	12.4	X	80.97828	15.35608	356.86757	4.51286	0.2248226	0.27160648	2.3614348	21	—	—
1701 Okavango	10.7	X	343.22323	259.91572	61.24854	16.27244	0.1930614	0.17516696	3.1635006	21	7 27.6	14.4
1702 Kalahari	11.1	X	354.52102	241.39591	103.86406	9.96044	0.1439749	0.20397511	2.8581472	21	9 28.7	14.4
1703 Barry	12.1	X	213.66469	213.44888	112.25507	4.52024	0.1715870	0.29898060	2.2150016	21	2 7.7	15.4
1704 Wachmann	12.9	X	123.01898	281.16801	259.42860	0.97090	0.0865333	0.29721192	2.2237804	21	8 14.8	15.6
1705 Tapio	13.3	X	331.49602	156.41469	188.59013	7.71040	0.2456588	0.28267996	2.2993505	21	8 1.1	14.8
1706 Dieckvoss	13.0	X	82.21780	339.35307	279.70017	1.87542	0.1150017	0.31804836	2.1255628	21	10 18.8	15.6
1707 Chantal	12.6	X	276.75108	42.75244	6.08665	4.03196	0.1707840	0.29803740	2.2196723	21	8 10.8	15.0
1708 Pólit	11.8	X	131.36626	248.77199	192.20513	6.04560	0.3077499	0.19846404	2.9108165	21	5 7.1	16.7
1709 Ukraina	12.4	X	39.02119	42.35151	300.06451	7.55676	0.2137411	0.26876950	2.3780230	21	12 24.1	15.4
1710 Gtohard	13.6	X	234.72807	336.09505	356.55518	8.46710	0.2682166	0.27863814	2.3215374	21	3 6.9	17.7
1711 Sandrine	10.9	X	270.44132	250.50646	134.77267	11.09878	0.1150712	0.18847944	3.0127289	21	7 4.5	15.3
1712 Angola	10.1	X	75.48693	18.10003	237.49539	19.37815	0.1542137	0.17494830	3.1661360	21	9 19.4	15.0
1713 Bancilhon	13.3	X	11.57787	256.38242	61.11391	3.74594	0.1847959	0.29627320	2.2284752	21	10 8.0	15.0
1714 Sy	11.9	X	25.15482	321.35786	300.89414	7.97231	0.1541137	0.23948567	2.5681262	21	7 25.9	14.2
1715 Salli	12.3	X	110.41655	209.22602	38.90294	11.47191	0.2414008	0.26548320	2.3976071	21	11 6.8	16.3
1716 Peter	12.1	X	89.71725	316.43080	243.61509	5.73089	0.0898619	0.21782132	2.7357041	21	7 26.3	15.9
1717 Arlon	12.2	X	287.67410	116.39090	340.42400	6.19159	0.1285787	0.30295246	2.1955992	21	11 17.6	14.2
1718 Namibia	13.8	X	246.75626	133.66221	202.82378	7.70385	0.2772660	0.27096319	2.3651708	21	3 18.4	17.8
1719 Jens	11.7	X	280.72281	57.84396	323.43146	14.28416	0.2230368	0.22770618	2.6559476	21	6 28.1	15.5
1720 Niels	12.8	X	306.12424	309.08030	127.85028	0.73095	0.1034598	0.30446341	2.1883291	21	11 27.6	14.6
1721 Wells	10.9	X	348.47845	137.92919	317.09658	16.12278	0.0490787	0.17655442	3.1469051	21	—	—
1722 Goffin	12.0	X	26.63525	284.79720	168.01725	5.46572	0.0503326	0.24724305	2.5141238	21	—	—
1723 Klemola	10.1	X	114.70216	1.65223	149.80876	10.93647	0.0410334	0.18850091	3.0125002	21	6 19.4	14.5
1724 Vladimir	11.4	X	69.78289	297.58242	163.98666	12.23210	0.0579473	0.22073524	2.7115748	21	2 11.9	14.9
1725 CrAO	11.3	X	136.94353	229.66507	119.08214	3.17093	0.0882924	0.19907401	2.9048675	21	—	—
1726 Hoffmeister	12.3	X	337.94893	69.65034	230.94909	3.48338	0.0431600	0.21181720	2.7871600	21	6 26.1	15.7
1727 Mette	12.6	X	149.33246	313.06519	133.00791	22.90010	0.1020512	0.39047834	1.8538364	21	5 9.5	15.4
1728 Goethe Link	11.4	X	358.54008	66.75236	240.49389	7.18464	0.0904740	0.24003237	2.5642253	21	8 4.7	14.3
1729 Beryl	12.5	X	205.56399	262.19559	9.02291	2.44165	0.1003508	0.29600132	2.2298396	21	—	—
1730 Marceline	12.0	X	82.27699	226.58569	171.14352	9.48884	0.2226213	0.21194375	2.7860504	21	1 2.4	15.2
1731 Smuts	10.5	X	286.38641	203.34534	152.47226	5.93524	0.1282072	0.17498487	3.1656948	21	6 15.7	14.9
1732 Heike	10.9	X	152.58317	211.76391	155.59939	10.77747	0.1119520	0.18836763	3.0139210	21	2 10.6	15.5
1733 Silke	12.8	X	270.62488	307.33688	159.32027	4.43370	0.0832472	0.30353067	2.1928099	21	11 12.8	15.0
1734 Zhongolovich	11.7	X	21.78911	186.22909	182.02881	8.34415	0.2292838	0.21288590	2.7778244	21	12 23.9	15.2
1735 ITA	10.0	X	87.51213	275.13011	9.21368	15.60835	0.1305508	0.17740737	3.1368104	21	11 5.4	14.9
1736 Floirac	12.3	X	26.28488	249.16509	159.71679	4.55235	0.1685865	0.29621800	2.2287520	21	—	—
1737 Severny	11.1	X	16.18660	221.99509	327.41201	9.37640	0.0475227	0.18859168	3.0115335	21	3 23.6	15.2
1738 Oosterhoff	12.5	X	64.35451	284.29404	44.08457	4.87655	0.2027973	0.30553056	2.1832306	21	—	—
1739 Meyermann	12.8	X	72.64342	82.05267	203.29588	3.41008	0.1244125	0.28995077	2.2607535	21	11 10.8	15.8
1740 Paavo Nurmi	13.3	X	39.95286	78.56068	296.05874	2.00022	0.1897246	0.25437556	2.4669052	21	—	—
1741 Giacás	11.5	X	301.05833	337.18089	55.40495	2.88376	0.0685152	0.20081109	2.8880913	21	9 3.5	15.1
1742 Schaifers	11.3	X	237.24346	213.88662	152.18723	2.49879	0.0970559	0.20088539	2.8873791	21	5 5.2	15.7
1743 Schmidt	12.5	X	45.00041	359.50979	189.62350	6.35688	0.1340867	0.25340270	2.4732151	21	5 11.2	15.0
1744 Harriet	13.5	X	266.67234	155.90383	27.42509	4.40681	0.1214885	0.29614748	2.2291058	21	—	—
1745 Ferguson	11.9	X	183.28352	337.98166	78.64034	3.25603	0.0576832	0.20548085	2.8441674	21	5 10.6	16.0
1746 Brouwer	9.9	X	107.65241	47.68491	321.94267	8.36700	0.2088208	0.12538845	3.9533417	21	1 21.2	15.6
1747 Wright	13.6	X	72.10563	340.48543	268.37641	21.41517	0.1103837	0.44105046	1.7092695	21	9 20.9	16.0
1748 Mauderli	10.5	X	40.93566	198.51270	125.59950	3.30195	0.2166907	0.12561304	3.9486280	21	11 8.0	15.6
1749 Telamon	9.5	X	291.05045	113.14936	340.85172	6.09888	0.1088812	0.08446155	5.1447390	21	10 13.6	16.1
1750 Eckert	14.0	X	141.99868	109.02783	273.74518	19.08594	0.1725267	0.36858274	1.9265460	21	1 20.2	16.0
1751 Herget	11.9	X	15.37235	130.59713	240.19700	8.12066	0.1726263	0.21155538	2.7894591	21	12 8.6	15.2
1752 van Herk	13.1	X	36.86176	98.81777	236.80879	3.50626	0.2006392	0.29441945	2.2378195	21	12 15.5	15.7
1753 Mieke	11.1	X	192.36931	230.22750	58.42167	11.36638	0.0793145	0.18813547	3.0164000	21	—	—
1754 Cunningham	9.7	X	257.48990	110.04026	162.85913	12.15441	0.1696946	0.12590904	3.9424371	21	2 4.4	15.9
1755 Lorbach	10.8	X	135.91954	321.25034	157.03560	10.70909	0.0467596	0.18147689	3.0897392	21	6 4.8	15.5
1756 Giacobini	12.1	X	238.74653	100.48881	291.03714	5.10390	0.2320141	0.24242299	2.5473396	21	5 24.3	16.4
1757 Porvoo	13.4	X	286.11530	149.10616	39.38856	3.97441	0.1266205	0.27335471	2.3513557	21	—	—
1758 Naantali	11.2	X	16.14124	115.51522	113.68723	10.82386	0.0308286	0.18914763	3.0056296	21	5 20.9	15.4
1759 Kienle	13.1	X	90.64841	206.28236	158.63641	4.56030	0.3129358	0.22835590	2.6509074	21	—	—
1760 Sandra	11.0	X	254.14080	332.27094	232.61054	8.44023						

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1761 Edmondson	11.8	X	165.67620	50.45971	76.94690	2.45922	0.2292828	0.17349022	3.1838509	21	7 23.5	17.3
1762 Russell	11.2	X	306.09230	232.20357	160.51680	2.28324	0.0757298	0.20178040	2.8788347	21	9 8.9	14.8
1763 Williams	12.8	X	3.81077	28.77298	304.45762	4.23572	0.2040390	0.30435050	2.1888704	21	10 17.5	14.4
1764 Cogshall	11.4	X	337.93390	80.20141	152.20897	2.23590	0.1201600	0.18117005	3.0932270	21	3 22.4	15.2
1765 Wrubel	10.0	X	198.07190	265.47991	70.16128	19.94086	0.1777718	0.17419449	3.1752635	21	3 1.7	15.6
1766 Slipher	12.3	X	327.82724	170.51263	188.57757	5.22979	0.0884749	0.21600425	2.7510249	21	8 26.5	15.5
1767 Lampland	11.7	X	104.15592	135.36544	192.09464	9.82661	0.0973092	0.18781881	3.0197894	21	—	—
1768 Appenzella	12.6	X	175.04044	20.09876	12.34458	3.25499	0.1796468	0.25705782	2.4497147	21	4 1.4	16.5
1769 Carlostortes	13.4	X	25.38109	24.16899	319.22832	1.58818	0.1418377	0.30654587	2.1784072	21	12 3.4	15.5
1770 Schlesinger	12.0	X	201.06099	39.49719	21.90831	5.29304	0.0612074	0.25593491	2.4568748	21	6 2.7	15.5
1771 Makover	10.4	X	309.06970	316.24328	86.23215	11.21633	0.1703895	0.17789822	3.1310378	21	9 18.7	14.3
1772 Gagarin	12.7	X	73.69693	93.54823	88.17226	5.74192	0.1042296	0.24535471	2.5270071	21	6 12.6	15.8
1773 Rumpelstilz	11.9	X	320.42000	169.38430	74.75875	5.39920	0.1265418	0.25909069	2.4368839	21	2 28.2	14.9
1774 Kulikov	12.1	X	272.09490	250.51946	174.95597	1.85939	0.0665091	0.20158641	2.8806813	21	9 5.0	15.8
1775 Zimmerwald	12.1	X	117.53959	84.54942	195.89068	12.55470	0.1863776	0.23489680	2.6014650	21	12 15.7	16.6
1776 Kuiper	11.2	X	282.88275	312.76862	176.44567	9.48558	0.0169469	0.18043770	3.1015910	21	12 12.3	15.6
1777 Gehrels	11.6	X	358.59318	134.40320	334.53741	3.14737	0.0187509	0.23155929	2.6264022	21	—	—
1778 Alfvén	11.8	X	69.17111	136.52165	106.22598	2.47311	0.1303544	0.17618707	3.1512778	21	8 31.2	16.2
1779 Paraná	10.7	X	53.83355	11.70852	254.39186	0.89853	0.1615271	0.30709173	2.1758250	21	9 27.2	16.4
1780 Kippes	14.1	X	51.63155	339.87794	290.96229	8.99538	0.0565705	0.18783247	3.0196430	21	8 29.2	14.9
1781 Van Biesbroeck	12.9	X	343.51251	342.43629	44.55607	6.94603	0.1071107	0.26593965	2.3948629	21	11 11.6	15.4
1782 Schneller	11.8	X	193.76328	106.72947	157.37934	1.54461	0.1530622	0.17906699	3.1173987	21	—	—
1783 Albittskij	12.0	X	341.57283	315.44823	189.44744	11.49950	0.1329663	0.22685934	2.6625531	21	—	—
1784 Benguella	12.2	X	25.39439	185.00859	95.26768	1.47256	0.1333621	0.26421301	2.4052852	21	8 23.1	14.6
1785 Wurm	12.6	X	354.94780	246.37916	283.28836	3.77455	0.0627661	0.29475172	2.2361374	21	1 4.5	15.1
1786 Raahe	11.0	X	315.52324	347.38006	16.23753	10.43506	0.1119062	0.18763482	3.0217632	21	8 14.4	14.9
1787 Chiny	11.3	X	13.96499	271.44430	307.16161	8.91589	0.0487750	0.18951779	3.0017146	21	4 26.7	15.4
1788 Kiess	11.9	X	213.54356	144.03382	161.87911	0.68193	0.1538382	0.17894690	3.1187933	21	1 29.9	17.0
1789 Dobrovolsky	12.3	X	254.29517	214.99779	102.07976	1.97620	0.1883717	0.29928620	2.2134935	21	3 5.2	15.7
1790 Volkov	12.4	X	98.05475	147.32221	1.97626	5.10900	0.1007430	0.29443021	2.2377650	21	5 28.3	15.0
1791 Patsayev	11.9	X	351.48516	74.85307	198.86600	5.36938	0.1414102	0.21648537	2.7469474	21	6 4.7	14.9
1792 Reni	12.0	X	252.79467	324.14134	72.72491	9.01028	0.2791021	0.21310908	2.7758846	21	6 9.9	16.5
1793 Zoya	12.2	X	17.82789	322.96352	225.97639	1.50920	0.0973913	0.29721551	2.2237625	21	3 7.6	14.0
1794 Finsen	11.0	X	104.92478	341.88341	120.86928	14.57038	0.1520249	0.17748189	3.1359323	21	8 19.1	16.1
1795 Voltjer	12.0	X	97.63166	79.60098	192.08764	7.53041	0.1913726	0.21213566	2.7843699	21	11 16.7	16.4
1796 Riga	9.9	X	5.56355	26.47113	186.70058	22.58726	0.0558487	0.16038878	3.3549552	21	4 16.6	14.4
1797 Schuamasse	12.7	X	142.84778	356.31657	29.63196	3.13939	0.0241769	0.29463037	2.2367513	21	1 24.9	15.4
1798 Watts	13.0	X	199.30273	4.21502	44.25322	6.19316	0.1226458	0.30235073	2.1985113	21	5 11.1	16.1
1799 Koussevitzky	11.3	X	148.39814	193.29873	156.58995	11.48938	0.1186492	0.18699954	3.0286030	21	1 17.4	15.9
1800 Aguilar	12.8	X	210.09370	214.76093	124.17749	5.79037	0.1354339	0.27230995	2.3573661	21	2 24.5	16.5
1801 Titicaca	11.1	X	314.53086	13.53457	77.53193	10.96933	0.0699482	0.18804494	3.0173680	21	12 4.2	14.8
1802 Zhang Heng	11.7	X	239.26192	295.92148	142.53343	2.69167	0.0348567	0.20521759	2.8465992	21	8 15.5	15.5
1803 Zwicky	12.2	X	339.67369	253.97532	337.24167	21.55395	0.2473045	0.27367747	2.3495067	21	2 16.5	14.6
1804 Chebotarev	12.2	X	107.93621	302.99993	325.68142	3.63344	0.0226014	0.26346816	2.4098164	21	11 14.6	15.3
1805 Dirikis	11.4	X	122.28677	87.47679	78.90772	2.51391	0.1104214	0.17678715	3.1441427	21	7 25.0	16.0
1806 Derice	12.0	X	126.83010	193.54027	271.06193	3.84363	0.1071836	0.29475261	2.2361329	21	5 3.9	14.9
1807 Slovakia	12.5	X	339.55986	140.26419	236.30413	3.49039	0.1782500	0.29668179	2.2264287	21	10 30.7	13.9
1808 Bellerophon	12.1	X	83.52267	48.17095	12.98362	2.02492	0.1798528	0.21635392	2.7480600	21	1 29.3	15.2
1809 Prometheus	11.7	X	79.84566	230.59630	99.45362	3.25955	0.1002761	0.19691711	2.9260410	21	12 25.9	15.9
1810 Epimetheus	12.6	X	34.12872	204.32664	254.10653	4.03168	0.0925000	0.29715012	2.2240888	21	—	—
1811 Bruwer	10.9	X	15.08327	136.99548	167.78043	8.52545	0.1102577	0.17709112	3.1405439	21	8 28.3	14.7
1812 Gilgamesh	11.5	X	166.04556	262.06143	178.56462	10.27469	0.0836065	0.18928358	3.0041902	21	5 24.8	16.2
1813 Imhotep	12.0	X	94.49215	166.74260	35.08028	8.08524	0.0791751	0.22396956	2.6854066	21	8 7.7	15.8
1814 Bach	12.9	X	312.04681	66.10182	20.20363	4.34601	0.1299281	0.29682094	2.2257328	21	12 21.2	14.8
1815 Beethoven	11.3	X	347.59080	358.41490	110.80890	2.74073	0.1917584	0.17610605	3.1522443	21	—	—
1816 Liberia	11.9	X	318.24114	341.01427	153.28557	26.15827	0.2186687	0.27566762	2.3381850	21	—	—
1817 Katanga	11.1	X	191.21780	140.16415	88.71739	25.71110	0.1919165	0.27002422	2.3706507	21	12 21.7	14.8
1818 Brahms	13.9	X	267.59622	74.68453	249.44023	2.97926	0.1783863	0.30965055	2.1638217	21	3 24.8	17.1
1819 Laputa	10.4	X	39.85593	166.13072	122.10811	23.90564	0.2290795	0.17750105	3.1357067	21	10 12.2	14.8
1820 Lohmann	13.2	X	27.70009	169.01627	145.16161	5.00079	0.2104557	0.30240804	2.1982335	21	11 7.8	15.4
1821 Aconcagua	13.3	X	128.71264	349.66216	297.40403	2.10260	0.2010113	0.26874600	2.3781617	21	—	—
1822 Waterman	13.1	X	116.60426	30.41922	221.18930	0.95697	0.1536236	0.30838974	2.1697154	21	11 18.1	16.3
1823 Gliese	12.6	X	93.01135	296.84740	309.98512	2.89164	0.1358651	0.29678813	2.2258968	21	10 13.9	15.5
1824 Haworth	11.4	X	169.20740	68.45496	15.01405	1.92963	0.0425641	0.20137051	2.8827399	21	5 27.5	15.4
1825 Klare	11.7	X	24.31566	144.18008	288.51016	4.04315	0.1154754	0.22501667	2.6770691	21	—	—
1826 Miller	11.2	X	179.20945	162.52602	274.21889	9.22893	0.0844583	0.19023486	2.9941667	21	5 31.9	15.8
1827 Atkinson	12.2	X	352.17943	240.32042	120.47179	4.51973	0.1804345	0.22115147	2.7081715	21	—	—
1828 Kashirina	11.3	X	33.46268	222.86386	184.37467	14.27831	0.1071466	0.18393145	3.0621894	21	—	—
1829 Dawson	12.5	X	171.61810	142.41337	293.37208	6.33665	0.1211245	0.29193625	2.2504915	21	5 17.9	15.7
1830 Pogson	12.6	X	225.64088	335.78405	147.43462	3.95631	0.0557832	0.30435363	2.1888553	21	10 5.4	15.0
1831 Nicholson	12.5	X	272.01524	183.53283	72.59965	5.63240	0.1274489	0.29406318	2.2396266	21	1 8.3	15.6
1832 Mrkos	11.2	X	326.96322	80.54060	303.33968	14.95073	0.0996974	0.17065844	2.3189745	21	9 15.2	15.5
1833 Shmakova	11.8	X	63.10743	153.27226	158.05451	10.01099	0.1145615	0.23065260	2.6332806	21	11 24.3	15.6
1834 Palach	11.3	X	3.83159	359.20572	268.15253	9.43696	0.0705933	0.18741607	3.0241141	21	6 19.9	15.1
1835 Gajdariya	11.7	X	187.54997	80.70171	296.22731	0.98574	0.0898825	0.20673985	2.8326087	21	3 26.1	16.1
1836 Komarov	12.1	X	287.59244	12.74608	272.72384	7.02091	0.1913421	0.21211209	2.7845761	21	3 4.2	16.4
1837 Osita	12.9	X	155.19161	315.03933	280.90857	3.84538	0.0867573	0.30099600	2.2051031	21	12 6.3	15.8
1838 Ursa	10.8	X	172.41373	48.58335	44.18040	21.96957	0.0145172	0.17103301	3.2143106	21	6 8.6	15.6
1839 Ragazza	12.0	X	211.12433	350.26005	50.88187	10.16761	0.1686533	0.21059104	2.7979683	21	5 16.9	16.4
1840 Hus	11.7	X										

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1841 Masaryk	10.9 <sup>m</sup>	X	167.66099	123.69340	44.39524	2.60740	0.1074913	0.15557373	3.4238275	21	9 10.3	16.3
1842 Hynek	12.5	X	23.76448	125.76248	153.42609	5.35506	0.1811331	0.28882559	2.2666211	21	8 27.4	14.2
1843 Jarmila	11.9	X	340.21156	32.52619	266.89678	8.41592	0.1697165	0.22812199	2.6527192	21	6 17.1	14.3
1844 Susilva	11.0	X	335.44595	72.41697	99.35721	11.78818	0.0510787	0.18814836	3.0162622	21	1 9.3	15.0
1845 Helewalda	11.2	X	121.02758	323.92698	142.59073	10.72035	0.0562823	0.19275612	2.9680003	21	5 5.5	15.6
1846 Bengt	13.8	X	281.14673	75.76016	18.95414	3.18401	0.1407680	0.27553565	2.3389316	21	10 27.2	16.1
1847 Stobbe	11.1	X	250.65905	137.53721	106.86679	11.14411	0.0202981	0.23362162	2.6109228	21	—	—
1848 Delvaux	11.0	X	64.60866	313.92520	331.59438	1.44110	0.0467540	0.20258698	2.8711884	21	10 7.6	14.9
1849 Kresák	11.4	X	260.76355	134.22729	50.33561	10.76102	0.0182652	0.18482063	3.0523600	21	—	—
1850 Kohoutek	12.8	X	112.18825	190.59581	68.89354	4.05007	0.1263559	0.29197379	2.2502985	21	11 20.6	16.1
1851 Lacroute	12.7	X	338.88466	342.43969	24.64784	1.66455	0.1912845	0.17992087	3.1075278	21	9 19.4	15.9
1852 Carpenter	11.3	X	344.26042	353.78759	95.34089	11.19842	0.0621993	0.18836851	3.0139117	21	—	—
1853 McElroy	11.0	X	1.28922	92.64664	298.63479	15.78842	0.0459102	0.18390286	3.0625068	21	11 20.9	15.4
1854 Skvortsov	12.5	X	321.46011	275.43627	189.04460	4.89814	0.1399208	0.24389636	2.5370703	21	—	—
1855 Korolev	12.8	X	336.82100	348.95953	190.99464	3.07872	0.0845493	0.29249803	2.2476089	21	—	—
1856 Růžena	12.9	X	304.60152	55.69368	185.84449	4.74111	0.0791159	0.29456735	2.2370704	21	1 30.7	15.7
1857 Parchomenko	12.3	X	249.96536	173.80281	236.04164	4.40007	0.1349500	0.29327153	2.2436552	21	7 8.9	15.2
1858 Lobachevskij	12.0	X	50.14477	17.03802	271.84896	1.65925	0.0789395	0.22223834	2.6993346	21	9 29.5	15.5
1859 Kovalevskaya	10.7	X	278.36698	245.21794	343.26829	7.69881	0.0980207	0.17119036	3.2123030	21	1 7.9	15.5
1860 Barbarossa	11.7	X	286.30104	162.23598	132.85465	9.92030	0.2011773	0.23960337	2.5672851	21	3 16.8	15.6
1861 Komenský	11.7	X	345.97070	268.39749	23.55800	10.45648	0.0655320	0.18788328	3.0190985	21	6 25.6	15.7
1862 Apollo	16.25	0.09	309.64024	286.00553	35.61185	6.35531	0.5600033	0.55285896	1.4702566	21	3 7.7	18.5
1863 Antinous	15.3	X	185.94987	268.09348	346.42668	18.39886	0.061953	0.29030631	2.2589072	21	12 26.1	20.4
1864 Daedalus	14.7	X	84.50569	325.64467	6.61802	22.21393	0.6145188	0.55818377	1.4608913	21	—	—
1865 Cerberus	16.7	X	354.58395	325.25312	212.90725	16.09676	0.16469905	0.87808439	1.0800534	21	—	—
1866 Sisyphus	12.4	X	255.48605	293.07507	63.47445	41.20365	0.5383079	0.37829469	1.8934299	21	4 24.7	16.9
1867 Deiphobus	8.3	X	348.64827	359.54658	283.71234	26.91157	0.0458200	0.08478340	5.1317109	21	6 22.7	15.0
1868 Thersites	9.5	X	13.26273	170.80549	197.78766	16.75462	0.1103927	0.08052050	5.3112835	21	10 31.6	16.0
1869 Philoctetes	11.1	X	359.47603	326.05631	43.84194	3.97282	0.0684190	0.08335466	5.1901845	21	10 13.0	17.5
1870 Glaukos	10.6	X	314.01755	130.44947	176.30678	6.57762	0.0337459	0.08208516	5.2435603	21	6 6.9	17.4
1871 Astyanax	11.2	X	283.08982	164.84727	145.78066	8.60603	0.0350994	0.08229957	5.2344496	21	5 7.9	18.2
1872 Helenos	10.8	X	324.98650	114.83577	188.78593	14.64002	0.0493052	0.08028656	5.3215828	21	6 14.8	17.8
1873 Agenor	10.1	X	58.60751	358.07362	197.91992	21.88279	0.0918550	0.08243962	5.2285195	21	6 12.7	17.1
1874 Kacivelia	11.3	X	127.99473	196.49324	158.93351	4.82209	0.2812132	0.17506767	3.1646966	21	1 23.2	16.4
1875 Neruda	12.3	X	132.11285	139.71307	193.73015	13.37439	0.1635391	0.17731558	3.1378929	21	—	—
1876 Napolitania	15.1	X	186.49381	243.68077	304.46733	23.11138	0.0482691	0.35805742	1.9641181	21	11 17.7	18.0
1877 Marsden	11.0	X	61.67309	305.95406	352.59968	17.53626	0.2057446	0.12575492	3.9456575	21	10 25.6	16.7
1878 Hughes	11.8	X	318.49378	297.10730	187.77781	1.78262	0.0124953	0.20538971	2.8450087	21	—	—
1879 Broederstroom	12.8	X	135.26410	174.37469	249.93156	1.72593	0.1489083	0.29293460	2.2453753	21	3 25.3	15.8
1880 McCrosky	12.1	X	50.43307	187.70551	116.84175	4.85230	0.0769083	0.22536567	2.6743047	21	10 24.0	15.6
1881 Shao	11.5	X	163.80238	66.99336	218.04841	9.86544	0.1041975	0.17481308	3.1677685	21	—	—
1882 Rauma	11.4	X	162.17451	126.37313	201.22227	9.48350	0.0921800	0.18884736	3.0088147	21	1 2.4	16.1
1883 Rimito	12.9	X	354.69041	330.27950	74.75234	25.45478	0.2610245	0.26264626	2.4148411	21	—	—
1884 Skip	12.1	X	310.83321	111.52285	353.43550	21.85070	0.2614159	0.26105156	2.4246656	21	—	—
1885 Herero	13.8	X	209.86109	5.61468	326.35053	5.66657	0.2481845	0.29203947	2.2499611	21	2 13.7	17.7
1886 Lowell	12.1	X	308.14670	217.69865	82.24897	14.87913	0.1568897	0.23151135	2.6267648	21	4 30.3	15.6
1887 Virton	11.0	X	201.09077	32.45827	348.56577	9.62375	0.1155116	0.18934360	3.0035553	21	4 12.5	15.9
1888 Zu Chong-Zhi	11.8	X	289.19021	233.93181	244.73782	5.85185	0.1686047	0.24266707	2.5456312	21	12 4.2	14.2
1889 Pakhmutova	11.1	X	287.89851	84.04282	55.10411	13.18012	0.1152449	0.18180258	3.0860481	21	12 18.7	15.1
1890 Konoshenkova	11.8	X	155.37189	15.87191	70.35404	9.88316	0.1385085	0.17142963	3.2093134	21	5 23.2	16.9
1891 Gondola	12.1	X	248.52437	11.05452	321.85993	11.50784	0.0688762	0.22143868	2.7058293	21	3 30.9	16.2
1892 Lucienne	12.0	X	277.44915	92.24392	315.66750	13.94925	0.0895944	0.25489834	2.4635311	21	8 18.4	15.0
1893 Jakoba	11.8	X	137.15625	241.29612	64.50198	10.03701	0.0541975	0.22121662	2.7076397	21	—	—
1894 Haffner	12.0	X	64.68488	117.35113	257.57200	0.91333	0.0705272	0.20093619	2.8868925	21	—	—
1895 Larink	12.2	X	228.64759	55.71413	45.08523	1.81160	0.1417237	0.17146291	3.2088981	21	8 18.6	17.1
1896 Beer	13.8	X	249.28866	180.34193	182.13429	2.22325	0.2212166	0.27058277	2.3673872	21	4 27.5	17.4
1897 Hind	13.4	X	195.31160	269.09336	63.41004	4.05318	0.1421089	0.28563204	2.2834847	21	1 31.4	16.8
1898 Cowell	12.3	X	11.21755	235.07138	163.02718	1.03008	0.1564821	0.17837533	3.1254521	21	12 26.2	16.1
1899 Crommelin	13.0	X	75.45586	128.20429	52.12048	7.27583	0.1056967	0.28916208	2.2648624	21	6 11.2	15.5
1900 Katyusha	12.3	X	53.72033	142.95475	281.88164	6.54620	0.1343737	0.30006439	2.2096649	21	—	—
1901 Moravia	11.6	X	48.06837	148.46984	94.28390	24.09544	0.0726813	0.16879190	3.2426618	21	7 24.3	16.1
1902 Shaposhnikov	9.3	X	1.72842	267.12541	59.15464	12.46593	0.2229509	0.12406720	3.9813596	21	9 10.9	13.9
1903 Adzhimushkaj	10.6	X	254.82919	356.59368	135.05542	10.98990	0.0477809	0.18969776	2.9998158	21	11 11.2	15.0
1904 Mashevitch	11.1	X	161.46757	262.17472	106.35808	12.82410	0.0730442	0.21676479	2.7445863	21	2 17.1	15.2
1905 Ambartsumian	12.8	X	280.97967	61.56753	201.34198	2.61531	0.1618851	0.29719517	2.2238640	21	1 21.7	16.0
1906 Naef	12.5	X	111.88309	14.79241	354.74264	6.47197	0.1341989	0.26944250	2.3740616	21	—	—
1907 Rudneva	12.1	X	160.47691	59.28186	152.01235	3.22369	0.0440853	0.24273057	2.5451872	21	11 3.9	15.6
1908 Pobeda	11.2	X	105.99978	222.91579	14.16638	4.76459	0.0375491	0.20033369	2.8926778	21	9 27.0	15.2
1909 Alekhin	12.8	X	59.44580	5.92065	227.40786	1.79526	0.2257748	0.26119920	2.4237519	21	8 24.6	15.6
1910 Mikhailov	11.5	X	292.53408	327.23754	200.81247	10.35986	0.0526444	0.18547448	3.0451822	21	—	—
1911 Schubart	10.0	X	311.52751	181.50316	284.82964	1.64526	0.1717191	0.12450621	3.9719952	21	11 25.8	14.8
1912 Anubis	11.7	X	71.60044	319.01222	76.18926	3.15878	0.0924244	0.19915082	2.9041206	21	—	—
1913 Sekanina	11.5	X	337.58812	34.81812	358.30478	1.56633	0.0747238	0.20173409	2.8792753	21	10 26.9	15.0
1914 Hartbeespoortdam	12.0	X	173.41410	158.99807	120.68349	5.68356	0.1469688	0.26407453	2.4061260	21	—	—
1915 Quetzálcoatl	18.97	0.10	352.80516	347.81637	160.93547	20.40451	0.5706958	0.24287298	2.5441922	21	—	—
1916 Boreas	14.9	X	294.70135	335.90418	340.59801	12.88282	0.4498091	0.28770935	2.2724800	21	3 14.5	18.9
1917 Cuyo	14.3	X	19.75867	194.49575	188.29037	23.95838	0.5054128	0.31276695	2.1494242	21	—	—
1918 Aiguillon	11.7	X	27.99849	245.26818	195.07033	9.19278	0.1335278	0.17295899	3.1903669	21	—	—
1919 Clemence	13.7	X	78.45740	100.12839	356.94885	19.33653	0.0951756	0.36588873	1.9359911	21	1 27.9	15.6
1920 Sarmiento	14.0	X	194.11538	316.9510								



ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
1921 Pala	14.5	X	34.83040	20.27695	351.86817	19.08843	0.3845071	0.16396509	3.3059920	21	—	—
1922 Zulu	12.4	X	98.99513	31.43974	226.52601	35.44363	0.4820188	0.16950702	3.2335352	21	11 15.6	18.5
1923 Osiris	13.6	X	270.92640	107.47600	352.97321	4.96141	0.0623186	0.25933319	2.4353646	21	10 26.7	16.5
1924 Horus	13.5	X	228.28140	153.13911	350.17761	2.73130	0.1315453	0.27543403	2.3395069	21	10 19.7	16.6
1925 Franklin-Adams	12.1	X	108.21719	242.17808	113.46613	7.73681	0.1753580	0.24166795	2.5526426	21	—	—
1926 Demiddeleer	11.0	X	349.23914	91.13148	93.41456	13.72169	0.1088490	0.22768450	2.6561162	21	1 29.7	14.3
1927 Suvanto	12.0	X	311.59311	96.45392	27.00655	13.35718	0.1487393	0.22847464	2.6499888	21	—	—
1928 Summa	12.9	X	92.25159	157.63435	180.36115	4.57481	0.2025588	0.25281921	2.4770190	21	—	—
1929 Kollaa	12.7	X	245.23246	72.44397	65.35698	7.77383	0.0751662	0.27146645	2.3622468	21	11 13.2	15.4
1930 Lucifer	11.0	X	253.82545	341.78142	318.51009	14.05835	0.1417316	0.19970697	2.8987265	21	2 23.6	15.7
1931 Čapek	13.0	X	278.56466	164.60502	182.41559	8.26547	0.2723978	0.24347077	2.5400260	21	5 3.7	16.9
1932 Jansky	13.6	X	138.36225	303.45967	188.97364	1.89074	0.1584796	0.26980473	2.3719362	21	7 2.5	17.2
1933 Tinchen	13.0	X	337.85369	214.04005	164.87957	6.88560	0.1231722	0.27302240	2.3532633	21	10 24.8	15.1
1934 Jeffers	12.5	X	81.96434	294.75460	86.49780	23.14510	0.2988588	0.26659136	2.3909583	21	—	—
1935 Lucerna	13.0	X	50.51234	199.36532	200.01998	9.54509	0.2268743	0.23145738	2.6271731	21	—	—
1936 Lugano	11.7	X	246.46162	255.28201	265.13047	10.25423	0.1382342	0.22539170	2.6740987	21	11 25.2	15.3
1937 Locarno	11.7	X	112.84801	226.16822	78.95464	12.45496	0.1559822	0.26885509	2.3775183	21	—	—
1938 Lausanna	12.5	X	21.57655	64.96861	171.66473	3.33421	0.1590476	0.29470583	2.2363695	21	6 5.8	14.0
1939 Loretta	11.1	X	274.78409	189.52010	40.47217	0.90529	0.1247327	0.17842571	3.1248638	21	—	—
1940 Whipple	11.3	X	271.52906	184.15137	263.62253	6.53849	0.0608278	0.18390890	3.0624398	21	9 28.9	15.7
1941 Wild	11.9	X	103.62675	302.87969	60.43753	3.95716	0.2896634	0.12526650	3.9559071	21	1 19.5	17.7
1942 Jablunka	13.0	X	298.09335	11.95223	346.34258	24.34659	0.1847764	0.27922734	2.3182704	21	6 28.5	16.3
1943 Anteros	15.6	X	58.64680	338.38754	246.32483	8.70534	0.2558937	0.57604766	1.4305304	21	9 6.4	16.3
1944 Günter	13.8	X	217.66804	124.87340	212.40887	5.48830	0.2367016	0.29397224	2.2400885	21	2 23.7	17.7
1945 Wesselink	12.7	X	74.81549	194.39342	142.58450	4.22784	0.1807353	0.24156668	2.5533559	21	—	—
1946 Walraven	12.0	X	279.41910	340.15149	17.24134	8.16043	0.2352575	0.28383778	2.2930978	21	5 16.8	15.1
1947 Iso-Heikkilä	11.4	X	83.07371	146.10358	90.84373	11.88988	0.0402661	0.17550309	3.1594600	21	9 1.2	16.0
1948 Kampala	12.8	X	141.86634	179.55308	23.16372	5.83008	0.1701022	0.24438594	2.5336808	21	10 5.4	16.8
1949 Messina	13.4	X	359.65920	66.40594	264.98135	4.65300	0.2297357	0.26778395	2.3838542	21	9 28.9	15.1
1950 Wempe	13.2	X	291.14880	53.72990	69.90451	4.22039	0.0844032	0.30660262	2.1781384	21	—	—
1951 Lick	14.2	X	342.84485	140.58752	130.74006	39.09434	0.0615016	0.60114851	1.3904270	21	5 1.5	16.3
1952 Hesburgh	10.5	X	67.33605	339.52152	78.14049	14.26337	0.1438029	0.17978417	3.1091028	21	1 3.4	14.3
1953 Rupertwildt	11.9	X	239.32026	326.50137	74.26362	2.45909	0.1827117	0.17992340	3.1074986	21	6 11.9	16.9
1954 Kukarkin	11.3	X	238.38410	70.44712	278.00395	14.79563	0.3139111	0.19603052	2.9348569	21	3 24.1	16.9
1955 McMath	12.1	X	316.81624	155.50333	257.93510	1.00324	0.0611201	0.20432982	2.8548355	21	10 23.4	15.5
1956 Artek	12.1	X	251.69858	347.39588	153.12128	1.49715	0.1084578	0.17238458	3.1974501	21	11 3.8	16.5
1957 Angara	11.3	X	249.10549	209.77080	50.68915	11.18685	0.0569355	0.18880919	3.0092202	21	1 15.3	15.9
1958 Chandra	11.2	X	126.18784	318.75897	344.88989	10.54736	0.1653648	0.18014215	3.1049225	21	—	—
1959 Karbyshev	12.8	X	313.32791	32.17779	285.01142	6.20140	0.1336959	0.27972081	2.3155431	21	5 25.9	15.4
1960 Guisan	12.1	X	58.00049	263.81667	22.14708	8.47497	0.1230042	0.24544476	2.5263889	21	10 16.9	15.3
1961 Dufour	10.8	X	69.35932	56.57528	29.56224	6.64819	0.1247837	0.17269953	3.1935615	21	2 13.4	15.0
1962 Dunant	12.1	X	143.35518	11.18429	15.24283	1.55302	0.2399378	0.17379882	3.1800809	21	3 9.8	17.2
1963 Bezovec	11.0	X	152.05984	355.48966	106.87139	25.05497	0.2106903	0.26155858	2.4215312	21	6 13.7	15.2
1964 Luyten	13.4	X	225.30684	163.72670	238.43636	2.39028	0.1964502	0.25475573	2.4644503	21	5 28.5	17.2
1965 van de Kamp	12.0	X	222.82885	342.88131	88.19215	2.21967	0.1063013	0.23939481	2.5687760	21	7 9.7	15.7
1966 Tristan	14.2	X	134.09480	60.25148	125.63833	2.48349	0.0896421	0.25708134	2.4495653	21	9 3.4	17.5
1967 Menzel	12.1	X	237.32414	347.73070	57.79189	3.90057	0.1394247	0.29540757	2.2328264	21	6 17.5	15.1
1968 Mehltrittter	11.7	X	179.31818	164.19981	71.48173	4.59358	0.1119297	0.21749387	2.7384493	21	12 16.1	15.8
1969 Alain	11.9	X	276.24565	346.77487	209.17768	3.33760	0.1574596	0.18148963	3.0895946	21	—	—
1970 Sumeria	12.4	X	206.95625	194.13732	312.32442	7.07533	0.1600831	0.21251963	2.7810151	21	9 19.3	16.9
1971 Hagihara	12.4	X	201.70427	119.74237	300.11018	8.70064	0.0854375	0.19055460	2.9908164	21	6 3.3	17.1
1972 Yi Xing	13.38	0.21	6.54091	33.53151	46.46125	4.11896	0.1661152	0.26190920	2.4193696	21	—	—
1973 Colocolo	12.2	X	91.47956	164.29608	183.04691	10.57426	0.0774308	0.17349354	3.1838103	21	—	—
1974 Caupolican	13.1	X	187.93244	90.29402	168.23960	10.21658	0.0971713	0.17505725	3.1648222	21	—	—
1975 Pikelner	12.1	X	1.19200	184.51048	170.16318	6.31340	0.1175396	0.21014119	2.8019600	21	10 19.0	15.3
1976 Kaverin	13.2	X	337.23939	119.06853	90.91755	2.37165	0.0742784	0.26823798	2.3811634	21	2 9.9	15.9
1977 Shura	11.6	X	59.37682	309.55229	332.20922	7.77056	0.0745522	0.21247908	2.7813689	21	9 28.9	15.4
1978 Patrice	12.9	X	96.29722	268.73941	54.26961	4.34273	0.2139513	0.30324538	2.1941851	21	—	—
1979 Sakharov	13.6	X	174.91446	220.97659	202.63811	6.04831	0.1011488	0.26959842	2.3731461	21	5 7.8	16.9
1980 Tezcatlipoca	13.8	X	225.96015	115.45815	246.56179	26.86755	0.3647554	0.44097934	1.7094532	21	3 11.3	17.5
1981 Midas	15.2	X	119.26475	267.82601	356.86109	39.83046	0.6502780	0.41632734	1.7762855	21	12 17.3	20.2
1982 Cline	12.8	X	52.02515	279.46563	42.33656	6.84150	0.2494994	0.28076620	2.3097918	21	12 18.3	16.1
1983 Bok	13.1	X	225.43908	346.76669	23.53714	9.41403	0.0994963	0.23230743	2.6207604	21	4 23.5	17.1
1984 Fedynskij	11.2	X	104.00583	126.86656	185.57384	4.78916	0.0875493	0.18868099	3.0105831	21	12 27.5	15.8
1985 Hopmann	10.9	X	225.23726	233.61857	305.05354	17.18509	0.1562619	0.17901029	3.1180570	21	11 9.7	16.1
1986 Plaut	12.0	X	268.18684	230.04651	146.56754	2.21343	0.2046325	0.18151781	3.0892749	21	6 9.1	16.6
1987 Kaplan	11.6	X	254.10310	38.34862	314.19018	23.65176	0.2275495	0.26818492	2.3814775	21	4 3.7	16.1
1988 Delores	13.6	X	303.23937	235.28265	106.35676	4.25291	0.1027844	0.31185457	2.1536145	21	6 21.1	15.7
1989 Tatry	12.6	X	189.50375	88.18510	25.26963	7.76378	0.0757739	0.27319665	2.3522626	21	8 3.2	16.0
1990 Pilcher	12.9	X	101.01507	12.79877	193.59284	3.13206	0.0509953	0.30731555	2.1747684	21	8 18.5	15.4
1991 Darwin	13.4	X	327.53348	345.73130	328.41641	5.91571	0.2076479	0.29234458	2.2483954	21	6 3.1	15.4
1992 Galvarino	12.6	X	107.37969	94.96194	182.41596	10.57235	0.0482631	0.19054157	2.9909528	21	11 18.6	17.1
1993 Guacolda	12.9	X	314.34105	157.15015	158.01157	11.48119	0.0657838	0.18429505	3.0581605	21	6 11.1	17.2
1994 Shane	12.3	X	253.07640	89.84690	244.70258	10.21768	0.2069282	0.22467373	2.6797926	21	3 27.2	16.8
1995 Hajek	13.2	X	350.50501	133.37325	47.21581	10.82246	0.0544727	0.24504270	2.5291517	21	1 31.3	16.5
1996 Adams	11.6	X	236.91833	355.23965	1.06657	15.13383	0.1389201	0.24090829	2.5580060	21	4 11.4	15.7
1997 Leverrier	13.3	X	213.38873	0.82939	353.14793	6.06457	0.2062796	0.30013087	2.2093385	21	3 14.3	16.9
1998 Titius	12.3	X	341.59138	246.96193	351.74013	7.62535	0.0632522	0.26200416	2.4187849	21	3 28.9	15.0
1999 Hirayama	10.9	X	291.39821	356.28257	147.86364	12.53620	0.1176015	0.17950105	3.1123712	21	12 30.4	15.0
2000 Herschel	11.2	X	148.54696	130.44787								

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2001 Einstein	13.0 <sup>m</sup>	X	303.94307	217.66611	357.05184	22.68257	0.0985889	0.36656686	1.9336027	21	—	—
2002 Euler	12.4	X	7.07327	53.66177	178.62722	8.50143	0.0680779	0.26228243	2.4170738	21	5 3.7	15.1
2003 Harding	12.0	X	356.72104	70.03845	64.47120	1.86872	0.1270400	0.18406688	3.0606872	21	—	—
2004 Lexell	12.8	X	287.28325	58.19735	4.49970	2.49694	0.0789397	0.30776708	2.1726408	21	10 4.5	14.7
2005 Hencke	12.2	X	55.14065	111.81726	290.95564	12.23953	0.1657967	0.23218198	2.6217043	21	—	—
2006 Polonskaya	13.0	X	163.01184	24.83442	0.87108	4.91107	0.1925078	0.27808632	2.3246075	21	3 12.0	16.5
2007 McCuskey	12.1	X	62.02119	185.45486	17.02472	3.04133	0.1144414	0.26772890	2.3841810	21	6 25.9	14.6
2008 Konstitutsiya	10.2	X	274.86487	201.83271	15.59718	20.65712	0.0966259	0.17082470	3.2168855	21	—	—
2009 Voloshina	11.2	X	152.50103	6.04586	107.54773	2.86104	0.1411507	0.19275551	3.1149810	21	6 22.3	16.2
2010 Chebyshev	11.5	X	165.41316	32.95016	8.53303	2.39733	0.1902314	0.18159296	3.0884225	21	4 10.1	16.6
2011 Veteraniya	13.1	X	296.16714	3.85224	338.50311	6.18013	0.1492598	0.26735549	2.3864004	21	6 2.7	16.1
2012 Guo Shou–Jing	13.4	X	35.14126	36.57454	277.08702	2.90630	0.1788821	0.27738642	2.3285161	21	11 5.1	16.0
2013 Tucapel	11.9	X	168.85267	238.08680	96.52704	7.50404	0.2256292	0.28433131	2.2904436	21	1 14.4	15.4
2014 Vasilevskis	12.3	X	305.97460	82.97029	204.06197	21.37424	0.2865189	0.26481525	2.4016371	21	3 6.7	16.1
2015 Kachuevskaya	12.2	X	317.78416	274.65964	344.45276	11.90893	0.1035276	0.27615459	2.3354355	21	3 13.4	15.0
2016 Heinemann	11.9	X	322.62480	340.39286	16.94854	0.91922	0.1922548	0.17782056	3.1319493	21	8 3.3	15.5
2017 Wesson	12.7	X	338.12891	136.49710	171.28963	4.86111	0.1861219	0.29168423	2.2517875	21	6 22.1	14.4
2018 Schuster	14.3	X	316.65056	157.86712	186.05923	2.55983	0.1923879	0.30554055	2.1831830	21	7 4.0	16.1
2019 van Albada	12.4	X	273.01055	24.95367	252.18122	4.04344	0.1649728	0.29369324	2.2415069	21	1 31.5	15.7
2020 Ukko	11.3	X	138.76535	329.08701	148.82996	11.14144	0.0676166	0.18775235	3.0205020	21	6 9.3	15.9
2021 Poincaré	13.5	X	51.39917	164.25984	154.98082	5.49111	0.2191967	0.28088784	2.3091249	21	12 11.7	16.8
2022 West	11.7	X	10.77901	37.99059	2.28642	5.65579	0.1161257	0.22143151	2.7058877	21	—	—
2023 Asaph	11.7	X	21.77909	357.31408	3.05248	22.34433	0.2790045	0.20192732	2.8774382	21	12 17.2	15.7
2024 McLaughlin	12.9	X	155.55857	291.59912	69.21331	7.31047	0.1379319	0.27787385	2.3257923	21	1 27.4	16.1
2025 Nortia	10.7	X	16.65327	310.26981	329.03294	7.02408	0.1137240	0.17494214	3.1662103	21	7 29.7	14.5
2026 Cottrell	13.1	X	135.25828	212.09576	311.08904	2.45009	0.1145954	0.25726355	2.4484085	21	8 6.2	16.5
2027 Shen Guo	11.4	X	295.43071	352.83394	55.03184	11.00349	0.0947385	0.18727036	3.2056825	21	9 15.5	15.5
2028 Janequao	14.8	X	106.78131	27.41255	242.75922	7.95441	0.1131413	0.28331504	2.9259176	21	11 26.4	18.0
2029 Binomi	13.0	X	143.68467	67.26482	278.00128	5.58865	0.1274728	0.27349250	2.3505659	21	—	—
2030 Belyaev	13.5	X	277.36810	61.62619	169.76979	2.58198	0.0932252	0.29249768	2.2476107	21	—	—
2031 BAM	12.9	X	176.72248	213.98698	169.20909	4.75063	0.1725927	0.29515676	2.2340912	21	3 18.5	16.0
2032 Ethel	11.4	X	165.59899	296.61515	30.12443	1.50777	0.1262950	0.18316514	3.0707244	21	1 10.1	16.1
2033 Basilea	12.9	X	247.14591	134.62371	321.70373	8.46424	0.1104824	0.29670098	2.2263327	21	9 12.3	15.8
2034 Bernoulli	12.5	X	199.73299	63.96883	19.03234	8.55291	0.1806388	0.29284019	2.2458579	21	6 27.3	16.1
2035 Stearns	12.4	X	231.45589	200.67992	77.03173	27.74732	0.1313247	0.38107855	1.8841973	21	—	—
2036 Sheragul	12.9	X	134.47189	306.27052	346.21706	3.97332	0.1851985	0.29311744	2.2444414	21	—	—
2037 Tripaxetialis	13.2	X	270.95912	346.42871	9.46915	4.25044	0.1320919	0.28242135	2.3007585	21	5 19.9	16.2
2038 Bistro	12.0	X	7.64570	184.24222	73.46540	14.80842	0.0906165	0.25944407	2.4346706	21	6 9.6	14.4
2039 Payne–Gaposchkin	12.7	X	140.79798	42.37357	95.86408	2.52468	0.1315275	0.17379463	3.1801320	21	7 10.7	17.7
2040 Chalonge	11.4	X	258.87728	90.76851	38.41825	14.63185	0.1900254	0.17954208	3.1118969	21	10 20.8	15.9
2041 Lancelot	12.6	X	275.71429	273.60958	134.02744	2.98231	0.0868227	0.17528959	3.1620250	21	7 27.8	17.0
2042 Sitarski	12.8	X	53.77973	56.21383	17.09052	5.31667	0.1515964	0.21573589	2.7533058	21	—	—
2043 Ortutay	10.8	X	175.08964	60.11176	321.19231	3.07443	0.1123575	0.18006041	3.1059221	21	3 21.9	15.7
2044 Wirt	13.2	X	69.10684	50.43790	53.62336	23.97156	0.3452519	0.26853950	2.3793807	21	4 6.1	15.8
2045 Peking	12.1	X	331.40338	197.43947	11.07574	6.90522	0.0552138	0.26841252	2.3801130	21	2 4.3	15.1
2046 Leningrad	11.5	X	174.66222	284.35881	73.55438	2.73507	0.1804466	0.17567283	3.1574246	21	2 27.9	16.6
2047 Smetana	14.1	X	194.56558	308.39438	36.59000	25.27516	0.0031615	0.38480548	1.8720117	21	1 21.7	16.7
2048 Dwornik	13.4	X	242.55177	105.31491	157.61450	23.75479	0.0422658	0.36091205	1.9537476	21	—	—
2049 Grietje	15.1	X	229.06932	141.96589	200.05920	24.41949	0.0842112	0.36221411	2.9490627	21	3 2.9	17.9
2050 Francis	12.4	X	96.96437	171.01941	72.46407	26.60351	0.2384235	0.27811531	2.3244459	21	11 2.7	16.5
2051 Chang	11.6	X	120.26369	175.59481	215.05646	1.35571	0.0762767	0.20571112	2.8420444	21	1 26.5	15.4
2052 Tamriko	10.5	X	245.92653	203.87751	213.80130	9.49582	0.0833976	0.18878898	3.0094349	21	7 18.4	15.0
2053 Nuki	11.8	X	215.79959	237.69130	193.16135	8.50554	0.1435391	0.21025208	2.8009747	21	6 28.5	16.3
2054 Gawain	12.6	X	222.42300	186.64442	293.15489	3.78002	0.0972234	0.19259153	2.9696910	21	9 7.6	17.0
2055 Dvořák	12.9	X	134.41659	244.14298	340.40874	21.49509	0.3117788	0.28084898	2.3093379	21	10 20.5	17.6
2056 Nancy	12.4	X	302.13316	145.55615	225.74874	3.93538	0.1392320	0.29835856	2.2180792	21	7 29.1	14.5
2057 Rosemary	12.5	X	1.97702	18.82106	14.72919	1.42617	0.2267613	0.18189727	3.0849770	21	12 14.7	15.7
2058 Róka	11.5	X	266.57685	180.95492	95.31876	2.53490	0.1457996	0.17839150	3.1252632	21	2 13.7	16.4
2059 Baboquivari	15.9	X	136.03900	192.41980	200.68414	11.01774	0.5312005	0.22930002	2.6436259	21	3 26.9	21.1
2060 Chiron	5.8	X	180.77494	339.70600	209.27483	6.92981	0.3772113	0.01943445	13.7010721	21	10 2.7	18.6
2061 Anza	16.3	X	296.28176	157.03352	207.37772	3.80032	0.5360443	0.28932769	2.2639980	21	5 7.9	19.7
2062 Aten	17.1	X	174.14332	148.05593	108.54376	18.93484	0.1828083	1.03664763	0.9669009	21	—	—
2063 Bacchus	17.3	X	265.93196	55.36744	33.07528	9.43085	0.3494081	0.88044491	1.0781220	21	—	—
2064 Thomsen	12.6	X	211.42011	2.76226	302.14150	5.69545	0.3297563	0.30642017	2.1790029	21	1 13.9	16.6
2065 Spicer	12.4	X	302.48067	65.97157	328.06542	6.43638	0.2334915	0.22205974	2.7007818	21	8 14.7	15.1
2066 Palala	12.7	X	207.28508	109.32302	117.20291	3.75481	0.1283805	0.26618228	2.3934074	21	—	—
2067 Aksnes	10.5	X	6.43976	297.01661	150.22570	3.07948	0.1825487	0.12464582	3.9690286	21	—	—
2068 Dangreen	11.2	X	24.30138	321.34859	95.92265	12.90963	0.0975792	0.21358353	2.7717723	21	—	—
2069 Hubble	11.3	X	328.74291	69.72348	46.36331	9.10340	0.1891502	0.17601887	3.1532851	21	—	—
2070 Humason	13.5	X	311.00533	350.23579	1.22303	2.75293	0.1551668	0.29204990	2.2499075	21	7 12.9	15.6
2071 Nadezhda	13.3	X	287.73183	1.15130	302.16667	3.63617	0.1574141	0.29169417	2.2517364	21	3 23.5	16.3
2072 Kosmodemyanskaya	12.7	X	112.59635	38.84052	26.13534	4.73647	0.1646948	0.25708140	2.4495649	21	3 7.9	15.7
2073 Janáček	12.8	X	266.05023	0.82242	84.96235	2.95860	0.1098947	0.21987738	2.7186231	21	9 20.7	16.4
2074 Shoemaker	13.9	X	94.88728	205.64007	207.26688	30.07401	0.0818902	0.40817404	1.7998617	21	—	—
2075 Martinez	12.8	X	150.50196	354.84336	112.18340	27.08613	0.2498700	0.26478704	2.4018077	21	6 20.0	17.1
2076 Levin	14.3	X	223.66226	75.26861	328.85136	4.98899	0.1526791	0.28764792	2.2728035	21	5 29.9	17.7
2077 Kiangsu	13.6	X	48.74271	344.22622	69.46052	28.08573	0.2950173	0.27749813	2.3278912	21	—	—
2078 Nanking	13.0	X	304.58390	99.42021	286.97596	20.16526	0.3750125	0.27032261	2.3689058	21	7 11.9	15.3
2079 Jacchia	12.6	X	315.38770	145.54949	352.96357	13.25953	0.0791255	0.23524549	2.5988937	21	—	—
2080 Jihlava	13.0	X	117.48315	51.88583	23.80614	3.84866	0.0613216	0.30692597	2			

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2081 Sázava	12.4	X	179.50857	223.74642	66.33506	3.90229	0.1621395	0.25670640	2.4519498	21	—	—
2082 Galahad	13.0	X	171.25488	144.80676	90.04925	3.06846	0.1673129	0.19780170	2.9173108	21	12 2.6	17.6
2083 Smither	13.1	X	152.43887	228.69235	259.17851	18.45429	0.0512253	0.38479012	1.8720615	21	7 2.3	15.1
2084 Okayama	12.2	X	202.55545	248.47635	148.95326	4.83946	0.1032561	0.26598319	2.3946015	21	5 4.4	15.8
2085 Henan	11.8	X	228.37363	293.81581	118.13630	3.83461	0.0863495	0.22237216	2.6982515	21	6 22.5	15.8
2086 Newell	12.4	X	2.97847	296.34686	135.12955	6.48774	0.1106693	0.26487119	2.4012990	21	—	—
2087 Kochera	13.2	X	351.00286	320.23601	95.62279	1.82866	0.0571986	0.30089834	2.2055802	21	—	—
2088 Sahlia	12.5	X	356.29010	91.77543	359.67344	5.54026	0.0791804	0.30061454	2.2069681	21	—	—
2089 Cetacea	11.4	X	299.20859	286.65600	102.68867	15.37226	0.1558919	0.24411291	2.5355697	21	8 20.3	14.4
2090 Mizuho	10.8	X	233.14548	341.52931	339.81652	11.81499	0.1340483	0.18292852	3.0733718	21	3 5.4	15.8
2091 Sampo	10.4	X	262.60752	319.25198	114.49918	11.37038	0.0570888	0.18781782	3.0198001	21	9 7.6	14.7
2092 Sumiana	11.9	X	28.16366	211.71372	72.31099	3.07322	0.0297913	0.20470397	2.8513589	21	8 17.1	15.6
2093 Genichesk	13.0	X	219.35629	118.16171	154.82312	6.09212	0.1678537	0.28823641	2.2697089	21	—	—
2094 Magnitka	12.0	X	202.17582	252.05975	281.89613	5.02709	0.0970870	0.29559032	2.2319061	21	11 4.8	14.9
2095 Parsifal	12.8	X	78.37254	7.63500	332.22536	3.58773	0.0095364	0.22969468	2.6405968	21	—	—
2096 Väinö	13.7	X	161.28250	38.70980	304.73995	0.92247	0.2336854	0.25781085	2.4449421	21	1 22.8	17.5
2097 Galle	11.9	X	86.28197	29.25457	318.96195	4.36781	0.2522875	0.17734694	3.1375230	21	—	—
2098 Zyskin	12.5	X	344.00613	354.29169	337.72051	6.49687	0.1276576	0.26108665	2.4244484	21	8 20.7	14.7
2099 Opik	15.1	X	182.87109	159.37204	218.80425	26.95730	0.3606103	0.28183611	2.3039424	21	3 21.6	19.8
2100 Ra-Shalom	16.05	0.12	331.21942	356.06000	170.79823	15.75386	0.4366090	1.29866371	0.8320286	21	—	—
2101 Adonis	18.8	X	129.79979	43.59656	349.49923	1.32208	0.7640476	0.38416286	1.8740987	21	4 2.6	22.5
2102 Tantalus	16.0	X	351.05584	61.52853	94.36045	64.00397	0.2992975	0.67262147	1.2900966	21	—	—
2103 Laverna	10.9	X	335.82639	238.04311	292.04207	7.69258	0.1919168	0.17676594	3.1443942	21	—	—
2104 Toronto	9.8	X	243.24454	290.55874	252.45456	18.39598	0.1216779	0.17337411	3.1852723	21	12 12.1	14.3
2105 Gudy	11.3	X	190.70860	155.98335	273.59743	29.35231	0.1508604	0.26710410	2.3878975	21	6 3.1	15.3
2106 Hugo	12.4	X	16.31729	249.50980	151.80008	8.03825	0.0949207	0.22179340	2.7029436	21	—	—
2107 Ilmari	11.5	X	259.01459	177.31649	221.20704	8.82594	0.0785524	0.23146333	2.6271281	21	7 11.3	15.3
2108 Otto Schmidt	12.2	X	35.84539	73.39769	327.88864	10.80337	0.0042388	0.25924413	2.4359223	21	—	—
2109 Dhotal	12.0	X	21.71767	192.12421	162.10350	8.07827	0.2607220	0.22331637	2.6906405	21	12 14.0	15.3
2110 Moore-Sitterly	13.4	X	36.00383	192.54858	140.45410	1.13131	0.1775425	0.30250832	2.1977477	21	12 9.1	15.9
2111 Tselina	10.6	X	222.02812	231.92571	167.15895	10.50605	0.0956753	0.18826823	3.0149818	21	5 31.8	15.4
2112 Ulyanov	12.4	X	88.20736	156.54739	243.66880	3.37182	0.1369360	0.29123422	2.2541066	21	—	—
2113 Ehrdni	12.7	X	192.20715	348.72425	23.34290	6.43174	0.0968123	0.25340671	3.1473189	21	3 22.1	16.3
2114 Wallenquist	11.8	X	331.93991	217.28930	1.51557	0.55509	0.1403184	0.17217629	3.2000283	21	2 22.9	16.0
2115 Irakli	11.1	X	90.47175	340.98605	241.31412	8.96432	0.0519838	0.18814240	3.0163259	21	8 16.3	15.5
2116 Mtskheta	12.4	X	18.62043	174.33162	170.55711	9.09012	0.0587438	0.23668691	2.5883314	21	11 1.3	15.7
2117 Danmark	11.8	X	222.17684	265.13160	59.48040	2.93195	0.0673913	0.20261456	2.8709279	21	3 1.1	16.0
2118 Flugstaff	11.7	X	106.72999	101.34228	331.26110	6.30064	0.2209771	0.24256483	2.5463465	21	3 17.4	15.0
2119 Schwall	13.3	X	357.51412	20.04588	268.18612	3.83757	0.1569813	0.29180689	2.2511565	21	7 8.1	14.7
2120 Tyumenia	11.0	X	61.02827	74.72658	222.35685	17.56272	0.1280442	0.18425712	3.0585801	21	10 26.7	15.3
2121 Sevastopol	12.3	X	162.62982	160.29767	145.68854	4.37912	0.1782121	0.30538552	2.1839218	21	—	—
2122 Pyatiletka	12.0	X	206.49067	238.38190	105.45252	7.90127	0.0291820	0.26479794	2.4017418	21	2 28.0	15.2
2123 Vltava	11.6	X	298.54478	57.59994	311.61095	1.01062	0.0793985	0.20365938	2.8611004	21	7 27.4	15.2
2124 Nissen	11.8	X	323.70494	258.63011	46.85702	10.69994	0.0929073	0.18753127	3.0228755	21	6 5.7	15.7
2125 Karl-Ontjes	11.9	X	52.49207	15.93974	315.51425	1.69062	0.1078519	0.21205773	2.7850520	21	11 29.7	15.7
2126 Gerasimovich	12.8	X	243.32629	69.91261	327.60459	8.47693	0.1211093	0.26684174	2.3894624	21	6 16.1	16.2
2127 Tanya	11.1	X	220.77762	187.64064	106.37790	13.09236	0.0319254	0.17115986	3.2126847	21	1 27.6	15.8
2128 Wetherill	14.4	X	216.31516	332.17217	358.39693	16.87894	0.3787905	0.21760067	2.7375531	21	2 26.9	19.8
2129 Cosicosi	14.5	X	291.50926	318.43846	58.47376	5.51781	0.1736623	0.30600226	2.1809864	21	7 15.2	16.6
2130 Evdokiya	13.2	X	326.40651	327.23062	350.02623	5.61366	0.1888477	0.29154087	2.2525257	21	6 9.8	15.2
2131 Mayall	12.7	X	250.24356	38.59220	306.03132	33.99337	0.1111843	0.38020839	1.8870711	21	3 7.0	16.0
2132 Zhukov	11.5	X	279.29660	336.79673	82.38265	5.85903	0.0803831	0.21219541	2.7838471	21	9 8.8	15.2
2133 Franceswright	13.3	X	15.07326	180.19922	78.33817	6.90017	0.1843357	0.26339836	2.4102421	21	12 6.2	15.7
2134 Dennispalm	13.2	X	123.74968	120.14613	11.59558	31.36090	0.2556736	0.23031470	2.6358556	21	6 25.7	18.2
2135 Aristaeus	17.9	X	337.70214	290.99511	191.12786	23.07104	0.5032030	0.48719800	1.5995545	21	—	—
2136 Jugta	11.3	X	17.88074	56.35740	148.93451	10.59641	0.0435228	0.18784512	3.0195075	21	4 23.1	15.4
2137 Priscilla	11.1	X	226.99396	138.91556	319.72742	11.67170	0.0481555	0.17243065	3.1968805	21	8 21.7	15.8
2138 Swissair	11.5	X	320.51861	169.71552	105.62370	5.92534	0.0654502	0.22392444	2.6857674	21	4 26.2	14.9
2139 Makharadze	12.9	X	52.39818	67.26814	256.14271	2.17979	0.1880238	0.25528232	2.4610601	21	12 8.9	16.2
2140 Kemerovo	11.4	X	243.19472	118.54917	274.74107	6.98610	0.0585215	0.19098621	2.9863087	21	6 19.3	15.6
2141 Simferopol	11.6	X	326.95305	57.19935	271.69152	5.93835	0.1307045	0.20992749	2.8038612	21	7 9.6	14.8
2142 Landau	12.0	X	273.31102	32.60582	155.55547	0.66419	0.1166158	0.17493369	3.1663123	21	—	—
2143 Jimarnold	13.7	X	311.61751	352.29715	17.38061	8.36547	0.2346541	0.28611268	2.2809266	21	8 2.5	15.7
2144 Marietta	11.3	X	268.50552	276.22128	138.46990	2.83235	0.0601061	0.20174799	2.8791430	21	8 18.4	15.2
2145 Blaauw	11.0	X	194.09033	278.11218	264.25449	15.01217	0.1011751	0.17116212	3.2126564	21	10 18.4	16.2
2146 Stentor	10.0	X	337.64029	274.07708	131.32015	39.28515	0.1021084	0.08337009	5.1895439	21	11 4.7	17.0
2147 Kharadze	12.1	X	331.89458	311.33047	144.16597	10.08673	0.0573216	0.17458268	3.1705549	21	12 30.7	16.4
2148 Epeios	10.8	X	342.58482	231.99267	176.55509	9.14829	0.0582091	0.08272275	5.2165823	21	11 4.5	17.4
2149 Schwambraniya	11.7	X	232.75093	229.07387	62.57949	7.72232	0.1069980	0.24209153	2.5496642	21	1 24.2	15.7
2150 Nyctimene	13.3	X	147.80353	235.75968	201.01033	25.31990	0.0574916	0.37249660	1.9130273	21	4 6.7	14.9
2151 Hadwiger	11.0	X	154.85433	86.14014	27.91127	15.48586	0.0564232	0.24048545	2.5610036	21	6 17.7	14.9
2152 Hannibal	10.8	X	244.88841	141.93528	250.92694	13.96513	0.2206489	0.17848532	3.1241680	21	6 4.2	15.9
2153 Akiyama	12.0	X	303.62525	35.73961	47.21631	1.16949	0.1511497	0.17866456	3.1220782	21	10 29.1	15.8
2154 Underhill	13.0	X	336.63314	120.48299	0.71258	7.74112	0.1250177	0.23035082	2.6355800	21	—	—
2155 Wodan	12.4	X	187.52820	348.79027	38.60390	2.53542	0.0784789	0.20428396	2.8552658	21	4 8.9	16.6
2156 Kate	12.6	X	315.49032	4.49688	17.14016	5.34741	0.2017711	0.29342879	2.2428535	21	9 7.2	14.0
2157 Ashbrook	12.0	X	273.26019	265.21762	349.41843	8.62573	0.1115891	0.21219484	2.7838522	21	1 25.6	16.3
2158 Tietjen	11.7	X	138.60814	101.57661	187.27020	1.58530	0.1811322	0.18332747	3.0689115	21	—	—
2159 Kukkamäki	11.8	X	69.58615	121.86795	351.06540	3.26578	0.0405590	0.25206434	2.4819619	21	2 20.6	14.7
2160 Spitzer	12.1	X	45.06076	207.61205								

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2161 Grissom	12.2	X	256.10085	249.38509	126.41297	7.30590	0.1632376	0.21656307	2.7462903	21	5 31.0	16.4
2162 Anhui	12.6	X	313.68044	285.50594	128.58349	3.04937	0.1231829	0.29646984	2.2274897	21	11 4.8	14.3
2163 Korczyk	11.7	X	334.76940	264.11586	113.27139	2.51031	0.1856429	0.17640413	3.1486922	21	9 25.9	15.0
2164 Lyalya	12.0	X	255.41673	197.22691	115.71559	2.62586	0.1321898	0.17330559	3.1861117	21	3 19.9	16.8
2165 Young	11.4	X	190.63414	23.92672	19.13110	0.94258	0.1765367	0.17840872	3.1250622	21	5 3.0	16.6
2166 Handahl	13.0	X	238.57028	136.73508	163.80956	5.13670	0.2177952	0.27413163	2.3469110	21	1 30.3	16.9
2167 Erin	12.1	X	185.82390	274.62911	252.75018	6.01767	0.1861175	0.24311295	2.5425177	21	9 26.7	16.3
2168 Swope	12.7	X	77.54574	10.97583	314.09920	4.74601	0.1543926	0.25664471	2.4523428	21	—	—
2169 Taiwan	12.6	X	51.58521	359.99248	71.85820	1.52728	0.0499870	0.21159277	2.7891305	21	—	—
2170 Byelorussia	13.9	X	114.98274	116.51820	255.82357	2.08052	0.1812549	0.26424491	2.4050916	21	—	—
2171 Kiev	12.7	X	86.30315	180.08313	102.04560	7.51599	0.1667562	0.29106043	2.2550038	21	11 27.3	16.0
2172 Plavsk	12.3	X	199.57251	333.96187	84.39158	3.32571	0.1416812	0.20027302	2.8932619	21	5 29.3	16.9
2173 Maresjev	11.5	X	165.45745	166.70627	174.62832	14.42405	0.1151012	0.17709276	3.1405244	21	1 24.7	16.6
2174 Asmodeus	13.8	X	123.12520	5.71295	359.83637	8.05732	0.2676227	0.24348598	2.5399202	21	1 20.6	17.4
2175 Andrea Doria	13.8	X	102.90153	143.63379	222.05974	3.70352	0.2065290	0.29877348	2.2160252	21	—	—
2176 Donar	12.2	X	135.24878	176.75575	89.93638	3.04541	0.0546149	0.19662818	2.9289067	21	12 6.0	16.5
2177 Oliver	11.9	X	258.06223	274.90402	51.45340	1.52454	0.1045212	0.17301591	3.1896671	21	4 9.7	16.6
2178 Kazakhstania	13.6	X	317.77923	350.88237	11.39654	3.07430	0.1550790	0.30040789	2.2079801	21	8 15.9	15.1
2179 Platzeck	11.2	X	109.12235	57.51316	14.84473	10.47382	0.0995120	0.18872289	3.0101375	21	3 14.4	15.5
2180 Marjaleena	11.0	X	192.11515	88.75436	233.26325	9.24859	0.0793370	0.18841654	3.0133994	21	1 23.9	15.8
2181 Fogelin	12.0	X	277.01953	117.00572	17.12425	13.00438	0.1205008	0.23647359	2.5898788	21	12 7.0	15.3
2182 Semiot	11.6	X	61.88777	202.03579	50.93815	2.25732	0.1348669	0.17762912	3.1341993	21	9 4.7	15.8
2183 Neufang	11.8	X	324.66345	239.95537	87.28660	18.11240	0.3772030	0.19044988	2.9919126	21	5 27.7	15.0
2184 Fujian	11.6	X	18.01472	121.57605	256.44685	5.19622	0.0937838	0.17399846	3.1776480	21	12 2.6	15.6
2185 Guangdong	11.4	X	256.78403	262.56053	60.56843	9.59453	0.1603918	0.22101747	2.7092660	21	3 29.5	15.7
2186 Keldysh	12.6	X	289.44591	132.38877	285.33280	2.36766	0.1008649	0.22430897	2.6826970	21	9 15.3	15.8
2187 La Silla	13.3	X	120.76879	214.46817	137.18570	13.26455	0.1169716	0.24396204	2.5366149	21	—	—
2188 Orlenok	11.7	X	86.38447	194.24952	140.28285	2.66207	0.0872326	0.19941176	2.9015866	21	—	—
2189 Zaragoza	13.0	X	90.19229	217.49133	128.79628	13.92170	0.2257620	0.26450356	2.4035235	21	—	—
2190 Coubertin	13.2	X	229.23607	315.18009	262.54892	0.82868	0.0895503	0.25378302	2.4707436	21	—	—
2191 Uppsala	11.2	X	34.35396	181.43123	247.27544	9.04811	0.0849924	0.18790856	3.0188277	21	—	—
2192 Pyatigoriya	11.6	X	190.67667	147.02701	201.40940	9.79384	0.0795046	0.17721342	3.1390987	21	2 24.2	16.6
2193 Jackson	10.5	X	116.68114	224.18421	36.46614	11.67769	0.0752211	0.18033601	3.1027568	21	11 6.9	15.1
2194 Arpola	12.7	X	358.18695	102.37716	47.10698	8.52247	0.0426089	0.27749012	2.3279360	21	—	—
2195 Tengström	12.4	X	14.38040	295.48004	100.95381	4.57449	0.1049255	0.29765745	2.2215608	21	—	—
2196 Ellicott	10.1	X	271.72774	305.36517	212.13281	10.32074	0.0567407	0.15482017	3.4349284	21	12 21.1	15.0
2197 Shanghai	11.4	X	308.32881	70.31891	56.32389	2.49480	0.1290155	0.17643607	3.1483122	21	—	—
2198 Ceplecha	14.4	X	331.02659	181.25064	223.01485	3.62961	0.1949443	0.23598248	2.5934798	21	11 7.9	16.5
2199 Klet	12.8	X	266.07368	142.80426	146.90600	8.19778	0.2008259	0.29366426	2.2416544	21	2 8.1	16.2
2200 Pasadena	12.8	X	264.84420	209.93810	345.49253	4.59608	0.1493374	0.26438791	2.4042243	21	—	—
2201 Oljato	15.3	X	326.13386	98.23659	74.98629	2.52241	0.1729528	0.30738090	2.1744602	21	—	—
2202 Pele	17.1	X	14.89750	217.89612	169.93067	8.74308	0.5124359	0.28430081	2.2906073	21	—	—
2203 van Rhijn	11.6	X	222.64772	328.56968	50.17870	1.64556	0.1888540	0.18034171	3.1026915	21	5 1.0	16.7
2204 Lyyli	12.2	X	320.39179	284.12619	159.94681	20.62397	0.4047842	0.23640063	2.5904206	21	12 15.5	13.7
2205 Glinka	12.2	X	103.88236	103.85405	227.64573	10.48147	0.1190740	0.18914370	3.0056711	21	—	—
2206 Gabrova	11.4	X	210.67312	161.34241	63.52818	10.92954	0.0519827	0.18840016	3.0135740	21	—	—
2207 Antenor	8.9	X	170.33095	309.29978	159.03766	6.80135	0.0133934	0.08402494	5.1625458	21	6 30.2	15.8
2208 Pushkin	10.7	X	162.00400	3.66460	78.53822	5.40295	0.0307319	0.15090729	3.4940509	21	5 20.3	15.7
2209 Tianjin	11.1	X	305.02460	262.12299	150.76966	2.61873	0.0639913	0.20513495	2.8473637	21	10 6.6	14.6
2210 Lois	14.1	X	122.86658	215.82221	123.51332	2.93282	0.2286415	0.26443846	2.4039179	21	—	—
2211 Hanuman	12.3	X	152.37412	205.36099	145.89092	17.27142	0.0830416	0.17343054	3.1845812	21	1 22.1	17.2
2212 Hephaistos	13.3	X	173.16974	209.41006	27.52087	11.54584	0.8374723	0.31061454	2.1593425	21	11 23.5	18.8
2213 Meeus	13.4	X	129.07255	222.14273	126.90791	5.33323	0.2266920	0.30234302	2.1985487	21	—	—
2214 Carol	11.8	X	293.24604	137.55179	187.37857	14.27868	0.2686142	0.17595705	3.1540235	21	4 27.2	16.4
2215 Sichuan	11.8	X	59.19889	333.46171	71.02997	10.76703	0.2611664	0.21100364	2.7943196	21	—	—
2216 Kerch	11.2	X	120.55313	183.08902	155.55028	10.43533	0.0962641	0.18772564	3.0207885	21	—	—
2217 Eltigen	11.4	X	348.28743	173.58113	127.49147	2.24891	0.1690818	0.17598960	3.1536347	21	7 7.0	14.7
2218 Wotho	11.2	X	320.22045	324.22267	96.45126	14.94049	0.1569333	0.18540040	3.0459933	21	11 4.8	14.9
2219 Mannucci	11.0	X	6.27874	293.77291	72.47272	7.56795	0.1141690	0.17606690	3.1527115	21	11 5.2	14.9
2220 Hicks	12.3	X	75.01237	281.68255	94.65056	2.59239	0.1546656	0.17549359	3.1595741	21	—	—
2221 Chilton	12.9	X	290.09052	82.17726	245.80925	13.79260	0.1378738	0.23634600	2.5908198	21	5 8.7	16.3
2222 Lermontov	11.3	X	308.94434	340.32487	94.80506	2.57267	0.1620666	0.17860755	3.1227424	21	10 27.5	14.9
2223 Sarpedon	9.1	X	5.84225	51.43101	220.85317	15.94109	0.0187090	0.08191777	5.2507013	21	6 27.8	16.1
2224 Tucson	11.9	X	220.37413	244.67293	51.21675	2.66581	0.0443857	0.20146072	2.8818794	21	1 23.6	16.1
2225 Serkowski	12.1	X	128.82148	7.86099	88.08516	3.26176	0.0342925	0.20473425	2.8510777	21	4 25.0	16.1
2226 Cunitza	11.7	X	121.61419	333.34182	42.90897	2.53673	0.0794047	0.20269230	2.8701937	21	1 12.4	15.7
2227 Otto Struve	13.4	X	193.65492	253.98879	178.87029	4.94957	0.1750346	0.29489384	2.2354189	21	6 8.3	16.9
2228 Soyuz-Apollo	11.5	X	230.62363	285.36898	140.37879	1.98939	0.1822993	0.17731151	3.1379409	21	7 4.3	16.6
2229 Mezzarco	13.1	X	352.28179	32.83523	271.96332	12.68954	0.2647517	0.22281460	2.6946785	21	7 17.0	15.0
2230 Yunnan	12.0	X	297.97822	253.64214	153.68085	2.57208	0.0615025	0.20372111	2.8605225	21	9 18.7	15.7
2231 Durrell	12.4	X	253.26006	24.58692	342.29378	8.23952	0.2528090	0.21897993	2.7260459	21	5 3.3	17.1
2232 Altaj	12.1	X	352.05842	92.31945	218.20670	3.69332	0.1433684	0.22617215	2.6679435	21	7 29.6	14.8
2233 Kuznetsov	12.4	X	85.77070	159.93945	247.23163	3.41416	0.0809598	0.28655904	2.2785574	21	—	—
2234 Schmadel	12.3	X	327.04788	272.28342	6.07727	25.24087	0.1988750	0.22219940	2.6996500	21	4 10.6	15.6
2235 Vitmore	10.6	X	341.21523	274.30158	205.02455	18.77782	0.2153674	0.17169731	3.2059769	21	—	—
2236 Austrasia	12.4	X	102.75939	300.98609	8.18786	10.11988	0.2183072	0.27449055	2.3448647	21	—	—
2237 Melnikov	12.0	X	263.17536	266.07739	118.47971	2.40076	0.2178113	0.17701428	3.1414527	21	6 12.1	16.8
2238 Steshenko	12.5	X	60.68280	293.41560	33.34990	1.30868	0.1772837	0.18406649	3.0606915	21	12 8.2	16.9
2239 Paracelsus	10.9	X	152.64788	2.94900	20.06350	10.93757	0.1058314	0.17256478	3.1952237	21	3 7.2	15.8
2240 Tsai	11.9	X	217.87278	24.41083	60.88619	0.84160	0.1507588	0.17583735	3.1554548	21	7 18.7</	

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2241 Alcathous	8.5	X	53.24476	292.98811	267.99741	16.62756	0.0666390	0.08363577	5.1785480	21	6 9.4	15.2
2242 Balaton	13.3	X	254.49247	95.86672	343.83986	2.53631	0.1172777	0.30016779	2.2091574	21	8 31.8	15.9
2243 Lönnrot	12.4	X	266.03320	303.60120	22.46947	6.84407	0.1966444	0.29242728	2.2479715	21	3 28.5	15.5
2244 Tesla	11.9	X	193.30656	297.54067	106.48332	7.82378	0.1815929	0.20928883	2.8095624	21	5 7.7	16.6
2245 Hekatosotos	11.7	X	237.48606	316.68576	85.18104	11.85091	0.1337320	0.23028433	2.6360873	21	6 14.9	15.7
2246 Bowell	10.3	X	59.42282	21.98319	155.64233	6.49719	0.0924360	0.12552119	3.9505542	21	5 23.3	15.7
2247 Hiroshima	13.5	X	279.94673	29.08128	7.35415	5.94152	0.1105270	0.25702314	2.4499350	21	8 6.4	16.5
2248 Kanda	11.3	X	63.16317	146.09689	33.77356	1.63333	0.1150747	0.18070160	3.0985706	21	5 29.6	15.3
2249 Yamamoto	11.2	X	286.46292	112.82364	147.88725	4.10512	0.0806027	0.17288893	3.1912287	21	2 24.4	15.9
2250 Stalingrad	11.9	X	158.38221	176.84744	157.88162	1.52426	0.1804389	0.17275184	3.1929167	21	1 17.9	16.9
2251 Tikhov	11.7	X	295.19316	183.15534	192.95895	7.43964	0.1493762	0.22082411	2.7108473	21	7 19.7	15.2
2252 CERGA	12.6	X	52.94606	25.15064	358.20010	4.21975	0.0711332	0.23292307	2.6161404	21	—	—
2253 Espinette	12.8	X	268.02320	175.84805	143.91571	3.88039	0.2782003	0.28560569	2.2836251	21	3 15.8	16.6
2254 Requiem	12.4	X	75.47922	24.54092	338.11361	5.04382	0.1490914	0.27492697	2.3423825	21	—	—
2255 Qinghai	11.7	X	2.24383	347.54350	40.90053	14.14177	0.1470839	0.18037243	3.1023392	21	11 26.9	15.5
2256 Wiśniewski	12.1	X	94.07391	192.29426	116.37088	0.46473	0.1727360	0.18127545	3.0920278	21	12 19.5	17.0
2257 Kaarina	13.3	X	292.22173	129.13878	233.69923	5.07071	0.2399519	0.25126608	2.4872158	21	6 12.9	16.5
2258 Viipuri	12.0	X	81.51532	173.89845	307.32595	1.47901	0.0807758	0.22301364	2.6930749	21	3 29.6	15.3
2259 Sofievka	12.6	X	144.52231	11.98885	280.27317	4.68092	0.1855117	0.28367919	2.2939524	21	—	—
2260 Neoptolemus	9.3	X	342.22395	321.05226	86.57393	17.77801	0.0449102	0.08319086	5.1969953	21	11 7.5	16.1
2261 Keeler	13.0	X	19.67186	99.44217	102.74490	22.74089	0.2359709	0.26873718	2.3782137	21	4 21.2	15.4
2262 Mitidika	12.4	X	95.83594	351.35941	0.46521	13.38222	0.2776437	0.23663018	2.5887451	21	—	—
2263 Shaanxi	11.3	X	83.43214	316.11475	54.35278	11.40121	0.1085038	0.18797463	3.0181204	21	—	—
2264 Sabrina	10.8	X	329.42742	78.94296	240.19370	0.15883	0.1781431	0.17844779	3.1246060	21	6 25.1	14.1
2265 Verbaandert	12.8	X	337.13567	339.34370	133.17193	19.83909	0.2116064	0.23291499	2.6162009	21	—	—
2266 Tchaikovsky	10.7	X	158.76149	205.38863	229.42871	13.25074	0.1815651	0.15737561	3.3976431	21	5 15.1	16.3
2267 Agassiz	13.6	X	157.76388	299.96034	328.53755	1.95299	0.1387299	0.29854556	2.2171529	21	—	—
2268 Szmytowna	11.8	X	221.34562	324.00114	89.62649	3.30454	0.1159747	0.19570988	2.9380615	21	6 15.0	16.1
2269 Efremliana	11.1	X	175.23388	34.61457	66.73924	15.37530	0.0834333	0.17821588	3.1273161	21	6 27.3	16.0
2270 Yazhi	11.5	X	34.32722	189.38424	75.96702	2.11999	0.1391602	0.17587140	3.1550475	21	8 11.6	15.4
2271 Kiso	11.0	X	336.08202	179.46869	136.46171	3.38928	0.0602374	0.21497942	2.7597609	21	7 13.3	14.5
2272 Montezuma	13.7	X	190.34595	278.11985	175.51496	24.33048	0.0901697	0.38643647	1.8667406	21	7 3.1	16.6
2273 Yariilo	13.5	X	78.72925	41.42350	66.16887	0.38955	0.1672036	0.25706586	2.4496636	21	3 15.1	16.1
2274 Ehrsson	12.5	X	34.95548	187.00548	348.24254	2.24689	0.2289469	0.26353594	2.4094032	21	3 31.7	13.9
2275 Cuitlahuac	12.6	X	325.97788	154.12016	197.17717	6.39409	0.1700660	0.28321035	2.2964833	21	8 8.1	14.5
2276 Warck	13.0	X	46.84319	55.48760	215.32291	2.46720	0.1717458	0.26931073	2.3748359	21	9 20.3	15.7
2277 Moreau	12.0	X	346.48415	70.52107	105.01557	11.55257	0.1241787	0.23491123	2.6013584	21	1 7.8	14.9
2278 Götz	13.6	X	232.63632	207.02811	53.40784	4.20158	0.1486007	0.25642228	2.4537614	21	—	—
2279 Barto	13.1	X	277.91661	61.86821	139.90821	2.98460	0.1572160	0.25560058	2.4590168	21	—	—
2280 Kunikov	13.3	X	166.16091	264.38310	106.48223	3.56890	0.1409186	0.30642626	2.1789741	21	2 16.2	16.1
2281 Biela	13.5	X	194.62170	109.51286	206.52152	1.48604	0.1445655	0.30440074	2.1886295	21	1 5.3	16.7
2282 Andrés Bello	13.3	X	255.44308	238.45493	207.70670	4.98283	0.0790143	0.30123061	2.2039580	21	9 16.6	15.8
2283 Bunke	12.4	X	158.02053	347.54672	176.76832	6.73436	0.0869606	0.29214327	2.2494282	21	9 30.1	15.5
2284 San Juan	12.6	X	239.56925	67.18204	145.86238	5.28602	0.0510286	0.27795614	2.3253333	21	—	—
2285 Ron Helin	14.1	X	196.06802	182.88062	157.79346	5.33322	0.2074210	0.29787680	2.2204701	21	2 10.9	17.6
2286 Fesenkov	12.9	X	167.48930	279.03020	59.47586	1.34529	0.0933426	0.30349824	2.1929662	21	—	—
2287 Kalmjydia	12.9	X	52.32266	214.49916	93.25149	5.28580	0.1703058	0.29403319	2.2397789	21	11 23.7	15.6
2288 Karolinum	10.9	X	15.31331	100.61604	75.72098	14.57174	0.1594063	0.19873202	2.9081992	21	3 13.3	14.4
2289 McMillan	13.6	X	186.89891	42.46831	189.75897	2.15333	0.1435831	0.23047098	2.6346639	21	12 19.4	17.7
2290 Helffrich	12.6	X	220.40401	270.61775	155.89168	11.55352	0.2339715	0.23632105	2.5910022	21	6 22.8	17.2
2291 Kevo	10.8	X	124.71236	295.90384	169.48512	24.49902	0.0649296	0.18579908	3.0416344	21	5 10.5	15.6
2292 Seili	11.7	X	243.98424	129.33094	172.42114	14.53100	0.2365249	0.23228306	2.6209437	21	2 8.1	16.3
2293 Guernica	11.3	X	16.97768	132.06014	23.62990	0.58793	0.1342021	0.17780747	3.1321030	21	2 13.9	15.0
2294 Andronikov	11.7	X	206.65878	43.39166	290.81221	6.29949	0.1168229	0.23755784	2.5820014	21	2 16.4	15.7
2295 Matusovskij	12.0	X	286.99852	69.45622	313.53853	2.50977	0.0957026	0.19916538	2.9039790	21	7 26.9	15.7
2296 Kugultinov	11.8	X	63.80923	99.86783	42.23650	1.25399	0.1655885	0.17369662	3.1813282	21	4 19.5	15.7
2297 Daghestan	11.4	X	331.29717	93.29906	140.49874	1.61286	0.1260479	0.17479452	3.1679928	21	3 14.5	15.5
2298 Cindijon	12.8	X	133.82969	147.60428	198.38543	5.16132	0.1721646	0.26396779	2.4067746	21	—	—
2299 Hanko	13.3	X	80.04882	165.86169	174.15254	5.25556	0.2956278	0.23703877	2.5857694	21	—	—
2300 Stebbins	11.8	X	44.26628	358.53167	31.64322	2.31116	0.0756516	0.20610736	2.8384008	21	—	—
2301 Whitford	11.0	X	306.25869	10.85838	78.76046	11.65001	0.2171331	0.17483755	3.1674729	21	11 6.1	14.6
2302 Florja	11.8	X	128.03304	70.05192	307.39622	12.07085	0.1938179	0.22891233	2.6466099	21	1 31.1	15.5
2303 Retsina	11.4	X	60.15142	329.58262	195.34041	18.94938	0.1151068	0.19030088	2.9934742	21	5 6.8	15.3
2304 Slavia	12.2	X	346.95153	59.55221	195.89370	13.59908	0.1317700	0.23339681	2.6125991	21	4 30.3	15.0
2305 King	11.6	X	249.86039	357.72364	25.24940	7.45872	0.0315773	0.21203024	2.7852927	21	6 16.4	15.5
2306 Bauschinger	12.3	X	49.22198	101.87190	236.65306	4.23100	0.0629244	0.21839897	2.7308782	21	11 29.6	16.0
2307 Garuda	11.2	X	355.19523	341.25731	251.51263	7.71028	0.0546119	0.18542272	3.0457488	21	4 20.3	15.3
2308 Schilt	12.0	X	96.93708	233.48668	34.21057	14.17556	0.1725518	0.24233537	2.5479536	21	11 10.3	16.0
2309 Mr. Spock	11.4	X	90.30228	271.88660	157.18574	10.98003	0.0927552	0.18850182	3.0124905	21	2 10.1	15.4
2310 Olshaniya	11.7	X	73.43598	330.63432	124.12497	2.64999	0.1615415	0.17681313	3.1438348	21	3 4.2	15.7
2311 El Leoncito	10.3	X	309.00832	186.90265	156.64380	6.61996	0.0425028	0.14196098	3.6393464	21	7 11.5	15.4
2312 Duboshin	10.0	X	40.16500	342.13619	61.43874	5.16341	0.1581997	0.12484896	3.9647223	21	—	—
2313 Aruna	13.0	X	242.27287	108.60324	229.61291	1.83942	0.1890919	0.25589917	2.4571036	21	3 23.6	17.0
2314 Field	13.7	X	136.29680	181.34791	33.96782	5.72704	0.0251938	0.28988587	2.2610909	21	10 16.2	16.3
2315 Czechoslovakia	10.6	X	85.62908	14.07541	30.80494	10.70209	0.1077735	0.18860594	3.0113817	21	1 8.4	14.7
2316 Jo-Ann	12.9	X	256.28672	147.40174	148.65311	1.81739	0.1662015	0.25675857	2.4516177	21	2 14.5	16.8
2317 Galya	13.2	X	40.28714	204.65044	187.09889	4.16686	0.1631880	0.24584798	2.5236258	21	—	—
2318 Lubarsky	13.8	X	327.11293	241.59141	153.23438	3.59947	0.1315742	0.29154331	2.2525131	21	10 31.6	15.6
2319 Aristides	12.1	X	79.92057	269.12498	112.53248	2.97257	0.0890731	0.19885214	2.9070279	21	—	—
2320 Blarney	10.5	X	146.92405	261.00065	11							

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2321 Lužnice	12.1	X	88.88505	6.38653	45.68543	7.79678	0.0646006	0.18909053	3.0062346	21	1 16.9	16.2
2322 Kitt Peak	13.1	X	87.23299	192.06885	194.73834	2.40454	0.0412154	0.28393051	2.2925985	21	—	—
2323 Zverev	11.1	X	299.89081	101.09842	4.75391	4.62878	0.1560304	0.17785484	3.1315470	21	11 19.4	15.0
2324 Janice	11.5	X	104.71338	305.08523	315.56619	0.39962	0.1806137	0.18217475	3.0818436	21	11 4.4	16.3
2325 Chernykh	11.9	X	134.65790	267.14105	139.93711	1.92029	0.1766322	0.17717884	3.1395072	21	3 20.5	16.7
2326 Tololo	10.9	X	139.03997	259.47220	155.81294	15.14942	0.1589023	0.20377370	2.8600303	21	4 1.8	15.4
2327 Gershberg	13.6	X	69.20664	211.32059	174.85933	4.03942	0.1289021	0.27036017	2.3686865	21	—	—
2328 Robeson	13.0	X	311.46601	340.76665	182.13049	10.01587	0.1463761	0.27514916	2.3411214	21	—	—
2329 Orthos	14.5	X	9.78530	146.05429	169.27622	24.47520	0.6541207	0.26361765	2.4089053	21	12 20.5	18.2
2330 Ontake	11.6	X	180.44453	130.96059	140.39973	8.65726	0.0350462	0.17371919	3.1810527	21	—	—
2331 Parvulesco	12.5	X	228.21202	224.00828	255.06160	3.70121	0.2192647	0.26038079	2.4288279	21	9 4.6	16.2
2332 Kalm	11.0	X	288.35169	244.16551	61.16986	14.55271	0.0607771	0.18299867	3.0725863	21	4 27.6	15.3
2333 Porthan	11.9	X	96.27402	99.19448	39.92394	11.94174	0.1368309	0.22920657	2.6443444	21	5 20.3	15.5
2334 Cuffey	13.1	X	98.24863	113.03511	120.97070	4.08795	0.0751903	0.28835058	2.2691097	21	9 28.5	16.0
2335 James	13.6	X	357.93360	79.59282	19.90117	36.30699	0.3601609	0.31854003	2.1233750	21	—	—
2336 Xinjiang	11.9	X	307.52134	37.06363	87.21840	2.78725	0.1616326	0.17345851	3.1842389	21	12 25.1	15.5
2337 Boubin	12.2	X	222.46015	26.96006	37.22765	14.34702	0.1682900	0.23591764	2.5939550	21	6 24.6	16.6
2338 Bokhan	11.9	X	106.75217	200.59274	112.57918	3.20601	0.0612620	0.20679019	2.8321489	21	—	—
2339 Anacreon	13.1	X	56.99134	340.86545	11.74140	4.85235	0.1974186	0.24550601	2.5259687	21	—	—
2340 Hathor	20.2	X	327.42050	40.09005	211.32238	5.85964	0.4498371	1.27153164	0.8438228	21	11 15.8	17.5
2341 Aoluta	12.8	X	221.16691	347.67204	61.58318	4.07442	0.1524245	0.29971047	2.2114041	21	6 3.7	16.1
2342 Lebedev	11.9	X	30.90854	216.56028	195.92009	0.36875	0.1366406	0.17068890	3.2185916	21	—	—
2343 Siding Spring	13.3	X	225.63796	155.53021	218.05770	1.76919	0.2551362	0.27641717	2.3339562	21	4 18.6	17.2
2344 Xizang	11.7	X	66.37984	239.10788	99.26657	3.89868	0.1878017	0.21575397	2.7531520	21	—	—
2345 Fučik	10.8	X	227.72055	135.11339	303.86302	9.15144	0.0752817	0.18780406	3.0199475	21	7 27.6	15.1
2346 Lilio	12.3	X	94.59995	106.33090	244.64324	5.92316	0.1558439	0.26988093	2.3714897	21	—	—
2347 Vinata	11.4	X	193.44782	108.14776	290.44847	13.08498	0.2137822	0.18170017	3.0872075	21	4 25.3	17.0
2348 Michkovitch	12.7	X	72.34294	295.44682	186.34035	4.67128	0.1724619	0.26568201	2.3964109	21	3 23.4	15.0
2349 Kurchenko	11.4	X	348.84119	217.55822	133.12066	17.49175	0.1200751	0.21376484	2.7702047	21	9 26.6	14.8
2350 von Lüde	13.3	X	357.18388	288.12467	141.02550	5.07860	0.1260536	0.29361747	2.2418925	21	—	—
2351 O' Higgins	13.1	X	26.85871	61.59630	332.74249	3.74396	0.1841313	0.24497226	2.5296365	21	—	—
2352 Kurčátov	11.5	X	171.00382	118.92599	232.05982	14.81754	0.1098742	0.17974726	3.1095284	21	2 5.9	16.6
2353 Alva	11.6	X	312.48035	301.24113	24.63603	4.79656	0.1137262	0.20993341	2.8038084	21	6 13.4	15.2
2354 Lavrov	11.8	X	149.77943	190.56856	175.96229	3.26917	0.1037069	0.21831498	2.7315785	21	2 1.1	15.8
2355 Nei Monggol	11.7	X	109.59052	277.99089	53.80990	9.99476	0.1127964	0.18765889	3.0215048	21	—	—
2356 Hiron	10.8	X	286.65149	355.99936	189.06702	15.59703	0.0394456	0.16933589	3.2357134	21	—	—
2357 Phereclos	8.9	X	18.17533	75.42629	179.20815	2.66779	0.0472103	0.08266169	5.2191508	21	6 25.3	15.5
2358 Bahner	11.2	X	131.94561	51.48096	344.46445	9.68595	0.0986024	0.18744077	3.0238483	21	2 23.1	15.6
2359 Debehogne	12.9	X	346.88297	76.69126	206.10796	4.34215	0.1164245	0.26107078	2.4245466	21	6 8.6	15.2
2360 Volgo-Don	12.9	X	158.67396	2.84462	38.25331	3.39372	0.1959033	0.22569991	2.6716637	21	4 1.8	17.2
2361 Gogol	12.1	X	105.39644	84.88309	42.96354	1.62195	0.1409022	0.17747325	3.1360342	21	5 21.9	16.7
2362 Mark Twain	13.4	X	276.84636	350.82396	9.01638	3.95009	0.1932355	0.30307798	2.1949929	21	5 23.2	16.3
2363 Cebriones	8.9	X	19.97853	53.78183	211.70318	32.08755	0.0391642	0.08258917	5.2222060	21	7 3.5	16.1
2364 Seillier	11.3	X	228.38670	167.78822	42.79985	10.70713	0.1399934	0.17431444	3.1738067	21	12 25.9	16.1
2365 Interkosmos	11.4	X	340.15098	208.14867	282.76189	5.35217	0.1171981	0.24284414	2.5443936	21	—	—
2366 Aaryn	13.9	X	77.37393	111.25468	308.14940	1.08345	0.1270563	0.29380882	2.2409190	21	—	—
2367 Praha	13.1	X	111.32352	297.72697	190.84053	1.87709	0.0998309	0.30079223	2.2060989	21	5 17.8	15.5
2368 Beltrovata	15.1	X	131.46327	43.03952	287.33797	5.22305	0.4133329	0.32260580	2.1054969	21	—	—
2369 Chekhov	12.0	X	182.42065	240.71531	47.91856	2.63130	0.0464626	0.21228639	2.7830517	21	—	—
2370 van Altena	13.0	X	155.74268	315.45996	10.30559	8.26472	0.1822900	0.22026983	2.7153931	21	—	—
2371 Dimitrov	12.5	X	227.08534	288.20134	234.92570	1.77777	0.0149025	0.25858449	2.4400632	21	11 28.9	15.6
2372 Proskurin	11.8	X	323.33561	319.25768	98.11542	2.74332	0.1701521	0.17901212	3.1180358	21	10 29.3	15.2
2373 Immo	12.4	X	205.08014	216.24541	146.30592	10.08166	0.1724932	0.21090004	2.7952347	21	3 28.8	17.1
2374 Vladvysotskij	11.7	X	212.70568	16.53542	347.34146	15.07302	0.2144366	0.18193254	3.0845782	21	3 31.1	17.1
2375 Radek	10.5	X	350.92560	101.71011	110.70083	14.97835	0.2096580	0.17369896	3.1812996	21	3 14.4	14.3
2376 Martynov	10.8	X	207.54039	300.86297	61.16993	3.83800	0.1183575	0.17203949	3.2017244	21	4 2.2	15.9
2377 Shcheglov	12.1	X	205.38314	161.94531	262.37745	1.00802	0.0577460	0.20192009	2.8775068	21	6 14.4	16.4
2378 Pannekoek	11.0	X	265.94237	266.27750	180.83875	14.26926	0.1397192	0.20030259	2.8929772	21	9 13.2	14.9
2379 Heiskanen	10.9	X	21.04030	176.54058	151.27971	0.46995	0.2766834	0.17503491	3.1650915	21	10 30.2	14.4
2380 Heilongjiang	12.9	X	13.31765	109.24808	324.58302	1.92229	0.0595193	0.30372586	2.1918704	21	—	—
2381 Landi	11.7	X	311.69192	278.40506	150.09318	13.64862	0.1660696	0.23366871	2.6105720	21	11 8.0	14.6
2382 Nonie	11.8	X	185.52623	66.75887	245.98657	30.98020	0.3293589	0.21472060	2.7619782	21	1 7.8	17.3
2383 Bradley	13.0	X	61.21702	184.53841	14.40286	3.56672	0.1042538	0.29839832	2.2178822	21	6 16.2	15.1
2384 Schulhof	11.9	X	177.04059	205.47185	7.82162	13.53602	0.1207609	0.23380201	2.6095797	21	11 14.6	16.1
2385 Mustel	13.4	X	183.33129	190.52707	153.19321	4.08103	0.1607809	0.29342985	2.2428481	21	2 1.1	16.7
2386 Nikonov	11.7	X	357.22036	311.55360	4.85482	9.08753	0.1596864	0.20866621	2.8151484	21	8 22.2	14.7
2387 Xi'an	11.4	X	350.68653	42.67622	53.04808	10.94616	0.0743910	0.18756928	3.0224670	21	—	—
2388 Gase	13.1	X	178.66990	253.16987	324.51260	2.21664	0.1830884	0.25734286	2.4479055	21	11 24.9	16.9
2389 Dibaj	12.9	X	192.60428	337.69983	333.76826	7.83584	0.2342150	0.25794886	2.4440700	21	1 12.0	17.1
2390 Nežárka	12.2	X	241.49207	355.30755	325.79320	10.32980	0.1443139	0.23235204	2.6204249	21	3 5.3	16.4
2391 Tomita	12.5	X	345.79504	283.77411	163.17463	3.01379	0.1336437	0.25855200	2.4402676	21	—	—
2392 Jonathan Murray	13.7	X	110.31228	302.61600	141.17494	3.36896	0.1543722	0.27466192	2.3438892	21	3 25.6	16.6
2393 Suzuki	10.6	X	183.70791	114.10278	223.93370	10.28478	0.1925334	0.17002287	3.2269915	21	2 8.9	16.2
2394 Nadeev	11.9	X	100.90049	300.72345	127.53553	1.62748	0.2140162	0.17429025	3.1741003	21	3 15.3	16.5
2395 Aho	12.5	X	326.19743	163.05983	100.47783	0.30275	0.0439631	0.18223565	3.0811570	21	4 22.9	16.7
2396 Kochi	11.6	X	189.66117	50.88810	158.31446	12.60344	0.0728782	0.21117459	2.7928114	21	11 29.3	16.0
2397 Lappajärvi	11.1	X	198.00194	296.84239	145.76954	10.30941	0.1778919	0.18193636	3.0845351	21	6 26.1	16.3
2398 Jilin	13.3	X	343.77955	12.53842	88.03335	3.72860	0.2358455	0.26649307	2.3915462	21	—	—
2399 Terradas	13.4	X	307.53536	159.97289	146.19733	5.12994	0.1695527	0.29413035	2.2392856	21	4 25.4	16.0
2400 Derevskaia	12.0	X	116.34507	137.30262	171.68792	10.40491	0.1004980	0.18				

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2401 Aehlita	12.5	X	262.56299	39.10323	50.73308	4.32186	0.0572599	0.21358147	2.7717901	21	9 28.9	16.2
2402 Satpaev	12.7	X	176.31750	64.70548	337.63960	5.16856	0.1309766	0.29762926	2.2217011	21	4 7.2	15.8
2403 Sumava	12.3	X	120.83511	39.16627	290.36857	3.30838	0.1298962	0.24251486	2.5466962	21	—	—
2404 Antarctica	11.8	X	241.40532	146.36706	110.85062	2.68992	0.1327988	0.17822979	3.1271534	21	—	—
2405 Welch	11.6	X	272.17545	3.21756	128.06381	2.25414	0.1400278	0.17253498	3.1955917	21	11 13.7	15.8
2406 Orelskaya	13.2	X	303.64464	347.79085	12.51486	2.30593	0.1636976	0.30357981	2.1925733	21	7 11.7	15.2
2407 Haug	10.9	X	31.33635	9.80915	342.10106	2.47404	0.2204488	0.19740788	2.9211895	21	12 11.6	14.7
2408 Astapovich	12.0	X	51.54759	103.35697	164.34133	17.71886	0.2415859	0.22991285	2.6389260	21	10 3.1	15.5
2409 Chapman	12.7	X	103.36209	207.95637	140.72239	3.51342	0.1908660	0.28887866	2.2663435	21	—	—
2410 Morrison	12.7	X	57.26360	62.19796	126.51664	2.39677	0.0623771	0.29891807	2.2153105	21	5 18.5	14.8
2411 Zellner	12.7	X	2.35315	130.12136	130.99260	1.61621	0.0863087	0.29690940	2.2252907	21	6 3.7	14.7
2412 Wil	11.8	X	13.45183	343.55389	303.50884	7.12753	0.1480893	0.22452013	2.6810147	21	8 7.4	14.5
2413 van de Hulst	11.4	X	167.98467	252.78385	166.50062	10.65684	0.1157724	0.18843274	3.0132267	21	5 2.9	16.2
2414 Vibeke	11.6	X	200.98224	46.69436	357.03373	16.76128	0.1297201	0.17251774	3.1958046	21	5 7.5	16.9
2415 Ganesa	12.3	X	33.46901	207.82616	89.75321	2.37156	0.0389431	0.22704083	2.6611340	21	9 14.8	15.6
2416 Sharonov	11.2	X	72.81340	107.05646	148.35219	10.51770	0.0468289	0.18806996	3.0171004	21	9 10.1	15.4
2417 McVittie	12.2	X	45.21400	19.38384	84.54854	3.10789	0.2243731	0.17369999	3.1812870	21	2 3.7	15.5
2418 Voskovec–Werich	12.8	X	349.31002	36.20958	30.61053	1.29779	0.1594714	0.17870389	3.1216201	21	12 27.2	16.3
2419 Moldavia	13.5	X	97.34177	261.55439	167.92251	6.39841	0.0920948	0.28328764	2.2960656	21	1 31.0	16.0
2420 Ciurlionis	12.3	X	32.31948	198.58861	205.52257	14.59246	0.1316033	0.24053101	2.5606802	21	—	—
2421 Nininger	10.7	X	98.38159	282.82214	77.41651	10.20602	0.0431829	0.16931072	3.2360340	21	—	—
2422 Perovskaya	13.2	X	352.65433	52.13036	159.92465	6.40733	0.1966902	0.27723611	2.3293577	21	2 15.0	15.1
2423 Ibarruri	13.3	X	21.75040	80.53776	264.94711	4.05666	0.2829195	0.30447012	2.1882970	21	12 24.2	15.6
2424 Tautenburg	13.2	X	7.09314	93.14833	30.12022	8.90688	0.1358059	0.27368746	2.3494495	21	—	—
2425 Shenzhen	11.3	X	199.32957	243.45014	52.55766	10.86731	0.0923260	0.18941542	3.0027960	21	1 4.2	16.1
2426 Simonov	11.7	X	25.62911	5.12812	237.12147	8.46622	0.1133366	0.19834208	2.9120096	21	6 22.4	15.2
2427 Kobzar	12.7	X	333.60730	171.33580	227.42903	4.15517	0.1630474	0.21717641	2.7411173	21	10 30.9	15.5
2428 Kamenyar	11.5	X	285.50823	351.04564	8.27878	9.31450	0.0967439	0.17511334	3.1641463	21	6 23.4	16.1
2429 Schürer	12.1	X	196.98463	29.75617	17.87999	15.05763	0.1022942	0.23910337	2.5708629	21	5 7.4	16.1
2430 Bruce Helin	11.9	X	42.11989	309.67869	45.82496	23.45069	0.2143150	0.27145007	2.3623419	21	—	—
2431 Skovoroda	12.7	X	359.26121	340.22498	328.70750	2.97548	0.2822278	0.22899238	2.6459930	21	8 20.3	14.2
2432 Soomana	12.6	X	143.05240	80.90157	7.80727	6.76339	0.1139471	0.27348552	2.3506059	21	5 3.4	16.0
2433 Sootyo	11.5	X	163.60402	71.20901	188.22920	10.36501	0.2220487	0.23429585	2.6059115	21	12 27.0	16.1
2434 Bateson	11.5	X	89.87151	283.97752	27.28943	15.61065	0.1690635	0.18222065	3.0813260	21	12 16.7	16.5
2435 Horemheb	14.7	X	220.52172	183.77705	162.52663	3.96760	0.2050161	0.30138163	2.2032217	21	3 10.9	18.1
2436 Hatshepsut	12.3	X	118.41006	294.55999	233.69583	4.10018	0.0976858	0.17353712	3.1832772	21	7 20.3	17.1
2437 Amnestia	13.0	X	114.11831	151.48202	218.92807	2.94462	0.1477056	0.30430582	2.1890846	21	—	—
2438 Oleshko	12.9	X	5.76287	171.03873	52.27659	4.90032	0.1076597	0.29324046	2.2438137	21	4 10.5	14.8
2439 Ulugbek	11.8	X	251.98449	335.51964	114.75245	0.28968	0.1496918	0.17645072	3.1481380	21	8 29.2	16.4
2440 Educatio	13.2	X	76.03281	77.72448	227.16530	4.10558	0.1630302	0.29894339	2.2151854	21	12 15.5	16.2
2441 Hibbs	13.9	X	36.85414	216.70793	140.10487	3.74395	0.1927351	0.26362811	2.4088416	21	—	—
2442 Corbett	12.7	X	90.32090	103.86318	190.58866	5.09699	0.1176093	0.26725988	2.3869695	21	12 8.2	16.2
2443 Tomeileen	10.3	X	5.01949	68.39528	118.75080	11.44416	0.0572988	0.18912261	3.0058946	21	3 12.3	14.3
2444 Lederle	11.8	X	186.38659	141.95178	286.11918	15.12244	0.1320580	0.21889378	2.7267612	21	5 27.0	16.3
2445 Blazhko	12.2	X	350.85051	341.37302	86.09391	6.06904	0.1460068	0.28839310	2.2688867	21	—	—
2446 Lunacharsky	13.1	X	353.50366	251.66712	26.06245	3.11108	0.1613833	0.27283448	2.3543438	21	6 2.6	15.0
2447 Kronstadt	12.9	X	292.23970	210.51147	146.86733	8.78236	0.2664905	0.24407108	2.5358594	21	6 3.1	16.4
2448 Sholokhov	10.8	X	286.58926	72.43982	131.08451	17.68704	0.1168097	0.21127024	2.7919684	21	—	—
2449 Kenos	14.1	X	61.73029	102.30594	179.83497	24.98641	0.1685185	0.37374007	1.9087818	21	11 14.9	16.9
2450 Ioannisianni	11.7	X	58.37048	98.05016	117.01515	2.52792	0.1023854	0.17857962	3.1230681	21	7 6.5	15.7
2451 Dollfus	11.8	X	58.71371	325.02225	331.75881	8.59561	0.1530900	0.21930590	2.7233440	21	10 28.9	15.7
2452 Lyot	11.4	X	56.82874	194.89318	2.67759	11.77198	0.1123568	0.17524272	3.1625888	21	6 11.3	15.8
2453 Wabash	11.2	X	14.02415	339.65025	11.64814	10.32093	0.1124988	0.18801059	3.0177355	21	10 26.8	15.0
2454 Olaus Magnus	13.5	X	245.25991	76.37054	247.58761	4.72835	0.2028566	0.29168667	2.2517750	21	3 2.5	17.2
2455 Somville	11.8	X	208.98493	116.18261	300.72782	7.54167	0.0878475	0.21892726	2.7264832	21	6 6.6	15.9
2456 Palamedes	9.2	X	327.92979	95.16365	327.35713	13.91383	0.0751046	0.08483654	5.1295675	21	10 24.3	15.9
2457 Rublyov	12.6	X	37.85667	76.99426	140.71313	6.27075	0.0650336	0.22985274	2.6393861	21	6 4.1	15.9
2458 Veniakaverin	12.0	X	5.02543	183.11222	128.16666	2.08617	0.1436468	0.17786232	3.1314591	21	8 23.3	15.7
2459 Spellmann	11.5	X	116.39862	220.10655	216.17777	9.69503	0.0729991	0.18787676	3.0191684	21	3 19.3	15.8
2460 Mitlincoln	12.5	X	267.11276	304.61804	176.01960	3.74467	0.1095163	0.29067814	2.2569805	21	11 20.2	14.9
2461 Clavel	11.7	X	217.59125	231.87803	116.03569	2.51017	0.1681190	0.17374648	3.1807195	21	3 23.9	16.9
2462 Nehalennia	13.7	X	306.53504	53.49173	99.77466	2.98674	0.1431239	0.26377844	2.4079263	21	—	—
2463 Sterpin	11.8	X	353.19593	265.89435	178.73392	13.37981	0.1549859	0.23513242	2.5997268	21	—	—
2464 Nordenskiöld	11.9	X	259.75717	80.30888	7.84606	0.84372	0.1942921	0.17240272	3.1972257	21	8 29.4	16.6
2465 Wilson	12.3	X	288.62639	6.36083	293.96626	3.85341	0.0736439	0.21580545	2.7527141	21	4 10.5	16.1
2466 Golson	12.2	X	154.31923	195.53202	159.69321	5.08775	0.1633842	0.22993622	2.6387472	21	1 27.4	16.1
2467 Kollontai	12.6	X	245.98626	18.14359	309.17060	5.80052	0.1606100	0.29932668	2.2132939	21	3 8.9	15.9
2468 Repin	13.0	X	260.93592	98.37671	216.33649	5.72085	0.1562420	0.27774865	2.3264912	21	3 10.6	16.5
2469 Tadjikistan	12.5	X	58.42385	139.09926	151.61447	9.68888	0.1390810	0.18000410	3.1065698	21	10 20.5	16.9
2470 Agematsu	11.8	X	257.69129	89.45150	79.41247	3.10859	0.0120755	0.20096036	2.8866610	21	—	—
2471 Ultrajectum	11.9	X	306.14602	280.91970	15.98657	10.30173	0.0836437	0.18987027	2.9979984	21	4 29.9	16.0
2472 Bradman	13.8	X	72.85680	159.80481	344.63518	5.11045	0.0945211	0.28920366	2.2646453	21	4 9.6	16.1
2473 Heyerdahl	13.2	X	332.09500	231.07128	185.59963	5.19181	0.1343680	0.29366148	2.2416685	21	12 15.2	15.1
2474 Ruby	11.9	X	235.57750	14.33198	237.80387	7.52481	0.2206382	0.22416191	2.6838702	21	—	—
2475 Semenov	11.6	X	77.25068	181.17452	209.95044	9.08343	0.1018575	0.18588373	3.0407109	21	—	—
2476 Andersen	11.2	X	100.37954	265.98370	82.26010	10.83247	0.1132840	0.18729624	3.0254037	21	—	—
2477 Biryukov	12.4	X	289.95392	86.66371	208.19639	6.10082	0.1502453	0.24089685	2.5580870	21	3 22.8	16.0
2478 Tokai	12.1	X	159.48723	233.27873	228.78848	4.13967	0.0686916	0.29692981	2.2251887	21	6 8.0	14.9
2479 Sodankylä	13.0	X	198.79212	156.63756	314.64592	2.91376	0.1952638	0.26657271	2.3910698	21	8 1.9	16.9
2480 Papanov	13.3	X	177.48493	13.93846	35.14269	2.91595	0					

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2481 Bürgi	13.6 <sup>m</sup>	X	250.57446	318.78715	13.69093	2.25897	0.2609991	0.23906108	2.5711661	21	3 21.7	17.9
2482 Perkin	12.8	X	135.17672	1.43816	103.04853	3.13139	0.0647287	0.19690239	2.9261868	21	5 17.4	16.9
2483 Guinevere	10.9	X	179.67752	183.13938	252.03896	4.50073	0.2767906	0.12475416	3.9667305	21	6 3.3	17.7
2484 Parenago	13.2	X	324.96969	148.02707	204.49785	1.20040	0.2545492	0.27481740	2.3430051	21	7 27.5	14.5
2485 Scheffler	12.9	X	262.08376	354.96379	97.56660	2.75145	0.1925480	0.16843551	3.2472342	21	9 7.4	17.6
2486 Metsähovi	12.5	X	90.82620	101.49430	359.90584	8.40614	0.0807175	0.28853759	2.2681292	21	3 7.5	14.8
2487 Juhani	13.1	X	256.18594	37.68373	347.42573	2.80675	0.1844389	0.26571429	2.3962168	21	6 6.3	16.5
2488 Bryan	13.9	X	76.74298	301.03547	62.30140	6.88961	0.2243010	0.28933493	2.2639603	21	—	—
2489 Suvorov	12.2	X	148.08041	233.99581	56.44548	1.78187	0.1549073	0.17995278	3.1071604	21	—	—
2490 Bussolini	12.0	X	336.29894	211.36240	212.43703	12.94771	0.1311528	0.23385793	2.6091636	21	12 14.4	14.9
2491 Tvashtri	13.5	X	130.38235	357.77272	125.29008	22.87088	0.0544109	0.38310353	1.8775519	21	6 1.5	16.0
2492 Kutuzov	11.6	X	280.40364	269.00888	20.64921	0.82637	0.1412712	0.17290857	3.1909870	21	3 16.4	16.4
2493 Elmer	12.7	X	122.83659	148.03611	205.83506	8.72571	0.1690086	0.21143047	2.7905577	21	—	—
2494 Inge	10.8	X	327.34340	95.34846	283.19585	11.52172	0.0634658	0.17519209	3.1631981	21	9 13.2	15.1
2495 Noviomagum	15.2	X	341.88711	136.47145	199.71662	21.12263	0.1027339	0.37110469	1.9178078	21	8 28.8	16.9
2496 Fernandus	13.3	X	348.49824	293.33186	163.26067	0.91874	0.0334714	0.30827328	2.1702618	21	—	—
2497 Kulikovskij	13.2	X	323.64582	346.13104	306.93939	5.82728	0.2269023	0.24311143	2.5425283	21	4 22.4	16.2
2498 Tsesevich	11.8	X	294.18704	3.10454	331.70083	1.23519	0.0850812	0.19792134	2.9161350	21	6 3.8	15.8
2499 Brunk	12.4	X	112.50795	53.26420	192.10358	0.75533	0.1322940	0.18100553	3.0951009	21	10 21.1	17.2
2500 Alascattalo	12.6	X	129.83253	160.96745	47.94332	6.98806	0.0993650	0.29382464	2.2408386	21	10 5.2	15.7
2501 Lohja	11.9	X	343.57685	229.71444	10.90397	3.30245	0.1958354	0.26154309	2.4216268	21	3 17.9	14.0
2502 Nummela	11.8	X	211.81617	131.25564	14.38032	17.80122	0.2227317	0.19574681	2.9376919	21	9 23.7	16.7
2503 Liaoning	14.4	X	54.06216	16.20840	11.82101	7.10450	0.2125695	0.30357002	2.1926204	21	—	—
2504 Gaviola	11.9	X	349.59818	160.47648	9.98075	4.07204	0.0882963	0.21476981	2.7615563	21	1 16.8	15.3
2505 Hebei	11.6	X	161.68423	206.90217	59.23476	2.07762	0.1729389	0.17688254	3.1430122	21	12 27.1	16.8
2506 Pirogov	11.9	X	282.19500	294.70889	164.67497	2.16948	0.0185252	0.19974242	2.8983834	21	11 8.1	15.8
2507 Bobone	11.7	X	23.18840	100.14435	129.94034	10.32034	0.0812842	0.21264410	2.7799298	21	6 1.2	15.2
2508 Alupka	13.2	X	304.70889	119.44906	191.46781	6.08173	0.1275809	0.27056027	2.3675184	21	5 6.6	15.9
2509 Chukotka	12.8	X	132.38925	348.61671	343.51973	2.85137	0.1938579	0.25604944	2.4561421	21	—	—
2510 Shandong	12.5	X	161.68650	209.71106	102.90407	5.26548	0.1681896	0.29134449	2.2535378	21	—	—
2511 Patterson	12.7	X	263.75125	190.36701	85.53305	8.04676	0.1034532	0.28276006	2.2989208	21	1 29.9	15.9
2512 Tavastia	12.6	X	161.73030	14.83259	69.51648	6.38074	0.1214496	0.29334159	2.2432979	21	5 20.6	15.7
2513 Baetslé	13.4	X	177.11576	97.96707	257.56604	3.16329	0.1804511	0.28502799	2.2867098	21	2 11.8	16.9
2514 Taiyuan	12.8	X	57.23231	13.03987	358.45990	2.33931	0.0989485	0.22839225	2.6506262	21	—	—
2515 Gansu	12.6	X	346.66483	356.17716	55.23052	3.99556	0.1827607	0.17287822	3.1913604	21	12 1.9	16.2
2516 Roman	13.6	X	149.99633	313.60777	123.40034	1.09350	0.1654083	0.28648559	2.2789468	21	5 1.8	16.9
2517 Orma	12.0	X	110.53213	299.99491	71.85920	2.63225	0.1741017	0.17343017	3.1845858	21	1 12.9	16.5
2518 Rutflant	13.4	X	128.64764	38.73130	205.53137	5.92734	0.1734403	0.28111021	2.3079070	21	11 17.9	17.0
2519 Annagerman	11.6	X	127.48681	225.58803	83.81609	2.42133	0.1674514	0.17663054	3.1460009	21	—	—
2520 Novorossijsk	11.8	X	92.10411	314.92524	6.57037	6.22536	0.0929910	0.18008778	3.1056073	21	12 25.2	16.5
2521 Heidi	11.7	X	23.08592	246.90255	281.23435	7.72300	0.0928717	0.21121445	2.7924600	21	3 1.7	15.2
2522 Triglav	11.4	X	91.90735	237.33046	272.75898	8.76033	0.0545783	0.18812322	3.0165309	21	5 19.9	15.6
2523 Ryba	11.3	X	41.75822	279.21446	282.72664	8.88855	0.0356962	0.18817466	3.1059812	21	5 16.3	15.4
2524 Budovicium	11.2	X	122.42886	19.80044	278.29834	0.29102	0.1575533	0.17920522	3.1157955	21	12 30.9	16.3
2525 O'Steen	11.0	X	64.42580	286.59489	86.80397	2.77521	0.1774538	0.17629517	3.1499895	21	—	—
2526 Alisary	12.4	X	302.22109	67.63101	15.25197	3.25469	0.1671406	0.17669370	3.1452512	21	10 23.8	16.0
2527 Gregory	13.2	X	94.68445	177.75903	186.20585	2.61471	0.1849400	0.25449895	2.4661078	21	—	—
2528 Mohler	12.2	X	76.31079	182.01422	162.77145	0.51181	0.1708376	0.17645893	3.1484003	21	—	—
2529 Rockwell Kent	13.0	X	332.80351	116.40038	202.70787	4.41198	0.0952107	0.24430743	2.5342236	21	7 15.6	15.8
2530 Shipka	12.2	X	28.05207	154.82374	198.52473	10.09794	0.1249770	0.18807926	3.0170009	21	11 24.2	16.1
2531 Cambridge	11.0	X	104.25095	31.76523	104.34208	11.03304	0.0555601	0.18898458	3.0073580	21	5 21.6	15.3
2532 Sutton	13.0	X	67.76527	8.22344	345.09150	4.33960	0.1712377	0.26970106	2.7925440	21	—	—
2533 Fechtig	11.9	X	63.02107	224.91924	201.17706	1.57715	0.1697861	0.18080377	3.0974031	21	1 9.5	15.4
2534 Houzeau	11.4	X	48.91646	201.41393	167.87201	0.81126	0.1669735	0.17638085	3.1489693	21	—	—
2535 Hämeenlinna	12.3	X	236.13120	309.61805	172.72559	3.43150	0.0795694	0.29397556	2.2400716	21	10 12.8	15.1
2536 Kozyrev	12.5	X	111.54056	90.47989	275.11754	4.86718	0.2273740	0.28134721	2.3066107	21	—	—
2537 Gilmore	12.8	X	40.38904	18.42197	334.92042	12.94287	0.1709589	0.22770868	2.6559282	21	12 25.8	16.6
2538 Vanderlinden	13.3	X	293.23146	29.11498	50.25622	4.76357	0.1291664	0.29409094	2.2394856	21	11 1.8	15.3
2539 Nangxia	14.4	X	219.80388	215.42997	193.29212	3.97979	0.1693928	0.28979225	2.2615779	21	6 1.6	17.8
2540 Blok	13.1	X	28.71165	262.23423	183.46293	1.26589	0.0514768	0.30274524	2.1966010	21	—	—
2541 Edebono	12.0	X	317.63228	327.65399	76.93941	3.19325	0.0773838	0.19585093	2.9366506	21	10 12.5	15.7
2542 Calpurnia	11.6	X	135.79268	49.83183	145.60016	4.63466	0.0773221	0.17761249	3.1343949	21	9 11.2	16.3
2543 Machado	11.1	X	146.68592	286.38533	40.86977	15.03931	0.2828084	0.18065558	3.0990967	21	1 8.2	16.5
2544 Gubarev	12.1	X	147.57284	262.06531	305.47612	22.51404	0.2413551	0.26964148	2.3728935	21	10 5.3	16.7
2545 Verbiest	12.8	X	249.51676	105.99816	322.63505	5.96800	0.1256266	0.29597041	2.2299948	21	8 7.3	15.4
2546 Libitina	11.9	X	355.86608	234.76695	315.13293	10.32476	0.1914333	0.23499517	2.6007389	21	2 1.9	14.6
2547 Hubei	13.6	X	153.05884	17.05987	348.31673	6.19182	0.1282920	0.26744886	2.3858450	21	1 31.0	16.9
2548 Leloir	12.0	X	251.47359	291.51579	299.45622	18.15282	0.1023730	0.23067339	2.6331224	21	—	—
2549 Baker	12.7	X	307.18119	204.95434	191.29200	0.06775	0.1724615	0.17190813	3.2033553	21	8 30.9	16.6
2550 Houssay	11.5	X	295.17041	242.18416	158.34697	10.40421	0.1681297	0.17203991	3.2017192	21	8 17.6	15.6
2551 Decabrina	12.5	X	22.31504	36.00115	8.85497	0.61090	0.1699939	0.17608415	3.1525056	21	—	—
2552 Remek	14.4	X	240.06070	343.97742	343.39527	0.90102	0.1886027	0.31334251	2.1467914	21	3 2.8	17.7
2553 Viljev	11.4	X	122.22600	250.28334	119.99921	5.24893	0.0474148	0.18157672	3.0886067	21	1 5.5	15.8
2554 Skiff	12.8	X	44.33985	333.94685	296.36413	4.85953	0.1454828	0.28930674	2.2641074	21	9 11.6	15.3
2555 Thomas	11.9	X	110.02998	91.39065	282.87674	0.90202	0.0811121	0.20261053	2.6709660	21	—	—
2556 Louise	13.2	X	273.76272	346.75610	126.46241	2.78951	0.0366825	0.30995355	2.1624113	21	12 3.9	15.3
2557 Putnam	12.6	X	9.75776	189.52161	188.17777	6.06917	0.1552544	0.27363690	2.3497389	21	12 22.3	15.1
2558 Viv	13.7	X	51.94899	282.27713	46.10111	5.15146	0.1558232	0.29886562	2.2155697	21	12 18.5	16.6
2559 Svoboda	12.4	X	153.89982	87.66934	350.21723	8.88849	0.1548081	0.21193643	2.7861146	21	5 6.8	16.9
2560 Siegma	12.0	X	295.12301	285.00644	148.32644	5.94637	0.0331607					



# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2561 Margolin	13.6	X	185.48511	275.81883	166.15504	2.48542	0.1382568	0.25995082	2.4315055	21	6 13.0	17.4
2562 Chaliapin	11.5	X	59.76633	240.61383	339.83244	10.26436	0.0417746	0.18873927	3.0099633	21	7 8.9	15.7
2563 Boyarchuk	11.7	X	302.76716	39.74326	114.56824	2.04204	0.1440412	0.17273638	3.1931073	21	—	—
2564 Kayala	13.3	X	309.96958	295.91713	153.46347	1.96491	0.1084075	0.29459631	2.2369238	21	12 21.1	15.3
2565 Grögler	14.3	X	31.42891	36.01483	343.91879	2.03374	0.2343809	0.27242570	2.3566983	21	—	—
2566 Kirghizia	12.4	X	73.16438	78.49880	51.65856	5.07877	0.0784506	0.25711274	2.4493658	21	3 27.2	15.2
2567 Elba	11.9	X	49.59221	191.03929	142.56910	8.92017	0.1411235	0.21780609	2.7358316	21	12 6.5	15.7
2568 Maksutov	13.5	X	150.88029	195.01683	87.53965	8.03214	0.1881202	0.30102478	2.2049626	21	—	—
2569 Madeline	11.0	X	151.75932	314.28888	76.22847	11.49422	0.1629091	0.23158601	2.6262002	21	3 15.6	15.2
2570 Porphyro	12.3	X	245.52183	96.14506	324.34386	16.24511	0.1066166	0.21411513	2.7671826	21	7 24.8	16.4
2571 Geisei	13.0	X	12.80436	284.56357	66.89492	2.87150	0.1944278	0.29635725	2.2280538	21	12 2.1	14.8
2572 Annschnell	13.3	X	20.81451	51.94148	200.45752	5.14044	0.1465984	0.26653835	2.3912753	21	6 30.2	15.5
2573 Hannu Olavi	11.6	X	353.62666	148.14067	54.09112	12.96613	0.1050658	0.18823971	3.0152863	21	3 14.9	15.6
2574 Ladoga	11.7	X	49.44671	306.77546	22.06902	2.10748	0.0721172	0.20495062	2.8490707	21	11 16.1	15.5
2575 Bulgaria	12.7	X	131.26987	287.23600	321.95957	4.67504	0.1236527	0.29409202	2.2394802	21	11 25.6	16.0
2576 Yesenin	11.4	X	239.83906	6.04108	311.12526	12.13842	0.1271610	0.18133455	3.0913559	21	3 3.9	16.4
2577 Litva	13.0	X	281.47222	284.16405	182.55294	22.91393	0.1762656	0.37504872	1.9043390	21	12 16.9	14.9
2578 Saint-Exupéry	11.5	X	283.97901	335.01217	55.65287	10.56127	0.0963044	0.18924843	3.0045621	21	8 4.9	15.7
2579 Spartacus	13.5	X	198.65818	333.62889	280.94200	5.77633	0.0747203	0.29993632	2.2102938	21	—	—
2580 Smilevskia	13.1	X	207.08914	221.73145	119.34092	1.61452	0.1953070	0.30564692	2.1826765	21	2 20.5	16.5
2581 Radegast	13.1	X	21.70277	193.33844	260.58457	2.49311	0.0983220	0.29474586	2.2361670	21	—	—
2582 Harimaya-Bashi	10.5	X	89.72896	233.84982	56.21917	18.12463	0.0641593	0.17219462	3.1998013	21	11 12.3	15.0
2583 Fatyanov	13.0	X	226.15951	310.44522	47.09685	6.87900	0.2096726	0.29165767	2.2519243	21	4 1.9	16.6
2584 Turkmenia	13.1	X	159.42758	238.46383	50.01009	1.43665	0.0655499	0.29639997	2.2278397	21	—	—
2585 Irpedina	12.2	X	347.39173	246.93966	136.54835	5.98604	0.2359268	0.26088065	2.4257245	21	11 27.9	14.0
2586 Matson	13.1	X	352.17695	153.83565	166.54039	4.36246	0.0897854	0.26717080	2.3875001	21	8 17.4	15.4
2587 Gardner	11.5	X	141.18646	183.53161	87.75029	2.63162	0.1553967	0.17502032	3.1652673	21	12 15.9	16.6
2588 Flavia	13.3	X	149.48764	95.48142	242.73830	2.26291	0.2116065	0.25579791	2.4577520	21	1 3.0	16.9
2589 Daniel	12.3	X	178.27920	208.74155	148.89855	2.62238	0.0811495	0.20158824	2.8806639	21	2 21.9	16.7
2590 Mourão	12.5	X	20.65235	165.79483	223.61663	6.13196	0.1170946	0.27494416	2.3422849	21	—	—
2591 Dworetzky	11.5	X	154.32417	270.20431	356.04289	1.54115	0.0411506	0.19576502	2.9375098	21	12 25.9	15.7
2592 Hunan	12.2	X	310.96437	7.04927	204.49918	1.33690	0.1228835	0.17876954	3.1208558	21	1 18.3	16.5
2593 Buryatia	13.9	X	119.05320	75.70829	63.77727	0.21334	0.0793457	0.30844453	2.1694585	21	6 9.9	16.4
2594 Acamas	11.9	X	345.31463	280.05561	356.69731	5.53647	0.0859416	0.08665161	5.0576834	21	6 6.5	18.2
2595 Gudachvili	12.3	X	225.26327	277.46049	148.40449	9.87544	0.1457209	0.21208327	2.7848284	21	7 1.9	16.8
2596 Vainu Bappu	13.1	X	231.50357	251.17457	138.86801	10.25245	0.0726911	0.18696936	3.0289289	21	6 2.1	17.8
2597 Arthur	12.0	X	258.99508	274.03389	120.45285	1.09286	0.1567678	0.18945091	3.0024209	21	6 27.1	16.3
2598 Merlin	13.2	X	235.32332	217.00008	197.74864	7.77656	0.2173786	0.21255377	2.7807173	21	6 21.9	17.9
2599 Veselí	11.5	X	57.64155	341.52048	353.31688	15.36893	0.1659366	0.24443536	2.5333393	21	12 25.2	15.4
2600 Lumme	11.7	X	1.25204	214.65078	95.38221	11.71967	0.0942977	0.18828595	3.0147926	21	8 16.6	15.5
2601 Bologna	11.4	X	67.90411	192.96279	288.15397	9.58645	0.0645765	0.17821164	3.1273657	21	3 10.6	15.8
2602 Moore	12.7	X	175.52725	65.10750	158.21657	5.54647	0.1080679	0.26786741	2.3833590	21	12 6.4	16.2
2603 Taylor	12.5	X	6.92890	280.18991	37.69072	3.04926	0.0449012	0.21232350	2.7827275	21	9 3.1	15.9
2604 Marshak	13.1	X	112.05419	134.59032	122.94489	14.84441	0.2335611	0.26735352	2.3864121	21	11 24.1	17.4
2605 Sahade	12.4	X	201.93524	182.06921	171.79810	9.42887	0.0777998	0.18117662	3.0931521	21	3 16.4	17.2
2606 Odessa	11.7	X	309.09587	353.03633	197.29549	12.44670	0.2639417	0.21492729	2.7620271	21	—	—
2607 Yakutia	13.6	X	341.82021	336.54650	359.72861	2.09191	0.2275422	0.26896395	2.3768768	21	8 20.6	14.9
2608 Seneca	17.5	X	338.89506	37.36939	167.33312	14.67197	0.5070716	0.24683415	1.5168996	21	—	—
2609 Kiril-Metodi	12.9	X	117.14383	245.53727	303.83528	5.71673	0.0873127	0.29749382	2.2223754	21	8 19.2	15.8
2610 Tuva	13.5	X	278.83096	39.80998	205.37765	0.67254	0.0983855	0.31057987	2.1595032	21	—	—
2611 Boyce	12.4	X	233.13533	139.27956	72.08494	3.32508	0.0579263	0.18599929	3.0394513	21	—	—
2612 Kathryn	11.1	X	233.45244	0.91024	132.63760	20.22546	0.1636574	0.20001898	2.8957112	21	10 8.4	15.8
2613 Plzeň	11.5	X	208.71569	194.12092	277.54026	12.99272	0.0423323	0.18533846	3.0466719	21	8 13.9	16.2
2614 Torrence	13.1	X	114.87395	228.11258	105.53234	6.91501	0.1676507	0.27559121	2.3386172	21	—	—
2615 Saito	12.5	X	169.06488	343.89939	322.61698	4.24578	0.1512769	0.17384793	3.1794820	21	—	—
2616 Lesya	12.5	X	349.19989	200.97693	146.73226	1.44495	0.0766053	0.30987788	2.1627633	21	9 30.3	14.4
2617 Jiangxi	10.4	X	43.55979	350.09447	73.23582	12.96310	0.2375739	0.17594656	3.1541489	21	—	—
2618 Coonabarabran	12.5	X	301.52676	76.82779	281.28959	9.22774	0.1189786	0.18756513	3.0225116	21	7 10.3	16.4
2619 Skalná Pleso	12.8	X	34.82125	70.87977	204.19781	1.12075	0.0442729	0.18847212	3.0128069	21	8 13.4	16.9
2620 Santana	12.8	X	147.09577	317.01101	72.93012	3.08776	0.0725543	0.20389590	2.8588874	21	2 27.8	16.9
2621 Goto	10.9	X	308.95586	271.95147	95.74976	13.03907	0.1758478	0.18204637	3.0832923	21	7 27.8	14.7
2622 Bolzano	11.8	X	51.12932	216.87271	134.54883	11.02149	0.0988904	0.18944996	3.0024311	21	12 18.2	16.1
2623 Zech	13.3	X	12.00949	22.68504	349.07405	4.05558	0.2347441	0.29114865	2.2545482	21	—	—
2624 Samitchell	10.8	X	221.91732	138.89061	161.50841	2.79747	0.1181119	0.12551940	3.9505917	21	2 7.6	16.8
2625 Jack London	13.4	X	258.83309	170.80844	128.72865	4.46095	0.1411098	0.30286109	2.1960407	21	2 17.4	16.4
2626 Belnika	11.7	X	188.30745	119.75994	355.78443	1.48926	0.0229493	0.20456571	2.8526435	21	8 1.5	15.7
2627 Churyumov	12.2	X	228.09566	314.16291	109.59874	2.50007	0.1474211	0.17986386	3.1081844	21	6 30.1	17.2
2628 Kopal	12.7	X	123.53240	148.10131	206.52082	1.34027	0.17474813	0.19849257	2.9105376	21	—	—
2629 Rudra	15.1	X	341.67720	280.72851	343.44195	23.44210	0.2289328	0.42930954	1.7402929	21	3 7.8	15.8
2630 Hermod	11.9	X	187.41035	23.89837	2.82568	1.91503	0.1265442	0.18301274	3.0724289	21	4 9.9	16.7
2631 Zhejiang	11.9	X	234.71629	18.94169	24.73912	9.58359	0.1620571	0.21081891	2.7959518	21	6 10.9	16.4
2632 Guizhou	11.6	X	307.70546	312.12637	18.26367	10.45414	0.1099009	0.18623904	3.0368423	21	6 12.8	15.8
2633 Bishop	13.1	X	71.94044	266.38094	62.38618	3.12613	0.1386876	0.29706147	2.2245312	21	—	—
2634 James Bradley	10.5	X	76.77875	332.95873	133.34750	6.42158	0.0487596	0.15321091	3.4589391	21	3 12.7	15.3
2635 Huggins	12.7	X	273.92237	270.93125	276.93156	4.16769	0.0791366	0.29567417	2.2314841	21	—	—
2636 Lassell	11.7	X	119.32259	152.09561	98.48935	10.47186	0.0790421	0.18948575	3.0020529	21	11 4.0	16.3
2637 Bobrovnikoff	13.1	X	31.46031	343.50982	356.09754	4.93262	0.2350226	0.29113334	2.2546273	21	12 18.3	15.9
2638 Gadolín	11.9	X	325.85656	172.69075	245.78710	14.33792	0.0810792	0.24141059	2.5544564	21	11 19.6	14.8
2639 Planman	13.2	X	52.06246	167.31276	79.11869	9.66583	0.1932010	0.25771062	2.4455761	21	9 1.8	16.2
2640 Hällström	13.0	X	206.27939	191.97640								

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2641 Lipschutz	12.9	X	257.35960	164.69092	27.62540	9.02429	0.1345549	0.26889725	2.3772698	21	—	—
2642 Vésale	12.7	X	287.74088	165.61153	201.15282	14.49672	0.1846230	0.26089538	2.4256332	21	6 20.3	16.0
2643 Bernhard	14.3	X	342.88746	65.69830	348.47155	22.96092	0.2736940	0.26878202	2.3779492	21	—	—
2644 Victor Jara	13.4	X	20.50660	309.46133	347.59421	2.68131	0.1658350	0.30820301	2.1705917	21	9 19.2	15.1
2645 Daphne Plane	12.0	X	336.58141	80.03519	349.73668	13.79520	0.1050020	0.26656891	2.3910926	21	—	—
2646 Abetti	11.4	X	318.96036	36.95303	352.21007	9.67569	0.0948211	0.18817977	3.0159265	21	9 19.7	15.2
2647 Sova	12.7	X	8.28073	122.56649	290.57678	3.93666	0.1364123	0.29324782	2.2437761	21	—	—
2648 Owa	13.0	X	2.51678	131.45136	279.89594	4.79580	0.1734429	0.29200065	2.2501605	21	—	—
2649 Oongaq	12.0	X	185.34860	169.60249	245.23550	12.20723	0.1426491	0.23163960	2.6257952	21	5 8.9	16.2
2650 Elinor	11.1	X	192.94978	23.68046	332.34275	13.92220	0.1974354	0.23025478	2.6363128	21	3 4.5	15.6
2651 Karen	11.8	X	303.60748	276.24721	126.34163	17.76960	0.3255331	0.19087422	2.9874768	21	8 10.7	15.2
2652 Yabuuti	12.8	X	183.10977	295.11662	64.43716	6.99613	0.0829503	0.23024350	2.6363990	21	3 1.0	16.8
2653 Principia	12.2	X	198.98320	317.62935	194.37054	4.75156	0.0801224	0.25789532	2.4444083	21	10 1.1	15.7
2654 Ristenpart	12.8	X	36.22654	40.05605	206.40072	7.43316	0.0929492	0.18498465	3.0505555	21	7 12.5	16.8
2655 Guangxi	11.5	X	55.90599	353.12620	87.81861	17.18632	0.1639908	0.17304477	3.1893124	21	1 19.2	15.3
2656 Evenkia	13.3	X	207.30583	75.81157	95.93322	3.19785	0.0804580	0.29103049	2.2551584	21	11 12.1	16.0
2647 Bashkiria	12.1	X	84.26728	13.53141	50.19911	2.24315	0.1589048	0.17434233	2.1734682	21	2 9.3	16.2
2658 Gingerich	12.4	X	236.71199	321.46375	213.97530	9.50144	0.2907515	0.18388427	3.0627132	21	11 8.9	17.3
2659 Millis	11.7	X	194.29804	332.34247	156.89395	1.32975	0.1005126	0.17710994	3.1403214	21	8 20.9	16.6
2660 Wasserman	12.0	X	5.38854	86.95701	203.83078	12.33764	0.1689076	0.23247812	2.6194774	21	7 25.7	14.8
2661 Bydžovský	11.5	X	260.04820	115.96538	321.05008	9.94231	0.0894002	0.18657671	3.0331770	21	8 29.3	15.8
2662 Kandinsky	14.0	X	287.91048	100.40239	339.41924	2.91494	0.1567503	0.25852070	2.4404645	21	10 10.6	16.6
2663 Miltiades	13.7	X	336.81265	82.71682	28.42296	6.21802	0.1390452	0.29527644	2.2334874	21	—	—
2664 Everhart	13.9	X	215.63171	207.07100	167.68824	3.25945	0.1823488	0.26844194	2.3799571	21	4 15.4	17.8
2665 Schrutka	13.1	X	229.18539	288.39308	275.91644	4.78948	0.0855162	0.29260622	2.2470549	21	—	—
2666 Gramme	11.7	X	87.77946	208.05158	200.43772	13.44500	0.2256019	0.17400719	3.1775417	21	1 31.7	16.1
2667 Oikawa	12.0	X	133.78896	307.00679	60.06139	2.23765	0.1890266	0.17002958	3.2269065	21	2 3.5	17.0
2668 Tataria	13.4	X	236.11298	63.30723	298.04359	3.15542	0.0783663	0.27957952	2.3163231	21	4 20.6	16.6
2669 Shostakovich	13.2	X	259.50722	95.62559	292.40495	7.79147	0.2208730	0.21291310	2.7775878	21	6 11.3	17.5
2670 Chuvashia	11.0	X	172.06285	167.42496	284.89965	9.85665	0.0730112	0.17472269	3.1688609	21	6 13.3	15.9
2671 Abkhazia	13.0	X	115.46896	157.34303	228.04998	1.48169	0.1192807	0.23382995	2.6093718	21	1 14.3	16.4
2672 Písek	12.4	X	324.22864	152.71492	128.99952	14.14167	0.1484639	0.23337984	2.6127257	21	5 1.1	15.8
2673 Lossignol	12.5	X	29.56409	179.34687	71.37276	2.27686	0.1516545	0.17157690	3.2074767	21	7 15.6	16.2
2674 Pandarus	9.1	X	50.12202	41.33284	179.75489	1.85406	0.0701356	0.08332643	5.1913568	21	6 28.9	15.7
2675 Tolkien	12.2	X	155.51714	2.16471	5.83389	2.75150	0.1014703	0.29936709	2.2130948	21	1 27.2	14.8
2676 Aarhus	12.9	X	201.83969	45.93732	289.57083	4.55867	0.1267652	0.26448904	2.4036115	21	2 10.6	16.6
2677 Joan	11.5	X	199.03133	18.40278	194.62214	10.09772	0.0524945	0.19060033	2.9903380	21	12 10.5	16.0
2678 Aavasaksa	12.5	X	249.91995	46.16514	53.96475	3.44246	0.0855083	0.28999591	2.2605188	21	9 29.8	15.1
2679 Kittisvaara	12.0	X	355.50036	281.29163	208.16071	10.09646	0.1019999	0.23220880	2.6215024	21	—	—
2680 Mateo	13.1	X	81.33235	336.69852	2.97091	2.43318	0.2145270	0.26455075	2.4032377	21	—	—
2681 Ostrovskij	12.3	X	283.27127	61.76256	66.71028	3.97594	0.1932147	0.21680544	2.7442432	21	11 26.9	15.3
2682 Soromundi	13.3	X	87.00223	183.06171	127.25583	5.49597	0.1699979	0.28818589	2.2699741	21	12 31.8	16.8
2683 Brian	11.8	X	169.03877	18.71949	342.17190	1.48073	0.0580629	0.19788693	2.9164731	21	2 15.1	15.9
2684 Douglas	11.6	X	86.70262	109.96234	150.66968	9.93906	0.0478664	0.18509173	3.0493787	21	10 5.2	16.0
2685 Masursky	12.1	X	342.72436	287.99222	215.32894	12.12292	0.1111259	0.23936897	2.5689608	21	—	—
2686 Linda Susan	11.7	X	317.44005	287.58091	225.67826	9.32585	0.0543352	0.18935081	3.0034790	21	—	—
2687 Tortali	11.9	X	204.32928	255.38274	49.71770	10.08096	0.1240710	0.24648612	2.5192682	21	1 11.8	15.9
2688 Halley	11.8	X	302.43815	188.77108	95.23240	3.44953	0.1438131	0.17473656	3.1686932	21	4 5.5	16.2
2689 Bruxelles	13.4	X	276.69827	10.84546	190.58457	5.50821	0.1184220	0.29551015	2.2323097	21	—	—
2690 Ristiina	11.3	X	34.31893	263.00333	135.89944	11.44965	0.1110705	0.18630306	3.0361465	21	—	—
2691 Sersic	13.3	X	2.92719	277.22403	319.83518	3.59374	0.1120487	0.29314837	2.2442835	21	4 22.7	15.3
2692 Chkalov	12.1	X	201.12782	299.24875	236.24742	9.28297	0.1832250	0.23764957	2.5813369	21	10 21.4	16.3
2693 Yan'an	13.1	X	0.23663	346.26083	59.75762	7.30024	0.1801099	0.29414188	2.2392271	21	—	—
2694 Pino Torinese	13.5	X	60.51952	344.09349	249.89287	1.59265	0.1045750	0.28094551	2.3088089	21	8 7.9	16.0
2695 Christabel	12.0	X	166.47550	289.81546	62.98402	14.88950	0.0761758	0.22091439	2.7101087	21	2 4.7	16.2
2696 Magion	12.2	X	343.50777	283.78971	186.14625	25.34378	0.1147183	0.25700968	2.4500206	21	—	—
2697 Albina	10.6	X	220.89445	131.06843	270.95635	3.58239	0.0793670	0.14689798	3.5573409	21	6 3.9	16.0
2698 Azerbajdzhan	12.2	X	96.31451	241.92105	206.46431	6.89618	0.0539870	0.22689992	2.6622356	21	2 28.8	15.7
2699 Kalinin	11.6	X	199.91668	295.46899	63.97156	16.14300	0.1682393	0.22992250	2.6388522	21	3 25.0	16.2
2700 Baikonur	12.0	X	358.03107	277.34597	171.23714	2.40601	0.0430604	0.19888212	2.9067358	21	—	—
2701 Cherson	12.6	X	242.83204	292.95771	13.59123	6.28722	0.1321617	0.17373807	3.1808222	21	3 1.0	17.6
2702 Batrakov	11.8	X	52.87927	324.06703	243.18282	1.61594	0.0999384	0.15669644	3.4074537	21	6 18.4	16.2
2703 Rodari	13.6	X	346.93063	170.82911	49.42095	6.03084	0.0565261	0.30340008	2.1934391	21	3 9.5	15.9
2704 Julian Loewe	12.7	X	342.98175	253.65563	207.25847	4.51626	0.0965887	0.26766054	2.3845869	21	—	—
2705 Wu	13.3	X	226.23513	334.81087	8.27673	4.52247	0.1598019	0.30412768	2.1899393	21	3 12.8	16.6
2706 Borovský	11.9	X	176.64223	100.03854	50.65319	10.83354	0.0359619	0.18733613	3.0249743	21	9 5.8	16.5
2707 Uferji	11.7	X	290.72317	343.94893	79.41702	2.66006	0.1179641	0.17230610	3.1984209	21	9 19.3	15.9
2708 Burns	12.1	X	86.64922	330.96246	111.64425	2.78277	0.1778597	0.18219565	3.0816079	21	3 9.4	16.1
2709 Sagan	13.2	X	23.83957	307.92291	241.10935	2.73252	0.0692825	0.30302078	2.1952692	21	3 18.2	15.2
2710 Veverka	13.3	X	158.26491	34.82169	144.42868	3.11529	0.1308817	0.26091847	2.4254901	21	9 22.2	17.1
2711 Aleksandrov	11.7	X	63.74594	205.18330	157.57474	10.27290	0.0946652	0.18900729	3.0071171	21	—	—
2712 Keaton	13.7	X	63.32769	333.93692	169.86992	0.82025	0.0369264	0.31008308	2.1618091	21	3 15.3	15.9
2713 Luxembourg	11.4	X	332.48602	300.51452	339.62141	1.34994	0.0229685	0.20447329	2.8535030	21	5 23.2	15.2
2714 Matti	12.9	X	214.25931	144.69701	134.14076	6.09828	0.2050457	0.29311721	2.2444426	21	—	—
2715 Mielikki	11.4	X	144.31253	144.31286	200.61447	6.74428	0.1500502	0.21768231	2.7368687	21	1 5.2	15.6
2716 Tuulikki	13.2	X	149.58317	164.40927	218.41698	5.95110	0.1060088	0.27024399	2.3693653	21	2 11.3	16.5
2717 Tellervo	12.2	X	231.12081	163.59647	164.82461	3.28536	0.2181287	0.29902285	2.2147929	21	2 25.0	15.6
2718 Handley	11.9	X	262.69524	265.79340	44.48000	1.49230	0.1554996	0.17894677	3.1187949	21	3 20.5	16.6
2719 Suzhou	13.0	X	13.30091	321.43342	125.65301	0.62452	0.1230729	0.30452663	2.1880263	21	—	—
2720 Pyotr Pervyj	14.2	X	263.81237	236.58412	113.41364	3.28955	0.2038179	0.27715296</				

## ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2721 Vsekhsvyatskij	12.3	X	73.54687	283.83942	84.77650	2.23287	0.1688173	0.16895571	3.2405655	21	—	—
2722 Abalakin	12.3	X	295.65517	111.72181	133.53997	1.67740	0.1407350	0.17157940	3.2074455	21	2 8.8	16.9
2723 Gorshkov	13.1	X	244.26237	227.31859	153.08100	2.08164	0.2004656	0.17924577	3.1153255	21	5 21.8	18.1
2724 Orlov	11.6	X	264.51702	144.23414	153.63736	3.98219	0.1202112	0.19697729	2.9254451	21	3 8.9	15.8
2725 David Bender	10.8	X	5.92759	28.43466	61.52582	15.55576	0.1520670	0.18653812	3.0335953	21	—	—
2726 Kotelnikov	12.2	X	205.14245	47.00421	355.68724	1.55818	0.0760948	0.20406183	2.8573374	21	5 16.2	16.3
2727 Paton	12.2	X	229.70619	281.02676	202.03977	3.51109	0.1018145	0.23360696	2.6110320	21	9 23.9	15.7
2728 Yatskiv	12.6	X	4.57772	97.25569	201.26757	2.60809	0.1667042	0.25588116	2.4572189	21	8 9.9	14.7
2729 Urumqi	11.5	X	224.46865	266.98770	64.03478	3.17037	0.0677063	0.20076828	2.8885018	21	3 11.7	15.8
2730 Barks	11.8	X	17.78671	273.40262	4.63387	6.42990	0.1307607	0.21953746	2.7214287	21	8 3.7	14.9
2731 Cucula	10.9	X	281.54554	133.28873	150.65721	13.35173	0.1892413	0.17306256	3.1890938	21	3 5.9	15.8
2732 Witt	11.9	X	21.71469	281.31368	144.94561	6.49688	0.0239091	0.21496484	2.7598857	21	—	—
2733 Hamina	12.9	X	101.97133	353.10237	121.47658	10.41205	0.1374987	0.27425525	2.3462057	21	4 27.6	16.0
2734 Hašek	11.8	X	41.61094	141.69184	36.96112	16.54528	0.0160488	0.17537216	3.1610324	21	4 19.2	16.1
2735 Ellen	14.4	X	69.30408	59.77417	344.56122	23.05716	0.0547748	0.38946224	1.8570595	21	—	—
2736 Ops	13.2	X	31.58564	64.67621	255.46364	7.45761	0.0853202	0.28430228	2.2905995	21	10 24.4	15.8
2737 Kotka	11.8	X	172.47541	105.22332	339.44969	8.82524	0.1955887	0.21673291	2.7448554	21	6 4.7	16.6
2738 Viracocha	12.6	X	26.37151	266.28429	290.66126	1.11427	0.1138777	0.21985304	2.7188238	21	4 18.4	15.5
2739 Taguacipa	13.4	X	24.77675	36.34991	267.32095	1.16663	0.1296853	0.25584500	2.4574504	21	9 23.5	15.8
2740 Tsoj	11.4	X	85.49609	94.24765	197.72358	9.37236	0.0708407	0.18974711	2.9929956	21	11 13.2	15.7
2741 Valdivia	11.9	X	109.83025	91.40038	151.08940	10.29557	0.1828037	0.23404020	2.6078088	21	10 27.7	16.2
2742 Gibson	12.0	X	209.06909	286.50294	122.76957	3.16246	0.0678328	0.19875971	2.9079291	21	5 30.5	16.3
2743 Chengdu	12.3	X	337.29490	137.01891	252.21670	12.28411	0.1736055	0.22788561	2.6545533	21	10 24.3	15.0
2744 Birgitta	14.7	X	37.63615	43.96932	315.53986	6.74455	0.3323194	0.28225780	2.3016471	21	—	—
2745 San Martín	13.3	X	273.25172	303.80213	137.74800	22.40515	0.1888231	0.28446776	2.2897110	21	9 23.6	16.2
2746 Hissao	13.2	X	24.24761	322.21123	177.15330	3.97665	0.0851725	0.29241038	2.2480581	21	1 5.8	15.6
2747 Český Krumlov	11.9	X	77.49572	300.98630	344.76679	5.82375	0.1288708	0.18085116	3.0968620	21	10 30.3	16.5
2748 Patrick Gene	12.5	X	94.84585	347.66766	350.27932	4.21988	0.1336884	0.20965682	2.8062738	21	—	—
2749 Waltherhorn	12.6	X	245.71811	74.51571	354.86335	0.32046	0.1636072	0.17303053	3.1894874	21	7 25.6	17.3
2750 Lovisa	13.3	X	151.64690	81.95354	45.87257	5.17246	0.0749435	0.29948591	2.2125094	21	7 5.8	16.1
2751 Campbell	13.0	X	201.66265	201.43075	246.26977	1.48953	0.1732378	0.26391829	2.4070756	21	7 5.3	16.6
2752 Wu Chien-Shiung	11.6	X	205.73745	198.53206	186.28607	10.13480	0.1118506	0.18767492	3.0213328	21	4 26.7	16.3
2753 Duncan	12.4	X	348.21286	128.84691	344.41015	6.85830	0.0378773	0.21148934	2.7900397	21	—	—
2754 Efimov	13.6	X	155.10400	91.20946	275.11836	5.71179	0.2320099	0.29630362	2.2283227	21	2 6.9	16.8
2755 Avicenna	13.3	X	330.25585	148.91199	232.26474	4.56305	0.2573867	0.20491977	2.8493567	21	9 17.6	15.7
2756 Dzhangar	13.3	X	162.26632	20.49316	350.47486	5.72952	0.1133400	0.24174206	2.5521209	21	2 19.1	17.0
2757 Crisser	11.9	X	260.46495	49.98937	10.08683	0.67920	0.1961739	0.17415227	3.1757767	21	7 26.1	16.5
2758 Cordelia	13.9	X	153.32104	67.24884	335.17115	2.78951	0.2789208	0.24216355	2.5491587	21	4 1.3	18.2
2759 Idomeneus	10.0	X	218.11280	8.49089	171.22215	21.93820	0.0647775	0.08331391	5.1918766	21	11 8.8	17.3
2760 Kacha	10.1	X	282.12464	150.61880	352.49683	13.48429	0.1191519	0.12368859	3.9894800	21	11 30.9	15.7
2761 Eddington	12.3	X	178.00576	101.10200	30.98128	3.16658	0.1772828	0.18111689	3.0938321	21	8 8.8	17.4
2762 Fowler	12.9	X	121.84265	186.16472	304.06081	4.70619	0.1523819	0.27707078	2.3302842	21	6 10.6	16.1
2763 Jeans	12.3	X	145.13252	33.86383	308.70808	3.54198	0.2179258	0.26442510	2.4039989	21	1 3.4	15.7
2764 Moeller	13.2	X	322.36166	252.27223	283.77431	1.99138	0.0840219	0.29266676	2.2467450	21	—	—
2765 Dinant	12.2	X	120.87040	128.85288	348.05666	14.04825	0.0548454	0.17670260	3.1451456	21	5 9.9	17.0
2766 Leeuwenhoek	12.9	X	282.41938	147.81350	330.18926	6.55531	0.1832282	0.24277509	2.5448761	21	11 16.4	15.7
2767 Takenouchi	11.7	X	186.78869	253.46053	65.84818	10.88435	0.0807458	0.18744399	3.0238137	21	1 19.9	16.4
2768 Gorky	12.2	X	199.18435	335.12659	53.26935	6.27708	0.1712704	0.29521890	2.2337777	21	4 16.7	15.6
2769 Mendeleev	12.2	X	92.52071	46.96354	102.35146	2.52197	0.1268806	0.17722938	3.1389103	21	6 1.1	16.6
2770 Tsvet	12.8	X	96.99981	135.24425	38.73760	2.85892	0.0632859	0.30829782	2.1701466	21	6 27.7	15.1
2771 Polzunov	12.5	X	304.80170	116.73457	207.36280	13.96120	0.2277431	0.22506881	2.6766557	21	5 12.4	15.9
2772 Dugan	14.0	X	305.41828	311.56530	130.54907	9.79596	0.2030207	0.27985101	2.3148248	21	11 24.0	15.8
2773 Brooks	13.1	X	299.50262	296.46480	101.18005	3.66923	0.1425594	0.27733429	2.3288079	21	9 5.8	15.3
2774 Tenojoki	11.3	X	284.69334	107.27973	290.93477	8.51947	0.1390778	0.17287318	3.1914225	21	8 3.6	15.8
2775 Odishaw	13.6	X	327.97922	306.17608	102.15616	3.73115	0.1851757	0.26148944	2.4219580	21	11 16.1	15.4
2776 Baikal	12.8	X	330.81060	320.96995	187.46596	4.78761	0.1758101	0.27062875	2.3671190	21	—	—
2777 Shukshin	12.9	X	62.90538	95.10762	36.83544	4.90752	0.0913941	0.27011848	2.3700992	21	3 12.3	15.3
2778 Tangshan	13.2	X	73.70844	286.42150	91.92494	4.61416	0.1209193	0.28600813	2.2814825	21	—	—
2779 Mary	13.3	X	51.20884	122.83672	80.27046	3.89145	0.0621168	0.29962531	2.2118231	21	5 30.1	15.4
2780 Monnig	13.6	X	108.27809	312.52461	274.91794	5.46544	0.1162279	0.30321276	2.1943424	21	10 2.2	16.8
2781 Kleczek	11.9	X	302.66041	256.03354	146.62602	2.31668	0.1794676	0.17547930	3.1597456	21	8 31.6	15.8
2782 Leonidas	13.7	X	331.50678	312.25300	10.33579	3.78160	0.2222893	0.22461749	2.6802399	21	6 27.9	16.2
2783 Chernyshevskij	13.3	X	140.39690	170.92555	198.28483	0.78325	0.1636401	0.24044303	2.5613048	21	1 28.9	16.8
2784 Domeyko	12.8	X	201.34920	180.84376	108.09160	6.69474	0.1733753	0.29358026	2.2420820	21	—	—
2785 Sedov	12.4	X	210.39294	94.05490	334.40816	1.43820	0.0439543	0.20245375	2.8724479	21	6 26.6	16.4
2786 Grinevia	11.9	X	44.84033	20.49407	9.10249	13.22120	0.1738479	0.23416880	2.6068539	21	—	—
2787 Tovarishch	11.4	X	343.41885	65.47287	30.13415	10.30785	0.0589533	0.18784766	3.0194802	21	—	—
2788 Andenne	13.2	X	315.62932	132.17935	14.43415	2.61570	0.1002654	0.24055105	2.5605379	21	—	—
2789 Foshan	13.6	X	186.65624	141.24162	242.68379	3.81763	0.1638783	0.29650432	2.2273170	21	3 26.4	17.1
2790 Needham	12.6	X	314.86658	359.04863	50.67565	14.61683	0.1787935	0.22797505	2.6538589	21	10 15.9	15.3
2791 Paradise	12.4	X	343.82335	165.69896	336.04918	31.09346	0.1729339	0.26576853	2.3958908	21	—	—
2792 Ponomarev	13.2	X	43.87714	72.04142	16.62014	9.36495	0.1287086	0.28686314	2.7694688	21	—	—
2793 Valdag	11.4	X	89.50013	189.24331	356.33049	22.10040	0.0296253	0.17493678	3.1662750	21	7 2.8	16.3
2794 Kulik	13.1	X	30.80083	76.44294	330.50564	7.49628	0.2149878	0.25769978	2.4456446	21	—	—
2795 Lepage	12.9	X	291.16786	286.96813	213.34101	6.04067	0.0290722	0.28341685	2.2953677	21	—	—
2796 Kron	12.2	X	178.86658	55.17386	158.36712	14.01334	0.1124686	0.22947121	2.6423109	21	11 24.0	16.5
2797 Teucer	8.7	X	277.43678	48.17196	69.93647	22.38841	0.0880371	0.08536149	5.1085155	21	11 4.7	15.5
2798 Vergilius	13.2	X	36.92802	174.59037	219.42458	5.32148	0.0575864	0.26218764	2.4176564	21	—	—
2799 Justus	14.2	X	218.42074	20.17603	283.04506	5.30063	0.1266413	0.26693249	2.3889208	21	1 18.0	17.7
2800 Ovidius	12.7	X	14.49154	181.52381	102.40961	3.08393	0.1528025	0.1766388				

# ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2801 Huygens	11.9 <sup>m</sup>	X	126.16163 <sup>o</sup>	314.40995 <sup>o</sup>	34.10760	9.55294 <sup>o</sup>	0.1712659	0.21008674 <sup>o</sup>	2.8024441	21	—	—
2802 Weisell	10.9	X	306.01873	59.22539	129.33698	9.61392	0.1230239	0.17938383	3.1137270	21	—	—
2803 Vilho	12.0	X	143.04948	42.78623	20.79826	1.33019	0.1792419	0.17717855	3.1395106	21	4 16.4	16.8
2804 Yrjö	11.3	X	48.12934	173.26515	109.14437	11.22374	0.0790935	0.18818743	3.0158448	21	9 20.6	15.5
2805 Kalle	12.5	X	34.50151	309.85296	49.08914	6.88092	0.1444734	0.22299460	2.6932282	21	12 18.8	16.0
2806 Graz	13.2	X	341.46914	313.76944	116.04239	2.34036	0.0455797	0.26872929	2.3782603	21	—	—
2807 Karl Marx	12.8	X	307.81320	93.08740	28.24772	7.86550	0.1830469	0.21119939	2.7925928	21	—	—
2808 Belgrano	11.4	X	0.38174	116.32054	314.31947	8.96471	0.0802379	0.18907165	3.0064347	21	—	—
2809 Vernadskij	13.5	X	115.03105	348.52731	357.15426	2.47407	0.1798323	0.26040674	2.4286666	21	—	—
2810 Lev Tolstoj	12.5	X	357.57777	259.84390	193.16915	12.70450	0.1536836	0.23424293	2.6063039	21	—	—
2811 Střemchoví	11.8	X	295.91696	113.56533	331.67760	1.03053	0.0335685	0.20333706	2.8641232	21	11 6.1	15.5
2812 Scaltriti	13.1	X	74.37603	100.49701	68.17827	6.81445	0.0913687	0.29713858	2.2241463	21	5 20.6	15.3
2813 Zappalà	10.9	X	349.76444	247.39620	231.77444	14.76092	0.1537514	0.17751036	3.1355970	21	—	—
2814 Vieira	12.2	X	257.28141	179.25618	154.02508	2.46218	0.0713905	0.20295996	2.8676697	21	4 18.9	16.2
2815 Soma	12.7	X	221.66010	237.80843	119.81080	5.70561	0.1688183	0.29541034	2.2328125	21	3 29.9	16.1
2816 Pien	12.0	X	219.88372	264.87379	93.65372	7.71273	0.1887663	0.21893261	2.7264388	21	4 5.7	16.7
2817 Perec	14.0	X	270.44584	97.45983	254.70219	2.27344	0.1789743	0.27235367	2.3571139	21	5 9.1	17.2
2818 Juvenalis	14.1	X	69.82443	100.50924	60.92416	2.95689	0.1503519	0.26913686	2.3758586	21	5 13.9	16.6
2819 Ensor	11.9	X	64.88426	344.23953	18.25371	2.43070	0.2017137	0.21504901	2.7591655	21	—	—
2820 Iisalmi	12.9	X	223.00172	160.15983	216.73754	2.94686	0.1619732	0.29619222	2.2288814	21	4 22.7	16.3
2821 Slávka	13.4	X	49.39692	349.60324	58.63804	6.73192	0.1949876	0.25863046	2.4397740	21	—	—
2822 Sacajawea	12.6	X	60.93763	20.87021	93.19211	14.72929	0.1423857	0.23753586	2.5821607	21	2 25.4	15.7
2823 van der Laan	13.2	X	79.81028	127.70902	248.46702	3.82010	0.0903393	0.26328581	2.4109290	21	—	—
2824 Franke	13.2	X	312.23720	71.96507	312.57841	3.36574	0.2071098	0.27777124	2.3263650	21	8 28.8	14.9
2825 Crosby	13.3	X	177.26813	81.94829	329.36718	3.51921	0.1742688	0.29295192	2.2452868	21	4 23.0	16.8
2826 Ahti	11.1	X	244.35815	147.22394	33.60491	15.44760	0.0491421	0.17046566	3.2214010	21	12 18.7	15.9
2827 Vellamo	12.2	X	175.05878	206.60502	345.46335	8.62695	0.0314230	0.28094461	2.3088138	21	10 28.8	15.3
2828 Iku-Turso	13.0	X	286.37106	24.40675	74.37252	3.30393	0.0896107	0.29366928	2.2416288	21	11 23.2	14.9
2829 Bobhope	10.8	X	166.29293	339.59480	323.93120	14.29685	0.1874447	0.18138487	3.0907841	21	—	—
2830 Greenwich	12.5	X	97.86377	141.30774	48.98652	25.34653	0.2047205	0.26855006	2.3793183	21	8 25.5	16.7
2831 Stevin	12.6	X	125.33066	273.00250	81.92631	4.21823	0.1975625	0.29680198	2.2582876	21	—	—
2832 Lada	12.3	X	333.60980	346.59834	162.63539	4.17069	0.0877172	0.25304781	2.4755269	21	—	—
2833 Radishchev	11.8	X	287.47426	349.91417	336.75650	1.33331	0.0683564	0.20221428	2.8747153	21	5 17.1	15.6
2834 Christy Carol	11.8	X	278.24995	280.03343	208.35539	6.43263	0.1602953	0.24351898	2.5396908	21	11 30.5	14.7
2835 Ryoma	12.1	X	229.97696	350.10705	5.27411	1.33234	0.0806866	0.21671756	2.7449850	21	4 12.6	16.2
2836 Sobolev	11.5	X	184.20669	320.23362	348.06478	9.65921	0.0916585	0.18939831	3.0029769	21	1 4.6	16.3
2837 Griboedov	11.9	X	331.82390	0.43636	61.81499	2.88005	0.0568905	0.19933160	2.9023645	21	11 24.9	15.5
2838 Takase	14.2	X	302.67287	333.22086	80.32765	2.12925	0.1889025	0.27499365	2.3420039	21	9 29.4	16.1
2839 Annette	12.9	X	259.03298	6.58900	44.54807	4.80732	0.1502165	0.29860124	2.2168773	21	7 22.7	15.7
2840 Kallavesi	12.6	X	225.94842	263.67901	59.04553	8.50791	0.0931380	0.26531291	2.3986329	21	2 24.2	16.2
2841 Puijo	13.0	X	41.22410	88.88017	91.57631	4.91499	0.0842314	0.29159786	2.2522322	21	4 12.3	15.2
2842 Unsöld	11.5	X	75.25182	202.97549	310.04012	11.70067	0.1006753	0.23287817	2.6164767	21	4 30.0	15.0
2843 Yeti	13.1	X	331.86233	255.61288	256.04904	5.46188	0.1301927	0.28287484	2.2982989	21	—	—
2844 Hess	13.3	X	8.40679	151.37018	127.71850	2.95541	0.1711649	0.29774124	2.2211440	21	7 20.3	14.6
2845 Franklinken	13.3	X	285.94550	135.38012	144.33713	6.01712	0.1621794	0.28986783	2.2611847	21	2 19.8	16.4
2846 Ylppö	11.4	X	191.17537	72.07692	144.48208	11.43442	0.0729110	0.17053885	3.2204792	21	12 2.9	16.4
2847 Parvati	12.7	X	82.67857	12.36019	246.89706	2.45291	0.1163436	0.30851510	2.1691276	21	10 18.7	15.4
2848 ASP	11.7	X	317.10581	51.00563	338.69445	0.91257	0.1915053	0.17136183	3.2101598	21	9 5.7	15.2
2849 Shklovskij	13.0	X	222.27483	300.88667	44.03548	6.81031	0.0096949	0.23981748	2.5657568	21	3 25.4	16.5
2850 Mozhaiskij	12.7	X	355.10159	345.89300	106.12618	7.85304	0.0499687	0.25716018	2.4490646	21	—	—
2851 Harbin	12.3	X	319.34915	16.39809	50.29885	8.53674	0.1215245	0.25246321	2.4793470	21	11 21.8	14.9
2852 Declercq	12.7	X	184.18093	257.20833	110.10222	1.70153	0.0852264	0.21201925	2.7533890	21	3 11.3	16.8
2853 Harvill	13.0	X	350.87790	202.06902	204.28568	4.15754	0.1437805	0.27454307	2.3445656	21	12 29.6	15.3
2854 Rawson	12.8	X	167.45936	280.52135	292.31167	5.76447	0.1225197	0.30110206	2.2045853	21	11 16.3	16.0
2855 Bastian	13.2	X	71.54345	100.60535	339.02701	8.14540	0.1689774	0.25644412	2.4536214	21	1 22.4	15.5
2856 Röser	11.1	X	233.62559	202.75723	16.79527	9.89426	0.0086774	0.18710241	3.0274928	21	—	—
2857 NOT	12.6	X	141.79056	331.16051	149.82646	5.73298	0.0952834	0.26508717	2.3999945	21	6 16.2	16.0
2858 Carlosporter	13.5	X	213.26176	182.04293	128.54952	6.69950	0.1943960	0.28871464	2.2672018	21	1 20.6	17.1
2859 Paganini	13.3	X	143.95784	341.03377	165.28972	3.55530	0.1177481	0.29412816	2.2392967	21	7 24.5	16.5
2860 Pasacentennium	12.7	X	344.89333	70.70014	334.45778	22.69143	0.2148512	0.27670532	2.3323356	21	—	—
2861 Lambrecht	12.7	X	54.31747	226.38341	188.44623	4.04233	0.0722740	0.25359894	2.4719391	21	—	—
2862 Vavilov	12.8	X	255.99413	278.65784	225.73321	3.48392	0.1150876	0.30192376	2.2005835	21	12 7.9	15.0
2863 Ben Mayer	12.4	X	34.41574	219.60830	120.78144	1.96952	0.1920411	0.17502131	3.1652554	21	11 23.3	16.4
2864 Soderblom	13.0	X	139.41943	11.12948	135.16281	3.14309	0.1483633	0.21627856	2.7486983	21	7 20.7	17.3
2865 Laurel	11.4	X	47.26310	294.09264	321.76443	14.29590	0.0709921	0.24033236	2.5620910	21	8 12.6	14.6
2866 Hardy	11.8	X	21.58272	25.06931	317.00303	8.22667	0.2051444	0.19866882	2.9088160	21	11 9.3	15.4
2867 Steins	12.7	X	147.88759	250.91354	55.35186	9.93086	0.1454629	0.27117355	2.3639476	21	—	—
2868 Upupa	13.0	X	107.37373	262.66896	137.90123	7.54232	0.1758458	0.20862484	2.8155205	21	2 5.9	16.6
2869 Nepryadva	12.0	X	241.20911	297.40534	357.31628	12.87620	0.1725763	0.23016211	2.6370204	21	2 6.7	16.4
2870 Haupt	12.9	X	236.47431	280.06996	85.93572	4.16046	0.2105116	0.26651251	2.3914299	21	4 22.6	16.8
2871 Schober	12.7	X	248.19214	335.53031	28.32903	5.77034	0.1393872	0.29054316	2.2576795	21	5 2.7	15.9
2872 Gentelec	12.2	X	178.02267	239.05763	241.42484	2.87045	0.1195923	0.21700207	2.7425852	21	7 24.7	16.6
2873 Binzel	12.8	X	161.66134	168.20726	100.96888	5.90110	0.1583431	0.29185750	2.2508963	21	—	—
2874 Jim Young	12.9	X	168.41210	322.73205	79.17051	4.89277	0.1341921	0.29312565	2.2443995	21	4 3.5	16.1
2875 Lagerkvist	12.2	X	67.32763	170.40824	340.23787	9.04661	0.1033873	0.21093668	2.7991109	21	4 18.2	15.8
2876 Aeschylus	13.0	X	85.44793	96.83375	2.92148	14.87321	0.1175833	0.23480118	2.6021712	21	3 13.2	16.1
2877 Likhachev	12.3	X	209.14046	233.78446	80.64170	2.33461	0.1818712	0.17866462	3.1220775	21	2 5.6	17.4
2878 Panacea	11.9	X	245.14562	21.37107	318.10764	10.24967	0.0851730	0.18553294	3.0445424	21	4 6.9	16.6
2879 Shimizu	11.9	X	132.52314	26.00390	149.20850	10.72478	0.1415235	0.21340275	2.7733374	21	8 18.9	16.2
2880 Nihondaira	12.7	X	134.65789	246.88511								

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2881 Meiden	13.1	X	134.24308	326.63349	172.98908	4.61619	0.1543745	0.29242823	2.2479666	21	7 7.3	16.3
2882 Tedesco	11.6	X	29.98227	6.35011	314.29701	0.28910	0.1933279	0.17594708	3.1541428	21	10 22.9	15.6
2883 Barabashov	13.2	X	75.54530	151.22010	48.49504	1.40694	0.0813487	0.29284103	2.2458535	21	7 7.6	15.5
2884 Reddish	12.0	X	227.84525	13.03136	41.27543	1.94522	0.1777135	0.17988561	3.1079338	21	6 18.1	16.9
2885 Palva	14.0	X	140.75393	44.53390	349.08256	2.86770	0.1940243	0.29444406	2.2376948	21	2 25.3	16.8
2886 Tinkaping	13.0	X	103.93109	332.83688	107.77873	1.30877	0.1556326	0.27085808	2.3657827	21	3 12.5	15.7
2887 Krinov	13.0	X	16.12680	149.37797	119.00346	4.37938	0.1501338	0.29026572	2.2591178	21	7 18.0	14.5
2888 Hodgson	12.8	X	117.41157	79.23711	351.33923	7.62461	0.1320151	0.29061136	2.2573262	21	3 9.9	15.3
2889 Brno	11.6	X	244.40774	124.57929	220.17374	9.49866	0.1174952	0.18772391	3.0208071	21	4 13.7	16.3
2890 Vilyujsk	13.1	X	185.95116	51.22201	356.72244	6.61921	0.1609811	0.29019491	2.2594853	21	4 25.9	16.7
2891 McGetchin	11.0	X	134.47745	251.24683	114.75647	9.29958	0.1381164	0.16038354	3.3550282	21	1 29.9	16.0
2892 Filipenko	10.3	X	338.99368	94.20107	325.82279	17.01380	0.2029235	0.17450148	3.1715384	21	11 25.8	14.0
2893 Peiroos	9.0	X	334.52645	172.65076	108.78081	14.66477	0.0774313	0.08449119	5.1435359	21	6 1.4	15.6
2894 Kakhovka	12.7	X	200.97166	33.86036	86.00958	2.57681	0.1311575	0.17782850	3.1318561	21	8 15.6	17.6
2895 Memnon	10.1	X	221.00807	275.30137	133.96188	27.20560	0.0486094	0.08209550	5.2431204	21	6 20.6	17.4
2896 Preiss	12.7	X	102.36519	121.11256	171.63738	6.00123	0.1872939	0.29801871	2.2197651	21	12 26.5	16.2
2897 Ole Römer	13.3	X	185.95925	101.53378	48.24016	5.83627	0.0998102	0.29233357	2.2484518	21	9 18.1	16.4
2898 Neuvo	11.9	X	330.27044	212.06859	116.72441	14.28280	0.0205733	0.24105664	2.5569563	21	7 26.5	14.9
2899 Runrun Shaw	13.5	X	282.30312	304.15860	19.68891	3.22153	0.1559818	0.28975893	2.2617512	21	4 16.3	16.2
2900 Luboš Perek	12.0	X	317.90660	291.24417	17.43354	10.15225	0.1027595	0.18752373	3.0229565	21	5 29.9	16.0
2901 Bagehot	12.1	X	204.08731	240.93510	69.06171	3.17174	0.0473149	0.20322146	2.8652002	21	1 22.3	16.3
2902 Westerlund	14.0	X	73.81275	158.80788	178.38978	4.37785	0.1985010	0.30141886	2.2030402	21	—	—
2903 Zhuhai	11.7	X	165.19692	243.60382	232.55328	14.34708	0.0582017	0.24036226	2.5618785	21	7 2.6	15.6
2904 Millman	11.8	X	159.01819	332.04364	79.49382	15.39345	0.1398195	0.23474438	2.6025909	21	4 17.2	16.1
2905 Plaskett	12.0	X	55.55428	220.83130	9.80585	8.90005	0.0949413	0.20975615	2.8053878	21	7 25.7	15.7
2906 Caltech	10.1	X	28.04281	296.82238	84.40840	30.68253	0.1037646	0.17498120	3.1657391	21	12 20.8	14.4
2907 Nekrasov	11.7	X	268.55538	199.34818	172.42166	10.21492	0.0967550	0.18835299	3.0140772	21	6 17.8	16.1
2908 Shimoyama	11.9	X	267.73927	153.80605	233.30068	13.36528	0.1549894	0.19195459	2.9762567	21	6 26.6	16.3
2909 Hoshi-no-ie	11.1	X	337.32689	283.85212	85.33388	11.43326	0.1172397	0.18763832	3.0217256	21	9 29.2	14.9
2910 Yoshkar-Ola	13.2	X	183.52422	326.47812	44.22754	2.93974	0.1558867	0.30155064	2.2023984	21	3 8.3	16.3
2911 Miahelena	11.7	X	283.18041	64.32038	149.21725	9.61750	0.0973659	0.21108816	2.7935737	21	—	—
2912 Lapalma	12.6	X	296.72977	75.74186	108.14025	7.27845	0.0715605	0.28455152	2.2892617	21	—	—
2913 Horta	12.3	X	38.84314	22.65531	30.22480	16.04170	0.1980139	0.22146010	2.7056548	21	—	—
2914 Glärnisch	13.4	X	116.73020	223.00711	166.71185	2.95934	0.1290146	0.28974706	2.2618130	21	1 9.6	15.8
2915 Moskva	13.2	X	247.75003	357.88565	352.79291	13.20585	0.1854574	0.24029856	2.5623313	21	4 11.1	17.4
2916 Voroneliya	13.6	X	71.69264	244.75433	310.98630	3.59618	0.0977356	0.29497347	2.2350166	21	6 28.3	15.9
2917 Sawyer Hogg	11.9	X	221.99649	39.40033	348.67221	12.82264	0.1132020	0.21109425	2.7935200	21	5 9.0	16.4
2918 Salazar	12.0	X	137.30660	165.74208	135.59456	2.09368	0.1514235	0.17430035	3.1739777	21	—	—
2919 Dali	12.1	X	353.66519	123.98896	161.26261	1.43036	0.1509687	0.17764100	3.1340595	21	6 26.0	15.5
2920 Automedon	8.7	X	324.52060	196.78746	230.94838	21.11710	0.0275440	0.08530284	5.1108569	21	11 3.2	15.4
2921 Sophocles	13.4	X	152.54292	198.00435	149.76792	1.48624	0.1551021	0.16823985	3.2497514	21	1 26.2	18.3
2922 Dikan'ka	13.8	X	157.09074	345.44264	187.89658	2.98580	0.1436442	0.26956049	2.3733688	21	9 12.7	17.5
2923 Schuyler	13.7	X	181.78580	173.13315	350.63579	2.87378	0.1325542	0.25625545	2.4548256	21	9 24.2	17.3
2924 Mitake-mura	12.0	X	220.73665	195.19942	110.68150	3.13893	0.0467713	0.20076284	2.8885540	21	2 4.8	16.3
2925 Beatty	13.7	X	152.93182	277.81516	217.23997	2.22207	0.1897690	0.26713111	2.3877365	21	7 21.7	17.6
2926 Caldeira	13.3	X	338.37425	35.57235	220.95969	3.48129	0.1182047	0.28733824	2.2744362	21	4 8.1	15.4
2927 Alamosa	12.1	X	358.60931	189.30117	150.46225	17.02681	0.1699357	0.24461021	2.5321320	21	10 6.9	14.7
2928 Epstein	11.5	X	324.80374	157.07003	110.34022	9.54253	0.0645406	0.18908187	3.0063264	21	—	—
2929 Harris	11.8	X	37.46730	22.91517	342.71006	14.89113	0.0671529	0.17876316	3.1209301	21	4 2.9	16.0
2930 Euripides	13.0	X	298.69220	103.28034	359.14766	4.06098	0.0225328	0.21276171	2.7789052	21	12 3.8	16.7
2931 Mayakovskiy	11.9	X	296.40472	290.61901	25.18717	2.21691	0.0575132	0.20227918	2.8741004	21	5 16.4	15.6
2932 Kempchinsky	11.6	X	329.64509	195.49775	168.97137	2.28954	0.1070973	0.14191306	3.6401655	21	8 29.9	16.2
2933 Amber	11.8	X	254.81797	222.73673	121.41509	7.21427	0.0477258	0.23397530	2.6082910	21	5 2.4	15.5
2934 Aristophanes	11.7	X	343.43656	90.43242	202.20903	8.79739	0.0523566	0.17475842	3.1684290	21	6 23.2	16.1
2935 Naerum	13.1	X	80.18469	137.44462	135.66315	13.06367	0.1260548	0.23528562	2.5985982	21	10 31.9	17.0
2936 Nechvíle	12.1	X	246.14736	321.66015	333.78423	8.45964	0.0734768	0.22473788	2.6792827	21	2 14.9	16.1
2937 Gibbs	13.4	X	192.05786	71.85475	265.68338	21.75964	0.3027769	0.27880328	2.3206205	21	2 1.6	18.0
2938 Hopi	11.6	X	84.80197	263.53024	108.86847	41.43733	0.3285077	0.17606317	3.1527561	21	1 3.7	15.5
2939 Coconino	12.6	X	49.22284	237.63622	349.94022	3.94837	0.1637927	0.25852819	2.4404174	21	7 21.6	15.2
2940 Bacon	14.2	X	13.78031	116.86601	273.68875	6.44177	0.2313259	0.21206503	2.7849881	21	—	—
2941 Alden	13.5	X	255.25709	64.79867	10.29969	3.23973	0.0892660	0.31212989	2.1523479	21	9 1.7	15.9
2942 Cordie	13.0	X	136.73972	154.73600	116.38067	6.81929	0.1539525	0.29436684	2.2380861	21	12 29.6	16.5
2943 Heinrich	12.7	X	314.30502	44.57449	313.88846	12.91684	0.1545344	0.25719908	2.4488176	21	7 30.0	15.1
2944 Peyo	12.9	X	324.27921	153.69706	194.64770	10.66986	0.1670935	0.22855085	2.6493998	21	7 26.8	15.9
2945 Zanstra	12.7	X	266.02582	244.17118	95.77159	2.62466	0.1390346	0.22610524	2.6684698	21	4 27.6	16.5
2946 Muchachos	13.3	X	241.43329	102.88624	321.57768	0.57882	0.1753048	0.25627801	2.4546815	21	7 14.7	17.0
2947 Kippenhahn	12.8	X	191.39749	166.32576	283.96169	3.13605	0.1248339	0.28113913	2.3077487	21	6 30.0	16.1
2948 Amosov	12.7	X	187.41360	245.43377	208.81348	12.32828	0.1073579	0.20351628	2.8624414	21	6 30.2	17.4
2949 Kaverznev	13.2	X	262.61677	130.89718	163.11460	4.86639	0.1397328	0.30310625	2.1948565	21	2 12.9	16.4
2950 Rousseau	11.8	X	63.83141	295.77777	111.66917	9.63260	0.2598160	0.21523054	2.7576138	21	—	—
2951 Perepadin	10.2	X	207.26130	121.47961	24.37181	14.76308	0.1170286	0.17776543	3.1325968	21	9 26.4	15.1
2952 Lilliputia	14.2	X	287.32106	78.63226	323.20945	3.31848	0.1710153	0.27996722	2.3141842	21	8 14.7	16.3
2953 Vysheslavia	11.8	X	39.74575	14.50929	250.87023	1.07123	0.0226286	0.20688041	2.8313255	21	8 5.9	15.4
2954 Delsemme	13.5	X	86.01802	51.21246	164.34810	3.93457	0.1944342	0.28470376	2.2884456	21	8 31.6	16.6
2955 Newburn	13.3	X	334.47028	234.79210	32.40784	3.59244	0.1153849	0.30618840	2.1801024	21	4 16.5	15.0
2956 Yeomans	12.3	X	171.11770	123.32544	112.19347	2.87020	0.0914832	0.21450693	2.7638120	21	12 8.7	16.5
2957 Tatsuo	10.8	X	37.57605	60.82818	249.31502	8.70265	0.0930748	0.18774600	3.0205701	21	10 4.9	14.9
2958 Arpetito	12.5	X	5.20602	316.85234	297.47125	1.02158	0.0128254	0.20244959	2.8724873	21	6 3.8	16.4
2959 Scholl	11.1	X	256.23500	284.88184	121.16793	5.23172	0.2722158	0.12537577	3.9536083	21		

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
2961 Katsurahama	13.0 <sup>m</sup>	X	109.43628	196.59327	221.04062	4.54719	0.1376434	0.28852699	2.2681847	21	2 7.2	15.5
2962 Otto	11.2	X	138.45846	119.03218	54.16465	15.63468	0.0386847	0.23926457	2.5697080	21	8 25.6	15.1
2963 Chen Jiageng	12.4	X	252.49323	350.77710	47.55240	2.70076	0.0758952	0.20269901	2.8701304	21	7 5.1	16.4
2964 Jaschek	12.7	X	10.81868	59.59445	330.50335	13.57889	0.1972893	0.23599455	2.5933914	21	—	—
2965 Surikov	12.5	X	156.23936	72.63638	126.86438	24.21667	0.2213801	0.26661766	2.3908011	21	10 25.0	17.1
2966 Korsunia	13.3	X	160.28748	197.06688	46.38216	2.54387	0.1392025	0.25741835	2.4474268	21	12 11.9	17.2
2967 Vladisvyat	11.1	X	224.40932	359.59631	32.41545	18.00134	0.1354393	0.17248403	3.1962209	21	5 17.9	16.2
2968 Iliya	14.9	X	286.14086	34.39510	274.29207	9.15471	0.3114461	0.27081062	2.3660591	21	3 10.0	18.8
2969 Mikula	12.7	X	42.94271	104.09118	181.17258	1.88211	0.0305885	0.20503829	2.8482585	21	9 6.7	16.4
2970 Pestalozzi	12.6	X	318.17308	77.27380	342.43989	12.09704	0.1511194	0.22995199	2.6386266	21	10 28.0	15.6
2971 Mohr	13.3	X	26.88526	353.19669	76.10805	6.99251	0.1167436	0.29273605	2.2463904	21	—	—
2972 Niilo	13.6	X	350.90344	139.33522	204.27317	1.09682	0.1697288	0.31234073	2.1513792	21	10 4.2	14.6
2973 Paola	13.1	X	89.85188	91.34290	336.23988	1.55598	0.1532431	0.25413873	2.4684375	21	2 3.4	15.8
2974 Holden	13.2	X	249.43140	130.73677	214.92222	6.42474	0.1406104	0.28039485	2.3118307	21	4 10.3	16.5
2975 Spahr	13.1	X	35.87417	316.81648	236.56951	6.89751	0.0942861	0.29240414	2.2480901	21	4 18.4	15.1
2976 Lautaro	10.8	X	42.48844	187.95272	206.71405	9.83278	0.1455411	0.16156744	3.3386187	21	—	—
2977 Chivilikhin	12.6	X	25.35778	184.71347	170.40636	9.59388	0.1699400	0.21220656	2.7877497	21	12 4.5	16.2
2978 Roudebush	12.2	X	303.87835	4.89488	348.32355	1.23429	0.1895754	0.18118825	3.0930198	21	6 26.8	16.0
2979 Murmansk	12.6	X	289.50980	196.71658	148.50353	11.42382	0.1589366	0.17890907	3.1192330	21	6 3.1	17.1
2980 Cameron	13.5	X	10.33892	255.43917	171.98891	7.27672	0.1801525	0.23954997	2.5676666	21	—	—
2981 Chagall	12.6	X	338.66512	99.32213	185.86941	0.86620	0.1721212	0.17639322	3.1488221	21	5 27.1	16.0
2982 Muriel	11.8	X	40.79419	40.54497	42.80567	10.23278	0.0643293	0.18969656	2.9998284	21	—	—
2983 Poltava	11.4	X	106.15776	86.50211	247.74474	4.27000	0.0578987	0.20518237	2.8469249	21	—	—
2984 Chaucer	13.2	X	33.51594	46.24526	81.80189	3.05377	0.1358291	0.25391576	2.4698824	21	1 15.7	15.6
2985 Shakespeare	12.1	X	16.55645	275.80049	34.12542	2.64853	0.0472170	0.20480209	2.8504480	21	9 5.7	15.7
2986 Mrinalini	12.2	X	260.25226	303.20369	51.24397	2.53700	0.1626956	0.17489799	3.1667431	21	5 9.3	16.9
2987 Sarabhai	12.4	X	6.60086	335.58608	167.38498	1.02070	0.0673322	0.20094633	2.8687954	21	1 10.5	16.0
2988 Korhonen	11.8	X	149.70321	133.39222	100.88229	14.73209	0.1246648	0.23415225	2.6069768	21	11 21.9	16.1
2989 Imago	13.1	X	169.37263	247.47835	75.75213	3.62650	0.1735957	0.29423442	2.2387576	21	—	—
2990 Trimberger	13.8	X	244.75935	320.29248	171.67307	2.80538	0.1219531	0.25874570	2.4390495	21	10 26.2	16.8
2991 Bilbo	13.6	X	291.22171	198.19516	96.60347	5.15155	0.2207904	0.27580981	2.3373813	21	3 14.6	17.0
2992 Vondel	13.5	X	64.34897	267.78407	184.91945	7.04764	0.1894236	0.21654402	2.7464514	21	2 6.7	16.4
2993 Wendy	12.1	X	33.75553	74.77489	133.26858	12.30391	0.1933509	0.23691491	2.5866705	21	—	—
2994 Flynn	13.9	X	73.48746	321.78516	358.30703	2.48582	0.2277202	0.26207593	2.4183433	21	12 31.9	17.8
2995 Taratuta	12.1	X	275.53145	330.10404	169.62627	14.84988	0.1372242	0.23314779	2.6144591	21	12 13.1	15.5
2996 Bowman	12.1	X	222.27244	301.24466	334.29118	3.66216	0.0312705	0.21231866	2.7827697	21	—	—
2997 Cabrera	12.7	X	139.83235	350.04516	355.01180	7.18195	0.1965697	0.24109220	2.5567049	21	1 3.5	16.4
2998 Berendeya	14.0	X	59.13589	204.48810	157.40340	3.07933	0.1961764	0.26139196	2.4225601	21	—	—
2999 Dante	13.6	X	316.00058	39.70833	74.91254	6.76418	0.1055010	0.28809940	2.2704284	21	—	—
3000 Leonardo	13.8	X	217.09642	173.66294	200.96794	2.75200	0.1810783	0.27347415	2.3506711	21	4 15.4	17.6
3001 Michelangelo	12.2	X	19.19301	137.23447	297.70057	18.36299	0.0692359	0.27244920	2.3565628	21	—	—
3002 Delasalle	12.6	X	180.55060	132.67190	115.38329	6.14503	0.1312726	0.29412848	2.2392951	21	—	—
3003 Konček	11.3	X	106.75575	285.75269	103.66046	11.60193	0.1163466	0.18727280	3.0256562	21	1 18.6	15.4
3004 Knud	15.1	X	315.96251	212.81898	322.40618	30.11135	0.2645799	0.23608208	2.5927503	21	—	—
3005 Pervictoralex	13.8	X	229.97468	77.55338	177.45055	2.36170	0.1840301	0.27028196	2.3691434	21	—	—
3006 Livadia	14.1	X	5.00194	6.11582	8.51611	3.04684	0.1883619	0.25975773	2.4327103	21	12 11.2	16.6
3007 Reaves	12.7	X	222.41683	252.80036	68.78664	8.33145	0.1329748	0.27037076	2.3686246	21	2 17.2	16.4
3008 Nojiri	12.4	X	206.06672	301.70288	168.37288	0.81293	0.1238196	0.17298734	3.1900183	21	8 7.9	17.3
3009 Coventry	13.8	X	260.67808	316.59499	8.44656	4.55650	0.2051172	0.30278710	2.1963985	21	3 19.4	16.9
3010 Ushakov	12.7	X	208.75377	173.28656	127.02303	2.03595	0.1654838	0.16986042	3.2290487	21	1 20.9	18.0
3011 Chongqing	12.5	X	152.78046	208.95134	207.05367	6.22501	0.2051592	0.17254988	3.1954077	21	4 18.2	17.7
3012 Minsk	11.0	X	357.00498	81.50935	354.87096	18.19105	0.0706609	0.17024254	3.2242150	21	—	—
3013 Dobrovoleva	13.9	X	115.17059	94.64635	7.04515	3.65957	0.1418150	0.27224213	2.3577576	21	4 22.0	16.9
3014 Huangsushu	13.1	X	205.89713	180.50872	140.75065	0.98946	0.2281081	0.27110279	2.3643588	21	1 30.7	17.0
3015 Candy	11.1	X	221.99900	301.04641	38.12036	17.40407	0.1749127	0.15824351	3.3852087	21	3 24.7	16.8
3016 Meuse	12.4	X	230.48493	318.03604	128.88937	2.89658	0.0419122	0.20617361	2.8377927	21	8 14.9	16.2
3017 Petrović	11.7	X	89.52935	216.55709	257.53168	11.83500	0.1287173	0.23412068	2.6072111	21	4 1.8	15.3
3018 Godiva	12.7	X	221.72664	72.76400	228.26569	4.72716	0.1863270	0.27030960	2.3689819	21	1 17.6	16.5
3019 Kulin	11.9	X	341.84734	321.05841	104.12312	3.22229	0.0503708	0.20350458	2.8625512	21	12 13.7	15.4
3020 Naudts	12.3	X	230.01285	196.53078	141.83611	6.27280	0.0596954	0.21478898	2.7613920	21	3 26.0	16.4
3021 Lucubratio	12.1	X	252.32131	97.67070	352.24885	16.58551	0.2387465	0.17122223	3.2119045	21	8 22.5	17.2
3022 Dobermann	14.1	X	21.18989	247.43668	180.82728	23.52319	0.1036555	0.36729170	1.9310579	21	—	—
3023 Heard	13.5	X	75.72377	344.93217	230.63311	3.99350	0.0845334	0.29866990	2.2165375	21	7 30.9	16.1
3024 Hainan	10.8	X	121.38253	341.58309	27.38691	14.84189	0.1308261	0.15618557	3.4148800	21	1 23.2	16.0
3025 Higson	10.4	X	237.09915	113.61808	293.41360	21.02062	0.0859058	0.17229785	3.1985230	21	6 28.6	15.2
3026 Sarastro	11.6	X	158.28468	111.92621	215.79765	9.65047	0.0213881	0.18675175	3.0312814	21	—	—
3027 Shavarsh	13.3	X	280.98150	155.01845	194.39181	1.97638	0.2209154	0.22574086	2.6713406	21	5 15.8	17.2
3028 Zhangguoxi	10.6	X	258.23866	5.03231	189.45037	9.51198	0.0311594	0.18794053	3.0184854	21	—	—
3029 Sanders	12.9	X	329.77907	269.09621	313.62419	3.42359	0.1111740	0.29400871	2.2399032	21	2 4.5	15.5
3030 Vhrenberg	13.8	X	42.30964	110.07715	292.74804	3.49009	0.2441275	0.28816966	2.2700594	21	—	—
3031 Houston	12.8	X	23.71078	249.20622	317.73556	4.34090	0.0974348	0.29480647	2.2358605	21	4 15.2	15.0
3032 Evans	11.5	X	7.08274	274.14143	88.36464	3.22261	0.0818626	0.20033296	2.8926848	21	11 2.4	15.0
3033 Holbaek	12.8	X	0.67861	67.47385	166.83256	4.73983	0.0944902	0.29488470	2.2354651	21	4 18.9	14.8
3034 Climenhaga	12.7	X	126.35816	313.91807	10.57574	4.92502	0.2012095	0.27810717	2.3244913	21	—	—
3035 Chambers	12.9	X	243.32947	31.01490	180.05533	2.59026	0.1314366	0.23052367	2.6342624	21	—	—
3036 Krat	10.4	X	222.42718	319.87953	23.67553	22.88895	0.1005673	0.17143633	3.2092298	21	3 30.1	15.4
3037 Alku	11.8	X	284.03420	330.78824	107.75786	19.00744	0.1861321	0.22514795	2.6760284	21	10 3.9	15.5
3038 Bernes	13.5	X	78.82086	11.02329	351.54919	4.71171	0.2048651	0.25875606	2.4389844	21	—	—
3039 Yangel	12.6	X	240.23478	72.10233	190.56453	15.24317	0.1467593	0.24094236	2.5577648	21	—	—
3040 Kozai	13.8	X	45.90667	290.22181	143.49160	46.65096	0.2002042	0.39463967	1.8407814	21	—	

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3041 Webb	12.5	X	91.15652	351.50010	82.35872	14.64418	0.1477094	0.23701607	2.5859345	21	2 23.1	15.9
3042 Zelinsky	13.9	X	165.09935	70.55457	226.18238	4.99354	0.2096891	0.28668663	2.2778813	21	—	—
3043 San Diego	13.8	X	163.44240	31.85163	351.06581	21.78721	0.1064974	0.36857690	1.9265664	21	2 21.0	16.0
3044 Saltykov	11.9	X	332.80160	71.37263	242.29391	13.49770	0.1608011	0.20472217	2.8511898	21	6 24.1	15.2
3045 Alois	11.6	X	9.97544	330.45935	35.95974	3.33355	0.1076278	0.17777751	3.1324549	21	11 8.7	15.5
3046 Molière	12.5	X	274.01775	267.25171	187.90244	18.39314	0.1432989	0.17707063	3.1407861	21	10 2.1	16.8
3047 Goethe	12.9	X	15.37465	81.24038	317.14284	1.61217	0.0255633	0.22951709	2.6419587	21	12 28.7	16.4
3048 Guangzhou	13.2	X	12.19063	267.09882	214.18001	1.93861	0.1478924	0.26540619	2.3980709	21	—	—
3049 Kuzbass	12.1	X	187.04966	167.54212	95.00632	2.49878	0.1375191	0.17900580	3.1181091	21	—	—
3050 Carrera	14.1	X	267.45741	85.27630	239.94201	1.30738	0.1891634	0.29705136	2.2245817	21	3 27.3	17.1
3051 Nantong	12.4	X	110.77447	93.81430	280.02462	13.37265	0.2556287	0.23577805	2.5949787	21	1 12.7	15.7
3052 Herzen	13.6	X	12.08931	279.01612	238.50832	3.89999	0.1836935	0.26945967	2.3739607	21	1 6.0	15.6
3053 Dresden	13.2	X	348.12604	316.41580	6.80624	4.60880	0.2060433	0.26848653	2.3796936	21	8 16.8	14.7
3054 Strugatskia	11.8	X	33.91923	186.93150	146.19479	2.08201	0.2099564	0.18112007	3.0937959	21	11 17.7	15.7
3055 Annapavlova	12.6	X	109.31926	63.62299	3.36641	14.98123	0.1087783	0.24041074	2.5615341	21	3 2.9	16.0
3056 INAG	12.6	X	163.17416	346.72157	11.30654	5.63032	0.1156964	0.26181597	2.4199438	21	2 1.8	16.1
3057 Mälaren	13.5	X	275.83994	122.13357	75.31619	7.27633	0.0750039	0.29002337	2.2603761	21	—	—
3058 Delmary	14.0	X	86.62978	210.97830	207.79096	3.54923	0.1566899	0.29216965	2.2492928	21	1 4.0	15.9
3059 Pryor	13.3	X	24.48683	242.02095	181.35784	2.36327	0.1285413	0.28850622	2.2682936	21	—	—
3060 Delcano	13.2	X	107.99725	4.94378	326.68400	7.26016	0.1770165	0.28667377	2.2779494	21	—	—
3061 Cook	11.9	X	86.45756	243.64370	97.98073	3.25907	0.1894909	0.18111167	3.0938916	21	—	—
3062 Wren	10.8	X	172.10814	272.58051	110.18947	11.32042	0.1148072	0.18798449	3.0180148	21	3 26.3	15.7
3063 Makhaon	8.5	X	268.89477	204.17408	287.87111	12.16130	0.0584633	0.08273582	5.2160331	21	11 3.8	15.5
3064 Zimmer	13.6	X	246.55520	5.70350	157.10412	2.94931	0.1214910	0.25649624	2.4532890	21	12 8.1	16.6
3065 Sarahill	12.4	X	127.46213	210.07141	303.04896	4.30535	0.0645022	0.219888774	2.7185378	21	7 9.6	16.2
3066 McFadden	11.2	X	263.30035	188.22833	175.67941	15.57716	0.1346881	0.24565310	2.5249603	21	5 26.8	15.1
3067 Akhmatova	13.0	X	144.11626	95.56936	350.41999	4.52275	0.1385143	0.29303510	2.2486119	21	5 2.3	16.1
3068 Khanina	13.0	X	154.71941	133.32575	21.50897	6.44249	0.1015502	0.29579486	2.3087771	21	8 20.7	16.1
3069 Heyrovský	13.7	X	298.68859	123.99652	177.37307	1.68563	0.2415803	0.27332208	2.3515429	21	5 21.2	16.5
3070 Aitken	13.8	X	211.28287	52.53285	210.40289	2.34618	0.1979048	0.28160206	2.3052189	21	—	—
3071 Nesterov	12.1	X	138.54766	52.60638	134.02407	2.21247	0.0848280	0.17108061	3.2136768	21	9 3.0	16.8
3072 Vilnius	13.7	X	327.54342	140.13770	152.44373	5.64610	0.1799654	0.29432367	2.2383049	21	5 6.7	15.7
3073 Kursk	13.6	X	114.91691	232.59259	204.07635	5.03486	0.1369279	0.29353341	2.2423205	21	3 13.7	16.2
3074 Popov	13.8	X	198.26301	151.88512	348.64801	2.41648	0.1101600	0.27528852	2.3403312	21	9 14.3	16.9
3075 Bornmann	14.1	X	115.11985	10.76534	334.50162	9.97339	0.1309077	0.28745311	2.2738302	21	—	—
3076 Garber	13.5	X	206.74346	166.67513	195.49724	7.71173	0.1890150	0.29442091	2.2378121	21	3 18.4	17.0
3077 Henderson	12.8	X	149.81712	118.19714	297.35929	1.47423	0.0556629	0.29389333	2.2404894	21	3 19.3	15.4
3078 Horrocks	11.6	X	249.27789	140.61857	32.39057	7.08789	0.1045647	0.17665482	3.1457127	21	12 9.6	16.1
3079 Schiller	13.6	X	202.20371	301.52845	182.77534	3.92809	0.2164543	0.22338293	2.6901060	21	8 17.9	18.1
3080 Moisseiev	11.7	X	133.49468	307.57757	48.16430	13.88036	0.1928189	0.23356498	2.6113449	21	1 11.3	15.6
3081 Martinūboh	13.7	X	151.56366	279.65261	43.75897	5.28425	0.1828492	0.26324680	2.4111671	21	—	—
3082 Dzhalil	12.8	X	225.76471	232.35462	117.55313	10.33007	0.0759116	0.23824896	2.5770057	21	4 4.4	16.7
3083 OaFA	13.8	X	246.47674	263.80339	346.46669	6.48228	0.1514421	0.28537244	2.2848693	21	—	—
3084 Kondratyuk	13.6	X	200.36632	144.70678	185.79637	4.14193	0.2282688	0.25912329	2.4366796	21	2 6.8	17.7
3085 Donna	13.1	X	145.23301	159.98537	270.95910	3.83340	0.1016867	0.26720837	2.3872763	21	4 11.2	16.4
3086 Kalbaugh	13.4	X	268.32828	281.31209	300.75626	19.00709	0.0267272	0.36592307	1.9358700	21	—	—
3087 Beatrice Tinsley	12.9	X	45.38893	83.72168	338.29184	19.80387	0.1124019	0.18246084	3.0786213	21	—	—
3088 Jinxiazhonghua	11.6	X	121.02964	314.41630	171.15249	10.25273	0.0527862	0.18810156	3.0167624	21	5 27.6	16.1
3089 Oujianquan	11.3	X	133.10226	184.09482	88.21894	16.70040	0.1864232	0.19666069	2.9285840	21	12 14.3	16.1
3090 Tjossem	13.0	X	102.38869	187.98803	170.35983	9.56049	0.0738913	0.17424706	3.1746248	21	—	—
3091 van den Heuvel	13.7	X	61.81514	10.16482	228.54428	2.01366	0.1666908	0.27352554	2.3503766	21	8 26.7	16.4
3092 Herodotus	11.3	X	29.09882	9.10617	7.96173	10.82884	0.1143745	0.14821707	3.5362034	21	12 12.4	16.2
3093 Bergholz	11.6	X	114.22593	61.00214	178.42356	12.76504	0.2048573	0.22495058	2.6775935	21	—	—
3094 Chukokkala	12.0	X	256.45929	50.67591	272.41569	14.55785	0.0733631	0.22867769	2.6484200	21	—	—
3095 Omarkhayyam	11.4	X	45.50502	116.60601	292.45859	2.97312	0.0794986	0.15096087	3.4932242	21	—	—
3096 Bezruč	12.7	X	57.75262	165.71150	168.49783	12.15256	0.1946911	0.22636017	2.6664660	21	12 23.9	16.8
3097 Tacitus	12.3	X	118.25099	86.58684	196.66040	7.46276	0.0898464	0.19674523	2.9277450	21	12 9.9	16.9
3098 van Sprang	14.8	X	176.30908	195.37695	117.81467	1.34688	0.2115530	0.28202818	2.3028963	21	—	—
3099 Hergenrother	11.6	X	232.09678	148.20370	31.01559	15.48945	0.2015584	0.20181433	2.8785120	21	11 17.3	16.1
3100 Zimmerman	13.7	X	71.05708	94.57716	27.03675	2.81878	0.0881843	0.29033284	2.2587696	21	3 5.3	15.9
3101 Goldberger	14.1	X	25.27402	208.48592	154.89595	28.55957	0.0462005	0.35412168	1.9786442	21	12 30.8	17.0
3102 Krok	16.2	X	226.78568	154.77721	172.05294	8.44401	0.4494509	0.31240954	2.1510633	21	2 16.0	20.5
3103 Eger	15.2	X	313.24784	254.05952	129.75261	20.93126	0.3542402	0.59230230	1.4042371	21	—	—
3104 Dürer	10.7	X	342.64233	243.39223	162.04051	24.18707	0.0863508	0.19322903	2.9631556	21	11 23.6	14.9
3105 Stumpff	12.9	X	155.91144	198.81464	140.45405	6.47944	0.1935937	0.28962798	2.2624329	21	1 2.4	16.0
3106 Morabito	11.5	X	144.79547	290.31203	121.38274	14.85009	0.2392445	0.17691110	3.1426740	21	4 14.8	17.0
3107 Weaver	13.4	X	30.54471	50.27514	271.52941	1.60107	0.2077891	0.30164220	2.2109527	21	11 20.1	15.8
3108 Lyubov	13.9	X	207.06419	226.78775	161.98353	3.28603	0.1681012	0.29624260	2.2286287	21	4 24.0	17.4
3109 Machin	12.1	X	6.05069	256.93472	22.75591	7.18286	0.0888140	0.25683250	2.4511472	21	7 12.9	14.8
3110 Wagman	12.8	X	11.20900	76.01110	347.45566	2.23843	0.1242410	0.24050626	2.5608558	21	—	—
3111 Misuzu	13.6	X	247.16875	291.89679	95.41996	2.01180	0.1613094	0.29731628	2.2232600	21	6 1.3	16.7
3112 Velimir	13.3	X	352.79210	246.24613	69.17859	3.95470	0.1971479	0.26871473	2.3783462	21	8 15.7	14.9
3113 Chizhevskij	13.2	X	92.98168	197.54329	185.71424	4.96884	0.1045046	0.26055816	2.4277256	21	—	—
3114 Ercilla	13.7	X	280.40836	108.46673	176.59244	2.23276	0.1996087	0.26191248	2.4193494	21	2 20.1	17.3
3115 Bailly	11.2	X	132.64272	172.02913	258.59352	10.18203	0.1430135	0.23794526	2.5791980	21	4 1.4	15.2
3116 Goodricke	12.5	X	329.60796	270.89905	80.31597	5.46836	0.2003536	0.29630505	2.2283155	21	8 21.2	13.8
3117 Niepce	12.4	X	190.49817	222.13084	93.26780	3.24024	0.0557201	0.20510586	2.8476329	21	1 13.5	16.6
3118 Clayton-Smith	11.0	X	32.33031	259.07331	304.88882	13.26341	0.0569142	0.18642306	3.0348435	21	5 3.9	15.3
3119 Dobronravín	12.9	X	48.41739	329.43581	110.23820	4.75800	0.2042754	0.18417638	3.0594740	21	1 2.5	16.0
3120 Dangrania	11.7	X	328.82641	134.86800	220.42573	12.94800	0.1012777					

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3121 Tamines	13.4	X	0.89345	87.81559	125.47718	6.36616	0.0850454	0.29642334	2.2277226	21	3 19.5	15.6
3122 Florence	14.1	X	217.98436	27.85248	336.06368	22.14513	0.4231631	0.41895949	1.7688379	21	3 15.2	17.6
3123 Dunham	13.4	X	109.63767	223.39031	123.08639	1.99670	0.1343727	0.25508767	2.4623119	21	—	—
3124 Kansas	13.2	X	315.44724	171.92192	160.86964	5.91821	0.0796024	0.21667543	2.7453408	21	7 2.4	16.7
3125 Hay	12.7	X	148.80761	356.66576	134.35123	12.77046	0.2014623	0.23497021	2.6009231	21	7 13.2	17.1
3126 Davydov	12.2	X	350.21636	159.98270	206.10384	9.71076	0.1060524	0.18918814	3.0052005	21	10 9.5	15.8
3127 Bagration	12.4	X	188.37711	30.12746	293.50075	4.82439	0.1984903	0.23520576	2.5991863	21	1 22.8	16.7
3128 Obruchev	12.2	X	164.15443	188.02013	102.36298	2.93836	0.1588610	0.17931263	3.1145511	21	—	—
3129 Bonestell	12.6	X	235.57791	84.01272	120.55548	6.92430	0.2146505	0.22235726	2.6983722	21	12 26.6	16.4
3130 Hillary	13.2	X	140.55853	244.39670	109.73876	4.21800	0.1993216	0.25450475	2.4660703	21	1 12.4	16.6
3131 Mason—Dixon	12.0	X	276.78880	146.39606	44.72890	2.40355	0.0434381	0.19715723	2.9236648	21	—	—
3132 Landgraf	11.7	X	184.88192	266.04493	112.97955	4.45690	0.1279875	0.17668808	3.1453179	21	4 1.4	16.7
3133 Sendai	12.9	X	112.68519	358.59276	37.11500	6.56078	0.1600767	0.30598032	2.1810907	21	1 14.7	15.1
3134 Kostinsky	10.4	X	221.50093	163.12944	256.97857	7.63938	0.2193543	0.12396758	3.9834922	21	6 17.7	16.7
3135 Lauer	13.8	X	351.66403	119.08640	304.86639	5.98578	0.1381353	0.26179558	2.4200695	21	—	—
3136 Anshan	12.0	X	327.74789	36.27688	80.78121	4.54217	0.1416187	0.17592904	3.1543583	21	—	—
3137 Horky	13.3	X	101.37027	135.96098	286.52160	2.47883	0.1901857	0.26493215	2.4009306	21	2 16.7	15.9
3138 Ciney	13.3	X	181.82930	320.54243	225.20099	4.61857	0.0748707	0.29688631	2.2254060	21	10 31.2	16.3
3139 Shantou	10.9	X	86.75262	116.43950	252.76412	20.56949	0.0216884	0.17266015	3.1940470	21	—	—
3140 Stellafane	10.9	X	217.81299	268.32889	101.51999	11.25952	0.1111703	0.18839372	3.0136428	21	4 23.9	15.8
3141 Buchar	10.8	X	196.64607	154.56331	321.05781	11.00326	0.0716653	0.15628060	3.4134956	21	8 7.8	15.9
3142 Kilopi	12.3	X	228.03710	189.24878	320.90169	14.20651	0.0896496	0.24166638	2.5526536	21	10 22.9	16.3
3143 Genecampbell	12.6	X	155.37803	328.01425	80.01122	3.09353	0.0844926	0.20532549	2.8456019	21	4 1.3	16.8
3144 Brosche	14.0	X	31.90075	95.77749	248.68007	5.51056	0.2094872	0.29700250	2.2248256	21	12 22.9	16.5
3145 Walter Adams	14.1	X	117.26160	42.16040	283.58217	5.02786	0.2358917	0.30359806	2.1924855	21	—	—
3146 Dato	13.5	X	323.97124	84.38952	183.27065	8.36584	0.2002501	0.25970442	2.4330432	21	3 22.7	16.2
3147 Samantha	13.8	X	169.17539	243.52134	215.63146	3.54534	0.1938283	0.23216267	2.6218497	21	6 20.8	18.2
3148 Grechko	12.3	X	209.27630	43.51173	0.82085	0.73335	0.1925874	0.18062029	3.0995500	21	5 19.8	17.4
3149 Okudzhava	13.8	X	238.14805	237.28053	188.26517	7.12884	0.1574244	0.29243354	2.2479394	21	7 13.5	17.1
3150 Tosa	11.2	X	165.85840	271.92001	350.23493	22.05287	0.1173644	0.17211769	3.2007546	21	12 29.5	16.7
3151 Talbot	11.6	X	80.54376	38.08314	212.24733	19.49954	0.1369557	0.21437195	2.7649721	21	9 23.6	15.7
3152 Jones	11.8	X	331.21010	289.95197	301.38996	11.30695	0.0898382	0.23161666	2.6259685	21	3 1.1	15.2
3153 Lincoln	12.9	X	249.74053	347.83516	40.63939	7.71006	0.1300915	0.26146336	2.4221191	21	6 9.5	16.3
3154 Grant	13.0	X	243.98225	305.76932	102.64447	2.47568	0.1728519	0.18082236	3.0971908	21	6 26.8	17.7
3155 Lee	12.4	X	57.45837	29.23551	28.43211	7.19559	0.1001471	0.27483778	2.3428893	21	—	—
3156 Ellington	11.6	X	91.67810	119.09691	6.94343	15.80947	0.1970313	0.20427906	2.8553114	21	5 3.8	15.8
3157 Novikov	11.6	X	197.95749	322.30372	41.62725	7.59940	0.1475858	0.17641113	3.1486089	21	3 27.2	16.7
3158 Anga	12.5	X	317.25216	229.04070	187.31071	14.58330	0.1013263	0.24216440	2.5915271	21	11 4.5	15.4
3159 Prokof'ev	12.2	X	45.02198	58.73588	222.89496	14.59375	0.1077796	0.23902193	2.5714469	21	9 14.5	15.6
3160 Angerhofer	13.5	X	74.10164	331.84086	150.52615	5.07134	0.1567756	0.26904521	2.3763982	21	11 6.9	16.9
3161 Beadell	12.5	X	65.09439	255.81626	351.51661	14.94027	0.1706531	0.23876208	2.5733122	21	9 11.7	15.9
3162 Nostalgia	11.4	X	106.51692	315.44592	128.64922	17.91416	0.1559853	0.17592458	3.1544117	21	4 8.3	16.3
3163 Randi	14.0	X	276.70882	121.65147	194.01199	3.08939	0.3347232	0.26610762	2.3938550	21	3 13.5	18.0
3164 Prast	12.3	X	210.05097	58.68145	63.92067	2.32191	0.1489127	0.17402212	3.1773599	21	8 26.7	17.3
3165 Mikawa	12.9	X	352.47682	239.60450	88.64013	3.92172	0.1793618	0.29304987	2.2447864	21	9 10.4	14.3
3166 Klondike	12.2	X	97.76704	118.78072	71.95001	5.23838	0.1162661	0.29427847	2.2385342	21	8 2.6	15.1
3167 Babcock	11.3	X	168.01722	257.41163	17.59307	15.55595	0.1066794	0.24327051	2.5414198	21	—	—
3168 Lomnický štít	11.9	X	48.18550	285.04417	22.58203	10.54312	0.1002714	0.19049160	2.9914758	21	10 20.5	15.9
3169 Ostro	12.7	X	290.35049	32.94807	96.36476	24.90315	0.0669449	0.37882063	1.8916769	21	—	—
3170 Džhanibekov	12.5	X	48.27912	79.72519	26.77211	2.01540	0.0887650	0.19664204	2.9287691	21	1 27.5	16.0
3171 Wangshouguan	11.1	X	92.84382	25.41979	31.71429	11.42060	0.1458139	0.17364642	3.1819412	21	2 15.2	15.6
3172 Hirst	13.2	X	214.49853	271.35697	83.33664	3.65069	0.2216980	0.26077621	2.4263721	21	3 21.6	17.3
3173 McNaught	13.1	X	134.28877	219.20252	79.27633	7.79366	0.2102966	0.30124605	2.2308827	21	—	—
3174 Alcock	12.0	X	183.95796	4.25303	72.23730	2.37149	0.1734630	0.17679206	3.1440845	21	6 6.5	17.1
3175 Netto	13.5	X	185.11471	190.49955	208.30496	0.64546	0.2124851	0.27129906	2.3632184	21	4 18.3	17.3
3176 Paolicchi	11.2	X	94.84109	24.27718	53.19470	18.11120	0.0322096	0.20208259	2.8759641	21	2 26.3	15.5
3177 Chillicothe	11.9	X	184.67877	40.51966	35.03769	15.96383	0.1492865	0.23075523	2.6324998	21	6 1.3	16.3
3178 Yoshitsune	12.1	X	42.26238	242.39745	241.37105	6.79660	0.3776806	0.22025646	2.7155030	21	2 18.4	13.4
3179 Beruti	12.0	X	32.74266	276.74179	179.53225	1.76037	0.1619042	0.18144941	3.0900512	21	—	—
3180 Morgan	13.9	X	207.25725	44.75543	354.13953	5.27007	0.1482826	0.29601035	2.2297942	21	5 4.9	17.4
3181 Ahnert	12.6	X	64.81728	304.24144	221.12432	3.95842	0.0650236	0.29621573	2.2287634	21	4 24.6	14.9
3182 Shimanto	11.9	X	242.49874	161.68432	248.32366	12.55839	0.1431667	0.23322346	2.6138936	21	6 28.8	15.8
3183 Franzkaiser	12.7	X	212.22733	219.38434	128.60088	2.18956	0.1395880	0.17349837	3.1837511	21	3 19.8	17.7
3184 Raab	12.3	X	180.20707	238.20370	97.08003	8.19826	0.2619373	0.22614758	2.6681367	21	2 4.6	17.0
3185 Clintford	13.8	X	254.84783	281.98745	71.22335	3.96075	0.1936082	0.27097429	2.5651063	21	4 23.9	17.4
3186 Manuilova	12.8	X	249.84326	204.79504	170.00330	0.80196	0.1806703	0.18040429	3.1019739	21	5 21.7	17.6
3187 Dalian	13.3	X	209.36724	105.46314	312.27198	2.75662	0.0586410	0.28570891	2.2830751	21	6 7.6	16.2
3188 Jekabsons	13.7	X	99.47825	22.85530	336.41706	4.69559	0.1333910	0.28446700	2.2897151	21	—	—
3189 Penza	12.8	X	303.94901	189.47168	177.51097	8.22533	0.1982053	0.18080908	3.0973424	21	7 12.8	16.9
3190 Aposhanskij	12.9	X	96.35922	0.19053	358.11308	9.94883	0.1107856	0.18972521	2.9995264	21	—	—
3191 Svanetia	12.3	X	342.83777	189.72747	50.73799	2.73418	0.0112383	0.20235344	2.8733971	21	4 17.2	16.0
3192 A'Hearn	13.7	X	267.39748	91.96786	56.64614	2.87654	0.1701654	0.26913733	2.3758558	21	12 15.1	16.0
3193 Elliot	13.2	X	165.32660	76.30620	11.74623	5.72720	0.1064462	0.28345650	2.2951537	21	5 27.6	16.4
3194 Dorsey	12.1	X	96.67953	256.92863	64.31927	10.94842	0.1007736	0.18868236	3.0105685	21	12 31.7	16.8
3195 Fedchenko	12.6	X	226.97276	59.99753	274.58757	0.86446	0.0614736	0.19839363	2.9115052	21	3 17.3	16.7
3196 Maklaj	12.0	X	71.66385	319.45777	12.91470	8.96230	0.0234190	0.18718673	3.0265836	21	12 6.6	16.4
3197 Weissman	11.6	X	141.64640	313.31866	111.63820	16.41061	0.1813847	0.22654050	2.6650507	21	4 21.2	16.1
3198 Wallonia	13.1	X	81.73240	40.48618	83.56624	17.96463	0.2389472	0.30619610	2.1800659	21	4 28.8	15.6
3199 Nefertiti	14.8	X	200.33251	53.41570	339.99091	32.96430	0.2841606	0.49889560	1.5744526	21	3 22.8	17.5
3200 Phaethon	14.3	X	143.97628	322.18012	265.2							



ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3201 Sijthoff	13.6 <sup>m</sup>	X	167.20859	53.89666	109.46265	2.98983	0.0870956	0.29026997	2.2590958	21	9 13.9	16.6
3202 Graff	11.0	X	112.47850	268.32826	205.12515	11.11156	0.1136960	0.12653295	3.9294668	21	5 12.9	16.8
3203 Huth	13.9	X	145.56404	305.34136	48.40084	6.66428	0.2628167	0.27831644	2.3233259	21	1 22.2	17.3
3204 Lindgren	12.3	X	178.00253	298.09718	108.70077	2.06314	0.2799505	0.17575810	3.1564032	21	4 29.9	17.9
3205 Boksenberg	13.3	X	117.27925	282.94071	120.05833	12.30395	0.1992090	0.22433240	2.6825102	21	2 24.1	17.1
3206 Wuhan	13.3	X	337.50680	356.33909	71.04251	8.64201	0.2321692	0.24159304	2.5531702	21	—	—
3207 Spinrad	12.4	X	264.77805	156.38938	167.78434	2.22076	0.0613393	0.19879511	2.9075838	21	4 17.6	16.4
3208 Lunn	12.2	X	152.99613	29.85459	136.49526	2.34277	0.1032559	0.17770970	3.1332518	21	8 25.2	16.9
3209 Buchwald	13.4	X	38.15554	30.32293	128.24558	5.23345	0.0533675	0.30363302	2.1923171	21	2 27.6	15.4
3210 Lupishko	10.9	X	227.59835	26.64315	127.98386	13.63767	0.0535061	0.17972794	3.1097513	21	11 5.8	15.6
3211 Louispharailda	12.7	X	59.31197	84.85670	336.87954	10.48225	0.2501183	0.21788994	2.7351297	21	—	—
3212 Agricola	13.6	X	226.52349	35.58617	109.94499	7.80846	0.1517900	0.29080035	2.2563481	21	10 24.8	16.6
3213 Smolensk	12.5	X	192.23934	325.98379	33.70913	0.95499	0.1605696	0.17227573	3.1987968	21	3 15.5	17.8
3214 Makarenko	11.4	X	187.53547	155.04552	100.21696	11.51015	0.0603934	0.18854416	3.0120395	21	—	—
3215 Lapko	12.3	X	202.73277	41.51815	66.96389	7.20154	0.0962248	0.17744865	3.1363240	21	8 6.6	17.2
3216 Harrington	13.7	X	6.14267	224.66823	107.88541	4.91106	0.3031297	0.26567095	2.3964774	21	11 4.6	15.5
3217 Seidelmann	14.6	X	23.54920	357.18508	343.48589	6.13199	0.2614621	0.26723530	2.3877159	21	12 7.3	17.4
3218 Delphine	14.0	X	20.12138	243.29371	182.84559	2.70111	0.2163947	0.24643852	2.5195926	21	—	—
3219 Komaki	11.7	X	99.50332	295.40208	289.05410	6.81295	0.1268643	0.18568321	3.0428996	21	9 8.9	16.4
3220 Murayama	13.0	X	352.71379	26.09509	26.61709	6.61229	0.1730852	0.29688424	2.2254164	21	—	—
3221 Changshi	13.0	X	138.98621	233.27348	78.60790	3.65095	0.1534416	0.30117024	2.2042525	21	—	—
3222 Liller	11.5	X	16.33929	129.81430	150.80893	15.98479	0.0644888	0.18137578	3.0908874	21	7 25.7	15.6
3223 Forsius	11.3	X	171.59662	293.39904	168.16340	10.06369	0.1432451	0.23424100	2.6063182	21	6 25.0	15.6
3224 Irkutsk	11.5	X	281.09606	3.93229	227.82651	4.31696	0.1670306	0.21227807	2.7831245	21	—	—
3225 Hoag	13.2	X	35.92141	138.01922	188.83158	25.06297	0.350514	0.38243288	1.8797463	21	11 28.2	15.6
3226 Plinius	13.2	X	132.58233	305.10080	98.82182	3.06059	0.0749118	0.20230850	2.8738227	21	2 28.6	17.2
3227 Hasegawa	12.7	X	169.11172	331.70126	154.39147	3.91087	0.1345145	0.25731135	2.4481052	21	7 24.0	16.5
3228 Pire	12.8	X	150.45538	189.23322	290.32120	1.92082	0.1325928	0.25495013	2.4631971	21	6 26.5	16.3
3229 Solnhofen	12.8	X	278.88721	19.25997	306.53808	9.46201	0.1532384	0.28009415	2.3134850	21	4 10.9	16.2
3230 Vampilov	12.0	X	252.69132	244.87156	73.58967	15.29416	0.3236886	0.17674092	3.1446909	21	3 15.9	17.8
3231 Mila	13.4	X	244.99860	54.69027	324.31851	6.37515	0.1272597	0.25778158	2.4451272	21	5 21.8	17.1
3232 Brest	11.7	X	2.90300	120.20938	191.99826	9.85666	0.0848193	0.18735244	3.0247987	21	8 15.8	15.6
3233 Krišbarons	13.1	X	26.71967	65.79934	347.59812	3.60280	0.1028874	0.29666820	2.2264967	21	—	—
3234 Hergiani	12.9	X	267.23258	313.22071	77.03021	0.96261	0.1916853	0.18064064	3.0992676	21	6 26.6	17.3
3235 Melchior	13.8	X	59.69597	168.79478	348.16866	13.52003	0.2448815	0.22431047	2.6826850	21	5 3.3	17.0
3236 Strand	13.5	X	76.59845	214.69368	217.26232	1.10845	0.1446343	0.30165755	2.2018780	21	—	—
3237 Victorplatt	10.6	X	131.15050	337.52016	280.26227	9.11696	0.0696660	0.18855368	3.0119381	21	11 18.8	15.2
3238 Timresovia	13.4	X	173.88137	44.85134	11.19559	11.72730	0.1851026	0.22660686	2.6645304	21	4 28.9	17.9
3239 Meizhou	14.2	X	126.33211	239.47319	93.72234	3.01807	0.2212195	0.30520923	2.1847627	21	—	—
3240 Laocoon	10.2	X	302.95203	15.84851	296.30360	2.33608	0.1283676	0.08248403	5.2266424	21	5 17.9	16.8
3241 Yeshuhua	12.3	X	349.40543	315.16269	126.99459	1.65443	0.1557976	0.18539607	3.0460407	21	—	—
3242 Bakhchisaraj	12.5	X	141.78374	243.46589	191.27249	12.39011	0.1606207	0.22478385	2.6789174	21	4 25.3	16.7
3243 Skytel	12.5	X	190.11193	288.01510	349.15514	9.33006	0.1036792	0.18614798	3.0378325	21	—	—
3244 Petronius	14.0	X	11.37602	58.33128	332.21513	3.67672	0.1635723	0.29328728	2.2435748	21	—	—
3245 Jensch	13.2	X	192.14526	82.64435	348.28596	0.32957	0.1636294	0.17877536	3.1207880	21	6 6.9	18.2
3246 Bidstrup	11.7	X	16.18006	325.29534	197.50230	21.79612	0.0321170	0.17273355	3.1931421	21	2 20.4	16.4
3247 Di Martino	13.2	X	192.09052	146.47801	45.52008	3.93296	0.1295372	0.26905979	2.3763123	21	11 11.7	16.8
3248 Fariella	10.8	X	183.73892	317.09400	12.04403	10.89898	0.1517954	0.17173692	3.2054840	21	2 4.9	16.1
3249 Musashino	13.5	X	224.63518	310.09368	76.24498	3.36898	0.2464907	0.27432439	2.3458114	21	5 5.1	17.5
3250 Martebo	11.3	X	169.87058	180.17533	204.06110	9.57604	0.1055469	0.18824159	3.0152662	21	3 18.4	16.0
3251 Eratosthenes	12.8	X	8.65205	236.84537	142.28941	0.72422	0.1519791	0.17914193	3.1165294	21	11 28.1	16.5
3252 Johnny	12.3	X	141.85041	157.61794	326.83559	12.74309	0.1144323	0.22686463	2.6625117	21	6 23.9	16.5
3253 Gradie	13.3	X	168.63564	234.37756	60.06455	7.41804	0.1974269	0.29233659	2.2484364	21	—	—
3254 Bus	11.2	X	359.97022	302.90136	42.80716	4.40961	0.1566003	0.12427749	3.9768671	21	9 24.2	15.9
3255 Tholen	13.4	X	22.49676	79.44184	337.03290	21.36085	0.3621638	0.26956773	2.3733263	21	—	—
3256 Daguerre	12.5	X	152.00527	267.76777	174.28340	7.83893	0.0991754	0.21304768	2.7764179	21	5 11.3	16.7
3257 Hanzlik	13.2	X	140.79800	275.54222	30.25814	5.55738	0.1694977	0.29188076	2.2507767	21	—	—
3258 Somnium	13.2	X	202.13853	296.98870	44.98972	7.55198	0.1961718	0.30076382	2.2062378	21	2 21.2	16.8
3259 Brownlee	10.1	X	26.02502	314.61319	242.48372	15.48043	0.1225362	0.17502502	3.1652107	21	4 22.4	14.1
3260 Vizbor	12.7	X	215.27346	260.19041	249.24239	5.21970	0.0924433	0.29506426	2.2345581	21	10 18.9	15.6
3261 Tvardovskij	11.8	X	198.71358	183.47349	142.93590	2.75145	0.0739507	0.19899403	2.9056459	21	2 5.7	16.0
3262 Miune	11.0	X	12.23367	59.21943	72.89949	9.45604	0.0665724	0.18880156	3.0093012	21	1 8.6	14.9
3263 Bligh	13.0	X	346.57906	11.54274	78.39510	7.73131	0.0676175	0.26277214	2.4140699	21	—	—
3264 Bounty	12.4	X	205.73116	8.76735	139.99503	0.97658	0.1343610	0.17553159	3.1591181	21	9 23.3	17.2
3265 Fletcher	13.0	X	58.85888	297.58068	72.79996	6.92649	0.1416432	0.26329589	2.4108674	21	—	—
3266 Bernardus	12.9	X	69.97774	255.89899	110.62400	26.37699	0.1100283	0.37387713	1.9083152	21	—	—
3267 Glo	12.8	X	169.40382	307.75525	110.45032	24.03458	0.2959051	0.27738313	2.3285346	21	5 12.6	17.4
3268 De Sanctis	13.1	X	298.53981	75.08484	221.61373	6.35198	0.1269646	0.27421990	2.3464073	21	4 4.5	16.2
3269 Vibert-Douglas	12.6	X	14.33139	44.00475	353.24851	17.18005	0.1571332	0.21205503	2.7850756	21	—	—
3270 Dudley	14.2	X	199.37025	326.97412	146.90963	27.68732	0.3295815	0.31270118	2.1497257	21	7 31.9	18.3
3271 Ul	16.4	X	276.25171	159.11291	158.81373	25.07551	0.3959950	0.32355695	2.1013686	21	3 7.9	20.0
3272 Tillandz	13.4	X	331.87221	14.01033	94.05619	3.92442	0.0917370	0.29326383	2.2436944	21	—	—
3273 Drukar	11.5	X	209.31566	225.98798	45.76053	14.07267	0.0239310	0.15675509	3.4066037	21	—	—
3274 Maillen	12.8	X	105.27260	233.26451	27.77944	1.23620	0.1252013	0.17712027	3.1401993	21	10 31.2	17.7
3275 Oberndorfer	13.4	X	349.64136	192.96470	45.32317	8.57252	0.1798166	0.27658102	2.3330343	21	3 29.3	15.5
3276 Porta Coeli	12.4	X	339.48744	343.02216	70.96809	2.65778	0.1582557	0.17817884	3.1277495	21	11 22.9	15.7
3277 Aaronson	11.6	X	341.46186	294.80548	84.93706	8.55496	0.2675859	0.17638736	3.1488919	21	10 15.9	14.5
3278 Běhounek	11.4	X	136.42561	92.41810	78.18193	9.70475	0.1333690	0.17033916	3.2229957	21	8 8.6	16.1
3279 Solon	13.2	X	212.55935	166.98868	191.89780	3.16454	0.1738061	0.30152251	2.2025354	21	3 19.4	16.5
3280 Grétry	12.4	X	89.40526	0.21858	317.10765	2.22996	0.1783946	0.2378193				

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3281 Maupertuis	12.9 <sup>m</sup>	X	349.18925	240.65325	348.43451	5.99048	0.0970113	0.27363068	2.3497745	21	3 21.7	15.3
3282 Spencer Jones	13.4	X	89.99811	19.22316	162.31778	3.16788	0.0418819	0.30422441	2.1894751	21	6 24.8	15.9
3283 Skorina	12.8	X	105.34098	352.66984	356.58338	6.89680	0.1000005	0.26559812	2.3969155	21	—	—
3284 Niebuhr	13.0	X	258.19299	261.56942	72.47520	6.64882	0.3820374	0.21365066	2.7711917	21	3 26.4	18.2
3285 Ruth Wolfe	12.2	X	131.11424	169.61149	246.06795	20.62214	0.2172056	0.24556697	2.5255506	21	3 15.4	16.5
3286 Anatoliya	12.7	X	202.54044	77.95355	107.39807	13.42927	0.1033521	0.23035092	2.6355793	21	11 16.1	16.8
3287 Olmstead	14.2	X	289.60144	95.78975	213.32918	12.07906	0.3005354	0.27092361	2.3654012	21	3 16.7	18.1
3288 Seleucus	15.2	X	193.19278	349.30602	218.62452	5.93141	0.4563078	0.34015021	2.0324610	21	11 16.9	18.9
3289 Mitani	13.9	X	134.52013	352.33662	46.32242	1.75493	0.2071925	0.27763849	2.3271065	21	3 1.6	17.0
3290 Azabu	12.1	X	196.69084	108.72702	75.06539	2.77225	0.1300469	0.12538678	3.9533769	21	10 21.9	18.2
3291 Dunlap	12.7	X	58.40229	161.75180	151.23985	2.00745	0.1022834	0.17665311	3.1457329	21	11 8.5	17.1
3292 Sather	13.1	X	257.59564	18.30398	36.88361	1.57240	0.1719055	0.17493429	3.1663051	21	7 20.1	17.8
3293 Rontaylor	14.0	X	266.05865	207.50111	9.55214	2.13964	0.1396201	0.26533001	2.3985299	21	—	—
3294 Carlesely	12.9	X	99.66004	154.73555	6.97071	6.97268	0.0702476	0.22254049	2.6968907	21	6 15.9	16.6
3295 MuraKami	12.9	X	138.77231	218.67530	168.16653	8.80236	0.2545835	0.22264654	2.6960343	21	3 1.9	17.2
3296 Bosque Alegre	12.2	X	193.65401	269.69825	112.86691	13.91163	0.1964875	0.22796230	2.6539579	21	4 14.7	16.9
3297 Hong Kong	12.4	X	251.55772	288.89074	112.32434	2.37622	0.1728967	0.17756268	3.1349810	21	6 25.7	17.0
3298 Massandra	13.8	X	202.43083	51.51155	285.07465	2.56855	0.1926215	0.27294531	2.3537064	21	2 13.6	17.7
3299 Hall	13.4	X	186.61866	242.60208	251.68290	5.47050	0.0773233	0.28598848	2.2815869	21	8 23.2	16.7
3300 McGlasson	10.4	X	172.03659	263.60710	27.26187	18.73909	0.2022917	0.17487157	3.1670620	21	—	—
3301 Jansje	13.0	X	266.21394	117.78944	136.92968	5.06784	0.1519568	0.29516089	2.2340703	21	—	—
3302 Schliemann	12.7	X	179.27707	169.99921	154.33230	3.38959	0.0968228	0.25641214	2.4538254	21	1 4.9	16.3
3303 Merta	12.0	X	54.28043	277.97632	52.11322	2.75959	0.0726567	0.20007592	2.8951617	21	11 23.2	15.8
3304 Pearce	13.5	X	345.98873	58.25491	320.30498	2.20296	0.2791796	0.18474992	3.0531388	21	10 22.8	16.1
3305 Ceadams	12.2	X	189.59858	240.44919	32.14025	13.43234	0.1548678	0.23477155	2.6023901	21	—	—
3306 Byron	12.8	X	230.68398	64.54406	213.30388	4.52560	0.1441857	0.29242318	2.2479925	21	—	—
3307 Athabasca	13.9	X	75.85382	146.57551	263.16165	6.37398	0.0954316	0.29019259	2.2594974	21	—	—
3308 Ferreri	11.6	X	150.90073	273.69321	172.32167	23.63994	0.1874203	0.17707489	3.1407357	21	5 24.1	17.1
3309 Brorfelde	13.7	X	279.56190	218.38128	29.77381	21.13208	0.0532290	0.40219012	1.8176703	21	—	—
3310 Patsy	10.7	X	201.79226	133.61673	101.36959	11.09834	0.0599388	0.18891936	3.0080501	21	—	—
3311 Podobed	12.3	X	51.72874	8.99882	157.32784	0.93128	0.0403432	0.21170998	2.7881010	21	4 13.6	15.9
3312 Pedersen	11.5	X	35.81483	128.62640	214.31991	9.65510	0.1206534	0.18944561	3.0024770	21	11 21.1	15.5
3313 Mendel	12.2	X	108.87083	346.37551	272.32189	11.39904	0.1315698	0.22799005	2.6537426	21	11 5.2	16.4
3314 Beals	12.8	X	206.50727	46.40097	359.41559	7.40669	0.0455248	0.29842104	2.2177696	21	5 15.4	15.8
3315 Chant	12.4	X	216.18118	58.52981	146.63141	10.04071	0.0861675	0.22977053	2.6400157	21	12 23.8	16.2
3316 Herzberg	11.9	X	264.78494	354.02586	200.26429	8.40907	0.1048386	0.17961056	3.1111060	21	—	—
3317 Paris	8.4	X	344.50111	150.30283	135.90855	27.87117	0.1281277	0.08260846	5.2213927	21	6 19.6	15.0
3318 Blixen	11.0	X	21.56350	48.82912	109.07848	11.57167	0.0487005	0.18880509	3.0092637	21	2 26.3	15.1
3319 Kibi	12.0	X	84.20614	119.58260	269.72037	3.83738	0.1506719	0.17463871	3.1698767	21	—	—
3320 Namba	13.1	X	219.19951	347.04100	118.09678	4.06413	0.0490153	0.25573097	2.4581809	21	—	—
3321 Dasha	12.7	X	101.98721	202.45363	162.50779	7.32199	0.1982055	0.24243740	2.5472387	21	—	—
3322 Lidiya	12.8	X	86.27362	224.07456	250.73442	23.49229	0.2175495	0.26662154	2.3907779	21	4 6.5	16.0
3323 Turgenev	13.6	X	45.66342	24.12312	21.32173	0.70710	0.1841074	0.24029573	2.5623514	21	—	—
3324 Avsyuk	11.9	X	233.22473	183.70030	316.73583	10.77409	0.0255853	0.22235631	2.6983798	21	10 25.1	15.8
3325 TARDIS	11.5	X	288.85542	85.84742	46.18993	22.20203	0.0179466	0.17358425	3.1827009	21	12 17.6	16.2
3326 Agafonikov	13.2	X	249.22275	280.62268	4.35291	3.38088	0.1721657	0.27032595	2.3688863	21	1 24.2	17.0
3327 Campins	11.8	X	145.93169	242.14160	69.73848	1.55626	0.0917987	0.17405853	3.1769168	21	—	—
3328 Interposita	11.5	X	316.29006	275.49803	60.40724	11.44735	0.1117125	0.18819751	3.0157370	21	7 4.5	15.5
3329 Golya	11.6	X	254.70624	68.31990	11.67502	10.40081	0.0825600	0.18939253	3.0030379	21	9 1.9	15.9
3330 Gantrisch	11.4	X	181.93020	306.32458	9.81445	10.26206	0.2011912	0.17582174	3.1556415	21	1 20.0	16.8
3331 Kvistaberg	13.4	X	263.43832	305.89225	168.31408	3.57097	0.0871753	0.26187556	2.4195768	21	11 3.4	16.2
3332 Raksha	11.5	X	108.16329	277.97024	138.66156	14.84959	0.0855718	0.24274561	2.5450821	21	2 7.4	14.6
3333 Schaber	11.8	X	186.20378	66.43991	231.14779	11.96093	0.2211281	0.17758053	3.1347710	21	—	—
3334 Somov	11.8	X	251.00190	189.22502	86.49882	3.25962	0.0242863	0.20483455	2.8501469	21	2 3.6	15.9
3335 Quanzhou	12.1	X	71.26479	179.43672	278.11112	13.31023	0.1271557	0.23362435	2.6109024	21	2 9.7	15.3
3336 Grygar	14.4	X	27.75059	123.66537	242.65556	0.85807	0.1866592	0.27817935	2.3240892	21	—	—
3337 Miloš	12.5	X	130.38256	221.24731	178.96496	1.99138	0.0783637	0.20555422	2.8434905	21	2 19.7	16.5
3338 Richter	14.3	X	124.87974	177.64706	126.18802	0.73549	0.1696188	0.31343355	2.1463756	21	—	—
3339 Treshnikov	11.3	X	216.71338	147.81004	84.73450	17.82026	0.1330999	0.17390854	3.1787432	21	—	—
3340 YinHai	13.4	X	218.09469	283.47170	35.59379	5.60017	0.1944067	0.29520655	2.2338400	21	2 5.6	17.0
3341 Hartmann	12.3	X	247.43579	235.37419	141.97131	10.44981	0.2397762	0.18798425	3.1801714	21	5 19.7	17.4
3342 Fivesparks	12.2	X	66.18556	311.85707	144.16335	6.18747	0.0843452	0.17755991	3.1350136	21	2 12.6	16.3
3343 Nedzel	13.2	X	286.97681	229.75826	43.43620	25.00254	0.3113574	0.27356282	2.3501631	21	2 11.2	17.6
3344 Modena	13.0	X	106.10549	206.04518	77.83738	9.43257	0.1180696	0.26253548	2.4155204	21	12 10.1	16.6
3345 Tarkovskij	12.0	X	290.63448	194.72515	304.83822	15.87191	0.1918100	0.25374475	2.4709920	21	—	—
3346 Gerla	10.9	X	94.46612	21.48154	2.63181	21.47652	0.0466569	0.17325708	3.1867064	21	—	—
3347 Konstantin	11.9	X	95.73791	221.74941	193.37516	4.77877	0.1060741	0.17839170	3.1252609	21	2 3.4	16.3
3348 Pokryshkin	12.0	X	197.42898	62.03062	185.78040	10.38488	0.1617778	0.17430099	3.1739699	21	—	—
3349 Manas	12.6	X	92.44288	150.89261	58.51786	4.23406	0.0308640	0.21718802	2.7410196	21	8 5.9	16.3
3350 Scobee	14.6	X	233.38712	330.93178	353.66023	3.40715	0.2047944	0.28059861	2.3107114	21	2 25.2	18.2
3351 Smith	12.9	X	228.80864	182.04321	185.79306	13.25203	0.2719216	0.18622917	3.0369496	21	4 20.4	18.2
3352 McAuliffe	15.8	X	248.56260	16.07918	107.34795	4.77094	0.3689056	0.38252501	1.8794444	21	9 28.2	17.8
3353 Jarvis	13.7	X	341.46847	34.85325	245.58806	21.80800	0.0846844	0.38765470	1.8628277	21	5 17.5	14.7
3354 McNair	13.1	X	77.86722	326.19656	321.10760	6.41197	0.0968765	0.27816807	2.3241520	21	11 11.5	16.4
3355 Onizuka	13.6	X	273.09051	299.92503	140.83739	4.06698	0.0658124	0.30479388	2.1867471	21	10 12.3	15.9
3356 Resnik	13.0	X	93.41375	157.80865	108.28391	4.09625	0.1142188	0.30359488	2.1925007	21	11 10.9	16.0
3357 Tolstikov	11.8	X	20.37431	59.91118	145.35524	11.25933	0.0548296	0.18777157	3.0202959	21	4 27.2	15.9
3358 Anikushin	12.7	X	141.11414	273.78216	147.03104	2.10377	0.2063223	0.17381202	3.1799199	21	4 14.6	17.9
3359 Purcari	13.8	X	179.93095	43.42928	24.85202	5.73586	0.1224696	0.29088678	2.2559011	21	5 17.1	17.0
3360 Syrinx	15.9	X	104.38791	63.48946	242.54251	21.15552	0.7460507					

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3361 Orpheus	19.0	X	216.32338	301.93842	189.15067	2.67795	0.3229947	0.74014999	1.2103832	21	11 7.1	15.0
3362 Khufu	18.3	X	238.34578	55.04821	152.43191	9.91725	0.4684977	1.00130453	0.9895216	21	—	—
3363 Bowen	12.2	X	122.45396	312.13945	183.15387	3.33187	0.1011176	0.21313595	2.7756513	21	6 14.2	16.3
3364 Zdenka	13.5	X	104.28208	108.41450	145.97735	5.55110	0.1048377	0.30234404	2.1985437	21	11 7.3	16.5
3365 Recogne	12.5	X	294.09890	108.90425	189.31620	7.80173	0.1738104	0.22072631	2.7116480	21	4 1.7	16.2
3366 Gödel	11.5	X	349.40393	147.29305	179.99194	9.96444	0.0879635	0.18903158	3.0068595	21	8 15.2	15.2
3367 Alex	12.4	X	118.06717	236.74515	258.16113	5.31968	0.0682219	0.21220091	2.7837991	21	6 4.1	16.4
3368 Duncombe	11.0	X	273.72796	351.11054	4.09022	19.15427	0.0900634	0.15833093	3.3839625	21	5 30.6	16.2
3369 Freuchen	12.3	X	238.29807	141.57337	267.43022	7.97865	0.1395126	0.18583782	3.0412117	21	6 24.9	17.1
3370 Kohsai	13.5	X	216.20091	300.71127	144.58321	7.11343	0.1094100	0.29877349	2.2160251	21	7 21.3	16.5
3371 Giacconi	12.1	X	271.10927	345.06660	293.59108	9.66827	0.0129805	0.21749164	2.7384680	21	2 25.8	15.9
3372 Bratijchuk	12.1	X	21.22456	20.18821	19.07316	3.27396	0.1390117	0.22288290	2.6941279	21	—	—
3373 Koktebelia	13.4	X	195.50907	251.12744	177.24624	3.20225	0.1312224	0.29298555	2.2451150	21	6 4.5	16.8
3374 Namur	12.7	X	54.94487	149.54827	75.35624	3.02135	0.0124534	0.19466175	2.9485985	21	7 2.6	16.8
3375 Amy	14.0	X	252.74370	354.01357	169.20564	1.08053	0.0261475	0.30800352	2.1715288	21	—	—
3376 Armandhammer	12.5	X	79.41600	329.02407	250.04724	6.34539	0.0661736	0.27365239	2.3496502	21	8 5.3	15.4
3377 Lodewijk	12.6	X	31.36861	203.19041	210.92825	1.30299	0.0591103	0.19813752	2.9140135	21	—	—
3378 Susanvictoria	13.6	X	349.56478	92.41166	335.88393	8.08111	0.0911400	0.27966068	2.3158750	21	—	—
3379 Oishi	13.3	X	237.01588	303.85218	146.73294	2.85267	0.1303067	0.27248172	2.3563754	21	8 20.1	16.5
3380 Awaji	12.2	X	54.76650	19.37269	92.88016	3.23781	0.0272682	0.20560838	2.8429912	21	2 7.6	15.9
3381 Mikkola	13.2	X	248.84134	134.84061	257.78592	4.21507	0.2068738	0.25662224	2.4524859	21	6 6.8	16.8
3382 Cassidy	12.9	X	246.65443	347.10586	357.74290	6.00033	0.1835196	0.29362501	2.2418541	21	4 1.8	16.3
3383 Koyama	12.3	X	271.71059	138.95631	139.12259	14.59205	0.0457082	0.23983466	2.5656343	21	2 23.5	15.8
3384 Dalija	13.8	X	223.09293	263.34182	139.43087	2.75955	0.2108258	0.26782362	2.3836188	21	5 26.6	17.6
3385 Bronnina	12.4	X	334.24103	68.56934	197.67032	6.80320	0.0406414	0.29787016	2.2205031	21	4 27.6	14.6
3386 Klementinum	12.7	X	18.24476	215.10107	168.25982	2.16563	0.0848966	0.20624781	2.8371120	21	12 15.7	16.3
3387 Greenberg	12.4	X	211.76409	115.41353	216.69921	12.87369	0.1861707	0.23489427	2.6014836	21	2 16.6	17.0
3388 Tsanghinchi	13.0	X	302.79164	17.85852	98.95914	24.97316	0.2007130	0.27132398	2.3630737	21	—	—
3389 Sinzot	12.6	X	100.83953	269.50731	149.97239	7.06346	0.1393733	0.21349156	2.7725682	21	2 14.8	16.3
3390 Demanet	13.3	X	319.34362	259.66682	322.81943	3.38877	0.1147919	0.29147726	2.2528534	21	2 17.7	15.7
3391 Sinon	10.3	X	297.43699	103.33325	341.08675	14.87996	0.0836987	0.08078990	5.2994566	21	10 9.8	17.2
3392 Setouchi	13.8	X	64.38546	239.89860	266.77659	26.32903	0.2807221	0.31495279	2.1394677	21	4 18.6	16.0
3393 Stúr	12.4	X	113.19940	104.94705	156.43498	9.65962	0.0651852	0.23716541	2.5848488	21	11 14.8	16.2
3394 Banno	13.2	X	354.13868	335.38126	192.30150	7.09198	0.1977424	0.27942442	2.3171802	21	—	—
3395 Jitka	11.8	X	160.25300	104.70160	4.90155	4.03037	0.0565185	0.21134849	2.7912792	21	6 20.5	15.9
3396 Muazzez	11.0	X	19.06077	315.49481	37.82619	8.32043	0.1793559	0.15778101	3.3918207	21	11 10.1	15.2
3397 Leyla	13.4	X	230.52112	95.68964	25.64932	21.99391	0.2967089	0.27332935	2.3515012	21	9 15.7	17.4
3398 Stättmayer	13.5	X	32.37012	42.72405	64.26183	24.15779	0.2382786	0.28494009	2.8718001	21	—	—
3399 Kobzon	12.6	X	250.56294	354.13323	359.13758	0.13636	0.1833906	0.18127458	3.0920376	21	4 25.7	17.6
3400 Aotearoa	15.8	X	16.82318	253.73446	254.31667	20.22528	0.0991572	0.36615488	1.9350528	21	—	—
3401 Vanphilos	12.4	X	283.10803	108.56428	322.33335	21.80194	0.3582522	0.27015869	2.3698640	21	8 16.4	15.0
3402 Wisdom	15.0	X	305.23436	303.81181	357.83500	4.85280	0.2798023	0.31674238	2.1314015	21	3 23.7	17.7
3403 Tammy	12.9	X	260.90832	95.46314	204.16466	4.57438	0.1957296	0.26312965	2.4118828	21	2 18.7	16.7
3404 Hinderer	12.8	X	10.72550	197.89260	302.45502	10.02785	0.1270822	0.22607134	2.6687366	21	1 1.9	15.8
3405 Daiwensai	12.2	X	237.27965	63.24741	241.86109	13.19082	0.1140621	0.23367553	2.6105212	21	2 7.8	16.5
3406 Omsk	11.8	X	17.02779	310.48426	269.82837	8.35890	0.1309770	0.21085829	2.7956036	21	5 4.8	15.0
3407 Jimmysimms	12.6	X	47.21865	344.51962	102.84657	13.09602	0.1570022	0.22376231	2.6870645	21	—	—
3408 Shalamov	13.3	X	355.65920	203.36378	132.71005	2.85945	0.2275280	0.26977195	2.3721284	21	10 1.7	14.8
3409 Abramov	12.0	X	17.71657	169.12621	211.24515	1.40086	0.0796139	0.20433399	2.8547996	21	12 10.1	15.7
3410 Vereshchagin	13.6	X	101.49391	155.74849	339.62453	4.73411	0.0975805	0.29018157	2.2595546	21	5 11.8	16.3
3411 Debetencourt	13.5	X	191.97356	50.18478	69.28629	5.38465	0.1171773	0.29318972	2.2440726	21	8 12.4	16.7
3412 Kafka	13.4	X	251.20225	117.28672	307.58826	2.97294	0.1039352	0.29688885	2.2253934	21	8 6.8	15.9
3413 Andriana	13.4	X	69.10914	288.15567	306.89744	5.79758	0.1277235	0.29153289	2.2525668	21	8 26.2	16.0
3414 Champollion	13.9	X	3.74735	61.43798	24.95699	5.29389	0.1008485	0.30408801	2.1901298	21	—	—
3415 Danby	10.9	X	261.27811	136.36183	253.95723	1.36673	0.2482677	0.12486446	3.9643940	21	6 14.8	17.0
3416 Dorrit	13.4	X	336.27214	293.77161	19.92503	22.06903	0.2070822	0.37116658	1.9175946	21	6 17.3	15.0
3417 Tambllyn	13.6	X	123.12147	113.48885	88.32538	7.94352	0.2277735	0.26122424	2.4235969	21	9 25.2	17.7
3418 Izvekov	12.4	X	167.42237	285.26990	83.96331	1.89303	0.1890911	0.17580574	3.1558300	21	3 6.9	17.7
3419 Guth	11.0	X	296.65567	226.01399	58.48947	17.48918	0.0650189	0.17127783	3.2112094	21	4 15.7	15.7
3420 Standish	11.9	X	283.78472	20.74881	145.90546	14.30580	0.0806559	0.18023227	3.1039474	21	—	—
3421 Yangchenning	13.8	X	226.26414	204.72852	243.62345	2.46508	0.0923973	0.29508407	2.2344580	21	8 8.4	16.7
3422 Reid	12.1	X	255.18862	199.96036	111.80156	13.92236	0.1492711	0.22313148	2.6921266	21	3 15.5	16.5
3423 Slouka	12.4	X	191.04646	181.52179	335.40719	0.40779	0.1028828	0.18452057	3.0556682	21	9 20.8	17.2
3424 Nuši	12.7	X	353.58459	245.52371	149.88264	6.77557	0.0710936	0.24250791	2.5467449	21	12 3.4	15.8
3425 Hurukawa	11.1	X	327.77840	138.57416	291.34709	9.23495	0.0829455	0.18971726	2.9996102	21	11 25.4	14.9
3426 Seki	12.9	X	280.60049	260.30715	5.53821	13.14694	0.0956689	0.23252313	2.6191394	21	2 17.4	16.7
3427 Szentmártoni	13.8	X	161.86821	76.70057	309.97626	2.60236	0.1345475	0.28615125	2.2807217	21	3 4.7	17.0
3428 Roberts	12.1	X	15.23670	303.33830	230.78754	8.87352	0.1653506	0.22678503	2.6631347	21	2 17.3	15.0
3429 Chuvaev	14.0	X	39.81033	162.80605	180.63084	1.33367	0.1897760	0.27563042	2.3383954	21	12 24.0	16.8
3430 Bradfield	12.5	X	0.85182	278.03734	43.16390	4.42651	0.0991174	0.21489170	2.7605119	21	9 1.9	15.7
3431 Nakano	10.6	X	261.49593	45.48109	312.34095	12.28164	0.0482375	0.18123741	3.0924604	21	5 26.8	15.2
3432 Kobuchizawa	12.0	X	12.44837	250.49946	8.93913	13.00139	0.2566270	0.17388574	3.1790210	21	7 3.9	15.3
3433 Fehrenbach	12.6	X	193.70661	74.65771	336.57001	4.51350	0.1880265	0.26633490	2.3924929	21	5 9.8	16.5
3434 Hurlless	13.2	X	122.48842	262.21436	88.12149	3.44909	0.2281315	0.22966939	2.6407906	21	—	—
3435 Bourry	13.2	X	25.21544	297.93512	170.77245	7.22262	0.0465500	0.27820139	2.3239665	21	—	—
3436 Ibadinov	12.5	X	127.14560	133.40375	188.30852	1.74388	0.0554021	0.20340060	2.8635267	21	—	—
3437 Kapitsa	12.9	X	36.34411	79.91704	34.60862	3.93634	0.0758221	0.28789123	2.2715228	21	—	—
3438 Inarradas	11.8	X	280.84939	349.83767	2.42082	15.30260	0.2028881	0.18549705	3.0449351	21	5 18.5	16.5
3439 Lebofsky	12.3	X	151.21689	283.50416	7.77366	4.73178	0.1383448	0.21699538	2.7426416	21	—	—
3440 Stampfer	12.6	X	265.20828	145.53005	171.12419							

## ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3441 Pochaina	12.6	X	164.44193	270.31810	112.83121	2.76381	0.1892893	0.18054046	3.1004139	21	3 20.4	17.6
3442 Yashin	11.7	X	221.36636	297.90583	100.17760	12.23794	0.1410842	0.17666048	3.1456455	21	5 27.9	16.7
3443 Leetsungdao	13.1	X	144.21110	112.42488	184.57444	12.70886	0.3063435	0.26622521	2.3931500	21	—	—
3444 Stepanian	12.7	X	314.19580	83.73405	342.50540	6.46358	0.2607913	0.24098040	2.5574956	21	10 25.3	14.6
3445 Pinson	12.6	X	251.02638	200.20222	334.03992	11.28689	0.1250881	0.22370672	2.6875097	21	12 21.4	16.4
3446 Combes	13.3	X	270.18477	95.75384	34.64274	7.68003	0.1576316	0.26909831	2.3760856	21	11 24.4	15.7
3447 Burckhalter	12.3	X	216.68230	164.98639	0.66406	20.71973	0.0289445	0.35093763	1.9905943	21	11 27.4	15.0
3448 Narbut	12.9	X	129.21444	349.68411	45.23288	3.38545	0.1180697	0.30365542	2.1922094	21	1 31.8	15.3
3449 Abell	12.8	X	330.01122	335.24644	81.34494	2.03731	0.1497903	0.18203052	3.0834713	21	11 10.4	16.3
3450 Dommanget	12.6	X	51.26493	337.47000	71.56256	6.46687	0.0633271	0.21667854	2.7453146	21	—	—
3451 Mentor	8.5	X	339.42645	130.09812	179.58640	24.63196	0.0716669	0.08424646	5.1534919	21	7 7.1	15.3
3452 Hawke	13.6	X	325.18926	290.06750	58.76884	2.31565	0.0810646	0.28823379	2.2697226	21	8 15.8	15.7
3453 Dostoevsky	12.2	X	42.42327	319.89308	300.65013	4.51138	0.0866330	0.26713540	2.3877110	21	8 14.5	14.7
3454 Lieske	13.4	X	200.47674	244.99993	193.63419	5.36152	0.1577855	0.28868843	2.2673390	21	6 22.5	16.9
3455 Kristensen	13.1	X	47.36145	359.57962	168.77922	3.55697	0.0646261	0.29340597	2.2426988	21	3 31.8	15.2
3456 Etienhemarey	13.7	X	177.80232	164.79667	78.34131	1.77861	0.0157115	0.30966756	2.1637425	21	—	—
3457 Arnenordheim	12.0	X	182.68769	208.03239	101.25414	3.24886	0.0528692	0.20429922	2.8551235	21	—	—
3458 Boduognat	12.7	X	4.32924	336.26765	155.97498	2.13250	0.1569192	0.25716905	2.4490083	21	—	—
3459 Bodil	12.9	X	79.70475	200.76422	98.58128	5.22003	0.1698105	0.29304871	2.2447924	21	12 12.0	16.0
3460 Ashkova	12.5	X	123.76830	298.92642	82.40884	2.37390	0.2234494	0.17377664	2.1803515	21	2 13.5	17.4
3461 Mandelshtam	13.4	X	313.28379	343.64230	57.84429	3.24356	0.1352307	0.26865161	2.3787187	21	10 8.0	15.5
3462 Zhouguangzhao	13.6	X	143.75282	255.06020	113.02538	5.79889	0.2122453	0.25637805	2.4540429	21	2 4.1	17.2
3463 Kaokuen	13.3	X	106.04271	48.69724	50.84986	3.02485	0.1358376	0.25767184	2.4458214	21	4 9.5	16.3
3464 Owensby	13.5	X	74.44525	251.76128	324.63056	6.77246	0.0435302	0.29393604	2.2402724	21	7 25.7	15.9
3465 Trevises	13.4	X	274.16099	138.26326	112.51264	6.07352	0.0513485	0.27988417	2.3146420	21	1 12.7	16.4
3466 Ritina	13.4	X	281.15519	127.78180	104.92605	1.76405	0.1582119	0.27559072	2.3386200	21	—	—
3467 Bernheim	13.3	X	151.57400	348.95181	105.31755	4.11334	0.1498358	0.26363136	2.4088218	21	5 26.7	16.8
3468 Urgenta	11.8	X	41.58966	306.31843	80.99774	10.99921	0.0787259	0.18777241	3.0202869	21	—	—
3469 Bulgakov	11.1	X	257.52490	66.02435	219.28818	9.24157	0.0769174	0.18767488	3.0213332	21	2 16.1	15.7
3470 Yaronika	13.2	X	292.52189	312.35716	237.13291	2.55703	0.1454733	0.27430726	2.3459091	21	—	—
3471 Amelin	11.5	X	108.69541	158.86136	334.83927	15.39130	0.0512163	0.17298812	3.1900087	21	5 16.4	16.3
3472 Uppgren	13.9	X	128.13026	142.00879	242.89416	4.50054	0.1756490	0.21897730	2.7260678	21	2 7.3	17.8
3473 Sapporo	13.6	X	273.29484	57.48416	129.71092	0.96535	0.1584310	0.27148357	2.3621475	21	—	—
3474 Linsley	12.9	X	126.19124	108.46232	169.01911	5.99067	0.2080515	0.24120075	2.5559378	21	12 20.8	17.3
3475 Fichte	11.5	X	128.93005	230.68869	241.94430	15.00055	0.1265623	0.17441704	3.1725620	21	5 27.5	16.2
3476 Dongguan	11.8	X	189.13648	25.41821	43.81545	21.60615	0.1949032	0.17554551	3.1589511	21	5 29.2	17.3
3477 Kazbegi	12.9	X	242.41645	97.52044	186.76874	6.71015	0.1120426	0.27427634	2.3460854	21	1 16.2	16.4
3478 Fanale	12.7	X	208.84787	270.29938	126.39501	3.84106	0.1631974	0.29484714	2.2356549	21	5 6.8	16.0
3479 Malaparte	11.6	X	318.10190	95.28506	196.24866	12.50986	0.1004453	0.18525410	3.0475967	21	5 11.9	15.6
3480 Abante	13.4	X	192.95905	25.46802	187.37698	3.76186	0.2836060	0.18592638	3.0402459	21	11 18.7	18.8
3481 Xianglupeak	13.1	X	328.25959	242.34236	186.99939	5.48575	0.1426182	0.29391534	2.2403775	21	12 27.4	15.0
3482 Lesnaya	12.3	X	330.61874	246.97584	128.74215	4.70038	0.1711509	0.21232618	2.7827041	21	9 22.4	15.1
3483 Svetlov	13.9	X	277.34328	277.50261	85.93440	23.61251	0.1248095	0.36682808	1.9326847	21	6 9.2	15.7
3484 Neugebauer	13.1	X	116.43764	176.23959	116.08759	15.37988	0.1862000	0.23667802	2.5883963	21	12 29.3	17.5
3485 Barucci	13.0	X	358.04904	339.36531	315.30824	1.80117	0.1662119	0.25869982	2.4393379	21	7 20.5	14.9
3486 Fulchignoni	13.6	X	12.81252	19.70156	46.90056	3.19585	0.1788508	0.25989097	2.4318788	21	—	—
3487 Edgeworth	12.5	X	112.29857	115.41118	194.59429	12.43107	0.1740516	0.23424291	2.6063041	21	—	—
3488 Brahic	13.1	X	219.77084	243.43620	142.04833	14.12623	0.1851563	0.23436471	2.6054010	21	5 8.6	17.6
3489 Lottie	13.2	X	150.74641	46.85855	18.11340	6.31066	0.0979472	0.26387990	2.4073090	21	4 11.3	16.5
3490 Solc	13.4	X	252.41183	99.22209	343.91245	5.87731	0.1159297	0.26465860	2.4025847	21	8 31.5	16.5
3491 Fridolin	12.3	X	277.16684	246.80942	161.29487	4.01401	0.0955464	0.21079610	2.7961535	21	8 15.8	15.9
3492 Petra-Pepi	11.8	X	151.57838	97.05504	138.77768	13.63057	0.1443762	0.23305519	2.6151515	21	11 24.9	16.2
3493 Stepanov	13.1	X	309.63291	76.35425	122.12172	5.97683	0.0879531	0.30134760	2.2033876	21	—	—
3494 Purple Mountain	12.7	X	205.50805	72.66232	234.40216	5.83066	0.1302012	0.27354049	2.3502910	21	1 8.7	16.2
3495 Colchagua	11.7	X	32.50550	107.71845	122.29891	2.48498	0.1191615	0.17065421	3.2190276	21	6 18.9	15.6
3496 Arioso	15.3	X	263.04376	283.64455	129.41596	29.71350	0.4575643	0.22037456	2.7145327	21	6 25.8	20.4
3497 Innanen	12.1	X	64.74454	62.66275	161.90897	11.32412	0.1505525	0.22340122	2.6899592	21	8 4.7	15.6
3498 Belton	14.1	X	171.13548	191.25008	223.52461	6.23839	0.1024845	0.27283557	2.3543375	21	4 20.1	17.4
3499 Hoppe	12.6	X	128.27616	190.68431	148.35124	2.22775	0.1666603	0.17946217	3.1128207	21	—	—
3500 Kobayashi	12.9	X	154.21948	10.58199	314.69471	4.25556	0.1964270	0.29401670	2.2398626	21	—	—
3501 Olegiya	11.8	X	359.54168	70.15555	246.10018	4.98887	0.0910167	0.19706012	2.9246252	21	8 17.2	15.4
3502 Huangpu	11.8	X	129.39296	210.85531	104.89444	2.81978	0.1721069	0.17756954	3.1349003	21	—	—
3503 Brandt	13.4	X	81.30519	113.43464	186.85727	11.91835	0.1857796	0.23306091	2.6151088	21	12 7.6	17.6
3504 Kholshvnikov	12.1	X	167.35854	164.63528	118.78922	2.04726	0.1772614	0.18018506	3.1044896	21	—	—
3505 Byrd	11.8	X	198.97353	90.30910	302.19012	9.10616	0.1171988	0.18896043	3.0076143	21	4 23.7	16.8
3506 French	11.7	X	196.90567	51.70554	342.77686	9.07944	0.0993417	0.19003093	2.9963084	21	4 24.5	16.5
3507 Vilas	11.5	X	90.82829	182.73115	88.23079	3.24623	0.1583081	0.17790799	3.1309232	21	11 1.9	16.4
3508 Pasternak	12.6	X	248.76600	299.07979	4.71710	6.63953	0.1103413	0.21503343	2.7592988	21	2 27.7	16.7
3509 Sanshui	12.0	X	105.29870	139.31868	219.79448	12.80008	0.1512838	0.23518305	2.5993537	21	—	—
3510 Veeder	12.5	X	274.11037	15.83163	279.69074	5.69009	0.1273039	0.24268293	2.5455203	21	3 6.3	16.4
3511 Tsvetaeva	12.2	X	132.26933	237.91980	229.55779	8.67240	0.2005633	0.21679753	2.7443100	21	5 30.0	16.5
3512 Eriepa	13.9	X	83.49822	301.05141	112.77322	7.49659	0.2472049	0.29217471	2.2492668	21	1 3.3	15.2
3513 Quqinyue	13.0	X	87.95485	351.27861	323.45846	2.64858	0.0111802	0.23126745	2.6286113	21	12 12.9	16.4
3514 Hooke	11.8	X	148.69206	341.72342	24.27229	3.50467	0.1928976	0.12518854	3.9575492	21	2 21.8	18.0
3515 Jindra	12.6	X	205.85366	239.20412	341.41173	1.39151	0.0123795	0.20553113	2.8437034	21	—	—
3516 Rusheva	12.3	X	4.91963	206.85630	161.62047	2.32338	0.0805787	0.20150838	2.8814249	21	11 6.7	15.8
3517 Tatianicheva	13.7	X	113.18784	182.83011	187.11775	3.15357	0.0954435	0.29373978	2.2412701	21	—	—
3518 Florena	12.4	X	12.86505	165.64136	147.83575	13.91669	0.1789438	0.22515897	2.6759411	21	9 22.3	15.2
3519 Ambiorix	13.2	X	110.80351	246.07819	49.69379	0.56614	0.1769163	0.30837331	2.1697924	21	—	—
3520 Klopsteg	13.4	X	118.32241	211.6								

## ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3521 Comrie	14.3	X	358.42187	35.35787	58.83730	3.86713	0.0672811	0.28977247	2.2616807	21	—	—
3522 Becker	12.3	X	40.27608	149.64084	201.66609	8.34591	0.2860877	0.17376967	3.1804366	21	12 26.4	16.8
3523 Arina	12.3	X	348.88639	158.70895	55.65018	9.66689	0.1343606	0.26981223	2.3718923	21	3 2.1	15.0
3524 Schulz	13.4	X	214.21831	330.67735	179.89196	13.07946	0.1294454	0.23317343	2.6142674	21	10 10.7	17.3
3525 Paul	12.2	X	73.53098	188.07543	279.99580	2.54050	0.1034868	0.18217055	3.0818910	21	3 10.0	16.2
3526 Jeffbell	12.4	X	228.85717	244.49553	42.43074	8.48932	0.0923196	0.21124953	2.7921509	21	1 20.3	16.8
3527 McCord	12.7	X	156.01784	355.15300	219.13627	5.51383	0.1221497	0.28415222	2.2914058	21	11 5.7	16.0
3528 Counselman	13.0	X	238.53198	32.34255	276.64793	7.46196	0.1582219	0.24416927	2.5351795	21	2 13.2	17.2
3529 Dowling	14.7	X	134.14243	184.85798	193.93820	2.76306	0.1833648	0.26806011	2.3822166	21	1 31.0	17.9
3530 Hammel	14.2	X	148.03895	76.06785	262.64075	1.17233	0.2259924	0.26501888	2.4004067	21	1 2.2	17.6
3531 Cruikshank	12.9	X	211.95993	300.10876	192.60474	13.14328	0.1467749	0.23176033	2.6248832	21	9 10.5	17.1
3532 Tracie	11.9	X	334.13048	343.16325	56.23643	10.33068	0.0542978	0.19803877	2.9149821	21	10 31.7	15.7
3533 Toyota	12.9	X	145.38184	237.78832	197.15518	4.86902	0.1175703	0.29808050	2.2194584	21	4 17.9	15.6
3534 Sax	12.4	X	173.10470	200.86719	247.08215	7.63791	0.1945939	0.21594307	2.7515445	21	6 10.6	17.0
3535 Ditte	14.6	X	320.80493	163.92454	262.49298	1.57153	0.1836597	0.28268334	2.2993367	21	12 4.3	15.9
3536 Schleicher	14.0	X	161.63967	114.00680	340.99659	6.54855	0.0499908	0.27493457	2.3423394	21	5 29.6	17.2
3537 Jürgen	12.4	X	170.28230	277.62430	44.22908	15.16568	0.1557744	0.23658313	2.5890883	21	1 1.9	16.6
3538 Nelsonia	13.6	X	7.36534	264.74842	170.02976	4.20410	0.2687194	0.22968631	2.6406610	21	—	—
3539 Weimar	12.5	X	123.29589	128.75615	141.15595	13.67907	0.1571406	0.22760194	2.6567585	21	12 8.4	17.0
3540 Protasilaios	9.3	X	252.79534	115.96461	26.43382	23.28376	0.1165447	0.08120984	5.2811718	21	10 23.7	16.3
3541 Graham	13.0	X	219.95276	129.91052	92.26437	4.00531	0.1434603	0.25551589	2.4595601	21	—	—
3542 Tanjiazhen	12.4	X	75.78269	61.09951	265.97789	8.08539	0.0852374	0.17452489	3.1712548	21	12 12.1	16.8
3543 Ningbo	12.0	X	121.96330	109.19700	162.75316	1.04670	0.1708721	0.17402382	3.1773392	21	12 1.1	17.3
3544 Borodino	12.5	X	301.65461	149.03677	147.59191	8.90363	0.2205848	0.26496914	2.4007072	21	3 30.6	15.7
3545 Gaffey	12.2	X	117.18184	255.20752	61.24692	2.97170	0.0560975	0.20278292	2.8693386	21	—	—
3546 Atanasoff	12.3	X	325.50433	249.04197	335.16268	7.02706	0.0259722	0.22289465	2.6940333	21	2 26.9	15.7
3547 Serov	13.6	X	291.02584	162.97708	274.53649	3.90171	0.0500163	0.25281682	2.4770346	21	10 25.3	16.5
3548 Eurybates	9.8	X	337.94782	27.15955	43.54978	8.05649	0.0899061	0.08311463	5.2001724	21	11 19.8	16.3
3549 Hapke	12.5	X	190.68457	210.96637	284.22873	7.53367	0.1656920	0.21432048	2.7654147	21	8 21.3	17.1
3550 Link	11.7	X	305.82040	29.85838	81.12367	14.68082	0.1584259	0.19705657	2.9246603	21	12 12.0	14.7
3551 Verenia	16.6	X	172.38312	193.25999	173.78123	9.50954	0.4870820	0.32552997	2.0928691	21	3 8.5	20.6
3552 Don Quixote	12.9	X	129.26137	316.56176	349.92866	31.09373	0.7088078	0.11200150	4.2623931	21	1 18.4	21.1
3553 Mera	16.4	X	88.87489	288.86851	232.52477	36.76782	0.3200857	0.46731677	1.6446057	21	6 25.9	18.8
3554 Amun	15.8	X	76.19044	359.40249	358.60760	23.35744	0.2806243	1.02534473	0.9739936	21	—	—
3555 Miyasaka	13.0	X	319.52928	310.43856	26.29096	9.47733	0.2380599	0.21815713	2.7328960	21	6 21.1	16.1
3556 Lixiaohua	12.7	X	51.26327	145.47837	240.73010	9.27757	0.2130005	0.17479338	3.1680065	21	—	—
3557 Sokolsky	10.9	X	204.54165	122.47110	185.77573	6.04952	0.1735335	0.12289859	4.0065582	21	1 30.9	17.4
3558 Shishkin	12.7	X	138.53423	302.99415	344.86990	13.40148	0.0651481	0.25843225	2.4410213	21	—	—
3559 Violaumayer	14.0	X	118.71800	71.57767	313.96984	3.81694	0.2140409	0.25140859	2.4862758	21	1 29.6	17.1
3560 Chenqian	11.0	X	253.98054	58.74372	325.18352	9.29148	0.1190685	0.18827154	3.0149464	21	6 12.4	15.6
3561 Devine	11.1	X	235.94969	176.66450	117.82123	9.68431	0.1296522	0.12508906	3.9596472	21	2 14.7	17.2
3562 Ignatius	13.3	X	141.85309	60.90874	92.86406	5.72337	0.1538031	0.27528055	2.3403763	21	8 4.9	16.8
3563 Canterbury	12.7	X	219.62574	345.87823	267.74904	6.95714	0.1800084	0.21127603	2.7919174	21	—	—
3564 Talthybius	9.4	X	151.21392	203.69340	23.76606	15.50679	0.0384479	0.08307884	5.2016656	21	10 21.9	16.5
3565 Ojima	11.9	X	3.36211	346.39669	91.85539	7.35198	0.1233517	0.17190371	3.2034101	21	—	—
3566 Levitan	13.1	X	153.28007	193.99118	289.21756	2.27305	0.1262817	0.27169376	2.3609291	21	7 4.0	16.6
3567 Alvena	13.1	X	175.02354	138.14025	270.97116	6.82427	0.3130104	0.21214890	2.7842540	21	4 26.8	18.3
3568 ASCI	11.8	X	115.66247	280.59040	58.19395	19.44941	0.2349703	0.17632799	3.1495986	21	—	—
3569 Kumon	12.5	X	30.93691	314.91853	161.81102	14.02424	0.1231089	0.23614060	2.5923220	21	—	—
3570 Wuyeesun	11.2	X	97.61089	220.42963	84.98771	11.32269	0.0886803	0.18791408	3.0187687	21	12 13.0	15.6
3571 Milanštefánik	11.0	X	292.83136	21.31805	248.92703	7.85549	0.1123695	0.12615157	3.9373825	21	3 13.4	16.7
3572 Leogoldberg	12.6	X	9.69983	165.70344	232.59489	3.40824	0.1328931	0.22207060	2.7006937	21	—	—
3573 Holmberg	12.9	X	76.88732	210.14057	268.78506	2.76450	0.0670508	0.29423092	2.2387753	21	3 4.7	15.3
3574 Rudaux	13.5	X	119.34867	144.43011	225.00757	4.65762	0.1836321	0.26189353	2.1494661	21	1 1.6	16.4
3575 Anyuta	12.2	X	19.14159	158.72270	71.19297	7.75852	0.1222956	0.21627275	2.7487475	21	5 24.5	15.2
3576 Galina	13.0	X	111.62017	48.22731	20.38153	10.09402	0.1328364	0.26595528	2.3947690	21	3 7.3	16.0
3577 Putilin	10.4	X	135.76180	179.43923	280.16092	3.74251	0.1958067	0.12597018	3.9411614	21	5 25.8	16.7
3578 Carestia	10.3	X	99.97751	48.06433	284.55039	21.32217	0.2045048	0.17098416	3.2148852	21	—	—
3579 Rockholt	13.8	X	213.17776	109.03826	14.33465	31.07288	0.3551751	0.21765977	2.7370576	21	9 4.5	19.2
3580 Avery	12.9	X	328.88918	178.84299	347.74255	3.40393	0.2401946	0.20433453	2.8547947	21	—	—
3581 Alvarez	12.2	X	249.66998	107.66128	217.42057	28.86314	0.4058485	0.21323306	2.7748086	21	2 28.1	18.0
3582 Cyrano	11.7	X	207.51429	351.74679	59.59405	10.86479	0.0811018	0.18976015	2.9991581	21	5 30.1	16.2
3583 Burdett	13.1	X	25.74611	31.83711	33.10469	2.79196	0.1744063	0.25959431	2.4337312	21	—	—
3584 Aisha	12.3	X	75.01079	108.90526	304.59066	2.12876	0.1019435	0.18184497	3.0855685	21	1 4.7	16.3
3585 Goshirakawa	12.7	X	109.47439	15.21088	162.78991	3.02119	0.1805926	0.18207546	3.0829639	21	8 1.3	17.5
3586 Vasnetsov	13.1	X	122.54086	260.06291	6.62210	9.85687	0.1162263	0.25557960	2.4591513	21	12 1.9	17.1
3587 Descartes	12.7	X	289.82430	25.73202	32.82568	7.82471	0.0373572	0.22152675	2.7051121	21	9 29.1	16.2
3588 Kirik	12.2	X	296.07952	108.17551	328.50066	6.42865	0.1875193	0.16974006	3.2305749	21	9 29.9	16.3
3589 Loyola	13.7	X	116.20510	286.79113	111.30455	4.46663	0.1636431	0.29293413	2.2453777	21	1 26.4	15.9
3590 Holst	13.1	X	46.81860	354.93135	128.60964	6.70853	0.0813765	0.29180800	2.2511508	21	1 22.4	15.2
3591 Vladimirkij	12.2	X	268.64009	261.78167	27.40452	1.14120	0.1390949	0.17477427	3.1682374	21	3 3.6	17.0
3592 Nedbal	13.8	X	246.06266	62.83708	20.51354	9.66217	0.1902134	0.27406594	2.3472860	21	8 17.8	17.2
3593 Osip	14.2	X	324.84324	205.65249	273.86653	1.11986	0.0938829	0.31236197	2.1512817	21	—	—
3594 Scotti	13.0	X	182.60919	164.68914	341.23177	14.64598	0.0292948	0.24425764	2.5345680	21	9 5.2	16.3
3595 Gallagher	12.8	X	102.68065	119.70746	232.78837	2.80069	0.1232059	0.22671205	2.6637062	21	—	—
3596 Meriones	9.3	X	341.58368	66.03692	356.68466	23.52037	0.0741589	0.08369321	5.1761782	21	11 7.5	16.1
3597 Kakkuri	11.9	X	90.41735	301.99737	86.15725	2.51712	0.1908909	0.17533439	3.1614863	21	1 8.9	15.9
3598 Saucier	12.2	X	301.95424	66.45628	161.57435	6.78518	0.0982212	0.17397093	3.1779831	21	1 31.7	16.7
3599 Basov	12.4	X	338.37958	49.51263	163.83210	1.64712	0.1140456	0.17500673	3.1654313	21	2 28.1	16.4
3600 Archimedes	12.9	X	21.83652	145.72629	5.479							

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3601 Velikhov	12.7	X	7.21776	359.79718	61.62730	2.27470	0.1516513	0.16891653	3.2410666	21	—	—
3602 Lazzaro	14.1	X	347.12551	232.85963	241.85283	5.57836	0.1331069	0.28895293	2.2659552	21	—	—
3603 Gajdušek	12.7	X	305.71218	347.25937	277.88533	5.22834	0.1251884	0.23933770	2.5691846	21	3 6.1	16.3
3604 Berkhuijsen	13.3	X	7.11202	157.36270	19.91084	12.02253	0.1168385	0.23505828	2.6002734	21	2 18.9	16.4
3605 Davy	12.8	X	31.07392	199.86200	282.56564	3.91861	0.0806700	0.29174216	2.2514895	21	—	—
3606 Pohjola	12.3	X	164.83790	108.85560	250.08427	12.42014	0.2285005	0.23422141	2.6064635	21	2 10.7	16.9
3607 Naniwa	14.1	X	84.59888	127.02881	1.73831	2.83904	0.0695378	0.29279421	2.2460930	21	4 2.6	16.5
3608 Kataev	11.4	X	355.89292	235.76713	78.57374	11.01262	0.1457722	0.15810654	3.3871635	21	8 12.5	15.5
3609 Liloketai	12.3	X	94.54442	30.85489	65.29460	4.85626	0.2442918	0.17885393	3.1198740	21	4 15.7	16.8
3610 Decampos	13.7	X	294.49707	39.19576	115.95763	2.07804	0.0468753	0.31300980	2.1483123	21	—	—
3611 Dabu	13.0	X	197.17222	290.90255	135.66865	8.49468	0.2153143	0.21205918	2.7850393	21	6 5.7	17.8
3612 Peale	13.7	X	81.73488	267.16746	77.33351	3.37315	0.1850174	0.25859679	2.4399858	21	—	—
3613 Kunlun	12.9	X	120.31933	79.42314	72.41951	7.42257	0.0748192	0.27012032	2.3700884	21	6 29.7	16.0
3614 Tumilty	10.6	X	79.33958	311.56729	287.14471	16.70349	0.1302136	0.19120937	2.9839848	21	8 30.2	15.2
3615 Sfronov	11.5	X	66.57535	112.30728	134.87356	2.11200	0.1317324	0.17500644	3.1654347	21	9 2.1	15.9
3616 Glazunov	12.3	X	297.29153	118.27251	117.79363	12.76892	0.1237693	0.23490306	2.6014188	21	1 21.6	15.9
3617 Eicher	12.4	X	269.16036	36.03504	181.46988	14.47569	0.1113642	0.23139214	2.6276669	21	—	—
3618 Kuprin	12.5	X	188.33958	101.08747	231.90626	2.02386	0.1783020	0.17582732	3.1555748	21	2 8.8	17.7
3619 Nash	14.0	X	172.34232	181.97620	161.21490	4.04815	0.2382450	0.26698784	2.3885907	21	1 30.5	17.8
3620 Platonov	12.5	X	226.36922	125.04182	272.33757	8.96759	0.1127110	0.19075379	2.9887340	21	5 30.9	17.1
3621 Curtis	12.6	X	122.99655	176.40462	174.65751	2.69373	0.1846577	0.18002021	3.1063845	21	1 1.9	17.1
3622 Ilinsky	11.8	X	129.58230	147.71782	254.24449	4.93335	0.0442711	0.15782037	3.3912568	21	2 22.1	16.8
3623 Chaplin	12.1	X	124.67691	235.45199	118.10342	3.07212	0.0833124	0.20445804	2.8536449	21	—	—
3624 Mironov	14.0	X	235.46630	49.93324	5.92051	4.17119	0.1204344	0.27221052	2.3579401	21	7 2.7	17.4
3625 Fracastoro	11.5	X	245.34551	109.14236	222.28232	5.02986	0.1169136	0.18477202	3.0528953	21	3 29.6	16.2
3626 Ohsaki	12.3	X	144.43559	37.72380	282.59909	4.08931	0.1501371	0.17561039	3.1581729	21	—	—
3627 Sayers	13.8	X	114.85874	127.10088	85.62427	9.70723	0.1476957	0.27373798	2.3491604	21	9 28.3	17.4
3628 Božněmcová	12.8	X	155.47918	187.87808	156.63591	6.88204	0.2973791	0.24345670	2.5401239	21	1 25.6	17.1
3629 Lebedinskij	12.9	X	147.96031	173.27363	235.19590	5.64379	0.1035382	0.26468408	2.4024305	21	3 15.4	16.4
3630 Lubomír	12.8	X	25.96460	324.08075	336.61790	7.42361	0.2066324	0.21389999	2.7690378	21	9 25.4	15.8
3631 Sigyn	11.1	X	298.85729	159.25307	150.85962	14.42782	0.0780530	0.18115808	3.0933632	21	5 15.4	15.6
3632 Grachevka	12.4	X	221.88880	238.54249	201.15543	6.43538	0.3119639	0.21440147	2.7647182	21	7 4.8	17.5
3633 Mira	13.7	X	266.40319	293.85887	230.51809	3.31086	0.1030692	0.28057745	2.3108276	21	—	—
3634 Iwan	13.7	X	338.36133	321.20249	341.60401	4.30291	0.0911586	0.29292173	2.2454411	21	6 25.3	15.7
3635 Kruz	14.9	X	127.30253	249.11485	235.34132	19.22172	0.0845368	0.40999713	1.7945222	21	5 25.0	16.4
3636 Pajdušáková	13.9	X	33.83332	93.90309	26.96101	4.10125	0.1765792	0.28689986	2.2767525	21	—	—
3637 O'Meara	11.7	X	87.58526	70.05687	207.73646	14.32912	0.1248990	0.24138298	2.5546513	21	11 11.5	15.5
3638 Davis	11.5	X	148.81972	167.26472	108.93197	11.30974	0.0759399	0.18846797	3.0128512	21	12 30.1	16.2
3639 Weidenschilling	13.3	X	196.74929	183.17179	222.56421	2.20439	0.1005624	0.26505873	2.4001662	21	5 7.4	16.6
3640 Gostin	12.6	X	221.48545	155.19933	289.18237	4.31079	0.0862682	0.29691205	2.2252775	21	7 28.9	15.4
3641 Williams Bay	11.6	X	107.66448	293.39542	30.73819	16.10273	0.1273196	0.19036254	2.9928277	21	—	—
3642 Frieden	11.2	X	138.92303	15.08447	131.28139	13.47350	0.0802501	0.21170625	2.7881337	21	7 15.1	15.3
3643 Tienchanglin	13.0	X	152.91526	4.36261	56.76814	13.87947	0.1511006	0.26478519	2.4018189	21	4 18.5	16.6
3644 Kojitaku	13.1	X	165.24621	81.88927	355.27042	3.53404	0.0944508	0.29246194	2.2477939	21	5 11.3	16.2
3645 Fabini	12.4	X	325.28378	108.51173	261.86745	7.12494	0.0820547	0.22191183	2.7019818	21	9 5.5	15.7
3646 Aduatiques	13.2	X	256.39182	41.01107	105.0212	0.58835	0.1058385	0.21538429	2.7563013	21	7 23.3	17.1
3647 Dermott	11.6	X	330.99130	218.73934	126.14488	8.04955	0.1036159	0.21018877	2.8015371	21	8 12.4	14.9
3648 Raffinetti	13.1	X	9.80030	33.94241	208.98137	7.90173	0.1069178	0.26264653	2.1448395	21	5 22.8	15.5
3649 Guillermina	12.2	X	53.27720	93.99083	118.30611	7.16458	0.0467169	0.17690885	3.427006	21	6 18.5	16.4
3650 Kunming	11.7	X	298.10566	285.23897	36.72923	14.60985	0.2421604	0.17910987	3.1169012	21	4 30.4	16.0
3651 Friedman	13.6	X	85.17871	139.00050	71.59053	7.31725	0.1029331	0.26843339	2.3800077	21	8 12.4	16.7
3652 Soros	13.3	X	21.38166	62.30467	245.36331	2.27129	0.1933755	0.27075009	2.3664118	21	10 5.6	15.4
3653 Klimishin	13.3	X	194.38740	73.83452	182.67880	4.95608	0.0992328	0.29479327	2.2359273	21	—	—
3654 AAS	14.1	X	7.14425	182.48034	200.80397	2.10905	0.2006533	0.28968154	2.2621540	21	—	—
3655 Eupraksia	11.0	X	115.45548	39.54959	338.01470	3.82205	0.2018490	0.12229782	4.0196686	21	2 5.9	16.8
3656 Hemingway	13.5	X	96.95351	301.14789	314.46076	0.80868	0.1405175	0.30125929	2.2038181	21	11 1.2	16.6
3657 Ermolova	12.7	X	82.25113	102.08495	237.25844	5.78972	0.1318629	0.28027333	2.3124989	21	—	—
3658 Feldman	13.4	X	320.06914	107.01205	320.36896	4.01353	0.0637956	0.30492452	2.1861224	21	12 7.9	15.5
3659 Bellingshausen	13.9	X	255.14779	260.22142	189.36850	3.44870	0.1168521	0.24464312	2.5319048	21	9 10.1	17.3
3660 Lazarev	11.7	X	280.50114	215.62541	354.90454	7.78564	0.0811632	0.17033813	3.2230086	21	—	—
3661 Dolmatovskij	12.2	X	340.74817	142.86972	17.59987	1.94097	0.0573651	0.19646370	2.9305412	21	—	—
3662 Dezhnev	12.1	X	183.84391	337.92407	350.70914	13.38631	0.1713068	0.22801736	2.6535307	21	1 28.8	16.5
3663 Tisserand	12.7	X	134.50641	155.16537	107.03051	3.09760	0.1712753	0.17635557	3.1492703	21	11 30.9	18.0
3664 Anneres	12.2	X	331.43916	145.09058	260.40060	3.59188	0.1301484	0.21085522	2.7956308	21	11 3.5	15.2
3665 Fitzgerald	13.0	X	223.28856	280.38193	115.17608	15.07151	0.0897631	0.26224252	2.4173191	21	5 28.2	16.7
3666 Holman	12.3	X	263.82424	53.92437	120.31519	2.36487	0.1288458	0.17923214	3.1154835	21	12 27.1	16.5
3667 Anne-Marie	12.2	X	214.88942	73.75289	0.08976	16.24125	0.2309347	0.18218220	3.0817596	21	6 28.7	17.7
3668 Il'fpetrov	13.3	X	171.34005	32.01050	194.02317	3.07722	0.1038120	0.30463565	2.1875042	21	12 11.3	16.3
3669 Vertinskij	13.1	X	200.31134	35.11882	90.92240	4.82489	0.0697840	0.29893258	2.2152388	21	9 4.5	15.9
3670 Northcott	12.3	X	55.98564	147.86033	107.00017	6.44577	0.0172832	0.21678602	2.7444071	21	8 15.7	15.9
3671 Dionysus	16.4	X	128.92606	204.27812	82.08703	13.53219	0.5414927	0.30230991	2.1987092	21	—	—
3672 Stevedberg	13.2	X	356.34192	32.22585	14.15528	6.29344	0.1386315	0.30552853	2.1832403	21	—	—
3673 Levy	12.9	X	304.56656	44.96341	13.27196	7.09048	0.1835904	0.27425394	2.3462131	21	10 10.0	14.8
3674 Erbisbühl	12.1	X	327.28356	98.06471	296.84204	21.02595	0.3753754	0.27172093	2.3607717	21	9 20.7	13.7
3675 Kemstach	11.2	X	46.00202	174.65380	339.63765	10.85443	0.0865934	0.15936292	3.3693377	21	3 27.9	15.6
3676 Hahn	13.9	X	247.80439	233.56635	358.99720	3.07325	0.0542240	0.31175013	2.1540955	21	—	—
3677 Magnusson	13.7	X	297.08032	125.27611	205.93570	4.29603	0.2007326	0.28898446	2.2657904	21	5 10.3	16.3
3678 Mongmanwai	12.6	X	160.44253	51.56850	141.97389	8.29247	0.1900276	0.24170739	2.5523649	21	10 12.6	16.9
3679 Condruces	13.6	X	274.83274	64.36951	309.09981	3.84942	0.2207270	0.30280518	2.1963111	21	6 5.9	16.3
3680 Sasha	12.9	X	258.36236	96.54019	26.00425	5.5040						

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	H	G	M	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	V
3681 Boyan	13.4	X	51.75053	172.45618	132.98158	4.06561	0.1843695	0.29608785	2.2294051	21	11 22.4	16.2
3682 Welther	11.8	X	107.86880	114.17947	255.41164	13.59631	0.3179446	0.21507293	2.7589609	21	1 15.3	15.7
3683 Baumann	11.1	X	70.43733	149.81644	101.81958	15.84288	0.1211097	0.17716217	3.1397041	21	9 17.9	15.8
3684 Berry	13.9	X	4.53986	67.64013	94.95920	6.81276	0.1539728	0.28481197	2.2878659	21	—	—
3685 Derdenye	13.5	X	241.03554	183.36048	202.77388	15.15017	0.1774884	0.22670902	2.6637299	21	5 26.4	17.8
3686 Antoku	12.4	X	154.40456	79.11578	134.54381	5.72642	0.1472991	0.21738276	2.7393823	21	10 28.8	16.9
3687 Dzus	11.5	X	31.10694	113.41805	224.83813	15.79135	0.2000391	0.21884571	2.7271604	21	11 25.9	14.9
3688 Navajo	15.1	X	353.38393	137.79145	19.98713	2.55726	0.4776642	0.17015026	3.2253806	21	—	—
3689 Yeates	12.4	X	301.06025	162.64336	202.11339	9.33981	0.0847539	0.20156228	2.8809112	21	7 21.7	16.4
3690 Larson	13.5	X	344.97603	35.61962	235.23914	5.03225	0.1652529	0.29303083	2.2448837	21	5 6.7	15.0
3691 Bede	14.7	X	204.85663	234.91828	348.74329	20.36143	0.2842394	0.41707815	1.7741531	21	—	—
3692 Rickman	13.4	X	255.17286	9.49285	219.55848	11.40884	0.1501254	0.21935400	2.7229459	21	—	—
3693 Barringer	11.8	X	353.84441	184.02532	178.71859	14.92543	0.2024593	0.17639343	3.1488196	21	10 16.2	15.1
3694 Sharon	10.5	X	246.30135	80.29148	311.08137	4.97791	0.2055671	0.12655435	3.9290238	21	6 6.0	16.6
3695 Fiala	14.0	X	107.47008	197.15961	177.02504	7.43989	0.2306461	0.27360780	2.3499055	21	—	—
3696 Herald	12.4	X	160.39722	18.58055	312.24275	10.11312	0.1461767	0.17859499	3.1228889	21	1 12.9	17.3
3697 Guyhurst	13.7	X	81.38830	185.72016	351.43829	6.73933	0.426014	0.27052844	2.6770741	21	6 5.1	16.6
3698 Manning	13.0	X	29.90307	180.68779	132.80765	3.52535	0.1919107	0.29299184	2.2450828	21	11 4.7	15.3
3699 Milbourn	12.9	X	8.73877	232.55629	94.96684	5.71164	0.1869198	0.26526046	2.3989491	21	10 13.9	15.1
3700 Geowilliams	12.6	X	248.36787	152.96492	289.15689	12.11245	0.2241297	0.26224144	2.4173257	21	8 6.5	16.2
3701 Purkyně	12.5	X	1.34339	299.81270	115.51674	4.92310	0.0903811	0.21058821	2.7979934	21	—	—
3702 Trubetskaya	11.7	X	314.31024	254.36240	119.91533	15.64606	0.2385502	0.23236604	2.6203197	21	8 8.8	14.2
3703 Volkonskaya	14.1	X	17.28416	152.16347	172.90100	6.74419	0.1342221	0.27680300	2.3317869	21	10 18.8	16.4
3704 Gaoshiqi	12.6	X	5.45717	37.75241	233.68340	5.89368	0.0505502	0.26343295	2.4100311	21	6 26.3	15.2
3705 Hotellasilla	12.5	X	40.10882	237.56154	154.19094	1.40005	0.1677509	0.17810571	3.1286056	21	—	—
3706 Sinnott	13.8	X	51.37101	310.70515	137.01361	3.51037	0.0981441	0.30419957	2.1895943	21	—	—
3707 Schröter	12.4	X	283.01084	142.91224	281.22778	12.54899	0.1558445	0.23274387	2.6174830	21	8 31.8	16.0
3708 1974 FV <sub>1</sub>	9.3	X	276.10821	57.59990	291.18049	13.36828	0.1591927	0.08280978	5.2129268	21	5 23.2	16.4
3709 Polypoites	9.1	X	301.59457	246.89496	187.07434	19.63603	0.0625574	0.08234645	5.2324624	21	10 12.2	15.9
3710 Bogoslovskij	12.6	X	194.82607	127.66441	198.80504	13.79858	0.1594738	0.21726413	2.7403794	21	1 29.4	17.3
3711 Ellensburg	13.0	X	208.55278	122.42888	312.68398	11.78996	0.1662302	0.22764221	2.6564452	21	6 27.3	17.3
3712 Kraft	11.7	X	18.94658	200.63280	287.88956	31.69992	0.2553187	0.21776774	2.7361528	21	—	—
3713 Pieters	11.6	X	200.46394	213.26334	109.15368	11.37420	0.0974550	0.18756322	3.0225322	21	2 6.4	16.3
3714 Kenrussell	12.7	X	48.63921	23.69380	29.49582	14.33419	0.1765896	0.24016429	2.5632861	21	—	—
3715 Stohl	13.4	X	26.03837	236.60090	145.17589	5.93949	0.0986023	0.27980744	2.3150651	21	—	—
3716 Petzval	13.6	X	46.68471	150.14197	139.00209	2.52509	0.2152553	0.26563465	2.3966957	21	10 24.6	16.4
3717 Thorenia	12.4	X	84.35669	57.37393	101.52735	2.56371	0.1705180	0.17560691	3.1582147	21	6 9.4	16.7
3718 Dunbar	13.1	X	113.03523	227.32121	71.64895	3.55342	0.0538918	0.23058106	2.6338253	21	12 26.8	16.8
3719 Karamzin	13.8	X	4.68360	112.04819	292.42760	2.77398	0.2056913	0.26415973	2.4056086	21	—	—
3720 Hokkaido	13.3	X	275.98483	285.70575	19.23405	6.78980	0.1266374	0.27903678	2.3193257	21	3 20.7	16.4
3721 Widorn	11.9	X	78.06501	150.73551	313.93995	8.76805	0.0853661	0.18792327	3.0186703	21	3 6.9	16.1
3722 Urata	12.8	X	27.27185	136.50569	232.29334	6.46151	0.1993385	0.29483562	2.2357132	21	—	—
3723 Voznesenskij	14.0	X	74.19644	168.36700	95.02193	1.37786	0.1114647	0.29097660	2.2554368	21	10 12.5	16.9
3724 Annenskij	11.7	X	72.34982	118.73771	269.10855	7.75050	0.1628263	0.21436586	2.7650244	21	—	—
3725 Valsecchi	13.9	X	235.71684	17.84587	345.60873	11.40969	0.2049943	0.22453671	2.6808827	21	4 15.7	18.6
3726 Johnnads	12.1	X	6.91971	232.01800	105.34404	3.02531	0.0766128	0.20305268	2.8667967	21	9 30.6	15.7
3727 Maxhell	11.5	X	204.43522	162.32866	161.52674	5.37852	0.1507649	0.16296060	3.3195634	21	2 13.2	17.0
3728 IRAS	12.1	X	236.37575	280.97262	167.29484	22.60370	0.2107581	0.22808885	2.6529761	21	8 3.3	16.6
3729 Yangzhou	11.8	X	8.49694	313.15112	4.62462	13.46179	0.1930918	0.23169165	2.6254019	21	9 20.8	14.3
3730 Hurban	11.8	X	207.60048	42.64570	305.27410	6.94150	0.1619484	0.21896973	2.7261306	21	3 7.4	16.3
3731 Hancock	10.8	X	126.77902	254.69616	264.24844	21.55071	0.1149007	0.16966115	3.2315765	21	7 15.7	15.9
3732 Vávra	14.1	X	289.14409	9.38258	278.37009	1.55796	0.0709959	0.31088731	2.1580792	21	3 14.2	16.7
3733 Yoshitomo	13.2	X	278.11334	211.60019	286.33647	5.86424	0.1945418	0.26554427	2.3972395	21	12 14.3	15.3
3734 Waland	12.8	X	12.40847	296.16941	180.43355	3.48499	0.0538962	0.21643742	2.7473531	21	—	—
3735 Třeboň	11.8	X	188.71916	258.47634	298.11306	5.21663	0.1535414	0.18106654	3.0944057	21	10 30.9	16.9
3736 Rokoske	11.0	X	231.20117	147.63259	145.27297	11.30440	0.0800430	0.18771080	3.0209477	21	1 31.4	15.6
3737 Beckman	12.5	X	30.84740	85.41333	288.18610	20.13180	0.3961574	0.26396698	2.4067796	21	—	—
3738 Ots	12.9	X	142.75899	269.53646	356.85345	1.24838	0.1687097	0.29721545	2.2237628	21	12 29.5	16.4
3739 Rem	13.3	X	156.94662	171.58629	113.38987	4.62331	0.1548127	0.29888520	2.2154729	21	—	—
3740 Menge	14.1	X	235.48869	53.80587	354.70504	5.75221	0.2680508	0.25511098	2.4621619	21	6 9.1	18.3
3741 Rogerburns	13.1	X	112.69552	140.37151	182.32453	6.80401	0.1518826	0.21263125	2.7800418	21	—	—
3742 Sunshine	13.5	X	315.45817	8.57815	163.93602	2.73314	0.1259877	0.24095243	2.5576936	21	—	—
3743 Pauljaniczek	13.7	X	210.92270	72.19497	167.76298	3.32827	0.1491657	0.30166281	2.2018524	21	—	—
3744 Horn-d Arturo	13.0	X	294.97259	185.58968	227.97346	3.74752	0.2755252	0.23082702	2.6319539	21	8 20.6	16.0
3745 Petaev	14.1	X	2.17706	329.52841	356.49424	9.02627	0.2470190	0.25999959	2.4312014	21	9 29.0	15.7
3746 Heyuan	12.7	X	28.70889	304.08354	24.44055	1.02775	0.2491775	0.17402636	3.1773083	21	11 7.9	16.5
3747 Belinskij	11.1	X	251.18720	105.48491	38.50208	24.32432	0.1237189	0.17337300	3.1852858	21	11 3.4	15.5
3748 Tatum	12.6	X	52.37217	110.49658	33.76214	5.97852	0.1514105	0.24432935	2.5340720	21	3 22.8	15.1
3749 Balam	13.4	X	305.84021	174.51482	295.68440	5.38187	0.1094363	0.29471671	2.2363145	21	—	—
3750 Ilizarov	12.2	X	323.20440	197.41925	7.91147	10.42272	0.0479836	0.18781592	3.0198204	21	2 7.8	16.4
3751 Kiang	11.8	X	298.59677	22.62926	271.26897	13.22564	0.1025197	0.17663573	3.1459394	21	4 11.5	16.5
3752 Camillo	15.3	X	25.00373	312.24570	147.96269	55.56498	0.3016180	0.58646089	1.4135462	21	—	—
3753 Cruithne	15.6	X	202.06413	43.84409	126.22005	19.80690	0.5149340	0.98899388	0.9977161	21	—	—
3754 Kathleen	10.4	X	8.38404	55.30992	110.48141	8.45279	0.1071096	0.17545952	3.1599831	21	2 16.2	14.3
3755 Leconte	13.4	X	20.56605	121.35665	225.78727	7.80336	0.2186115	0.29276571	2.2462387	21	12 11.7	15.9
3756 Ruscannon	13.5	X	34.03924	98.40027	225.75037	3.54714	0.0598356	0.26200112	2.4188036	21	10 27.9	16.3
3757 Anagoly	18.9	X	177.80557	17.21943	74.95930	3.86739	0.4460880	0.39671549	1.8343545	21	6 20.0	22.4
3758 Karttunen	12.8	X	235.98559	57.59253	80.85741	14.12203	0.1151201	0.23126526	2.6286279	21	10 26.5	16.7
3759 Piironen	11.9	X	133.96662	165.81326	292.86896	13.05324	0.1180660	0.21993893	2.7181159	21	5 8.6	16.2
3760 Poutanen	12.5	X	31.93803	87.07603	113.55720	10.49776	0.1830781	0.24460431	2.5321726	21		

## ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3761 Romanskaya	11.5	X	128.85434	83.66137	207.27469	16.02037	0.2816850	0.17847913	3.1242403	21	12 29.7	17.4
3762 Amaravella	13.5	X	25.40578	188.41932	163.79085	1.45926	0.0785124	0.28748601	2.2736568	21	12 1.9	16.1
3763 Qianxuesen	12.6	X	205.06350	169.88923	23.10396	7.02436	0.1053601	0.29167324	2.2518441	21	12 2.6	15.5
3764 Holmesacourt	13.3	X	312.97460	326.33976	146.08073	4.88108	0.0904150	0.29217941	2.2492427	21	—	—
3765 Texereau	12.8	X	337.83993	185.63039	249.36945	1.02402	0.0381874	0.20568573	2.8422783	21	12 20.5	16.6
3766 Junepatterson	12.0	X	201.45777	4.03655	129.01408	1.49373	0.1047315	0.16860347	3.2450773	21	9 1.6	17.1
3767 DiMaggio	11.6	X	161.80204	74.59328	122.78872	13.70540	0.1385599	0.23465801	2.6032295	21	10 21.4	16.0
3768 Monroe	11.6	X	132.45164	224.04739	147.59165	13.94605	0.2146342	0.18099344	3.0952388	21	2 7.4	16.4
3769 Arthurmilller	13.4	X	251.30053	36.09433	56.49866	6.44969	0.1133793	0.28900669	2.2656742	21	9 17.2	16.1
3770 Nizami	14.4	X	132.33410	21.06646	345.37730	6.35326	0.1799666	0.30321472	2.1943329	21	1 6.2	16.9
3771 Alexejtolstoj	14.0	X	19.64507	137.22673	249.30870	4.54710	0.1679510	0.29695382	2.2250688	21	—	—
3772 Piaf	11.3	X	240.91380	198.56122	101.31773	11.00719	0.0596581	0.18745867	3.0236559	21	2 23.9	15.9
3773 Smithsonian	13.3	X	237.53216	286.86127	63.44964	1.32543	0.1838386	0.30925407	2.1656708	21	3 31.3	16.5
3774 Megumi	11.2	X	58.43550	277.64515	292.07423	9.20848	0.0508839	0.18914352	3.0056731	21	6 22.6	15.3
3775 Ellenbeth	12.8	X	117.30855	313.97451	30.34445	8.24096	0.2293120	0.21161715	2.7889163	21	—	—
3776 Vartiouvuori	10.8	X	217.51342	159.87666	39.59789	27.39014	0.0671608	0.17358068	3.1827446	21	12 3.3	15.8
3777 McCauley	13.2	X	141.22065	300.43006	46.47451	4.18938	0.1617318	0.28685054	2.2770135	21	—	—
3778 Regge	12.6	X	353.29448	101.82271	339.16343	1.36877	0.0403287	0.20262574	2.8708223	21	—	—
3779 Kieffer	11.6	X	242.97052	72.79992	59.10704	13.88037	0.1115656	0.23035174	2.6355720	21	10 24.9	15.3
3780 Maury	12.1	X	153.44904	183.98121	143.50901	2.74067	0.0609563	0.20261092	2.8709623	21	—	—
3781 Dufek	12.4	X	94.77838	157.12980	183.55605	2.04604	0.0728328	0.20547813	2.8441924	21	—	—
3782 Celle	12.6	X	203.19709	333.78956	271.34517	5.24985	0.0937042	0.26257804	2.4152594	21	—	—
3783 Morris	13.1	X	90.60004	256.37673	63.50106	6.17739	0.1733541	0.28793170	2.2713099	21	—	—
3784 Chopin	11.5	X	205.56502	192.83279	94.51813	13.53417	0.1639650	0.17783387	3.1317931	21	1 2.6	16.7
3785 Kitami	12.2	X	17.08387	232.42048	150.46528	1.92548	0.1622505	0.16918890	3.2375871	21	12 23.3	16.1
3786 Yamada	11.2	X	290.57335	356.77121	261.71653	14.32204	0.0801643	0.24204735	2.5499744	21	2 8.8	15.0
3787 Aivazovskij	11.5	X	292.41387	306.14414	185.68665	12.05078	0.1329983	0.20484731	2.8500285	21	12 21.2	15.2
3788 Steyaert	12.1	X	256.69479	105.99347	135.12718	9.68399	0.1046252	0.21128317	2.7918545	21	—	—
3789 Zhongguo	12.7	X	269.62970	312.76498	86.95577	2.74513	0.1829852	0.16518529	3.2896912	21	7 12.6	17.5
3790 Raywilson	12.8	X	310.14728	98.02606	319.64512	0.47442	0.1597206	0.17453110	3.1711796	21	10 4.9	16.4
3791 Marci	12.1	X	110.42382	353.57217	329.51580	1.28280	0.0654716	0.20135970	2.8828432	21	—	—
3792 Preston	13.3	X	219.46710	51.04085	63.24966	23.67175	0.2193346	0.28373005	2.2936783	21	9 6.9	17.4
3793 Leonteus	8.8	X	294.94782	262.22339	200.51914	20.89684	0.0897720	0.08263638	5.2202165	21	11 2.2	15.5
3794 Sthenelos	10.5	X	12.95344	36.02150	343.17384	6.06399	0.1470550	0.08304076	5.2032558	21	11 11.8	16.9
3795 Nigel	12.8	X	145.43122	197.36317	65.98939	9.80970	0.1809623	0.26677129	2.3898831	21	12 22.8	16.6
3796 Lene	12.0	X	89.42906	357.95026	269.41970	6.51781	0.1512317	0.22253183	2.6969608	21	10 28.8	16.1
3797 Ching-Sung Yu	12.9	X	286.84670	266.95909	179.35794	0.84764	0.1388277	0.17060330	3.2196680	21	10 8.3	17.1
3798 de Jager	13.8	X	73.30950	244.96870	314.37356	2.43145	0.0765532	0.30871701	2.1681817	21	7 2.6	16.1
3799 Novgorod	12.2	X	282.91497	95.28384	156.86726	1.35700	0.1403011	0.17594131	3.1542117	21	2 2.2	16.9
3800 Karayusuf	15.1	X	226.72574	115.71759	95.44168	14.84726	0.0758039	0.49729931	1.5778201	21	—	—
3801 Thrasymedes	11.1	X	327.07115	205.06923	209.46734	28.49452	0.0239969	0.08021664	5.3246747	21	10 22.7	18.1
3802 Dornburg	13.9	X	65.43717	146.45089	139.13418	4.43941	0.1647030	0.28548046	2.2842929	21	11 8.4	16.9
3803 Tuchkova	11.2	X	45.22243	275.28526	250.34840	13.04595	0.0504356	0.18518983	3.0483018	21	4 2.4	15.5
3804 Drunina	12.6	X	248.78432	284.61914	21.71405	2.15599	0.0613528	0.19975129	2.9982976	21	3 7.8	16.7
3805 Goldreich	12.8	X	224.36195	64.81187	312.31728	11.81447	0.1909401	0.22439660	2.6819985	21	4 22.2	17.5
3806 Tremaine	14.3	X	101.91466	189.02064	199.33647	9.99830	0.3084264	0.24281849	2.5445728	21	1 24.6	17.6
3807 Pagels	13.1	X	332.65145	129.44367	160.92255	4.29880	0.1678143	0.29141015	2.2531993	21	5 14.9	15.1
3808 Tempel	13.8	X	81.07367	10.61914	153.13364	6.33205	0.1479542	0.28136438	3.2065169	21	6 4.7	16.5
3809 Amici	12.6	X	269.49195	307.60227	124.63967	6.56159	0.1045871	0.22288416	2.6941178	21	9 8.8	16.1
3810 Aoraki	13.2	X	263.88670	288.14949	243.84283	6.82241	0.1096225	0.29223830	2.2489405	21	—	—
3811 Karma	11.9	X	115.80166	68.63428	338.77586	10.18509	0.1308306	0.23823866	2.5770800	21	2 14.7	15.3
3812 Lidaksum	11.4	X	320.21176	35.83683	122.91695	18.41122	0.1184796	0.17423906	3.1747220	21	—	—
3813 Fortov	13.5	X	278.18554	349.63331	319.78234	4.15778	0.1758485	0.30392648	2.1909057	21	3 17.3	16.4
3814 Hoshi-no-mura	12.4	X	65.83435	81.43641	141.44070	1.54928	0.1085420	0.17563857	3.1578352	21	7 27.5	16.6
3815 König	12.4	X	32.60849	10.17425	197.21502	8.64373	0.1052041	0.23928272	2.5695781	21	5 14.2	15.2
3816 Chugainov	11.8	X	228.93899	196.71218	310.91367	12.18114	0.1259791	0.23432730	2.6056783	21	10 15.9	15.8
3817 Lencarter	14.1	X	125.48490	112.84593	151.63967	3.27275	0.1104073	0.28852537	2.2681932	21	12 9.7	17.4
3818 Gorlitsa	14.2	X	198.87801	63.91021	244.01077	2.03897	0.1789165	0.27027592	2.3691786	21	1 7.0	17.8
3819 Robinson	12.0	X	179.17809	352.32709	46.19106	11.11325	0.1392141	0.21368257	2.7709157	21	4 16.9	16.4
3820 Sauval	12.4	X	152.39924	76.78754	320.36673	9.57492	0.1118451	0.18918386	3.0052457	21	3 14.9	17.1
3821 Sonet	12.6	X	303.25219	341.90694	113.97788	0.55071	0.1935237	0.17015802	3.2252825	21	11 7.4	16.3
3822 Segovia	13.8	X	203.26197	280.23905	335.86013	2.56040	0.1173963	0.28826802	2.2695430	21	—	—
3823 Yorii	13.1	X	99.78797	15.33701	112.00977	5.50581	0.2475523	0.18367203	3.0650721	21	5 29.5	17.7
3824 Brendalee	13.5	X	354.76285	108.02513	329.44624	2.80117	0.2357371	0.29118671	2.2543517	21	—	—
3825 Nürnberg	12.9	X	214.76544	145.21493	75.19868	5.14527	0.0950661	0.29385219	2.2406985	21	—	—
3826 Handel	13.7	X	15.58868	258.35400	211.10940	4.61920	0.1325035	0.29406293	2.2396279	21	—	—
3827 Zdeněkhorský	13.0	X	256.81082	34.10358	333.50501	4.09776	0.1290518	0.21737159	2.7394761	21	5 22.5	17.1
3828 Hoshino	11.6	X	343.58962	272.26800	221.99759	6.18508	0.0378078	0.17460272	3.1703123	21	—	—
3829 Gunma	12.2	X	65.17896	314.41221	189.52604	7.55133	0.1662916	0.21207332	2.7849156	21	4 20.5	15.4
3830 Trelleborg	11.6	X	244.79715	56.86398	257.67635	9.62554	0.092348	0.18645812	3.0344630	21	12 6.4	15.3
3831 Pettengill	13.3	X	21.25750	147.78409	151.26242	4.58232	0.1963428	0.30889233	2.1673612	21	10 1.8	15.0
3832 Shapiro	12.5	X	40.71708	1.35431	28.07899	1.02339	0.1706911	0.17690424	3.1425752	21	—	—
3833 Calingasta	15.3	X	114.08211	174.17473	170.13654	12.01852	0.3893339	0.30293031	2.1957062	21	—	—
3834 Zappafrank	13.6	X	27.05550	170.97332	55.44962	14.06723	0.1930179	0.24185693	2.5513127	21	6 5.7	15.8
3835 Koroenko	12.3	X	343.17231	232.98937	225.29790	12.61920	0.1543523	0.22561510	2.6723332	21	12 6.4	15.3
3836 Lem	13.8	X	244.95635	204.82907	78.15433	2.03618	0.1459475	0.29423039	2.2387780	21	1 14.3	17.2
3837 Carr	12.9	X	186.34231	41.10006	233.66355	4.82290	0.0695045	0.26091896	2.4254871	21	—	—
3838 Epona	15.6	X	305.11189	49.71993	235.48366	29.20073	0.7024365	0.53382753	1.5049662	21	1 6.2	19.5
3839 Bogaevsckij	13.2	X	31.22430	36.74419	240.61201	2.68826	0.1836193	0.25695814	2.4503482	21	9 3.5	15.6
3840 Mimistrobell	13.3	X	185.19256	167.88581	42.23648	3.91734	0.0831944	0.2922				



ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3841 Diccico	13.1	X	348.06496	359.75431	46.01116	5.22032	0.1593103	0.28742908	2.2739570	21	12 30.7	15.2
3842 Harlansmith	13.0	X	88.72467	112.76572	345.32005	4.05879	0.1191109	0.27288312	2.3540640	21	3 6.9	15.6
3843 OISCA	10.7	X	190.89832	23.63213	28.29290	3.92778	0.1439788	0.12391405	3.9846393	21	5 15.9	17.0
3844 Lujixi	11.8	X	221.36791	230.21454	137.96768	3.83070	0.1047317	0.21837052	2.7311154	21	4 19.9	15.9
3845 Neyachenko	11.9	X	169.20457	260.43221	187.24370	5.97496	0.1563957	0.15522988	3.4288817	21	6 7.9	17.5
3846 Hazel	12.1	X	263.09291	286.13009	223.49461	9.03390	0.0877393	0.19597640	2.9353971	21	12 5.7	16.0
3847 Sindel	12.0	X	131.94875	330.31444	66.80069	3.42713	0.0949283	0.17728927	3.1382034	21	2 26.1	16.5
3848 Analucia	13.7	X	24.31987	62.16177	185.59365	3.48838	0.0958261	0.25648155	2.4533827	21	6 25.9	16.2
3849 Incidencia	13.0	X	285.85567	80.45720	25.80060	5.77369	0.0479591	0.25331136	2.4738096	21	11 26.8	16.0
3850 Peltier	13.6	X	179.92695	207.29540	124.09628	5.26981	0.1616209	0.29498330	2.2349669	21	1 13.2	16.8
3851 Alhambra	13.2	X	259.40621	97.20798	344.63201	4.62857	0.0637532	0.30720845	2.1752739	21	9 20.3	15.6
3852 Glennford	12.2	X	213.76060	127.15361	254.81770	1.25121	0.1960034	0.18035580	3.1025299	21	4 26.7	17.3
3853 Haas	12.7	X	141.82570	283.14663	142.85279	9.08317	0.1375575	0.20950664	2.8076148	21	4 15.4	17.1
3854 George	14.2	X	316.42212	87.71926	8.36115	24.21139	0.1338975	0.37867412	1.8921668	21	—	—
3855 Pasasympsonia	13.1	X	127.95655	233.77681	105.95919	6.83983	0.2092107	0.29445038	2.2376628	21	—	—
3856 Luts kij	12.0	X	1.78900	61.40356	348.00617	1.44522	0.0558528	0.20212142	2.8755956	21	12 21.4	15.8
3857 Cellino	13.4	X	343.49910	178.35458	48.92525	3.08834	0.1593094	0.26616231	2.9352721	21	3 4.3	15.9
3858 Dorchester	13.8	X	287.92364	335.35548	347.91469	7.70869	0.2431820	0.30430785	2.1890748	21	4 6.7	16.7
3859 B6rning	12.1	X	45.03524	348.11353	126.10985	2.88478	0.1406775	0.17238740	3.1974152	21	2 9.9	15.8
3860 Plovidiv	11.6	X	146.30524	44.52581	289.45595	8.12829	0.1531566	0.20947639	2.8078851	21	—	—
3861 Lorenz	12.3	X	82.94515	343.10277	198.08143	5.67189	0.1902972	0.24155304	2.5534521	21	7 8.2	15.7
3862 Agekian	13.0	X	26.02121	180.24340	106.58903	8.98901	0.2485889	0.24305246	2.5429395	21	9 24.4	15.7
3863 Gilyarovskij	13.0	X	50.72656	145.70225	176.74207	9.74089	0.1489662	0.27811839	2.3244288	21	12 5.7	16.2
3864 Sp6ren	13.3	X	103.08531	16.64247	25.15961	3.03701	0.1574468	0.23449776	2.6044154	21	1 25.7	16.6
3865 Lindbloom	12.8	X	215.95231	32.45508	214.45618	6.55295	0.0793317	0.26541807	2.3979993	21	—	—
3866 Langley	11.8	X	135.74478	125.84566	222.15971	3.64176	0.1851065	0.17607324	3.1526359	21	1 11.8	16.6
3867 Shiretoko	13.1	X	159.52092	32.79548	79.92321	6.27558	0.1069775	0.27346491	2.3507240	21	6 25.5	16.3
3868 Mendoza	12.6	X	20.81483	185.64860	171.52047	8.11125	0.0984489	0.27645572	2.3337392	21	12 3.8	15.4
3869 Norton	12.6	X	81.46482	68.81506	248.85208	4.35655	0.1263556	0.25663028	2.4524347	21	12 26.2	16.1
3870 Mayr6	11.9	X	210.02346	65.82036	201.99904	12.35018	0.1656707	0.23207417	2.6225162	21	—	—
3871 Reiz	12.2	X	19.34586	205.07089	273.63791	15.63722	0.0939827	0.17293532	3.1906579	21	1 3.8	16.3
3872 Akirafujii	12.6	X	282.20899	65.87210	94.74317	13.04892	0.2051769	0.22720503	2.6598517	21	—	—
3873 Roddy	12.8	X	310.89412	267.64625	250.03979	23.35150	0.1341509	0.37869793	1.8920855	21	—	—
3874 Stuart	12.5	X	119.09006	315.54926	276.95949	7.67627	0.0512305	0.22441821	2.6818264	21	10 6.3	16.4
3875 Staehle	13.3	X	289.70400	188.04900	131.69016	6.20658	0.1937169	0.29705663	2.2245554	21	4 16.9	16.2
3876 Quaide	11.6	X	67.05272	191.57075	101.45306	11.24622	0.0856903	0.18810137	3.0167645	21	10 29.4	16.0
3877 Braes	12.2	X	265.40153	1.60795	234.47958	14.19517	0.1285894	0.23380126	2.6095852	21	—	—
3878 Jyomun	13.1	X	67.10799	196.82651	157.77436	2.24895	0.1754589	0.17969579	3.1101222	21	—	—
3879 Machar	13.2	X	157.62776	31.89978	321.99260	8.66242	0.2573314	0.27262226	2.3555654	21	2 1.9	16.9
3880 Kaiserman	13.8	X	238.64997	59.32624	276.48949	17.56507	0.0826162	0.36293919	1.9464659	21	2 27.2	16.7
3881 Doumergua	13.0	X	338.15959	40.81879	37.08554	3.60865	0.1493593	0.25732859	2.4479959	21	—	—
3882 Johncox	12.9	X	194.94689	75.70703	195.27556	5.00330	0.1353023	0.25659940	2.4526314	21	—	—
3883 Verbano	11.7	X	204.48038	182.66449	169.16030	12.84569	0.1227199	0.23356193	2.6113676	21	3 10.3	15.7
3884 Alferov	13.1	X	69.83363	112.81471	9.48195	1.16099	0.1378085	0.17957172	3.1115546	21	3 29.1	16.9
3885 Bogorodskij	12.8	X	16.69032	152.89874	144.96519	5.32499	0.0726339	0.21541805	2.7560134	21	8 22.4	16.2
3886 Shcherbakovia	12.7	X	269.32225	124.94703	185.28976	5.06568	0.0998228	0.21333617	2.7739144	21	3 29.5	16.6
3887 Gerstner	12.8	X	334.43689	141.58089	191.10318	9.92838	0.1107503	0.19003869	2.9962269	21	7 27.3	16.6
3888 Hoyt	12.8	X	338.70912	97.28060	175.43361	22.17129	0.2531369	0.26621602	2.3932051	21	4 19.1	15.2
3889 Menshikov	13.1	X	58.41723	236.43516	116.36151	3.50464	0.2174785	0.22526991	2.6750625	21	—	—
3890 Bunin	13.8	X	287.13206	71.86811	259.52529	5.21469	0.1405243	0.27715668	2.3298027	21	5 5.7	16.9
3891 Werner	14.4	X	228.74232	346.67617	269.43559	1.59877	0.1727833	0.26405516	2.4062437	21	—	—
3892 Dezs6	12.6	X	4.13661	71.82582	159.52804	13.76368	0.1399121	0.23441825	2.6050295	21	4 29.6	15.5
3893 DeLaeter	13.2	X	261.48972	107.67964	196.71905	23.07458	0.2640742	0.26142575	2.4223514	21	2 17.8	17.7
3894 Williamcooke	12.1	X	205.37721	188.30278	163.04877	13.35897	0.21713987	0.23158069	2.6224051	21	3 11.6	16.3
3895 Earhart	12.0	X	182.31988	9.10029	150.77541	24.36395	0.1809199	0.27315300	2.3525132	21	9 22.6	15.9
3896 Pordenone	11.4	X	36.61653	313.39149	232.77810	9.67716	0.0434384	0.18928047	3.0042231	21	4 19.2	15.4
3897 Louhi	13.0	X	302.76486	149.23185	188.80128	7.09944	0.1585000	0.22308242	2.6925213	21	6 8.8	16.4
3898 Curlewis	12.6	X	49.50959	215.60113	184.17323	0.65817	0.1580497	0.17939686	3.1135762	21	—	—
3899 Wichterle	11.5	X	269.79017	325.46952	82.01740	2.81628	0.1755174	0.17269977	3.1935585	21	7 23.9	16.2
3900 Knezevi6	13.4	X	260.07586	55.48543	338.17190	6.71644	0.1386486	0.27001945	2.3706786	21	6 29.8	16.6
3901 Nanjingdaxue	12.5	X	288.76931	231.70900	8.51736	12.80981	0.2811720	0.23214810	2.6219594	21	1 3.3	17.1
3902 Yoritomo	11.6	X	262.94588	354.61143	293.68208	15.55108	0.0653867	0.17016106	3.2252441	21	2 25.8	16.5
3903 Kliment Ohridski	12.1	X	335.94229	306.62682	342.01633	1.31125	0.0804643	0.19656740	2.9295105	21	6 3.9	15.8
3904 Honda	11.6	X	126.20539	125.88581	312.26444	14.98601	0.0985795	0.24114837	2.5563079	21	3 24.7	15.5
3905 Doppler	12.7	X	296.72274	91.16112	343.13764	14.20831	0.2546903	0.24036989	2.5618243	21	9 26.0	15.3
3906 Chao	10.6	X	189.30282	208.51292	149.12574	26.05242	0.0698716	0.19616004	2.9335648	21	3 7.3	15.1
3907 Kilmartin	11.8	X	338.44756	85.08785	283.64291	11.00215	0.1208547	0.21088371	2.7953789	21	9 20.0	15.3
3908 Nyx	17.3	X	83.82670	126.57945	261.24034	2.18520	0.4590031	0.36818037	1.9279494	21	—	—
3909 Gladys	11.9	X	289.52979	25.98775	218.54796	13.18389	0.1207873	0.23366448	2.6106035	21	1 20.0	15.9
3910 Liszt	11.9	X	68.67879	273.19302	2.51831	8.69343	0.1337628	0.21099662	2.7943816	21	10 12.7	15.9
3911 Otomo	11.4	X	90.59372	133.94772	210.29071	10.72718	0.0946771	0.18604008	3.0390070	21	—	—
3912 Troja	13.1	X	255.53390	59.88702	26.13645	2.40193	0.0306083	0.26904255	2.3764138	21	9 23.2	15.8
3913 Chemin	12.9	X	141.72942	44.25087	155.72728	23.88445	0.2247851	0.27208757	2.3586504	21	10 8.9	17.1
3914 Kokogahama	11.7	X	236.45034	317.27944	321.51586	9.32887	0.0771767	0.18819254	3.0157901	21	1 21.9	16.3
3915 Futushima	12.3	X	239.52689	144.85999	173.45724	14.42704	0.0405396	0.25880235	2.4386936	21	3 3.9	15.7
3916 Maeva	12.2	X	202.36054	82.66039	27.85445	1.94510	0.1253482	0.16794815	3.2535132	21	8 5.4	17.2
3917 Franz Schubert	13.6	X	297.20727	300.63863	137.08956	2.42935	0.0207893	0.27221348	2.3579231	21	11 12.5	16.3
3918 Brel	12.7	X	265.01071	203.05877	160.63731	7.51160	0.2088501	0.29326648	2.2436809	21	5 16.4	15.9
3919 Maryanning	13.8	X	337.88829	138.36428	158.44143	3.96213	0.1896569	0.29841091	2.2178198	21	6 1.6	15.4
3920 Aubignan	13.0	X	212.72275	237.66714								

ELEMENTS AND OPPOSITION DATES IN 2021

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2021 JULY 5.0 TT

Planet	<i>H</i>	<i>G</i>	<i>M</i>	$\omega$	$\Omega$	<i>i</i>	<i>e</i>	$\mu$	<i>a</i>	TE	Oppos.	<i>V</i>
3921 Klement'ev	12.6	X	172.05869	216.47337	155.27681	12.02974	0.2848843	0.22863369	2.6487597	21	3 13.5	17.3
3922 Heather	12.8	X	352.02386	10.52098	350.82001	2.01317	0.2012052	0.17730105	3.1380644	21	10 7.9	16.0
3923 Radzievskij	11.7	X	202.05963	283.08256	152.06774	3.49248	0.2205568	0.12502619	3.9609746	21	6 19.9	18.2
3924 Birch	12.4	X	63.22249	96.19331	331.59118	6.70056	0.1105217	0.22211943	2.7002979	21	—	—
3925 Tret'yakov	11.0	X	287.83158	206.78947	163.66108	15.61387	0.1947906	0.17586143	3.1551667	21	6 26.2	15.6
3926 Ramirez	13.8	X	120.20609	235.82277	239.06422	9.19191	0.1230739	0.24151087	2.5537493	21	5 16.7	17.2
3927 Feliciaplatt	14.0	X	83.25232	26.10801	255.41864	1.95275	0.1359810	0.30339551	2.1934612	21	11 20.6	17.0
3928 Randa	13.3	X	299.63156	54.65326	269.05461	2.45276	0.1895660	0.29281210	2.2460015	21	5 3.1	16.0
3929 Carmelmaria	13.7	X	309.00018	221.63482	153.12979	2.89097	0.1367360	0.26821006	2.3813286	21	8 16.6	15.9
3930 Vasilev	12.7	X	98.24341	246.73933	37.55327	1.22597	0.1609031	0.17860951	3.1227196	21	11 23.8	17.5
3931 Batten	13.7	X	63.92440	151.07112	328.13377	3.80140	0.0831581	0.26606187	2.3941294	21	2 21.0	16.2
3932 Edshay	11.9	X	38.57896	329.02232	324.51064	14.57532	0.1657656	0.23971455	2.5664912	21	9 28.2	15.2
3933 Portugal	12.5	X	264.22474	250.90694	42.69706	1.69150	0.0962601	0.16825649	3.2495371	21	3 9.9	17.2
3934 Tove	12.8	X	5.41942	94.28634	157.60619	13.14340	0.1407861	0.23582078	2.5946652	21	5 31.9	15.7
3935 Toatenmongakkai	12.0	X	72.09799	105.20879	300.23487	8.76031	0.2313242	0.24332199	2.5410613	21	—	—
3936 Elst	13.0	X	287.05144	38.71980	240.71363	5.64689	0.1287487	0.26054413	2.4278127	21	2 25.9	16.4
3937 Bretagnon	11.9	X	272.00350	116.90855	357.39038	8.85427	0.0259946	0.18374032	3.0643127	21	11 6.5	16.3
3938 Chapront	13.7	X	199.25171	75.36016	157.84485	2.08873	0.0408125	0.25099353	2.4890160	21	—	—
3939 Huruhata	11.5	X	77.05155	251.50283	32.35021	24.76933	0.1023811	0.17980781	3.1088303	21	10 26.0	15.9
3940 Larion	12.9	X	123.24701	304.24888	194.69546	22.83433	0.0563762	0.35167495	1.9878110	21	6 9.9	15.7
3941 Haydn	13.1	X	108.24072	282.41385	185.22482	1.67022	0.0231760	0.19684764	2.9267294	21	4 12.2	17.1
3942 Churivannia	13.2	X	346.71976	288.17308	18.24441	4.61921	0.1971263	0.26653695	2.3912837	21	7 12.4	15.0
3943 Silbermann	13.9	X	228.65361	354.27880	6.95058	6.46700	0.1895299	0.28759036	2.2731067	21	4 6.6	17.3
3944 Halliday	13.3	X	15.72158	288.04311	69.55770	7.54711	0.1509970	0.27043776	2.3682334	21	12 2.0	15.5
3945 Gerasimenko	12.5	X	13.33267	332.77258	9.39440	1.83375	0.2700121	0.17902618	3.1178725	21	11 3.0	15.6
3946 Shor	12.4	X	328.78328	272.98167	325.83258	0.73522	0.1277725	0.18134887	3.0911932	21	3 15.2	16.4
3947 Swedenborg	12.2	X	21.27767	99.90277	253.88379	5.38003	0.1480196	0.18077724	3.0977061	21	11 14.8	16.0
3948 Bohr	13.4	X	219.08263	121.10201	190.63130	2.73050	0.1949817	0.28959765	2.2625909	21	1 26.2	16.9
3949 Mach	13.4	X	151.58037	305.41965	249.78033	3.77922	0.0325524	0.30034267	2.2082998	21	10 7.2	16.1
3950 Yoshida	11.9	X	258.57157	277.06140	268.85224	8.93941	0.0553971	0.19036883	2.9927618	21	—	—
3951 Zichichi	12.8	X	19.96872	152.24226	270.01169	5.41371	0.1728924	0.27543156	2.3395208	21	—	—
3952 Russellmark	14.1	X	263.81284	176.84430	288.34259	1.94805	0.1531082	0.26736295	2.3863560	21	10 10.2	17.0
3953 Perth	13.6	X	92.25946	237.93649	129.04421	4.95272	0.1877520	0.28983476	2.2613567	21	—	—
3954 Mendelssohn	14.6	X	277.32040	71.80899	161.64012	3.18726	0.0930174	0.31383126	2.1445619	21	—	—
3955 Bruckner	11.3	X	36.86295	82.17022	23.55200	10.42491	0.0761637	0.18789843	3.0189363	21	1 12.7	15.3
3956 Caspar	12.9	X	301.12394	108.07755	255.27928	4.80953	0.1799274	0.29409903	2.2394446	21	7 7.6	15.0
3957 Sugie	12.6	X	84.93740	130.55891	181.76209	5.72709	0.1976355	0.18223523	3.0811617	21	12 17.9	17.5
3958 Komendantov	12.3	X	149.43973	29.21790	11.61998	4.82509	0.2092192	0.25426265	2.4676354	21	3 22.1	16.1
3959 Irwin	14.0	X	223.10104	198.31124	210.83762	3.28387	0.1880359	0.29042259	2.2583043	21	6 4.1	17.6
3960 Chaliubieju	12.4	X	178.62815	12.48687	84.83225	14.40982	0.2780123	0.22943490	2.6425897	21	6 26.9	17.1
3961 Arthurcox	12.1	X	340.51857	327.56879	316.60170	12.65233	0.1527108	0.23211471	2.6222108	21	5 23.9	15.2
3962 Valyaev	12.4	X	169.73830	109.72643	49.13508	1.99115	0.1168067	0.17079573	3.2172493	21	9 2.0	17.5
3963 Paradzhanov	13.5	X	199.79908	286.08147	109.68952	3.27715	0.1976163	0.25888230	2.4381915	21	4 28.9	17.5
3964 Danilevskij	13.2	X	93.69427	8.71957	333.96050	8.66206	0.1660459	0.21524972	2.7574501	21	—	—
3965 Konopleva	12.1	X	206.27665	132.26531	284.67118	12.71948	0.1564425	0.22859522	2.6490569	21	5 31.8	16.5
3966 Cherednichenko	12.2	X	217.68405	12.34636	32.27041	3.52598	0.0221902	0.16964326	3.2318037	21	6 6.6	16.8
3967 Shekhtelia	11.4	X	203.91039	12.28809	101.05168	17.42414	0.0477330	0.16776547	3.2558746	21	8 17.6	16.4
3968 Koptelov	13.0	X	153.91037	312.29447	312.03912	6.20480	0.0919523	0.27873379	2.3210062	21	—	—
3969 Rossi	14.1	X	336.84047	211.93487	172.64452	2.14560	0.1254987	0.29786339	2.2025367	21	11 5.0	15.7
3970 Herran	12.3	X	98.68926	303.90535	21.67155	15.13113	0.1337082	0.24116183	2.5562128	21	—	—
3971 Voronikhin	11.4	X	302.35936	83.06410	284.82159	13.00839	0.1849067	0.20489659	2.8495715	21	7 14.5	15.0
3972 Richard	13.9	X	125.23600	179.16853	163.21381	4.14985	0.1771956	0.30964922	2.1638279	21	—	—
3973 Ogilvie	13.0	X	40.07117	244.92890	70.96896	1.84822	0.2082553	0.27225234	2.3576987	21	11 20.0	15.9
3974 Verveer	12.2	X	137.66356	159.23863	21.11577	13.41642	0.1093778	0.23473461	2.6026632	21	9 5.0	16.3
3975 Verdi	12.4	X	221.81798	246.78627	204.54431	1.29224	0.0516315	0.19930076	2.9026638	21	8 7.9	16.5
3976 Lise	11.7	X	31.14517	102.25719	222.32759	12.71141	0.0711249	0.21518412	2.7580104	21	10 17.5	15.3
3977 Maxine	12.0	X	307.47006	74.16456	218.04527	12.54606	0.1656679	0.22955187	2.6416918	21	4 9.8	15.4
3978 Klepešta	11.9	X	203.72434	218.73284	242.36213	12.15596	0.0031392	0.20115978	2.8847529	21	7 29.4	16.1
3979 Brorsen	12.1	X	276.54079	113.94113	343.62698	3.06177	0.0285763	0.18028243	3.1033716	21	10 23.7	16.3
3980 Hviezdoslav	13.1	X	290.72308	358.72772	73.81282	2.26316	0.1486354	0.17727532	3.1383680	21	9 26.9	17.1
3981 Stodola	12.0	X	280.59682	348.32074	79.50836	2.44761	0.1630872	0.17378390	3.1802628	21	9 4.2	16.2
3982 Kastel'	12.9	X	276.72041	51.04217	251.87868	5.29778	0.2192695	0.29031443	2.2588651	21	3 3.2	16.4
3983 Sakiko	12.9	X	20.69385	225.75133	329.14695	2.60769	0.1126842	0.25713469	2.4492264	21	3 29.3	15.2
3984 Chacos	14.5	X	240.93615	263.56263	99.98961	2.93822	0.1821000	0.25931919	2.4354522	21	4 25.4	18.4
3985 Raybatson	11.5	X	124.37916	151.74668	83.93927	16.28626	0.0983525	0.20488148	2.8497116	21	10 28.5	16.1
3986 Rozhkovskij	12.8	X	143.72073	164.00604	281.59725	4.94957	0.1336629	0.29141958	2.2531507	21	4 30.9	15.9
3987 Wujek	12.2	X	128.84690	308.08135	48.49081	4.82405	0.1163722	0.21796558	2.7344969	21	—	—
3988 Huma	17.8	X	60.18101	86.90581	229.80575	10.76759	0.3167327	0.51352577	1.5444051	21	—	—
3989 Odin	13.8	X	73.30651	52.49491	327.46041	3.47328	0.1862057	0.29060097	2.2573800	21	—	—
3990 Heimdall	10.8	X	86.82571	197.85518	192.62847	9.49491	0.2418163	0.12582345	3.9442248	21	1 22.8	16.3
3991 Basilevsky	13.1	X	63.67615	356.00983	282.73742	3.87260	0.1745348	0.29202042	2.2500590	21	10 26.9	16.0
3992 Wagner	11.5	X	198.31413	157.98106	168.77518	10.42147	0.0792838	0.18786492	3.0192953	21	2 6.1	16.1
3993 Šorm	12.8	X	290.22611	249.12512	205.67616	3.06956	0.0726382	0.23930701	2.5694042	21	11 13.8	15.7
3994 Ayashi	12.8	X	244.42574	298.25871	51.85783	3.68435	0.2438301	0.22809077	2.6529613	21	4 9.7	17.2
3995 Sakaino	12.2	X	267.27721	276.45761	99.85234	9.29902	0.0951638	0.23047010	2.6346706	21	6 21.3	15.8
3996 Fugaku	13.0	X	24.44950	156.51353	90.74914	2.28417	0.1032761	0.29021798	2.2593656	21	6 25.6	14.7
3997 Taga	13.7	X	265.42456	310.26825	84.27058	3.62399	0.1734783	0.26107064	2.4245475	21	7 2.2	17.0
3998 Tezuka	12.8	X	171.04324	75.97477	5.50179	6.48967	0.1964707	0.28651104	2.2788119	21	5 28.1	16.5
3999 Aristarchus	12.7	X	119.97443	210.06745	296.60203	2.54168	0.1197132	0.25543640	2.4600703	21	6 27.9	16.0
4000 Hipparchus	12.8	X	266.981									