

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>		
476001	2007	RG <sub>48</sub>	17.6	X	348.07854	280.48788	13.89074	4.16823	0.1915868	0.21862621	2.7289856	20	7 13.8	20.1
476002	2007	RT <sub>49</sub>	17.3	X	341.49087	145.10292	210.18497	1.93523	0.1245436	0.22671440	2.6636877	20	9 29.7	19.9
476003	2007	RP <sub>56</sub>	17.0	X	39.96234	107.62852	189.74319	15.60481	0.3886202	0.23430260	2.6058614	20	11 25.6	21.1
476004	2007	RZ <sub>59</sub>	16.6	X	4.31354	10.85901	341.26322	9.38587	0.0912624	0.23424593	2.6062816	20	10 29.3	19.8
476005	2007	RL <sub>66</sub>	17.2	X	322.34556	37.76149	337.73620	9.62382	0.1447352	0.22950839	2.6420255	20	9 20.5	19.9
476006	2007	RN <sub>76</sub>	17.5	X	317.62833	198.17028	170.88467	1.51332	0.1160486	0.22712949	2.6604414	20	9 6.0	20.4
476007	2007	RQ <sub>89</sub>	17.3	X	351.32483	257.56260	2.67938	7.78899	0.1847232	0.21337230	2.7736013	20	5 25.1	20.1
476008	2007	RO <sub>93</sub>	16.9	X	306.76605	2.85158	7.12468	5.45056	0.1702944	0.22213365	2.7001827	20	8 13.5	19.8
476009	2007	RP <sub>94</sub>	16.8	X	317.11717	341.08499	20.11984	7.37486	0.2176760	0.22233860	2.6985230	20	8 16.6	19.4
476010	2007	RK <sub>95</sub>	16.9	X	335.70669	262.91376	39.17927	13.41133	0.2114759	0.21284244	2.7782025	20	6 22.5	19.7
476011	2007	RL <sub>96</sub>	16.9	X	295.74700	303.80803	45.49348	5.59316	0.0295581	0.21385239	2.7694486	20	7 14.9	20.6
476012	2007	RA <sub>107</sub>	16.9	X	236.16441	56.29154	350.26073	10.84198	0.2762670	0.21238971	2.7821491	20	6 13.4	21.7
476013	2007	RA <sub>131</sub>	17.2	X	275.12152	85.68164	6.17368	6.93039	0.1817761	0.22797443	2.6538638	20	10 10.5	20.2
476014	2007	RU <sub>132</sub>	17.0	X	305.35224	244.76096	124.62376	12.51509	0.1990106	0.22371873	2.6874134	20	8 3.9	19.7
476015	2007	RD <sub>134</sub>	16.8	X	294.64144	229.98954	149.08983	9.09942	0.2399706	0.22097486	2.7096142	20	7 20.9	19.9
476016	2007	RQ <sub>136</sub>	16.6	X	30.35527	291.99312	357.98934	14.68240	0.1457933	0.22876060	2.6477800	20	9 24.6	19.8
476017	2007	RO <sub>157</sub>	16.7	X	332.92882	334.21798	14.59195	15.03675	0.1254637	0.22596217	2.6695961	20	9 10.4	19.7
476018	2007	RE <sub>160</sub>	17.2	X	291.23859	44.68175	19.50396	5.12778	0.1711066	0.22691507	2.6621171	20	10 2.0	20.0
476019	2007	RB <sub>166</sub>	16.9	X	0.00857	332.84341	338.94188	8.87377	0.1751926	0.22662094	2.6644200	20	9 5.3	19.5
476020	2007	RP <sub>173</sub>	17.3	X	272.56267	281.58647	131.29919	4.07644	0.1892589	0.22044626	2.7139441	20	8 12.8	20.7
476021	2007	RH <sub>189</sub>	17.6	X	316.61436	212.76558	154.59712	2.91036	0.1538831	0.22402054	2.6849991	20	8 28.9	20.5
476022	2007	RR <sub>190</sub>	17.4	X	346.64425	352.18114	343.06952	3.88340	0.2265710	0.22639423	2.6661985	20	9 15.3	19.5
476023	2007	RR <sub>192</sub>	16.6	X	299.33045	323.69509	13.43931	12.30915	0.2158713	0.21645619	2.7471943	20	5 31.7	20.2
476024	2007	RS <sub>194</sub>	16.8	X	273.38046	250.65723	174.41377	11.30164	0.1670320	0.22360728	2.6883063	20	9 2.3	20.2
476025	2007	RM <sub>203</sub>	17.8	X	281.69568	249.64639	185.27005	2.80753	0.2952501	0.22532238	2.6746471	20	9 14.6	20.9
476026	2007	RN <sub>203</sub>	17.3	X	216.99087	67.30428	7.07453	4.05616	0.0908427	0.21371263	2.7706559	20	7 17.7	21.4
476027	2007	RY <sub>206</sub>	17.1	X	271.30910	253.89770	150.95067	4.39088	0.0810512	0.22072494	2.7116592	20	8 16.8	20.7
476028	2007	RC <sub>221</sub>	15.9	X	71.99528	154.57643	10.08781	27.30023	0.1744152	0.20072045	2.8889607	20	5 31.6	20.4
476029	2007	RC <sub>230</sub>	17.2	X	295.85905	6.50896	33.47080	3.17012	0.1761885	0.22456178	2.6806832	20	9 5.1	20.1
476030	2007	RW <sub>232</sub>	16.4	X	305.59285	352.83801	23.46639	9.60173	0.2061700	0.22328056	2.6909282	20	8 18.3	19.4
476031	2007	RB <sub>235</sub>	17.1	X	215.76297	120.01755	350.81027	16.94148	0.1489910	0.22328461	2.6908957	20	8 29.9	21.2
476032	2007	RB <sub>235</sub>	17.9	X	303.58022	181.75231	201.19409	1.74393	0.2158582	0.22417939	2.6837307	20	8 16.9	20.7
476033	2007	RQ <sub>252</sub>	16.7	X	314.13049	31.98878	323.09784	9.57551	0.3257365	0.22016838	2.7162272	20	7 9.8	19.3
476034	2007	RE <sub>260</sub>	17.3	X	206.10735	0.25215	101.22227	3.76670	0.1354966	0.21596383	2.7513681	20	8 5.9	21.6
476035	2007	RR <sub>265</sub>	17.7	X	350.22541	150.28627	181.81990	7.11308	0.1569499	0.22726108	2.6594144	20	9 14.1	20.3
476036	2007	RB <sub>267</sub>	16.9	X	301.82227	346.97343	28.82858	5.59306	0.1341636	0.22188981	2.7021605	20	8 18.7	20.1
476037	2007	RB <sub>271</sub>	17.2	X	349.70426	39.50428	354.52802	14.76758	0.1555429	0.23471951	2.6027748	20	12 12.6	20.4
476038	2007	RZ <sub>272</sub>	17.2	X	297.16547	7.40485	358.81985	15.06719	0.2427786	0.21889355	2.7267631	20	7 10.6	20.7
476039	2007	RL <sub>280</sub>	17.5	X	329.82911	127.77949	230.39846	13.32109	0.2575714	0.22616577	2.6679937	20	8 30.3	19.9
476040	2007	RU <sub>280</sub>	16.4	X	257.65204	119.90512	272.39182	11.86443	0.1918074	0.21434875	2.7651716	20	6 26.1	20.4
476041	2007	RX <sub>280</sub>	16.2	X	279.27602	126.39211	290.13729	12.23232	0.1619054	0.22306508	2.6926609	20	8 26.5	19.8
476042	2007	RH <sub>286</sub>	17.0	X	301.08543	64.72976	315.89674	11.79938	0.2835645	0.22208406	2.7005847	20	7 29.1	19.9
476043	2007	RN <sub>287</sub>	17.5	X	53.49057	228.44559	19.14419	2.01985	0.2030066	0.21830443	2.7316665	20	8 12.9	21.0
476044	2007	RT <sub>287</sub>	17.1	X	308.22719	167.80933	166.95790	10.27543	0.0610030	0.21918590	2.7243379	20	7 7.4	20.8
476045	2007	RH <sub>288</sub>	17.3	X	265.17120	216.16570	146.84552	5.08694	0.2614109	0.21385321	2.7694410	20	5 26.0	21.4
476046	2007	RN <sub>288</sub>	17.1	X	298.26211	250.91616	158.19120	3.75134	0.2318886	0.22549645	2.6732705	20	9 7.9	19.8
476047	2007	RL <sub>290</sub>	17.5	X	217.24049	57.85903	37.72408	8.81549	0.1754471	0.21141979	2.7906516	20	8 9.1	22.0
476048	2007	RX <sub>290</sub>	17.2	X	302.11470	323.35952	36.00023	10.07595	0.2268882	0.21453675	2.7635559	20	7 9.5	20.6
476049	2007	RB <sub>293</sub>	16.1	X	105.33979	197.76938	29.94326	15.19644	0.1368629	0.22407526	2.6845620	20	10 7.7	20.3
476050	2007	RJ <sub>294</sub>	17.5	X	282.69697	165.86619	205.15661	3.70334	0.1131854	0.21577791	2.7529484	20	7 11.7	21.0
476051	2007	RQ <sub>296</sub>	17.0	X	298.88560	2.96221	15.98970	5.87122	0.0609580	0.22075452	2.7114170	20	8 27.2	20.4
476052	2007	RL <sub>308</sub>	17.8	X	277.13179	191.31604	177.02790	4.24060	0.1160243	0.21767859	2.7368999	20	6 30.2	21.4
476053	2007	RB <sub>313</sub>	16.7	X	287.58717	28.08291	341.69196	13.05070	0.1591766	0.21714906	2.7413474	20	7 14.0	20.3
476054	2007	RY <sub>314</sub>	16.6	X	297.26102	345.09350	348.11803	9.13588	0.1688401	0.21565511	2.7539933	20	5 31.9	20.2
476055	2007	RF <sub>316</sub>	17.3	X	260.60987	196.18264	219.81124	0.12283	0.1920352	0.22075197	2.7114378	20	7 31.4	20.9
476056	2007	RN <sub>318</sub>	17.8	X	347.55368	315.61462	21.59237	2.16932	0.2100729	0.22671483	2.6636844	20	9 20.8	19.9
476057	2007	RU <sub>319</sub>	16.9	X	235.83893	215.74440	191.48958	7.78982	0.2168530	0.21229469	2.7829792	20	6 19.7	21.5
476058	2007	RQ <sub>321</sub>	16.9	X	290.02973	13.37445	6.56643	9.09867	0.1970609	0.22086112	2.7105445	20	7 25.9	20.3
476059	2007	RE <sub>322</sub>	17.0	X	268.69022	67.72183	323.57369	14.32421	0.2831406	0.21681593	2.7441547	20	6 27.1	21.2
476060	2007	RA <sub>325</sub>	16.9	X	187.25807	42.74894	38.24353	11.13353	0.1251861	0.20584739	2.8407901	20	6 20.6	21.5
476061	2007	RS <sub>325</sub>	17.5	X	329.75923	136.48082	228.86525	8.30304	0.1455863	0.21930746	2.7233311	20	9 16.9	20.6
476062	2007	SH <sub>12</sub>	17.1	X	323.60384	309.51924	36.18730	8.67244	0.3112889	0.22468054	2.6797385	20	7 24.3	19.2
476063	2007	SG <sub>13</sub>	16.4	X	9.12953	336.00768	357.12947	13.26930	0.0614069	0.22792585	2.6542409	20	10 7.2	19.8
476064	2007	SR <sub>13</sub>	16.9	X	347.26733	347.79631	355.60022	9.33973	0.1254188	0.22568002	2.6718207	20	9 22.9	19.7
476065	2007	SN <sub>14</sub>	17.0	X	303.13513	154.46496	194.48302	3.51199	0.2411116	0.21654625	2.7464325	20	6 22.4	20.1
476066	2007	SY <sub>19</sub>	16.4	X	250.08344	155.79174	270.80405	8.91522	0.2127452	0.21781207	2.7357815	20	7 27.7	20.6
476067	2007	SF <sub>21</sub>	17.1	X	222.63250	87.17118	354.88458	11.35125	0.2413115	0.21041748	2.7995067	20	7 22.4	21.9
476068	2007	SL <sub>21</sub>	17.0	X	289.11429	109.27921	302.37648	10.30527	0.1853043	0.22399792	2.6851799	20	9 2.3	20.2
476069	2007	SQ <sub>21</sub>	16.7	X	262.73448	184.04079	232.09854	5.12732	0.1704180					

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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>
476081 2007 <i>TS</i> <sub>43</sub>	17.1	X	287.46128	173.42210	233.24032	9.20949	0.2808888	0.22008527	2.7169109	20	8 6.8	20.6
476082 2007 <i>TK</i> <sub>44</sub>	17.1	X	259.85063	42.87153	9.81214	7.55213	0.2955866	0.21359715	2.7716545	20	7 13.3	21.4
476083 2007 <i>TX</i> <sub>46</sub>	16.8	X	17.85707	75.63965	226.87546	6.06454	0.2448123	0.22611093	2.6684250	20	10 6.2	19.7
476084 2007 <i>TZ</i> <sub>47</sub>	16.6	X	209.61007	252.07538	217.48972	9.28136	0.1840771	0.21498821	2.7596857	20	8 11.8	21.2
476085 2007 <i>TP</i> <sub>48</sub>	17.4	X	277.34093	67.77284	357.07370	3.98637	0.1096171	0.22286017	2.6943111	20	9 18.1	20.4
476086 2007 <i>TK</i> <sub>52</sub>	16.9	X	29.88948	66.69228	212.08176	12.50299	0.0452331	0.21703666	2.7422938	20	8 19.4	20.7
476087 2007 <i>TL</i> <sub>52</sub>	17.0	X	289.24317	165.76088	213.36313	9.07186	0.1480426	0.21655079	2.7463942	20	7 25.1	20.6
476088 2007 <i>TS</i> <sub>55</sub>	17.0	X	313.95352	355.88909	21.92493	4.91591	0.0356718	0.22092044	2.7100593	20	9 18.4	20.3
476089 2007 <i>TB</i> <sub>58</sub>	17.0	X	148.88894	115.88099	36.52267	5.58961	0.0983063	0.21072212	2.7968078	20	8 14.4	21.3
476090 2007 <i>TA</i> <sub>61</sub>	17.1	X	236.15693	219.22289	214.21610	3.68698	0.1892780	0.21270065	2.7794370	20	7 25.1	21.4
476091 2007 <i>TB</i> <sub>63</sub>	17.2	X	206.53488	174.70921	227.91625	1.16171	0.0705811	0.20317905	2.8656079	20	5 26.0	21.4
476092 2007 <i>TP</i> <sub>64</sub>	17.5	X	314.05784	170.15760	190.28847	4.16431	0.2287229	0.21886299	2.7270169	20	8 1.2	20.1
476093 2007 <i>TC</i> <sub>66</sub>	19.5	X	58.96848	34.91687	102.48834	10.58931	0.7102044	0.33105049	2.0695371	20	7 6.9	22.7
476094 2007 <i>TY</i> <sub>75</sub>	17.7	X	280.00621	38.31844	19.88395	3.38409	0.1139462	0.22126593	2.7072375	20	9 13.1	21.0
476095 2007 <i>TG</i> <sub>88</sub>	17.0	X	313.00522	309.85119	80.19722	3.89494	0.1614860	0.22295514	2.6935460	20	9 25.9	19.8
476096 2007 <i>TG</i> <sub>98</sub>	16.9	X	217.76277	348.86054	88.15864	2.81571	0.1023780	0.21306799	2.7762415	20	7 20.2	20.9
476097 2007 <i>TV</i> <sub>113</sub>	16.8	X	282.80308	211.55138	154.49738	8.64214	0.2318110	0.215446606	2.7556040	20	6 17.3	20.6
476098 2007 <i>TH</i> <sub>115</sub>	16.5	X	230.51803	28.34130	60.02129	14.41244	0.2713731	0.21301516	2.7767005	20	8 4.7	21.3
476099 2007 <i>TO</i> <sub>123</sub>	17.4	X	303.67264	266.97735	134.85768	1.76949	0.1709247	0.22334933	2.6903758	20	9 22.2	20.1
476100 2007 <i>TZ</i> <sub>124</sub>	16.6	X	20.27401	270.49245	41.80679	10.70098	0.1684033	0.225700085	2.6716563	20	10 15.8	19.7
476101 2007 <i>TP</i> <sub>126</sub>	17.5	X	281.35260	190.07612	194.92923	3.16228	0.1950552	0.21521527	2.7577443	20	7 15.8	21.1
476102 2007 <i>TX</i> <sub>129</sub>	17.1	X	306.16283	315.45419	43.81826	4.88576	0.0871076	0.21483917	2.7609619	20	8 6.9	20.5
476103 2007 <i>TU</i> <sub>138</sub>	16.6	X	276.32287	61.22912	315.98874	13.89479	0.1928225	0.21498550	2.7597089	20	7 1.1	20.4
476104 2007 <i>TA</i> <sub>147</sub>	17.1	X	273.04658	14.89915	31.99967	10.58905	0.2258622	0.21609329	2.7502691	20	8 3.0	20.9
476105 2007 <i>TB</i> <sub>149</sub>	17.2	X	294.36773	189.06527	172.46084	3.63986	0.2070467	0.21697854	2.7427835	20	7 1.3	20.4
476106 2007 <i>TA</i> <sub>155</sub>	16.4	X	355.17983	144.07092	203.55566	31.54419	0.1921457	0.22778300	2.6553505	20	10 22.1	18.8
476107 2007 <i>TR</i> <sub>155</sub>	16.1	X	312.64795	343.83028	110.40789	13.98974	0.1089286	0.21833834	2.7313837	20	8 12.5	19.5
476108 2007 <i>TU</i> <sub>156</sub>	16.8	X	355.04443	112.80726	214.49937	12.05569	0.2805079	0.22572094	2.6714977	20	9 27.9	19.0
476109 2007 <i>TZ</i> <sub>157</sub>	16.9	X	343.10187	293.87968	16.06667	23.88204	0.2771132	0.22084333	2.7106900	20	8 8.7	19.6
476110 2007 <i>TF</i> <sub>158</sub>	17.5	X	289.16562	165.87549	217.25597	5.57197	0.2145073	0.21819442	2.7325847	20	7 21.0	20.8
476111 2007 <i>TD</i> <sub>162</sub>	16.9	X	347.97036	126.00148	195.64620	12.31497	0.2794583	0.22401802	2.6850193	20	8 26.0	19.0
476112 2007 <i>TG</i> <sub>169</sub>	16.8	X	309.75110	161.86700	229.13723	7.37180	0.2226705	0.22317259	2.6917961	20	9 7.1	19.6
476113 2007 <i>TG</i> <sub>172</sub>	17.0	X	270.89223	277.72234	123.40046	3.77263	0.2540323	0.21528438	2.751540	20	7 14.8	20.8
476114 2007 <i>TT</i> <sub>176</sub>	16.7	X	334.95905	280.10948	38.59231	6.74993	0.0389148	0.21384274	2.7695319	20	7 30.3	20.3
476115 2007 <i>TL</i> <sub>179</sub>	16.9	X	281.28328	333.95759	51.89304	12.71400	0.3274095	0.21577353	2.7529856	20	6 26.0	20.9
476116 2007 <i>TN</i> <sub>187</sub>	17.4	X	292.96627	227.28695	141.78254	5.16368	0.2324202	0.21662024	2.7458071	20	7 5.4	20.7
476117 2007 <i>TK</i> <sub>193</sub>	17.3	X	276.73571	181.26674	204.18543	4.24701	0.0837075	0.21275089	2.7789994	20	7 26.8	21.0
476118 2007 <i>TU</i> <sub>198</sub>	16.4	X	76.64556	232.81883	17.30942	10.77743	0.0513726	0.22183429	2.7026113	20	9 22.6	20.1
476119 2007 <i>TM</i> <sub>204</sub>	17.4	X	280.44607	221.51406	166.86683	4.17507	0.0839925	0.21454877	2.7634527	20	8 5.7	21.0
476120 2007 <i>TO</i> <sub>212</sub>	17.0	X	307.35415	348.16881	13.77292	10.24881	0.2239879	0.21802812	2.7339740	20	7 26.5	20.1
476121 2007 <i>TC</i> <sub>213</sub>	16.5	X	343.98236	110.25415	230.50871	11.15246	0.1876022	0.22224246	2.6993013	20	9 9.3	19.2
476122 2007 <i>TO</i> <sub>215</sub>	16.9	X	338.24577	304.80688	10.95906	6.10198	0.0141741	0.21086021	2.7955867	20	7 31.3	20.6
476123 2007 <i>TA</i> <sub>216</sub>	17.7	X	303.06472	346.32532	14.95134	4.58820	0.2152678	0.21633307	2.7482365	20	7 15.9	20.8
476124 2007 <i>TU</i> <sub>217</sub>	17.3	X	235.50454	45.86225	33.71827	10.49027	0.0992482	0.21322388	2.7748882	20	8 18.3	21.5
476125 2007 <i>TS</i> <sub>224</sub>	17.3	X	257.96910	226.93435	180.81092	3.08930	0.1894714	0.21747617	2.7385979	20	7 16.7	21.3
476126 2007 <i>TQ</i> <sub>225</sub>	16.8	X	359.65932	262.64974	352.80908	13.30341	0.1828697	0.21779837	2.7358963	20	6 5.6	19.8
476127 2007 <i>TC</i> <sub>227</sub>	17.6	X	268.02952	206.39390	220.87518	12.34286	0.1619100	0.21929098	2.7234676	20	8 24.8	21.5
476128 2007 <i>TL</i> <sub>227</sub>	17.4	X	293.85006	142.57643	234.44513	3.37371	0.0895326	0.21618894	2.7494579	20	8 8.7	21.0
476129 2007 <i>TS</i> <sub>228</sub>	17.1	X	272.20146	176.35875	229.90669	0.87080	0.2249315	0.21624124	2.7490146	20	7 27.7	20.8
476130 2007 <i>TB</i> <sub>230</sub>	16.6	X	304.83378	343.08620	347.36269	7.76030	0.2301679	0.21387478	2.7692553	20	5 29.9	20.1
476131 2007 <i>TW</i> <sub>232</sub>	17.4	X	258.51109	201.50836	218.01772	9.48209	0.2027002	0.21388896	2.7691329	20	7 28.3	21.6
476132 2007 <i>TP</i> <sub>237</sub>	17.2	X	290.66617	116.90633	242.47374	3.71840	0.1641888	0.21162906	2.7888117	20	6 29.5	20.8
476133 2007 <i>TO</i> <sub>240</sub>	16.6	X	289.19401	274.73958	104.23970	11.59774	0.2349308	0.21925665	2.7237518	20	7 13.6	19.8
476134 2007 <i>TR</i> <sub>241</sub>	16.7	X	200.64991	88.70055	42.85511	12.16199	0.2179298	0.21652297	2.7466294	20	9 14.5	21.0
476135 2007 <i>TY</i> <sub>245</sub>	16.9	X	298.46369	14.88083	11.67435	9.49600	0.2762127	0.22338056	2.6901251	20	8 6.6	19.9
476136 2007 <i>TG</i> <sub>249</sub>	17.3	X	356.45561	49.55891	236.71283	4.51701	0.1416126	0.21629635	2.7485475	20	7 16.7	20.2
476137 2007 <i>TZ</i> <sub>250</sub>	17.1	X	327.94158	18.66654	345.19180	5.50404	0.0687620	0.22386991	2.6862034	20	9 17.4	20.4
476138 2007 <i>TK</i> <sub>251</sub>	16.9	X	289.43099	146.66469	243.88131	3.51121	0.1229215	0.22000008	2.7176122	20	8 16.0	20.3
476139 2007 <i>TJ</i> <sub>262</sub>	16.8	X	323.52033	320.77767	37.88878	7.00803	0.0750434	0.21831146	2.7316079	20	9 6.3	20.2
476140 2007 <i>TD</i> <sub>268</sub>	16.8	X	232.66184	77.82507	32.48433	14.31058	0.1392096	0.22105707	2.7089424	20	9 20.7	20.8
476141 2007 <i>TN</i> <sub>288</sub>	17.1	X	260.73723	305.10406	109.95223	4.56347	0.1895126	0.21709781	2.7417788	20	7 30.8	20.7
476142 2007 <i>TV</i> <sub>291</sub>	17.1	X	320.75244	115.03500	256.51721	4.76618	0.0568605	0.22545399	2.6736061	20	9 15.4	20.5
476143 2007 <i>TF</i> <sub>295</sub>	17.2	X	256.00832	180.84884	204.47203	7.97913	0.1176525	0.21342772	2.7731210	20	6 24.6	21.2
476144 2007 <i>TT</i> <sub>296</sub>	16.9	X	276.88089	302.90209	64.62097	5.36440	0.1574913	0.21042087	2.7994766	20	6 22.1	20.6
476145 2007 <i>TQ</i> <sub>297</sub>	17.5	X	322.14431	344.33577	41.89167	8.89479	0.1469017	0.22119746	2.7077961	20	7 11.5	20.5
476146 2007 <i>TK</i> <sub>308</sub>	16.5	X	295.47123	311.36513	55.81471	5.20112	0.0814656	0.21602448	2.7508532	20	8 1.9	20.0
476147 2007 <i>TV</i> <sub>309</sub>	16.4	X	263.28656	66.67695	359.76644	13.43868	0.0410225	0.22785000	2.6548298	20	9 13.1	19.8
476148 2007 <i>TS</i> <sub>320</sub>	17.2	X	338.38033	114.98223	218.55230	2.62854	0.0955066	0.22110632	2.7085401	20	8 21.4	20.2
476149 2007 <i>TK</i> <sub>324</sub>	16.2	X	245.60097	52.46010	8.63788	11.28063	0.0221474	0.21490223	2.7604217	20	8 17.3	20.1
476150 2007 <i>TG</i> <sub>325</sub>	17.0	X	274.83665	121.52301	236.98343	7.41720	0.1913154	0.21099323	2.7944116	20	6 2.6	20.8
476151 2007 <i>TB</i> <sub>326</sub>	17.2											

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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>		
476161	2007	TG <sub>371</sub>	16.8	X	289.48815	285.78353	92.18837	6.74762	0.0611360	0.21453889	2.7635375	20	8 10.6	20.3
476162	2007	TE <sub>374</sub>	16.1	X	43.25316	275.31344	4.18395	13.86426	0.1099896	0.22561940	2.6722993	20	9 24.6	19.5
476163	2007	TB <sub>379</sub>	17.1	X	314.06260	207.91720	142.25856	3.31166	0.2412093	0.21992909	2.7181970	20	7 15.4	19.7
476164	2007	TO <sub>383</sub>	17.0	X	297.86710	142.21787	208.61940	3.29270	0.1104822	0.21201344	2.7854399	20	7 6.9	20.5
476165	2007	TX <sub>384</sub>	17.0	X	310.02698	158.47401	172.77702	8.21910	0.2279844	0.21147676	2.7901504	20	6 11.9	20.2
476166	2007	TC <sub>385</sub>	16.8	X	185.70044	80.67902	53.38648	16.98585	0.0647218	0.21276946	2.7788377	20	9 8.2	21.3
476167	2007	TZ <sub>391</sub>	17.1	X	330.85437	148.24420	219.47658	4.60875	0.0828156	0.22478455	2.6789118	20	9 26.7	20.3
476168	2007	TC <sub>398</sub>	17.3	X	255.81349	62.89210	343.78460	5.07533	0.0561393	0.21320232	2.7750753	20	8 2.7	21.0
476169	2007	TQ <sub>402</sub>	17.1	X	320.54890	133.06469	190.16636	13.63529	0.1357036	0.21404129	2.7678189	20	7 1.4	20.6
476170	2007	TP <sub>414</sub>	16.6	X	283.30561	309.43303	80.36889	13.86130	0.1848132	0.21705129	2.7421706	20	7 30.3	20.2
476171	2007	TQ <sub>420</sub>	16.7	X	356.25086	15.83125	336.99935	17.44228	0.2154361	0.22999816	2.6382735	20	10 25.1	19.7
476172	2007	TZ <sub>424</sub>	17.4	X	252.55883	188.84703	217.12856	4.46575	0.1002202	0.21212005	2.7845065	20	7 19.5	21.4
476173	2007	TB <sub>427</sub>	17.1	X	265.99498	191.70260	215.92603	14.86490	0.0813307	0.21703464	2.7423108	20	8 7.4	21.2
476174	2007	TH <sub>427</sub>	17.2	X	222.68184	30.18599	40.46741	13.27055	0.0841649	0.21144985	2.7903871	20	7 22.1	21.5
476175	2007	TZ <sub>428</sub>	16.7	X	196.31676	280.86043	214.59838	14.77657	0.2514838	0.21524179	2.7575178	20	8 26.6	21.8
476176	2007	TD <sub>432</sub>	16.9	X	309.87905	155.64394	231.68507	4.72887	0.0412131	0.22335857	2.6903016	20	9 21.9	20.3
476177	2007	TK <sub>432</sub>	17.4	X	259.51891	179.78793	228.37736	3.10876	0.0988141	0.21511115	2.7586341	20	7 31.9	21.1
476178	2007	TH <sub>438</sub>	16.6	X	131.29176	111.26156	37.98751	2.82777	0.0301000	0.20922014	2.8101773	20	7 14.8	20.5
476179	2007	TM <sub>440</sub>	17.0	X	258.42786	6.30093	62.24499	8.91124	0.1578218	0.21790217	2.7350274	20	8 23.6	20.9
476180	2007	TM <sub>441</sub>	16.8	X	307.62391	11.30906	356.60149	11.74609	0.1740356	0.21893466	2.7264217	20	8 13.4	19.8
476181	2007	TS <sub>447</sub>	16.7	X	325.09577	328.86078	52.67650	10.29709	0.1393373	0.22608165	2.6686555	20	10 11.4	19.5
476182	2007	TV <sub>449</sub>	17.0	X	235.02070	138.72504	262.63808	8.35062	0.1183708	0.20620667	2.8374894	20	6 21.0	21.1
476183	2007	TW <sub>449</sub>	16.7	X	278.33805	320.76266	76.12068	4.17272	0.0934409	0.21504644	2.7591875	20	8 15.4	20.3
476184	2007	TY <sub>451</sub>	16.6	X	321.65336	323.81428	25.91290	14.31844	0.2473772	0.21788994	2.7351297	20	8 8.4	19.4
476185	2007	TO <sub>452</sub>	17.1	X	223.03323	203.41182	269.43435	6.68053	0.1852741	0.21574873	2.7531965	20	8 29.1	21.4
476186	2007	UN <sub>8</sub>	17.2	X	254.97733	81.66730	330.87499	8.64958	0.2643990	0.21282196	2.7783807	20	7 11.8	21.5
476187	2007	UQ <sub>13</sub>	20.0	X	120.79343	29.41494	217.68073	29.30154	0.4253904	0.78375387	1.1650635	20	—	—
476188	2007	UT <sub>17</sub>	17.1	X	334.42051	279.57325	19.72988	4.51927	0.0536619	0.21202912	2.7853025	20	6 29.7	20.7
476189	2007	UP <sub>24</sub>	17.2	X	254.74488	348.77324	86.11012	4.59503	0.1743101	0.21668744	2.7452394	20	8 22.3	21.0
476190	2007	UR <sub>26</sub>	16.8	X	211.89133	64.56267	25.98211	8.93901	0.1028712	0.21828850	2.7317995	20	8 3.6	21.0
476191	2007	UP <sub>28</sub>	17.2	X	249.98383	138.57708	246.98395	1.51303	0.1962202	0.20874393	2.8144496	20	6 8.5	21.6
476192	2007	UO <sub>40</sub>	16.8	X	215.98266	217.87625	227.77109	8.10330	0.1054405	0.21142695	2.7905886	20	7 26.1	21.1
476193	2007	US <sub>40</sub>	17.4	X	319.34177	347.61109	23.69472	5.39446	0.1315505	0.22103044	2.7091600	20	9 12.4	20.3
476194	2007	UH <sub>41</sub>	17.3	X	265.91892	161.61180	222.35043	3.66201	0.0770334	0.21130170	2.7916913	20	7 11.4	21.0
476195	2007	UJ <sub>41</sub>	16.6	X	246.54947	28.73429	33.65971	9.44947	0.1573446	0.21339673	2.7733896	20	7 30.5	20.8
476196	2007	UB <sub>43</sub>	17.2	X	230.81770	234.48081	195.60418	3.50830	0.0791959	0.21323304	2.7748087	20	7 27.5	21.2
476197	2007	UD <sub>45</sub>	16.9	X	314.34253	321.07844	16.79524	9.98643	0.1159427	0.21366672	2.7710528	20	7 18.3	20.4
476198	2007	UD <sub>46</sub>	16.8	X	263.20945	336.55981	56.21363	5.73313	0.1801296	0.21328637	2.7743461	20	7 5.4	20.7
476199	2007	UY <sub>51</sub>	16.5	X	294.60835	284.48933	59.28388	15.19044	0.2075198	0.21001573	2.8030757	20	6 5.6	20.1
476200	2007	UX <sub>55</sub>	17.5	X	310.92278	135.42983	223.14453	12.46014	0.1860266	0.21689417	2.7434950	20	7 25.7	20.8
476201	2007	UE <sub>58</sub>	18.3	X	310.34840	125.53664	225.73636	2.70515	0.2451259	0.21680917	2.7442118	20	7 8.3	21.2
476202	2007	UE <sub>59</sub>	17.6	X	234.17260	54.82471	42.86790	3.85252	0.1615301	0.21640407	2.7476354	20	8 29.5	21.6
476203	2007	UP <sub>60</sub>	17.5	X	262.04581	212.71241	216.62362	3.04125	0.1593265	0.21654021	2.7464836	20	8 23.3	21.2
476204	2007	US <sub>62</sub>	17.7	X	287.45170	204.83165	206.92759	2.41896	0.1631245	0.22344425	2.6896138	20	9 6.7	20.9
476205	2007	UD <sub>71</sub>	16.6	X	285.90345	191.36058	221.39653	12.34350	0.0965601	0.22067274	2.7120869	20	9 11.4	20.2
476206	2007	UO <sub>74</sub>	17.3	X	254.38307	162.05182	219.57207	5.19978	0.0860835	0.20871772	2.8146852	20	6 22.3	21.2
476207	2007	UH <sub>78</sub>	16.7	X	295.62190	187.79705	226.24359	11.45524	0.1804800	0.22459508	2.6804182	20	9 18.4	19.8
476208	2007	UE <sub>87</sub>	16.6	X	272.61925	145.12989	247.67966	3.71896	0.1140686	0.21233918	2.7825905	20	7 26.4	20.3
476209	2007	UL <sub>89</sub>	17.5	X	267.88461	335.29073	72.60468	0.29339	0.0907773	0.21437218	2.7649700	20	8 14.3	21.1
476210	2007	UC <sub>91</sub>	17.3	X	234.89039	342.65738	34.07945	2.33082	0.0833424	0.20286883	2.8685285	20	5 23.7	21.4
476211	2007	UY <sub>93</sub>	17.1	X	246.11879	145.31094	240.36734	2.62110	0.0802582	0.20689143	2.8312250	20	6 18.3	21.2
476212	2007	UQ <sub>97</sub>	17.4	X	356.16565	264.30245	50.29506	5.83907	0.2406344	0.22010522	2.7167467	20	9 10.4	19.7
476213	2007	UN <sub>102</sub>	17.3	X	300.61502	126.64578	229.73642	2.71306	0.1082611	0.21338515	2.7734899	20	7 19.3	20.8
476214	2007	UT <sub>102</sub>	16.8	X	254.59052	176.93760	234.39134	3.37415	0.0598231	0.21261533	2.7801805	20	8 4.2	20.6
476215	2007	US <sub>107</sub>	17.4	X	304.55236	46.12233	331.83278	1.50057	0.0892025	0.22091064	2.7101394	20	8 28.9	20.7
476216	2007	UX <sub>109</sub>	17.2	X	272.43463	170.82634	210.30029	4.17843	0.0831828	0.21286958	2.7779664	20	7 15.3	21.0
476217	2007	UP <sub>112</sub>	17.0	X	293.04546	325.15987	41.38920	6.79611	0.0838071	0.21439897	2.7647398	20	7 28.4	20.6
476218	2007	UU <sub>114</sub>	17.1	X	308.68735	144.32615	240.32225	8.65586	0.1467488	0.21983541	2.7189692	20	9 3.3	20.3
476219	2007	US <sub>116</sub>	16.7	X	291.46645	340.73796	73.48294	8.16090	0.2551007	0.22226564	2.6991136	20	9 7.6	19.8
476220	2007	UK <sub>129</sub>	16.9	X	315.93531	110.15575	257.86594	8.05756	0.1161896	0.21728246	2.7402253	20	8 26.3	20.3
476221	2007	UA <sub>130</sub>	17.2	X	320.42741	197.07366	183.15149	14.12812	0.2524002	0.22289718	2.6940128	20	9 15.6	19.4
476222	2007	UM <sub>131</sub>	17.5	X	230.73872	204.86735	247.49513	2.99465	0.0670561	0.21408626	2.7674313	20	8 26.8	21.5
476223	2007	UW <sub>134</sub>	17.2	X	285.20293	247.85121	123.96304	1.01757	0.0878835	0.21333633	2.7739130	20	7 20.9	20.6
476224	2007	UU <sub>136</sub>	17.2	X	276.37739	289.79853	117.57903	9.38272	0.1760411	0.21625658	2.7488845	20	8 13.4	20.7
476225	2007	UT <sub>140</sub>	16.7	X	20.46723	214.99567	66.03350	10.63383	0.1765266	0.21398607	2.7682950	20	9 4.8	20.0
476226	2007	VU <sub>16</sub>	17.9	X	272.59980	357.19742	69.12069	2.74196	0.1655958	0.22036548	2.7146072	20	9 5.3	21.3
476227	2007	VX <sub>18</sub>	17.4	X	72.82373	96.18352	114.04558	1.37619	0.0440568	0.20919038	2.8104438	20	7 21.5	21.0
476228	2007	VU <sub>20</sub>	17.3	X	261.89246	340.25485	42.11655	5.11307	0.1251148	0.21349877	2.7725058	20	6 27.6	21.2
476229	2007	VZ <sub>20</sub>	17.1	X	271.16403	207.94905	179.33640	3.83924	0.1871446	0.2159083				

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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>
476241 2007 <i>VH</i> <sub>64</sub>	16.8 <sup>m</sup>	X	309.58963	309.04531	35.48579	4.46775	0.2033559	0.21101157	2.7942497	20	7 4.3	19.9
476242 2007 <i>VT</i> <sub>65</sub>	17.6	X	275.27229	264.25004	165.54775	2.39487	0.0713345	0.22655375	2.6649468	20	9 28.4	20.7
476243 2007 <i>VJ</i> <sub>66</sub>	17.3	X	336.72213	173.11273	195.15558	5.83467	0.0323845	0.22132378	2.7067657	20	10 6.9	20.8
476244 2007 <i>VL</i> <sub>67</sub>	16.9	X	238.86270	16.22359	34.20794	7.26156	0.0480150	0.21281546	2.7784373	20	7 18.3	20.9
476245 2007 <i>VC</i> <sub>69</sub>	17.4	X	279.51591	355.62884	4.08991	4.24391	0.0894847	0.21234620	2.7825291	20	6 26.2	21.1
476246 2007 <i>VT</i> <sub>74</sub>	17.5	X	294.63937	298.44289	52.49268	5.64843	0.0515220	0.20974219	2.8055124	20	7 12.0	21.2
476247 2007 <i>VT</i> <sub>76</sub>	17.5	X	236.46648	323.89914	60.57643	6.58113	0.1158581	0.20467686	2.8516106	20	5 31.9	21.6
476248 2007 <i>VB</i> <sub>77</sub>	17.6	X	265.36279	160.49965	128.05415	3.11073	0.1071783	0.20876778	2.8142353	20	6 29.1	21.6
476249 2007 <i>VV</i> <sub>77</sub>	17.2	X	235.14210	357.01127	59.61788	6.87770	0.0178813	0.20928619	2.8095860	20	7 25.6	21.1
476250 2007 <i>VU</i> <sub>79</sub>	17.0	X	331.72065	98.67442	243.25103	5.48502	0.0538870	0.21312206	2.7757719	20	8 20.6	20.5
476251 2007 <i>VU</i> <sub>84</sub>	17.2	X	321.16681	113.38659	239.77507	1.67877	0.1528242	0.21800291	2.7341848	20	8 14.9	20.1
476252 2007 <i>VG</i> <sub>91</sub>	16.8	X	215.28429	240.69230	233.73574	8.96815	0.1922068	0.21590134	2.7518990	20	8 22.1	21.3
476253 2007 <i>VJ</i> <sub>94</sub>	17.1	X	274.81760	128.85723	251.74104	5.27438	0.1245287	0.21105807	2.7938392	20	7 11.5	20.8
476254 2007 <i>VG</i> <sub>97</sub>	16.2	X	135.32717	250.97064	249.74514	13.93560	0.0970964	0.20260299	2.8710372	20	7 10.2	20.7
476255 2007 <i>VW</i> <sub>97</sub>	17.1	X	283.14200	351.38708	9.68547	3.82560	0.1114343	0.20915314	2.8107774	20	6 29.7	20.9
476256 2007 <i>VE</i> <sub>99</sub>	17.3	X	235.21248	318.19366	99.13622	0.57987	0.0643708	0.21322036	2.7749187	20	7 19.0	21.3
476257 2007 <i>VF</i> <sub>103</sub>	17.2	X	267.13750	197.68543	163.08926	4.24337	0.1296532	0.21047753	2.7989742	20	6 5.4	21.1
476258 2007 <i>VF</i> <sub>103</sub>	17.4	X	279.33178	269.42828	80.57858	3.31162	0.0938691	0.21080855	2.7960434	20	6 11.9	21.0
476259 2007 <i>VJ</i> <sub>103</sub>	17.6	X	290.25205	232.51028	115.42069	2.71402	0.1447309	0.21337517	2.7735764	20	6 16.7	21.2
476260 2007 <i>VS</i> <sub>104</sub>	17.0	X	278.88793	3.42430	15.77678	2.17681	0.1013384	0.21097965	2.7945315	20	7 20.3	20.5
476261 2007 <i>VS</i> <sub>110</sub>	16.9	X	225.58411	157.98879	240.39453	5.02316	0.0635650	0.20169951	2.8796044	20	6 12.1	21.0
476262 2007 <i>VC</i> <sub>117</sub>	16.9	X	206.52399	126.45418	296.39988	4.73076	0.0322198	0.20038561	2.8921781	20	6 23.7	20.9
476263 2007 <i>VN</i> <sub>124</sub>	17.2	X	224.39187	120.57036	55.06470	5.51573	0.1572204	0.22690654	2.6621838	20	11 24.9	21.0
476264 2007 <i>VX</i> <sub>124</sub>	17.0	X	201.22815	15.31135	53.58204	2.56975	0.0645973	0.20123978	2.8839883	20	6 23.0	21.2
476265 2007 <i>VO</i> <sub>142</sub>	16.8	X	247.98554	221.95622	205.62321	4.14265	0.0449098	0.21306568	2.7762616	20	8 19.1	20.5
476266 2007 <i>VV</i> <sub>145</sub>	17.2	X	257.30882	20.88502	26.83012	5.68418	0.0738029	0.21000550	2.8031668	20	8 4.1	21.1
476267 2007 <i>VF</i> <sub>154</sub>	17.1	X	273.88766	348.13621	37.90749	6.61603	0.0498556	0.21575029	2.7531833	20	8 1.9	20.8
476268 2007 <i>VH</i> <sub>158</sub>	17.5	X	308.28972	254.61364	104.21620	4.36675	0.2109079	0.21569807	2.7536276	20	7 21.9	20.2
476269 2007 <i>VM</i> <sub>160</sub>	16.4	X	293.41006	278.42274	101.00224	6.29213	0.0754752	0.21401975	2.7680047	20	8 16.3	19.9
476270 2007 <i>VC</i> <sub>161</sub>	17.3	X	239.65369	278.29011	138.89089	4.36520	0.0835026	0.20888603	2.8131731	20	7 21.2	21.2
476271 2007 <i>VG</i> <sub>163</sub>	17.3	X	266.88757	335.81593	20.51162	2.14755	0.0835023	0.20275014	2.8696478	20	6 4.9	21.3
476272 2007 <i>VT</i> <sub>168</sub>	17.2	X	240.98075	321.87055	61.03735	3.88996	0.0909242	0.20052116	2.8908745	20	6 6.9	21.4
476273 2007 <i>VZ</i> <sub>177</sub>	17.2	X	224.85161	329.98161	74.00256	3.00269	0.0726572	0.20692438	2.8309244	20	6 17.6	21.4
476274 2007 <i>VQ</i> <sub>178</sub>	17.3	X	245.24163	294.44379	82.15911	2.92084	0.0984236	0.20550278	2.8439650	20	6 3.2	21.3
476275 2007 <i>VF</i> <sub>183</sub>	17.1	X	285.91698	36.99689	355.34597	8.02209	0.2359721	0.21651721	2.7466781	20	7 29.3	20.6
476276 2007 <i>VV</i> <sub>195</sub>	17.1	X	272.37115	161.22230	238.38570	3.34422	0.0650940	0.21632982	2.7482641	20	8 11.9	20.7
476277 2007 <i>VH</i> <sub>199</sub>	17.1	X	218.07661	170.33883	225.30735	1.25219	0.0748745	0.20303598	2.8669539	20	5 29.9	21.4
476278 2007 <i>VZ</i> <sub>213</sub>	17.2	X	302.47123	189.07763	170.02380	4.13380	0.1110770	0.21268910	2.7795377	20	7 25.5	20.6
476279 2007 <i>VB</i> <sub>218</sub>	16.9	X	229.17083	309.50854	91.15259	3.29745	0.0707395	0.20243958	2.8725820	20	6 18.5	21.1
476280 2007 <i>VO</i> <sub>218</sub>	17.0	X	315.23838	258.90173	70.79683	9.68673	0.1599741	0.20918273	2.8105124	20	6 29.1	20.3
476281 2007 <i>VL</i> <sub>222</sub>	17.1	X	308.43234	141.26147	195.91056	7.07324	0.1182819	0.21407320	2.7675439	20	7 3.3	20.5
476282 2007 <i>VT</i> <sub>225</sub>	17.3	X	52.33648	220.71226	47.25266	2.90558	0.0686923	0.21846272	2.7303469	20	9 15.2	20.9
476283 2007 <i>VN</i> <sub>227</sub>	17.2	X	267.59865	83.88230	261.32343	0.95752	0.0771178	0.20409579	2.8570205	20	5 23.4	21.0
476284 2007 <i>VB</i> <sub>231</sub>	17.2	X	198.53747	264.59648	238.68914	2.95994	0.1282713	0.21613797	2.7498901	20	9 18.5	21.3
476285 2007 <i>VJ</i> <sub>238</sub>	16.8	X	244.30758	174.13777	248.24545	5.37252	0.0341487	0.20998338	2.8033636	20	8 8.1	20.8
476286 2007 <i>VW</i> <sub>239</sub>	17.0	X	276.43004	178.25187	231.28942	7.42118	0.1453666	0.21473925	2.7618183	20	8 16.5	20.8
476287 2007 <i>VG</i> <sub>242</sub>	16.9	X	265.64874	252.11413	141.64222	8.42448	0.2378784	0.21194092	2.7860752	20	6 30.9	20.9
476288 2007 <i>VM</i> <sub>244</sub>	17.2	X	245.01533	92.31795	41.16734	14.20766	0.2848128	0.22223798	2.6993376	20	10 12.9	21.2
476289 2007 <i>VU</i> <sub>256</sub>	17.3	X	314.76853	157.23123	190.72450	9.04266	0.1497089	0.21488289	2.7605873	20	7 24.3	20.6
476290 2007 <i>VT</i> <sub>263</sub>	16.8	X	27.03401	282.50948	319.05249	4.86911	0.0111862	0.20475083	2.8509238	20	6 26.3	20.7
476291 2007 <i>VS</i> <sub>284</sub>	17.1	X	53.38367	210.15326	68.83740	7.30389	0.0223498	0.21626722	2.7487944	20	9 26.6	20.9
476292 2007 <i>VE</i> <sub>295</sub>	17.1	X	206.77781	267.95897	236.21898	8.36513	0.1359622	0.21970011	2.7200854	20	9 26.2	21.4
476293 2007 <i>VY</i> <sub>307</sub>	16.9	X	207.03193	30.79776	68.37171	3.90875	0.0382484	0.20916894	2.8106358	20	8 12.4	20.8
476294 2007 <i>VZ</i> <sub>310</sub>	16.6	X	261.79337	296.80613	103.47035	4.48460	0.1944985	0.20399650	2.8579474	20	7 10.8	20.5
476295 2007 <i>VW</i> <sub>315</sub>	16.7	X	279.53147	334.47903	80.34021	10.29703	0.0715003	0.21550519	2.7552704	20	9 18.2	20.5
476296 2007 <i>VE</i> <sub>319</sub>	17.2	X	232.90861	143.70679	245.79489	1.07624	0.0778554	0.20296933	2.8675815	20	6 7.7	21.4
476297 2007 <i>VZ</i> <sub>321</sub>	16.0	X	260.60596	211.30449	277.24587	10.54841	0.1244157	0.22632663	2.6667294	20	11 14.4	19.5
476298 2007 <i>VQ</i> <sub>325</sub>	17.1	X	265.83488	84.62526	358.08088	7.28105	0.2805764	0.21856984	2.7294547	20	8 30.7	20.7
476299 2007 <i>VV</i> <sub>326</sub>	17.0	X	228.68346	310.59003	79.70167	12.21799	0.0936908	0.19963876	2.8993867	20	6 2.8	21.2
476300 2007 <i>VQ</i> <sub>328</sub>	17.0	X	233.41202	62.59028	5.95896	9.15443	0.1874202	0.20887383	2.8132826	20	7 19.6	21.5
476301 2007 <i>VZ</i> <sub>332</sub>	16.6	X	173.87674	128.69050	315.99652	8.38262	0.2577515	0.19775909	2.9177299	20	6 13.3	21.8
476302 2007 <i>VD</i> <sub>334</sub>	17.1	X	286.46813	135.42846	284.46450	13.94836	0.3278907	0.21566355	2.7539215	20	8 13.6	20.6
476303 2007 <i>VW</i> <sub>334</sub>	17.2	X	259.39789	44.20602	16.86449	4.95737	0.1478424	0.20897644	2.8123616	20	8 13.1	21.1
476304 2007 <i>VH</i> <sub>335</sub>	16.8	X	265.27252	346.06142	81.98546	14.05412	0.1163465	0.21630589	2.7484667	20	9 10.6	20.7
476305 2007 <i>WO</i> <sub>26</sub>	16.7	X	323.44954	265.14558	82.17454	5.26893	0.0790277	0.21495058	2.7600077	20	8 19.1	20.0
476306 2007 <i>WW</i> <sub>30</sub>	15.9	X	223.38118	184.84081	259.67443	13.89270	0.0507463	0.21033050	2.8002784	20	8 5.0	20.1
476307 2007 <i>WU</i> <sub>31</sub>	17.1	X	272.61795	120.96665	270.62439	7.23763	0.2339519	0.21225326	2.7833414	20	7 6.8	21.0
476308 2007 <i>WL</i> <sub>34</sub>	17.0	X	320.28024	319.60763	34.53061	6.39211	0.0631543	0.21283278	2.7782866	20	8 25.3	20.5
476309 2007 <i>WD</i> <sub>62</sub>	16.5	X	270.92958	331.17222	75.53269	13.78218	0.1555033	0.21155968	2.7894213	20	8 10.6	20.4
476310 2007 <i>XA</i> <sub>13</sub>	17.0	X	281.39655	29.54335	8.97788	2.75359	0.0979148	0.21549249	2.7553787	20	8 20.7	20.4
476311 2007 <i>XF</i> <sub>17</sub>	16.7	X	257									

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
476321 2007 YX <sub>3</sub>	16.9 <sup>m</sup>	X	318.63204	289.94630	70.62128	10.25631	0.1809350	0.21419769	2.7664715	20	8 23.7	19.9
476322 2007 YZ <sub>5</sub>	16.9	X	238.42260	43.67076	16.34617	4.35450	0.0957144	0.20906721	2.8115476	20	7 23.5	20.9
476323 2007 YL <sub>7</sub>	18.2	X	248.21986	171.37827	284.99297	1.69955	0.2527379	0.21169217	2.7882573	20	8 28.8	22.5
476324 2007 YQ <sub>10</sub>	16.7	X	134.90821	113.38676	333.55494	8.50650	0.0572942	0.18362790	3.0655632	20	4 27.8	21.4
476325 2007 YG <sub>26</sub>	16.3	X	354.74733	242.11326	85.49164	12.07474	0.0531803	0.20615291	2.8379826	20	9 13.6	20.1
476326 2007 YX <sub>28</sub>	17.3	X	246.58065	143.63802	279.28234	3.18999	0.0927206	0.20872638	2.8146074	20	8 4.7	21.3
476327 2007 YM <sub>41</sub>	16.0	X	272.87616	35.53740	300.06423	9.84139	0.1219369	0.18996279	2.9970249	20	5 8.4	20.5
476328 2007 YW <sub>63</sub>	17.6	X	108.70960	313.72639	312.35853	7.53100	0.1014844	0.29190998	2.2506264	20	12 3.6	20.9
476329 2007 YS <sub>65</sub>	17.4	X	121.16693	292.79244	315.97152	7.72784	0.1133577	0.29072555	2.2567351	20	11 23.4	20.8
476330 2007 YV <sub>66</sub>	16.4	X	204.16483	128.05059	291.41113	8.43577	0.1539693	0.19253714	2.9702502	20	6 9.4	21.3
476331 2008 AW <sub>20</sub>	15.8	X	11.94151	237.67312	322.62482	14.74555	0.0216636	0.17560653	3.1582192	20	4 6.1	20.4
476332 2008 AT <sub>31</sub>	16.0	X	174.39989	152.36270	284.64766	11.33387	0.1275578	0.19138751	2.9821328	20	6 3.3	20.8
476333 2008 AW <sub>36</sub>	16.1	X	119.34374	325.73361	135.33441	16.58550	0.2849332	0.18329421	3.0692826	20	5 28.2	21.5
476334 2008 AR <sub>37</sub>	18.5	X	308.74259	154.27012	319.16339	1.94672	0.0860853	0.30520890	2.1847643	20	—	—
476335 2008 AP <sub>43</sub>	16.0	X	34.04887	220.55600	314.01442	9.11369	0.0562818	0.17446410	3.1719914	20	4 8.2	20.4
476336 2008 AQ <sub>44</sub>	16.3	X	98.23337	231.07965	312.02871	16.37920	0.1266079	0.18883873	3.0089064	20	7 29.1	20.8
476337 2008 AY <sub>44</sub>	16.1	X	17.71375	260.67000	317.73762	17.41010	0.1404263	0.17752646	3.1354075	20	5 14.9	20.2
476338 2008 AB <sub>53</sub>	16.3	X	306.84073	228.36149	118.48361	18.94796	0.1479574	0.20100711	2.8862133	20	7 10.3	19.7
476339 2008 AS <sub>72</sub>	16.7	X	267.51282	263.10975	149.73601	10.70517	0.3614953	0.21092162	2.7950440	20	7 10.8	21.0
476340 2008 AQ <sub>73</sub>	16.6	X	270.53157	116.60530	280.71117	7.96784	0.1349919	0.20387046	2.8591252	20	7 25.5	20.5
476341 2008 AZ <sub>75</sub>	16.3	X	173.47531	329.97129	110.53625	18.95232	0.2503675	0.19024890	2.9940194	20	6 10.7	21.7
476342 2008 AT <sub>83</sub>	16.4	X	141.23489	341.20021	102.11817	15.85279	0.0451860	0.18444774	3.0564725	20	5 9.3	21.1
476343 2008 AC <sub>98</sub>	18.5	X	16.63713	102.06572	341.90723	3.71003	0.0497097	0.31430392	2.1424113	20	—	—
476344 2008 AM <sub>98</sub>	16.6	X	132.64740	98.82652	300.34982	8.26306	0.0802824	0.17756486	3.1349554	20	4 6.1	21.4
476345 2008 AV <sub>105</sub>	16.4	X	145.89445	343.41608	133.82320	19.85137	0.1073633	0.18717737	3.0266845	20	5 20.5	21.3
476346 2008 AO <sub>111</sub>	16.9	X	304.18207	306.04810	124.99845	7.30207	0.2336759	0.21856075	2.7295304	20	10 30.6	19.5
476347 2008 AS <sub>117</sub>	16.8	X	337.57940	323.35566	332.08093	10.92713	0.0572560	0.18947377	3.0021795	20	6 29.0	20.9
476348 2008 AT <sub>123</sub>	17.4	X	252.64497	238.94729	121.96037	3.07019	0.1505560	0.19161469	2.9797753	20	5 17.3	21.9
476349 2008 AC <sub>127</sub>	17.0	X	158.82376	105.46167	323.82818	9.09531	0.0924521	0.18539189	3.0460865	20	5 4.9	21.8
476350 2008 AE <sub>127</sub>	16.9	X	144.52402	114.87223	350.88691	10.48828	0.0898518	0.18974429	2.9993253	20	6 6.0	21.6
476351 2008 AZ <sub>127</sub>	16.5	X	47.34742	298.51236	263.36130	4.27755	0.0405950	0.18534747	3.0465731	20	6 3.9	20.5
476352 2008 AB <sub>134</sub>	16.2	X	315.81943	203.02782	98.60034	11.53440	0.0737486	0.19027170	2.9937803	20	6 3.4	20.8
476353 2008 BZ <sub>1</sub>	16.2	X	81.20148	145.98514	353.33314	12.64293	0.1384173	0.17867272	3.1219831	20	5 9.2	20.1
476354 2008 BN <sub>3</sub>	16.8	X	174.52495	155.99630	294.53578	12.21216	0.0853664	0.19167194	2.9791819	20	6 20.9	21.3
476355 2008 BV <sub>12</sub>	17.9	X	130.12166	265.01491	315.53857	17.66729	0.1000895	0.36663194	1.9333739	20	11 2.8	20.9
476356 2008 BR <sub>14</sub>	16.7	X	244.17255	307.28879	89.77919	2.97065	0.1056461	0.19735554	2.9217059	20	6 27.3	21.0
476357 2008 BX <sub>22</sub>	16.1	X	4.99552	250.89072	335.35788	11.64603	0.1111118	0.17520393	3.1630555	20	5 2.5	20.2
476358 2008 BO <sub>33</sub>	16.2	X	26.50129	250.10663	317.60311	8.29932	0.0288845	0.17730822	3.1379797	20	5 9.9	20.7
476359 2008 BR <sub>38</sub>	16.4	X	182.60219	97.57794	328.17686	10.35751	0.1372707	0.18437251	3.0573039	20	5 26.5	21.5
476360 2008 BA <sub>40</sub>	16.7	X	224.88284	43.33942	53.96842	8.33567	0.2111638	0.20514067	2.8473108	20	8 14.9	21.4
476361 2008 BP <sub>46</sub>	16.4	X	3.12527	253.05621	345.15593	8.13184	0.0344451	0.17754226	3.1352214	20	5 17.8	20.8
476362 2008 BS <sub>46</sub>	17.9	X	151.23195	270.83909	314.87115	2.70291	0.0804457	0.28888244	2.2663238	20	11 27.3	20.9
476363 2008 BJ <sub>49</sub>	17.2	X	148.08728	335.32909	152.32115	12.60201	0.1333672	0.19110812	2.9850386	20	7 10.5	22.0
476364 2008 BP <sub>49</sub>	16.4	X	182.53288	108.13605	330.07415	18.10957	0.0967405	0.18632920	3.0358626	20	6 13.2	21.4
476365 2008 CX <sub>2</sub>	15.6	X	99.88810	159.56347	349.08309	28.28254	0.1325253	0.17979428	3.1089863	20	6 16.4	20.8
476366 2008 CW <sub>11</sub>	16.0	X	109.22799	348.36044	311.84542	10.15996	0.0181871	0.17848857	3.1241301	20	5 11.3	20.6
476367 2008 CH <sub>14</sub>	15.8	X	334.18800	290.33407	342.69840	15.71551	0.0671705	0.18025581	3.1036772	20	5 17.4	20.2
476368 2008 CE <sub>19</sub>	18.1	X	137.32587	62.24237	142.32985	2.34042	0.1492804	0.27882912	2.3204772	20	10 15.2	21.7
476369 2008 CL <sub>26</sub>	16.8	X	68.96427	130.51214	29.67139	3.27996	0.1019462	0.17936848	3.1139046	20	5 18.5	21.0
476370 2008 CB <sub>27</sub>	18.4	X	293.24339	110.35455	21.50712	2.26258	0.1292014	0.30431382	2.1890462	20	—	—
476371 2008 CY <sub>33</sub>	17.1	X	174.69394	343.68097	117.09691	3.48586	0.0834685	0.18918598	3.0052233	20	7 3.3	21.6
476372 2008 CB <sub>34</sub>	16.4	X	26.53461	239.04215	327.12812	13.31284	0.0495096	0.17810664	3.1285948	20	5 6.8	20.9
476373 2008 CO <sub>35</sub>	18.3	X	248.06534	185.61249	338.46496	2.81842	0.0453158	0.29883836	2.2157044	20	—	—
476374 2008 CS <sub>35</sub>	16.4	X	154.20686	107.74281	339.97174	9.54902	0.1138963	0.18178576	3.0862384	20	5 17.3	21.4
476375 2008 CK <sub>36</sub>	16.3	X	345.18788	304.48736	291.25903	4.46714	0.1466811	0.17288962	3.1912202	20	4 12.6	20.1
476376 2008 CT <sub>36</sub>	18.1	X	307.87950	194.00942	258.89053	2.18808	0.0873131	0.29813337	2.2191960	20	—	—
476377 2008 CD <sub>41</sub>	18.1	X	250.41190	5.17118	207.80660	2.99569	0.1134869	0.30692112	2.1766313	20	—	—
476378 2008 CD <sub>43</sub>	16.4	X	40.62409	199.67828	0.70289	9.72291	0.0540342	0.17757223	3.1348687	20	5 22.4	20.7
476379 2008 CG <sub>48</sub>	16.5	X	210.49165	232.53589	164.92721	10.05686	0.0434997	0.18201409	3.0836568	20	5 27.7	21.2
476380 2008 CH <sub>48</sub>	16.8	X	172.18402	154.27186	323.74957	9.53730	0.0492182	0.19082419	2.9879989	20	7 24.2	21.2
476381 2008 CS <sub>50</sub>	16.2	X	71.80900	61.25235	121.18843	9.54817	0.1895556	0.18072661	3.0982847	20	7 3.9	20.5
476382 2008 CO <sub>54</sub>	16.1	X	132.63959	312.82328	144.02637	18.37212	0.0609879	0.18184595	3.0855574	20	5 17.2	21.0
476383 2008 CQ <sub>68</sub>	16.1	X	266.78772	31.37794	313.81343	13.65863	0.1338017	0.18841315	3.0134356	20	5 10.2	20.8
476384 2008 CC <sub>69</sub>	16.5	X	166.77462	168.23304	289.84826	7.72579	0.0514512	0.19059005	2.9904455	20	6 21.1	20.8
476385 2008 CH <sub>71</sub>	15.7	X	61.13132	196.98611	12.87526	13.63660	0.1984294	0.17418427	3.1753877	20	5 3.7	20.0
476386 2008 CX <sub>76</sub>	15.8	X	43.05817	243.22751	329.91499	20.82156	0.1345155	0.18333933	3.0687791	20	6 28.6	20.1
476387 2008 CS <sub>90</sub>	16.7	X	154.53117	286.89054	159.97275	11.66520	0.0488886	0.18206431	3.0830898	20	5 25.9	21.4
476388 2008 CL <sub>108</sub>	16.5	X	125.56762	227.85799	273.56581	4.62770	0.2101430	0.18612001	3.0381369	20	7 11.3	21.4
476389 2008 CG <sub>127</sub>	16.3	X	350.40312	91.93598	152.69598	11.01157	0.0754976	0.17782458	3.1319021	20	5 12.9	20.5
476390 2008 CZ <sub>133</sub>	16.3	X	167.47050	127.91461	302.92141	9.16890	0.1005407	0.18427771	3.0583523	20	5 17.5	21.2
476391 2008 CQ <sub>136</sub>	18.4	X	177.42221	322.93500	265.55982	1.05125	0.0493601	0.29805129	2.2196034	20	—	—
476392 2008 CW <sub>149</sub>	17.9	X	170.43497	52.86055	168.18100	7.72156	0.0567660	0.29191562	2.2505975	20	12 17.4	20.9
476393 2008 CD <sub>163</sub>	16.2	X	268.13064	154.78132	149.52399	9.49691	0.0710298	0.1742483				

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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>
476401 2008 CF <sub>203</sub>	16.2	X	287.22797	128.40149	173.45690	10.91292	0.0387327	0.17138088	3.2099220	20	5 1.9	20.8
476402 2008 CE <sub>205</sub>	18.1	X	260.75020	138.44149	37.82250	5.35513	0.0811102	0.30286771	2.1960087	20	—	—
476403 2008 CE <sub>207</sub>	16.5	X	296.52508	347.77044	331.42481	9.45040	0.0456743	0.18288175	3.0738958	20	5 30.9	20.9
476404 2008 CG <sub>207</sub>	17.1	X	158.66248	285.07428	156.44107	4.49882	0.1154079	0.18388003	3.0627603	20	5 25.5	21.9
476405 2008 CK <sub>207</sub>	16.7	X	60.63070	268.89773	249.31717	3.63832	0.0957615	0.17494432	3.1661840	20	5 3.5	20.8
476406 2008 CO <sub>207</sub>	16.9	X	311.04634	288.09953	352.26116	18.32606	0.1469338	0.17294667	3.1905183	20	4 11.3	21.3
476407 2008 CW <sub>207</sub>	16.8	X	164.93394	138.32138	326.93975	11.61729	0.0255473	0.18783341	3.0196329	20	6 28.7	21.3
476408 2008 CU <sub>210</sub>	16.3	X	14.76127	213.38800	3.16847	5.86480	0.0909760	0.17462819	3.1700040	20	5 8.7	20.4
476409 2008 DV <sub>212</sub>	17.8	X	165.92852	144.12121	55.22372	4.31781	0.1649783	0.28110253	2.3079490	20	11 4.0	21.3
476410 2008 DY <sub>1</sub>	15.8	X	273.74153	338.57343	327.14097	9.40711	0.0964208	0.17875813	3.1209886	20	4 4.8	20.4
476411 2008 DK <sub>3</sub>	16.8	X	218.56582	83.01276	328.09139	9.00172	0.1634234	0.19094740	2.9867134	20	6 11.9	21.7
476412 2008 DQ <sub>3</sub>	17.1	X	152.39114	136.18385	335.96616	6.18752	0.1488531	0.18612571	3.0380749	20	6 26.9	22.1
476413 2008 DD <sub>13</sub>	16.4	X	169.43035	171.09888	352.91709	6.38601	0.1205981	0.17951823	3.1121726	20	5 11.8	21.3
476414 2008 DT <sub>17</sub>	16.5	X	153.49592	100.77559	345.86438	8.47605	0.0406232	0.17955831	3.1117095	20	5 18.8	21.2
476415 2008 DX <sub>20</sub>	17.9	X	112.57824	196.46150	7.10332	4.75863	0.1559955	0.27153895	2.3618263	20	9 18.8	21.3
476416 2008 DC <sub>26</sub>	17.8	X	119.22336	338.85074	224.83642	5.19622	0.2456360	0.27361953	2.3498383	20	9 27.5	21.9
476417 2008 DW <sub>28</sub>	16.2	X	29.73081	264.70273	325.95935	8.26310	0.0579906	0.18627676	3.0364323	20	6 18.5	20.3
476418 2008 DO <sub>29</sub>	16.5	X	200.96979	77.59040	335.89223	6.50941	0.0358710	0.18654210	3.0335522	20	6 3.2	21.0
476419 2008 DS <sub>31</sub>	16.6	X	216.92754	68.72056	10.18710	10.16536	0.0903297	0.19179107	2.9779481	20	7 24.4	21.2
476420 2008 DP <sub>32</sub>	16.2	X	31.90115	40.79877	154.64690	14.69727	0.0725627	0.17380191	3.1800432	20	5 12.3	20.6
476421 2008 DE <sub>34</sub>	16.5	X	71.61350	237.69929	174.05331	10.42073	0.1744086	0.18225814	3.0809035	20	7 14.9	20.8
476422 2008 DT <sub>34</sub>	16.0	X	20.92862	39.60867	313.13611	17.62571	0.0260230	0.17742610	3.1365897	20	5 15.1	20.6
476423 2008 DE <sub>55</sub>	18.5	X	280.31119	84.41365	165.90189	25.06899	0.0886782	0.40101737	1.8212124	20	1 7.2	21.2
476424 2008 DS <sub>59</sub>	16.5	X	205.58693	285.79270	175.81545	11.18131	0.0590937	0.19421218	2.9531470	20	8 7.1	21.0
476425 2008 DO <sub>62</sub>	16.0	X	346.88771	72.98114	175.83805	26.17116	0.1615154	0.16952016	3.2333681	20	4 15.9	20.2
476426 2008 DR <sub>65</sub>	16.1	X	99.29408	352.58573	178.65340	23.28572	0.1108594	0.18039998	3.1020233	20	7 10.1	21.1
476427 2008 DR <sub>67</sub>	17.8	X	234.87818	342.38264	219.30078	5.10183	0.0834008	0.29839308	2.2179081	20	—	—
476428 2008 DR <sub>71</sub>	16.5	X	12.93834	8.43530	187.42693	4.42116	0.0735776	0.17071461	3.2182684	20	4 11.1	20.5
476429 2008 DG <sub>77</sub>	17.8	X	242.72954	353.35516	145.22821	6.84591	0.0341390	0.29076339	2.2565393	20	12 5.5	20.5
476430 2008 DY <sub>78</sub>	17.2	X	134.35754	262.94472	334.45584	21.53537	0.1949891	0.28903546	2.2655238	20	11 15.5	21.5
476431 2008 DA <sub>82</sub>	16.4	X	165.89316	105.66491	0.18985	9.89971	0.1134833	0.18487232	3.0517910	20	7 1.8	21.3
476432 2008 DZ <sub>82</sub>	16.8	X	145.11283	133.19884	3.55009	9.49179	0.0204270	0.18514442	3.0488002	20	7 15.4	21.3
476433 2008 DV <sub>83</sub>	18.3	X	198.39197	215.76569	9.00580	2.05916	0.1080502	0.29535833	2.2330746	20	—	—
476434 2008 DQ <sub>87</sub>	16.3	X	339.31054	60.64009	182.51500	15.83641	0.0742279	0.17055333	3.2202969	20	4 23.7	20.6
476435 2008 DY <sub>88</sub>	18.1	X	162.56232	235.50405	11.29860	6.82511	0.0730832	0.29245691	2.2478196	20	—	—
476436 2008 DM <sub>89</sub>	16.0	X	257.53161	340.29456	7.42706	12.25484	0.1008627	0.17655514	3.1468966	20	5 7.8	20.8
476437 2008 EQ <sub>3</sub>	18.9	X	8.71071	335.79076	108.14075	6.77138	0.0862664	0.30971209	2.1635351	20	—	—
476438 2008 EB <sub>9</sub>	20.4	X	40.74119	251.42940	341.70573	21.34853	0.2172628	0.50448457	1.5628026	20	9 10.2	20.9
476439 2008 ET <sub>9</sub>	16.4	X	54.18731	7.42800	141.84302	17.84496	0.0655045	0.17382016	3.1798206	20	4 16.1	20.9
476440 2008 EA <sub>17</sub>	17.2	X	150.63059	286.51866	260.87676	5.62304	0.0750796	0.27605552	2.3359942	20	10 2.6	20.5
476441 2008 EL <sub>26</sub>	16.6	X	193.58190	257.21979	174.83790	16.51515	0.0564908	0.18495817	3.0508465	20	6 18.8	21.5
476442 2008 EL <sub>28</sub>	16.9	X	162.56825	81.57163	39.34433	13.46809	0.1915430	0.18879406	3.0093810	20	7 20.3	22.2
476443 2008 EP <sub>35</sub>	18.2	X	215.11292	160.21541	54.63892	6.68768	0.1045908	0.29678548	2.2259101	20	—	—
476444 2008 EA <sub>36</sub>	16.4	X	135.16595	281.07464	182.64095	14.37715	0.2381314	0.18229198	3.0805222	20	6 6.9	21.8
476445 2008 EW <sub>39</sub>	17.5	X	212.01245	196.01719	340.62168	7.27014	0.0999920	0.28881057	2.2666997	20	12 1.7	20.4
476446 2008 EN <sub>40</sub>	16.5	X	111.09017	192.89063	337.44123	9.14664	0.1328050	0.18416880	3.0595579	20	7 28.5	21.2
476447 2008 EW <sub>41</sub>	18.0	X	186.42417	209.74554	20.17397	7.79802	0.0573067	0.29261338	2.2470182	20	—	—
476448 2008 EQ <sub>45</sub>	18.2	X	81.86240	51.65290	208.08413	4.88456	0.1857222	0.27649742	2.3335046	20	11 2.3	21.6
476449 2008 EW <sub>45</sub>	17.7	X	101.89193	355.57212	239.63335	5.95044	0.1899369	0.27269029	2.3551736	20	10 19.4	21.3
476450 2008 EO <sub>50</sub>	17.3	X	190.90504	325.08878	120.54588	3.07203	0.0941649	0.18834840	3.0141261	20	7 1.2	21.8
476451 2008 EV <sub>50</sub>	15.8	X	103.07616	162.15869	330.94644	13.14535	0.1116038	0.17718207	3.1394690	20	5 26.2	20.6
476452 2008 EY <sub>50</sub>	18.2	X	110.86793	247.32441	341.24663	4.66681	0.1856749	0.27415950	2.3467519	20	10 18.8	21.8
476453 2008 EZ <sub>58</sub>	16.3	X	5.62366	272.35583	326.58801	13.58469	0.0846397	0.17734136	3.1375888	20	5 21.9	20.5
476454 2008 EC <sub>65</sub>	16.4	X	109.08372	321.95433	188.02654	15.13286	0.1459942	0.18136014	3.0910651	20	6 29.1	21.4
476455 2008 EV <sub>70</sub>	17.8	X	191.65730	223.52240	318.25019	5.75624	0.1362480	0.28723047	2.2750051	20	11 8.2	21.0
476456 2008 EY <sub>74</sub>	17.8	X	244.63598	13.10474	90.70453	2.50288	0.1264962	0.28293813	2.2979561	20	10 3.6	20.5
476457 2008 EY <sub>79</sub>	15.8	X	98.91086	336.53333	176.62600	27.76507	0.1063215	0.17831340	3.1261757	20	6 18.6	20.9
476458 2008 EP <sub>108</sub>	16.6	X	238.00800	60.00478	325.01238	7.58595	0.1316863	0.18906822	3.0064710	20	5 31.9	21.2
476459 2008 EZ <sub>116</sub>	15.7	X	22.19407	197.14907	18.78520	27.91561	0.1375407	0.17115616	3.2127310	20	5 13.3	20.0
476460 2008 EB <sub>126</sub>	18.3	X	219.72171	310.36223	190.42159	6.18551	0.1008148	0.28311630	2.2969919	20	10 24.9	21.2
476461 2008 EG <sub>127</sub>	18.3	X	101.73922	93.53002	166.35871	3.42511	0.1404464	0.27743138	2.3282646	20	11 19.4	21.7
476462 2008 EG <sub>130</sub>	16.2	X	12.92728	239.66346	7.11338	17.61220	0.1561206	0.17674608	3.1446297	20	6 20.1	20.2
476463 2008 EF <sub>141</sub>	15.8	X	251.71210	30.74534	338.84096	10.31920	0.0523286	0.17885672	3.1198416	20	6 6.4	20.5
476464 2008 EU <sub>149</sub>	16.4	X	299.17728	99.08649	188.63556	8.15554	0.0394407	0.16982083	3.2295505	20	4 28.4	20.9
476465 2008 ED <sub>153</sub>	16.7	X	355.33616	230.30129	52.64948	9.85620	0.0514780	0.17959864	3.1112436	20	7 7.8	20.9
476466 2008 EO <sub>154</sub>	16.0	X	279.11783	250.68057	25.33237	7.66961	0.0794385	0.15919083	3.3717654	20	3 16.5	20.8
476467 2008 EY <sub>156</sub>	16.1	X	52.16510	189.56404	14.63375	18.11189	0.1666478	0.17565084	3.1576881	20	7 3.2	20.6
476468 2008 ER <sub>158</sub>	18.3	X	328.76186	348.70005	133.45229	3.68321	0.0846703	0.30230500	2.1987330	20	—	—
476469 2008 EU <sub>164</sub>	15.9	X	33.37416	224.25541	344.47515	15.46895	0.1495171	0.17415003	3.1758039	20	6 1.6	20.1
476470 2008 EY <sub>164</sub>	16.7	X	142.88044	98.74102	14.27382	9.92310	0.0748492	0.17927614	3.1149737	20	6 12.6	21.5
476471 2008 FL <sub>2</sub>	18.1	X	3.78093	135.37137	315.49624	3.06262	0.1166251	0.30850271	2.1691857	20	—	—
476472 2008 FP <sub>2</sub>	16.3	X	242.96111	41.26612	351.76029	11.31428	0.0331609	0.18556865	3.0441519	20	6 30.9	20.8
476473 2008 FG <sub>9</sub>	16.2	X	244.53378	10.80465	348.80991	9.45907	0.1003074	0.18097630	3.0954342	20	5 8.3	21.0

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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>
476481 2008 FZ <sub>44</sub>	18.2	X	139.38871	227.18387	7.95588	7.48672	0.1170892	0.28473502	2.2882780	20	11 23.4	21.7
476482 2008 FF <sub>49</sub>	16.9	X	198.85595	284.54193	186.39798	12.99225	0.1403113	0.19181789	2.9776705	20	8 5.2	21.8
476483 2008 FN <sub>52</sub>	17.4	X	232.35705	322.43903	188.35685	22.84591	0.1147530	0.28771387	2.2724562	20	11 24.7	20.6
476484 2008 FA <sub>56</sub>	18.0	X	343.83918	351.68941	63.02094	5.65977	0.0926190	0.29282391	2.2459411	20	—	—
476485 2008 FT <sub>63</sub>	15.8	X	113.01543	122.57433	39.30751	14.63728	0.2173006	0.18222160	3.0813153	20	7 30.2	21.1
476486 2008 FV <sub>63</sub>	17.9	X	107.11402	40.64251	207.52704	5.23840	0.1342333	0.27362572	2.3498029	20	11 8.6	21.2
476487 2008 FR <sub>64</sub>	17.9	X	82.89175	169.88624	87.94090	2.36498	0.1623394	0.27068520	2.3667899	20	10 29.4	21.2
476488 2008 FK <sub>90</sub>	16.1	X	30.41796	40.51695	152.02852	10.88864	0.1453129	0.17441475	3.1725897	20	5 11.8	20.1
476489 2008 FL <sub>98</sub>	18.1	X	307.20998	277.52573	144.45841	6.27246	0.0834398	0.28286305	2.2983627	20	11 21.6	20.5
476490 2008 FZ <sub>104</sub>	17.8	X	62.46368	69.61246	184.60111	4.79526	0.1975782	0.26295349	2.4129598	20	10 4.8	21.1
476491 2008 FY <sub>106</sub>	18.3	X	116.85304	60.49985	153.95336	2.73542	0.1645038	0.27220086	2.3579959	20	10 7.9	22.0
476492 2008 FG <sub>108</sub>	16.7	X	142.06605	93.30441	26.15489	8.69980	0.0864693	0.17978635	3.1090777	20	6 21.4	21.5
476493 2008 FR <sub>112</sub>	17.9	X	76.38001	87.07860	156.41599	5.9231	0.1605486	0.26743429	2.3859316	20	10 3.7	21.2
476494 2008 FS <sub>116</sub>	18.5	X	186.61391	196.24041	26.75913	3.73119	0.1246890	0.28826627	2.2695521	20	12 30.4	21.5
476495 2008 FQ <sub>120</sub>	16.3	X	119.84000	126.68379	47.74332	10.00378	0.0862444	0.18565141	3.0432471	20	8 9.7	21.0
476496 2008 FD <sub>123</sub>	15.9	X	227.69470	191.50195	201.85643	26.21324	0.0582806	0.17393609	3.1784075	20	6 7.4	21.0
476497 2008 FG <sub>126</sub>	18.0	X	90.94930	97.22569	165.99270	8.32391	0.0926428	0.27641124	2.3339896	20	11 10.1	21.3
476498 2008 FA <sub>133</sub>	16.6	X	100.49538	333.94356	219.29736	5.82478	0.1566938	0.18327239	3.0695263	20	8 13.0	21.4
476499 2008 FG <sub>136</sub>	17.7	X	101.38567	129.95836	100.08160	6.86186	0.2179905	0.26946086	2.3739537	20	10 18.6	21.6
476500 2008 GA <sub>6</sub>	16.3	X	274.94475	287.84447	54.81752	12.76174	0.0706254	0.17429145	3.1740858	20	5 29.6	20.8
476501 2008 GS <sub>8</sub>	15.9	X	173.42778	45.85779	6.55579	17.46662	0.1358512	0.17481518	3.1677431	20	4 28.2	21.2
476502 2008 GP <sub>10</sub>	16.6	X	17.33413	50.53128	206.21369	9.00312	0.0556959	0.17412200	3.1761447	20	7 3.4	20.9
476503 2008 GE <sub>17</sub>	18.1	X	302.84999	333.80757	172.99292	7.36268	0.1278217	0.29872133	2.2162830	20	—	—
476504 2008 GD <sub>20</sub>	19.1	X	232.86413	292.91446	29.36732	19.58916	0.1170208	0.40266149	1.8162515	20	3 5.3	21.7
476505 2008 GA <sub>22</sub>	15.7	X	264.19306	319.80266	87.80690	28.98914	0.1757588	0.17875749	3.1209961	20	7 24.5	20.5
476506 2008 GE <sub>32</sub>	18.1	X	283.03599	1.16108	135.38141	6.96861	0.0639020	0.29251271	2.2475338	20	—	—
476507 2008 GT <sub>34</sub>	16.0	X	324.02863	286.22134	15.64140	9.87963	0.0760620	0.17648222	3.1477634	20	6 12.9	20.2
476508 2008 GG <sub>43</sub>	19.0	X	257.67735	348.94489	187.65867	2.46532	0.0581739	0.29651297	2.2272737	20	—	—
476509 2008 GX <sub>48</sub>	18.0	X	173.14303	237.86785	350.23362	7.03248	0.0658355	0.29156399	2.2524066	20	12 29.3	21.0
476510 2008 GY <sub>50</sub>	16.6	X	159.97557	252.24643	185.43570	10.78927	0.0814044	0.17351099	3.1835968	20	5 21.4	21.5
476511 2008 GP <sub>52</sub>	18.5	X	87.44575	102.05573	181.02651	3.98891	0.1454235	0.27904886	2.3192588	20	12 4.7	22.0
476512 2008 GA <sub>58</sub>	16.6	X	327.51860	252.74871	23.17889	11.68555	0.0383498	0.17192756	3.2031140	20	5 16.9	21.1
476513 2008 GW <sub>61</sub>	16.2	X	354.42688	117.51989	148.02006	10.83712	0.0570924	0.17375293	3.1806408	20	6 13.7	20.5
476514 2008 GD <sub>69</sub>	18.1	X	100.95441	138.13507	123.95574	3.19797	0.1806990	0.27389251	2.3482768	20	11 22.8	21.8
476515 2008 GM <sub>70</sub>	16.8	X	229.66030	115.40291	54.92962	22.36810	0.1657826	0.28725395	2.2748811	20	12 4.4	19.7
476516 2008 GW <sub>72</sub>	16.3	X	71.12933	358.19981	189.40750	11.74252	0.0105006	0.17696269	3.1420631	20	6 13.4	20.9
476517 2008 GR <sub>73</sub>	16.1	X	284.78836	270.27267	58.80128	12.23813	0.0727985	0.17351493	3.1835486	20	5 24.7	20.4
476518 2008 GN <sub>75</sub>	16.0	X	175.13114	8.05001	72.27051	10.22701	0.0579710	0.17384906	3.1794682	20	6 7.6	20.8
476519 2008 GM <sub>77</sub>	18.3	X	98.72826	128.73940	110.29789	5.71190	0.1098692	0.27054496	2.3676077	20	10 19.2	21.7
476520 2008 GR <sub>82</sub>	16.3	X	103.66192	355.00670	178.02607	10.27532	0.0539462	0.17925641	3.1152023	20	7 10.7	20.9
476521 2008 GH <sub>84</sub>	18.0	X	38.20583	268.08619	60.69180	5.61646	0.1699230	0.27804768	2.3248228	20	12 11.7	21.0
476522 2008 GH <sub>88</sub>	18.3	X	52.64811	143.37085	105.20525	2.27417	0.1511372	0.26308181	2.4121751	20	9 8.3	21.1
476523 2008 GO <sub>90</sub>	17.9	X	60.06195	238.27532	35.76201	6.50675	0.0951538	0.27111702	2.3642761	20	10 15.9	20.9
476524 2008 GQ <sub>93</sub>	18.3	X	84.79784	9.21706	46.29442	1.86891	0.1156587	0.31876447	2.1223782	20	1 3.3	19.9
476525 2008 GQ <sub>95</sub>	16.0	X	32.67907	201.83501	42.41873	17.02912	0.1990148	0.17605706	3.1528290	20	8 4.5	20.1
476526 2008 GP <sub>99</sub>	18.1	X	71.39526	150.48647	110.36685	2.74039	0.1626816	0.26812577	3.3818277	20	10 21.1	21.3
476527 2008 GY <sub>104</sub>	15.4	X	233.71736	280.13724	47.77787	15.66346	0.1454112	0.15839631	3.3830313	20	3 27.9	20.9
476528 2008 GX <sub>111</sub>	16.6	X	107.50337	183.47146	31.97357	26.34102	0.1597196	0.26979467	2.3719952	20	10 7.3	20.4
476529 2008 GJ <sub>117</sub>	16.2	X	169.61472	78.15250	48.76867	23.37197	0.0533439	0.18230972	3.0803223	20	8 7.9	21.2
476530 2008 GD <sub>126</sub>	17.6	X	120.57777	323.30339	249.31785	2.99417	0.1350184	0.27215250	2.3582753	20	10 5.6	21.2
476531 2008 GX <sub>129</sub>	15.9	X	239.47865	358.73060	43.56043	28.02004	0.0505609	0.17950727	3.1122993	20	7 3.3	20.9
476532 2008 GT <sub>131</sub>	18.4	X	62.33847	124.43574	164.82795	5.67801	0.2137688	0.26965539	2.3728119	20	11 22.9	21.9
476533 2008 GZ <sub>138</sub>	17.4	X	359.72022	341.83098	44.08283	10.98412	0.1082587	0.28307349	2.2972235	20	12 28.4	20.1
476534 2008 GQ <sub>141</sub>	14.1	X	41.28146	107.28556	73.27310	2.72159	0.0258947	0.08204616	5.2452220	20	5 2.1	20.8
476535 2008 GP <sub>143</sub>	17.5	X	102.68817	316.78180	259.88769	3.98675	0.1683542	0.26805740	2.3822327	20	9 23.6	21.2
476536 2008 HE <sub>5</sub>	16.1	X	175.79786	84.99838	25.44197	12.67241	0.1247135	0.18444741	3.0564761	20	7 19.3	21.2
476537 2008 HE <sub>6</sub>	18.5	X	132.03946	216.37745	39.74098	5.89282	0.1970568	0.28175337	2.3043935	20	12 12.4	22.3
476538 2008 HN <sub>9</sub>	16.0	X	17.59838	51.72575	201.24816	27.06399	0.1064838	0.17670885	3.1450715	20	6 29.8	20.6
476539 2008 HL <sub>14</sub>	16.2	X	329.42503	268.98818	19.65088	31.54012	0.0939980	0.17268071	3.1937935	20	5 20.7	20.9
476540 2008 HC <sub>24</sub>	16.3	X	225.19886	305.83012	115.06685	10.96448	0.0414532	0.17860591	3.1227616	20	7 12.1	20.7
476541 2008 HM <sub>36</sub>	17.7	X	278.43505	357.16522	119.85597	6.25761	0.0437716	0.28385919	2.2929825	20	12 23.9	20.3
476542 2008 HV <sub>36</sub>	16.0	X	34.35063	137.25251	92.82531	10.73829	0.0352662	0.17051840	3.2207366	20	6 22.0	20.2
476543 2008 HQ <sub>43</sub>	16.6	X	161.40946	91.94830	43.89949	10.59669	0.0685659	0.18336395	3.0685044	20	8 5.7	21.4
476544 2008 HB <sub>44</sub>	16.0	X	195.50005	7.19191	44.02638	15.53843	0.0870297	0.17130506	3.2108691	20	5 22.3	20.9
476545 2008 HD <sub>46</sub>	18.2	X	78.57478	190.31683	107.23861	3.50655	0.2166786	0.27354741	2.3502513	20	12 17.9	21.8
476546 2008 HO <sub>50</sub>	18.3	X	60.42547	75.38760	201.43949	4.33084	0.2066949	0.26606511	2.3941100	20	11 2.9	21.6
476547 2008 HH <sub>51</sub>	18.0	X	142.09400	9.78570	218.59916	7.04611	0.1698844	0.27725202	2.3292686	20	11 17.7	21.5
476548 2008 HO <sub>56</sub>	18.0	X	88.85073	219.29127	83.37490	3.69682	0.2220686	0.28061916	2.3105986	20	—	—
476549 2008 JB <sub>10</sub>	18.3	X	55.38774	204.79455	60.49167	2.92220	0.1670771	0.26351233	2.4095471	20	10 7.7	21.5
476550 2008 JQ <sub>10</sub>	16.5	X	336.34428	227.75794	65.83098	10.59638	0.0341347	0.17538258	3.1609073	20	6 23.7	20.8
476551 2008 JO <sub>13</sub>	17.5	X	22.35742	282.89190	80.61160	13.65132	0.2749173	0.27542729	2.3395450	20	—	—
476552 2008 JQ <sub>16</sub>	18.2	X	100.53348	127.91199	151.35475	3.74618	0.2183665	0.27534094	2.3400341	20	12 14.7	22.1
476553 2008 JP <sub>16</sub>	16.1	X	181.28386	56.32612	63.38529	18.29457	0.0801077	0.18193602	3.0845390			

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
476561 2008 <i>OU</i> <sub>20</sub>	17.8	X	19.60809	180.86202	145.84598	7.09869	0.1651447	0.25516960	2.4617848	20	11 10.3	20.7
476562 2008 <i>OB</i> <sub>21</sub>	17.7	X	320.33999	257.47582	162.25200	5.29109	0.0925889	0.25939134	2.4350006	20	12 2.8	20.3
476563 2008 <i>PD</i> <sub>19</sub>	18.5	X	305.66241	225.60399	150.55914	2.09262	0.2303096	0.24419747	2.5349843	20	8 12.2	20.6
476564 2008 <i>QL</i> <sub>21</sub>	17.1	X	312.83520	185.82476	215.27094	6.61598	0.1910319	0.25068737	2.4910422	20	10 14.4	19.2
476565 2008 <i>QA</i> <sub>37</sub>	18.4	X	351.71500	319.96460	345.68397	3.03087	0.2298175	0.24417495	2.5351401	20	8 15.9	20.1
476566 2008 <i>RC</i> <sub>4</sub>	18.4	X	310.79958	191.48927	193.28095	2.48657	0.2727556	0.24439423	2.5336235	20	8 31.1	20.1
476567 2008 <i>RY</i> <sub>9</sub>	17.8	X	332.39847	4.39331	337.72163	5.85128	0.0538418	0.24088742	2.5581537	20	8 28.7	20.9
476568 2008 <i>RE</i> <sub>12</sub>	17.3	X	277.25566	205.67266	186.63860	12.15618	0.1887860	0.23799838	2.5788142	20	7 20.8	20.8
476569 2008 <i>RJ</i> <sub>16</sub>	18.1	X	350.77922	77.57070	312.07212	4.26994	0.1378332	0.25588892	2.4571692	20	12 14.6	20.7
476570 2008 <i>RH</i> <sub>23</sub>	17.0	X	298.07970	133.43195	207.10367	13.00931	0.2869252	0.23424301	2.6063033	20	5 26.3	20.3
476571 2008 <i>RZ</i> <sub>28</sub>	18.2	X	326.30592	174.30952	173.79210	9.83593	0.1424800	0.24328516	2.5413177	20	8 21.6	20.7
476572 2008 <i>RX</i> <sub>30</sub>	17.0	X	130.24268	237.27896	348.10646	10.77308	0.1182258	0.25568091	2.4585017	20	10 25.7	20.9
476573 2008 <i>RA</i> <sub>35</sub>	18.4	X	49.63525	305.61389	174.48751	23.97803	0.0222494	0.37659528	1.8991217	20	1 18.9	20.8
476574 2008 <i>RQ</i> <sub>40</sub>	17.3	X	277.38190	36.50143	357.47836	13.91637	0.0988095	0.23942593	2.5685533	20	8 15.8	20.6
476575 2008 <i>RG</i> <sub>41</sub>	16.6	X	137.45974	18.72838	171.18589	3.73078	0.1811879	0.24473521	2.5312696	20	9 22.8	20.7
476576 2008 <i>RZ</i> <sub>43</sub>	18.2	X	319.81527	54.80316	9.49027	2.52746	0.1811960	0.25423680	2.4678027	20	12 8.4	20.1
476577 2008 <i>RX</i> <sub>44</sub>	17.3	X	203.39714	104.07366	1.38043	12.22680	0.2148224	0.23423331	2.6063753	20	8 8.1	21.8
476578 2008 <i>RX</i> <sub>57</sub>	17.8	X	293.44008	225.18793	162.43559	3.72940	0.1255258	0.24235708	2.5478014	20	8 22.3	20.5
476579 2008 <i>RC</i> <sub>63</sub>	17.9	X	322.17422	15.75160	23.95368	2.72156	0.2124807	0.25050996	2.4922182	20	11 4.1	19.7
476580 2008 <i>RZ</i> <sub>88</sub>	17.3	X	248.98568	226.38180	243.27557	5.34189	0.2191719	0.24508278	2.5288759	20	9 22.7	20.8
476581 2008 <i>RY</i> <sub>117</sub>	17.2	X	225.03733	261.96122	195.86763	20.94672	0.0720639	0.23856911	2.5746996	20	8 26.2	21.2
476582 2008 <i>RW</i> <sub>123</sub>	18.3	X	295.80903	38.14903	329.53718	2.68835	0.1604751	0.24142855	2.5543298	20	7 23.1	21.0
476583 2008 <i>RA</i> <sub>131</sub>	17.4	X	224.33628	56.55275	27.20586	6.88779	0.2291481	0.22863434	2.6487547	20	7 26.8	21.8
476584 2008 <i>RP</i> <sub>131</sub>	17.5	X	290.82936	206.80143	178.35127	13.04926	0.1730957	0.24217391	2.5490860	20	8 4.1	20.6
476585 2008 <i>RM</i> <sub>135</sub>	15.9	X	117.05888	254.44295	193.65744	9.78909	0.2811694	0.12552632	3.9504465	20	5 8.9	22.3
476586 2008 <i>RV</i> <sub>135</sub>	17.3	X	308.92415	200.16588	156.03601	5.85921	0.1870475	0.23884024	2.5727508	20	7 24.2	19.9
476587 2008 <i>RP</i> <sub>137</sub>	16.8	X	216.60346	246.10560	182.95608	21.80529	0.0482063	0.23447593	2.6045771	20	7 11.9	20.9
476588 2008 <i>RB</i> <sub>139</sub>	18.0	X	331.99916	169.92063	187.34002	3.77223	0.1584621	0.24120716	2.5558925	20	9 17.4	20.4
476589 2008 <i>SU</i> <sub>11</sub>	18.1	X	210.17097	121.34770	195.82709	21.47087	0.0829940	0.37717650	1.8971702	20	1 17.3	21.0
476590 2008 <i>RS</i> <sub>13</sub>	17.9	X	19.30252	1.17149	334.91860	4.41085	0.2132133	0.25682163	2.4512164	20	11 27.2	20.7
476591 2008 <i>SL</i> <sub>19</sub>	18.0	X	23.30657	20.60838	318.22110	3.91182	0.1988196	0.25733118	2.4479795	20	12 4.9	21.0
476592 2008 <i>SS</i> <sub>21</sub>	18.0	X	38.95628	165.43101	150.18588	1.95078	0.1967869	0.25721162	2.4487380	20	11 25.3	21.2
476593 2008 <i>SD</i> <sub>38</sub>	17.7	X	2.49723	13.58031	352.73474	3.23987	0.22572711	0.25508818	2.4623087	20	12 20.7	20.2
476594 2008 <i>SH</i> <sub>40</sub>	18.1	X	347.01041	322.88953	66.49323	2.68753	0.2021688	0.25254495	2.4788120	20	12 15.5	20.4
476595 2008 <i>SE</i> <sub>44</sub>	17.7	X	242.78729	224.86858	194.63199	4.62028	0.1931131	0.23181020	2.6245067	20	7 14.8	21.7
476596 2008 <i>SU</i> <sub>49</sub>	18.7	X	327.59759	166.75886	184.73537	5.66070	0.2588065	0.24382789	2.5375452	20	8 22.3	20.3
476597 2008 <i>ST</i> <sub>54</sub>	17.9	X	324.78883	328.43296	9.06993	0.66707	0.1571397	0.23885388	2.5726528	20	8 2.1	20.2
476598 2008 <i>SB</i> <sub>72</sub>	17.5	X	323.67273	350.11090	41.36395	5.26177	0.2161459	0.24313386	2.5423719	20	10 23.7	19.3
476599 2008 <i>SA</i> <sub>74</sub>	18.5	X	317.84865	91.72479	290.05089	1.12459	0.2317475	0.24479928	2.5308279	20	9 20.2	20.2
476600 2008 <i>SR</i> <sub>83</sub>	15.7	X	142.40303	273.77913	149.71601	1.59498	0.1756052	0.12629637	3.9343724	20	4 23.2	21.8
476601 2008 <i>SE</i> <sub>85</sub>	19.8	X	188.19159	294.87096	177.46006	29.59637	0.5251457	0.47533650	1.6260552	20	7 26.3	23.6
476602 2008 <i>SZ</i> <sub>96</sub>	17.6	X	247.54477	62.41701	344.82405	3.31737	0.1703362	0.23151307	2.6267518	20	7 8.2	21.5
476603 2008 <i>ST</i> <sub>99</sub>	17.0	X	268.13491	222.84047	181.89845	11.67442	0.0597146	0.23567313	2.5957488	20	8 14.8	20.5
476604 2008 <i>SQ</i> <sub>105</sub>	17.2	X	267.48720	211.27708	200.29432	11.55329	0.0527540	0.23701224	2.5859624	20	8 23.6	20.7
476605 2008 <i>SM</i> <sub>110</sub>	15.4	X	120.69110	285.67655	166.43852	6.23150	0.2654101	0.12422227	3.9780455	20	5 14.5	21.7
476606 2008 <i>SM</i> <sub>120</sub>	17.0	X	120.90148	162.06458	27.19870	15.39887	0.0659750	0.23494510	2.6011084	20	9 5.7	20.9
476607 2008 <i>SL</i> <sub>124</sub>	17.6	X	306.98277	184.15457	206.85128	14.72504	0.1150749	0.24256433	2.5463500	20	9 18.7	20.5
476608 2008 <i>SF</i> <sub>125</sub>	17.6	X	244.55151	237.65571	213.50545	3.97021	0.2274070	0.23698777	2.5861404	20	8 22.8	21.4
476609 2008 <i>SR</i> <sub>130</sub>	18.0	X	284.20520	42.61708	347.51575	3.47811	0.1682463	0.23618544	2.5919938	20	8 4.2	21.0
476610 2008 <i>SE</i> <sub>132</sub>	17.7	X	254.26195	32.40983	15.54426	3.42229	0.0852950	0.23226917	2.6210482	20	7 30.4	21.1
476611 2008 <i>SV</i> <sub>135</sub>	16.8	X	228.50884	280.75304	169.01238	28.68916	0.3178559	0.23576728	2.5950578	20	7 27.3	21.7
476612 2008 <i>SC</i> <sub>137</sub>	18.2	X	337.13682	119.69867	242.70695	3.99827	0.1779479	0.24452549	2.5327168	20	10 6.9	20.5
476613 2008 <i>SV</i> <sub>137</sub>	18.6	X	305.40921	338.23501	59.82268	2.32594	0.1855240	0.24266012	2.5456798	20	9 23.3	20.9
476614 2008 <i>SC</i> <sub>138</sub>	17.7	X	292.89297	304.51454	85.92439	4.17971	0.1430529	0.23819311	2.5774085	20	8 24.7	20.6
476615 2008 <i>SJ</i> <sub>142</sub>	17.5	X	235.29475	318.94735	77.36435	2.90117	0.0939601	0.22516846	2.6758659	20	6 17.9	21.4
476616 2008 <i>ST</i> <sub>142</sub>	17.8	X	0.54710	157.75207	177.91078	2.69283	0.2547560	0.24606589	2.5221356	20	10 30.9	19.9
476617 2008 <i>SX</i> <sub>143</sub>	17.2	X	328.84158	265.31004	42.58928	7.83738	0.1590071	0.23001868	2.6381165	20	6 23.8	19.9
476618 2008 <i>SG</i> <sub>151</sub>	17.1	X	266.97373	117.82536	323.34614	7.01108	0.2139545	0.24459760	2.5322189	20	9 9.6	20.1
476619 2008 <i>SA</i> <sub>155</sub>	17.8	X	357.69104	342.32856	22.28863	5.07562	0.2021839	0.25347681	2.4727330	20	11 28.9	20.2
476620 2008 <i>SD</i> <sub>157</sub>	18.0	X	5.35882	131.07788	231.66477	1.44470	0.2200661	0.25495158	2.4631881	20	12 14.1	20.6
476621 2008 <i>SP</i> <sub>162</sub>	17.7	X	265.98460	233.33029	179.97549	3.63797	0.2256511	0.23742421	2.5829701	20	7 29.9	21.3
476622 2008 <i>SC</i> <sub>163</sub>	17.7	X	28.06506	338.52720	42.78607	3.24386	0.2115201	0.26176825	2.4202380	20	—	—
476623 2008 <i>SQ</i> <sub>167</sub>	17.6	X	310.27354	222.35466	189.17069	9.78028	0.2808441	0.24547653	2.5261709	20	10 17.0	19.1
476624 2008 <i>SE</i> <sub>182</sub>	16.8	X	180.08563	118.82053	35.37500	31.75984	0.2699373	0.23318222	2.6142017	20	9 28.6	21.9
476625 2008 <i>SA</i> <sub>188</sub>	15.7	X	130.62562	119.39228	310.37232	2.23452	0.1794452	0.12300518	4.0042432	20	4 18.9	21.9
476626 2008 <i>SP</i> <sub>189</sub>	17.1	X	11.74380	237.95891	13.36071	14.74963	0.0838145	0.22776366	2.6555007	20	6 22.1	20.5
476627 2008 <i>SB</i> <sub>190</sub>	17.4	X	199.87110	95.86931	8.84375	6.95357	0.1457250	0.23157140	2.6263107	20	8 5.9	21.6
476628 2008 <i>SV</i> <sub>194</sub>	17.6	X	340.68357	132.20435	200.49706	7.90983	0.1782281	0.23970477	2.5665610	20	8 26.1	20.0
476629 2008 <i>SG</i> <sub>198</sub>	17.9	X	314.94716	301.38259	42.61860	10.58468	0.2184059	0.23573812	2.5952717	20	7 15.5	20.6
476630 2008 <i>SA</i> <sub>200</sub>	17.5	X	335.00624	331.08982	354.54953	4.66133	0.1521166	0.23664491	2.5886377	20	8 6.6	20.0
476631 2008 <i>SW</i> <sub>200</sub>	18.0	X	335.202									



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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>		
476641	2008	SL <sub>254</sub>	16.9	X	143.51816	128.56486	21.14627	16.63567	0.1382384	0.22845931	2.6501074	20	8 13.5	21.4
476642	2008	SW <sub>257</sub>	15.3	X	113.47823	77.30092	20.42863	13.11050	0.1741359	0.12402106	3.9823468	20	5 2.9	21.3
476643	2008	SS <sub>260</sub>	17.0	X	330.01670	12.79873	347.86844	14.82565	0.2698405	0.24326619	2.5414499	20	9 15.6	18.5
476644	2008	SN <sub>264</sub>	18.4	X	307.65870	218.40551	195.91737	12.51555	0.2959477	0.24511682	2.5286418	20	10 10.5	19.7
476645	2008	SD <sub>266</sub>	18.2	X	280.69047	224.48045	177.69009	3.31232	0.2116349	0.23668567	2.5883405	20	8 6.7	21.4
476646	2008	SS <sub>269</sub>	18.3	X	283.98430	231.15047	205.05542	4.70514	0.2326185	0.24296329	2.5435617	20	9 28.2	20.7
476647	2008	SH <sub>270</sub>	17.8	X	235.05723	45.04472	45.60903	2.84572	0.1321983	0.23661246	2.5888743	20	8 26.6	21.5
476648	2008	SK <sub>271</sub>	17.2	X	317.68889	239.33513	136.90357	5.48544	0.2426131	0.24251704	2.5466809	20	9 11.1	18.9
476649	2008	SG <sub>273</sub>	18.0	X	284.87897	2.07378	62.54803	5.24996	0.1727659	0.24071821	2.5593524	20	9 26.4	20.8
476650	2008	SP <sub>273</sub>	17.8	X	293.75056	352.20391	72.56043	9.61057	0.1634644	0.24097775	2.5575144	20	10 16.3	20.6
476651	2008	SZ <sub>282</sub>	17.6	X	300.14936	178.92013	182.72084	3.74396	0.2286902	0.23279050	2.6171335	20	7 8.2	20.6
476652	2008	SF <sub>283</sub>	18.0	X	301.48620	196.40034	207.04703	7.47532	0.1880656	0.24177186	2.5519112	20	9 19.3	20.4
476653	2008	SF <sub>284</sub>	18.1	X	249.16634	268.87956	185.84295	5.35851	0.2764891	0.23580520	2.5947795	20	8 26.4	22.0
476654	2008	SJ <sub>284</sub>	17.1	X	176.55995	253.96878	273.71065	5.66775	0.1152626	0.24050671	2.5608526	20	9 28.8	21.0
476655	2008	SD <sub>288</sub>	18.0	X	331.12187	193.58961	165.92621	4.28728	0.2698111	0.24355292	2.5394548	20	9 19.5	19.1
476656	2008	SE <sub>290</sub>	17.4	X	234.26564	83.86670	354.27800	2.82239	0.1969755	0.23318653	2.6141695	20	7 31.4	21.2
476657	2008	SC <sub>300</sub>	17.7	X	307.07101	30.59190	346.78344	4.52479	0.2179579	0.23973176	2.5663684	20	8 19.7	19.8
476658	2008	SP <sub>303</sub>	16.8	X	275.37877	120.70063	316.81399	12.04897	0.2518468	0.24086038	2.5583452	20	9 7.7	20.1
476659	2008	SO <sub>306</sub>	18.0	X	154.02352	110.61032	212.32798	20.13065	0.0842753	0.36253152	1.9479249	20	—	—
476660	2008	SW <sub>309</sub>	17.1	X	305.50691	179.99099	192.09206	5.79519	0.2257449	0.24167365	2.5526024	20	10 9.2	18.9
476661	2008	TB <sub>8</sub>	18.2	X	336.94471	328.72055	31.28112	7.22689	0.1852897	0.24601329	2.5224952	20	10 7.0	20.3
476662	2008	TH <sub>8</sub>	17.6	X	336.36652	285.18427	54.60154	4.45583	0.2896872	0.24319622	2.5419373	20	9 2.8	18.9
476663	2008	TG <sub>10</sub>	17.4	X	325.19495	310.94669	359.54360	7.48320	0.1810891	0.23455962	2.6039614	20	6 17.6	20.2
476664	2008	TC <sub>17</sub>	18.3	X	344.05774	109.24195	225.54227	3.68314	0.2026734	0.24064138	2.5598971	20	9 8.8	20.3
476665	2008	TH <sub>17</sub>	18.4	X	289.90977	177.20489	129.65610	4.69430	0.2246057	0.23778400	2.5803639	20	8 10.9	21.2
476666	2008	TC <sub>18</sub>	17.7	X	306.89358	32.74960	357.00961	0.97575	0.2013533	0.24064696	2.5598575	20	9 9.7	19.8
476667	2008	TB <sub>31</sub>	18.2	X	347.02542	155.52683	195.55916	4.38832	0.1380703	0.24503324	2.5292167	20	10 9.8	20.5
476668	2008	TC <sub>33</sub>	18.2	X	342.17464	149.11326	180.32110	3.67799	0.1572014	0.23996952	2.5646730	20	8 26.2	20.6
476669	2008	TN <sub>33</sub>	17.1	X	149.12607	98.49815	65.02735	3.97634	0.1302307	0.23398268	2.6082362	20	8 31.1	21.1
476670	2008	TW <sub>35</sub>	17.7	X	289.91572	27.08130	352.30662	5.13817	0.1724797	0.23854220	2.5748933	20	7 29.1	20.7
476671	2008	TR <sub>39</sub>	17.3	X	326.45066	321.64809	24.18821	9.88373	0.1802249	0.23875147	2.5733885	20	8 22.5	19.8
476672	2008	TX <sub>39</sub>	17.1	X	189.43029	74.87505	29.80968	14.88073	0.0242405	0.22985981	2.6393320	20	8 5.2	21.0
476673	2008	TN <sub>44</sub>	17.7	X	242.41547	52.51876	33.03749	17.46622	0.1553899	0.23501422	2.6005984	20	9 2.9	21.7
476674	2008	TX <sub>47</sub>	17.6	X	2.46119	198.97015	109.18333	4.76212	0.2027251	0.23984280	2.5655763	20	9 14.3	19.9
476675	2008	TD <sub>51</sub>	17.8	X	313.64558	346.54373	26.97062	4.96893	0.1642390	0.24199143	2.5503673	20	9 5.9	20.2
476676	2008	TU <sub>54</sub>	16.0	X	144.72771	179.19369	242.78431	1.79904	0.2445158	0.12456075	3.9708356	20	4 26.5	22.5
476677	2008	TV <sub>55</sub>	16.2	X	142.57571	39.95303	25.61383	3.11057	0.2457193	0.12432231	3.9759112	20	4 28.9	22.7
476678	2008	TP <sub>58</sub>	17.6	X	261.83952	16.68687	27.16300	5.01789	0.1922078	0.23390400	2.6088210	20	7 18.8	21.3
476679	2008	TV <sub>63</sub>	15.7	X	146.38838	221.41371	208.18139	3.47697	0.2580903	0.12505857	3.9602909	20	5 7.6	22.2
476680	2008	TB <sub>64</sub>	17.7	X	268.55562	8.03194	37.39090	2.67852	0.1016933	0.23587474	2.5942695	20	8 13.5	20.9
476681	2008	TB <sub>67</sub>	17.4	X	207.98329	296.64742	195.28885	8.01401	0.1092857	0.23945259	2.5683627	20	9 18.9	21.0
476682	2008	TY <sub>73</sub>	17.6	X	280.79774	192.33755	225.50881	4.54370	0.1491290	0.23955636	2.5676210	20	9 8.0	20.5
476683	2008	TR <sub>74</sub>	18.0	X	318.45433	24.25917	19.13251	3.91660	0.1719117	0.24578115	2.5240832	20	10 30.3	20.0
476684	2008	TE <sub>79</sub>	18.1	X	349.14256	115.12380	181.75601	5.13071	0.2701322	0.23978675	2.5659760	20	7 21.2	19.6
476685	2008	TN <sub>80</sub>	17.2	X	58.78997	222.29979	19.40039	9.03782	0.1184662	0.23848862	2.5752789	20	9 1.5	20.6
476686	2008	TW <sub>85</sub>	17.7	X	36.25928	306.54347	12.98532	6.32845	0.1066613	0.25204138	2.4821126	20	11 10.1	20.8
476687	2008	TP <sub>88</sub>	17.7	X	247.42393	170.04816	282.59439	4.53816	0.1064119	0.24270443	2.5453699	20	9 14.5	21.2
476688	2008	TN <sub>95</sub>	17.7	X	341.08352	14.33131	298.34490	6.54629	0.0919664	0.23712944	2.5851102	20	7 29.5	20.6
476689	2008	TL <sub>99</sub>	18.7	X	295.01041	212.63517	179.42986	3.56353	0.2127331	0.24083101	2.5585531	20	8 16.8	21.4
476690	2008	TY <sub>101</sub>	17.6	X	263.98536	17.43646	22.35502	3.15672	0.1309834	0.23409733	2.6073845	20	7 25.2	21.0
476691	2008	TS <sub>102</sub>	18.1	X	295.75123	12.27449	22.20487	8.71253	0.2067107	0.24073322	2.5592460	20	8 28.5	20.8
476692	2008	TO <sub>103</sub>	16.8	X	230.63248	64.65438	29.37796	8.90868	0.0971281	0.23777565	2.5804243	20	9 2.4	20.5
476693	2008	TH <sub>103</sub>	17.6	X	50.69277	209.95911	29.71714	9.51196	0.0424745	0.23242377	2.6198858	20	8 5.6	21.0
476694	2008	TX <sub>104</sub>	18.4	X	290.44165	177.51426	246.21349	1.60666	0.1637488	0.24452314	2.5327330	20	10 3.5	21.0
476695	2008	TF <sub>107</sub>	17.5	X	335.61540	185.90723	113.90208	2.88591	0.1483366	0.23415105	2.6069856	20	6 26.7	20.1
476696	2008	TN <sub>119</sub>	17.3	X	225.99805	177.46002	274.22455	6.74109	0.1620639	0.23679706	2.5875287	20	8 10.3	21.2
476697	2008	TC <sub>121</sub>	17.5	X	304.16314	227.22831	183.61633	10.93297	0.1520593	0.24563626	2.5250757	20	10 14.8	19.9
476698	2008	TG <sub>126</sub>	16.9	X	188.77401	291.08640	218.12810	11.16926	0.0945610	0.24274796	2.5450657	20	9 19.6	20.7
476699	2008	TY <sub>130</sub>	17.9	X	309.04657	145.00915	243.56982	3.42362	0.2255548	0.24238636	2.5475962	20	9 7.5	20.2
476700	2008	TU <sub>131</sub>	17.4	X	302.25889	91.46973	300.76664	3.00360	0.2107624	0.24140610	2.5544882	20	8 31.9	19.7
476701	2008	TX <sub>131</sub>	17.2	X	321.99467	160.55763	265.79369	3.54570	0.1679300	0.25226084	2.4806728	20	12 15.2	19.4
476702	2008	TC <sub>136</sub>	15.6	X	154.22127	46.48129	12.44674	2.87665	0.2417821	0.12478406	3.9660967	20	4 29.7	22.2
476703	2008	TQ <sub>145</sub>	16.2	X	150.45895	255.78930	168.75932	3.12491	0.2367398	0.12776735	3.9041167	20	5 4.4	22.6
476704	2008	TH <sub>152</sub>	17.1	X	208.21747	289.71336	182.34589	15.26491	0.1153527	0.23808928	2.5781578	20	8 21.9	21.1
476705	2008	TO <sub>152</sub>	18.5	X	282.50809	19.49797	35.35222	7.53697	0.2487271	0.24126504	2.5554837	20	8 27.1	21.5
476706	2008	TT <sub>154</sub>	17.1	X	45.33687	33.36139	251.71971	10.62853	0.1298210	0.24491421	2.5300362	20	10 6.7	20.6
476707	2008	TO <sub>161</sub>	17.6	X	205.35251	115.86924	18.38184	5.53856	0.0768910	0.24154005	2.5535436	20	9 24.8	21.2
476708	2008	TE <sub>165</sub>	18.3	X	291.49412	25.41061	3.73652	4.14782	0.1922080	0.23718809	2.5846841	20	8 11.6	21.0
476709	2008	TG <sub>172</sub>	18.4	X	79.53818	24.01974	37.44229	21.68796	0.0936961	0.36348073	1.9445321	20</		

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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>		
476721	2008	UV <sub>4</sub>	17.6	X	306.82713	51.88499	326.73426	6.80079	0.1825411	0.24093101	2.5578452	20	8 25.2	20.1
476722	2008	UT <sub>6</sub>	18.6	X	310.30861	200.20930	212.02485	2.41422	0.2503888	0.24510357	2.5287329	20	10 20.1	20.1
476723	2008	UG <sub>12</sub>	17.7	X	349.04326	340.68768	320.00077	4.85897	0.1741941	0.23729028	2.5839419	20	7 27.9	20.0
476724	2008	UH <sub>16</sub>	17.6	X	301.27165	198.60504	202.49741	12.67175	0.1733132	0.24379469	2.5377756	20	9 16.9	20.3
476725	2008	UW <sub>19</sub>	16.0	X	134.59438	43.55663	35.97469	7.95389	0.2465604	0.12377513	3.9876202	20	5 8.3	22.5
476726	2008	UW <sub>21</sub>	17.1	X	321.48553	321.92712	26.34825	15.51985	0.1547998	0.23870479	2.5737239	20	8 21.5	20.0
476727	2008	UX <sub>21</sub>	18.2	X	5.55247	301.84758	23.68290	2.24694	0.1407506	0.24467654	2.5316743	20	10 7.2	20.9
476728	2008	UZ <sub>24</sub>	17.9	X	335.76189	44.26944	5.68132	2.63784	0.1945421	0.25557907	2.4591548	20	12 23.6	20.0
476729	2008	UR <sub>29</sub>	17.6	X	331.66768	133.24976	211.31755	7.74113	0.2323579	0.23940196	2.5687248	20	8 20.8	19.6
476730	2008	UR <sub>32</sub>	17.8	X	347.36267	314.12778	51.73645	8.30055	0.1897638	0.24636744	2.5200772	20	11 7.8	19.8
476731	2008	UE <sub>33</sub>	16.0	X	150.31827	291.19715	143.80994	3.27702	0.3114620	0.12433672	3.9756038	20	5 19.1	22.8
476732	2008	UR <sub>34</sub>	17.7	X	250.72837	283.96351	186.58175	4.49018	0.2131255	0.24045067	2.5612505	20	9 28.8	20.9
476733	2008	UF <sub>35</sub>	18.2	X	289.84365	16.59148	25.26954	4.39846	0.2223614	0.24007762	2.5639030	20	8 23.3	20.9
476734	2008	UH <sub>35</sub>	17.8	X	316.05623	333.25994	33.08366	3.14757	0.1402994	0.24051551	2.5607901	20	9 1.1	20.3
476735	2008	UL <sub>35</sub>	17.7	X	260.43054	24.82114	26.98052	7.01076	0.0786386	0.23591741	2.5939567	20	8 16.7	21.2
476736	2008	UR <sub>36</sub>	17.6	X	256.78469	172.09648	260.88783	3.51220	0.1630719	0.23529182	2.5985525	20	8 22.4	21.1
476737	2008	UX <sub>45</sub>	17.2	X	352.45309	252.43553	38.66728	11.87570	0.1859604	0.23499741	2.6007224	20	7 23.9	19.8
476738	2008	UN <sub>46</sub>	17.8	X	287.24202	114.69528	292.04634	2.68717	0.0814827	0.23735519	2.5834708	20	9 13.1	20.9
476739	2008	UP <sub>47</sub>	16.7	X	305.61397	333.07486	40.75187	11.20887	0.1966270	0.23612119	2.5924641	20	8 19.4	19.5
476740	2008	UO <sub>51</sub>	17.2	X	314.56542	116.28147	42.41294	5.90980	0.1858942	0.23500955	2.6006328	20	8 12.6	19.7
476741	2008	UU <sub>52</sub>	16.6	X	58.74568	232.82864	60.62924	4.51104	0.1511316	0.24321504	2.5418062	20	11 11.1	20.0
476742	2008	UB <sub>53</sub>	17.6	X	284.26453	336.06677	50.97195	4.54731	0.0894663	0.23152893	2.6266319	20	8 13.4	20.8
476743	2008	UX <sub>53</sub>	18.3	X	310.77077	202.86637	221.55564	5.50581	0.2106714	0.24548850	2.5260888	20	11 13.9	20.2
476744	2008	UN <sub>54</sub>	16.5	X	38.28149	269.83302	52.16839	3.13672	0.1413805	0.24519171	2.5281269	20	11 21.3	19.7
476745	2008	UO <sub>57</sub>	17.9	X	314.63449	180.24864	186.91325	3.45625	0.2176486	0.23979511	2.5659164	20	8 18.5	20.3
476746	2008	UZ <sub>57</sub>	15.5	X	183.02140	304.16871	83.22930	4.10475	0.0819076	0.12653389	3.9294473	20	4 16.4	21.4
476747	2008	UB <sub>59</sub>	18.1	X	269.26898	253.20331	155.74207	3.83748	0.1929665	0.23498120	2.6008420	20	8 2.7	21.4
476748	2008	UF <sub>59</sub>	15.3	X	150.42805	232.08545	191.92751	8.30311	0.2703395	0.12384773	3.9860616	20	5 5.6	21.9
476749	2008	UG <sub>60</sub>	17.3	X	253.83559	214.20569	266.06772	4.27604	0.1473254	0.24493260	2.5299095	20	10 25.7	20.5
476750	2008	UJ <sub>61</sub>	18.0	X	311.30802	36.20484	353.89722	3.06611	0.2821514	0.24185397	2.5513336	20	9 9.8	19.5
476751	2008	UY <sub>61</sub>	18.3	X	302.31031	30.70010	27.85427	7.91654	0.3297889	0.24327582	2.5413828	20	9 27.6	20.1
476752	2008	UZ <sub>62</sub>	18.7	X	289.37382	188.99656	234.06349	6.03992	0.2682405	0.24121117	2.5558642	20	9 9.7	21.3
476753	2008	UB <sub>64</sub>	17.4	X	316.92377	282.17414	81.16980	6.24318	0.0585028	0.24073662	2.5592219	20	9 6.6	20.5
476754	2008	UJ <sub>66</sub>	17.8	X	334.36632	107.90476	269.52483	4.57573	0.2043115	0.24419376	2.5350100	20	10 25.3	19.9
476755	2008	UA <sub>71</sub>	16.7	X	75.66315	219.98646	14.13330	9.16863	0.0450124	0.23041227	2.6351114	20	9 1.2	20.2
476756	2008	UR <sub>72</sub>	17.8	X	233.68680	62.38568	14.27891	6.29136	0.2266692	0.22814975	2.6525040	20	7 26.7	22.0
476757	2008	UB <sub>73</sub>	17.6	X	251.32012	81.27722	16.72073	5.99439	0.3217454	0.23548027	2.5971659	20	8 30.6	21.4
476758	2008	UJ <sub>73</sub>	17.2	X	305.97075	9.77475	17.61485	7.59001	0.2908715	0.23939329	2.5687868	20	8 23.5	19.3
476759	2008	UJ <sub>74</sub>	17.4	X	224.09035	161.33530	270.58068	6.53593	0.1515986	0.22578780	2.6709704	20	7 15.4	21.5
476760	2008	UH <sub>76</sub>	17.9	X	352.46600	293.82832	39.97860	8.43080	0.2213278	0.23920863	2.5701087	20	10 4.7	20.0
476761	2008	UV <sub>76</sub>	17.3	X	272.82944	169.62340	239.10875	11.14658	0.2052515	0.23360019	2.6110825	20	8 1.3	20.9
476762	2008	UU <sub>79</sub>	17.9	X	323.11256	126.88739	231.26092	10.33918	0.1556275	0.24013094	2.5635235	20	8 25.3	20.7
476763	2008	UP <sub>90</sub>	16.0	X	311.54685	97.72001	308.29177	27.68575	0.3260804	0.23691582	2.5866640	20	9 7.1	18.7
476764	2008	UJ <sub>99</sub>	15.6	X	171.35545	159.95578	233.99546	2.82550	0.2736689	0.12517880	3.9577545	20	4 14.6	22.3
476765	2008	UT <sub>108</sub>	17.0	X	285.38527	90.77378	325.14740	4.84137	0.1284319	0.23793766	2.5792529	20	9 16.4	20.1
476766	2008	UX <sub>109</sub>	17.5	X	259.90504	99.41740	289.50547	4.70132	0.0844729	0.22919635	2.6444229	20	7 10.6	20.8
476767	2008	UZ <sub>109</sub>	17.3	X	232.18988	183.42867	277.16569	4.78885	0.0343773	0.23873109	2.5735349	20	9 15.2	20.8
476768	2008	UN <sub>111</sub>	17.7	X	285.54947	122.74162	307.74347	3.28407	0.2261025	0.24208044	2.5497421	20	9 22.8	20.3
476769	2008	UJ <sub>112</sub>	18.7	X	333.06153	89.91048	282.54475	2.73551	0.1989364	0.24455155	2.5325368	20	10 14.3	20.8
476770	2008	UN <sub>113</sub>	17.6	X	357.08749	104.84273	239.89951	8.68215	0.0149704	0.24169026	2.5524855	20	10 3.7	21.0
476771	2008	UG <sub>116</sub>	17.6	X	278.64587	171.30377	246.76216	9.03377	0.1879925	0.23794621	2.5791911	20	8 26.3	20.9
476772	2008	UL <sub>118</sub>	17.3	X	337.41864	5.65385	21.44910	9.24811	0.1990414	0.24727659	2.5138964	20	11 16.9	19.6
476773	2008	US <sub>120</sub>	16.9	X	269.76212	120.11254	278.80783	7.61345	0.1026949	0.23183999	2.6242819	20	8 2.4	20.3
476774	2008	UR <sub>123</sub>	17.8	X	311.79625	62.08404	324.98051	3.42091	0.2534696	0.24066822	2.5597068	20	9 8.8	19.5
476775	2008	UT <sub>125</sub>	16.3	X	341.41439	78.93148	252.95341	15.53662	0.2584349	0.23750783	2.5823638	20	8 19.6	18.6
476776	2008	UH <sub>126</sub>	17.1	X	211.72684	187.37664	279.82010	4.77969	0.0821320	0.23015624	2.6370652	20	8 22.8	20.9
476777	2008	UJ <sub>126</sub>	17.1	X	23.35089	353.34305	338.36233	3.49634	0.1400906	0.24410274	2.5356401	20	11 11.9	20.2
476778	2008	UF <sub>128</sub>	16.9	X	7.51886	243.79386	67.43065	13.27847	0.1196878	0.23390185	2.6088370	20	9 23.5	20.1
476779	2008	UQ <sub>128</sub>	17.8	X	323.50881	217.88462	168.04731	4.50726	0.2493249	0.24406820	2.5358793	20	10 14.6	19.4
476780	2008	UC <sub>131</sub>	18.0	X	287.93404	124.83582	317.50984	1.09165	0.1219073	0.24587369	2.5234498	20	11 1.1	20.6
476781	2008	UP <sub>132</sub>	17.4	X	256.12763	234.54011	223.16953	9.33382	0.1407656	0.24077266	2.5589665	20	9 27.4	20.9
476782	2008	UC <sub>133</sub>	18.0	X	312.21428	131.45703	235.49919	1.33778	0.1928174	0.23789330	2.5795735	20	8 16.2	20.5
476783	2008	UK <sub>134</sub>	17.6	X	245.53466	65.30719	38.07362	9.09345	0.1236007	0.24022192	2.5628762	20	9 29.4	21.0
476784	2008	UZ <sub>134</sub>	17.8	X	213.69045	65.80837	218.85611	19.87500	0.0391458	0.36430698	1.9415909	20	—	—
476785	2008	UZ <sub>141</sub>	17.6	X	332.13645	308.05141	52.35750	6.77764	0.1694909	0.24051655	2.5607827	20	9 26.8	20.0
476786	2008	UV <sub>145</sub>	17.4	X	312.91640	307.73026	59.59699	4.44021	0.2431538	0.23824086	2.5770641	20	8 14.1	19.6
476787	2008	UP <sub>146</sub>	17.7	X	326.22838	153.81981	246.36851	3.71737	0.1149863	0.24567075	2.5248394	20	11 10.1	20.2
476788	2008	UB <sub>149</sub>	17.6	X	288.45296	54.05669	13.81646	1.41493	0.1218692	0.24123794	2.5556751	20	10 11.7	20.3
476789	2008	UJ <sub>149</sub>	17.8	X	302.81504	320.44603	88.91328	1.74142	0.1272754	0.24464596	2.531885			

# ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>		
476801	2008	UY <sub>167</sub>	18.3	X	2.03244	143.46054	179.67679	2.69475	0.1773851	0.24171912	2.5522823	20	10 1.2	20.6
476802	2008	UG <sub>168</sub>	17.7	X	244.09488	43.08635	52.96035	10.66232	0.0835168	0.23896490	2.5718559	20	9 25.9	21.2
476803	2008	UJ <sub>169</sub>	18.7	X	325.33813	300.44883	89.18894	2.94469	0.2070477	0.24498562	2.5295445	20	10 26.5	20.7
476804	2008	UY <sub>169</sub>	16.8	X	29.16819	39.27611	261.93486	5.32737	0.1747808	0.24658615	2.5185869	20	10 15.1	19.9
476805	2008	UW <sub>176</sub>	15.8	X	148.11421	90.33128	347.05710	2.29839	0.2539902	0.12568701	3.9470787	20	5 16.5	22.3
476806	2008	UJ <sub>185</sub>	17.5	X	235.55406	7.60310	53.76088	6.78017	0.1672297	0.22668372	2.6639281	20	7 14.1	21.5
476807	2008	UP <sub>188</sub>	16.9	X	351.40469	266.31511	50.86340	16.83580	0.3664574	0.24057918	2.5603383	20	10 4.1	18.5
476808	2008	UJ <sub>190</sub>	18.3	X	303.60537	47.09635	40.64103	3.08082	0.1652516	0.25407528	2.4688485	20	12 8.5	20.3
476809	2008	UK <sub>193</sub>	16.8	X	161.88055	96.69979	56.69043	14.27449	0.1099065	0.23221073	2.6214879	20	9 5.8	21.1
476810	2008	UM <sub>193</sub>	18.3	X	45.44861	272.78859	228.36163	20.10877	0.0597629	0.36981759	1.9222550	20	2 8.8	20.6
476811	2008	UD <sub>196</sub>	17.5	X	15.24564	181.79960	100.55455	5.91567	0.0864220	0.23747924	2.5825711	20	8 15.7	20.5
476812	2008	UN <sub>196</sub>	17.7	X	37.83331	108.49126	197.22631	6.71927	0.1184969	0.24506945	2.5289676	20	10 27.5	20.9
476813	2008	UT <sub>199</sub>	19.2	X	243.43044	224.62173	45.88619	23.12271	0.1116438	0.37003498	1.9215021	20	—	—
476814	2008	UB <sub>206</sub>	16.7	X	255.84289	200.94374	244.64754	12.71806	0.1164763	0.23811349	2.5779830	20	9 10.1	20.4
476815	2008	UD <sub>207</sub>	17.5	X	311.64492	307.12523	44.54654	5.90133	0.0547095	0.23749794	2.5824355	20	8 11.6	20.7
476816	2008	UP <sub>207</sub>	18.0	X	293.71233	21.52452	9.91765	4.35642	0.1026628	0.23790440	2.5794932	20	9 1.8	20.9
476817	2008	UP <sub>209</sub>	18.0	X	262.78401	221.39095	247.19295	2.35100	0.1730082	0.24480258	2.5308052	20	10 19.5	20.8
476818	2008	UV <sub>222</sub>	16.7	X	75.68396	354.78324	277.27143	3.67562	0.0642800	0.24236392	2.5477535	20	10 21.1	20.1
476819	2008	UG <sub>240</sub>	17.7	X	272.92165	176.02204	256.86353	8.92938	0.1793498	0.23906209	2.5711588	20	9 8.7	21.0
476820	2008	UJ <sub>242</sub>	16.6	X	71.68603	220.21519	354.51978	9.18656	0.1195551	0.22328717	2.6908750	20	8 10.8	20.3
476821	2008	UA <sub>243</sub>	17.1	X	240.28715	217.08012	262.06000	15.53848	0.1701255	0.23866711	2.5739948	20	9 25.3	21.1
476822	2008	UG <sub>245</sub>	16.5	X	185.79923	216.77753	258.70193	12.37649	0.2095302	0.22314385	2.6920272	20	7 27.9	21.3
476823	2008	UU <sub>245</sub>	16.8	X	289.58950	17.11381	45.82306	15.45714	0.0746535	0.23925202	2.5678449	20	10 16.9	20.0
476824	2008	UJ <sub>248</sub>	18.0	X	279.70271	335.48042	79.36462	3.72061	0.1333999	0.23555030	2.5966512	20	9 8.3	21.0
476825	2008	UL <sub>254</sub>	16.7	X	332.18430	246.43965	47.34215	13.16124	0.1831908	0.22674491	2.6634488	20	6 4.2	19.4
476826	2008	UO <sub>261</sub>	17.2	X	216.33489	243.92108	220.28583	14.00738	0.2897752	0.22847785	2.6499641	20	8 2.8	22.1
476827	2008	UF <sub>263</sub>	17.4	X	293.90411	90.96974	285.70239	2.13190	0.2422187	0.23313452	2.6145583	20	7 17.5	20.4
476828	2008	UH <sub>272</sub>	17.5	X	229.02914	123.07560	18.98044	4.40382	0.1309949	0.24295576	2.5436142	20	10 25.1	21.0
476829	2008	UB <sub>278</sub>	17.4	X	194.09485	100.23199	37.61253	17.20772	0.2025195	0.23417185	2.6068313	20	9 14.7	21.9
476830	2008	UP <sub>279</sub>	17.8	X	348.43882	263.55762	49.33262	3.28637	0.2172771	0.23806024	2.5783674	20	8 18.6	19.8
476831	2008	US <sub>279</sub>	17.1	X	142.29556	127.46814	41.99059	10.25700	0.0551268	0.23348726	2.6119243	20	9 1.7	21.0
476832	2008	UB <sub>280</sub>	18.7	X	295.98158	338.41554	64.80019	4.33457	0.2933187	0.24020761	2.5629780	20	8 24.5	21.1
476833	2008	UU <sub>281</sub>	16.8	X	116.28853	176.94441	57.82764	15.61675	0.0905434	0.23915621	2.5704842	20	10 27.9	20.7
476834	2008	UP <sub>284</sub>	17.6	X	309.77133	314.02876	73.42154	3.07999	0.1039359	0.24080486	2.5587384	20	9 24.3	20.4
476835	2008	UC <sub>286</sub>	17.7	X	335.78997	167.28579	170.26291	3.57730	0.2200042	0.23990441	2.5651370	20	8 24.0	19.5
476836	2008	UD <sub>295</sub>	18.1	X	339.53702	314.12372	6.65167	2.65791	0.2414735	0.23713622	2.5850610	20	8 6.0	19.9
476837	2008	UD <sub>296</sub>	17.7	X	305.30177	125.10824	298.82992	1.59494	0.1482510	0.24592081	2.5231275	20	11 3.9	20.2
476838	2008	UO <sub>298</sub>	17.4	X	320.33735	358.29864	16.70574	6.72625	0.1810579	0.24030434	2.5622902	20	9 20.5	19.5
476839	2008	UT <sub>300</sub>	17.3	X	307.62209	75.50102	323.42286	4.31698	0.2655542	0.24144099	2.5542420	20	9 15.3	19.3
476840	2008	UB <sub>301</sub>	17.2	X	203.94883	217.25637	253.47532	12.96513	0.0467162	0.23108499	2.6299948	20	8 17.2	21.2
476841	2008	UG <sub>302</sub>	17.6	X	251.39308	103.27026	23.53903	4.09995	0.2369479	0.24105327	2.5569802	20	10 17.8	21.0
476842	2008	UN <sub>304</sub>	18.0	X	344.02319	48.11926	176.70690	4.41853	0.1554920	0.25276462	2.4773756	20	—	—
476843	2008	UO <sub>304</sub>	17.7	X	337.34355	42.40265	345.17801	3.03661	0.1214601	0.24387480	2.5372198	20	11 11.3	20.3
476844	2008	UF <sub>306</sub>	17.0	X	285.48234	166.16166	268.50479	5.84298	0.1696660	0.24329103	2.5412769	20	10 6.8	19.9
476845	2008	UC <sub>308</sub>	16.9	X	324.63247	356.63683	29.83696	15.79530	0.1195061	0.24296380	2.5435582	20	10 18.9	19.3
476846	2008	UG <sub>308</sub>	17.7	X	286.84564	71.74136	304.84653	4.35661	0.2587651	0.23361487	2.6109731	20	7 3.5	20.8
476847	2008	UR <sub>308</sub>	17.1	X	191.04639	277.53584	241.42615	26.00408	0.0964888	0.23897402	2.5717905	20	9 30.0	21.4
476848	2008	UQ <sub>321</sub>	18.1	X	311.92054	146.36731	227.55940	13.02615	0.1948637	0.24085076	2.5584133	20	8 20.7	20.9
476849	2008	UJ <sub>322</sub>	17.9	X	241.83767	91.37121	339.02249	5.21245	0.2270226	0.23246711	2.6195601	20	7 26.2	21.9
476850	2008	UU <sub>325</sub>	18.2	X	275.93973	145.83394	284.04913	4.72449	0.3283211	0.23893777	2.5720507	20	8 18.2	21.6
476851	2008	UN <sub>326</sub>	16.8	X	327.33989	352.54744	0.75330	11.12146	0.2065764	0.24023877	2.5627564	20	9 2.2	18.8
476852	2008	UG <sub>326</sub>	16.7	X	5.79814	79.42430	296.59414	4.26266	0.2535608	0.24406329	2.5359133	20	—	—
476853	2008	UT <sub>326</sub>	16.0	X	263.77412	130.70771	284.52423	20.91751	0.0971021	0.22380881	2.6866923	20	8 10.1	19.9
476854	2008	UV <sub>330</sub>	17.7	X	312.35012	181.93071	211.00749	1.37086	0.1144937	0.24075825	2.5590686	20	10 3.9	20.4
476855	2008	UB <sub>335</sub>	17.8	X	271.26813	182.05974	217.01893	2.89007	0.1175395	0.23544046	2.5974587	20	8 3.5	21.1
476856	2008	UW <sub>336</sub>	16.6	X	229.39240	211.38246	231.77734	21.33846	0.0406896	0.23167553	2.6255237	20	8 10.4	20.7
476857	2008	US <sub>337</sub>	17.4	X	280.08605	138.87127	288.34712	2.03845	0.1587353	0.23988374	2.5652843	20	9 19.8	20.2
476858	2008	UJ <sub>340</sub>	17.4	X	347.30331	55.85338	317.73770	2.45491	0.0614467	0.24216728	2.5491325	20	11 3.5	20.5
476859	2008	UM <sub>341</sub>	17.3	X	311.89008	11.94910	2.34784	5.47466	0.1726370	0.23885265	2.5726617	20	9 1.1	19.6
476860	2008	UW <sub>344</sub>	17.0	X	234.86921	351.91668	109.83560	15.01474	0.2027362	0.22581159	2.6707827	20	9 3.2	21.2
476861	2008	UE <sub>350</sub>	16.8	X	183.99547	56.88807	52.05277	15.48195	0.0495876	0.22692448	2.6620435	20	7 31.9	20.9
476862	2008	UA <sub>352</sub>	16.9	X	327.67639	253.42989	148.62496	12.78478	0.2223521	0.24606351	2.5221519	20	11 25.2	19.2
476863	2008	UY <sub>354</sub>	17.6	X	331.88364	96.49126	260.38582	2.34267	0.1531597	0.23783234	2.5800143	20	9 14.8	20.1
476864	2008	UC <sub>356</sub>	16.9	X	270.25190	223.47167	230.09018	26.65267	0.1824943	0.24056510	2.5604382	20	10 3.4	20.4
476865	2008	UP <sub>361</sub>	17.9	X	60.59140	179.06920	264.16745	17.75035	0.0778715	0.36413194	1.9422130	20	—	—
476866	2008	UK <sub>365</sub>	16.5	X	241.41503	328.15343	116.16992	8.49599	0.1731645	0.23390993	2.6087769	20	8 20.3	20.2
476867	2008	VD <sub>5</sub>	17.3	X	296.16203	313.41139	80.92885	5.06781	0.1888878	0.23852543	2.5750140	20	8 29.9	20.0
476868	2008	VS <sub>8</sub>	17.6	X	333.72280	101.62253	279.87849	5.92124	0.1458434	0.24466387	2.5317617	20	10 26.5	20.2
476869	2008	VU <sub>10</sub>	17.7	X	339.60292	176.78501	185.45086	4.65						

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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>
476881 2008 VJ <sub>43</sub>	17.5	X	140.49232	263.56312	284.35777	9.76798	0.0708581	0.23376086	2.6098859	20	9 13.3	21.5
476882 2008 VN <sub>45</sub>	16.8	X	268.95798	190.56303	221.85324	31.82063	0.1306386	0.23361739	2.6109543	20	8 5.6	21.1
476883 2008 VV <sub>46</sub>	18.1	X	267.41692	211.99246	232.29016	10.88103	0.1574884	0.23880823	2.5729807	20	9 20.6	21.4
476884 2008 VR <sub>50</sub>	17.5	X	320.35792	333.85580	41.09857	3.22079	0.1800405	0.24170941	2.5523507	20	9 20.7	19.6
476885 2008 VF <sub>62</sub>	17.7	X	13.13545	146.59614	182.81668	0.48402	0.0579647	0.24137716	2.5546923	20	10 13.5	20.8
476886 2008 VW <sub>66</sub>	17.4	X	205.07762	220.97000	219.50386	3.40558	0.0953446	0.22393810	2.6856581	20	7 10.7	21.3
476887 2008 VV <sub>71</sub>	17.0	X	314.45170	58.88997	317.13501	3.31795	0.2556064	0.23429843	2.6058923	20	8 26.6	19.1
476888 2008 VT <sub>73</sub>	17.4	X	6.71218	249.98594	74.73707	5.59604	0.1334161	0.23876830	2.5732675	20	10 8.7	20.2
476889 2008 VK <sub>74</sub>	17.7	X	250.19302	221.20752	235.80330	8.02128	0.1269082	0.23773665	2.5807065	20	9 19.2	21.2
476890 2008 VY <sub>77</sub>	16.8	X	12.96634	268.49567	63.22577	15.37702	0.1355499	0.24207839	2.5497565	20	10 31.7	19.8
476891 2008 VJ <sub>78</sub>	17.2	X	293.90778	258.00319	189.20114	4.33552	0.2497522	0.24374141	2.5381454	20	11 4.4	19.2
476892 2008 WU <sub>70</sub>	17.5	X	223.92216	13.12297	56.19720	5.30637	0.0719301	0.22859613	2.6490499	20	7 22.2	21.2
476893 2008 WB <sub>10</sub>	17.4	X	294.60025	278.94319	75.13879	3.04766	0.0772012	0.22704614	2.6610925	20	7 13.3	20.6
476894 2008 WR <sub>12</sub>	16.2	X	339.34912	103.72517	259.14611	9.91054	0.1536776	0.23979010	2.5659521	20	10 6.6	19.0
476895 2008 WT <sub>12</sub>	17.5	X	327.80043	329.33392	65.77374	6.68843	0.1307234	0.24570515	2.5246037	20	11 7.8	19.9
476896 2008 WU <sub>19</sub>	17.2	X	258.30996	16.58159	56.77205	12.39233	0.0479462	0.23547873	2.5971773	20	9 21.2	20.8
476897 2008 WJ <sub>20</sub>	17.5	X	340.01060	282.35767	43.18520	2.52598	0.2078815	0.23506210	2.6002452	20	8 16.3	19.6
476898 2008 WS <sub>21</sub>	17.5	X	297.66734	201.19133	223.84039	5.54956	0.1283423	0.24245152	2.5471398	20	10 22.8	20.1
476899 2008 WD <sub>23</sub>	15.6	X	170.56173	178.42119	227.99555	1.89434	0.2656748	0.12528868	3.9554403	20	4 28.3	22.3
476900 2008 WE <sub>28</sub>	15.8	X	160.25919	354.58541	58.14063	11.84817	0.1433836	0.12340606	3.9955668	20	4 26.6	22.0
476901 2008 WA <sub>30</sub>	17.0	X	264.17967	173.81373	257.12540	12.97009	0.2215296	0.23393936	2.6085581	20	8 15.4	20.8
476902 2008 WQ <sub>30</sub>	17.1	X	322.42471	91.22134	309.51283	2.32053	0.0844076	0.24128398	2.5553500	20	11 2.0	19.9
476903 2008 WS <sub>30</sub>	17.6	X	285.42565	141.24524	287.57352	2.48823	0.2327084	0.23866511	2.5740092	20	9 18.4	20.1
476904 2008 WK <sub>32</sub>	19.2	X	251.57854	139.84972	58.79174	15.45199	0.3788189	0.59747367	1.3961225	20	—	—
476905 2008 WB <sub>33</sub>	18.0	X	240.27404	246.35061	47.65880	22.20665	0.0494482	0.37226985	1.9138041	20	2 6.3	20.8
476906 2008 WK <sub>39</sub>	17.9	X	309.88608	216.90828	195.63756	1.47968	0.1938951	0.24359293	2.5391767	20	10 24.2	20.0
476907 2008 WS <sub>39</sub>	17.6	X	244.85038	358.31767	79.92420	2.84352	0.1724474	0.23200812	2.6230139	20	8 15.7	21.3
476908 2008 WF <sub>40</sub>	17.7	X	222.06077	35.86047	76.27116	4.97035	0.1634638	0.23288705	2.6164101	20	9 6.1	21.7
476909 2008 WU <sub>40</sub>	17.6	X	292.29038	317.67216	71.82916	5.04512	0.1577396	0.23466355	2.6031886	20	8 19.9	20.5
476910 2008 WN <sub>42</sub>	17.3	X	281.67302	104.11972	260.46593	5.14216	0.0389544	0.22418044	2.6837222	20	7 13.5	20.8
476911 2008 WO <sub>44</sub>	17.3	X	291.20503	290.70868	62.39183	5.51797	0.1980971	0.22799680	2.6536902	20	6 16.5	20.6
476912 2008 WV <sub>50</sub>	17.6	X	210.82666	34.34424	63.95141	5.90430	0.1794141	0.22835826	2.6508892	20	8 5.4	21.8
476913 2008 WF <sub>56</sub>	16.9	X	315.20383	276.69834	46.69220	14.07694	0.1497748	0.22724901	2.6595085	20	6 20.8	20.0
476914 2008 WJ <sub>61</sub>	17.9	X	63.87222	68.89566	53.77779	22.15519	0.1127050	0.36917533	1.9244838	20	3 19.9	20.0
476915 2008 WH <sub>63</sub>	16.1	X	295.58038	172.17757	253.39308	29.25683	0.1353228	0.24126180	2.5555066	20	10 11.2	19.6
476916 2008 WY <sub>72</sub>	17.3	X	211.98294	64.46229	44.31291	4.41041	0.1137584	0.22839204	2.6506278	20	8 25.9	21.2
476917 2008 WN <sub>73</sub>	17.5	X	238.18100	5.02073	43.51018	3.02097	0.1287034	0.22282197	2.6946191	20	7 3.7	21.4
476918 2008 WS <sub>73</sub>	16.7	X	324.50459	164.04661	232.08624	5.29282	0.2343548	0.24280349	2.5446776	20	11 1.3	18.4
476919 2008 WK <sub>83</sub>	17.1	X	320.44714	288.73513	121.01328	4.31099	0.2502286	0.24467325	2.5316970	20	11 16.2	18.8
476920 2008 WE <sub>94</sub>	17.2	X	311.48388	283.90603	81.41324	4.52038	0.1823380	0.23494368	2.6011189	20	8 15.8	19.7
476921 2008 WM <sub>96</sub>	17.1	X	344.85454	314.59965	16.30851	9.03071	0.1759642	0.23798359	2.5789210	20	9 8.4	19.4
476922 2008 WN <sub>98</sub>	17.5	X	346.65809	246.14005	171.38202	8.60404	0.1929292	0.25235227	2.4800736	20	—	—
476923 2008 WH <sub>99</sub>	17.1	X	297.14278	331.45087	85.19081	4.76432	0.1246740	0.24145601	2.5541361	20	10 13.2	19.8
476924 2008 WQ <sub>102</sub>	17.5	X	295.25691	227.64503	180.17810	2.07169	0.2056304	0.23981269	2.5657910	20	9 12.0	19.9
476925 2008 WQ <sub>109</sub>	17.8	X	274.55023	10.39403	22.90974	1.56538	0.0882032	0.22932187	2.6434579	20	8 6.2	21.2
476926 2008 WF <sub>113</sub>	18.1	X	295.86798	166.97728	252.02570	3.71138	0.1923511	0.24000029	2.5644538	20	9 30.5	20.6
476927 2008 WM <sub>113</sub>	17.5	X	312.68511	298.89317	76.44474	5.10233	0.1747220	0.23596382	2.5936166	20	9 5.2	20.0
476928 2008 WV <sub>117</sub>	17.7	X	316.10894	305.69347	77.61504	6.33808	0.0876080	0.23681206	2.5874195	20	10 1.6	20.7
476929 2008 WV <sub>122</sub>	17.5	X	310.46202	232.52546	114.01213	3.40063	0.1884076	0.23444571	2.6048008	20	7 12.6	20.0
476930 2008 WP <sub>123</sub>	16.7	X	36.11346	252.38952	58.23442	5.86155	0.0821694	0.23891979	2.5721796	20	10 25.5	20.0
476931 2008 WB <sub>125</sub>	16.4	X	294.16602	263.60120	75.63147	13.80331	0.0584272	0.22371450	2.6874473	20	6 23.5	19.8
476932 2008 WD <sub>126</sub>	17.5	X	296.47438	3.19345	46.34766	2.05042	0.1068815	0.23361586	2.6109657	20	9 30.3	20.3
476933 2008 WQ <sub>126</sub>	17.7	X	260.93867	179.79124	293.36141	2.92210	0.1868533	0.23642892	2.5902141	20	10 18.2	20.8
476934 2008 WB <sub>128</sub>	16.3	X	27.65467	211.99427	92.94155	15.72458	0.0792228	0.22975164	2.6401604	20	10 11.4	20.0
476935 2008 WP <sub>129</sub>	17.1	X	317.46902	272.87040	74.72902	14.94171	0.2384663	0.23306197	2.6151008	20	7 23.6	19.7
476936 2008 WX <sub>129</sub>	16.2	X	233.79726	177.80626	253.33498	21.22833	0.0406739	0.22599510	2.6693367	20	7 30.6	20.3
476937 2008 WP <sub>133</sub>	16.8	X	256.12616	184.71776	273.35277	11.13698	0.1377647	0.23992930	2.5649596	20	9 24.4	20.4
476938 2008 WY <sub>136</sub>	16.7	X	312.24963	353.60714	31.77523	8.49026	0.2036989	0.23802460	2.5786248	20	9 18.1	19.0
476939 2008 WL <sub>138</sub>	16.5	X	276.86894	327.69539	86.21842	10.06328	0.1186646	0.23220189	2.6215545	20	9 7.7	19.9
476940 2008 WK <sub>139</sub>	17.1	X	210.99404	292.18563	134.71513	4.81900	0.2587337	0.21937773	2.7227495	20	6 20.1	21.8
476941 2008 WR <sub>140</sub>	16.9	X	279.63039	17.22655	71.25845	15.93237	0.0992773	0.24077376	2.5589587	20	11 3.5	20.1
476942 2008 WS <sub>140</sub>	17.4	X	343.87684	25.47452	338.03161	3.08301	0.1799287	0.24307913	2.5427536	20	10 23.6	19.7
476943 2008 XC	17.9	X	301.66387	303.60299	83.71007	6.64336	0.2990417	0.23735316	2.5834856	20	8 9.8	20.3
476944 2008 XY <sub>2</sub>	16.9	X	313.27895	162.21236	251.60835	17.10192	0.1528122	0.24134758	2.5549011	20	11 1.2	19.6
476945 2008 XG <sub>3</sub>	16.0	X	245.81863	345.66734	83.40050	22.81530	0.0293878	0.22843581	2.6502891	20	9 3.3	20.1
476946 2008 XH <sub>4</sub>	16.6	X	311.94398	118.97726	277.46490	8.36553	0.1752356	0.24011346	2.5636479	20	9 28.4	19.2
476947 2008 XZ <sub>4</sub>	17.4	X	306.68402	42.18072	358.24764	6.84922	0.2446155	0.24136429	2.5547831	20	9 20.4	19.2
476948 2008 XT <sub>16</sub>	17.8	X	312.34133	162.21502	246.77003	5.61026	0.2353198	0.24203240	2.5500795	20	10 18.4	19.6
476949 2008 XA <sub>17</sub>	17.6	X	288.14266	176.02752	177.17317	2.48354	0.1238104	0.22405597	2.6847162	20	6 24.4	20.9
476950 2008 XA <sub>24</sub>	17.7	X	233.28079	117.52561	320.18278	4.69244	0.1938972	0.22861893	2.6488738	20	7 29.6	21.8
476951 2008 XE <sub>28</sub>	17.2	X	310.05379	8.27153	335.37960	5.13328	0.0143712	0.22514461	2.6760548	20	7 29.9	20.8
476952 2008 XH <sub>34</sub>	17.3	X	311.71012	79.56445	304.53536	3.12317	0.2237032	0.23828661	2.5767342	20	9 6.7	19.6
476953 2008 XO <sub>34</sub>	17.1	X	222.23070	225.97271	269.13990	11.85605						

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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>		
476961	2008	XJ <sub>53</sub>	16.8	X	309.89984	358.03627	34.98514	5.39919	0.2947012	0.23628974	2.5912310	20	9 10.0	18.6
476962	2008	XW <sub>53</sub>	18.0	X	287.98681	226.23827	208.01786	2.31772	0.2787677	0.24012958	2.5635332	20	9 24.4	20.5
476963	2008	XA <sub>56</sub>	16.8	X	312.86299	299.96609	120.01677	6.97649	0.0815767	0.24416947	2.5351781	20	11 17.4	19.7
476964	2008	YK <sub>1</sub>	16.3	X	291.92303	323.47673	92.97440	14.44024	0.1443278	0.23491297	2.6013456	20	10 6.2	19.5
476965	2008	YG <sub>4</sub>	17.1	X	282.16298	143.06914	274.64159	11.72850	0.1469766	0.23073653	2.6326421	20	9 4.1	20.6
476966	2008	YS <sub>4</sub>	17.0	X	251.14560	108.04145	312.78300	5.38812	0.1731837	0.22128806	2.7070570	20	7 29.2	21.0
476967	2008	YL <sub>13</sub>	16.6	X	281.51201	119.43367	294.43888	29.74859	0.3165011	0.23402896	2.6078923	20	7 31.3	20.0
476968	2008	YO <sub>13</sub>	17.1	X	280.91591	312.48358	105.50454	4.29758	0.2327031	0.23157780	2.6262623	20	8 27.9	20.2
476969	2008	YU <sub>13</sub>	16.7	X	262.84957	339.94026	91.79124	4.94891	0.2341366	0.22998623	2.6383647	20	8 20.7	20.2
476970	2008	YG <sub>16</sub>	17.7	X	301.24538	145.30965	277.11740	2.87483	0.2253747	0.23804097	2.5785066	20	10 12.4	19.9
476971	2008	YZ <sub>16</sub>	17.4	X	282.22153	274.38563	111.34788	13.79583	0.2809200	0.22623329	2.6674628	20	7 5.3	20.8
476972	2008	YB <sub>21</sub>	17.2	X	321.43075	112.83794	282.23480	2.69628	0.1916558	0.23511893	2.5998262	20	10 19.3	19.3
476973	2008	YF <sub>21</sub>	16.7	X	297.86549	108.97419	289.92044	10.43769	0.2031935	0.23061617	2.6335579	20	8 28.2	19.8
476974	2008	YS <sub>31</sub>	17.1	X	217.01980	84.14607	303.38924	14.06314	0.1503168	0.22471208	2.6794877	20	9 12.5	21.3
476975	2008	YC <sub>37</sub>	17.1	X	255.20727	93.06556	303.56150	12.02211	0.1787875	0.21865660	2.7287327	20	7 2.1	21.0
476976	2008	YQ <sub>38</sub>	16.2	X	336.69779	130.11626	267.69869	10.60530	0.3012125	0.24203483	2.5500624	20	12 15.7	17.9
476977	2008	YB <sub>49</sub>	17.6	X	268.20938	17.49501	91.00851	4.84661	0.1538832	0.23558525	2.5963944	20	10 31.9	20.6
476978	2008	YT <sub>49</sub>	17.4	X	85.73604	85.41001	71.97033	3.35569	0.0098297	0.20148863	2.8816132	20	5 23.9	21.2
476979	2008	YO <sub>51</sub>	17.4	X	279.05355	336.39370	87.31207	3.61585	0.1998578	0.23111751	2.6297481	20	9 8.0	20.4
476980	2008	YZ <sub>53</sub>	17.7	X	264.90664	5.40362	75.60773	4.89485	0.2076664	0.23022454	2.6365437	20	9 10.2	21.1
476981	2008	YT <sub>54</sub>	17.7	X	306.02656	70.73033	359.28526	3.98101	0.2751085	0.23953663	2.5677619	20	10 31.5	19.4
476982	2008	YE <sub>54</sub>	17.2	X	197.18474	39.55366	31.22442	3.85120	0.0730496	0.20832870	2.8181881	20	6 20.5	21.3
476983	2008	YZ <sub>54</sub>	17.7	X	236.88714	150.32692	342.84057	1.44458	0.1430940	0.20831624	2.6035385	20	10 20.0	21.1
476984	2008	YA <sub>65</sub>	17.1	X	348.98068	234.12376	81.36349	7.23265	0.1778973	0.22193178	2.7018198	20	8 22.8	19.4
476985	2008	YC <sub>73</sub>	16.7	X	300.01211	106.88808	288.23453	14.18698	0.1752509	0.23335057	2.6129442	20	8 28.8	19.9
476986	2008	YE <sub>81</sub>	17.2	X	281.19983	343.16563	87.68043	6.99985	0.2466773	0.23540485	2.5977207	20	9 16.6	20.2
476987	2008	YF <sub>81</sub>	16.0	X	257.74259	126.22139	290.36422	20.91751	0.0732684	0.22417057	2.6838011	20	8 8.9	19.9
476988	2008	YA <sub>93</sub>	17.5	X	242.23127	300.88240	104.58488	9.30213	0.2031334	0.21982569	2.7190493	20	6 25.5	21.7
476989	2008	YH <sub>95</sub>	16.9	X	170.17719	66.05868	108.08719	17.52683	0.1126015	0.22647173	2.6655902	20	10 10.6	21.4
476990	2008	YU <sub>98</sub>	17.5	X	311.96801	252.00649	120.72916	4.04702	0.2544455	0.23057416	2.6338778	20	8 15.8	19.7
476991	2008	YU <sub>102</sub>	16.7	X	111.10257	92.96262	118.78642	11.89129	0.1139248	0.21973308	2.7198132	20	9 22.9	21.0
476992	2008	YA <sub>104</sub>	17.2	X	220.26276	116.42054	302.93671	3.01155	0.0912265	0.21362187	2.7714406	20	6 30.9	21.1
476993	2008	YE <sub>108</sub>	16.8	X	22.41434	279.73035	306.21663	6.49529	0.1161348	0.19964508	2.8993255	20	6 5.8	20.3
476994	2008	YZ <sub>108</sub>	16.8	X	224.52707	313.50964	111.97629	5.91659	0.0541258	0.21376227	2.7702269	20	7 17.9	20.7
476995	2008	YV <sub>109</sub>	17.5	X	312.50996	282.58713	88.38109	5.81171	0.1942357	0.23543487	2.5974998	20	8 26.2	20.0
476996	2008	YW <sub>111</sub>	16.4	X	56.15219	220.78227	86.93805	12.38850	0.1422752	0.24406247	2.5359190	20	11 26.6	20.0
476997	2008	YN <sub>115</sub>	17.5	X	252.51566	357.34428	90.12388	3.33358	0.1790270	0.22986912	2.6392607	20	9 5.7	21.1
476998	2008	YN <sub>122</sub>	17.0	X	205.39710	237.60329	280.06688	13.06508	0.0508275	0.23294420	2.6159822	20	10 20.4	20.9
476999	2008	YL <sub>124</sub>	17.0	X	0.45289	53.73252	295.37229	13.05099	0.0110727	0.23042541	2.6350112	20	10 7.4	20.9
477000	2008	YN <sub>125</sub>	16.7	X	340.52181	259.80629	106.90486	7.04794	0.1841492	0.23393598	2.6085833	20	10 24.2	19.2
477001	2008	YF <sub>127</sub>	16.6	X	317.44805	243.19681	108.66840	14.68530	0.2058218	0.22416979	2.6838073	20	8 2.1	19.2
477002	2008	YT <sub>128</sub>	17.9	X	248.45380	35.09838	13.69539	2.22683	0.1144729	0.22091778	2.7100810	20	7 18.4	21.8
477003	2008	YE <sub>132</sub>	17.4	X	213.48501	327.81110	76.96641	4.20344	0.0443098	0.20953860	2.8073293	20	6 7.7	21.4
477004	2008	YG <sub>133</sub>	16.8	X	239.03345	179.14831	246.57740	10.19720	0.1299558	0.22701516	2.6613346	20	7 17.2	21.0
477005	2008	YO <sub>133</sub>	16.7	X	321.72973	93.25268	283.96919	12.10910	0.1457286	0.23216936	2.6217993	20	9 16.9	19.8
477006	2008	YH <sub>136</sub>	17.4	X	48.76851	305.65792	333.04938	2.34513	0.0312198	0.22663218	2.6643319	20	9 18.3	20.7
477007	2008	YB <sub>140</sub>	17.2	X	275.88467	110.18470	269.82633	5.71458	0.0881994	0.21926357	2.7236945	20	7 18.4	20.8
477008	2008	YB <sub>143</sub>	17.4	X	285.55242	99.08263	302.60696	3.98729	0.2771165	0.23070555	2.6328777	20	8 2.3	20.4
477009	2008	YH <sub>146</sub>	17.4	X	212.01592	334.09334	136.58070	5.62432	0.0683447	0.22122271	2.7075900	20	8 31.1	21.1
477010	2008	YO <sub>146</sub>	17.2	X	306.74162	266.47550	133.23110	2.70431	0.0979839	0.22886337	2.6469873	20	10 4.1	20.2
477011	2008	YJ <sub>150</sub>	17.2	X	266.79254	329.83104	103.75283	5.07048	0.1968425	0.22907588	2.6453500	20	9 3.7	20.6
477012	2008	YP <sub>150</sub>	17.5	X	306.54566	129.64016	257.64879	2.52708	0.1148910	0.22963403	2.6410617	20	9 11.8	20.4
477013	2008	YA <sub>151</sub>	17.6	X	258.88789	183.73266	264.28347	4.48017	0.2767403	0.23244880	2.6196977	20	8 27.3	21.4
477014	2008	YW <sub>154</sub>	16.2	X	331.89393	184.38477	126.14629	15.14493	0.1937316	0.21248087	2.7813533	20	6 30.4	19.0
477015	2008	YV <sub>156</sub>	17.3	X	190.76294	156.65157	287.92333	3.76435	0.0908177	0.21085200	2.7956592	20	6 30.7	21.3
477016	2008	YT <sub>159</sub>	17.2	X	198.82492	284.91708	145.46461	5.00810	0.0424072	0.20860681	2.8156828	20	6 23.6	21.2
477017	2008	YZ <sub>159</sub>	16.8	X	302.85635	77.35631	304.36709	5.24701	0.0360605	0.22253877	2.6969047	20	9 4.4	20.3
477018	2008	YQ <sub>160</sub>	17.3	X	236.30372	341.31181	148.56089	3.21965	0.2558167	0.22729879	2.6591202	20	9 30.7	21.2
477019	2008	YN <sub>161</sub>	17.3	X	226.87021	13.82177	106.03894	14.49291	0.1263813	0.22965815	2.6408768	20	9 30.2	21.4
477020	2008	YC <sub>162</sub>	17.7	X	258.01009	341.38032	112.22377	5.20876	0.1781809	0.23316965	2.6142957	20	9 22.7	21.1
477021	2008	YN <sub>162</sub>	17.3	X	156.40216	116.85617	10.45195	1.65846	0.0363255	0.21465389	2.7625504	20	7 17.6	21.2
477022	2008	YK <sub>164</sub>	17.7	X	286.10510	333.60745	105.93991	2.68113	0.1862314	0.23673190	2.5880035	20	10 15.7	20.4
477023	2008	YD <sub>169</sub>	16.2	X	105.88315	68.21887	123.80907	11.04014	0.1039389	0.21376062	2.7702412	20	8 17.9	20.3
477024	2008	YU <sub>169</sub>	17.8	X	299.21721	87.18515	319.40135	3.26347	0.2267355	0.23531416	2.5983881	20	9 12.9	20.2
477025	2008	YR <sub>170</sub>	17.1	X	304.41146	231.32548	156.71185	2.51247	0.0791133	0.22583303	2.6706137	20	9 14.1	20.3
477026	2008	YU <sub>170</sub>	17.8	X	266.62077	301.67989	150.16731	4.36895	0.1954580	0.23382845	2.6093829	20	9 28.5	20.9
477027	2008	YE <sub>172</sub>	17.1	X	281.02620	31.88588	54.93966	4.19459	0.1741446	0.23472913	2.6027036	20	10 18.2	19.8
477028	2008	YY <sub>172</sub>	17.6	X	287.79220	207.14699	227.62472	1.79440	0.1401714	0.23510554	2.5999249	20	10 16.2	20.5
477029	2009	AP <sub>10</sub>	17.2	X	239.47140	81.24834	316							

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
477041 2009 AD <sub>29</sub>	17.6	X	267.03985	359.95906	85.34526	6.14741	0.1538711	0.23393919	2.6085594	20	9 29.3	20.8
477042 2009 AJ <sub>32</sub>	16.9	X	322.44471	47.51572	303.44103	8.28130	0.0966827	0.22017050	2.7162097	20	8 17.8	20.2
477043 2009 AE <sub>34</sub>	16.9	X	247.13996	341.71625	91.88826	6.51162	0.0439368	0.22614898	2.6681258	20	9 1.4	20.5
477044 2009 AO <sub>36</sub>	17.4	X	303.19131	324.25791	81.16992	5.37273	0.2127292	0.23614411	2.5922963	20	9 26.9	19.9
477045 2009 AT <sub>42</sub>	16.6	X	228.54712	127.07346	307.13470	13.39219	0.1773585	0.22084546	2.7106726	20	7 21.8	20.7
477046 2009 AW <sub>44</sub>	17.1	X	330.02250	52.31818	15.82067	4.07615	0.2522216	0.24355033	2.5394728	20	—	—
477047 2009 AM <sub>45</sub>	17.4	X	268.44016	273.70670	155.55064	3.99339	0.0701739	0.22378041	2.6869196	20	9 17.9	20.9
477048 2009 AS <sub>45</sub>	16.9	X	129.92350	42.36155	138.29612	10.67388	0.0805961	0.21680633	2.7442357	20	8 28.3	21.0
477049 2009 AZ <sub>45</sub>	16.5	X	33.10552	158.03936	122.19923	14.96189	0.0848364	0.22101282	2.7093040	20	9 10.3	20.1
477050 2009 AB <sub>48</sub>	16.9	X	0.52516	311.98943	346.55110	5.74436	0.0653937	0.21262646	2.7800835	20	8 9.8	20.2
477051 2009 BD <sub>2</sub>	17.7	X	283.86436	263.88730	165.44848	14.62219	0.5065607	0.23588445	2.5941983	20	7 29.5	21.5
477052 2009 BU <sub>7</sub>	18.2	X	113.28111	82.70032	303.92746	18.50868	0.0608345	0.35302740	1.9827309	20	—	—
477053 2009 BC <sub>10</sub>	17.1	X	294.24032	4.56462	53.32948	7.45316	0.2947930	0.23636217	2.5907017	20	9 13.8	19.6
477054 2009 BD <sub>10</sub>	17.3	X	190.34723	178.52569	279.15621	4.13247	0.1240140	0.21535445	2.7565559	20	7 15.7	21.6
477055 2009 BU <sub>11</sub>	17.1	X	215.90415	355.55793	147.38545	14.53914	0.1921911	0.22870447	2.6482132	20	10 6.8	21.3
477056 2009 BE <sub>21</sub>	17.5	X	313.23384	252.09480	135.26935	5.28352	0.2534768	0.23478823	2.6022669	20	9 14.5	19.5
477057 2009 BU <sub>21</sub>	17.5	X	232.05683	306.74996	116.57944	3.49243	0.0608775	0.21434049	2.7652426	20	7 18.3	21.4
477058 2009 BM <sub>27</sub>	16.6	X	134.54433	155.59042	317.37386	14.18173	0.0888543	0.20341521	2.8633896	20	6 4.8	21.1
477059 2009 BA <sub>33</sub>	17.5	X	207.83006	189.86262	316.60702	4.49006	0.1584839	0.22702705	2.6612416	20	9 30.0	21.6
477060 2009 BF <sub>33</sub>	17.0	X	144.37092	188.31953	323.45376	3.60949	0.1391198	0.21226043	2.7832787	20	8 8.3	21.5
477061 2009 BL <sub>36</sub>	17.4	X	206.02422	75.16868	3.60765	4.66204	0.1435755	0.21266928	2.7797104	20	7 7.3	21.8
477062 2009 BJ <sub>40</sub>	16.9	X	202.41292	27.72017	124.37495	12.70982	0.1390613	0.22541028	2.6739518	20	10 10.7	21.2
477063 2009 BC <sub>42</sub>	16.9	X	216.33852	344.09508	127.39591	5.68254	0.0656407	0.22075591	2.7114056	20	9 7.4	20.8
477064 2009 BB <sub>43</sub>	17.0	X	213.04520	157.22788	325.23628	5.31326	0.1870684	0.22299608	2.6932163	20	9 3.3	21.2
477065 2009 BE <sub>53</sub>	16.7	X	301.31872	335.45314	117.93288	7.18400	0.0479219	0.21312704	2.7757287	20	7 25.1	20.2
477066 2009 BG <sub>57</sub>	17.2	X	327.27466	86.99470	143.60370	5.16636	0.1572134	0.18815513	3.0161899	20	3 7.9	20.9
477067 2009 BS <sub>58</sub>	17.1	X	251.29452	1.66696	138.78597	13.38175	0.2101949	0.23362138	2.6109246	20	11 12.2	20.7
477068 2009 BS <sub>58</sub>	16.8	X	212.35366	50.49540	91.23777	14.20642	0.1949505	0.23313678	2.6145414	20	10 5.8	21.1
477069 2009 BA <sub>59</sub>	17.5	X	281.11339	294.38135	100.41660	2.58729	0.1141136	0.22498957	2.6772841	20	8 13.5	20.8
477070 2009 BM <sub>63</sub>	16.8	X	31.16870	171.05199	102.78620	4.89441	0.0627820	0.21457053	2.7632658	20	8 22.9	20.3
477071 2009 BO <sub>63</sub>	16.7	X	199.08514	132.31725	321.42656	11.54591	0.1743364	0.21500587	2.7595346	20	7 19.0	21.3
477072 2009 BU <sub>69</sub>	16.7	X	291.27171	316.19838	99.58180	6.81731	0.2634672	0.23396655	2.6083560	20	9 8.8	19.4
477073 2009 BW <sub>73</sub>	16.8	X	134.28312	51.92684	105.82340	5.96975	0.0973660	0.21130090	2.7916983	20	8 3.9	21.0
477074 2009 BV <sub>74</sub>	16.7	X	271.55041	75.87115	5.71263	11.16367	0.2859766	0.23405471	2.6077010	20	9 8.2	19.9
477075 2009 BT <sub>78</sub>	16.5	X	215.29949	154.91146	328.36899	12.49287	0.1378784	0.22456946	2.6806220	20	9 9.3	20.5
477076 2009 BV <sub>78</sub>	16.5	X	175.78279	149.45899	358.23652	8.52193	0.2518254	0.21703955	2.7422695	20	9 1.3	21.3
477077 2009 BU <sub>79</sub>	17.9	X	262.04655	145.17229	331.66724	5.67560	0.2430445	0.23670682	2.5881863	20	10 14.7	21.2
477078 2009 BA <sub>85</sub>	16.7	X	307.56275	89.76667	289.21592	6.16295	0.1069498	0.22402371	2.6849738	20	8 31.0	19.8
477079 2009 BB <sub>89</sub>	17.3	X	196.25728	255.80624	157.84116	2.36891	0.0594756	0.20352834	2.8623284	20	5 29.4	21.6
477080 2009 BD <sub>89</sub>	17.1	X	235.46584	289.36322	137.29727	6.77184	0.0211622	0.21499646	2.7596151	20	8 6.6	20.9
477081 2009 BF <sub>90</sub>	16.8	X	238.06469	277.70451	140.81954	4.76854	0.0632610	0.21430072	2.7655847	20	7 23.9	20.6
477082 2009 BT <sub>91</sub>	17.9	X	257.96499	296.29666	136.72688	4.54475	0.2347558	0.22617683	2.6679067	20	8 14.2	21.6
477083 2009 BZ <sub>97</sub>	17.3	X	302.58264	32.54714	22.15730	3.80901	0.1357524	0.23390071	2.6088455	20	10 14.6	20.0
477084 2009 BO <sub>104</sub>	16.1	X	355.84907	252.43147	323.80523	15.32154	0.1798080	0.18551265	3.0447644	20	3 27.2	19.7
477085 2009 BB <sub>106</sub>	17.1	X	259.54844	301.31811	149.74708	12.15310	0.1431698	0.22675463	2.6633727	20	9 26.1	20.6
477086 2009 BE <sub>106</sub>	16.6	X	150.45530	54.51432	138.01013	10.91515	0.0846349	0.21951041	2.7216523	20	10 7.9	20.8
477087 2009 BS <sub>113</sub>	17.9	X	246.51527	130.60946	308.66753	10.75553	0.2567529	0.22710477	2.6606345	20	8 6.1	22.0
477088 2009 BX <sub>114</sub>	17.2	X	271.54787	346.37019	126.85431	14.85723	0.2152130	0.23648979	2.5897696	20	11 7.4	20.4
477089 2009 BR <sub>119</sub>	16.7	X	219.70915	127.21140	329.64037	11.77359	0.1683438	0.21964868	2.7205099	20	8 11.9	20.8
477090 2009 BN <sub>123</sub>	16.5	X	299.95058	327.50926	314.40292	8.55464	0.0300543	0.19187056	2.9771256	20	4 16.5	20.8
477091 2009 BH <sub>129</sub>	17.1	X	281.01552	48.27053	351.33793	5.43166	0.1227178	0.21949121	2.7218110	20	8 18.7	20.6
477092 2009 BU <sub>134</sub>	16.7	X	311.65909	303.58850	311.81473	8.60698	0.0478621	0.19064572	2.9898633	20	3 26.7	20.9
477093 2009 BW <sub>142</sub>	17.4	X	240.48659	40.67890	24.28171	2.58937	0.1882737	0.21836714	2.7311436	20	7 20.9	21.4
477094 2009 BN <sub>143</sub>	17.4	X	230.56915	308.65067	134.52784	4.80250	0.0928769	0.21842134	2.7306917	20	8 13.4	21.2
477095 2009 BS <sub>146</sub>	16.4	X	27.42327	252.11350	318.69097	9.19200	0.0437902	0.19258390	2.9697694	20	5 16.1	20.5
477096 2009 BE <sub>147</sub>	18.0	X	237.00339	293.13326	188.18699	2.67711	0.1844348	0.22654542	2.6650122	20	9 28.4	21.6
477097 2009 BU <sub>147</sub>	17.4	X	330.20831	123.30309	295.05129	3.38599	0.2878476	0.23970882	2.5665321	20	12 28.0	18.8
477098 2009 BW <sub>147</sub>	17.8	X	249.51561	240.49474	211.38291	1.87888	0.1517375	0.22363567	2.6880789	20	9 8.6	21.3
477099 2009 BJ <sub>148</sub>	16.0	X	46.89594	251.10392	314.45671	10.70499	0.0680320	0.19689237	2.9262861	20	6 11.6	19.9
477100 2009 BZ <sub>148</sub>	18.2	X	271.33091	117.10857	318.91057	5.82734	0.2407775	0.23101864	2.6304983	20	9 2.9	21.5
477101 2009 BJ <sub>153</sub>	17.1	X	217.54201	70.83225	337.82618	1.98304	0.0970728	0.20898533	2.8122819	20	6 13.1	21.2
477102 2009 BP <sub>154</sub>	17.2	X	267.64755	28.63296	356.60393	3.62066	0.1098380	0.21501286	2.7594748	20	7 12.0	20.9
477103 2009 BL <sub>162</sub>	16.7	X	313.26602	236.05796	84.14051	3.13510	0.0469337	0.20437270	2.8544392	20	6 26.7	20.4
477104 2009 BY <sub>164</sub>	16.2	X	331.57199	245.49621	329.70763	25.60386	0.2044979	0.17970643	3.1099995	20	2 17.9	20.0
477105 2009 BL <sub>166</sub>	17.2	X	227.37363	305.24400	127.63815	5.99353	0.1011119	0.21168612	2.7883105	20	7 25.4	21.3
477106 2009 BX <sub>166</sub>	16.5	X	339.87500	48.76558	142.69741	11.06582	0.1689871	0.17659888	3.1463769	20	2 5.5	20.3
477107 2009 BD <sub>172</sub>	16.9	X	34.16600	336.28843	222.22774	1.08178	0.0125415	0.19664588	2.9287310	20	5 9.7	20.9
477108 2009 BA <sub>174</sub>	16.7	X	299.41970	259.64557	126.46439	3.73104	0.1324052	0.22290510	2.6939491	20	8 27.8	19.8
477109 2009 BN <sub>175</sub>	16.7	X	123.81936	110.70078	76.20283	13.07108	0.2053450	0.21088365	2.7953795	20	9 11.6	21.6
477110 2009 BQ <sub>177</sub>	16.6	X	41.53196	236.48404	344.89062	12.08916	0.0519363	0.19549838	2.9401801	20	6 24.0	20.7
477111 2009 BX <sub>177</sub>	16.4	X	6.79159	269.46018	332.71571	15.49763	0.2030756	0.19030940	2.9933848	20	6 1.7	19.8
477112 2009 BB <sub>178</sub>	17.7	X	292.16323	97.57054	339.46705	5.47497	0.2500190	0.23279753	2.6170808	20	10 8.8	20.1
477113 2009 BT <sub>181</sub>	16.9	X	172.25669	156.97922	28.38017	12.77						

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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>
477121 2009 <i>CL</i> <sub>31</sub>	16.4	X	347.62358	126.56754	140.00675	11.82826	0.0644416	0.19606451	2.9345177	20	6 5.9	20.3
477122 2009 <i>CM</i> <sub>33</sub>	17.0	X	246.03723	131.38936	341.78806	15.02637	0.1876278	0.22686730	2.6624908	20	9 24.0	20.8
477123 2009 <i>CU</i> <sub>36</sub>	16.8	X	129.44985	224.50430	319.43978	11.01486	0.1745318	0.21130739	2.7916412	20	9 2.0	21.4
477124 2009 <i>CX</i> <sub>37</sub>	17.2	X	300.32614	212.44734	267.03477	13.05945	0.0941443	0.24502172	2.5292960	20	—	—
477125 2009 <i>CM</i> <sub>44</sub>	16.9	X	222.15890	218.57157	281.72439	6.73954	0.2186531	0.22708968	2.6607523	20	9 28.9	21.1
477126 2009 <i>CD</i> <sub>48</sub>	16.8	X	72.06953	251.18817	357.18626	5.57946	0.0178139	0.21354983	2.7720639	20	9 6.6	20.6
477127 2009 <i>CK</i> <sub>48</sub>	16.7	X	287.77119	65.02901	352.72319	12.83194	0.1864653	0.22505055	2.6768005	20	9 13.6	19.7
477128 2009 <i>CJ</i> <sub>54</sub>	16.3	X	348.13975	73.14874	144.19900	28.04708	0.1346622	0.18573964	3.0422833	20	4 1.7	20.4
477129 2009 <i>CZ</i> <sub>54</sub>	18.4	X	28.80182	120.72846	330.51140	16.90597	0.1156976	0.34470779	2.0145064	20	—	—
477130 2009 <i>CS</i> <sub>57</sub>	16.9	X	135.41111	189.37945	346.77591	9.39244	0.1146071	0.21263509	2.7800083	20	8 29.9	21.1
477131 2009 <i>CH</i> <sub>59</sub>	17.1	X	190.98366	352.67213	150.69252	10.73546	0.1236874	0.21790833	2.7349759	20	9 14.4	21.3
477132 2009 <i>DM</i>	18.1	X	290.41556	95.61184	311.13394	10.29765	0.3015225	0.22886850	2.6469477	20	8 12.3	20.9
477133 2009 <i>DY</i> <sub>2</sub>	17.7	X	268.24201	172.65440	286.13941	12.41601	0.2130009	0.24013495	2.5634950	20	9 29.8	21.1
477134 2009 <i>DU</i> <sub>9</sub>	16.7	X	269.15052	315.69811	158.84827	33.30074	0.2726043	0.23413669	2.6070922	20	10 25.5	20.4
477135 2009 <i>DM</i> <sub>10</sub>	18.2	X	280.72645	282.29970	150.62126	0.66182	0.2375632	0.22933784	2.6433352	20	9 15.1	21.2
477136 2009 <i>DL</i> <sub>14</sub>	16.7	X	247.25229	147.20270	276.13141	3.29644	0.0486625	0.21081038	2.7960272	20	8 12.3	20.5
477137 2009 <i>DM</i> <sub>14</sub>	17.3	X	220.50235	119.03172	317.23761	5.44309	0.0846959	0.20806083	2.8206064	20	7 23.9	21.4
477138 2009 <i>DE</i> <sub>15</sub>	18.1	X	66.91260	94.86247	335.94784	16.13982	0.1155425	0.35079445	1.9911359	20	—	—
477139 2009 <i>DT</i> <sub>16</sub>	17.0	X	224.24924	320.78085	145.86965	17.13674	0.2333937	0.22353872	2.6888560	20	8 22.0	21.2
477140 2009 <i>DA</i> <sub>17</sub>	16.6	X	182.02721	165.18796	343.82250	8.95139	0.2699343	0.21697530	2.7428108	20	9 5.4	21.5
477141 2009 <i>DK</i> <sub>33</sub>	16.5	X	336.93148	237.60913	9.37833	15.97957	0.0697931	0.18401165	3.0612996	20	4 18.4	20.6
477142 2009 <i>DM</i> <sub>36</sub>	18.1	X	310.71736	53.68154	145.11261	25.46877	0.0710783	0.34861881	1.9994114	20	—	—
477143 2009 <i>DH</i> <sub>37</sub>	17.8	X	244.38653	297.29624	159.72919	2.00205	0.0475347	0.22259067	2.6964854	20	9 25.3	21.4
477144 2009 <i>DW</i> <sub>39</sub>	17.2	X	241.06445	80.66084	329.26029	3.26941	0.2075458	0.21404212	2.7678118	20	6 29.5	21.6
477145 2009 <i>DQ</i> <sub>41</sub>	17.6	X	296.88276	101.22894	329.35988	12.16603	0.268427	0.23419523	2.6066578	20	10 5.6	20.3
477146 2009 <i>DJ</i> <sub>52</sub>	16.5	X	88.48835	246.01754	340.80030	13.58016	0.1235404	0.21453959	2.7635315	20	9 11.3	20.5
477147 2009 <i>DL</i> <sub>58</sub>	16.9	X	202.35693	299.93709	153.29844	9.56681	0.1832844	0.21058808	2.7979946	20	7 18.1	21.6
477148 2009 <i>DS</i> <sub>64</sub>	16.9	X	214.81478	318.25268	167.68576	18.68643	0.1572672	0.22226432	2.6991242	20	9 13.3	21.0
477149 2009 <i>DT</i> <sub>76</sub>	16.5	X	181.85840	154.61819	346.66280	8.53777	0.1799597	0.21521807	2.7577204	20	8 30.5	20.9
477150 2009 <i>DE</i> <sub>79</sub>	17.1	X	206.05298	151.01332	348.52444	10.08568	0.2298325	0.22146106	2.7056470	20	9 14.9	21.6
477151 2009 <i>DC</i> <sub>84</sub>	17.0	X	354.22276	243.52327	12.25849	6.55040	0.0859947	0.19250083	2.9706237	20	5 28.4	20.8
477152 2009 <i>DJ</i> <sub>84</sub>	16.5	X	254.47390	278.46685	79.58686	3.04829	0.0786053	0.19538993	2.9412680	20	5 23.9	20.6
477153 2009 <i>DS</i> <sub>88</sub>	18.3	X	112.79097	248.23360	19.08658	7.50722	0.1770271	0.30947252	2.1646515	20	12 14.2	21.8
477154 2009 <i>DA</i> <sub>91</sub>	17.4	X	251.19167	134.64251	287.26474	2.37454	0.1858520	0.21793898	2.7347194	20	7 28.3	21.4
477155 2009 <i>DQ</i> <sub>106</sub>	15.8	X	317.94897	243.94904	0.13667	27.17022	0.0593149	0.17873001	3.1213159	20	3 23.3	19.9
477156 2009 <i>DS</i> <sub>130</sub>	16.0	X	333.52704	62.47063	200.65566	19.46370	0.0853761	0.18206084	3.0831289	20	5 8.7	20.1
477157 2009 <i>DG</i> <sub>132</sub>	17.5	X	311.76041	8.64655	7.14865	6.61137	0.0441460	0.21562668	2.7542354	20	9 11.1	20.9
477158 2009 <i>DH</i> <sub>132</sub>	16.5	X	351.18462	231.90075	15.56013	2.01015	0.1158143	0.18789657	3.0189562	20	5 11.9	19.9
477159 2009 <i>DO</i> <sub>133</sub>	16.8	X	4.88764	48.50575	164.97719	7.18683	0.0911886	0.18400297	3.0613959	20	4 22.4	20.6
477160 2009 <i>DR</i> <sub>133</sub>	16.8	X	235.46977	119.42934	316.61239	2.25118	0.1657514	0.21117742	2.7927865	20	7 31.4	20.8
477161 2009 <i>DV</i> <sub>138</sub>	16.6	X	171.09503	70.42163	26.08891	9.01095	0.0640444	0.19676770	2.9275221	20	6 24.1	21.1
477162 2009 <i>ES</i>	20.6	X	84.41576	311.16278	343.72823	30.33200	0.3293919	0.57266242	1.4361625	20	—	—
477163 2009 <i>ED</i> <sub>9</sub>	16.6	X	291.57944	267.49938	136.77731	22.73643	0.1354437	0.22729139	2.6591779	20	9 12.9	19.9
477164 2009 <i>EW</i> <sub>14</sub>	18.1	X	28.23903	294.03284	165.57974	25.21132	0.2276584	0.34720847	2.0048221	20	—	—
477165 2009 <i>EY</i> <sub>18</sub>	17.2	X	182.26954	147.55523	341.99892	9.90046	0.0561246	0.21475753	2.7616615	20	8 21.5	21.1
477166 2009 <i>EX</i> <sub>19</sub>	17.1	X	255.00668	81.33519	331.98413	7.31900	0.1229794	0.21666748	2.7454080	20	7 31.9	20.8
477167 2009 <i>ED</i> <sub>24</sub>	16.7	X	295.32952	257.79652	5.54178	9.91546	0.0877070	0.17911718	3.1168164	20	3 16.5	21.0
477168 2009 <i>EM</i> <sub>28</sub>	16.1	X	350.62121	60.84462	188.43875	9.32312	0.1496930	0.18190819	3.0848535	20	5 14.3	19.6
477169 2009 <i>EF</i> <sub>29</sub>	16.7	X	226.18231	81.37679	3.09355	7.33053	0.2035834	0.21293699	2.7773800	20	7 31.1	21.1
477170 2009 <i>FL</i> <sub>2</sub>	17.2	X	215.98238	273.27669	199.68880	14.73772	0.3186400	0.22241914	2.6978716	20	8 11.8	22.2
477171 2009 <i>FR</i> <sub>9</sub>	17.3	X	317.47303	345.69920	12.18004	5.96644	0.0536906	0.21228615	2.7830538	20	8 25.8	20.8
477172 2009 <i>FJ</i> <sub>15</sub>	16.6	X	330.77130	24.43023	316.86414	5.58299	0.0232932	0.21593559	2.7516080	20	8 21.8	20.1
477173 2009 <i>FR</i> <sub>27</sub>	16.9	X	89.71784	1.71182	143.78760	7.20210	0.0840491	0.19086252	2.9875989	20	5 26.4	21.1
477174 2009 <i>FD</i> <sub>28</sub>	15.3	X	352.03738	202.64030	73.35641	11.90297	0.0529744	0.19690506	2.9261604	20	6 23.2	19.0
477175 2009 <i>FZ</i> <sub>31</sub>	15.7	X	271.88693	52.52032	283.74456	16.49185	0.1990493	0.17591907	3.1544775	20	4 25.9	20.7
477176 2009 <i>FX</i> <sub>34</sub>	16.5	X	266.28927	55.11926	28.42367	13.77666	0.0812846	0.21775213	2.7362836	20	10 3.9	20.1
477177 2009 <i>FJ</i> <sub>49</sub>	15.8	X	89.32501	29.87933	158.42429	19.48392	0.1032266	0.19805990	2.9147748	20	7 20.7	20.2
477178 2009 <i>FW</i> <sub>53</sub>	17.0	X	278.24422	348.90268	76.11245	5.95644	0.0926945	0.21553228	2.7550395	20	9 24.4	20.5
477179 2009 <i>FN</i> <sub>55</sub>	16.7	X	248.83968	46.46712	46.43492	9.76049	0.0828789	0.21584861	2.7523471	20	9 23.7	20.5
477180 2009 <i>FE</i> <sub>58</sub>	17.1	X	171.29415	320.52968	230.45572	3.48463	0.1255533	0.21682584	2.7440711	20	10 21.4	21.3
477181 2009 <i>FT</i> <sub>58</sub>	16.8	X	80.66522	352.16065	186.84823	9.41541	0.0498976	0.19429443	2.9523135	20	6 20.5	21.0
477182 2009 <i>FR</i> <sub>61</sub>	17.2	X	357.61379	41.32251	164.71971	4.59298	0.1089449	0.17873069	3.1213080	20	3 30.6	21.0
477183 2009 <i>FH</i> <sub>65</sub>	16.4	X	299.64964	311.00763	358.36382	9.60149	0.0988304	0.19023620	2.9941527	20	5 12.9	20.5
477184 2009 <i>FB</i> <sub>68</sub>	16.6	X	328.13935	233.89353	4.98788	5.98211	0.0720034	0.17651415	3.1473837	20	3 30.4	20.8
477185 2009 <i>FJ</i> <sub>69</sub>	16.5	X	303.69879	225.39368	27.69096	16.05041	0.1385757	0.17480263	3.1678948	20	3 13.4	21.0
477186 2009 <i>FT</i> <sub>69</sub>	18.8	X	140.69169	175.94674	91.24840	3.45690	0.0896322	0.31322696	2.1473193	20	—	—
477187 2009 <i>FS</i> <sub>73</sub>	16.8	X	205.06758	327.38978	203.26357	15.56001	0.2106077	0.22330091	2.6907647	20	10 24.5	21.1
477188 2009 <i>FK</i> <sub>78</sub>	15.8	X	83.51792	84.47040	68.06781	18.24382	0.0503766	0.19006347	2.9959664	20	5 21.9	19.8
477189 2009 <i>GJ</i>	16.1	X	282.10905	33.14460	291.02050	15.09086	0.1240526	0.17753031	3.1353621	20	5 4.0	20.8
477190 2009 <i>HR</i> <sub>6</sub>	16.5	X	106.46385	344.16961	166.63835	10.42094	0.0688994	0.18962091	3.0006262	20	6 19.6	21.0
477191 2009 <i>HS</i> <sub>7</sub>	16.5	X	354.88748	102.51925	132.88368	6.26730	0.0826519	0.18124078	3.0924221	20	5 6.3</	

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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>
477201 2009 <i>HH</i> <sub>67</sub>	16.3	X	10.57358	341.26532	219.76358	15.33648	0.1839082	0.17904761	3.1176237	20	4 12.4	19.6
477202 2009 <i>HX</i> <sub>70</sub>	16.6	X	316.12069	54.28523	214.36504	18.42714	0.1958679	0.17624936	3.1505353	20	4 1.2	20.6
477203 2009 <i>HQ</i> <sub>71</sub>	16.3	X	47.71283	128.43297	47.43181	12.49533	0.0648953	0.18051553	3.1006994	20	5 4.8	20.3
477204 2009 <i>HG</i> <sub>85</sub>	15.8	X	307.41703	239.50367	66.15177	20.47261	0.2057965	0.18178167	3.0862847	20	5 10.5	19.9
477205 2009 <i>HE</i> <sub>86</sub>	16.8	X	164.46903	86.08559	60.26054	9.62432	0.1124649	0.20511069	2.8475882	20	8 24.7	21.4
477206 2009 <i>HR</i> <sub>97</sub>	15.4	X	338.93161	195.24402	71.66890	17.01310	0.1933978	0.18092957	3.0959672	20	5 14.3	18.8
477207 2009 <i>HN</i> <sub>98</sub>	16.8	X	331.09289	135.10236	91.46987	14.87600	0.2246386	0.17199971	3.2022181	20	3 7.2	20.9
477208 2009 <i>HK</i> <sub>105</sub>	16.3	X	313.17125	203.80242	113.80342	5.94258	0.1807965	0.18294018	3.0732412	20	6 5.6	20.0
477209 2009 <i>JN</i>	18.0	X	111.49932	52.85403	224.76402	7.02359	0.2099602	0.30219916	2.1992464	20	12 25.2	21.7
477210 2009 <i>JL</i> <sub>7</sub>	16.3	X	282.80447	261.51719	67.95218	1.60060	0.2351566	0.17684613	3.1434436	20	4 30.6	20.9
477211 2009 <i>JN</i> <sub>8</sub>	15.6	X	267.98311	258.86905	87.08752	14.24807	0.2860442	0.17636756	3.1491275	20	5 3.8	20.7
477212 2009 <i>JJ</i> <sub>16</sub>	15.9	X	354.74325	353.63000	233.43586	16.23660	0.1416165	0.17732315	3.1378036	20	4 18.1	19.7
477213 2009 <i>JT</i> <sub>16</sub>	16.2	X	350.94233	19.65670	229.03991	11.37109	0.1621407	0.18024179	3.1038380	20	5 11.8	19.4
477214 2009 <i>JF</i> <sub>18</sub>	16.2	X	294.19135	206.67193	97.88647	19.88087	0.0774476	0.17906242	3.1174518	20	5 13.5	20.8
477215 2009 <i>KY</i> <sub>6</sub>	16.3	X	296.33436	131.63441	178.41982	12.11884	0.1405918	0.17867378	3.1219707	20	5 9.1	20.7
477216 2009 <i>KL</i> <sub>9</sub>	18.8	X	114.11156	234.61975	84.77771	2.86368	0.2038320	0.31139206	2.1557465	20	—	—
477217 2009 <i>KG</i> <sub>14</sub>	16.5	X	317.86769	150.77606	155.97729	14.39667	0.1345458	0.18234099	3.0799701	20	6 6.7	20.6
477218 2009 <i>KG</i> <sub>16</sub>	16.9	X	342.55680	175.59305	111.99925	7.59514	0.0846137	0.18526477	3.0474797	20	6 23.5	20.6
477219 2009 <i>KC</i> <sub>17</sub>	18.6	X	141.71832	135.43601	149.77346	3.16593	0.1029744	0.31330520	2.1469618	20	—	—
477220 2009 <i>LK</i>	15.5	X	174.76670	204.18487	228.70732	5.64235	0.0667732	0.16935427	3.2354792	20	5 29.5	20.4
477221 2009 <i>LY</i>	15.7	X	334.21849	78.19668	151.19643	25.23126	0.3349243	0.17060122	3.2196942	20	2 21.1	19.0
477222 2009 <i>PL</i> <sub>11</sub>	17.6	X	338.70255	101.06788	236.37787	1.29572	0.2357667	0.27062449	2.3671438	20	9 9.9	18.7
477223 2009 <i>PS</i> <sub>11</sub>	18.1	X	22.36967	227.28410	151.82326	5.86733	0.2030309	0.28629957	2.2799339	20	—	—
477224 2009 <i>PK</i> <sub>15</sub>	17.7	X	2.27016	241.26605	151.85927	6.09878	0.2430899	0.28405181	2.2919458	20	—	—
477225 2009 <i>PY</i> <sub>15</sub>	17.9	X	52.39830	317.32874	344.76289	6.59179	0.1324447	0.27802325	2.3249591	20	11 16.5	21.1
477226 2009 <i>PB</i> <sub>21</sub>	18.4	X	66.51649	17.34569	290.84148	1.48128	0.2270316	0.28699237	2.2762632	20	12 23.4	21.9
477227 2009 <i>QB</i> <sub>12</sub>	18.3	X	74.98975	325.32968	10.75092	1.37086	0.2705062	0.29340798	2.2429595	20	—	—
477228 2009 <i>QG</i> <sub>42</sub>	17.7	X	44.79031	234.10998	125.56698	3.30844	0.1772445	0.28961733	2.2624884	20	—	—
477229 2009 <i>RX</i> <sub>3</sub>	18.5	X	346.28658	53.49346	336.06660	5.24638	0.2410117	0.27788400	2.3257357	20	12 31.8	20.5
477230 2009 <i>RW</i> <sub>6</sub>	17.9	X	60.41314	99.00214	233.12014	3.36536	0.2855272	0.28829496	2.2694016	20	—	—
477231 2009 <i>RH</i> <sub>9</sub>	17.8	X	55.34423	344.40667	347.56952	1.85641	0.0748970	0.28269422	2.2992777	20	12 25.4	20.8
477232 2009 <i>RG</i> <sub>12</sub>	18.3	X	29.94162	160.41492	166.69418	2.48201	0.1848206	0.27711778	2.3300208	20	12 1.9	21.1
477233 2009 <i>RT</i> <sub>14</sub>	17.5	X	277.21333	66.58832	11.63407	5.30108	0.1304999	0.26917746	2.3756197	20	10 11.9	19.9
477234 2009 <i>RD</i> <sub>16</sub>	18.7	X	3.69283	221.48367	170.15241	1.88898	0.2169220	0.28095682	2.3087469	20	—	—
477235 2009 <i>RA</i> <sub>20</sub>	18.3	X	61.96245	131.94823	187.32520	21.66908	0.2057974	0.28630111	2.2799257	20	12 29.5	22.3
477236 2009 <i>RU</i> <sub>30</sub>	17.1	X	29.94711	341.33422	2.86403	26.08118	0.2016750	0.28008493	2.3135358	20	12 30.2	20.8
477237 2009 <i>RQ</i> <sub>31</sub>	17.6	X	40.99650	357.45815	343.71558	4.45560	0.1420404	0.28142760	2.3061715	20	12 28.9	20.6
477238 2009 <i>RC</i> <sub>34</sub>	18.5	X	345.48078	188.74833	190.90192	3.42201	0.2409684	0.27346102	2.3507463	20	12 12.7	20.4
477239 2009 <i>RJ</i> <sub>35</sub>	17.2	X	85.61260	42.29324	199.11585	12.02631	0.0630985	0.26349378	2.4096602	20	9 26.3	20.5
477240 2009 <i>RW</i> <sub>42</sub>	18.2	X	48.83410	98.70474	329.05985	5.99822	0.0669585	0.30252158	2.1976835	20	—	—
477241 2009 <i>RW</i> <sub>46</sub>	18.6	X	349.61826	107.84558	283.47124	1.02873	0.2011357	0.27762670	2.3271724	20	—	—
477242 2009 <i>RD</i> <sub>48</sub>	18.2	X	36.01925	121.95458	196.59910	3.73878	0.2543280	0.27780908	2.3261538	20	12 7.9	21.2
477243 2009 <i>RS</i> <sub>48</sub>	18.7	X	49.57673	107.88187	203.94100	1.86975	0.2225784	0.27914751	2.3187124	20	12 9.9	21.9
477244 2009 <i>RK</i> <sub>54</sub>	18.0	X	102.55905	257.05832	37.78089	6.34652	0.2100561	0.28692524	2.2766182	20	—	—
477245 2009 <i>RF</i> <sub>65</sub>	17.5	X	189.68570	186.89026	40.38349	4.47982	0.0780440	0.28647279	2.2790147	20	—	—
477246 2009 <i>RL</i> <sub>70</sub>	18.4	X	58.34700	122.70049	187.68042	3.15465	0.1673911	0.28026857	2.3125251	20	12 11.4	21.6
477247 2009 <i>RS</i> <sub>70</sub>	18.2	X	74.68119	109.63080	179.87213	5.41669	0.2267065	0.28139504	2.3063493	20	12 7.3	21.8
477248 2009 <i>SV</i>	19.8	X	141.47390	4.65106	185.40142	24.93595	0.2783777	0.54977600	1.4757480	20	11 2.9	21.6
477249 2009 <i>SM</i> <sub>11</sub>	16.8	X	230.38457	249.19750	207.08824	6.73467	0.1285630	0.17357734	3.1827855	20	8 19.2	21.6
477250 2009 <i>SS</i> <sub>11</sub>	18.3	X	59.75547	338.04057	340.88740	5.42004	0.2018082	0.28225557	2.3016593	20	12 27.8	21.7
477251 2009 <i>SR</i> <sub>27</sub>	17.8	X	64.54312	79.59110	186.77074	23.05001	0.2515937	0.27425724	2.3461943	20	11 2.0	21.5
477252 2009 <i>SM</i> <sub>30</sub>	18.3	X	28.88859	127.33889	178.76193	8.54849	0.2397763	0.27350877	2.3504727	20	11 11.3	21.2
477253 2009 <i>SV</i> <sub>36</sub>	17.9	X	34.37876	5.00350	322.16199	2.27354	0.1690735	0.27679063	2.3318563	20	12 4.4	20.9
477254 2009 <i>SS</i> <sub>48</sub>	18.2	X	316.85714	63.98799	0.75447	7.28037	0.2343036	0.27305228	2.3530916	20	12 13.3	19.8
477255 2009 <i>SX</i> <sub>58</sub>	18.0	X	233.34175	184.77285	345.36021	6.50607	0.0538438	0.28186595	2.3037798	20	12 29.7	20.7
477256 2009 <i>SB</i> <sub>61</sub>	18.2	X	29.16940	17.42302	286.72988	3.29343	0.2074734	0.27140096	2.3626268	20	10 30.9	20.9
477257 2009 <i>SM</i> <sub>61</sub>	16.7	X	176.25169	352.23890	207.65649	22.97790	0.1604973	0.27636220	2.3342657	20	11 14.6	20.4
477258 2009 <i>SB</i> <sub>65</sub>	17.6	X	354.89371	262.23946	173.34979	7.15814	0.1972360	0.29052762	2.2577599	20	—	—
477259 2009 <i>SV</i> <sub>65</sub>	18.1	X	7.18520	258.82067	172.89670	6.23304	0.0639621	0.29088202	2.2559257	20	—	—
477260 2009 <i>SH</i> <sub>74</sub>	17.9	X	267.95661	58.64701	106.35181	4.12309	0.0989117	0.28834270	2.2691511	20	—	—
477261 2009 <i>SO</i> <sub>74</sub>	17.4	X	62.81320	249.82763	41.68582	10.48090	0.1326282	0.27421744	2.3464213	20	11 15.5	20.6
477262 2009 <i>SA</i> <sub>76</sub>	18.4	X	3.01659	257.90066	135.01466	5.11401	0.1309906	0.28030164	2.3123432	20	—	—
477263 2009 <i>SH</i> <sub>77</sub>	17.7	X	328.19022	313.68513	107.60418	5.01630	0.1138762	0.27702880	2.3305196	20	12 25.4	20.0
477264 2009 <i>SA</i> <sub>79</sub>	17.5	X	81.15007	320.79761	289.26266	4.60115	0.1064966	0.27029100	2.3690906	20	10 7.7	20.9
477265 2009 <i>SW</i> <sub>90</sub>	18.4	X	16.20531	188.05388	229.86924	4.43991	0.1293354	0.29208686	2.2497177	20	—	—
477266 2009 <i>SR</i> <sub>92</sub>	18.0	X	11.23690	347.28603	22.21209	3.37911	0.1958000	0.27578300	2.3375328	20	—	—
477267 2009 <i>SR</i> <sub>100</sub>	17.6	X	276.00854	317.03208	128.69259	2.89334	0.1823566	0.26858755	2.3790969	20	10 14.9	19.9
477268 2009 <i>SG</i> <sub>102</sub>	18.2	X	37.64643	195.91698	186.38944	2.23607	0.1879402	0.28897134	2.2658589	20	—	—
477269 2009 <i>SH</i> <sub>102</sub>	18.0	X	32.27083	156.70075	196.67063	7.01251	0.1682016	0.28267904	2.2993600	20	—	—
477270 2009 <i>SF</i> <sub>107</sub>	17.6	X	305.82213	205.57598	214.67280	4.95123	0.1483699	0.27123589	2.3635853	20	11 8.7	19.4
477271 2009 <i>SR</i> <sub>109</sub>	17.7	X	331.51596	15.77989	19.00932	7.11143	0.1363800	0.27479704	2.3431208	20	11 21.2	19.8
477272 2009 <i>SJ</i> <sub>110</sub>	17.8	X	354.50107	325.66761	36.19007	5.33957	0.2452298</					



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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>
477281 2009 SK <sub>135</sub>	18.4	X	55.23608	91.37510	234.89535	2.14947	0.2323988	0.28272705	2.2990997	20	—	—
477282 2009 SX <sub>140</sub>	17.9	X	10.64377	144.11566	246.03675	3.22995	0.2272605	0.28288683	2.2982339	20	—	—
477283 2009 SV <sub>144</sub>	17.0	X	331.35782	42.89000	10.58073	6.47284	0.0629190	0.28179013	2.3041930	20	12 15.9	19.6
477284 2009 SW <sub>151</sub>	18.4	X	307.18131	202.18269	223.65256	0.87639	0.1684183	0.27448224	2.3449120	20	11 20.7	20.0
477285 2009 SZ <sub>151</sub>	18.1	X	57.79186	353.73739	305.97200	1.20034	0.1870544	0.27910671	2.3189383	20	11 28.7	21.2
477286 2009 SL <sub>156</sub>	17.7	X	334.71463	56.76684	20.74430	5.40876	0.2304357	0.28138032	2.3064298	20	—	—
477287 2009 SA <sub>157</sub>	18.6	X	348.55265	262.11093	150.28429	2.30669	0.1864071	0.28122400	2.3072844	20	—	—
477288 2009 ST <sub>157</sub>	17.6	X	332.88839	2.19161	11.64897	10.09261	0.1234701	0.26898383	2.3767597	20	10 20.0	19.7
477289 2009 SD <sub>170</sub>	17.8	X	278.20551	36.76307	27.54898	3.60362	0.1830367	0.26303847	2.4124401	20	9 15.2	20.3
477290 2009 SS <sub>170</sub>	18.1	X	327.40180	77.35012	330.45148	2.15340	0.1619538	0.27310338	2.3527981	20	12 5.9	20.1
477291 2009 SG <sub>171</sub>	18.4	X	349.11925	80.32758	338.97530	5.77884	0.1732122	0.28356232	2.2945826	20	—	—
477292 2009 SD <sub>185</sub>	17.7	X	258.55287	136.43694	344.06700	6.44809	0.0551139	0.27557124	2.3387302	20	11 23.0	20.5
477293 2009 SM <sub>187</sub>	18.3	X	350.00311	277.89600	109.72977	3.22755	0.2174755	0.27576459	2.3376369	20	12 30.1	20.3
477294 2009 SF <sub>187</sub>	17.6	X	5.79342	324.90060	48.60242	5.53296	0.2213046	0.27790686	2.3256082	20	—	—
477295 2009 SD <sub>192</sub>	17.5	X	325.76827	109.41513	340.43772	5.65878	0.1243268	0.28512535	2.2861892	20	—	—
477296 2009 SD <sub>199</sub>	17.4	X	281.77930	145.08788	341.85349	5.96943	0.1454069	0.28096690	2.3086917	20	—	—
477297 2009 SA <sub>202</sub>	18.6	X	64.63596	139.24704	159.35165	4.54088	0.2553358	0.28084508	2.3093593	20	12 11.7	22.2
477298 2009 SY <sub>203</sub>	18.2	X	322.36646	165.91223	229.68864	1.74773	0.2038394	0.27025358	2.3693092	20	11 6.1	19.8
477299 2009 SA <sub>204</sub>	17.8	X	48.95949	320.51631	351.90935	2.15985	0.2300540	0.27831005	2.3233615	20	12 10.4	21.0
477300 2009 SG <sub>204</sub>	19.0	X	351.21997	185.22757	240.05139	0.96343	0.1886667	0.28304976	2.2973519	20	—	—
477301 2009 SC <sub>205</sub>	18.1	X	80.49460	107.08371	201.28691	4.91999	0.1803653	0.28364123	2.2941570	20	12 31.8	21.7
477302 2009 ST <sub>209</sub>	18.4	X	48.92721	311.91948	7.26748	5.43846	0.2138326	0.28059270	2.3107439	20	12 17.5	21.7
477303 2009 SY <sub>222</sub>	17.7	X	138.01640	238.98839	322.67092	4.90723	0.0751441	0.27157891	2.3615946	20	10 7.0	21.1
477304 2009 SM <sub>225</sub>	17.9	X	94.49234	261.29308	320.99847	4.00430	0.1391579	0.26764845	2.3846587	20	9 20.4	21.3
477305 2009 SJ <sub>253</sub>	18.2	X	97.39952	270.14117	10.93571	4.60365	0.2267164	0.28393392	2.2925802	20	12 15.5	22.1
477306 2009 SD <sub>257</sub>	18.2	X	62.50960	70.05397	223.87094	2.14059	0.2586394	0.28203045	2.3028839	20	12 4.3	21.8
477307 2009 SS <sub>275</sub>	18.2	X	354.52352	246.32660	170.01090	4.94536	0.2002677	0.28344004	2.2952425	20	—	—
477308 2009 SZ <sub>287</sub>	18.1	X	328.82678	183.65133	270.96540	3.45237	0.0976310	0.28629675	2.2799489	20	—	—
477309 2009 SB <sub>289</sub>	18.9	X	324.14174	341.58119	69.26955	3.23996	0.2080106	0.27350815	2.3504763	20	12 7.9	20.2
477310 2009 SZ <sub>294</sub>	18.4	X	289.06491	169.22971	250.03938	0.74324	0.1739206	0.26910283	2.3760589	20	9 28.8	20.3
477311 2009 SR <sub>302</sub>	18.2	X	49.96542	63.68086	244.38635	1.63378	0.1976652	0.27717666	2.3296908	20	12 2.1	21.4
477312 2009 SW <sub>306</sub>	18.3	X	352.60185	217.74633	155.19142	4.34927	0.2227479	0.27514829	2.3411263	20	12 14.3	20.5
477313 2009 SG <sub>313</sub>	19.0	X	346.74833	307.76525	127.61285	3.01262	0.1701111	0.28484595	2.2876839	20	—	—
477314 2009 SX <sub>327</sub>	17.8	X	40.16012	216.95544	105.42382	3.02479	0.2339108	0.27840605	2.3228274	20	12 14.7	21.0
477315 2009 SO <sub>333</sub>	18.0	X	278.05455	82.57867	32.64941	6.96100	0.1265297	0.28305984	2.2972973	20	12 12.3	20.2
477316 2009 SE <sub>342</sub>	18.2	X	22.28532	48.61631	314.20173	1.32389	0.0353643	0.27918458	2.3185071	20	12 16.6	21.1
477317 2009 SO <sub>342</sub>	18.4	X	40.78960	136.65291	184.59940	6.74199	0.2066476	0.28089296	2.3090968	20	12 11.4	21.6
477318 2009 SR <sub>345</sub>	18.3	X	0.90256	332.63183	55.97487	5.05309	0.2551493	0.28042590	2.3116601	20	—	—
477319 2009 SQ <sub>347</sub>	18.7	X	351.18773	6.03631	61.22510	6.31891	0.0706974	0.28591698	2.2819673	20	—	—
477320 2009 SF <sub>349</sub>	17.8	X	74.28850	260.02171	34.05765	10.31695	0.2097138	0.27925620	2.3181107	20	12 8.8	21.5
477321 2009 SZ <sub>349</sub>	17.7	X	292.06105	284.49600	215.99954	8.28955	0.1122754	0.28811137	2.2703655	20	—	—
477322 2009 SV <sub>357</sub>	18.5	X	6.18860	209.61256	201.47181	2.06931	0.0864367	0.28555057	2.2839190	20	—	—
477323 2009 TE <sub>1</sub>	17.8	X	21.15037	282.66470	63.45971	4.98385	0.2471619	0.27787144	2.3258058	20	12 25.0	20.7
477324 2009 TF <sub>2</sub>	17.7	X	264.53074	154.63475	345.89288	2.49743	0.1721967	0.28074790	2.3098922	20	12 18.7	19.6
477325 2009 TK <sub>2</sub>	18.3	X	0.02387	162.18273	196.24109	3.67241	0.2248312	0.27513603	2.3411958	20	12 6.8	20.6
477326 2009 TQ <sub>7</sub>	17.8	X	43.97617	111.36179	214.94612	11.19336	0.3007570	0.28034178	2.3121225	20	12 29.9	21.5
477327 2009 TB <sub>8</sub>	18.3	X	358.08944	227.38086	277.45188	10.31788	0.7090321	0.28840274	2.2688361	20	—	—
477328 2009 TR <sub>19</sub>	18.4	X	28.81399	106.04518	195.01355	2.11478	0.1921111	0.26798070	2.3826872	20	10 24.4	21.1
477329 2009 TG <sub>21</sub>	17.7	X	31.82662	282.74579	82.62121	5.99366	0.2487293	0.28341764	2.2953635	20	—	—
477330 2009 TV <sub>21</sub>	18.6	X	54.32309	286.23310	199.17111	21.13051	0.0851353	0.40891820	1.7976774	20	1 25.4	20.4
477331 2009 TW <sub>22</sub>	17.7	X	40.08361	183.12911	149.69599	2.76780	0.2378942	0.27903637	2.3193280	20	12 28.3	20.8
477332 2009 TE <sub>29</sub>	18.1	X	143.89413	28.01587	245.72833	6.03982	0.0884796	0.28982735	2.2613952	20	—	—
477333 2009 TA <sub>33</sub>	17.9	X	297.51899	274.52196	224.50896	7.07605	0.0620156	0.29215945	2.2493451	20	—	—
477334 2009 TE <sub>33</sub>	18.1	X	22.89883	333.31731	350.99347	5.35783	0.2080075	0.27500713	2.3419273	20	11 19.4	20.8
477335 2009 TV <sub>42</sub>	18.8	X	356.07181	328.18751	96.45654	0.58245	0.1889841	0.28436859	2.2902434	20	—	—
477336 2009 TY <sub>43</sub>	18.1	X	351.76160	247.20270	148.21913	5.53949	0.2296384	0.27558891	2.3386302	20	—	—
477337 2009 TU <sub>46</sub>	17.6	X	320.97704	102.17788	308.18771	4.15686	0.1990359	0.27033678	2.3688230	20	11 26.1	19.4
477338 2009 UE <sub>3</sub>	18.0	X	330.98819	5.35154	53.79983	6.65220	0.2196342	0.27724733	2.3292948	20	—	—
477339 2009 UZ <sub>11</sub>	17.7	X	333.25577	55.09305	45.90482	7.25027	0.1430145	0.28124176	2.3071872	20	—	—
477340 2009 UB <sub>13</sub>	18.1	X	37.68522	273.35438	58.08498	6.99628	0.2686791	0.27941571	2.3172284	20	12 27.9	21.4
477341 2009 UJ <sub>16</sub>	17.8	X	25.62338	143.18377	213.96848	5.07329	0.1321331	0.28443589	2.2898821	20	12 29.5	20.6
477342 2009 UK <sub>19</sub>	18.1	X	350.63302	182.48510	212.33570	1.73255	0.1773261	0.27578235	2.3375365	20	—	—
477343 2009 UD <sub>27</sub>	17.8	X	330.19677	184.87146	199.79730	6.08018	0.1415174	0.26784114	2.3835148	20	11 3.9	19.9
477344 2009 UB <sub>33</sub>	18.4	X	326.29313	211.59083	205.13179	0.76821	0.1706431	0.27264747	2.3554203	20	12 18.5	20.1
477345 2009 UC <sub>34</sub>	17.6	X	239.80438	310.96707	220.81241	4.01401	0.0586741	0.27854389	2.3220610	20	—	—
477346 2009 UW <sub>36</sub>	17.5	X	216.77682	312.11802	210.20993	6.14164	0.0657980	0.27241700	2.3567485	20	11 22.0	20.4
477347 2009 UQ <sub>37</sub>	18.1	X	346.34029	339.75930	73.38799	3.07388	0.1695308	0.27722163	2.3294388	20	—	—
477348 2009 UG <sub>39</sub>	17.9	X	4.04002	295.15742	82.99496	1.90753	0.2168147	0.27566699	2.3381886	20	—	—
477349 2009 UV <sub>39</sub>	18.0	X	37.87844	329.68689	39.21842	3.96377	0.2043778	0.28174734	2.3044263	20	—	—
477350 2009 UJ <sub>52</sub>	18.0	X	273.68287	106.58580	17.49996	1.89942	0.1412099	0.27495512	2.3422227	20	12 13.4	20.2
477351 2009 UF <sub>63</sub>	18.3	X	272.23425	50.61443	86.22966	3.63887	0.1250567	0.28066584	2.3103424	20	—	—
477352 2009 UM <sub>68</sub>	17.4	X	342.82717	348.57866	33.02749	8.19373	0.1652338	0.27091847	2.3654311	20	11 25.7	19.6
477353 2009 UR <sub>68</sub>	17.7	X	21.95778	3.22528	7.85015	7.47169	0.1301478	0.28556499	2.2838421	20	—	—
477354 2009 UR <sub>76</sub>	18.0	X	275.87690	103.69446	19.11795	4.72493	0.1348205	0.27683998	2.3315792	20	12 16.9	

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ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
477361 2009 US <sub>93</sub>	18.3	X	328.16046	0.26618	29.09852	2.51603	0.2194903	0.26854513	2.3793474	20	11 10.6	19.7
477362 2009 UT <sub>98</sub>	17.9	X	20.31652	290.19224	62.73586	4.89027	0.0894690	0.27358438	2.3500396	20	12 7.1	20.4
477363 2009 UU <sub>100</sub>	18.3	X	311.28733	350.29547	99.89741	3.12674	0.1738142	0.27530524	2.3402364	20	—	—
477364 2009 UT <sub>101</sub>	18.1	X	336.86562	327.92022	62.00089	7.09427	0.1073618	0.27022204	2.3694936	20	11 22.0	20.4
477365 2009 UT <sub>104</sub>	17.9	X	298.70837	76.54520	59.79496	7.91488	0.2173257	0.28327104	2.2961554	20	—	—
477366 2009 UQ <sub>106</sub>	17.7	X	56.09269	83.76550	261.52297	3.54107	0.1624215	0.28415082	2.2914134	20	—	—
477367 2009 UM <sub>107</sub>	17.9	X	254.50591	15.08734	75.56665	4.21367	0.1699572	0.26011339	2.4304923	20	9 19.1	20.9
477368 2009 UZ <sub>107</sub>	18.4	X	7.36759	324.77386	55.50808	2.25004	0.2010439	0.27701699	2.3305859	20	—	—
477369 2009 UP <sub>113</sub>	17.9	X	280.84648	39.16092	58.65619	2.47759	0.1525047	0.27385014	2.3485190	20	11 15.9	20.1
477370 2009 UM <sub>115</sub>	17.7	X	264.27805	74.37946	28.62927	7.19176	0.0825841	0.27250453	2.3562439	20	11 3.5	20.4
477371 2009 UO <sub>118</sub>	18.4	X	21.18559	261.56128	40.56497	1.91483	0.1824670	0.26832430	2.3806527	20	10 12.5	20.8
477372 2009 UB <sub>127</sub>	17.7	X	31.84414	352.34429	17.36824	6.02126	0.1811303	0.28176303	2.3043408	20	—	—
477373 2009 UO <sub>131</sub>	17.5	X	353.30349	239.55375	195.14946	5.65448	0.1344388	0.28234554	2.3011703	20	—	—
477374 2009 UZ <sub>132</sub>	17.6	X	309.22261	240.68323	203.96257	7.57007	0.1723105	0.27318109	2.3523519	20	12 24.4	19.6
477375 2009 UE <sub>137</sub>	17.8	X	6.46892	35.38967	356.04462	6.14188	0.2532431	0.27823084	2.3238024	20	—	—
477376 2009 UO <sub>141</sub>	17.5	X	324.87571	3.80368	61.44302	6.51154	0.2030395	0.27185004	2.3600242	20	—	—
477377 2009 UM <sub>149</sub>	18.7	X	6.01301	180.87244	167.74250	1.46452	0.2036825	0.27143085	2.3624533	20	11 27.9	20.9
477378 2009 UP <sub>149</sub>	18.3	X	301.62908	130.13803	302.78025	2.03385	0.2025582	0.26785476	2.3834340	20	11 13.6	20.0
477379 2009 VO	17.8	X	8.16090	311.76445	55.06380	23.87832	0.2440657	0.27707190	2.3302780	20	—	—
477380 2009 VF <sub>4</sub>	18.1	X	345.45732	22.87688	0.68078	2.45286	0.1995817	0.27189999	2.3597351	20	12 10.6	20.1
477381 2009 VG <sub>12</sub>	17.4	X	311.99021	61.22182	39.67386	9.57554	0.1863872	0.27773491	2.3265679	20	—	—
477382 2009 VR <sub>18</sub>	18.5	X	324.46543	31.26100	11.41008	2.85387	0.1820212	0.26955307	2.3734124	20	11 20.9	20.2
477383 2009 VJ <sub>19</sub>	17.9	X	354.31319	133.94657	255.94972	6.99999	0.2311547	0.27451914	2.3447019	20	—	—
477384 2009 VY <sub>22</sub>	18.1	X	4.30304	196.31194	171.35894	1.49786	0.1901922	0.27213447	2.3583794	20	12 19.8	20.5
477385 2009 VH <sub>24</sub>	18.4	X	326.51075	124.14661	295.66091	2.00117	0.2135646	0.27136098	2.3628589	20	12 28.1	19.8
477386 2009 VU <sub>25</sub>	18.5	X	75.04672	246.35530	232.30569	24.89714	0.0746482	0.40882154	1.7979607	20	2 18.0	20.8
477387 2009 VV <sub>26</sub>	17.8	X	263.11720	217.18400	249.09101	6.44371	0.1043308	0.26753469	2.3853347	20	11 1.5	20.5
477388 2009 VB <sub>28</sub>	17.8	X	53.29954	122.02586	233.72347	2.38560	0.1847060	0.28401138	2.2921633	20	—	—
477389 2009 VV <sub>28</sub>	17.5	X	354.81521	338.16327	45.95588	10.69852	0.1390513	0.27410792	2.3470463	20	12 19.1	20.0
477390 2009 VQ <sub>32</sub>	18.2	X	22.81376	58.06129	306.60788	3.21419	0.2215621	0.27683617	2.3316006	20	—	—
477391 2009 VO <sub>37</sub>	18.1	X	11.33325	125.03706	228.64284	1.71338	0.2235382	0.27380021	2.3488045	20	12 17.1	20.5
477392 2009 VO <sub>38</sub>	18.4	X	340.69498	73.83825	309.01744	0.89543	0.1930907	0.27027644	2.3691756	20	11 28.1	20.1
477393 2009 VH <sub>43</sub>	18.0	X	0.61877	292.62829	99.65601	2.35933	0.1897640	0.27576549	2.3376318	20	—	—
477394 2009 VG <sub>45</sub>	17.5	X	44.75944	334.52150	10.97284	4.09924	0.2473829	0.27856300	2.3219548	20	—	—
477395 2009 VA <sub>46</sub>	18.8	X	357.23548	12.46946	47.53730	1.12863	0.1724796	0.28375069	2.2935670	20	—	—
477396 2009 VA <sub>49</sub>	18.5	X	335.93050	132.68694	279.46519	0.39171	0.1682581	0.27435951	2.3456112	20	12 31.7	20.5
477397 2009 VF <sub>51</sub>	17.3	X	24.07882	258.07451	102.42126	4.31472	0.2576749	0.27761611	2.3272316	20	—	—
477398 2009 VZ <sub>54</sub>	17.9	X	284.58006	62.15760	33.33487	4.51171	0.1427580	0.26590233	2.3950870	20	11 17.5	20.0
477399 2009 VL <sub>57</sub>	17.1	X	346.46517	140.43275	272.37881	5.36931	0.0798689	0.27559417	2.3386005	20	—	—
477400 2009 VM <sub>58</sub>	18.1	X	6.94244	256.52515	129.33915	3.15371	0.2333842	0.27763538	2.3271239	20	—	—
477401 2009 VC <sub>59</sub>	18.2	X	29.29930	184.84906	202.21959	2.27834	0.1987540	0.28422746	2.2910014	20	—	—
477402 2009 VM <sub>59</sub>	18.0	X	8.91540	252.76508	129.97358	2.92420	0.2013195	0.27799083	2.3251398	20	—	—
477403 2009 VQ <sub>59</sub>	17.5	X	306.02646	18.18698	90.21384	5.03563	0.1385377	0.27805989	2.3247548	20	—	—
477404 2009 VS <sub>61</sub>	19.0	X	345.48274	341.80605	59.38166	2.14338	0.1902091	0.27425131	2.3462281	20	—	—
477405 2009 VM <sub>67</sub>	17.7	X	27.17389	93.10602	256.02916	5.69261	0.1613982	0.27370633	2.3493415	20	12 22.7	20.6
477406 2009 VQ <sub>68</sub>	18.2	X	34.98593	326.74206	22.95286	2.61401	0.2098175	0.27625544	2.3348671	20	—	—
477407 2009 VF <sub>70</sub>	17.9	X	220.17732	122.24115	17.79180	2.33974	0.1592627	0.25970328	2.4330503	20	10 11.5	21.2
477408 2009 VZ <sub>79</sub>	17.4	X	339.67832	273.61176	138.45552	20.90345	0.2555797	0.27366995	2.3495497	20	—	—
477409 2009 VQ <sub>84</sub>	18.0	X	254.96947	73.09451	57.03642	3.51876	0.1258458	0.26658046	2.3910235	20	11 20.1	20.5
477410 2009 VG <sub>86</sub>	17.9	X	221.34198	39.59686	75.67551	6.88066	0.1003964	0.25590079	2.4570932	20	9 21.0	21.3
477411 2009 VQ <sub>93</sub>	18.3	X	345.57289	135.55958	274.28381	0.69195	0.1712299	0.27638851	2.3341176	20	—	—
477412 2009 VO <sub>97</sub>	17.7	X	245.08962	195.13459	277.25587	3.77789	0.1776040	0.26065737	2.4271095	20	9 30.4	20.8
477413 2009 VO <sub>98</sub>	18.2	X	352.77817	355.89692	359.47100	2.38791	0.1862533	0.26552116	2.3973786	20	11 7.5	20.2
477414 2009 VV <sub>108</sub>	17.8	X	54.30725	252.28856	78.46131	6.46187	0.1829415	0.27926357	2.3180699	20	—	—
477415 2009 VK <sub>116</sub>	18.3	X	292.37089	61.66264	49.58913	2.99545	0.1615163	0.26649660	2.3915251	20	12 26.3	20.4
477416 2009 WW <sub>1</sub>	17.8	X	267.69246	2.88476	104.71248	2.19259	0.1453997	0.27160287	2.3614558	20	11 7.7	20.0
477417 2009 WF <sub>15</sub>	17.7	X	245.65353	0.67664	107.59399	5.03786	0.1909525	0.25840083	2.4412192	20	9 28.2	20.9
477418 2009 WE <sub>35</sub>	17.3	X	24.33007	176.71577	194.62588	5.93189	0.2509181	0.27901950	2.3194215	20	—	—
477419 2009 WB <sub>37</sub>	18.3	X	318.82689	53.63157	18.10594	2.72382	0.1724824	0.27166359	2.3611038	20	12 25.5	20.2
477420 2009 WV <sub>38</sub>	17.5	X	15.99902	312.51820	58.83104	7.50302	0.1219089	0.27382564	2.3486591	20	12 31.7	20.3
477421 2009 WY <sub>45</sub>	17.6	X	304.30183	106.19876	279.30728	3.93331	0.1991594	0.25912907	2.4366433	20	8 30.0	19.6
477422 2009 WA <sub>49</sub>	18.1	X	340.95212	325.92068	123.46723	3.13652	0.1701173	0.27966281	2.3158632	20	—	—
477423 2009 WK <sub>50</sub>	18.0	X	353.84405	272.44450	148.10491	5.51114	0.2251657	0.28095995	2.3087298	20	—	—
477424 2009 WX <sub>56</sub>	18.6	X	314.20567	24.53169	95.26023	3.32357	0.1674187	0.28128415	2.3069554	20	—	—
477425 2009 WB <sub>79</sub>	18.4	X	328.11725	21.87481	65.48470	4.07904	0.2035283	0.27958180	2.3163106	20	—	—
477426 2009 WE <sub>80</sub>	17.8	X	82.73693	311.11327	331.07782	4.22317	0.0088995	0.26315412	2.4117332	20	11 9.5	20.9
477427 2009 WL <sub>81</sub>	17.9	X	315.02396	46.34364	19.52637	2.57821	0.1972778	0.26732324	2.3865923	20	12 5.9	19.7
477428 2009 WX <sub>84</sub>	17.7	X	88.82236	308.26700	330.46124	4.67090	0.1213236	0.26893549	2.3770445	20	11 25.2	21.3
477429 2009 WV <sub>96</sub>	18.2	X	359.54785	168.00723	209.62720	2.28474	0.1745425	0.27343447	2.3508985	20	12 23.9	20.6
477430 2009 WF <sub>120</sub>	18.1	X	22.91085	139.88082	203.83271	0.90518	0.2067116	0.27251154	2.3562034	20	12 16.6	21.0
477431 2009 WH <sub>123</sub>	15.8	X	111.04903	13.12363	68.66454	4.43905	0.1535783	0.12600169	3.9405043	20	4 13.9	21.6
477432 2009 WO <sub>125</sub>	17.6	X	252.09567	56.11047	74.06921	4.54165	0.1678213	0.26559036	2.3969622	20	11 9.6	20.2
477433 2009 WS <sub>133</sub>	17.5	X	44.84883	346.98747	6.71325	6.47086	0.1968921	0.28137670	2.3064496	20	—	—
477434 2009 WJ <sub>136</sub>	18.1	X	289.92203	51.64980	48.54622	4.27582	0.1925042	0.27134785	2.3629351	20	12 2.7	19.9
477435 2009 WU <sub>155</sub>	18.4	X</										

ELEMENTS AND OPPOSITION DATES IN 2020

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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>
477441 2009 WP <sub>168</sub>	18.1	X	318.26821	309.05934	135.57232	1.81465	0.1506329	0.27412150	2.3469688	20	—	—
477442 2009 WM <sub>170</sub>	17.7	X	274.71319	158.39076	287.40739	3.61421	0.1143714	0.26296651	2.4128802	20	10 18.6	20.3
477443 2009 WM <sub>171</sub>	18.2	X	43.21612	55.72486	295.01939	2.80955	0.1901810	0.27964090	2.3159842	20	—	—
477444 2009 WT <sub>173</sub>	18.1	X	315.60035	166.88269	291.73059	4.69795	0.1200073	0.27799349	2.3251250	20	—	—
477445 2009 WM <sub>177</sub>	17.1	X	337.00062	141.14649	293.68906	5.58879	0.0801688	0.27758064	2.3274299	20	—	—
477446 2009 WP <sub>180</sub>	15.7	X	124.26133	325.89996	115.88315	4.50329	0.2573675	0.12741877	3.9112338	20	5 5.7	22.0
477447 2009 WQ <sub>185</sub>	18.0	X	270.09988	219.19594	238.61885	5.80314	0.0615199	0.26818495	2.3814773	20	11 7.4	20.5
477448 2009 WJ <sub>196</sub>	17.6	X	59.24317	219.55762	90.96826	6.32964	0.1219210	0.27269098	2.3551697	20	12 5.9	20.8
477449 2009 WV <sub>202</sub>	16.0	X	105.61331	56.80019	26.93060	0.84441	0.1694905	0.12529686	3.9552682	20	4 11.0	21.6
477450 2009 WS <sub>203</sub>	17.7	X	0.75078	297.67811	89.07974	3.17304	0.2172012	0.27437618	2.3455162	20	—	—
477451 2009 WL <sub>207</sub>	18.0	X	351.22274	17.74939	28.90628	1.97695	0.1854933	0.27593623	2.3366674	20	—	—
477452 2009 WM <sub>214</sub>	18.5	X	323.19951	203.11770	204.86092	0.78122	0.1784958	0.26762211	2.3848152	20	11 26.5	20.4
477453 2009 WK <sub>217</sub>	17.5	X	310.81365	303.95276	121.61238	3.48592	0.2048622	0.26743025	2.3859556	20	11 26.4	19.2
477454 2009 WB <sub>226</sub>	15.8	X	191.66206	109.23592	201.46193	2.91063	0.2404167	0.12414346	3.9797288	20	1 28.4	22.5
477455 2009 WC <sub>230</sub>	17.9	X	335.64089	267.17858	97.07784	2.54061	0.1920129	0.26597623	2.3946433	20	10 17.5	19.7
477456 2009 WH <sub>240</sub>	17.7	X	314.10384	7.38965	103.53598	3.98540	0.1924367	0.27237989	2.3569626	20	—	—
477457 2009 WQ <sub>240</sub>	18.4	X	311.83177	223.65900	206.38722	2.03367	0.1747666	0.26975132	2.3722493	20	12 6.4	20.3
477458 2009 WR <sub>243</sub>	18.1	X	24.36963	57.15568	336.91170	2.72432	0.2069908	0.28136238	2.3065278	20	—	—
477459 2009 WO <sub>249</sub>	17.3	X	333.96730	347.33834	93.70485	10.77848	0.0986457	0.27762597	2.3271765	20	—	—
477460 2009 WU <sub>251</sub>	15.3	X	108.99471	231.95755	223.02019	10.60276	0.2332064	0.12558082	3.9493034	20	5 4.1	21.3
477461 2009 WP <sub>255</sub>	15.5	X	144.68122	306.51769	93.15498	4.57548	0.1388218	0.12548191	3.9513786	20	3 28.5	21.6
477462 2009 WH <sub>261</sub>	15.0	X	104.27466	192.44367	263.09592	9.80220	0.2318971	0.12413973	3.9798085	20	4 28.1	21.1
477463 2009 WK <sub>263</sub>	17.1	X	200.20052	110.14467	65.55375	11.04093	0.0923776	0.26958618	2.3733354	20	11 15.2	20.3
477464 2009 XK <sub>1</sub>	17.9	X	320.98056	145.45033	296.52245	1.61420	0.1560666	0.27261243	2.3556221	20	—	—
477465 2009 XZ <sub>1</sub>	21.7	X	317.32098	152.98419	81.99487	8.15821	0.2373992	1.24514803	0.8557010	20	11 12.8	20.7
477466 2009 XM <sub>17</sub>	18.1	X	332.86411	342.28910	87.64348	2.18798	0.1494822	0.26908287	2.3761764	20	—	—
477467 2009 XA <sub>20</sub>	16.8	X	103.56927	236.57124	292.81001	12.75473	0.1557135	0.22665199	2.6641767	20	7 21.5	20.6
477468 2009 YO <sub>3</sub>	18.5	X	336.06176	249.16715	172.95383	1.45062	0.1730902	0.26958650	2.3732161	20	—	—
477469 2009 YU <sub>5</sub>	18.1	X	246.34722	150.30188	139.08940	1.72767	0.1545487	0.25386555	2.4702081	20	10 1.9	21.2
477470 2009 YH <sub>7</sub>	18.1	X	269.33140	27.93200	96.16479	3.62192	0.1684144	0.26521154	2.3992441	20	11 28.9	20.3
477471 2010 AG <sub>2</sub>	17.5	X	305.75519	103.80427	352.17683	4.32913	0.1556658	0.26663884	2.3906745	20	—	—
477472 2010 AS <sub>5</sub>	17.7	X	267.16376	193.28603	273.60433	1.49787	0.1669198	0.25691120	2.4506466	20	10 28.0	20.2
477473 2010 AE <sub>8</sub>	17.1	X	267.01716	105.96205	329.65033	6.14626	0.2361522	0.25487484	2.4636825	20	8 31.9	19.9
477474 2010 AB <sub>9</sub>	18.0	X	350.55247	196.35699	223.32993	1.98738	0.1700624	0.27020269	2.3696067	20	—	—
477475 2010 AL <sub>12</sub>	17.4	X	318.10419	151.36753	309.45195	6.31905	0.2507188	0.27102766	2.3647957	20	—	—
477476 2010 AK <sub>18</sub>	15.5	X	127.89563	133.41811	304.12438	4.65616	0.2736037	0.12438444	3.9745871	20	5 1.8	21.9
477477 2010 AX <sub>21</sub>	16.5	X	106.76707	278.30894	297.36065	15.67737	0.1441277	0.23808693	2.5781747	20	9 14.3	20.8
477478 2010 AO <sub>35</sub>	18.3	X	287.82429	290.90015	158.39169	2.31919	0.1707591	0.25904896	2.4371456	20	11 10.5	20.4
477479 2010 AG <sub>38</sub>	17.2	X	354.79951	57.85019	337.30788	5.95650	0.1806236	0.26373909	2.4081658	20	—	—
477480 2010 AX <sub>43</sub>	18.3	X	299.25148	13.56147	80.09733	5.29762	0.1948128	0.26596484	2.3947117	20	12 12.2	20.0
477481 2010 AN <sub>71</sub>	16.7	X	170.12061	197.35682	315.74440	13.13678	0.1035701	0.23820954	2.5772900	20	9 2.7	20.7
477482 2010 AN <sub>131</sub>	15.9	X	315.83674	174.69757	128.10204	23.75959	0.3501525	0.19961038	2.8996615	20	5 1.6	19.9
477483 2010 AO <sub>132</sub>	16.4	X	296.59406	331.88862	65.28482	12.00187	0.1326842	0.23267579	2.6179936	20	9 16.3	19.6
477484 2010 BO <sub>1</sub>	17.3	X	212.53024	151.02578	308.62974	11.26689	0.1378322	0.24050253	2.5608823	20	8 10.2	21.0
477485 2010 BU <sub>3</sub>	18.2	X	317.50307	308.35182	111.87563	3.00772	0.1957272	0.26292521	2.4131328	20	12 1.8	19.9
477486 2010 BL <sub>51</sub>	16.2	X	150.09319	100.75608	84.23989	15.79621	0.1018730	0.22992618	2.6388240	20	10 4.4	20.6
477487 2010 BW <sub>66</sub>	16.4	X	219.69619	117.70058	337.16603	11.27319	0.1784410	0.22870286	2.6482256	20	8 10.0	20.5
477488 2010 CA <sub>2</sub>	17.9	X	319.01314	313.23421	149.11340	3.73966	0.2119115	0.26984386	2.3717069	20	—	—
477489 2010 CU <sub>11</sub>	16.6	X	188.69324	85.89536	50.97346	27.62511	0.1732855	0.22856902	2.6492594	20	9 18.7	21.5
477490 2010 CG <sub>18</sub>	20.6	X	16.33638	351.62719	78.80577	10.15542	0.2260841	0.57119746	1.4386171	20	—	—
477491 2010 CD <sub>19</sub>	18.0	X	20.33546	132.63284	309.43166	20.75291	0.5787358	0.29069111	2.2569133	20	—	—
477492 2010 CG <sub>19</sub>	19.5	X	357.05778	117.54090	148.97350	61.93521	0.1866963	0.50422555	1.5633378	20	8 9.3	19.8
477493 2010 CN <sub>24</sub>	16.9	X	14.90233	305.67722	312.76974	8.37711	0.0766043	0.22614017	2.6681950	20	7 8.7	20.1
477494 2010 CM <sub>38</sub>	16.9	X	125.19400	216.55272	335.48277	12.42535	0.1293121	0.23246538	2.6195732	20	9 8.5	20.8
477495 2010 CH <sub>56</sub>	16.3	X	135.52805	246.31371	301.61316	12.94942	0.1220060	0.23712970	2.5851084	20	9 9.3	20.5
477496 2010 CK <sub>62</sub>	16.9	X	121.84939	192.56391	348.92171	12.94792	0.1614016	0.22828554	2.6514520	20	8 28.3	21.1
477497 2010 CO <sub>65</sub>	16.7	X	111.55565	199.80054	339.44388	14.73974	0.1150857	0.22482948	2.6785549	20	8 11.7	20.7
477498 2010 CQ <sub>79</sub>	17.8	X	86.03525	99.29200	161.72897	1.01719	0.0999731	0.23855205	2.5748224	20	10 24.8	21.5
477499 2010 CW <sub>81</sub>	17.3	X	143.56540	217.01694	334.66575	11.01177	0.1174121	0.23702195	2.5858917	20	9 24.8	21.4
477500 2010 CC <sub>82</sub>	16.4	X	192.55108	300.16560	169.08425	22.45655	0.0803360	0.22797869	2.6538307	20	8 3.0	20.6
477501 2010 CK <sub>89</sub>	17.6	X	345.11676	206.44027	157.06839	12.14608	0.0418370	0.24675968	2.5174059	20	10 22.0	20.8
477502 2010 CH <sub>93</sub>	16.8	X	355.53095	220.99017	137.50313	5.84205	0.0932822	0.24274002	2.5451212	20	11 2.3	19.7
477503 2010 CL <sub>94</sub>	17.0	X	36.94585	275.81194	350.93428	3.90647	0.0636276	0.22686727	2.6624910	20	8 22.4	20.2
477504 2010 CQ <sub>101</sub>	17.2	X	353.21516	53.55624	332.98569	9.82087	0.2652710	0.26190141	2.4194176	20	—	—
477505 2010 CH <sub>105</sub>	17.7	X	154.74058	59.51806	131.54433	4.91797	0.0186192	0.24397717	2.5365100	20	10 13.5	21.1
477506 2010 CE <sub>125</sub>	18.3	X	114.34792	265.74314	159.93337	21.24654	0.0773735	0.39004614	1.8552057	20	2 16.8	19.8
477507 2010 CQ <sub>129</sub>	16.8	X	155.39433	57.02429	122.44794	13.31185	0.1536548	0.23813782	2.5778074	20	9 30.2	21.1
477508 2010 CK <sub>140</sub>	16.9	X	69.16475	141.81711	70.79198	8.76788	0.1255024	0.21007387	2.8025585	20	8 3.9	20.8
477509 2010 CZ <sub>140</sub>	16.2	X	183.64883	337.04494	143.00280	28.76725	0.0960113	0.23316879	2.6143021	20	8 8.8	20.3
477510 2010 CM <sub>144</sub>	17.3	X	286.04155	67.37250	62.00396	11.19987	0.1691999	0.26528661	2.3987915	20	—	—
477511 2010 CK <sub>150</sub>	17.3	X	154.40198	11.70272	100.31185	4.83816	0.1444259	0.22327630	2.6909624	20	6 29.1	21.6
477512 2010 CL <sub>155</sub>	16.9	X	148.18526	171.78643	347.85744	11.88076	0.1331185	0.23149889	2.6268591	20	8 25.2	21.0
477513 2010 CD <sub>160</sub>	17.3	X	268.17019	147.35476	331.80813	11.84865	0.1718360	0.26039900	2.4287147	20	11 12.0	20.2
477514 2010 CT <sub>168</sub>	17.5	X	169.									

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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>
477521 2010 DQ <sub>77</sub>	16.6	X	82.41164	195.88302	60.85905	14.10857	0.1327251	0.23865763	2.5740630	20	10 23.4	20.4
477522 2010 DA <sub>79</sub>	17.7	X	314.73407	10.88971	80.51462	3.15500	0.1803122	0.26026799	2.4295297	20	—	—
477523 2010 ES <sub>32</sub>	16.9	X	75.64024	24.38855	169.40599	8.29924	0.0686964	0.21867137	2.7286098	20	7 6.6	20.7
477524 2010 EH <sub>43</sub>	18.8	X	11.28138	196.03237	5.42012	37.54235	0.0440543	0.68232618	1.2778347	20	3 5.3	19.7
477525 2010 EF <sub>69</sub>	17.1	X	231.56283	264.77788	178.66385	8.79411	0.1409089	0.22833764	2.6510487	20	8 7.8	21.2
477526 2010 EP <sub>73</sub>	16.6	X	162.74167	166.12501	349.83966	13.99043	0.1796473	0.23146934	2.6270826	20	9 2.9	20.9
477527 2010 EO <sub>84</sub>	17.1	X	209.30034	105.05215	10.82365	12.04309	0.0867362	0.23364595	2.6107415	20	9 6.3	20.9
477528 2010 EP <sub>84</sub>	17.9	X	237.75864	355.38348	124.53715	2.44221	0.1799041	0.24486554	2.5303714	20	10 1.9	21.3
477529 2010 EH <sub>86</sub>	16.4	X	232.23077	129.11189	359.29750	8.85763	0.0590648	0.23931233	2.5693661	20	10 18.9	19.8
477530 2010 EU <sub>87</sub>	16.6	X	139.10130	173.51377	37.38581	14.37719	0.1818235	0.22997196	2.6384738	20	10 19.8	20.9
477531 2010 EZ <sub>87</sub>	16.4	X	68.44572	64.52525	160.01755	18.44673	0.2569864	0.21693909	2.7431160	20	9 4.9	20.4
477532 2010 ET <sub>96</sub>	16.2	X	339.30639	312.25497	2.48580	14.72561	0.0793819	0.22442829	2.6817460	20	8 4.3	19.6
477533 2010 EX <sub>97</sub>	17.0	X	177.44067	339.92114	126.97465	5.43910	0.1043079	0.22521806	2.6754730	20	7 15.3	21.1
477534 2010 EL <sub>106</sub>	16.4	X	116.56695	189.04658	24.92125	13.87470	0.2179108	0.22926395	2.6439031	20	10 6.1	20.9
477535 2010 EZ <sub>112</sub>	17.5	X	64.88701	228.39933	21.07220	4.06327	0.1176542	0.22348665	2.6892737	20	9 15.3	21.1
477536 2010 EF <sub>123</sub>	16.9	X	23.97706	213.81141	77.95504	6.50838	0.1167507	0.22076264	2.7113505	20	9 16.0	20.2
477537 2010 EJ <sub>138</sub>	17.1	X	172.83498	165.92856	34.03463	16.06688	0.0598261	0.23936123	2.5690162	20	11 8.7	20.7
477538 2010 EU <sub>138</sub>	18.3	X	334.89995	342.53949	167.48934	22.92044	0.0522031	0.37228468	1.9137532	20	—	—
477539 2010 EJ <sub>140</sub>	16.4	X	45.45654	214.01405	15.48651	16.35234	0.1631051	0.21452412	2.7636644	20	8 4.1	20.2
477540 2010 EQ <sub>171</sub>	16.8	X	299.71820	330.33413	105.24511	8.81491	0.1804857	0.25160195	2.4850018	20	11 13.5	19.1
477541 2010 FG <sub>14</sub>	16.9	X	51.73611	97.86293	173.25066	10.69432	0.0933875	0.22539836	2.6740460	20	9 22.6	20.3
477542 2010 FY <sub>16</sub>	17.1	X	321.62126	18.23811	6.76942	7.09812	0.0355180	0.23481517	2.6020678	20	10 9.5	20.2
477543 2010 FS <sub>20</sub>	17.3	X	80.13069	188.76562	21.11688	7.32221	0.0401074	0.22201023	2.7011833	20	8 3.1	21.0
477544 2010 FX <sub>22</sub>	16.7	X	4.45793	198.13342	170.38449	14.93323	0.1233578	0.24525801	2.5276712	20	12 4.6	20.0
477545 2010 FJ <sub>26</sub>	16.8	X	321.57767	303.07345	41.76079	6.37004	0.06227981	0.22597490	2.6694958	20	8 15.9	20.1
477546 2010 FT <sub>29</sub>	17.0	X	100.75566	171.34250	35.53784	8.05732	0.0645777	0.22124275	2.7074265	20	8 30.2	20.9
477547 2010 FR <sub>48</sub>	16.3	X	162.76556	51.18092	86.40180	14.07298	0.2089362	0.22918363	2.6445208	20	8 12.7	21.0
477548 2010 FT <sub>53</sub>	17.2	X	205.79378	3.53913	140.71736	7.63923	0.0994943	0.24015026	2.5633860	20	10 7.7	21.0
477549 2010 FS <sub>56</sub>	16.6	X	122.85227	1.80836	203.22299	13.71439	0.1844746	0.22861897	2.6488734	20	9 24.9	21.0
477550 2010 FJ <sub>82</sub>	16.2	X	96.88413	161.07800	42.19944	14.16787	0.0831946	0.22249107	2.6972901	20	8 26.8	20.3
477551 2010 FA <sub>85</sub>	16.2	X	34.64283	86.38071	173.53203	27.15486	0.2450866	0.21571362	2.7534953	20	9 3.4	19.5
477552 2010 FK <sub>87</sub>	17.4	X	44.87625	0.99038	249.81863	0.68744	0.1075940	0.21831833	2.7315506	20	8 16.6	20.9
477553 2010 FO <sub>90</sub>	17.4	X	107.48483	359.12704	188.64331	2.44363	0.1160567	0.22235306	2.6984061	20	8 14.1	21.4
477554 2010 FO <sub>101</sub>	17.8	X	137.17434	118.90300	204.17486	22.89110	0.0504967	0.35794288	1.9645371	20	—	—
477555 2010 GF <sub>75</sub>	16.6	X	113.89287	175.29326	38.87829	15.76234	0.1403200	0.22869582	2.6482799	20	10 2.9	20.8
477556 2010 GP <sub>75</sub>	16.7	X	301.30775	2.70961	9.03725	11.59554	0.0708643	0.22858338	2.6491483	20	8 23.3	20.0
477557 2010 GV <sub>97</sub>	16.9	X	59.88675	117.76943	124.68359	4.40854	0.1128353	0.21895213	2.7262767	20	8 28.9	20.6
477558 2010 GW <sub>101</sub>	16.9	X	18.15085	289.09630	19.91468	10.78924	0.1425319	0.22586926	2.6703281	20	10 2.8	19.9
477559 2010 GJ <sub>108</sub>	18.1	X	72.75550	285.00593	211.66891	19.54643	0.0848858	0.39067784	1.8532053	20	4 2.8	19.4
477560 2010 GX <sub>109</sub>	16.7	X	97.69023	127.97142	80.97683	6.10125	0.0644372	0.22122182	2.7075973	20	8 27.9	20.6
477561 2010 GY <sub>113</sub>	17.3	X	162.62688	122.21867	24.23448	2.95672	0.0871588	0.22295749	2.6935270	20	8 21.1	21.2
477562 2010 GE <sub>114</sub>	17.1	X	345.32826	237.08442	37.68648	2.29330	0.2159398	0.20245542	2.8724321	20	6 2.7	19.6
477563 2010 GA <sub>115</sub>	17.7	X	229.38212	125.10112	24.45970	5.80529	0.1918220	0.24429128	2.5343353	20	10 27.2	21.4
477564 2010 GJ <sub>122</sub>	17.0	X	214.61855	339.70530	126.00126	6.59234	0.2675998	0.23432695	2.6056809	20	8 10.5	21.2
477565 2010 GX <sub>126</sub>	16.6	X	328.83735	239.34448	95.91491	10.09902	0.1215894	0.21416566	2.7667473	20	8 8.2	19.8
477566 2010 GG <sub>128</sub>	17.8	X	351.45083	124.44841	35.03323	21.17490	0.0369107	0.37844498	1.8929285	20	—	—
477567 2010 GE <sub>129</sub>	16.9	X	223.95764	71.82388	60.73572	16.26902	0.0239947	0.23387975	2.6090013	20	10 25.9	20.5
477568 2010 GV <sub>133</sub>	17.7	X	239.28862	279.10221	188.15396	8.12813	0.1219439	0.23948349	2.5681418	20	9 22.8	21.1
477569 2010 GY <sub>145</sub>	16.1	X	81.16634	218.57740	46.86246	33.44122	0.1858999	0.23027648	2.6361473	20	11 4.4	20.2
477570 2010 GK <sub>160</sub>	16.6	X	81.36076	235.45064	348.91437	13.71644	0.1941688	0.22012455	2.7165877	20	9 11.0	20.5
477571 2010 HC <sub>44</sub>	16.6	X	310.59336	175.39543	119.39812	10.14802	0.1016092	0.18483646	3.0521857	20	5 16.0	20.7
477572 2010 HH <sub>74</sub>	16.3	X	288.58992	11.38119	303.54720	8.31844	0.1397932	0.18198758	3.0839563	20	4 29.1	20.8
477573 2010 HV <sub>77</sub>	16.9	X	17.81199	62.90806	219.23682	12.02769	0.1254977	0.21454693	2.7634684	20	8 14.3	20.4
477574 2010 HQ <sub>105</sub>	16.7	X	81.76128	222.03510	50.80779	15.70388	0.0910461	0.22684037	2.6627015	20	10 15.4	20.5
477575 2010 HZ <sub>105</sub>	17.2	X	359.85148	241.56097	55.21420	4.49774	0.0759451	0.21318416	2.7752328	20	8 7.2	20.6
477576 2010 JS <sub>1</sub>	16.6	X	30.84710	231.04319	51.95475	14.22341	0.0826395	0.21669900	2.7451417	20	9 13.9	20.4
477577 2010 JN <sub>2</sub>	16.8	X	221.78291	93.69231	33.29967	14.69670	0.0442729	0.23385163	2.6092105	20	10 10.6	20.3
477578 2010 JY <sub>14</sub>	16.6	X	85.53334	180.92030	54.18648	15.21544	0.1072348	0.22458534	2.6804957	20	9 27.7	20.7
477579 2010 JH <sub>15</sub>	17.6	X	104.58348	351.18980	70.56319	23.70402	0.0909539	0.37499411	1.9045238	20	2 8.7	19.9
477580 2010 JO <sub>17</sub>	16.3	X	277.25001	96.26687	221.40674	23.07178	0.3859023	0.17714523	3.1399042	20	3 19.7	21.8
477581 2010 JP <sub>20</sub>	15.8	X	301.78736	42.47163	243.42743	23.51205	0.2006358	0.17910050	3.1170099	20	3 28.3	20.5
477582 2010 JQ <sub>37</sub>	16.7	X	18.12326	297.89429	2.70153	7.32565	0.2037355	0.21794237	2.7346911	20	9 26.9	19.7
477583 2010 JO <sub>43</sub>	16.8	X	51.00942	161.60840	77.86736	8.23990	0.0678299	0.21074284	2.7966245	20	8 5.9	20.5
477584 2010 JT <sub>43</sub>	16.3	X	171.26845	113.86823	77.39845	15.09480	0.0706178	0.23262345	2.6183863	20	11 1.8	20.3
477585 2010 JJ <sub>46</sub>	16.8	X	107.00768	13.66773	179.55686	12.91504	0.0993960	0.21510054	2.7587248	20	8 16.6	21.0
477586 2010 JD <sub>53</sub>	17.2	X	132.86163	259.19968	268.81452	7.67131	0.1665606	0.23161865	2.6259535	20	8 16.9	21.6
477587 2010 JT <sub>86</sub>	15.3	X	246.67163	331.71638	26.67788	26.40575	0.4879513	0.17193027	3.2030802	20	4 13.6	21.3
477588 2010 JD <sub>87</sub>	19.4	X	1.69315	148.54347	338.37330	24.60916	0.6397802	0.57784267	1.4275664	20	—	—
477589 2010 JA <sub>89</sub>	15.8	X	332.11668	320.89500	309.39459	13.03377	0.2416029	0.18521744	3.0479989	20	4 18.3	19.5
477590 2010 JN <sub>98</sub>	16.0	X	263.14188	87.15350	232.85265	24.75053	0.3056546	0.17348281	3.1839415	20	3 16.7	21.7
477591 2010 JA <sub>102</sub>	15.9	X	266.53438	60.90428	259.63017	14.18728	0.0892620	0.17531421	3.1617290	20	4 15.8	20.7
477592 2010 JF <sub>119</sub>	16.7	X	207.44687	248.55021	211.35534	12.14984	0.2305636	0.22223776	2.6993393	20	7 26.1	21.5
477593 2010 JR <sub>131</sub>	15.9	X	262.70929	118.09200	244.57709	24.68832	0.3673208	0.17801292				

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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>
477601 2010 KH <sub>17</sub>	16.1	X	238.62019	146.23123	234.16942	16.86322	0.1239494	0.17961083	3.1111029	20	5 28.8	20.9
477602 2010 KJ <sub>36</sub>	17.1	X	154.24907	25.97807	185.04565	13.72037	0.1985990	0.23294316	2.6159900	20	11 2.1	21.6
477603 2010 KG <sub>46</sub>	16.2	X	281.22176	213.43811	120.13822	4.22529	0.0730725	0.18050242	3.1008495	20	5 27.6	20.5
477604 2010 KX <sub>52</sub>	15.5	X	276.24031	10.91949	308.65355	16.27489	0.2036850	0.17581563	3.1557147	20	4 6.1	20.6
477605 2010 KF <sub>56</sub>	15.7	X	252.97029	36.58566	320.89440	15.41297	0.2467053	0.17549206	3.1595925	20	4 25.9	21.1
477606 2010 KN <sub>84</sub>	15.1	X	286.25615	45.04398	279.60091	26.81138	0.2087908	0.17856099	3.1232853	20	4 24.9	20.1
477607 2010 KU <sub>90</sub>	15.1	X	251.78277	55.69295	304.04148	25.80148	0.2229925	0.17510524	3.1642439	20	4 26.9	20.7
477608 2010 KS <sub>103</sub>	16.6	X	290.70108	116.05770	191.07526	12.02447	0.2181816	0.17710320	3.1404011	20	4 15.2	21.0
477609 2010 KC <sub>109</sub>	16.3	X	239.40803	87.95471	280.68097	11.10777	0.1550214	0.17415298	3.1757680	20	5 9.9	21.5
477610 2010 KM <sub>114</sub>	16.7	X	315.49867	174.16893	135.94499	2.63707	0.2627496	0.18438043	3.0572163	20	5 17.2	20.2
477611 2010 KL <sub>115</sub>	16.3	X	245.20361	129.95899	227.42985	7.71109	0.1801673	0.17314791	3.1880458	20	5 1.6	21.2
477612 2010 KZ <sub>119</sub>	16.1	X	305.09479	306.99606	346.63419	10.81929	0.2461916	0.17880130	3.1204862	20	4 7.7	20.4
477613 2010 KE <sub>121</sub>	16.0	X	213.80304	62.02948	338.86483	25.52487	0.2543938	0.17188004	3.2037042	20	5 12.3	22.0
477614 2010 KW <sub>121</sub>	15.8	X	274.02651	43.48348	296.39849	14.60402	0.2067398	0.17745473	3.1362524	20	5 2.1	20.7
477615 2010 KT <sub>122</sub>	15.8	X	300.14760	129.68201	155.17532	26.76152	0.2178025	0.17563586	3.1578677	20	4 2.8	20.4
477616 2010 LR <sub>2</sub>	16.7	X	260.78422	171.28144	167.12325	16.57873	0.2427135	0.17367893	3.1815441	20	4 21.1	21.9
477617 2010 LT <sub>5</sub>	15.8	X	251.74953	90.25749	280.47623	10.43226	0.1236658	0.17794136	3.1305318	20	5 30.5	20.6
477618 2010 LF <sub>13</sub>	15.4	X	268.72216	348.88594	343.63246	26.12999	0.1245960	0.17501454	3.1653371	20	4 18.5	20.6
477619 2010 LU <sub>32</sub>	15.7	X	247.04953	100.25711	302.33822	14.33460	0.0501471	0.18536046	3.0464308	20	7 15.7	20.0
477620 2010 LR <sub>36</sub>	17.8	X	333.58813	46.52512	119.52359	24.37012	0.0626201	0.36606528	1.9353686	20	—	—
477621 2010 LD <sub>37</sub>	16.4	X	281.74487	145.95924	172.16605	7.51577	0.1705141	0.17535136	3.1612824	20	4 25.8	20.9
477622 2010 LT <sub>51</sub>	17.0	X	286.40143	33.05063	289.75648	0.12743	0.1805657	0.17715256	3.1398177	20	5 3.9	21.3
477623 2010 LU <sub>55</sub>	16.8	X	274.37066	216.45891	125.19713	0.72072	0.2208221	0.17721323	3.1391010	20	5 7.9	21.5
477624 2010 LZ <sub>56</sub>	16.3	X	317.51953	122.10356	167.35296	22.15498	0.2195274	0.18035256	3.1025671	20	5 3.7	20.4
477625 2010 LR <sub>58</sub>	16.0	X	300.30568	50.89249	254.68937	11.74170	0.1559487	0.17724537	3.1387215	20	5 2.2	20.2
477626 2010 LF <sub>68</sub>	15.6	X	310.96159	21.30848	288.77026	27.08660	0.1498875	0.17520243	3.1630736	20	5 26.5	20.1
477627 2010 LY <sub>69</sub>	16.2	X	254.22416	188.76626	196.89771	4.89947	0.1917943	0.17408484	3.1765967	20	5 8.8	21.2
477628 2010 LN <sub>78</sub>	15.4	X	210.96928	90.02997	292.52453	12.13769	0.0497591	0.16970195	3.2310586	20	5 3.7	20.4
477629 2010 LZ <sub>87</sub>	16.8	X	335.29220	356.82660	287.95266	9.16229	0.1518842	0.18182444	3.0858007	20	6 1.7	20.4
477630 2010 LZ <sub>96</sub>	15.7	X	332.45051	100.92965	167.13598	26.02215	0.2096086	0.17925562	3.1152114	20	5 3.2	19.7
477631 2010 LG <sub>97</sub>	16.3	X	266.23196	16.89439	328.29724	10.05302	0.2326087	0.17499288	3.1655982	20	4 27.8	21.4
477632 2010 LT <sub>112</sub>	15.4	X	346.48249	343.57991	268.65306	16.38037	0.1495696	0.18565564	3.0432009	20	5 5.8	19.1
477633 2010 LD <sub>118</sub>	16.6	X	345.36368	248.92206	6.84292	9.97008	0.1903386	0.17877706	3.1207682	20	5 5.2	20.1
477634 2010 LU <sub>122</sub>	15.8	X	266.89177	92.38550	286.71849	9.61948	0.0840258	0.18246741	3.0785474	20	7 4.6	20.1
477635 2010 MU	15.9	X	245.16694	145.36295	243.69635	26.15324	0.1619833	0.17390648	3.1787683	20	6 9.9	20.9
477636 2010 MQ <sub>6</sub>	15.8	X	303.61818	321.76401	343.05298	19.82615	0.1990411	0.17776475	3.1326048	20	4 21.0	20.3
477637 2010 MK <sub>20</sub>	15.9	X	243.68152	30.56034	348.71814	14.31860	0.0032266	0.17712982	3.1400864	20	6 16.1	20.6
477638 2010 MW <sub>31</sub>	16.8	X	254.51953	228.66794	132.83798	3.21640	0.2015180	0.17356193	3.1829738	20	5 14.8	21.7
477639 2010 MC <sub>37</sub>	15.9	X	312.71323	273.44414	345.75703	23.60411	0.3111297	0.17281492	3.1921398	20	3 2.2	20.0
477640 2010 MD <sub>41</sub>	15.9	X	309.64521	335.72928	342.65678	14.11731	0.0493733	0.17836024	3.1256284	20	6 18.1	20.4
477641 2010 MN <sub>61</sub>	16.6	X	294.32905	327.06106	356.51832	10.19098	0.2280470	0.17770668	3.1332873	20	5 4.3	21.0
477642 2010 ME <sub>68</sub>	15.4	X	265.36708	342.68332	357.55919	14.99771	0.0602805	0.17134647	3.2103517	20	5 11.7	20.2
477643 2010 MO <sub>74</sub>	16.7	X	256.01824	80.90371	295.66278	7.33134	0.0927922	0.17666818	3.1455541	20	6 16.4	21.3
477644 2010 MP <sub>77</sub>	16.2	X	278.40126	131.45882	208.44892	4.59061	0.2068903	0.17566614	3.1575048	20	5 12.5	20.6
477645 2010 MJ <sub>84</sub>	17.5	X	201.50760	249.51070	269.79304	7.68475	0.1971663	0.24313374	2.5423728	20	10 6.8	21.8
477646 2010 ME <sub>87</sub>	15.9	X	259.51535	311.60547	345.05436	9.33669	0.0480818	0.15761973	3.3941341	20	3 18.9	20.9
477647 2010 MQ <sub>89</sub>	16.1	X	251.17180	130.46984	231.23188	15.06305	0.1267642	0.17214953	3.2003600	20	5 19.0	20.9
477648 2010 MX <sub>89</sub>	16.1	X	290.68717	54.16024	291.53745	14.69479	0.1040265	0.17897356	3.1184836	20	6 20.5	20.3
477649 2010 ML <sub>102</sub>	15.9	X	263.11321	238.37019	112.52089	18.28611	0.0416498	0.17198287	3.2024271	20	6 3.3	20.6
477650 2010 MR <sub>105</sub>	16.1	X	209.84156	236.62643	195.11936	15.65161	0.2377279	0.17222730	3.1993964	20	6 24.2	21.8
477651 2010 NZ <sub>31</sub>	16.3	X	205.62826	58.04038	11.64137	10.57752	0.1415906	0.17224117	3.1992247	20	6 23.8	21.6
477652 2010 NT <sub>44</sub>	17.0	X	322.53614	323.85745	33.98247	7.78460	0.0515475	0.22467093	2.6798149	20	9 5.9	20.4
477653 2010 NH <sub>45</sub>	16.2	X	262.28923	193.58440	163.49811	6.68946	0.1700577	0.17266074	3.1940398	20	5 21.7	21.0
477654 2010 NG <sub>49</sub>	16.7	X	303.38146	136.45688	174.42109	1.63624	0.1923093	0.17522451	3.1628079	20	5 10.3	20.9
477655 2010 NF <sub>61</sub>	15.8	X	278.61942	346.69643	353.95979	18.95203	0.1855168	0.17390137	3.1788306	20	5 8.4	20.8
477656 2010 ND <sub>62</sub>	16.5	X	287.81891	337.68561	3.89657	9.11644	0.0929609	0.17530565	3.1618318	20	6 10.8	20.9
477657 2010 NJ <sub>67</sub>	15.9	X	257.32280	161.76166	208.55264	15.08991	0.2290509	0.17322846	3.1870574	20	5 25.1	21.0
477658 2010 NA <sub>69</sub>	16.0	X	300.60088	282.32284	43.78142	15.20828	0.2044503	0.17731305	3.1379227	20	5 21.5	20.1
477659 2010 NN <sub>82</sub>	16.5	X	222.98665	49.41681	14.89244	15.47215	0.1803282	0.17563149	3.1579200	20	7 2.4	21.8
477660 2010 NJ <sub>91</sub>	15.5	X	236.72451	184.19378	207.56152	20.67993	0.1527891	0.17340484	3.1848959	20	6 6.6	20.7
477661 2010 NB <sub>98</sub>	16.7	X	203.30533	250.19741	200.44230	12.79828	0.2595107	0.17209016	3.2010959	20	7 9.5	22.5
477662 2010 NU <sub>101</sub>	16.0	X	261.89454	356.52553	11.45032	13.65479	0.0897600	0.17401685	3.1774241	20	6 10.9	20.8
477663 2010 NY <sub>117</sub>	16.6	X	335.08372	77.07739	215.21057	9.90538	0.1340846	0.18863274	3.0110965	20	6 13.9	20.2
477664 2010 OE <sub>2</sub>	16.1	X	214.02848	357.73551	63.21321	5.95711	0.1626421	0.17046098	3.2214599	20	6 19.6	21.4
477665 2010 OZ <sub>11</sub>	15.9	X	280.12493	332.66652	8.91236	12.20731	0.1320264	0.17276111	3.1928026	20	5 23.6	20.5
477666 2010 OG <sub>14</sub>	15.8	X	152.97184	166.82633	220.16393	9.29219	0.0907614	0.14698099	3.5560014	20	3 12.1	21.2
477667 2010 OG <sub>15</sub>	15.7	X	202.02047	237.91730	211.42442	24.72326	0.2454800	0.17162239	3.2069099	20	7 4.9	21.7
477668 2010 OY <sub>43</sub>	15.8	X	257.46083	11.86037	5.83974	16.92444	0.1307884	0.17307827	3.1889009	20	6 12.3	20.8
477669 2010 OA <sub>63</sub>	16.6	X	100.06524	116.33768	49.67067	8.31894	0.1565957	0.21191978	2.7862605	20	7 14.4	20.8
477670 2010 OZ <sub>77</sub>	16.2	X	187.53303	241.28399	227.96307	12.61834	0.2457465	0.17066642	3.2188741	20	7 18.9	22.0
477671 2010 OH <sub>85</sub>	15.9	X	239.21838	186.57459	217.90748	15.07309	0.1286965	0.17279173	3.1924254	20	6 26.0	21.0
477672 2010 OJ <sub>101</sub>	16.3	X	306.60203	75.56060	230.68514	9.53838	0.1713817	0.18431257	3.0579667	20	5 11.5	19.9
477673 2010 OT <sub>109</sub>	15.2	X	159.40759	258.73710	232.7635							

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
477681 2010 RO <sub>8</sub>	17.1	X	310.50061	112.95098	209.19359	3.88621	0.1066871	0.18256221	3.0774815	20	6 17.1	21.1
477682 2010 RL <sub>16</sub>	15.9	X	260.75220	60.86016	303.07759	9.86416	0.0602235	0.18083296	3.0970697	20	6 10.4	20.3
477683 2010 RW <sub>36</sub>	16.3	X	247.63178	152.47028	212.28076	4.06408	0.3270868	0.17249540	3.1960804	20	4 30.6	21.9
477684 2010 RP <sub>37</sub>	16.2	X	251.12068	198.65363	184.61472	9.59412	0.2275832	0.17581374	3.1557373	20	6 4.2	21.3
477685 2010 RR <sub>48</sub>	16.4	X	275.06211	334.16294	5.72918	9.88247	0.1618601	0.17345638	3.1842650	20	5 11.3	21.1
477686 2010 RU <sub>49</sub>	16.2	X	229.89653	37.20526	5.49416	12.08555	0.0993166	0.17346725	3.1841319	20	6 17.8	21.2
477687 2010 RE <sub>65</sub>	16.0	X	293.77630	336.62648	311.86603	16.21483	0.2889508	0.17511961	3.1640709	20	3 9.5	20.9
477688 2010 RT <sub>67</sub>	16.6	X	306.42634	287.40432	4.12733	16.17510	0.2178386	0.17364171	3.1819988	20	4 11.6	20.8
477689 2010 RN <sub>69</sub>	16.2	X	271.62957	195.77414	169.40313	7.58693	0.1597556	0.18079503	3.0975030	20	6 12.1	20.7
477690 2010 RQ <sub>91</sub>	16.7	X	252.98076	163.92159	212.86002	6.75192	0.1728290	0.17728620	3.1382395	20	6 3.5	21.5
477691 2010 RV <sub>92</sub>	15.4	X	288.43224	332.90314	326.66368	15.31599	0.0985751	0.17105549	3.2139913	20	4 11.6	20.2
477692 2010 RR <sub>96</sub>	16.3	X	258.11616	4.69014	13.87871	11.88885	0.1234347	0.17503230	3.1651229	20	6 16.2	21.1
477693 2010 RM <sub>97</sub>	15.9	X	292.75120	326.34636	7.87794	16.50183	0.2089771	0.17708484	3.1406181	20	5 16.8	20.5
477694 2010 RA <sub>99</sub>	16.5	X	274.88276	161.58538	201.69411	8.60587	0.1859023	0.17843686	3.1247337	20	6 9.6	21.1
477695 2010 RV <sub>110</sub>	16.3	X	228.97830	214.20946	182.83109	16.33258	0.1567386	0.17188992	3.2035815	20	6 6.5	21.6
477696 2010 RM <sub>111</sub>	17.0	X	224.77354	267.52511	141.62684	1.85597	0.1820780	0.17316105	3.1878844	20	6 14.2	22.1
477697 2010 RR <sub>113</sub>	16.0	X	160.05834	289.59358	208.58709	19.05990	0.1163605	0.17928073	3.1149206	20	7 29.4	21.3
477698 2010 RR <sub>116</sub>	16.1	X	290.89018	299.60860	22.55635	25.15767	0.2017329	0.17365816	3.1817979	20	4 29.5	20.8
477699 2010 RA <sub>118</sub>	15.3	X	53.36130	136.55588	36.37401	12.17017	0.0504530	0.16057435	3.3523699	20	5 6.4	19.9
477700 2010 RA <sub>124</sub>	16.1	X	313.47153	129.99124	180.70400	26.71671	0.1801434	0.17854686	3.1234501	20	5 29.2	20.5
477701 2010 RL <sub>132</sub>	15.6	X	168.71448	192.91803	269.10198	7.07892	0.1582717	0.17228594	3.1986705	20	6 28.8	20.9
477702 2010 RA <sub>141</sub>	16.1	X	290.40564	303.78031	351.61026	16.22461	0.1871335	0.17203551	3.2017739	20	3 30.9	20.8
477703 2010 RB <sub>141</sub>	16.4	X	234.44577	54.78776	351.50706	8.17209	0.2326670	0.17671736	3.1449704	20	6 15.8	21.6
477704 2010 RW <sub>143</sub>	16.7	X	256.76713	169.72611	209.48069	10.20862	0.0509812	0.17594910	3.1541186	20	6 25.5	21.3
477705 2010 RY <sub>143</sub>	16.5	X	210.00113	239.34891	206.35788	9.40263	0.1940055	0.17542073	3.1604490	20	7 12.6	21.8
477706 2010 RD <sub>145</sub>	16.4	X	287.74940	331.79445	359.83830	9.79733	0.0741945	0.17327196	3.1865240	20	5 30.6	21.0
477707 2010 RO <sub>148</sub>	16.4	X	282.19200	11.97092	342.00956	10.62047	0.1149104	0.17981755	3.1087181	20	6 17.1	20.9
477708 2010 RX <sub>149</sub>	16.1	X	168.63693	262.24617	193.94085	9.81631	0.0827809	0.17395285	3.1782033	20	6 20.6	21.1
477709 2010 RF <sub>164</sub>	16.2	X	243.25650	62.40461	352.03543	15.15586	0.1547147	0.18455149	3.0553268	20	7 16.1	21.0
477710 2010 RK <sub>166</sub>	15.8	X	276.22412	171.41958	180.70571	18.05813	0.1285437	0.17720719	3.1391723	20	5 25.7	20.7
477711 2010 RB <sub>168</sub>	16.0	X	203.09996	60.71983	350.64322	14.48705	0.0803151	0.17287412	3.1914109	20	5 29.5	21.2
477712 2010 RJ <sub>170</sub>	16.6	X	258.66727	133.00895	218.46177	9.00525	0.0601576	0.17641346	3.1485812	20	5 23.7	21.1
477713 2010 RY <sub>175</sub>	16.7	X	207.15176	99.82199	321.28443	4.34068	0.1162343	0.17138793	3.2098339	20	6 16.0	21.7
477714 2010 SV	16.7	X	228.59454	88.68393	322.30732	11.88865	0.2564840	0.17417538	3.1754958	20	6 14.3	22.2
477715 2010 SL <sub>6</sub>	18.6	X	36.30095	17.10536	351.24416	4.86823	0.1891608	0.31347424	2.1461899	20	—	—
477716 2010 SZ <sub>8</sub>	15.9	X	189.91841	134.91202	314.29859	4.16225	0.0380257	0.17722065	3.1390134	20	7 6.7	20.5
477717 2010 ST <sub>14</sub>	16.3	X	227.12851	38.85083	15.84868	11.35714	0.1001749	0.17672545	3.1448745	20	7 1.2	21.2
477718 2010 SD <sub>15</sub>	16.5	X	349.36529	85.15885	184.39355	26.25239	0.1100821	0.17650512	3.1474911	20	6 9.5	20.9
477719 2010 SG <sub>15</sub>	25.2	X	75.25314	199.52331	182.29134	0.82754	0.4762900	0.32867339	2.0795036	20	—	—
477720 2010 SW <sub>17</sub>	16.3	X	284.74416	128.13345	189.07011	26.68948	0.2335216	0.17316022	3.1878947	20	4 19.3	21.0
477721 2010 SW <sub>20</sub>	16.2	X	227.76374	205.00350	193.89488	8.42346	0.0649221	0.17298235	3.1900796	20	6 14.9	21.0
477722 2010 SA <sub>21</sub>	16.8	X	224.07240	153.91009	261.10544	1.11121	0.1114773	0.17464625	3.1697855	20	6 26.4	21.6
477723 2010 SK <sub>21</sub>	16.3	X	193.99259	249.09661	192.89239	15.54029	0.1808699	0.17035858	3.2227506	20	6 25.6	21.9
477724 2010 SC <sub>22</sub>	15.8	X	256.09218	345.43384	8.76442	9.50798	0.1258390	0.17240294	3.1972231	20	5 12.4	20.6
477725 2010 SN <sub>25</sub>	16.3	X	219.15714	34.02687	12.08248	5.08349	0.1677579	0.17174541	3.2053783	20	6 5.5	21.5
477726 2010 SN <sub>26</sub>	16.0	X	265.86929	333.59414	13.98805	18.45488	0.1788319	0.17326740	3.1865799	20	5 5.4	21.0
477727 2010 SY <sub>31</sub>	16.6	X	197.77469	2.93216	62.50290	4.95665	0.1043443	0.17140716	3.2095939	20	6 12.3	21.5
477728 2010 TX <sub>3</sub>	16.6	X	240.99949	43.62951	353.74113	9.16524	0.1057541	0.17458434	3.1705348	20	6 23.7	21.4
477729 2010 TP <sub>12</sub>	16.0	X	167.74592	293.01015	204.01847	26.17698	0.1779751	0.17942784	3.1132178	20	8 3.7	21.7
477730 2010 TV <sub>34</sub>	16.3	X	164.08239	81.87784	33.47682	9.54471	0.0364941	0.17370462	3.1812305	20	7 10.1	21.1
477731 2010 TX <sub>44</sub>	15.7	X	116.87891	86.03575	19.82789	10.27407	0.0919817	0.15583798	3.4199559	20	5 6.7	20.8
477732 2010 TK <sub>69</sub>	16.4	X	264.51498	4.62790	3.46424	9.26151	0.0864821	0.1759300	3.1535940	20	6 16.2	21.0
477733 2010 TU <sub>69</sub>	16.4	X	288.39630	145.09981	186.48735	12.19957	0.1444015	0.17830350	3.1262915	20	5 24.8	20.8
477734 2010 TL <sub>77</sub>	16.6	X	258.36306	162.36926	198.08805	10.56174	0.0736249	0.17050124	3.2209527	20	6 2.1	21.3
477735 2010 TC <sub>80</sub>	16.5	X	194.90645	255.80167	187.97181	9.97787	0.0810581	0.17224756	3.1991456	20	7 2.2	21.5
477736 2010 TT <sub>88</sub>	17.0	X	256.29341	273.14433	94.96910	2.68200	0.1379093	0.17360408	3.1824587	20	5 31.3	21.6
477737 2010 TZ <sub>99</sub>	16.2	X	175.14403	275.48427	189.18352	21.99985	0.1045332	0.17351707	3.1835224	20	7 5.8	21.6
477738 2010 TR <sub>107</sub>	16.3	X	308.37471	295.30508	17.72203	8.96634	0.0912317	0.17428367	3.1741803	20	6 2.0	20.6
477739 2010 TV <sub>121</sub>	16.1	X	254.20831	344.36418	43.30830	10.21288	0.0774244	0.17689927	3.1428141	20	6 30.5	20.7
477740 2010 TW <sub>138</sub>	15.5	X	129.22836	297.99847	218.62460	32.22664	0.0810615	0.17210890	3.2008635	20	7 14.2	21.0
477741 2010 TF <sub>141</sub>	16.4	X	219.78427	48.11235	6.86921	9.61941	0.0628239	0.17011793	3.2257893	20	6 26.2	21.3
477742 2010 TG <sub>142</sub>	15.8	X	254.82467	155.50776	241.00856	10.08327	0.0336734	0.17549946	3.1595036	20	7 16.1	20.4
477743 2010 TX <sub>166</sub>	16.7	X	191.80419	114.49394	338.80558	8.02333	0.0600168	0.17410718	3.1763249	20	7 14.2	21.5
477744 2010 TX <sub>177</sub>	15.6	X	248.48519	287.20028	53.96252	21.87240	0.2583985	0.16727919	3.2621814	20	4 16.8	21.2
477745 2010 TW <sub>179</sub>	16.6	X	312.24165	286.95253	20.76477	9.12016	0.0825796	0.17444587	3.1722123	20	6 1.8	20.9
477746 2010 UL <sub>9</sub>	16.1	X	153.91625	120.75384	35.79338	26.73699	0.1914256	0.17496436	3.1659422	20	9 6.1	21.9
477747 2010 UR <sub>65</sub>	15.6	X	63.06657	338.43728	236.60220	17.47743	0.1715179	0.17193999	3.2029595	20	7 25.2	20.3
477748 2010 VB <sub>32</sub>	15.7	X	199.51105	271.50196	175.22237	4.49689	0.1089760	0.16853857	3.2459102	20	7 9.6	20.9
477749 2010 VY <sub>42</sub>	16.9	X	265.41945	41.51575	318.36650	2.64789	0.0969842	0.17057676	3.2200020	20	6 5.6	21.5
477750 2010 VE <sub>44</sub>	16.2	X	328.29407	69.28927	229.74466	13.70188	0.1309767	0.17381386	3.1798975	20	6 11.1	20.1
477751 2010 VE <sub>46</sub>	18.8	X	2.17588	174.81283	260.58823	2.49768	0.1008201	0.31442150	2.1418772	20	—	—
477752 2010 VY <sub>120</sub>	17.1	X	218.91767	308.40598	183.36839	3.93222	0.1092097	0.18351548	3.0668150	20	9 24.9	21.7
477753 2010 VN <sub>129</sub>	15.7	X	199.47425	82.57835	57.41136	19.75811	0.1824662	0.18				

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
477761 2010 XW <sub>51</sub>	15.8 <sup>m</sup>	X	218.72893	238.49683	221.97671	13.60935	0.2316563	0.17341570	3.1847630	20	8 1.6	21.3
477762 2010 XZ <sub>67</sub>	19.7	X	63.48683	169.14268	280.23252	11.85628	0.4949766	0.33350781	2.0593589	20	3 19.9	20.9
477763 2010 YJ <sub>2</sub>	15.6	X	204.76887	64.29470	85.97102	27.63918	0.1573081	0.17539507	3.1607571	20	10 13.5	21.1
477764 2011 AV <sub>18</sub>	18.7	X	3.72655	78.72310	6.03412	3.64471	0.1679539	0.30923575	2.1657563	20	—	—
477765 2011 AH <sub>20</sub>	18.2	X	352.22383	111.02298	331.34049	5.42383	0.1720020	0.30586694	2.1816296	20	—	—
477766 2011 AQ <sub>24</sub>	16.3	X	187.06173	229.09157	284.53649	7.61608	0.1907863	0.16898941	3.2401346	20	9 9.9	21.8
477767 2011 AD <sub>28</sub>	17.8	X	321.93032	84.39188	321.48516	6.57104	0.0930840	0.28410799	2.2916436	20	11 19.9	20.1
477768 2011 AY <sub>37</sub>	18.5	X	318.94165	27.74229	35.28397	3.79095	0.0757578	0.29417152	2.2390767	20	—	—
477769 2011 AO <sub>39</sub>	19.0	X	6.98234	68.35820	57.49219	3.36952	0.1529165	0.30674301	2.1774738	20	—	—
477770 2011 AJ <sub>54</sub>	17.9	X	135.56111	261.48806	299.88004	9.50189	0.1206556	0.27149603	2.3620752	20	10 1.6	21.6
477771 2011 AR <sub>56</sub>	18.5	X	261.81987	151.21355	307.85997	1.71327	0.1585937	0.28143711	2.3061195	20	10 14.7	21.0
477772 2011 AK <sub>62</sub>	17.5	X	104.51196	277.20129	336.53964	6.35013	0.0947027	0.27919695	2.3184386	20	11 8.7	20.8
477773 2011 AS <sub>66</sub>	18.4	X	295.33944	143.49372	305.46532	4.51476	0.0992058	0.28761784	2.2729620	20	12 9.1	20.4
477774 2011 AU <sub>68</sub>	18.4	X	305.13657	190.75404	292.66417	4.02876	0.0983087	0.29768797	2.2214090	20	—	—
477775 2011 BR <sub>3</sub>	18.4	X	3.18629	322.51787	107.85340	5.68343	0.0940017	0.30488309	2.1863205	20	—	—
477776 2011 BS <sub>4</sub>	17.9	X	195.46968	1.80586	128.92287	6.23423	0.0722865	0.27069193	2.3667507	20	9 13.6	21.1
477777 2011 BP <sub>8</sub>	19.0	X	23.53624	354.31900	60.49905	1.41329	0.1644085	0.30853252	2.1690460	20	—	—
477778 2011 BK <sub>26</sub>	18.0	X	330.73922	308.56605	106.89431	6.84576	0.1271107	0.29220150	2.2491293	20	12 28.6	19.8
477779 2011 BQ <sub>26</sub>	17.9	X	312.70779	99.37526	331.83822	2.74442	0.1288390	0.29067251	2.2570096	20	12 17.1	19.6
477780 2011 BE <sub>33</sub>	18.0	X	356.53471	277.04374	136.16966	6.05807	0.1234995	0.29610657	2.2293111	20	—	—
477781 2011 BD <sub>36</sub>	18.3	X	331.77897	220.24961	267.78184	1.37513	0.0788515	0.30719438	2.1753403	20	—	—
477782 2011 BY <sub>40</sub>	15.6	X	107.83212	250.43163	193.43732	2.56947	0.1687397	0.12441957	3.9738390	20	4 13.6	21.4
477783 2011 BV <sub>51</sub>	17.9	X	0.09134	94.89887	342.81457	3.89709	0.0766810	0.30303422	2.1952042	20	—	—
477784 2011 BD <sub>54</sub>	17.9	X	216.59635	247.07873	328.40471	4.09071	0.0994983	0.29541550	2.2327865	20	—	—
477785 2011 BZ <sub>56</sub>	17.8	X	159.81098	49.22723	184.00324	6.80411	0.0744306	0.28367399	2.2939804	20	12 17.0	21.0
477786 2011 BS <sub>57</sub>	17.7	X	101.69901	255.94685	343.53932	3.00191	0.1367852	0.26761271	2.3848710	20	10 20.6	21.2
477787 2011 BU <sub>70</sub>	15.9	X	107.78409	204.66200	239.76695	4.01280	0.1354082	0.12362142	3.9909250	20	4 9.1	21.8
477788 2011 BJ <sub>76</sub>	17.6	X	80.23851	340.27579	309.10044	5.58146	0.1514969	0.27278207	2.3546453	20	12 3.5	21.1
477789 2011 BW <sub>86</sub>	17.9	X	114.55166	279.71061	285.80210	1.35781	0.1299285	0.26365046	2.4087054	20	9 19.4	21.3
477790 2011 BM <sub>93</sub>	18.7	X	328.23221	221.33555	254.63646	2.14579	0.1631112	0.30294911	2.1956154	20	—	—
477791 2011 BL <sub>103</sub>	17.2	X	45.93468	122.54920	161.45659	15.93587	0.2405269	0.26041522	2.4286139	20	11 3.2	20.7
477792 2011 BS <sub>104</sub>	18.1	X	199.02549	7.07251	154.01171	6.80840	0.0560285	0.27310203	2.3528059	20	10 31.9	21.2
477793 2011 BP <sub>108</sub>	18.3	X	278.95318	205.40123	309.82971	4.81967	0.0757647	0.29659933	2.2268413	20	—	—
477794 2011 BG <sub>112</sub>	18.3	X	33.94214	205.10720	176.57655	7.16462	0.1769865	0.29498629	2.2349518	20	—	—
477795 2011 CZ <sub>33</sub>	15.6	X	89.96916	338.58803	124.26018	4.86111	0.1642956	0.12774871	3.9044965	20	4 17.7	21.2
477796 2011 CQ <sub>46</sub>	17.1	X	66.66811	237.71789	317.44580	29.76153	0.3945959	0.23790825	2.5794654	20	8 13.6	21.0
477797 2011 CJ <sub>55</sub>	18.1	X	219.73068	251.08168	321.23191	2.55702	0.0410022	0.29577215	2.2309913	20	—	—
477798 2011 CM <sub>67</sub>	17.8	X	231.60711	233.66511	304.99171	6.83011	0.0939916	0.29103424	2.2551390	20	—	—
477799 2011 CH <sub>77</sub>	18.2	X	356.11793	39.12501	28.75215	5.29619	0.1177510	0.29783003	2.2207025	20	—	—
477800 2011 CY <sub>80</sub>	17.7	X	303.62337	120.01401	306.52106	4.95326	0.1093352	0.27998463	2.3140883	20	11 16.4	20.0
477801 2011 CB <sub>85</sub>	18.4	X	264.03056	239.38911	257.26885	1.95760	0.1625885	0.28795746	2.2711745	20	12 16.2	20.5
477802 2011 CB <sub>91</sub>	17.6	X	88.16223	310.79748	297.67194	5.84719	0.0944009	0.26398952	2.4066426	20	10 10.9	21.0
477803 2011 CQ <sub>91</sub>	15.4	X	107.53335	236.94150	214.08664	2.62470	0.1568950	0.12532558	3.9546637	20	4 19.9	21.3
477804 2011 CK <sub>103</sub>	17.8	X	122.48283	277.55094	316.42594	7.19203	0.0717111	0.27071584	2.3666113	20	10 30.6	21.2
477805 2011 CE <sub>116</sub>	18.4	X	71.78548	358.30543	248.36979	1.68893	0.1683085	0.25568012	2.4585066	20	9 29.6	21.7
477806 2011 DA <sub>5</sub>	17.1	X	202.78737	229.64769	281.33357	9.83204	0.1104803	0.27156640	2.3616672	20	10 8.3	20.6
477807 2011 DC <sub>9</sub>	16.8	X	183.95612	123.17745	93.27317	10.44405	0.1703000	0.27950250	2.3167486	20	12 12.5	20.2
477808 2011 DY <sub>9</sub>	18.1	X	237.79692	135.65889	33.38179	2.37569	0.1411759	0.28246315	2.3005315	20	12 20.3	20.5
477809 2011 DX <sub>17</sub>	17.8	X	195.69657	54.35101	139.80010	5.63053	0.1644137	0.27820224	2.3239617	20	11 27.5	21.1
477810 2011 DX <sub>23</sub>	18.2	X	271.84904	28.10033	77.97222	3.85850	0.1610858	0.27762070	2.3272060	20	11 12.1	20.3
477811 2011 DH <sub>44</sub>	17.7	X	335.03189	85.56962	348.96533	7.43629	0.0771401	0.28891580	2.2661493	20	—	—
477812 2011 DV <sub>47</sub>	17.3	X	252.37849	213.87969	327.57295	7.19402	0.0435094	0.29337876	2.2431084	20	—	—
477813 2011 EA <sub>3</sub>	17.6	X	251.92659	191.85965	332.00244	4.21147	0.0629702	0.28570900	2.2830746	20	—	—
477814 2011 EX <sub>6</sub>	17.8	X	206.00421	260.56185	300.28662	5.41924	0.1454023	0.28469962	2.2884677	20	12 20.5	20.7
477815 2011 ED <sub>9</sub>	17.7	X	47.94648	250.91892	334.63521	4.04221	0.1298648	0.24060772	2.5601359	20	7 23.6	20.6
477816 2011 EE <sub>21</sub>	15.3	X	102.10026	62.46905	43.55888	4.24268	0.1864769	0.12626778	3.9349663	20	5 5.1	21.1
477817 2011 EY <sub>25</sub>	17.6	X	81.91320	225.64421	66.60634	3.57044	0.2204608	0.26806261	2.3822019	20	12 13.5	21.4
477818 2011 EP <sub>26</sub>	18.2	X	267.43457	342.34637	124.67158	2.59619	0.1319889	0.27779348	2.3262409	20	11 10.5	20.5
477819 2011 EA <sub>32</sub>	17.9	X	108.15588	65.55542	174.26758	7.82924	0.1722567	0.26284767	2.4136074	20	10 31.9	21.7
477820 2011 EC <sub>36</sub>	17.7	X	229.44915	188.06638	4.63086	5.77964	0.1168189	0.28562190	2.2835387	20	—	—
477821 2011 EH <sub>36</sub>	17.4	X	310.07652	238.83964	159.35662	6.26371	0.0997404	0.26650382	2.3914819	20	10 17.2	19.8
477822 2011 EB <sub>37</sub>	17.9	X	322.37303	82.64421	6.95963	5.39548	0.1053047	0.28673852	2.2776065	20	—	—
477823 2011 EC <sub>42</sub>	17.0	X	324.15196	301.23229	126.78424	7.27088	0.0668138	0.28036899	2.3119729	20	12 25.6	19.6
477824 2011 EA <sub>45</sub>	17.1	X	335.69408	38.06180	22.00182	8.14285	0.1397559	0.28473835	2.2882602	20	—	—
477825 2011 EL <sub>50</sub>	17.6	X	332.33870	10.12262	88.71285	7.94710	0.0725560	0.29368021	2.2415732	20	—	—
477826 2011 EB <sub>51</sub>	16.8	X	36.99978	104.67904	141.07308	28.62826	0.3745358	0.23427847	2.6060403	20	9 18.1	20.4
477827 2011 EU <sub>52</sub>	17.0	X	29.80191	84.70843	162.37307	12.20730	0.3015867	0.23276046	2.6173587	20	8 20.5	19.6
477828 2011 EW <sub>60</sub>	17.0	X	27.25782	186.84776	70.71410	8.83110	0.1670493	0.24236507	2.5477454	20	8 13.9	19.8
477829 2011 EJ <sub>67</sub>	17.6	X	202.54244	289.93512	275.19248	1.25382	0.1590761	0.28084275	2.3093720	20	12 19.2	20.5
477830 2011 EG <sub>69</sub>	17.8	X	274.30883	66.43559	72.03845	4.14497	0.1138499	0.28543044	2.2845598	20	—	—
477831 2011 EL <sub>71</sub>	17.6	X	7.35247	3.65920	44.34683	7.66504	0.1029697	0.28247417	2.3004717	20	—	—
477832 2011 EW <sub>75</sub>	17.9	X	227.72995	188.59262	349.00665	3.20775	0.1084448	0.28346976	2.2950821	20	12 23.2	20.6
477833 2011 ET <sub>85</sub>	17.4	X	249.85934	28.51210	106.92425	8.30609	0.1110210	0.27851554	2.3222186	20	11 27.1	20.0
477834 2011 FZ <sub>4</sub>	17.5	X	202.68459	345.58561	152.17120	12.32326	0.1375127	0.26498096	2.4006357			

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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>
477841 2011 FS <sub>45</sub>	17.8	X	240.16744	42.28269	118.04172	3.23287	0.1340891	0.27705119	2.3303941	20	12 11.6	20.4
477842 2011 FL <sub>55</sub>	16.9	X	195.48872	91.48359	93.99990	9.27696	0.0598628	0.27190713	2.3596938	20	11 27.3	19.9
477843 2011 FJ <sub>70</sub>	17.6	X	120.18356	174.94942	40.24735	5.99270	0.1429901	0.25942893	2.4347654	20	10 9.9	21.2
477844 2011 FO <sub>76</sub>	18.1	X	76.34211	136.82345	150.37289	3.72668	0.1158382	0.26547679	2.3976457	20	11 23.5	21.5
477845 2011 FJ <sub>81</sub>	18.2	X	246.46041	339.57170	157.67016	2.03259	0.1499376	0.27730719	2.3289596	20	11 16.7	20.9
477846 2011 FY <sub>100</sub>	18.5	X	315.90614	177.07578	286.98759	1.64229	0.1271731	0.28786057	2.2716841	20	—	—
477847 2011 FH <sub>129</sub>	17.1	X	57.23360	199.78962	28.58469	16.13451	0.1056004	0.24466408	2.5317602	20	8 14.9	20.7
477848 2011 FJ <sub>137</sub>	18.2	X	340.15422	77.10209	356.30287	7.58709	0.1694438	0.29113668	2.2546100	20	—	—
477849 2011 FH <sub>152</sub>	18.6	X	249.52645	319.47769	48.51316	17.14561	0.1430086	0.44434422	1.7008122	20	5 17.8	20.0
477850 2011 FC <sub>153</sub>	17.4	X	242.19982	174.79044	335.48125	4.73721	0.0633037	0.28008218	2.3135509	20	12 11.9	20.1
477851 2011 GT <sub>27</sub>	17.3	X	132.04193	102.58604	145.20285	14.66620	0.1664602	0.26564475	2.3966349	20	12 3.4	21.4
477852 2011 GZ <sub>28</sub>	17.0	X	334.72008	128.44093	167.69885	12.15767	0.2682694	0.23102236	2.6304701	20	6 6.8	19.4
477853 2011 GN <sub>36</sub>	18.0	X	245.46829	326.92977	206.36022	11.21011	0.1865796	0.28224577	2.3017126	20	12 29.6	20.6
477854 2011 GJ <sub>47</sub>	17.2	X	349.75955	237.09810	40.14130	17.27799	0.2186031	0.22537674	2.6742170	20	6 15.6	19.8
477855 2011 GR <sub>48</sub>	18.5	X	142.66809	269.90427	311.69311	1.05907	0.0909536	0.26338754	2.4103081	20	11 7.7	21.8
477856 2011 GC <sub>49</sub>	18.0	X	40.42543	232.88677	21.61883	7.47368	0.1675786	0.23935497	2.5690610	20	8 31.1	21.1
477857 2011 GQ <sub>49</sub>	18.0	X	145.32996	212.31916	27.33434	3.60779	0.1117554	0.26807213	2.3821454	20	12 3.6	21.6
477858 2011 GV <sub>57</sub>	16.7	X	32.10574	230.96717	30.73482	32.21971	0.3561115	0.23331673	2.6131969	20	10 7.7	20.2
477859 2011 GU <sub>58</sub>	17.6	X	77.87511	5.10206	202.39651	8.24308	0.1007248	0.23937512	2.5689168	20	8 1.9	21.2
477860 2011 GH <sub>61</sub>	17.3	X	17.07389	206.86780	73.62480	12.22416	0.1895586	0.23766022	2.5812598	20	9 4.7	20.2
477861 2011 GE <sub>69</sub>	16.8	X	267.27830	358.00217	140.48874	26.16497	0.2162284	0.28061025	2.3106475	20	12 19.4	19.5
477862 2011 HD <sub>10</sub>	17.8	X	266.12703	341.64772	159.95182	8.34882	0.1462609	0.27957225	2.3163633	20	12 26.6	20.2
477863 2011 HM <sub>10</sub>	18.2	X	276.53593	96.37198	39.10559	6.51680	0.0874161	0.28272005	2.2991377	20	—	—
477864 2011 HE <sub>12</sub>	17.5	X	50.15208	216.10465	84.38321	4.79879	0.1606522	0.25332764	2.4737036	20	11 13.9	20.8
477865 2011 HC <sub>21</sub>	17.6	X	32.46634	323.89584	324.65585	3.88137	0.1556649	0.24378512	2.5378421	20	9 29.5	20.5
477866 2011 HN <sub>22</sub>	17.3	X	138.09382	191.74675	75.43627	6.37373	0.0355722	0.27189701	2.3597523	20	—	—
477867 2011 HY <sub>24</sub>	17.5	X	21.44994	69.39757	172.42732	15.22970	0.1507749	0.22647379	2.6655740	20	7 1.4	20.7
477868 2011 HV <sub>25</sub>	17.2	X	190.50289	18.03083	147.66855	8.28385	0.0538914	0.25866802	2.4395378	20	10 25.7	20.6
477869 2011 HZ <sub>30</sub>	17.0	X	193.19723	99.70138	97.68690	7.41290	0.0721588	0.26667757	2.3904430	20	12 6.5	20.3
477870 2011 HO <sub>37</sub>	16.7	X	322.75896	246.00396	68.94063	14.77246	0.1468455	0.22950112	2.6420813	20	6 23.3	19.6
477871 2011 HC <sub>40</sub>	16.9	X	15.07787	235.69676	59.69091	17.54754	0.1595435	0.24132049	2.5550922	20	9 23.9	20.1
477872 2011 HC <sub>42</sub>	16.9	X	64.02321	137.22835	77.30467	13.16398	0.0517447	0.23207196	2.6225328	20	7 19.1	20.4
477873 2011 HZ <sub>49</sub>	17.2	X	45.68131	115.48097	123.08701	5.91469	0.2335594	0.23278515	2.6117137	20	8 24.9	20.3
477874 2011 HN <sub>52</sub>	17.0	X	58.88537	49.87455	178.03948	13.39404	0.1107407	0.23376603	2.6098474	20	8 5.2	20.6
477875 2011 HD <sub>56</sub>	17.1	X	85.04966	145.66460	57.36067	12.20502	0.1118908	0.23814779	2.5777354	20	8 14.7	20.9
477876 2011 HO <sub>56</sub>	17.5	X	43.51439	84.52288	177.68242	7.19271	0.1806292	0.23810231	2.5780637	20	9 13.8	20.6
477877 2011 HE <sub>64</sub>	17.4	X	25.81266	26.73162	216.66308	11.27112	0.1305693	0.22816434	2.6523910	20	7 7.9	20.6
477878 2011 HW <sub>65</sub>	18.1	X	183.65828	130.44563	88.33400	3.56836	0.1055715	0.27572829	2.3378420	20	12 20.5	21.2
477879 2011 HC <sub>66</sub>	17.5	X	10.94951	201.27799	43.51295	8.88943	0.2249027	0.22771824	2.6558538	20	6 20.7	19.8
477880 2011 HA <sub>66</sub>	17.6	X	6.31714	197.67859	181.32229	7.49766	0.1830028	0.23222912	2.6213495	20	8 20.1	20.2
477881 2011 HA <sub>80</sub>	17.6	X	14.57772	113.47283	180.48907	7.34880	0.1963465	0.23474159	2.6026115	20	9 12.4	20.1
477882 2011 HS <sub>84</sub>	17.4	X	147.77319	5.08872	228.14222	6.63788	0.1172170	0.26263546	2.4149074	20	11 27.7	20.9
477883 2011 HQ <sub>97</sub>	17.3	X	107.61377	304.20598	325.88811	6.15440	0.0966723	0.26474773	2.4020454	20	12 1.8	20.9
477884 2011 JO <sub>6</sub>	17.7	X	142.63402	137.33034	55.66533	5.74774	0.0775979	0.25498009	2.4630045	20	10 3.3	21.2
477885 2011 JT <sub>9</sub>	17.1	X	343.25891	185.25321	118.96663	19.06730	0.5197297	0.22313243	2.6921190	20	6 6.2	18.0
477886 2011 JA <sub>13</sub>	16.3	X	37.58938	185.32412	93.09782	19.13185	0.2345314	0.23858743	2.5745678	20	10 18.0	20.1
477887 2011 JS <sub>13</sub>	16.9	X	24.41761	181.97368	90.24689	16.36263	0.1157880	0.23595516	2.5936800	20	8 24.3	20.2
477888 2011 JX <sub>17</sub>	17.2	X	47.02689	148.13653	98.40733	7.75210	0.1939018	0.23436791	2.6053772	20	9 2.8	20.5
477889 2011 JX <sub>20</sub>	17.7	X	248.94660	93.06768	75.58998	7.70296	0.0571111	0.27585827	2.3371076	20	—	—
477890 2011 JP <sub>21</sub>	17.7	X	45.13263	40.45033	199.52497	4.47754	0.1116723	0.23907714	2.5710509	20	8 3.4	20.8
477891 2011 JH <sub>22</sub>	17.5	X	354.23895	114.19541	176.06796	11.49460	0.1886181	0.22936244	2.6431462	20	7 19.8	20.2
477892 2011 JE <sub>27</sub>	17.0	X	25.38030	169.56169	87.91851	15.28908	0.2220172	0.23136670	2.6278595	20	8 19.4	20.1
477893 2011 KL <sub>1</sub>	16.6	X	21.15474	166.68614	94.05239	9.50720	0.1012787	0.23032728	2.6357596	20	7 25.3	19.6
477894 2011 KW <sub>3</sub>	16.9	X	45.37615	213.72294	81.50250	7.27845	0.2609940	0.24209390	2.5496475	20	11 13.6	20.5
477895 2011 KU <sub>4</sub>	17.4	X	48.07172	186.28148	73.09153	9.97451	0.1346225	0.23769760	2.5809892	20	9 15.4	20.8
477896 2011 KB <sub>6</sub>	17.6	X	222.04136	290.09230	239.57401	2.73705	0.1025261	0.26982602	2.3718115	20	12 2.0	20.5
477897 2011 KP <sub>6</sub>	16.9	X	98.11735	321.46357	233.18324	12.04819	0.0834274	0.23741952	2.5830041	20	8 5.4	20.8
477898 2011 KM <sub>9</sub>	16.4	X	51.86600	149.91950	100.47419	16.49758	0.2051982	0.23528476	2.5986045	20	9 21.7	20.2
477899 2011 KP <sub>11</sub>	16.8	X	23.34093	192.63758	77.07017	15.80579	0.2260825	0.23138589	2.6277142	20	9 7.6	19.9
477900 2011 KX <sub>11</sub>	16.3	X	113.56655	295.84895	244.56811	21.15303	0.0632356	0.23499363	2.6007503	20	7 29.8	20.5
477901 2011 KL <sub>23</sub>	17.5	X	108.96301	350.17487	187.13677	7.91296	0.1666003	0.23658611	2.5890666	20	8 6.9	21.6
477902 2011 KT <sub>24</sub>	17.2	X	231.84865	87.18016	69.81426	8.03285	0.0665636	0.26657302	2.3910680	20	12 2.8	20.1
477903 2011 KF <sub>27</sub>	17.7	X	172.72708	128.18085	81.66801	5.60620	0.1671841	0.26388107	2.4073019	20	11 21.0	21.4
477904 2011 KQ <sub>27</sub>	17.5	X	10.37618	39.12564	241.40695	10.54994	0.1589960	0.23018253	2.6368644	20	8 4.4	20.5
477905 2011 KX <sub>29</sub>	17.6	X	73.90495	340.48514	259.84736	4.28361	0.1826904	0.24117336	2.5561313	20	9 22.0	21.3
477906 2011 KY <sub>30</sub>	17.2	X	3.56028	89.18836	228.85740	10.45276	0.2593044	0.23407434	2.6075552	20	10 3.3	19.6
477907 2011 KW <sub>32</sub>	16.8	X	292.60123	275.50725	80.42847	7.95113	0.1918985	0.22525706	2.6751642	20	6 23.8	20.0
477908 2011 KS <sub>45</sub>	17.6	X	36.95517	105.51900	167.24263	11.00801	0.1686561	0.23598634	2.5934516	20	9 17.4	20.7
477909 2011 LF <sub>4</sub>	17.5	X	23.41869	92.69500	218.16948	10.73032	0.1997236	0.24109677	2.5566727	20	10 24.4	20.4
477910 2011 LF <sub>6</sub>	17.8	X	207.33715	339.78557	205.71711	4.42841	0.1443724	0.26720440	2.3872999	20	11 28.7	21.0
477911 2011 LY <sub>10</sub>	16.8	X	353.76568	189.32371	110.30773	15.35783	0.2490429	0.22657375	2.6647900	20	8 10.5	18.9
477912 2011 LO <sub>17</sub>	17.6	X	271.90996	46.67582	256.78800	15.59092	0.4739777	0.19576929	2.9374670	20	2 18.4	23.3
477913 2011 LG <sub>25</sub>	17.2	X	105.02650	348.85879	203.70038	7.44138	0.1343235	0.23840029	2.5759150	20	8 19.	



ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
477921 2011 QN <sub>10</sub>	16.7	X	86.13128	263.65953	323.54557	11.89728	0.0646564	0.21767702	2.7369130	20	9 1.0	20.5
477922 2011 QY <sub>18</sub>	17.0	X	38.81812	126.29958	163.26754	14.32190	0.1189358	0.22590579	2.6700403	20	10 5.5	20.4
477923 2011 QV <sub>23</sub>	16.7	X	247.80119	36.91985	330.88377	7.10614	0.0685559	0.19599899	2.9351715	20	5 28.0	21.1
477924 2011 QQ <sub>24</sub>	16.6	X	12.49692	279.72316	338.14313	9.22596	0.0509840	0.20388031	2.8590331	20	7 1.3	20.4
477925 2011 QK <sub>29</sub>	16.4	X	251.55200	2.62308	342.61341	9.80140	0.0774623	0.19168497	2.9790469	20	4 30.0	21.0
477926 2011 QL <sub>36</sub>	17.0	X	320.98669	193.35568	158.44236	4.80754	0.0798733	0.21476551	2.7615931	20	8 18.6	20.4
477927 2011 QG <sub>46</sub>	17.5	X	354.30218	169.25157	6.22460	20.23600	0.0756964	0.39590161	1.8368677	20	1 10.5	19.6
477928 2011 QS <sub>48</sub>	17.3	X	46.28835	276.25961	342.97894	8.10614	0.1343647	0.21842043	2.7306993	20	9 3.9	20.7
477929 2011 QM <sub>55</sub>	17.1	X	0.30026	10.59273	289.20089	7.15356	0.1829176	0.21516594	2.7581658	20	8 15.2	19.9
477930 2011 QZ <sub>57</sub>	16.8	X	215.43489	96.88864	300.54867	9.18529	0.1218925	0.19302743	2.9652185	20	5 24.5	21.5
477931 2011 QX <sub>58</sub>	16.4	X	6.50411	339.43143	304.58777	8.21210	0.1150240	0.21448174	2.7640284	20	7 31.7	19.3
477932 2011 QO <sub>62</sub>	16.8	X	81.02571	257.11383	327.35629	7.67495	0.0932774	0.21496908	2.7598494	20	8 27.4	20.7
477933 2011 QZ <sub>63</sub>	17.2	X	55.76331	334.99877	276.31941	7.97841	0.0899370	0.21906069	2.7253760	20	8 26.6	21.0
477934 2011 QC <sub>67</sub>	15.3	X	234.32256	57.70490	267.05987	21.91516	0.1980603	0.18023622	3.1039020	20	3 1.7	21.0
477935 2011 QD <sub>74</sub>	17.0	X	227.05016	127.93922	238.62951	1.33528	0.1120385	0.18877966	3.0095340	20	4 30.2	21.7
477936 2011 QQ <sub>74</sub>	17.4	X	302.72401	33.03895	346.43842	2.70716	0.1031978	0.21466527	2.7624527	20	8 26.0	20.7
477937 2011 QO <sub>78</sub>	16.8	X	314.63894	359.73809	346.29799	8.38612	0.1366248	0.21127682	2.7919104	20	7 27.5	20.1
477938 2011 QM <sub>82</sub>	16.5	X	235.87452	39.39519	349.94092	8.80155	0.1070230	0.20026816	2.8933087	20	6 6.5	21.0
477939 2011 QH <sub>83</sub>	16.5	X	341.85254	324.30066	349.36146	9.81227	0.1127758	0.21360995	2.7715437	20	8 2.1	19.7
477940 2011 QF <sub>88</sub>	17.2	X	246.63175	295.40962	50.99060	1.87386	0.2106963	0.18966609	3.0001497	20	4 17.1	22.0
477941 2011 QM <sub>88</sub>	16.9	X	249.84017	42.80227	334.10111	1.11087	0.0707508	0.19870063	2.9085055	20	6 12.5	20.9
477942 2011 QJ <sub>93</sub>	16.6	X	352.68615	332.21551	337.90858	14.28660	0.0594485	0.21098275	2.7945041	20	8 14.5	20.1
477943 2011 QH <sub>94</sub>	17.0	X	183.34246	106.86433	313.07193	8.98322	0.1243647	0.18755517	3.0226187	20	5 20.1	22.0
477944 2011 QQ <sub>94</sub>	17.6	X	297.15376	56.43065	323.90268	6.57434	0.2352272	0.21058276	2.7980416	20	7 28.7	20.9
477945 2011 QV <sub>94</sub>	16.2	X	102.96534	148.79186	310.04186	8.65245	0.2533875	0.17794898	3.1304424	20	3 30.7	20.8
477946 2011 QY <sub>94</sub>	17.6	X	328.57713	45.16052	236.78633	2.23651	0.0891647	0.19816026	2.9137906	20	5 24.1	21.1
477947 2011 QB <sub>97</sub>	17.0	X	0.93545	281.23194	11.55657	4.32566	0.0443523	0.20854152	2.8162704	20	8 1.2	20.5
477948 2011 QF <sub>98</sub>	16.2	X	185.02008	267.63191	158.08423	26.03363	0.2612551	0.18379798	3.0636717	20	6 3.2	22.1
477949 2011 RM <sub>4</sub>	16.9	X	297.56066	254.07961	78.59752	3.25769	0.0934916	0.19827065	2.9127090	20	6 14.1	20.6
477950 2011 RT <sub>11</sub>	16.1	X	186.01958	95.74864	295.47516	6.63649	0.0366194	0.17960457	3.1111752	20	4 16.7	20.8
477951 2011 RE <sub>12</sub>	16.6	X	266.61980	244.07413	181.34736	15.46815	0.1989118	0.21066175	2.7973422	20	8 15.9	20.6
477952 2011 RL <sub>12</sub>	16.6	X	322.91797	356.41788	355.76415	15.97085	0.1730704	0.21249304	2.7812471	20	8 21.2	19.6
477953 2011 RX <sub>12</sub>	17.2	X	354.72598	157.50371	177.45714	6.48477	0.0608068	0.21999101	2.7176870	20	9 19.4	20.3
477954 2011 RW <sub>15</sub>	16.7	X	94.13951	285.64550	283.86045	8.84717	0.1094937	0.21743180	2.7389704	20	8 22.9	20.8
477955 2011 RS <sub>17</sub>	16.5	X	152.36775	246.09771	193.87901	9.08387	0.0724027	0.18391294	3.0623949	20	5 15.1	21.1
477956 2011 RT <sub>18</sub>	16.8	X	158.48039	42.65447	13.20889	10.06780	0.0885794	0.17582168	3.1556423	20	4 20.0	21.7
477957 2011 SF <sub>5</sub>	17.1	X	261.79209	132.35080	250.89993	1.06239	0.0786631	0.20264020	2.8706857	20	7 4.9	21.0
477958 2011 SG <sub>9</sub>	16.3	X	346.58876	14.59027	24.84315	14.87385	0.1759919	0.22874417	2.6479068	20	12 14.3	19.4
477959 2011 SU <sub>11</sub>	16.8	X	209.08591	165.76171	243.10164	6.73724	0.0827610	0.19166266	2.9792781	20	6 5.1	21.3
477960 2011 SB <sub>23</sub>	16.9	X	301.22727	94.08921	263.47450	0.94314	0.0806199	0.20346288	2.8629422	20	7 25.4	20.9
477961 2011 SX <sub>33</sub>	16.7	X	166.98833	263.68453	156.25773	0.44698	0.1704210	0.17659328	3.1464435	20	5 8.2	21.9
477962 2011 SA <sub>34</sub>	18.0	X	316.87489	201.68972	340.86491	16.60156	0.0583888	0.38456212	1.8728013	20	—	—
477963 2011 SG <sub>35</sub>	16.2	X	218.55985	323.59195	26.95636	9.15796	0.0934459	0.17525621	3.1624265	20	4 5.2	21.0
477964 2011 SL <sub>37</sub>	15.6	X	54.46674	146.03086	30.16381	27.33611	0.1416748	0.17462490	3.1700438	20	5 16.5	20.0
477965 2011 SH <sub>42</sub>	16.7	X	198.85933	340.54511	21.86896	0.39548	0.1091979	0.17723943	3.1387916	20	3 29.2	21.7
477966 2011 SF <sub>45</sub>	16.1	X	162.43066	65.29462	332.71014	7.95322	0.0943406	0.17572251	3.1568295	20	4 1.6	21.0
477967 2011 SW <sub>47</sub>	17.2	X	208.36812	213.90924	181.83853	4.70731	0.2214570	0.18624317	3.0367974	20	5 13.8	22.3
477968 2011 SE <sub>51</sub>	15.7	X	237.75750	25.76107	289.50743	6.72261	0.2046667	0.17411339	3.1762494	20	3 2.2	21.0
477969 2011 SF <sub>52</sub>	16.6	X	160.54407	72.70049	9.18406	10.96865	0.1047013	0.18341382	3.0679482	20	5 23.5	21.5
477970 2011 SZ <sub>52</sub>	16.4	X	263.05357	322.26844	9.15003	8.71522	0.0136270	0.18478343	3.0527697	20	5 6.9	20.8
477971 2011 SL <sub>64</sub>	17.5	X	334.78783	97.55866	221.85022	7.41326	0.2111490	0.21323705	2.7747739	20	7 16.6	20.2
477972 2011 SE <sub>65</sub>	15.9	X	107.07664	263.89794	247.97078	9.06574	0.0538679	0.18994431	2.9972194	20	6 19.1	20.2
477973 2011 SH <sub>65</sub>	16.3	X	234.72948	54.63882	310.11862	7.34563	0.1541137	0.18609714	3.0383858	20	4 29.6	21.3
477974 2011 SL <sub>68</sub>	17.9	X	221.54284	102.92314	178.35313	27.02004	0.1117513	0.38457616	1.8727558	20	—	—
477975 2011 ST <sub>76</sub>	17.3	X	308.16059	12.37518	306.70859	1.45600	0.1068049	0.19950377	2.9006944	20	6 9.6	21.1
477976 2011 SJ <sub>78</sub>	17.2	X	234.71134	220.20796	185.36611	8.90223	0.1413858	0.19767692	2.9185383	20	6 23.3	21.8
477977 2011 SJ <sub>82</sub>	16.5	X	211.99513	12.45581	346.09543	4.22720	0.1536227	0.18009652	3.1055069	20	4 3.3	21.5
477978 2011 SL <sub>83</sub>	16.5	X	254.26105	335.03472	8.48745	11.38381	0.0766346	0.18426476	3.0584956	20	5 2.1	21.0
477979 2011 SK <sub>85</sub>	17.9	X	209.63637	115.12161	194.55445	21.57310	0.0462248	0.38476434	1.8721451	20	1 3.6	20.5
477980 2011 SN <sub>85</sub>	17.0	X	184.55848	237.41452	191.61535	11.02556	0.2261820	0.17904680	3.1176331	20	6 3.6	22.5
477981 2011 SN <sub>89</sub>	15.9	X	262.10594	331.92357	3.60143	9.52554	0.1048033	0.18538854	3.0461232	20	4 28.1	20.5
477982 2011 SF <sub>91</sub>	16.4	X	168.16472	126.73061	306.52791	3.23461	0.0903180	0.17884820	3.1199407	20	5 22.4	21.1
477983 2011 SY <sub>93</sub>	16.3	X	145.08259	233.71938	216.80597	15.35613	0.2020517	0.17382639	3.1797446	20	5 27.6	21.7
477984 2011 SU <sub>95</sub>	17.4	X	231.86607	67.28516	2.98450	1.61968	0.1424341	0.20276898	2.8694701	20	7 22.5	21.6
477985 2011 SE <sub>99</sub>	16.8	X	340.48787	120.14986	144.37855	1.31422	0.0847144	0.19132899	2.9827409	20	5 20.1	20.6
477986 2011 SN <sub>101</sub>	17.2	X	271.88002	238.85692	150.79301	2.45118	0.0789482	0.20614476	2.8380575	20	7 26.9	21.0
477987 2011 SY <sub>104</sub>	16.9	X	266.78547	184.30820	226.83491	14.50074	0.1223674	0.20391265	2.8587308	20	8 5.3	21.2
477988 2011 SG <sub>107</sub>	16.1	X	275.53560	105.55957	225.38569	21.90058	0.0571407	0.17950585	3.1123157	20	5 18.7	20.5
477989 2011 SW <sub>109</sub>	17.0	X	263.67008	72.76579	2.38300	8.75218	0.2098335	0.21503049	2.7593239	20	8 29.1	20.7
477990 2011 SB <sub>116</sub>	17.0	X	283.09532	39.13001	9.16083	7.71512	0.2237363	0.21361699	2.7714828	20	8 18.4	20.5
477991 2011 SX <sub>117</sub>	16.5	X	335.01818	2.20729	14.71909	9.62876	0.1485972	0.22106326	2.7088919	20	10 17.2	19.4
477992 2011 SL <sub>124</sub>	16.9	X	38.49430	106.59770	182.92167	4.19005	0.0345301	0.21327435	2.7744504	20	9 17.4	20.7
477993 2011 SB <sub>127</sub>	17.1	X	233.29596	337.29697	29.99298	4.59495	0.2277381	0.18527423				

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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>		
478001	2011	SN <sub>139</sub>	17.3	X	216.73864	47.31170	15.68164	5.39662	0.1579526	0.19220890	2.9736309	20	6 25.8	22.1
478002	2011	SG <sub>140</sub>	17.1	X	288.62451	307.49254	30.35988	2.02466	0.0691237	0.19345795	2.9608177	20	6 11.8	21.0
478003	2011	SU <sub>141</sub>	17.4	X	279.24835	0.11847	30.43157	2.04684	0.2230521	0.20379393	2.8598410	20	7 16.3	21.2
478004	2011	SH <sub>142</sub>	16.9	X	245.31203	153.06717	197.65173	1.76972	0.0964996	0.18360234	3.0658477	20	5 2.2	21.3
478005	2011	SF <sub>144</sub>	16.3	X	201.56885	242.93847	173.45887	9.05276	0.1392743	0.18846121	3.0129232	20	6 5.1	21.2
478006	2011	SC <sub>160</sub>	16.5	X	286.86758	343.43129	358.33092	17.44946	0.1176096	0.20176984	2.8789351	20	6 3.7	20.7
478007	2011	SL <sub>164</sub>	17.2	X	244.44340	235.94165	165.04524	2.11432	0.1060448	0.19559311	2.9392307	20	7 2.4	21.4
478008	2011	SN <sub>164</sub>	16.5	X	114.29432	293.60445	194.37843	10.06513	0.0598404	0.18092813	3.0959836	20	5 30.3	21.1
478009	2011	SM <sub>165</sub>	16.8	X	233.62022	321.16797	39.17784	2.74053	0.1632847	0.18197634	3.0840833	20	4 25.7	21.7
478010	2011	SN <sub>170</sub>	16.3	X	229.95423	169.12175	214.36413	9.06974	0.0787090	0.18406687	3.0606873	20	5 28.1	20.9
478011	2011	SA <sub>178</sub>	16.5	X	183.50122	55.69252	2.85154	12.88052	0.1388526	0.18142454	3.0903335	20	5 16.6	21.7
478012	2011	ST <sub>183</sub>	16.5	X	274.16034	186.37552	145.72584	3.64324	0.0683974	0.18403657	3.0610233	20	5 17.6	20.8
478013	2011	SQ <sub>184</sub>	18.6	X	215.43308	95.44882	196.51294	20.99231	0.1006587	0.38289630	1.8782293	20	—	—
478014	2011	SX <sub>189</sub>	16.7	X	339.92646	310.18391	344.90407	9.27450	0.0815534	0.20500619	2.8485558	20	7 1.7	20.3
478015	2011	SM <sub>191</sub>	16.3	X	286.10423	2.21462	31.66807	9.64237	0.1654453	0.20951417	2.8075475	20	8 13.9	19.9
478016	2011	SH <sub>192</sub>	17.2	X	320.84662	109.77296	247.35494	1.76992	0.0957348	0.21324970	2.7746642	20	8 23.9	20.4
478017	2011	SL <sub>197</sub>	17.3	X	308.42101	26.65001	307.40833	1.02399	0.0712932	0.20382902	2.8595128	20	7 5.5	20.9
478018	2011	SF <sub>197</sub>	17.2	X	224.57949	254.07561	190.47905	1.74430	0.0219235	0.21097995	2.7945288	20	8 15.3	21.1
478019	2011	SS <sub>197</sub>	17.4	X	277.64608	354.68725	328.56441	2.26696	0.0891253	0.19231330	2.9725546	20	5 5.4	21.5
478020	2011	SZ <sub>199</sub>	17.3	X	249.14547	23.07643	28.48172	3.09942	0.1409716	0.20550579	2.8439372	20	7 18.6	21.5
478021	2011	SB <sub>202</sub>	17.0	X	220.98225	22.94082	1.62468	10.04699	0.1095776	0.19079193	2.9883357	20	5 13.3	21.7
478022	2011	SZ <sub>206</sub>	16.2	X	96.53016	46.87644	166.14556	25.63347	0.0770618	0.21821416	2.7324198	20	8 29.3	20.0
478023	2011	SY <sub>208</sub>	16.6	X	248.92808	14.38242	329.53899	10.07164	0.0616360	0.18718116	3.0266437	20	4 26.9	21.2
478024	2011	SX <sub>208</sub>	16.5	X	229.52324	290.21776	62.88344	6.29898	0.1548548	0.17943781	3.1131024	20	4 15.8	21.4
478025	2011	SA <sub>210</sub>	17.0	X	259.68038	163.48378	150.53737	1.77900	0.1094264	0.18336810	3.0684581	20	4 5.4	21.4
478026	2011	SE <sub>217</sub>	16.8	X	308.88374	18.62837	356.02243	8.04474	0.1558917	0.21391948	2.7688695	20	8 25.1	19.8
478027	2011	SY <sub>225</sub>	16.9	X	237.53894	47.53539	345.94228	9.69956	0.1974532	0.19154437	2.9805045	20	6 4.3	21.8
478028	2011	SN <sub>233</sub>	15.9	X	140.35879	195.05798	283.50596	9.16325	0.0393550	0.18528302	3.0472795	20	6 15.4	20.3
478029	2011	SF <sub>236</sub>	17.1	X	6.17601	13.13092	288.57640	2.63826	0.0802282	0.21374968	2.7703357	20	8 21.9	20.4
478030	2011	SM <sub>236</sub>	17.3	X	309.15622	124.94677	188.11919	8.61042	0.0995793	0.19940961	2.9016075	20	6 4.9	21.1
478031	2011	SH <sub>240</sub>	17.0	X	236.03528	38.84198	13.22118	1.79374	0.0645088	0.20077357	2.8884512	20	7 12.7	21.0
478032	2011	SH <sub>241</sub>	16.8	X	202.57220	351.19759	27.34853	2.41232	0.0708877	0.18141214	3.0904744	20	4 21.9	21.3
478033	2011	SY <sub>242</sub>	16.7	X	246.36839	173.79822	172.15874	9.89458	0.1806567	0.18651488	3.0338473	20	4 20.9	21.6
478034	2011	SA <sub>254</sub>	16.5	X	223.81216	81.19750	289.58440	9.89971	0.1093607	0.18505308	3.0498033	20	4 29.1	21.4
478035	2011	SB <sub>255</sub>	17.1	X	275.37997	145.84009	249.36022	6.74781	0.2265986	0.20998370	2.8033608	20	7 15.3	20.9
478036	2011	SS <sub>255</sub>	16.3	X	148.29518	233.24513	203.08147	10.75593	0.0629856	0.17944023	3.1130744	20	5 5.2	20.9
478037	2011	SN <sub>256</sub>	17.5	X	184.43121	11.47706	36.94990	0.53048	0.1750671	0.18231236	3.0802926	20	5 9.2	22.7
478038	2011	SA <sub>257</sub>	16.8	X	112.94405	130.62465	355.51928	10.80148	0.0561616	0.18264380	3.0765650	20	5 21.6	21.4
478039	2011	SA <sub>258</sub>	17.2	X	192.04234	66.26023	11.41145	2.16525	0.2027604	0.18615382	3.0377690	20	6 19.4	22.4
478040	2011	SY <sub>258</sub>	16.4	X	91.66250	139.49633	41.36383	16.95956	0.0472403	0.18449583	3.0559413	20	7 7.4	21.0
478041	2011	SY <sub>258</sub>	16.2	X	227.29619	174.05042	219.91374	9.64743	0.1052021	0.18195683	3.0843037	20	6 4.6	20.9
478042	2011	SE <sub>259</sub>	16.2	X	312.10661	106.29225	224.95642	11.41701	0.1239466	0.20448918	2.8533551	20	6 29.1	19.9
478043	2011	SG <sub>259</sub>	16.4	X	195.15762	25.45278	4.85190	11.12091	0.0892783	0.18274599	3.0754180	20	4 24.9	21.2
478044	2011	SZ <sub>259</sub>	16.9	X	177.63472	218.00914	208.58693	10.11800	0.1362750	0.18164870	3.0877907	20	5 25.8	21.9
478045	2011	SB <sub>260</sub>	17.2	X	202.16786	198.33030	199.42164	9.47607	0.1196364	0.18391790	3.0623398	20	5 14.6	22.0
478046	2011	SS <sub>260</sub>	16.4	X	130.26557	83.60029	31.70374	10.45807	0.1916660	0.17418720	3.1753521	20	6 11.0	21.6
478047	2011	SB <sub>261</sub>	16.8	X	277.78420	339.58030	8.94299	2.33869	0.0801902	0.18930091	3.0040068	20	6 9.4	21.0
478048	2011	SD <sub>261</sub>	17.4	X	286.37279	20.56219	344.47917	1.31028	0.1162886	0.20048307	2.8912407	20	7 8.4	21.2
478049	2011	SO <sub>261</sub>	17.5	X	243.77073	3.06096	28.88796	2.27046	0.0780274	0.19803339	2.9150350	20	6 23.8	21.6
478050	2011	SR <sub>265</sub>	16.5	X	248.03293	281.04072	62.05291	3.85599	0.1260157	0.18312940	3.0711238	20	4 23.3	21.0
478051	2011	SU <sub>268</sub>	16.3	X	186.39154	23.63530	31.17404	9.71812	0.1151716	0.18323560	3.0699371	20	5 17.3	21.2
478052	2011	SH <sub>274</sub>	16.7	X	340.17599	311.02178	21.74123	4.95602	0.1617804	0.21383949	2.7695600	20	8 25.5	19.5
478053	2011	SU <sub>275</sub>	16.8	X	205.40133	294.50677	105.00918	5.22757	0.1468333	0.18709184	3.0276068	20	5 18.8	21.7
478054	2011	TX <sub>7</sub>	16.1	X	294.43264	291.64147	335.42451	9.66870	0.0553613	0.17303873	3.1893866	20	3 21.1	20.7
478055	2011	TU <sub>7</sub>	17.2	X	280.89900	225.72283	173.41014	8.86383	0.1563501	0.20975461	2.8054016	20	8 8.2	21.0
478056	2011	TB <sub>8</sub>	17.0	X	294.09464	239.67185	115.10367	3.13914	0.0874799	0.20116269	2.8847250	20	7 9.9	20.8
478057	2011	TC <sub>10</sub>	17.9	X	357.70419	133.69434	339.10431	18.57213	0.0823962	0.36714484	1.9315729	20	—	—
478058	2011	TJ <sub>10</sub>	16.9	X	265.11284	166.54874	189.04007	11.20972	0.0312743	0.19251865	2.9704404	20	6 10.3	21.2
478059	2011	TR <sub>13</sub>	16.3	X	212.90410	9.77755	30.41803	18.10208	0.2764759	0.18214004	3.0822351	20	5 15.6	21.9
478060	2011	TH <sub>14</sub>	16.9	X	212.23074	298.55382	100.60281	3.86783	0.1944184	0.18772258	3.0208213	20	5 21.9	21.8
478061	2011	TN <sub>15</sub>	17.0	X	283.65067	159.80426	241.54823	7.06318	0.2200649	0.21073080	2.7967311	20	8 4.0	20.6
478062	2011	UZ <sub>2</sub>	16.2	X	191.46073	23.66442	14.59141	14.68971	0.1993029	0.17633463	3.1495195	20	4 29.3	21.7
478063	2011	UA <sub>4</sub>	16.3	X	203.39877	174.13884	223.40232	8.24837	0.1140305	0.17998443	3.1067962	20	5 14.9	21.1
478064	2011	UM <sub>4</sub>	17.4	X	156.62572	140.92893	12.47269	1.89090	0.0165946	0.20512594	2.8474471	20	8 20.3	21.2
478065	2011	UT <sub>5</sub>	15.8	X	147.51737	78.77975	47.23991	15.15219	0.0097291	0.18617686	3.0375184	20	7 1.5	20.3
478066	2011	UB <sub>6</sub>	16.0	X	292.49436	262.18483	45.88851	10.67437	0.0973978	0.17985868	3.1082441	20	5 5.4	20.2
478067	2011	UR <sub>6</sub>	17.0	X	286.73433	324.45410	37.48613	2.75440	0.0850971	0.19373346	2.9580099	20	7 9.4	21.0
478068	2011	UY <sub>6</sub>	16.2	X	234.08829	319.81074	45.57318	16.73247	0.0568936	0.17747774	3.1359812	20	5 10.9	20.9
478069	2011	UA <sub>7</sub>	16.9	X	245.44113	346.05101	37.42174	2.13828	0.1628758	0.18753912	3.0227911	20	6 4.4	

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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>		
478081	2011	UX <sub>29</sub>	16.4 <sup>m</sup>	X	218.32729	204.83916	215.19682	8.34619	0.2458587	0.18604129	3.0389939	20	6 17.5	21.7
478082	2011	UQ <sub>33</sub>	16.1	X	174.87925	233.51746	210.49262	24.31398	0.2403943	0.18225994	3.0808832	20	6 11.6	21.8
478083	2011	UM <sub>35</sub>	16.4	X	266.26741	69.00572	230.36241	8.13750	0.0569994	0.17469222	3.1692294	20	3 26.4	21.0
478084	2011	UB <sub>38</sub>	16.2	X	255.93698	308.18121	24.05151	9.60556	0.0890650	0.17548336	3.1596969	20	4 21.4	20.7
478085	2011	US <sub>38</sub>	17.1	X	279.62742	289.61091	55.70230	12.41752	0.1185955	0.18708577	3.0276724	20	5 31.9	21.2
478086	2011	UP <sub>40</sub>	17.0	X	255.98215	358.22045	0.18798	2.52820	0.0171706	0.18784722	3.0194849	20	6 3.1	21.2
478087	2011	UB <sub>41</sub>	17.3	X	253.15978	142.93809	198.73761	1.01711	0.2062537	0.18539387	3.0460647	20	4 17.7	22.1
478088	2011	UU <sub>41</sub>	17.2	X	248.91665	28.65775	2.10410	1.68188	0.1165381	0.19394532	3.2958554	20	6 23.3	21.4
478089	2011	JU <sub>41</sub>	16.5	X	185.30474	22.99021	23.95329	9.83569	0.1083256	0.17876588	3.1208984	20	5 6.6	21.4
478090	2011	UD <sub>45</sub>	16.2	X	182.81937	199.14928	215.86675	18.86779	0.1310303	0.17899455	3.1182398	20	5 16.4	21.2
478091	2011	UF <sub>48</sub>	16.8	X	254.24572	146.10492	226.97752	7.98723	0.1297009	0.18824078	3.0152749	20	6 5.3	22.1
478092	2011	UF <sub>48</sub>	16.7	X	191.41629	1.42775	32.55029	1.02412	0.2014686	0.17374485	3.1807394	20	4 27.9	21.2
478093	2011	US <sub>48</sub>	16.1	X	308.04818	253.95854	38.02106	9.75434	0.0526223	0.18003370	3.1062293	20	5 10.9	20.4
478094	2011	UF <sub>49</sub>	16.3	X	193.78394	199.80860	207.81129	2.38239	0.0757173	0.17758528	3.1347151	20	5 18.6	21.1
478095	2011	UV <sub>50</sub>	16.2	X	221.20322	350.57961	52.31075	9.93187	0.1233291	0.18443893	3.0565698	20	6 6.6	21.0
478096	2011	UA <sub>54</sub>	16.4	X	152.42464	228.73655	230.63029	10.62982	0.0834078	0.17643098	3.1483728	20	6 7.7	21.2
478097	2011	UF <sub>54</sub>	15.9	X	256.47485	124.30252	230.14283	9.74621	0.0976608	0.18089599	3.0963503	20	5 19.5	20.5
478098	2011	UO <sub>58</sub>	17.1	X	277.44303	150.76322	200.49797	8.64642	0.1070788	0.19262970	2.9692987	20	6 9.2	21.3
478099	2011	UF <sub>61</sub>	16.2	X	211.01689	342.43477	69.21252	12.20456	0.1233554	0.17973169	3.1097080	20	6 7.6	21.1
478100	2011	UZ <sub>61</sub>	16.7	X	192.93203	27.24679	65.12224	14.18595	0.1120252	0.18428482	3.0582736	20	7 11.7	21.6
478101	2011	US <sub>64</sub>	17.2	X	241.70572	298.68422	98.49393	3.62270	0.1697297	0.19135119	2.9825102	20	6 17.3	21.8
478102	2011	UF <sub>66</sub>	16.7	X	297.42056	247.51062	57.37308	10.67617	0.0986799	0.18522715	3.0478923	20	5 8.4	20.8
478103	2011	UH <sub>74</sub>	17.0	X	267.95946	251.24795	72.28514	2.07655	0.2802645	0.18626758	3.0365320	20	4 3.1	21.7
478104	2011	UL <sub>74</sub>	16.7	X	211.68843	199.87849	192.30818	4.51983	0.1429379	0.18115553	3.0933922	20	5 15.6	21.6
478105	2011	UV <sub>74</sub>	16.4	X	180.25118	226.50880	203.20735	9.15797	0.0535060	0.18110468	3.0939712	20	6 1.0	21.0
478106	2011	UB <sub>76</sub>	16.5	X	183.27176	179.44639	255.53270	6.80127	0.1353651	0.18125521	3.0922580	20	6 9.5	21.5
478107	2011	UF <sub>76</sub>	15.8	X	199.41133	156.92026	242.02896	9.62181	0.2270610	0.17797559	3.1301304	20	5 8.9	21.3
478108	2011	UC <sub>78</sub>	15.9	X	182.57666	34.99258	37.26871	27.98363	0.1569845	0.17908433	3.1171975	20	5 29.0	21.3
478109	2011	UK <sub>80</sub>	16.3	X	264.43978	111.08878	236.26849	8.86141	0.0452187	0.18221718	3.0813652	20	5 27.3	20.6
478110	2011	UV <sub>81</sub>	16.2	X	204.45222	4.63520	52.37426	10.39018	0.1892577	0.18184854	3.0855281	20	6 4.3	21.3
478111	2011	UF <sub>82</sub>	16.1	X	203.26093	169.56959	249.16435	10.56067	0.1447353	0.18127794	3.0919995	20	6 8.1	21.1
478112	2011	US <sub>82</sub>	16.0	X	225.72141	19.62637	40.31628	17.63449	0.1667782	0.18782488	3.0197243	20	6 29.3	21.1
478113	2011	UF <sub>82</sub>	16.0	X	258.86811	119.40191	255.01450	8.83671	0.0885071	0.18644883	3.0345638	20	6 17.7	20.4
478114	2011	UW <sub>84</sub>	16.3	X	213.15023	9.96940	42.27534	14.16870	0.0796467	0.18116051	3.0933355	20	6 11.9	21.1
478115	2011	UK <sub>85</sub>	16.0	X	166.70187	192.85260	248.95828	9.65536	0.0157105	0.17622306	3.1508488	20	5 29.9	20.6
478116	2011	UM <sub>88</sub>	17.2	X	238.85568	334.09263	31.16115	0.37230	0.2017769	0.17946956	3.1127353	20	5 3.3	22.1
478117	2011	UF <sub>97</sub>	17.1	X	322.89306	31.14080	266.29717	2.40218	0.1399420	0.19319701	2.9634831	20	5 30.1	20.7
478118	2011	UG <sub>98</sub>	16.6	X	203.82759	103.06255	51.14493	6.01948	0.1049688	0.18262704	3.0767532	20	6 4.3	21.4
478119	2011	UZ <sub>99</sub>	15.9	X	106.81795	248.74878	235.05166	9.69411	0.0746718	0.17050319	3.2209282	20	5 17.1	20.5
478120	2011	UY <sub>101</sub>	16.0	X	218.31259	354.69468	32.58440	9.22037	0.1430821	0.17945741	3.1128757	20	5 13.7	20.9
478121	2011	UB <sub>103</sub>	15.9	X	333.34810	24.60681	254.04872	15.90209	0.0708924	0.17900296	3.1181421	20	5 28.7	20.0
478122	2011	UY <sub>103</sub>	16.2	X	230.83275	15.60607	33.81883	10.22305	0.0759477	0.18854341	3.0120474	20	7 1.2	20.7
478123	2011	UF <sub>105</sub>	16.1	X	245.67898	321.38609	48.34704	9.63120	0.1280348	0.18069519	3.0986438	20	5 21.8	20.7
478124	2011	UG <sub>107</sub>	16.9	X	169.28539	223.69866	207.83554	8.56718	0.1159985	0.18080742	3.0973614	20	5 23.5	21.8
478125	2011	UU <sub>107</sub>	16.9	X	164.23197	24.50713	78.83544	15.23763	0.1059968	0.18579705	3.0416565	20	6 25.3	21.7
478126	2011	UW <sub>112</sub>	15.9	X	125.78697	258.58339	229.38878	12.96838	0.0862303	0.17485996	3.1672023	20	6 14.0	20.7
478127	2011	UZ <sub>112</sub>	16.3	X	206.55801	167.68617	222.93098	8.19804	0.0981793	0.17436650	3.1731750	20	5 10.3	21.3
478128	2011	UY <sub>113</sub>	16.2	X	345.34550	354.57330	53.03327	15.10090	0.0852098	0.22420028	2.6835640	12	12.5	19.5
478129	2011	UF <sub>119</sub>	15.7	X	176.70725	37.01131	42.84697	28.57341	0.1673770	0.17849165	3.1240942	20	6 2.6	21.1
478130	2011	US <sub>120</sub>	16.9	X	253.22328	101.32311	246.77261	1.43418	0.1347301	0.18442948	3.0566742	20	5 2.8	21.4
478131	2011	UX <sub>122</sub>	16.5	X	217.03830	203.48700	173.49506	1.16809	0.1934405	0.18081238	3.0973048	20	4 29.2	21.7
478132	2011	UF <sub>125</sub>	17.0	X	228.54459	67.44603	307.32780	3.91832	0.1810234	0.18492330	3.0512300	20	5 5.5	22.0
478133	2011	UG <sub>126</sub>	18.0	X	180.20994	273.05343	25.52451	20.03734	0.0690117	0.37196244	1.9148584	20	—	—
478134	2011	UL <sub>127</sub>	16.0	X	263.21063	276.32587	63.87607	13.23612	0.1210732	0.18039285	3.1021051	20	5 8.2	20.6
478135	2011	UG <sub>129</sub>	16.9	X	281.29101	323.76712	60.86222	6.56224	0.0796217	0.20533667	2.8454986	20	8 4.7	20.7
478136	2011	UU <sub>131</sub>	17.1	X	262.25582	10.28730	358.00573	0.48965	0.2148059	0.18981619	2.9985678	20	5 28.3	21.7
478137	2011	UK <sub>136</sub>	16.1	X	228.84866	148.00491	237.65243	9.50456	0.1512167	0.18307676	3.0717125	20	5 22.8	20.8
478138	2011	UV <sub>136</sub>	16.8	X	327.67860	266.68433	32.71550	11.11435	0.0509044	0.18446637	3.0562666	20	6 21.4	21.2
478139	2011	UW <sub>136</sub>	15.6	X	28.01701	316.73652	244.43032	8.31877	0.0273310	0.17201677	3.2020064	20	5 5.9	20.0
478140	2011	UL <sub>138</sub>	16.4	X	302.87664	288.68113	46.58156	10.82911	0.1898225	0.19164498	2.9794614	20	6 9.4	20.3
478141	2011	UD <sub>139</sub>	16.9	X	213.52944	31.35227	31.96295	5.03794	0.1115612	0.18597563	3.0397091	20	6 26.0	21.6
478142	2011	UF <sub>143</sub>	16.8	X	211.77833	205.74517	192.94123	16.54300	0.1403695	0.17843573	3.1247468	20	5 24.5	22.0
478143	2011	UU <sub>145</sub>	16.1	X	231.20617	117.86200	251.35283	14.81952	0.0850893	0.17522505	3.1628014	20	5 9.6	21.0
478144	2011	UV <sub>145</sub>	16.6	X	211.94091	117.63994	305.51868	2.78976	0.1212835	0.18267733	3.0761885	20	6 23.4	21.3
478145	2011	UW <sub>147</sub>	16.5	X	248.94484	151.09123	195.05674	10.10563	0.0443496	0.18782364	3.0197377	20	5 7.8	20.9
478146	2011	US <sub>152</sub>	16.0	X	220.88377	176.04734	229.84099	12.60105	0.1548211	0.18110255	3.0939955	20	6 8.5	21.0
478147	2011	UA <sub>154</sub>	15.8	X	189.58752	116.35962	322.61450	16.76340	0.1635305	0.18570418	3.0426705	20	6 21.3	21.0
478148	2011	UE <sub>154</sub>	16.2	X	138.84003	105.71156	356.78759	26.76304	0.0244427	0.17993961	3.1073120	20	5 10.3	21.2
478149	2011	UT <sub>154</sub>	16.7	X	232.47948	326.09282	51.00052	0.17455	0.2005942	0.17927887	3.1149420</			

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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>		
478161	2011	UC <sub>173</sub>	16.4	X	170.27532	161.88351	268.52170	9.36722	0.2109545	0.17648178	3.1477686	20	5 23.5	21.8
478162	2011	UN <sub>175</sub>	16.1	X	267.17131	42.02942	259.36226	9.34210	0.2093669	0.17589340	3.1547844	20	3 9.7	21.3
478163	2011	UW <sub>175</sub>	16.6	X	221.84481	24.43875	20.22708	9.88536	0.1369726	0.18539720	3.0460283	20	6 7.8	21.5
478164	2011	UE <sub>176</sub>	16.3	X	166.07141	311.55022	243.30465	9.02269	0.1668850	0.21205246	2.7850981	20	10 17.6	21.1
478165	2011	UG <sub>176</sub>	16.2	X	271.46938	256.65054	38.10054	22.91489	0.2960573	0.17641579	3.1485535	20	3 14.1	21.6
478166	2011	UW <sub>176</sub>	16.2	X	179.29308	200.34358	232.46490	9.61071	0.2045629	0.17767106	3.1337060	20	6 3.3	21.5
478167	2011	UV <sub>177</sub>	16.7	X	282.89209	261.89955	62.17298	9.78462	0.2184928	0.18588608	3.0406852	20	4 27.8	21.1
478168	2011	UH <sub>178</sub>	16.9	X	231.29983	232.13606	188.68929	4.26410	0.1761502	0.18984422	2.9982727	20	7 5.1	21.6
478169	2011	UR <sub>180</sub>	16.8	X	261.53953	141.56915	238.76367	8.94251	0.0211495	0.19031013	2.9933772	20	7 7.4	21.1
478170	2011	UM <sub>181</sub>	16.0	X	228.99084	32.51101	26.67314	12.15448	0.1786512	0.18998795	2.9967603	20	7 1.7	20.9
478171	2011	UR <sub>182</sub>	16.4	X	260.50968	318.47386	25.73861	9.37467	0.0876671	0.17752688	3.1354025	20	5 10.7	21.1
478172	2011	UM <sub>183</sub>	16.0	X	150.99217	221.19877	243.54934	15.66355	0.1758264	0.17218683	3.1998978	20	6 16.4	21.3
478173	2011	UP <sub>190</sub>	16.7	X	292.76371	336.22946	54.40220	13.11474	0.2018848	0.20996036	2.8035685	20	8 15.8	20.3
478174	2011	UZ <sub>190</sub>	16.3	X	226.80927	326.26540	60.46304	10.80890	0.1173763	0.18021176	3.1041828	20	5 24.5	21.0
478175	2011	UV <sub>191</sub>	16.5	X	265.53945	41.99099	331.83022	5.59332	0.0669807	0.19035090	2.9929498	20	6 29.2	20.8
478176	2011	UT <sub>193</sub>	16.3	X	230.02795	63.85765	338.07897	4.49082	0.2770838	0.18735926	3.0247253	20	6 2.5	21.5
478177	2011	UY <sub>193</sub>	17.7	X	95.66160	1.88096	53.07415	22.90107	0.0801324	0.37883721	1.8916217	20	—	—
478178	2011	UU <sub>198</sub>	17.1	X	227.44985	181.68188	212.83191	4.75276	0.1690110	0.18216175	3.0819902	20	5 31.2	21.9
478179	2011	UX <sub>199</sub>	16.8	X	232.52085	122.42927	266.85459	9.45301	0.2737109	0.18391453	3.0623772	20	5 20.6	22.2
478180	2011	UX <sub>201</sub>	17.1	X	225.04635	286.93142	90.15022	2.58893	0.1717845	0.17822977	3.1271536	20	5 7.9	22.2
478181	2011	UN <sub>202</sub>	17.2	X	202.42398	25.73653	62.11083	8.53787	0.2104252	0.18554619	3.0443975	20	7 10.7	22.4
478182	2011	UU <sub>208</sub>	16.5	X	230.99139	4.29216	17.85162	12.38651	0.0910377	0.18543327	3.0456333	20	5 20.9	21.4
478183	2011	UL <sub>212</sub>	16.0	X	182.31413	38.27841	14.37752	15.24903	0.0474988	0.17896883	3.1185385	20	5 7.7	20.8
478184	2011	UP <sub>223</sub>	16.9	X	161.19954	20.46277	41.48927	2.79192	0.1428975	0.17399962	3.1776338	20	5 4.3	21.9
478185	2011	UC <sub>230</sub>	16.9	X	248.19723	22.25902	42.18218	9.14441	0.0787617	0.20363684	2.8613116	20	8 15.2	21.0
478186	2011	UO <sub>233</sub>	16.5	X	138.56281	254.38565	210.25716	8.25497	0.0347732	0.18209142	3.0827838	20	5 26.7	21.0
478187	2011	UG <sub>235</sub>	16.5	X	266.10513	280.91598	36.92163	26.22370	0.2393278	0.18039961	3.1020725	20	4 6.9	21.6
478188	2011	UW <sub>241</sub>	16.1	X	323.10150	44.69719	238.41672	18.00574	0.1711672	0.18082461	3.0971651	20	5 6.3	19.9
478189	2011	UZ <sub>241</sub>	16.9	X	247.43885	120.22969	250.72829	3.37689	0.2177305	0.18499005	3.0504960	20	5 16.4	21.8
478190	2011	UV <sub>242</sub>	17.4	X	213.04354	109.87733	288.25209	0.16724	0.2483340	0.17993046	3.1074173	20	5 18.2	22.8
478191	2011	UG <sub>243</sub>	16.0	X	176.12681	36.32476	52.02976	16.62336	0.1040775	0.17931487	3.1145252	20	6 17.3	21.0
478192	2011	UB <sub>244</sub>	16.0	X	314.84986	63.81996	238.94670	15.62947	0.1149376	0.18291015	3.0735776	20	5 27.8	19.9
478193	2011	UD <sub>244</sub>	16.6	X	246.81989	167.39745	234.70778	11.43834	0.2065639	0.19057917	2.9905594	20	6 23.8	21.3
478194	2011	UY <sub>244</sub>	16.7	X	219.82399	86.86916	293.72077	1.26970	0.1432521	0.17975595	3.1094282	20	5 8.0	21.7
478195	2011	UK <sub>247</sub>	16.0	X	254.29970	107.90167	230.80639	9.47499	0.0856027	0.17433381	3.1735716	20	4 28.1	20.7
478196	2011	UQ <sub>249</sub>	16.1	X	281.17593	284.84863	56.80376	19.55624	0.1560162	0.18585218	3.0410550	20	5 23.7	20.3
478197	2011	UC <sub>250</sub>	17.2	X	217.71480	8.60054	36.61210	0.31229	0.1671040	0.18145676	3.0899678	20	6 3.9	22.1
478198	2011	UU <sub>250</sub>	16.9	X	209.53101	267.53169	137.42520	1.95350	0.1774189	0.17857080	3.1231709	20	5 27.0	22.0
478199	2011	UQ <sub>252</sub>	16.2	X	251.16044	150.38165	224.85314	11.10268	0.0786609	0.18160447	3.0882921	20	6 10.7	20.7
478200	2011	UV <sub>252</sub>	17.0	X	228.79393	335.40791	73.63355	0.48973	0.1958146	0.18621318	3.0371234	20	6 16.8	21.9
478201	2011	UB <sub>253</sub>	16.7	X	232.51608	168.02121	194.41372	0.85954	0.2074700	0.17759553	3.1345945	20	4 24.2	21.8
478202	2011	UQ <sub>253</sub>	16.1	X	243.14927	314.49133	72.39057	11.33112	0.0966094	0.18320663	3.0702607	20	6 13.5	20.6
478203	2011	UA <sub>257</sub>	17.7	X	238.30871	121.79770	290.80669	1.05867	0.1354095	0.19230618	2.9726279	20	7 6.9	22.2
478204	2011	UD <sub>263</sub>	17.0	X	229.63487	319.39103	69.06426	0.08201	0.1920585	0.18066810	3.0989535	20	5 22.5	21.9
478205	2011	UM <sub>268</sub>	16.6	X	260.24783	29.33137	1.69529	8.01030	0.2092999	0.19489704	2.9462248	20	6 24.9	21.1
478206	2011	UB <sub>279</sub>	16.8	X	194.67514	35.86436	31.28177	2.54694	0.1122906	0.17846837	3.1243658	20	6 11.1	21.6
478207	2011	UP <sub>282</sub>	15.8	X	114.46732	101.86093	57.69875	17.92807	0.1321673	0.18172195	3.0869609	20	7 18.4	20.8
478208	2011	UM <sub>283</sub>	16.3	X	193.99000	3.15648	73.16552	10.55430	0.1322733	0.18286242	3.0741124	20	6 21.1	21.1
478209	2011	UV <sub>283</sub>	16.2	X	119.50859	93.29841	65.21397	17.80868	0.1187999	0.18239562	3.0793552	20	7 21.2	21.1
478210	2011	UC <sub>297</sub>	17.0	X	206.02389	281.95264	209.67790	10.41864	0.1904598	0.20301451	2.8671560	20	9 3.6	21.8
478211	2011	US <sub>297</sub>	17.2	X	235.68109	306.16614	97.66274	2.82427	0.1766440	0.19000691	2.9965609	20	6 18.7	22.0
478212	2011	UU <sub>298</sub>	17.0	X	280.63524	76.28147	238.26833	16.89725	0.2399351	0.18338607	3.0688276	20	4 4.5	21.8
478213	2011	UK <sub>299</sub>	16.1	X	223.46588	345.88909	54.40536	12.50795	0.1401990	0.18390766	3.0624535	20	6 4.1	20.9
478214	2011	UV <sub>299</sub>	16.9	X	232.11586	279.73870	98.73453	2.28221	0.1934322	0.18126026	3.0922006	20	5 14.3	21.8
478215	2011	UO <sub>301</sub>	16.9	X	310.85425	61.72207	263.47507	1.60784	0.0903717	0.19269492	2.9686287	20	6 24.2	20.6
478216	2011	UG <sub>303</sub>	17.0	X	161.61225	244.71602	226.70923	8.41701	0.1122934	0.18578401	3.0417989	20	7 2.3	21.8
478217	2011	UQ <sub>305</sub>	16.9	X	240.15639	16.52186	350.68551	5.78257	0.1281847	0.18610110	3.0383427	20	5 11.6	21.5
478218	2011	UV <sub>308</sub>	16.0	X	239.04965	122.71181	264.64076	13.83076	0.1256601	0.18542017	3.0457767	20	6 6.7	20.6
478219	2011	UY <sub>311</sub>	16.7	X	255.25686	350.85453	37.68132	12.22304	0.0565789	0.19213736	2.9743689	20	7 7.4	21.1
478220	2011	UL <sub>312</sub>	16.3	X	45.32036	233.84408	33.80493	16.75394	0.2322967	0.21368411	2.7709024	20	10 3.9	20.0
478221	2011	UU <sub>313</sub>	17.0	X	302.37322	115.18303	213.43248	10.79810	0.1188702	0.19059453	2.9903987	20	6 11.9	20.9
478222	2011	UO <sub>313</sub>	16.0	X	354.60248	189.74674	56.87599	11.51608	0.0224860	0.17720217	3.1392316	20	5 19.7	20.3
478223	2011	UB <sub>314</sub>	16.2	X	201.23507	343.12983	56.62746	12.15620	0.1141430	0.17786360	3.1314441	20	5 15.4	21.1
478224	2011	UV <sub>314</sub>	16.5	X	131.66090	281.38007	212.07126	12.09178	0.0533037	0.18214733	3.0821529	20	6 24.1	21.2
478225	2011	UC <sub>317</sub>	16.6	X	207.77376	182.37704	236.20910	10.98191	0.1515922	0.18207770	3.0829386	20	6 11.8	21.5
478226	2011	UY <sub>317</sub>	16.2	X	246.31674	131.64622	235.77588	14.02839	0.0432727	0.17905897	3.1174918	20	5 30.6	20.7
478227	2011	UH <sub>323</sub>	16.6	X	258.36919	275.39027	46.69191	1.98498	0.1776233	0.18208363	3.0828717	20	4 2.8	21.2
478228	2011	UH <sub>327</sub>	16.6	X	215.12933	326.25500	144.11752	3.32496	0.1462962	0.17752886	3.1353792	20	4 22.9	21.6
478229	2011	UV <sub>329</sub>	16.8	X	206.46807	246.86558	163.97372	7.23789						

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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>
478241 2011 UK <sub>344</sub>	16.0	X	224.92662	167.91103	215.28830	10.89395	0.1078863	0.18320519	3.0702768	20	5 19.9	20.8
478242 2011 UK <sub>349</sub>	15.7	X	67.60141	303.23649	218.11248	17.10568	0.1202777	0.17597790	3.1537744	20	5 22.0	20.0
478243 2011 UW <sub>350</sub>	16.7	X	118.88068	340.00573	229.66681	4.28041	0.1058561	0.21007198	2.8025754	20	9 20.2	20.9
478244 2011 UH <sub>351</sub>	17.1	X	180.02653	300.58571	151.01683	1.21467	0.1359128	0.18108073	3.0942440	20	6 26.8	22.1
478245 2011 UB <sub>356</sub>	17.0	X	269.59976	225.23481	118.48148	3.07488	0.0969410	0.18825180	3.0151572	20	5 22.2	21.2
478246 2011 UQ <sub>356</sub>	16.6	X	190.66383	201.45942	218.28498	15.53436	0.0660279	0.17831929	3.1261069	20	5 30.6	21.4
478247 2011 UX <sub>359</sub>	16.4	X	19.96902	23.37001	223.66798	13.54213	0.0393529	0.18867084	3.0106911	20	6 23.8	20.6
478248 2011 UE <sub>360</sub>	17.5	X	251.62231	109.52424	311.55926	1.93797	0.1408799	0.20328713	2.8645921	20	8 2.0	21.5
478249 2011 UT <sub>360</sub>	17.1	X	187.21330	341.66849	104.57623	2.40310	0.1269353	0.18481894	3.0523786	20	6 27.3	22.0
478250 2011 UV <sub>365</sub>	17.4	X	233.45312	261.19800	118.77113	1.93267	0.2360456	0.18673961	3.0314128	20	5 14.1	22.4
478251 2011 UQ <sub>367</sub>	16.7	X	221.71207	219.84737	194.97655	10.47425	0.0995717	0.19080879	2.9881597	20	6 24.5	21.4
478252 2011 UJ <sub>368</sub>	16.4	X	234.65399	308.42263	45.88515	9.26640	0.0917057	0.17990164	3.1077492	20	4 26.2	21.0
478253 2011 UV <sub>368</sub>	17.6	X	209.91940	351.61479	35.23636	4.77385	0.2403225	0.17711361	3.1402780	20	5 2.7	22.9
478254 2011 UM <sub>373</sub>	16.7	X	267.00377	261.63641	58.31273	9.91387	0.2210765	0.18478164	3.0527893	20	4 7.3	21.5
478255 2011 UB <sub>374</sub>	16.0	X	272.16230	297.28742	49.76614	10.22170	0.0346699	0.18395922	3.0618812	20	6 6.0	20.3
478256 2011 UV <sub>387</sub>	16.9	X	240.41678	178.04257	187.92956	9.55558	0.2650667	0.18318843	3.0704641	20	5 2.1	22.1
478257 2011 UF <sub>391</sub>	16.5	X	190.91529	236.29647	186.65776	16.78031	0.2206439	0.17867827	3.1219185	20	6 1.8	22.1
478258 2011 UA <sub>392</sub>	16.5	X	197.52575	312.35291	82.11794	6.27481	0.1611588	0.17603378	3.1531070	20	5 5.7	21.7
478259 2011 UP <sub>394</sub>	16.4	X	168.79193	153.75602	285.57461	14.20746	0.1234253	0.18189218	3.0850346	20	5 31.5	21.4
478260 2011 UA <sub>395</sub>	16.0	X	308.37863	248.02707	27.71810	15.29096	0.0482387	0.17744760	3.1263364	20	4 22.8	20.2
478261 2011 UB <sub>400</sub>	16.8	X	162.18289	323.74442	120.65712	4.35762	0.1403132	0.17796287	3.1302795	20	6 1.9	21.8
478262 2011 UR <sub>401</sub>	17.1	X	221.57347	11.04982	54.94364	4.68932	0.1128379	0.18875101	3.0098384	20	7 8.3	21.7
478263 2011 UT <sub>401</sub>	16.4	X	283.88358	285.31462	46.08659	11.45911	0.0955842	0.18513803	3.0488703	20	5 22.8	20.5
478264 2011 UW <sub>401</sub>	17.1	X	163.38546	238.47552	235.56952	7.07963	0.0511202	0.18667472	3.0321153	20	7 6.2	21.6
478265 2011 UU <sub>403</sub>	16.4	X	204.82754	210.44897	194.67392	27.68801	0.1537642	0.17828117	3.1265525	20	5 24.4	21.8
478266 2011 UG <sub>404</sub>	17.1	X	353.48801	284.86995	264.29822	18.65492	0.0909681	0.37005804	1.9214223	20	1 22.1	19.0
478267 2011 UE <sub>406</sub>	16.3	X	211.97972	178.61610	200.49297	27.52338	0.1291700	0.17955921	3.1116990	20	4 30.9	21.4
478268 2011 UF <sub>407</sub>	16.0	X	216.06412	133.08245	269.01432	12.75905	0.1944827	0.19071305	2.9891597	20	5 27.6	21.0
478269 2011 UO <sub>408</sub>	17.1	X	264.82121	205.04737	203.56876	8.09218	0.2028945	0.20407486	2.8572158	20	7 21.9	21.2
478270 2011 VF	16.1	X	173.93382	9.86616	60.42251	15.95939	0.0765825	0.17537502	3.1609980	20	5 24.8	20.8
478271 2011 VE <sub>2</sub>	17.4	X	122.71346	74.03100	260.60696	17.46015	0.0978746	0.36831068	1.9274946	20	—	—
478272 2011 VN <sub>4</sub>	16.2	X	234.63558	352.03895	343.96681	10.75184	0.0691310	0.16988419	3.2287474	20	4 2.1	21.0
478273 2011 VY <sub>4</sub>	15.6	X	218.88866	109.16148	257.79550	11.68126	0.0884171	0.17263826	3.1943171	20	4 21.7	20.6
478274 2011 VT <sub>8</sub>	16.8	X	222.76563	299.35894	87.64471	14.78268	0.1592903	0.18404243	3.0609582	20	5 20.9	21.8
478275 2011 VN <sub>13</sub>	16.1	X	310.28805	69.90276	229.87428	21.47171	0.1396913	0.18299529	3.0726242	20	5 13.4	19.9
478276 2011 VX <sub>14</sub>	17.3	X	228.68648	39.81452	40.38531	4.49969	0.1344438	0.19689513	2.9262588	20	8 2.4	21.7
478277 2011 VV <sub>15</sub>	16.6	X	270.67874	125.50838	222.74711	10.87021	0.0860079	0.18634756	3.0356631	20	5 30.6	21.0
478278 2011 VU <sub>19</sub>	17.7	X	206.15894	27.93889	62.70684	0.54057	0.2580588	0.18846354	3.0128984	20	7 14.9	22.9
478279 2011 VQ <sub>19</sub>	16.7	X	203.93377	233.55407	166.34727	13.70151	0.2147278	0.18061451	3.0995665	20	5 17.4	22.2
478280 2011 VM <sub>21</sub>	17.2	X	198.71264	303.60506	121.73047	2.24481	0.1559539	0.18134316	3.0902244	20	6 11.7	22.1
478281 2011 VY <sub>21</sub>	16.6	X	321.05935	187.70315	119.26994	4.39390	0.1163057	0.18926087	3.0044305	20	6 12.5	20.2
478282 2011 VK <sub>22</sub>	16.5	X	254.01286	349.49761	1.39656	8.66562	0.1126287	0.17993677	3.1073447	20	5 7.3	21.2
478283 2011 WC <sub>4</sub>	16.2	X	246.32467	305.60770	48.70561	10.27773	0.0847777	0.18233025	3.0800911	20	5 8.9	20.8
478284 2011 WM <sub>4</sub>	15.8	X	216.87295	147.73736	254.04470	17.67714	0.2127862	0.18199303	3.0838947	20	5 27.3	21.0
478285 2011 WU <sub>5</sub>	17.0	X	211.93423	359.68058	70.95805	2.16069	0.1587399	0.18602058	3.0392194	20	6 30.3	21.7
478286 2011 WX <sub>5</sub>	16.6	X	247.17110	142.77540	229.96720	4.58959	0.1227790	0.18300154	3.0725542	20	5 28.7	21.2
478287 2011 WK <sub>10</sub>	17.2	X	208.40214	17.22061	74.79681	3.04637	0.0624429	0.19191103	2.9767070	20	7 31.5	21.5
478288 2011 WH <sub>11</sub>	16.4	X	329.38246	216.75082	65.44000	10.51491	0.0743023	0.17955763	3.1117174	20	5 27.2	20.4
478289 2011 WU <sub>13</sub>	16.3	X	218.17243	158.03871	242.56037	14.29142	0.0700385	0.17988838	3.1079020	20	6 5.5	20.9
478290 2011 WE <sub>14</sub>	16.8	X	260.98431	320.04060	63.29278	16.43041	0.0987647	0.19159692	2.9799595	20	6 29.9	21.2
478291 2011 WJ <sub>16</sub>	16.6	X	211.88350	233.13699	220.06470	7.94677	0.0439879	0.19030909	2.9933881	20	8 3.9	21.1
478292 2011 WT <sub>16</sub>	16.1	X	218.03357	168.87755	245.61393	12.27776	0.1834829	0.18226991	3.0807709	20	6 14.2	21.1
478293 2011 WO <sub>18</sub>	16.7	X	214.85162	8.35663	30.23896	9.91183	0.1729750	0.18542738	3.0456977	20	5 22.1	21.7
478294 2011 WQ <sub>19</sub>	16.6	X	285.53953	60.49385	230.62762	21.67863	0.2220986	0.17776766	3.1325707	20	3 12.5	21.6
478295 2011 WY <sub>22</sub>	16.8	X	37.87246	15.22918	240.52930	7.87259	0.0187717	0.18826212	3.0150470	20	7 26.9	21.1
478296 2011 WH <sub>23</sub>	16.2	X	314.11405	246.68248	67.85748	9.82958	0.1319001	0.18525291	3.0476097	20	6 8.7	20.1
478297 2011 WS <sub>23</sub>	16.7	X	258.85808	263.53089	69.01085	10.93937	0.2404682	0.17764727	3.1339858	20	4 13.6	21.8
478298 2011 WG <sub>24</sub>	17.0	X	216.05690	4.67904	66.92718	10.30260	0.1122206	0.18631671	3.0359982	20	7 9.5	21.8
478299 2011 WW <sub>24</sub>	16.6	X	202.84541	337.85468	72.99293	6.56256	0.1854055	0.17998151	3.1068297	20	5 27.8	21.8
478300 2011 WB <sub>33</sub>	16.9	X	289.01992	291.23782	64.45732	10.64743	0.0470980	0.19047459	2.9916539	20	7 9.9	21.1
478301 2011 WU <sub>40</sub>	16.0	X	234.98614	320.97637	67.62761	18.97470	0.2813744	0.18399009	3.0615388	20	5 22.9	21.1
478302 2011 WP <sub>49</sub>	16.2	X	243.11756	261.90660	78.96597	19.68998	0.1785440	0.17172112	3.2056806	20	4 19.8	21.6
478303 2011 WH <sub>55</sub>	16.1	X	151.87226	42.51688	49.55696	15.65458	0.0469614	0.17835275	3.1257159	20	5 25.0	20.7
478304 2011 WQ <sub>55</sub>	16.9	X	214.29598	312.19302	89.33779	3.47595	0.1039267	0.18291865	3.0734824	20	5 31.3	21.5
478305 2011 WA <sub>59</sub>	17.0	X	196.14215	348.05318	101.66379	6.15486	0.0720663	0.18488199	3.0516846	20	7 13.0	21.5
478306 2011 WZ <sub>64</sub>	15.7	X	234.69083	120.75050	260.15489	25.99146	0.2010345	0.17943235	3.1131656	20	5 18.3	21.0
478307 2011 WV <sub>67</sub>	16.2	X	237.42262	153.78038	233.36779	8.97539	0.0876255	0.17883021	3.1201499	20	6 8.7	20.9
478308 2011 WX <sub>68</sub>	16.5	X	227.88470	8.83727	12.19042	7.15527	0.0699365	0.17877388	3.1208053	20	5 21.2	21.1
478309 2011 WS <sub>69</sub>	16.5	X	222.91451	101.39281	280.80378	8.83457	0.2384320	0.17885860	3.1198197	20	5 5.4	21.9
478310 2011 WD <sub>71</sub>	16.4	X	215.81155	18.24720	61.07645	11.57501	0.1241040	0.18722157	3.0262081	20	7 19.1	21.2
478311 2011 WS <sub>72</sub>	16.0	X	256.84266	320.49305	59.49926	11.04623	0.1095532	0.18367000	3.0650947	20	6 18.8	20.5
478312 2011 WU <sub>73</sub>	16.3	X	166.52993	145.48887	284.54388	7.97530	0.0723970	0.17348707	3.1838895	20	5 15.4	21.2
478313 2011 WZ <sub>73</sub>	16.4	X	251.69841	108.26701	274.8							

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>		
478321	2011	WT <sub>88</sub>	15.8	X	134.30543	216.89703	267.86158	10.66948	0.1574369	0.16986730	3.2289614	20	6 24.9	20.9
478322	2011	WZ <sub>89</sub>	16.3	X	235.57931	171.79098	247.80491	8.50874	0.0655259	0.18826027	3.0150668	20	7 18.7	20.8
478323	2011	WZ <sub>92</sub>	15.9	X	238.82175	271.72217	79.35122	16.19810	0.1093089	0.17067639	3.2187488	20	4 30.5	21.0
478324	2011	WW <sub>96</sub>	15.6	X	83.52393	308.73466	252.72285	13.43072	0.2289377	0.17767206	3.1336943	20	8 9.9	20.6
478325	2011	WA <sub>97</sub>	17.0	X	172.20786	350.23383	109.76963	2.51361	0.1335503	0.18047059	3.1012142	20	6 29.7	22.0
478326	2011	WS <sub>97</sub>	16.6	X	158.89838	245.71418	241.94245	3.27525	0.1029958	0.18316501	3.0707258	20	7 19.8	21.5
478327	2011	WY <sub>103</sub>	16.4	X	324.01629	265.44989	9.65673	9.73426	0.0156601	0.17464247	3.1698312	20	5 13.2	20.9
478328	2011	WA <sub>104</sub>	16.8	X	117.61641	151.01399	9.92904	10.42006	0.0695204	0.18424803	3.0586807	20	7 18.1	21.5
478329	2011	WF <sub>104</sub>	16.7	X	117.45680	115.09141	17.07893	11.60160	0.0271086	0.17060497	3.1527346	20	5 31.8	21.3
478330	2011	WO <sub>104</sub>	16.1	X	332.64902	357.11231	286.17751	10.28023	0.0606902	0.18147327	3.0897803	20	6 3.3	20.2
478331	2011	WV <sub>109</sub>	16.2	X	249.07133	321.32346	70.50760	12.27644	0.0559257	0.18621682	3.0370838	20	7 2.5	20.6
478332	2011	WD <sub>110</sub>	16.6	X	250.64091	97.84356	235.36896	10.19849	0.1381679	0.17251624	3.1958231	20	4 10.1	21.7
478333	2011	WU <sub>113</sub>	15.7	X	173.05675	192.33377	262.92598	7.91266	0.0528347	0.17615737	3.1516321	20	6 24.0	20.3
478334	2011	WB <sub>116</sub>	16.4	X	223.94538	175.61027	257.99180	8.29099	0.1200903	0.18780019	3.0199891	20	7 17.7	21.1
478335	2011	WG <sub>118</sub>	16.8	X	190.92861	347.71203	79.43204	4.76938	0.1681561	0.17951149	3.1122505	20	6 6.5	21.9
478336	2011	WM <sub>120</sub>	16.6	X	249.24086	291.07643	109.66762	12.70571	0.2279918	0.19258207	2.9697883	20	6 23.5	21.2
478337	2011	WG <sub>127</sub>	16.2	X	100.70828	271.96924	255.33245	9.12714	0.1141439	0.17471617	3.1689398	20	7 7.6	20.9
478338	2011	WV <sub>128</sub>	16.8	X	251.17047	308.42986	66.22572	11.79082	0.0560954	0.18176859	3.0864328	20	6 12.3	21.2
478339	2011	WU <sub>129</sub>	16.0	X	71.33793	179.85394	352.54995	9.83988	0.0953085	0.17114304	3.2128952	20	6 4.4	20.6
478340	2011	WE <sub>130</sub>	15.9	X	234.86295	304.89598	110.40148	17.31255	0.0887077	0.18967209	3.0000864	20	7 11.6	20.1
478341	2011	WR <sub>130</sub>	16.0	X	267.39695	239.66209	76.70787	11.69606	0.0456951	0.17006860	3.2264131	20	4 26.2	20.7
478342	2011	WB <sub>135</sub>	15.8	X	77.37970	300.03943	259.53770	15.31804	0.1822158	0.17483390	3.1675170	20	7 26.5	20.6
478343	2011	WF <sub>135</sub>	16.3	X	162.47853	21.30185	74.28785	10.86121	0.0678478	0.17376735	3.1804649	20	6 12.8	21.0
478344	2011	WE <sub>136</sub>	16.2	X	225.98490	339.97780	80.52128	15.87512	0.1440001	0.18259761	3.0770838	20	7 2.2	21.0
478345	2011	WT <sub>136</sub>	17.0	X	217.43730	52.66172	12.23779	7.15741	0.0905266	0.18561943	3.0435966	20	7 4.6	21.7
478346	2011	WU <sub>136</sub>	16.3	X	246.82864	96.84913	272.11666	8.43372	0.1033039	0.18049941	3.1008840	20	5 25.1	20.9
478347	2011	WX <sub>136</sub>	16.5	X	171.41161	42.63022	57.45354	12.61512	0.1159666	0.17788614	3.1311796	20	6 28.6	21.6
478348	2011	WZ <sub>136</sub>	16.5	X	246.59326	310.50387	52.27102	6.23947	0.1447950	0.17989009	3.1184078	20	5 13.1	21.1
478349	2011	WR <sub>138</sub>	16.5	X	187.29853	195.79385	242.49803	8.45698	0.0586961	0.17975048	3.1094913	20	6 18.7	21.2
478350	2011	WZ <sub>140</sub>	15.7	X	203.27122	137.32189	270.21340	12.89540	0.0636837	0.17403134	3.1772477	20	5 28.6	20.6
478351	2011	WV <sub>141</sub>	17.2	X	226.66140	168.87970	201.41090	0.15140	0.1953899	0.17755944	3.1350192	20	4 29.1	22.4
478352	2011	WT <sub>143</sub>	16.7	X	316.83041	284.46141	57.43778	15.62120	0.1719898	0.20137232	2.8827227	20	7 20.1	20.2
478353	2011	WA <sub>150</sub>	16.4	X	315.17754	144.87352	289.74670	15.42770	0.1100162	0.22395280	2.6855406	20	12 1.9	19.6
478354	2011	WY <sub>150</sub>	15.9	X	280.90871	196.10147	175.05126	19.61360	0.1997735	0.19297628	2.9657424	20	6 25.3	20.4
478355	2011	WQ <sub>151</sub>	16.3	X	272.32293	359.42966	354.30163	15.56477	0.1629039	0.19015480	2.9950071	20	5 23.5	20.9
478356	2011	XW <sub>2</sub>	18.7	X	178.39157	138.04330	220.14988	21.01088	0.0811054	0.38384822	1.8751227	20	1 31.8	21.5
478357	2011	YZ <sub>1</sub>	16.2	X	219.46920	8.76587	28.20360	10.50260	0.0737403	0.17602052	3.1532654	20	5 31.2	21.0
478358	2011	YJ <sub>3</sub>	15.1	X	234.33539	97.55558	299.31113	24.99093	0.1689895	0.17484818	3.1673445	20	6 11.2	20.4
478359	2011	YR <sub>7</sub>	16.1	X	181.72834	6.40907	99.30716	11.85338	0.1714352	0.17477541	3.1682236	20	7 15.1	21.3
478360	2011	YP <sub>8</sub>	16.2	X	272.40686	94.66227	245.56195	11.19275	0.1138231	0.17911397	3.1168536	20	5 17.9	20.7
478361	2011	YY <sub>19</sub>	16.0	X	145.80957	228.78474	289.37881	15.13292	0.1877938	0.17535924	3.1611877	20	8 12.0	21.4
478362	2011	YR <sub>23</sub>	16.0	X	266.72412	275.17799	101.46959	18.04672	0.2537030	0.18293091	3.0733451	20	6 9.8	20.8
478363	2011	YX <sub>23</sub>	16.4	X	197.70336	86.58744	36.82587	10.57055	0.2997622	0.18531961	3.0468784	20	8 18.8	22.0
478364	2011	YU <sub>24</sub>	16.5	X	185.55249	341.93681	107.77815	6.22644	0.1889191	0.17214918	3.2003643	20	6 28.5	21.9
478365	2011	YP <sub>25</sub>	16.0	X	238.25194	106.01087	295.02927	14.91090	0.2336152	0.17782862	3.1318548	20	6 12.8	21.2
478366	2011	YW <sub>30</sub>	15.9	X	251.20604	99.39886	302.13677	6.86682	0.0763000	0.18148683	3.0896265	20	7 15.1	20.3
478367	2011	YB <sub>36</sub>	16.6	X	234.01185	38.78412	352.61227	8.65350	0.1009121	0.17442654	3.1724467	20	6 7.6	21.5
478368	2011	YN <sub>37</sub>	17.6	X	294.67669	78.77717	116.88845	24.48369	0.0705036	0.35359288	1.9806164	20	—	—
478369	2011	YU <sub>45</sub>	16.4	X	156.99584	166.84852	309.29003	16.89051	0.1363192	0.16828729	3.2491406	20	7 6.9	21.7
478370	2011	YK <sub>48</sub>	18.6	X	194.01225	341.47201	309.15817	17.34515	0.0452762	0.35509721	1.9750187	20	—	—
478371	2011	YF <sub>55</sub>	17.0	X	234.00041	13.31042	46.79277	3.51535	0.2451808	0.18305822	3.0719199	20	7 1.0	22.0
478372	2011	YU <sub>56</sub>	16.5	X	145.35122	30.95224	101.54669	7.18467	0.1865352	0.16860420	3.2450679	20	7 16.1	21.9
478373	2011	YX <sub>56</sub>	16.4	X	151.75212	175.50455	309.68402	5.57184	0.2288965	0.16875114	3.2431839	20	7 14.4	21.9
478374	2011	YA <sub>62</sub>	15.9	X	246.69207	297.60344	65.91381	17.45741	0.2339677	0.17882467	3.1202144	20	5 8.7	21.0
478375	2011	YK <sub>70</sub>	17.8	X	103.65617	321.75069	97.03110	23.56454	0.0914012	0.36891780	1.9253793	20	1 27.6	19.6
478376	2011	YS <sub>71</sub>	16.4	X	222.51437	287.02531	112.32452	9.77602	0.1199090	0.17232180	3.1982266	20	6 5.9	21.4
478377	2012	AJ <sub>6</sub>	15.4	X	210.93511	289.32415	123.78672	27.22691	0.2609064	0.17244126	3.1967494	20	6 8.9	21.3
478378	2012	AR <sub>11</sub>	17.7	X	43.02057	114.28360	343.72019	18.06520	0.1027012	0.36098220	1.9539495	20	—	—
478379	2012	AS <sub>11</sub>	16.4	X	227.12560	183.43864	285.79980	13.22524	0.2579762	0.19800389	2.9153245	20	8 18.5	21.5
478380	2012	AS <sub>18</sub>	18.0	X	102.29266	85.57744	325.54442	18.32099	0.1171769	0.36709926	1.9317328	20	1 21.2	19.7
478381	2012	AK <sub>22</sub>	16.2	X	185.19903	127.43579	10.57510	14.46120	0.2909257	0.18120484	3.0928309	20	8 28.0	21.9
478382	2012	AU <sub>22</sub>	17.4	X	87.96793	344.12763	71.93253	24.41615	0.0714970	0.35916244	1.9600874	20	—	—
478383	2012	BZ	15.9	X	211.80913	112.63745	301.22918	10.91018	0.0671471	0.16837072	3.2480672	20	6 15.4	20.8
478384	2012	BE <sub>2</sub>	15.7	X	205.83188	126.85231	306.98441	12.69761	0.0450441	0.17392661	3.1785230	20	7 6.3	20.4
478385	2012	BP <sub>13</sub>	19.3	X	153.11869	84.19083	310.10798	8.47828	0.2482577	0.37978804	1.8884632	20	3 15.4	22.0
478386	2012	BK <sub>16</sub>	17.1	X	190.18494	39.80874	74.83921	6.24931	0.3164149	0.17665344	3.1457291	20	7 30.2	22.8
478387	2012	BF <sub>22</sub>	17.3	X	231.83981	220.12266	201.10430	3.04642	0.2970628	0.18185942	3.0854050	20	6 26.2	22.6
478388	2012	BQ <sub>26</sub>	16.1	X	123.24866	85.53164	87.27724	16.69928	0.0471221	0.17508036	3.1645437	20	8 6.0	20.9
478389	2012	BH <sub>27</sub>	17.8	X	97.18500	116.36489	303.23488	17.76820	0.1049101	0.36620810	1.93			

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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>
478401 2012 BX <sub>106</sub>	18.2	X	10.14282	167.74130	312.16687	18.40718	0.0432438	0.35379729	1.9798535	20	—	—
478402 2012 BE <sub>128</sub>	15.9	X	197.45675	130.93543	334.71184	9.70782	0.1864377	0.17488186	3.1669378	20	7 29.9	21.2
478403 2012 BW <sub>131</sub>	15.8	X	177.96885	310.39302	151.25893	17.10864	0.1942577	0.16882291	3.2422647	20	7 6.3	21.5
478404 2012 BJ <sub>132</sub>	15.7	X	165.82144	76.30502	46.29492	26.18924	0.2553859	0.17226136	3.1989747	20	7 27.8	21.7
478405 2012 BQ <sub>146</sub>	18.6	X	152.52784	62.64116	302.19022	17.52065	0.0781428	0.36709112	1.9317613	20	1 18.3	20.5
478406 2012 CB	16.4	X	230.44945	157.39156	267.51454	9.77921	0.1630751	0.17960788	3.1111369	20	7 9.7	21.4
478407 2012 CQ	17.8	X	95.70851	78.60557	342.48500	19.40804	0.0920479	0.36051264	1.9551904	20	1 25.7	19.8
478408 2012 CQ <sub>18</sub>	16.1	X	177.17728	280.01781	210.66474	13.98515	0.2117872	0.17578627	3.1560660	20	8 5.2	21.7
478409 2012 CK <sub>33</sub>	16.7	X	188.34064	286.46662	167.21548	11.24911	0.2329500	0.16904721	3.2393960	20	7 4.0	22.4
478410 2012 CZ <sub>42</sub>	16.6	X	165.46130	121.57672	2.88017	8.42506	0.1618050	0.17029761	3.2235198	20	7 25.5	22.0
478411 2012 CC <sub>44</sub>	18.0	X	83.41055	270.59942	150.95482	22.71776	0.1079408	0.36115558	1.9528692	20	—	—
478412 2012 CF <sub>55</sub>	16.2	X	178.12072	60.63860	73.76746	12.36206	0.2549194	0.17669441	3.1452428	20	8 18.3	21.9
478413 2012 DG	15.3	X	189.58749	324.83452	121.66211	19.29113	0.1353471	0.16219838	3.3299550	20	6 29.9	20.8
478414 2012 DU	16.3	X	181.53058	111.54257	8.36572	18.98743	0.3192661	0.17893711	3.1189071	20	8 6.1	22.3
478415 2012 DB <sub>16</sub>	16.0	X	200.94067	335.17407	163.81912	26.82360	0.1162467	0.17560074	3.1582886	20	9 14.2	20.9
478416 2012 DE <sub>97</sub>	16.1	X	160.11350	68.89504	75.27235	18.65639	0.1486677	0.17213927	3.2004870	20	8 16.8	21.6
478417 2012 EB <sub>3</sub>	18.4	X	155.72139	283.57545	326.05980	5.24839	0.1518588	0.31063483	1.9529484	20	—	—
478418 2012 EU <sub>3</sub>	18.1	X	90.01808	54.44832	341.40825	17.66013	0.1341196	0.34728408	2.0045311	20	—	—
478419 2012 FK <sub>65</sub>	18.5	X	116.28013	269.84710	31.76113	4.14211	0.2053876	0.31181804	2.1537827	20	—	—
478420 2012 FP <sub>67</sub>	18.4	X	127.38271	183.35389	88.20549	5.99553	0.1744188	0.29957265	2.2120823	20	12 31.4	21.8
478421 2012 GA <sub>3</sub>	18.6	X	187.49949	173.01427	31.80664	2.76227	0.1006849	0.30694968	2.1764963	20	12 14.4	21.4
478422 2012 GG <sub>5</sub>	18.0	X	120.37184	34.45493	244.46124	7.41810	0.3019708	0.29974765	2.2112212	20	—	—
478423 2012 GX <sub>26</sub>	18.3	X	156.92789	209.18302	23.66428	5.44888	0.1034947	0.30143258	2.2029734	20	12 14.4	21.4
478424 2012 GC <sub>40</sub>	17.5	X	357.29840	79.25826	85.45733	23.87432	0.0738350	0.35306137	1.9826037	20	11 2.2	19.3
478425 2012 HS <sub>5</sub>	17.8	X	90.42970	171.33953	96.474075	5.87019	0.2217831	0.28741662	2.2740227	20	11 25.5	21.5
478426 2012 HW <sub>6</sub>	18.0	X	70.53272	136.52800	152.57386	3.83805	0.1430467	0.28959844	2.2625867	20	11 27.1	21.1
478427 2012 HE <sub>21</sub>	18.2	X	99.27897	232.68394	101.17719	4.18728	0.1988586	0.31291213	2.1487593	20	—	—
478428 2012 HN <sub>21</sub>	18.1	X	118.68564	247.69238	43.21412	3.13365	0.1637435	0.30430467	2.1890901	20	—	—
478429 2012 HE <sub>28</sub>	18.4	X	77.60512	146.09882	131.01638	3.88021	0.3021918	0.27907174	2.3191320	20	11 29.8	22.3
478430 2012 HN <sub>34</sub>	17.6	X	180.72052	243.50535	219.717299	18.02694	0.0999931	0.38882378	1.8590918	20	7 17.7	20.3
478431 2012 HX <sub>38</sub>	18.3	X	91.59893	32.45652	215.93875	4.97457	0.2117783	0.27937168	2.3174718	20	10 30.4	21.8
478432 2012 HS <sub>39</sub>	17.4	X	142.52077	217.14636	38.19775	6.56345	0.2045618	0.30099305	2.2051175	20	12 23.7	21.0
478433 2012 HT <sub>52</sub>	18.1	X	89.13650	58.82197	208.03612	4.79849	0.1579975	0.28716733	2.2753386	20	11 18.2	21.3
478434 2012 HA <sub>58</sub>	17.6	X	66.89633	165.81370	104.91901	9.16025	0.1528680	0.27645853	2.3337234	20	10 31.9	20.9
478435 2012 HF <sub>66</sub>	17.9	X	120.73168	127.61760	132.91967	7.47927	0.1697637	0.29383577	2.2407820	20	12 11.6	21.4
478436 2012 HY <sub>67</sub>	18.0	X	47.19286	113.52780	187.00702	5.29120	0.2254271	0.27510211	2.3413883	20	11 23.4	21.2
478437 2012 HB <sub>72</sub>	18.1	X	82.48752	175.37404	94.21798	7.52177	0.2022719	0.28265402	2.2994957	20	11 19.0	21.6
478438 2012 HA <sub>73</sub>	18.2	X	47.01721	102.10984	193.14520	7.96591	0.2211113	0.28013732	2.3132473	20	11 17.1	21.3
478439 2012 HB <sub>79</sub>	18.3	X	174.70269	20.84005	238.06709	3.82368	0.1169825	0.31187896	2.1535023	20	—	—
478440 2012 JH <sub>21</sub>	18.0	X	106.17620	39.55847	212.69844	6.87662	0.1863459	0.28603945	2.2813159	20	11 17.3	21.5
478441 2012 JJ <sub>21</sub>	18.0	X	144.66071	202.00165	71.42516	4.92932	0.1933497	0.30396182	2.1907359	20	—	—
478442 2012 JZ <sub>25</sub>	18.4	X	58.94376	153.85147	98.75351	4.11135	0.1648394	0.27017705	2.3697566	20	9 26.8	21.5
478443 2012 JU <sub>66</sub>	17.5	X	101.82784	124.29947	135.62452	22.93736	0.2031238	0.28967925	2.2621659	20	11 29.9	21.7
478444 2012 KR	18.1	X	108.15283	129.05937	82.28135	2.18684	0.1408029	0.27749183	2.3279264	20	9 24.7	21.5
478445 2012 KZ <sub>4</sub>	18.5	X	71.55738	185.21521	113.02616	2.98082	0.2258007	0.28286364	2.2983595	20	12 14.9	22.1
478446 2012 KT <sub>11</sub>	17.9	X	104.47882	253.33828	85.67833	2.30117	0.1909912	0.31389817	2.1442571	20	—	—
478447 2012 KR <sub>12</sub>	18.6	X	76.66114	197.35472	121.34253	3.60165	0.2453824	0.29298002	2.2451432	20	—	—
478448 2012 KN <sub>43</sub>	18.1	X	116.55320	24.38241	236.69217	5.50550	0.1753410	0.29088502	2.2559102	20	12 7.4	21.5
478449 2012 KK <sub>44</sub>	18.1	X	79.98758	55.69418	226.48134	2.34042	0.2251083	0.28131236	2.3068012	20	12 2.3	21.7
478450 2012 KJ <sub>45</sub>	17.1	X	239.06884	307.72224	251.02797	24.93235	0.2286670	0.31893308	2.1216301	20	—	—
478451 2012 KF <sub>48</sub>	17.9	X	56.70697	89.46902	209.68046	6.50079	0.1970119	0.27744737	2.3281751	20	11 28.5	21.1
478452 2012 LK	18.0	X	39.15864	138.15918	184.67292	4.65944	0.2408533	0.27710504	2.3300922	20	12 14.9	21.3
478453 2012 LT <sub>4</sub>	16.7	X	92.27468	20.30271	160.14450	24.39216	0.1682646	0.28528997	2.2853096	20	12 8.3	20.0
478454 2012 LZ <sub>7</sub>	18.3	X	89.85415	172.93988	157.13309	6.15345	0.2024872	0.29820446	2.2188432	20	—	—
478455 2012 NV <sub>1</sub>	17.0	X	9.05807	3.64490	332.35830	14.67824	0.1637468	0.25962098	2.4335645	20	10 27.3	20.0
478456 2012 OY <sub>1</sub>	17.8	X	0.41732	227.32369	171.38558	7.07296	0.1212832	0.27329647	2.3516898	20	—	—
478457 2012 OV <sub>2</sub>	17.5	X	28.39698	235.82909	90.15139	3.68939	0.2077805	0.25881486	2.4386150	20	11 27.4	20.3
478458 2012 PB <sub>14</sub>	17.7	X	68.60808	357.52974	304.50539	4.37547	0.1135891	0.26587485	2.3952520	20	12 2.2	21.0
478459 2012 PF <sub>16</sub>	17.5	X	17.92948	133.66740	182.44215	3.30961	0.1935362	0.25670924	2.4519318	20	10 26.9	20.1
478460 2012 PY <sub>31</sub>	17.4	X	91.37847	324.92122	358.48557	5.53559	0.1669146	0.28577918	2.2827008	20	—	—
478461 2012 PB <sub>34</sub>	17.6	X	59.07001	95.44257	246.72355	5.81861	0.1347022	0.27911826	2.3188744	20	—	—
478462 2012 PN <sub>38</sub>	17.8	X	83.77340	350.86834	272.63963	3.91063	0.2060667	0.26773872	2.3841226	20	11 7.9	21.4
478463 2012 QO <sub>3</sub>	18.1	X	86.10562	217.66287	77.22927	8.02053	0.2328712	0.28019285	2.3129417	20	12 22.9	21.9
478464 2012 QT <sub>13</sub>	17.5	X	241.52858	86.14622	334.89562	11.23314	0.0563167	0.23677151	2.5877148	20	8 6.3	21.0
478465 2012 QS <sub>14</sub>	17.2	X	1.98632	105.80732	263.68578	7.78245	0.3790226	0.25723958	2.4485606	20	—	—
478466 2012 QG <sub>15</sub>	17.6	X	346.83592	37.93449	304.65452	2.59299	0.1463065	0.24736527	2.5132956	20	9 26.2	20.1
478467 2012 QF <sub>20</sub>	18.0	X	28.47009	182.05766	171.60827	7.84545	0.1521367	0.26677499	2.3898610	20	12 26.9	21.2
478468 2012 QS <sub>20</sub>	18.1	X	36.05115	57.82175	278.98640	2.38817	0.2351709	0.26574200	2.3960502	20	12 25.8	21.4
478469 2012 QJ <sub>22</sub>	18.0	X	16.79235	347.25296	304.52263	4.07620	0.2059391	0.24737183	2.5132511	20	9 16.1	20.6
478470 2012 QP <sub>22</sub>	17.7	X	343.23761	215.34041	206.08960	3.59841	0.1347983	0.26982544	2.3718149	20	—	—
478471 2012 QH <sub>23</sub>	17.8	X	4.98883	208.82293	179.23622	6.45763	0.1164041	0.26759776	2.3849598	20	—	—
478472 2012 QJ <sub>23</sub>	17.0	X	221.88278	91.90933	338.67048	14.57284	0.0964428	0.22991593	2.6389025	20	7 21.7	21.0
478473 2012 QU <sub>24</sub>	17.4	X	352.15341	2.41435	273.83428	2.61692	0.1364779	0.23050767	2.6343843	20	6 24.8	20.0
478474 2012 QK <sub>26</sub>	17.7	X	336.01348	224.94516	179.87518	6.44601	0.1230605	0.26094608	2.4253190			

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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>
478481 2012 QH <sub>51</sub>	17.3	X	37.20411	306.02731	352.46597	14.00932	0.1748286	0.25767171	2.4458223	20	10 21.7	20.5
478482 2012 RV <sub>1</sub>	17.6	X	267.47468	94.87033	290.49923	3.64974	0.0476230	0.23430256	2.6058617	20	7 22.1	20.8
478483 2012 RT <sub>2</sub>	18.3	X	48.86426	346.26588	348.02326	0.97929	0.2010150	0.26872175	2.3783048	20	—	—
478484 2012 RP <sub>3</sub>	16.7	X	38.44471	42.37622	277.94416	10.00788	0.2660466	0.26252044	2.4156127	20	12 10.8	20.0
478485 2012 RW <sub>5</sub>	17.2	X	172.39772	274.80255	338.30306	7.91835	0.1359601	0.29001850	2.2604015	20	—	—
478486 2012 RV <sub>7</sub>	17.7	X	322.15242	92.44732	262.20413	4.26449	0.2412011	0.24299520	2.5433390	20	8 13.2	19.6
478487 2012 RA <sub>18</sub>	18.0	X	348.05278	108.58964	190.88361	8.55279	0.3300182	0.23943534	2.5684861	20	7 21.3	19.2
478488 2012 RS <sub>21</sub>	18.2	X	4.05748	139.49571	197.82445	1.94058	0.2337160	0.25259518	2.4784834	20	11 7.4	20.3
478489 2012 RT <sub>21</sub>	17.7	X	291.58464	35.47441	304.87186	3.35590	0.0679302	0.22777374	2.6554224	20	6 20.6	20.9
478490 2012 RT <sub>22</sub>	18.1	X	352.16343	211.04164	176.12082	1.49052	0.2303049	0.25873777	2.4390993	20	12 28.9	20.3
478491 2012 RY <sub>27</sub>	17.2	X	29.84403	64.36260	254.00906	5.56018	0.1559988	0.25848179	2.4407094	20	11 9.7	20.1
478492 2012 RR <sub>31</sub>	17.8	X	321.64942	214.76258	151.59843	4.34041	0.1893833	0.24481294	2.5307338	20	9 9.1	19.7
478493 2012 RP <sub>32</sub>	17.0	X	21.62126	271.80663	40.78279	7.57205	0.1181293	0.25176775	2.4839108	20	10 15.3	19.8
478494 2012 RC <sub>33</sub>	17.8	X	285.44829	225.51985	182.39842	7.49579	0.1909823	0.24326997	2.5414235	20	8 26.6	20.7
478495 2012 RT <sub>37</sub>	17.2	X	258.84954	227.26177	194.65040	12.49746	0.1100656	0.23603617	2.5930866	20	8 16.5	20.9
478496 2012 RB <sub>40</sub>	17.3	X	4.13622	341.20475	26.62981	4.91183	0.2072884	0.26051071	2.4280204	20	12 18.5	19.9
478497 2012 RE <sub>40</sub>	17.3	X	323.75505	224.07778	114.78756	6.43567	0.3458858	0.23803505	2.5785493	20	7 3.9	18.8
478498 2012 SO <sub>3</sub>	17.2	X	349.43983	349.11730	31.07199	4.82769	0.1859401	0.25511750	2.4621200	20	12 4.5	19.6
478499 2012 SQ <sub>6</sub>	17.8	X	39.75924	280.54939	53.45764	3.05024	0.2328187	0.26464054	2.4026940	20	12 25.8	21.2
478500 2012 SM <sub>12</sub>	17.8	X	309.80058	75.56914	21.81371	2.38963	0.1789563	0.26302192	2.4125413	20	—	—
478501 2012 SC <sub>13</sub>	18.0	X	22.28717	313.39392	46.09339	2.23498	0.2067963	0.26273373	2.4143052	20	—	—
478502 2012 SJ <sub>17</sub>	17.6	X	343.87366	347.64470	347.47188	2.38126	0.1322725	0.24183445	2.5514708	20	9 8.3	19.8
478503 2012 SY <sub>17</sub>	17.2	X	300.54579	11.64829	331.09296	4.70730	0.0735397	0.22392676	2.6857488	20	7 7.1	20.6
478504 2012 SN <sub>19</sub>	18.1	X	88.75160	136.55103	161.15236	2.62780	0.1635194	0.27149459	2.3620836	20	12 23.4	21.7
478505 2012 SW <sub>21</sub>	16.9	X	64.27687	271.35311	64.26028	10.28464	0.0918348	0.24503243	2.5292223	20	9 16.9	20.3
478506 2012 SA <sub>23</sub>	18.0	X	319.81369	27.90690	23.36145	1.63053	0.1767101	0.25374474	2.4709920	20	11 17.8	19.8
478507 2012 SQ <sub>27</sub>	17.9	X	30.50670	157.64110	187.70485	2.09012	0.2154293	0.26323106	2.4112632	20	12 27.0	20.9
478508 2012 SY <sub>28</sub>	17.4	X	15.15344	26.24023	311.10881	6.02300	0.1825390	0.25841023	2.4411600	20	11 17.2	20.2
478509 2012 SH <sub>29</sub>	18.3	X	29.38840	104.09863	238.14822	1.81565	0.2306474	0.26175731	2.4203054	20	12 23.5	21.5
478510 2012 SZ <sub>29</sub>	17.9	X	284.97856	294.28225	195.31791	5.67391	0.0798551	0.27042273	2.3683211	20	—	—
478511 2012 SZ <sub>30</sub>	17.0	X	276.57358	34.02776	18.17406	6.19587	0.2308855	0.23365708	2.6106586	20	8 14.7	20.2
478512 2012 SC <sub>31</sub>	16.7	X	220.30822	84.97707	27.61933	22.33918	0.0541301	0.23486341	2.6017115	20	9 24.9	20.5
478513 2012 SR <sub>36</sub>	17.6	X	106.71267	266.50116	356.88987	6.43934	0.1474466	0.26582311	2.3955628	20	11 24.4	21.4
478514 2012 ST <sub>39</sub>	18.0	X	32.85398	83.97015	233.75524	1.46043	0.2105264	0.25813639	2.4428862	20	11 22.2	21.0
478515 2012 SR <sub>46</sub>	17.9	X	349.07968	176.26742	192.50941	1.68347	0.2147382	0.25393310	2.4697700	20	11 21.8	19.9
478516 2012 SF <sub>48</sub>	17.7	X	13.79499	192.33819	139.89160	1.79269	0.1970720	0.25412192	2.4685464	20	11 11.8	20.3
478517 2012 SG <sub>50</sub>	17.5	X	51.57289	110.98878	198.98863	11.82701	0.1769593	0.25951230	2.4342439	20	12 1.1	21.0
478518 2012 SA <sub>55</sub>	17.0	X	312.53821	324.83586	35.01063	9.87252	0.1892065	0.23265335	2.6181619	20	8 11.4	19.8
478519 2012 SE <sub>56</sub>	17.2	X	277.43480	121.44249	325.24427	4.33504	0.2061626	0.24536229	2.5269550	20	10 5.6	20.0
478520 2012 SG <sub>56</sub>	16.7	X	17.71585	289.48125	355.31095	11.92380	0.1167812	0.23325642	2.6136473	20	8 27.9	19.7
478521 2012 SK <sub>56</sub>	17.1	X	282.15344	204.81297	167.09398	2.35015	0.2195049	0.22673467	2.6635290	20	6 26.0	20.5
478522 2012 SL <sub>56</sub>	16.8	X	287.62465	356.38885	26.35272	13.86589	0.1356123	0.23089304	2.6314522	20	8 9.9	20.3
478523 2012 SM <sub>57</sub>	16.9	X	239.40552	94.93662	357.81137	11.98372	0.2173276	0.23385198	2.6092079	20	8 25.3	20.8
478524 2012 SV <sub>57</sub>	16.7	X	240.04830	46.94947	21.13248	13.08803	0.1775759	0.22498292	2.6773368	20	7 30.4	20.9
478525 2012 SL <sub>58</sub>	16.5	X	291.84603	339.00930	24.57186	18.73311	0.2269251	0.23267631	2.6179897	20	6 27.8	20.1
478526 2012 SU <sub>60</sub>	18.2	X	18.14519	162.83888	164.80761	1.44119	0.1955193	0.25502018	2.4627464	20	11 12.1	20.9
478527 2012 SW <sub>60</sub>	17.5	X	299.65510	139.63169	217.28561	6.32229	0.1245298	0.23380589	2.6095507	20	7 17.7	20.6
478528 2012 SY <sub>64</sub>	17.6	X	286.70605	49.81510	325.49465	4.96091	0.2625796	0.23203741	2.6227932	20	7 1.0	20.8
478529 2012 TG <sub>1</sub>	17.9	X	10.44519	177.48917	177.71543	2.18800	0.2162849	0.25822763	2.4423107	20	12 12.2	20.6
478530 2012 TB <sub>2</sub>	17.7	X	27.91805	305.01938	12.62672	7.14964	0.2295377	0.25415658	2.4683220	20	11 15.6	20.8
478531 2012 TR <sub>2</sub>	17.1	X	245.80285	142.98170	351.59607	6.67161	0.1195218	0.26142073	2.4223824	20	11 9.8	20.1
478532 2012 TZ <sub>5</sub>	17.4	X	310.86859	134.68049	192.86135	11.53168	0.0927116	0.22485411	2.6783592	20	6 27.6	20.9
478533 2012 TX <sub>7</sub>	17.3	X	173.98588	176.83349	295.94322	9.28232	0.1675917	0.22896205	2.6462267	20	7 19.0	21.7
478534 2012 TP <sub>9</sub>	16.4	X	264.37381	41.91159	11.39565	31.92329	0.2331315	0.23107004	2.6301082	20	8 16.0	20.7
478535 2012 TW <sub>10</sub>	16.6	X	166.55313	313.43640	212.22975	31.54695	0.2306446	0.22873437	2.6479824	20	9 10.3	21.6
478536 2012 TP <sub>11</sub>	18.5	X	308.18309	23.56960	36.69188	2.74110	0.1986230	0.24699657	2.5157961	20	11 1.9	20.5
478537 2012 TZ <sub>12</sub>	16.6	X	244.81823	47.39187	29.01666	22.48043	0.0630164	0.23138297	2.6277364	20	9 10.0	20.6
478538 2012 TK <sub>14</sub>	16.5	X	223.57646	110.12509	307.26263	11.83700	0.3086070	0.21335776	2.7737272	20	6 15.5	21.5
478539 2012 TB <sub>17</sub>	17.2	X	0.00091	349.63307	16.77785	7.26679	0.1135875	0.25518380	2.4616935	20	11 21.9	20.0
478540 2012 TU <sub>17</sub>	17.4	X	315.67980	316.51311	29.68947	4.89848	0.1329270	0.23370507	2.6103012	20	7 31.9	20.2
478541 2012 TZ <sub>17</sub>	18.0	X	44.68689	17.75976	286.39571	1.73959	0.1856239	0.25551140	2.4595889	20	11 14.5	21.3
478542 2012 TY <sub>18</sub>	17.9	X	264.79879	129.57699	17.71087	5.02722	0.1099817	0.26733032	2.3865502	20	—	—
478543 2012 TK <sub>22</sub>	17.0	X	208.71951	244.22996	202.32889	13.16352	0.1878517	0.21945929	2.7220749	20	7 13.9	21.7
478544 2012 TB <sub>23</sub>	18.0	X	343.37544	75.69772	314.54457	2.21729	0.1823345	0.25577643	2.4578896	20	12 7.8	20.1
478545 2012 TM <sub>25</sub>	17.3	X	297.70655	152.78511	194.38659	6.32188	0.1148917	0.22629742	2.6669588	20	7 1.5	20.6
478546 2012 TU <sub>25</sub>	17.4	X	26.81443	329.37920	22.42095	6.75918	0.1257456	0.26007373	2.4307394	20	12 16.2	20.6
478547 2012 TF <sub>26</sub>	17.5	X	351.00199	174.61960	144.00912	2.95873	0.1820890	0.24129498	2.5552723	20	8 31.7	19.5
478548 2012 TE <sub>32</sub>	17.5	X	276.99707	149.71167	243.94504	1.13523	0.1411595	0.23123375	2.6288667	20	7 31.8	20.6
478549 2012 TB <sub>33</sub>	17.3	X	251.32147	252.12194	202.45702	14.22585	0.0541760	0.24263320	2.5458681	20	10 1.9	20.6
478550 2012 TR <sub>34</sub>	17.3	X	263.71500	117.68159	295.92211	3.09940	0.2258125	0.22959848	2.6413344	20	7 27.6	21.0
478551 2012 TU <sub>34</sub>	17.5	X	282.62303	166.53198	184.84123	5.80519	0.0337239	0.22038781	2.7144239	20	6 27.6	21.2
478552 2012 TW <sub>34</sub>	17.5	X	268.25762	108.33422	310.89346	2.59189	0.2041920	0.23438368	2.6052604	20	8 13.9	20.8
478553 2012 TX <sub>36</sub>	17.3	X	282.36319	98.87723	345.97763	5.81785	0.0723265	0.25682535	2.4511927	20	11 2.1	20.2</



ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
478561 2012 TA <sub>57</sub>	16.4	X	120.50387	172.35586	40.17339	16.57771	0.1071414	0.23151892	2.6267076	20	10 6.0	20.5
478562 2012 TG <sub>60</sub>	17.3	X	315.63705	51.47656	30.49532	8.98955	0.1829194	0.25903776	2.4372159	20	12 29.4	19.4
478563 2012 TM <sub>64</sub>	17.9	X	344.41097	330.53745	7.01489	12.80461	0.2114930	0.24197564	2.5504782	20	9 19.5	19.8
478564 2012 TP <sub>66</sub>	17.0	X	312.74348	356.53834	25.58182	15.49123	0.1259513	0.23842908	2.5757077	20	9 23.8	19.8
478565 2012 TQ <sub>66</sub>	16.9	X	287.18465	322.97419	21.59888	11.56057	0.1453614	0.21899394	2.7259297	20	6 5.2	20.6
478566 2012 TK <sub>67</sub>	17.5	X	301.84932	126.43748	267.94654	2.66095	0.1644584	0.23822452	2.5771819	20	9 9.1	20.0
478567 2012 TL <sub>67</sub>	16.7	X	281.79668	160.78339	221.89500	13.00661	0.1145901	0.22742300	2.6581519	20	7 23.6	20.4
478568 2012 TY <sub>67</sub>	17.6	X	304.85941	143.24708	203.24824	3.11661	0.1273962	0.22450552	2.6811310	20	7 10.3	20.6
478569 2012 TZ <sub>68</sub>	17.3	X	290.78911	250.68756	151.12193	1.54872	0.1560629	0.23547452	2.5972082	20	9 2.3	20.1
478570 2012 TZ <sub>68</sub>	17.8	X	358.82916	119.11935	189.20055	3.16039	0.2444310	0.23696481	2.5863074	20	9 7.2	19.8
478571 2012 TZ <sub>69</sub>	17.6	X	342.08035	324.78484	8.21587	5.05113	0.1998380	0.24106391	2.5569049	20	9 4.6	19.6
478572 2012 TT <sub>73</sub>	17.4	X	228.23969	76.20881	348.58364	5.55583	0.1018376	0.22567929	2.6718264	20	7 17.9	21.3
478573 2012 TF <sub>77</sub>	16.8	X	280.16486	25.62827	44.02366	12.54968	0.1589591	0.23569354	2.5955990	20	9 29.8	19.9
478574 2012 TS <sub>78</sub>	18.5	X	70.53346	196.71975	8.28893	32.67200	0.3814179	0.48326071	1.6082309	20	9 25.1	20.7
478575 2012 TQ <sub>79</sub>	13.8	X	322.48355	280.18140	359.21093	18.14531	0.1330910	0.08287909	5.2100200	20	5 2.8	20.4
478576 2012 TF <sub>81</sub>	18.2	X	65.77762	220.33968	73.71985	2.33611	0.2135624	0.26184336	2.4197751	20	11 29.6	21.7
478577 2012 TU <sub>85</sub>	17.3	X	24.93380	256.44905	17.49885	17.08994	0.1937274	0.23644876	2.5900691	20	9 10.6	20.3
478578 2012 TF <sub>86</sub>	16.8	X	266.02742	325.13120	18.79909	3.81483	0.0704972	0.21160531	2.7890203	20	5 19.9	20.8
478579 2012 TZ <sub>90</sub>	17.3	X	16.27573	338.46737	34.26445	7.14772	0.1018896	0.26341479	2.4101419	20	12 27.7	20.3
478580 2012 TK <sub>91</sub>	17.7	X	343.98598	113.87337	180.16719	12.11327	0.2566902	0.23343698	2.6122994	20	6 29.0	20.0
478581 2012 TF <sub>93</sub>	18.0	X	316.78896	276.39602	113.73718	2.92930	0.1121724	0.24671022	2.5177423	20	10 11.6	20.5
478582 2012 TZ <sub>93</sub>	17.6	X	261.72951	350.80867	103.19255	3.03861	0.1580374	0.24458702	2.5322920	20	10 2.7	20.6
478583 2012 TE <sub>96</sub>	17.5	X	331.18064	12.40370	326.22861	2.13656	0.0221976	0.23077385	2.6323582	20	8 21.2	20.7
478584 2012 TR <sub>96</sub>	17.7	X	347.51428	177.27112	217.83410	5.17167	0.0886941	0.25703330	2.4498704	20	12 11.4	20.4
478585 2012 TK <sub>96</sub>	17.2	X	268.16084	354.12502	13.80867	6.23344	0.0539252	0.21937049	2.7228095	20	6 27.7	21.0
478586 2012 TL <sub>100</sub>	17.1	X	354.36507	167.28743	223.47400	14.02375	0.0839559	0.25819251	2.4425321	20	12 15.1	20.1
478587 2012 TQ <sub>102</sub>	17.4	X	27.55294	130.13012	229.45854	4.28731	0.1100955	0.26208939	2.4182605	20	12 25.9	20.5
478588 2012 TC <sub>104</sub>	17.5	X	9.72105	299.58689	325.87203	6.77099	0.1947445	0.23922189	2.5700137	20	9 7.2	20.0
478589 2012 TK <sub>109</sub>	17.0	X	310.09625	135.94835	219.43719	10.74151	0.1993252	0.23441319	2.6050417	20	7 20.2	19.9
478590 2012 TD <sub>111</sub>	17.8	X	4.79344	54.71122	249.86001	6.53628	0.2006093	0.24022220	2.5628742	20	9 6.7	20.4
478591 2012 TR <sub>111</sub>	17.5	X	31.02061	319.84017	320.55349	4.89994	0.1478606	0.23936027	2.5690230	20	9 13.6	20.5
478592 2012 TL <sub>114</sub>	17.5	X	302.11204	106.39463	219.99980	13.79846	0.0927963	0.22117280	2.7079974	20	6 12.5	21.0
478593 2012 TQ <sub>115</sub>	17.2	X	94.11674	16.17219	275.07101	5.60848	0.1120519	0.26378807	2.4078676	20	12 15.9	20.8
478594 2012 TF <sub>117</sub>	17.6	X	324.56993	84.79099	230.30027	7.43713	0.1569806	0.22720488	2.6598529	20	6 25.9	20.5
478595 2012 TP <sub>119</sub>	17.2	X	280.51887	83.49852	263.28513	5.05793	0.0245167	0.21761003	2.7374747	20	6 20.1	20.6
478596 2012 TC <sub>122</sub>	17.5	X	16.89686	282.70353	353.06215	11.78474	0.1750928	0.23227162	2.6210297	20	8 21.3	20.2
478597 2012 TD <sub>127</sub>	17.0	X	351.96280	121.42275	3.32623	23.69014	0.1709635	0.28430814	2.2905680	20	—	—
478598 2012 TA <sub>128</sub>	17.7	X	268.24591	242.67857	145.32020	4.32921	0.1120078	0.22891234	2.6466098	20	7 15.9	21.2
478599 2012 TJ <sub>129</sub>	17.7	X	39.38271	239.23731	90.35022	3.46156	0.2250679	0.26046890	2.4282802	20	12 17.8	20.8
478600 2012 TA <sub>130</sub>	17.0	X	269.20361	33.70313	1.12646	6.23630	0.2244603	0.22584748	2.6704998	20	7 10.6	20.7
478601 2012 TQ <sub>130</sub>	16.3	X	204.84101	43.57868	30.88722	14.86638	0.0727068	0.21199855	2.7855703	20	7 5.4	20.7
478602 2012 TJ <sub>132</sub>	16.7	X	212.89929	235.54491	219.34960	12.46348	0.2302299	0.22344147	2.6896361	20	7 24.4	21.4
478603 2012 TD <sub>137</sub>	17.9	X	12.55856	224.12644	108.75626	1.12107	0.0531650	0.24729542	2.5137688	20	10 18.5	20.7
478604 2012 TL <sub>137</sub>	17.7	X	35.34590	250.01294	81.41593	2.68022	0.2118297	0.26225554	2.4172390	20	12 14.2	20.9
478605 2012 TT <sub>138</sub>	17.3	X	305.58807	93.39086	257.53976	2.96175	0.1483377	0.23130978	2.6282906	20	7 15.6	20.2
478606 2012 TN <sub>141</sub>	17.9	X	57.63778	145.04478	153.11287	3.35290	0.1854574	0.25928092	2.4356919	20	11 23.7	21.4
478607 2012 TX <sub>143</sub>	17.4	X	150.49130	283.80504	219.45661	4.61227	0.0581169	0.22579763	2.6708928	20	7 30.9	21.2
478608 2012 TM <sub>145</sub>	16.6	X	318.50288	268.23083	128.84959	14.26206	0.1698719	0.23916140	2.5704470	20	10 26.7	19.3
478609 2012 TN <sub>150</sub>	17.7	X	322.54052	95.35841	232.42293	3.90818	0.3365995	0.23273906	2.6175192	20	6 12.8	19.6
478610 2012 TY <sub>150</sub>	17.1	X	282.84637	24.29213	327.65421	2.82436	0.1129546	0.21914279	2.7246952	20	6 16.5	20.7
478611 2012 TL <sub>151</sub>	17.2	X	276.06846	187.83620	216.72171	2.25758	0.1998305	0.23064329	2.6333515	20	8 4.5	20.5
478612 2012 TZ <sub>151</sub>	17.1	X	333.80467	45.38064	279.43805	12.31927	0.2248633	0.23509272	2.6000194	20	7 24.4	19.2
478613 2012 TB <sub>157</sub>	18.0	X	289.51151	51.07232	21.12583	10.61964	0.2331746	0.24550342	2.5259865	20	10 5.9	20.4
478614 2012 TF <sub>157</sub>	17.3	X	145.29164	246.68543	228.71339	3.26691	0.0545668	0.21386547	2.7693356	20	6 18.8	21.3
478615 2012 TP <sub>157</sub>	17.6	X	329.50703	272.72770	36.14822	0.52094	0.1345071	0.22699376	2.6615018	20	6 29.3	20.5
478616 2012 TT <sub>157</sub>	17.1	X	195.52790	181.99978	15.27844	6.56587	0.0639827	0.26278300	2.4140033	20	12 7.6	20.3
478617 2012 TB <sub>160</sub>	17.4	X	309.23408	191.75659	157.15622	4.32844	0.1471511	0.23181950	2.6244365	20	7 19.2	20.4
478618 2012 TU <sub>162</sub>	16.6	X	231.80104	49.64727	32.47307	15.12333	0.0907727	0.22926266	2.6439130	20	8 22.7	20.6
478619 2012 TZ <sub>163</sub>	17.0	X	280.64338	201.71599	193.05884	14.05953	0.2565181	0.23151947	2.6267034	20	7 17.0	20.7
478620 2012 TU <sub>165</sub>	18.1	X	312.70546	351.20975	38.44833	7.48389	0.2851847	0.24212078	2.5494589	20	9 17.0	19.9
478621 2012 TW <sub>168</sub>	17.2	X	279.86097	232.71726	192.62116	12.00179	0.1716334	0.23852748	2.5749993	20	9 13.6	20.2
478622 2012 TV <sub>171</sub>	18.0	X	351.99202	102.70420	214.62930	8.06972	0.1756597	0.23886437	2.5725775	20	8 26.6	20.6
478623 2012 TC <sub>173</sub>	17.7	X	92.03527	340.63811	313.55302	2.69002	0.1244078	0.26586920	2.3952859	20	12 18.7	21.1
478624 2012 TP <sub>173</sub>	16.9	X	72.99441	249.21698	354.99056	7.16690	0.1331924	0.24060283	2.5601705	20	9 21.5	20.3
478625 2012 TH <sub>174</sub>	17.9	X	244.54251	282.46120	226.86329	6.66280	0.0692597	0.26224362	2.4173123	20	12 8.8	20.7
478626 2012 TJ <sub>175</sub>	17.8	X	279.31055	187.08659	193.75809	14.00855	0.1909314	0.23099170	2.6307029	20	7 7.3	21.6
478627 2012 TS <sub>176</sub>	17.8	X	351.17388	117.33351	218.36293	0.57202	0.1196808	0.24379590	2.5377672	20	9 22.8	20.3
478628 2012 TQ <sub>178</sub>	17.4	X	262.02054	104.33967	258.58517	5.40571	0.0340782	0.21795104	2.7346185	20	6 15.3	21.1
478629 2012 TJ <sub>186</sub>	17.3	X	309.65280	122.34095	228.96701	15.74755	0.2099302	0.22595899	2.6696211	20	7 9.9	20.6
478630 2012 TA <sub>187</sub>	17.1	X	331.31570	329.20548	50.69668	6.65588	0.1398347	0.24052331	2.5607348	20	10 22.3	19.5
478631 2012 TN <sub>189</sub>	17.7	X	283.89631	210.44203	196.82289	8.27106	0.1344887	0.23665335	2.5885761	20	8 30.5	20.8
478632 2012 TP <sub>189</sub>	17.5	X	283.07846	219.61834	201.84199	14.31256	0.0796379	0.24141685	2.5544123	20	9 28.1	20.5
478633 2012 TD <sub>190</sub>	17.4	X	223.63206									

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>	
478641	2012 TY <sub>195</sub>	17.1	X	246.66920	198.99927	236.75877	13.51556	0.2343469	0.22601721	2.6691627	20	7 30.8	21.4
478642	2012 TM <sub>196</sub>	17.1	X	254.90014	43.51380	354.06306	5.89610	0.0222659	0.21924790	2.7238243	20	7 26.4	20.8
478643	2012 TU <sub>198</sub>	17.0	X	218.27333	85.40916	8.37323	10.07498	0.0728330	0.22906088	2.6454655	20	8 19.8	20.8
478644	2012 TJ <sub>199</sub>	17.1	X	330.54746	344.12474	9.98940	4.72013	0.2334272	0.24091513	2.5579575	20	9 9.1	18.7
478645	2012 TL <sub>199</sub>	17.5	X	253.79385	239.75538	157.41900	5.28935	0.1221657	0.22788817	2.6545334	20	7 7.7	21.3
478646	2012 TU <sub>199</sub>	16.7	X	277.38785	14.49411	12.04828	15.65309	0.3099853	0.22733282	2.6588548	20	6 26.0	20.8
478647	2012 TE <sub>205</sub>	16.9	X	178.15238	138.56456	307.21359	6.03028	0.0237862	0.21183478	2.7870058	20	6 19.1	20.9
478648	2012 TA <sub>220</sub>	17.2	X	11.31933	243.44284	21.90365	12.94361	0.1763088	0.22976545	2.6400546	20	7 25.8	20.1
478649	2012 TA <sub>228</sub>	17.4	X	268.33984	252.38438	181.83635	14.33895	0.1483307	0.23987402	2.5653536	20	9 12.9	20.6
478650	2012 TL <sub>230</sub>	17.1	X	285.08642	349.60190	50.49592	7.04883	0.2486161	0.23281109	2.6169792	20	8 7.8	20.3
478651	2012 TQ <sub>230</sub>	17.2	X	275.84649	109.33367	329.93070	11.88127	0.2393274	0.24350130	2.5398137	20	9 14.5	20.2
478652	2012 TL <sub>232</sub>	18.0	X	351.57274	334.66175	60.28898	2.22643	0.1890654	0.25805068	2.4434271	20	—	—
478653	2012 TX <sub>239</sub>	17.8	X	272.10196	281.05118	141.29316	1.67949	0.1675257	0.23667552	2.5884145	20	8 30.7	20.7
478654	2012 TF <sub>241</sub>	17.3	X	278.21841	231.18721	164.13394	4.98240	0.1419004	0.22914520	2.6448164	20	8 4.1	20.6
478655	2012 TE <sub>242</sub>	17.3	X	236.54546	256.67895	198.27973	12.65784	0.1545509	0.23395914	2.6084111	20	8 25.9	21.3
478656	2012 TH <sub>243</sub>	17.4	X	284.62260	2.31112	41.36959	5.83250	0.0870930	0.23743984	2.5828567	20	9 8.5	20.5
478657	2012 TX <sub>244</sub>	17.8	X	7.44219	242.99620	81.27765	3.02850	0.1215217	0.24664729	2.5181706	20	10 8.1	20.4
478658	2012 TY <sub>245</sub>	17.1	X	324.97532	145.61681	226.28442	8.06105	0.2484702	0.23957331	2.5674999	20	9 17.1	19.2
478659	2012 TJ <sub>247</sub>	17.3	X	323.99866	56.23117	291.93395	2.84820	0.2398002	0.23700481	2.5860164	20	8 7.7	19.4
478660	2012 TQ <sub>247</sub>	17.0	X	264.15010	126.50463	277.27192	4.83759	0.1053831	0.22669248	2.6638594	20	8 1.2	20.4
478661	2012 TK <sub>251</sub>	17.4	X	352.74730	351.54312	337.25507	7.12688	0.2492608	0.24263767	2.5458368	20	9 25.8	19.4
478662	2012 TH <sub>255</sub>	17.3	X	350.21333	12.96547	326.78971	2.60875	0.2312688	0.24232272	2.5480422	20	10 6.3	19.3
478663	2012 TO <sub>256</sub>	16.5	X	321.44709	292.34539	25.50911	9.65624	0.0799092	0.21889719	2.7267329	20	7 4.1	20.0
478664	2012 TJ <sub>257</sub>	17.5	X	327.51532	348.66241	74.97893	5.33928	0.1605978	0.25697609	2.4502341	20	12 23.9	19.7
478665	2012 TN <sub>258</sub>	17.7	X	329.89932	199.47251	142.48662	1.76437	0.2142629	0.23704450	2.5857277	20	8 16.0	19.7
478666	2012 TP <sub>258</sub>	16.8	X	344.66302	308.05576	28.66596	29.02186	0.1939623	0.24046183	2.5611712	20	9 30.5	19.5
478667	2012 TL <sub>263</sub>	17.6	X	266.13294	310.91666	43.70557	6.92660	0.0237292	0.21548553	2.7554380	20	6 10.5	21.3
478668	2012 TL <sub>263</sub>	17.1	X	227.24988	321.56807	73.48408	5.43338	0.0708661	0.21117815	2.7927800	20	6 8.9	21.2
478669	2012 TV <sub>276</sub>	17.2	X	321.22967	337.39146	341.52661	4.59110	0.0307314	0.22203600	2.7009743	20	7 9.8	20.8
478670	2012 TZ <sub>277</sub>	17.1	X	219.78197	165.94893	262.14357	4.03696	0.1016854	0.22049790	2.7135203	20	7 10.6	21.0
478671	2012 TS <sub>280</sub>	17.6	X	31.87392	295.93241	2.89610	11.52530	0.0483013	0.24109345	2.5566961	20	9 27.2	20.9
478672	2012 TB <sub>282</sub>	17.5	X	334.03697	63.24917	265.51214	12.15976	0.1887077	0.23443512	2.6048793	20	7 31.7	20.0
478673	2012 TU <sub>285</sub>	17.5	X	271.75971	307.72406	110.25007	2.63556	0.1129545	0.23258014	2.6187114	20	9 2.3	20.7
478674	2012 TO <sub>290</sub>	17.5	X	331.14347	255.99791	88.36647	5.01448	0.1975764	0.23627632	2.5913291	20	8 26.8	19.7
478675	2012 TQ <sub>292</sub>	17.2	X	341.05419	70.33067	263.79250	6.15366	0.1434371	0.23321183	2.6139804	20	8 26.9	20.0
478676	2012 TJ <sub>293</sub>	17.6	X	234.67285	88.35259	323.49805	4.51920	0.1634094	0.21672852	2.7448925	20	6 30.2	21.7
478677	2012 TO <sub>294</sub>	17.7	X	340.93299	125.25109	227.54394	13.65056	0.1913163	0.23926801	2.5696834	20	9 26.6	20.3
478678	2012 TA <sub>295</sub>	17.6	X	277.82657	162.51079	235.64573	2.73228	0.2075200	0.22797505	2.6538589	20	7 27.6	21.0
478679	2012 TH <sub>295</sub>	17.6	X	303.83276	172.14363	227.70313	8.29962	0.1581439	0.23754534	2.5820919	20	9 19.9	20.3
478680	2012 TA <sub>300</sub>	17.2	X	279.67354	139.76046	228.52950	10.65921	0.1589991	0.21977354	2.7194794	20	6 26.1	20.9
478681	2012 TL <sub>301</sub>	17.4	X	358.82089	189.64480	144.39468	6.09236	0.2258007	0.24723640	2.5141688	20	10 22.4	19.6
478682	2012 TA <sub>302</sub>	17.0	X	118.57664	233.79869	40.77700	7.96011	0.1127172	0.26855998	2.3792597	20	12 20.5	20.6
478683	2012 TE <sub>302</sub>	17.3	X	352.75680	297.98957	72.60795	4.81580	0.1924298	0.25589582	2.4571250	20	11 28.9	19.4
478684	2012 TJ <sub>307</sub>	17.0	X	261.31317	151.06255	241.13659	10.49176	0.2032084	0.21920413	2.7241868	20	6 27.9	21.1
478685	2012 TB <sub>311</sub>	17.1	X	268.75067	177.96593	260.06261	4.03496	0.2567296	0.23403682	2.6078339	20	8 30.0	20.4
478686	2012 TD <sub>313</sub>	16.9	X	341.93873	60.49022	284.61079	10.92973	0.2303590	0.24182425	2.5515426	20	9 16.2	19.2
478687	2012 TE <sub>313</sub>	16.5	X	281.71038	143.27000	290.60712	12.02532	0.1405586	0.24244128	2.5472115	20	9 28.9	19.7
478688	2012 TF <sub>314</sub>	17.9	X	90.61521	278.25574	32.65209	2.80357	0.1554800	0.27161158	2.3614053	20	—	—
478689	2012 TJ <sub>315</sub>	16.8	X	286.48809	222.75998	196.93631	12.37225	0.2704225	0.23657108	2.5891762	20	8 28.7	19.9
478690	2012 UZ <sub>12</sub>	18.0	X	328.20192	193.87339	176.04976	6.75821	0.2284010	0.24396916	2.5365656	20	9 30.1	19.6
478691	2012 UD <sub>15</sub>	17.5	X	340.09104	121.86675	189.55613	9.58267	0.1734620	0.23161707	2.6259655	20	7 20.6	20.1
478692	2012 UT <sub>19</sub>	17.6	X	344.96270	110.81982	192.69255	14.32501	0.0996876	0.22804022	2.6533533	20	7 19.0	21.0
478693	2012 UY <sub>20</sub>	17.1	X	266.94130	53.07129	344.34702	14.01901	0.1833046	0.22702259	2.6612765	20	7 20.4	20.9
478694	2012 UV <sub>25</sub>	17.0	X	166.41678	174.85431	334.99772	10.15041	0.1710196	0.22756832	2.6570201	20	8 28.3	21.2
478695	2012 UE <sub>28</sub>	17.1	X	283.43890	266.99940	66.94605	4.98667	0.1088121	0.21268554	2.7795687	20	5 24.7	20.7
478696	2012 UG <sub>29</sub>	16.5	X	306.27339	26.18539	359.40873	14.96973	0.1116284	0.23750809	2.5823619	20	9 14.1	19.3
478697	2012 UH <sub>31</sub>	16.4	X	343.57434	231.66814	46.65236	14.03099	0.0979473	0.21199204	2.7856273	20	6 10.2	19.8
478698	2012 UQ <sub>34</sub>	17.4	X	349.74639	211.83505	181.38862	5.00119	0.1085859	0.25863402	2.4397516	20	12 15.4	20.1
478699	2012 UZ <sub>34</sub>	17.8	X	274.17192	9.68302	19.19413	2.10296	0.2262314	0.22559236	2.6725128	20	7 7.7	21.4
478700	2012 UG <sub>35</sub>	17.9	X	250.64138	148.87382	243.01143	2.41914	0.2016758	0.21757975	2.7377286	20	6 16.8	22.1
478701	2012 UG <sub>36</sub>	17.4	X	302.67538	166.10925	207.63751	2.15394	0.1591095	0.23017804	2.6368987	20	8 10.9	20.2
478702	2012 UL <sub>36</sub>	17.3	X	253.54298	256.09933	215.26169	12.02533	0.1021569	0.24110471	2.5566165	20	10 20.5	20.4
478703	2012 UN <sub>36</sub>	17.0	X	338.89235	293.87007	51.35464	13.59119	0.1637567	0.23517413	2.5994194	20	9 21.8	19.7
478704	2012 UO <sub>36</sub>	17.2	X	312.08129	301.26487	65.38127	4.10835	0.2075239	0.23246610	2.6195677	20	8 15.3	19.7
478705	2012 UP <sub>36</sub>	17.0	X	304.58680	305.45344	54.72071	7.78628	0.1961010	0.22769671	2.6560212	20	7 22.0	19.9
478706	2012 UJ <sub>37</sub>	16.8	X	277.53497	9.30231	316.86987	7.14937	0.0153324	0.20385911	2.8592314	20	5 18.7	20.9
478707	2012 UH <sub>38</sub>	17.3	X	229.50078	169.62739	307.59731	4.00365	0.0459501	0.23947764	2.5681836	20	10 2.9	20.8
478708	2012 UV <sub>38</sub>	16.6	X	356.72310	46.75563	251.15690	5.15088	0.0701010	0.22569221	2.6717245	20	8 1.0	19.8
478709	2012 UF <sub>45</sub>	16.9	X	40.96517	218.48295	43.96038	12.38075	0.1505641	0.23223606	2.6212973	20	9 12.1	20.3
478710	2012 UG <sub>45</sub>	17.6	X	266.32902	243.37704	174.85812	1.98327	0.1733404	0.23169831	2.6253516	20	8 14.4	21.0
478711	2012 UW <sub>45</sub>	17.0	X	218.64438	94.36164	53.04819	8.99477	0.085796					

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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>		
478721	2012	UK <sub>55</sub>	16.9	X	287.26315	157.55947	225.75375	12.56108	0.2468429	0.22968379	2.6406803	20	7 12.1	20.4
478722	2012	UO <sub>56</sub>	17.5	X	247.04033	131.49323	248.04680	3.08022	0.1146321	0.21254114	2.7808275	20	6 7.2	21.6
478723	2012	UC <sub>58</sub>	17.1	X	270.35586	36.75857	28.90434	6.94127	0.3041702	0.23167182	2.6255517	20	8 12.9	20.6
478724	2012	UG <sub>58</sub>	17.3	X	358.31555	293.34007	36.23266	9.44687	0.1798585	0.23944622	2.5684083	20	10 5.9	19.8
478725	2012	UF <sub>59</sub>	17.5	X	9.96948	15.30726	307.59508	2.63149	0.1236675	0.23935909	2.5690315	20	10 5.9	20.4
478726	2012	UV <sub>60</sub>	16.5	X	334.43461	302.60947	53.56533	13.65336	0.1966988	0.23771535	2.5808607	20	9 29.8	19.0
478727	2012	UV <sub>63</sub>	16.7	X	317.94938	193.17305	201.82211	12.84346	0.0794386	0.24088283	2.5581862	20	10 18.9	19.3
478728	2012	UX <sub>63</sub>	16.9	X	292.80427	249.75466	167.52462	5.19129	0.2236445	0.23811153	2.5779927	20	9 18.8	19.2
478729	2012	UJ <sub>65</sub>	16.9	X	284.79287	145.54657	214.45722	4.17382	0.1739512	0.21975258	2.7196523	20	6 20.6	20.3
478730	2012	UR <sub>65</sub>	17.5	X	262.72831	266.64092	194.84394	2.57544	0.2554244	0.23770136	2.5809620	20	9 25.3	20.8
478731	2012	UV <sub>65</sub>	17.0	X	313.76459	296.56879	48.41867	7.62163	0.2543201	0.22933686	2.6433427	20	7 6.3	19.6
478732	2012	UG <sub>66</sub>	17.4	X	228.54377	229.08337	207.96193	6.29720	0.0382713	0.22202275	2.7010817	20	8 7.6	21.3
478733	2012	UJ <sub>66</sub>	17.1	X	255.45075	235.63002	218.48202	12.09765	0.0954024	0.23641444	2.5903198	20	9 27.8	20.7
478734	2012	UR <sub>66</sub>	17.0	X	208.71673	302.28435	217.27972	11.80898	0.20210607	0.24468298	2.5316299	20	11 8.0	20.2
478735	2012	UA <sub>67</sub>	17.4	X	356.65193	194.99726	129.41881	5.54680	0.2771054	0.24085975	2.5583496	20	10 8.5	19.3
478736	2012	UQ <sub>67</sub>	17.5	X	304.21952	213.40602	197.97570	4.65722	0.3468306	0.24048653	2.5609959	20	9 11.9	19.2
478737	2012	UG <sub>72</sub>	18.0	X	293.54674	252.64239	142.17241	0.23331	0.1740438	0.23654048	2.5893995	20	8 29.4	20.6
478738	2012	UE <sub>73</sub>	17.8	X	261.97514	190.19653	195.95800	3.02635	0.1775785	0.22251591	2.6970894	20	6 25.3	21.6
478739	2012	UJ <sub>73</sub>	18.0	X	46.99053	268.75162	40.75810	2.60650	0.1876987	0.254533003	2.4659070	20	11 24.4	21.4
478740	2012	UK <sub>76</sub>	17.8	X	352.72224	131.60744	202.35530	7.98805	0.1781720	0.23969007	2.5666660	20	9 26.2	20.2
478741	2012	UT <sub>78</sub>	17.0	X	347.36497	315.78101	21.12626	13.19956	0.2027657	0.23924287	2.5698634	20	9 26.1	19.2
478742	2012	UV <sub>78</sub>	17.4	X	291.39644	23.30233	23.62624	15.42183	0.1710147	0.23660552	2.5889250	20	9 15.7	20.4
478743	2012	UK <sub>80</sub>	17.1	X	285.79615	153.56148	238.81148	13.32735	0.0938139	0.23034936	2.6355912	20	8 13.7	20.7
478744	2012	UC <sub>84</sub>	16.8	X	300.65089	4.60260	18.84959	8.35698	0.1234403	0.23004651	2.6379038	20	8 31.3	19.8
478745	2012	UH <sub>85</sub>	17.7	X	323.43844	313.53058	4.24669	5.41121	0.2759487	0.23276017	2.6173609	20	6 9.6	20.2
478746	2012	UX <sub>85</sub>	17.3	X	280.63073	177.53621	237.14554	3.97659	0.2357855	0.23315337	2.6144174	20	8 18.8	20.6
478747	2012	UN <sub>88</sub>	17.9	X	2.35190	120.51822	228.21642	14.14495	0.1556769	0.24396497	2.5365946	20	11 5.3	20.6
478748	2012	UT <sub>88</sub>	17.5	X	291.17613	43.92364	12.50980	0.12703	0.1136991	0.23694967	2.5864176	20	9 30.2	20.2
478749	2012	UH <sub>89</sub>	16.6	X	160.71674	203.16330	226.20770	9.33334	0.1098240	0.19259984	2.9696056	20	5 11.3	21.0
478750	2012	UD <sub>94</sub>	17.5	X	117.28725	207.89781	135.25530	4.44263	0.1761527	0.28962702	2.2624379	20	—	—
478751	2012	UZ <sub>95</sub>	17.1	X	34.73716	359.70154	225.14100	3.41006	0.0444125	0.21162533	2.7888444	20	6 17.7	20.7
478752	2012	UX <sub>96</sub>	17.3	X	307.00965	244.49132	134.54410	4.82742	0.2037150	0.23715816	2.5849015	20	8 23.7	19.6
478753	2012	UJ <sub>97</sub>	17.1	X	334.70903	65.55704	277.35343	10.72524	0.1989422	0.23533962	2.5982006	20	8 23.9	19.6
478754	2012	UG <sub>98</sub>	16.2	X	147.86252	307.71939	242.18316	26.15488	0.1275933	0.23407559	2.6075459	20	9 21.4	20.8
478755	2012	UK <sub>101</sub>	17.3	X	157.84794	240.68143	209.14091	5.01879	0.0369536	0.20341031	2.8634355	20	5 30.8	21.5
478756	2012	UG <sub>102</sub>	18.0	X	333.64913	270.75541	65.97797	3.08819	0.2208989	0.23453993	2.6041032	20	8 18.0	20.1
478757	2012	UX <sub>103</sub>	17.3	X	291.55364	325.22912	77.84706	5.40564	0.0632711	0.23528131	2.5986299	20	9 21.4	20.5
478758	2012	UJ <sub>103</sub>	17.6	X	17.21679	249.68175	85.66381	1.82180	0.0848233	0.24585264	2.5235939	20	11 1.8	20.5
478759	2012	UJ <sub>106</sub>	17.5	X	254.91670	177.59052	224.21514	3.31006	0.1454168	0.22236994	2.6982695	20	7 11.6	21.2
478760	2012	UD <sub>107</sub>	16.7	X	25.09560	235.97943	15.96513	14.44617	0.1619508	0.22000908	2.7175381	20	7 31.6	20.0
478761	2012	UJ <sub>108</sub>	16.8	X	279.81010	0.03971	31.77198	10.06587	0.1227374	0.22802463	2.6534742	20	8 10.3	20.3
478762	2012	UM <sub>109</sub>	17.4	X	311.65633	267.74547	35.45710	13.49555	0.2969980	0.21926971	2.7236437	20	4 23.3	20.4
478763	2012	UZ <sub>110</sub>	17.2	X	305.24629	179.95595	189.86300	4.57590	0.1660048	0.23112865	2.6296636	20	8 8.4	20.2
478764	2012	UJ <sub>112</sub>	17.8	X	258.26697	226.55856	219.67698	4.07451	0.2138041	0.23656161	2.5892454	20	9 3.5	21.3
478765	2012	UK <sub>117</sub>	17.2	X	259.37589	47.44377	24.17512	12.88613	0.2491858	0.23174379	2.6250081	20	8 18.7	21.1
478766	2012	UR <sub>118</sub>	16.6	X	8.11401	46.13190	232.84391	33.90781	0.1487396	0.21886319	2.7270152	20	7 16.2	20.5
478767	2012	UN <sub>119</sub>	16.8	X	341.56333	288.77578	56.37872	12.77111	0.2862838	0.23850767	2.5751418	20	10 5.2	18.6
478768	2012	UR <sub>120</sub>	17.0	X	319.11018	338.72974	30.85531	17.50123	0.0745344	0.23305555	2.6151488	20	9 21.7	20.3
478769	2012	UT <sub>121</sub>	16.8	X	204.25428	212.18250	251.99512	10.37705	0.1664439	0.21856622	2.7294849	20	8 1.2	21.3
478770	2012	UD <sub>124</sub>	17.0	X	160.32483	210.08859	315.21424	3.42370	0.0610835	0.22680579	2.6629722	20	9 10.1	20.8
478771	2012	UF <sub>125</sub>	16.0	X	119.62666	332.63763	241.91546	22.31768	0.1225440	0.22986622	2.6392829	20	9 24.9	20.5
478772	2012	UO <sub>127</sub>	17.2	X	349.95166	314.67645	33.18746	11.77594	0.2553618	0.24201806	2.5501802	20	10 23.8	19.0
478773	2012	UA <sub>130</sub>	17.1	X	14.58043	325.30544	357.94118	9.78439	0.1063430	0.24280619	2.5446587	20	10 11.3	20.0
478774	2012	UG <sub>131</sub>	18.0	X	304.61560	256.74493	112.26265	4.16066	0.2422816	0.23549559	2.5970533	20	7 26.8	20.5
478775	2012	UT <sub>131</sub>	16.9	X	325.71020	115.83778	243.29424	15.31758	0.2664584	0.23674311	2.5879218	20	8 19.3	19.3
478776	2012	UW <sub>131</sub>	16.9	X	324.18078	60.49130	254.64142	12.12589	0.2793840	0.23084941	2.6317838	20	6 7.2	19.2
478777	2012	UY <sub>131</sub>	17.4	X	343.71880	143.64755	209.33606	12.80081	0.3026178	0.24366227	2.5386950	20	10 21.9	18.7
478778	2012	UR <sub>132</sub>	16.7	X	291.65262	88.84394	311.75444	4.95778	0.1815576	0.23419137	2.6066864	20	8 27.4	19.7
478779	2012	UU <sub>132</sub>	17.3	X	311.84117	244.49021	132.09111	2.43040	0.1953701	0.23522600	2.5990372	20	8 31.1	19.5
478780	2012	UC <sub>133</sub>	16.4	X	277.58181	191.36669	259.67503	13.88817	0.0742829	0.24549249	2.5260615	20	10 30.7	19.6
478781	2012	UG <sub>133</sub>	16.7	X	281.67103	136.81797	269.27635	10.78992	0.1462609	0.23244265	2.6197439	20	8 19.7	20.0
478782	2012	US <sub>133</sub>	16.4	X	60.33010	4.19807	279.72290	13.66596	0.0533134	0.24372710	2.5382448	20	10 10.5	20.1
478783	2012	US <sub>135</sub>	16.4	X	327.38510	61.50493	324.57930	4.87331	0.1195800	0.24063663	2.5599308	20	10 19.3	19.0
478784	2012	UV <sub>136</sub>	25.5	X	97.42435	288.62544	208.59276	2.13176	0.1402190	0.97805227	1.0051434	20	6 6.5	20.1
478785	2012	UD <sub>137</sub>	17.8	X	322.33705	349.25174	59.20206	6.87563	0.1456002	0.25047228	2.4924680	20	11 17.7	19.8
478786	2012	UV <sub>139</sub>	16.8	X	178.67763	179.96295	319.55813	9.18275	0.1140876	0.22779025	2.6552941	20	8 26.4	20.9
478787	2012	UO <sub>140</sub>	17.4	X	96.53855	289.93639	306.14691	6.50440	0.0458884	0.24169617	2.5524439	20	9 25.5	21.0
478788	2012	UX <sub>140</sub>	17.6	X	342.43067	144.86328	192.44637	5.00811	0.3062959	0.24214294	2.5493033	20	9 16.5	18.8
478789	2012	US <sub>145</sub>	17.1	X	9.54422	168.92313	133.67603	5.56950	0					

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>		
478801	2012	UM <sub>161</sub>	16.7	X	242.35487	205.39888	243.94454	13.34889	0.0281661	0.23215647	2.6218963	20	9 9.6	20.5
478802	2012	UT <sub>166</sub>	18.2	X	306.12342	99.61732	346.02570	8.30944	0.1888440	0.25365197	2.4715945	20	12 9.1	20.4
478803	2012	UF <sub>169</sub>	16.5	X	234.64267	27.82520	76.27090	10.92893	0.1100908	0.23687903	2.5869318	20	9 21.1	20.3
478804	2012	UJ <sub>169</sub>	17.2	X	220.53764	265.87463	143.60520	8.93936	0.2525358	0.21209815	2.7846982	20	6 7.8	22.1
478805	2012	UT <sub>171</sub>	16.2	X	273.10838	188.39198	247.59810	13.54452	0.0886412	0.23534588	2.5981546	20	9 26.2	19.8
478806	2012	UZ <sub>171</sub>	17.2	X	265.19501	75.10887	344.89506	4.74247	0.1478113	0.22902816	2.6457174	20	8 20.3	20.5
478807	2012	UQ <sub>172</sub>	16.6	X	242.42599	139.43135	264.71196	7.94920	0.0960147	0.21608530	2.7503369	20	7 5.8	20.5
478808	2012	UM <sub>174</sub>	15.9	X	321.03954	276.95506	83.80034	28.86936	0.3996065	0.23227603	2.6209966	20	7 22.8	18.0
478809	2012	VT	17.3	X	331.87601	12.94657	43.24107	15.29039	0.0904203	0.25424948	2.4677206	20	12 12.0	20.2
478810	2012	VN <sub>2</sub>	16.9	X	341.51777	141.31834	223.73678	13.64199	0.1389257	0.24017374	2.5632189	20	10 16.7	19.6
478811	2012	VO <sub>2</sub>	16.8	X	57.82529	32.24834	248.30877	14.25650	0.0795415	0.24284588	2.5443815	20	10 8.7	20.4
478812	2012	VG <sub>7</sub>	17.0	X	301.33073	188.78422	196.99612	34.46158	0.2197929	0.23247629	2.6194912	20	8 11.7	20.6
478813	2012	VB <sub>9</sub>	17.8	X	348.84069	118.88680	214.99196	7.68077	0.1718143	0.23945972	2.5683117	20	9 15.9	20.3
478814	2012	VO <sub>10</sub>	16.9	X	263.03490	224.56974	240.60299	13.90419	0.0338475	0.24429811	2.5342881	20	11 4.8	20.2
478815	2012	VO <sub>10</sub>	16.9	X	237.11040	218.65791	239.12592	10.78359	0.1521109	0.22914964	2.6447823	20	8 28.3	21.0
478816	2012	VF <sub>11</sub>	17.7	X	240.44229	226.08669	207.83879	7.27638	0.1803316	0.22856544	2.6492870	20	7 31.1	21.7
478817	2012	VF <sub>14</sub>	17.1	X	101.88264	2.35066	204.12241	11.57326	0.1266176	0.22770218	2.6559787	20	8 31.1	21.2
478818	2012	VM <sub>14</sub>	17.1	X	274.15420	179.35577	238.07267	5.36289	0.2444877	0.23226110	2.6211089	20	8 10.8	20.4
478819	2012	VN <sub>18</sub>	17.2	X	334.86036	189.16760	156.17574	3.45221	0.1812777	0.23341858	2.6124366	20	9 3.7	19.4
478820	2012	VO <sub>18</sub>	17.2	X	255.78000	219.56573	183.94273	5.27380	0.1598576	0.21975199	2.7196573	20	7 12.4	21.1
478821	2012	VX <sub>18</sub>	17.4	X	269.59747	285.71236	91.41102	6.03718	0.2816001	0.22041681	2.7141858	20	6 8.4	21.5
478822	2012	VG <sub>20</sub>	17.6	X	2.91017	125.04249	239.48060	1.50903	0.2354421	0.26113976	2.4241197	20	12 17.2	19.9
478823	2012	VO <sub>23</sub>	17.6	X	332.40153	336.41204	30.55891	2.92157	0.1556435	0.24111804	2.5565223	20	10 4.5	19.9
478824	2012	VT <sub>26</sub>	17.9	X	355.43932	340.60271	347.35622	0.73252	0.1794994	0.24140959	2.5544635	20	9 24.6	20.2
478825	2012	VW <sub>28</sub>	18.0	X	359.11750	36.40277	337.33831	2.49971	0.1029922	0.25311259	2.4751046	20	11 29.5	20.7
478826	2012	VT <sub>29</sub>	17.0	X	278.55714	114.86310	319.05842	5.43991	0.1576882	0.24091412	2.5579647	20	9 25.8	20.1
478827	2012	VP <sub>30</sub>	17.1	X	217.93029	243.87657	227.55545	21.35450	0.0536689	0.23429218	2.6059386	20	9 2.5	21.0
478828	2012	VV <sub>33</sub>	16.9	X	336.86215	132.70453	222.67694	30.53603	0.1874633	0.23748929	2.5824982	20	9 17.4	20.2
478829	2012	VT <sub>36</sub>	18.2	X	295.15333	216.43806	230.81080	4.31503	0.2224002	0.24434647	2.5339537	20	11 10.4	20.2
478830	2012	VE <sub>38</sub>	17.7	X	314.41708	277.19185	100.94632	7.24491	0.3423331	0.23856330	2.5747415	20	8 19.2	19.3
478831	2012	VF <sub>38</sub>	16.4	X	263.87217	358.72240	66.67135	13.26579	0.1407980	0.23020188	2.6367167	20	9 2.8	20.1
478832	2012	VT <sub>38</sub>	17.0	X	259.41750	68.26421	47.39419	13.57029	0.2124504	0.23970098	2.5665881	20	10 20.9	20.1
478833	2012	VE <sub>39</sub>	17.2	X	277.87448	42.95485	42.32275	12.78922	0.1555471	0.23986085	2.5654475	20	10 16.7	20.2
478834	2012	VM <sub>39</sub>	17.3	X	276.50218	138.49735	287.68788	12.30008	0.1719555	0.23548598	2.5971240	20	9 3.8	20.7
478835	2012	VE <sub>40</sub>	17.2	X	276.60065	355.30026	31.58220	2.04322	0.1450331	0.22111008	2.7085094	20	7 21.3	20.6
478836	2012	VG <sub>40</sub>	16.5	X	348.02193	268.34622	54.36992	8.18794	0.0576668	0.22285988	2.6943135	20	8 27.9	19.9
478837	2012	VN <sub>40</sub>	16.8	X	90.93314	139.48160	38.79556	9.48969	0.0588133	0.21308815	2.7760664	20	7 5.9	20.8
478838	2012	VW <sub>40</sub>	17.4	X	294.66650	106.95862	211.63761	3.47732	0.0624416	0.21127355	2.7919392	20	5 27.1	21.1
478839	2012	VJ <sub>44</sub>	17.2	X	292.52637	122.16485	223.84679	6.15705	0.0863336	0.22033925	2.7148227	20	6 26.3	20.7
478840	2012	VO <sub>44</sub>	17.3	X	305.62206	115.34124	287.41823	1.76886	0.1543950	0.23541886	2.5976176	20	9 30.2	19.8
478841	2012	VH <sub>45</sub>	17.1	X	170.24049	45.58918	103.07423	10.16133	0.1328038	0.21747334	2.7386216	20	9 2.2	21.5
478842	2012	VZ <sub>45</sub>	17.2	X	232.95935	200.36048	250.09789	8.39106	0.2319880	0.22292283	2.6938062	20	8 6.5	21.6
478843	2012	VN <sub>47</sub>	17.2	X	174.68098	273.62758	183.68258	3.69707	0.0610301	0.21355238	2.7720417	20	6 29.6	21.4
478844	2012	VQ <sub>49</sub>	17.5	X	244.46276	290.70918	132.57300	1.73799	0.1143953	0.22597683	2.6694806	20	8 1.5	21.1
478845	2012	VC <sub>52</sub>	17.2	X	305.81288	261.65603	153.51965	2.73585	0.2006894	0.23937239	2.5689364	20	10 18.0	19.3
478846	2012	VM <sub>53</sub>	17.3	X	194.12038	282.45871	228.84522	13.03894	0.0896910	0.23469489	2.6029568	20	9 26.9	21.4
478847	2012	VB <sub>56</sub>	17.3	X	344.02921	289.90262	51.48230	12.16222	0.2052650	0.23804939	2.5784457	20	9 28.7	19.7
478848	2012	VB <sub>60</sub>	17.6	X	62.53063	214.01005	72.55628	4.65686	0.0588113	0.24051222	2.5608135	20	10 25.7	21.0
478849	2012	VQ <sub>60</sub>	17.6	X	282.41242	148.28843	204.42748	2.91325	0.1080398	0.21480330	2.7612692	20	6 17.8	21.3
478850	2012	VH <sub>61</sub>	17.3	X	316.56923	313.53832	59.54116	3.33128	0.1284990	0.23402656	2.6079101	20	9 12.4	20.0
478851	2012	VF <sub>63</sub>	17.6	X	217.40669	337.58624	108.95192	3.48178	0.0723359	0.22187317	2.7022956	20	8 5.0	21.4
478852	2012	VT <sub>67</sub>	17.1	X	291.30875	126.58119	219.42238	6.40292	0.0718574	0.21665674	2.7454987	20	6 26.5	20.7
478853	2012	VN <sub>70</sub>	17.9	X	310.45305	271.29279	132.35532	2.98823	0.1224112	0.24111834	2.5565201	20	10 17.6	20.6
478854	2012	VS <sub>71</sub>	18.3	X	4.68706	262.33228	66.14626	3.43903	0.2005084	0.23961263	2.5672190	20	10 18.4	20.7
478855	2012	VC <sub>72</sub>	17.2	X	285.37632	144.99382	214.12286	4.50870	0.1312831	0.21709081	2.7418377	20	6 26.8	20.8
478856	2012	VK <sub>73</sub>	17.3	X	245.15615	245.91517	125.40869	2.98027	0.0898666	0.20705904	2.8296969	20	5 28.8	21.4
478857	2012	VT <sub>73</sub>	16.3	X	314.48961	258.89268	77.60236	17.19877	0.2155746	0.22146870	2.7055848	20	6 29.3	19.2
478858	2012	VZ <sub>73</sub>	17.0	X	288.88369	199.41225	220.02385	12.64042	0.1360921	0.23775676	2.5805610	20	9 24.1	20.1
478859	2012	VE <sub>75</sub>	17.4	X	330.80849	142.41377	232.55101	2.76495	0.2162710	0.23980965	2.5658127	20	10 12.4	19.3
478860	2012	VK <sub>75</sub>	16.8	X	349.42264	308.76535	32.95707	9.82701	0.1365616	0.23736392	2.5834075	20	10 1.7	19.4
478861	2012	VB <sub>76</sub>	17.4	X	210.24066	271.16993	166.35003	2.21437	0.1846937	0.20905867	2.8116241	20	7 6.1	22.0
478862	2012	VW <sub>78</sub>	17.3	X	298.93412	318.97501	91.17825	2.98104	0.0931739	0.23752883	2.5822116	20	10 8.5	20.1
478863	2012	VK <sub>80</sub>	16.9	X	252.32770	298.32010	83.56482	5.87735	0.1707315	0.21480948	2.7612163	20	6 9.4	21.1
478864	2012	VX <sub>80</sub>	17.3	X	302.75932	308.97829	91.56547	9.90699	0.1629714	0.23782192	2.5800897	20	9 28.4	20.1
478865	2012	VG <sub>82</sub>	17.7	X	301.73989	178.01103	229.42906	6.34362	0.3272207	0.23881536	2.5729295	20	8 30.9	19.9
478866	2012	VN <sub>84</sub>	18.0	X	303.64537	90.18723	339.30956	2.66802	0.2420406	0.24299785	2.5433205	20	10 29.7	19.8
478867	2012	VU <sub>84</sub>	16.9	X	74.35369	230.46161	57.30702	12.69222	0.1465269	0.24806256	2.5085835	20	11 20.9	20.5
478868	2012	VT <sub>86</sub>	17.0	X	281.32792	10.05071	14.84199	5.40891	0.0953530	0.22295906	2.6935144	20	8 4.1	20.4
478869	2012	VA <sub>91</sub>	17.5	X	316.09519	201.81430	216.02568	3.08973	0.1387259	0.24474579	2.5311967</			

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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>		
478881	2012	VZ <sub>110</sub>	16.4	X	291.03493	263.79107	39.44778	15.33320	0.1595032	0.20591929	2.8401288	20	4 18.8	20.3
478882	2012	WV <sub>1</sub>	17.6	X	283.05790	276.73200	69.34351	8.02239	0.0717895	0.21123839	2.7922490	20	6 14.9	21.3
478883	2012	WA <sub>8</sub>	16.3	X	208.83054	328.99302	47.64613	11.62057	0.0280656	0.18976071	2.9991523	20	4 29.2	20.6
478884	2012	WB <sub>8</sub>	17.2	X	199.40607	57.67186	45.54688	8.33934	0.1895462	0.21274849	2.7790204	20	7 31.1	21.9
478885	2012	WD <sub>8</sub>	16.7	X	310.29142	340.93292	53.50808	13.59769	0.1745494	0.23583687	2.5945472	20	10 4.1	19.4
478886	2012	WM <sub>8</sub>	17.2	X	285.91624	85.54543	255.60735	4.77597	0.0450486	0.20899904	2.8121588	20	6 16.6	21.0
478887	2012	WD <sub>9</sub>	17.3	X	301.95961	272.96595	66.45973	11.31852	0.2755976	0.22179236	2.7029520	20	5 31.5	20.2
478888	2012	WH <sub>9</sub>	17.6	X	329.88766	104.97005	292.34141	2.26962	0.1936850	0.24349512	2.5398566	20	11 15.4	19.8
478889	2012	WX <sub>9</sub>	17.3	X	236.66649	259.44585	224.85364	4.65768	0.1924617	0.22902406	2.6457490	20	9 29.7	21.0
478890	2012	WX <sub>10</sub>	18.0	X	237.19569	274.98163	233.45547	12.89667	0.1297554	0.24542178	2.5265466	20	11 13.8	21.3
478891	2012	WQ <sub>12</sub>	17.3	X	316.90814	258.19878	144.99840	1.95654	0.1191672	0.24081518	2.5586653	20	10 28.3	19.8
478892	2012	WM <sub>13</sub>	16.5	X	25.02367	31.44746	229.26967	12.88820	0.0525453	0.21321651	2.7749521	20	7 19.6	20.4
478893	2012	WA <sub>15</sub>	17.0	X	286.19027	273.12319	95.25317	5.03091	0.1080878	0.21672510	2.7449213	20	7 15.1	20.4
478894	2012	WZ <sub>16</sub>	16.5	X	272.09548	324.67668	137.00282	30.12453	0.2974535	0.24322283	2.5417519	20	10 13.4	20.1
478895	2012	WF <sub>17</sub>	17.2	X	267.01880	350.66238	44.68122	14.07349	0.1573221	0.22242277	2.6978423	20	7 20.2	21.1
478896	2012	WC <sub>18</sub>	16.4	X	326.07458	243.58635	22.57779	6.51017	0.0765385	0.19509810	2.9442003	20	4 29.4	20.3
478897	2012	WJ <sub>20</sub>	17.1	X	281.88097	328.38352	37.56077	5.63182	0.1768557	0.21844940	2.7304579	20	6 24.1	20.7
478898	2012	WR <sub>21</sub>	16.6	X	332.91449	300.55089	41.39218	7.39178	0.1382625	0.22796665	2.6539242	20	8 29.4	19.4
478899	2012	WV <sub>21</sub>	17.2	X	228.39181	176.95358	266.12202	6.43015	0.0575373	0.22041205	2.7142249	20	8 12.5	21.0
478900	2012	WC <sub>22</sub>	17.0	X	292.78902	334.41516	48.19942	6.41512	0.0297529	0.22332545	2.6905676	20	8 28.5	20.6
478901	2012	WL <sub>22</sub>	17.9	X	317.77529	47.64555	334.20181	1.25714	0.1755578	0.23588452	2.5941978	20	9 22.6	20.2
478902	2012	WN <sub>22</sub>	17.3	X	267.89464	327.52879	50.63306	5.60987	0.1098830	0.21455547	2.7633952	20	7 2.3	21.0
478903	2012	WH <sub>23</sub>	17.2	X	331.90653	63.12219	305.96631	2.86296	0.1110620	0.23532254	2.5983264	20	10 2.5	20.0
478904	2012	WK <sub>23</sub>	17.0	X	3.82940	84.97322	257.70982	10.91189	0.0640213	0.23632921	2.5909425	20	10 12.9	20.4
478905	2012	WP <sub>27</sub>	17.6	X	302.71570	2.02020	53.59783	4.70414	0.1027365	0.23967752	2.5667555	20	10 3.2	19.5
478906	2012	WA <sub>28</sub>	17.7	X	274.70179	27.75191	20.35294	2.70112	0.1939362	0.22872714	2.6480383	20	8 10.2	20.9
478907	2012	WT <sub>29</sub>	17.2	X	249.66147	41.82056	80.69112	13.88597	0.2069154	0.23511915	2.5998246	20	10 22.9	20.9
478908	2012	WM <sub>32</sub>	16.2	X	121.62489	167.18154	306.46547	7.74867	0.0318970	0.17403959	3.1771473	20	5 14.4	20.9
478909	2012	WQ <sub>33</sub>	16.4	X	343.26488	275.36842	108.64779	13.54630	0.1262934	0.24349651	2.5398470	20	11 25.9	19.1
478910	2012	WY <sub>34</sub>	17.4	X	330.29619	279.20036	92.46737	6.78906	0.2981304	0.23853038	2.5749783	20	10 12.0	18.8
478911	2012	WF <sub>35</sub>	16.9	X	328.90471	28.49578	5.50999	2.55730	0.1278583	0.24215336	2.5492301	20	11 5.1	19.5
478912	2012	XS	17.4	X	273.28451	123.98240	298.58833	1.13311	0.1145547	0.23219403	2.6216136	20	9 9.0	20.4
478913	2012	XZ	17.3	X	229.22391	228.66833	242.51543	5.24578	0.1032675	0.22842185	2.6503971	20	9 14.5	21.2
478914	2012	XH <sub>1</sub>	16.7	X	287.38636	324.82842	45.06712	6.69555	0.0558878	0.21737973	2.7394078	20	7 28.9	20.4
478915	2012	XV <sub>1</sub>	17.2	X	342.06482	94.88569	235.80752	11.96955	0.2117769	0.23212771	2.6221129	20	8 20.9	19.7
478916	2012	XB <sub>2</sub>	16.9	X	193.58010	242.31896	229.98049	8.01875	0.1126356	0.21456359	2.7633254	20	8 4.4	21.3
478917	2012	XH <sub>2</sub>	17.8	X	302.68866	280.88045	128.69894	5.73063	0.3412116	0.23807499	2.5782609	20	9 8.7	19.6
478918	2012	XV <sub>2</sub>	17.3	X	343.23745	274.57040	84.13623	7.45704	0.2774909	0.24200200	2.5502930	20	10 29.9	19.0
478919	2012	XG <sub>3</sub>	17.6	X	270.16938	83.43769	313.96860	2.42129	0.1430622	0.22069900	2.7118717	20	7 26.6	21.2
478920	2012	XO <sub>3</sub>	16.7	X	251.95087	176.04307	240.50139	11.72932	0.1474941	0.21929216	2.7234578	20	7 23.9	20.8
478921	2012	XW <sub>3</sub>	16.6	X	306.69687	273.34650	91.25199	6.96317	0.0356726	0.22056704	2.7129532	20	8 22.0	20.1
478922	2012	XL <sub>4</sub>	17.4	X	257.51886	330.81558	95.07857	10.03030	0.0871915	0.22442519	2.6817707	20	8 30.1	21.1
478923	2012	XP <sub>7</sub>	17.8	X	345.62420	18.84417	41.27926	4.24603	0.2973851	0.25816744	2.4426903	20	—	—
478924	2012	XS <sub>8</sub>	17.2	X	349.62786	240.37292	88.07959	6.62416	0.1358543	0.22971366	2.6404513	20	9 11.4	20.0
478925	2012	XG <sub>10</sub>	16.9	X	295.57132	18.97182	34.16538	2.83392	0.0878468	0.23442749	2.6049358	20	10 6.0	20.0
478926	2012	XJ <sub>10</sub>	17.3	X	263.94252	154.54109	262.18400	7.34477	0.2205301	0.22477915	2.6789547	20	7 30.4	21.0
478927	2012	XP <sub>10</sub>	17.5	X	258.37888	8.85879	23.41450	2.45480	0.1874111	0.21606759	2.7504872	20	6 27.8	21.5
478928	2012	XW <sub>10</sub>	17.6	X	248.74761	277.38384	174.18042	2.19420	0.1225473	0.23238041	2.6202116	20	9 13.4	21.1
478929	2012	XN <sub>11</sub>	17.2	X	277.82595	120.86672	221.88345	3.09924	0.1118897	0.20953116	2.8073957	20	5 28.6	21.0
478930	2012	XY <sub>11</sub>	18.1	X	284.08510	68.95893	305.83766	3.01189	0.2726118	0.22538663	2.6741388	20	6 24.2	21.5
478931	2012	XF <sub>12</sub>	17.6	X	260.74598	88.48139	300.45611	1.92902	0.1132134	0.21749391	2.7384489	20	7 6.9	21.4
478932	2012	XO <sub>14</sub>	17.2	X	308.99331	135.41706	272.17318	12.66469	0.1570080	0.23777148	2.5804545	20	10 8.6	20.1
478933	2012	XH <sub>19</sub>	16.9	X	198.84844	211.60957	249.52392	9.30144	0.1091548	0.21394657	2.7686358	20	7 27.0	21.3
478934	2012	XM <sub>20</sub>	17.0	X	272.38925	4.99866	70.52703	16.62049	0.1211483	0.23357185	2.6112937	20	10 5.6	20.6
478935	2012	XC <sub>21</sub>	17.2	X	15.82201	99.36456	223.08928	1.67227	0.2293905	0.24042677	2.5614202	20	11 2.5	19.9
478936	2012	XR <sub>25</sub>	17.4	X	308.93827	125.42081	242.44255	5.49698	0.1557644	0.22896123	2.6462330	20	8 12.5	20.3
478937	2012	XN <sub>29</sub>	16.3	X	144.99229	254.11344	255.99953	13.20480	0.1280172	0.20876977	2.8142173	20	8 1.2	20.9
478938	2012	XR <sub>29</sub>	17.0	X	336.95245	85.91592	268.01001	4.26962	0.0364638	0.22853849	2.6494993	20	9 16.7	20.5
478939	2012	XV <sub>30</sub>	17.4	X	353.95304	296.78959	32.48974	3.87249	0.1932555	0.23213085	2.6220893	20	9 24.1	19.7
478940	2012	XL <sub>34</sub>	17.0	X	347.46857	296.99725	77.94439	6.91191	0.1445591	0.24190743	2.5509576	20	11 15.6	19.6
478941	2012	XU <sub>36</sub>	16.2	X	228.82612	72.70724	251.33073	10.42117	0.0804928	0.17851417	3.1238314	20	3 9.6	21.2
478942	2012	XF <sub>38</sub>	17.1	X	233.47112	240.47079	245.40998	10.71932	0.2464663	0.22897598	2.6461194	20	9 18.1	21.3
478943	2012	XE <sub>40</sub>	17.2	X	317.84005	297.88350	83.86225	5.11409	0.2824002	0.23704804	2.5857020	20	9 16.7	18.9
478944	2012	XK <sub>44</sub>	17.7	X	335.62896	0.46478	8.42673	1.02693	0.1650458	0.23619330	2.5919364	20	10 12.4	20.0
478945	2012	XK <sub>45</sub>	17.2	X	271.33346	2.31089	70.63475	13.23733	0.1693223	0.23068051	2.6330682	20	9 20.2	20.7
478946	2012	XR <sub>45</sub>	17.1	X	325.96251	110.55000	226.69100	8.69942	0.1252477	0.22693027	2.6619982	20	8 1.2	20.2
478947	2012	XS <sub>45</sub>	17.0	X	195.20901	239.23945	225.90425	8.35284	0.1169384	0.21714503	2.7413814	20	7 28.2	21.4
478948	2012	XV <sub>45</sub>	17.4	X	262.34475	12.27311	59.44979	5.80135	0.0963219	0.23257541	2.6187469	20	9 12.5	20.8
478949	2012	XS <sub>46</sub>	17.0	X	219.23534	6.89534	92.47280	6.59667	0.0886063	0.21940450	2.7225280	20	8 24.1	21.0
478950	2012	XO<												

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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>		
478961	2012	XG <sub>79</sub>	17.4	X	333.80470	276.11211	113.82857	4.51510	0.2059189	0.24534221	2.5270928	20	11 17.0	19.4
478962	2012	XM <sub>79</sub>	16.8	X	318.13464	324.84211	79.51597	16.17081	0.1032297	0.24252502	2.5466251	20	11 7.1	19.8
478963	2012	XA <sub>85</sub>	17.7	X	242.65929	303.96977	140.56819	9.17977	0.2935385	0.22233429	2.6985580	20	8 4.7	22.0
478964	2012	XJ <sub>85</sub>	17.9	X	279.53716	286.92735	152.33133	10.34215	0.2203498	0.23499259	2.6007580	20	9 28.8	20.8
478965	2012	XD <sub>86</sub>	16.7	X	304.61204	356.82907	34.33199	13.47068	0.1745450	0.23269639	2.6178391	20	9 16.4	19.6
478966	2012	XQ <sub>86</sub>	17.8	X	279.48634	39.25114	63.11639	4.70992	0.1331943	0.24483894	2.5305546	20	11 14.2	20.6
478967	2012	XO <sub>94</sub>	17.1	X	333.56052	193.28287	177.45584	2.23227	0.2425092	0.23819485	2.5773959	20	10 14.5	18.8
478968	2012	XL <sub>95</sub>	17.0	X	263.15967	354.47661	91.14818	14.32110	0.2225687	0.23069010	2.6329953	20	9 16.7	20.7
478969	2012	XP <sub>96</sub>	17.2	X	223.25581	96.86715	350.38491	3.91070	0.1162932	0.21681135	2.7441934	20	8 8.2	21.3
478970	2012	XK <sub>97</sub>	17.3	X	300.04079	318.17854	38.77049	6.24179	0.0676439	0.21573351	2.7533260	20	7 27.8	20.9
478971	2012	XN <sub>97</sub>	17.1	X	56.51818	342.21565	317.87827	4.38615	0.0973966	0.23857934	2.5746260	20	11 6.5	20.7
478972	2012	XB <sub>99</sub>	17.2	X	293.88293	49.87856	39.27891	5.94277	0.2136052	0.24334116	2.5409279	20	11 10.7	19.3
478973	2012	XH <sub>99</sub>	17.3	X	322.97221	359.67513	344.50962	4.14292	0.1148570	0.22191093	2.7019891	20	8 10.8	20.2
478974	2012	XL <sub>103</sub>	15.7	X	173.20286	251.93285	233.27487	23.54286	0.1694169	0.20974363	2.8054995	20	7 24.5	20.8
478975	2012	XT <sub>104</sub>	16.7	X	322.65241	128.88070	235.01948	8.60448	0.1040545	0.23430057	2.6058764	20	9 5.1	19.8
478976	2012	XU <sub>105</sub>	16.6	X	281.52274	331.20242	77.96056	11.59266	0.2005554	0.22209616	2.7004866	20	8 24.3	20.1
478977	2012	XB <sub>106</sub>	16.0	X	75.77852	255.73550	274.72032	14.94174	0.1770708	0.17870242	3.1216372	20	6 21.9	20.2
478978	2012	XL <sub>108</sub>	16.3	X	227.37983	201.82428	261.50244	15.99893	0.0929272	0.22254503	2.6968541	20	8 27.4	20.6
478979	2012	XK <sub>109</sub>	16.5	X	222.80658	297.43492	74.43057	6.79118	0.0596502	0.19124305	2.9836344	20	5 7.7	20.9
478980	2012	XU <sub>111</sub>	17.0	X	230.49697	264.87685	239.09970	14.88669	0.1156451	0.22538153	2.6741792	20	9 19.8	21.9
478981	2012	XK <sub>116</sub>	17.0	X	244.64311	207.92183	217.96652	7.89384	0.1751739	0.21774853	2.7363138	20	7 25.1	21.2
478982	2012	XV <sub>116</sub>	17.0	X	228.95627	131.03146	293.29059	6.72953	0.2808630	0.21362450	2.7714179	20	6 29.9	21.8
478983	2012	XB <sub>118</sub>	17.0	X	266.92645	80.72447	320.96349	6.54285	0.0530333	0.21102872	2.7940983	20	8 10.2	20.5
478984	2012	XL <sub>119</sub>	17.2	X	204.54248	31.17480	80.00892	12.38218	0.1298889	0.21028135	2.8007148	20	8 20.5	21.7
478985	2012	XY <sub>119</sub>	17.3	X	231.16311	68.34710	235.22272	5.08934	0.1314146	0.21325841	2.7745886	20	8 24.6	21.4
478986	2012	XQ <sub>120</sub>	17.6	X	307.27611	153.22202	256.66584	2.40391	0.2425388	0.24034318	2.5620141	20	10 5.8	19.7
478987	2012	XR <sub>120</sub>	16.3	X	322.46794	341.25826	49.99337	6.47127	0.3458487	0.23619003	2.5919603	20	10 14.2	17.2
478988	2012	XM <sub>121</sub>	16.6	X	70.06855	301.15788	206.50540	11.10149	0.0615295	0.18277959	3.0750411	20	4 29.2	20.8
478989	2012	XD <sub>124</sub>	17.3	X	320.46210	278.41860	103.33567	14.05641	0.1840662	0.23484490	2.6018482	20	10 7.2	20.0
478990	2012	XT <sub>124</sub>	16.3	X	13.42950	129.11168	213.53491	10.28212	0.1900767	0.24133214	2.5550100	20	11 21.1	19.1
478991	2012	XJ <sub>126</sub>	18.0	X	290.99138	47.01567	9.86813	2.82377	0.1656875	0.23690743	2.5867250	20	9 23.6	20.7
478992	2012	XU <sub>128</sub>	17.0	X	191.94448	222.74712	243.79090	10.48560	0.1207210	0.21604751	2.7506577	20	7 25.8	21.5
478993	2012	XV <sub>128</sub>	17.0	X	96.49647	200.89603	52.92160	12.39019	0.0240957	0.23937501	2.5689176	20	10 22.8	20.5
478994	2012	XQ <sub>131</sub>	17.0	X	190.77661	8.44862	124.68504	7.98982	0.2489057	0.21637208	2.7479062	20	8 25.9	21.8
478995	2012	XX <sub>131</sub>	16.7	X	10.70012	82.10514	240.04004	13.36158	0.1338402	0.23133997	2.6280620	20	10 2.3	19.9
478996	2012	XF <sub>132</sub>	18.5	X	289.42677	223.67403	199.56570	4.77251	0.2703112	0.23556910	2.5965130	20	9 10.4	21.0
478997	2012	XU <sub>134</sub>	17.6	X	265.79833	84.58083	55.50322	28.04050	0.4061143	0.23556324	2.5965560	20	11 2.8	20.9
478998	2012	XD <sub>135</sub>	17.3	X	205.24337	4.60315	88.13105	4.60591	0.1662223	0.21417039	2.7667065	20	7 22.7	21.6
478999	2012	XQ <sub>136</sub>	17.1	X	331.47541	346.52991	35.24323	1.76712	0.2289544	0.24237150	2.5477004	20	10 27.7	19.0
479000	2012	XK <sub>137</sub>	17.3	X	273.06269	38.71127	33.86579	9.57170	0.1905801	0.23306383	2.6150869	20	9 15.5	20.5
479001	2012	XX <sub>137</sub>	17.3	X	321.00470	355.66161	46.93561	5.27689	0.1734807	0.24223597	2.5486506	20	11 3.5	19.5
479002	2012	XF <sub>140</sub>	16.5	X	117.07212	97.16512	83.03520	9.73787	0.0703848	0.21268184	2.7796009	20	8 13.6	20.6
479003	2012	XT <sub>141</sub>	17.6	X	259.97656	195.03933	220.72052	4.26248	0.1549440	0.22268763	2.6957027	20	8 3.3	21.3
479004	2012	XX <sub>143</sub>	17.9	X	272.09455	352.01057	114.20601	2.30417	0.2063661	0.24075937	2.5590607	20	10 26.5	20.8
479005	2012	XF <sub>144</sub>	15.8	X	23.22340	334.00748	230.90626	22.36886	0.1476103	0.18107749	3.0942809	20	5 12.2	19.1
479006	2012	XH <sub>146</sub>	16.9	X	358.95599	79.76189	247.91176	3.22671	0.2689317	0.23730418	2.5838410	20	10 12.2	18.9
479007	2012	XN <sub>146</sub>	18.0	X	277.39114	345.77308	89.54113	7.16463	0.2643375	0.23476021	2.6024740	20	9 13.3	21.1
479008	2012	XZ <sub>146</sub>	17.4	X	279.32112	1.53006	46.25479	5.13789	0.0911665	0.22610758	2.6684515	20	9 3.6	20.7
479009	2012	XG <sub>147</sub>	16.7	X	175.14951	255.38961	251.67145	14.35596	0.2371922	0.21371442	2.7706404	20	8 22.6	21.8
479010	2012	XO <sub>147</sub>	16.8	X	242.89511	344.25901	81.50720	7.64511	0.0059451	0.21607909	2.7503896	20	8 20.9	20.6
479011	2012	XG <sub>149</sub>	16.5	X	217.29064	355.54802	105.57331	14.88992	0.0545348	0.22022295	2.7157784	20	8 30.0	20.5
479012	2012	XK <sub>151</sub>	16.2	X	243.08099	250.60224	99.76810	15.98977	0.0125013	0.18027517	3.1034549	20	5 14.1	20.8
479013	2012	XD <sub>152</sub>	16.6	X	230.08748	149.92249	302.38745	8.67609	0.2164680	0.21548801	2.7554169	20	8 9.2	20.8
479014	2012	XJ <sub>152</sub>	15.9	X	121.17770	210.99580	277.93159	20.55026	0.1726263	0.18135945	3.0910730	20	6 19.7	20.9
479015	2012	XC <sub>154</sub>	16.0	X	120.65680	202.34765	264.45859	15.80990	0.1843608	0.17576992	3.1562617	20	5 22.9	21.0
479016	2012	XF <sub>156</sub>	16.9	X	315.63897	32.15608	19.05650	4.43061	0.1962823	0.24069962	2.5594842	20	11 2.3	19.0
479017	2012	YG <sub>1</sub>	16.1	X	111.07237	322.76052	138.86544	11.88311	0.1245956	0.17085511	3.2165038	20	5 5.1	21.0
479018	2012	YW <sub>1</sub>	16.3	X	96.39340	31.85148	94.54086	17.24940	0.1444766	0.17432337	3.1736983	20	5 21.6	21.1
479019	2012	YL <sub>3</sub>	16.9	X	299.80915	356.33968	30.01045	8.58828	0.3391524	0.22435049	2.6823660	20	7 26.8	19.9
479020	2012	YH <sub>8</sub>	15.9	X	201.58112	310.59048	227.41106	31.01818	0.2136075	0.23398180	2.6082426	20	10 30.4	20.1
479021	2013	AC <sub>2</sub>	17.5	X	218.04783	273.61469	183.39274	6.14224	0.2803959	0.21105326	2.7938817	20	7 29.5	22.5
479022	2013	AY <sub>11</sub>	16.5	X	157.58547	278.04891	271.05943	11.26764	0.1329295	0.22504412	2.6768515	20	10 1.8	20.0
479023	2013	AZ <sub>11</sub>	17.3	X	300.32377	13.35672	41.23600	14.61535	0.2751224	0.23205277	2.6226774	20	9 28.2	19.8
479024	2013	AL <sub>12</sub>	15.7	X	354.33448	141.93288	118.21920	18.74896	0.0876368	0.18391469	3.0623754	20	6 8.6	19.8
479025	2013	AP <sub>12</sub>	16.3	X	206.82599	254.89628	121.39021	11.54619	0.1211121	0.17951136	3.1122520	20	4 26.9	21.4
479026	2013	AP <sub>13</sub>	15.6	X	278.51964	340.85290	280.00733	8.46009	0.0750095	0.15581605	3.4202769	20	2 22.0	20.6
479027	2013	AQ <sub>17</sub>	17.1	X	266.40461	352.07215	112.03557	14.04767	0.2419282	0.22928033	2.6437772	20	10 12.6	20.7
479028	2013	AC <sub>19</sub>	16.1	X	145.91482	332.30992	125.13582	10.48671	0.0171165	0.17764149	3.1340537	20	5 26.9	20.7
479029	2013	AZ <sub>19</sub>	16.6	X	311.91974	97.85975	286.33447	9.86768						

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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>
479041 2013 AJ <sub>37</sub>	16.6	X	192.83664	309.92513	116.29779	12.76025	0.1504629	0.19001710	2.9964539	20	6 9.2	21.6
479042 2013 AS <sub>37</sub>	16.3	X	209.52218	96.88993	298.80503	7.88005	0.1083741	0.18418798	3.0593455	20	5 16.9	21.2
479043 2013 AR <sub>39</sub>	17.1	X	150.67877	210.22242	275.70012	1.95486	0.1067501	0.18938730	3.0030933	20	7 10.3	21.6
479044 2013 AJ <sub>40</sub>	16.1	X	12.68774	295.91165	294.29178	13.25398	0.0564949	0.17457640	3.1706309	20	5 22.2	20.4
479045 2013 AR <sub>41</sub>	16.8	X	178.29187	284.13713	120.90713	10.36805	0.0877764	0.17563441	3.1578850	20	5 3.2	21.8
479046 2013 AN <sub>44</sub>	16.5	X	259.29680	82.23831	326.34142	8.54831	0.1212807	0.20323309	2.8650999	20	7 30.3	20.4
479047 2013 AJ <sub>45</sub>	16.3	X	223.70769	112.11739	316.82408	9.66431	0.1057057	0.19609045	2.9342589	20	7 16.2	20.7
479048 2013 AF <sub>46</sub>	16.5	X	167.05377	126.52302	328.39764	8.22422	0.1037853	0.18380974	3.0635411	20	6 18.2	21.4
479049 2013 AX <sub>47</sub>	17.0	X	234.11108	15.34776	23.42191	8.61226	0.0355111	0.19672452	2.9279504	20	6 26.1	21.3
479050 2013 AF <sub>48</sub>	16.7	X	251.35827	16.69906	72.28903	14.35047	0.1169489	0.22159353	2.7045686	20	9 21.5	20.7
479051 2013 AD <sub>50</sub>	15.8	X	287.44143	246.60328	60.85040	10.08616	0.0855523	0.17972218	3.1098177	20	5 1.5	20.0
479052 2013 AU <sub>52</sub>	17.0	X	196.05504	193.53816	320.02307	18.52011	0.2014919	0.21552273	2.7551209	20	9 16.8	21.9
479053 2013 AJ <sub>53</sub>	15.3	X	114.92440	349.71940	113.64148	23.62347	0.1180451	0.17125247	3.2115263	20	5 15.6	20.5
479054 2013 AR <sub>56</sub>	16.1	X	95.15218	178.78494	330.44756	8.94952	0.1418375	0.17820382	3.1274572	20	6 12.8	20.8
479055 2013 AG <sub>56</sub>	16.8	X	163.63008	97.51843	322.89579	10.40602	0.0964194	0.17686508	3.1432191	20	4 28.5	21.9
479056 2013 AO <sub>56</sub>	16.5	X	61.41568	264.81481	327.97609	10.31546	0.0422859	0.19756663	2.9196244	20	8 5.4	20.5
479057 2013 AS <sub>56</sub>	16.7	X	287.81995	39.83520	353.47481	2.97116	0.1037602	0.21356387	2.7719423	20	8 17.8	20.2
479058 2013 AR <sub>57</sub>	16.5	X	204.21030	94.57868	315.13167	9.40015	0.1226412	0.18686573	3.0300487	20	5 28.5	21.5
479059 2013 AR <sub>64</sub>	16.2	X	180.70404	142.83028	281.78248	8.58549	0.1327487	0.18702922	3.0282826	20	5 24.5	21.1
479060 2013 AX <sub>68</sub>	16.0	X	81.38053	228.71564	290.78211	15.22534	0.0495283	0.17940633	3.1134666	20	5 25.6	20.5
479061 2013 AA <sub>69</sub>	17.7	X	272.99698	303.38212	103.43502	4.51096	0.1924710	0.21722072	2.7407445	20	8 4.8	21.3
479062 2013 AU <sub>75</sub>	17.5	X	265.10593	113.43110	322.05645	6.89602	0.2964253	0.22228453	2.6989607	20	8 16.5	21.3
479063 2013 AK <sub>78</sub>	16.8	X	200.23063	272.21870	160.09007	9.20140	0.0751422	0.19189538	2.9768689	20	6 25.5	21.4
479064 2013 AQ <sub>78</sub>	17.0	X	270.94621	141.32471	279.10252	14.80181	0.2350145	0.21952005	2.7215726	20	8 7.8	20.9
479065 2013 AY <sub>78</sub>	16.7	X	275.23918	301.25756	133.95761	13.42291	0.2249737	0.22464502	2.6800209	20	9 10.9	20.0
479066 2013 AP <sub>81</sub>	17.2	X	197.17852	123.21858	292.11067	7.39740	0.1629052	0.19073664	2.9889131	20	5 27.9	22.2
479067 2013 AV <sub>82</sub>	17.5	X	285.32369	136.96717	301.21896	3.95237	0.2270825	0.23120280	2.6291013	20	9 30.5	20.3
479068 2013 AB <sub>83</sub>	16.4	X	235.63877	295.75739	115.47895	10.89550	0.0573295	0.19917019	2.9039323	20	7 11.5	20.4
479069 2013 AJ <sub>83</sub>	16.3	X	119.73296	77.06705	69.38939	9.75728	0.0260708	0.18911109	3.0060167	20	6 24.3	20.5
479070 2013 AY <sub>84</sub>	17.3	X	327.67693	316.31180	12.62422	1.90596	0.0698352	0.20321968	2.8652259	20	7 28.9	20.9
479071 2013 AK <sub>85</sub>	17.5	X	245.38670	101.39375	337.63939	1.70347	0.1187826	0.21478201	2.7614517	20	8 22.1	21.3
479072 2013 AC <sub>87</sub>	15.6	X	332.78028	155.58684	104.53252	18.38672	0.1224169	0.17432831	3.1736383	20	5 6.9	19.9
479073 2013 AK <sub>87</sub>	16.1	X	142.89891	330.74499	99.05751	10.52990	0.0590934	0.17239272	3.1973494	20	4 24.7	21.0
479074 2013 AK <sub>90</sub>	16.0	X	294.97039	40.92668	314.93046	15.70535	0.0797151	0.20269118	2.8702043	20	7 16.5	19.8
479075 2013 AA <sub>91</sub>	17.0	X	245.51447	325.53888	118.52843	10.47061	0.1927201	0.21578916	2.7528526	20	8 20.6	21.0
479076 2013 AT <sub>92</sub>	16.8	X	263.07395	118.55687	335.12404	12.40706	0.2345430	0.22307373	2.6925912	20	9 13.9	20.4
479077 2013 AE <sub>93</sub>	17.1	X	222.91961	127.85167	357.51080	4.56668	0.1107260	0.21749371	2.7384506	20	9 25.4	21.1
479078 2013 AR <sub>93</sub>	15.6	X	89.38482	169.37516	324.88682	14.34485	0.1017657	0.17147519	3.2087448	20	5 7.1	20.4
479079 2013 AE <sub>95</sub>	17.8	X	294.76399	325.28619	98.65625	6.84404	0.1657616	0.22839360	2.6506156	20	10 12.6	20.7
479080 2013 AK <sub>96</sub>	16.8	X	207.38862	142.39427	280.03804	4.70963	0.1205640	0.20227442	2.8741454	20	6 18.3	21.3
479081 2013 AE <sub>99</sub>	16.2	X	221.60004	317.65824	78.08630	13.65789	0.0528986	0.18915443	3.0055575	20	6 5.1	20.5
479082 2013 AQ <sub>99</sub>	17.2	X	256.62450	94.45052	330.76228	8.20843	0.2658915	0.21840543	2.7308243	20	7 29.9	21.4
479083 2013 AU <sub>100</sub>	16.4	X	139.72562	281.55146	160.03362	3.19497	0.1406373	0.17322960	3.1870435	20	5 8.6	21.4
479084 2013 AL <sub>101</sub>	17.7	X	188.18099	46.78417	102.17193	3.31416	0.1448689	0.21393792	2.7687104	20	9 17.0	22.1
479085 2013 AF <sub>104</sub>	16.0	X	293.31347	249.00975	104.16787	17.45433	0.1199729	0.19932047	2.9024725	20	7 1.8	19.6
479086 2013 AQ <sub>105</sub>	17.0	X	225.95711	87.37873	31.41962	8.21478	0.1839803	0.21434913	2.7651683	20	9 15.2	21.3
479087 2013 AS <sub>108</sub>	15.9	X	264.07848	40.46297	285.60755	6.88602	0.0198188	0.17319184	3.1875066	20	5 1.1	20.4
479088 2013 AO <sub>110</sub>	15.8	X	324.39771	334.24628	295.00657	9.34100	0.0535351	0.17706366	3.1408685	20	5 1.8	20.1
479089 2013 AM <sub>116</sub>	16.5	X	157.29083	16.68737	68.34870	3.80435	0.0792910	0.17712215	3.1401771	20	5 25.9	21.2
479090 2013 AU <sub>116</sub>	16.1	X	136.60131	356.49593	109.24173	13.26546	0.0642374	0.17554585	3.1589470	20	5 30.4	20.9
479091 2013 AF <sub>117</sub>	17.2	X	250.51488	347.75797	95.95344	8.36898	0.1135514	0.21518542	2.7579993	20	9 8.4	21.1
479092 2013 AJ <sub>118</sub>	17.0	X	271.17000	56.22094	21.02979	5.07627	0.1484704	0.22120500	2.7077346	20	9 20.7	20.3
479093 2013 AV <sub>119</sub>	17.3	X	242.25071	328.45829	95.45554	5.65175	0.1189772	0.20981348	2.8048768	20	7 29.7	21.4
479094 2013 AY <sub>119</sub>	16.5	X	145.67482	173.11648	305.26200	8.53208	0.0203681	0.19042899	2.9921315	20	6 20.6	20.7
479095 2013 AM <sub>120</sub>	17.0	X	217.77827	310.65250	112.99424	4.90515	0.0603043	0.19318630	2.9635926	20	7 5.5	21.3
479096 2013 AC <sub>121</sub>	15.8	X	57.03844	304.85332	270.27863	11.44454	0.0601742	0.19953276	2.9004134	20	7 7.3	19.7
479097 2013 AU <sub>123</sub>	16.1	X	39.58757	242.99638	322.94462	10.08717	0.0318418	0.17686569	3.1432119	20	5 26.6	20.6
479098 2013 AU <sub>128</sub>	16.4	X	163.71396	100.36072	340.22954	15.87932	0.1126224	0.18504112	3.0499347	20	5 24.1	21.5
479099 2013 AT <sub>130</sub>	17.1	X	198.30928	211.30414	251.67373	2.83012	0.0599581	0.21402637	2.7679476	20	8 2.9	21.1
479100 2013 AR <sub>135</sub>	16.7	X	205.73905	276.87738	143.21528	11.67294	0.0310157	0.18789551	3.0189676	20	6 19.6	21.3
479101 2013 AN <sub>142</sub>	16.6	X	206.84108	197.69776	183.38925	16.63908	0.1242571	0.17992197	3.1075152	20	4 30.0	21.7
479102 2013 AE <sub>153</sub>	17.5	X	228.94866	291.88801	179.07274	9.09015	0.2293046	0.21781545	2.7357533	20	8 30.3	21.7
479103 2013 AW <sub>154</sub>	17.3	X	206.70500	209.33884	193.93463	9.77173	0.1046812	0.18692108	3.0294505	20	5 26.5	22.1
479104 2013 AN <sub>156</sub>	16.3	X	241.75202	112.80191	244.72500	11.84428	0.0556631	0.18039511	3.1020792	20	5 10.3	20.9
479105 2013 AP <sub>160</sub>	16.6	X	296.34736	226.80809	148.52219	14.93131	0.1642552	0.21219343	2.7838645	20	7 30.2	19.9
479106 2013 AE <sub>163</sub>	17.2	X	154.82370	230.55646	240.81365	11.32776	0.1025139	0.18834938	3.0141157	20	6 25.3	21.9
479107 2013 AS <sub>163</sub>	17.0	X	298.69570	246.68563	153.42279	14.65954	0.1819478	0.22288482	2.6941124	20	9 9.1	19.8
479108 2013 AO <sub>164</sub>	16.6	X	346.34496	71.87602	208.44668	10.37841	0.0920296	0.18647229	3.0343093	20	6 18.9	20.5
479109 2013 AH <sub>168</sub>	16.4	X	289.98980	94.22185	218.92917	8.21196	0.0663811	0.17941421	3.1133754	20	5 13.5	20.6
479110 2013 AO <sub>168</sub>	16.6	X	114.74924	264.85735	245.49419	8.18548	0.0896529	0.18504554	3.0498863	20	6 30.1	21.1
479111 2013 AH <sub>169</sub>	16.3	X	88.55821	293.75390	201.86145	8.86060	0.0156687	0.17179164	3.2048032	20	5 1.9	20.7
479112 2013 AQ <sub>170</sub>	17.4	X	245.08866	278.13480	209.86015	8.48924	0.1634448	0.22702373	2.6612676	20	10 19.6	20.8
479113 2013 AS <sub>177</sub>	16.9	X	305.37797	2								

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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>
479121 2013 BY <sub>20</sub>	16.9 <sup>m</sup>	X	164.87361	133.31628	308.86244	7.36297	0.1042720	0.18436262	3.0574131	20	5 30.1	21.8
479122 2013 BZ <sub>20</sub>	17.1	X	316.07702	292.96153	99.84298	5.46765	0.1867778	0.22751736	2.6574169	20	10 6.6	19.6
479123 2013 BR <sub>22</sub>	16.9	X	230.02887	247.65475	210.19366	3.30200	0.1095233	0.21056515	2.7981976	20	8 27.6	21.1
479124 2013 BW <sub>23</sub>	15.8	X	48.44913	256.05078	298.32229	16.96777	0.0422316	0.17799172	3.1299413	20	5 25.1	20.3
479125 2013 BR <sub>25</sub>	17.3	X	197.34188	115.17126	324.49548	3.04076	0.1713883	0.19255495	2.9700671	20	6 27.7	22.2
479126 2013 BD <sub>26</sub>	15.6	X	317.76871	333.51986	326.39879	20.98109	0.0283316	0.17671191	3.1450351	20	6 6.2	20.4
479127 2013 BA <sub>27</sub>	17.3	X	289.36475	264.89987	157.06538	27.93859	0.3886295	0.22873286	2.6479940	20	8 16.4	20.5
479128 2013 BH <sub>28</sub>	16.1	X	95.46211	164.79691	39.43785	10.27489	0.1298726	0.19136340	2.9823833	20	8 26.5	20.7
479129 2013 BB <sub>30</sub>	16.7	X	191.44213	19.65584	14.96698	3.72525	0.1524077	0.18013299	3.1050877	20	4 28.3	21.8
479130 2013 BA <sub>37</sub>	17.0	X	244.12623	298.77785	123.68274	8.61679	0.2140316	0.20974197	2.8055143	20	7 17.3	21.3
479131 2013 BN <sub>38</sub>	17.2	X	200.47813	106.84621	25.88477	8.00428	0.1776272	0.21383471	2.7696013	20	9 8.1	21.7
479132 2013 BM <sub>39</sub>	16.6	X	91.23852	60.75679	136.61490	8.90602	0.0735283	0.19113536	2.9847550	20	7 31.1	20.7
479133 2013 BS <sub>41</sub>	16.0	X	261.14537	215.67894	131.76992	28.61886	0.1382406	0.18018871	3.1044476	20	5 20.7	21.2
479134 2013 BC <sub>48</sub>	16.0	X	180.53561	94.69821	318.39939	7.07565	0.0482868	0.17808518	3.1288461	20	5 8.3	20.8
479135 2013 BZ <sub>48</sub>	16.9	X	186.11041	282.16482	317.86654	3.24193	0.1270289	0.24289778	2.5440190	20	—	—
479136 2013 BD <sub>51</sub>	17.5	X	256.07590	48.51624	25.05973	4.62660	0.1533507	0.21570738	2.7535484	20	8 25.3	21.3
479137 2013 BE <sub>51</sub>	16.4	X	266.53160	28.90522	31.63944	18.40722	0.1239470	0.18585654	3.0410074	20	5 9.7	21.3
479138 2013 BK <sub>54</sub>	17.1	X	302.59752	343.23824	42.80867	4.92060	0.1104415	0.21405865	2.7676693	20	9 5.3	20.4
479139 2013 BY <sub>54</sub>	16.0	X	173.81161	130.04511	326.97346	10.82083	0.1195293	0.18493581	3.0510925	20	6 28.9	21.0
479140 2013 BM <sub>57</sub>	16.8	X	279.90984	258.75553	110.05263	6.81847	0.0613464	0.20135819	2.8828575	20	7 22.1	20.5
479141 2013 BU <sub>57</sub>	16.5	X	236.70153	311.98270	123.38049	9.52427	0.1136360	0.20808215	2.8204138	20	8 7.4	20.6
479142 2013 BY <sub>58</sub>	17.1	X	243.08035	84.87788	309.13605	1.32922	0.2429681	0.20207921	2.8759961	20	6 7.3	21.8
479143 2013 BU <sub>61</sub>	16.1	X	53.02782	258.79037	319.65433	9.67436	0.0918567	0.18071625	3.0984030	20	7 11.9	20.2
479144 2013 BZ <sub>62</sub>	15.9	X	265.66587	40.30749	322.23003	14.81730	0.0602754	0.18373098	3.0644165	20	6 15.5	20.5
479145 2013 BP <sub>65</sub>	17.1	X	242.81598	180.84180	289.85353	7.44738	0.2209327	0.22020777	2.7159032	20	9 11.9	21.2
479146 2013 BF <sub>67</sub>	15.8	X	287.64406	315.60181	331.98676	9.93029	0.0252272	0.16919148	3.2375543	20	4 9.8	20.6
479147 2013 BZ <sub>70</sub>	16.3	X	177.59008	266.44590	157.11877	12.41091	0.1923592	0.18179871	3.0860918	20	5 24.4	21.7
479148 2013 BN <sub>71</sub>	16.9	X	301.26196	352.85906	13.59565	3.65507	0.1060117	0.20920087	2.8103498	20	8 5.5	20.3
479149 2013 BG <sub>73</sub>	16.1	X	207.32807	68.42505	327.09771	9.32621	0.0943366	0.17573805	3.1566434	20	5 14.0	21.1
479150 2013 BH <sub>74</sub>	16.0	X	112.40685	151.63387	345.52243	15.62696	0.1137194	0.17985115	3.1083308	20	6 13.3	20.9
479151 2013 BJ <sub>74</sub>	16.0	X	157.17155	117.37775	317.13442	10.15868	0.1029949	0.17972329	3.1098049	20	5 10.4	21.1
479152 2013 BP <sub>76</sub>	15.8	X	186.05765	294.58993	131.18321	22.20248	0.1285770	0.18426300	3.0585151	20	6 5.9	21.0
479153 2013 BR <sub>79</sub>	16.1	X	114.93452	159.12936	330.58742	7.82120	0.1495938	0.17197502	3.2025246	20	6 10.8	21.1
479154 2013 CG	16.1	X	123.73094	303.05078	156.00774	13.04990	0.1634987	0.17071568	3.2182549	20	5 18.4	21.3
479155 2013 CD <sub>6</sub>	16.8	X	129.64175	301.88463	152.94185	7.44314	0.1292907	0.17235814	3.1977771	20	5 14.8	21.8
479156 2013 CN <sub>6</sub>	17.2	X	282.35323	131.12231	261.73727	4.56342	0.1363950	0.20877165	2.8142005	20	8 5.1	20.9
479157 2013 CS <sub>6</sub>	16.3	X	275.67177	31.73538	290.86535	8.12684	0.0805514	0.17549144	3.1595999	20	5 1.9	20.9
479158 2013 CH <sub>8</sub>	17.4	X	239.58935	143.86105	305.23887	13.91214	0.2949874	0.21531535	2.7568896	20	8 6.1	21.9
479159 2013 CL <sub>14</sub>	15.9	X	236.07947	18.93205	341.07949	9.17113	0.0884471	0.17144159	3.2091642	20	4 30.8	20.9
479160 2013 CL <sub>14</sub>	16.9	X	183.32665	60.93251	40.28575	2.93416	0.0832185	0.18889427	3.0083165	20	7 13.7	21.4
479161 2013 CB <sub>15</sub>	17.0	X	223.64035	295.73787	127.68517	11.26332	0.0886083	0.19065434	2.9897733	20	7 9.0	21.6
479162 2013 CO <sub>17</sub>	16.4	X	86.31626	173.20369	2.05769	8.74192	0.0173034	0.17505352	3.1648671	20	6 17.3	21.0
479163 2013 CX <sub>20</sub>	16.6	X	149.80696	141.46606	293.47180	3.54535	0.1598802	0.17316387	3.1878498	20	5 9.3	21.8
479164 2013 CM <sub>21</sub>	16.2	X	177.44666	91.11008	334.95441	9.25092	0.0609857	0.17559187	3.1583950	20	5 21.1	21.1
479165 2013 CY <sub>24</sub>	16.0	X	241.22281	201.08208	157.78769	9.92730	0.0956560	0.17558639	3.1584608	20	5 10.7	20.9
479166 2013 CF <sub>29</sub>	16.1	X	203.93810	92.10126	309.32171	8.97831	0.1010809	0.17956720	3.1116068	20	5 18.3	21.1
479167 2013 CT <sub>29</sub>	16.4	X	174.19451	73.13785	340.01084	8.98205	0.1328326	0.17282686	3.1919927	20	5 2.1	21.6
479168 2013 CC <sub>30</sub>	16.9	X	269.33328	313.37138	107.03392	5.44352	0.0573963	0.20814011	2.8198902	20	9 8.7	20.6
479169 2013 CS <sub>31</sub>	15.7	X	147.42635	126.33544	40.67812	13.60985	0.0953939	0.19156251	2.9803164	20	9 3.2	20.5
479170 2013 CQ <sub>34</sub>	15.8	X	83.59574	46.77656	154.53478	18.04865	0.1710371	0.17802893	3.1295051	20	8 7.3	20.5
479171 2013 CB <sub>37</sub>	17.6	X	230.61091	312.23197	154.78061	5.48501	0.3085107	0.21478438	2.7614313	20	8 20.1	22.0
479172 2013 CC <sub>40</sub>	16.1	X	136.53029	128.78995	354.49436	16.20215	0.1228727	0.18460582	3.0547274	20	6 24.2	21.1
479173 2013 CZ <sub>44</sub>	16.7	X	262.40355	76.47775	336.63159	14.38991	0.2709590	0.20962061	2.8065970	20	7 21.7	20.9
479174 2013 CF <sub>45</sub>	16.6	X	56.61104	247.02880	328.12653	13.26841	0.0211591	0.18148295	3.0896705	20	7 3.4	21.0
479175 2013 CO <sub>45</sub>	16.0	X	41.69516	259.62868	337.87008	9.98027	0.0525680	0.18236101	3.0797448	20	7 16.6	20.2
479176 2013 CO <sub>50</sub>	17.9	X	247.57576	283.33501	176.71681	3.01769	0.2232946	0.22242943	2.6977884	20	9 7.1	21.9
479177 2013 CE <sub>51</sub>	17.3	X	267.46285	273.16083	140.62754	8.87266	0.2404345	0.21479513	2.7613392	20	7 28.9	21.2
479178 2013 CP <sub>52</sub>	17.2	X	298.90673	13.63839	87.84341	5.80100	0.1789151	0.23383798	2.6093120	20	12 10.6	19.5
479179 2013 CR <sub>53</sub>	15.1	X	246.72917	95.34607	154.00580	3.39326	0.1577526	0.12251950	4.0148184	20	1 7.2	21.3
479180 2013 CU <sub>53</sub>	16.2	X	142.60863	133.74668	337.10983	9.10675	0.1529640	0.17654818	3.1469793	20	6 15.6	21.4
479181 2013 CA <sub>55</sub>	15.4	X	131.01795	123.27502	1.44415	14.29766	0.1027680	0.17160268	3.2071555	20	6 16.7	20.5
479182 2013 CL <sub>56</sub>	16.0	X	218.08363	231.90578	151.97239	27.02687	0.1908506	0.17638657	3.1489012	20	5 14.9	21.7
479183 2013 CY <sub>56</sub>	15.6	X	112.90825	186.99063	331.90351	27.09821	0.0720090	0.17887636	3.1196132	20	7 15.8	20.5
479184 2013 CC <sub>59</sub>	16.6	X	201.11432	328.93979	147.32397	15.91223	0.0915039	0.20469977	2.8513978	20	8 21.3	20.7
479185 2013 CW <sub>60</sub>	16.2	X	203.15741	67.98998	350.08861	7.70130	0.1120789	0.18188420	3.0851248	20	6 7.7	21.2
479186 2013 CB <sub>63</sub>	16.3	X	21.41605	304.96648	295.19695	9.89269	0.0788483	0.17631280	3.1497795	20	6 20.9	20.3
479187 2013 CH <sub>66</sub>	16.5	X	89.82502	233.81495	320.18391	8.99046	0.0944194	0.18258385	3.0772383	20	7 28.6	21.0
479188 2013 CS <sub>66</sub>	16.1	X	173.85778	140.88667	314.56132	10.85737	0.1861000	0.18548812	3.0450328	20	6 26.9	21.3
479189 2013 CV <sub>66</sub>	16.9	X	171.97906	265.74434	185.51632	4.86882	0.1870516	0.18351971	3.0667678	20	6 19.3	22.1
479190 2013 CE <sub>67</sub>	16.4	X	164.60870	266.75647	172.36502	5.92923	0.1784439	0.17754424	3.1351981	20	5 30.1	21.7
479191 2013 CH <sub>69</sub>	16.5	X	184.99318	130.54231	301.02640	5.26598	0.1801311	0.18286977	3.0740300	20	6 6.1	21.7
479192 2013 CY <sub>71</sub>	16.4	X	212.61096	250.66558	138.13647	12.05741	0.0384409	0.17678239	3.1441992	20	5 21.2	21.2
479193 2013 CG <sub>72</sub>	16.0	X	91.19939	17.93237	147.19127	18.83569	0.0764856	0.1785				



ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
479201 2013 CS <sub>90</sub>	16.6 <sup>m</sup>	X	129.51838	343.26359	140.84665	10.70999	0.0171567	0.18034526	3.1026508	20	6 8.5	21.2
479202 2013 CT <sub>101</sub>	16.3	X	208.56115	30.13529	161.34229	22.58975	0.0462119	0.22511766	2.6762684	20	12 13.3	20.5
479203 2013 CN <sub>103</sub>	16.7	X	150.74845	82.20124	40.72677	4.05618	0.1411456	0.18511607	3.0491115	20	7 8.4	21.6
479204 2013 CK <sub>107</sub>	17.2	X	198.20514	44.77600	1.69485	1.75378	0.1344073	0.17758012	3.1347758	20	5 19.4	22.3
479205 2013 CQ <sub>109</sub>	16.6	X	156.52425	128.14028	2.56575	6.77331	0.0526720	0.18841573	3.0134081	20	7 22.6	21.1
479206 2013 CB <sub>119</sub>	16.5	X	187.73401	292.42504	142.08967	6.27067	0.1279492	0.18092243	3.0960486	20	6 13.8	21.5
479207 2013 CM <sub>124</sub>	15.3	X	282.18713	350.02323	310.45859	14.21613	0.0599511	0.17174525	3.2053802	20	4 10.7	20.2
479208 2013 CO <sub>126</sub>	16.2	X	74.16852	208.77866	314.46880	15.49099	0.0735026	0.17282816	3.1919767	20	5 22.8	20.9
479209 2013 CV <sub>127</sub>	15.7	X	145.41161	52.25639	96.65001	19.26414	0.0331140	0.18043997	3.1015650	20	7 30.9	20.3
479210 2013 CG <sub>128</sub>	16.7	X	241.46540	324.21797	151.44592	33.25824	0.2260946	0.22887939	2.6468637	20	9 24.3	20.8
479211 2013 CH <sub>130</sub>	17.0	X	261.75008	269.63748	168.89966	7.54395	0.2094205	0.21340726	2.7732983	20	8 27.7	20.9
479212 2013 CS <sub>132</sub>	16.9	X	283.79296	258.17347	137.16639	4.08563	0.2003146	0.21683866	2.7439629	20	8 2.5	20.2
479213 2013 CZ <sub>155</sub>	16.0	X	190.24873	74.18570	349.90608	9.40293	0.0691146	0.17443595	3.1723326	20	6 2.4	20.9
479214 2013 CD <sub>156</sub>	15.7	X	213.18238	65.13913	346.80505	14.80596	0.0993743	0.17976904	3.1092772	20	6 10.9	20.7
479215 2013 CU <sub>159</sub>	16.6	X	228.60711	71.26373	348.49250	4.77944	0.1393664	0.18911473	3.0059781	20	7 5.6	21.3
479216 2013 CS <sub>160</sub>	16.5	X	188.71735	92.09699	348.20574	11.46404	0.1710078	0.18285061	3.0742448	20	6 20.6	21.7
479217 2013 CK <sub>163</sub>	16.1	X	2.50574	248.61534	16.33253	11.37144	0.0521181	0.17281785	3.1921036	20	6 23.4	20.5
479218 2013 CC <sub>169</sub>	16.6	X	115.17324	31.43881	130.33902	11.68062	0.0683191	0.18145600	3.0899764	20	7 13.0	21.1
479219 2013 CO <sub>177</sub>	16.3	X	357.35778	305.02315	319.21037	15.19376	0.0087928	0.17780506	3.1321314	20	6 15.8	20.9
479220 2013 CR <sub>177</sub>	15.8	X	336.60329	351.34242	314.72762	11.56119	0.0535116	0.18465524	3.0541823	20	7 12.0	19.8
479221 2013 CG <sub>178</sub>	16.8	X	221.24221	315.65398	180.68448	10.26041	0.1892719	0.21526512	2.7573185	20	9 28.8	20.8
479222 2013 CV <sub>178</sub>	16.6	X	89.45168	200.15090	338.15418	16.88302	0.1345674	0.17824646	3.1269584	20	7 16.7	21.4
479223 2013 CW <sub>178</sub>	16.6	X	185.59293	92.67548	341.16457	8.43541	0.1322209	0.18311352	3.0713014	20	6 9.6	21.7
479224 2013 CY <sub>178</sub>	17.2	X	256.94917	341.09392	111.77302	4.58579	0.1660057	0.21729324	2.7401347	20	9 19.4	20.8
479225 2013 CF <sub>180</sub>	16.5	X	116.74017	173.21711	356.96638	6.86983	0.1805827	0.18394304	3.0620608	20	8 9.5	21.5
479226 2013 CD <sub>184</sub>	16.9	X	275.05088	341.73868	98.00843	15.05109	0.2230051	0.22240968	2.6979481	20	9 25.1	20.5
479227 2013 CT <sub>188</sub>	16.9	X	211.99238	128.33627	326.73315	10.83034	0.0645193	0.20093155	2.8869369	20	8 22.1	21.0
479228 2013 CK <sub>189</sub>	16.7	X	234.06291	341.34447	139.55699	13.04596	0.2347604	0.21405723	2.7676815	20	9 20.3	21.0
479229 2013 CL <sub>189</sub>	17.1	X	226.78774	20.16244	115.31216	9.44143	0.3162484	0.21556936	2.7547236	20	9 24.2	21.8
479230 2013 CM <sub>189</sub>	16.1	X	155.27348	177.47063	292.52331	14.79537	0.1771070	0.18400074	3.0614206	20	6 28.3	21.2
479231 2013 CX <sub>189</sub>	16.7	X	342.35305	81.56152	303.50604	14.17937	0.2688014	0.23099464	2.6306805	20	11 27.6	19.1
479232 2013 CS <sub>193</sub>	16.9	X	252.67747	38.74943	355.38255	9.22739	0.0721993	0.19176711	2.9781962	20	7 9.9	21.3
479233 2013 CM <sub>205</sub>	16.4	X	159.98185	350.84272	118.29863	10.27667	0.0088983	0.18095793	3.0956437	20	6 25.6	20.8
479234 2013 CT <sub>205</sub>	16.4	X	292.56701	199.77647	139.70087	16.31586	0.0674857	0.18983835	2.9983345	20	6 21.3	20.7
479235 2013 CV <sub>205</sub>	16.8	X	244.40612	231.21010	150.02050	9.13719	0.1215231	0.19066946	2.9896152	20	6 6.7	21.4
479236 2013 CD <sub>212</sub>	16.7	X	216.09573	105.23812	315.32386	7.22854	0.1735282	0.18889355	3.0083241	20	6 21.2	21.6
479237 2013 CH <sub>214</sub>	16.5	X	207.19319	127.19236	277.78716	3.38532	0.1228541	0.19756201	3.1116668	20	5 26.7	21.4
479238 2013 DN <sub>7</sub>	15.8	X	326.79056	337.37276	0.18337	11.82044	0.0672197	0.19710756	2.9241560	20	8 11.9	19.6
479239 2013 DC <sub>8</sub>	16.2	X	198.34865	315.74150	109.35534	12.20375	0.0938432	0.18502832	3.0500754	20	6 14.3	20.9
479240 2013 DU <sub>8</sub>	16.2	X	62.52532	191.77024	3.43167	7.14379	0.0628098	0.16885914	3.2418009	20	6 18.5	20.8
479241 2013 DH <sub>11</sub>	16.6	X	207.22411	307.59554	120.38960	10.28704	0.1578246	0.18910028	3.0061312	20	6 23.1	21.5
479242 2013 DO <sub>12</sub>	16.1	X	145.33778	196.59502	299.13089	9.86751	0.1148701	0.17713001	3.1400841	20	7 17.2	21.0
479243 2013 DP <sub>16</sub>	16.9	X	221.54949	24.84955	97.97043	12.71595	0.2592837	0.21466534	2.7624521	20	9 10.8	21.6
479244 2013 EO <sub>1</sub>	16.5	X	71.97228	197.04196	356.58645	9.22742	0.0057281	0.17475292	3.1684955	20	6 21.2	21.1
479245 2013 EE <sub>3</sub>	16.0	X	352.43212	312.50829	318.67725	14.59449	0.0494821	0.17891689	3.1191420	20	6 18.1	20.4
479246 2013 EX <sub>7</sub>	15.9	X	252.10128	36.05911	337.33922	17.66728	0.0992303	0.17674767	3.1446109	20	6 4.6	20.9
479247 2013 EB <sub>11</sub>	16.4	X	165.54265	142.35684	292.99251	9.28301	0.2211755	0.17698273	3.1418260	20	5 25.3	21.9
479248 2013 EV <sub>16</sub>	16.6	X	216.53106	262.12139	153.63017	9.37794	0.1531522	0.18987111	2.9979896	20	6 17.4	21.5
479249 2013 EB <sub>37</sub>	15.6	X	170.07931	81.38591	353.64794	17.15808	0.1408682	0.17024586	3.2241731	20	5 23.3	21.1
479250 2013 EJ <sub>40</sub>	17.1	X	293.39079	349.25196	75.80012	8.99667	0.1970607	0.22838874	2.6506533	20	10 8.5	20.0
479251 2013 EV <sub>57</sub>	15.9	X	221.28707	41.46676	3.56455	9.02952	0.0805522	0.17503257	3.1651197	20	6 12.8	20.8
479252 2013 EL <sub>69</sub>	15.9	X	168.59348	289.18397	162.03041	19.51544	0.1133454	0.17618737	3.1512743	20	6 16.8	21.2
479253 2013 EK <sub>70</sub>	17.1	X	179.58482	311.90734	142.55233	1.31065	0.1361720	0.18244355	3.0788158	20	6 29.9	22.1
479254 2013 ED <sub>81</sub>	16.4	X	157.95991	84.54067	19.52730	11.69259	0.0922414	0.17422822	3.1748537	20	6 18.9	21.5
479255 2013 ER <sub>86</sub>	16.3	X	155.44246	311.05547	168.03978	9.50036	0.0611233	0.17594846	3.1541263	20	7 3.9	21.1
479256 2013 EF <sub>90</sub>	15.3	X	132.60516	300.94168	162.95643	27.17283	0.2134390	0.17258453	3.1949800	20	6 5.9	21.1
479257 2013 ES <sub>90</sub>	16.7	X	225.72755	72.43015	47.65880	9.78959	0.3016134	0.21286533	2.7780033	20	9 6.7	21.5
479258 2013 EH <sub>101</sub>	15.6	X	186.55321	60.33279	19.25544	12.16019	0.0582929	0.17596524	3.1539257	20	6 18.8	20.5
479259 2013 EU <sub>101</sub>	16.4	X	107.45379	88.83068	71.61074	5.63260	0.0921443	0.17030290	3.2234531	20	7 5.1	21.1
479260 2013 ER <sub>102</sub>	15.6	X	26.45526	217.39904	1.15657	16.79123	0.0314906	0.16941231	3.2347402	20	5 21.6	20.3
479261 2013 EP <sub>110</sub>	16.5	X	144.44050	59.87673	105.35836	13.13483	0.1606417	0.18816753	3.0160573	20	8 27.4	21.5
479262 2013 EK <sub>111</sub>	16.5	X	207.49672	316.80758	129.21855	5.14681	0.0914816	0.18013636	3.1050490	20	7 18.9	21.3
479263 2013 EN <sub>111</sub>	15.7	X	127.80448	127.17364	40.26073	9.96653	0.0397661	0.17787016	3.1313671	20	8 5.0	20.4
479264 2013 EN <sub>112</sub>	16.2	X	100.35316	85.50711	74.61478	11.35772	0.0756766	0.16941390	3.2347200	20	6 23.7	20.8
479265 2013 ET <sub>119</sub>	15.7	X	219.02211	54.12270	359.92788	21.81728	0.1216710	0.17876908	3.1208611	20	6 18.4	21.0
479266 2013 EV <sub>121</sub>	16.6	X	168.00972	114.18104	3.70397	4.61939	0.0783803	0.17995319	3.1071557	20	7 18.4	21.4
479267 2013 EE <sub>122</sub>	16.9	X	154.44921	105.23767	47.29568	9.04177	0.1267746	0.18763606	3.0217499	20	8 17.1	21.7
479268 2013 FL <sub>1</sub>	16.7	X	116.73847	235.05710	284.65837	8.30728	0.1211143	0.18059154	3.0998294	20	7 17.4	21.4
479269 2013 FO <sub>1</sub>	16.3	X	130.21539	125.32021	35.66923	11.97672	0.1037729	0.18392045	3.0623116	20	8 6.1	21.2
479270 2013 FD <sub>3</sub>	15.9	X	106.36159	120.52450	63.12705	10.25104	0.0405550	0.18022617	3.1040174	20	7 29.8	20.5
479271 2013 FU <sub>6</sub>	15.7	X	118.42994	54.50902	93.41406	16.81042	0.1560768	0.17042639	3.2218958	20	7 7.7	20.8
479272 2013 FT <sub>19</sub>	16.4	X	160.55932	72.92774	48.52527	9.81981	0.1532060	0.18113580	3.0936168	20	7 17.1	21.6
479273 2013 FS <sub>22</sub>	16.1	X	111.94239	191.539								

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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>
479281 2013 GR <sub>22</sub>	15.5	X	100.46643	136.13630	48.91430	28.36251	0.2347663	0.17424674	3.1746287	20	8 27.6	21.1
479282 2013 GM <sub>34</sub>	16.2	X	145.98285	85.59804	43.13250	14.29192	0.2071352	0.17364684	3.1819361	20	7 14.9	21.7
479283 2013 GO <sub>39</sub>	16.5	X	152.99352	305.07883	183.91406	17.52031	0.2470113	0.18398293	3.0616182	20	7 18.0	22.2
479284 2013 GK <sub>45</sub>	16.3	X	145.63132	87.16610	84.41837	2.66768	0.0638983	0.18940827	3.0028716	20	8 30.8	20.7
479285 2013 GK <sub>46</sub>	15.9	X	140.64287	128.29037	24.43316	12.37799	0.0544337	0.18243698	3.0788898	20	8 3.9	20.6
479286 2013 GM <sub>46</sub>	15.8	X	200.90908	54.43337	14.92426	16.16493	0.0901865	0.17591884	3.1544803	20	6 20.5	20.9
479287 2013 GY <sub>56</sub>	16.6	X	121.66239	1.45781	145.00382	1.86469	0.1230914	0.16987785	3.2288278	20	7 6.2	21.5
479288 2013 GE <sub>69</sub>	18.7	X	231.90969	225.68499	359.73136	4.56884	0.2615280	0.36866266	1.9262676	20	—	—
479289 2013 GL <sub>76</sub>	16.8	X	183.39486	293.05558	184.97225	9.64556	0.0842443	0.18832817	3.0143420	20	8 1.2	21.5
479290 2013 GD <sub>83</sub>	15.6	X	45.08821	145.78631	90.26299	9.83272	0.1104471	0.17023042	3.2243680	20	7 25.3	19.9
479291 2013 GH <sub>91</sub>	16.7	X	257.98134	287.67054	211.19893	8.01419	0.0356806	0.22160918	2.7044412	20	12 7.8	20.3
479292 2013 GQ <sub>91</sub>	16.0	X	158.31336	132.95257	33.80404	15.14372	0.1862777	0.19036194	2.9928340	20	9 14.3	21.2
479293 2013 GG <sub>95</sub>	16.0	X	90.66354	25.41048	175.36434	19.59487	0.1177711	0.17057753	3.2199923	20	8 5.7	21.0
479294 2013 GN <sub>102</sub>	16.5	X	165.43530	75.10611	29.53628	9.93502	0.1868724	0.17418593	3.1753675	20	6 30.0	21.9
479295 2013 GT <sub>103</sub>	15.8	X	187.70650	67.65523	23.02236	20.57224	0.1341585	0.17478531	3.1681041	20	7 4.2	21.2
479296 2013 GF <sub>136</sub>	16.5	X	159.79612	87.67569	50.77918	10.53236	0.1443434	0.17949504	3.1124406	20	8 8.0	21.7
479297 2013 GS <sub>15</sub>	15.6	X	144.31781	66.42746	105.47691	27.31560	0.2012722	0.18158030	3.0885661	20	9 9.2	21.2
479298 2013 HY <sub>26</sub>	16.5	X	145.55553	287.80750	223.19829	8.92355	0.1860014	0.17643104	3.1483721	20	8 4.5	21.9
479299 2013 HU <sub>53</sub>	16.9	X	184.48013	262.46370	213.94952	16.09833	0.2001165	0.18491933	3.0512738	20	7 25.5	22.4
479300 2013 HC <sub>140</sub>	16.2	X	206.77277	253.91999	201.90732	11.90198	0.2375375	0.18589055	3.0406365	20	7 19.3	21.7
479301 2013 HD <sub>144</sub>	15.4	X	103.08306	264.21692	243.75274	9.89477	0.0812781	0.15914391	3.3724281	20	6 12.5	20.2
479302 2013 JT <sub>14</sub>	18.6	X	185.64352	120.24074	220.81052	20.77692	0.0523201	0.39349625	1.8443457	20	1 13.0	21.1
479303 2013 JL <sub>17</sub>	17.7	X	39.21095	249.45085	224.91052	20.37848	0.0894970	0.38838155	1.8605028	20	—	—
479304 2013 JX <sub>17</sub>	18.0	X	151.50105	311.17434	66.34415	23.46710	0.0842889	0.39532499	1.8386534	20	2 8.8	20.5
479305 2013 JM <sub>20</sub>	18.2	X	172.55462	270.07208	102.70831	22.29938	0.0921803	0.39694566	1.8336454	20	3 2.2	20.8
479306 2013 JD <sub>33</sub>	15.6	X	102.71016	115.78639	45.89451	27.22952	0.1817583	0.17081833	3.2169655	20	7 13.0	21.0
479307 2013 KF <sub>3</sub>	17.8	X	22.52503	288.64402	193.55188	22.02507	0.0521662	0.38662429	1.8661360	20	—	—
479308 2013 LZ <sub>6</sub>	18.4	X	171.70582	104.04254	233.41842	20.84494	0.0730259	0.37856366	1.8925329	20	—	—
479309 2013 LK <sub>17</sub>	16.3	X	139.89288	85.33046	79.55288	16.24727	0.1767620	0.17308060	3.1888722	20	8 24.8	21.8
479310 2013 MA	18.1	X	139.24557	228.15830	159.19787	23.81305	0.0856749	0.38921400	1.8578490	20	1 27.8	20.2
479311 2013 ME <sub>7</sub>	18.0	X	256.58306	67.57051	225.05773	20.98155	0.1154056	0.39204882	1.8488824	20	1 30.6	21.0
479312 2013 MS <sub>7</sub>	16.1	X	251.23521	72.58987	82.01063	30.46335	0.3665539	0.21718755	2.7410235	20	11 11.8	20.4
479313 2013 NC <sub>2</sub>	18.0	X	92.12644	125.66220	283.29055	18.52830	0.1055117	0.36402068	1.9426088	20	—	—
479314 2013 OQ <sub>3</sub>	18.3	X	350.66735	352.47016	153.78445	34.38333	0.2646864	0.36454560	1.9407435	20	—	—
479315 2013 OS <sub>6</sub>	17.9	X	129.26622	252.90385	149.73747	23.96412	0.0785875	0.37493687	1.9047177	20	2 7.4	19.7
479316 2013 PF <sub>44</sub>	18.7	X	20.75570	182.10020	311.39535	17.73688	0.0839030	0.36630943	1.9345085	20	—	—
479317 2013 PB <sub>47</sub>	18.4	X	161.40931	357.46449	335.79140	16.13189	0.0829450	0.35360933	1.9805550	20	—	—
479318 2013 QJ <sub>11</sub>	17.9	X	60.19807	273.62957	191.07181	21.83461	0.1244541	0.36681895	1.9327167	20	1 16.3	19.9
479319 2013 QQ <sub>17</sub>	17.8	X	82.24989	268.92392	197.70516	21.04406	0.1189907	0.36955262	1.9231738	20	3 6.7	19.5
479320 2013 RR <sub>12</sub>	18.2	X	65.71125	105.04179	331.39739	16.52382	0.1069356	0.35364542	1.9804202	20	—	—
479321 2013 SL <sub>24</sub>	17.5	X	245.12526	41.78888	203.37322	22.36915	0.0739489	0.34862132	1.9994018	20	—	—
479322 2013 SO <sub>39</sub>	18.4	X	32.17920	8.30814	4.66146	3.26778	0.1360368	0.30843092	2.1695222	20	—	—
479323 2013 SL <sub>50</sub>	18.2	X	319.80423	56.37280	18.48693	3.54285	0.1922709	0.29098528	2.2553920	20	—	—
479324 2013 SB <sub>71</sub>	18.3	X	52.29284	49.87396	280.54383	3.55387	0.1622378	0.30630066	2.1795697	20	—	—
479325 2013 TV <sub>5</sub>	19.3	X	100.06080	69.84003	351.20660	18.77348	0.2527530	0.63984405	1.3337874	20	—	—
479326 2013 TR <sub>25</sub>	18.0	X	358.73146	2.14816	13.78938	4.42136	0.1445535	0.29252854	2.2474526	20	12 21.6	20.3
479327 2013 TS <sub>37</sub>	18.1	X	13.02802	278.37293	98.79181	4.38669	0.1467068	0.30218709	2.1993049	20	—	—
479328 2013 TY <sub>49</sub>	17.9	X	7.62695	14.15182	34.27281	6.81063	0.1083904	0.30823528	2.1704402	20	—	—
479329 2013 TP <sub>84</sub>	17.8	X	253.97795	257.46871	229.89720	4.90828	0.1668864	0.28714756	2.2754430	20	11 13.4	20.1
479330 2013 TM <sub>89</sub>	18.2	X	325.03668	71.38029	1.80322	5.83473	0.1629101	0.29669759	2.2263497	20	—	—
479331 2013 TX <sub>113</sub>	17.2	X	123.99770	325.25709	237.74790	7.14620	0.0604739	0.26547259	2.3976710	20	9 19.9	20.6
479332 2013 TU <sub>124</sub>	17.6	X	205.60539	338.06836	210.12257	6.33036	0.1046105	0.29835910	2.2180765	20	12 12.5	20.3
479333 2013 WU	17.5	X	256.35721	274.18152	64.43365	22.23756	0.1018400	0.37877277	1.8918363	20	4 28.9	19.8
479334 2013 WC <sub>4</sub>	18.1	X	305.05533	304.07281	103.36020	3.39745	0.1932927	0.27430869	2.3459009	20	10 16.8	19.8
479335 2013 WR <sub>4</sub>	18.3	X	356.52207	192.94987	250.16499	3.28521	0.1520275	0.30799111	2.1715871	20	—	—
479336 2013 WM <sub>9</sub>	19.1	X	7.76945	0.47175	24.58860	3.23892	0.2180787	0.29639407	2.2278693	20	—	—
479337 2013 WS <sub>10</sub>	18.1	X	22.49838	158.11088	247.45668	3.69035	0.1262585	0.30769151	2.1729966	20	—	—
479338 2013 WK <sub>19</sub>	18.0	X	285.30708	218.84474	225.39866	6.18979	0.0628148	0.27806770	2.3247113	20	11 15.0	20.5
479339 2013 WP <sub>26</sub>	17.5	X	295.83786	176.43753	257.70884	6.18008	0.0885517	0.28226509	2.3016076	20	11 16.3	19.9
479340 2013 WD <sub>28</sub>	18.3	X	159.85068	185.40311	60.86333	6.76743	0.0419054	0.29590951	2.2303007	20	—	—
479341 2013 WP <sub>35</sub>	18.6	X	1.85763	149.92528	251.14950	3.18780	0.1912909	0.29758270	2.2219329	20	—	—
479342 2013 WX <sub>47</sub>	18.1	X	58.17763	241.37027	126.63361	0.43204	0.1875706	0.31462417	2.1409572	20	—	—
479343 2013 WY <sub>48</sub>	17.7	X	358.00483	74.14405	350.56912	8.50357	0.1160466	0.30344038	2.1932449	20	—	—
479344 2013 WT <sub>64</sub>	17.7	X	299.99317	46.85326	21.11426	6.52581	0.1765145	0.27981663	2.3150144	20	11 7.5	19.3
479345 2013 WY <sub>67</sub>	19.3	X	321.18614	151.95942	64.00131	19.82130	0.3726801	0.63337719	1.3428508	20	—	—
479346 2013 WV <sub>72</sub>	17.8	X	276.70628	241.86862	265.79189	6.70621	0.0748473	0.29963486	2.2117761	20	—	—
479347 2013 WW <sub>73</sub>	18.2	X	323.25101	30.59411	37.74215	8.16879	0.1295345	0.28990404	2.2609964	20	—	—
479348 2013 WF <sub>74</sub>	15.9	X	157.42649	227.36019	278.52086	30.95902	0.2206822	0.23197801	2.6232409	20	8 1.5	20.8
479349 2013 WG <sub>85</sub>	18.3	X	257.28936	229.35439	223.08277	4.66069	0.1432052	0.26634388	2.3924392	20	9 26.9	21.3
479350 2013 WZ <sub>91</sub>	18.4	X	59.29261	12.95972	335.17232	1.43447	0.0859972	0.29847037	2.2175252	20	—	—
479351 2013 WY <sub>92</sub>	17.3	X	158.79015	338.73783	265.70411	6.66181	0.0487182	0.29248941	2.2476531	20	—	—
479352 2013 WA <sub>95</sub>	17.2	X	243.80810	217.79428	262.35350	5.72322	0.0790413	0.27378064	2.3489164	20	10 28.0	20.0
479353 2013 WZ <sub>97</sub>	17.6	X	244.99890	145.15772	336.15489	1.73950	0.1722911	0.27012482	2.3700621	20	10 16.6	20.6
479354 2013 WK <sub>106</sub>	16.3	X	294.12753	176.30855	194.36259	24.10718	0.2358358	0.28429854	2.2906195	20	—	—
479355 2013 WL <sub>10</sub>												

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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>
479361 2013 XV <sub>12</sub>	17.7	X	274.35405	127.86392	333.90022	2.00584	0.1602108	0.27026642	2.3692342	20	11 6.5	20.1
479362 2013 XW <sub>12</sub>	18.7	X	332.26348	26.98225	33.42384	2.46188	0.2348345	0.28414395	2.2914503	20	—	—
479363 2013 XY <sub>12</sub>	17.8	X	251.33264	103.61645	72.83954	5.18739	0.0528531	0.28903578	2.2655222	20	—	—
479364 2013 XF <sub>15</sub>	18.3	X	300.57523	341.71374	63.34132	2.39050	0.1766208	0.26998049	2.3709067	20	10 2.1	20.1
479365 2013 XK <sub>15</sub>	18.0	X	93.87765	85.28743	258.61679	3.66466	0.1046064	0.30995965	2.1623830	20	—	—
479366 2013 XS <sub>15</sub>	18.2	X	347.92133	311.83025	70.41302	3.20623	0.1064182	0.28050763	2.3112110	20	12 3.1	20.5
479367 2013 XH <sub>16</sub>	17.9	X	220.84522	205.38327	298.24056	6.33529	0.0404509	0.27258714	2.3557677	20	11 2.6	21.0
479368 2013 XJ <sub>16</sub>	18.1	X	93.50182	300.15116	25.95652	5.13645	0.2236977	0.30794475	2.1718051	20	—	—
479369 2013 XA <sub>18</sub>	18.1	X	292.84150	213.49730	232.92316	2.78235	0.1892153	0.27863319	2.3215648	20	11 21.1	19.6
479370 2013 XX <sub>19</sub>	17.8	X	242.98494	96.44489	50.75773	1.94754	0.1326683	0.27171360	2.3608141	20	11 25.9	20.6
479371 2013 XB <sub>20</sub>	17.3	X	267.67765	349.49299	96.41065	7.04628	0.1112174	0.25898921	2.4375205	20	10 13.2	20.2
479372 2013 XF <sub>20</sub>	16.8	X	177.77864	188.08361	309.46437	7.70118	0.0590360	0.23302272	2.6153945	20	8 25.1	20.6
479373 2013 XL <sub>20</sub>	17.9	X	304.05347	13.17809	75.34811	4.59398	0.1527315	0.27894524	2.3198331	20	12 21.8	19.7
479374 2013 XR <sub>20</sub>	18.1	X	7.83256	95.83242	330.09810	6.56051	0.1272565	0.30450639	2.1881232	20	—	—
479375 2013 XD <sub>21</sub>	17.2	X	42.52863	57.30471	291.56762	22.28480	0.2255690	0.28259846	2.2997971	20	—	—
479376 2013 XZ <sub>23</sub>	17.3	X	310.31721	134.56029	275.53845	5.43447	0.1769907	0.26936342	2.3745262	20	10 28.6	19.1
479377 2013 XF <sub>24</sub>	16.8	X	135.25970	90.50684	84.59724	4.25379	0.0915712	0.22350484	2.6891277	20	8 29.2	20.8
479378 2013 XA <sub>25</sub>	17.7	X	254.89571	91.75477	33.67397	5.49291	0.1353908	0.27613837	2.3355269	20	11 13.6	20.3
479379 2013 YM <sub>1</sub>	16.5	X	2.57121	330.69041	289.57760	10.20578	0.0899420	0.21825223	2.7321021	20	6 20.0	19.6
479380 2013 YT <sub>1</sub>	16.9	X	77.06783	84.15428	99.45802	8.41170	0.1552604	0.21207054	2.7849399	20	7 8.7	20.8
479381 2013 YR <sub>3</sub>	17.7	X	326.68529	248.62561	147.92773	2.43255	0.2158901	0.27952263	2.3166374	20	11 24.9	19.1
479382 2013 YA <sub>4</sub>	16.8	X	123.20017	86.60018	103.24131	16.44278	0.1267288	0.23659431	2.5890068	20	9 12.4	21.0
479383 2013 YC <sub>5</sub>	18.5	X	5.39306	312.72818	94.18568	4.09415	0.1428702	0.29082835	2.2562033	20	—	—
479384 2013 YN <sub>7</sub>	18.2	X	290.57718	24.53546	85.27171	4.71738	0.0471631	0.28813172	2.2702586	20	—	—
479385 2013 YV <sub>8</sub>	18.4	X	1.68085	283.60717	121.78052	2.06419	0.1508182	0.28729381	2.2746707	20	—	—
479386 2013 YZ <sub>10</sub>	17.9	X	265.05559	266.76679	223.18215	2.43903	0.1248231	0.27059527	2.3673143	20	12 7.7	20.1
479387 2013 YD <sub>11</sub>	17.2	X	223.01545	346.38083	145.17768	7.31835	0.1208545	0.25301754	2.4757244	20	10 10.4	20.6
479388 2013 YF <sub>11</sub>	18.0	X	0.45029	293.64626	153.83855	4.73885	0.1262778	0.29719540	2.2238628	20	—	—
479389 2013 YN <sub>11</sub>	16.8	X	264.47257	204.32391	291.31394	23.09554	0.1833823	0.27324920	2.3519610	20	12 8.1	19.4
479390 2013 YR <sub>13</sub>	16.7	X	308.69178	146.76498	291.00130	23.94315	0.1899716	0.27427121	2.3461146	20	12 21.6	18.7
479391 2013 YA <sub>16</sub>	17.7	X	310.41720	294.63690	120.68259	5.69477	0.1041877	0.26541288	2.3980306	20	11 11.9	20.1
479392 2013 YM <sub>16</sub>	18.3	X	300.15591	228.82259	202.89923	1.10713	0.1423362	0.26923333	2.3752911	20	11 14.2	20.0
479393 2013 YX <sub>20</sub>	18.2	X	50.36356	340.05604	54.93959	6.18952	0.1488541	0.30328107	2.1940129	20	—	—
479394 2013 YE <sub>24</sub>	17.0	X	164.92811	257.11150	256.85574	13.67276	0.0341163	0.25653588	2.4530363	20	8 28.9	20.8
479395 2013 YS <sub>26</sub>	16.3	X	104.06634	62.10677	98.71368	14.42195	0.1525321	0.21541638	2.7560277	20	7 10.6	20.3
479396 2013 YF <sub>27</sub>	17.5	X	257.79439	52.43268	85.02640	2.25621	0.1250054	0.27347376	2.3506733	20	12 7.1	19.7
479397 2013 YA <sub>28</sub>	18.4	X	4.25975	315.13555	93.50337	3.89715	0.1983002	0.29171568	2.2516257	20	—	—
479398 2013 YN <sub>28</sub>	17.7	X	338.00685	292.23352	102.08525	6.61867	0.1025180	0.27168445	2.3609830	20	12 1.4	20.1
479399 2013 YJ <sub>29</sub>	17.1	X	263.08625	286.67427	63.81443	4.68982	0.2147035	0.23907831	2.5710426	20	5 6.5	20.9
479400 2013 YI <sub>29</sub>	18.4	X	350.46527	175.75719	219.44271	1.96002	0.2340719	0.28089216	2.3091012	20	—	—
479401 2013 YZ <sub>29</sub>	18.0	X	1.89049	163.01040	232.53928	2.46239	0.1298514	0.28095648	2.3087488	20	—	—
479402 2013 YB <sub>33</sub>	18.1	X	219.63011	44.97571	91.81422	3.55475	0.1602487	0.26483118	2.4015408	20	10 9.2	21.4
479403 2013 YL <sub>33</sub>	17.8	X	306.33987	35.84175	97.38323	22.84556	0.1729482	0.29346464	2.2426708	20	—	—
479404 2013 YI <sub>34</sub>	17.7	X	308.87689	11.58161	60.82827	2.18153	0.1489344	0.27509605	2.3414226	20	12 5.2	19.7
479405 2013 YI <sub>41</sub>	18.0	X	246.98561	129.02416	331.98122	2.68063	0.1455044	0.26453039	2.4033669	20	9 24.3	21.0
479406 2013 YM <sub>42</sub>	16.7	X	160.11113	10.97036	134.62897	14.20603	0.1261374	0.22646243	2.6656632	20	8 17.1	20.9
479407 2013 YR <sub>47</sub>	16.3	X	142.72547	278.89574	273.29453	16.19216	0.1175355	0.24377596	2.5379056	20	9 19.8	20.6
479408 2013 YQ <sub>49</sub>	18.1	X	219.87736	6.97517	155.23651	1.66355	0.1474350	0.26393846	2.4069529	20	11 12.1	21.3
479409 2013 YI <sub>49</sub>	16.8	X	219.62071	169.44788	289.65567	14.42856	0.0672113	0.24148776	2.5539122	20	8 20.4	20.5
479410 2013 YV <sub>58</sub>	16.9	X	188.03336	172.73221	295.93219	9.20273	0.1470799	0.23171187	2.6252491	20	7 27.1	21.1
479411 2013 YU <sub>60</sub>	17.8	X	281.44436	1.10844	87.48290	7.33802	0.0817704	0.26688931	2.3891785	20	11 12.1	20.4
479412 2013 YG <sub>61</sub>	17.3	X	126.98330	298.12659	209.30802	7.44218	0.1610963	0.25696528	2.4503028	20	11 9.5	21.3
479413 2013 YR <sub>65</sub>	16.7	X	87.96459	145.48688	110.34935	13.96855	0.1451423	0.24086140	2.5583380	20	10 31.4	20.8
479414 2013 YI <sub>66</sub>	18.2	X	290.46974	85.97904	18.59704	6.28915	0.1666656	0.27898084	2.3196358	20	12 16.4	20.2
479415 2013 YR <sub>72</sub>	16.4	X	324.89922	301.58283	277.43322	8.64303	0.1633313	0.17526895	3.1622732	20	2 15.3	20.6
479416 2013 YV <sub>72</sub>	17.8	X	183.15477	244.64481	320.59566	2.14246	0.1299277	0.26802020	2.3824531	20	11 28.1	21.1
479417 2013 YG <sub>73</sub>	17.6	X	246.60284	245.17089	247.39738	3.86121	0.1391816	0.26576065	2.3959381	20	11 8.1	20.3
479418 2013 YT <sub>74</sub>	18.3	X	333.63108	78.63048	337.89599	4.66596	0.1772442	0.28056218	2.3109114	20	—	—
479419 2013 YI <sub>75</sub>	18.5	X	340.23386	271.42255	132.57416	8.34187	0.2549063	0.28049119	2.3113013	20	—	—
479420 2013 YS <sub>76</sub>	17.9	X	243.34618	133.96419	20.39632	2.67347	0.1259111	0.27317991	2.3523587	20	12 7.6	20.4
479421 2013 YT <sub>77</sub>	17.6	X	260.42603	9.35347	86.73538	7.30620	0.0451697	0.25935984	2.4351977	20	10 25.9	20.7
479422 2013 YR <sub>78</sub>	17.7	X	245.50535	121.20403	356.41514	2.59083	0.1225891	0.26339905	2.4102379	20	10 18.9	20.5
479423 2013 YG <sub>80</sub>	18.1	X	238.95522	160.65056	349.26374	1.24718	0.1218027	0.27047317	2.3680266	20	11 25.1	21.0
479424 2013 YV <sub>82</sub>	18.2	X	294.31538	175.47664	289.45803	4.85050	0.1779545	0.27821221	2.3239062	20	12 25.5	19.9
479425 2013 YI <sub>83</sub>	17.7	X	297.02056	316.74870	128.75915	10.24392	0.1322753	0.27181119	2.3602490	20	12 2.8	20.1
479426 2013 YK <sub>84</sub>	18.0	X	1.96092	115.66891	268.23559	6.09891	0.1182235	0.27503830	2.3417504	20	12 27.9	20.4
479427 2013 YW <sub>86</sub>	18.0	X	280.84662	68.37614	48.93690	3.65520	0.1867946	0.27497445	2.3421129	20	12 11.8	19.8
479428 2013 YR <sub>88</sub>	17.1	X	174.58134	92.29583	109.25523	10.32470	0.0627857	0.25909896	2.4368321	20	11 21.4	20.6
479429 2013 YE <sub>90</sub>	18.4	X	309.91086	239.65555	185.31806	1.50881	0.1521599	0.26695894	2.3887631	20	11 23.1	20.4
479430 2013 YQ <sub>90</sub>	16.7	X	221.85639	332.28102	130.22455	10.29739	0.0232595	0.23812111	2.5779280	20	9 11.2	20.2
479431 2013 YW <sub>90</sub>	18.6	X	320.13792	278.98329	161.15161	3.91393	0.2139337	0.27944092	2.3170890	20	—	—
479432 2013 YC <sub>93</sub>	18.0	X	274.88600	76.57949	58.36866	5.54063	0.0820417	0.28070180	2.3101451	20	—	—
479433 2013 YG <sub>95</sub>	17.1	X	158.24588	118.78441	84.34604	3.95174	0.1194188	0.25288906	2.4765629	20	10 30.9	20.8
479434 2013 YI <sub>99</sub>	18.0	X	29									

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
479441 2013 YH <sub>109</sub>	17.2	X	279.96892	223.47896	275.68658	6.02660	0.0476600	0.28475378	2.2881776	20	—	—
479442 2013 YM <sub>109</sub>	17.4	X	217.84230	26.23703	127.83476	7.18533	0.0600881	0.26322531	2.4112983	20	11 13.2	20.6
479443 2013 YH <sub>110</sub>	16.3	X	194.39099	151.82922	16.67459	33.67965	0.1704030	0.23049375	2.6344903	20	10 13.1	20.5
479444 2013 YD <sub>111</sub>	17.8	X	226.96868	201.13495	331.70912	6.19104	0.0772284	0.26921036	2.3754262	20	12 16.3	20.9
479445 2013 YE <sub>114</sub>	17.9	X	198.74469	200.78614	338.80995	0.93434	0.1335124	0.26012473	2.4304216	20	11 10.5	21.3
479446 2013 YQ <sub>115</sub>	18.0	X	312.17547	284.28526	119.40242	3.04642	0.2093376	0.26513916	2.3996807	20	10 23.8	19.6
479447 2013 YL <sub>117</sub>	17.7	X	311.45826	27.01264	28.12360	1.44711	0.1653687	0.26532180	2.3985793	20	11 9.6	19.5
479448 2013 YM <sub>118</sub>	17.6	X	272.65717	284.60845	214.95256	5.13775	0.1575933	0.28041220	2.3117353	20	—	—
479449 2013 YT <sub>120</sub>	18.8	X	312.70771	212.71133	211.59299	0.82206	0.1683893	0.27447361	2.3449612	20	11 30.9	20.4
479450 2013 YZ <sub>120</sub>	18.3	X	316.42644	259.80949	197.82849	1.93310	0.0616565	0.28549087	2.2842374	20	—	—
479451 2013 YJ <sub>121</sub>	17.4	X	195.22889	29.71030	126.85768	6.63860	0.0789904	0.25544451	2.4600183	20	10 16.2	20.9
479452 2013 YB <sub>123</sub>	18.1	X	335.71219	269.56205	128.71329	6.15504	0.2248048	0.27736310	2.3286467	20	12 19.7	19.8
479453 2013 YX <sub>123</sub>	18.3	X	350.37438	198.22048	236.88167	3.37679	0.0895784	0.28679708	2.2772964	20	—	—
479454 2013 YT <sub>124</sub>	17.4	X	19.19405	282.18500	90.89430	6.88580	0.1159579	0.27234199	2.3571813	20	—	—
479455 2013 YD <sub>125</sub>	17.5	X	351.53567	58.97833	318.88404	5.87098	0.1259056	0.26450848	2.4034937	20	11 29.3	20.0
479456 2013 YG <sub>126</sub>	18.0	X	26.42756	27.26344	314.79905	5.61167	0.2223331	0.28708895	2.2757527	20	12 25.2	20.9
479457 2013 YL <sub>129</sub>	18.2	X	324.45074	186.29076	276.76317	2.12254	0.1632934	0.29009172	2.2602111	20	—	—
479458 2013 YM <sub>129</sub>	17.3	X	243.16991	176.28314	280.71471	5.06508	0.0927555	0.25235000	2.4800885	20	9 17.9	20.7
479459 2013 YS <sub>129</sub>	16.7	X	315.78890	97.32383	347.75221	22.97506	0.2553081	0.28439306	2.2901120	20	—	—
479460 2013 YC <sub>131</sub>	17.3	X	255.51844	178.18261	349.74700	5.83856	0.1560193	0.28299900	2.2976266	20	—	—
479461 2013 YL <sub>132</sub>	18.0	X	4.83636	29.35360	10.55065	5.74018	0.1383159	0.28766155	2.2727317	20	—	—
479462 2013 YD <sub>133</sub>	17.4	X	9.99834	353.95369	33.96350	6.92888	0.1769008	0.28679214	2.2773226	20	—	—
479463 2013 YC <sub>135</sub>	17.5	X	203.38531	199.69654	32.61672	7.24321	0.0560775	0.29209527	2.2496746	20	—	—
479464 2013 YK <sub>137</sub>	18.2	X	347.84527	32.40687	21.37854	7.14693	0.0883958	0.28431553	2.2905283	20	—	—
479465 2013 YL <sub>139</sub>	17.0	X	134.00403	114.10269	59.56508	11.05962	0.0473737	0.23929834	2.5694663	20	8 28.9	20.8
479466 2013 YB <sub>140</sub>	18.0	X	287.33587	352.78741	113.37216	2.12208	0.1368853	0.27503699	2.3417578	20	12 13.5	20.1
479467 2013 YY <sub>146</sub>	17.5	X	263.71106	194.39114	335.23498	7.44522	0.0782549	0.29101405	2.2552433	20	—	—
479468 2013 YJ <sub>149</sub>	18.0	X	347.77639	178.69786	236.43992	3.92374	0.1910856	0.28479470	2.2879583	20	—	—
479469 2014 AC <sub>1</sub>	15.9	X	329.03007	266.21690	304.71052	24.26599	0.2471958	0.16998571	3.2274618	20	2 1.2	19.8
479470 2014 AP <sub>1</sub>	18.5	X	299.71986	26.10518	40.32475	3.13189	0.1498993	0.26754088	2.3852978	20	11 3.8	20.6
479471 2014 AS <sub>1</sub>	17.9	X	27.61290	102.41953	307.26624	8.13563	0.1218087	0.29796096	2.2200520	20	—	—
479472 2014 AV <sub>1</sub>	17.6	X	276.13657	2.39894	32.02629	3.02417	0.1598073	0.24538218	2.5268184	20	7 31.4	20.6
479473 2014 AW <sub>1</sub>	18.3	X	358.01259	332.37597	91.63315	6.90909	0.1488249	0.29141592	2.2531695	20	—	—
479474 2014 AH <sub>2</sub>	17.9	X	252.17186	59.29983	60.80462	3.87514	0.1205452	0.26410914	2.4059158	20	11 2.8	20.7
479475 2014 AC <sub>6</sub>	17.6	X	207.07238	149.42765	39.29060	4.11989	0.1459609	0.26921431	2.3754030	20	12 1.7	20.8
479476 2014 AJ <sub>6</sub>	18.7	X	337.64180	91.33602	314.99052	4.39352	0.1708710	0.27758808	2.3273883	20	12 28.2	20.6
479477 2014 AY <sub>6</sub>	17.7	X	188.94473	43.92386	83.87281	3.41917	0.0708214	0.24022371	2.5628635	20	8 28.9	21.4
479478 2014 AB <sub>8</sub>	17.7	X	277.40169	43.03870	99.11630	6.89058	0.0760413	0.28303308	2.2974422	20	—	—
479479 2014 AE <sub>14</sub>	16.7	X	284.07786	90.46281	302.39860	28.20123	0.1814434	0.23951795	2.5678954	20	8 1.7	19.7
479480 2014 AZ <sub>19</sub>	17.7	X	324.50305	243.61048	156.79635	2.84675	0.1612318	0.26322421	2.4113051	20	11 15.8	19.8
479481 2014 AQ <sub>22</sub>	16.5	X	178.10514	36.97514	80.47381	13.96095	0.1401771	0.23044583	2.6348555	20	7 31.8	20.8
479482 2014 AW <sub>25</sub>	17.1	X	110.58254	143.87125	97.06885	6.28614	0.1077821	0.24463903	2.5319330	20	10 29.9	20.9
479483 2014 AY <sub>25</sub>	18.3	X	345.60195	22.00073	60.23494	3.75590	0.1497894	0.28858771	2.2678665	20	—	—
479484 2014 AR <sub>26</sub>	16.9	X	169.85508	22.71598	118.85485	13.42678	0.0913353	0.23197728	2.6232464	20	8 24.6	20.9
479485 2014 AR <sub>26</sub>	17.6	X	338.21529	2.20327	68.40967	6.87692	0.1016199	0.28649182	2.2789138	20	—	—
479486 2014 AD <sub>28</sub>	16.7	X	72.49556	326.11342	278.27244	9.39099	0.0930909	0.22693538	2.6619583	20	9 8.6	20.5
479487 2014 AH <sub>28</sub>	17.2	X	206.10764	148.28683	289.16238	5.87190	0.0909635	0.22462819	2.6801548	20	7 8.9	21.2
479488 2014 AZ <sub>31</sub>	17.5	X	269.62611	37.41423	118.55171	5.99275	0.0681303	0.28470387	2.2884449	20	—	—
479489 2014 AC <sub>33</sub>	17.4	X	293.82736	146.53170	299.87074	5.40268	0.0887339	0.27065223	2.3669821	20	11 26.9	20.0
479490 2014 AZ <sub>33</sub>	17.3	X	206.15237	303.12701	130.70661	6.68892	0.1359347	0.23019147	2.6367962	20	7 1.3	21.3
479491 2014 AC <sub>34</sub>	18.6	X	8.62611	271.60964	143.98963	2.58127	0.2151439	0.29593420	2.2301767	20	—	—
479492 2014 AE <sub>36</sub>	17.6	X	321.15560	311.69380	109.05551	5.24003	0.0777329	0.28081496	2.3095244	20	12 11.3	19.9
479493 2014 AN <sub>36</sub>	17.3	X	132.39227	277.11278	157.52006	12.44820	0.1032576	0.24244969	2.5471526	20	8 19.6	21.3
479494 2014 AU <sub>41</sub>	17.0	X	212.14502	308.08494	233.20791	22.66112	0.0245658	0.22502998	2.6769636	20	7 27.0	20.7
479495 2014 AA <sub>42</sub>	17.3	X	96.79966	94.10074	130.54650	6.43880	0.1338180	0.23213088	2.6220891	20	9 25.0	21.2
479496 2014 AN <sub>42</sub>	17.0	X	150.68403	245.67867	276.89539	3.51973	0.1832905	0.23370691	2.6102875	20	8 28.6	21.4
479497 2014 AB <sub>43</sub>	16.6	X	192.01077	177.28621	314.46975	13.86308	0.0666731	0.23408311	2.6074901	20	8 31.5	20.4
479498 2014 AB <sub>44</sub>	16.4	X	251.87300	89.64113	330.73224	21.58979	0.0483758	0.22530453	2.6747884	20	8 18.7	20.1
479499 2014 AY <sub>47</sub>	17.8	X	329.83272	347.43898	107.28380	3.55783	0.0189682	0.28493305	2.2872176	20	—	—
479500 2014 AW <sub>49</sub>	18.3	X	14.53194	289.40379	154.34602	4.78497	0.0910450	0.30441107	2.1885800	20	—	—
479501 2014 AC <sub>53</sub>	16.5	X	264.22898	193.73451	336.11641	24.61737	0.1641443	0.28239708	2.3008903	20	—	—
479502 2014 AR <sub>53</sub>	16.9	X	154.55044	259.89582	227.97080	11.78025	0.2170829	0.22265858	2.6959371	20	7 18.1	21.7
479503 2014 AW <sub>54</sub>	16.4	X	66.04076	306.84201	298.62639	9.52346	0.0734548	0.23016585	2.6369919	20	8 31.4	20.0
479504 2014 BR <sub>2</sub>	16.8	X	143.41506	126.12955	113.69371	6.06430	0.0963021	0.26231080	2.4168995	20	12 2.6	20.4
479505 2014 BK <sub>4</sub>	18.1	X	10.77822	13.58561	58.53574	3.38057	0.1053967	0.29951483	2.2123670	20	—	—
479506 2014 BF <sub>7</sub>	18.2	X	247.11882	153.59126	1.25920	1.43575	0.1165283	0.26993798	2.3711556	20	12 14.8	20.9
479507 2014 BX <sub>7</sub>	16.8	X	59.67499	107.21346	128.38307	7.54201	0.0761068	0.22038138	2.7144767	20	8 13.3	20.3
479508 2014 BA <sub>10</sub>	17.7	X	301.04674	55.64230	358.22339	5.29770						

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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>
479521 2014 BQ <sub>29</sub>	17.9	X	298.01797	19.00176	92.43432	6.70004	0.1862446	0.27923187	2.3182453	20	—	—
479522 2014 BT <sub>29</sub>	16.7	X	238.87280	118.27073	326.13645	7.50761	0.0444780	0.23511427	2.5998606	20	9 1.8	20.1
479523 2014 BD <sub>30</sub>	16.7	X	91.27148	232.49603	291.25031	8.64465	0.0342042	0.20361580	2.8615087	20	6 12.2	20.6
479524 2014 BQ <sub>30</sub>	16.1	X	77.35256	179.88085	294.25579	9.72225	0.0698715	0.17883490	3.1200954	20	3 22.8	20.5
479525 2014 BA <sub>34</sub>	16.9	X	115.97207	261.01662	323.67458	21.59591	0.0398193	0.24176238	2.5519778	20	9 25.3	20.9
479526 2014 BE <sub>34</sub>	17.9	X	199.74384	162.92986	7.84630	2.90771	0.1418539	0.25292652	2.4763183	20	10 28.9	21.4
479527 2014 BL <sub>34</sub>	18.2	X	327.29475	101.54827	14.62545	3.37223	0.1532166	0.29052435	2.2577769	20	—	—
479528 2014 BW <sub>35</sub>	17.9	X	314.14824	333.22959	127.38360	4.41186	0.1627628	0.27890062	2.3200806	20	—	—
479529 2014 BX <sub>35</sub>	18.0	X	269.17057	118.54626	335.22246	3.24953	0.2065751	0.25857243	2.4401390	20	10 5.5	20.7
479530 2014 BL <sub>36</sub>	17.8	X	57.20954	323.26600	9.11649	2.44859	0.0369916	0.26586574	2.3953067	20	12 18.8	20.8
479531 2014 BW <sub>36</sub>	17.3	X	269.56195	317.56321	143.73659	6.79801	0.1034680	0.25982334	2.4323007	20	11 6.9	20.2
479532 2014 BS <sub>37</sub>	15.7	X	314.39826	263.23836	329.91638	13.59765	0.1214641	0.16358469	3.3111151	20	2 27.5	20.2
479533 2014 BV <sub>37</sub>	16.1	X	11.29510	285.54169	322.36337	15.69020	0.0831419	0.19725068	2.9227413	20	6 16.7	20.0
479534 2014 BS <sub>38</sub>	16.9	X	133.06288	43.07923	140.72947	5.98536	0.1027775	0.22507605	2.6765983	20	9 6.8	21.0
479535 2014 BU <sub>38</sub>	17.2	X	352.80110	60.88750	337.81621	6.02824	0.1412925	0.26663949	2.3906706	20	—	—
479536 2014 BR <sub>39</sub>	18.0	X	264.77057	1.24032	85.24103	2.91716	0.1600513	0.25641381	2.4538148	20	9 28.6	20.7
479537 2014 BS <sub>39</sub>	17.9	X	248.24342	97.79959	43.25003	2.09366	0.1631951	0.26658549	2.3909934	20	11 23.2	20.6
479538 2014 BX <sub>39</sub>	17.6	X	323.85044	337.56095	107.98402	5.19400	0.1834444	0.28105354	2.3082172	20	—	—
479539 2014 BP <sub>40</sub>	17.4	X	225.99058	85.30593	343.40878	5.03166	0.1685089	0.23084276	2.6318343	20	7 13.6	21.4
479540 2014 BS <sub>41</sub>	17.7	X	224.79725	64.78399	18.15726	2.29542	0.1155501	0.23294444	2.6159804	20	8 5.4	21.5
479541 2014 BT <sub>42</sub>	17.7	X	273.78101	259.11082	209.85639	1.81988	0.1587149	0.26537317	2.3982698	20	11 16.0	20.1
479542 2014 BC <sub>46</sub>	17.4	X	167.81303	61.62407	29.98938	4.51017	0.0338965	0.21662101	2.7458006	20	6 13.5	21.2
479543 2014 BR <sub>46</sub>	17.6	X	281.83907	102.97494	332.96837	4.59137	0.1606062	0.25533999	2.4606896	20	10 7.6	20.3
479544 2014 BO <sub>47</sub>	18.2	X	294.93046	197.30232	313.47846	2.02198	0.1730364	0.28725377	2.2748821	20	—	—
479545 2014 BH <sub>53</sub>	17.3	X	66.12411	18.71081	320.36877	6.51336	0.1353976	0.28340088	2.2954540	20	—	—
479546 2014 BU <sub>53</sub>	17.9	X	334.04697	274.17875	139.67690	1.59790	0.1780883	0.27524418	2.3405825	20	—	—
479547 2014 BZ <sub>54</sub>	17.7	X	238.01144	121.15269	320.83725	11.44415	0.2203539	0.24263959	2.5458234	20	8 7.3	21.6
479548 2014 BG <sub>55</sub>	17.5	X	208.09064	352.61539	109.67305	15.16313	0.0913723	0.24050885	2.5608374	20	8 16.6	21.3
479549 2014 BV <sub>55</sub>	17.8	X	356.34972	294.75439	141.24769	7.75744	0.1555009	0.28757845	2.2731695	20	—	—
479550 2014 BS <sub>58</sub>	18.3	X	5.59449	112.74248	293.44118	4.54111	0.2184842	0.28399441	2.2922546	20	—	—
479551 2014 BU <sub>60</sub>	18.3	X	337.37849	231.54764	217.80930	3.37838	0.2205449	0.28577382	2.2827294	20	—	—
479552 2014 BG <sub>61</sub>	17.1	X	283.02872	234.96853	245.36224	7.69970	0.1130623	0.27479692	2.3431215	20	12 27.5	19.3
479553 2014 BY <sub>63</sub>	16.8	X	182.49790	127.34035	33.49217	6.24943	0.0491445	0.25060515	2.4915870	20	10 6.7	20.3
479554 2014 CA	17.0	X	262.32759	299.75603	115.27668	8.72213	0.2485502	0.24188802	2.5510941	20	7 25.7	20.5
479555 2014 CD	17.0	X	148.41805	202.84422	344.72125	13.44956	0.1786926	0.23359653	2.6111097	20	9 24.9	21.4
479556 2014 CK	17.1	X	197.60266	270.43957	238.03301	10.77197	0.1202572	0.24246180	2.5470678	20	9 25.2	21.1
479557 2014 CY	17.3	X	220.04218	60.21268	93.13291	3.91021	0.1452995	0.25806586	2.4433313	20	10 31.8	20.6
479558 2014 CP <sub>3</sub>	16.5	X	118.61028	192.63923	326.07353	13.20165	0.1362045	0.21436360	2.7650438	20	7 24.3	20.8
479559 2014 CT <sub>3</sub>	16.4	X	25.53983	310.34018	309.72329	12.57766	0.1759429	0.21382181	2.7697127	20	8 7.5	19.5
479560 2014 CB <sub>4</sub>	17.4	X	181.15016	79.36405	123.12637	4.56553	0.0584337	0.26099150	2.4252235	20	11 29.2	20.6
479561 2014 CG <sub>5</sub>	17.8	X	302.67974	87.11656	354.50391	2.34624	0.1456350	0.26990370	2.3713564	20	12 4.0	19.9
479562 2014 CN <sub>5</sub>	18.0	X	299.64880	20.77702	115.47501	8.12712	0.0985629	0.28631450	2.2798546	20	—	—
479563 2014 CU <sub>5</sub>	16.7	X	235.80212	94.09912	324.21444	26.82709	0.1897192	0.23351702	2.6117024	20	7 14.8	21.0
479564 2014 CF <sub>6</sub>	17.5	X	4.05393	287.05689	104.56642	6.52647	0.0613576	0.27113408	2.3641769	20	12 31.9	20.2
479565 2014 CF <sub>6</sub>	17.7	X	200.18851	79.17684	115.57098	5.44646	0.0551107	0.26632948	2.3925254	20	12 13.5	20.8
479566 2014 CF <sub>7</sub>	17.8	X	299.27185	84.91026	343.22936	6.35049	0.1188064	0.26167082	2.4208387	20	11 3.2	20.3
479567 2014 CC <sub>8</sub>	17.6	X	224.57666	108.00329	341.13942	11.01251	0.2318643	0.24001870	2.5643226	20	8 3.9	21.7
479568 2014 CE <sub>8</sub>	15.9	X	182.76736	59.79295	327.08378	11.12629	0.0618991	0.18464467	3.0542989	20	4 5.6	20.7
479569 2014 CO <sub>8</sub>	17.4	X	50.66214	305.46889	328.46908	11.15265	0.0464502	0.23638589	2.5905283	20	9 15.3	20.9
479570 2014 CB <sub>9</sub>	17.3	X	359.04386	244.35866	114.76223	7.11804	0.2058061	0.25997222	2.4313721	20	11 28.9	19.7
479571 2014 CV <sub>9</sub>	17.3	X	263.95375	316.03311	118.02053	13.43803	0.0595626	0.24540417	2.5266675	20	9 28.8	20.8
479572 2014 CU <sub>11</sub>	15.6	X	359.86311	247.05565	332.06442	25.81214	0.1806568	0.18256030	3.0775031	20	3 31.6	19.6
479573 2014 CY <sub>11</sub>	18.3	X	260.51411	11.12721	106.67589	1.62441	0.1780024	0.26197432	2.4189686	20	11 2.5	20.9
479574 2014 CS <sub>12</sub>	17.2	X	258.41974	187.75598	332.19454	7.62510	0.1337013	0.27373071	2.3492020	20	—	—
479575 2014 CM <sub>12</sub>	17.2	X	123.19451	148.39216	31.74432	4.35513	0.1154875	0.22480512	2.6787484	20	8 24.3	21.2
479576 2014 CN <sub>15</sub>	17.2	X	230.75269	107.06718	332.11223	3.12506	0.1882551	0.23333306	2.6130749	20	7 29.8	21.3
479577 2014 CW <sub>15</sub>	16.6	X	195.19873	157.23933	338.06601	5.15809	0.2496991	0.23608625	2.5927198	20	8 31.9	20.9
479578 2014 CB <sub>16</sub>	16.8	X	197.77029	105.25225	13.26910	13.04601	0.2177635	0.22797782	2.6538375	20	8 20.0	21.4
479579 2014 CS <sub>17</sub>	17.9	X	309.36115	325.42727	121.21107	4.02499	0.2002054	0.27175338	2.3605837	20	12 28.7	19.3
479580 2014 CC <sub>18</sub>	16.9	X	191.75442	227.12607	229.24953	4.36939	0.1275223	0.21842644	2.7306492	20	7 14.8	21.2
479581 2014 CK <sub>18</sub>	16.0	X	66.06311	126.14833	2.24631	10.72074	0.0238795	0.17121573	3.2119858	20	3 25.5	20.4
479582 2014 CS <sub>18</sub>	16.6	X	2.28829	160.73167	142.97181	7.27023	0.0384718	0.21575827	2.7531154	20	8 17.1	20.1
479583 2014 CV <sub>18</sub>	17.8	X	330.94152	51.07891	25.45682	5.40151	0.1129637	0.26891573	2.3771609	20	—	—
479584 2014 CF <sub>20</sub>	18.1	X	317.72420	216.53683	266.19165	3.82196	0.2059410	0.28875291	2.2670015	20	—	—
479585 2014 CB <sub>21</sub>	17.0	X	159.32321	176.11045	304.70987	3.44160	0.1636249	0.21947326	2.7219593	20	7 15.5	21.4
479586 2014 CC <sub>22</sub>	17.1	X	191.20951	148.26377	341.56014	13.71106	0.1896351	0.23406443	2.6076288	20	8 26.2	21.4
479587 2014 CK <sub>22</sub>	17.2	X	339.23697	144.70626	289.43725	5.86140	0.0764155	0.27618194	2.3352813	20	—	—
479588 2014 CL <sub>22</sub>	16.8	X	199.64994	247.78816	242.44390	3.53366	0.1709102	0.23786824	2.5797547	20	9 1.9	20.9
479589 2014 CM <sub>22</sub>	17.7	X	240.64519	349.43405	177.07584	6.71069	0.1483838	0.26691038	2.3890527	20	12 15.7	20.7
479590 2014 CN <sub>22</sub>	16.9	X	235.32110	148.15388	305.61938	10.21891	0.1419966	0.23988061	2.5653067	20	8 25.6	20.6
479591 2014 DV	17.7	X	221.28400	290.26151	253.32534	1.53184	0.1356709	0.26515642	2.3995766	20	12 13.3	20.8
479592 2014 DD <sub>4</sub>	15.7	X	335.05731	267.47478	330.16412	25.10919	0.2335040	0.17483307	3.1675270	20	3 10.5	19.7
479593 2014 DE <sub>4</sub>	16.8	X	233.02754	265.76985	164.82182	22.26115	0.0373142	0.22605411	2.6688722	20	8 5.6	20.7
479594 2014 DS <sub>4</sub>	17.4	X	299.44602	289.40369	245.21180	14.61406	0.19					

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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>
479601 2014 DU <sub>9</sub>	17.0	X	76.30817	113.27766	136.20280	13.47298	0.1389412	0.23140130	2.6275976	20	10 7.0	20.9
479602 2014 DM <sub>10</sub>	16.2	X	36.12436	283.40890	306.23802	13.77900	0.1108293	0.20172501	2.8793616	20	7 5.6	19.8
479603 2014 DW <sub>10</sub>	17.5	X	277.42471	156.03344	339.07013	9.54511	0.1364811	0.27459363	2.3442778	20	—	—
479604 2014 DG <sub>13</sub>	15.8	X	321.59101	266.54982	3.26874	15.85343	0.2137343	0.17968637	3.1102308	20	4 7.3	19.7
479605 2014 DR <sub>15</sub>	16.4	X	176.89685	5.30326	132.99637	11.39733	0.0981308	0.22648079	2.6655191	20	8 26.2	20.4
479606 2014 DM <sub>16</sub>	17.0	X	65.82038	311.76720	298.62028	11.77694	0.1478813	0.22116774	2.7080387	20	9 14.2	21.0
479607 2014 DY <sub>18</sub>	17.4	X	256.54469	230.50172	294.25102	4.25321	0.1519160	0.27330676	2.3516308	20	—	—
479608 2014 DJ <sub>19</sub>	17.9	X	240.77017	296.69212	188.80956	1.61788	0.1694434	0.25446843	2.4663050	20	10 15.1	21.1
479609 2014 DN <sub>19</sub>	17.1	X	197.37370	339.16359	141.25502	8.32932	0.1630081	0.23172544	2.6251467	20	8 22.2	21.0
479610 2014 DJ <sub>20</sub>	17.8	X	315.43557	76.84538	359.73105	9.30284	0.2520087	0.26638364	2.3922011	20	12 29.4	19.4
479611 2014 DT <sub>20</sub>	17.7	X	272.42581	39.95465	95.49675	3.23141	0.1523464	0.26940645	2.3742734	20	12 24.6	19.9
479612 2014 DH <sub>21</sub>	17.2	X	225.44458	357.61438	119.77548	1.86233	0.1020563	0.23722507	2.5844154	20	9 22.9	20.7
479613 2014 DC <sub>24</sub>	16.2	X	296.58999	49.50981	340.27239	13.74915	0.0573085	0.22969853	2.6405673	20	9 6.3	19.5
479614 2014 DC <sub>26</sub>	17.4	X	160.68593	134.57835	29.32104	5.09575	0.0691852	0.22776326	2.6555039	20	9 11.8	21.2
479615 2014 DL <sub>26</sub>	16.1	X	23.29655	202.39530	6.13411	10.50318	0.1178229	0.18272086	3.0756999	20	5 11.4	19.9
479616 2014 DP <sub>26</sub>	17.1	X	266.15611	109.98802	327.02059	14.36766	0.0917895	0.24531824	2.5272575	20	9 18.8	20.4
479617 2014 DH <sub>26</sub>	17.9	X	333.68853	231.48724	218.62204	2.06609	0.1175658	0.28440005	2.2900744	20	—	—
479618 2014 DD <sub>29</sub>	18.1	X	285.45166	313.07519	144.14665	2.40055	0.1502328	0.26591307	2.3950225	20	11 22.4	20.3
479619 2014 DM <sub>29</sub>	16.5	X	345.08214	248.55865	329.31049	8.62456	0.1105840	0.17670225	3.1451498	20	3 21.9	20.6
479620 2014 DP <sub>30</sub>	17.6	X	296.72285	138.55977	299.80443	5.75623	0.1102242	0.25983322	2.4322391	20	11 14.7	20.2
479621 2014 DQ <sub>30</sub>	17.0	X	86.59328	57.77134	157.62606	3.91339	0.0333653	0.22185762	2.7024219	20	8 14.8	20.6
479622 2014 DH <sub>32</sub>	17.1	X	184.53384	144.59272	354.02185	13.03258	0.1951632	0.23270226	2.6177951	20	8 31.9	21.4
479623 2014 DY <sub>32</sub>	17.6	X	257.61013	17.07472	124.37262	7.66828	0.0848168	0.26347791	2.4097569	20	12 15.8	20.5
479624 2014 DJ <sub>34</sub>	16.4	X	106.65861	198.32501	347.32662	13.32700	0.1298349	0.21317566	2.7753066	20	8 15.4	20.6
479625 2014 DV <sub>34</sub>	17.4	X	151.46227	117.76263	299.49750	6.24612	0.0561479	0.23974654	2.5662629	20	10 13.0	21.1
479626 2014 DX <sub>35</sub>	17.3	X	247.27003	308.54882	134.97646	5.87913	0.2459437	0.24233109	2.5479836	20	8 15.8	21.0
479627 2014 DP <sub>36</sub>	18.0	X	266.49232	106.25773	12.09732	4.71655	0.1697675	0.26108120	2.4244821	20	11 12.2	20.6
479628 2014 DH <sub>38</sub>	17.1	X	179.86409	309.29152	182.34021	14.23806	0.1699228	0.22059326	2.7127382	20	8 13.9	21.7
479629 2014 DM <sub>39</sub>	16.8	X	295.97491	231.36771	122.47931	14.64888	0.1180888	0.22907728	2.6453392	20	7 8.6	20.1
479630 2014 DO <sub>39</sub>	17.1	X	77.52706	236.44704	346.75406	1.38525	0.1435039	0.22249244	2.6972791	20	8 29.9	20.7
479631 2014 DZ <sub>40</sub>	17.1	X	148.30280	136.05984	34.73583	4.55422	0.1369910	0.22605035	2.6689018	20	9 7.8	21.4
479632 2014 DH <sub>41</sub>	18.1	X	340.22411	341.96398	93.38701	5.70427	0.1936632	0.27895237	2.3197936	20	—	—
479633 2014 DM <sub>42</sub>	17.0	X	83.16753	191.14887	61.83880	4.53527	0.0623062	0.23118710	2.6292203	20	10 6.9	20.7
479634 2014 DP <sub>43</sub>	16.8	X	142.26760	162.56791	323.31462	8.44868	0.0771727	0.20448232	2.8534189	20	7 1.2	21.1
479635 2014 DT <sub>44</sub>	17.0	X	54.94990	185.21190	104.34326	5.12032	0.0362674	0.23707108	2.5855344	20	10 16.8	20.5
479636 2014 DD <sub>45</sub>	17.4	X	299.73111	88.72815	356.18894	6.27979	0.0897155	0.26301313	2.4125950	20	12 2.0	20.0
479637 2014 DF <sub>46</sub>	16.2	X	318.08110	218.82901	96.28189	7.33836	0.0741845	0.20083662	2.8878465	20	6 23.8	19.8
479638 2014 DM <sub>46</sub>	17.3	X	204.15191	177.82456	313.03760	3.04527	0.1208917	0.23257486	2.6187509	20	9 11.5	21.2
479639 2014 DA <sub>47</sub>	18.0	X	306.06458	253.32927	201.25672	1.92966	0.1400015	0.26371453	2.4083153	20	12 28.5	20.0
479640 2014 DH <sub>47</sub>	17.0	X	262.61213	74.88835	345.96403	10.13740	0.0586790	0.22453058	2.6809315	20	8 31.6	20.4
479641 2014 DT <sub>47</sub>	16.7	X	164.49747	315.53785	179.38564	10.10127	0.0624977	0.21282356	2.7783668	20	8 3.9	20.9
479642 2014 DC <sub>48</sub>	16.3	X	320.03050	102.17504	177.50750	16.64021	0.0675029	0.18009221	3.1055565	20	5 13.9	20.7
479643 2014 DY <sub>49</sub>	17.9	X	342.33792	61.48102	16.91399	7.28938	0.1931257	0.27756173	2.3275356	20	—	—
479644 2014 DM <sub>53</sub>	17.6	X	238.96050	282.44679	171.00079	11.37941	0.1561182	0.23528054	2.5986356	20	8 29.1	21.2
479645 2014 DX <sub>53</sub>	17.7	X	205.95603	74.61721	75.62877	0.37129	0.0669250	0.23934417	2.5691383	20	10 16.3	21.3
479646 2014 DM <sub>55</sub>	16.6	X	11.31845	243.12162	9.05348	10.43152	0.1198067	0.19099910	2.9861744	20	6 23.8	20.3
479647 2014 DV <sub>57</sub>	16.5	X	305.51556	282.32342	20.73703	10.11874	0.0986792	0.18616148	3.0376857	20	5 13.9	20.6
479648 2014 DM <sub>57</sub>	17.0	X	143.70236	42.86699	108.13941	5.50479	0.0116224	0.21172689	2.7879525	20	7 31.8	20.7
479649 2014 DZ <sub>57</sub>	16.7	X	333.96755	232.80240	147.21399	13.03744	0.1714411	0.24183513	2.5514660	20	11 2.4	19.3
479650 2014 DU <sub>59</sub>	16.9	X	260.46762	355.71435	64.52463	4.87413	0.0435189	0.22415820	2.6838998	20	8 31.8	20.4
479651 2014 DC <sub>60</sub>	16.8	X	312.63940	297.79001	109.50265	5.76337	0.1103334	0.24387337	2.5372297	20	10 29.5	19.5
479652 2014 DO <sub>60</sub>	16.9	X	227.66279	321.82488	121.03984	7.59316	0.1494620	0.22480067	2.6787837	20	8 3.8	20.8
479653 2014 DB <sub>61</sub>	16.3	X	355.86793	188.88913	41.80714	5.25992	0.0865927	0.17696552	3.1420178	20	4 29.3	20.3
479654 2014 DA <sub>62</sub>	16.3	X	175.76278	332.10822	156.29984	12.92579	0.1072218	0.21789553	2.7350829	20	8 8.9	20.7
479655 2014 DZ <sub>62</sub>	17.0	X	241.98606	309.82573	121.30446	3.31178	0.1154220	0.22353938	2.6888507	20	8 8.9	20.9
479656 2014 DJ <sub>63</sub>	16.1	X	0.22124	202.40109	30.08467	5.20143	0.0738186	0.17948245	3.1125862	20	5 7.8	20.1
479657 2014 DM <sub>64</sub>	17.4	X	261.63906	30.47335	61.31447	3.42741	0.1659713	0.24387115	2.5372452	20	9 28.1	20.4
479658 2014 DX <sub>66</sub>	17.2	X	135.28968	148.29366	23.46248	15.15040	0.0374421	0.21560086	2.7544552	20	8 26.7	21.3
479659 2014 DY <sub>66</sub>	16.7	X	309.10244	308.72578	65.40469	7.18980	0.0481358	0.22265655	2.6959535	20	9 8.4	20.2
479660 2014 DA <sub>67</sub>	16.9	X	107.17106	129.83122	70.47656	7.62780	0.0398354	0.21451922	2.7637064	20	8 25.5	20.9
479661 2014 DM <sub>67</sub>	17.3	X	262.36569	350.08625	89.05229	6.05760	0.2210919	0.24121741	2.5558201	20	9 3.7	20.6
479662 2014 DN <sub>68</sub>	16.4	X	335.29762	159.06111	111.63846	6.61371	0.1198819	0.18116133	3.0933262	20	5 18.9	20.2
479663 2014 DZ <sub>68</sub>	16.4	X	246.33198	67.74626	9.65621	22.07534	0.0567009	0.22446266	2.6814723	20	9 8.8	20.2
479664 2014 DM <sub>71</sub>	16.8	X	88.68962	95.92183	44.54789	5.95331	0.1257035	0.18303810	3.0721450	20	5 22.4	21.0
479665 2014 DG <sub>73</sub>	18.0	X	322.99281	42.01125	62.93555	6.59480	0.1454710	0.27470515	2.3436433	20	—	—
479666 2014 DQ <sub>75</sub>	16.2	X	325.98973	219.29921	94.55113	7.23152	0.0888003	0.19637553	2.9314183	20	7 2.8	19.7
479667 2014 DV <sub>75</sub>	17.3	X	310.96674	308.83890	111.70161	5.28051	0.1729508	0.25412843	2.4685043	20	11 14.9	19.5
479668 2014 DA <sub>77</sub>	16.5	X	92.54630	51.73265	89.49219	6.36802	0.0511374	0.18597792	3.0396841	20	5 19.1	20.8
479669 2014 DP <sub>77</sub>	17.2	X	219.15979	9.66896	82.36603	2.97899	0.0681632	0.22073352	2.7115889	20	8 15.4	21.0
479670 2014 DW <sub>78</sub>	17.1	X	267.78320	283.58579	143.53896	8.38736	0.2527365	0.23885414	2.5726510	20	8 17.2	20.5
479671 2014 DL <sub>79</sub>	16.0	X	29.67705	187.56088	18.51239	18.06367	0.1338432	0.17960215	3.1112031	20	5 18.1	20.0
479672 2014 DM <sub>79</sub>	16.9	X	99.28407	116.29130	26.44293	8.85698	0.0828768	0.18815840	3.0161549	20	5 31.2	21.2
479673 2014 DK <sub>81</sub>	17.9	X	317.28204	3.59514	81.20725	2.54611	0.1621718	0.26962226	2.3730063	20	—	—

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
479681 2014 DV <sub>85</sub>	16.9	X	187.37709	163.62809	340.88963	4.70831	0.1037216	0.23321327	2.6139696	20	9 12.9	20.8
479682 2014 DE <sub>87</sub>	17.8	X	279.38725	276.66045	143.08935	1.80301	0.1897314	0.24481334	2.5307311	20	9 5.1	20.7
479683 2014 DX <sub>87</sub>	17.3	X	157.83529	26.85550	139.06669	4.40900	0.1037351	0.23199567	2.6231077	20	9 10.6	21.2
479684 2014 DB <sub>90</sub>	16.4	X	120.85032	176.07219	23.06748	13.48814	0.1192997	0.21481210	2.7611938	20	9 17.1	20.7
479685 2014 DM <sub>90</sub>	16.6	X	302.55587	256.73765	165.98229	13.28786	0.1168089	0.24016091	2.5633102	20	11 2.2	19.6
479686 2014 DY <sub>90</sub>	16.8	X	137.22719	10.54206	159.97345	8.08606	0.0676917	0.22129384	2.7070099	20	8 21.4	20.7
479687 2014 DJ <sub>91</sub>	16.5	X	353.30744	354.23048	343.32422	4.56711	0.0650358	0.23156873	2.6263309	20	9 22.3	19.6
479688 2014 DT <sub>91</sub>	16.6	X	16.02568	124.74763	155.04225	4.64537	0.0715360	0.21303392	2.7765375	20	8 6.6	20.1
479689 2014 DW <sub>93</sub>	16.9	X	245.69287	69.81192	353.50845	4.98982	0.0218738	0.22294992	2.6935880	20	8 17.8	20.6
479690 2014 DE <sub>97</sub>	17.5	X	324.66479	223.02221	176.09284	2.94719	0.0323410	0.24287495	2.5441784	20	11 5.3	20.7
479691 2014 DN <sub>103</sub>	16.7	X	230.38834	96.91349	345.43182	21.75022	0.0479021	0.22490275	2.6779731	20	8 23.5	20.5
479692 2014 DK <sub>104</sub>	17.9	X	290.63222	273.69314	177.91088	2.42069	0.1403395	0.25973873	2.4328290	20	11 22.8	20.2
479693 2014 DR <sub>104</sub>	16.5	X	336.93724	8.38231	261.51091	3.02154	0.0667074	0.18580707	3.0415471	20	5 22.6	20.3
479694 2014 DW <sub>104</sub>	17.0	X	159.56548	86.17104	349.14321	9.21558	0.0495511	0.19130563	2.9829837	20	5 11.2	21.5
479695 2014 DN <sub>109</sub>	16.9	X	172.16067	139.69360	118.07568	15.98332	0.1895241	0.22474067	2.6792604	20	9 16.2	21.5
479696 2014 DS <sub>109</sub>	17.0	X	199.39341	318.35470	142.63702	6.57856	0.0991818	0.21890540	2.7266647	20	7 30.8	21.0
479697 2014 DJ <sub>111</sub>	17.5	X	232.36494	87.31656	338.97490	1.23021	0.0645679	0.22651272	2.6652686	20	7 28.5	21.2
479698 2014 DY <sub>113</sub>	16.8	X	151.42334	219.25818	339.07944	16.28556	0.0559625	0.23947297	2.5682170	20	10 8.0	20.7
479699 2014 DA <sub>114</sub>	16.7	X	33.96927	116.78619	148.15206	4.96240	0.0747712	0.21469887	2.7621645	20	8 14.6	20.1
479700 2014 DT <sub>114</sub>	17.7	X	303.19686	232.34731	219.91200	1.95894	0.1570078	0.26893314	2.3770583	20	12 21.4	19.6
479701 2014 DB <sub>116</sub>	16.1	X	308.27054	269.00089	354.11460	10.90212	0.0871697	0.16985210	3.2291540	20	3 30.5	20.6
479702 2014 DQ <sub>116</sub>	17.1	X	221.91321	112.00377	344.70965	14.47832	0.0972474	0.23240865	2.6199994	20	8 24.1	20.8
479703 2014 DV <sub>116</sub>	17.4	X	346.19388	50.81706	286.41920	0.97834	0.0976263	0.22536952	2.6742742	20	9 10.9	20.3
479704 2014 DB <sub>117</sub>	16.5	X	70.34068	128.09066	15.74460	10.78069	0.0721570	0.18005574	3.1059758	20	4 23.5	20.7
479705 2014 DJ <sub>119</sub>	16.6	X	176.80966	141.75054	342.35123	13.16960	0.0935760	0.21963446	2.7206273	20	8 9.3	20.8
479706 2014 DL <sub>119</sub>	16.5	X	296.36685	334.58302	344.93357	9.85219	0.1106180	0.19443028	2.9509382	20	5 20.1	20.7
479707 2014 DR <sub>119</sub>	17.1	X	140.66597	8.40319	145.83050	4.17913	0.0315609	0.21187494	2.7866536	20	8 1.5	20.9
479708 2014 DO <sub>119</sub>	17.0	X	7.74978	190.51085	138.68242	5.65009	0.0774940	0.22794448	2.6540962	20	10 7.0	20.2
479709 2014 DN <sub>120</sub>	17.2	X	253.86957	165.54976	319.53695	5.62823	0.0833159	0.25825495	2.4421385	20	11 13.9	20.3
479710 2014 DO <sub>120</sub>	16.7	X	107.98193	202.93112	10.52791	10.63015	0.2188318	0.22118374	2.7079081	20	9 26.2	21.2
479711 2014 DB <sub>125</sub>	16.1	X	281.97431	309.96703	338.60761	21.81678	0.0452060	0.17775259	3.1327478	20	3 26.9	20.8
479712 2014 DZ <sub>125</sub>	16.6	X	128.11813	217.75639	344.81897	14.24025	0.0429754	0.23062437	2.6334955	20	9 19.4	20.2
479713 2014 DW <sub>127</sub>	16.9	X	280.98603	80.79581	340.37547	11.39807	0.0445863	0.23642747	2.5902246	20	9 26.4	20.3
479714 2014 DZ <sub>128</sub>	17.2	X	80.10808	190.47158	27.06102	3.92860	0.0334371	0.21444940	2.7643063	20	8 10.5	20.9
479715 2014 DA <sub>129</sub>	17.4	X	11.51927	216.88789	95.28206	2.78600	0.0493827	0.22584057	2.6705542	20	9 15.2	20.7
479716 2014 DH <sub>129</sub>	16.6	X	353.35131	184.17233	122.09482	3.80437	0.0824548	0.21345665	2.7728705	20	8 8.6	20.0
479717 2014 DJ <sub>129</sub>	16.6	X	359.46587	245.82492	354.85947	15.24555	0.0392116	0.18857075	3.0117563	20	5 12.3	20.9
479718 2014 DM <sub>130</sub>	16.2	X	193.09764	228.24247	160.89057	15.08647	0.0896495	0.18462472	3.0545189	20	4 28.4	21.1
479719 2014 DS <sub>130</sub>	17.2	X	96.04429	169.80437	29.27315	2.58380	0.0124421	0.21316345	2.7754126	20	8 2.9	20.9
479720 2014 DX <sub>131</sub>	17.9	X	318.91764	304.69396	128.26856	2.25108	0.1640214	0.26446825	2.4037374	20	12 23.7	19.9
479721 2014 DM <sub>132</sub>	16.6	X	28.23032	220.24098	337.86608	4.64506	0.0480473	0.18175893	3.0865421	20	5 2.2	20.7
479722 2014 DZ <sub>132</sub>	16.9	X	154.54263	191.76548	345.88496	10.67287	0.1183945	0.22868886	2.6483337	20	9 19.3	20.9
479723 2014 DO <sub>133</sub>	16.8	X	306.38412	345.12227	5.80269	3.51114	0.0123238	0.21287030	2.7779601	20	8 3.1	20.4
479724 2014 DA <sub>134</sub>	18.6	X	322.36821	40.73126	45.77201	2.39884	0.1630171	0.27085848	2.3657804	20	—	—
479725 2014 DE <sub>134</sub>	17.1	X	359.10044	142.84446	152.74502	6.27781	0.0408309	0.21009501	2.8023705	20	7 30.9	20.6
479726 2014 DE <sub>136</sub>	17.0	X	188.88040	36.55421	35.52300	2.33601	0.0458867	0.20047752	2.8912941	20	6 13.4	21.1
479727 2014 DP <sub>136</sub>	18.0	X	297.05468	6.07803	110.12142	2.28862	0.0603101	0.26776100	2.3839904	20	—	—
479728 2014 DR <sub>136</sub>	16.9	X	271.66106	264.39094	153.31896	8.96965	0.0615720	0.23129425	2.6284083	20	9 9.5	20.1
479729 2014 DJ <sub>137</sub>	16.9	X	265.93848	283.28851	77.52125	2.95355	0.0217523	0.20048926	2.8911812	20	6 19.2	20.9
479730 2014 DU <sub>137</sub>	17.4	X	208.03656	63.18290	22.56149	4.40604	0.0213126	0.21299513	2.7768746	20	7 28.8	21.3
479731 2014 DA <sub>138</sub>	16.9	X	40.98159	73.03598	172.05591	4.42658	0.0191255	0.20888278	2.8132022	20	7 20.2	20.6
479732 2014 DP <sub>138</sub>	15.9	X	250.81859	338.84145	357.89084	10.28683	0.0640117	0.18142481	3.0903305	20	4 21.2	20.4
479733 2014 DM <sub>139</sub>	16.9	X	141.17596	25.65959	150.36564	9.25849	0.0747880	0.22389573	2.6859969	20	9 4.1	20.8
479734 2014 DN <sub>140</sub>	16.6	X	103.73143	212.90974	358.88633	8.78225	0.0934321	0.21848429	2.7301671	20	9 9.2	20.4
479735 2014 DV <sub>140</sub>	17.3	X	188.38585	280.73685	255.21325	2.91303	0.1959941	0.24265160	2.5457394	20	10 17.9	21.5
479736 2014 DA <sub>142</sub>	17.5	X	215.10051	250.33876	234.06546	3.59746	0.2088364	0.24165113	2.5527610	20	9 6.6	21.6
479737 2014 DD <sub>142</sub>	18.0	X	325.94249	20.82945	79.05573	3.72986	0.1597530	0.28123343	2.3072328	20	—	—
479738 2014 EM <sub>2</sub>	16.9	X	266.34566	20.86334	13.29154	6.47957	0.0474419	0.21818237	2.7326852	20	8 3.0	20.6
479739 2014 ET <sub>2</sub>	17.4	X	259.86046	303.64997	115.11672	3.52572	0.2151820	0.23424226	2.6063089	20	8 1.1	20.8
479740 2014 EG <sub>4</sub>	16.0	X	336.35898	148.96705	154.80030	9.91151	0.1181674	0.19888841	2.9066745	20	7 3.7	19.5
479741 2014 EE <sub>5</sub>	17.6	X	221.79007	129.40018	349.70289	13.16292	0.2042006	0.24171859	2.5522861	20	9 9.2	21.3
479742 2014 ER <sub>6</sub>	16.4	X	308.37728	108.15844	169.64410	10.92032	0.0656845	0.17918891	3.1159845	20	4 25.3	20.7
479743 2014 EK <sub>8</sub>	17.1	X	99.31597	109.80545	102.08617	10.03341	0.1365374	0.21477900	2.7614775	20	9 11.7	21.4
479744 2014 EL <sub>9</sub>	17.0	X	329.89277	254.21576	104.77909	4.68768	0.0581812	0.23118788	2.6292145	20	9 18.4	20.1
479745 2014 EZ <sub>9</sub>	16.8	X	252.63182	265.06346	130.70927	6.97471	0.0162885	0.21311230	2.7758566	20	7 19.4	20.7
479746 2014 EQ <sub>10</sub>	16.7	X	325.92547	258.48211	119.50288	6.08405	0.1099729	0.23510630	2.5999193	20	10 9.5	19.5
479747 2014 EA <sub>12</sub>	17.4	X	272.13990	43.91060	81.07520	4.70228	0.1634476	0.26205110	2.4184961	20	12 4.6	19.8
479748 2014 EE <sub>12</sub>	17.9	X	292.68230	157.53931	308.89639	5.05498	0.1477338	0.26404469	2.4063073	20	12 19.4	20.0
479749 2014 EZ <sub>12</sub>	16.8	X	51.64937	112.65509	126.35026	5.28869	0.0771509	0.20893269	2.8127542	20	8 5.2	20.4
479750 2014 EA <sub>16</sub>	17.0	X	237.94570	40.77541	16.00868	5.56975	0.1241366	0.21854463	2.7296646	20	7 15.7	21.0
479751 2014 EY <sub>16</sub>	18.0	X	316.12097	69.05398	354.25661	1.21955	0.1638878	0.25878208	2.4388210	20	11 30.1	19.9
479752 2014 EO <sub>17</sub>	18.3	X	308.66561	358.69320	100.72526	5.78502	0.1838568	0.27312006	2.3527023	20	—	—
479753 2014 EF <sub>18</sub>	17.5	X	263.62936	71.96795	14.63301	10.29324						

ELEMENTS AND OPPOSITION DATES IN 2020

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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>
479761 2014 EJ <sub>25</sub>	16.7	X	236.26750	28.34918	88.25673	6.53189	0.0900619	0.24477803	2.5309744	20	10 11.0	20.1
479762 2014 EN <sub>25</sub>	16.7	X	237.45928	40.70168	65.96814	9.54722	0.1740647	0.24435769	2.5338761	20	9 19.2	20.4
479763 2014 EG <sub>26</sub>	17.3	X	230.86223	37.11861	50.18947	2.98001	0.0439056	0.22466335	2.6798752	20	8 27.7	21.0
479764 2014 EM <sub>26</sub>	17.2	X	308.47998	346.98820	45.01707	3.14035	0.0207073	0.23285435	2.6166551	20	10 2.4	20.5
479765 2014 EP <sub>26</sub>	16.7	X	93.28552	23.10082	136.95454	2.83961	0.0306559	0.19431131	2.9521426	20	6 9.6	20.9
479766 2014 EW <sub>26</sub>	17.0	X	356.84249	266.08744	34.75951	6.03472	0.0206736	0.21214597	2.7842796	20	8 6.7	20.7
479767 2014 EX <sub>26</sub>	17.7	X	236.39038	71.22091	30.38849	5.19493	0.2048292	0.24042019	2.5614670	20	9 3.6	21.4
479768 2014 EX <sub>28</sub>	16.7	X	107.30654	126.51504	67.41833	5.93620	0.1018969	0.21496111	2.7599176	20	8 23.3	20.8
479769 2014 EL <sub>28</sub>	16.8	X	166.00027	180.00335	333.37541	11.89465	0.0564746	0.22978184	2.6399290	20	9 1.7	20.5
479770 2014 EO <sub>29</sub>	16.8	X	61.03735	154.36263	126.97199	4.28162	0.0364378	0.23480901	2.6021133	20	10 13.0	20.2
479771 2014 EF <sub>30</sub>	17.6	X	273.62945	23.67521	44.86671	5.84414	0.2063321	0.24245961	2.5470831	20	9 8.1	20.6
479772 2014 EF <sub>30</sub>	16.6	X	196.08438	124.93308	11.01695	15.28987	0.0574108	0.22880552	2.6474335	20	9 18.6	20.3
479773 2014 EK <sub>31</sub>	16.5	X	21.79166	235.95629	46.23041	5.45969	0.0851689	0.20809787	2.8202718	20	8 23.3	20.0
479774 2014 EM <sub>32</sub>	16.2	X	11.92059	35.19184	164.98726	11.28481	0.0380936	0.17542052	3.1604514	20	4 16.7	20.5
479775 2014 EP <sub>32</sub>	17.0	X	307.68005	204.67338	161.02927	5.93966	0.0386405	0.22034653	2.7147629	20	8 21.5	20.4
479776 2014 EB <sub>33</sub>	16.6	X	330.91254	203.76906	128.82877	9.77295	0.0589932	0.21148112	2.7901121	20	8 9.3	19.9
479777 2014 ES <sub>34</sub>	17.1	X	193.90860	119.71300	24.06131	13.39501	0.1353602	0.23284684	2.6167114	20	9 21.5	21.2
479778 2014 EY <sub>34</sub>	15.3	X	269.21193	298.53874	16.54491	23.31407	0.1682410	0.17311085	3.1885008	20	4 6.4	20.1
479779 2014 EB <sub>36</sub>	16.1	X	347.33615	178.61841	63.43677	6.54014	0.0768849	0.17907456	3.1173109	20	5 2.5	20.0
479780 2014 EN <sub>36</sub>	17.6	X	244.09270	306.39510	123.74529	7.12965	0.2249549	0.23135749	2.6279292	20	7 27.3	21.6
479781 2014 ER <sub>38</sub>	16.1	X	311.99837	258.88851	34.46397	10.52464	0.1052114	0.18513977	3.0488513	20	5 10.7	20.2
479782 2014 EV <sub>39</sub>	16.2	X	159.70927	328.46177	114.79695	10.15588	0.0164138	0.18569547	3.0427657	20	5 25.6	20.6
479783 2014 EK <sub>44</sub>	16.2	X	29.88211	125.71688	10.60947	7.12540	0.0282586	0.19692255	2.9259871	20	6 16.5	20.1
479784 2014 EP <sub>44</sub>	16.1	X	357.55532	278.59542	10.47558	16.77005	0.0899398	0.20630927	2.8365485	20	7 28.4	19.9
479785 2014 EE <sub>45</sub>	16.1	X	325.01345	144.88035	121.39277	12.09605	0.0933836	0.17416708	3.1755966	20	5 3.2	20.4
479786 2014 EV <sub>45</sub>	17.0	X	7.92494	247.25973	88.96390	3.97027	0.0928025	0.23519613	2.5992573	20	10 19.8	20.0
479787 2014 EM <sub>47</sub>	16.5	X	64.49978	103.07828	56.27415	9.19989	0.0585686	0.18289570	3.0737395	20	5 6.4	20.6
479788 2014 EN <sub>48</sub>	16.5	X	257.98537	295.16534	138.28551	15.51451	0.1083974	0.23418217	2.6067547	20	9 6.3	20.0
479789 2014 EO <sub>48</sub>	16.2	X	228.42855	76.15185	13.70459	22.16714	0.0576783	0.22677982	2.6631754	20	9 4.5	20.2
479790 2014 ET <sub>49</sub>	15.8	X	65.72128	258.51291	272.37338	11.19003	0.1767379	0.18464511	3.0542940	20	6 8.9	19.9
479791 2014 ES <sub>50</sub>	17.0	X	164.81978	136.80002	29.70416	13.08942	0.1713482	0.22849893	2.6498011	20	9 20.9	21.4
479792 2014 EB <sub>51</sub>	17.8	X	269.38199	8.91550	124.86363	2.94299	0.1540623	0.26633566	2.3924884	20	12 15.3	20.2
479793 2014 FD <sub>1</sub>	16.8	X	134.61142	9.22261	92.87992	2.90628	0.0013689	0.18348135	3.0671953	20	5 15.0	21.0
479794 2014 FS <sub>5</sub>	17.1	X	33.31035	187.23523	75.63577	4.82123	0.0545658	0.20988085	2.8042766	20	8 9.5	20.7
479795 2014 FW <sub>5</sub>	16.2	X	327.74056	255.58402	35.96764	9.25391	0.2096081	0.18634970	3.0356399	20	5 19.9	19.7
479796 2014 FH <sub>6</sub>	16.2	X	269.97082	283.82524	32.41425	15.95853	0.0813534	0.17908171	3.1172280	20	4 20.1	20.7
479797 2014 FF <sub>8</sub>	16.3	X	15.08590	49.89523	169.15939	8.65219	0.0858834	0.18072012	3.0983588	20	5 16.2	20.3
479798 2014 FW <sub>8</sub>	16.5	X	329.09447	179.03805	172.69245	6.28130	0.0451895	0.22120430	2.7077403	20	9 2.7	19.8
479799 2014 FK <sub>15</sub>	17.0	X	70.52866	244.68354	355.80053	11.31381	0.0558321	0.21916642	2.7244993	20	9 2.0	20.6
479800 2014 FP <sub>16</sub>	17.1	X	183.33467	298.48017	181.14982	14.07325	0.1452307	0.22022616	2.7157520	20	8 2.8	21.6
479801 2014 FD <sub>20</sub>	15.6	X	344.50758	270.69776	329.10160	25.26808	0.1521799	0.18035951	3.1024874	20	4 2.2	19.8
479802 2014 FD <sub>27</sub>	16.3	X	323.40067	321.38349	344.34852	9.51839	0.0723499	0.19592938	2.9358667	20	6 19.2	20.3
479803 2014 FU <sub>27</sub>	17.2	X	211.83712	175.25993	285.31742	2.90322	0.0647149	0.22168095	2.7038575	20	8 16.3	21.1
479804 2014 FD <sub>28</sub>	16.6	X	338.72076	315.89674	334.58195	8.44132	0.0628450	0.19649357	2.9302443	20	6 23.2	20.4
479805 2014 FN <sub>28</sub>	16.8	X	125.44639	211.70856	337.44928	10.72039	0.1103318	0.21864145	2.7288587	20	9 3.7	20.9
479806 2014 FC <sub>30</sub>	16.5	X	50.27098	194.32309	6.52593	8.69816	0.0168601	0.19277364	2.9678204	20	6 2.0	20.7
479807 2014 FQ <sub>30</sub>	17.7	X	2.07439	5.01645	55.43066	8.13052	0.2159214	0.27842748	2.3227082	20	—	—
479808 2014 FL <sub>31</sub>	16.7	X	194.43365	142.48783	0.61543	11.79562	0.1251249	0.23227535	2.6210017	20	9 18.3	20.5
479809 2014 FG <sub>34</sub>	16.7	X	330.31504	260.48046	11.51299	10.77716	0.0957928	0.18231830	3.0802257	20	5 9.7	20.8
479810 2014 FK <sub>35</sub>	15.3	X	11.93731	195.26364	6.51655	23.44985	0.1168417	0.17807786	3.1289318	20	4 10.8	19.3
479811 2014 FW <sub>35</sub>	16.0	X	99.52538	110.54085	28.19866	27.59034	0.1448115	0.18484430	3.0520995	20	5 27.6	20.9
479812 2014 FY <sub>35</sub>	16.2	X	99.45255	158.22130	37.59068	17.06745	0.1617910	0.20341309	2.8634094	20	8 28.9	20.9
479813 2014 FB <sub>36</sub>	17.4	X	222.23563	319.11180	154.93857	5.00656	0.1806835	0.23948331	2.5681430	20	9 5.2	21.3
479814 2014 FD <sub>36</sub>	16.4	X	29.20407	197.51809	13.76903	10.15536	0.0804157	0.18842303	3.0133302	20	5 22.4	20.3
479815 2014 FN <sub>36</sub>	17.0	X	180.60109	132.41823	43.25774	14.09534	0.1878755	0.23046652	2.6346979	20	10 14.5	21.4
479816 2014 FD <sub>39</sub>	17.1	X	62.95461	226.37336	24.07612	13.75094	0.0921719	0.21335028	2.7737921	20	9 13.5	21.0
479817 2014 FN <sub>46</sub>	16.2	X	51.11532	111.49314	52.88011	17.09882	0.1716869	0.17585061	3.1552961	20	5 9.4	20.1
479818 2014 FJ <sub>51</sub>	16.7	X	120.00276	154.29286	67.67639	14.15431	0.1229574	0.22574164	2.6713344	20	10 17.7	21.0
479819 2014 FS <sub>51</sub>	16.9	X	159.54116	148.32191	41.34844	11.18463	0.1405860	0.22922026	2.6442390	20	10 13.1	21.1
479820 2014 FP <sub>53</sub>	16.3	X	190.61823	29.41503	38.56802	12.18730	0.1057378	0.18866311	3.0107733	20	6 6.8	21.1
479821 2014 FL <sub>57</sub>	17.0	X	127.26487	239.46361	295.01478	3.55845	0.2362270	0.21316964	2.7753589	20	8 24.3	21.7
479822 2014 FA <sub>58</sub>	17.3	X	292.33282	27.17321	11.61302	5.68259	0.0430442	0.22342794	2.6897447	20	9 15.1	20.7
479823 2014 FR <sub>62</sub>	16.7	X	165.95765	57.43559	93.03970	12.33227	0.1261356	0.22019811	2.7159827	20	9 1.9	21.1
479824 2014 FZ <sub>62</sub>	17.2	X	223.25087	329.64614	216.29341	5.34104	0.1193069	0.26163219	2.4210770	20	12 20.4	20.3
479825 2014 FF <sub>63</sub>	15.8	X	30.44595	295.50629	248.94987	12.91851	0.1375467	0.17402087	3.1773751	20	4 24.2	19.7
479826 2014 FE <sub>64</sub>	16.3	X	123.56501	150.47294	342.19795	9.86821	0.0882913	0.19127518	2.9833003	20	6 18.4	20.9
479827 2014 FG <sub>64</sub>	17.1	X	222.96848	180.42939	309.97216	4.29962	0.1289919	0.23713140	2.5850960	20	9 30.5	20.8
479828 2014 FR <sub>64</sub>	17.2	X	212.86538	331.15640	171.09360	9.34153	0.0904922	0.23687626	2.5869519	20	10 12.7	20.8
479829 2014 FV <sub>64</sub>	15.9	X	241.28121	336.68023	50.17621	12.82579	0.0652213	0.19720080	2.9232341	20	6 14.3	20.2
479830 2014 FY <sub>64</sub>	16.3	X	356.00544	358.90888	254.65462	9.63003	0.1796371	0.17715182	3.1398264	20	5 27.9	19.7
479831 2014 FQ <sub>65</sub>	16.8	X	160.76397	332.12443	183.00405	9.59563	0.1034179	0.21807411	2.7335896	20	8 26.7	21.1
479832 2014 FC <sub>66</sub>	16.9	X	202.07331	270.07260	216.51957	10.60557	0.2526992	0.22948671	2.6421919	20	8 22.3	21.6
479833 2014 FM <sub>66</sub>	16.4	X	261.20410	358.37657	78.62419	14.49583	0.0125552	0.22486945	2.6782374			



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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>		
479841	2014	GL <sub>8</sub>	18.1	X	284.66982	60.91930	73.83040	2.47420	0.1299189	0.27300886	2.3533412	20	—	—
479842	2014	GM <sub>11</sub>	16.3	X	66.74718	195.96582	357.44184	12.88234	0.0674248	0.19242385	2.9714159	20	6 23.9	20.6
479843	2014	GY <sub>12</sub>	16.5	X	247.33507	74.17221	358.57217	8.29497	0.1596483	0.22590403	2.6700541	20	8 14.2	20.3
479844	2014	GE <sub>15</sub>	16.1	X	260.96666	321.34638	27.77377	16.71001	0.0826262	0.18471332	3.0535421	20	5 15.7	20.6
479845	2014	GH <sub>18</sub>	16.4	X	13.95408	233.53544	30.33531	19.30253	0.0910405	0.18490491	3.0514324	20	7 16.0	20.6
479846	2014	GS <sub>18</sub>	17.4	X	241.79559	359.63389	104.29701	5.81440	0.1660192	0.23679079	2.5875744	20	9 18.3	21.0
479847	2014	GT <sub>18</sub>	16.1	X	66.97972	106.59979	114.74192	10.93670	0.1154582	0.20120848	2.8842873	20	8 8.9	20.1
479848	2014	GV <sub>18</sub>	16.7	X	212.62251	2.19185	150.14506	12.67159	0.1283342	0.23729175	2.5839313	20	10 23.4	20.6
479849	2014	GD <sub>21</sub>	16.7	X	175.62200	138.58541	354.14860	8.44157	0.1285037	0.21623779	2.7490437	20	8 17.0	21.1
479850	2014	GZ <sub>22</sub>	16.6	X	336.96248	316.03177	358.83187	12.67146	0.0785695	0.19850446	2.9104214	20	7 27.4	20.4
479851	2014	GA <sub>26</sub>	17.0	X	176.50102	125.45597	13.18358	8.53116	0.1470736	0.21522546	2.7576573	20	8 25.7	21.5
479852	2014	GR <sub>26</sub>	17.1	X	183.94926	149.05120	9.98344	9.53546	0.1392173	0.22533703	2.6745312	20	9 26.1	21.3
479853	2014	GQ <sub>27</sub>	17.2	X	168.95682	307.41794	201.34264	7.18727	0.1624761	0.21433475	2.7652920	20	8 25.5	21.8
479854	2014	GV <sub>27</sub>	15.8	X	213.12897	335.47288	47.62126	11.89006	0.0545594	0.16822688	3.2499184	20	5 10.1	20.7
479855	2014	GG <sub>28</sub>	16.5	X	95.03430	311.36636	210.70713	8.81987	0.0349069	0.17972068	3.1098350	20	6 14.6	21.0
479856	2014	GD <sub>29</sub>	17.1	X	52.21276	99.64018	176.28927	4.54777	0.0209033	0.21132473	2.7914885	20	9 15.9	20.9
479857	2014	GR <sub>30</sub>	16.5	X	185.14421	28.82006	34.01892	10.17982	0.0896106	0.18142226	3.0903595	20	5 26.1	21.3
479858	2014	GT <sub>31</sub>	17.1	X	250.76288	68.22211	42.46651	13.74007	0.1341655	0.23600717	2.5932990	20	10 14.3	20.5
479859	2014	GW <sub>31</sub>	16.5	X	260.16512	292.48535	170.19642	13.24829	0.1513510	0.23784934	2.5798914	20	10 12.9	19.7
479860	2014	GB <sub>32</sub>	16.6	X	244.81233	49.18681	65.07276	8.35381	0.0543765	0.23047107	2.6346632	20	10 21.5	20.1
479861	2014	GC <sub>32</sub>	16.7	X	233.29488	85.36568	47.93491	18.04649	0.1181717	0.23592770	2.5938812	20	10 24.2	20.3
479862	2014	GA <sub>36</sub>	16.5	X	271.76600	283.49278	103.09073	4.73167	0.1022365	0.20933639	2.8091369	20	7 19.8	20.4
479863	2014	GE <sub>36</sub>	16.8	X	180.23089	356.51015	135.76891	4.78147	0.0454275	0.21038729	2.7997745	20	8 21.6	20.7
479864	2014	GC <sub>37</sub>	16.7	X	95.56817	182.93841	61.98401	6.18493	0.0171390	0.22623989	2.6674109	20	10 6.4	20.4
479865	2014	GM <sub>38</sub>	16.1	X	147.33276	272.22745	172.99051	15.64022	0.0993389	0.18260147	3.0770405	20	5 19.5	21.1
479866	2014	GY <sub>38</sub>	16.4	X	328.23534	96.12042	165.60456	12.68645	0.0753372	0.17373183	3.1808983	20	5 2.3	20.7
479867	2014	GJ <sub>39</sub>	16.4	X	297.29437	252.62776	123.55228	7.27052	0.0808891	0.21416384	2.7667630	20	8 16.2	19.9
479868	2014	GS <sub>39</sub>	16.0	X	84.14018	325.11812	192.56622	12.44298	0.0440109	0.18254736	3.0776484	20	5 28.6	20.5
479869	2014	GF <sub>40</sub>	17.7	X	287.80349	331.44481	164.77544	6.90001	0.1974041	0.26570112	2.3962960	20	—	—
479870	2014	GG <sub>40</sub>	16.3	X	8.46185	203.88974	63.71903	10.10199	0.1272590	0.18604584	3.0389443	20	7 10.3	19.9
479871	2014	GV <sub>40</sub>	16.6	X	86.60668	63.71085	109.13753	10.11602	0.0630150	0.18726078	3.0257856	20	6 22.3	20.8
479872	2014	GQ <sub>41</sub>	16.3	X	322.85581	271.91333	22.69220	9.87131	0.0497316	0.17771404	3.1332008	20	6 3.5	20.6
479873	2014	GR <sub>44</sub>	16.1	X	267.34726	30.45273	43.11574	22.23144	0.0624817	0.22578367	2.6710029	20	10 4.1	19.9
479874	2014	GR <sub>46</sub>	16.9	X	223.86133	85.53329	37.49739	16.81954	0.0881515	0.22556063	2.6727634	20	10 3.9	20.8
479875	2014	GX <sub>46</sub>	17.2	X	216.28816	349.56817	153.96080	4.52549	0.1921163	0.23475501	2.6025124	20	10 5.9	21.2
479876	2014	GD <sub>51</sub>	16.3	X	101.93751	44.75533	152.81655	15.56986	0.0818149	0.20388996	2.8589429	20	8 15.0	20.5
479877	2014	HK <sub>1</sub>	15.8	X	246.85545	308.98635	34.34046	17.07974	0.1272135	0.17270275	3.1935218	20	4 22.2	20.5
479878	2014	HX <sub>3</sub>	17.1	X	138.31081	335.06132	208.85173	7.68996	0.1365856	0.21568019	2.7537798	20	9 9.3	21.5
479879	2014	HE <sub>6</sub>	16.0	X	93.06099	134.38199	6.92142	15.77019	0.0171588	0.18003575	3.1062057	20	5 8.3	20.6
479880	2014	HF <sub>6</sub>	16.6	X	76.22020	291.57131	217.01509	4.77325	0.0882254	0.17804283	3.1293423	20	5 12.2	20.7
479881	2014	HO <sub>6</sub>	16.3	X	321.21415	223.55533	81.71097	6.53534	0.1275186	0.18010519	3.1054072	20	6 8.7	20.2
479882	2014	HL <sub>7</sub>	17.1	X	195.29143	303.51426	192.81596	12.77105	0.2119627	0.22464698	2.6800054	20	8 31.9	21.7
479883	2014	HM <sub>8</sub>	16.5	X	140.40069	276.53576	199.77513	18.58875	0.0808725	0.18496230	3.0508011	20	6 15.1	21.4
479884	2014	HO <sub>9</sub>	16.9	X	61.96173	10.42526	180.64237	5.51832	0.0718607	0.18105690	3.0945155	20	6 14.5	21.1
479885	2014	HX <sub>9</sub>	16.0	X	320.13285	287.51581	41.68535	12.95277	0.1719163	0.18833650	3.0142531	20	7 5.4	19.7
479886	2014	HC <sub>12</sub>	16.6	X	72.66935	156.84951	44.74669	12.14601	0.0846631	0.18889341	3.0083257	20	7 16.8	20.9
479887	2014	HA <sub>16</sub>	17.4	X	36.44240	48.73442	208.16868	9.52422	0.0652706	0.19596276	2.9355333	20	8 1.1	21.4
479888	2014	HP <sub>16</sub>	17.3	X	180.46183	328.25052	209.21589	5.70204	0.0637059	0.22930834	2.6435619	20	10 19.9	20.9
479889	2014	HM <sub>19</sub>	16.5	X	61.24615	159.36386	25.25705	10.36466	0.0468257	0.17828062	3.1265589	20	5 30.1	20.9
479890	2014	HK <sub>22</sub>	16.0	X	68.36539	106.04122	48.55772	20.30672	0.1196321	0.17250988	3.1959016	20	5 12.9	20.2
479891	2014	HL <sub>24</sub>	16.9	X	336.40162	335.80998	22.51953	13.90795	0.0414451	0.22074680	2.7114802	20	9 26.9	20.4
479892	2014	HP <sub>25</sub>	17.6	X	195.36075	98.57529	46.35519	5.78967	0.0576271	0.22141846	2.7059940	20	9 27.4	21.5
479893	2014	HS <sub>25</sub>	16.6	X	219.92361	233.55289	197.74693	5.73418	0.0742153	0.19841862	2.9112607	20	7 15.6	21.0
479894	2014	HH <sub>26</sub>	16.1	X	284.37316	292.86718	38.67891	10.53546	0.1164475	0.17572950	3.1567458	20	5 20.4	20.6
479895	2014	HM <sub>26</sub>	16.9	X	254.25027	105.38433	89.63224	14.26536	0.0916337	0.26405655	2.4062352	20	—	—
479896	2014	HY <sub>26</sub>	16.4	X	282.66403	143.47778	197.92292	10.83910	0.0838445	0.18345435	3.0674963	20	6 6.8	20.8
479897	2014	HY <sub>27</sub>	17.3	X	226.84111	350.28719	162.23359	4.88646	0.1225764	0.24360716	2.5390778	20	11 8.4	20.7
479898	2014	HC <sub>33</sub>	16.3	X	293.84429	266.38264	51.07269	16.60040	0.0857855	0.17372148	3.1810246	20	5 19.8	20.7
479899	2014	HS <sub>34</sub>	16.7	X	246.55756	320.11954	131.52055	5.84057	0.0775980	0.22006277	2.7170961	20	9 17.8	20.5
479900	2014	HQ <sub>36</sub>	16.6	X	278.15660	155.43230	180.94808	10.23670	0.1509423	0.17176972	3.2050759	20	5 17.2	21.3
479901	2014	HT <sub>37</sub>	16.8	X	94.63022	44.40340	153.39713	8.27755	0.0476167	0.19576982	2.9374617	20	8 1.1	20.9
479902	2014	HK <sub>40</sub>	16.5	X	5.39879	211.68855	47.27239	10.48330	0.0946709	0.18776448	3.0203719	20	6 20.9	20.3
479903	2014	HR <sub>40</sub>	17.0	X	134.52135	302.54599	188.16765	11.29703	0.0538857	0.18533893	3.0466667	20	6 24.6	21.7
479904	2014	HW <sub>42</sub>	16.9	X	183.88643	70.70795	62.70916	7.01059	0.0969984	0.21176570	2.7876118	20	8 28.2	21.2
479905	2014	HF <sub>43</sub>	16.7	X	286.38534	230.68525	189.38988	15.12616	0.0931234	0.23612031	2.5924705	20	9 29.9	19.6
479906	2014	HB <sub>44</sub>	17.0	X	233.55695	359.11307	105.61067	5.66667	0.0632856	0.22015178	2.7163636	20	9 21.3	20.7
479907	2014	HV <sub>44</sub>	16.8	X	78.24565	119.69900	69.75234	1.99666	0.0615825	0.18953317	3.0015522	20	7 2.8	20.8
479908	2014	HC <sub>45</sub>	16.9	X	341.88745	324.91443	31.79154	13.82634	0.0999511	0.21868939	2.7284599	20	10 4.4	20.1
479909	2014	HN <sub>45</sub>	15.6	X	223.78659	295.03820	81.44096	10.74130	0.0933188	0.17303212	3.1894679	20	5 13.3	20.5
479910	2014</													

ELEMENTS AND OPPOSITION DATES IN 2020

ECLIPTIC AND EQUINOX 2000.0, EPOCH 2020 MAY 31.0 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>
479921 2014 HQ <sub>96</sub>	16.0	X	121.95121	35.12912	73.96686	8.25597	0.0732011	0.17335125	3.1855523	20	5 17.1	20.7
479922 2014 HV <sub>97</sub>	17.1	X	180.42826	257.27123	177.20629	11.20037	0.1304156	0.18407500	3.0605972	20	6 7.3	22.2
479923 2014 HH <sub>100</sub>	15.8	X	228.23354	327.63998	46.50477	17.71769	0.1340663	0.17209022	3.2010952	20	5 9.2	20.9
479924 2014 HJ <sub>110</sub>	15.6	X	224.18030	121.03111	160.21220	9.44988	0.1063744	0.12480941	3.9655596	20	1 24.2	21.7
479925 2014 HW <sub>121</sub>	17.4	X	255.11977	284.31704	169.70775	6.26867	0.0123403	0.22079950	2.7110488	20	10 11.4	20.9
479926 2014 HG <sub>122</sub>	15.9	X	221.30729	171.76842	195.98399	5.26012	0.0786939	0.16913470	3.2382789	20	4 29.6	20.8
479927 2014 HX <sub>122</sub>	16.8	X	50.85365	179.85360	40.62069	1.58571	0.0857020	0.19023074	2.9942099	20	7 10.0	20.6
479928 2014 HZ <sub>125</sub>	17.3	X	219.53957	53.70532	43.81195	4.89227	0.0334001	0.21082106	2.7959327	20	8 27.5	21.3
479929 2014 HR <sub>126</sub>	17.0	X	190.73155	13.76248	71.09720	2.44194	0.0178530	0.19082305	2.9880108	20	7 3.2	21.1
479930 2014 HE <sub>128</sub>	16.1	X	114.14204	90.97262	33.23147	16.19304	0.0437359	0.17562783	3.1579639	20	5 18.9	20.8
479931 2014 HL <sub>128</sub>	16.2	X	300.90090	304.21981	38.38788	14.35609	0.1845488	0.18671133	3.0317189	20	6 16.6	20.3
479932 2014 HO <sub>130</sub>	16.1	X	334.67483	273.05748	46.36106	12.54748	0.0174309	0.20432032	2.8549270	20	8 1.8	20.2
479933 2014 HP <sub>130</sub>	17.1	X	184.04354	115.09273	48.76715	11.78811	0.0977870	0.23139176	2.6276698	20	10 9.1	21.1
479934 2014 HF <sub>136</sub>	17.8	X	226.31871	345.59033	154.82031	1.67843	0.0969444	0.23553374	2.5967728	20	10 24.2	21.3
479935 2014 HL <sub>141</sub>	16.6	X	228.11086	74.02281	12.15752	6.78546	0.0937625	0.20938210	2.8087280	20	8 16.4	20.7
479936 2014 HU <sub>141</sub>	17.1	X	250.98011	191.19894	237.01110	3.19232	0.0836844	0.21057120	2.7981440	20	8 17.9	21.1
479937 2014 HH <sub>142</sub>	17.4	X	182.27749	247.66894	265.68774	2.49300	0.0420650	0.21591131	2.7518143	20	9 19.3	21.2
479938 2014 HT <sub>145</sub>	16.5	X	328.62694	252.37419	100.56537	7.41819	0.0518918	0.21654290	2.7464609	20	9 6.8	20.0
479939 2014 HN <sub>150</sub>	16.3	X	232.10003	313.70955	85.91175	3.10570	0.1170830	0.19606296	2.9345331	20	6 15.6	20.7
479940 2014 HQ <sub>150</sub>	16.7	X	190.46024	88.16708	359.29550	1.59199	0.0240575	0.20006436	2.8952733	20	7 6.5	20.8
479941 2014 HV <sub>150</sub>	16.3	X	248.94965	325.76619	43.05027	10.30502	0.0965149	0.17426480	3.1744094	20	5 27.4	21.0
479942 2014 HL <sub>153</sub>	16.8	X	350.06755	73.11945	206.42174	9.12568	0.0673304	0.18399030	3.0615364	20	6 24.1	20.8
479943 2014 HL <sub>155</sub>	16.4	X	71.00034	324.05285	208.00177	12.72138	0.1353476	0.17839988	3.1251654	20	6 11.3	20.8
479944 2014 HZ <sub>155</sub>	16.5	X	164.76333	225.51291	210.41326	8.57072	0.0658276	0.17574893	3.1565131	20	5 22.8	21.2
479945 2014 HU <sub>161</sub>	16.7	X	244.07186	9.74174	85.70052	14.92153	0.1514384	0.22285853	2.6943244	20	9 15.3	20.8
479946 2014 HQ <sub>163</sub>	17.1	X	202.83668	265.81472	223.20003	8.42746	0.1236355	0.22883788	2.6471838	20	9 4.7	21.3
479947 2014 HV <sub>167</sub>	15.6	X	262.48524	288.03027	76.76344	23.20380	0.0952042	0.17896251	3.1186120	20	6 8.6	20.1
479948 2014 HF <sub>169</sub>	16.2	X	46.43214	158.21136	59.64291	9.77533	0.0471629	0.17856698	3.1232155	20	6 23.9	20.4
479949 2014 HD <sub>172</sub>	16.7	X	86.16702	30.87288	165.39589	8.00028	0.1444946	0.19190585	2.9767606	20	8 1.2	21.0
479950 2014 HL <sub>176</sub>	17.0	X	194.79446	248.16422	252.15738	4.97428	0.0267328	0.21699806	2.7426190	20	9 17.8	21.0
479951 2014 HW <sub>178</sub>	17.0	X	206.74993	295.99284	191.02781	12.94754	0.1244716	0.22742819	2.6581115	20	9 7.4	21.2
479952 2014 HH <sub>181</sub>	17.1	X	144.08238	67.87238	129.13211	8.98551	0.1382461	0.21598188	2.7512148	20	10 6.9	21.6
479953 2014 HX <sub>181</sub>	17.1	X	233.12467	63.15738	63.97742	12.96945	0.1281355	0.22855606	2.6493595	20	10 15.1	21.0
479954 2014 HG <sub>182</sub>	16.5	X	71.42272	110.87207	41.20363	16.65385	0.1666592	0.17950098	3.1123720	20	5 19.1	20.8
479955 2014 HP <sub>182</sub>	16.4	X	231.45364	249.30755	177.70829	14.65357	0.1397887	0.21229647	2.7829637	20	7 16.3	20.9
479956 2014 HP <sub>185</sub>	16.4	X	45.95521	5.62905	179.09271	18.74394	0.0619588	0.17659573	3.1464144	20	5 16.2	20.9
479957 2014 HP <sub>188</sub>	15.5	X	9.27609	190.47992	66.00099	29.49394	0.1572665	0.17413269	3.1760147	20	6 23.1	19.4
479958 2014 HA <sub>195</sub>	15.8	X	344.55311	56.48591	230.84724	20.76863	0.1180236	0.17712910	3.1400948	20	6 21.8	19.9
479959 2014 JC <sub>4</sub>	16.5	X	315.75367	86.37805	217.80087	15.68841	0.1458062	0.17338579	3.1851291	20	5 27.4	20.6
479960 2014 JA <sub>8</sub>	16.2	X	252.79000	318.42729	63.36470	10.83707	0.0424594	0.18183399	3.0856927	20	6 25.7	20.6
479961 2014 JM <sub>10</sub>	16.1	X	244.20758	334.83358	66.38387	14.01512	0.0930937	0.18505888	3.0497397	20	7 3.7	20.6
479962 2014 JS <sub>10</sub>	16.6	X	348.74150	250.80819	69.15139	11.14774	0.0909494	0.19268983	2.9686809	20	8 22.6	20.4
479963 2014 JN <sub>11</sub>	16.3	X	176.19152	45.44700	68.11202	13.03541	0.0598968	0.19186936	2.9771380	20	7 23.5	20.9
479964 2014 JH <sub>11</sub>	17.2	X	282.58132	31.37136	61.55553	14.77198	0.2233657	0.23711303	2.5852295	20	10 26.6	20.0
479965 2014 JJ <sub>17</sub>	16.1	X	11.83301	43.84438	185.45840	9.15754	0.0721607	0.17921877	3.1156384	20	5 23.6	20.2
479966 2014 JO <sub>27</sub>	15.6	X	256.23343	286.14485	98.07435	22.55635	0.1096631	0.18523958	3.0477559	20	6 24.7	20.0
479967 2014 JM <sub>31</sub>	16.4	X	158.05766	90.41895	53.16389	15.71904	0.0957332	0.20280005	2.8691770	20	8 16.6	21.1
479968 2014 JZ <sub>35</sub>	16.4	X	59.75185	131.15344	47.59250	14.31389	0.0831574	0.17108408	3.2136332	20	5 25.9	20.8
479969 2014 JF <sub>36</sub>	16.8	X	133.06114	330.56909	221.35237	7.98395	0.1877650	0.21188936	2.7865272	20	9 15.4	21.6
479970 2014 JN <sub>36</sub>	16.3	X	95.73015	93.56764	54.65329	13.12664	0.1148691	0.17541654	3.1604992	20	6 7.5	20.9
479971 2014 JT <sub>37</sub>	16.8	X	44.88165	38.60734	212.78290	9.82991	0.0580339	0.19082384	2.9880025	20	8 4.1	21.0
479972 2014 JB <sub>38</sub>	16.2	X	337.80791	188.22203	83.40957	12.29533	0.0432279	0.16903074	3.2396065	20	5 29.2	20.6
479973 2014 JJ <sub>39</sub>	16.7	X	209.15706	314.17446	212.39614	5.45904	0.1742906	0.23634573	2.5908218	20	10 28.3	20.3
479974 2014 JV <sub>42</sub>	16.5	X	32.79259	19.43920	209.55890	15.64185	0.0282189	0.17281799	3.1921019	20	6 17.1	21.1
479975 2014 JM <sub>43</sub>	15.3	X	14.35693	184.62605	86.29223	19.32615	0.1874832	0.17832101	3.1260868	20	8 2.4	19.0
479976 2014 JL <sub>45</sub>	16.7	X	192.60209	75.07052	42.77085	5.72977	0.0668827	0.20545654	2.8443917	20	8 18.1	21.0
479977 2014 JS <sub>45</sub>	16.9	X	29.00934	10.10290	228.71561	4.75799	0.0973438	0.18069143	3.0986868	20	7 1.9	20.8
479978 2014 JB <sub>47</sub>	16.1	X	50.95461	162.71490	35.24885	9.48422	0.1585598	0.17329848	3.1861989	20	6 19.3	20.3
479979 2014 JB <sub>53</sub>	15.8	X	331.63394	252.43037	52.61320	15.94391	0.0394271	0.18038894	3.1021499	20	7 2.2	20.2
479980 2014 JE <sub>58</sub>	16.1	X	132.95344	17.52591	130.28300	12.68012	0.0269763	0.18824378	3.0152429	20	7 12.7	20.4
479981 2014 JJ <sub>59</sub>	16.2	X	263.70003	155.77115	213.11028	12.25170	0.1302177	0.17659951	3.1463695	20	6 10.7	20.9
479982 2014 JZ <sub>63</sub>	16.9	X	72.62957	350.15802	218.00634	8.48987	0.0194267	0.18654134	3.0335604	20	7 11.5	21.2
479983 2014 JJ <sub>64</sub>	16.7	X	266.11659	53.53459	51.47131	13.51415	0.1203378	0.23237094	2.6202828	20	10 28.6	19.9
479984 2014 JK <sub>65</sub>	16.8	X	231.89262	299.57751	164.35905	4.60807	0.0391006	0.21317243	2.7753347	20	9 18.1	20.4
479985 2014 JD <sub>72</sub>	16.6	X	231.15466	73.92425	48.69931	14.10653	0.0487223	0.21905137	2.7254532	20	10 15.2	20.4
479986 2014 JV <sub>77</sub>	16.5	X	177.50906	91.79234	97.66532	12.39579	0.1311112	0.22906192	2.6454575	20	11 1.8	20.8
479987 2014 JE <sub>79</sub>	15.5	X	86.44930	291.66382	219.31592	24.93279	0.1653033	0.17369916	3.1812971	20	6 6.8	20.3
479988 2014 KH <sub>1</sub>	16.1	X	167.44229	74.43659	81.45842	16.19017	0.1111843	0.21238562	2.7821848	20	9 13.1	20.7
479989 2014 KT <sub>8</sub>	17.6	X	244.44744	151.19256	345.21868	3.65950	0.1762689	0.24003924	2.5641764	20	10 29.0	20.9
479990 2014 KT <sub>18</sub>	17.1	X	184.37706	308.08758	199.13001	4.67933	0.0966778	0.21431203	2.7654874	20	9 10.8	21.2
479991 2014 KQ <sub>22</sub>	16.3	X	60.66323	327.73456	248.89467	9.54398	0.0530881	0.19259395	2.9696661	20	7 11.9	20.4
479992 2014 KT <sub>22</sub>	16.8	X	144.02185	52.22189	131.45298	13.38945	0.0915810	0.21612856	2.7496999	20	9 19.7	21.1
479993 2014 KN <sub>23</sub>	16.9	X	158.72364	297.51225	226.09							