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CATALOGUE OF PERIODIC COMETS (1967)

BY

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Introduction

With respects to 99 periodic comets, the orbital elements at every perihelion passage are listed in increasing order of their periods at the first apparition. In the case when the comet had been observed and its improved orbit has been obtained, one or two sets of the most reliable orbits are selected for each return, but otherwise only the predicted orbital elements are given.

The angular elements of all orbits have been reduced to the common equinox of 1950.0. In addition to the ordinary set of elements, some quantities are given as defined below.

The main list gives the orbital elements and some values as follows:

1. Comet Number and the Name of Comet. Comet number is adapted in this catalogue in order of increasing period. The names of the comets with the symbol P/ are used samely as in Catalogue of Cometary Orbits (Memoirs B. A. A., vol. 39, No. 3 and vol. 40, No. 2).
2. No. This is current number of perihelion passage from its first apparition to the latest return or prediction.
3. Designation. The Roman numeral designation is used as the official number of comet. For the unobserved case, the year is enclosed with the parentheses.
4. T (U. T.). The time of phrihelion passage given in U. T. (day begins at midnight) in the decimals of a day. Dates before 1583 are in Julian calendar. The symbol E given in the next column indicates that the time is in Ephemeris Time, and the symbol P means that the elements are predicted ones.
5. Angular elements. ARG. PERI., the argument of perihelion, NODE, the longitude of ascending node, and INCLINATION are given refered to the ecliptic and equinox of 1950.0. All calculations for the precessions have been done by a method of the rectangular coordinates (K. Hurukawa, Publ. Inter. Lat. Obs., vol. 5, 130, 1967) with a high-speed computer.
6. Size and Shape of Orbit. PERI. DIST. is the perihelion distance q, ECCENT. is the eccentricity e, A means the semi-major axis, while a indicates $q/(1-e)$.
7. T and PERIOD. T (U. T.) is converted to T expressed in the Besselian solar year defined as B. Y. = (J. D. of T (U. T.) $-243\,3282.423)/365.2422+1950.000$ (Explanatory Supplement to A. E., p. 489, 1961). Con-

sequently, the PERIOD is given in the tropical years or by $1.00004027\, a\sqrt{a}$. It is noted, in the case of the year before 0 A. D. (for the first four sets of P/Halley), T's are calculated algebraically defined above.

8. R (A), A (D), and Q. The nodal distances at the ascending and descending nodes, and the aphelion distance, $Q=2a-q$.
9. The ecliptic coordinates of the aphelion L is the longitude, and B is the latitude, referred to the ecliptic and equinox of 1950.0.
10. Tisserand's criterion and its variation. $C=1/a+C_1/r'^2$, where $C_1=2\sqrt{a'(1-e'^2)}\sqrt{a(1-e^2)}\cos I$, and $\cos I=\cos i'\cdot\cos i+\sin i'\cdot\sin i\times\cos(\Omega'-\Omega)$, I is the inclination of the comet orbit referred to Jupiter's one and r', a', e', i', and Ω' are Jupiter's heliocentric distance, semi-major axis, eccentricity, inclination and longitude of ascending node respectively. C is calculated with the value of a' in stead of r', accordingly $C=1/a+0.03694C_1$. In the column of DC, $0.0036C_1$ is given, since the variation of $1/r'^2$ from $1/a'^2$ is $0.5(1/q'^2-1/Q'^2)=0.0036$. As to the parabolic orbit (P/Herschel-Rigollet, 1788 II), C_1 is calculated by;

$$C=2\sqrt{2}\sqrt{a'(1-e'^2)}\sqrt{q}\cos I.$$

The main list is followed by the notes where the Date of discovery, the name of Discoverers, References, the approximate correction dT (days) to be applied to the predicted T, and remarks are given.

Comet Index and Abbreviations for References are appended in the end of this catalogue.

Acknowledgments are made to Mr. K. Hurukawa for his programming of the calculations in this catalogue, and to Prof. T. Shimizu for his interest in the compiling this catalogue.

Addenda

C. J. van Houten and I. van Houten-Groeneveld have detected a new comet on plates taken in 1960. P. Herget has determined a periodic orbit (B. A. N., vol. 18, 441, 1966), and this comet has been designated P/van Houten, 1961 X (I. A. U. C., 1973).

Jean H. Anderson has detected a new comet on plates taken by W. J. Luyten in 1963. B. G. Marsden and K. Aksnes have determined its parabolic and elliptic orbits. This comet has been designated Comet Anderson, 1963, IX (I. A. U. C., 2013).

G. Schrutka has communicated his new results of three definitive orbits of P/Temple (1), 1867 II, 1873 I and 1879 III.

J. Schubart has communicated his results of P/de Vico-Swift (based on the elements for Comet 1844 I=14−1 in this catalogue), P/Tempel (1) (based on the orbit of Comet 1879 III by Schrutka above mentioned) and P/Tempel-Tuttle (based on his new orbit determined with observations of 1865/66 and 1965. Empirical changes of the elements are applied at JD 2342040.5, da=−0.001250, dM=−0.2094, at JD 2341740.5, da=−0.002018, and at JD 2220320.5, dT=+4.34 days).

The orbital elements of these five comets are appended as Addenda at the end of this catalogue.

CATALOGUE OF PERIODIC COMETS (1967)

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
1	P/WILSON-HARRINGTON																	
1	1949 III	OCT. 13,1658		91,946	278,652	2,196	1,0276	0,41218	1,75	1949,782	2,31	1,472	1,431	2,47	190,6	-2,2	0,774	0,019
2	P/ENCKE																	
1	1786 I	JAN. 31,3735		182,47	336,45	13,62	0,33483	0,84836	2,208	1786,085	3,281	4,060	0,335	4,08	338,9	0,6	0,581	0,013
4	1795	DEC. 21,94099		182,0066	336,8329	13,7275	0,334429	0,848883	2,2130	1795,974	3,292	4,078	0,335	4,09	338,8	0,5	0,580	0,012
7	1805	NOV. 21,99989		182,4285	336,3724	13,5762	0,340421	0,846175	2,2130	1805,890	3,292	4,066	0,341	4,09	338,7	0,6	0,581	0,013
11	1819 I	JAN. 27,75309		182,4185	336,4059	13,6319	0,335183	0,848619	2,2142	1819,073	3,295	4,073	0,335	4,09	338,8	0,6	0,579	0,013
12	1822 II	MAY 24,46345		182,7631	336,2229	13,3550	0,345876	0,844506	2,2244	1822,393	3,318	4,077	0,346	4,10	338,9	0,6	0,579	0,013
13	1825 III	SEPT. 16,77541		182,7709	336,2150	13,3732	0,344762	0,844930	2,2233	1825,709	3,315	4,076	0,345	4,10	338,9	0,6	0,579	0,013
14	1829	JAN. 10,24332		182,7938	336,2013	13,3589	0,345451	0,844666	2,2239	1829,026	3,317	4,076	0,346	4,10	338,9	0,6	0,579	0,013
15	1832 I	MAY 4,48580		182,8028	336,1991	13,3846	0,343378	0,845453	2,2218	1832,343	3,312	4,074	0,344	4,10	338,9	0,6	0,580	0,013
16	1835 II	AUG. 26,86182		182,7973	336,1996	13,3695	0,344345	0,845075	2,2227	1835,651	3,314	4,074	0,345	4,10	338,9	0,6	0,580	0,013
17	1838	DEC. 19,50967		182,8292	336,1811	13,3727	0,343948	0,845218	2,2221	1838,966	3,313	4,073	0,344	4,10	338,9	0,7	0,580	0,013
18	1842 I	APR. 12,51934		182,8278	336,1757	13,3551	0,344920	0,844831	2,2229	1842,279	3,314	4,074	0,345	4,10	338,9	0,7	0,580	0,013
19	1845 IV	AUG. 10,10101		183,4023	335,8032	13,1404	0,338062	0,847472	2,2164	1845,607	3,299	4,055	0,338	4,09	339,1	0,8	0,580	0,013
20	1848 II	NOV. 26,58146		183,4062	335,8012	13,1572	0,336957	0,847865	2,2149	1848,907	3,296	4,053	0,337	4,09	339,1	0,8	0,580	0,013
21	1852 I	MAR. 15,20794		183,4381	335,7809	13,1427	0,337553	0,847603	2,2149	1852,205	3,297	4,052	0,338	4,09	339,1	0,8	0,581	0,013
22	1855 III	JULY 1,53472		183,4312	335,7812	13,1465	0,337237	0,847731	2,2147	1855,497	3,296	4,052	0,338	4,09	339,1	0,8	0,580	0,013
23	1858 VIII	OCT. 18,86560		183,4661	335,7681	13,0828	0,340737	0,846394	2,2183	1858,797	3,304	4,055	0,341	4,10	339,1	0,8	0,580	0,013
24	1862 I	FEB. 6,74777		183,4861	335,7606	13,0934	0,339956	0,846703	2,2176	1862,102	3,303	4,054	0,340	4,10	339,2	0,8	0,580	0,013
25	1865 II	MAY 28,42452		183,5045	335,6757	13,0741	0,340955	0,846305	2,2184	1865,406	3,304	4,054	0,341	4,10	339,1	0,8	0,580	0,013
26	1868 III	SEPT. 15,11396		183,6472	335,6858	13,1215	0,333624	0,849128	2,2113	1868,709	3,288	4,043	0,334	4,09	339,2	0,8	0,581	0,013
27	1871 V	DEC. 29,30710		183,6321	335,6909	13,1331	0,333020	0,849332	2,2103	1871,993	3,286	4,042	0,333	4,09	339,2	0,8	0,581	0,012
28	1875 II	APR. 13,48469		183,6563	335,6774	13,1315	0,332956	0,849402	2,2109	1875,281	3,288	4,042	0,333	4,09	339,2	0,8	0,581	0,012
29	1878 II	JULY 26,66749		183,6582	335,6719	13,1192	0,333480	0,849154	2,2107	1878,567	3,287	4,042	0,334	4,09	339,2	0,8	0,581	0,013
30	1881 VII	NOV. 15,79568		183,9068	335,5507	12,8938	0,343342	0,845400	2,2208	1881,875	3,309	4,047	0,344	4,10	339,4	0,9	0,580	0,013
31	1885 I	MAR. 8,13464		183,9179	335,5352	12,9083	0,342310	0,845776	2,2196	1885,183	3,307	4,045	0,343	4,10	339,4	0,9	0,581	0,013
32	1888 II	JUNE 28,49021 P		183,9395	335,5247	12,8927	0,343092	0,845469	2,2202	1888,494	3,308	4,045	0,343	4,10	339,4	0,9	0,581	0,013
33	1891 III	OCT. 18,47850 P		183,9443	335,5255	12,9234	0,340473	0,846474	2,2177	1891,796	3,303	4,042	0,341	4,09	339,4	0,9	0,581	0,013
34	1895 I	FEB. 5,24866		183,9565	335,5178	12,9112	0,343101	0,845331	2,2183	1895,098	3,304	4,041	0,343	4,09	339,4	0,9	0,581	0,013
35	1898 III	MAY 27,3704		183,9915	335,4983	12,9148	0,340671	0,846402	2,2179	1898,403	3,303	4,041	0,341	4,10	339,4	0,9	0,581	0,013
36	1901 II	SEPT. 15,9629		183,9940	335,4902	12,8991	0,341591	0,846044	2,2188	1901,706	3,305	4,042	0,342	4,10	339,4	0,9	0,581	0,013
37	1905 I	JAN. 12,3798		184,6267	335,0571	12,5796	0,338882	0,847126	2,2167	1905,031	3,301	4,022	0,339	4,09	339,6	1,0	0,581	0,013
38	1908 I	MAY 1,4106		184,6292	335,0555	12,5943	0,337816	0,847534	2,2157	1908,333	3,298	4,021	0,338	4,09	339,6	1,0	0,581	0,013
39	1911 III	AUG. 19,5350		184,6605	335,0350	12,5799	0,338454	0,847251	2,2158	1911,629	3,298	4,019	0,339	4,09	339,6	1,0	0,581	0,013
40	1914 VI	DEC. 5,47708 P		184,6334	335,0469	12,5866	0,337910	0,847465	2,2153	1914,926	3,297	4,019	0,338	4,09	339,6	1,0	0,581	0,013
41	1918 I	MAR. 24,813 P		184,6565	335,0478	12,5347	0,340865	0,846331	2,2182	1918,226	3,304	4,022	0,341	4,10	339,6	1,0	0,581	0,013
42	1921 IV	JULY 13,782 P		184,7195	335,0020	12,5214	0,340005	0,846712	2,2181	1921,531	3,304	4,021	0,341	4,10	339,6	1,0	0,581	0,013
43	1924 III	NOV. 1,000 P		184,7365	334,9881	12,5032	0,34101	0,846317	2,219	1924,836	3,305	4,021	0,342	4,10	339,6	1,0	0,581	0,013
44	1928 II	FEB. 19,6984 P		184,9239	334,8913	12,5342	0,332668	0,849503	2,2105	1928,137	3,287	4,005	0,333	4,09	339,7	1,1	0,581	0,013
45	1931 II	JUNE 3,11363E		184,9133	334,8974	12,5633	0,331867	0,849786	2,2093	1931,418	3,284	4,003	0,332	4,09	339,7	1,1	0,581	0,013
46	1934 III	SEPT. 15,2816 E		184,9459	334,8823	12,5599	0,331861	0,849806	2,2095	1934,704	3,285	4,003	0,332	4,09	339,7	1,1	0,581	0,013
47	1937 VI	DEC. 27,7538 E		184,9393	334,8810	12,5488	0,332391	0,849604	2,2101	1937,988	3,286	4,004	0,333	4,09	339,7	1,1	0,581	0,013
48	1941 V	APR. 17,1513 E		185,1599	334,7634	12,3505	0,341369	0,846175	2,2192	1941,291	3,306	4,008	0,342	4,10	339,8	1,1	0,581	0,013
49	(1944)	AUG. 7,316 P		185,188	334,738	12,339	0,34112	0,84628	2,219	1944,602	3,306	4,007	0,342	4,10	339,8	1,1	0,581	0,013
50	1947 XI	NOV. 26,3254		185,1933	334,7393	12,3507	0,341012	0,846297	2,2186	1947,901	3,305	4,006	0,342	4,10	339,8	1,1	0,581	0,013
51	1951 III	MAR. 16,2097		185,2125	334,7379	12,3801	0,338000	0,847464	2,2159	1951,203	3,299	4,002	0,339	4,09	339,8	1,1	0,581	0,013
52	1954 IX	JULY 2,5218		185,1994	334,7460	12,3738	0,338402	0,847302	2,2162	1954,500	3,299	4,003	0,339	4,09	339,8	1,1	0,581	0,013
53	1957 VIII	OCT. 19,8487		185,2264	334,7310	12,3749	0,338125	0,847398	2,2157	1957,800	3,298	4,001	0,339	4,09	339,8	1,1	0,581	0,013
54	1961 I	FEB. 5,5851 P		185,2259	334,7234	12,3597	0,339020	0,847054	2,2166	1961,099	3,300	4,002	0,339	4,09	339,8	1,1	0,581	0,013
55	1964 IV	JUNE 3,4616 EP		185,9081	334,2385	11,9759	0,339270	0,846999	2,2174	1964,425	3,302	3,979	0,340	4,10	340,0	1,2	0,581	0,013
56	1967	SEPT. 22,0486 EP		185,9096	334,2419	11,9894	0,338217	0,847393	2,2163	1967,723	3,299	3,977	0,339	4,09	340,0	1,2	0,581	0,013

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
3	P/HELFENZRIEDER																	
1A	1766 II	APR.	28,21648	180,5687	73,9497	7,8031	0,411083	0,83375	2,4727	1766,323	3,888	4,533	0,411	4,53	74,5	0,1	0,549	0,014
1B	1766 II	APR.	27,77814	178,1333	76,1270	7,9274	0,402654	0,852396	2,7279	1766,322	4,506	5,038	0,403	5,05	74,3	0,3	0,511	0,014
4	P/GRIGG-SKJELLERUP																	
1	1902 II	JULY	3,343	347,5872	224,4971	8,6459	0,74554	0,738949	2,856	1902,501	4,827	0,753	4,658	4,97	32,2	1,9	0,539	0,018
5	1922 I	MAY	15,69521	355,0078	215,8719	17,5104	0,888939	0,695175	2,9162	1922,368	4,980	0,890	4,901	4,94	31,1	1,5	0,539	0,019
6	1927 V	MAY	10,245	355,0328	215,8613	17,4860	0,892608	0,694211	2,9190	1927,353	4,987	0,894	4,904	4,95	31,1	1,5	0,539	0,019
7	1932 II	MAY	12,59	355,1937	215,7774	17,4426	0,90755	0,69051	2,932	1932,364	5,022	0,909	4,919	4,96	31,2	1,4	0,539	0,019
8	1937 III	MAY	22,51 P	355,2704	215,7445	17,4454	0,907783	0,69045	2,9326	1937,388	5,022	0,909	4,920	4,96	31,2	1,4	0,539	0,019
9	1942 V	MAY	23,250 P	356,3627	215,3974	17,6224	0,856083	0,703677	2,8890	1942,389	4,911	0,857	4,899	4,92	31,9	1,1	0,539	0,019
10	1947 II	APR.	18,13774E	356,3953	215,3777	17,6469	0,853127	0,704275	2,8849	1947,293	4,900	0,854	4,894	4,92	31,9	1,1	0,539	0,019
11	1952 IV	MAR.	11,15780E	356,3602	215,3820	17,6279	0,855611	0,703599	2,8867	1952,194	4,905	0,856	4,894	4,92	31,9	1,1	0,539	0,019
12	1957 I	FEB.	2,6314 E	356,3270	215,3880	17,6360	0,855283	0,703649	2,8860	1957,090	4,903	0,856	4,893	4,92	31,9	1,1	0,539	0,019
13	1961 IX	DEC.	31,35740E	356,3829	215,3627	17,6206	0,857753	0,702980	2,8879	1961,999	4,908	0,858	4,895	4,92	31,9	1,1	0,539	0,019
14	1967	JAN.	16,46197EP	359,1700	212,6855	21,0495	1,002929	0,662442	2,9711	1967,042	5,122	1,003	4,938	4,94	31,9	0,3	0,539	0,019
15	1972	MAR.	2,5794 EP	359,2804	212,6524	21,0679	1,00125	0,662876	2,969	1972,171	5,119	1,001	4,938	4,94	31,9	0,3	0,539	0,019
16	1977	APR.	10,8924 EP	359,3213	212,6453	21,1043	0,99329	0,664735	2,963	1977,275	5,099	0,993	4,931	4,93	32,0	0,2	0,539	0,019
5	P/BLANPAIN																	
1	1819 IV	NOV.	20,84741	350,2203	79,1540	9,1074	0,892317	0,698752	2,9621	1819,886	5,098	0,898	4,868	5,03	249,5	1,5	0,543	0,020
6	P/TEMPEL(2)																	
1	1873 II	JUNE	25,7078	185,1890	121,9838	12,7506	1,344126	0,552604	3,0043	1873,483	5,208	4,641	1,346	4,66	127,0	1,1	0,571	0,023
2	1878 III	SEPT.	7,76081	185,1534	121,9855	12,7626	1,339670	0,553691	3,0017	1878,685	5,201	4,640	1,342	4,66	127,0	1,1	0,571	0,023
3	(1884)	NOV.	20,245 P	185,115	121,981	12,749	1,3447	0,5525	3,00	1884,891	5,21	4,642	1,347	4,67	126,9	1,1	0,571	0,023
4	(1889)	FEB.	2,098 P	185,007	121,965	12,746	1,3463	0,5521	3,01	1889,090	5,21	4,643	1,348	4,67	126,8	1,1	0,571	0,023
5	1894 III	APR.	23,74050	185,1084	121,9242	12,7349	1,350609	0,551077	3,0086	1894,311	5,219	4,644	1,353	4,67	126,9	1,1	0,571	0,023
6	1899 IV	JULY	28,99176 P	185,6235	121,6543	12,6439	1,388532	0,542124	3,0326	1899,573	5,281	4,650	1,391	4,68	127,1	1,2	0,571	0,024
7	1904 III	NOV.	10,93517 P	185,7661	121,6187	12,6449	1,387864	0,542200	3,0316	1904,863	5,279	4,647	1,390	4,68	127,2	1,3	0,571	0,024
8	(1910)	FEB.	10,615 P	186,6643	121,1730	12,7516	1,32260	0,55783	2,991	1910,111	5,173	4,620	1,326	4,66	127,7	1,5	0,571	0,023
9	1915 I	APR.	15,1632 P	186,6652	121,1749	12,7519	1,32260	0,557829	2,991	1915,284	5,173	4,620	1,326	4,66	127,7	1,5	0,571	0,023
10	1920 II	JULY	10,696	186,6643	121,1731	12,7516	1,32051	0,557830	2,986	1920,526	5,161	4,613	1,324	4,65	127,7	1,5	0,571	0,023
11	1925 IV	AUG.	7,0423	186,5834	121,1387	12,7709	1,313284	0,560086	2,9853	1925,597	5,158	4,619	1,316	4,66	127,6	1,5	0,571	0,023
12	1930 VIII	OCT.	5,7896	186,5991	121,1212	12,7569	1,318691	0,558856	2,9893	1930,760	5,168	4,621	1,322	4,66	127,6	1,5	0,571	0,023
13	(1935)	DEC.	7,037 P	186,558	120,365	12,753	1,3266	0,5569	2,99	1935,930	5,18	4,623	1,329	4,66	126,8	1,4	0,571	0,023
14	(1941)	FEB.	12,605 P	186,6818	121,0280	12,7261	1,33004	0,55591	2,995	1941,117	5,183	4,621	1,333	4,66	127,5	1,5	0,571	0,023
15	1946 III	JULY	2,3436	190,8549	119,4163	12,4310	1,393315	0,542233	3,0437	1946,499	5,310	4,597	1,402	4,69	130,0	2,3	0,571	0,024
16	1951 VIII	OCT.	25,323 P	190,9927	119,3820	12,4327	1,391232	0,542620	3,0417	1951,814	5,305	4,592	1,400	4,69	130,1	2,4	0,571	0,024
17	1957 II	FEB.	4,9492 P	191,0129	119,2780	12,4701	1,36947	0,547576	3,027	1957,097	5,267	4,582	1,378	4,68	130,0	2,4	0,571	0,023
18	1962 VI	MAY	12,3900 EP	191,0331	119,2737	12,4817	1,364177	0,548895	3,0241	1962,360	5,259	4,581	1,373	4,68	130,1	2,4	0,571	0,023
19A	1967	AUG.	14,1830 EP	190,9587	119,2687	12,4738	1,366769	0,548307	3,0259	1967,616	5,264	4,584	1,376	4,68	129,9	2,4	0,571	0,023
19B	1967	AUG.	14,2489 E	190,9776	119,2718	12,4739	1,366512	0,548397	3,0259	1967,617	5,264	4,583	1,375	4,69	129,9	2,4	0,571	0,023
7	P/HONDA-MRKOS-PAJDUSAKOVA																	
1	1948 XII	NOV.	17,7086 E	184,1047	233,0918	13,1632	0,559024	0,814293	3,0102	1948,882	5,223	5,401	0,559	5,46	237,1	0,9	0,497	0,016
2	1954 III	FEB.	5,1067 E	184,1410	233,0836	13,1949	0,555646	0,815126	3,0055	1954,096	5,211	5,393	0,556	5,46	237,1	0,9	0,497	0,016
3	(1959)	APR.	23,3142 EP	184,1507	233,0953	13,1806	0,556874	0,814799	3,0069	1959,307	5,214	5,395	0,558	5,46	237,1	0,9	0,497	0,016
4	1964 VII	JULY	6,9891 EP	184,1527	233,1079	13,1984	0,555687	0,815064	3,0048	1964,517	5,209	5,391	0,556	5,45	237,2	0,9	0,497	0,016

NO.	DESIGNATION	T (U,T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
8	P/DU TOIT(2)																	
1A	1945 II	APR. 18,7103		201,5217	358,8614	6,9191	1,249747	0,587519	3,0298	1945,296	5,274	4,375	1,283	4,81	20,2	2,5	0,565	0,023
1B	1945 II	APR. 18,71651E		201,5286	358,8591	6,9192	1,249772	0,587621	3,0306	1945,296	5,276	4,376	1,283	4,81	20,2	2,5	0,565	0,023
2	(1950)	JULY 30,30	P	201,591	358,821	6,907	1,2547	0,58633	3,03	1950,576	5,28	4,376	1,288	4,81	20,3	2,5	0,565	0,023
3	(1955)	NOV. 17,88	P	201,771	358,705	6,861	1,27405	0,58195	3,048	1955,878	5,321	4,386	1,308	4,82	20,3	2,5	0,565	0,023
4	(1961)	MAR. 16,884	EP	201,866	358,695	6,858	1,27534	0,58165	3,049	1961,206	5,323	4,383	1,309	4,82	20,4	2,5	0,565	0,023
5	(1966)	JULY 10,0146	EP	244,4382	315,9728	3,2236	1,197138	0,601018	3,0005	1966,521	5,198	2,588	1,522	4,80	20,4	2,9	0,566	0,023
9	P/LA HIRE																	
1	1678	AUG. 18,8149		159,5599	167,03	2,83	1,14529	0,62697	3,070	1678,632	5,379	4,517	1,174	4,99	146,6	-0,9	0,555	0,022
10	P/BARNARD(1)																	
1	1884 II	AUG. 16,9793		301,0512	6,0532	5,4691	1,279756	0,584214	3,0779	1884,629	5,400	1,558	2,902	4,88	127,2	4,7	0,563	0,023
3	(1895)	JUNE 4,0	P	300,996	6,038	5,467	1,2824	0,5837	3,08	1895,423	5,41	1,562	2,904	4,88	127,1	4,7	0,563	0,023
4	(1900)	OCT. 29,1	P	300,915	6,023	5,464	1,2863	0,5829	3,08	1900,825	5,42	1,567	2,907	4,88	127,1	4,7	0,563	0,023
11	P/SCHWASSMANN-WACHMANN(3)																	
1	1930 VI	JUNE 14,19560E		192,3276	77,0524	17,4039	1,011426	0,6726729	3,0899	1930,449	5,432	4,935	1,021	5,17	88,8	3,7	0,534	0,020
2A	(1935)	NOV. 14,674	P	192,272	77,066	17,413	1,0093	0,67297	3,09	1935,869	5,42	4,931	1,019	5,16	88,8	3,6	0,534	0,020
2B	(1935)	NOV. 14,69	P	192,2789	77,0681	17,4119	1,00946	0,67286	3,086	1935,869	5,421	4,930	1,019	5,16	88,8	3,6	0,534	0,020
3A	(1941)	APR. 17,409	P	192,3067	77,0293	17,3839	1,014477	0,671667	3,0898	1941,292	5,431	4,933	1,024	5,17	88,8	3,7	0,534	0,021
3B	(1941)	APR. 19,538	P	192,3069	77,0323	17,3834	1,0145	0,67180	3,09	1941,298	5,43	4,936	1,024	5,17	88,8	3,7	0,534	0,021
5A	(1952)	MAR. 8,914	P	192,4475	76,9673	17,3262	1,023669	0,669575	3,0980	1952,188	5,453	4,937	1,033	5,17	88,9	3,7	0,534	0,021
5B	(1952)	MAR. 13,3105	EP	192,4435	76,9699	17,3279	1,023457	0,6697807	3,0993	1952,199	5,457	4,939	1,033	5,18	88,9	3,7	0,534	0,021
6	(1957)	OCT. 12,1454	EP	193,7005	76,6451	17,0810	1,085613	0,6562217	3,1579	1957,779	5,612	4,961	1,098	5,23	89,8	3,9	0,534	0,021
12	P/NEUJMIN(2)																	
1	1916 II	MAR. 11,8155		193,7750	328,0284	10,6320	1,339829	0,566493	3,0907	1916,195	5,434	4,666	1,354	4,84	341,6	2,5	0,562	0,023
2	(1921)	AUG. 18,875	P	193,8	328,0	10,6	1,34	0,57	3,	1921,629	6,	4,712	1,354	4,89	341,6	2,5	0,560	0,023
3	1927 I	JAN. 16,2336		193,7315	328,0027	10,6325	1,338168	0,566823	3,0892	1927,041	5,429	4,666	1,352	4,84	341,5	2,5	0,563	0,023
4	(1932)	JUNE 19,63	P	193,631	327,993	10,646	1,3348	0,5649	3,07	1932,468	5,37	4,631	1,349	4,80	341,4	2,5	0,564	0,023
5A	(1937)	NOV. 21,249	P	193,679	327,624	10,624	1,33893	0,56661	3,089	1937,888	5,430	4,667	1,353	4,84	341,1	2,5	0,563	0,023
5B	(1937)	NOV. 24,580	P	193,6545	327,9662	10,6268	1,3401	0,566482	3,09	1937,898	5,44	4,669	1,354	4,84	341,4	2,5	0,562	0,023
6A	(1943)	APR. 27,8443	P	193,6394	327,9664	10,6219	1,346471	0,564919	3,0948	1943,319	5,444	4,672	1,360	4,84	341,4	2,5	0,563	0,023
6B	(1943)	MAY 1,540	P	193,6108	327,9606	10,6089	1,3469	0,5649	3,09	1943,329	5,45	4,674	1,361	4,84	341,3	2,5	0,562	0,023
7A	(1948)	OCT. 9,054	P	193,739	327,928	10,611	1,34981	0,56415	3,097	1948,774	5,450	4,671	1,364	4,84	341,4	2,5	0,563	0,023
7B	(1948)	OCT. 15,115	P	193,7059	327,9255	10,5973	1,35092	0,563990	3,098	1948,790	5,454	4,674	1,365	4,85	341,4	2,5	0,562	0,023
8A	(1954)	MAY 5,064	P	195,127	327,414	10,316	1,43207	0,547008	3,161	1954,340	5,621	4,694	1,449	4,89	342,3	2,7	0,562	0,024
8B	(1954)	MAY 6,370	P	195,172	327,363	10,333	1,43066	0,547071	3,159	1954,344	5,614	4,689	1,449	4,89	342,3	2,7	0,562	0,024
8C	(1954)	MAY 6,445	P	195,118	327,430	10,326	1,43155	0,547120	3,161	1954,344	5,620	4,694	1,449	4,89	342,3	2,7	0,562	0,024
8D	(1954)	MAY 15,432	P	195,217	327,426	10,338	1,43041	0,54790	3,164	1954,368	5,628	4,698	1,448	4,89	342,4	2,7	0,562	0,024
10	(1965)	JULY 16,5859	EP	213,6395	308,1840	5,4028	1,311949	0,577439	3,1048	1965,539	5,471	3,986	1,398	4,89	341,7	2,9	0,563	0,023
13	P/GRISCHOW																	
1	1743 I	JAN. 8,69404		7,2359	88,9800	1,8932	0,861561	0,721309	3,0915	1743,022	5,436	0,864	5,214	5,32	276,2	-0,2	0,528	0,019

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
14	P/DE VICO-SWIFT																	
1	1844 I	SEPT. 2,97789		278,9416	65,0426	2,9174	1,186317	0,617372	3,1004	1844,676	5,459	1,751	2,122	5,01	163,9	2,9	0,556	0,023
10	1894 IV	OCT. 12,70098		296,6834	49,4012	2,9694	1,391753	0,571577	3,2485	1894,781	5,855	1,741	2,943	5,11	166,1	2,7	0,557	0,024
11	(1901)	FEB. 14,2	P	324,159	25,480	3,594	1,6696	0,5157	3,45	1901,121	6,40	1,785	4,349	5,23	169,7	2,1	0,557	0,026
21	1965 VII	AUG. 23,2713	E	325,3738	24,4179	3,6066	1,624286	0,524292	3,4145	1965,643	6,309	1,729	4,355	5,20	169,8	2,0	0,557	0,026
15	P/TEMPEL-SWIFT																	
1	1869 III	NOV. 19,30926		106,1326	297,9745	5,4052	1,063662	0,657959	3,1098	1869,884	5,484	2,158	1,491	5,16	224,2	5,2	0,544	0,022
3	1880 IV	NOV. 8,49834		106,1151	297,9324	5,4028	1,067186	0,657153	3,1127	1880,858	5,492	2,163	1,496	5,16	224,1	5,2	0,544	0,022
4	(1886)		P	106,079	297,979	5,399	1,0726	0,65595	3,12		5,50	2,171	1,503	5,16	224,1	5,2	0,544	0,022
5	1891 V	NOV. 17,86894		106,6829	297,4002	5,3945	1,086416	0,652901	3,1299	1891,879	5,538	2,209	1,512	5,17	224,2	5,2	0,544	0,022
6	(1897)	JUNE 5,23	P	106,9336	297,2092	5,3938	1,08969	0,652235	3,133	1897,428	5,547	2,223	1,513	5,18	224,2	5,2	0,543	0,022
7	(1903)	JAN. 25,2	P	113,3769	271,1315	5,4462	1,150854	0,638267	3,1815	1903,065	5,675	2,525	1,504	5,21	224,6	4,9	0,544	0,022
8	1908 II	OCT. 1,37591		113,6387	290,9188	5,4448	1,153161	0,637793	3,1837	1908,752	5,681	2,538	1,504	5,21	224,7	4,9	0,544	0,022
9	(1914)	JULY 21,78	P	139,3393	264,9238	7,1428	1,23571	0,618607	3,239	1914,552	5,832	3,769	1,361	5,24	224,5	4,6	0,544	0,023
11	(1925)		P	113,960	290,581	5,522	1,1532	0,63779	3,18		5,68	2,549	1,500	5,21	224,6	5,0	0,544	0,022
12	(1932)	APR. 4,15	P	153,76	250,18	10,38	1,326	0,5958	3,3	1932,259	5,9	4,545	1,379	5,24	224,3	4,6	0,545	0,023
13	(1938)	MAY 7,63	P	161,49	241,81	13,28	1,483	0,5589	3,4	1938,347	6,2	4,919	1,511	5,24	223,8	4,2	0,545	0,024
14	(1944)	JULY 10,69	P	161,63	241,75	13,28	1,491	0,5569	3,4	1944,526	6,2	4,924	1,519	5,24	223,8	4,2	0,546	0,024
15	(1950)	SEPT. 30,10	P	163,32	240,32	13,50	1,574	0,5402	3,4	1950,745	6,3	5,024	1,598	5,27	224,1	3,8	0,546	0,025
17	(1963)	AUG. 29,0301	P	163,5005	240,3349	13,1641	1,586227	0,539643	3,4456	1963,657	6,396	5,061	1,609	5,31	224,2	3,7	0,545	0,025
16	P/DU TOIT-NEUJMIN-DELPORTE																	
1A	1941 VII	JULY 21,2136		69,3378	229,6075	3,2606	1,305019	0,583105	3,1303	1941,552	5,539	1,713	2,601	4,96	118,9	3,1	0,561	0,024
1B	1941 VII	JULY 21,2208	E	69,3394	229,6123	3,2604	1,305008	0,582987	3,1294	1941,552	5,536	1,713	2,601	4,95	118,9	3,1	0,561	0,024
2	(1947)	JAN. 14,3452	P	70,4874	228,5954	3,2134	1,33400	0,57198	3,117	1947,036	5,502	1,761	2,592	4,89	119,1	3,0	0,564	0,024
3	(1952)	SEPT. 10,3756	P	70,7901	228,3713	3,2238	1,33726	0,574945	3,146	1952,695	5,581	1,771	2,597	4,95	119,1	3,0	0,561	0,024
4	(1958)	AUG. 8,2063	P	92,1678	208,9903	2,8688	1,488309	0,544759	3,2693	1958,601	5,911	2,347	2,253	5,05	121,2	2,9	0,561	0,025
17	P/BRORSEN																	
1	1846 III	FEB. 25,869		13,8017	104,1251	30,9169	0,650130	0,793068	3,1418	1846,154	5,569	0,659	5,072	5,63	296,0	7,0	0,476	0,015
2	(1851)	NOV. 10,838	P	13,5948	103,9459	30,9724	0,651738	0,795904	3,1933	1851,859	5,707	0,659	5,169	5,73	295,7	6,9	0,471	0,015
3	1857 II	MAR. 29,7458		14,0199	103,0524	29,8006	0,620513	0,801757	3,1301	1857,242	5,538	0,629	5,033	5,64	295,3	6,9	0,476	0,015
5	1868 I	APR. 17,9222		14,8220	102,3333	29,3707	0,597034	0,807973	3,1091	1868,298	5,482	0,606	4,931	5,62	295,3	7,2	0,476	0,015
6	1873 VI	OCT. 10,9786		14,8473	102,3078	29,4051	0,593777	0,808859	3,1065	1873,777	5,475	0,603	4,924	5,62	295,3	7,2	0,476	0,015
7	1879 I	MAR. 31,0348		14,9356	102,2788	29,3833	0,589842	0,809842	3,1019	1879,245	5,463	0,599	4,908	5,61	295,4	7,3	0,476	0,015
8	(1884)	SEPT. 15,0	P	14,946	102,295	29,385				1884,709					295,4	7,3		
9A	(1890)	FEB. 24,36	P	14,911	102,291	29,396	0,589873	0,80970	3,0997	1890,151	5,458	0,599	4,907	5,61	295,4	7,3	0,476	0,015
9B	(1890)	FEB. 24,6	P	14,943	102,281	29,399	0,5878	0,8103	3,09	1890,151	5,45	0,597	4,901	5,61	295,4	7,3	0,476	0,015
23	1967	SEPT. 6,4614	EP	18,0391	98,1828	24,1059	0,531497	0,828730	3,1033	1967,680	5,467	0,544	4,585	5,68	294,7	7,3	0,475	0,015
18	P/BROOKS(1)																	
1	1886 IV	JUNE 7,18459		176,8314	54,3439	12,7281	1,327733	0,578739	3,1518	1886,432	5,596	4,965	1,328	4,98	51,3	0,7	0,556	0,023
19	P/LEXELL																	
1	1770 I	AUG. 14,04086		224,8586	133,9261	1,5566	0,674449	0,786119	3,1534	1770,618	5,599	2,721	0,774	5,63	178,8	1,1	0,502	0,018

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L		B	C	DC
20	P/PONS-WINNECKE																		
1	1819 III	JULY 19,40021		161,5808	114,9231	10,7047	0,773639	0,755190	3,1602	1819,545	5,618	4,789	0,791	5,55	96,8	-	3,4	0,509	0,019
8	1858 II	MAY 2,53917		162,1641	114,7723	10,7971	0,768951	0,754858	3,1368	1858,334	5,556	4,795	0,785	5,50	97,2	-	3,3	0,512	0,019
10	1869 I	JUNE 30,44327		162,4181	114,6352	10,8003	0,781518	0,751928	3,1504	1869,496	5,592	4,835	0,798	5,52	97,3	-	3,2	0,512	0,019
11	1875 I	MAR. 12,60046		165,1789	112,4975	11,2807	0,829043	0,740998	3,2009	1875,194	5,727	5,088	0,841	5,57	97,9	-	2,9	0,512	0,019
12	(1880)	DEC. 4,8	P	165,2461	112,4545	11,2779	0,830571	0,740607	3,2019	1880,931	5,729	5,094	0,842	5,57	97,9	-	2,9	0,512	0,019
13	1886 VI	SEPT. 4,88532		172,0646	104,9343	14,5251	0,885494	0,726178	3,2338	1886,678	5,816	5,444	0,889	5,58	97,2	-	1,9	0,512	0,019
14	1892 IV	JULY 1,38781		172,1368	104,8863	14,5234	0,886554	0,725991	3,2355	1892,503	5,820	5,449	0,890	5,58	97,3	-	1,9	0,512	0,019
15	1898 II	MAR. 20,892		173,3751	101,5675	16,9908	0,924121	0,714762	3,2398	1898,218	5,832	5,464	0,927	5,56	95,2	-	1,9	0,513	0,019
16	(1904)	JAN. 21,24	P	170,139	104,847	16,997	0,9234	0,7149	3,24	1904,056	5,83	5,356	0,929	5,55	95,4	-	2,9	0,513	0,019
17	1909 II	OCT. 9,52345	P	172,2759	99,9124	18,2814	0,972519	0,701897	3,2624	1909,771	5,893	5,436	0,976	5,55	92,6	-	2,4	0,514	0,020
18	1915 III	SEPT. 1,51015	P	172,3444	99,8600	18,2949	0,971644	0,701439	3,2544	1915,666	5,871	5,424	0,975	5,54	92,6	-	2,4	0,514	0,020
19	1921 III	JUNE 13,42766		170,2769	98,5328	18,9416	1,040900	0,686240	3,3175	1921,448	6,043	5,424	1,047	5,59	89,3	-	3,1	0,514	0,021
20	1927 VII	JUNE 21,07452		170,3936	98,4572	18,9476	1,039228	0,685636	3,3058	1927,467	6,011	5,407	1,045	5,57	89,4	-	3,1	0,515	0,021
21	1933 II	MAY 18,3030		169,2628	96,8574	20,1334	1,101956	0,669599	3,3352	1933,377	6,091	5,378	1,109	5,57	86,8	-	3,7	0,516	0,021
22	1939 V	JUNE 22,71288		169,3489	96,7978	20,1228	1,101475	0,669681	3,3346	1939,472	6,089	5,379	1,109	5,57	86,8	-	3,6	0,516	0,021
23	1945 IV	JULY 10,5854		170,1081	94,4551	21,6938	1,159230	0,654913	3,3592	1945,523	6,157	5,407	1,166	5,56	85,3	-	3,6	0,516	0,021
24A	1951 VI	SEPT. 8,6114		170,2266	94,4012	21,6809	1,160607	0,6532457	3,3471	1951,686	6,124	5,386	1,167	5,53	85,3	-	3,6	0,517	0,021
24B	1951 VI	SEPT. 8,6143		170,2051	94,4026	21,6903	1,160455	0,654531	3,3591	1951,686	6,157	5,408	1,167	5,56	85,3	-	3,6	0,516	0,021
25	(1957)	NOV. 22,744	P	171,9848	92,9026	22,3467	1,22807	0,638396	3,396	1957,893	6,259	5,469	1,233	5,56	85,5	-	3,0	0,517	0,022
26	1964 I	MAR. 23,2565	P	172,0173	92,8783	22,3264	1,230110	0,639244	3,4098	1964,227	6,297	5,495	1,235	5,59	85,5	-	3,0	0,516	0,022
21	P/KULIN																		
1	1939 VIII	OCT. 3,5212		292,7546	137,6336	4,8020	1,749439	0,447694	3,1675	1939,754	5,638	2,159	3,063	4,59	250,5		4,4	0,583	0,026
2	(1945)	MAY 27,551	P	293,098	137,392	4,789	1,7534	0,44717	3,17	1945,402	5,65	2,159	3,077	4,59	250,6		4,4	0,583	0,026
3	(1951)	MAR. 19,7	P	300,607	131,667	5,045	1,8713	0,42193	3,24	1951,212	5,82	2,190	3,389	4,60	252,4		4,3	0,583	0,027
4	(1957)	JAN. 11,5	P	301,025	131,607	5,050	1,8763	0,41915	3,23	1957,029	5,81	2,189	3,397	4,58	252,7		4,3	0,584	0,027
5	(1963)	JAN. 11,56	P	314,522	122,625	5,681	1,90938	0,40967	3,234	1963,029	5,817	2,091	3,776	4,56	257,3		4,0	0,584	0,027
22	P/TEMPEL(1)																		
1	1867 II	MAY 24,42448		135,1027	102,2183	6,4075	1,563547	0,509712	3,1890	1867,393	5,695	3,694	1,734	4,81	57,5	-	4,5	0,571	0,025
2	1873 I	MAY 10,29375		159,3773	79,7467	9,7672	1,771171	0,462621	3,2959	1873,356	5,984	4,569	1,808	4,82	59,4	-	3,4	0,571	0,026
3	1879 III	MAY 7,62	P	159,5476	79,7029	9,7679	1,771115	0,462551	3,2954	1879,347	5,982	4,572	1,807	4,82	59,5	-	3,4	0,571	0,026
4A	(1885)	SEPT. 24,42	P	168,7189	73,4266	10,8063	2,068838	0,406054	3,4832	1885,732	6,501	4,834	2,080	4,89	62,3	-	2,1	0,570	0,028
4B	(1885)	SEPT. 26,30	P	169,005	73,267	10,843	2,0736	0,40504	3,49	1885,737	6,51	4,837	2,085	4,89	62,5	-	2,1	0,570	0,028
5A	(1892)	MAR. 30,69	P	168,8428	73,3821	10,8026	2,072828	0,405261	3,4853	1892,249	6,507	4,835	2,084	4,89	62,4	-	2,1	0,570	0,028
5B	(1892)	APR. 4,04	P	169,009	73,333	10,842	2,0741	0,40514	3,49	1892,261	6,51	4,839	2,085	4,89	62,5	-	2,1	0,570	0,028
6A	(1898)	OCT. 4,47	P	168,7017	73,2924	10,7885	2,091137	0,401943	3,4966	1898,759	6,538	4,839	2,103	4,90	62,2	-	2,1	0,570	0,028
6B	(1898)	OCT. 4,47	P	168,7035	73,3057	10,7866	2,090944	0,402216	3,4978	1898,759	6,542	4,842	2,103	4,90	62,2	-	2,1	0,570	0,028
17A	1967	JAN. 11,5996	EP	179,1392	68,3687	10,5366	1,503830	0,517859	3,1191	1967,029	5,509	4,734	1,504	4,73	67,5	-	0,2	0,571	0,024
17B	1967	JAN. 12,54454	EP	179,1254	68,3722	10,5379	1,502971	0,517998	3,1182	1967,032	5,506	4,733	1,503	4,73	67,5	-	0,2	0,571	0,024
23	P/PIGOTT																		
1	1783	NOV. 20,43036		354,6428	57,9866	45,1249	1,459289	0,552456	3,2607	1783,887	5,888	1,462	5,035	5,06	234,2		3,8	0,488	0,018
24	P/TUTTLE-GIACOBINI-KRESAK																		
1	1858 III	MAY 3,44706		25,6490	176,6745	19,2563	1,145554	0,653750	3,3085	1858,336	6,018	1,192	4,613	5,47	21,1	-	8,2	0,521	0,021
10	1907 III	MAY 28,78563		35,9895	168,4073	13,5600	1,147310	0,554236	2,5738	1907,403	4,129	1,231	3,233	4,00	23,6	-	7,9	0,607	0,021
14	(1928)	NOV. 17,27	P	35,319	166,028	14,052	1,1370	0,62815	3,06	1928,881	5,35	1,224	3,798	4,98	20,5	-	8,1	0,549	0,022
15	(1934)	MAR. 21,31	P	35,260	166,050	14,066	1,1323	0,62923	3,05	1934,217	5,34	1,219	3,794	4,98	20,5	-	8,1	0,549	0,022
16	(1939)	FEB. 9,2	P	37,860	167,497	13,772	1,1579	0,60166	2,91	1939,107	4,96	1,257	3,533	4,66	24,6	-	8,4	0,567	0,022

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	H	C	DC
24	P/TUTTLE-GIACOBINI-KRESAK	(CONTINUED)																
18	1951 IV	MAY 9,3714		37,9425	165,6358	13,7929	1,116522	0,640888	3,1091	1951.351	5,482	1,217	3,704	5,10	22,8	8,4	0,543	0,022
19	(1956)	OCT. 30,648	P	37,927	165,635	13,783	1,11834	0,64045	3,110	1956.833	5,486	1,219	3,708	5,10	22,8	8,4	0,543	0,022
20	1962 V	APR. 23,8771	E	38,0051	165,5742	13,7608	1,122519	0,638959	3,1091	1962,309	5,482	1,224	3,705	5,09	22,8	8,4	0,544	0,022
21	1967	NOV. 5,49282	EP	38,6135	165,2536	13,6147	1,148956	0,633712	3,1368	1967,845	5,556	1,255	3,718	5,12	23,1	8,4	0,543	0,022
25	P/TAYLOR																	
1-1	1916 IA	JAN. 31,4066		354,8038	114,3677	15,5223	1,558006	0,54625	3,4336	1916,084	6,363	1,560	5,283	5,31	289,4	1,4	0,544	0,025
1-2	1916 IB	JAN. 31,4168		354,8138	114,3636	15,5259	1,558005	0,54647	3,4353	1916,084	6,367	1,560	5,286	5,31	289,4	1,4	0,544	0,025
2	(1922)	JUNE 13,7	P	354,832	114,363	15,526	1,5579	0,54646	3,43	1922,448	6,37	1,560	5,286	5,31	289,4	1,4	0,544	0,025
3A	(1928)	OCT. 22,38	P	355,537	108,555	20,747	1,83234	0,48738	3,574	1928,809	6,758	1,834	5,301	5,32	284,4	1,6	0,542	0,026
3B	(1928)	OCT. 25,1	P	355,39	108,47	21,17	1,8457	0,4853	3,59	1928,817	6,79	1,848	5,310	5,33	284,2	1,7	0,541	0,026
4	(1935)	AUG. 1,449	P	355,678	108,514	20,730	1,8390	0,48632	3,58	1935,581	6,77	1,841	5,307	5,32	284,5	1,5	0,542	0,026
5	(1942)	MAY 10,425	P	355,627	108,507	20,731	1,8460	0,48530	3,59	1942,354	6,79	1,848	5,313	5,33	284,4	1,5	0,542	0,026
7A	(1955)	DEC. 16,20	P	355,678	108,525	20,727	1,84404	0,48525	3,582	1955,956	6,781	1,846	5,307	5,32	284,5	1,5	0,542	0,026
7B	(1955)	DEC. 19,330	P	355,20	108,40	21,15	1,85408	0,48327	3,588	1955,964	6,797	1,856	5,305	5,32	283,9	1,7	0,541	0,026
26	P/SPITALER																	
1	1890 VII	OCT. 27,0222		13,3479	45,8933	12,8402	1,817331	0,471296	3,4373	1890,820	6,373	1,833	4,938	5,06	238,9	2,9	0,560	0,026
3A	(1903) EP= 1901	JAN. 19.5	P	17,572	44,906	12,004	2,00469	0,44068	3,585		6,789	2,034	4,983	5,17	242,1	3,6	0,559	0,027
3B	(1903)	DEC. 12,4	P	19,09	42,94	11,56	2,0493	0,4302	3,59	1903,944	6,82	2,084	4,939	5,14	241,7	3,8	0,561	0,028
4	(1910)	OCT. 14,5	P	19,232	42,907	11,543	2,095	0,4287	3,7	1910,784	7,0	2,131	5,029	5,24	241,8	3,8	0,559	0,028
27	P/HARRINGTON-WILSON																	
1	1951 IX	OCT. 30,370		342,989	127,834	16,375	1,66524	0,51597	3,440	1951,827	6,382	1,690	4,983	5,22	291,5	4,7	0,549	0,025
2A	(1958)	MAR. 20,942	P	343,162	127,775	16,380	1,66566	0,51580	3,440	1958,217	6,381	1,690	4,987	5,21	291,6	4,7	0,549	0,025
2B	(1958)	MAR. 21,19	P	343,1362	127,7735	16,3794	1,66527	0,51605	3,441	1958,217	6,383	1,690	4,988	5,22	291,6	4,7	0,549	0,025
3	(1964)	OCT. 1,70595	EP	346,3093	123,7462	18,4270	1,858203	0,477060	3,5534	1964,754	6,699	1,875	5,116	5,25	290,7	4,3	0,548	0,026
28	P/FORBES																	
1	1929 II	JUNE 26,0463		259,5099	25,7661	4,6393	1,528364	0,555822	3,4409	1929,483	6,383	2,646	2,159	5,35	105,2	4,6	0,549	0,025
2A	(1935)	NOV. 15,214	P	259,571	25,641	4,629	1,53950	0,55370	3,449	1935,871	6,407	2,658	2,174	5,36	105,2	4,6	0,549	0,025
2B	(1935)	NOV. 15,676	P	259,587	25,635	4,629	1,5398	0,55362	3,45	1935,872	6,41	2,658	2,175	5,36	105,2	4,6	0,549	0,025
2C	(1935)	NOV. 16,000	P	259,6012	25,6402	4,6289	1,53957	0,553755	3,450	1935,873	6,409	2,658	2,175	5,36	105,2	4,6	0,549	0,025
3A	1942 III	APR. 16,264	P	259,624	25,599	4,624	1,5482	0,55215	3,46	1942,288	6,43	2,668	2,186	5,37	105,2	4,5	0,549	0,025
3B	1942 III	APR. 16,9025	P	259,6206	25,5961	4,6236	1,548684	0,55205	3,4573	1942,290	6,429	2,669	2,186	5,37	105,2	4,5	0,549	0,025
3C	1942 III	APR. 17,758	P	259,6339	25,6022	4,6242	1,54843	0,55218	3,458	1942,292	6,429	2,669	2,186	5,37	105,2	4,5	0,549	0,025
4A	1948 VIII	SEPT. 16,1176	P	259,741	25,445	4,621	1,545187	0,552735	3,4547	1948,711	6,422	2,661	2,184	5,36	105,2	4,5	0,549	0,025
4B	1948 VIII	SEPT. 16,1212	E	259,7387	25,4443	4,6207	1,545253	0,552716	3,4547	1948,711	6,422	2,661	2,184	5,36	105,2	4,5	0,549	0,025
5	(1955)	FEB. 18,607	P	259,6984	25,4409	4,6186	1,55259	0,551417	3,461	1955,133	6,439	2,672	2,193	5,37	105,1	4,5	0,549	0,025
6	1961 VI	JULY 24,7622	E	259,7187	25,4012	4,6212	1,544685	0,553016	3,4558	1961,562	6,425	2,662	2,183	5,37	105,1	4,5	0,549	0,025
7	1967	DEC. 23,7124	EP	259,7974	25,2954	4,6250	1,541024	0,553671	3,4527	1967,977	6,416	2,655	2,180	5,36	105,1	4,6	0,549	0,025
29	P/D'ARREST																	
1	1851 II	JULY 9,1740		174,5396	149,7621	13,9081	1,173308	0,659282	3,4436	1851,518	6,391	5,664	1,175	5,71	144,5	1,3	0,519	0,022
2	1857 VII	NOV. 28,6879		174,6205	149,7183	13,9241	1,169991	0,659865	3,4398	1857,909	6,379	5,661	1,172	5,71	144,5	1,3	0,519	0,022
4	1870 III	SEPT. 23,1795		172,2872	147,5232	15,6489	1,279997	0,635021	3,5070	1870,727	6,568	5,645	1,285	5,73	140,1	2,1	0,521	0,023
5	1877 IV	MAY 10,9799		173,0239	147,1167	15,7122	1,318122	0,627809	3,5415	1877,358	6,665	5,694	1,322	5,76	140,4	1,9	0,521	0,023
6	(1884)	JAN. 15,09	P	173,079	147,085	15,688	1,3265	0,6263	3,55	1884,042	6,69	5,703	1,330	5,77	140,4	1,9	0,521	0,023

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
29	P/D'ARREST			(CONTINUED)														
7	1890 V	SEPT. 17,98667	P	172,9806	147,1004	15,7044	1,324042	0,627125	3,5509	1890,714	6,692	5,706	1,328	5,78	140,3 - 1,9		0,520	0,023
8	1897 II	MAY 24,28091		173,0303	147,1071	15,7031	1,326997	0,626113	3,5492	1897,395	6,687	5,701	1,331	5,77	140,4 - 1,9		0,521	0,023
10	1910 IV	SEPT. 16,90600		173,7981	146,9219	15,7865	1,270024	0,636915	3,4979	1910,708	6,542	5,668	1,273	5,73	140,9 - 1,7		0,520	0,023
11	(1917)	APR. 3,32	P	173,789	147,086	15,801	1,26674	0,637460	3,494	1917,253	6,532	5,663	1,269	5,72	141,1 - 1,7		0,520	0,023
12	1923 II	SEPT. 14,62	P	174,1262	143,8823	18,0603	1,35245	0,616911	3,530	1923,702	6,634	5,660	1,355	5,71	138,3 - 1,8		0,521	0,023
13	(1930)	MAY 10,037	P	174,132	143,820	18,055	1,35895	0,61556	3,535	1930,353	6,646	5,663	1,362	5,71	138,2 - 1,8		0,521	0,023
14	(1937)	JAN. 6,528	P	174,2865	143,9304	18,0485	1,3754	0,61240	3,55	1937,016	6,68	5,677	1,378	5,72	138,5 - 1,8		0,521	0,023
15	1943 III	SEPT. 23,774	P	174,4003	143,2693	18,0114	1,385798	0,610627	3,5591	1943,727	6,715	5,689	1,388	5,73	137,9 - 1,7		0,521	0,023
16	1950 II	JUNE 6,5946	P	174,4318	143,6137	18,0545	1,377873	0,612275	3,5537	1950,429	6,699	5,687	1,380	5,73	138,3 - 1,7		0,521	0,023
17A	(1957)	FEB. 13,0223	P	174,4250	143,6418	18,0499	1,376557	0,612428	3,5517	1957,119	6,694	5,684	1,379	5,73	138,3 - 1,7		0,521	0,023
17B	(1957)	FEB. 13,0914	P	174,4262	143,6406	18,0495	1,37654	0,612453	3,552	1957,119	6,694	5,685	1,379	5,73	138,3 - 1,7		0,521	0,023
18	1963 VII	OCT. 22,5968	EP	174,5130	143,6059	18,0790	1,369486	0,613599	3,5442	1963,806	6,673	5,678	1,372	5,72	138,4 - 1,7		0,521	0,023
30	P/SCHWASSMANN-WACHMANN(2)																	
0	(1920)	MAY 9,56	P	335,462	126,681	0,710	3,553848	0,19707	4,4261	1920,356	9,312	3,607	5,183	5,29	282,1	0,3	0,573	0,034
1	1929 I	MAR. 23,1300		357,7120	126,3273	3,7284	2,090521	0,394547	3,4528	1929,223	6,416	2,091	4,813	4,82	304,0	0,1	0,577	0,028
2	1935 III	AUG. 28,5958		357,9869	126,2902	3,7286	2,094675	0,393868	3,4558	1935,655	6,425	2,095	4,815	4,82	304,3	0,1	0,577	0,028
3	1942 I	FEB. 13,76080	P	358,0084	126,0433	3,7252	2,143815	0,385449	3,4884	1942,119	6,516	2,144	4,831	4,83	304,1	0,1	0,576	0,028
4A	1948 VII	AUG. 23,577	P	358,1003	126,0201	3,7239	2,152365	0,383651	3,4921	1948,647	6,526	2,153	4,830	4,83	304,1	0,1	0,577	0,028
4B	1948 VII	AUG. 23,6215	P	358,1140	126,0114	3,7237	2,151956	0,383775	3,4922	1948,647	6,526	2,152	4,831	4,83	304,1	0,1	0,577	0,028
5A	1955 I	FEB. 27,2926	P	357,8555	126,0080	3,7250	2,150081	0,384536	3,4934	1955,157	6,529	2,150	4,835	4,84	303,9	0,1	0,576	0,028
5B	1955 I	FEB. 27,1929	E	357,8692	126,0108	3,7252	2,150373	0,384269	3,4924	1955,156	6,527	2,151	4,832	4,83	303,9	0,1	0,576	0,028
6A	1961 VII	SEPT. 5,0462	E	357,6958	125,9997	3,7236	2,157268	0,382862	3,4956	1961,678	6,536	2,158	4,832	4,83	303,7	0,1	0,576	0,028
6B	1961 VII	SEPT. 5,47079	EP	357,7413	126,0055	3,7236	2,156881	0,382774	3,4945	1961,679	6,533	2,157	4,829	4,83	303,8	0,1	0,577	0,028
7	1968	MAR. 14,3201	EP	357,6658	125,9934	3,7267	2,147446	0,384415	3,4885	1968,203	6,516	2,148	4,827	4,83	303,7	0,2	0,577	0,028
31	P/PERRINE-MRKOS																	
1	1896 VII	NOV. 25,1285		163,8742	247,3438	13,6695	1,110235	0,679280	3,4617	1896,904	6,441	5,366	1,128	5,81	231,7 - 3,8		0,511	0,022
2	(1903)	APR. 27,14	P	166,706	243,017	15,686	1,1663	0,6606	3,44	1903,317	6,37	5,424	1,179	5,71	230,2 - 3,6		0,515	0,022
3A	1909 III	NOV. 1,31		166,824	242,915	15,694	1,173088	0,66417	3,4931	1909,833	6,529	5,525	1,186	5,81	230,2 - 3,5		0,511	0,022
3B	1909 III	NOV. 1,328		166,8421	242,8844	15,6736	1,17274	0,661702	3,467	1909,833	6,455	5,479	1,185	5,76	230,2 - 3,5		0,513	0,022
4	(1916)	MAY 22,5	P	167,159	242,735	15,726	1,19163	0,66055	3,510	1916,391	6,578	5,559	1,204	5,83	230,4 - 3,5		0,512	0,022
5A	(1922)	DEC. 23,8	P	167,175	242,736	15,699	1,19881	0,65925	3,518	1922,977	6,599	5,569	1,211	5,84	230,4 - 3,4		0,512	0,022
5B	(1922)	DEC. 25,7	P	167,2409	242,7118	15,7079	1,19824	0,659484	3,519	1922,982	6,601	5,573	1,210	5,84	230,4 - 3,4		0,511	0,022
6A	(1929)	JULY 24,752	P	167,184	242,739	15,727	1,1937	0,66015	3,51	1929,561	6,58	5,562	1,206	5,83	230,4 - 3,4		0,512	0,022
6B	(1929)	JULY 25,9	P	167,187	242,739	15,728	1,19394	0,66012	3,513	1929,564	6,584	5,563	1,206	5,83	230,4 - 3,4		0,512	0,022
7	(1936)	FEB. 23,1	P	167,148	242,774	15,719	1,19567	0,65976	3,514	1936,147	6,588	5,563	1,208	5,83	230,4 - 3,5		0,512	0,022
8	(1942)	SEPT. 21,946	P	167,208	242,728	15,754	1,18850	0,66100	3,506	1942,723	6,565	5,554	1,200	5,82	230,4 - 3,4		0,512	0,022
9	(1949)	APR. 5,6	P	167,684	242,635	15,861	1,15676	0,66703	3,474	1949,259	6,476	5,536	1,168	5,79	230,8 - 3,3		0,511	0,022
10	1955 VII	SEPT. 27,3506		167,7804	242,5630	15,8799	1,154032	0,667499	3,4708	1955,737	6,466	5,536	1,165	5,79	230,8 - 3,3		0,511	0,022
11A	1962 I	FEB. 11,254	P	165,9483	240,2791	17,7418	1,267619	0,643534	3,5561	1962,113	6,706	5,545	1,283	5,84	226,9 - 4,2		0,511	0,022
11B	1962 I	FEB. 13,76341	EP	166,0364	240,2105	17,7520	1,270554	0,642837	3,5574	1962,120	6,709	5,549	1,285	5,84	226,9 - 4,2		0,511	0,022
32	P/DANIEL																	
1	1909 IV	NOV. 29,2313		3,4995	71,5407	19,4506	1,381771	0,602502	3,4762	1909,909	6,481	1,383	5,555	5,57	254,8 - 1,2		0,525	0,023
2	(1916)	MAY 22,258	P	3,541	71,534	19,446			3,47490	1916,390	6,478				254,9 - 1,2			
4	(1930)	APR. 7,516	P	6,091	70,479	19,839	1,5331	0,57361	3,59	1930,264	6,82	1,536	5,615	5,66	256,2 - 2,1		0,526	0,024
5	1937 I	JAN. 28,586	P	6,016	70,491	19,825	1,53639	0,572977	3,598	1937,076	6,825	1,539	5,618	5,66	256,2 - 2,0		0,526	0,024
6	1943 IV	NOV. 22,5086		6,1035	70,4328	19,8461	1,526564	0,574673	3,5892	1943,891	6,799	1,529	5,609	5,65	256,2 - 2,1		0,526	0,024
7A	1950 V	AUG. 23,9163	E	7,2520	69,7465	19,7009	1,464704	0,586295	3,5405	1950,643	6,662	1,469	5,553	5,62	256,6 - 2,4		0,526	0,024

NO.	DESIGNATION	T (U,T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
32	P/DANIEL			.(CONTINUED)														
7B	1950 V	AUG. 24,3105	P	7,2430	69,7359	19,7121	1.46496	0,586267	3,541	1950,645	6,663	1,469	5,554	5,62	256,6 - 2,4		0,526	0,024
8	(1957)	APR. 25,384	P	7,3610	69,6691	19,7125	1,4640	0,58661	3,54	1957,314	6,66	1,468	5,554	5,62	256,6 - 2,5		0,526	0,024
9	1964 II	APR. 21,7218	EP	10,9725	68,5178	20,1356	1,661188	0,550038	3,6918	1964,308	7,094	1,672	5,597	5,72	258,8 - 3,8		0,526	0,025
33	P/GIACOBINI-ZINNER																	
1	1900 III	NOV. 28,53067		171,1003	197,4066	29,8427	0,931852	0,733117	3,4916	1900,908	6,525	5,858	0,937	6,05	189,7 - 4,4		0,472	0,018
3	1913 V	NOV. 2,57185		171,4909	196,3929	30,7222	0,975900	0,720106	3,4867	1913,837	6,511	5,832	0,980	5,99	189,1 - 4,3		0,474	0,018
5	1926 VI	DEC. 7,91	P	171,7333	196,2802	30,7177	0,99371	0,716806	3,509	1926,933	6,573	5,869	0,998	6,02	189,2 - 4,2		0,474	0,018
6	1933 III	JULY 15,1466		171,7698	196,2433	30,6839	0,999516	0,716002	3,5194	1933,535	6,603	5,887	1,004	6,04	189,2 - 4,2		0,473	0,018
7A	1940 I	FEB. 17,1387	P	171,8313	196,2144	30,7544	0,99547	0,716728	3,514	1940,131	6,588	5,882	0,999	6,03	189,2 - 4,2		0,473	0,018
7B	1940 I	FEB. 17,2080		171,7917	196,2495	30,7412	0,995638	0,716660	3,5139	1940,131	6,587	5,879	0,999	6,03	189,2 - 4,2		0,473	0,018
8	1946 V	SEPT. 18,4865		171,8109	196,2932	30,7268	0,995707	0,716675	3,5144	1946,713	6,589	5,881	0,999	6,03	189,2 - 4,2		0,473	0,018
9A	(1953)	APR. 17,0169	P	171,9085	196,2307	30,8277	0,98867	0,717920	3,505	1953,291	6,562	5,872	0,993	6,02	189,3 - 4,1		0,473	0,018
9B	(1953)	APR. 19,17	P	171,9007	196,2389	30,8289	0,98833	0,718119	3,506	1953,297	6,566	5,875	0,992	6,02	189,3 - 4,1		0,473	0,018
10A	1959 VIII	OCT. 25,8195	P	172,8903	196,0197	30,9123	0,93614	0,723841	3,389	1959,815	6,242	5,728	0,939	5,84	189,9 - 3,6		0,478	0,018
10B	1959 VIII	OCT. 26,9182	E	172,8433	196,0298	30,9038	0,935951	0,728934	3,4529	1959,818	6,416	5,847	0,939	5,97	189,9 - 3,7		0,473	0,018
11	1966	MAR. 28,19683	EP	172,9171	195,9672	30,9430	0,933530	0,729424	3,4502	1966,237	6,409	5,847	0,937	5,97	189,9 - 3,6		0,473	0,018
34	P/KOPFF																	
1	1906 IV	MAY 3,1489		19,7409	264,3297	8,7125	1,698431	0,516525	3,5129	1906,334	6,585	1,733	5,013	5,33	103,9 - 2,9		0,551	0,026
3	1919 I	JUNE 28,7098		19,7039	264,2736	8,6917	1,706526	0,514209	3,5129	1919,488	6,584	1,741	5,009	5,32	103,8 - 2,9		0,551	0,026
4	1926 II	JAN. 28,3869		19,6565	264,2510	8,7067	1,698059	0,516293	3,5105	1926,075	6,578	1,732	5,011	5,32	103,7 - 2,9		0,551	0,026
5	1932 III	AUG. 21,4108		19,7178	264,2057	8,7062	1,688183	0,518130	3,5034	1932,640	6,558	1,723	5,003	5,32	103,7 - 2,9		0,551	0,026
6	1939 II	MAR. 12,4118	P	19,8054	264,1534	8,7160	1,68459	0,51908	3,503	1939,192	6,556	1,719	5,002	5,32	103,7 - 2,9		0,551	0,026
7A	1945 V	AUG. 11,2676		31,5393	253,1185	7,2228	1,495675	0,556076	3,3692	1945,609	6,185	1,579	4,424	5,24	104,5 - 3,8		0,551	0,025
7B	1945 V	AUG. 11,27532		31,5472	253,0430	7,2239	1,49574	0,556325	3,371	1945,609	6,190	1,579	4,426	5,25	104,4 - 3,8		0,551	0,025
8A	1951 VII	OCT. 20,3975		31,7353	253,0186	7,2202	1,494908	0,556224	3,3686	1951,800	6,183	1,579	4,415	5,24	104,6 - 3,8		0,551	0,025
8B	1951 VII	OCT. 20,4242	P	31,7118	253,0354	7,2218	1,49491	0,556072	3,367	1951,800	6,179	1,579	4,414	5,24	104,5 - 3,8		0,551	0,025
9A	1958 I	JAN. 20,077	P	161,7203	120,9975	4,7078	1,516199	0,556223	3,4166	1958,053	6,315	5,001	1,544	5,32	102,8 - 1,5		0,551	0,025
9B	1958 I	JAN. 20,4590	E	161,8079	120,9117	4,7066	1,517654	0,555526	3,4145	1958,054	6,309	4,999	1,545	5,31	102,8 - 1,5		0,551	0,025
10A	1964 III	MAY 16,0384	EP	161,9253	120,8694	4,7075	1,519635	0,555014	3,4150	1964,374	6,311	5,003	1,547	5,31	102,9 - 1,5		0,551	0,025
10B	1964 III	MAY 18,84674	EP	161,9367	120,8888	4,7080	1,519660	0,555366	3,4178	1964,382	6,319	5,008	1,547	5,32	102,9 - 1,5		0,551	0,025
35	P/REINMUTH(2)																	
1	1947 VII	AUG. 19,5152	E	43,9357	297,3662	7,1260	1,866590	0,468921	3,5147	1947,631	6,589	2,049	4,139	5,16	161,1 - 4,9		0,560	0,027
2	1954 VI	MAR. 27,0663	E	44,2512	297,2072	7,1168	1,868117	0,468543	3,5151	1954,233	6,591	2,054	4,129	5,16	161,2 - 4,9		0,560	0,027
3	1960 IX	NOV. 24,8138	E	45,4870	296,1761	6,9908	1,932493	0,456843	3,5579	1960,902	6,711	2,132	4,142	5,18	161,4 - 4,9		0,561	0,027
4	1967	AUG. 18,24057	EP	45,6380	296,0950	6,9797	1,942058	0,455450	3,5664	1967,628	6,735	2,144	4,147	5,19	161,5 - 4,9		0,560	0,027
36	P/TSUCHINSHAN(1)																	
0	(1958)	JUNE 7,723		26,26	99,44	12,25	1,6858	0,5456	3,71	1958,432	7,15	1,749	5,102	5,73	305,2 - 5,4		0,536	0,026
1	1965 I	JAN. 28,6527	E	22,6388	96,2436	10,5284	1,486273	0,578298	3,5245	1965,077	6,617	1,529	5,031	5,56	298,5 - 4,0		0,538	0,025
37	P/BARNARD(3)																	
1	1892 V	DEC. 11,00272		169,8807	207,2515	31,3053	1,434085	0,593813	3,5306	1892,948	6,634	5,502	1,442	5,63	198,6 - 5,2		0,499	0,021

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	OC
38	**P/GIACOBINI**																	
1	1896 V	OCT. 28.5313		140.5171	194.1918	11.3552	1.454712	0.588479	3.5349	1896.829	6.647	4.234	1.589	5.62	155.3	-7.2	0.534	0.024
3	(1909)	DEC. 19.86	P	140.5941	194.1636	11.3516	1.45710	0.584702	3.509	1909.966	6.572	4.212	1.591	5.56	155.3	-7.2	0.536	0.024
6	(1929)	SEPT. 24.75	P	142.4239	192.8681	11.8771	1.37494	0.60254	3.459	1929.731	6.434	4.217	1.491	5.54	155.9	-7.2	0.533	0.024
39	**P/FINLAY**																	
1	1886 VII	NOV. 22.6882		315.2285	53.2400	3.0324	0.997551	0.717865	3.5357	1886.894	6.649	1.135	3.495	6.07	188.5	2.1	0.503	0.021
2	1893 III	JULY 12.6755	P	315.3510	53.1376	3.0378	0.989138	0.719506	3.5264	1893.530	6.622	1.125	3.484	6.06	188.5	2.1	0.503	0.021
4	1906 V	SEPT. 7.7844	P	315.8968	52.8996	3.0544	0.965030	0.724048	3.4971	1906.683	6.540	1.095	3.466	6.03	188.8	2.1	0.503	0.021
5	(1913)	FEB. 6.50	P	318.465	47.180	3.388	1.00755	0.71547	3.541	1913.100	6.664	1.126	3.722	6.07	185.7	2.2	0.503	0.022
6	1919 II	OCT. 15.9727		318.2378	47.2769	3.3969	1.012825	0.714945	3.5531	1919.787	6.698	1.133	3.722	6.09	185.6	2.3	0.503	0.022
7	1926 V	AUG. 7.2	P	320.6208	45.5944	3.4353	1.058065	0.706490	3.6049	1926.597	6.845	1.168	3.978	6.15	186.3	2.2	0.503	0.022
8	(1933)	JUNE 19.8	P	320.602	45.621	3.430	1.0658	0.70532	3.62	1933.466	6.88	1.176	3.995	6.17	186.3	2.2	0.503	0.022
9	(1940)	APR. 20.02	P	320.969	45.419	3.454	1.0485	0.70927	3.61	1940.303	6.85	1.156	3.991	6.16	186.4	2.2	0.502	0.022
11	1953 VII	DEC. 25.8725	E	321.0836	45.3897	3.4401	1.048942	0.708045	3.5928	1953.984	6.810	1.155	3.989	6.14	186.5	2.2	0.503	0.022
12	1960 VIII	SEPT. 1.10085	E	321.6120	42.0583	3.6446	1.077209	0.702663	3.6229	1960.670	6.896	1.183	4.083	6.17	183.7	2.3	0.504	0.022
13	1967	JULY 30.69799	P	321.6894	41.9977	3.6422	1.080423	0.702172	3.6277	1967.577	6.909	1.186	4.096	6.17	183.7	2.3	0.504	0.022
40	**P/SCHORR**																	
1	1918 III	SEPT. 29.1031		278.6743	118.3305	5.5821	1.882253	0.470759	3.5565	1918.742	6.707	2.565	2.979	5.23	217.0	5.5	0.560	0.027
2	(1925)	MAY 27.90	P	279.541	117.537	5.620	1.8269	0.4809	3.52	1925.403	6.60	2.506	2.939	5.21	217.1	5.5	0.560	0.027
3	(1932)	JAN. 6.247	P	279.718	117.462	5.622	1.8254	0.48109	3.52	1932.016	6.59	2.501	2.943	5.21	217.2	5.5	0.560	0.027
4	(1938)	NOV. 30.407	P	291.756	106.864	5.649	2.0443	0.44219	3.66	1938.913	7.02	2.533	3.526	5.29	218.7	5.2	0.561	0.028
41	**P/WIRTANEN**																	
1	1947 XIII	DEC. 2.9327	E	343.5197	86.5103	13.3565	1.634961	0.540484	3.5580	1947.919	6.712	1.659	5.228	5.48	250.5	3.8	0.542	0.025
2A	1954 XI	AUG. 13.4891		343.5094	86.4859	13.3766	1.625131	0.542058	3.5488	1954.615	6.686	1.649	5.218	5.47	250.4	3.8	0.542	0.025
2B	1954 XI	AUG. 13.5070	E	343.5226	86.4858	13.3772	1.625239	0.542070	3.5491	1954.615	6.686	1.649	5.219	5.47	250.4	3.8	0.542	0.025
3	1961 IV	APR. 15.3005	EP	343.5033	86.4674	13.3896	1.618046	0.543319	3.5431	1961.287	6.669	1.642	5.213	5.47	250.4	3.8	0.542	0.025
4A	1967	DEC. 15.9387	EP	343.6076	86.4257	13.4007	1.6117496	0.5443729	3.53743	1967.955	6.653	1.635	5.210	5.46	250.5	3.8	0.542	0.025
4B	1967	DEC. 18.2679	P	343.5954	86.4152	13.4092	1.614509	0.5438301	3.5393	1967.962	6.659	1.638	5.211	5.46	250.4	3.8	0.542	0.025
42	**P/AREND-RIGAUX**																	
1	1950 VII	DEC. 18.9235		326.2709	124.7144	17.1898	1.386497	0.610388	3.5587	1950.964	6.713	1.481	4.535	5.73	272.2	9.4	0.523	0.024
2A	1957 VII	SEPT. 6.5957	E	326.4219	124.6105	17.1972	1.385986	0.610353	3.5570	1957.682	6.709	1.479	4.541	5.73	272.2	9.4	0.523	0.024
2B	1957 VII	SEPT. 8.29	EP	326.405	124.648	17.199	1.38539	0.61070	3.559	1957.686	6.713	1.479	4.542	5.73	272.3	9.4	0.523	0.024
3A	1964 V	JUNE 3.3952	EP	328.8645	121.6119	17.8527	1.436796	0.600193	3.5937	1964.425	6.813	1.519	4.728	5.75	271.7	9.1	0.523	0.024
3B	1964 V	JUNE 4.4110	EP	328.8913	121.5999	17.8492	1.437111	0.600216	3.5947	1964.427	6.816	1.519	4.731	5.75	271.7	9.1	0.523	0.024
43	**P/BIELA**																	
1	1772	FEB. 17.1553		212.9700	259.8208	17.0501	0.98603	0.72451	3.579	1772.132	6.772	4.336	1.058	6.17	291.6	9.2	0.488	0.020
6	1806 I	JAN. 3.765		218.0981	253.3995	13.6015	0.906417	0.745696	3.5643	1806.008	6.729	3.829	0.997	6.22	290.7	8.3	0.485	0.019
9	1826 I	MAR. 18.9466		218.2899	253.2522	13.5618	0.902419	0.746601	3.5613	1826.211	6.721	3.807	0.994	6.22	290.8	8.4	0.485	0.019
10	1832 III	NOV. 26.6169		221.6872	249.9513	13.2214	0.879086	0.751448	3.5368	1832.907	6.652	3.509	0.986	6.19	290.9	8.7	0.485	0.019
12-1	1846 II	FEB. 11.4932		223.0842	247.4143	12.5774	0.856446	0.756663	3.5196	1846.114	6.603	3.363	0.969	6.18	289.8	8.6	0.485	0.019
12-2	1846 II	FEB. 11.5752		223.0839	247.4148	12.5779	0.856465	0.756606	3.5188	1846.115	6.601	3.363	0.969	6.18	289.8	8.6	0.485	0.019
13-1	1852 III	SEPT. 24.2274		223.2245	247.2803	12.5506	0.860502	0.755922	3.5259	1852.734	6.621	3.364	0.974	6.19	289.8	8.6	0.485	0.019
13-2	1852 III	SEPT. 23.5567		223.2237	247.2809	12.5515	0.860618	0.755866	3.5252	1852.732	6.619	3.364	0.974	6.19	289.8	8.6	0.485	0.019
14	(1859)	MAY 23.88	P	223.7666	247.0589	12.3916	0.873379	0.753546	3.5438	1859.392	6.671	3.359	0.992	6.21	290.2	8.5	0.485	0.019

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
43	P/BIELA			(CONTINUED)														
15A	(1866)	JAN. 26.1	P	223.90	245.77	12.37	0.8792	0.7524	3.55	1866.069	6.69	3.365	0.999	6.22	288.9	8.5	0.485	0.019
15B	(1866)	JAN. 26.88	P	223.8697	246.9647	12.3639	0.882543	0.751525	3.5518	1866.072	6.694	3.374	1.003	6.22	290.2	8.5	0.485	0.019
16A	(1872)	SEPT. 30.5	P	223.85	247.02	12.38	0.8733	0.7535	3.54	1872.752	6.67	3.354	0.992	6.21	290.2	8.5	0.485	0.019
16B	(1872)	OCT. 6.9	P	223.874	246.971	12.364	0.87911	0.75249	3.552	1872.769	6.694	3.367	0.999	6.22	290.2	8.5	0.485	0.019
17	(1879)	MAY 31.4	P	224.16	246.80	12.36	0.8692	0.7543	3.54	1879.413	6.65	3.323	0.989	6.21	290.3	8.6	0.485	0.019
18	(1886)	JUNE 23.1	P	224.23	246.73	12.37	0.8653	0.7550	3.53	1886.476	6.64	3.308	0.985	6.19	290.3	8.6	0.485	0.019
19	(1892)	AUG. 29.1	P	228.16	241.99	11.87	0.8592	0.7569	3.53	1892.663	6.64	3.049	1.003	6.21	289.5	8.8	0.485	0.019
20	(1899)	APR. 23.3	P	228.31	241.85	11.85	0.8601	0.7568	3.54	1899.309	6.65	3.042	1.005	6.21	289.5	8.8	0.484	0.019
21	(1905)	NOV. 21.8	P	234.76	234.15	9.77	0.8278	0.7648	3.52	1905.889	6.60	2.615	1.014	6.21	288.5	7.9	0.484	0.019
22	(1912)	JULY 4.1	P	234.91	234.02	9.75	0.8329	0.7648	3.54	1912.508	6.66	2.623	1.021	6.25	288.5	7.9	0.483	0.019
23	(1919)	FEB. 18.1	P	235.11	233.95	9.72	0.8340	0.7636	3.53	1919.131	6.63	2.611	1.024	6.22	288.7	7.9	0.484	0.019
24	(1925)	OCT. 4.9	P	235.01	233.93	9.74	0.8371	0.7630	3.53	1925.759	6.64	2.624	1.027	6.23	288.5	7.9	0.484	0.019
25	(1932)	MAY 23.0	P	235.03	233.92	9.75	0.8313	0.7641	3.52	1932.393	6.62	2.609	1.019	6.22	288.6	7.9	0.484	0.019
26	(1938)	DEC. 29.0	P	236.08	233.07	9.73	0.8200	0.7663	3.51	1938.991	6.57	2.530	1.015	6.19	288.8	8.1	0.484	0.019
27	(1945)	JULY 23.8	P	236.21	232.94	9.73	0.8162	0.7671	3.50	1945.559	6.56	2.515	1.011	6.19	288.8	8.1	0.484	0.019
28	(1952)	JAN. 18.5	P	240.97	227.20	9.40	0.8157	0.7678	3.51	1952.049	6.58	2.298	1.051	6.21	287.8	8.2	0.484	0.019
30	(1965)	JUNE 19.6856	EP	254.4807	214.0187	7.6177	0.836724	0.764548	3.5537	1965.466	6.699	1.856	1.226	6.27	288.4	7.3	0.484	0.019
44	P/WOLF																	
1	1884 III	NOV. 18.28312		172.6951	207.2965	25.2534	1.571970	0.560927	3.5802	1884.885	6.775	5.531	1.577	5.59	200.7 - 3.1		0.517	0.023
2	1891 II	SEPT. 4.93038		172.7968	207.2038	25.2361	1.592779	0.557197	3.5970	1891.677	6.825	5.546	1.597	5.60	200.7 - 3.1		0.517	0.023
3	1898 IV	JULY 5.06294		172.8671	207.1896	25.1989	1.603046	0.555334	3.6051	1898.509	6.845	5.553	1.607	5.61	200.7 - 3.0		0.517	0.023
4A	(1905)	MAY 4.66	P	172.8218	207.1853	25.2375	1.59492	0.55656	3.597	1905.339	6.821	5.544	1.599	5.59	200.7 - 3.1		0.517	0.023
4B	(1905)	MAY 4.7	P	172.8357	207.1889	25.2389	1.595268	0.556534	3.5973	1905.339	6.823	5.545	1.599	5.59	200.7 - 3.0		0.517	0.023
5	1912 I	FEB. 24.25722		172.8317	207.1955	25.2621	1.587170	0.557977	3.5907	1912.149	6.804	5.539	1.592	5.59	200.7 - 3.1		0.517	0.023
6	1918 V	DEC. 13.98881		172.9342	207.1349	25.2888	1.582288	0.558646	3.5851	1918.949	6.788	5.535	1.587	5.59	200.7 - 3.0		0.517	0.023
7	1925 X	NOV. 7.96414		160.7368	204.4458	27.2981	2.434730	0.405238	4.0936	1925.852	8.263	5.541	2.475	5.75	187.2 - 8.7		0.520	0.027
8	1934 I	FEB. 28.26219		160.8109	204.4099	27.2634	2.450265	0.403667	4.1089	1934.159	8.329	5.558	2.490	5.77	187.2 - 8.7		0.519	0.027
9	1942 VI	JUNE 23.56252		160.9685	204.3420	27.3031	2.437385	0.404776	4.0949	1942.475	8.287	5.546	2.476	5.75	187.3 - 8.6		0.520	0.027
10	1950 VI	OCT. 23.6522		161.1456	203.8793	27.3162	2.497584	0.396372	4.1376	1950.809	8.417	5.581	2.536	5.78	187.0 - 8.5		0.520	0.027
11	1959 II	MAR. 21.8244	P	161.0779	203.9045	27.2975	2.506895	0.394754	4.1419	1959.218	8.429	5.580	2.546	5.78	186.9 - 8.6		0.520	0.027
12A	1967	AUG. 30.09927	EP	161.2520	203.7989	27.3069	2.5060374	0.3949156	4.14163	1967.660	8.429	5.584	2.544	5.78	187.0 - 8.5		0.520	0.027
12B	1967	AUG. 30.2056	EP	161.2522	203.7992	27.3068	2.506097	0.394915	4.1417	1967.660	8.429	5.584	2.544	5.78	187.0 - 8.5		0.520	0.027
45	P/TSUCHINSHAN(2)																	
1	1965 II	FEB. 9.18413	E	202.9407	287.7209	6.7400	1.769542	0.5067291	3.5874	1965.109	6.795	4.999	1.818	5.41	310.5	2.6	0.551	0.027
46	P/JOHNSON																	
1	1949 II	SEPT. 16.5095		206.1319	118.1859	13.8722	2.248076	0.377412	3.6109	1949.709	6.862	4.683	2.313	4.97	143.7	6.1	0.566	0.028
2	1956 V	JULY 26.8755		206.0061	118.1667	13.8575	2.258835	0.375438	3.6167	1956.571	6.878	4.689	2.323	4.97	143.5	6.0	0.566	0.028
3A	1963 IV	JUNE 6.4392	EP	205.9284	118.1619	13.8712	2.247234	0.377099	3.6077	1963.428	6.853	4.683	2.311	4.97	143.4	6.0	0.566	0.028
3B	1963 IV	JUNE 9.372	EP	206.035	118.155	13.868	2.24728	0.37748	3.609	1963.436	6.859	4.684	2.312	4.97	143.5	6.0	0.566	0.028
47	P/HOLMES																	
1	1892 III	JUNE 13.89048		14.2861	332.5032	20.7947	2.140739	0.409532	3.6255	1892.455	6.903	2.160	5.003	5.11	165.9 - 5.0		0.548	0.026
2	1899 II	APR. 28.59850		14.0890	332.4367	20.8087	2.128154	0.411336	3.6152	1899.323	6.874	2.147	4.997	5.10	165.6 - 4.9		0.548	0.026
3	1906 III	MAR. 14.74607		14.3049	332.3742	20.8209	2.121406	0.412280	3.6096	1906.199	6.858	2.141	4.989	5.09	165.8 - 5.0		0.548	0.026
4	(1913)	JULY 12.92419	P	21.801	330.109	19.581	2.3422	0.37944	3.77	1913.528	7.33	2.389	4.988	5.21	170.8 - 7.1		0.548	0.028
6	(1928)	MAR. 24.06	P	21.804	330.069	19.569	2.3442	0.37965	3.78	1928.229	7.35	2.391	4.995	5.21	170.7 - 7.1		0.548	0.028
7	(1935)	JULY 11.20	P	21.579	329.817	19.589	2.3180	0.38362	3.76	1935.523	7.29	2.364	4.986	5.20	170.3 - 7.1		0.548	0.028

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(0)	Q	L	B	C	DC
47	P/HOLMES			(CONTINUED)														
11	1964 X	NOV. 15,3632	EP	21,8401	329,5502	19,5128	2,347144	0,378833	3,7786	1964,876	7,345	2,394	4,992	5,21	170,2	7,1	0,548	0,028
48	P/BORRELLY																	
1	1905 II	JAN. 17,2916		352,3488	77,3822	30,4845	1,395356	0,615235	3,6265	1905,045	6,906	1,400	5,775	5,86	250,8	3,9	0,496	0,021
2	1911 VIII	DEC. 18,4887		352,3734	77,3757	30,4417	1,402659	0,614076	3,6345	1911,961	6,929	1,407	5,785	5,87	250,8	3,9	0,496	0,022
3	1918 IV	NOV. 17,0895		352,3966	77,3689	30,4911	1,395754	0,615118	3,6264	1918,876	6,906	1,400	5,776	5,86	250,8	3,8	0,496	0,021
4	1925 VIII	OCT. 7,606		352,4313	77,3784	30,5113	1,388149	0,616450	3,6192	1925,766	6,886	1,393	5,769	5,85	250,8	3,8	0,496	0,021
5	1932 IV	AUG. 27,8156	P	352,5571	77,3093	30,5299	1,385457	0,616807	3,6156	1932,658	6,875	1,389	5,767	5,85	250,9	3,8	0,496	0,021
6	(1939)	JUNE 10,195	P	350,856	76,212	31,096	1,4514	0,60561	3,68	1939,438	7,06	1,458	5,796	5,91	248,4	4,7	0,494	0,022
7	(1946)	JUNE 12,065	P	350,9144	76,1825	31,0739	1,446892	0,605066	3,6636	1946,444	7,013	1,454	5,769	5,88	248,4	4,7	0,495	0,022
8A	1953 IV	JUNE 8,7304		350,7279	76,2147	31,1125	1,448467	0,604383	3,6613	1953,436	7,006	1,456	5,759	5,87	248,3	4,8	0,496	0,022
8B	1953 IV	JUNE 11,924	P	350,935	76,178	31,088	1,4493	0,60435	3,66	1953,444	7,01	1,456	5,767	5,88	248,4	4,7	0,495	0,022
9	1960 V	JUNE 12,5582	P	350,7521	76,2312	31,0894	1,452474	0,603854	3,6665	1960,449	7,021	1,459	5,766	5,88	248,3	4,8	0,495	0,022
10	1967	JUNE 13,4666	P	351,0346	76,1368	31,1151	1,446540	0,6045537	3,6579	1967,461	6,997	1,453	5,762	5,87	248,4	4,6	0,496	0,022
49	P/HARRINGTON																	
1	1953 VI	SEPT. 22,1260	E	219,3599	136,6222	11,6011	1,694011	0,535980	3,6507	1953,724	6,976	4,443	1,839	5,61	175,4	7,3	0,541	0,026
2	1960 VII	JUNE 28,354	EP	232,7977	119,1646	8,6842	1,582423	0,559229	3,5901	1960,493	6,803	3,728	1,844	5,59	171,6	6,9	0,541	0,026
3A	1967	APR. 23,4239	EP	232,9806	119,0831	8,6805	1,5875367	0,5584420	3,59531	1967,308	6,817	3,727	1,852	5,60	171,7	6,9	0,541	0,026
3B	1967	APR. 23,4835	EP	232,9781	119,0607	8,6805	1,5874485	0,5584733	3,59536	1967,308	6,818	3,727	1,851	5,60	171,7	6,9	0,541	0,026
50	P/BROOKS(2)																	
1	1889 V	SEPT. 30,84784		343,6349	18,7914	6,0757	1,949857	0,470812	3,6846	1889,749	7,073	1,975	5,231	5,42	182,5	1,7	0,555	0,028
2	1896 VI	NOV. 4,63525		343,8213	18,7417	6,0654	1,959219	0,469461	3,6929	1896,848	7,097	1,984	5,243	5,43	182,6	1,7	0,555	0,028
3	1903 V	DEC. 6,74613		343,6467	18,7321	6,0677	1,958905	0,469757	3,6944	1903,929	7,101	1,985	5,242	5,43	182,5	1,7	0,555	0,028
4	1911 I	JAN. 8,62998		343,5166	18,7534	6,0637	1,963069	0,468835	3,6958	1911,019	7,105	1,989	5,238	5,43	182,4	1,7	0,555	0,028
5	(1918)	FEB. 16,08	P	343,5344	18,7578	6,0641	1,966301	0,468875	3,7021	1918,126	7,126	1,992	5,248	5,44	182,4	1,7	0,555	0,028
6	1925 IX	NOV. 1,81142		195,7028	177,7703	5,5499	1,861649	0,487300	3,6311	1925,835	6,919	5,215	1,885	5,40	193,4	1,5	0,554	0,027
7	1932 VIII	OCT. 9,52707		195,8327	177,6973	5,5448	1,869997	0,486088	3,6387	1932,775	6,941	5,220	1,893	5,41	193,5	1,5	0,554	0,027
8	1939 VII	SEPT. 15,41545		195,6864	177,7019	5,5456	1,871490	0,486038	3,6413	1939,704	6,949	5,227	1,895	5,41	193,3	1,5	0,554	0,027
9	1946 IV	AUG. 25,7931		195,6078	177,6957	5,5393	1,878849	0,484597	3,6454	1946,649	6,960	5,231	1,902	5,41	193,2	1,5	0,554	0,027
10	1953 V	AUG. 7,36162		195,6918	177,6806	5,5509	1,866110	0,486654	3,6352	1953,599	6,931	5,219	1,889	5,40	193,3	1,5	0,554	0,027
11	1960 VI	JUNE 17,3132	P	197,1018	176,8906	5,5713	1,763116	0,504884	3,5610	1960,463	6,720	5,128	1,789	5,36	193,9	1,6	0,554	0,027
12A	1967	MAR. 11,29911	EP	197,2560	176,8178	5,5725	1,76315	0,5048891	3,561	1967,189	6,720	5,124	1,790	5,36	193,9	1,7	0,554	0,027
12B	1967	MAR. 11,421	EP	197,2563	176,8251	5,5729	1,76307	0,504895	3,561	1967,190	6,720	5,124	1,790	5,36	194,0	1,7	0,554	0,027
51	P/HARRINGTON-ABELL																	
1	1954 XIII	DEC. 13,1469	E	338,3479	145,9131	16,8168	1,777389	0,523438	3,7296	1954,948	7,203	1,822	5,273	5,68	305,1	6,1	0,534	0,026
2	1962 II	FEB. 23,76136	E	338,0034	145,9532	16,8154	1,781213	0,522935	3,7337	1962,148	7,215	1,827	5,266	5,69	304,8	6,2	0,534	0,026
52	P/SWIFT(2)																	
1	1895 II	AUG. 21,3160		167,7778	171,0665	3,0003	1,298019	0,652492	3,7352	1895,637	7,219	5,920	1,309	6,17	158,9	0,6	0,514	0,024
2	(1902)	NOV. 7,9	P	167,9899	170,9449	3,0054	1,30472	0,650987	3,738	1902,850	7,228	5,929	1,316	6,17	158,9	0,6	0,514	0,024
11	1967	SEPT. 10,40	EP	187,387	145,757	8,765	1,3339	0,6413	3,72	1967,691	7,17	6,014	1,338	6,10	153,1	1,1	0,516	0,024

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
53	P/REINMUTH(1)																	
1	1928 I	JAN. 31.07272		8.6670	125.2267	8.0606	1.86036	0.502786	3.742	1928.084	7.238	1.867	5.559	5.62	313.8	-1.2	0.547	0.027
2A	1935 II	APR. 29.8733		8.7885	125.1723	8.0613	1.855808	0.503718	3.7394	1935.325	7.231	1.863	5.557	5.62	313.9	-1.2	0.547	0.027
2B	1935 II	APR. 29.9138		8.8114	125.1674	8.0641	1.855797	0.503853	3.7404	1935.325	7.234	1.863	5.558	5.63	313.9	-1.2	0.547	0.027
3A	(1942)	SEPT. 20.408	P	12.6848	123.6594	8.3932	2.02525	0.47845	3.883	1942.719	7.652	2.041	5.615	5.74	316.2	-1.8	0.546	0.028
3B	(1942)	DEC. 5.341	P	12.1716	123.7794	8.3597	2.011943	0.48307	3.8921	1942.926	7.679	2.027	5.653	5.77	315.8	-1.8	0.545	0.028
4	1950 IV	JULY 23.7442	P	12.8760	123.5994	8.3896	2.037299	0.476943	3.8949	1950.558	7.687	2.054	5.624	5.75	316.3	-1.9	0.546	0.028
5	1958 II	MAR. 26.0329	E	12.9129	123.5597	8.4031	2.027779	0.477938	3.8842	1958.231	7.655	2.044	5.611	5.74	316.3	-1.9	0.547	0.028
6	1965 V	AUG. 7.9967	EP	9.3915	121.1529	8.3036	1.983256	0.486872	3.8650	1965.601	7.599	1.992	5.675	5.75	310.4	-1.4	0.546	0.028
54	P/SCHAJN-SCHALDACH																	
1	1949 VI	NOV. 26.9055	E	215.2968	167.3944	6.1530	2.234134	0.405164	3.7559	1949.904	7.279	4.690	2.359	5.28	202.5	3.6	0.563	0.029
2A	(1957)	MAR. 15.307	P	215.5151	167.3092	6.1471	2.24582	0.403325	3.764	1957.202	7.303	4.692	2.373	5.28	202.7	3.6	0.563	0.029
2B	(1957)	MAR. 17.7204	P	215.5634	167.3103	6.1463	2.245838	0.403604	3.7657	1957.208	7.308	4.693	2.373	5.29	202.7	3.6	0.563	0.029
3	(1964)	JUNE 25.8842	EP	215.3276	167.3315	6.1509	2.238068	0.404631	3.7591	1964.486	7.289	4.693	2.363	5.28	202.5	3.6	0.563	0.029
55	P/DENNING(2)																	
1	1894 I	FEB. 9.95360		46.3229	45.0784	5.5294	1.147195	0.698400	3.8037	1894.111	7.419	1.314	3.764	6.46	311.3	-3.9	0.497	0.023
56	P/FAYE																	
1	1843 III	OCT. 17.6302		200.0239	211.0134	11.3644	1.692232	0.555830	3.8099	1843.793	7.437	5.511	1.729	5.93	230.7	3.9	0.529	0.026
2	1851 I	APR. 2.4367		200.1450	210.9363	11.3502	1.699879	0.554895	3.8191	1851.251	7.464	5.517	1.738	5.94	230.7	3.9	0.529	0.026
3	1858 V	SEPT. 13.3727		200.1374	210.9024	11.3600	1.694078	0.555789	3.8137	1858.700	7.448	5.512	1.732	5.93	230.7	3.9	0.529	0.026
4	1866 II	FEB. 14.4735		200.2055	210.9071	11.3603	1.682139	0.557546	3.8018	1866.123	7.413	5.495	1.720	5.92	230.7	3.9	0.529	0.026
5	1873 III	JULY 18.9867		200.3675	210.7968	11.3555	1.682555	0.557383	3.8014	1873.547	7.412	5.488	1.721	5.92	230.8	3.9	0.529	0.026
6	1881 I	JAN. 23.1653	P	201.1954	210.5945	11.3204	1.738140	0.549017	3.8541	1881.063	7.567	5.516	1.781	5.97	231.4	4.1	0.529	0.026
7	1888 IV	AUG. 20.44	P							1888.639								
8	1896 II	MAR. 19.7628		201.1954	210.5945	11.3203	1.740096	0.549017	3.8585	1896.219	7.579	5.522	1.783	5.98	231.4	4.1	0.529	0.026
9	(1903)	JUNE 4.11	P	198.962	207.141	10.619	1.64972	0.56516	3.794	1903.421	7.389	5.547	1.683	5.94	225.8	3.4	0.529	0.026
10	1910 V	NOV. 1.9616		199.2723	206.8106	10.5892	1.655222	0.565604	3.8104	1910.834	7.438	5.559	1.689	5.97	225.8	3.5	0.528	0.026
11	(1918)	FEB. 10.2	P	199.828	206.714	10.516	1.64274	0.56206	3.751	1918.109	7.265	5.445	1.679	5.86	226.2	3.5	0.531	0.026
12	1925 V	AUG. 6.66	P	199.7114	206.5878	10.6058	1.61373	0.571545	3.766	1925.596	7.309	5.489	1.649	5.92	225.9	3.6	0.529	0.026
13	1932 IX	DEC. 6.2290	E	200.0644	206.4209	10.5813	1.619993	0.570435	3.7712	1932.933	7.324	5.481	1.657	5.92	226.2	3.6	0.529	0.026
14	1940 II	APR. 24.9478	E	200.5373	206.3732	10.5518	1.653689	0.565230	3.8036	1940.316	7.418	5.499	1.693	5.95	226.6	3.7	0.529	0.026
15	1947 IX	SEPT. 28.4169	E	200.5309	206.3512	10.5335	1.663249	0.563718	3.8123	1947.739	7.444	5.509	1.702	5.96	226.6	3.7	0.529	0.026
16	1955 II	MAR. 4.6669	E	200.5817	206.3124	10.5537	1.651831	0.565405	3.8009	1955.171	7.410	5.494	1.691	5.95	226.6	3.7	0.529	0.026
17	1962 VII	MAY 14.7304	EP	203.5602	199.1227	9.0942	1.608086	0.575727	3.7902	1962.367	7.379	5.365	1.659	5.97	222.4	3.6	0.528	0.026
57	P/ASHBROOK-JACKSON																	
1	1948 IX	OCT. 4.7793	E	348.9042	2.3412	12.5132	2.311017	0.395537	3.8233	1948.762	7.476	2.323	5.271	5.34	171.5	2.4	0.556	0.029
2A	1956 II	APR. 5.596	P	349.0793	2.3024	12.4922	2.32441	0.393761	3.834	1956.264	7.508	2.336	5.282	5.34	171.6	2.3	0.556	0.029
2B	1956 II	APR. 5.5718	P	349.0818	2.3022	12.4919	2.32441	0.393768	3.834	1956.263	7.508	2.336	5.282	5.34	171.6	2.3	0.556	0.029
2C	1956 II	APR. 6.262	P	349.080	2.294	12.493	2.32072	0.394781	3.835	1956.265	7.509	2.333	5.286	5.35	171.6	2.3	0.556	0.029
3	1963 VI	OCT. 2.0038	EP	348.9686	2.2807	12.5081	2.314135	0.395639	3.8291	1963.750	7.493	2.326	5.280	5.34	171.5	2.4	0.556	0.029
58	P/WHIPPLE																	
1	1933 IV	AUG. 1.40362		190.5488	188.8008	10.2129	2.496945	0.348118	3.8304	1933.582	7.497	5.118	2.508	5.16	199.2	1.9	0.565	0.029
2A	1941 III	JAN. 13.3	P	190.1661	188.8258	10.2253	2.48244	0.350843	3.824	1941.034	7.478	5.122	2.493	5.17	198.8	1.8	0.565	0.029
2B	1941 III	JAN. 22.691	P	190.468	188.814	10.223	2.4848	0.34995	3.82	1941.060	7.47	5.114	2.496	5.16	199.1	1.8	0.565	0.029

NO.	DESIGNATION	T (U,T.)			ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
58	P/WHIPPLE				(CONTINUED)														
3	1948 VI	JUNE	25.7933		190.1272	188.5978	10.2474	2.448965	0.355569	3.8002	1948.486	7.408	5.108	2.459	5.15	198.6	1.8	0.565	0.029
4	1955 VIII	NOV.	29.6926		190.4345	188.5091	10.2507	2.449952	0.355800	3.8031	1955.911	7.417	5.109	2.461	5.16	198.8	1.8	0.565	0.029
5	1963 II	APR.	29.6142	EP	189.9843	188.3910	10.2444	2.471245	0.352831	3.8185	1963.325	7.462	5.124	2.481	5.17	198.2	1.8	0.565	0.029
59	P/WOLF-HARRINGTON																		
1A	1924 IV	DEC.	30.6002		176.5087	260.5614	23.9915	2.44213	0.371397	3.885	1924.999	7.658	5.322	2.443	5.33	257.4	-1.4	0.536	0.027
1B	1925	JAN.	5.0216		178.2885	260.6659	23.7356	2.42863	0.365456	3.827	1925.011	7.488	5.225	2.429	5.23	259.1	-0.7	0.539	0.027
1C	1925	JAN.	10.9570		180.0919	260.6754	23.6779	2.427978	0.371169	3.8611	1925.028	7.587	5.294	2.428	5.29	260.8	0.0	0.538	0.027
2A	(1932)	JUNE	26.58	P	177.914	260.603	23.807	2.4753	0.35152	3.82	1932.488	7.46	5.157	2.476	5.16	258.7	-0.8	0.541	0.027
2B	(1932)	JULY	14.	P	177.467	260.652	23.775	2.4322	0.36714	3.84	1932.535	7.53	5.251	2.433	5.25	258.3	-1.0	0.538	0.027
3A	(1939)	SEPT.	14.64	P	183.880	257.487	22.807	1.9221	0.45942	3.56	1939.703	6.70	5.179	1.923	5.19	261.1	1.5	0.539	0.025
3B	(1939)	SEPT.	19.94	P	183.808	257.719	22.922	1.9586	0.45199	3.57	1939.717	6.76	5.180	1.959	5.19	261.2	1.5	0.539	0.025
4	(1946)	JUNE	4.720	P	184.051	257.432	22.790	1.9277	0.45862	3.56	1946.424	6.72	5.183	1.929	5.19	261.2	1.6	0.539	0.025
5A	1952 II	FEB.	6.6825		186.9033	254.2753	18.4945	1.599159	0.540813	3.4826	1952.102	6.499	5.321	1.603	5.37	260.8	2.2	0.536	0.024
5B	1952 II	FEB.	6.6834		186.9059	254.2770	18.4939	1.599111	0.540714	3.4817	1952.102	6.497	5.319	1.603	5.36	260.8	2.2	0.536	0.024
5C	1952 II	FEB.	6.6923		186.9145	254.2665	18.5000	1.599252	0.541319	3.4866	1952.102	6.511	5.328	1.603	5.37	260.8	2.2	0.536	0.024
6A	1958 V	AUG.	11.830	P	187.6288	254.2266	18.4790	1.604438	0.539881	3.4870	1958.611	6.512	5.323	1.609	5.37	260.9	2.2	0.536	0.024
6B	1958 V	AUG.	12.335	P	187.209	254.234	18.470	1.60585	0.53961	3.488	1958.612	6.515	5.324	1.610	5.37	260.9	2.2	0.536	0.024
7	1965 III	FEB.	15.359	EP	187.0249	254.2172	18.4587	1.614493	0.538115	3.4954	1965.125	6.535	5.329	1.619	5.38	260.9	2.2	0.536	0.024
60	P/AREND																		
1	1951 X	NOV.	23.4231		44.4940	357.6944	21.7004	1.821056	0.5356853	3.9220	1951.893	7.768	2.023	4.526	6.02	220.1	-15.0	0.516	0.025
2A	1959 V	SEPT.	1.6679	P	44.5378	357.6158	21.6540	1.831746	0.533958	3.9304	1959.667	7.793	2.035	4.536	6.03	220.1	-14.9	0.516	0.026
2B	1959 V	SEPT.	2.4651	P	44.6001	357.6076	21.6503	1.831613	0.5341093	3.9314	1959.669	7.795	2.036	4.534	6.03	220.1	-15.0	0.516	0.026
3	1967	JUNE	13.7111	P	44.6861	357.5262	21.6626	1.822127	0.535164	3.9199	1967.448	7.761	2.026	4.515	6.02	220.1	-15.0	0.516	0.025
61	P/METCALF																		
1	1906 VI	OCT.	10.3105		199.9894	195.1197	14.6196	1.632311	0.584003	3.9239	1906.772	7.773	5.731	1.669	6.22	214.5	4.9	0.517	0.026
3	(1922)	FEB.	18.0	P	202.65	190.57	13.53	1.5842	0.5941	3.90	1922.131	7.71	5.581	1.632	6.22	212.8	5.2	0.516	0.025
4	(1929)	NOV.	23.	P	203.07	190.13	13.47	1.5896	0.5934	3.91	1929.893	7.73	5.578	1.638	6.23	212.6	5.2	0.516	0.025
62	P/OTERMA																		
1	1942 VII	AUG.	21.7241	E	354.7890	155.1711	3.9899	3.389446	0.144443	3.9617	1942.637	7.886	3.391	4.531	4.53	329.9	0.4	0.583	0.032
2	1950 III	JULY	16.4856	E	354.7913	155.1305	3.9886	3.404682	0.142763	3.9719	1950.538	7.916	3.407	4.536	4.54	329.9	0.4	0.583	0.032
3	1958 IV	JUNE	10.5045	E	354.8723	155.1100	3.9921	3.387830	0.144497	3.9600	1958.439	7.881	3.389	4.529	4.53	329.9	0.4	0.583	0.032
63	P/SCHAUMASSE																		
1	1911 VII	NOV.	13.5595		44.1768	94.2216	17.6983	1.226263	0.695239	4.0237	1911.865	8.071	1.387	4.146	6.82	317.0	-12.2	0.481	0.023
2	1919 IV	OCT.	20.89588		45.7983	91.0428	14.7417	1.168401	0.706458	3.9804	1919.801	7.941	1.336	3.929	6.79	315.9	-10.5	0.482	0.023
3	1927 VIII	OCT.	1.3529		46.0163	90.9137	14.7191	1.172087	0.705860	3.9848	1927.748	7.955	1.342	3.922	6.79	315.9	-10.5	0.482	0.023
4	(1935)	SEPT.	13.39	P	46.217	90.736	14.708	1.1645	0.70728	3.98	1935.699	7.94	1.335	3.894	6.79	315.9	-10.6	0.482	0.022
5	1943 V	NOV.	25.8050		50.9175	86.9276	12.0818	1.202971	0.704387	4.0689	1943.899	8.208	1.419	3.688	6.93	317.2	-9.4	0.482	0.023
6	1952 III	FEB.	10.6574		51.8338	86.3808	12.0309	1.194195	0.705648	4.0570	1952.113	8.172	1.418	3.612	6.92	317.6	-9.4	0.482	0.023
7	1960 III	APR.	17.434	P	51.9509	86.2407	12.0178	1.195952	0.705395	4.0595	1960.296	8.179	1.422	3.608	6.92	317.6	-9.4	0.482	0.023
8A	1968	JULY	2.53626	EP	52.5774	85.9490	11.9345	1.201946	0.704455	4.0669	1968.505	8.202	1.435	3.582	6.93	317.9	-9.5	0.483	0.023
8B	1968	JULY	7.9682	EP	52.5491	85.9710	11.9522	1.20088	0.702462	4.036	1968.519	8.109	1.433	3.569	6.87	317.9	-9.5	0.484	0.023

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
64	P/JACKSON-NEUJMIN																	
1	1936 IV	OCT. 3,4169	E	197,3187	164,4330	13,2863	1,462608	0,650697	4,1872	1936,758	8,569	6,374	1,489	6,91	181,3	3,9	0,494	0,025
2	(1945)	APR. 25,798	P	197,4271	164,2741	13,2474	1,4723	0,64858	4,19	1945,315	8,58	6,367	1,499	6,91	181,3	3,9	0,494	0,025
3	(1953)	NOV. 14,0734	P	197,5360	164,1906	13,2900	1,455564	0,651014	4,1708	1953,869	8,518	6,337	1,483	6,89	181,3	3,9	0,494	0,025
65	P/DENNING(1)																	
1	1881 V	SEPT. 13,8129		312,5065	66,8407	6,8538	0,725276	0,828377	4,2259	1881,703	8,688	0,849	3,018	7,73	199,6	5,0	0,429	0,019
2	(1890)	MAY 19,3	P	312,6132	66,2765	6,9264	0,735874	0,826803	4,2488	1890,380	8,758	0,862	3,054	7,76	199,1	5,1	0,429	0,019
66	P/SWIFT(1)																	
1	1889 VI	NOV. 30,07222		69,7476	331,2692	10,2830	1,356304	0,684584	4,3000	1889,914	8,917	1,847	2,994	7,24	220,7	- 9,6	0,482	0,024
67	P/KEARNS-KWEE																	
1	1963 VIII	DEC. 6,9519	E	131,1739	315,4333	8,9922	2,213302	0,486666	4,3116	1963,931	8,953	4,842	2,492	6,41	266,9	- 6,8	0,533	0,029
68	P/COMAS SOLA																	
-1	(1910)	MAR. 9,97	P	45,2884	68,2953	18,1134	2,14830	0,518776	4,464	1910,186	9,433	2,390	5,138	6,78	292,1	-12,8	0,515	0,028
0	(1918)	SEPT. 15,50	P	38,3097	66,0197	13,7461	1,770105	0,575479	4,1697	1918,705	8,515	1,921	5,085	6,57	283,5	- 8,5	0,514	0,027
1	1927 III	MAR. 22,19299		38,4788	65,9308	13,7632	1,772492	0,574960	4,1702	1927,219	8,516	1,925	5,077	6,57	283,6	- 8,5	0,514	0,027
2	1935 IV	OCT. 8,383	P	38,7861	65,7081	13,7219	1,77726	0,574605	4,178	1935,767	8,539	1,933	5,069	6,58	283,7	- 8,5	0,514	0,027
3	1944 II	APR. 11,619	P	38,860	65,726	13,731	1,7657	0,57593	4,16	1944,279	8,49	1,921	5,045	6,56	283,8	- 8,6	0,514	0,027
4	1952 VII	SEPT. 10,6979	P	39,9299	62,9372	13,4608	1,766358	0,577681	4,1825	1952,696	8,554	1,931	5,003	6,59	282,1	- 8,6	0,513	0,027
5	1961 III	APR. 4,4931	EP	40,0191	62,8448	13,4411	1,777189	0,576145	4,1929	1961,257	8,586	1,944	5,013	6,61	282,1	- 8,6	0,514	0,027
69	P/VAISALA(1)																	
1	1939 IV	APR. 26,0826		44,3449	135,5634	11,2707	1,762299	0,634239	4,8182	1939,314	10,576	1,981	5,271	7,87	359,4	- 7,9	0,489	0,027
2	1949 V	NOV. 11,2782		44,3340	135,4651	11,2804	1,752058	0,635232	4,8032	1949,861	10,527	1,969	5,251	7,85	359,2	- 7,9	0,489	0,027
3	1960 IV	MAY 10,849	P	44,4458	135,4298	11,2905	1,741458	0,635817	4,7818	1960,360	10,457	1,959	5,217	7,82	359,3	- 7,9	0,489	0,027
70	P/NEUJMIN(3)																	
1	1929 III	JUNE 28,7421		140,7916	158,5006	3,6853	2,042362	0,584538	4,9159	1929,489	10,899	5,916	2,227	7,79	119,4	- 2,3	0,506	0,029
2A	(1940)	MAY 8,26	P	140,865	158,423	3,690	2,02821	0,58517	4,889	1940,353	10,811	5,887	2,211	7,75	119,3	- 2,3	0,506	0,029
2B	(1940)	MAY 14,609	P	141,0489	158,4086	3,6929	2,0247	0,58623	4,89	1940,369	10,82	5,903	2,206	7,76	119,5	- 2,3	0,506	0,029
3	1951 V	MAY 28,372	P	144,807	156,197	3,761	2,0316	0,58799	4,93	1951,403	10,95	6,210	2,179	7,83	121,1	- 2,2	0,505	0,029
4A	(1961)	DEC. 2,4735	EP	147,6522	150,6848	3,8566	1,970115	0,591002	4,8169	1961,919	10,572	6,259	2,091	7,66	118,4	- 2,1	0,505	0,029
4B	(1961)	DEC. 4,740	P	147,603	150,644	3,853	1,96873	0,59127	4,817	1961,926	10,572	6,256	2,089	7,66	118,3	- 2,1	0,505	0,029
71	P/KLEMOLA																	
1	1965 VI	AUG. 18,403	E	148,066	181,991	10,609	1,76382	0,64270	4,937	1965,629	10,969	6,374	1,875	8,11	150,5	- 5,6	0,484	0,027
72	P/GALE																	
1	1927 VI	JUNE 14,5681		209,8601	67,4033	11,6225	1,213456	0,757425	5,0024	1927,449	11,189	6,215	1,287	8,79	96,8	5,8	0,442	0,024
2	1938	JUNE 18,4733		209,1162	67,2537	11,7254	1,182888	0,760730	4,9437	1938,461	10,993	6,209	1,251	8,70	95,9	5,7	0,441	0,023

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
72	P/GALE		(CONTINUED)															
3	(1949)	APR. 25,847	P	209,995	66,079	11,466	1,15126	0,76470	4,893	1949,315	10,823	6,016	1,222	8,63	95,6	5,7	0,440	0,023
4	(1960)	JAN. 30,3523	P	209,8125	66,0474	11,4397	1,150135	0,764750	4,8889	1960,082	10,811	6,033	1,220	8,63	95,4	5,7	0,440	0,023
73	P/SLAUGHTER-BURNHAM																	
1	1958 VI	SEPT. 5,36629		44,4252	346,2406	8,1652	2,544598	0,5044450	5,1348	1958,678	11,636	2,814	5,984	7,73	210,4	- 5,7	0,520	0,032
74	P/VAN BIESBROECK																	
1	1954 IV	FEB. 20,7140	E	134,3269	148,9758	6,5907	2,414021	0,550059	5,3652	1954,139	12,428	6,078	2,703	8,32	103,5	- 4,7	0,510	0,032
2	1966	JULY 17,2558	EP	134,2332	148,8348	6,5978	2,409376	0,550441	5,3594	1966,541	12,408	6,064	2,699	8,31	103,3	- 4,7	0,510	0,032
75	P/WILD																	
1	1960 I	MAR. 17,3816	E	166,7459	359,0163	19,6897	1,927118	0,654756	5,5819	1960,211	13,188	8,793	1,948	9,24	346,5	- 4,4	0,462	0,028
76	P/PETERS																	
1	1846 VI	JUNE 1,63446		339,6023	261,8729	30,6688	1,529280	0,728604	5,6349	1846,416	13,377	1,571	8,337	9,74	64,1	10,2	0,409	0,023
77	P/TUTTLE																	
1A	1790 II	JAN. 31,36979		207,0649	270,8578	54,1094	1,044382	0,819330	5,7806	1790,085	13,899	7,027	1,099	10,52	287,5	21,6	0,305	0,013
1B	1790 II	JAN. 31,37022		207,0649	270,8578	54,1094	1,044379	0,819330	5,7806	1790,085	13,899	7,027	1,099	10,52	287,5	21,6	0,305	0,013
6	1858 I	FEB. 24,01937		206,7878	270,3437	54,4069	1,025549	0,821209	5,7360	1858,149	13,738	6,997	1,078	10,45	286,7	21,5	0,304	0,013
7	1871 III	DEC. 2,29910		206,7853	270,4104	54,2819	1,030104	0,82111	5,7583	1871,919	13,818	7,026	1,082	10,49	286,8	21,5	0,304	0,013
8	1885 IV	SEPT. 11,79274		206,7768	270,5433	54,3305	1,024731	0,82155	5,7424	1885,697	13,761	7,003	1,077	10,46	286,9	21,5	0,304	0,013
9	1899 III	MAY 5,01401		206,6445	270,5344	54,4885	1,019131	0,821712	5,7162	1899,341	13,667	6,991	1,070	10,41	286,8	21,4	0,304	0,013
10A	1912 IV	OCT. 28,97445		206,9532	270,2782	55,0485	1,030000	0,818399	5,6718	1912,828	13,508	6,924	1,083	10,31	286,5	21,8	0,304	0,012
10B	1912 IV	OCT. 29,04300		206,9494	270,2774	55,0499	1,029936	0,818528	5,6755	1912,828	13,521	6,928	1,083	10,32	286,5	21,8	0,304	0,012
11	1926 IV	APR. 27,65	P	206,9771	270,1363	54,9584	1,030619	0,818541	5,6796	1926,319	13,536	6,928	1,084	10,33	286,4	21,8	0,304	0,012
12A	1939 X	NOV. 10,08	P	206,9611	269,8431	54,6542	1,022255	0,820634	5,6993	1939,857	13,606	6,930	1,075	10,38	286,2	21,7	0,304	0,013
12B	1939 X	NOV. 10,6143		206,9578	269,8432	54,6509	1,022562	0,820593	5,6997	1939,858	13,608	6,932	1,075	10,38	286,2	21,7	0,304	0,013
13	(1953)	JULY 13,201	P	206,936	269,755	54,471	1,03019	0,82055	5,741	1953,530	13,756	6,986	1,083	10,45	286,2	21,6	0,304	0,013
14	1967	MAR. 31,2098	EP	206,9156	269,7892	54,3750	1,022932	0,821910	5,7439	1967,244	13,767	6,977	1,075	10,46	286,3	21,6	0,304	0,013
78	P/DU TOIT(1)																	
1	1944 III	JUNE 17,4951		257,0198	22,4539	18,7455	1,276941	0,788059	6,0249	1944,463	14,789	2,774	1,939	10,77	98,8	18,2	0,407	0,024
2	(1959)	APR. 10,221	P	256,987	22,188	18,714	1,29198	0,78736	6,076	1959,271	14,977	2,807	1,961	10,86	98,5	18,2	0,407	0,024
79	P/SCHWASSMANN-WACHMANN(1)																	
1A	1925 II	MAY 9,9723	E	359,3159	323,0641	9,4372	5,476948	0,150359	6,4462	1925,354	16,367	5,477	7,415	7,42	142,4	0,1	0,571	0,040
1B	1927 EP=	NOV. 10,5		359,2058	323,0510	9,4360	5,476246	0,149428	6,4383		16,337	5,476	7,400	7,40	142,3	0,1	0,571	0,040
1C	1932 EP=	MAR. 2,734		357,586	322,058	9,517	5,5466	0,13672	6,43		16,29	5,547	7,302	7,30	139,7	0,4	0,571	0,040
2A	1941 VI	APR. 21,3882	E	356,2279	322,0031	9,5168	5,522837	0,135495	6,3884	1941,303	16,148	5,524	7,252	7,25	138,3	0,6	0,571	0,040
2B	1944 EP=	SEPT. 10,0		355,4541	321,9938	9,5311	5,519914	0,133363	6,3693		16,075	5,522	7,215	7,22	137,5	0,8	0,571	0,040
3	1957 IV	MAY 12,8910	E	355,8271	321,6094	9,4872	5,53774	0,131488	6,376	1957,362	16,101	5,539	7,212	7,21	137,5	0,7	0,571	0,040
4	1974	JAN. 31,494	EP	13,3806	319,6603	9,7574	5,448588	0,1107797	6,1274	1974,084	15,168	5,463	6,783	6,81	152,9	- 2,2	0,569	0,039

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
80	P/PERRINE																	
1	1916 III	JUNE 14,5		95.	224.	103.	0.471	0.927	6.5	1916.454	16.4	0.987	0.839	12.43	292.7	-76.1	0.117	0.004
81	P/NEUJMIN(1)																	
1	1913 III	AUG. 16,9747		346.2425	348.4145	14.8434	1.528789	0.775472	6.8089	1913.624	17.768	1.548	10.999	12.09	155.1	3.5	0.414	0.026
2	1931 I	APR. 30,0767		346.9631	347.5733	15.1508	1.527911	0.774925	6.7885	1931.325	17.688	1.545	11.067	12.05	154.9	3.4	0.414	0.026
3	1948 XIII	DEC. 15,93892		346.6889	347.1738	15.0036	1.547391	0.774463	6.8609	1948.959	17.972	1.566	11.146	12.17	154.3	3.4	0.414	0.026
4	1966	DEC. 10,0608	EP	346.8077	347.1871	15.0235	1.543056	0.774776	6.8512	1966.939	17.934	1.561	11.147	12.16	154.4	3.4	0.414	0.026
82	P/CROMMELIN																	
1	1457 I	JAN. 24,97		204.15	242.08	23.72	0.7276	0.921	9.21	1457.089	27.95	8.757	0.759	17.69	264.4	9.5	0.289	0.018
7	1625	JAN. 30,		196.36	232.47	28.98	0.7391	0.9183	9.05	1625.082	27.21	11.926	0.754	17.35	266.9	7.8	0.286	0.017
14	1818 I	FEB. 6,55		195.6972	251.3642	29.1285	0.746865	0.918471	9.1607	1818.100	27.728	12.375	0.760	17.57	265.2	7.6	0.283	0.017
16	1873 VII	DEC. 2,4595		196.1092	250.9131	28.7729	0.747047	0.919043	9.2277	1873.921	28.032	12.249	0.761	17.71	265.1	7.7	0.283	0.017
18	1928 III	NOV. 5,0458		195.9603	250.3007	28.8825	0.744935	0.919021	9.1991	1928.847	27.902	12.281	0.759	17.65	264.4	7.6	0.283	0.017
19	1956 VI	OCT. 19,3698	P	196.0472	250.3651	28.8698	0.743220	0.919153	9.1929	1956.802	27.874	12.226	0.757	17.64	264.5	7.7	0.283	0.017
83	P/TEMPEL-TUTTLE																	
1A	1366	OCT. 18,54		164.68	226.54	149.75	0.98896	0.9059	10.509	1366.816	34.072	14.925	1.006	20.03	239.9	- 7.6	-0.106	0.019
1B	1366	OCT. 18,54		164.29	224.58	162.15	0.9760	0.9067	10.46	1366.816	33.84	14.633	0.994	19.95	239.6	- 4.8	-0.124	0.021
11	1699 II	OCT. 10,95		168.93	230.03	162.56	0.96412	0.90796	10.475	1699.777	33.904	16.886	0.973	19.99	240.6	- 3.3	-0.123	0.021
14	(1799)	DEC. 18,3	P	170.91	232.28	162.87	0.9799	0.9048	10.29	1799.964	33.02	17.516	0.986	19.61	240.9	- 2.7	-0.124	0.022
15	(1833)	JAN. 8,8	P	170.83	232.44	162.70	0.9818	0.9048	10.31	1833.023	33.12	17.517	0.988	19.64	241.2	- 2.7	-0.124	0.022
16A	1866 I	JAN. 11,6211		170.9179	232.5718	162.6931	0.976520	0.906045	10.3935	1866.030	33.509	17.674	0.982	19.81	241.2	- 2.7	-0.124	0.021
16B	1866 I	JAN. 11,63388		170.9348	232.5769	162.6928	0.976520	0.905420	10.3248	1866.030	33.177	17.572	0.982	19.67	241.2	- 2.7	-0.123	0.021
17	(1899)	JULY 1,5	P	173.18	233.29	162.63	0.9756	0.9064	10.42	1899.498	33.65	18.596	0.979	19.87	239.8	- 2.0	-0.124	0.021
18A	(1932)	JULY 10,1	P	172.63	234.38	162.72	0.9818	0.9049	10.32	1932.524	33.17	18.233	0.986	19.67	241.4	- 2.2	-0.124	0.022
18B	(1932)	NOV. 1,84	P	172.5888	234.1506	162.6894	0.979616	0.90547	10.3630	1932.839	33.362	18.283	0.984	19.75	241.2	- 2.2	-0.124	0.021
19	1965 IV	APR. 25,28	EP	172.57	234.43	162.71	0.98149	0.90443	10.269	1965.314	32.913	18.119	0.985	19.56	241.5	- 2.2	-0.123	0.022
84	P/STEPHAN-OTERMA																	
1	1867 I	JAN. 20,7072		357.5554	79.5855	18.2103	1.577231	0.865352	11.7137	1867.055	40.092	1.578	21.723	21.85	257.3	0.8	0.361	0.027
3	1942 IX	DEC. 19,1967		358.3641	78.5895	17.8909	1.595861	0.861140	11.4926	1942.964	38.962	1.596	21.335	21.39	257.0	0.5	0.365	0.027
85	P/WESTPHAL																	
1	1852 IV	OCT. 13,24255		57.0543	347.5455	40.9377	1.250075	0.919815	15.5899	1852.786	61.558	1.599	4.802	29.93	216.9	-33.4	0.259	0.019
2	1913 VI	NOV. 26,76938		57.0619	347.3069	40.8726	1.254143	0.919706	15.6194	1913.903	61.732	1.605	4.816	29.98	216.7	-33.3	0.259	0.019
86	P/PONS-GAMBART																	
1	1827 II	JUNE 7,69242		19.3021	319.3682	136.4495	0.806694	0.949492	15.9716	1827.431	63.832	0.829	15.139	31.14	125.1	-13.2	-0.093	0.015
87	P/ROSS																	
1	1883 II	DEC. 25,61139		137.5979	265.2142	114.6993	0.308575	0.980840	16.1052	1883.983	64.635	2.217	0.354	31.90	286.1	-37.8	0.004	0.006

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	Q	L	B	C	DC
88	P/DUBIAGO																	
1	1921 I	MAY 5,35344		97,4348	66,4744	22,3359	1,115699	0,932373	16,4978	1921,341	67,013	2,452	1,924	31,88	344,5	-22,1	0,291	0,022
89	P/BRORSEN-METCALF																	
1	1847 V	SEPT. 10,0656		129,4154	311,2124	19,1296	0,487625	0,970749	16,6704	1847,690	68,067	2,505	0,595	32,85	262,2	-14,7	0,215	0,015
2	1919 III	OCT. 17,3816		129,5093	311,1766	19,1955	0,484915	0,971192	16,8327	1919,791	69,063	2,501	0,591	33,18	262,3	-14,7	0,214	0,015
90	P/PONS-BROOKS																	
1	1812	SEPT. 15,8256		199,2993	254,9436	73,9569	0,777124	0,955584	17,4965	1812,710	73,189	15,489	0,799	34,22	260,5	18,5	0,110	0,005
2	1884 I	JAN. 26,2174		199,1831	255,0749	74,0418	0,775729	0,954996	17,2369	1884,072	71,566	15,469	0,797	33,69	260,5	18,4	0,111	0,005
3	1954 VII	MAY 22,8905		199,0233	255,1913	74,1782	0,773930	0,954803	17,1235	1954,389	70,861	15,542	0,795	33,47	260,6	18,3	0,111	0,005
91	P/OLBERS																	
1	1815	APR. 26,4999		65,5817	85,3435	44,4978	1,212997	0,931732	17,7682	1815,316	74,899	1,692	3,811	34,32	322,9	-39,7	0,244	0,018
2	1887 V	OCT. 8,97609		65,3464	85,3686	44,5713	1,199109	0,930974	17,3718	1887,770	72,408	1,668	3,786	33,54	322,6	-39,6	0,244	0,018
3	1956 IV	JUNE 15,867	P	64,6362	85,4153	44,6099	1,178530	0,930327	16,9152	1956,459	69,572	1,627	3,782	32,65	321,8	-39,4	0,244	0,018
92	P/DE VICO																	
1	1846 IV	MAR. 6,04588		12,9039	79,0051	85,1088	0,663798	0,962910	17,8969	1846,176	75,716	0,672	21,219	35,13	260,1	-12,9	0,076	0,002
93	P/HALLEY																	
1	-466	WINTER		109,	61,	162,	0,600	0,967	18,2	-466,	77	1,763	0,887	35,76	130,1	-16,9	-0,118	0,017
4	-239	MAY 15,		109,	58,	162,	0,600	0,967	18,2	-238,646	77	1,763	0,887	35,76	127,1	-16,9	-0,118	0,017
5	-162	MAY 20,		109,	57,	162,	0,600	0,967	18,2	-161,631	77	1,763	0,887	35,76	126,1	-16,9	-0,118	0,017
6	-86	AUG. 15,		109,	57,	162,	0,600	0,967	18,2	- 85,392	77	1,763	0,887	35,76	126,1	-16,9	-0,118	0,017
7	-11	OCT. 9,3		109,	56,	162,	0,600	0,967	18,2	- 10,238	77	1,722	0,898	35,76	126,1	-16,9	-0,118	0,017
8	66	JAN. 26,		109,	56,	162,	0,594	0,967	18,0	66,061	76,4	1,705	0,889	35,41	126,1	-16,9	-0,117	0,017
9	141	MAR. 25,		109,	55,	163,	0,599	0,967	18,2	141,222	77,3	1,719	0,896	35,70	125,2	-16,0	-0,119	0,017
10	218	APR. 6,		109,	55,	163,	0,599	0,967	18,2	218,256	77,3	1,719	0,896	35,70	125,2	-16,0	-0,119	0,017
11	295	APR. 7,		109,	55,	163,	0,610	0,967	18,5	295,259	79,5	1,751	0,913	36,36	125,2	-16,0	-0,121	0,017
12	374	FEB. 13,		109,	54,	163,	0,606	0,967	18,4	374,117	78,7	1,739	0,907	36,12	124,2	-16,0	-0,120	0,017
13	451	JULY 4,0		109,1	53,9	164,	0,610	0,967	18,5	451,504	79,5	1,755	0,911	36,36	124,1	-15,1	-0,122	0,017
14	530	NOV. 15,		109,	53,	163,	0,606	0,967	18,4	530,873	78,7	1,739	0,907	36,12	123,2	-16,0	-0,120	0,017
15	607	MAR. 20,		108,	53,	163,	0,600	0,967	18,2	607,217	77,5	1,683	0,909	35,76	124,2	-16,1	-0,119	0,017
16	684	NOV. 6,		108,	53,	163,	0,600	0,967	18,2	684,856	77,5	1,683	0,909	35,76	124,2	-16,1	-0,119	0,017
17	760	JUNE 11,		107,9	53,5	163,	0,597	0,967	18,1	760,449	76,9	1,671	0,905	35,58	124,8	-16,2	-0,118	0,017
18	837	MAR. 1,		108,	53,	163,	0,596	0,967	18,1	837,172	76,8	1,672	0,903	35,53	124,2	-16,1	-0,118	0,017
19	912	JULY 20,		109,	54,	163,	0,601	0,967	18,2	912,563	77,7	1,725	0,899	35,82	124,2	-16,0	-0,119	0,017
20	989	SEPT. 2,5		111,05	56,89	163,06	0,584	0,967	17,7	989,683	74,5	1,760	0,853	34,81	124,9	-15,8	-0,115	0,017
21	1066	MAR. 27,		105,63	51,24	163,6	0,610	0,967	18,5	1066,247	79,5	1,623	0,952	36,36	124,9	-15,8	-0,122	0,017
22	1145	APR. 19,		105,71	51,41	163,56	0,608	0,967	18,4	1145,312	79,1	1,620	0,948	36,24	125,1	-15,8	-0,121	0,017
23	1222	SEPT. 10,		105,8	52,	163,6	0,608	0,967	18,4	1222,708	79,1	1,623	0,947	36,24	125,6	-15,8	-0,121	0,017
24	1301	OCT. 23,2		107,	53,	163,	0,608	0,967	18,4	1301,828	79,1	1,667	0,932	36,24	125,3	-16,2	-0,121	0,017
25	1378	NOV. 9,27		107,98	55,46	162,11	0,601	0,967	18,2	1378,876	77,7	1,685	0,910	35,82	126,6	-16,9	-0,118	0,017
26	1456	JUNE 8,70226		104,9970	50,8185	162,4128	0,58027	0,967825	18,035	1456,461	76,592	1,523	0,913	35,49	125,1	-16,9	-0,115	0,017
27	1531	AUG. 26,292		104,46	51,49	163,03	0,57994	0,967391	17,785	1531,673	75,004	1,504	0,919	34,99	126,4	-16,4	-0,115	0,017
28	1607	OCT. 27,21595		107,1677	53,5838	162,8189	0,587974	0,967089	17,8656	1607,819	75,517	1,619	0,899	35,14	125,7	-16,4	-0,116	0,017
29	1682	SEPT. 15,29506		109,3609	55,0132	162,2718	0,582894	0,967920	18,1700	1682,707	77,455	1,689	0,868	35,76	124,8	-16,7	-0,116	0,017
30	1759 I	MAR. 13,05178		110,7391	56,5733	162,3975	0,584519	0,967684	18,0876	1759,196	76,929	1,749	0,857	35,59	124,9	-16,4	-0,116	0,017

NO.	DESIGNATION	T (U.T.)	ARG.PERI.	NODE	INCLINATION	PERI.DIS.	ECCENT.	A	T	PERIOD	R(A)	R(D)	G	L	B	C	DC
93	P/HALLEY	(CONTINUED)															
31A	1835 III	NOV. 16.43817	110.6862	56.8027	162.2557	0.586566	0.967399	17.9923	1835.874	76.321	1.753	0.860	35.39	125.2	-16.6	-0.116	0.017
31B	1835 III	NOV. 16.43867	110.6841	56.8009	162.2556	0.586569	0.967392	17.9885	1835.874	76.297	1.753	0.860	35.39	125.2	-16.6	-0.116	0.017
32A	1910 II	APR. 20.17873	111.7189	57.8466	162.2158	0.587212	0.967297	17.9559	1910.298	76.090	1.799	0.851	35.32	125.1	-16.5	-0.116	0.017
32B	1910 II	APR. 20.1790 E	111.7230	57.8451	162.2156	0.587135	0.967288	17.9486	1910.298	76.044	1.799	0.851	35.31	125.1	-16.5	-0.116	0.017
32C	1910 II	APR. 20.1794 P	111.7197	57.8431	162.2140	0.587165	0.967283	17.9468	1910.298	76.032	1.799	0.851	35.31	125.1	-16.5	-0.116	0.017
32D	1910 II	APR. 20.1998	111.7197	57.8431	162.2140	0.587326	0.967275	17.9473	1910.298	76.036	1.799	0.851	35.31	125.1	-16.5	-0.116	0.017
33	1986	FEB. 5.3677 P	111.8575	58.1545	162.2383	0.587105	0.967276	17.9411	1986.098	75.996	1.805	0.849	35.29	125.3	-16.4	-0.116	0.017
94	P/VAISALA(2)																
1	1942 II	FEB. 15.8162	335.2178	171.5925	38.0067	1.28714	0.933692	19.412	1942.126	85.528	1.347	16.343	37.54	331.6	14.9	0.262	0.021
95	P/SHIFT-TUTTLE																
1	1862 III	AUG. 23.40888	152.7655	138.6854	113.5599	0.962637	0.960353	24.2802	1862.643	119.645	12.916	1.018	47.59	150.3	-24.8	-0.047	0.009
96	P/BARNARD(2)																
1	1889 III	JUNE 21.24439	60.1194	271.8325	31.2149	1.102397	0.956665	25.4389	1889.471	128.312	1.461	4.121	49.78	147.9	-26.7	0.248	0.020
97	P/MELLISH																
1	1917 I	APR. 11.17514	121.3069	57.9798	32.6830	0.190186	0.993120	27.6433	1917.275	145.346	0.783	0.250	55.09	33.8	-27.5	0.125	0.009
98	P/HERSCHEL-RIGOLLET																
1	1788 II	NOV. 20.8313	30.4392	354.7317	64.4889	0.757427	1		1788.893		0.813	10.991		188.9	-27.2	0.088	0.009
2	1939 VI	AUG. 9.4640	29.2989	355.2831	64.2008	0.748492	0.974176	28.9844	1939.603	156.049	0.799	9.822	57.22	189.0	-26.1	0.122	0.009
99	P/GRIGG-MELLISH																
1	1742	FEB. 8.1533	327.0939	188.2893	112.6921	0.762383	0.974587	29.9997	1742.106	164.321	0.823	8.282	59.24	22.3	30.1	-0.046	0.008
2	1907 II	MAR. 27.68559	328.8248	189.8279	109.8377	0.923280	0.969224	30.0000	1907.233	164.323	0.996	10.433	59.08	21.6	29.5	-0.044	0.008

NO.	DESIGNATION	T (U.T.)		ARG.PERI.	NODE	INCLI.	PERI.DIS.	ECCENT.	A	PERIOD	T	R(A)	R(D)	Q	L	B	C	DC
	COMET ANDERSON,1963IX																	
1	1963 IX	NOV.	7.87	356.89	96.83	4.46	1,9495	0,3778	3,1332	5,546	1963,851	1,950	4,313	4,32	273,7	0,2	0,595	0,027
	P/VAN HOUTEN,1961X																	
1	1961 X	APR.	29.60	14.937	23,004	6.617	3,9389	0,3731	6,2831	15,750	1961,326	3,975	8,457	8,63	217,8	-1,7	0,548	0,038
14	P/DE VICO-SWIFT																	
2	(1850)	FEB.	17.13392 P	278.8896	65.0507	2.9171	1,188908	0,616762	3,102271	5,464	1850,130	1,755	2,125	5,02	164,0	2,9	0,556	0,023
3	(1855)	AUG.	3.19729 P	278.8471	65.0355	2.9175	1,188276	0,617380	3,100402	5,459	1855,587	1,752	2,120	5,01	163,9	2,9	0,556	0,023
4	(1861)	JAN.	18.95402 P	278.8512	65.0240	2.9163	1,191287	0,616317	3,104673	5,471	1861,051	1,759	2,127	5,02	163,9	2,9	0,555	0,023
5	(1866)	JULY	10.08988 P	278.8076	64.9997	2.9149	1,196798	0,614993	3,106510	5,481	1866,522	1,766	2,134	5,02	163,8	2,9	0,556	0,023
6	(1872)	JAN.	5.20967 P	278.8653	64.9717	2.9136	1,201720	0,613948	3,112845	5,492	1872,014	1,772	2,142	5,02	163,8	2,9	0,556	0,023
7	(1877)	JULY	14.95300 P	279.4219	64.5141	2.9072	1,229520	0,607545	3,132894	5,545	1877,536	1,798	2,195	5,04	163,9	2,9	0,556	0,023
8	(1883)	FEB.	2.74547 P	279.5395	64.4606	2.9064	1,232096	0,606973	3,134889	5,551	1883,091	1,799	2,201	5,04	164,0	2,9	0,556	0,023
9	(1888)	NOV.	29.23138 P	296.0057	49.9256	2.9661	1,388388	0,572691	3,249143	5,857	1888,915	1,745	2,916	5,11	166,0	2,7	0,556	0,024
10D	1894 IV	OCT.	12.26367	296.1887	49.8562	2.9656	1,389674	0,572373	3,249734	5,859	1894,780	1,744	2,924	5,11	166,1	2,7	0,556	0,024
11	(1901)	FEB.	15.13005 P	324.0251	25,5592	3.5896	1,667813	0,516173	3,447127	6,400	1901,123	1,764	4,343	5,23	169,6	2,1	0,557	0,026
12	(1907)	JULY	16.84308 P	324.1575	25,5129	3.5872	1,671814	0,515561	3,450618	6,410	1907,538	1,767	4,352	5,23	169,7	2,1	0,557	0,026
13	(1913)	DEC.	23.81867 P	324.2537	25,3867	3.5758	1,703043	0,509555	3,472444	6,471	1913,977	1,819	4,384	5,24	169,7	2,1	0,557	0,026
14	(1920)	JUNE	18.11168 P	324.3000	25,3679	3.5720	1,710992	0,508331	3,479967	6,492	1920,464	1,827	4,395	5,25	169,7	2,1	0,557	0,026
15	(1926)	DEC.	11.93700 P	324.1680	25,3577	3.5713	1,712343	0,508075	3,480903	6,495	1926,944	1,829	4,391	5,25	169,6	2,1	0,557	0,026
16	(1933)	JUNE	10.89383 P	324.0581	25,3887	3.5682	1,719974	0,506711	3,486747	6,511	1933,441	1,837	4,395	5,25	169,5	2,1	0,557	0,026
17	(1939)	DEC.	10.69481 P	324.1146	25,3481	3.5723	1,711466	0,508305	3,480747	6,494	1939,940	1,828	4,389	5,25	169,5	2,1	0,557	0,026
18	(1946)	JUNE	2.01187 P	323.9820	25,3329	3.5738	1,706322	0,509089	3,475328	6,480	1946,416	1,824	4,378	5,25	169,4	2,1	0,557	0,026
19	(1952)	NOV.	23.04803 P	324.1926	25,2423	3.5779	1,697170	0,510719	3,468702	6,461	1952,897	1,813	4,377	5,24	169,5	2,1	0,557	0,026
20	(1959)	APR.	21.79238 P	325.1332	24,5622	3.6075	1,629280	0,523630	3,420199	6,325	1959,303	1,739	4,352	5,21	169,7	2,1	0,557	0,026
22	P/TEMPEL(1)																	
1B	1867 II	MAY	24.21817E	134.9259	102,2764	9.3910	1,562061	0,507716	3,173130	5,653	1867,393	3,672	1,734	4,78	57,4	-4,5	0,572	0,025
2B	1873 I	MAY	10.28196E	159.3709	79,7466	9.7658	1,771129	0,462635	3,295952	5,984	1873,356	4,569	1,808	4,82	59,4	-3,4	0,571	0,026
3B	1879 III	MAY	7.60483E	159.5409	79,7028	9.7668	1,771096	0,462555	3,295400	5,982	1879,347	4,572	1,807	4,82	59,5	-3,4	0,571	0,026
4C	(1885)	SEPT.	24.40339 P	168.7836	73,4080	10.8120	2,067267	0,406401	3,482599	6,499	1885,732	4,835	2,079	4,90	62,4	-2,1	0,570	0,028
5C	(1892)	MAR.	29.79117 P	168.9539	73,3584	10.8076	2,071398	0,405600	3,484855	6,506	1892,246	4,837	2,083	4,90	62,5	-2,1	0,570	0,028
6C	(1898)	OCT.	3.22763 P	168.8333	73,2657	10.7939	2,089668	0,402252	3,495501	6,537	1898,755	4,840	2,101	4,90	62,3	-2,1	0,570	0,028
7	(1905)	APR.	21.55739 P	168.8786	73,2425	10.7831	2,099975	0,400466	3,502679	6,556	1905,303	4,845	2,111	4,91	62,3	-2,1	0,570	0,028
8	(1911)	NOV.	4.44681 P	168.6413	73,2218	10.7919	2,094053	0,401585	3,499332	6,546	1911,841	4,841	2,106	4,90	62,1	-2,1	0,570	0,028
9	(1918)	MAY	21.82350 P	168.5017	73,2253	10.7789	2,103877	0,399755	3,505030	6,562	1918,389	4,841	2,116	4,91	61,9	-2,1	0,570	0,028
10	(1924)	DEC.	9.22952 P	168.5057	73,1981	10.7894	2,094069	0,401634	3,499446	6,547	1924,941	4,840	2,106	4,91	61,9	-2,1	0,570	0,028
11	(1931)	JUNE	17.70940 P	168.3603	73,1395	10.7993	2,077670	0,404333	3,487972	6,514	1931,458	4,831	2,090	4,90	61,7	-2,2	0,570	0,028
12	(1937)	DEC.	23.05180 P	168.5304	73,0951	10.8050	2,072074	0,405279	3,484111	6,504	1937,976	4,830	2,084	4,90	61,8	-2,1	0,570	0,028
13	(1944)	MAY	5.60000 P	176.0214	69,8785	10.5777	1,690118	0,478702	3,242134	5,838	1944,345	4,784	1,691	4,79	66,0	-0,7	0,571	0,026
14	(1950)	MAR.	9.71500 P	176.1695	69,8379	10.5794	1,686195	0,479029	3,240478	5,834	1950,186	4,783	1,689	4,79	66,1	-0,7	0,571	0,026
15	(1955)	DEC.	13.58966 P	178.9202	68,5116	10.5102	1,528673	0,512557	3,136106	5,554	1955,949	4,743	1,529	4,74	67,4	-0,2	0,571	0,025
16	(1961)	JULY	4.24877 P	179.0473	68,4823	10.5148	1,525267	0,513344	3,134179	5,549	1961,506	4,742	1,525	4,74	67,5	-0,2	0,571	0,025
83	P/TEMPEL-TUTTLE																	
1C	1366	OCT.	18.60000E	164.4935	224,7503	162.2447	0,975872	0,906438	10,43022	33,687	1366,816	14,700	0,993	19,88	239,6	+4,7	-0,124	0,021
2	(1400)	MAY	16.80528EP	165,7540	226,0901	161.9506	0,978701	0,906266	10,44126	33,740	1400,397	15,342	0,993	19,90	239,7	+4,4	-0,124	0,021
3	(1433)	JULY	28.33940EP	165,9167	226,2804	161.9059	0,984626	0,904756	10,33793	33,241	1433,593	15,318	0,999	19,69	239,7	+4,3	-0,123	0,021
4	(1466)	JULY	30.21470EP	165,7637	226,3584	161.9062	0,986552	0,904400	10,31958	33,152	1466,598	15,228	1,001	19,65	239,9	+4,4	-0,123	0,021
5	(1499)	SEPT.	5.94278EP	165,8012	226,5798	161,7500	0,980926	0,905618	10,39315	33,507	1499,702	15,316	0,995	19,81	240,1	+4,4	-0,123	0,021
6	(1533)	FEB.	25.53256EP	166,0659	226,8230	161,8021	0,969103	0,907813	10,51236	34,085	1533,177	15,550	0,983	20,06	240,1	+4,3	-0,123	0,021
7	(1567)	MAR.	14.05073EP	167,0578	227,9766	161,8943	0,975246	0,906755	10,45896	33,826	1567,222	15,992	0,987	19,94	240,3	+4,0	-0,123	0,021
8	(1600)	JULY	20.87002EP	167,4148	228,3395	161,8429	0,988503	0,904590	10,36058	33,350	1600,552	16,072	1,000	19,73	240,3	+3,9	+0,124	0,021
9	(1633)	JUNE	21,43149EP	168,6694	229,5515	162,8767	0,982586	0,904543	10,29328	33,025	1633,472	16,548	0,992	19,60	240,4	+3,3	-0,124	0,022
10	(1666)	JUNE	6.24775EP	168,8158	229,8859	162,6148	0,975667	0,905874	10,36554	33,374	1666,430	16,703	0,985	19,76	240,6	+3,3	-0,124	0,021
11B	1699 II	OCT.	10.97435E	168,9340	230,0329	162,5604	0,963833	0,908078	10,48534	33,954	1699,777	16,902	0,972	20,01	240,6	+3,3	-0,123	0,021
12	(1733)	SEPT.	28.32309EP	170,3360	231,5539	162,9548	0,962338	0,907980	10,45792	33,821	1733,742	17,503	0,969	19,95	240,8	+2,8	-0,123	0,021
13	(1767)	FEB.	21.81075EP	170,9978	232,2244	162,8271	0,971979	0,906365	10,38051	33,446	1767,143	17,681	0,978	19,79	240,8	+2,6	-0,124	0,021
14B	(1800)	MAR.	1.56476EP	170,9120	232,2808	162,8678	0,979976	0,904781	10,29181	33,018	1800,164	17,515	0,986	19,60	241,0	+2,7	-0,124	0,022
15B	(1833)	JAN.	2.31492EP	170,8298	232,4333	162,7037	0,981751	0,904802	10,31273	33,119	1833,005	17,516	0,988	19,64	241,2	+2,7	-0,124	0,022
16C	1866 I	JAN.	11,62308E	170,9190	232,5717	162,6930	0,976552	0,906070	10,39659	33,524	1866,030	17,679	0,982	19,82	241,2	+2,7	-0,124	0,021
17B	(1899)	JULY	2,38797EP	172,2211	233,9127	162,8554	0,972657	0,906327	10,38354	33,461	1899,501	18,176	0,977	19,79	241,3	+2,3	-0,124	0,021
18C	(1932)	JULY	13,07215EP	172,7014	234,3742	162,7104	0,978537	0,905139	10,31548	33,182	1932,533	18,242	0,982	19,65	241,3	+2,2	-0,124	0,021
19B	1965 IV	APR.	30.00378E	172,5769	234,4350	162,7092	0,981730	0,904396	10,26871	32,907	1965,327	18,119	0,986	19,56	241,5	+2,2	+0,123	0,022
20	1998	FEB.	27,38890EP	172,5178	234,5567	162,4833	0,975813	0,905553	10,33186	33,211	1998,158	18,202	0,980	19,69	241,7	+2,2	-0,123	0,021

No.	Designation	Year of Discovery	Date of Discovery	Discoverers	References and Notes
1) P/WILSON-HARRINGTON					
1	1949 III	1949 g	Nov. 19	Wilson, Harrington	L. E. Cunningham, H. A. C. 1052
2) P/ENCKE					
1	1786 I	1786 a	Jan. 17	Mechain	J. F. Encke, B. J., 1822, 196.
4	1795	1795	Nov. 7	C. Herschel	J. F. Encke, B. J., 1822, 186.
7	1805	1805 b	Oct, 19	Pons etc.	J. F. Encke, J. B. 1822, 190.
11	1819 I	1818 b	Nov. 26	Pons	E. von Asten, Mem. Ac. St. Petersburg, VII, **26** (2), 105.
12	1822 II	1822 c	June 2	Rümker	E. von Asten, ibid.
13	1825 III	1825 b	July 12	Valz	E. von Asten, ibid.
14	1829	1828 a	Sept. 16	W. Struve	E. von Asten, ibid.
15	1832 I	1832 a	June 1	Mossoti	E. von Asten, ibid.
16	1835 II	1835 b	July 22	Kreil	E. von Asten, ibid.
17	1838	1838	Aug. 14	Boguslawski	E. von Asten, ibid.
18	1842 I	1842 a	Feb. 8	Galle	E. von Asten, ibid.
19	1848 IV	1845 c	July 4	Walker	E. von Asten, ibid.
20	1848 II	1848 b	Aug. 27	G. P. Bond	E. von Asten, ibid.
21	1852 I	1852 a	Jan. 9	E. Vogel	E. von Asten, ibid.
22	1855 III	1855 e	July. 12	Maclear	E. von Asten, ibid.
23	1858 VIII	1858 f	Aug. 7	Förster	E. von Asten, ibid.
24	1862 I	1861 c	Oct. 4	Förster	E. von Asten, ibid.
25	1865 II	1865 b	Jan. 25	D'Arrest	E. von Asten, ibid.
26	1868 III	1868 c	July 16	Winnecke	E. von Asten, ibid.
27	1871 V	1871 c	Sept. 18	Stephan	O. Backlund, Men. Ac. St. Petersburg, VII, 34 (8), 38.
28	1875 II	1875 a	Jan. 26	Holden, Tuttle	O. Backlund, ibid.
29	1878 II	1878 c	Aug. 3	Tebbutt, Gould	O. Backlund, ibid.
30	1881 VII	1881 e	Aug. 20	Hartwig, Peter	O. Backlund, ibid.
31	1885 I	1884 f	Dec. 13	Tempel	O. Backlund, ibid.
32	1888 II	1888 b	July 8	Tebbutt	O. Backlund, B. Seraphimoff, A. N., **119**, 174. (dT=0)
33	1891 III	1891 d	Aug. 1	Barnard	O. Backlund, A. N., **127**, 428. (dT=0)

34	1895 I	1894 d	Oct.	31	Perrotin, M. Wolf	O. Backlund, Men. Ac. St. Petersburg, VIII, **30** (2)
35	1898 III	1898 d	June	7	Grigg	S. G. Makower, N. A. Bokhan, Tr. Inst. Th. Astr. (Leningrad), 8, 177.
36	1901 II	1901 b	Aug.	5	Wilson	S. G. Makower, N. A. Bokhan, ibid.
37	1905 I	1904 b	Sept.	11	Kopff	S. G. Makower, N. A. Bokhan, ibid.
38	1908 I	1908 b	May	27	Woodgate	S. G. Makower, N. A. Bokhan, ibid.
39	1911 III	1911 d	July	31	Gonnessiat	S. G. Makower, N. A. Bokhan, ibid.
40	1914 VI	1914 d	Sept.	18	Barnard	L. Matkiewicz, A. N., **199**, 175, 427. (dT=−0.05)
41	1918 I	1917 c	Dec.	30	Schorr	M. Viljev, A. N., **205**, 124. (dT=−0.2)
42	1921 IV	1921 d	July	27	Skjellerup, Reid	L. Matkiewicz, M. N., **82**, 269. (dT=−0.2)
43	1924 III	1924 b	July	31	G. van Biesbroeck	A. C. D. Crommelin, H. B. A. A., 1924. (dT=+0.4)
44	1928 II	1927 h	Nov.	13	G. van Biesbroeck	L. Matkiewicz, A. N., **231**, 11. (dT=0)
45	1931 II	1931 a	June	21	J. Bobone	S. Y. Luchich, Bull. Inst. Th. Astr. (Leningrod), **7**, (2), 154.
46	1934 III	1934 a	July	10	H. M. Jeffers	S. Y. Luchich, ibid.
47	1937 VI	1937 h	Sept.	3	H. M. Jeffers	S. Y. Luchich, ibid.
48	1941 V	1941 b	Jan.	19	G. van Biesbroeck	S. Y. Luchich, ibid.
49	(1941)	—	—		—	M. Sumner, H. B. A. A., 1941.
50	1947 XI	1947 i	Aug.	14	H. M. Jeffers	S. G. Makower, S. Y. Luchich, Bull. Inst. Th. Astr. (Leningrad), 9, 231.
51	1951 III	1950 e	July	21	L. E. Cunningham	S. G. Makower, S. Y. Luchich, ibid.
52	1954 IX	1953 f	Sept.	3	L. E. Cunningham	S. G. Makower, S. Y. Luchich, ibid.
53	1957 VIII	1957 c	July	25	H. M. Jeffers	S. G. Makower, S. Y. Luchich, ibid.
54	1961 I	1960 i	Aug.	17	E. Roemer	S. G. Makower, S. Y. Luchich, ibid. (dT=0)
55	1964 IV	1963 h	Sept.	24	E. Roemer	S. G. Makower, Astr. Circ. U. S. S. R., 239. (dT=0)
56	1967	1967 h	Aug.	3	N. S. Chernykh, K. Tomita	G. Kastel, H. B. A. A., 1967. (dT=0)
3) P/HELFENZRIEDER						
1 A	1766 II	1766 b	Apr.	1	Helfenzrieder	C. Wirtz, A. N. 208, 201.
2 B	〃	〃	〃		〃	C. Wirtz, A. N. 201, 79.
4) P/GRIGG-SKJELLERUP						
1	1902 II	1902 c	July	22	Grigg	G. Merton, Mem. R. A. S., **64**, 74.
5	1922 I	1922 b	May	16	Skjellerup	G. Merton, Mem. R. A. S., **64**, 96.
6	1927 V	1927 e	Mar.	27	Hargreaves	G. Merton, Obs., **50**, 159.
7	1932 II	1932 d	Apr.	28	G. van Biesbroeck	A. C. D. Crommelin, M. N., **93**, 273.

No.	Designation	Year of Discovery	Date of Discovery	Discoverers	References and Notes
8	1937 III	1937 e	Apr. 20	Cunningham	P. J. Harris, W. P. Henderson, H. B. A. A., 1937. (dT=+0.5)
9	1942 V	1942 d	Apr. 11	G. van Biesbroeck	F. R. Cripps, U. A. I. C. 929. (dT=0)
10	1947 II	1947 a	Mar. 11	Giclas, Johnson	G. Sitarski, A. A., **14**, 1.
11	1952 IV	1952 b	Mar. 25	Bruwer	G. Sitarski, A. A., **16**, 212.
12	1957 I	1956 i	Dec. 29	Tomita	G. Sitarski, A. A., **14**, 1.
13	1961 IX	1961 g	Nov. 9	Tomita	G. Sitarski, A. A., **16**, 212.
14	1967	1966 f	Dec. 19	Rudnicki	G. Sitarski, A. A., **16**, 209.
15	1972				G. Sitarski, A. A., **14**, 1.
16	1977				G. Sitarski, A. A., **14**, 1.
5) P/BLANPAIN					
1	1819 IV	1819 d	Nov. 27	Blanpain	S. Lagarde, C. R., **144**, 182.
6) P/TEMPEL (2)					
1	1873 II	1873 b	July 3	Tempel	L. Schulhof, Ann. Bur. Long., 1884.
2	1878 III	1878 b	July 18	Tempel	L. Schulhof, ibid.
3	(1884)	—	—	—	L. Schulhof, A. N., **106**, 221.
4	(1889)	—	—	—	L. Schulhof, A. N., **120**, 173.
5	1894 III	1894 c	May 8	Finlay	L. Schulhof, A. N., **136**, 91.
6	1899 IV	1899 c	May 6	Perrine	L. Schulhof, B. A., **16**, 302. (dT=0)
7	1904 III	1904 c	Nov. 30	Javelle	L. Schulhof, A. N., **166**, 26. (dT=+0.01)
8	(1910)	—	—	—	E. Maubant, C. R., **150**, 210.
9	1915 I	1915 c	May 16	Delavan	J. Braae, A. N., **200**, 279. (dT=−0.57)
10	1920 II	1920 b	May 25	K. Kudara	K. Kudara, T. A. B., Nos. 39-40.
11	1925 IV	1925 d	June 11	Stobbe	P. Ramensky, T. A. B., No. 615.
12	1930 VIII	1930 f	Aug. 26	Wood	P. Ramensky, ibid.
13	(1935)	—	—	—	A. C. D. Crommelin, H. B. A. A., 1935.
14	(1941)	—	—	—	F. R. Cripps, H. B. A. A., 1940.
15	1946 III	1946 b	May 1	G. van Biesbroeck	L. E. Cunningham, H. A. C., 842.
16	1951 VIII	1951 d	Feb. 3	L. E. Cunningham	T. A. Goodchild, H. B. A. A., 1951. (dT=+0.2)
17	1957 II	1956 e	May 5	G. van Biesbroeck	A. Luss, H. B. A. A., 1956. (dT=+0.1)
18	1962 VI	1961 b	Mar. 19	E. Roemer	B. G. Marsden, Q. J. R. A. S., **3**, 174. (dT=+0.2)
19 A	1967	1967 d	Feb. 12	K. Tomita	B. G. Marsden, I. A. U. C., 1982.

	19 B	1967	〃	〃	〃	K. Aksnes, I. A. U. C., 2033.
7)	P/HONDA-MRKOS-PAJDUŠÁKOVÁ					
	1	1948 XIII	1948 n	Dec. 3	Honda, Mrkos, Pajdušáková	B. G. Marsden, M. N., **119**, 442.
	2	1954 III	1954 a	Jan. 28	Mitani	B. G. Marsden, M. N., **119**, 442.
	3	(1957)	—	—	—	B. G. Marsden, H. B. A. A., 1959.
	4	1964 VII	1964 d	June 14	Roemer	B. G. Marsden, Suppl. B. A. A. Catalogue, 1965. (dT = −0.4)
8)	P/DU TOIT (2)					
	1 A	1945 II	1945 c	Apr. 9	Du Toit	K. Hurukawa, U. A. I. C., 1368.
	1 B	1945 II	〃	〃	〃	M. P. Candy, U. A. I. C., 1754.
	2	(1950)	—	—	—	K. Hurukawa, Private Communication.
	3	(1955)	—	—	—	K. Hurukawa, K. A. C., 304.
	4	(1961)	—	—	—	K. Hurukawa, U. A. I. C., 1749, 1752.
	5	(1966)	—	—	—	B. G. Marsden, U. A. I. C., 1927.
9)	P/LA HIRE					
	1	1678	1678	Sept. 11	La Hire	Le Verrier, A. N., **26**, 383.
10)	P/BARNARD (1)					
	1	1884 II	1884 c	July 16	Barnard	Berberich, A. N., **123**, 175.
	3	(1895)	—	—	—	Berberich, A. N., **136**, 333.
	4	(1900)	—	—	—	Berberich, A. N., **153**, 219.
11)	P/SCHWASSMANN-WACHAMANN (3)					
	1	1930 VI	1930 d	May 2	Schwassmann, Wachamann	D. A. Kalnin, Astr. Circ. U. S. S. R., No. 145.
	2 A	(1935)	—	—	—	F. R. Cripps, H. B. A. A., 1935.
	2 B	(1935)	—	—	—	Rasmusen, A. N., **253**, 221.
	3 A	(1941)	—	—	—	F. R. Cripps, J. B. A. A., **50**, 278.
	3 B	(1941)	—	—	—	S. Kanda, Tokyo Report, 8, 54.
	5 A	(1952)	—	—	—	W. E. Beart, U. A. I. C., 1343.
	5 B	(1952)	—	—	—	D. A. Kalnin, U. A. I. C., 1592.
	6	(1957)	—	—	—	D. A. Kalnin, U. A. I. C., 1592.

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12)	P/NEUJMIN (2)				
1	1916 II	1916 a	Feb. 24	G. N. Neujmin	G. N. Neujmin, Bull. Pulkovo, **17**, (6), 21, No. 141.
2	(1921)	—	—	—	G. N. Neujmin, B. S. A. F., **35**, 160; A. N. **217**, 293.
3	1927 I	1926 g	Nov. 5	G. N. Neujmin	G. N. Neujmin, Bull. Pulkovo, **17**, (6), 21, No. 141.
4	(1932)	—	—	—	A. C. D. Crommelin, H. B. A. A., 1932.
5 A	(1937)	—	—	—	G. N. Neujmin, Astr. Circ. U. S. S. R., No. 140.
5 B	(1937)	—	—	—	F. R. Cripps, J. B. A. A., **48**, 88.
6 A	(1943)	—	—	—	F. R. Cripps, H. B. A. A., 1943.
6 B	(1943)	—	—	—	S. Kanda, J. A. S. A. C., No. 124.
7 A	(1948)	—	—	—	F. R. Cripps, H. B. A. A., 1948.
7 B	(1948)	—	—	—	S. Kanda, J. A. S. A. C., No. 124.
8 A	(1954)	—	—	—	E. A. Mitrofanova, U. A. I. C., 1433.
8 B	(1954)	—	—	—	W. E. Beart, U. A. I. C., 1433.
8 C	(1954)	—	—	—	T. Higami, Y. C., 1241.
8 D	(1954)	—	—	—	S. Kanda, J. A. S. A. C., No. 124.
10	(1965)	—	—	—	B. G. Marsden, U. A. I. C., 1879.
13)	P/GRISCHOW				
1	1743 I	1743 a	Feb. 10	Grischow	T. Clausen, A. N., **10**, 345.
14)	P/DE VICO-SWIFT				
1	1844 I	1844 b	Aug. 22	de Vico	F. Brünnow, Brünnow's Astr. Not., 1859, No. 3.
10	1894 VI	1894 e	Nov. 20	E. Swift	F. E. Seares, A. N. **151**, 82.
11	(1901)	—	—	—	F. E. Seares, A. N. **153**, 125.
12	1965 VII	1965 e	June 30	A. Klemola	B. G. Marsden, Suppl. B. A. A. Catalogue, 1965.
15)	P/TEMPEL-SWIFT				
1	1869 III	1869 c	Nov. 27	Temple	E. Maubant, Ann. Paris, 30, D. 58.
3	1880 IV	1880 f	Oct. 10	L. Swift	E. Maubant, Ann. Paris, 30, D. 58.
4	(1886)	—	—	—	J. Bossert, A. N., **114**, 95.
5	1891 V	1891 e	Sept. 27	Barnard	J. Bossert, B. A., **14**, 11.
6	(1897)	—	—	—	J. Bossert, B. A., **14**, 9.
7	(1903)	—	—	—	J. Bossert, E. Maubant, B. A., **26**, 37.

8	1908 II	1908 d	Sept. 29	Javelle	E. Maubant, A. N., **179**, 79. (dT=+3.65)
9	(1914)	—	—	—	M. Viljev, A. N., **198**, 349.
11	(1925)	—	—	—	— H. B. A. A., 1925.
12	(1932)	—	—	—	A. C. D. Crommelin, M. N., **93**, 272.
13	(1938)	—	—	—	Ramensky, J. O. **20**, 201.
14	(1944)	—	—	—	S. Kanda, J. A. S. A. C., No. 88.
15	(1950)	—	—	—	S. Kanda, J. A. S. A. C., No. 88, I. A. U. C., No. 1287.
17	(1963)	—	—	—	B. G. Marsden, A. J. **68**, 795, U. A. I. C., No. 1838.

16) P/DU TOIT-NEUJMIN-DELPORTE

1 A	1941 VII	1941 e	July 18	du Toit, Neujmin, Delporte	N. F. Boieva, Bull. Inst. Theor. Astr. Leningard, **5**, No. 1.
1 B	1941 VII	〃	〃	〃	B. G. Marsden, U. A. I. C., 1652.
2	(1947)	—	—	—	W. E. Beart, Henderson, H. B. A. A., 1946.
3	(1952)	—	—	—	R. Luss, H. B. A. A., 1952.
4	(1958)	—	—	—	Sotchilina, U. A. I. C., 1628.

17) P/BRORSEN

1	1846 III	1846 c	Feb. 26	Brorsen	C. Bruhns, A. N., **71**, 39.
2	(1851)	—	—	—	P. Van Galen, A. N., **44**, 325.
3	1857 II	1857 b	Mar. 18	Bruhns	C. Bruhns, A. N., **71**, 40.
5	1868 I	1868 a	Apr. 11	Tempel	L. R. Schulze, A. N., **93**, 184.
6	1873 VI	1873 e	Aug. 31	Stephan	E. Lamp, Kiel Obs. Publ., **7**, 56.
7	1879 I	1879 a	Jan. 14	Tempel	E. Lamp, Kiel Obs, Publ., **7**, 56.
8	(1884)	—	—	—	L. R. Schulze, A. N., **109**, 255.
9 A	(1890)	—	—	—	A. Kruger, A. N., **129**, 65.
9 B	(1890)	—	—	—	E. Lamp, A. N., **124**, 83.
23	1967				B. G. Marsden, I. A. U. C., 2006.

18) P/BROOKS (1)

1	1886 IV	1886 c	May 22	Brooks	S. Oppenheim, A. N., **128**, 302.

19) P/LEXELL

1	1770 I	1770 b	June 14	Messier	U. J. J. LeVerrier, C. R., **26**, 468.

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20)	P/PONS-WINNECKE				
1	1819 III	1819 a	June 12	Pons	J. F. Encke, Corr. Astr., 3, 293.
8	1858 II	1858 b	Mar. 8	Winnecke	E. V. Haerdtl, Denksch. Wiener. Ak., **56**, 162.
10	1869 I	1869 a	Apr. 9	Winnecke	E. V. Haerdtl, ibid.
11	1875 I	1875 b	Feb. 1	Borrelly	E. V. Haerdtl, ibid.
12	(1880)	—	—	—	Oppolzer, A. N., **97**, 337.
13	1886 VI	1886 d	Aug. 19	Finlay	E. V. Haerdtl, Denksch. Wiener. Ak., **56**, 162.
14	1892 IV	1892 c	Mar. 18	Spitaler	E. V. Haerdtl, A. N., **129**, 169. (dT=0)
15	1898 II	1898 a	Jan. 1	Perrine	S. C. Chandler, A. J., **18**, 127. (dT=0)
16	(1904)	—	—	—	K. Hillebrand, A. N., **163**, 301.
17	1909 II	1909 d	Oct. 31	Porro	K. Hillebrand, A. N., **181**, 156. See E. Waage, A. N., **200**, 182.
18	1915 III	1915 b	Apr. 4	Thiele	K. Hillebrand, A. N., **200**, 182. (dT=+0.04)
19	1921 III	1921 b	Apr. 12	Barnard	F. E. Seagrave, A. J., **34**, 174. See A. J. **33**, 184, and B. A. A. Catalogue 1960, No. 558.
20	1927 VII	1927 c	Mar. 3	G. Van Biesbroeck	M. S. Mello e Simas, A. N., **235**, 345.
21	1933 II	1933 b	Mar. 24	Wachmann	A. E. Levin, J. G. Porter, H. B. A. A., 1939.
22	1939 V	1939 c	Mar. 17	Jeffers	V. L. Ananjeva, Tr. Univ. Obs. Kazan, **32**.
23	1945 IV	1945 a	May 3	Giclas	J. G. Porter, M. N., **109**, 254.
24 A	1951 VI	1951 c	Feb. 3	Cunningham	M. P. Candy, J. G. Porter, M. N., **116**, 226.
24 B	1951 VI	〃	〃	〃	B. G. Marsden, Q. J. R. A. S., **3**, 174.
25	(1957)	—	—	—	M. P. Candy, J. G. Porter, H. B. A. A., 1957.
26	1964 I	1964 b	Feb. 19	E. Roemer	B. G. Marsden, H. B. A. A., 1963 (dT=+1.3)
21)	P/KULIN				
1	1939 VIII	1940 a	Jan. 6	G. Kulin	G. Kulin, U. A. I. C., 810, 904.
2	(1945)	—	—	—	P. Naur, U. A. I. C., 1021.
3	(1951)	—	—	—	I. Hasegawa, M. S.
4	(1957)	—	—	—	I. Hasegawa, M. S.
5	(1963)	—	—	—	I. Hasegawa, U. A. I. C., 1802.
22)	P/TEMPEL (1)				
1	1867 II		Apr. 3	Tempel	R. Gautier, Men. Ae. Geneve, **29**, No. 12.
2	1873 I		Apr. 3	Stephan	R. Gautier, ibid.

3	1879 III		Apr. 24	Tempel	R. Gautier, A. N., **146**, 177.
4 A	(1885)		—	—	R. Gautier, ibid.
4 B	(1885)		—	—	R. Gautier, A. N., **111**, 241.
5 A	(1892)		—	—	R. Gautier, A. N., **146**, 179.
5 B	(1892)		—	—	R. Gautier, A. N., **129**, 45.
6 A	(1898)		—	—	R. Gautier, A. N., **146**, 180.
6 B	(1898)		—	—	R. Gautier, ibid.
17 A	1967				B. G. Marsden, I. A. U. C., 1989, A. J. **68**, 795.
17 B	1967				J. Schubart, I. A. U. C., 1989.

23) P/PIGOTT

1	1783	1783 a	Nov. 19	Pigott	C. H. F. Peters, Brünnow's Astr. Not., No. 19.

24) P/TUTTLE-GIACOBINI-KRESÁK

1	1858 III	1858 c	May 2	Tuttle	A. C. D. Crommelin, M. N., **89**, 362.
10	1907 III	1907 c	June 1	Giacobini	A. C. D. Crommelin, ibid.
14	(1928)	—	—	—	A. C. D. Crommelin, ibid.
15	(1934)	—	—	—	A. C. D. Crommelin, H. B. A. A., 1934.
16	(1939)	—	—	—	A. C. D. Crommelin, H. B. A. A., 1937.
18	1951 IV	1951 f	Apr. 24	L. Kresák	L. Kresák, Contr. Skalnate Pleso, **2**, 57.
19	(1956)	—	—	—	L. Kresák, H. B. A. A., 1956.
20	1962 V	1962 b	Jan. 28	E. Roemer	L. Kresák, Q. J. R. A. S., **4**, 310.
21	1967				G. Lea, S. W. Milbourn, H. B. A. A., 1967.

25) P/TAYLOR

1	1916 I	1915 e	Nov. 24	C. Taylor (a : Nucleus A, b : Nucleus B.)	H. M. Jeffers, L. O. B., **10**, 120.
2	(1922)	—	—	—	S. Beljawsky Beob. Zirc. A. N., No. 26.
3 A	(1928)	—	—	—	G. Van Biesbroeck, U. A. I. C., 211.
3 B	(1928)	—	—	—	A. C. D. Crommelin, U. A. I. C., 210.
4	(1935)	—	—	—	S. Kanda, Tokyo Report, **9**, 43.
5	(1942)	—	—	—	S. Kanda, ibid.
7 A	(1955)	—	—	—	S. Kanda, U. A. I. C., 1535.
7 B	(1955)	—	—	—	T. Higami, Private communication.

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26)	P/SPITALER				
1	1890 VII	1890 f	Nov. 16	R. Spitaler	R. Spitaler, Denk. Wiener Akad., **64**, 167.
3 A	(1903)	—	—	—	Mello e Simas, A. N., **230**, 287. (M=204°.443)
3 B	(1903)	—	—	—	F. Hopfner, A. N., **180**, 45.
4	(1910)	—	—	—	F. Hopfner, A. N., **185**, 337.
27)	P/HARRINGTON-WILSON				
1	1951 IX	1952 a	Jan. 30	Harrington, Wilson	L. E. Cunningham, H. A. C., 1168-1169.
2 A	(1958)	—	—	—	I. Hasegawa, U. A. I. C., 1603.
2 B	(1958)	—	—	—	J. G. Porter, U. A. I. C., 1637.
3	(1964)	—	—	—	P. Egerton, B. O. Wheel, H. B. A. A., 1964.
28)	P/FORBES				
1	1929 II	1929 c	Aug. 1	Forbes	N. Makarov, A. J., **50**, 37.
2 A	(1935)	—	—	—	S. Kanda, Tokyo Report, **9**, 134.
2 B	(1935)	—	—	—	F. R. Cripps, H. B. A. A., 1935.
2 C	(1935)	—	—	—	H. Q. Rasmusen, A. N., **253**, 425.
3 A	1942 III	1942 e	June 15	G. Van Biesbroeck	S. Kanda, Tokyo Report, **9**, 135.
3 B	1942 III	〃	〃	〃	F. R. Cripps, H. B. A. A., 1942. (dT=−0.5)
3 C	1942 III	〃	〃	〃	N. Makarov, A. J., **50**, 37.
4 A	1948 VIII	1948 e	May 14	H. M. Jeffers	F. R. Cripps, H. B. A. A., 1949.
4 B	1948 VIII	〃	〃	〃	B. G. Marsden, M. N., **119**, 442.
5	(1955)	—	—	—	D. H. Christ, P. J. D. Gething, H. B. A. A., 1954.
6	1961 VI	1961 a	Jan. 16	E. Roemer	B. G. Marsden, U. A. I. C., 1759.
7	1967				B. G. Marsden, H. B. A. A., 1967.
29)	P/D'ARREST				
1	1851 II	1851 a	June 27	d'Arrest	G. Levean, Ann. Obs. Paris, **14**, B, 21.
2	1857 VII	1857 g	Dec. 4	Maclear	L. R. Schulze, A. N., **65**, 168.
4	1870 III	1870 c	Aug. 31	Winnecke	G. Leveau, A. N., **105**, 19.
5	1877 IV	1877 d	June 13	White	G. Leveau, ibid.
6	(1884)	—	—	—	G. Leveau, ibid.
7	1890 V	1890 d	Oct. 6	Barnard	G. Leveau, A. N., **125**, 115. (dT=−1.0)

8	1897 II	1897 a	June 28	Perrine	G. Leveau, B. A., **20**, 312.
10	1910 IV	1910 c	Aug. 26	Gonnessiat	J. Braae, A. N., **204**, 31. (dT=0)
11	(1917)	—	—	—	J. Braae, ibid.
12	1923 II	1923 b	Dec. 1	Reid	F. R. Cripps, J. B. A. A., **33**, 294. (dT=+0.95)
13	(1930)	—	—	—	— J. B. A. A., **40**, 175.
14	(1937)	—	—	—	J. T. Foxell, A. E. Levin, H. B. A. A., 1936.
15	1943 III	1943 e	Oct. 4	G. Van Biesbroeck	A. W. Recht, H. A. C., 655. (dT=−1.2)
16	1950 II	1950 a	Apr. 14	G. Van Biesbroeck	A. W. Recht, H .B. A. A., 1950. (dT=−0.2)
17 A	(1957)	—	—	—	A. W. Recht, H. A. C., 1361–1363.
17 B	(1957)	—	—	—	M. Sumner, H. B. A. A., 1956.
18	1963 VII	1963 f	Oct. 9	E. Roemer	B. G. Marsden, Q. J. R. A. S., **5**, 234. (dT=+0.4)
30)	P/SCHWASSMANN-WACHMANN (2)				
0	(1920)	—	—	—	H. Q. Rasmusen, Publ. Copenhagen Obs., No. 106.
1	1929 I	1929 a	Jan. 17	Schwassmann, Wachmann	H. Q. Rasmusen, ibid.
2	1935 III	1934 c	Apr. 7	G. Van Biesbroeck	H. Q. Rasmusen, Q. J. R. A. S., **1**, Pt. 2.
3	1942 I	1941 f	Sept. 20	H. M. Jeffers	H. Q. Rasmusen, Publ. Copenhagen Obs., No. 128. (dT=0)
4 A	1948 VII	1947 l	Oct. 20	G. Van Biesbroeck	H. Q. Rasmusen, Publ. Copenhagen Obs., No. 184.
4 B	1948 VII	—	—	—	C. Dinwoodie, H. B. A. A., 1954, B. A. A. Catalogue, 1960.
5 A	1955 I	1954 g	July 28	H. M. Jeffers, E. Roemer	C. Dinwoodie, M. N., **115**, 196. (dT=−0.2)
5 B	1955 I	〃	〃	〃 〃	B. G. Marsden, K. Aksnes I. A. U. C., 2015.
6 A	1961 VII	1960 j	Aug. 18	E. Roemer	B. G. Marsden, K. Aksnes, ibid.
6 B	1961 VII	〃	〃	〃	H. Q. Rasmusen, H. B. A. A., 1961.
7	1968	1967 i	Aug. 8	K. Tomita	B. G. Marsden, K. Aksnes, loc. cit.
31)	P/PERRINE-MRKOS				
1	1896 VII	1896 g	Dec. 8	Perrine	H. Osten, A. N., **145**, 349.
2	(1903)	—	—	—	Ristenpart, A. N., **161**, 11.
3 A	1909 III	1909 b	Aug. 12	Ebell	H. Hirose, Private Communication
3 B	1909 III	〃	〃	〃	H. Kobold, A. N., **182**, 405.
4	(1916)	—	—	—	H. Hirose, Private Communication
5 A	(1922)	—	—	—	H. Hirose, Private Communication
5 B	(1922)	—	—	—	S. Kasakov, A. N., **217**, 127.
6 A	(1929)	—	—	—	F. R. Cripps, H. B. A. A., 1929.

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6 B	(1929)	—	—	—	H. Hirose, Private Communication
7	(1936)	—	—	—	H. Hirose, Private Communication
8	(1942)	—	—	—	H. Hirose, Private Communication
9	(1949)	—	—	—	H. Hirose, Private Communication
10	1955 VII	1955 i	Oct. 19	A. Mrkos	H. Hirose, U. A. I. C., 1534.
11 A	1962 I	1961 h	Nov. 29	E. Roemer	W. H. Julian, P. Egerton, H. B. A. A., 1961.
11 B	1962 I	〃	〃	〃	H. Hirose, M. Uchida, U. A. I. C., 1787 (dT=−0.6)
32) P/DANIEL					
1	1909 IV	1909 e	Dec. 6	Daniel	F. R. Cripps, M. N., **90**, 424.
2	(1916)	—	—	—	J. Krassowski, A. N., **203**, 358.
4	(1930)	—	—	—	F. R. Cripps, M. N., **69**, 362, H. B. A. A., 1930.
5	1937 I	1937 a	Jan. 31	S. Shimizu	H. Hirose, U. A. I. C., 646. (dT=−0.7)
6	1943 IV	1943 h	Nov. 30	Kellaway	G. Merton, H. B. A. A., 1950.
7 A	1950 V	1950 d	Aug. 16	E. L. Cunningham	B. G. Marsden, Q. J. R. A. S., **1**, Pt. 2.
7 B	1950 V	〃	〃	〃	F. R. Cripps, H. B. A. A., 1950.
8	(1957)	—	—	—	W. E. Beart, U. A. I. C., 1562.
9	1964 II	1964 a	Feb. 6	E. Roemer	B. G. Marsden, H. B. A. A., 1963. (dT=−0.5)
33) P/GIACOBINI-ZINNER					
1	1900 III	1900	Dec. 20	Giacobini	W. Abold, S. Scharbe, V. J. S., **43**, 394.
3	1913 V	1913	Oct. 23	Zinner	M. Ebell, A. N., **196**, 353.
5	1926 VI	1926	Oct. 6	Schwassmann, Wachmann	F. R. Cripps, H. B. A. A., 1926. (dT=+3.75)
6	1933 III	1933	Apr. 23	Schorr	Y. V. Evdokimov, M. N., **118**, 396.
7 A	1940 I	1939	Oct. 15	G. Van Biesbroeck	F. R. Cripps, H. B. A. A., 1939.
7 B	1940 I	—	〃	〃	Y. V. Evdokimov, A. J. U. S. S. R., **40**, 550.
8	1946 V	1946	May 29	H. M. Jeffers	Y. V. Evdokimov, A. J. U. S. S. R., **40**, 550.
9 A	(1953)	—	—	—	F. R. Cripps, H. B. A. A., 1952.
9 B	(1953)	—	—	—	I. Hasegawa, M. S.
10 A	1959 VIII	1959	May 8	E. Roemer	C. Dinwoodie, H. B. A. A., 1958.
10 B	1959 VIII	〃	〃	〃	C. Dinwoodie, Suppl. B. A. A. Catalogue, 1965.
11	1966	1965 g	Sept. 17	E. Roemer	C. Dinwoodie, J. G. Freeman, H. B. A. A., 1965. (dT=+0.1)

34)	P/KOPFF					
	1	1906 IV	1906 e	Aug. 20	Kopff	G. Zappa, Men. Soc. Ital. Sci., (3) **18**, 139.
	3	1919 I	1919 a	July 30	M. Wolf	M. Ebell, A. M., **209**, 283. See B. A. A. Catalogue 1960 No. 548.
	4	1926 II	1926 c	July 13	M. Wolf	F. Kepinski, B. A. A. Mem., **30**, 1, 8. See B. A. A. Catalogue, 1960, No. 582.
	5	1932 III	1932 e	May 25	J. Bobone	F. Kepinski, Bull. Ac. Sci. Polonaise, (A), 1938, 180.
	6	1939 II	1939 e	Apr. 22	G. Van Biesbroeck	Henderson, P. J. Harris, H. B. A. A., 1939. (dT=+0.4)
	7 A	1945 V	1945 b	May 7	H. Giclas	F. Kepinski, A. A., **7**, (2).
	7 B	1945 V	〃	〃	〃	J. Bobone, U. A. I. C., 1019.
	8 A	1951 VII	1951 e	Apr. 12	H. M. Jeffers	F. Kepinski, A. A., (c) **7**, (2), 109.
	8 B	1951 VII	〃	〃	〃	G. Merton, U. A. I. C., 1314, 1335.
	9 A	1958 I	1958 d	June 25	E. Roemer	F. Kepinski, A. A., 8, (4). (dT=0)
	9 B	1958 I	〃	〃	〃	F. Kepinski, A. A., **13**, 87.
	10 A	1964 III	1963 i	Dec. 18	E. Roemer	F. Kepinski, A. A., **13**, 195. (dT=+0.1)
	10 B	1964 III	〃	〃	〃	P. Egerton, J. R. Ainslie, W. H. F. Calway, H. B. A. A., 1963.
35)	P/REINMUTH (2)					
	1	1947 VII	1947 j	Sept. 10	Reinmuth	E. Rabe, Suppl. B. A. A. Catalogue, 1965.
	2	1954 VI	1953 d	July 5	G. Van Biesbroeck	E. Rabe, ibid.
	3	1960 IX	1960 c	May 22	E. Roemer	E. Rabe, ibid.
	4	1967	1967 e	June 5	K. Tomita	E. Rabe, H. B. A. A., 1967.
36)	P/TSUCHINSHAN (1)					
	0	(1958)	—	—	—	G. Sitarski, I. A. U. C., 1916.
	1	1965 I	1965 b	Jan. 1	—	Planetary Section, Purple Mt. Obs., Acta Astr. Sinica, **13**, 124.
37)	P/BARNARD (3)					
	1	1892 V	1892 f	Oct. 12	Barnard	J. R. Hind, A. N., **137**, 110.
38)	P/GIACOBINI					
	1	1896 V	1896 e	Sept. 4	Giacobini	F. R. Cripps, J. B. A. A., **39**, 261.
	3	(1909)	—	—	—	Giacobini, A. N., **182**, 333.
	6	(1929)	—	—	—	F. R. Cripps, J. B. A. A., **39**, 261.
39)	P/FINLAY					
	1	1886 VII	1886 e	Sept. 26	Finlay	L. Schulhof, A. N., **133**, 51.
	2	1893 III	1893 b	May 17	Finlay	L. Schulhof, ibid.

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4	1906 V	1906 d	July 14	Kopff	L. Schulhof, A. N., **172**, 29. (dT=+0.5)
5	(1913)	—	—	—	G. Fayet, A. N., **193**, 333.
6	1919 II	1919 d	Oct. 25	T. Sasaki	M. Cimino, Att. Ac. Lincei (6) 27, 674.
7	1926 V	1926 d	Aug. 3	Stobbe	S. Hasunuma, A. N., 228, 88. (dT=+0.7)
8	(1933)	—	—	—	P. J. Harris, M. Sumner, H. B. A. A., 1933.
9	(1940)	—	—	—	A. C. D. Crommelin, H. B. A. A., 1940.
11	1953 VII	1953 i	Dec. 7	Churms	M. P. Candy, H. B. A. A., 1960.
12	1960 VIII	1960 d	June 21	R. Burnham	M. P. Candy, U. A. I. C., 1741.
13	1967	1967 g	Aug. 7	G. Van Biesbroeck, K. Tomita	M. P. Candy, H. B. A. A., 1967.
40)	P/SCHORR				
1	1918 III	1918	Nov. 23	Schorr	J. Larnik, Bergedorf Mitt., **5**, 23.
2	(1925)	—	—	—	J. Larnik, ibid.
3	(1932)	—	—	—	F. R. Cripps, H. B. A. A., 1931.
4	(1938)	—	—	—	F. R. Cripps, H. B. A. A., 1938.
41)	P/WIRTANEN				
1	1947 XIII	1948 b	Jan. 17	Wirtanen	P. Herget, B. G. Marsden, Q. J. R. A. S., **2**, 158.
2 A	1954 XI	1954 j	Sept. 26	H. M. Jeffers, E. Roemer,	M. P. Imnadze, Proc. Acad. Sci. Georgian S. S. R., **30**, 157.
2 B	1954 XI	〃	〃	〃	P. Herget, B. G. Marsden, Q. J. R. A. S., **2**, 158.
3	1961 IV	1960 m	Oct. 26	E. Roemer	P. Herget, B. G. Marsden, ibid. (dT=0)
4 A	1967	1967 k	Oct. 5	K. Tomita	W. H. Julian, H. B. A. A., 1967. (dT=−0.26)
4 B	1967	〃	〃	〃	M. P. Imnadze, I. A. U. C., 2019. (dT=−2.6)
42)	P/AREND-RIGAUX				
1	1950 VII	1951 b	Feb. 5	Arend, Rigaux	I. Hasegawa, U. A. I. C., 1566.
2 A	1957 VII	1958 b	Jan. 29	E. Roemer	C. M. Christison, E. C. Gibbons, Q. J. R. A. S., **4**, 310.
2 B	1957 VII	〃	〃	〃	I. Hasegawa, U. A. I. C., 1566. (dT=−1.5)
3 A	1964 V	1963 g	Sept. 12	E. Roemer, B. G. Londak	C. M. Christison, E. C. Gibbons, H. B. A. A., 1963.
3 B	1964 V	〃	〃	〃	I. Hasegawa, U. A. I. C., 1835. (dT=+1.3)
43)	P/BIELA				
1	1772	1772	Mar. 8	Montaigne	J. S. Hubbard, A. J., **6**, 114.
6	1806 I	1805 b	Nov. 9	Pons	J. V. Hepperger, Sitz Ber. Ak. Wien, **109**, 623. See B. A. A. Catalogue 1960, No. 156.

	9	1826 I	1826 a	Feb. 27	Biela	J. S. Hubbard, A. J., **6**, 124.
	10	1832 III	1832 c	Aug. 22	Doumochel	J. Baranowski, A. N., **14**, 177.
	12	1846 II	1845 d	Nov. 26	De Vico	J. S. Hubbard, A. J., **6**, 131.
	13	1852 III	1852 d	Aug. 25	Secchi	J. S. Hubbard, A. J., **6**, 140.
	14	(1859)	—	—	—	G. Santini, A. N. **50**, 121.
	15 B	(1866)	—	—	—	G. Michez, A. N., **63**, 297.
	16 B	(1872)	—	—	—	G. Michez, A. N., **79**, 331.
	15 A, 16 A, 17—28		—	—	—	K. Saito, Private Communication
	30	(1965)	—	—	—	B. G. Marsden, A. J., **68**, 795, U. A. I. C., 1879.
44)	P/WOLF					
	1	1884 III	1884 e	Sept. 17	M. Wolf	M. Kamienski, A. A., (a) **3**, 50.
	2	1891 II	1891 c	May 1	Spitaler	M. Kamienski, ibid.
	3	1898 IV	1898 f	June 16	Hussey	M. Kamienski, ibid.
	4 A	(1905)	—	—	—	M. Kamienski, A. J. **32**, 86.
	4 B	(1905)	—	—	—	A. Thraen, A. Berberich. A. N., **165**, 63.
	5	1912 I	1911 a	June 19	M. Wolf	M. Kamienski, A. A., (a) **3**, 50.
	6	1918 V	1918 b	July 9	Jonckheere	M. Kamienski, ibid. and **9**, (2), 58.
	7	1925 X	1925 e	July 13	Baade	M. Kamienski, Bull. Ac. Sci. Polonaise, (A) 1948.
	8	1934 I	1933 e	July 25	H. M. Jeffers	M. Kamienski, ibid.
	9	1942 VI	1942	Nov. 5	Baade	M. Kamienski, ibid.
	10	1950 VI	1950 c	June 18	L. E. Cunningham	M. Kamienski, A. A., **6**, (2), 76.
	11	1959 II	1958 c	June 13	W. A. Baum	M. Kamienski, A. A., **7**, (1), 6. (dT=0)
	12 A	1967	1967 j	Oct. 5	K. Tomita	G. Sitarski, I. A. U. C., 2009. (dT=0)
	12 B	1967	〃	〃	〃	P. Egerton, H. B. A. A., 1967. (dT=0)
45)	P/TSUCHINSHAN (2)					
	1	1965 II	1965 c	Jan. 11	—	Planetary Section, Purple Mt. Obs., Acta Astr. Sinica, **13**, 125.
46)	P/JOHNSON					
	1	1949 II	1949 d	Aug. 24	E. L. Johnson,	E. A. Vorobjev, U. A. I. C., 1822.
	2	1956 V	1956 f	Aug. 6	J. A. Bruwer	E. A. Vorobjev, ibid. (dT=+2.4)
	3 A	1963 IV	1963 c	Aug. 24	E. Roemer	W. H. Julian, B. O. Wheel, H. B. A. A., 1963.
	3 B	1963 IV	〃	〃	〃	B. G. Marsden, Q. J. R. A. S., **5**, 234. (dT=−0.2)
47)	P/HOLMES					
	1	1892 III	1892 h	Nov. 6	Holmes	F. Koebcke, Bull. Poznan, B. (9), 47.

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2	1899 II	1899 d	June 10	Perrine	F. Koebcke, ibid.
3	1906 III	1906 f	Apr. 28	M. Wolf	F. Koebecke, ibid.
4	(1913)	—	—	—	J. Polak, A. N., **231**, 366.
6	(1928)	—	—	—	J. Polak, A. N., **231**, 366.
7	(1935)	—	—	—	J. T. Foxell, J. D. McNeile, H. B. A. A., 1935.
11	1964 X	1964 i	July 16	E. Roemer	B. G. Marsden, A. J., **68**, 795, U. A. I. C., 1858. (dT=+0.7)
48)	P/BORRELLY				
1	1905 II	1904 e	Dec. 28	Borrelly	L. V. Tolnay, A. N., **207**, 189,
2	1911 VIII	1911 e	Sept. 19	Knox-Shaw, A. Schaumasse	G. Fayet, J. O., 8, 123.
3	1918 IV	1918 c	Aug. 7	Fayet	A. Schaumasse, J. O., **14**, 148.
4	1925 VIII	1925 f	Aug. 14	A. Schaumasse	A. Schaumasse, ibid. (dT=+0.1)
5	1932 IV	1932 j	July 30	G. Van Biesbroeck	A. Schaumasse, J. O., **15**, 56. (dT=−0.6)
6	(1939)	—	—	—	S. Kanda, Tokyo Obs. Circ., 95.
7	(1946)	—	—	—	F. R. Cripps, H. B. A. A., 1946.
8 A	1953 IV	1954 b	Feb. 8	R. Roemer	M. Sumner, M. N., **115**, 196.
8 B	1953 IV	〃	〃	〃	S. Kanda, J. A. S. A. C., 120.
9	1960 V	1960 k	Sept. 5	A. McClure	M. Sumner, M. P. Candy, H. B. A. A., 1959 (dT=−0.4)
10	1967	1967 m	Oct. 5	K. Tomita	C. M. Christison, E. R. Delo, H. B. A. A., 1966. (dT=−0.9)
49)	P/HARRINGTON				
1	1953 VI	1953 e	Aug. 14	Harrington	B. G. Marsden, M. N., **118**, 396.
2	1960 VII	1960 g	Aug. 3	E. Roemer	B. G. Marsden, U. A. I. C., 1736. (dT=−0.2)
3 A	1967				G. Sitarski, I. A. U. C., 2012.
3 B	1967				I. W. Wilson, H. B. A. A., 1967.
50)	P/BROOKS (2)				
1	1889 V	1889 d	July 6	Brooks	A. Dubiago, Tr. Univ. Obs. Kazan, 31.
2	1896 VI	1896 c	June 20	Javelle	A. Dubiago, ibid.
3	1903 V	1903 d	Aug. 18	Aitken	A. Dubiago, ibid.
4	1911 I	1910 d	Sept. 28	Aitken, Wilson	A. Dubiago, ibid.
5	(1918)	—	—	—	J. Bauschinger, A. N., **205**, 317.
6	1925 IX	1925 g	Sept. 9	Schajn	A. Dubiago, Bull. Engelhardt Obs., **32**, 3.
7	1932 VIII	1932 m	Sept. 25	G. Van Biesbroeck	A. Dubiago, ibid.

8	1939 VII	1939 g	June	17	H. M. Jeffers, Adams	A. Dubiago, ibid.
9	1946 IV	1946 e	June	28	H. M. Jeffers	A. Dubiago, ibid.
10	1953 V	1953 b	June	18	H. M. Jeffers, E. Roemer	A. Dubiago, ibid.
11	1960 VI	1960 h	Aug.	4	E. Roemer, B.G. Marsden	A. Dubiago, Astr. Circ. U. S. S. R., 168. (dT=0)
12 A	1967					J. G. Freeman, H. B. A. A., 1966.
12 B	1967					E. A. Vorobjev, I. A. U. C., 1956.
51) P/HARRINGTON-ABELL						
1	1954 XIII	1955 a	Mar.	22	Harrington, Abell	I. Hasegawa, U. A. I. C., 1742.
2	1962 II	1962 a	Jan.	26	A. McClure	B. G. Marsden, Private Communication.
52) P/SWIFT (2)						
1	1895 II	1895 a	Aug.	20	L. Swift	H. R. Morgan, A. J., **19**, 155.
2	(1902)	—	—		—	L. Schulhof, A. N., **159**, 30.
11	1967					N. A. Belyavev, I. A. U. C., 2011.
53) P/REINMUTH (1)						
1	1928 I	1928 a	Jan.	26	Reinmuth	L. Berman, F. L. Whipple, H. A. C., 65, L. O. B., 399.
2 A	1935 II	1934 b	Nov.	5	H. M. Jeffers	F. R. Cripps, H. B. A. A., 1949.
2 B	1935 II	〃	〃		〃	G. Merton, M. N., **109**, 254.
3 A	(1942)	—	—		—	S. Kanda, H. Hirose, Tokyo Obs. Circ., 180.
3 B	(1942)	—	—		—	M. Sumner, H. B. A. A., 1943.
4	1950 IV	1949 f	Nov.	19	A. Mrkos	F. R. Cripps, H. B. A. A., 1949. (dT=−1.1)
5	1958 II	1957 e	Sept.	20	E. Roemer	I. H. Wilson, Suppl. B. A. A. Catalogue, 1965. (dT=+0.8)
6	1965 V	1965 a	Jan.	6	K. Tomita	I. H. Wilson, P. Egerton, H. B. A. A., 1965, (dT=−0.1)
54) P/SCHAJN-SCHALDACH						
1	1949 VI	1949 e	Sept.	18	Schajn, Schaldach	A. Dubiago, Astr. Circ. U. S. S. R., 164.
2 A	(1957)	—	—		—	J. T. Foxell, H. B. A. A., 1956.
2 B	(1957)	—	—		—	A. Dubiago, N. A. Z., **10**, No. 5.
3	(1946)	—	—		—	G. Lea, S. W. Milbourn, H. B. A. A., 1963.
55) P/DENNING (2)						
1	1894 I	1894 a	Mar.	26	Denning	P. Gast, Astr. Jahresb., **5**, 190.
56) P/FAYE						
1	1843 III	1843 c	Nov.	22	Faye	A. Möller, A. N., **79**, 121.
2	1851 I	1850 c	Nov.	28	Challis	A. Möller, V. J. S., **7**, 96.

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3	1858 V	1858 h	Sept. 7	Bruhns	A. Möller, ibid.
4	1866 II	1865 c	Aug. 22	Thiele, d'Arrest	A. Möller, ibid.
5	1873 III	1873 f	Sept. 3	Stephan	A. Möller, A. N., **80**, 337. (dT=0)
6	1881 I	1880 c	Aug. 2	Common	A. Möller, Astr. Jahrb., 1882. (dT=0)
7	1888 IV	1888 d	Aug. 9	Perrotin	A. Möller, A. N., **120**, 77. (dT=+2.6)
8	1896 II	1895 b	Sept. 26	Javelle	E. Strömgren, A. N., **161**, 319.
9	(1903)	—	—	—	E. Strömgren, ibid.
10	1910 V	1910 e	Nov. 8	Cerulli	S. H. Levy, Publ. Kazan. Obs., 31.
11	(1918)	—	—	—	V. Fontana, A. N., **206**, 23.
12	1925 V	1925 h	Oct. 20	Baade	F. R. Cripps, J. B. A. A., **35**, 186. (dT=+0.9)
13	1932 IX	1932 l	Aug. 30	Schwassmann, Wachmann, Guyot	F. B. Khanina, O. N. Barteneva, Bull. Inst. Th. Astr. (Leningrad), 8, 238.
14	1940 II	1939 m	Nov. 3	H. M. Jeffers	F. B. Khanina, O. N. Barteneva, ibid.
15	1947 IX	1947 f	June 19	H. M. Jeffers	F. B. Khanina, O. N. Barteneva, ibid.
16	1955 II	1954 e	July 25	G. Van Biesbroeck	F. B. Khanina, O. N. Barteneva, ibid.
17	1962 VII	1961 c	July 5	E. Roemer	F. B. Khanina, H. B. A. A., 1961. (dT=0)
57)	P/ASHBROOK-JACKSON				
1	1948 IX	1948	Aug. 26	Ashbrook, Jackson	M. A. Merslyakova, M. N., **116**, 226.
2 A	1956 II	1955 c	Apr. 24	G. Van Biesbroeck	W. E. Beart, U. A. I. C., 1487.
2 B	1956 II	〃	〃	〃	M. P. Candy, ibid. (dT=+0.6)
2 C	1956 II	〃	〃	〃	T. Higami Private Communication.
3	1963 VI	1962 e	May 9	E. Roemer	M. A. Merslyakova, M. J. Shmakova, Q. J. R. A. S., 4, 310. (dT=+0.3)
58)	P/WHIPPLE				
1	1933 IV	1933 f	Oct. 15	F. L. Whipple	G. G. Cillie, W. A. Johnson, Harvard Circ., 409.
2 A	1941 III	1940 b	Sept. 1	L. E. Cunningham	H. Q. Rasmusen, A. N., **253**, 163.
2 B	1941 III	〃	〃	〃	D. H. Sadler, F. M. McBain, Plan. Co-ords., 1940-60. (dT=−0.2)
3	1948 VI	1947 g	June 21	H. M. Jeffers, G. Van Biesbroeck	C. Dinwoodie, Q. J. R. A. S., **1**, Pt. 2.
4	1955 VIII	1955 d	May 25	E. Roemer	C. Dinwoodie, M. N., **119**, 442.
5	1963 II	1962 f	May 4	E. Roemer	B. G. Marsden, H. B. A. A., 1962. (dT=−0.9)
59)	P/WOLF-HARRINGTON				
1 A	1924 IV	1924 d	Dec. 22	M. Wolf	G. Van Biesbroeck, A. J., 36, 96.

	1 B	1924 IV	〃	〃	〃	S. Kanda, Tokyo Report, **7**, 98.
	1 C	1924 IV	〃	〃	〃	A. Przybylski, A. A., (c), **5**, 184.
	2 A	(1932)	—	—	—	S. Kanda, T. A. B., 61.
	2 B	(1932)	—	—	—	A. C. D. Crommelin, H. B. A. A., 1931.
	3 A	(1939)	—	—	—	A. E. Levin, K. Pollock, J. B. A. A., **49**, 353.
	3 B	(1939)	—	—	—	S. Kanda, Tokyo Circ., 97.
	4	(1946)	—	—	—	F. R. Cripps, H. B. A. A., 1940.
	5 A	1952 II	1951 k	Oct. 4	Harrington	K. Hurukawa, N. A. Z., **10**, 9.
	5 B	1952 II	〃	〃	〃	W. Wisniewski, U. A. I. C., 1603.
	5 C	1952 II	〃	〃	〃	A. Przybylski, U. A. I. C., 1360.
	6 A	1958 V	1957 g	Nov. 18	E. Roemer	J. Kordylewski, A. A., 8 (2) (dT=0)
	6 B	1958 V	〃	〃	〃	K. Hurukawa, N. A. Z., **10**, 9.
	7	1965 III	1964 g	July 10	E. Roemer	G. Lea, S. M. Milbourn, H. B. A. A., 1964. (dT=+0.2)
60)	P/AREND					
	1	1951 X	1951 j	Oct. 4	S. Arend	S. U. Kan, Bull. Inst. Th. Astr. (Leningrard), **7**, (3), 217.
	2 A	1959 V	1959 c	July 6	E. Roemer	W. H. F. Calway, H. B. A. A., 1958. (dT=−0.5)
	2 B	1959 V	〃	〃	〃	S. U. Kan, U. A. I. C., 1671.
	3	1967	1967 l	Oct. 5	K. Tomita	G. Lea, S. W. Milbourn, H. B. A. A., 1966. (dT=0)
61)	P/METCALF					
	1	1906 VII	1906	Nov. 14	Metcalf	E. Bianchi, M. N., **82**, 382.
	3	(1922)	—	—	—	H. Mahnkopf, A. N., **216**, 91.
	4	(1929)	—	—	—	G. Merton, M. N., **82**, 382.
62)	P/OTERMA					
	1	1942 VII	1943 b	Apr. 3	L. Oterma	P. Herget, B. G. Marsden, B. A. A. Catalogue, 1960.
	2	1950 III	—			P. Herget, B. G. Marsden, ibid.
	3	1958 IV	—			P. Herget, B. G. Marsden, ibid. See A. J. **66**, 246.
63)	P/SCHAUMASSE					
	1	1911 VII	1911 h	Nov. 30	A. Schaumasse	G. Fayet, A. Schaumasse, C. R., **154**, 682.
	2	1919 IV	1919 e	Oct. 29	A. Schaumasse	G. Merton, M. N., **87**, 567.
	3	1927 VIII	1927 g	Oct. 4	G. Van Biesbroeck	S. Kanda, H. Hirose, U. A. I. C., 579.
	4	(1935)	—	—	—	W. P. Henderson, M. Sumner, H. B. A. A., 1935.
	5	1943 V	1944 a	Mar. 24	H. Giclas	M. G. Sumner, M. N., **109**, 254.

No.	Designation	Year of Discovery	Date of Discovery	Discoverers	References and Notes
6	1952 III	1951 l	Sept. 30	L. E. Cunningham	M. G. Sumner, M. N., **113**, 390.
7	1960 III	1959 h	Sept. 30	H. M. Jeffers, J. Gibson	M. G. Sumner, H. B. A. A., 1959. (dT = +0.6)
8 A	1968				E. R. Delo, C. M. Christison, I. A. U. C., 2029.
8 B	1968				K. P. Matsukov, I. A. U. C., 2029.
64) P/JACKSON-NEUJMIN					
1	1936 IV	1936 c	Sept. 20	Jackson, Neujmin	B. G. Marsden, B. A. A. Catalogue, 1960.
2	(1945)	—	—		W. E. Beart, W. P. Henderson, H. B. A. A., 1945.
3	(1953)	—	—		W. H. F. Calway, H. B. A. A., 1953.
65) P/DENNING (1)					
1	1881 V	1881 g	Oct. 4	Denning	B. Matthiessen, Veröft. Sternw. Karlsruhe, **3**, 179.
2	(1890)	—	—	—	B. Matthiessen, A. N., **123**, 221.
66) P/SWIFT (1)					
1	1889 VI	1889 f	Nov. 16	L. Swift	J. Coniel, B. A., **13**, 264.
67) P/KEARNS-KWEE					
1	1963 III	1963 d	Aug. 17	Kearns, Kwee	B. G. Marsden, H. A. C., 1636., U. A. I. C., 1857.
68) P/COMAS SOLÁ					
−1	(1910)	—	—	—	P. Ramensky, J. B. A. A., **45**, 243.
0	(1918)	—	—	—	P. Ramensky, ibid., J. O., **19**, 19.
1	1927 III	1926 f	Nov. 5	Comas Solá	J. Vinter Hansen, Publ. Copenhagen Obs., No. 154.
2	1935 IV	1935 c	Aug. 9	H. M. Jeffers	J. Vinter Hansen, Publ. Copenhagen Obs., No. 85. (dT = −1.8)
3	1944 II	1943 d	Oct. 2	L. Oterma	C. Dinwoodie, W. P. Henderson, H. B. A. A., 1943. (dT = −0.2)
4	1952 VII	1951 h	July 7	L. E. Cunningham	J. Vinter Hansen, H. Q. Rasmusen, H. B. A. A., 1952. (dT = −0.4)
5	1961 III	1960 f	June 29	E. Roemer, B.G. Marsden	J. Vinter Hansen, H. Q. Rasmusen, H. B. A. A., 1960. (dT = 0)
69) P/VÄISÄLÄ (1)					
1	1939 IV	1939 b	Feb. 8	Väisälä	L. Oterma, H. B. A. A., 1949.
2	1949 V	1949 h	Dec. 19	A. Mrkos	L. Oterma, M. N., **119**, 442.
3	1960 IV	1959 i	Nov. 11	J. Gibson	L. Oterma, Q. J. R. A. S., **2**, 158. (dT = 0)
70) P/NEUJMIN (3)					
1	1929 III	1929 b	Aug. 2	Neujmin	I. Imai, J. Shanghai Sc. Inst. Sec. I, **1**.

	2 A	(1940)	—	—	—	H. Q. Rasmusen, A. N., **252**, 289.
	2 B	(1940)	—	—	—	S. Kanda, Tokyo Obs. Circ. 99.
	3	1951 V	1951 g	May 4	L. E. Cunningham	W. H. Julian, H. B. A. A., 1951. (dT = −1.5)
	4 A	(1961)	—	—	—	P. Egerton, W. H. Julian, H. B. A. A., 1962.
	4 B	(1961)	—	—	—	S. G. Makower, U. A. I. C., 1757.
71)	P/KLEMOLA					
	1	1965 VI	1965 j	Oct. 28	A. R. Klemola	B. G. Marsden, I. A. U. C., 2017.
72)	P/GALE					
	1	1927 VI	1927 f	June 7	Gale	L. E. Cunningham, H. A. C., 444.
	2	1938	1938 a	May 1	L. E. Cunningham	F. R. Cripps, M. N., **107**, 110.
	3	(1949)	—	—	—	C. Dinwoodie, H. B. A. A., 1949.
	4	(1960)	—	—	—	C. Dinwoodie, H. B. A. A., 1958.
73)	P/SLAUGHTER-BURNHAM					
	1	1958 VI	1959 a	(1958 Dec. 10)	Slaughter, Burnham	E. Roemer, U. A. I. C., 1682.
74)	P/VAN BIESBROECL					
	1	1954 IV	1954 i	Sept. 1	G. Van Biesbroeck	S. W. Milbourn, G. Lea, Suppl. B. A. A. Catalogue, 1965.
	2	1966	1965 d	May 1	E. Roemer	S. W. Milbourn, G. Lea, H. B. A. A., 1965. (dT = +0.3)
75)	P/WILD					
	1	1960 I	1960 b	Apr. 5	Wild	B. G. Marsden, U. A. I. C., 1740.
76)	P/PETERS					
	1	1846 VI	1846 e	June 26	C. H. F. Peters	A. Berberich, A. N., **117**, 251.
77)	P/TUTTLE					
	1 A	1790 II	1790 b	Jan. 9	Méchain	F. C. A. Tischler, Dissert. Inaug., 32.
	1 B	1790 II	〃	〃	〃	F. C. A. Tischler, V. J. S., **6**, 91.
	6	1858 I	1858 a	Jan. 4	Tuttle	J. Rahts, A. N., **113**, 194.
	7	1871 III	1871 d	Oct. 12	Borrelly	J. Rahts, A. N., **136**, 66.
	8	1885 IV	1885 c	Aug. 8	Perrotin, Charlois	J. Rahts, A. N., **136**, 65.
	9	1899 III	1899 b	Mar. 5	M. Wolf	J. Rahts, A. N., **149**, 42. (dT = 0)
	10 A	1912 IV	1912 b	Oct. 19	Schaumasse	N. Idelson, M. Musselius, Bull. Inst. Th. Astr. (Leningrad), No. 7.
	10 B	1912 IV	〃	〃	〃	E. Heise, Dissert. Bamberg, 1920.
	11	1926 IV	1926 a	Jan. 12	Baade	N. Idelson, M. Musselius, B. Z., 1925, 28. (dT = +1.1)

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12 A	1939 X	1939 k	Aug. 14	H. M. Jeffers	A. C. D. Crommelin, H. B. A. A., 1939. (dT=+0.7)
12 B	1939 X	〃	〃	〃	C. Dinwoodie, H. B. A. A., 1966.
13	(1935)	—	—	—	C. Dinwoodie, H. B. A. A., 1953.
14	1967	1967 a	Jan. 3	K. Tomita	B. G. Marsden, I. A. U. C., 1991.
78) P/DU TOIT (1)					
1	1944 III	1944 c	May 24	du Toit	J. Bobone, Contr. Obs. Cordoba, No. 1, 5.
2	(1959)	—	—	—	J. Bobone, ibid.
79) P/SCHWASSMANN-WACHMANN (1)					
1 A	1925 II	1925 j	Nov. 15	Schwassmann, Wachmann	P. Herget, B. G. Marsden, B. A. A. Catalogue, 1960.
1 B	1927	—	—	—	J. G. Behrens, A. N., 274, 222. (M=55.°2580)
1 C	1932	—	—	—	J. G. Behrens, A. N., 245, 309. (M=151.°012)
2 A	1941 VI	—	—	—	P. Herget, B. G. Marsden, loc. cit.
2 B	1944	—	—	—	J. G. Behrens, A. N., 274, 222. (M=76.°5247)
3	1957 IV	—	—	—	P. Herget, B. G. Marsden, loc. cit.
4	1974				P. Herget, A. J., 66, 268.
80) P/PERRINE					
1	1916 III	1916 c	May 4	Perrine (Seen one day only)	E. Glancy, Obs., 39, 517.
81) P/NEUJMIN (1)					
1	1913 III	1913 c	Sept. 6	Neujmin	G. Van Biesbroeck, A. J., 44, 113.
2	1931 I	1931 d	Aug. 20	Nicholson	G. Van Biesbroeck, ibid.
3	1948 XIII	1948 f	May 6	Nicholson	H. Raudsaar, Bull. Inst. Theor. Astr. (Leningrad), 7, 232.
4	1966	1966 a	May 16	A. D. Andrews	B. G. Marsden, U. A. I. C., 1945. (dT=−0.6)
82) P/CROMMELIN					
1	1657 I	1457 a	Jan. 14	Toscanelli	A. C. D. Crommelin, M. N., 92, 451.
7	1625	1625	Jan. 26	Schickhardt	A. C. D. Crommelin, J. B. A. A., 44, 240, 339.
14	1818 I	1818 a	Feb. 23	Pons	A. C. D. Crommelin, M. N., 90, 322, B. A. A. Mem., 30, 1.
16	1873 VII	1873 g	Nov. 10	Coggia	A. C. D. Crommelin, ibid.
18	1928 III	1928 c	Oct. 26	M. Yamasaki	M. P. Candy, J. G. Porter, H. B. A. A., 1956.
19	1956 VI	1956 g	Sept. 29	L. Pajdusăkova	M. P. Candy, J. G. Porter, ibid. (dT=+5.9)

83)	P/TEMPEL-TUTTLE					
	1 A	1366	1366	Oct. 25	(China, Japan)	S. Kanda, Mem. Astr. Soc. Japan (1932).
	1 B	1366	〃	〃	〃	J. Schubart, Suppl B. A. A. Catalogue, 1965.
	11	1699 II	1699 b	Oct. 26	G. Kirch	J. Schubart, ibid.
	14	(1799)	—	—	—	J. Schubart, Private Communication.
	15	(1833)	—	—	—	J. Schubart, Private Communication.
	16 A	1866 I	1865 f	Dec. 19	Tempel, 1866 Jan. 5 Tuttle	J. Schubart, Suppl. B. A. A. Catalogue, 1965.
	16 B	1866 I	〃	〃	〃	T. Oppolaer, A. N., 68, 249.
	17	(1899)	—	—	—	J. Schubart, Private Communication.
	18 A	(1932)	—	—	—	J. Schubart, Private Communication.
	18 B	(1932)	—	—	—	A. C. D. Crommelin, J. B. A. A., 41, 333, 422.
	19	1965 IV	1965 i	June 30	M. J. Bester, J. Schubart	J. Schubart, I. A. U. C., 1907. (dT = +5.0)
84)	P/STEPHAN-OTERMA					
	1	1867 I	1867 a	Jan. 22	Coggia, Stephan	L. Becker, M. N., 51, 489.
	3	1942 IX	1942 f	Nov. 6	L. Oterma	A. D. Dubiago, Astr. Circ., U. S. S. R., No. 17.
85)	P/WESTPHAL					
	1	1852 IV	1852 c	July 24	Westphal	A. Hnatek, A. N., 185, 345.
	2	1913 VI	1913 d	Sept. 26	Delavan	M. Viljev, A. N., 199, 11.
86)	P/PONS-GAMBERT					
	1	1827 II	1827 a	June 20	Pons, Gambert	S. Ogura, Ann. Tokyo Obs., 5, 3.
87)	P/ROSS					
	1	1883 II	1884 a	Jan. 7	D. Ross	E. Moravi, A. N., 184, 130.
88)	P/DUBIAGO					
	1	1921 I	1921 c	Apr. 29	A. D. Dubiago	H. Hirose, V. J. S., 72, 364.
89)	P/BRORSEN-METCALF					
	1	1847 V	1847 d	July 20	Brorsen	P. Duckert, A. N., 215, 208.
	2	1919 III	1919 b	Aug. 20	Metcalf	P. Duckert, ibid.
90)	P/PONS-BROOKS					
	1	1812	1812	July 12	Pons	L. Schulhof, J. Bossert, A. N., 103, 291.
	2	1884 I	1883 b	Sept. 1	Brooks	L. Schulhof, J. Bossert, A. N., 108, 16.

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3	1954 VII	1853 c	June 20	E. Roemer	P. Musen, H. A. C., 1249.
91)	P/OLBERS				
1	1815	1815	Mar. 6	Olbers	H. Q. Rasmusen, Pub. Copenhagen Obs., No. 147.
2	1887 V	1887 f	Aug. 24	Brooks	H. Q. Rasmusen, ibid.
3	1956 IV	1956 a	Jan. 2	A. Mrkos, K. Tomita	H. Q. Rasmusen, ibid. (dT=+3.3)
92)	P/DE VICO				
1	1846 IV	1846 b	Feb. 20	de Vico	J. r. Hepperger, Anz. Akad. Wien., 1887 (9), 98.
93)	P/HALLEY				
1	−466	−466	Winter	(China)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 668.
4	−239	−239		(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
5	−162	−162 a		(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
6	− 86	− 86	Aug.	(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
7	− 11	− 11	Aug. 26	(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
8	66	66	Feb. 20	(China)	J. Holetschek, A. N., 143, 113.
9	141	141	Mar. 27	(China)	P. H. Cowell, A. C. D. Crommelin, loc. cit.
10	218	218	Apr.	(China)	P. H. Cowell, A. C. D. Crommelin, loc. cit.
11	295	295	May	(China)	P. H. Cowell, A. C. D. Crommelin, loc. cit.
12	374	374	Mar. 4	(China)	P. H. Cowell, A. C. D. Crommelin, loc. cit.
13	451	451	May 17	(China)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 112, 668.
14	530	530	Aug. 29	(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
15	607	607 a	Mar. 13	(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
16	684	684 c	Sept. 6	(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
17	760	760 b	May 16	(China)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 112, 513.
18	837	837 a	Mar. 22	(China)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 513.
19	912	912	May 15	(China)	P. H. Cowell, A. C. D. Crommelin, ibid.
20	989	989 c	Aug. 13	(China)	J. Holetschek, A. N., 143, 115.
21	1066	1066	Apr. 2	(China)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 378.
22	1145	1145 a	Apr. 15	(Europe)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 377.
23	1222	1222	Sept. 3	(Korea)	P. H. Cowell, A. C. D. Crommelin, ibid.
24	1301	1301 a	Sept. 1	(Europe)	P. H. Cowell, A. C. D. Crommelin, M. N., 68, 125.

	25	1378	1378	Sept. 26	(China)	E. Laugier, C.R., **16**, 1005.
	26	1456	1456	May 27	(China)	G. Celoria, A.N., **111**, 70.
	27	1531	1531 a	July	(Europe)	E. Halley, Tab. Astron.
	28	1607	1607	Sept. 11	(China)	F.W. Bessel, Mon. Corr., **10**, 438. Eq. assumed 1607.0.
	29	1682	1682	Aug. 26	Picard, La Hire	O.A. Rosenberger, A.N., **12**, 190.
	30	1759 I	1758 c	Dec. 25	Palitsch	O.A. Rosenberger, ibid.
	31 A	1835 III	1835 c	Aug. 5	Dumouchet, de Vico	J.L. Brady, E. Carpenter, A.J., **72**, 367.
	31 B	1835 III	〃	〃	〃	P.H. Cowell, A.C.D. Crommelin, A.N., **185**, 265.
	32 A	1910 II	1909 c	Sept. 11	M. Wolf	J.L. Brady, E. Carpenter, loc. cit.
	32 B	1910 II	〃	〃	〃	P.E. Zadunaisky, A.J., **71**, 20.
	32 C	1910 II	〃	〃	〃	A.C.D. Crommelin, Mem. B.A.A., **19**, 32.
	32 D	1910 II	〃	〃	〃	F.E. Seagrave, A.J., **28**, 71.
	33	1986				J.L. Brady, E. Carpenter, loc. cit.
94)	P/VÄISÄLÄ (2)					
	1	1942 II	1942 c	Mar. 12	Y. Väisälä	Y. Väisälä, U.A.I.C., 910.
95)	P/SWIFT-TUTTLE					
	1	1862 III	1862 b	July 15	L. Swift, July 18 Tuttle.	F. Hayn, Dissert. Inaug. Göttingen, 1889.
96)	P/BARNARD (2)					
	1	1889 III	1889 c	June 23	Barnard	A. Berberich, A.N., **123**, 77.
97)	P/MELLISH					
	1	1917 I	1917 a	Mar. 19	Mellish	S. Asklöf, Ark. Mat, Stockholm, **23**, A, No. 11, 14.
98)	P/HERSCHEL-RIGOLLET					
	1	1788 II	1788 b	Dec. 21	C. Herschel	M. Palmer, A.J., **34**, 84.
	2	1939 VI	1939 h	July 28	R. Rigollet	A.D. Maxwell, K.P. Kaster, A.J., **49**, 56.
99)	P/GRIGG-MELLISH					
	1	1742	1742 a	Feb. 5		E. Weiss, Denk. Wiener Akad. **84**, 12.
	2	1907 II	1907 b	Apr. 8	Grigg, Apr. 14 Mellish.	E. Weiss, ibid. (Not linked)

Abbreviations for References

A. A. Acta Astronomica (Poland)
A. N. Astronomische Nachrichten
A. J. Astronomical Journal
Ann. Bur. Long. Annuaire de Bureau des Longitudes
Astr. Circ. Astronomical Circular
A. B. Bulletin Astronomique, Paris
BAA Catalogue 1960 Catalogue of Cometary Orbits 1960, Mem. B. A. A., Vol. 39, No. 3, 1961.
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