

THE COMET HANDBOOK FOR 2018

彗星年表 2018

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Comet 95P/(2060) Chiron

Epoch = 2018 July 21.0 TT
 T = 1996 Feb. 29.46196 TT
 Peri. = 339.77176
 Node = 209.20160 2000.0
 Incl. = 6.94953
 q = 8.4483353 AU
 e = 0.3814526
 a = 13.6583474 AU
 n = 0.01952571
 P = 50.48 years

H = 5.8 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		V	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	23 33.76	+01 07.1	18.885	18.624	+0.10	+0.4	18.8	73.2
Jan. 12	23 34.89	+01 11.8	19.049	18.628	+0.13	+0.6	18.8	63.3
Jan. 22	23 36.30	+01 18.5	19.200	18.632	+0.15	+0.8	18.8	53.5
Feb. 1	23 37.95	+01 27.0	19.334	18.636	+0.18	+0.9	18.8	43.8
Feb. 11	23 39.79	+01 37.0	19.447	18.639	+0.19	+1.1	18.8	34.2
Feb. 21	23 41.80	+01 48.4	19.537	18.643	+0.21	+1.2	18.8	24.7
Mar. 3	23 43.92	+02 00.9	19.601	18.647	+0.22	+1.3	18.7	15.4
Mar. 13	23 46.10	+02 14.0	19.638	18.651	+0.22	+1.3	18.7	6.6
Mar. 23	23 48.30	+02 27.7	19.647	18.654	+0.22	+1.4	18.7	5.1
Apr. 2	23 50.48	+02 41.4	19.628	18.658	+0.21	+1.4	18.7	13.5
Apr. 12	23 52.58	+02 55.0	19.583	18.662	+0.20	+1.3	18.8	22.6
Apr. 22	23 54.56	+03 08.2	19.513	18.665	+0.19	+1.3	18.8	31.7
May 2	23 56.40	+03 20.6	19.419	18.669	+0.17	+1.2	18.8	40.9
May 12	23 58.04	+03 32.0	19.304	18.672	+0.15	+1.1	18.8	50.1
May 22	23 59.45	+03 42.1	19.172	18.676	+0.13	+0.9	18.9	59.3
June 1	00 00.60	+03 50.8	19.026	18.679	+0.10	+0.8	18.9	68.6
June 11	00 01.48	+03 57.7	18.869	18.683	+0.07	+0.6	18.8	77.9
June 21	00 02.04	+04 02.8	18.707	18.686	+0.04	+0.4	18.8	87.3
July 1	00 02.30	+04 05.9	18.544	18.690	+0.01	+0.2	18.8	96.7
July 11	00 02.24	+04 06.8	18.383	18.693	-0.02	0.0	18.8	106.2
July 21	00 01.86	+04 05.7	18.231	18.696	-0.05	-0.2	18.8	115.8
July 31	00 01.17	+04 02.4	18.091	18.700	-0.08	-0.4	18.7	125.6
Aug. 10	00 00.22	+03 57.1	17.968	18.703	-0.11	-0.6	18.7	135.3
Aug. 20	23 59.01	+03 50.0	17.866	18.706	-0.13	-0.8	18.6	145.2
Aug. 30	23 57.61	+03 41.3	17.788	18.709	-0.15	-0.9	18.6	155.2
Sept. 9	23 56.07	+03 31.3	17.737	18.713	-0.16	-1.1	18.5	165.1
Sept. 19	23 54.44	+03 20.3	17.716	18.716	-0.16	-1.1	18.5	174.4
Sept. 29	23 52.80	+03 08.8	17.724	18.719	-0.16	-1.2	18.5	173.0
Oct. 9	23 51.21	+02 57.3	17.762	18.722	-0.15	-1.1	18.6	163.4
Oct. 19	23 49.73	+02 46.2	17.830	18.725	-0.14	-1.1	18.6	153.2
Oct. 29	23 48.43	+02 35.8	17.925	18.728	-0.12	-1.0	18.7	143.0
Nov. 8	23 47.36	+02 26.7	18.045	18.731	-0.09	-0.8	18.7	132.7
Nov. 18	23 46.58	+02 19.2	18.185	18.734	-0.06	-0.7	18.7	122.4
Nov. 28	23 46.10	+02 13.5	18.341	18.737	-0.03	-0.5	18.8	112.2
Dec. 8	23 45.95	+02 09.8	18.509	18.740	0.00	-0.2	18.8	102.0
Dec. 18	23 46.14	+02 08.4	18.684	18.742	+0.04	0.0	18.8	91.9
Dec. 28	23 46.67	+02 09.2	18.859	18.745	+0.07	+0.2	18.8	81.9
Jan. 7	23 47.52	+02 12.1	19.030	18.748	+0.10	+0.4	18.9	71.9
Jan. 17	23 48.67	+02 17.2	19.192	18.751	+0.13	+0.6	18.9	62.1
Jan. 27	23 50.10	+02 24.2	19.340	18.753	+0.16	+0.8	18.9	52.3
Feb. 6	23 51.75	+02 33.0	19.470	18.756	+0.18	+1.0	18.9	42.6
Feb. 16	23 53.61	+02 43.3	19.580	18.759	+0.19	+1.1	18.8	33.0
Feb. 26	23 55.61	+02 54.8	19.665	18.761	+0.21	+1.2	18.8	23.5
Mar. 8	23 57.72	+03 07.3	19.725	18.764	+0.22	+1.3	18.8	14.2
Mar. 18	23 59.89	+03 20.5	19.757	18.767	+0.22	+1.3	18.7	5.4
Mar. 28	00 02.08	+03 34.0	19.762	18.769	+0.22	+1.4	18.7	5.8

Comet 174P/(60558) Echeclus

Epoch = 2018 July 21.0 TT
 T = 2015 Apr. 21.15828 TT
 Peri. = 162.78337
 Node = 173.32328 2000.0
 Incl. = 4.34389
 q = 5.8123094 AU
 e = 0.4560285
 a = 10.6849521 AU
 n = 0.02821923
 P = 34.93 years

H = 9.1 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		V	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	02 35.43	+11 15.7	6.835	7.358	-0.05	+0.1	18.1	118.7
Jan. 12	02 35.36	+11 18.9	7.011	7.383	+0.04	+0.6	18.2	108.5
Jan. 22	02 36.17	+11 26.6	7.197	7.409	+0.13	+1.0	18.3	98.6
Feb. 1	02 37.86	+11 38.3	7.387	7.435	+0.21	+1.4	18.3	88.9
Feb. 11	02 40.34	+11 53.6	7.577	7.460	+0.29	+1.7	18.4	79.5
Feb. 21	02 43.58	+12 11.9	7.762	7.486	+0.36	+2.0	18.4	70.2
Mar. 3	02 47.48	+12 32.7	7.939	7.512	+0.42	+2.2	18.5	61.2
Mar. 13	02 51.95	+12 55.2	8.103	7.538	+0.48	+2.3	18.5	52.4
Mar. 23	02 56.93	+13 19.1	8.252	7.564	+0.52	+2.4	18.5	43.7
Apr. 2	03 02.32	+13 43.7	8.384	7.590	+0.56	+2.5	18.5	35.3
Apr. 12	03 08.03	+14 08.4	8.496	7.616	+0.59	+2.5	18.5	26.9
Apr. 22	03 14.00	+14 32.9	8.587	7.642	+0.61	+2.4	18.5	18.7
May 2	03 20.13	+14 56.8	8.656	7.669	+0.62	+2.3	18.4	10.8
May 12	03 26.34	+15 19.6	8.702	7.695	+0.62	+2.2	18.3	3.9
May 22	03 32.58	+15 41.0	8.725	7.721	+0.62	+2.1	18.4	6.8
June 1	03 38.74	+16 00.8	8.725	7.748	+0.61	+1.9	18.5	14.4
June 11	03 44.77	+16 18.8	8.703	7.774	+0.59	+1.7	18.5	22.4
June 21	03 50.58	+16 34.7	8.659	7.800	+0.57	+1.5	18.6	30.4
July 1	03 56.09	+16 48.4	8.596	7.827	+0.53	+1.2	18.6	38.6
July 11	04 01.23	+16 59.8	8.514	7.853	+0.49	+1.0	18.7	46.9
July 21	04 05.92	+17 08.9	8.415	7.880	+0.44	+0.8	18.7	55.2
July 31	04 10.08	+17 15.6	8.303	7.907	+0.38	+0.5	18.7	63.8
Aug. 10	04 13.62	+17 19.8	8.179	7.933	+0.32	+0.3	18.7	72.5
Aug. 20	04 16.48	+17 21.7	8.048	7.960	+0.25	+0.1	18.7	81.4
Aug. 30	04 18.58	+17 21.2	7.914	7.987	+0.17	-0.2	18.6	90.5
Sept. 9	04 19.88	+17 18.5	7.779	8.014	+0.08	-0.4	18.6	99.9
Sept. 19	04 20.34	+17 13.7	7.649	8.040	0.00	-0.6	18.6	109.5
Sept. 29	04 19.94	+17 06.9	7.528	8.067	-0.09	-0.8	18.5	119.4
Oct. 9	04 18.72	+16 58.4	7.422	8.094	-0.17	-0.9	18.4	129.5
Oct. 19	04 16.72	+16 48.5	7.334	8.121	-0.24	-1.1	18.4	139.8
Oct. 29	04 14.06	+16 37.5	7.270	8.148	-0.30	-1.1	18.3	150.3
Nov. 8	04 10.88	+16 25.9	7.232	8.175	-0.34	-1.2	18.2	160.9
Nov. 18	04 07.36	+16 14.2	7.223	8.201	-0.36	-1.1	18.1	171.1
Nov. 28	04 03.71	+16 03.2	7.246	8.228	-0.36	-1.1	18.1	174.3
Dec. 8	04 00.14	+15 53.2	7.300	8.255	-0.34	-0.9	18.2	164.9
Dec. 18	03 56.87	+15 45.1	7.385	8.282	-0.30	-0.7	20.1	154.3
Dec. 28	03 54.08	+15 39.2	7.498	8.309	-0.25	-0.4	20.0	143.5
Jan. 7	03 51.92	+15 36.0	7.635	8.336	-0.18	-0.2	19.9	132.9
Jan. 17	03 50.50	+15 35.6	7.794	8.363	-0.10	+0.1	19.7	122.4
Jan. 27	03 49.88	+15 38.1	7.969	8.390	-0.02	+0.4	19.6	112.2
Feb. 6	03 50.08	+15 43.3	8.155	8.417	+0.07	+0.7	19.5	102.1
Feb. 16	03 51.10	+15 51.2	8.347	8.444	+0.15	+0.9	19.9	92.3
Feb. 26	03 52.89	+16 01.2	8.540	8.471	+0.22	+1.1	20.2	82.7
Mar. 8	03 55.41	+16 13.1	8.729	8.498	+0.29	+1.3	20.5	73.3
Mar. 18	03 58.58	+16 26.5	8.911	8.525	+0.35	+1.4	20.8	64.2
Mar. 28	04 02.33	+16 40.7	9.082	8.552	+0.40	+1.5	21.1	55.2

Comet C/2011 KP36 (Spacewatch)

Epoch = 2018 July 21.0 TT
 T = 2016 May 26.54181 TT
 Peri. = 180.55113 e = 0.8731466
 Node = 173.38255 2000.0 a = 38.4785051 AU
 Incl. = 18.98293 n = 0.00412930
 q = 4.8811292 AU P = 238.69 years

$$m_1 = 3.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	03 12.85	-01 01.7	5.816	6.395	-0.08	+1.5	15.7	122.2
Jan. 12	03 12.48	+00 44.1	5.994	6.439	+0.02	+2.1	15.8	112.7
Jan. 22	03 13.09	+00 21.1	6.183	6.482	+0.11	+2.5	15.9	103.4
Feb. 1	03 14.65	+00 06.0	6.379	6.526	+0.21	+2.9	16.0	94.2
Feb. 11	03 17.13	+00 36.2	6.578	6.570	+0.29	+3.1	16.1	85.3
Feb. 21	03 20.45	+01 08.4	6.775	6.615	+0.38	+3.3	16.2	76.5
Mar. 3	03 24.52	+01 41.7	6.967	6.660	+0.45	+3.3	16.2	68.0
Mar. 13	03 29.27	+02 15.0	7.150	6.705	+0.51	+3.3	16.3	59.8
Mar. 23	03 34.60	+02 47.8	7.321	6.750	+0.56	+3.2	16.4	51.8
Apr. 2	03 40.41	+03 19.2	7.479	6.796	+0.60	+3.0	16.5	44.0
Apr. 12	03 46.61	+03 48.7	7.620	6.841	+0.64	+2.8	16.6	36.6
Apr. 22	03 53.12	+04 15.8	7.743	6.887	+0.66	+2.6	16.6	29.6
May 2	03 59.85	+04 40.0	7.848	6.933	+0.68	+2.3	16.7	23.3
May 12	04 06.73	+05 01.1	7.932	6.980	+0.69	+1.9	16.7	18.3
May 22	04 13.66	+05 18.7	7.995	7.026	+0.69	+1.6	16.8	15.7
June 1	04 20.57	+05 32.6	8.038	7.073	+0.69	+1.2	16.8	16.8
June 11	04 27.39	+05 42.7	8.059	7.120	+0.67	+0.8	16.9	20.9
June 21	04 34.03	+05 48.8	8.061	7.167	+0.65	+0.4	16.9	26.7
July 1	04 40.42	+05 50.8	8.042	7.214	+0.62	0.0	16.9	33.3
July 11	04 46.49	+05 48.8	8.005	7.261	+0.59	-0.4	16.9	40.4
July 21	04 52.15	+05 42.9	7.951	7.309	+0.54	-0.8	16.9	47.9
July 31	04 57.32	+05 33.1	7.882	7.357	+0.49	-1.2	16.9	55.6
Aug. 10	05 01.93	+05 19.6	7.799	7.404	+0.43	-1.5	17.0	63.6
Aug. 20	05 05.90	+05 02.8	7.706	7.452	+0.36	-1.9	17.0	71.8
Aug. 30	05 09.16	+04 43.0	7.606	7.500	+0.28	-2.1	17.0	80.2
Sept. 9	05 11.65	+04 20.7	7.502	7.548	+0.20	-2.4	17.0	88.8
Sept. 19	05 13.30	+03 56.4	7.398	7.597	+0.12	-2.5	17.0	97.6
Sept. 29	05 14.09	+03 31.0	7.297	7.645	+0.03	-2.6	16.9	106.7
Oct. 9	05 14.00	+03 05.1	7.205	7.694	-0.06	-2.6	16.9	115.8
Oct. 19	05 13.06	+02 39.8	7.126	7.742	-0.14	-2.5	17.0	125.1
Oct. 29	05 11.33	+02 16.1	7.064	7.791	-0.21	-2.2	17.0	134.3
Nov. 8	05 08.90	+01 54.9	7.024	7.839	-0.28	-1.9	17.0	143.2
Nov. 18	05 05.92	+01 37.3	7.008	7.888	-0.32	-1.5	17.0	151.1
Nov. 28	05 02.57	+01 24.2	7.020	7.937	-0.35	-1.0	17.0	156.9
Dec. 8	04 59.06	+01 16.1	7.061	7.986	-0.35	-0.5	17.1	158.6
Dec. 18	04 55.59	+01 13.5	7.131	8.035	-0.34	0.0	17.1	155.2
Dec. 28	04 52.38	+01 16.4	7.230	8.084	-0.30	+0.6	17.2	148.4
Jan. 7	04 49.61	+01 24.6	7.356	8.133	-0.25	+1.1	17.2	139.9
Jan. 17	04 47.44	+01 37.5	7.506	8.183	-0.18	+1.5	17.3	130.8
Jan. 27	04 45.98	+01 54.5	7.676	8.232	-0.10	+1.9	17.4	121.4
Feb. 6	04 45.28	+02 14.7	7.861	8.281	-0.03	+2.2	17.5	112.0
Feb. 16	04 45.39	+02 37.4	8.058	8.330	+0.06	+2.4	17.5	102.6
Feb. 26	04 46.29	+03 01.5	8.262	8.380	+0.13	+2.5	17.6	93.4
Mar. 8	04 47.96	+03 26.3	8.468	8.429	+0.21	+2.5	17.7	84.4
Mar. 18	04 50.33	+03 51.1	8.671	8.479	+0.27	+2.5	17.8	75.6
Mar. 28	04 53.34	+04 15.2	8.868	8.528	+0.33	+2.3	17.8	67.0

Comet C/2014 R3 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2016 Aug. 8.57837 TT
 Peri. = 113.45900
 Node = 334.09792 2000.0
 Incl. = 90.85611
 q = 7.2769611 AU
 e = 0.9988435

$$m1 = -0.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .3			m	'		°
Jan. 2	11 57.63	+38 28.3	7.516	7.963	-0.32	+2.3	17.5	113.8
Jan. 12	11 53.85	+38 51.9	7.419	7.988	-0.44	+2.4	17.5	122.3
Jan. 22	11 48.90	+39 16.1	7.340	8.014	-0.56	+2.4	17.5	130.5
Feb. 1	11 42.86	+39 38.4	7.284	8.041	-0.66	+2.0	17.5	137.8
Feb. 11	11 35.90	+39 56.3	7.253	8.067	-0.74	+1.5	17.5	143.5
Feb. 21	11 28.25	+40 07.5	7.250	8.094	-0.79	+0.7	17.5	146.6
Mar. 3	11 20.23	+40 10.1	7.278	8.121	-0.81	-0.3	17.6	146.3
Mar. 13	11 12.17	+40 03.1	7.335	8.149	-0.80	-1.3	17.6	142.8
Mar. 23	11 04.41	+39 45.9	7.421	8.177	-0.75	-2.3	17.6	136.9
Apr. 2	10 57.25	+39 18.9	7.533	8.206	-0.67	-3.2	17.7	129.6
Apr. 12	10 50.93	+38 43.0	7.668	8.234	-0.58	-4.0	17.8	121.4
Apr. 22	10 45.61	+37 59.6	7.822	8.263	-0.47	-4.7	17.8	112.8
May 2	10 41.38	+37 10.0	7.990	8.293	-0.36	-5.2	17.9	104.1
May 12	10 38.24	+36 15.9	8.168	8.322	-0.25	-5.6	18.0	95.3
May 22	10 36.18	+35 18.6	8.352	8.352	-0.15	-5.9	18.0	86.6
June 1	10 35.11	+34 19.2	8.535	8.383	-0.06	-6.0	18.1	78.0
June 11	10 34.95	+33 18.8	8.716	8.413	+0.03	-6.1	18.2	69.5
June 21	10 35.59	+32 18.1	8.888	8.444	+0.10	-6.1	18.2	61.1
July 1	10 36.92	+31 17.8	9.049	8.476	+0.17	-6.0	18.3	53.0
July 11	10 38.83	+30 18.5	9.195	8.507	+0.22	-5.9	18.4	45.0
July 21	10 41.22	+29 20.5	9.325	8.539	+0.26	-5.7	18.4	37.3
July 31	10 43.98	+28 24.3	9.434	8.571	+0.29	-5.5	18.5	30.1
Aug. 10	10 47.01	+27 30.2	9.522	8.604	+0.32	-5.3	18.5	23.7
Aug. 20	10 50.23	+26 38.4	9.587	8.636	+0.33	-5.0	18.6	19.0
Aug. 30	10 53.54	+25 49.2	9.628	8.669	+0.33	-4.8	18.6	17.4
Sept. 9	10 56.86	+25 03.0	9.644	8.702	+0.33	-4.4	18.6	19.7
Sept. 19	11 00.10	+24 20.1	9.636	8.736	+0.32	-4.1	18.6	25.1
Sept. 29	11 03.16	+23 40.6	9.603	8.770	+0.29	-3.7	18.7	32.0
Oct. 9	11 05.98	+23 05.0	9.548	8.804	+0.26	-3.3	18.7	39.8
Oct. 19	11 08.45	+22 33.4	9.472	8.838	+0.22	-2.9	18.7	48.1
Oct. 29	11 10.49	+22 06.2	9.377	8.872	+0.18	-2.5	18.7	56.8
Nov. 8	11 12.01	+21 43.5	9.266	8.907	+0.12	-2.0	18.7	65.9
Nov. 18	11 12.93	+21 25.5	9.144	8.942	+0.06	-1.5	18.7	75.2
Nov. 28	11 13.17	+21 12.1	9.013	8.977	-0.02	-1.1	18.7	84.8
Dec. 8	11 12.67	+21 03.3	8.879	9.013	-0.09	-0.6	18.7	94.6
Dec. 18	11 11.36	+20 58.7	8.748	9.048	-0.18	-0.2	18.7	104.7
Dec. 28	11 09.23	+20 58.0	8.625	9.084	-0.26	+0.1	18.7	115.0
Jan. 7	11 06.27	+21 00.3	8.515	9.120	-0.34	+0.4	18.7	125.5
Jan. 17	11 02.54	+21 04.7	8.424	9.157	-0.41	+0.5	18.7	136.0
Jan. 27	10 58.12	+21 10.1	8.357	9.193	-0.48	+0.6	18.7	146.4
Feb. 6	10 53.14	+21 15.4	8.317	9.230	-0.52	+0.5	18.7	156.5
Feb. 16	10 47.77	+21 19.3	8.310	9.267	-0.55	+0.3	18.7	164.8
Feb. 26	10 42.21	+21 20.7	8.335	9.304	-0.56	0.0	18.7	167.5
Mar. 8	10 36.68	+21 18.9	8.393	9.341	-0.54	-0.4	18.8	161.8
Mar. 18	10 31.38	+21 13.1	8.484	9.379	-0.51	-0.8	18.8	152.6
Mar. 28	10 26.51	+21 03.0	8.605	9.416	-0.46	-1.2	18.9	142.5

Comet C/2014 OE4 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2016 Dec. 11.38973 TT
 Peri. = 65.79384
 Node = 240.38761 2000.0
 Incl. = 81.34797
 q = 6.2452114 AU
 e = 1.0008258

$$m_1 = 1.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	19 44.50	+58 45.2	6.839	6.781	+1.55	+1.2	17.6	82.5
Jan. 12	20 00.19	+59 00.7	6.893	6.808	+1.59	+2.0	17.7	80.9
Jan. 22	20 16.14	+59 23.6	6.951	6.835	+1.60	+2.7	17.7	79.2
Feb. 1	20 32.24	+59 53.5	7.012	6.863	+1.61	+3.3	17.8	77.3
Feb. 11	20 48.38	+60 29.8	7.074	6.891	+1.61	+4.0	17.8	75.3
Feb. 21	21 04.48	+61 12.0	7.138	6.919	+1.60	+4.5	17.9	73.3
Mar. 3	21 20.45	+61 59.5	7.202	6.949	+1.59	+5.0	17.9	71.3
Mar. 13	21 36.21	+62 51.6	7.265	6.978	+1.56	+5.4	18.0	69.5
Mar. 23	21 51.67	+63 47.7	7.325	7.008	+1.53	+5.8	18.0	67.7
Apr. 2	22 06.75	+64 47.1	7.382	7.039	+1.48	+6.1	18.1	66.2
Apr. 12	22 21.37	+65 49.2	7.434	7.070	+1.43	+6.3	18.1	65.0
Apr. 22	22 35.43	+66 53.2	7.481	7.101	+1.37	+6.5	18.1	64.2
May 2	22 48.82	+67 58.6	7.521	7.133	+1.30	+6.6	18.2	63.8
May 12	23 01.41	+69 04.6	7.554	7.166	+1.21	+6.6	18.2	63.8
May 22	23 13.04	+70 10.9	7.579	7.198	+1.10	+6.6	18.3	64.3
June 1	23 23.52	+71 16.5	7.596	7.232	+0.98	+6.5	18.3	65.3
June 11	23 32.62	+72 20.8	7.605	7.265	+0.82	+6.3	18.3	66.8
June 21	23 40.06	+73 23.1	7.605	7.299	+0.64	+6.1	18.4	68.8
July 1	23 45.52	+74 22.2	7.597	7.334	+0.42	+5.7	18.4	71.2
July 11	23 48.66	+75 17.3	7.582	7.369	+0.17	+5.2	18.4	74.1
July 21	23 49.11	+76 06.8	7.560	7.404	-0.11	+4.6	18.4	77.3
July 31	23 46.63	+76 49.1	7.533	7.439	-0.41	+3.8	18.5	80.9
Aug. 10	23 41.14	+77 22.2	7.502	7.475	-0.71	+2.7	18.5	84.6
Aug. 20	23 32.84	+77 44.1	7.468	7.512	-0.96	+1.5	18.5	88.6
Aug. 30	23 22.45	+77 52.7	7.434	7.548	-1.12	+0.1	18.5	92.7
Sept. 9	23 11.00	+77 46.8	7.401	7.585	-1.15	-1.4	18.5	96.7
Sept. 19	22 59.83	+77 25.6	7.373	7.623	-1.05	-3.0	18.6	100.6
Sept. 29	22 50.17	+76 49.5	7.350	7.660	-0.85	-4.4	18.6	104.3
Oct. 9	22 42.87	+76 00.0	7.336	7.698	-0.58	-5.6	18.6	107.6
Oct. 19	22 38.39	+74 59.1	7.333	7.736	-0.29	-6.6	18.7	110.4
Oct. 29	22 36.78	+73 49.1	7.342	7.775	-0.01	-7.4	18.7	112.4
Nov. 8	22 37.82	+72 32.5	7.366	7.814	+0.24	-7.9	18.7	113.5
Nov. 18	22 41.19	+71 12.0	7.405	7.853	+0.45	-8.2	18.8	113.6
Nov. 28	22 46.51	+69 49.8	7.460	7.892	+0.62	-8.2	18.8	112.6
Dec. 8	22 53.41	+68 28.2	7.531	7.932	+0.77	-8.1	18.9	110.6
Dec. 18	23 01.59	+67 09.2	7.618	7.972	+0.88	-7.7	18.9	107.7
Dec. 28	23 10.76	+65 54.4	7.719	8.012	+0.96	-7.2	19.0	103.9
Jan. 7	23 20.70	+64 45.2	7.832	8.053	+1.03	-6.6	19.1	99.5
Jan. 17	23 31.22	+63 42.7	7.956	8.094	+1.08	-5.9	19.1	94.5
Jan. 27	23 42.15	+62 47.5	8.087	8.135	+1.11	-5.1	19.2	89.3
Feb. 6	23 53.38	+62 00.1	8.224	8.176	+1.13	-4.3	19.3	83.8
Feb. 16	00 04.79	+61 20.7	8.362	8.217	+1.15	-3.5	19.3	78.2
Feb. 26	00 16.28	+60 49.1	8.500	8.259	+1.15	-2.7	19.4	72.7
Mar. 8	00 27.78	+60 25.1	8.634	8.301	+1.15	-2.0	19.5	67.3
Mar. 18	00 39.23	+60 08.4	8.761	8.343	+1.14	-1.3	19.5	62.2
Mar. 28	00 50.54	+59 58.3	8.879	8.385	+1.12	-0.7	19.6	57.5

Comet 103P/Hartley

Epoch = 2018 July 21.0 TT
 T = 2017 Apr. 20.41930 TT
 Peri. = 181.32691 e = 0.6931975
 Node = 219.72359 2000.0 a = 3.4774938 AU
 Incl. = 13.59349 n = 0.15198633
 q = 1.0669038 AU P = 6.48 years

$$m1 = 11.4 + 5 \log(\Delta) + 15.0 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	12 01.93	-13 22.3	2.712	2.969	+0.17	-3.8	20.1	95.3
Jan. 12	12 02.59	-13 53.9	2.636	3.041	-0.06	-2.3	20.3	104.9
Jan. 22	12 00.95	-14 09.7	2.566	3.113	-0.29	-0.6	20.4	115.0
Feb. 1	11 57.05	-14 07.7	2.506	3.183	-0.51	+1.2	20.5	125.6
Feb. 11	11 51.09	-13 46.6	2.462	3.251	-0.70	+3.2	20.6	136.7
Feb. 21	11 43.47	-13 06.4	2.440	3.319	-0.83	+5.0	20.7	147.8
Mar. 3	11 34.81	-12 08.8	2.444	3.385	-0.89	+6.6	20.9	158.3
Mar. 13	11 25.87	-10 57.9	2.478	3.450	-0.88	+7.6	21.1	165.8
Mar. 23	11 17.41	-09 39.2	2.543	3.514	-0.79	+8.1	21.2	164.7
Apr. 2	11 10.08	-08 19.0	2.638	3.577	-0.65	+7.9	21.5	156.4
Apr. 12	11 04.33	-07 02.9	2.762	3.638	-0.48	+7.2	21.7	146.2
Apr. 22	11 00.40	-05 55.3	2.911	3.699	-0.29	+6.2	21.9	135.9
May 2	10 58.37	-04 59.0	3.079	3.758	-0.10	+5.0	.	125.7
May 12	10 58.12	-04 15.1	3.264	3.816	+0.07	+3.7	.	116.0
May 22	10 59.51	-03 43.8	3.460	3.873	+0.22	+2.4	.	106.7
June 1	11 02.35	-03 24.7	3.662	3.929	+0.36	+1.3	.	97.8
June 11	11 06.43	-03 16.7	3.868	3.984	+0.47	+0.2	.	89.2
June 21	11 11.56	-03 18.8	4.072	4.039	+0.56	-0.7	.	80.9
July 1	11 17.56	-03 29.9	4.274	4.092	+0.64	-1.5	.	72.9
July 11	11 24.28	-03 48.6	4.468	4.144	+0.71	-2.3	.	65.1
July 21	11 31.59	-04 14.2	4.653	4.195	+0.76	-2.9	.	57.5
July 31	11 39.36	-04 45.4	4.826	4.245	+0.80	-3.4	.	50.0
Aug. 10	11 47.51	-05 21.4	4.986	4.294	+0.83	-3.8	.	42.5
Aug. 20	11 55.93	-06 01.4	5.130	4.342	+0.85	-4.2	.	35.2
Aug. 30	12 04.55	-06 44.5	5.256	4.390	+0.87	-4.5	.	27.9
Sept. 9	12 13.29	-07 30.0	5.364	4.436	+0.88	-4.7	.	20.7
Sept. 19	12 22.09	-08 17.2	5.451	4.482	+0.88	-4.8	.	13.7
Sept. 29	12 30.88	-09 05.5	5.518	4.526	+0.88	-4.9	.	7.4
Oct. 9	12 39.58	-09 54.2	5.563	4.570	+0.86	-4.9	.	5.7
Oct. 19	12 48.13	-10 42.7	5.586	4.613	+0.84	-4.8	.	11.3
Oct. 29	12 56.45	-11 30.4	5.587	4.655	+0.82	-4.7	.	18.5
Nov. 8	13 04.46	-12 16.6	5.565	4.696	+0.78	-4.5	.	26.2
Nov. 18	13 12.05	-13 00.8	5.523	4.737	+0.73	-4.3	.	34.1
Nov. 28	13 19.14	-13 42.3	5.460	4.776	+0.68	-4.0	.	42.3
Dec. 8	13 25.60	-14 20.6	5.380	4.815	+0.61	-3.6	.	50.6
Dec. 18	13 31.32	-14 54.9	5.282	4.853	+0.53	-3.2	.	59.3
Dec. 28	13 36.17	-15 24.6	5.171	4.891	+0.43	-2.7	.	68.1
Jan. 7	13 40.01	-15 49.1	5.050	4.927	+0.32	-2.1	.	77.3
Jan. 17	13 42.72	-16 07.5	4.921	4.963	+0.20	-1.5	.	86.7
Jan. 27	13 44.17	-16 19.1	4.791	4.998	+0.07	-0.8	.	96.4
Feb. 6	13 44.28	-16 23.2	4.662	5.032	-0.07	0.0	.	106.5
Feb. 16	13 42.99	-16 19.1	4.541	5.065	-0.21	+0.9	.	116.9
Feb. 26	13 40.32	-16 06.3	4.434	5.098	-0.34	+1.8	.	127.6
Mar. 8	13 36.36	-15 44.7	4.344	5.130	-0.46	+2.6	.	138.5
Mar. 18	13 31.29	-15 14.7	4.277	5.161	-0.56	+3.4	.	149.7
Mar. 28	13 25.42	-14 37.3	4.238	5.191	-0.62	+4.1	.	160.9

Comet C/2017 D3 (ATLAS)

Epoch = 2018 July 21.0 TT
 T = 2017 Apr. 26.79148 TT
 Peri. = 340.78464
 Node = 186.61660 2000.0
 Incl. = 125.55767
 q = 4.9720651 AU
 e = 1.0013618

$$m1 = 7.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .3			m	'		°
Jan. 2	12 54.58	+03 51.3	5.234	5.330	-0.07	+8.4	18.3	90.2
Jan. 12	12 53.32	+05 20.9	5.080	5.358	-0.20	+9.7	18.2	101.1
Jan. 22	12 50.67	+07 03.5	4.935	5.386	-0.34	+10.9	18.2	112.3
Feb. 1	12 46.57	+08 58.2	4.807	5.416	-0.49	+12.1	18.1	123.7
Feb. 11	12 41.01	+11 03.0	4.702	5.446	-0.63	+12.9	18.1	135.1
Feb. 21	12 34.08	+13 14.7	4.628	5.477	-0.76	+13.4	18.1	146.2
Mar. 3	12 25.98	+15 28.6	4.589	5.509	-0.86	+13.3	18.1	155.9
Mar. 13	12 17.04	+17 39.6	4.590	5.542	-0.93	+12.7	18.1	161.6
Mar. 23	12 07.65	+19 42.5	4.631	5.576	-0.95	+11.7	18.2	159.5
Apr. 2	11 58.29	+21 32.8	4.712	5.610	-0.92	+10.2	18.3	151.4
Apr. 12	11 49.39	+23 07.6	4.828	5.645	-0.85	+8.6	18.3	141.3
Apr. 22	11 41.34	+24 25.9	4.975	5.681	-0.75	+6.9	18.4	130.6
May 2	11 34.44	+25 27.7	5.146	5.717	-0.62	+5.3	18.5	120.0
May 12	11 28.86	+26 14.6	5.335	5.754	-0.48	+3.9	18.6	109.6
May 22	11 24.67	+26 48.4	5.536	5.792	-0.34	+2.7	18.7	99.6
June 1	11 21.86	+27 11.4	5.743	5.830	-0.21	+1.8	18.9	89.9
June 11	11 20.34	+27 25.7	5.949	5.869	-0.08	+1.0	19.0	80.6
June 21	11 20.03	+27 33.4	6.150	5.909	+0.03	+0.5	19.1	71.6
July 1	11 20.79	+27 36.2	6.341	5.949	+0.13	+0.1	19.2	63.0
July 11	11 22.48	+27 35.8	6.518	5.990	+0.22	-0.2	19.2	54.8
July 21	11 24.98	+27 33.4	6.679	6.031	+0.29	-0.3	19.3	46.9
July 31	11 28.15	+27 30.3	6.820	6.073	+0.35	-0.3	19.4	39.6
Aug. 10	11 31.87	+27 27.7	6.939	6.115	+0.40	-0.2	19.5	33.1
Aug. 20	11 36.04	+27 26.5	7.035	6.158	+0.44	0.0	19.5	27.8
Aug. 30	11 40.53	+27 27.9	7.107	6.201	+0.46	+0.3	19.6	24.3
Sept. 9	11 45.26	+27 32.7	7.154	6.245	+0.48	+0.7	19.6	23.7
Sept. 19	11 50.12	+27 42.0	7.176	6.289	+0.49	+1.2	19.7	26.1
Sept. 29	11 55.01	+27 56.8	7.174	6.334	+0.49	+1.8	19.7	30.8
Oct. 9	11 59.82	+28 18.0	7.148	6.379	+0.47	+2.5	19.7	37.0
Oct. 19	12 04.46	+28 46.6	7.101	6.424	+0.45	+3.3	19.7	44.2
Oct. 29	12 08.81	+29 23.7	7.035	6.470	+0.41	+4.2	19.7	52.0
Nov. 8	12 12.75	+30 10.1	6.952	6.516	+0.37	+5.2	19.8	60.2
Nov. 18	12 16.15	+31 06.5	6.856	6.563	+0.30	+6.2	19.8	68.8
Nov. 28	12 18.86	+32 13.6	6.752	6.610	+0.23	+7.3	19.7	77.5
Dec. 8	12 20.74	+33 31.4	6.644	6.657	+0.14	+8.4	19.7	86.5
Dec. 18	12 21.62	+34 59.7	6.538	6.705	+0.03	+9.4	19.7	95.5
Dec. 28	12 21.35	+36 37.6	6.439	6.753	-0.10	+10.3	19.7	104.5
Jan. 7	12 19.77	+38 23.3	6.353	6.801	-0.23	+10.9	19.7	113.2
Jan. 17	12 16.76	+40 14.4	6.285	6.850	-0.38	+11.3	19.7	121.5
Jan. 27	12 12.24	+42 07.4	6.240	6.899	-0.54	+11.3	19.8	128.7
Feb. 6	12 06.20	+43 58.5	6.221	6.948	-0.69	+10.8	19.8	134.5
Feb. 16	11 58.73	+45 43.2	6.233	6.997	-0.82	+10.0	19.8	137.9
Feb. 26	11 50.08	+47 17.4	6.275	7.047	-0.92	+8.7	19.9	138.5
Mar. 8	11 40.57	+48 37.9	6.348	7.097	-0.98	+7.2	19.9	136.1
Mar. 18	11 30.66	+49 42.2	6.450	7.147	-0.99	+5.5	20.0	131.4
Mar. 28	11 20.85	+50 29.7	6.577	7.197	-0.96	+3.8	20.1	125.1

Comet C/2015 ER61 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2017 May 9.98616 TT
 Peri. = 68.18663
 Node = 235.22103 2000.0
 Incl. = 6.34977
 q = 1.0417960 AU
 e = 0.9973925

$$m_1 = 7.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	02 42.54	+15 31.0	2.844	3.463	+0.06	-0.7	15.3	121.7
Jan. 12	02 43.93	+15 28.9	3.087	3.572	+0.24	+0.3	15.6	111.8
Jan. 22	02 47.00	+15 35.6	3.340	3.679	+0.39	+1.1	15.9	102.4
Feb. 1	02 51.48	+15 49.4	3.598	3.786	+0.52	+1.7	16.2	93.3
Feb. 11	02 57.13	+16 08.7	3.858	3.891	+0.62	+2.2	16.4	84.6
Feb. 21	03 03.75	+16 32.0	4.116	3.996	+0.71	+2.5	16.7	76.1
Mar. 3	03 11.13	+16 58.0	4.369	4.100	+0.77	+2.7	16.9	67.9
Mar. 13	03 19.13	+17 25.5	4.613	4.203	+0.83	+2.8	17.2	59.9
Mar. 23	03 27.61	+17 53.5	4.847	4.305	+0.87	+2.8	17.4	52.0
Apr. 2	03 36.45	+18 21.4	5.067	4.406	+0.90	+2.7	17.6	44.2
Apr. 12	03 45.52	+18 48.3	5.272	4.507	+0.92	+2.6	17.7	36.6
Apr. 22	03 54.75	+19 13.9	5.459	4.607	+0.93	+2.5	17.9	29.1
May 2	04 04.03	+19 37.6	5.628	4.706	+0.93	+2.3	18.1	21.6
May 12	04 13.28	+19 59.2	5.777	4.804	+0.92	+2.0	18.2	14.1
May 22	04 22.43	+20 18.5	5.905	4.901	+0.91	+1.8	18.4	6.7
June 1	04 31.39	+20 35.3	6.012	4.998	+0.88	+1.5	18.5	1.6
June 11	04 40.08	+20 49.5	6.096	5.094	+0.85	+1.3	18.6	8.5
June 21	04 48.44	+21 01.1	6.158	5.190	+0.81	+1.0	18.7	16.1
July 1	04 56.36	+21 10.2	6.199	5.284	+0.77	+0.8	18.8	23.7
July 11	05 03.78	+21 16.9	6.219	5.379	+0.71	+0.5	18.9	31.5
July 21	05 10.60	+21 21.2	6.218	5.472	+0.65	+0.3	18.9	39.5
July 31	05 16.74	+21 23.5	6.199	5.565	+0.57	+0.1	19.0	47.6
Aug. 10	05 22.10	+21 23.9	6.163	5.657	+0.49	-0.1	19.1	55.9
Aug. 20	05 26.58	+21 22.5	6.112	5.749	+0.40	-0.2	19.1	64.5
Aug. 30	05 30.10	+21 19.8	6.049	5.840	+0.29	-0.4	19.2	73.3
Sept. 9	05 32.56	+21 15.7	5.979	5.931	+0.18	-0.5	19.2	82.4
Sept. 19	05 33.88	+21 10.6	5.904	6.021	+0.07	-0.6	19.3	91.9
Sept. 29	05 34.01	+21 04.6	5.829	6.110	-0.05	-0.6	19.3	101.6
Oct. 9	05 32.92	+20 57.8	5.760	6.199	-0.18	-0.7	19.3	111.7
Oct. 19	05 30.64	+20 50.3	5.701	6.288	-0.29	-0.8	19.4	122.1
Oct. 29	05 27.23	+20 42.0	5.658	6.376	-0.40	-0.9	19.4	132.9
Nov. 8	05 22.84	+20 33.2	5.636	6.463	-0.49	-0.9	19.5	143.9
Nov. 18	05 17.68	+20 23.7	5.640	6.550	-0.55	-1.0	19.5	155.1
Nov. 28	05 12.02	+20 14.0	5.674	6.637	-0.58	-1.0	19.6	166.4
Dec. 8	05 06.17	+20 04.2	5.739	6.723	-0.58	-1.0	19.7	176.7
Dec. 18	05 00.44	+19 54.8	5.837	6.808	-0.55	-0.9	19.8	169.9
Dec. 28	04 55.16	+19 46.2	5.968	6.893	-0.49	-0.8	19.9	158.6
Jan. 7	04 50.56	+19 39.1	6.129	6.978	-0.41	-0.6	20.0	147.4
Jan. 17	04 46.84	+19 33.7	6.317	7.062	-0.32	-0.4	20.1	136.4
Jan. 27	04 44.12	+19 30.4	6.528	7.146	-0.21	-0.2	20.2	125.6
Feb. 6	04 42.45	+19 29.2	6.756	7.230	-0.11	0.0	20.3	115.1
Feb. 16	04 41.84	+19 30.2	6.997	7.313	0.00	+0.2	20.5	104.8
Feb. 26	04 42.23	+19 33.1	7.245	7.395	+0.09	+0.4	20.6	94.9
Mar. 8	04 43.56	+19 37.7	7.496	7.478	+0.18	+0.5	20.7	85.2
Mar. 18	04 45.74	+19 43.6	7.743	7.560	+0.26	+0.6	20.8	75.7
Mar. 28	04 48.66	+19 50.4	7.984	7.641	+0.33	+0.7	20.9	66.5

Comet 47P/Ashbrook-Jackson

Epoch = 2018 July 21.0 TT
 T = 2017 June 10.04573 TT
 Peri. = 357.63791 e = 0.3172333
 Node = 356.96600 2000.0 a = 4.1269439 AU
 Incl. = 13.02866 n = 0.11756044
 q = 2.8177399 AU P = 8.38 years

$$m_1 = 3.8 + 5 \log(\Delta) + 22.5 \log(r(t+20))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	01 04.65	+17 54.9	2.714	3.048	+0.65	+3.0	17.0	100.3
Jan. 12	01 11.87	+18 28.4	2.871	3.069	+0.81	+3.8	17.2	92.1
Jan. 22	01 20.57	+19 09.8	3.030	3.091	+0.94	+4.5	17.4	84.2
Feb. 1	01 30.54	+19 58.0	3.188	3.113	+1.06	+5.1	17.6	76.7
Feb. 11	01 41.59	+20 51.4	3.343	3.136	+1.16	+5.6	17.7	69.5
Feb. 21	01 53.56	+21 48.9	3.492	3.159	+1.24	+5.9	17.9	62.5
Mar. 3	02 06.33	+22 49.1	3.635	3.183	+1.32	+6.1	18.1	55.7
Mar. 13	02 19.77	+23 50.9	3.769	3.207	+1.38	+6.2	18.2	49.1
Mar. 23	02 33.79	+24 53.1	3.893	3.232	+1.43	+6.2	18.4	42.7
Apr. 2	02 48.29	+25 54.7	4.006	3.257	+1.47	+6.1	18.5	36.5
Apr. 12	03 03.19	+26 54.8	4.107	3.283	+1.51	+5.9	18.6	30.5
Apr. 22	03 18.44	+27 52.8	4.196	3.309	+1.54	+5.6	18.8	24.7
May 2	03 33.94	+28 47.9	4.271	3.335	+1.56	+5.3	18.9	19.1
May 12	03 49.63	+29 39.5	4.332	3.362	+1.58	+5.0	19.0	14.2
May 22	04 05.44	+30 27.3	4.379	3.389	+1.58	+4.6	19.1	10.5
June 1	04 21.29	+31 11.0	4.411	3.416	+1.58	+4.1	19.2	9.7
June 11	04 37.10	+31 50.4	4.429	3.443	+1.58	+3.7	19.3	12.2
June 21	04 52.79	+32 25.6	4.431	3.471	+1.56	+3.3	19.3	16.8
July 1	05 08.27	+32 56.6	4.419	3.499	+1.53	+2.9	19.4	22.2
July 11	05 23.45	+33 23.7	4.392	3.526	+1.50	+2.5	19.5	27.9
July 21	05 38.21	+33 47.3	4.351	3.554	+1.45	+2.2	19.5	34.0
July 31	05 52.46	+34 08.0	4.296	3.583	+1.39	+1.9	19.6	40.3
Aug. 10	06 06.07	+34 26.3	4.228	3.611	+1.32	+1.7	19.6	46.8
Aug. 20	06 18.91	+34 43.2	4.147	3.639	+1.24	+1.6	19.7	53.6
Aug. 30	06 30.84	+34 59.4	4.056	3.667	+1.14	+1.6	19.7	60.6
Sept. 9	06 41.72	+35 15.9	3.955	3.696	+1.02	+1.7	19.7	67.9
Sept. 19	06 51.35	+35 33.8	3.847	3.724	+0.89	+1.9	19.7	75.5
Sept. 29	06 59.55	+35 54.0	3.733	3.752	+0.73	+2.2	19.7	83.4
Oct. 9	07 06.13	+36 17.3	3.617	3.780	+0.56	+2.5	19.7	91.7
Oct. 19	07 10.85	+36 44.1	3.501	3.809	+0.36	+2.9	19.7	100.4
Oct. 29	07 13.53	+37 14.5	3.389	3.837	+0.15	+3.2	19.7	109.5
Nov. 8	07 13.98	+37 47.9	3.286	3.865	-0.08	+3.4	19.7	119.0
Nov. 18	07 12.09	+38 22.7	3.196	3.893	-0.32	+3.5	19.7	128.9
Nov. 28	07 07.92	+38 56.3	3.124	3.921	-0.54	+3.2	19.8	138.9
Dec. 8	07 01.66	+39 25.5	3.073	3.949	-0.73	+2.5	19.8	148.8
Dec. 18	06 53.77	+39 46.9	3.049	3.977	-0.85	+1.6	19.8	157.6
Dec. 28	06 44.95	+39 57.6	3.054	4.004	-0.90	+0.4	19.9	162.9
Jan. 7	06 35.98	+39 56.1	3.089	4.032	-0.87	-0.8	20.0	161.1
Jan. 17	06 27.72	+39 42.6	3.153	4.059	-0.76	-1.9	20.1	153.8
Jan. 27	06 20.87	+39 19.1	3.246	4.086	-0.59	-2.8	20.2	144.4
Feb. 6	06 15.89	+38 48.1	3.362	4.113	-0.38	-3.4	20.4	134.4
Feb. 16	06 13.06	+38 12.7	3.500	4.140	-0.16	-3.7	20.5	124.5
Feb. 26	06 12.40	+37 35.2	3.653	4.167	+0.05	-3.8	20.7	114.9
Mar. 8	06 13.80	+36 57.4	3.817	4.193	+0.25	-3.8	20.8	105.5
Mar. 18	06 17.09	+36 20.4	3.989	4.220	+0.42	-3.6	21.0	96.5
Mar. 28	06 22.04	+35 44.5	4.164	4.246	+0.58	-3.5	21.1	87.9

Comet C/2015 V2 (Johnson)

Epoch = 2018 July 21.0 TT
 T = 2017 June 12.33438 TT
 Peri. = 164.90958
 Node = 69.84477 2000.0
 Incl. = 49.87691
 q = 1.6374249 AU
 e = 1.0016368

$$m1 = 5.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	21 06.20	-54 29.1	3.708	3.030	+2.73	+6.4	13.3	40.6
Jan. 12	21 32.77	-53 22.3	3.827	3.124	+2.57	+7.0	13.5	39.0
Jan. 22	21 57.77	-52 10.2	3.938	3.220	+2.42	+7.4	13.7	38.0
Feb. 1	22 21.25	-50 55.4	4.040	3.315	+2.27	+7.5	13.8	37.6
Feb. 11	22 43.32	-49 40.5	4.134	3.410	+2.13	+7.4	14.0	38.0
Feb. 21	23 04.09	-48 27.5	4.217	3.505	+2.01	+7.1	14.2	39.0
Mar. 3	23 23.64	-47 18.3	4.292	3.600	+1.89	+6.6	14.3	40.8
Mar. 13	23 42.08	-46 14.6	4.356	3.694	+1.79	+6.0	14.5	43.2
Mar. 23	23 59.49	-45 17.9	4.411	3.789	+1.69	+5.2	14.6	46.2
Apr. 2	00 15.90	-44 29.5	4.455	3.883	+1.59	+4.3	14.7	49.6
Apr. 12	00 31.38	-43 50.4	4.491	3.977	+1.50	+3.4	14.9	53.5
Apr. 22	00 45.93	-43 21.6	4.517	4.070	+1.40	+2.3	15.0	57.8
May 2	00 59.55	-43 03.9	4.535	4.164	+1.31	+1.1	15.1	62.3
May 12	01 12.22	-42 57.9	4.547	4.256	+1.21	-0.1	15.2	67.1
May 22	01 23.90	-43 04.0	4.552	4.349	+1.11	-1.3	15.3	72.1
June 1	01 34.51	-43 22.4	4.552	4.441	+1.00	-2.5	15.4	77.3
June 11	01 43.97	-43 53.0	4.550	4.533	+0.88	-3.7	15.5	82.6
June 21	01 52.17	-44 35.4	4.547	4.624	+0.74	-4.9	15.5	88.0
July 1	01 58.97	-45 28.6	4.544	4.715	+0.60	-5.9	15.6	93.4
July 11	02 04.22	-46 31.4	4.545	4.805	+0.43	-6.7	15.7	98.7
July 21	02 07.75	-47 41.7	4.552	4.895	+0.25	-7.4	15.8	103.8
July 31	02 09.41	-48 56.9	4.566	4.985	+0.06	-7.7	15.9	108.7
Aug. 10	02 09.06	-50 13.9	4.591	5.074	-0.15	-7.7	16.0	113.0
Aug. 20	02 06.60	-51 28.8	4.629	5.163	-0.36	-7.2	16.1	116.7
Aug. 30	02 02.07	-52 37.3	4.680	5.251	-0.56	-6.3	16.2	119.5
Sept. 9	01 55.60	-53 35.2	4.748	5.339	-0.74	-5.1	16.3	121.2
Sept. 19	01 47.51	-54 18.5	4.832	5.427	-0.88	-3.4	16.4	121.7
Sept. 29	01 38.33	-54 44.1	4.933	5.514	-0.96	-1.5	16.5	120.8
Oct. 9	01 28.66	-54 50.2	5.052	5.601	-0.97	+0.5	16.6	118.7
Oct. 19	01 19.18	-54 36.3	5.187	5.687	-0.91	+2.5	16.7	115.5
Oct. 29	01 10.51	-54 03.5	5.336	5.774	-0.80	+4.2	16.9	111.4
Nov. 8	01 03.13	-53 14.0	5.499	5.859	-0.65	+5.8	17.0	106.6
Nov. 18	00 57.35	-52 10.6	5.673	5.944	-0.48	+7.0	17.1	101.2
Nov. 28	00 53.30	-50 56.5	5.855	6.029	-0.31	+7.9	17.2	95.5
Dec. 8	00 50.96	-49 34.7	6.042	6.114	-0.14	+8.5	17.4	89.5
Dec. 18	00 50.24	-48 08.0	6.233	6.198	+0.01	+8.8	17.5	83.4
Dec. 28	00 50.99	-46 38.9	6.423	6.282	+0.15	+9.0	17.6	77.4
Jan. 7	00 53.01	-45 09.3	6.610	6.365	+0.27	+8.9	17.7	71.4
Jan. 17	00 56.15	-43 41.0	6.792	6.448	+0.37	+8.7	17.9	65.6
Jan. 27	01 00.20	-42 15.2	6.966	6.531	+0.45	+8.4	18.0	60.1
Feb. 6	01 05.01	-40 53.2	7.129	6.613	+0.52	+8.0	18.1	55.0
Feb. 16	01 10.43	-39 35.8	7.280	6.695	+0.57	+7.5	18.2	50.5
Feb. 26	01 16.33	-38 23.8	7.418	6.777	+0.61	+6.9	18.3	46.7
Mar. 8	01 22.58	-37 17.9	7.540	6.859	+0.64	+6.2	18.3	43.8
Mar. 18	01 29.08	-36 18.5	7.646	6.940	+0.66	+5.6	18.4	42.1
Mar. 28	01 35.72	-35 26.1	7.736	7.020	+0.67	+4.8	18.5	41.6

Comet 90P/Gehrels

Epoch = 2018 July 21.0 TT
 T = 2017 June 19.02195 TT
 Peri. = 29.21995 e = 0.5094640
 Node = 13.24348 2000.0 a = 6.0636551 AU
 Incl. = 9.63494 n = 0.06600888
 q = 2.9744411 AU P = 14.93 years

$$m_1 = 0.8 + 5 \log(\Delta) + 30.0 \log(r(t-90))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	05 07.76	+35 45.7	2.363	3.278	-0.56	-1.8	17.3	154.6
Jan. 12	05 03.07	+35 24.6	2.456	3.307	-0.35	-2.4	17.4	144.6
Jan. 22	05 00.62	+34 59.9	2.572	3.337	-0.11	-2.6	17.6	134.6
Feb. 1	05 00.58	+34 34.4	2.706	3.368	+0.13	-2.5	17.8	124.9
Feb. 11	05 02.90	+34 10.1	2.856	3.400	+0.36	-2.3	18.0	115.5
Feb. 21	05 07.41	+33 48.1	3.017	3.432	+0.56	-2.1	18.2	106.5
Mar. 3	05 13.85	+33 28.6	3.186	3.466	+0.74	-1.8	18.5	98.0
Mar. 13	05 21.95	+33 11.1	3.359	3.500	+0.89	-1.7	18.7	89.8
Mar. 23	05 31.47	+32 55.0	3.533	3.534	+1.02	-1.6	18.9	82.0
Apr. 2	05 42.16	+32 39.5	3.705	3.570	+1.12	-1.6	19.1	74.5
Apr. 12	05 53.79	+32 23.6	3.874	3.606	+1.21	-1.6	19.3	67.2
Apr. 22	06 06.18	+32 06.7	4.037	3.642	+1.27	-1.8	19.5	60.1
May 2	06 19.15	+31 48.1	4.192	3.679	+1.32	-2.0	19.7	53.3
May 12	06 32.54	+31 27.2	4.338	3.717	+1.36	-2.2	19.9	46.6
May 22	06 46.22	+31 03.7	4.473	3.755	+1.38	-2.5	20.1	40.0
June 1	07 00.07	+30 37.4	4.596	3.793	+1.39	-2.8	20.3	33.6
June 11	07 13.99	+30 08.2	4.706	3.832	+1.39	-3.1	20.5	27.3
June 21	07 27.87	+29 36.2	4.801	3.871	+1.38	-3.4	20.7	21.2
July 1	07 41.64	+29 01.5	4.882	3.910	+1.37	-3.6	20.8	15.3
July 11	07 55.22	+28 24.3	4.947	3.950	+1.35	-3.8	21.0	10.1
July 21	08 08.54	+27 45.1	4.996	3.990	+1.32	-4.0	21.1	7.4
July 31	08 21.54	+27 04.3	5.028	4.030	+1.28	-4.1	21.3	9.6
Aug. 10	08 34.15	+26 22.4	5.043	4.071	+1.24	-4.2	21.4	14.8
Aug. 20	08 46.31	+25 40.1	5.041	4.111	+1.19	-4.2	21.6	20.9
Aug. 30	08 57.96	+24 58.0	5.022	4.152	+1.13	-4.2	21.7	27.4
Sept. 9	09 09.04	+24 16.8	4.987	4.193	+1.07	-4.0	21.8	34.3
Sept. 19	09 19.47	+23 37.4	4.936	4.234	+1.00	-3.8	21.9	41.4
Sept. 29	09 29.17	+23 00.6	4.869	4.275	+0.93	-3.5	22.0	48.7
Oct. 9	09 38.07	+22 27.3	4.790	4.316	+0.84	-3.1	.	56.3
Oct. 19	09 46.05	+21 58.4	4.698	4.358	+0.74	-2.6	.	64.2
Oct. 29	09 53.01	+21 35.0	4.596	4.399	+0.64	-2.0	.	72.4
Nov. 8	09 58.85	+21 17.7	4.487	4.440	+0.52	-1.3	.	80.9
Nov. 18	10 03.42	+21 07.5	4.374	4.482	+0.38	-0.6	.	89.8
Nov. 28	10 06.62	+21 04.9	4.261	4.523	+0.24	+0.2	.	99.1
Dec. 8	10 08.35	+21 10.1	4.151	4.564	+0.09	+0.9	.	108.8
Dec. 18	10 08.50	+21 22.9	4.050	4.606	-0.07	+1.7	.	118.8
Dec. 28	10 07.09	+21 42.5	3.963	4.647	-0.23	+2.3	.	129.2
Jan. 7	10 04.16	+22 07.4	3.894	4.688	-0.37	+2.7	.	139.8
Jan. 17	09 59.88	+22 35.6	3.848	4.729	-0.49	+2.9	.	150.6
Jan. 27	09 54.54	+23 04.2	3.829	4.771	-0.58	+2.8	.	161.0
Feb. 6	09 48.51	+23 30.7	3.839	4.812	-0.62	+2.4	.	169.2
Feb. 16	09 42.27	+23 52.5	3.881	4.853	-0.62	+1.8	.	168.3
Feb. 26	09 36.29	+24 07.7	3.954	4.893	-0.57	+1.1	.	159.5
Mar. 8	09 31.01	+24 15.2	4.055	4.934	-0.48	+0.3	.	149.2
Mar. 18	09 26.77	+24 14.7	4.183	4.975	-0.36	-0.5	.	138.8
Mar. 28	09 23.80	+24 06.5	4.333	5.015	-0.22	-1.2	.	128.5

Comet 352P/Skiff

Epoch = 2018 July 21.0 TT
 T = 2017 June 21.60918 TT
 Peri. = 309.07603 e = 0.6175823
 Node = 28.15552 2000.0 a = 6.6307226 AU
 Incl. = 21.01694 n = 0.05772485
 q = 2.5357057 AU P = 17.07 years

$$m_1 = 5.4 + 5 \log(\Delta) + 22.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	00 40.99	+05 32.4	2.832	3.003	+0.74	+9.8	18.4	90.3
Jan. 12	00 48.97	+07 11.2	3.012	3.046	+0.86	+9.9	18.7	82.6
Jan. 22	00 58.07	+08 50.6	3.192	3.089	+0.96	+10.0	18.9	75.1
Feb. 1	01 08.09	+10 30.2	3.369	3.134	+1.05	+9.9	19.2	67.9
Feb. 11	01 18.87	+12 09.4	3.541	3.180	+1.11	+9.9	19.5	60.9
Feb. 21	01 30.28	+13 47.6	3.707	3.227	+1.17	+9.8	19.7	54.0
Mar. 3	01 42.22	+15 24.4	3.864	3.275	+1.22	+9.6	19.9	47.3
Mar. 13	01 54.58	+16 59.3	4.012	3.323	+1.26	+9.4	20.2	40.7
Mar. 23	02 07.28	+18 31.9	4.148	3.372	+1.29	+9.1	20.4	34.3
Apr. 2	02 20.25	+20 01.8	4.271	3.421	+1.31	+8.8	20.6	28.0
Apr. 12	02 33.42	+21 28.7	4.381	3.471	+1.33	+8.5	20.8	21.8
Apr. 22	02 46.73	+22 52.4	4.477	3.521	+1.34	+8.2	21.0	15.9
May 2	03 00.11	+24 12.7	4.557	3.572	+1.34	+7.8	21.1	10.7
May 12	03 13.50	+25 29.3	4.622	3.623	+1.34	+7.5	21.3	7.5
May 22	03 26.84	+26 42.3	4.671	3.674	+1.33	+7.1	21.5	8.9
June 1	03 40.04	+27 51.7	4.704	3.726	+1.31	+6.7	21.6	13.6
June 11	03 53.05	+28 57.6	4.720	3.778	+1.29	+6.4	21.8	19.4
June 21	04 05.77	+30 00.3	4.721	3.830	+1.25	+6.1	21.9	25.7
July 1	04 18.10	+30 59.9	4.705	3.882	+1.21	+5.8	22.0	32.1
July 11	04 29.96	+31 56.9	4.675	3.934	+1.16	+5.6	.	38.8
July 21	04 41.22	+32 51.7	4.630	3.987	+1.09	+5.4	.	45.7
July 31	04 51.75	+33 44.8	4.572	4.039	+1.01	+5.2	.	52.8
Aug. 10	05 01.43	+34 36.9	4.502	4.092	+0.91	+5.2	.	60.1
Aug. 20	05 10.08	+35 28.5	4.422	4.144	+0.80	+5.1	.	67.7
Aug. 30	05 17.53	+36 20.0	4.334	4.197	+0.67	+5.2	.	75.5
Sept. 9	05 23.60	+37 11.9	4.240	4.249	+0.52	+5.2	.	83.7
Sept. 19	05 28.09	+38 04.4	4.144	4.301	+0.35	+5.3	.	92.2
Sept. 29	05 30.82	+38 57.3	4.050	4.354	+0.17	+5.3	.	101.0
Oct. 9	05 31.60	+39 49.8	3.960	4.406	-0.03	+5.2	.	110.2
Oct. 19	05 30.33	+40 40.7	3.881	4.458	-0.24	+4.9	.	119.6
Oct. 29	05 26.99	+41 28.0	3.815	4.510	-0.44	+4.4	.	129.2
Nov. 8	05 21.69	+42 09.3	3.769	4.562	-0.63	+3.7	.	138.8
Nov. 18	05 14.73	+42 41.9	3.745	4.613	-0.77	+2.7	.	148.0
Nov. 28	05 06.61	+43 03.5	3.749	4.665	-0.85	+1.5	.	155.5
Dec. 8	04 57.97	+43 13.0	3.781	4.716	-0.87	+0.3	.	159.4
Dec. 18	04 49.52	+43 10.3	3.843	4.767	-0.81	-0.9	.	157.5
Dec. 28	04 41.94	+42 57.2	3.935	4.818	-0.69	-1.8	.	150.9
Jan. 7	04 35.74	+42 36.3	4.054	4.869	-0.53	-2.4	.	142.2
Jan. 17	04 31.29	+42 10.6	4.198	4.920	-0.34	-2.7	.	132.8
Jan. 27	04 28.75	+41 43.1	4.362	4.970	-0.15	-2.8	.	123.3
Feb. 6	04 28.12	+41 16.2	4.541	5.020	+0.04	-2.6	.	113.8
Feb. 16	04 29.32	+40 51.5	4.732	5.070	+0.21	-2.3	.	104.5
Feb. 26	04 32.18	+40 30.2	4.930	5.120	+0.37	-1.9	.	95.4
Mar. 8	04 36.52	+40 12.6	5.131	5.170	+0.51	-1.6	.	86.7
Mar. 18	04 42.15	+39 58.8	5.331	5.219	+0.63	-1.2	.	78.2
Mar. 28	04 48.88	+39 48.4	5.525	5.268	+0.73	-0.9	.	70.0

Comet 71P/Clark

Epoch = 2018 July 21.0 TT
 T = 2017 June 30.26068 TT
 Peri. = 208.94275 e = 0.4944983
 Node = 59.44442 2000.0 a = 3.1382351 AU
 Incl. = 9.44538 n = 0.17728658
 q = 1.5863832 AU P = 5.56 years

$$m_1 = 10.4 + 5 \log(\Delta) + 15.0 \log(r(t-40))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	22 34.29	-16 42.7	2.735	2.283	+1.83	+13.1	17.3	53.0
Jan. 12	22 52.40	-14 31.7	2.883	2.338	+1.78	+13.1	17.6	47.8
Jan. 22	23 10.02	-12 21.7	3.026	2.394	+1.74	+12.9	17.9	42.4
Feb. 1	23 27.16	-10 13.6	3.162	2.449	+1.69	+12.7	18.1	37.0
Feb. 11	23 43.89	-08 08.0	3.290	2.504	+1.65	+12.4	18.4	31.6
Feb. 21	00 00.22	-06 05.5	3.409	2.559	+1.61	+12.1	18.6	26.1
Mar. 3	00 16.19	-04 06.5	3.517	2.613	+1.58	+11.7	18.8	20.7
Mar. 13	00 31.80	-02 11.7	3.613	2.667	+1.54	+11.2	19.0	15.2
Mar. 23	00 47.09	+00 21.3	3.697	2.721	+1.51	+10.8	19.2	10.0
Apr. 2	01 02.03	+01 24.0	3.767	2.774	+1.48	+10.3	19.4	5.6
Apr. 12	01 16.64	+03 04.1	3.822	2.826	+1.44	+9.7	19.6	5.5
Apr. 22	01 30.91	+04 38.7	3.863	2.878	+1.41	+9.1	19.7	9.9
May 2	01 44.79	+06 07.4	3.889	2.930	+1.37	+8.5	19.9	15.4
May 12	01 58.28	+07 30.0	3.899	2.980	+1.32	+7.9	20.0	21.3
May 22	02 11.31	+08 46.5	3.894	3.030	+1.28	+7.3	20.1	27.3
June 1	02 23.84	+09 56.5	3.873	3.079	+1.22	+6.6	20.2	33.5
June 11	02 35.80	+11 00.1	3.838	3.128	+1.16	+6.0	20.3	39.9
June 21	02 47.09	+11 57.1	3.789	3.176	+1.09	+5.3	20.4	46.5
July 1	02 57.62	+12 47.6	3.726	3.223	+1.01	+4.7	20.5	53.3
July 11	03 07.27	+13 31.6	3.651	3.269	+0.91	+4.0	20.5	60.3
July 21	03 15.88	+14 09.1	3.565	3.315	+0.80	+3.4	20.6	67.7
July 31	03 23.31	+14 40.2	3.470	3.359	+0.67	+2.8	20.6	75.3
Aug. 10	03 29.39	+15 05.0	3.369	3.403	+0.53	+2.1	20.7	83.3
Aug. 20	03 33.90	+15 23.5	3.263	3.447	+0.36	+1.5	20.7	91.8
Aug. 30	03 36.68	+15 35.7	3.157	3.489	+0.18	+0.9	20.7	100.7
Sept. 9	03 37.54	+15 41.9	3.055	3.531	-0.02	+0.3	20.7	110.2
Sept. 19	03 36.36	+15 41.9	2.960	3.572	-0.23	-0.3	20.7	120.2
Sept. 29	03 33.10	+15 36.0	2.878	3.612	-0.44	-0.9	20.8	130.7
Oct. 9	03 27.87	+15 24.5	2.814	3.651	-0.62	-1.4	20.8	141.8
Oct. 19	03 20.94	+15 08.0	2.772	3.690	-0.77	-1.9	20.8	153.3
Oct. 29	03 12.78	+14 47.8	2.759	3.728	-0.86	-2.1	20.9	165.1
Nov. 8	03 04.02	+14 25.9	2.775	3.765	-0.88	-2.2	21.0	176.3
Nov. 18	02 55.34	+14 04.6	2.824	3.801	-0.83	-2.0	21.1	169.9
Nov. 28	02 47.45	+13 46.3	2.903	3.836	-0.73	-1.6	21.2	158.1
Dec. 8	02 40.86	+13 33.3	3.012	3.871	-0.57	-0.9	21.4	146.4
Dec. 18	02 35.95	+13 27.3	3.146	3.905	-0.39	-0.2	21.5	135.1
Dec. 28	02 32.90	+13 29.0	3.300	3.938	-0.20	+0.6	21.7	124.2
Jan. 7	02 31.72	+13 38.5	3.470	3.970	-0.02	+1.4	21.9	113.8
Jan. 17	02 32.34	+13 55.5	3.651	4.002	+0.16	+2.1	22.0	103.9
Jan. 27	02 34.60	+14 19.1	3.837	4.033	+0.31	+2.7	.	94.3
Feb. 6	02 38.33	+14 48.3	4.025	4.063	+0.45	+3.2	.	85.2
Feb. 16	02 43.36	+15 22.1	4.211	4.093	+0.57	+3.6	.	76.4
Feb. 26	02 49.49	+15 59.3	4.390	4.121	+0.67	+3.9	.	67.9
Mar. 8	02 56.57	+16 39.0	4.560	4.149	+0.75	+4.1	.	59.7
Mar. 18	03 04.46	+17 20.3	4.719	4.176	+0.83	+4.2	.	51.7
Mar. 28	03 13.00	+18 02.2	4.864	4.203	+0.89	+4.2	.	44.0

Comet 217P/LINEAR

Epoch = 2018 July 21.0 TT
 T = 2017 July 16.54420 TT
 Peri. = 246.93099 e = 0.6877115
 Node = 125.45310 2000.0 a = 3.9548693 AU
 Incl. = 12.85801 n = 0.12531581
 q = 1.2350602 AU P = 7.86 years

$$m1 = 10.6 + 5 \log(\Delta) + 15.0 \log(r(t-20))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	07 53.02	+15 01.7	1.341	2.299	-1.20	+9.3	16.2	162.9
Jan. 12	07 41.02	+16 34.7	1.399	2.380	-1.18	+9.1	16.5	174.5
Jan. 22	07 29.87	+18 02.1	1.487	2.460	-1.02	+8.2	16.9	169.0
Feb. 1	07 20.80	+19 18.9	1.603	2.539	-0.76	+7.0	17.3	157.1
Feb. 11	07 14.52	+20 22.6	1.745	2.618	-0.46	+5.7	17.7	145.4
Feb. 21	07 11.27	+21 13.4	1.909	2.696	-0.16	+4.4	18.1	134.5
Mar. 3	07 10.94	+21 52.3	2.090	2.773	+0.12	+3.3	18.5	124.3
Mar. 13	07 13.20	+22 20.6	2.286	2.849	+0.35	+2.3	18.9	114.8
Mar. 23	07 17.68	+22 39.7	2.491	2.924	+0.56	+1.4	19.2	105.8
Apr. 2	07 24.00	+22 50.4	2.701	2.998	+0.72	+0.7	19.6	97.3
Apr. 12	07 31.78	+22 53.7	2.915	3.071	+0.85	-0.1	19.9	89.3
Apr. 22	07 40.73	+22 50.1	3.129	3.143	+0.95	-0.7	20.2	81.5
May 2	07 50.58	+22 40.3	3.341	3.213	+1.03	-1.3	20.5	74.1
May 12	08 01.11	+22 24.7	3.547	3.283	+1.08	-1.9	20.8	66.8
May 22	08 12.13	+22 03.8	3.746	3.352	+1.12	-2.4	21.1	59.8
June 1	08 23.50	+21 38.1	3.936	3.420	+1.15	-2.8	21.3	52.8
June 11	08 35.08	+21 08.1	4.115	3.487	+1.17	-3.2	21.6	46.0
June 21	08 46.78	+20 34.2	4.281	3.553	+1.17	-3.6	21.8	39.3
July 1	08 58.51	+19 57.0	4.433	3.618	+1.17	-3.9	22.0	32.6
July 11	09 10.19	+19 17.1	4.570	3.682	+1.16	-4.1	.	25.9
July 21	09 21.76	+18 34.8	4.689	3.745	+1.15	-4.3	.	19.3
July 31	09 33.16	+17 50.9	4.791	3.807	+1.13	-4.5	.	12.7
Aug. 10	09 44.34	+17 06.0	4.874	3.869	+1.10	-4.5	.	6.4
Aug. 20	09 55.25	+16 20.6	4.938	3.929	+1.07	-4.5	.	3.7
Aug. 30	10 05.83	+15 35.5	4.982	3.988	+1.04	-4.5	.	9.1
Sept. 9	10 16.05	+14 51.2	5.006	4.047	+1.00	-4.3	.	15.9
Sept. 19	10 25.83	+14 08.7	5.010	4.105	+0.95	-4.1	.	23.1
Sept. 29	10 35.12	+13 28.7	4.994	4.161	+0.90	-3.8	.	30.4
Oct. 9	10 43.85	+12 52.0	4.959	4.217	+0.84	-3.5	.	38.0
Oct. 19	10 51.93	+12 19.5	4.906	4.273	+0.77	-3.0	.	45.9
Oct. 29	10 59.27	+11 52.2	4.836	4.327	+0.69	-2.4	.	54.0
Nov. 8	11 05.78	+11 30.9	4.752	4.380	+0.60	-1.7	.	62.3
Nov. 18	11 11.33	+11 16.8	4.655	4.433	+0.50	-1.0	.	71.0
Nov. 28	11 15.81	+11 10.8	4.549	4.485	+0.38	-0.1	.	80.0
Dec. 8	11 19.09	+11 13.6	4.438	4.536	+0.26	+0.8	.	89.4
Dec. 18	11 21.04	+11 25.9	4.326	4.586	+0.12	+1.8	.	99.1
Dec. 28	11 21.57	+11 47.9	4.218	4.636	-0.03	+2.7	.	109.2
Jan. 7	11 20.61	+12 19.6	4.118	4.684	-0.18	+3.7	.	119.7
Jan. 17	11 18.15	+12 59.9	4.033	4.732	-0.33	+4.5	.	130.6
Jan. 27	11 14.28	+13 47.2	3.968	4.780	-0.46	+5.0	.	141.6
Feb. 6	11 09.17	+14 39.2	3.928	4.826	-0.57	+5.3	.	152.8
Feb. 16	11 03.12	+15 32.6	3.917	4.872	-0.64	+5.3	.	163.4
Feb. 26	10 56.52	+16 24.1	3.937	4.917	-0.67	+4.9	.	170.8
Mar. 8	10 49.81	+17 10.7	3.990	4.962	-0.66	+4.3	.	166.9
Mar. 18	10 43.44	+17 49.7	4.074	5.005	-0.60	+3.4	.	157.0
Mar. 28	10 37.82	+18 19.6	4.188	5.048	-0.51	+2.5	.	146.3

Comet 30P/Reinmuth

Epoch = 2018 July 21.0 TT
 T = 2017 Aug. 19.36300 TT
 Peri. = 13.39104 e = 0.5027199
 Node = 119.64423 2000.0 a = 3.7735019 AU
 Incl. = 8.13033 n = 0.13445818
 q = 1.8764874 AU P = 7.33 years

$$m1 = 9.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	14 17.02	-06 14.3	2.396	2.212	+1.59	-5.2	16.5	67.4
Jan. 12	14 32.34	-07 00.6	2.326	2.256	+1.45	-3.9	16.5	73.6
Jan. 22	14 46.10	-07 33.7	2.252	2.301	+1.28	-2.6	16.6	80.3
Feb. 1	14 58.04	-07 53.5	2.175	2.348	+1.09	-1.2	16.6	87.4
Feb. 11	15 07.92	-08 00.1	2.097	2.395	+0.86	0.0	16.7	95.1
Feb. 21	15 15.45	-07 54.0	2.020	2.444	+0.61	+1.3	16.7	103.3
Mar. 3	15 20.38	-07 36.1	1.947	2.493	+0.34	+2.4	16.8	112.0
Mar. 13	15 22.53	-07 07.9	1.881	2.543	+0.06	+3.3	16.9	121.3
Mar. 23	15 21.79	-06 31.4	1.826	2.594	-0.23	+4.0	16.9	131.2
Apr. 2	15 18.32	-05 49.7	1.788	2.645	-0.48	+4.3	17.0	141.6
Apr. 12	15 12.50	-05 06.6	1.770	2.696	-0.69	+4.2	17.1	152.0
Apr. 22	15 04.95	-04 26.6	1.775	2.747	-0.82	+3.6	17.2	161.7
May 2	14 56.58	-03 54.4	1.806	2.799	-0.85	+2.7	17.4	167.6
May 12	14 48.31	-03 33.4	1.865	2.850	-0.79	+1.4	17.6	164.2
May 22	14 41.00	-03 25.9	1.950	2.902	-0.65	0.0	17.8	155.5
June 1	14 35.30	-03 32.4	2.059	2.953	-0.47	-1.4	18.0	145.7
June 11	14 31.54	-03 52.1	2.190	3.004	-0.26	-2.6	18.3	136.0
June 21	14 29.86	-04 23.4	2.339	3.055	-0.05	-3.7	18.5	126.6
July 1	14 30.22	-05 04.1	2.502	3.106	+0.14	-4.5	18.8	117.6
July 11	14 32.45	-05 52.1	2.675	3.157	+0.32	-5.1	19.0	109.0
July 21	14 36.38	-06 45.7	2.857	3.207	+0.48	-5.6	19.3	100.8
July 31	14 41.80	-07 43.0	3.043	3.257	+0.62	-5.9	19.5	92.9
Aug. 10	14 48.50	-08 42.5	3.231	3.306	+0.73	-6.0	19.7	85.3
Aug. 20	14 56.32	-09 43.1	3.418	3.355	+0.84	-6.1	20.0	77.9
Aug. 30	15 05.08	-10 43.6	3.602	3.404	+0.92	-6.0	20.2	70.7
Sept. 9	15 14.66	-11 43.1	3.780	3.452	+1.00	-5.9	20.4	63.6
Sept. 19	15 24.93	-12 40.8	3.951	3.500	+1.06	-5.6	20.5	56.6
Sept. 29	15 35.77	-13 36.0	4.113	3.547	+1.11	-5.4	20.7	49.6
Oct. 9	15 47.10	-14 28.1	4.264	3.594	+1.16	-5.0	20.9	42.7
Oct. 19	15 58.83	-15 16.6	4.401	3.640	+1.19	-4.6	21.0	35.8
Oct. 29	16 10.85	-16 01.0	4.524	3.686	+1.22	-4.2	21.2	28.9
Nov. 8	16 23.09	-16 41.0	4.631	3.731	+1.23	-3.7	21.3	22.0
Nov. 18	16 35.46	-17 16.3	4.721	3.776	+1.24	-3.3	21.4	15.2
Nov. 28	16 47.87	-17 46.7	4.792	3.820	+1.24	-2.8	21.5	8.7
Dec. 8	17 00.23	-18 12.1	4.845	3.864	+1.23	-2.3	21.6	4.5
Dec. 18	17 12.44	-18 32.5	4.878	3.907	+1.21	-1.8	21.7	8.3
Dec. 28	17 24.40	-18 48.1	4.891	3.949	+1.18	-1.3	21.8	15.0
Jan. 7	17 36.02	-18 58.9	4.884	3.991	+1.14	-0.8	21.9	22.2
Jan. 17	17 47.19	-19 05.4	4.859	4.033	+1.09	-0.4	21.9	29.6
Jan. 27	17 57.78	-19 07.9	4.814	4.074	+1.02	-0.1	22.0	37.2
Feb. 6	18 07.69	-19 07.0	4.752	4.114	+0.95	+0.3	22.0	45.0
Feb. 16	18 16.80	-19 03.2	4.675	4.154	+0.86	+0.5	22.0	52.9
Feb. 26	18 24.97	-18 57.3	4.583	4.194	+0.76	+0.7	22.0	61.0
Mar. 8	18 32.09	-18 49.9	4.480	4.232	+0.65	+0.8	.	69.3
Mar. 18	18 38.01	-18 41.8	4.368	4.271	+0.52	+0.8	.	77.9
Mar. 28	18 42.60	-18 33.8	4.250	4.308	+0.38	+0.8	.	86.7

Comet C/2015 VL62 (Lemmon–Yeung–PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2017 Aug. 28.75225 TT
 Peri. = 128.41553
 Node = 94.55983 2000.0
 Incl. = 165.62125
 q = 2.7211901 AU
 e = 1.0023817

$$m_1 = 8.7 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	19 13.13	-19 33.7	3.993	3.018	+0.31	-2.3	16.5	6.6
Jan. 12	19 16.18	-19 55.3	4.043	3.064	+0.30	-2.1	16.6	4.3
Jan. 22	19 19.08	-20 15.5	4.061	3.111	+0.27	-2.0	16.7	13.3
Feb. 1	19 21.58	-20 35.5	4.046	3.161	+0.22	-2.0	16.7	22.8
Feb. 11	19 23.43	-20 56.5	4.001	3.213	+0.14	-2.2	16.8	32.5
Feb. 21	19 24.36	-21 19.6	3.928	3.268	+0.03	-2.5	16.8	42.5
Mar. 3	19 24.07	-21 46.1	3.830	3.324	-0.11	-2.9	16.8	52.6
Mar. 13	19 22.23	-22 17.0	3.712	3.381	-0.28	-3.4	16.8	63.1
Mar. 23	19 18.45	-22 53.4	3.578	3.441	-0.50	-4.0	16.8	74.0
Apr. 2	19 12.32	-23 36.0	3.436	3.501	-0.76	-4.6	16.8	85.4
Apr. 12	19 03.40	-24 24.6	3.293	3.564	-1.06	-5.1	16.8	97.4
Apr. 22	18 51.28	-25 17.8	3.158	3.627	-1.40	-5.5	16.8	110.0
May 2	18 35.71	-26 12.5	3.042	3.691	-1.75	-5.4	16.8	123.2
May 12	18 16.72	-27 03.9	2.953	3.757	-2.07	-4.7	16.8	137.1
May 22	17 54.81	-27 45.3	2.903	3.823	-2.31	-3.4	16.8	151.5
June 1	17 31.07	-28 11.0	2.900	3.891	-2.42	-1.5	16.9	165.8
June 11	17 06.99	-28 17.7	2.947	3.959	-2.36	+0.4	17.0	174.4
June 21	16 44.17	-28 06.5	3.045	4.028	-2.16	+1.9	17.2	162.9
July 1	16 23.86	-27 42.2	3.190	4.097	-1.86	+2.9	17.3	149.3
July 11	16 06.79	-27 11.1	3.374	4.167	-1.52	+3.2	17.5	136.1
July 21	15 53.16	-26 39.1	3.590	4.238	-1.18	+3.1	17.7	123.6
July 31	15 42.81	-26 10.2	3.828	4.309	-0.87	+2.6	18.0	111.8
Aug. 10	15 35.38	-25 46.8	4.080	4.380	-0.60	+2.0	18.2	100.5
Aug. 20	15 30.46	-25 30.1	4.338	4.452	-0.37	+1.3	18.4	89.8
Aug. 30	15 27.63	-25 20.1	4.596	4.524	-0.18	+0.7	18.6	79.6
Sept. 9	15 26.52	-25 16.3	4.847	4.596	-0.03	+0.1	18.8	69.7
Sept. 19	15 26.81	-25 18.1	5.088	4.669	+0.09	-0.5	18.9	60.1
Sept. 29	15 28.21	-25 24.7	5.312	4.742	+0.19	-0.9	19.1	50.8
Oct. 9	15 30.49	-25 35.5	5.517	4.815	+0.27	-1.3	19.2	41.6
Oct. 19	15 33.43	-25 49.6	5.699	4.889	+0.32	-1.6	19.4	32.6
Oct. 29	15 36.84	-26 06.4	5.855	4.962	+0.36	-1.8	19.5	23.7
Nov. 8	15 40.56	-26 25.4	5.985	5.036	+0.38	-2.0	19.6	15.2
Nov. 18	15 44.41	-26 46.0	6.086	5.109	+0.39	-2.1	19.7	8.2
Nov. 28	15 48.24	-27 08.0	6.157	5.183	+0.38	-2.2	19.8	8.4
Dec. 8	15 51.89	-27 30.8	6.199	5.257	+0.35	-2.3	19.9	15.6
Dec. 18	15 55.21	-27 54.2	6.212	5.331	+0.31	-2.4	19.9	24.3
Dec. 28	15 58.03	-28 18.0	6.197	5.404	+0.25	-2.4	20.0	33.5
Jan. 7	16 00.19	-28 41.8	6.157	5.478	+0.17	-2.4	20.0	43.0
Jan. 17	16 01.52	-29 05.3	6.094	5.552	+0.08	-2.3	20.1	52.6
Jan. 27	16 01.83	-29 28.1	6.012	5.626	-0.03	-2.2	20.1	62.6
Feb. 6	16 00.96	-29 49.7	5.915	5.700	-0.16	-2.1	20.1	72.7
Feb. 16	15 58.76	-30 09.4	5.808	5.774	-0.30	-1.8	20.1	83.1
Feb. 26	15 55.09	-30 26.3	5.698	5.847	-0.45	-1.5	20.1	93.8
Mar. 8	15 49.87	-30 39.2	5.591	5.921	-0.61	-1.0	20.2	104.7
Mar. 18	15 43.08	-30 46.7	5.494	5.995	-0.76	-0.4	20.2	115.8
Mar. 28	15 34.81	-30 47.5	5.413	6.068	-0.90	+0.3	20.2	127.1

Comet 145P/Shoemaker-Levy

Epoch = 2018 July 21.0 TT
 T = 2017 Aug. 31.84217 TT
 Peri. = 10.34457 e = 0.5406238
 Node = 26.80739 2000.0 a = 4.1444470 AU
 Incl. = 11.25970 n = 0.11681650
 q = 1.9038603 AU P = 8.44 years

$$m_1 = 11.8 + 5 \log(\Delta) + 12.5 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	05 02.05	+40 04.8	1.284	2.199	-0.50	-2.3	16.1	151.7
Jan. 12	04 58.70	+39 36.0	1.380	2.243	-0.13	-3.4	16.3	142.7
Jan. 22	04 59.04	+38 59.6	1.495	2.289	+0.24	-3.8	16.6	133.7
Feb. 1	05 02.94	+38 21.1	1.626	2.336	+0.57	-3.8	16.8	125.1
Feb. 11	05 09.90	+37 43.5	1.770	2.384	+0.85	-3.7	17.1	116.8
Feb. 21	05 19.44	+37 07.5	1.925	2.434	+1.08	-3.5	17.4	109.0
Mar. 3	05 31.05	+36 33.2	2.088	2.485	+1.26	-3.4	17.7	101.6
Mar. 13	05 44.26	+35 59.4	2.256	2.536	+1.39	-3.4	18.0	94.5
Mar. 23	05 58.71	+35 25.2	2.429	2.589	+1.50	-3.5	18.2	87.7
Apr. 2	06 14.05	+34 49.6	2.603	2.641	+1.57	-3.7	18.5	81.2
Apr. 12	06 30.03	+34 11.5	2.778	2.695	+1.62	-4.0	18.7	74.8
Apr. 22	06 46.41	+33 30.4	2.951	2.749	+1.65	-4.3	19.0	68.6
May 2	07 03.03	+32 45.8	3.120	2.803	+1.67	-4.7	19.2	62.6
May 12	07 19.71	+31 57.4	3.285	2.857	+1.67	-5.0	19.4	56.6
May 22	07 36.36	+31 05.2	3.444	2.911	+1.66	-5.4	19.6	50.8
June 1	07 52.86	+30 09.3	3.595	2.965	+1.64	-5.8	19.9	45.0
June 11	08 09.14	+29 09.9	3.737	3.020	+1.61	-6.1	20.0	39.2
June 21	08 25.14	+28 07.3	3.869	3.074	+1.58	-6.4	20.2	33.5
July 1	08 40.81	+27 02.0	3.990	3.128	+1.55	-6.7	20.4	27.9
July 11	08 56.12	+25 54.4	4.099	3.182	+1.51	-6.9	20.6	22.3
July 21	09 11.03	+24 45.0	4.194	3.235	+1.47	-7.0	20.7	16.9
July 31	09 25.52	+23 34.4	4.275	3.289	+1.42	-7.1	20.9	11.9
Aug. 10	09 39.57	+22 23.2	4.341	3.342	+1.38	-7.1	21.0	8.4
Aug. 20	09 53.16	+21 12.1	4.391	3.394	+1.33	-7.1	21.1	8.6
Aug. 30	10 06.26	+20 01.7	4.425	3.447	+1.28	-7.0	21.2	12.5
Sept. 9	10 18.84	+18 52.8	4.443	3.499	+1.23	-6.8	21.3	18.0
Sept. 19	10 30.88	+17 45.9	4.443	3.550	+1.17	-6.5	21.4	24.2
Sept. 29	10 42.33	+16 42.1	4.426	3.602	+1.11	-6.2	21.5	30.7
Oct. 9	10 53.13	+15 41.9	4.393	3.652	+1.04	-5.8	21.6	37.5
Oct. 19	11 03.23	+14 46.4	4.344	3.703	+0.97	-5.3	21.6	44.7
Oct. 29	11 12.53	+13 56.4	4.280	3.753	+0.88	-4.7	21.7	52.1
Nov. 8	11 20.96	+13 12.8	4.203	3.802	+0.79	-4.0	21.7	59.8
Nov. 18	11 28.40	+12 36.6	4.113	3.851	+0.68	-3.2	21.7	67.8
Nov. 28	11 34.72	+12 08.7	4.015	3.899	+0.57	-2.3	21.8	76.2
Dec. 8	11 39.79	+11 49.9	3.910	3.948	+0.43	-1.3	21.8	85.0
Dec. 18	11 43.46	+11 40.9	3.801	3.995	+0.28	-0.3	21.8	94.2
Dec. 28	11 45.59	+11 42.2	3.694	4.042	+0.13	+0.7	21.8	103.7
Jan. 7	11 46.09	+11 53.7	3.593	4.089	-0.04	+1.7	21.8	113.7
Jan. 17	11 44.86	+12 14.9	3.502	4.135	-0.22	+2.6	21.8	124.1
Jan. 27	11 41.95	+12 44.4	3.427	4.180	-0.38	+3.3	21.9	134.9
Feb. 6	11 37.46	+13 20.0	3.373	4.225	-0.53	+3.8	21.9	145.8
Feb. 16	11 31.66	+13 58.7	3.345	4.270	-0.64	+3.9	21.9	156.7
Feb. 26	11 24.95	+14 36.9	3.345	4.314	-0.70	+3.7	22.0	166.4
Mar. 8	11 17.80	+15 11.3	3.377	4.357	-0.72	+3.1	.	169.9
Mar. 18	11 10.76	+15 38.7	3.440	4.400	-0.68	+2.3	.	162.9
Mar. 28	11 04.34	+15 57.2	3.532	4.443	-0.59	+1.3	.	152.7

Comet C/2016 T3 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2017 Sept. 6.99352 TT
 Peri. = 194.68970
 Node = 271.74814 2000.0
 Incl. = 22.67668
 q = 2.6497972 AU
 e = 0.9811256

$$m1 = 7.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	09 59.16	-11 29.4	2.270	2.915	-0.13	-10.9	16.1	122.1
Jan. 12	09 56.90	-13 09.5	2.225	2.959	-0.33	-8.9	16.2	130.3
Jan. 22	09 52.80	-14 28.3	2.199	3.005	-0.49	-6.6	16.3	138.2
Feb. 1	09 47.37	-15 22.8	2.194	3.054	-0.59	-4.1	16.4	145.1
Feb. 11	09 41.29	-15 52.2	2.212	3.105	-0.62	-1.6	16.5	149.9
Feb. 21	09 35.28	-15 57.7	2.255	3.159	-0.57	+0.6	16.7	151.4
Mar. 3	09 30.10	-15 43.2	2.322	3.214	-0.45	+2.4	16.8	149.2
Mar. 13	09 26.30	-15 14.0	2.414	3.271	-0.29	+3.5	17.0	144.1
Mar. 23	09 24.22	-14 36.0	2.528	3.330	-0.10	+4.1	17.3	137.4
Apr. 2	09 24.04	-13 55.0	2.661	3.390	+0.08	+4.1	17.5	129.9
Apr. 12	09 25.70	-13 15.4	2.811	3.452	+0.26	+3.7	17.7	122.3
Apr. 22	09 29.10	-12 40.8	2.976	3.515	+0.43	+3.1	18.0	114.6
May 2	09 34.03	-12 13.4	3.151	3.579	+0.57	+2.3	18.2	107.1
May 12	09 40.28	-11 54.5	3.335	3.645	+0.69	+1.4	18.4	99.8
May 22	09 47.64	-11 44.8	3.525	3.711	+0.79	+0.5	18.7	92.6
June 1	09 55.91	-11 44.3	3.717	3.778	+0.87	-0.5	18.9	85.7
June 11	10 04.90	-11 52.8	3.911	3.846	+0.93	-1.3	19.1	78.9
June 21	10 14.48	-12 09.7	4.103	3.915	+0.98	-2.1	19.4	72.3
July 1	10 24.49	-12 34.6	4.292	3.984	+1.02	-2.9	19.6	65.8
July 11	10 34.84	-13 06.7	4.476	4.054	+1.05	-3.6	19.8	59.4
July 21	10 45.42	-13 45.2	4.653	4.125	+1.07	-4.2	20.0	53.2
July 31	10 56.16	-14 29.6	4.821	4.196	+1.08	-4.7	20.2	47.0
Aug. 10	11 06.98	-15 19.0	4.979	4.267	+1.08	-5.2	20.3	41.0
Aug. 20	11 17.83	-16 12.9	5.126	4.339	+1.08	-5.6	20.5	35.3
Aug. 30	11 28.64	-17 10.6	5.259	4.411	+1.08	-6.0	20.7	29.8
Sept. 9	11 39.37	-18 11.5	5.377	4.483	+1.07	-6.2	20.8	24.9
Sept. 19	11 49.96	-19 14.9	5.480	4.556	+1.05	-6.5	21.0	21.0
Sept. 29	12 00.35	-20 20.4	5.566	4.629	+1.03	-6.6	21.1	18.8
Oct. 9	12 10.49	-21 27.3	5.635	4.702	+1.00	-6.8	21.2	19.0
Oct. 19	12 20.31	-22 35.2	5.686	4.775	+0.96	-6.8	21.4	21.8
Oct. 29	12 29.75	-23 43.6	5.719	4.849	+0.92	-6.8	21.5	26.3
Nov. 8	12 38.73	-24 51.9	5.734	4.922	+0.87	-6.8	21.6	32.0
Nov. 18	12 47.16	-25 59.6	5.731	4.996	+0.81	-6.7	21.7	38.5
Nov. 28	12 54.94	-27 06.2	5.711	5.069	+0.74	-6.6	21.8	45.5
Dec. 8	13 01.98	-28 11.1	5.676	5.143	+0.66	-6.4	21.8	52.9
Dec. 18	13 08.15	-29 13.7	5.627	5.216	+0.56	-6.1	21.9	60.7
Dec. 28	13 13.33	-30 13.1	5.567	5.290	+0.46	-5.8	22.0	68.7
Jan. 7	13 17.42	-31 08.8	5.497	5.364	+0.34	-5.3	22.0	77.1
Jan. 17	13 20.29	-31 59.5	5.422	5.437	+0.22	-4.8	.	85.7
Jan. 27	13 21.87	-32 44.2	5.346	5.511	+0.08	-4.1	.	94.5
Feb. 6	13 22.10	-33 21.6	5.271	5.585	-0.05	-3.3	.	103.5
Feb. 16	13 20.99	-33 50.5	5.203	5.658	-0.18	-2.4	.	112.7
Feb. 26	13 18.61	-34 09.5	5.147	5.732	-0.30	-1.3	.	121.9
Mar. 8	13 15.12	-34 17.5	5.106	5.805	-0.40	-0.2	.	130.9
Mar. 18	13 10.74	-34 13.9	5.085	5.878	-0.47	+1.0	.	139.6
Mar. 28	13 05.81	-33 58.8	5.087	5.951	-0.51	+2.1	.	147.3

Comet C/2014 B1 (Schwartz)

Epoch = 2018 July 21.0 TT
 T = 2017 Sept. 11.04780 TT
 Peri. = 345.86972
 Node = 161.39402 2000.0
 Incl. = 28.37963
 q = 9.5568758 AU
 e = 1.0026058

$$m1 = 1.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	10 34.24	+04 13.7	9.012	9.578	-0.04	+1.3	16.2	122.6
Jan. 12	10 33.58	+04 28.8	8.884	9.581	-0.10	+1.8	16.2	133.0
Jan. 22	10 32.37	+04 48.2	8.776	9.586	-0.15	+2.1	16.1	143.5
Feb. 1	10 30.71	+05 11.2	8.694	9.590	-0.19	+2.5	16.1	154.1
Feb. 11	10 28.71	+05 37.2	8.639	9.595	-0.21	+2.7	16.1	164.7
Feb. 21	10 26.52	+06 05.2	8.615	9.600	-0.22	+2.9	16.1	174.7
Mar. 3	10 24.28	+06 34.2	8.621	9.605	-0.22	+2.9	16.1	172.6
Mar. 13	10 22.15	+07 03.2	8.659	9.611	-0.20	+2.8	16.1	162.4
Mar. 23	10 20.27	+07 31.0	8.726	9.617	-0.17	+2.7	16.1	152.0
Apr. 2	10 18.78	+07 56.8	8.820	9.623	-0.12	+2.4	16.2	141.6
Apr. 12	10 17.77	+08 19.7	8.937	9.630	-0.07	+2.1	16.2	131.5
Apr. 22	10 17.32	+08 39.3	9.074	9.637	-0.01	+1.8	16.2	121.5
May 2	10 17.47	+08 55.1	9.226	9.644	+0.05	+1.4	16.3	111.7
May 12	10 18.24	+09 07.0	9.389	9.652	+0.11	+1.0	16.3	102.1
May 22	10 19.63	+09 14.8	9.558	9.660	+0.17	+0.6	16.4	92.8
June 1	10 21.61	+09 18.6	9.729	9.668	+0.23	+0.2	16.4	83.6
June 11	10 24.14	+09 18.7	9.897	9.677	+0.28	-0.2	16.4	74.6
June 21	10 27.18	+09 15.2	10.058	9.686	+0.33	-0.5	16.5	65.8
July 1	10 30.68	+09 08.5	10.210	9.695	+0.37	-0.8	16.5	57.1
July 11	10 34.58	+08 58.9	10.348	9.704	+0.41	-1.1	16.5	48.5
July 21	10 38.82	+08 46.8	10.471	9.714	+0.44	-1.3	16.6	40.0
July 31	10 43.33	+08 32.6	10.575	9.724	+0.46	-1.5	16.6	31.6
Aug. 10	10 48.07	+08 16.6	10.658	9.735	+0.48	-1.7	16.6	23.2
Aug. 20	10 52.96	+07 59.4	10.720	9.745	+0.50	-1.8	16.6	14.8
Aug. 30	10 57.94	+07 41.3	10.759	9.756	+0.50	-1.8	16.7	6.5
Sept. 9	11 02.97	+07 22.8	10.774	9.768	+0.50	-1.8	16.7	2.3
Sept. 19	11 07.97	+07 04.5	10.765	9.779	+0.50	-1.8	16.7	10.6
Sept. 29	11 12.88	+06 46.7	10.732	9.791	+0.48	-1.7	16.7	19.1
Oct. 9	11 17.64	+06 30.0	10.677	9.803	+0.47	-1.6	16.7	27.7
Oct. 19	11 22.19	+06 15.0	10.599	9.816	+0.44	-1.4	16.6	36.5
Oct. 29	11 26.46	+06 02.1	10.501	9.829	+0.41	-1.2	16.6	45.4
Nov. 8	11 30.39	+05 51.8	10.385	9.842	+0.37	-0.9	16.6	54.4
Nov. 18	11 33.91	+05 44.7	10.254	9.855	+0.33	-0.5	16.6	63.6
Nov. 28	11 36.97	+05 41.1	10.112	9.869	+0.28	-0.1	16.6	73.0
Dec. 8	11 39.51	+05 41.4	9.962	9.883	+0.22	+0.3	16.5	82.5
Dec. 18	11 41.48	+05 46.0	9.809	9.897	+0.16	+0.7	16.5	92.3
Dec. 28	11 42.85	+05 55.0	9.657	9.911	+0.10	+1.1	16.5	102.2
Jan. 7	11 43.59	+06 08.4	9.512	9.926	+0.04	+1.6	16.5	112.3
Jan. 17	11 43.71	+06 26.1	9.378	9.941	-0.02	+2.0	16.4	122.5
Jan. 27	11 43.24	+06 47.6	9.261	9.956	-0.08	+2.3	16.4	132.9
Feb. 6	11 42.22	+07 12.3	9.164	9.972	-0.13	+2.6	16.4	143.3
Feb. 16	11 40.74	+07 39.5	9.092	9.988	-0.17	+2.8	16.4	153.7
Feb. 26	11 38.91	+08 08.1	9.049	10.004	-0.20	+2.9	16.4	164.0
Mar. 8	11 36.84	+08 37.2	9.035	10.020	-0.21	+2.9	16.4	172.9
Mar. 18	11 34.69	+09 05.5	9.052	10.037	-0.21	+2.7	16.4	171.5
Mar. 28	11 32.60	+09 32.0	9.100	10.054	-0.20	+2.5	16.4	162.1

Comet C/2016 N4 (MASTER)

Epoch = 2018 July 21.0 TT
 T = 2017 Sept. 16.56350 TT
 Peri. = 55.95274
 Node = 354.02549 2000.0
 Incl. = 72.55761
 q = 3.1990808 AU
 e = 0.9989875

$$m1 = 8.4 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	20 08.07	+62 22.2	3.269	3.360	+0.95	+3.9	14.9	86.8
Jan. 12	20 18.25	+63 13.0	3.324	3.390	+1.09	+6.5	15.0	85.4
Jan. 22	20 29.73	+64 28.9	3.377	3.423	+1.21	+8.9	15.1	84.3
Feb. 1	20 42.40	+66 08.5	3.429	3.458	+1.33	+11.2	15.1	83.4
Feb. 11	20 56.33	+68 10.0	3.480	3.494	+1.47	+13.3	15.2	82.7
Feb. 21	21 11.75	+70 31.5	3.532	3.533	+1.64	+15.2	15.3	82.0
Mar. 3	21 29.19	+73 10.3	3.587	3.574	+1.89	+16.7	15.3	81.3
Mar. 13	21 49.84	+76 03.5	3.645	3.617	+2.32	+18.0	15.4	80.5
Mar. 23	22 16.42	+79 07.2	3.708	3.661	+3.19	+18.8	15.5	79.6
Apr. 2	22 56.23	+82 15.4	3.776	3.707	+5.36	+18.7	15.6	78.4
Apr. 12	00 14.80	+85 13.0	3.852	3.754	+12.61	+15.7	15.6	76.9
Apr. 22	03 35.89	+86 54.7	3.934	3.803	+27.44	-0.3	15.7	75.2
May 2	07 08.96	+85 24.0	4.023	3.854	+12.34	-16.1	15.8	73.1
May 12	08 33.07	+82 24.2	4.119	3.905	+5.27	-19.3	15.9	70.8
May 22	09 14.33	+79 07.9	4.220	3.958	+3.13	-19.8	16.0	68.2
June 1	09 41.18	+75 50.6	4.326	4.012	+2.27	-19.6	16.1	65.5
June 11	10 01.71	+72 37.2	4.434	4.068	+1.84	-19.0	16.2	62.6
June 21	10 18.91	+69 30.2	4.544	4.124	+1.60	-18.3	16.3	59.6
July 1	10 34.10	+66 31.2	4.653	4.181	+1.44	-17.4	16.4	56.6
July 11	10 47.96	+63 41.1	4.759	4.239	+1.33	-16.5	16.5	53.8
July 21	11 00.87	+61 00.6	4.862	4.298	+1.25	-15.5	16.6	51.2
July 31	11 13.04	+58 30.4	4.958	4.357	+1.18	-14.5	16.7	48.9
Aug. 10	11 24.61	+56 10.6	5.046	4.418	+1.13	-13.4	16.8	47.1
Aug. 20	11 35.66	+54 01.6	5.124	4.479	+1.08	-12.3	16.8	45.9
Aug. 30	11 46.23	+52 03.9	5.192	4.541	+1.03	-11.2	16.9	45.4
Sept. 9	11 56.32	+50 17.6	5.247	4.603	+0.98	-10.0	17.0	45.9
Sept. 19	12 05.95	+48 43.0	5.289	4.666	+0.94	-8.8	17.0	47.3
Sept. 29	12 15.07	+47 20.5	5.317	4.729	+0.88	-7.6	17.1	49.6
Oct. 9	12 23.66	+46 10.4	5.331	4.793	+0.83	-6.3	17.1	52.8
Oct. 19	12 31.64	+45 13.1	5.331	4.857	+0.76	-5.0	17.2	56.8
Oct. 29	12 38.93	+44 28.8	5.318	4.922	+0.69	-3.7	17.2	61.5
Nov. 8	12 45.44	+43 57.8	5.292	4.987	+0.60	-2.4	17.3	66.9
Nov. 18	12 51.03	+43 40.4	5.256	5.052	+0.50	-1.0	17.3	72.8
Nov. 28	12 55.56	+43 36.3	5.211	5.118	+0.39	+0.3	17.3	79.2
Dec. 8	12 58.87	+43 45.3	5.160	5.184	+0.26	+1.6	17.3	85.9
Dec. 18	13 00.77	+44 06.4	5.106	5.250	+0.11	+2.7	17.3	93.0
Dec. 28	13 01.08	+44 38.3	5.053	5.317	-0.06	+3.7	17.4	100.2
Jan. 7	12 59.61	+45 18.6	5.005	5.383	-0.25	+4.4	17.4	107.5
Jan. 17	12 56.20	+46 04.5	4.966	5.450	-0.45	+4.7	17.4	114.6
Jan. 27	12 50.80	+46 52.0	4.941	5.517	-0.65	+4.7	17.4	121.3
Feb. 6	12 43.42	+47 36.7	4.934	5.584	-0.84	+4.1	17.5	127.1
Feb. 16	12 34.28	+48 13.6	4.947	5.651	-1.00	+3.1	17.5	131.6
Feb. 26	12 23.74	+48 38.5	4.985	5.719	-1.11	+1.7	17.6	134.2
Mar. 8	12 12.35	+48 47.6	5.047	5.786	-1.16	0.0	17.6	134.5
Mar. 18	12 00.77	+48 39.0	5.135	5.854	-1.14	-1.9	17.7	132.5
Mar. 28	11 49.66	+48 12.4	5.248	5.922	-1.06	-3.6	17.8	128.5

Comet 213P/Van Ness

Epoch = 2018 July 21.0 TT
 T = 2017 Sept. 24.39829 TT
 Peri. = 5.56771 e = 0.4076080
 Node = 311.30875 2000.0 a = 3.3478619 AU
 Incl. = 10.37700 n = 0.16089879
 q = 1.9832466 AU P = 6.13 years

$$m1 = 8.3 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2018/19	h m	° ' "			m		°
Jan. 2	22 15.82	-04 14.6	2.562	2.126	+1.97 +12.6	16.9	53.3
Jan. 12	22 35.48	-02 07.2	2.675	2.154	+1.96 +12.9	17.1	48.5
Jan. 22	22 55.04	+00 02.7	2.785	2.183	+1.95 +13.1	17.3	43.8
Feb. 1	23 14.47	+02 14.0	2.891	2.215	+1.93 +13.2	17.5	39.1
Feb. 11	23 33.75	+04 25.7	2.992	2.248	+1.92 +13.2	17.7	34.4
Feb. 21	23 52.89	+06 36.8	3.088	2.282	+1.91 +13.0	17.9	29.7
Mar. 3	00 11.88	+08 46.3	3.178	2.318	+1.89 +12.8	18.1	25.0
Mar. 13	00 30.73	+10 53.1	3.260	2.355	+1.88 +12.5	18.3	20.4
Mar. 23	00 49.46	+12 56.6	3.335	2.393	+1.87 +12.1	18.5	16.0
Apr. 2	01 08.05	+14 55.8	3.401	2.431	+1.85 +11.7	18.7	11.8
Apr. 12	01 26.50	+16 50.1	3.458	2.471	+1.84 +11.1	18.9	8.5
Apr. 22	01 44.82	+18 38.9	3.504	2.511	+1.82 +10.6	19.0	7.3
May 2	02 02.97	+20 21.7	3.541	2.551	+1.81 +9.9	19.2	9.3
May 12	02 20.95	+21 58.1	3.566	2.592	+1.79 +9.3	19.3	13.1
May 22	02 38.70	+23 27.8	3.580	2.634	+1.76 +8.6	19.5	17.7
June 1	02 56.17	+24 50.6	3.582	2.675	+1.73 +7.9	19.6	22.7
June 11	03 13.32	+26 06.4	3.573	2.717	+1.69 +7.2	19.7	27.9
June 21	03 30.05	+27 15.5	3.551	2.759	+1.65 +6.5	19.9	33.3
July 1	03 46.27	+28 17.8	3.518	2.801	+1.59 +5.9	20.0	39.0
July 11	04 01.88	+29 13.8	3.472	2.843	+1.52 +5.3	20.1	44.8
July 21	04 16.74	+30 03.9	3.416	2.885	+1.44 +4.7	20.2	50.9
July 31	04 30.70	+30 48.7	3.349	2.927	+1.34 +4.2	20.3	57.2
Aug. 10	04 43.61	+31 28.9	3.272	2.968	+1.22 +3.8	20.3	63.9
Aug. 20	04 55.25	+32 05.1	3.186	3.010	+1.09 +3.4	20.4	70.8
Aug. 30	05 05.41	+32 38.2	3.094	3.051	+0.93 +3.2	20.4	78.1
Sept. 9	05 13.86	+33 08.9	2.996	3.092	+0.74 +3.0	20.5	85.9
Sept. 19	05 20.33	+33 37.6	2.896	3.132	+0.53 +2.8	20.5	94.1
Sept. 29	05 24.55	+34 04.5	2.797	3.173	+0.29 +2.6	20.6	102.8
Oct. 9	05 26.29	+34 29.3	2.702	3.213	+0.03 +2.3	20.6	112.0
Oct. 19	05 25.34	+34 50.8	2.615	3.252	-0.25 +1.9	20.6	121.8
Oct. 29	05 21.68	+35 07.3	2.542	3.291	-0.51 +1.3	20.7	132.1
Nov. 8	05 15.45	+35 16.1	2.487	3.330	-0.75 +0.4	20.7	142.8
Nov. 18	05 07.09	+35 14.6	2.455	3.368	-0.93 -0.8	20.8	153.5
Nov. 28	04 57.37	+35 01.0	2.450	3.406	-1.01 -2.1	20.9	163.2
Dec. 8	04 47.20	+34 35.1	2.474	3.444	-1.00 -3.2	21.0	167.9
Dec. 18	04 37.62	+33 58.6	2.530	3.481	-0.89 -4.1	21.1	162.5
Dec. 28	04 29.48	+33 15.4	2.615	3.517	-0.71 -4.5	21.3	152.6
Jan. 7	04 23.38	+32 29.7	2.726	3.553	-0.48 -4.5	21.5	142.0
Jan. 17	04 19.63	+31 45.5	2.861	3.588	-0.24 -4.2	21.7	131.4
Jan. 27	04 18.28	+31 05.7	3.015	3.623	-0.01 -3.7	21.9	121.1
Feb. 6	04 19.20	+30 31.8	3.182	3.658	+0.21 -3.0	.	111.3
Feb. 16	04 22.20	+30 04.4	3.359	3.692	+0.40 -2.4	.	101.9
Feb. 26	04 27.01	+29 43.2	3.541	3.725	+0.57 -1.8	.	92.9
Mar. 8	04 33.39	+29 27.2	3.725	3.758	+0.71 -1.3	.	84.3
Mar. 18	04 41.09	+29 15.6	3.906	3.790	+0.83 -1.0	.	76.0
Mar. 28	04 49.90	+29 07.1	4.081	3.822	+0.93 -0.7	.	68.0

Comet 355P/LINEAR-NEAT

Epoch = 2018 July 21.0 TT
 T = 2017 Oct. 12.64060 TT
 Peri. = 336.31520 e = 0.5063527
 Node = 51.46091 2000.0 a = 3.4756643 AU
 Incl. = 11.03234 n = 0.15210635
 q = 1.7157523 AU P = 6.48 years

$$m_1 = 10.8 + 5 \log(\Delta) + 20.0 \log(r(t+50))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	02 30.38	+20 23.9	1.172	1.872	+1.01	+10.3	17.5	120.3
Jan. 12	02 41.61	+22 04.2	1.295	1.909	+1.26	+9.7	17.9	113.2
Jan. 22	02 55.15	+23 38.5	1.426	1.949	+1.47	+9.1	18.3	106.5
Feb. 1	03 10.60	+25 06.1	1.566	1.992	+1.63	+8.4	18.8	100.2
Feb. 11	03 27.57	+26 26.1	1.712	2.037	+1.77	+7.5	19.1	94.2
Feb. 21	03 45.78	+27 37.6	1.863	2.084	+1.88	+6.7	19.5	88.4
Mar. 3	04 04.96	+28 40.0	2.017	2.132	+1.96	+5.7	19.9	82.7
Mar. 13	04 24.86	+29 32.6	2.174	2.182	+2.02	+4.7	20.3	77.3
Mar. 23	04 45.31	+30 14.9	2.332	2.233	+2.07	+3.7	20.6	71.9
Apr. 2	05 06.12	+30 46.6	2.489	2.285	+2.09	+2.6	20.9	66.6
Apr. 12	05 27.10	+31 07.7	2.645	2.338	+2.10	+1.5	21.2	61.4
Apr. 22	05 48.15	+31 18.2	2.799	2.391	+2.10	+0.5	21.5	56.2
May 2	06 09.10	+31 18.5	2.948	2.445	+2.08	-0.5	21.8	51.1
May 12	06 29.84	+31 08.9	3.093	2.499	+2.06	-1.5	.	46.0
May 22	06 50.28	+30 50.2	3.230	2.553	+2.02	-2.4	.	40.9
June 1	07 10.33	+30 22.9	3.361	2.607	+1.98	-3.2	.	35.8
June 11	07 29.93	+29 47.9	3.483	2.661	+1.93	-3.9	.	30.7
June 21	07 49.03	+29 06.0	3.595	2.715	+1.88	-4.5	.	25.6
July 1	08 07.58	+28 18.2	3.697	2.769	+1.82	-5.1	.	20.6
July 11	08 25.56	+27 25.3	3.787	2.822	+1.77	-5.5	.	15.8
July 21	08 42.95	+26 28.4	3.865	2.876	+1.71	-5.9	.	11.4
July 31	08 59.73	+25 28.3	3.929	2.929	+1.64	-6.1	.	8.5
Aug. 10	09 15.91	+24 26.0	3.979	2.981	+1.58	-6.3	.	8.7
Aug. 20	09 31.46	+23 22.5	4.015	3.033	+1.52	-6.4	.	12.2
Aug. 30	09 46.37	+22 18.8	4.035	3.085	+1.46	-6.3	.	17.2
Sept. 9	10 00.63	+21 15.8	4.040	3.136	+1.39	-6.2	.	22.8
Sept. 19	10 14.21	+20 14.6	4.030	3.186	+1.32	-6.0	.	28.8
Sept. 29	10 27.08	+19 16.2	4.004	3.236	+1.25	-5.6	.	35.1
Oct. 9	10 39.20	+18 21.6	3.963	3.286	+1.17	-5.2	.	41.8
Oct. 19	10 50.50	+17 32.1	3.907	3.335	+1.08	-4.6	.	48.7
Oct. 29	11 00.89	+16 48.8	3.838	3.383	+0.99	-4.0	.	55.9
Nov. 8	11 10.30	+16 12.8	3.756	3.430	+0.88	-3.1	.	63.5
Nov. 18	11 18.59	+15 45.3	3.664	3.477	+0.76	-2.2	.	71.4
Nov. 28	11 25.64	+15 27.6	3.565	3.524	+0.63	-1.2	.	79.6
Dec. 8	11 31.28	+15 20.6	3.460	3.570	+0.48	-0.1	.	88.3
Dec. 18	11 35.34	+15 25.2	3.354	3.615	+0.31	+1.1	.	97.4
Dec. 28	11 37.67	+15 41.8	3.250	3.659	+0.13	+2.3	.	106.9
Jan. 7	11 38.12	+16 10.1	3.153	3.703	-0.06	+3.4	.	116.9
Jan. 17	11 36.61	+16 49.1	3.068	3.746	-0.26	+4.4	.	127.3
Jan. 27	11 33.16	+17 36.4	3.000	3.789	-0.45	+5.1	.	137.9
Feb. 6	11 27.92	+18 28.6	2.955	3.830	-0.61	+5.3	.	148.5
Feb. 16	11 21.22	+19 21.3	2.936	3.872	-0.73	+5.1	.	158.4
Feb. 26	11 13.56	+20 09.8	2.946	3.912	-0.80	+4.4	.	165.3
Mar. 8	11 05.54	+20 49.8	2.988	3.952	-0.80	+3.4	.	164.3
Mar. 18	10 57.82	+21 18.0	3.059	3.991	-0.73	+2.1	.	156.5
Mar. 28	10 51.00	+21 32.9	3.159	4.030	-0.62	+0.7	.	146.6

Comet C/2017 01 (ASASSN)

Epoch = 2018 July 21.0 TT
 T = 2017 Oct. 14.76553 TT
 Peri. = 20.90065
 Node = 25.80787 2000.0
 Incl. = 39.84838
 q = 1.4986029 AU
 e = 0.9962037

$$m_1 = 5.1 + 5 \log(\Delta) + 25.0 \log(r(t+30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	00 12.92	+85 38.4	1.242	1.853	+6.22	-2.1	13.7	112.2
Jan. 12	01 28.86	+85 11.4	1.341	1.933	+8.81	-4.0	14.3	111.6
Jan. 22	02 58.15	+84 13.1	1.447	2.018	+8.58	-8.2	14.9	110.8
Feb. 1	04 15.99	+82 30.9	1.560	2.106	+6.72	-12.5	15.5	109.6
Feb. 11	05 15.04	+80 11.3	1.681	2.197	+5.01	-15.6	16.1	108.1
Feb. 21	05 59.56	+77 26.0	1.812	2.291	+3.86	-17.5	16.7	106.0
Mar. 3	06 34.63	+74 25.6	1.953	2.386	+3.13	-18.6	17.2	103.4
Mar. 13	07 03.57	+71 17.6	2.105	2.482	+2.65	-19.0	17.8	100.2
Mar. 23	07 28.51	+68 07.2	2.267	2.579	+2.33	-19.0	18.3	96.6
Apr. 2	07 50.69	+64 58.6	2.438	2.678	+2.10	-18.7	18.9	92.7
Apr. 12	08 10.84	+61 54.1	2.618	2.776	+1.92	-18.2	19.4	88.3
Apr. 22	08 29.48	+58 55.2	2.805	2.875	+1.79	-17.5	19.9	83.8
May 2	08 46.93	+56 03.1	2.997	2.974	+1.69	-16.8	20.4	79.0
May 12	09 03.39	+53 18.1	3.193	3.073	+1.60	-16.1	20.8	74.1
May 22	09 19.06	+50 40.4	3.390	3.172	+1.53	-15.4	21.3	69.0
June 1	09 34.02	+48 10.2	3.588	3.271	+1.46	-14.6	21.7	63.9
June 11	09 48.38	+45 47.1	3.783	3.369	+1.41	-13.9	.	58.7
June 21	10 02.20	+43 31.0	3.973	3.468	+1.35	-13.2	.	53.6
July 1	10 15.52	+41 21.9	4.158	3.566	+1.31	-12.5	.	48.5
July 11	10 28.39	+39 19.5	4.334	3.663	+1.26	-11.9	.	43.4
July 21	10 40.85	+37 23.8	4.501	3.760	+1.22	-11.2	.	38.6
July 31	10 52.90	+35 34.8	4.656	3.857	+1.18	-10.5	.	34.0
Aug. 10	11 04.56	+33 52.5	4.798	3.953	+1.14	-9.9	.	30.1
Aug. 20	11 15.83	+32 16.9	4.926	4.049	+1.11	-9.2	.	26.9
Aug. 30	11 26.71	+30 48.2	5.037	4.145	+1.07	-8.5	.	25.0
Sept. 9	11 37.19	+29 26.6	5.132	4.240	+1.03	-7.8	.	24.9
Sept. 19	11 47.24	+28 12.5	5.210	4.334	+0.98	-7.0	.	26.5
Sept. 29	11 56.84	+27 06.1	5.269	4.428	+0.93	-6.2	.	29.8
Oct. 9	12 05.94	+26 07.8	5.310	4.521	+0.88	-5.4	.	34.5
Oct. 19	12 14.48	+25 18.1	5.332	4.614	+0.82	-4.5	.	40.1
Oct. 29	12 22.41	+24 37.4	5.337	4.707	+0.76	-3.6	.	46.4
Nov. 8	12 29.65	+24 06.0	5.326	4.799	+0.68	-2.6	.	53.2
Nov. 18	12 36.11	+23 44.4	5.299	4.890	+0.60	-1.6	.	60.6
Nov. 28	12 41.69	+23 32.9	5.260	4.981	+0.51	-0.6	.	68.4
Dec. 8	12 46.28	+23 31.6	5.210	5.072	+0.40	+0.4	.	76.5
Dec. 18	12 49.76	+23 40.4	5.154	5.162	+0.28	+1.4	.	85.0
Dec. 28	12 52.03	+23 58.8	5.095	5.251	+0.16	+2.3	.	93.7
Jan. 7	12 52.98	+24 25.9	5.037	5.341	+0.02	+3.1	.	102.7
Jan. 17	12 52.54	+25 00.2	4.985	5.429	-0.12	+3.8	.	111.9
Jan. 27	12 50.68	+25 39.8	4.945	5.517	-0.26	+4.1	.	121.0
Feb. 6	12 47.44	+26 22.0	4.920	5.605	-0.40	+4.3	.	130.0
Feb. 16	12 42.93	+27 03.8	4.916	5.693	-0.51	+4.0	.	138.4
Feb. 26	12 37.36	+27 41.8	4.936	5.779	-0.61	+3.5	.	145.5
Mar. 8	12 31.01	+28 13.2	4.984	5.866	-0.66	+2.7	.	150.3
Mar. 18	12 24.24	+28 35.2	5.059	5.952	-0.68	+1.6	.	151.4
Mar. 28	12 17.44	+28 46.2	5.164	6.038	-0.67	+0.5	.	148.5

Comet 65P/Gunn

Epoch = 2018 July 21.0 TT
 T = 2017 Oct. 16.97017 TT
 Peri. = 213.57930 e = 0.2500010
 Node = 62.01649 2000.0 a = 3.8803794 AU
 Incl. = 9.18529 n = 0.12894152
 q = 2.9102807 AU P = 7.64 years

$$m_1 = 5.8 + 5 \log(\Delta) + 15.0 \log(r(t+90))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	19 27.71	-27 17.6	3.900	2.936	+1.87	+2.9	16.0	9.8
Jan. 12	19 46.34	-26 45.3	3.919	2.943	+1.85	+3.6	16.0	5.9
Jan. 22	20 04.75	-26 06.4	3.926	2.951	+1.83	+4.2	16.0	6.8
Feb. 1	20 22.87	-25 21.7	3.919	2.959	+1.79	+4.8	16.1	11.4
Feb. 11	20 40.60	-24 32.1	3.899	2.969	+1.75	+5.2	16.1	16.9
Feb. 21	20 57.88	-23 38.5	3.867	2.979	+1.70	+5.5	16.1	22.7
Mar. 3	21 14.63	-22 42.1	3.822	2.990	+1.64	+5.8	16.1	28.6
Mar. 13	21 30.81	-21 43.9	3.766	3.001	+1.58	+5.9	16.1	34.6
Mar. 23	21 46.35	-20 45.2	3.698	3.014	+1.52	+5.8	16.1	40.7
Apr. 2	22 01.20	-19 47.3	3.620	3.026	+1.44	+5.7	16.1	46.9
Apr. 12	22 15.28	-18 51.4	3.532	3.040	+1.36	+5.4	16.1	53.2
Apr. 22	22 28.55	-17 58.9	3.436	3.054	+1.28	+5.0	16.1	59.7
May 2	22 40.89	-17 11.1	3.332	3.069	+1.18	+4.5	16.0	66.3
May 12	22 52.24	-16 29.4	3.223	3.085	+1.08	+3.8	16.0	73.1
May 22	23 02.47	-15 55.2	3.109	3.101	+0.96	+3.0	16.0	80.2
June 1	23 11.45	-15 29.8	2.992	3.117	+0.82	+2.0	15.9	87.5
June 11	23 19.03	-15 14.3	2.876	3.134	+0.67	+1.0	15.9	95.1
June 21	23 25.04	-15 09.8	2.761	3.152	+0.51	-0.2	15.8	103.2
July 1	23 29.32	-15 17.1	2.651	3.170	+0.33	-1.4	15.8	111.6
July 11	23 31.69	-15 36.2	2.550	3.188	+0.13	-2.5	15.7	120.4
July 21	23 32.04	-16 06.3	2.461	3.207	-0.08	-3.6	15.7	129.7
July 31	23 30.35	-16 45.7	2.387	3.226	-0.28	-4.3	15.7	139.4
Aug. 10	23 26.72	-17 31.3	2.333	3.246	-0.46	-4.7	15.7	149.2
Aug. 20	23 21.42	-18 18.7	2.302	3.265	-0.60	-4.6	15.7	158.6
Aug. 30	23 14.94	-19 02.8	2.298	3.286	-0.69	-4.0	15.7	165.7
Sept. 9	23 07.92	-19 38.8	2.320	3.306	-0.70	-3.0	15.8	165.9
Sept. 19	23 01.08	-20 02.6	2.370	3.327	-0.65	-1.6	15.9	158.8
Sept. 29	22 55.11	-20 12.1	2.447	3.348	-0.53	-0.1	16.0	149.4
Oct. 9	22 50.55	-20 06.5	2.547	3.369	-0.36	+1.4	16.1	139.4
Oct. 19	22 47.74	-19 46.6	2.668	3.391	-0.18	+2.7	16.3	129.6
Oct. 29	22 46.85	-19 13.9	2.806	3.412	+0.02	+3.9	16.4	120.0
Nov. 8	22 47.85	-18 30.2	2.956	3.434	+0.20	+4.9	16.6	110.7
Nov. 18	22 50.65	-17 37.3	3.116	3.456	+0.37	+5.7	16.7	101.8
Nov. 28	22 55.06	-16 36.8	3.281	3.478	+0.52	+6.4	16.9	93.2
Dec. 8	23 00.87	-15 30.0	3.448	3.501	+0.65	+7.0	17.0	84.9
Dec. 18	23 07.89	-14 18.1	3.614	3.523	+0.76	+7.4	17.2	76.8
Dec. 28	23 15.91	-13 02.0	3.776	3.545	+0.85	+7.8	17.3	69.0
Jan. 7	23 24.77	-11 42.7	3.932	3.568	+0.93	+8.1	17.4	61.4
Jan. 17	23 34.31	-10 20.8	4.079	3.590	+0.99	+8.3	17.5	54.0
Jan. 27	23 44.38	-08 57.2	4.216	3.613	+1.03	+8.4	17.6	46.7
Feb. 6	23 54.89	-07 32.4	4.340	3.635	+1.07	+8.5	17.7	39.6
Feb. 16	00 05.72	-06 07.2	4.451	3.658	+1.10	+8.5	17.8	32.6
Feb. 26	00 16.79	-04 42.2	4.546	3.680	+1.12	+8.5	17.9	25.8
Mar. 8	00 28.03	-03 17.9	4.626	3.703	+1.13	+8.4	18.0	19.1
Mar. 18	00 39.36	-01 54.9	4.689	3.725	+1.14	+8.2	18.1	12.7
Mar. 28	00 50.72	+00 33.8	4.736	3.748	+1.14	+8.0	18.1	7.2

Comet C/2018 A1 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2017 Oct. 20.39768 TT
 Peri. = 96.37442 e = 0.9040082
 Node = 336.62427 2000.0 a = 25.2008901 AU
 Incl. = 53.55754 n = 0.00779077
 q = 2.4190788 AU P = 126.51 years

$$m_1 = 12.3 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	12 02.42	+73 59.6	1.959	2.539	-3.17	+4.7	17.8	115.2
Jan. 12	11 24.36	+74 32.3	1.944	2.572	-4.53	+0.9	17.8	119.2
Jan. 22	10 35.48	+74 13.0	1.946	2.609	-5.12	-5.9	17.9	122.4
Feb. 1	09 46.21	+72 38.6	1.967	2.649	-4.50	-13.7	18.0	124.1
Feb. 11	09 06.74	+69 51.2	2.012	2.692	-3.23	-20.0	18.1	124.1
Feb. 21	08 40.22	+66 11.7	2.081	2.739	-1.99	-23.9	18.3	122.2
Mar. 3	08 24.81	+62 04.5	2.174	2.787	-1.05	-25.4	18.4	118.5
Mar. 13	08 17.43	+57 49.3	2.292	2.839	-0.40	-25.4	18.6	113.5
Mar. 23	08 15.62	+53 38.6	2.430	2.892	+0.05	-24.5	18.8	107.6
Apr. 2	08 17.61	+49 40.0	2.587	2.948	+0.36	-23.0	19.1	101.2
Apr. 12	08 22.20	+45 56.8	2.758	3.006	+0.57	-21.4	19.3	94.4
Apr. 22	08 28.61	+42 29.7	2.940	3.065	+0.72	-19.8	19.5	87.5
May 2	08 36.27	+39 18.1	3.129	3.126	+0.82	-18.4	19.7	80.6
May 12	08 44.79	+36 20.6	3.322	3.189	+0.89	-17.0	19.9	73.7
May 22	08 53.92	+33 35.4	3.515	3.252	+0.94	-15.9	20.2	66.8
June 1	09 03.43	+31 00.9	3.706	3.317	+0.97	-14.9	20.4	60.0
June 11	09 13.17	+28 35.4	3.892	3.383	+0.98	-14.1	20.5	53.2
June 21	09 23.05	+26 17.5	4.070	3.450	+0.99	-13.4	20.7	46.5
July 1	09 32.96	+24 06.2	4.239	3.518	+0.99	-12.8	20.9	39.8
July 11	09 42.82	+22 00.4	4.395	3.586	+0.98	-12.3	21.1	33.1
July 21	09 52.58	+19 59.3	4.538	3.655	+0.97	-11.9	21.2	26.3
July 31	10 02.18	+18 02.4	4.666	3.725	+0.95	-11.5	21.4	19.6
Aug. 10	10 11.58	+16 09.1	4.777	3.795	+0.93	-11.1	21.5	12.9
Aug. 20	10 20.72	+14 19.1	4.870	3.866	+0.90	-10.8	21.6	6.3
Aug. 30	10 29.55	+12 32.2	4.944	3.937	+0.86	-10.5	21.7	3.4
Sept. 9	10 38.01	+10 48.1	4.999	4.008	+0.82	-10.3	21.8	9.2
Sept. 19	10 46.06	+09 06.9	5.034	4.080	+0.78	-10.0	21.9	16.3
Sept. 29	10 53.62	+07 28.5	5.049	4.151	+0.73	-9.7	22.0	23.7
Oct. 9	11 00.62	+05 52.9	5.045	4.224	+0.67	-9.4	.	31.3
Oct. 19	11 06.97	+04 20.4	5.021	4.296	+0.60	-9.1	.	39.2
Oct. 29	11 12.58	+02 51.2	4.980	4.368	+0.52	-8.7	.	47.3
Nov. 8	11 17.35	+01 25.6	4.923	4.440	+0.43	-8.4	.	55.7
Nov. 18	11 21.15	+00 03.9	4.852	4.513	+0.32	-7.9	.	64.3
Nov. 28	11 23.87	-01 13.3	4.770	4.585	+0.21	-7.5	.	73.3
Dec. 8	11 25.38	-02 25.5	4.681	4.658	+0.08	-6.9	.	82.6
Dec. 18	11 25.57	-03 32.0	4.588	4.730	-0.06	-6.3	.	92.2
Dec. 28	11 24.36	-04 31.9	4.498	4.803	-0.20	-5.6	.	102.2
Jan. 7	11 21.70	-05 24.5	4.413	4.875	-0.35	-4.8	.	112.5
Jan. 17	11 17.61	-06 08.8	4.342	4.947	-0.48	-3.9	.	123.0
Jan. 27	11 12.21	-06 44.2	4.288	5.019	-0.60	-3.0	.	133.8
Feb. 6	11 05.71	-07 10.1	4.257	5.091	-0.70	-2.1	.	144.5
Feb. 16	10 58.42	-07 26.6	4.254	5.163	-0.76	-1.2	.	154.6
Feb. 26	10 50.74	-07 34.4	4.281	5.235	-0.77	-0.3	.	162.9
Mar. 8	10 43.09	-07 34.8	4.341	5.307	-0.75	+0.3	.	165.4
Mar. 18	10 35.91	-07 29.6	4.433	5.379	-0.68	+0.7	.	159.9
Mar. 28	10 29.53	-07 21.1	4.556	5.450	-0.58	+1.0	.	150.9

Comet 96P/Machholz

Epoch = 2018 July 21.0 TT
 T = 2017 Oct. 27.96104 TT
 Peri. = 14.78645 e = 0.9591850
 Node = 94.25240 2000.0 a = 3.0346956 AU
 Incl. = 58.17066 n = 0.18643669
 q = 0.1238611 AU P = 5.29 years

m1 = 12.8 + 5 log(Delta) + 12.5 log(r) (r < 2.4 AU)
 H = 14.6 , G = 0.15 (r > 2.4 AU)

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		Mag.	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	18 10.83	-16 22.9	2.524	1.571	+1.75	-3.6	17.3	11.1
Jan. 12	18 27.48	-16 53.6	2.647	1.724	+1.56	-2.5	17.9	16.1
Jan. 22	18 42.30	-17 14.6	2.743	1.869	+1.39	-1.7	18.4	22.2
Feb. 1	18 55.47	-17 28.7	2.811	2.007	+1.23	-1.1	18.8	29.0
Feb. 11	19 07.07	-17 38.4	2.853	2.138	+1.07	-0.8	19.2	36.2
Feb. 21	19 17.10	-17 45.6	2.870	2.263	+0.91	-0.7	19.5	43.9
Mar. 3	19 25.49	-17 52.3	2.864	2.383	+0.75	-0.7	19.8	51.9
Mar. 13	19 32.14	-18 00.4	2.837	2.498	+0.56	-1.0	19.9	60.3
Mar. 23	19 36.88	-18 11.6	2.792	2.609	+0.36	-1.4	19.9	69.1
Apr. 2	19 39.52	-18 27.6	2.734	2.716	+0.14	-1.9	20.0	78.4
Apr. 12	19 39.83	-18 49.9	2.666	2.819	-0.11	-2.6	20.0	88.2
Apr. 22	19 37.57	-19 19.5	2.595	2.919	-0.38	-3.4	20.0	98.6
May 2	19 32.52	-19 56.8	2.525	3.016	-0.66	-4.2	20.0	109.6
May 12	19 24.59	-20 41.4	2.464	3.110	-0.95	-4.8	19.9	121.2
May 22	19 13.80	-21 31.3	2.419	3.201	-1.22	-5.2	19.8	133.5
June 1	19 00.52	-22 23.3	2.398	3.289	-1.44	-5.2	19.7	146.3
June 11	18 45.40	-23 13.4	2.406	3.375	-1.58	-4.7	19.6	159.4
June 21	18 29.41	-23 57.7	2.448	3.459	-1.60	-4.0	19.5	172.6
July 1	18 13.68	-24 33.7	2.527	3.540	-1.52	-3.1	19.6	174.1
July 11	17 59.23	-25 00.9	2.641	3.619	-1.34	-2.3	19.9	161.3
July 21	17 46.86	-25 20.3	2.787	3.695	-1.10	-1.6	20.2	149.0
July 31	17 37.03	-25 34.2	2.961	3.770	-0.84	-1.2	20.5	137.3
Aug. 10	17 29.84	-25 44.6	3.158	3.843	-0.57	-0.9	20.8	126.1
Aug. 20	17 25.25	-25 53.3	3.371	3.914	-0.33	-0.8	21.0	115.5
Aug. 30	17 23.01	-26 01.7	3.595	3.983	-0.10	-0.8	21.2	105.3
Sept. 9	17 22.87	-26 10.2	3.825	4.050	+0.09	-0.9	21.4	95.6
Sept. 19	17 24.54	-26 19.1	4.057	4.116	+0.26	-0.9	21.5	86.3
Sept. 29	17 27.74	-26 28.5	4.285	4.180	+0.40	-0.9	21.6	77.2
Oct. 9	17 32.24	-26 37.9	4.507	4.242	+0.51	-0.9	21.8	68.4
Oct. 19	17 37.81	-26 47.3	4.717	4.303	+0.61	-0.9	21.8	59.8
Oct. 29	17 44.26	-26 56.3	4.914	4.363	+0.69	-0.9	21.9	51.3
Nov. 8	17 51.41	-27 04.6	5.094	4.421	+0.75	-0.8	22.0	42.9
Nov. 18	17 59.11	-27 12.1	5.255	4.477	+0.79	-0.7	22.0	34.7
Nov. 28	18 07.19	-27 18.6	5.394	4.532	+0.82	-0.6	22.0	26.4
Dec. 8	18 15.54	-27 24.1	5.511	4.586	+0.84	-0.5	22.0	18.3
Dec. 18	18 24.02	-27 28.6	5.602	4.638	+0.85	-0.4	21.9	10.4
Dec. 28	18 32.50	-27 32.2	5.669	4.689	+0.84	-0.3	21.9	4.5
Jan. 7	18 40.87	-27 35.2	5.710	4.739	+0.83	-0.3	22.0	8.3
Jan. 17	18 49.01	-27 38.0	5.725	4.788	+0.80	-0.3	.	16.1
Jan. 27	18 56.78	-27 40.8	5.715	4.835	+0.75	-0.3	.	24.4
Feb. 6	19 04.09	-27 44.3	5.681	4.881	+0.70	-0.4	.	32.8
Feb. 16	19 10.80	-27 49.0	5.624	4.926	+0.63	-0.6	.	41.4
Feb. 26	19 16.77	-27 55.4	5.547	4.970	+0.55	-0.8	.	50.1
Mar. 8	19 21.88	-28 04.3	5.451	5.012	+0.46	-1.0	.	59.0
Mar. 18	19 25.99	-28 16.2	5.341	5.054	+0.35	-1.4	.	68.0
Mar. 28	19 28.95	-28 31.7	5.220	5.094	+0.23	-1.8	.	77.3

Comet C/2017 W2 (Leonard)

Epoch = 2018 July 21.0 TT
 T = 2017 Nov. 1.96417 TT
 Peri. = 169.16253 e = 0.7112133
 Node = 312.81078 2000.0 a = 13.7034351 AU
 Incl. = 98.18531 n = 0.01942942
 q = 3.9573698 AU P = 50.73 years

$$m_1 = 14.0 + 5 \log(\Delta) + 5.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	09 39.94	+15 07.8	3.187	3.982	-1.33	-5.9	19.5	139.0
Jan. 12	09 25.76	+14 08.8	3.095	3.991	-1.52	-5.9	19.5	152.1
Jan. 22	09 09.99	+13 08.8	3.041	4.001	-1.63	-6.1	19.4	165.4
Feb. 1	08 53.51	+12 07.9	3.030	4.012	-1.65	-6.1	19.4	174.8
Feb. 11	08 37.30	+11 06.8	3.063	4.025	-1.57	-6.1	19.5	165.1
Feb. 21	08 22.32	+10 06.8	3.139	4.039	-1.40	-5.9	19.5	152.0
Mar. 3	08 09.30	+09 09.2	3.252	4.054	-1.18	-5.6	19.6	139.2
Mar. 13	07 58.64	+08 14.6	3.395	4.070	-0.93	-5.3	19.7	127.0
Mar. 23	07 50.47	+07 23.0	3.560	4.088	-0.68	-5.0	19.8	115.4
Apr. 2	07 44.72	+06 33.9	3.741	4.106	-0.45	-4.8	19.9	104.5
Apr. 12	07 41.16	+05 46.5	3.930	4.126	-0.24	-4.7	20.0	94.2
Apr. 22	07 39.54	+04 59.6	4.120	4.147	-0.07	-4.7	20.2	84.5
May 2	07 39.56	+04 12.2	4.307	4.169	+0.08	-4.8	20.3	75.4
May 12	07 40.95	+03 23.2	4.486	4.192	+0.20	-5.0	20.4	66.8
May 22	07 43.46	+02 31.9	4.653	4.216	+0.30	-5.3	20.5	58.7
June 1	07 46.88	+01 37.4	4.806	4.241	+0.38	-5.7	20.5	51.0
June 11	07 51.00	+00 39.0	4.941	4.267	+0.44	-6.1	20.6	43.9
June 21	07 55.65	+00 23.9	5.058	4.294	+0.49	-6.6	20.7	37.4
July 1	08 00.68	-01 31.8	5.154	4.322	+0.52	-7.1	20.7	31.7
July 11	08 05.95	-02 45.1	5.229	4.351	+0.54	-7.6	20.8	27.4
July 21	08 11.34	-04 04.2	5.283	4.381	+0.54	-8.3	20.8	24.8
July 31	08 16.70	-05 29.6	5.315	4.411	+0.53	-8.9	20.9	24.5
Aug. 10	08 21.94	-07 01.4	5.326	4.443	+0.51	-9.6	20.9	26.7
Aug. 20	08 26.92	-08 40.1	5.316	4.475	+0.48	-10.3	20.9	30.6
Aug. 30	08 31.52	-10 25.9	5.287	4.508	+0.43	-11.0	20.9	35.9
Sept. 9	08 35.60	-12 18.7	5.240	4.542	+0.37	-11.7	20.9	42.0
Sept. 19	08 39.02	-14 18.8	5.178	4.576	+0.30	-12.4	20.9	48.6
Sept. 29	08 41.62	-16 25.8	5.102	4.611	+0.21	-13.1	20.9	55.6
Oct. 9	08 43.23	-18 39.3	5.016	4.647	+0.10	-13.7	20.8	62.9
Oct. 19	08 43.63	-20 58.5	4.924	4.683	-0.03	-14.2	20.8	70.3
Oct. 29	08 42.63	-23 22.0	4.828	4.720	-0.18	-14.5	20.8	77.8
Nov. 8	08 40.02	-25 47.8	4.734	4.757	-0.36	-14.6	20.8	85.4
Nov. 18	08 35.59	-28 12.9	4.645	4.795	-0.55	-14.3	20.7	92.8
Nov. 28	08 29.19	-30 33.5	4.567	4.834	-0.75	-13.6	20.7	99.8
Dec. 8	08 20.76	-32 45.0	4.503	4.873	-0.95	-12.4	20.7	106.4
Dec. 18	08 10.35	-34 42.1	4.458	4.913	-1.14	-10.7	20.7	112.0
Dec. 28	07 58.25	-36 19.7	4.435	4.953	-1.29	-8.5	20.7	116.5
Jan. 7	07 44.92	-37 33.5	4.436	4.993	-1.38	-5.9	20.7	119.4
Jan. 17	07 31.03	-38 20.9	4.463	5.034	-1.39	-3.3	20.8	120.5
Jan. 27	07 17.35	-38 41.7	4.514	5.075	-1.33	-0.7	20.8	119.8
Feb. 6	07 04.59	-38 38.2	4.588	5.117	-1.20	+1.6	20.9	117.4
Feb. 16	06 53.36	-38 14.3	4.683	5.159	-1.02	+3.3	20.9	113.6
Feb. 26	06 44.04	-37 35.5	4.795	5.202	-0.82	+4.5	21.0	108.9
Mar. 8	06 36.79	-36 47.0	4.921	5.244	-0.61	+5.2	21.1	103.6
Mar. 18	06 31.61	-35 53.9	5.056	5.287	-0.41	+5.4	21.1	98.0
Mar. 28	06 28.37	-35 00.7	5.197	5.331	-0.22	+5.2	21.2	92.3

Comet 183P/Korlevic-Juric

Epoch = 2018 July 21.0 TT
 T = 2017 Nov. 12.79173 TT
 Peri. = 161.45574 e = 0.1381429
 Node = 5.84443 2000.0 a = 4.4935155 AU
 Incl. = 18.74309 n = 0.10347245
 q = 3.8727682 AU P = 9.53 years

$$m1 = 7.4 + 5 \log(\Delta) + 15.0 \log(r(t-90))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	12 41.15	+00 13.3	3.720	3.876	+0.40	-4.5	19.1	91.7
Jan. 12	12 44.46	+00 54.6	3.570	3.878	+0.25	-3.7	19.0	100.9
Jan. 22	12 46.24	-01 28.2	3.425	3.879	+0.09	-2.9	18.9	110.4
Feb. 1	12 46.35	-01 53.8	3.289	3.881	-0.08	-2.1	18.8	120.4
Feb. 11	12 44.73	-02 11.3	3.167	3.884	-0.26	-1.3	18.7	130.8
Feb. 21	12 41.41	-02 21.0	3.063	3.886	-0.42	-0.6	18.7	141.6
Mar. 3	12 36.55	-02 23.8	2.982	3.889	-0.56	0.0	18.6	152.7
Mar. 13	12 30.47	-02 21.1	2.927	3.892	-0.66	+0.5	18.6	164.2
Mar. 23	12 23.63	-02 14.9	2.901	3.896	-0.71	+0.7	18.5	175.7
Apr. 2	12 16.58	-02 07.7	2.906	3.899	-0.69	+0.7	18.5	172.7
Apr. 12	12 09.89	-02 02.0	2.941	3.903	-0.63	+0.4	18.6	161.3
Apr. 22	12 04.08	-02 00.2	3.003	3.907	-0.52	-0.1	18.6	150.1
May 2	11 59.55	-02 04.1	3.091	3.912	-0.37	-0.8	18.7	139.4
May 12	11 56.54	-02 14.9	3.200	3.916	-0.21	-1.5	18.8	129.1
May 22	11 55.15	-02 33.3	3.326	3.921	-0.05	-2.3	18.9	119.2
June 1	11 55.40	-02 59.5	3.464	3.926	+0.11	-3.0	18.9	109.9
June 11	11 57.17	-03 33.2	3.610	3.931	+0.26	-3.8	19.0	101.0
June 21	12 00.38	-04 14.0	3.761	3.937	+0.39	-4.5	19.1	92.4
July 1	12 04.85	-05 01.3	3.913	3.943	+0.51	-5.1	19.2	84.2
July 11	12 10.45	-05 54.5	4.063	3.949	+0.62	-5.6	19.3	76.4
July 21	12 17.04	-06 53.1	4.208	3.955	+0.71	-6.1	19.4	68.8
July 31	12 24.49	-07 56.3	4.346	3.961	+0.79	-6.5	19.5	61.4
Aug. 10	12 32.68	-09 03.5	4.476	3.968	+0.86	-6.9	19.5	54.2
Aug. 20	12 41.51	-10 14.1	4.594	3.975	+0.92	-7.2	19.6	47.1
Aug. 30	12 50.90	-11 27.6	4.700	3.982	+0.97	-7.5	19.7	40.1
Sept. 9	13 00.76	-12 43.4	4.793	3.989	+1.01	-7.7	19.7	33.3
Sept. 19	13 11.03	-14 00.9	4.870	3.997	+1.05	-7.8	19.8	26.6
Sept. 29	13 21.63	-15 19.7	4.931	4.004	+1.08	-7.9	19.8	20.0
Oct. 9	13 32.51	-16 39.3	4.976	4.012	+1.10	-8.0	19.8	13.7
Oct. 19	13 43.60	-17 59.2	5.003	4.020	+1.12	-8.0	19.9	8.5
Oct. 29	13 54.83	-19 19.0	5.012	4.028	+1.13	-8.0	19.9	7.3
Nov. 8	14 06.14	-20 38.3	5.003	4.037	+1.13	-7.9	19.9	11.5
Nov. 18	14 17.46	-21 56.7	4.976	4.045	+1.13	-7.8	19.9	17.7
Nov. 28	14 28.70	-23 14.1	4.932	4.054	+1.12	-7.7	19.9	24.4
Dec. 8	14 39.77	-24 30.1	4.870	4.063	+1.09	-7.5	19.9	31.5
Dec. 18	14 50.55	-25 44.5	4.792	4.072	+1.06	-7.4	19.8	38.8
Dec. 28	15 00.93	-26 57.3	4.699	4.081	+1.01	-7.2	19.8	46.2
Jan. 7	15 10.79	-28 08.5	4.593	4.090	+0.95	-7.0	19.8	53.8
Jan. 17	15 19.95	-29 17.9	4.475	4.100	+0.87	-6.9	19.7	61.6
Jan. 27	15 28.24	-30 25.7	4.347	4.109	+0.78	-6.7	19.7	69.6
Feb. 6	15 35.50	-31 31.9	4.213	4.119	+0.66	-6.5	19.6	77.8
Feb. 16	15 41.50	-32 36.2	4.075	4.129	+0.52	-6.3	19.6	86.2
Feb. 26	15 46.05	-33 38.6	3.935	4.139	+0.37	-6.1	19.5	94.9
Mar. 8	15 48.94	-34 38.6	3.799	4.149	+0.19	-5.8	19.4	103.8
Mar. 18	15 49.99	-35 35.0	3.670	4.159	0.00	-5.4	19.4	112.9
Mar. 28	15 49.10	-36 26.8	3.551	4.169	-0.20	-4.8	19.3	122.2

Comet 62P/Tsuchinshan

Epoch = 2018 July 21.0 TT
 T = 2017 Nov. 16.17481 TT
 Peri. = 30.38709 e = 0.5977137
 Node = 90.23136 2000.0 a = 3.4401736 AU
 Incl. = 9.70939 n = 0.15446623
 q = 1.3839347 AU P = 6.38 years

$$m1 = 6.2 + 5 \log(\Delta) + 35.0 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	13 17.63	+03 31.1	1.198	1.480	+2.28	-6.6	11.7	84.8
Jan. 12	13 39.13	+02 33.7	1.170	1.522	+1.98	-4.6	11.8	89.5
Jan. 22	13 57.50	+01 57.1	1.141	1.570	+1.65	-2.5	12.1	94.9
Feb. 1	14 12.37	+01 41.9	1.112	1.623	+1.28	-0.4	12.4	101.2
Feb. 11	14 23.37	+01 47.1	1.083	1.679	+0.87	+1.6	12.8	108.3
Feb. 21	14 30.12	+02 11.0	1.057	1.740	+0.43	+3.3	13.2	116.4
Mar. 3	14 32.39	+02 49.6	1.036	1.803	-0.02	+4.5	13.6	125.5
Mar. 13	14 30.21	+03 37.3	1.025	1.867	-0.45	+5.0	14.1	135.3
Mar. 23	14 24.00	+04 26.2	1.028	1.934	-0.81	+4.6	14.7	145.5
Apr. 2	14 14.78	+05 07.0	1.050	2.002	-1.03	+3.3	15.3	155.3
Apr. 12	14 04.00	+05 31.5	1.093	2.070	-1.10	+1.3	15.9	162.3
Apr. 22	13 53.24	+05 34.4	1.159	2.139	-1.01	-1.0	16.5	162.4
May 2	13 43.96	+05 14.6	1.250	2.208	-0.81	-3.2	17.2	155.9
May 12	13 37.01	+04 34.3	1.362	2.277	-0.55	-5.0	17.9	147.1
May 22	13 32.80	+03 37.6	1.494	2.346	-0.27	-6.4	18.6	137.9
June 1	13 31.33	+02 28.7	1.644	2.415	0.00	-7.4	19.3	129.1
June 11	13 32.35	+01 11.4	1.807	2.483	+0.23	-8.1	20.0	120.6
June 21	13 35.54	+00 11.3	1.982	2.551	+0.43	-8.5	20.6	112.5
July 1	13 40.58	-01 37.3	2.166	2.618	+0.59	-8.7	21.3	104.9
July 11	13 47.14	-03 04.6	2.355	2.684	+0.73	-8.8	21.9	97.5
July 21	13 54.98	-04 32.2	2.549	2.750	+0.85	-8.7	.	90.4
July 31	14 03.87	-05 59.0	2.744	2.815	+0.94	-8.6	.	83.5
Aug. 10	14 13.63	-07 24.3	2.938	2.879	+1.02	-8.4	.	76.7
Aug. 20	14 24.13	-08 47.4	3.130	2.942	+1.09	-8.2	.	70.0
Aug. 30	14 35.24	-10 07.7	3.317	3.005	+1.14	-7.9	.	63.4
Sept. 9	14 46.87	-11 24.9	3.498	3.066	+1.19	-7.5	.	56.9
Sept. 19	14 58.93	-12 38.3	3.671	3.127	+1.23	-7.1	.	50.3
Sept. 29	15 11.34	-13 47.7	3.834	3.187	+1.26	-6.7	.	43.8
Oct. 9	15 24.03	-14 52.8	3.985	3.246	+1.28	-6.3	.	37.2
Oct. 19	15 36.95	-15 53.2	4.122	3.304	+1.30	-5.8	.	30.6
Oct. 29	15 50.00	-16 48.6	4.245	3.361	+1.31	-5.3	.	23.9
Nov. 8	16 03.14	-17 39.0	4.351	3.417	+1.32	-4.7	.	17.2
Nov. 18	16 16.29	-18 24.1	4.440	3.472	+1.31	-4.2	.	10.5
Nov. 28	16 29.36	-19 03.9	4.510	3.527	+1.30	-3.7	.	4.2
Dec. 8	16 42.28	-19 38.4	4.562	3.581	+1.28	-3.2	.	4.6
Dec. 18	16 54.96	-20 07.8	4.593	3.633	+1.25	-2.7	.	11.3
Dec. 28	17 07.28	-20 32.2	4.605	3.685	+1.21	-2.2	.	18.4
Jan. 7	17 19.17	-20 51.9	4.597	3.736	+1.16	-1.7	.	25.7
Jan. 17	17 30.50	-21 07.3	4.570	3.786	+1.10	-1.3	.	33.2
Jan. 27	17 41.16	-21 19.0	4.525	3.835	+1.02	-1.0	.	40.9
Feb. 6	17 51.03	-21 27.4	4.462	3.884	+0.94	-0.7	.	48.8
Feb. 16	17 59.96	-21 33.3	4.384	3.931	+0.84	-0.5	.	56.8
Feb. 26	18 07.82	-21 37.4	4.293	3.978	+0.72	-0.3	.	65.0
Mar. 8	18 14.48	-21 40.4	4.191	4.024	+0.59	-0.3	.	73.5
Mar. 18	18 19.76	-21 43.2	4.082	4.069	+0.45	-0.3	.	82.3
Mar. 28	18 23.55	-21 46.3	3.968	4.113	+0.29	-0.4	.	91.3

Comet 24P/Schaumasse

Epoch = 2018 July 21.0 TT
 T = 2017 Nov. 16.95426 TT
 Peri. = 58.05713 e = 0.7048117
 Node = 79.62279 2000.0 a = 4.0854909 AU
 Incl. = 11.73812 n = 0.11935420
 q = 1.2059891 AU P = 8.26 years

$$m_1 = 10.2 + 5 \log(\Delta) + 20.0 \log(r(t-20))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	14 44.05	-04 59.3	1.498	1.346	+2.73	-12.2	13.0	61.6
Jan. 12	15 10.22	-06 52.2	1.505	1.406	+2.48	-10.2	13.3	64.9
Jan. 22	15 33.79	-08 24.9	1.507	1.473	+2.21	-8.2	13.7	68.8
Feb. 1	15 54.63	-09 39.0	1.502	1.545	+1.93	-6.5	14.0	73.5
Feb. 11	16 12.60	-10 36.8	1.490	1.622	+1.63	-5.0	14.4	79.0
Feb. 21	16 27.47	-11 20.9	1.470	1.701	+1.31	-3.8	14.8	85.2
Mar. 3	16 39.01	-11 54.1	1.445	1.783	+0.96	-2.8	15.2	92.2
Mar. 13	16 46.98	-12 19.3	1.415	1.866	+0.59	-2.2	15.6	100.1
Mar. 23	16 51.08	-12 39.0	1.385	1.950	+0.19	-1.8	15.9	108.8
Apr. 2	16 51.15	-12 55.7	1.358	2.035	-0.21	-1.6	16.3	118.5
Apr. 12	16 47.22	-13 11.2	1.339	2.119	-0.61	-1.5	16.6	129.1
Apr. 22	16 39.59	-13 26.6	1.333	2.203	-0.94	-1.6	17.0	140.5
May 2	16 29.04	-13 42.8	1.346	2.287	-1.17	-1.7	17.4	152.5
May 12	16 16.76	-14 00.0	1.382	2.371	-1.27	-1.8	17.8	164.5
May 22	16 04.16	-14 18.7	1.445	2.453	-1.22	-2.0	18.2	173.5
June 1	15 52.63	-14 39.6	1.536	2.535	-1.05	-2.2	18.6	167.7
June 11	15 43.15	-15 03.6	1.652	2.616	-0.81	-2.6	19.1	156.8
June 21	15 36.30	-15 31.2	1.794	2.696	-0.53	-3.0	19.5	146.0
July 1	15 32.23	-16 02.9	1.956	2.776	-0.26	-3.4	20.0	135.7
July 11	15 30.82	-16 38.1	2.135	2.854	0.00	-3.7	20.5	126.0
July 21	15 31.82	-17 16.5	2.328	2.931	+0.22	-4.0	20.9	116.9
July 31	15 34.92	-17 57.3	2.531	3.007	+0.41	-4.2	21.3	108.2
Aug. 10	15 39.81	-18 39.6	2.740	3.082	+0.58	-4.3	21.7	99.9
Aug. 20	15 46.23	-19 22.5	2.955	3.156	+0.72	-4.3	.	92.0
Aug. 30	15 53.91	-20 05.3	3.170	3.229	+0.83	-4.2	.	84.3
Sept. 9	16 02.66	-20 47.2	3.383	3.301	+0.93	-4.1	.	76.7
Sept. 19	16 12.31	-21 27.6	3.593	3.372	+1.01	-3.9	.	69.3
Sept. 29	16 22.69	-22 05.8	3.796	3.442	+1.07	-3.7	.	62.0
Oct. 9	16 33.66	-22 41.5	3.991	3.511	+1.13	-3.4	.	54.8
Oct. 19	16 45.13	-23 14.1	4.174	3.578	+1.17	-3.1	.	47.6
Oct. 29	16 56.96	-23 43.4	4.345	3.645	+1.20	-2.7	.	40.4
Nov. 8	17 09.06	-24 09.1	4.501	3.711	+1.22	-2.4	.	33.1
Nov. 18	17 21.34	-24 31.1	4.641	3.776	+1.23	-2.0	.	25.9
Nov. 28	17 33.68	-24 49.3	4.762	3.840	+1.23	-1.6	.	18.7
Dec. 8	17 46.00	-25 03.8	4.864	3.903	+1.23	-1.3	.	11.4
Dec. 18	17 58.20	-25 14.8	4.946	3.966	+1.21	-0.9	.	4.3
Dec. 28	18 10.18	-25 22.4	5.007	4.027	+1.18	-0.6	.	4.1
Jan. 7	18 21.86	-25 27.2	5.047	4.087	+1.15	-0.3	.	11.4
Jan. 17	18 33.12	-25 29.4	5.065	4.147	+1.10	-0.1	.	19.0
Jan. 27	18 43.86	-25 29.7	5.062	4.205	+1.04	+0.1	.	26.7
Feb. 6	18 53.99	-25 28.7	5.039	4.263	+0.98	+0.1	.	34.5
Feb. 16	19 03.39	-25 27.1	4.996	4.320	+0.90	+0.2	.	42.5
Feb. 26	19 11.96	-25 25.7	4.936	4.376	+0.81	+0.1	.	50.7
Mar. 8	19 19.59	-25 25.2	4.861	4.432	+0.71	0.0	.	59.0
Mar. 18	19 26.14	-25 26.5	4.772	4.486	+0.59	-0.3	.	67.5
Mar. 28	19 31.50	-25 30.3	4.673	4.540	+0.47	-0.5	.	76.2

Comet C/2016 A1 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2017 Nov. 23.40041 TT
 Peri. = 10.32475
 Node = 128.17894 2000.0
 Incl. = 121.19393
 q = 5.3277963 AU
 e = 1.0022899

$$m1 = 5.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	°			m	'		°
Jan. 2	08 45.46	+33 48.4	4.446	5.336	-1.11	+12.6	15.7	152.3
Jan. 12	08 33.67	+35 51.8	4.403	5.341	-1.26	+11.9	15.7	160.6
Jan. 22	08 20.65	+37 46.2	4.402	5.346	-1.34	+10.7	15.7	162.0
Feb. 1	08 07.08	+39 26.8	4.442	5.353	-1.36	+9.2	15.7	155.3
Feb. 11	07 53.70	+40 50.7	4.522	5.361	-1.30	+7.4	15.8	145.1
Feb. 21	07 41.22	+41 57.1	4.635	5.370	-1.17	+5.7	15.8	134.0
Mar. 3	07 30.26	+42 47.5	4.777	5.379	-1.00	+4.3	15.9	122.8
Mar. 13	07 21.20	+43 24.7	4.940	5.390	-0.79	+3.1	16.0	111.9
Mar. 23	07 14.22	+43 51.8	5.117	5.402	-0.58	+2.3	16.1	101.4
Apr. 2	07 09.34	+44 11.9	5.300	5.415	-0.38	+1.7	16.2	91.2
Apr. 12	07 06.44	+44 27.7	5.484	5.428	-0.19	+1.4	16.2	81.6
Apr. 22	07 05.35	+44 41.2	5.664	5.443	-0.02	+1.3	16.3	72.3
May 2	07 05.85	+44 54.0	5.833	5.459	+0.13	+1.3	16.4	63.5
May 12	07 07.72	+45 07.3	5.989	5.475	+0.25	+1.4	16.5	55.2
May 22	07 10.75	+45 21.8	6.127	5.493	+0.36	+1.6	16.5	47.4
June 1	07 14.76	+45 38.5	6.247	5.511	+0.45	+1.8	16.6	40.2
June 11	07 19.56	+45 57.7	6.344	5.531	+0.52	+2.1	16.6	33.9
June 21	07 24.98	+46 20.1	6.419	5.551	+0.57	+2.4	16.7	28.9
July 1	07 30.88	+46 46.1	6.469	5.572	+0.61	+2.8	16.7	25.9
July 11	07 37.13	+47 16.4	6.496	5.594	+0.64	+3.3	16.7	25.3
July 21	07 43.58	+47 51.6	6.499	5.617	+0.65	+3.8	16.8	27.5
July 31	07 50.10	+48 32.4	6.478	5.641	+0.65	+4.4	16.8	31.8
Aug. 10	07 56.56	+49 19.6	6.436	5.665	+0.64	+5.1	16.8	37.5
Aug. 20	08 02.82	+50 14.1	6.373	5.691	+0.61	+5.9	16.8	44.1
Aug. 30	08 08.72	+51 16.8	6.293	5.717	+0.56	+6.8	16.8	51.3
Sept. 9	08 14.08	+52 28.6	6.198	5.744	+0.50	+7.7	16.8	59.0
Sept. 19	08 18.69	+53 50.4	6.090	5.772	+0.41	+8.8	16.7	67.0
Sept. 29	08 22.27	+55 22.8	5.975	5.800	+0.29	+9.8	16.7	75.2
Oct. 9	08 24.51	+57 06.2	5.857	5.829	+0.13	+10.9	16.7	83.5
Oct. 19	08 24.96	+59 00.2	5.741	5.859	-0.07	+11.9	16.7	91.9
Oct. 29	08 23.11	+61 03.6	5.632	5.890	-0.34	+12.8	16.7	100.2
Nov. 8	08 18.25	+63 14.2	5.535	5.921	-0.68	+13.3	16.6	108.3
Nov. 18	08 09.53	+65 27.7	5.456	5.953	-1.12	+13.3	16.6	115.8
Nov. 28	07 55.97	+67 38.3	5.399	5.986	-1.66	+12.6	16.6	122.4
Dec. 8	07 36.69	+69 37.9	5.370	6.019	-2.27	+11.0	16.6	127.4
Dec. 18	07 11.28	+71 17.2	5.369	6.053	-2.86	+8.4	16.7	130.4
Dec. 28	06 40.59	+72 27.2	5.400	6.088	-3.28	+5.1	16.7	130.8
Jan. 7	06 07.11	+73 02.1	5.460	6.123	-3.36	+1.5	16.8	128.7
Jan. 17	05 34.55	+73 02.2	5.549	6.159	-3.07	-1.7	16.8	124.4
Jan. 27	05 06.19	+72 33.8	5.663	6.195	-2.52	-4.0	16.9	118.6
Feb. 6	04 43.76	+71 46.5	5.798	6.232	-1.90	-5.4	17.0	111.8
Feb. 16	04 27.47	+70 49.9	5.949	6.270	-1.31	-5.9	17.0	104.5
Feb. 26	04 16.61	+69 51.6	6.111	6.307	-0.83	-5.7	17.1	96.9
Mar. 8	04 10.20	+68 56.7	6.278	6.346	-0.43	-5.2	17.2	89.4
Mar. 18	04 07.33	+68 08.7	6.446	6.385	-0.12	-4.3	17.3	82.0
Mar. 28	04 07.20	+67 29.2	6.611	6.424	+0.11	-3.4	17.4	75.0

Comet 139P/Vaisala-Oterma

Epoch = 2018 July 21.0 TT
 T = 2017 Dec. 10.54852 TT
 Peri. = 166.01858 e = 0.2461888
 Node = 242.20767 2000.0 a = 4.5292958 AU
 Incl. = 2.33327 n = 0.10224876
 q = 3.4142339 AU P = 9.64 years

$$m_1 = 9.9 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	02 18.49	+14 21.2	2.871	3.416	+0.21	+0.4	17.5	115.8
Jan. 12	02 21.47	+14 29.6	3.007	3.418	+0.40	+1.4	17.6	106.4
Jan. 22	02 26.22	+14 47.2	3.151	3.420	+0.57	+2.2	17.7	97.4
Feb. 1	02 32.59	+15 12.5	3.298	3.423	+0.72	+2.9	17.8	88.8
Feb. 11	02 40.37	+15 44.0	3.446	3.426	+0.85	+3.4	17.9	80.6
Feb. 21	02 49.42	+16 20.4	3.591	3.431	+0.97	+3.8	18.0	72.8
Mar. 3	02 59.57	+17 00.0	3.730	3.435	+1.07	+4.1	18.1	65.2
Mar. 13	03 10.65	+17 41.5	3.863	3.441	+1.16	+4.2	18.2	58.0
Mar. 23	03 22.55	+18 23.7	3.987	3.447	+1.23	+4.2	18.3	50.9
Apr. 2	03 35.15	+19 05.2	4.100	3.453	+1.29	+4.1	18.3	44.1
Apr. 12	03 48.32	+19 45.1	4.202	3.460	+1.35	+3.9	18.4	37.4
Apr. 22	04 01.99	+20 22.6	4.291	3.468	+1.39	+3.6	18.5	30.9
May 2	04 16.05	+20 56.7	4.368	3.476	+1.42	+3.2	18.5	24.5
May 12	04 30.41	+21 27.0	4.430	3.485	+1.45	+2.8	18.6	18.2
May 22	04 45.00	+21 52.7	4.478	3.494	+1.47	+2.3	18.6	12.0
June 1	04 59.72	+22 13.6	4.511	3.504	+1.48	+1.8	18.6	5.9
June 11	05 14.49	+22 29.3	4.530	3.515	+1.48	+1.3	18.6	0.6
June 21	05 29.24	+22 39.8	4.533	3.526	+1.47	+0.7	18.7	6.5
July 1	05 43.86	+22 44.9	4.522	3.537	+1.45	+0.2	18.7	12.6
July 11	05 58.27	+22 44.7	4.496	3.549	+1.43	-0.3	18.7	18.8
July 21	06 12.40	+22 39.5	4.455	3.561	+1.39	-0.8	18.7	25.1
July 31	06 26.13	+22 29.5	4.400	3.574	+1.35	-1.2	18.6	31.5
Aug. 10	06 39.38	+22 15.2	4.331	3.587	+1.29	-1.6	18.6	38.0
Aug. 20	06 52.04	+21 57.2	4.250	3.601	+1.23	-2.0	18.6	44.6
Aug. 30	07 04.00	+21 36.1	4.156	3.615	+1.15	-2.3	18.6	51.5
Sept. 9	07 15.14	+21 12.7	4.052	3.629	+1.06	-2.4	18.5	58.6
Sept. 19	07 25.34	+20 47.9	3.937	3.644	+0.96	-2.5	18.5	65.9
Sept. 29	07 34.44	+20 22.7	3.816	3.659	+0.84	-2.5	18.4	73.5
Oct. 9	07 42.30	+19 58.0	3.688	3.675	+0.71	-2.4	18.4	81.5
Oct. 19	07 48.76	+19 35.1	3.558	3.691	+0.56	-2.1	18.3	89.8
Oct. 29	07 53.64	+19 15.1	3.427	3.707	+0.40	-1.8	18.3	98.5
Nov. 8	07 56.80	+18 59.0	3.300	3.724	+0.22	-1.4	18.2	107.8
Nov. 18	07 58.10	+18 47.7	3.180	3.741	+0.02	-0.8	18.1	117.5
Nov. 28	07 57.47	+18 41.7	3.072	3.758	-0.17	-0.3	18.1	127.7
Dec. 8	07 54.94	+18 41.3	2.981	3.775	-0.35	+0.3	18.0	138.4
Dec. 18	07 50.66	+18 46.1	2.912	3.793	-0.51	+0.7	18.0	149.6
Dec. 28	07 44.96	+18 55.1	2.867	3.811	-0.63	+1.1	18.0	161.0
Jan. 7	07 38.34	+19 06.8	2.852	3.829	-0.69	+1.3	18.0	172.6
Jan. 17	07 31.41	+19 19.9	2.867	3.848	-0.68	+1.3	18.0	174.6
Jan. 27	07 24.84	+19 32.7	2.913	3.866	-0.61	+1.2	18.1	163.3
Feb. 6	07 19.20	+19 44.3	2.988	3.885	-0.49	+1.1	18.2	151.9
Feb. 16	07 14.99	+19 53.8	3.088	3.904	-0.33	+0.8	18.3	140.8
Feb. 26	07 12.49	+20 00.9	3.211	3.923	-0.15	+0.6	18.4	130.1
Mar. 8	07 11.83	+20 05.2	3.352	3.943	+0.04	+0.3	18.5	120.0
Mar. 18	07 12.99	+20 06.7	3.506	3.962	+0.21	0.0	18.6	110.3
Mar. 28	07 15.87	+20 05.2	3.669	3.982	+0.38	-0.3	18.7	101.0

Comet C/2015 V1 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2017 Dec. 17.65317 TT
 Peri. = 179.62614
 Node = 197.19289 2000.0
 Incl. = 139.22676
 q = 4.2666691 AU
 e = 1.0002551

$$m1 = 4.2 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .8			m	'		°
Jan. 2	00 11.21	+00 13.8	4.307	4.269	-0.13	-7.1	15.2	81.2
Jan. 12	00 10.56	-01 18.3	4.499	4.272	+0.01	-5.7	15.3	70.4
Jan. 22	00 11.26	-02 09.6	4.681	4.277	+0.13	-4.5	15.4	60.1
Feb. 1	00 13.06	-02 50.4	4.847	4.283	+0.23	-3.6	15.5	50.2
Feb. 11	00 15.73	-03 23.1	4.993	4.291	+0.31	-2.9	15.6	40.5
Feb. 21	00 19.11	-03 50.1	5.116	4.301	+0.37	-2.5	15.7	31.2
Mar. 3	00 23.00	-04 13.3	5.213	4.312	+0.41	-2.2	15.7	22.3
Mar. 13	00 27.26	-04 34.7	5.282	4.325	+0.44	-2.1	15.8	14.1
Mar. 23	00 31.74	-04 55.9	5.323	4.340	+0.46	-2.2	15.8	8.3
Apr. 2	00 36.32	-05 18.7	5.336	4.356	+0.46	-2.4	15.8	10.2
Apr. 12	00 40.87	-05 44.7	5.320	4.373	+0.45	-2.8	15.8	17.3
Apr. 22	00 45.26	-06 15.4	5.276	4.392	+0.43	-3.4	15.8	25.7
May 2	00 49.36	-06 52.6	5.207	4.412	+0.39	-4.1	15.8	34.3
May 12	00 53.05	-07 37.9	5.115	4.434	+0.34	-5.0	15.8	43.2
May 22	00 56.17	-08 32.9	5.003	4.457	+0.28	-6.1	15.8	52.3
June 1	00 58.58	-09 39.5	4.874	4.482	+0.19	-7.4	15.8	61.6
June 11	01 00.09	-10 59.4	4.732	4.507	+0.10	-8.8	15.7	71.1
June 21	01 00.52	-12 34.1	4.583	4.535	-0.03	-10.3	15.7	80.9
July 1	00 59.64	-14 24.9	4.432	4.563	-0.17	-12.0	15.7	90.9
July 11	00 57.25	-16 32.5	4.285	4.593	-0.33	-13.7	15.6	101.2
July 21	00 53.12	-18 56.4	4.150	4.623	-0.52	-15.2	15.6	111.7
July 31	00 47.04	-21 34.6	4.035	4.655	-0.72	-16.5	15.6	122.2
Aug. 10	00 38.89	-24 23.0	3.946	4.689	-0.93	-17.2	15.6	132.3
Aug. 20	00 28.65	-27 15.3	3.890	4.723	-1.13	-17.2	15.6	141.4
Aug. 30	00 16.48	-30 03.6	3.872	4.758	-1.31	-16.3	15.6	148.0
Sept. 9	00 02.79	-32 39.2	3.895	4.795	-1.43	-14.5	15.7	150.1
Sept. 19	23 48.18	-34 54.3	3.960	4.832	-1.48	-12.2	15.7	146.8
Sept. 29	23 33.44	-36 43.9	4.064	4.870	-1.45	-9.5	15.8	139.6
Oct. 9	23 19.38	-38 06.1	4.203	4.910	-1.34	-6.7	16.0	130.4
Oct. 19	23 06.70	-39 02.2	4.370	4.950	-1.17	-4.3	16.1	120.4
Oct. 29	22 55.90	-39 35.7	4.559	4.991	-0.96	-2.3	16.2	110.2
Nov. 8	22 47.24	-39 51.1	4.763	5.033	-0.74	-0.7	16.4	100.1
Nov. 18	22 40.78	-39 52.7	4.973	5.075	-0.53	+0.4	16.5	90.3
Nov. 28	22 36.41	-39 44.7	5.185	5.119	-0.33	+1.2	16.6	80.7
Dec. 8	22 33.93	-39 30.5	5.391	5.163	-0.15	+1.7	16.8	71.5
Dec. 18	22 33.12	-39 12.8	5.587	5.208	0.00	+1.9	16.9	62.6
Dec. 28	22 33.73	-38 53.8	5.767	5.254	+0.13	+1.9	17.0	54.3
Jan. 7	22 35.51	-38 35.2	5.929	5.300	+0.23	+1.8	17.1	46.4
Jan. 17	22 38.24	-38 18.4	6.070	5.347	+0.32	+1.5	17.2	39.4
Jan. 27	22 41.71	-38 04.6	6.187	5.395	+0.38	+1.2	17.3	33.6
Feb. 6	22 45.75	-37 54.9	6.279	5.443	+0.43	+0.7	17.4	29.6
Feb. 16	22 50.19	-37 50.3	6.344	5.492	+0.46	+0.1	17.5	28.0
Feb. 26	22 54.85	-37 51.7	6.384	5.541	+0.47	-0.5	17.5	29.2
Mar. 8	22 59.61	-38 00.1	6.398	5.591	+0.48	-1.3	17.6	32.9
Mar. 18	23 04.33	-38 16.6	6.387	5.641	+0.46	-2.1	17.6	38.4
Mar. 28	23 08.86	-38 41.9	6.354	5.692	+0.44	-3.1	17.7	44.9

Comet C/2017 K6 (Jacques)

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 3.12900 TT
 Peri. = 303.83360
 Node = 85.05381 2000.0
 Incl. = 57.25353
 q = 2.0026586 AU
 e = 0.9982203

$$m1 = 11.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	01 48.32	-43 34.7	1.844	2.003	+1.03	+42.7	15.3	84.4
Jan. 12	01 59.14	-36 24.1	1.885	2.006	+1.14	+43.2	15.4	82.3
Jan. 22	02 11.01	-29 15.0	1.947	2.016	+1.23	+42.3	15.5	79.5
Feb. 1	02 23.69	-22 20.0	2.032	2.033	+1.30	+40.3	15.6	76.1
Feb. 11	02 36.99	-15 48.4	2.136	2.057	+1.36	+37.6	15.8	72.0
Feb. 21	02 50.84	-09 46.1	2.257	2.088	+1.41	+34.5	16.0	67.4
Mar. 3	03 05.15	-04 16.0	2.392	2.125	+1.45	+31.2	16.2	62.5
Mar. 13	03 19.84	+00 41.8	2.537	2.168	+1.49	+28.1	16.4	57.3
Mar. 23	03 34.89	+05 08.9	2.687	2.216	+1.52	+25.1	16.6	51.9
Apr. 2	03 50.24	+09 07.5	2.840	2.269	+1.55	+22.4	16.8	46.4
Apr. 12	04 05.85	+12 40.4	2.991	2.327	+1.57	+20.0	17.0	40.8
Apr. 22	04 21.69	+15 50.2	3.139	2.388	+1.59	+17.8	17.3	35.1
May 2	04 37.71	+18 39.5	3.280	2.453	+1.61	+15.9	17.5	29.4
May 12	04 53.86	+21 10.8	3.413	2.521	+1.62	+14.2	17.7	23.7
May 22	05 10.12	+23 26.2	3.536	2.591	+1.63	+12.7	17.9	18.0
June 1	05 26.40	+25 27.7	3.646	2.665	+1.63	+11.5	18.1	12.4
June 11	05 42.67	+27 17.2	3.743	2.740	+1.62	+10.4	18.2	7.5
June 21	05 58.88	+28 56.4	3.827	2.817	+1.61	+9.4	18.4	5.5
July 1	06 14.94	+30 27.0	3.895	2.895	+1.60	+8.6	18.6	9.0
July 11	06 30.80	+31 50.6	3.948	2.975	+1.57	+8.0	18.7	14.6
July 21	06 46.38	+33 08.8	3.986	3.056	+1.54	+7.6	18.9	20.7
July 31	07 01.61	+34 23.3	4.009	3.138	+1.50	+7.3	19.0	27.0
Aug. 10	07 16.42	+35 35.8	4.016	3.221	+1.45	+7.2	19.1	33.6
Aug. 20	07 30.71	+36 48.0	4.009	3.305	+1.40	+7.3	19.2	40.4
Aug. 30	07 44.37	+38 01.6	3.989	3.389	+1.33	+7.5	19.3	47.5
Sept. 9	07 57.30	+39 18.6	3.958	3.474	+1.25	+7.9	19.4	54.7
Sept. 19	08 09.37	+40 40.6	3.916	3.559	+1.15	+8.6	19.5	62.1
Sept. 29	08 20.41	+42 09.4	3.866	3.644	+1.04	+9.3	19.6	69.8
Oct. 9	08 30.26	+43 46.5	3.811	3.730	+0.91	+10.2	19.6	77.8
Oct. 19	08 38.68	+45 32.9	3.755	3.815	+0.75	+11.2	19.7	85.9
Oct. 29	08 45.41	+47 29.2	3.700	3.901	+0.57	+12.2	19.8	94.2
Nov. 8	08 50.14	+49 34.7	3.652	3.987	+0.35	+13.0	19.8	102.6
Nov. 18	08 52.52	+51 47.9	3.614	4.073	+0.09	+13.6	19.9	110.9
Nov. 28	08 52.19	+54 05.4	3.590	4.159	-0.20	+13.8	20.0	119.0
Dec. 8	08 48.80	+56 22.4	3.586	4.244	-0.52	+13.4	20.1	126.3
Dec. 18	08 42.13	+58 32.4	3.604	4.330	-0.85	+12.3	20.1	132.5
Dec. 28	08 32.28	+60 28.3	3.646	4.415	-1.15	+10.6	20.3	136.9
Jan. 7	08 19.71	+62 03.8	3.716	4.501	-1.37	+8.2	20.4	138.6
Jan. 17	08 05.43	+63 13.9	3.811	4.586	-1.47	+5.5	20.5	137.6
Jan. 27	07 50.84	+63 57.1	3.932	4.671	-1.42	+2.9	20.7	134.1
Feb. 6	07 37.41	+64 14.9	4.076	4.756	-1.23	+0.5	20.8	128.7
Feb. 16	07 26.36	+64 11.3	4.241	4.841	-0.94	-1.3	21.0	122.3
Feb. 26	07 18.40	+63 51.7	4.421	4.925	-0.61	-2.6	21.2	115.2
Mar. 8	07 13.76	+63 21.2	4.614	5.009	-0.28	-3.5	21.3	107.9
Mar. 18	07 12.33	+62 44.2	4.816	5.093	+0.02	-3.9	21.5	100.6
Mar. 28	07 13.75	+62 03.9	5.023	5.177	+0.28	-4.1	21.6	93.3

Comet C/2017 K4 (ATLAS)

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 8.0560 TT
 Peri. = 15.11732 e = 0.9059860
 Node = 298.89454 2000.0 a = 28.1673134 AU
 Incl. = 16.67797 n = 0.00659304
 q = 2.6481218 AU P = 149.49 years

$$m_1 = 8.0 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	20 20.40	-16 38.1	3.532	2.649	+1.92	+10.4	16.0	22.4
Jan. 12	20 39.51	-14 51.0	3.572	2.648	+1.90	+11.1	16.1	17.2
Jan. 22	20 58.42	-12 56.6	3.605	2.652	+1.88	+11.8	16.1	12.3
Feb. 1	21 17.04	-10 55.7	3.631	2.659	+1.84	+12.4	16.1	7.9
Feb. 11	21 35.34	-08 49.3	3.651	2.670	+1.81	+12.9	16.1	5.4
Feb. 21	21 53.25	-06 38.2	3.664	2.685	+1.77	+13.3	16.2	7.0
Mar. 3	22 10.73	-04 23.5	3.669	2.703	+1.72	+13.6	16.2	11.1
Mar. 13	22 27.76	-02 06.1	3.667	2.725	+1.68	+13.8	16.3	15.8
Mar. 23	22 44.31	+00 12.9	3.658	2.750	+1.63	+13.9	16.3	20.8
Apr. 2	23 00.33	+02 32.4	3.642	2.778	+1.57	+13.9	16.4	25.9
Apr. 12	23 15.81	+04 51.6	3.619	2.810	+1.52	+13.9	16.4	31.2
Apr. 22	23 30.70	+07 09.6	3.589	2.844	+1.46	+13.7	16.4	36.5
May 2	23 44.96	+09 25.6	3.551	2.882	+1.39	+13.5	16.5	42.0
May 12	23 58.53	+11 38.8	3.506	2.922	+1.32	+13.1	16.5	47.6
May 22	00 11.34	+13 48.5	3.455	2.965	+1.24	+12.8	16.6	53.4
June 1	00 23.29	+15 54.1	3.398	3.009	+1.14	+12.3	16.6	59.3
June 11	00 34.29	+17 54.9	3.335	3.057	+1.04	+11.8	16.7	65.5
June 21	00 44.20	+19 50.4	3.268	3.106	+0.92	+11.2	16.7	71.9
July 1	00 52.86	+21 39.8	3.197	3.157	+0.79	+10.6	16.8	78.6
July 11	01 00.13	+23 22.3	3.124	3.210	+0.64	+9.8	16.8	85.6
July 21	01 05.82	+24 56.9	3.051	3.265	+0.48	+9.0	16.8	92.9
July 31	01 09.76	+26 22.3	2.980	3.321	+0.29	+8.0	16.9	100.7
Aug. 10	01 11.83	+27 36.9	2.913	3.378	+0.10	+6.8	16.9	108.7
Aug. 20	01 11.92	+28 38.7	2.855	3.437	-0.10	+5.4	17.0	117.2
Aug. 30	01 10.08	+29 25.6	2.808	3.497	-0.28	+3.8	17.0	125.9
Sept. 9	01 06.49	+29 55.7	2.777	3.558	-0.45	+2.0	17.1	134.7
Sept. 19	01 01.47	+30 07.4	2.764	3.620	-0.56	+0.1	17.2	143.3
Sept. 29	00 55.55	+30 00.6	2.775	3.683	-0.62	-1.7	17.3	151.0
Oct. 9	00 49.33	+29 36.7	2.810	3.746	-0.61	-3.2	17.4	156.4
Oct. 19	00 43.47	+28 58.7	2.872	3.811	-0.54	-4.4	17.6	157.5
Oct. 29	00 38.55	+28 11.1	2.961	3.876	-0.42	-5.1	17.7	153.7
Nov. 8	00 34.96	+27 18.9	3.076	3.942	-0.27	-5.3	17.9	146.7
Nov. 18	00 32.98	+26 27.1	3.215	4.008	-0.10	-5.0	18.1	138.3
Nov. 28	00 32.70	+25 39.7	3.376	4.075	+0.06	-4.4	18.3	129.4
Dec. 8	00 34.07	+24 59.5	3.556	4.142	+0.22	-3.5	18.5	120.4
Dec. 18	00 36.99	+24 28.5	3.749	4.209	+0.37	-2.6	18.7	111.4
Dec. 28	00 41.30	+24 07.3	3.953	4.277	+0.50	-1.6	18.9	102.6
Jan. 7	00 46.83	+23 55.9	4.164	4.345	+0.61	-0.6	19.1	94.0
Jan. 17	00 53.40	+23 54.0	4.378	4.413	+0.71	+0.3	19.3	85.6
Jan. 27	01 00.86	+24 00.7	4.592	4.482	+0.79	+1.1	19.5	77.5
Feb. 6	01 09.04	+24 15.0	4.802	4.551	+0.85	+1.8	19.6	69.5
Feb. 16	01 17.82	+24 35.9	5.005	4.620	+0.91	+2.4	19.8	61.7
Feb. 26	01 27.07	+25 02.3	5.200	4.689	+0.95	+2.9	20.0	54.1
Mar. 8	01 36.70	+25 33.1	5.383	4.758	+0.98	+3.3	20.1	46.7
Mar. 18	01 46.60	+26 07.6	5.553	4.827	+1.00	+3.6	20.3	39.5
Mar. 28	01 56.69	+26 44.7	5.708	4.897	+1.02	+3.8	20.4	32.6

Comet P/1998 VS24 (LINEAR)

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 18.95875 TT
 Peri. = 244.91639 e = 0.2416088
 Node = 159.04673 2000.0 a = 4.5340289 AU
 Incl. = 5.02226 n = 0.10208869
 q = 3.4385676 AU P = 9.65 years

$$m_1 = 4.4 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	01 39.02	+04 58.3	3.076	3.439	-0.71 -3.3	20.3	6.7/61	103.4
Jan. 12	01 43.66	+05 34.5	3.218	3.439	-0.68 -3.1	20.3	9.2/64	94.6
Jan. 22	01 49.81	+06 18.6	3.362	3.439	-0.65 -3.0	20.4	11.4/65	86.1
Feb. 1	01 57.31	+07 08.9	3.506	3.439	-0.63 -2.9	20.5	13.3/66	78.0
Feb. 11	02 05.99	+08 03.9	3.646	3.440	-0.61 -2.7	20.6	14.9/68	70.2
Feb. 21	02 15.70	+09 02.1	3.780	3.442	-0.59 -2.6	20.7	16.3/69	62.8
Mar. 3	02 26.31	+10 02.1	3.907	3.444	-0.58 -2.5	20.8	17.4/70	55.5
Mar. 13	02 37.69	+11 02.9	4.024	3.447	-0.57 -2.3	20.9	18.3/71	48.5
Mar. 23	02 49.73	+12 03.2	4.130	3.451	-0.56 -2.2	20.9	19.1/72	41.7
Apr. 2	03 02.34	+13 02.0	4.224	3.455	-0.55 -2.1	21.0	19.7/73	35.1
Apr. 12	03 15.43	+13 58.6	4.305	3.459	-0.55 -1.9	21.0	20.1/74	28.7
Apr. 22	03 28.91	+14 52.1	4.373	3.464	-0.54 -1.8	21.1	20.5/75	22.4
May 2	03 42.70	+15 41.7	4.427	3.470	-0.54 -1.7	21.1	20.7/77	16.2
May 12	03 56.74	+16 27.0	4.466	3.477	-0.54 -1.5	21.2	20.8/78	10.3
May 22	04 10.95	+17 07.5	4.491	3.484	-0.54 -1.4	21.2	20.8/80	5.1
June 1	04 25.24	+17 42.7	4.500	3.491	-0.54 -1.2	21.2	20.7/81	4.8
June 11	04 39.56	+18 12.5	4.496	3.499	-0.54 -1.1	21.3	20.5/82	9.7
June 21	04 53.81	+18 36.5	4.476	3.508	-0.54 -0.9	21.3	20.3/84	15.5
July 1	05 07.90	+18 54.7	4.442	3.517	-0.54 -0.8	21.3	19.9/86	21.6
July 11	05 21.76	+19 07.3	4.394	3.526	-0.54 -0.6	21.3	19.4/87	27.7
July 21	05 35.28	+19 14.2	4.333	3.536	-0.55 -0.5	21.3	18.8/89	34.0
July 31	05 48.36	+19 15.9	4.258	3.547	-0.55 -0.3	21.3	18.1/90	40.4
Aug. 10	06 00.90	+19 12.6	4.171	3.558	-0.55 -0.2	21.3	17.3/92	47.0
Aug. 20	06 12.78	+19 04.9	4.073	3.570	-0.56 -0.1	21.3	16.3/93	53.8
Aug. 30	06 23.85	+18 53.4	3.965	3.582	-0.57 0.0	21.2	15.1/95	60.8
Sept. 9	06 34.00	+18 38.9	3.848	3.594	-0.58 +0.1	21.2	13.7/97	68.0
Sept. 19	06 43.05	+18 22.1	3.724	3.607	-0.59 +0.2	21.2	12.1/98	75.6
Sept. 29	06 50.85	+18 04.2	3.595	3.620	-0.61 +0.3	21.1	10.2/100	83.5
Oct. 9	06 57.23	+17 46.1	3.464	3.634	-0.63 +0.4	21.1	8.1/103	91.7
Oct. 19	07 02.00	+17 29.0	3.334	3.648	-0.65 +0.4	21.1	5.7/106	100.4
Oct. 29	07 05.01	+17 14.0	3.208	3.662	-0.67 +0.5	21.0	3.2/115	109.6
Nov. 8	07 06.14	+17 02.1	3.090	3.677	-0.70 +0.5	21.0	1.0/176	119.3
Nov. 18	07 05.31	+16 54.3	2.985	3.692	-0.73 +0.5	21.0	2.8/259	129.4
Nov. 28	07 02.58	+16 51.2	2.897	3.708	-0.76 +0.5	20.9	5.3/269	140.0
Dec. 8	06 58.12	+16 52.8	2.831	3.724	-0.78 +0.5	20.9	7.6/273	151.1
Dec. 18	06 52.29	+16 59.1	2.791	3.740	-0.80 +0.4	20.9	9.2/275	162.2
Dec. 28	06 45.64	+17 09.4	2.779	3.756	-0.81 +0.3	21.0	9.9/277	172.3
Jan. 7	06 38.78	+17 22.7	2.798	3.773	-0.81 +0.2	21.1	9.7/279	171.1
Jan. 17	06 32.38	+17 38.3	2.848	3.790	-0.80 +0.1	21.1	8.6/281	160.6
Jan. 27	06 27.04	+17 55.1	2.926	3.807	-0.78 +0.1	21.2	6.8/285	149.5
Feb. 6	06 23.20	+18 12.5	3.029	3.825	-0.75 0.0	21.4	4.5/293	138.6
Feb. 16	06 21.14	+18 29.8	3.153	3.843	-0.72 0.0	21.5	2.2/319	128.1
Feb. 26	06 20.96	+18 46.3	3.295	3.861	-0.69 0.0	21.7	2.0/37	118.0
Mar. 8	06 22.62	+19 01.6	3.449	3.879	-0.66 0.0	21.8	4.0/69	108.4
Mar. 18	06 26.03	+19 15.0	3.611	3.897	-0.62 0.0	22.0	6.2/79	99.3
Mar. 28	06 31.00	+19 26.0	3.777	3.916	-0.60 +0.1	.	8.2/83	90.6

Comet 130P/McNaught-Hughes

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 21.77922 TT
 Peri. = 245.91702 e = 0.4608947
 Node = 70.25536 2000.0 a = 3.3827241 AU
 Incl. = 6.06536 n = 0.15841788
 q = 1.8236445 AU P = 6.22 years

$$m_1 = 10.6 + 5 \log(\Delta) + 15.0 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	20 02.06	-23 54.5	2.751	1.832	+2.85	+7.2	16.9	16.8
Jan. 12	20 30.40	-22 33.9	2.768	1.826	+2.81	+9.0	16.8	13.4
Jan. 22	20 58.34	-20 56.1	2.785	1.824	+2.76	+10.6	16.8	10.1
Feb. 1	21 25.70	-19 03.2	2.800	1.826	+2.70	+12.0	16.8	7.0
Feb. 11	21 52.40	-16 57.8	2.814	1.832	+2.63	+13.1	16.8	4.6
Feb. 21	22 18.38	-14 42.5	2.827	1.842	+2.56	+14.0	16.8	4.0
Mar. 3	22 43.60	-12 20.1	2.839	1.856	+2.48	+14.5	16.8	5.9
Mar. 13	23 08.06	-09 53.2	2.850	1.874	+2.41	+14.8	16.8	8.8
Mar. 23	23 31.81	-07 24.4	2.858	1.895	+2.34	+14.9	16.9	12.1
Apr. 2	23 54.85	-04 56.2	2.864	1.920	+2.27	+14.7	16.9	15.6
Apr. 12	00 17.22	-02 30.5	2.866	1.948	+2.20	+14.4	17.0	19.2
Apr. 22	00 38.96	+00 09.1	2.864	1.979	+2.14	+13.8	17.1	23.0
May 2	01 00.08	+02 06.2	2.858	2.012	+2.08	+13.2	17.1	26.9
May 12	01 20.59	+04 14.3	2.846	2.048	+2.02	+12.4	17.2	31.0
May 22	01 40.49	+06 14.2	2.829	2.086	+1.95	+11.5	17.3	35.3
June 1	01 59.73	+08 04.9	2.804	2.125	+1.89	+10.6	17.4	39.7
June 11	02 18.29	+09 46.1	2.773	2.167	+1.82	+9.6	17.5	44.3
June 21	02 36.10	+11 17.4	2.735	2.209	+1.73	+8.6	17.6	49.2
July 1	02 53.04	+12 38.6	2.689	2.253	+1.64	+7.6	17.7	54.4
July 11	03 09.03	+13 49.8	2.635	2.299	+1.54	+6.6	17.7	59.8
July 21	03 23.90	+14 51.2	2.574	2.345	+1.42	+5.6	17.8	65.6
July 31	03 37.48	+15 43.2	2.507	2.391	+1.28	+4.7	17.9	71.7
Aug. 10	03 49.58	+16 26.4	2.433	2.439	+1.12	+3.9	18.0	78.3
Aug. 20	03 59.95	+17 01.3	2.355	2.486	+0.93	+3.1	18.0	85.3
Aug. 30	04 08.33	+17 28.7	2.274	2.535	+0.72	+2.4	18.1	92.9
Sept. 9	04 14.46	+17 49.3	2.193	2.583	+0.48	+1.7	18.1	101.1
Sept. 19	04 18.04	+18 03.7	2.114	2.631	+0.21	+1.1	18.2	109.9
Sept. 29	04 18.87	+18 12.5	2.041	2.680	-0.07	+0.6	18.2	119.5
Oct. 9	04 16.83	+18 15.9	1.979	2.729	-0.36	+0.1	18.3	129.8
Oct. 19	04 11.98	+18 14.3	1.933	2.777	-0.63	-0.4	18.3	140.8
Oct. 29	04 04.72	+18 07.9	1.907	2.825	-0.84	-0.9	18.4	152.4
Nov. 8	03 55.70	+17 57.6	1.906	2.873	-0.96	-1.2	18.5	164.5
Nov. 18	03 45.87	+17 45.0	1.934	2.921	-0.99	-1.3	18.7	176.4
Nov. 28	03 36.29	+17 32.4	1.991	2.969	-0.91	-1.2	18.9	170.4
Dec. 8	03 27.90	+17 22.4	2.078	3.016	-0.74	-0.8	19.1	158.4
Dec. 18	03 21.42	+17 17.6	2.192	3.063	-0.52	-0.1	19.3	146.7
Dec. 28	03 17.24	+17 19.5	2.330	3.109	-0.29	+0.6	19.5	135.6
Jan. 7	03 15.47	+17 28.9	2.486	3.155	-0.05	+1.3	19.8	125.0
Jan. 17	03 16.04	+17 45.5	2.658	3.201	+0.18	+2.0	20.0	115.0
Jan. 27	03 18.73	+18 08.5	2.839	3.246	+0.38	+2.6	20.3	105.6
Feb. 6	03 23.31	+18 36.8	3.028	3.290	+0.55	+3.1	20.5	96.6
Feb. 16	03 29.51	+19 09.1	3.218	3.334	+0.70	+3.4	20.7	88.0
Feb. 26	03 37.10	+19 44.0	3.409	3.377	+0.83	+3.6	20.9	79.8
Mar. 8	03 45.85	+20 20.4	3.595	3.420	+0.93	+3.7	21.1	71.9
Mar. 18	03 55.58	+20 57.2	3.776	3.463	+1.02	+3.7	21.3	64.3
Mar. 28	04 06.11	+21 33.3	3.948	3.504	+1.09	+3.5	21.5	56.9

Comet 350P/McNaught

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 22.41309 TT
 Peri. = 145.74056
 Node = 65.50282 2000.0
 Incl. = 7.36904
 q = 3.7494889 AU
 e = 0.0913699
 a = 4.1265295 AU
 n = 0.11757816
 P = 8.38 years

H = 15.2 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	V	Elong.	
2018/19	h m	° '			m		°	
Jan. 2	14 42.04	-11 30.9	4.149	3.750	+0.95	-4.5	21.9	59.7
Jan. 12	14 51.23	-12 13.2	4.014	3.750	+0.87	-3.9	21.9	67.5
Jan. 22	14 59.52	-12 49.5	3.872	3.749	+0.77	-3.3	21.8	75.5
Feb. 1	15 06.75	-13 19.7	3.725	3.750	+0.66	-2.7	21.8	83.8
Feb. 11	15 12.73	-13 43.7	3.576	3.750	+0.52	-2.1	21.7	92.4
Feb. 21	15 17.27	-14 01.5	3.428	3.750	+0.37	-1.4	21.6	101.4
Mar. 3	15 20.19	-14 13.2	3.285	3.751	+0.20	-0.8	21.5	110.7
Mar. 13	15 21.37	-14 18.8	3.151	3.752	+0.02	-0.2	21.3	120.3
Mar. 23	15 20.71	-14 18.8	3.029	3.753	-0.17	+0.3	21.2	130.4
Apr. 2	15 18.24	-14 13.6	2.926	3.754	-0.34	+0.8	21.0	140.9
Apr. 12	15 14.12	-14 03.9	2.843	3.756	-0.49	+1.2	20.9	151.6
Apr. 22	15 08.64	-13 50.9	2.786	3.757	-0.61	+1.4	20.7	162.6
May 2	15 02.28	-13 36.2	2.756	3.759	-0.66	+1.5	20.5	173.3
May 12	14 55.58	-13 21.8	2.756	3.761	-0.67	+1.3	20.5	173.6
May 22	14 49.14	-13 09.8	2.784	3.763	-0.61	+1.0	20.7	163.0
June 1	14 43.52	-13 02.1	2.839	3.765	-0.50	+0.5	20.9	152.1
June 11	14 39.13	-13 00.3	2.919	3.768	-0.36	-0.2	21.0	141.6
June 21	14 36.28	-13 05.6	3.020	3.771	-0.19	-0.9	21.2	131.4
July 1	14 35.11	-13 18.2	3.139	3.774	-0.02	-1.7	21.3	121.7
July 11	14 35.64	-13 38.0	3.270	3.777	+0.15	-2.4	21.5	112.4
July 21	14 37.84	-14 04.6	3.411	3.780	+0.31	-3.0	21.6	103.5
July 31	14 41.59	-14 37.2	3.557	3.783	+0.46	-3.5	21.7	95.0
Aug. 10	14 46.77	-15 14.7	3.705	3.787	+0.59	-4.0	21.8	86.8
Aug. 20	14 53.25	-15 56.2	3.853	3.791	+0.71	-4.3	21.9	78.9
Aug. 30	15 00.89	-16 40.7	3.997	3.795	+0.82	-4.6	21.9	71.2
Sept. 9	15 09.56	-17 27.3	4.135	3.799	+0.92	-4.7	22.0	63.7
Sept. 19	15 19.16	-18 14.9	4.265	3.803	+1.01	-4.8	22.0	56.4
Sept. 29	15 29.57	-19 02.7	4.385	3.807	+1.08	-4.8	22.0	49.2
Oct. 9	15 40.70	-19 49.8	4.494	3.812	+1.15	-4.7	22.0	42.1
Oct. 19	15 52.45	-20 35.6	4.589	3.816	+1.21	-4.5	22.0	35.1
Oct. 29	16 04.73	-21 19.3	4.669	3.821	+1.25	-4.2	22.0	28.1
Nov. 8	16 17.46	-22 00.3	4.734	3.826	+1.29	-3.9	21.9	21.1
Nov. 18	16 30.54	-22 38.1	4.782	3.831	+1.32	-3.6	21.9	14.1
Nov. 28	16 43.89	-23 12.4	4.814	3.837	+1.35	-3.2	21.8	7.2
Dec. 8	16 57.41	-23 42.8	4.827	3.842	+1.36	-2.8	21.6	1.1
Dec. 18	17 11.00	-24 09.0	4.822	3.848	+1.36	-2.4	21.8	7.0
Dec. 28	17 24.56	-24 31.1	4.800	3.853	+1.35	-2.0	21.9	14.0
Jan. 7	17 37.99	-24 49.2	4.760	3.859	+1.33	-1.6	22.0	21.2
Jan. 17	17 51.17	-25 03.4	4.702	3.865	+1.30	-1.2	22.0	28.4
Jan. 27	18 04.00	-25 14.1	4.629	3.871	+1.26	-0.9	.	35.6
Feb. 6	18 16.34	-25 21.7	4.540	3.877	+1.20	-0.6	.	43.0
Feb. 16	18 28.07	-25 27.0	4.437	3.883	+1.13	-0.4	.	50.4
Feb. 26	18 39.07	-25 30.6	4.322	3.890	+1.05	-0.3	.	58.0
Mar. 8	18 49.20	-25 33.4	4.196	3.896	+0.96	-0.3	.	65.8
Mar. 18	18 58.30	-25 36.4	4.063	3.902	+0.85	-0.3	.	73.7
Mar. 28	19 06.24	-25 40.4	3.923	3.909	+0.72	-0.5	.	81.9

Comet C/2016 Q4 (Kowalski)

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 26.83962 TT
 Peri. = 99.42529 e = 0.5790395
 Node = 271.28712 2000.0 a = 16.8309276 AU
 Incl. = 7.25664 n = 0.01427388
 q = 7.0851557 AU P = 69.05 years

$$m_1 = 1.8 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	23 53.17	+06 59.1	7.190	7.086	+0.36	+1.2	18.8	80.0
Jan. 12	23 57.05	+07 13.7	7.346	7.086	+0.43	+1.7	18.9	70.9
Jan. 22	00 01.58	+07 33.3	7.495	7.085	+0.49	+2.2	18.9	61.9
Feb. 1	00 06.67	+07 57.6	7.632	7.085	+0.54	+2.7	19.0	53.2
Feb. 11	00 12.24	+08 25.9	7.754	7.086	+0.58	+3.0	19.0	44.6
Feb. 21	00 18.20	+08 57.7	7.860	7.086	+0.61	+3.4	19.0	36.2
Mar. 3	00 24.48	+09 32.6	7.947	7.087	+0.64	+3.6	19.1	28.0
Mar. 13	00 30.98	+10 09.8	8.014	7.089	+0.66	+3.8	19.1	20.0
Mar. 23	00 37.65	+10 48.9	8.060	7.090	+0.67	+4.0	19.1	12.5
Apr. 2	00 44.40	+11 29.2	8.084	7.092	+0.68	+4.1	19.1	6.8
Apr. 12	00 51.16	+12 10.3	8.086	7.095	+0.67	+4.1	19.1	8.1
Apr. 22	00 57.87	+12 51.7	8.065	7.098	+0.66	+4.1	19.1	14.6
May 2	01 04.45	+13 32.9	8.024	7.101	+0.65	+4.1	19.1	22.1
May 12	01 10.83	+14 13.4	7.962	7.104	+0.62	+4.0	19.1	29.8
May 22	01 16.94	+14 52.8	7.882	7.108	+0.59	+3.9	19.1	37.7
June 1	01 22.71	+15 30.6	7.783	7.112	+0.56	+3.7	19.0	45.7
June 11	01 28.06	+16 06.4	7.670	7.116	+0.51	+3.5	19.0	53.7
June 21	01 32.91	+16 39.8	7.543	7.121	+0.46	+3.2	19.0	61.9
July 1	01 37.19	+17 10.4	7.405	7.126	+0.39	+2.9	18.9	70.2
July 11	01 40.83	+17 37.8	7.260	7.131	+0.32	+2.5	18.9	78.7
July 21	01 43.74	+18 01.5	7.110	7.137	+0.25	+2.1	18.9	87.4
July 31	01 45.86	+18 21.1	6.960	7.143	+0.17	+1.7	18.8	96.3
Aug. 10	01 47.15	+18 36.1	6.813	7.150	+0.08	+1.2	18.8	105.4
Aug. 20	01 47.57	+18 46.3	6.673	7.156	-0.01	+0.7	18.7	114.8
Aug. 30	01 47.13	+18 51.2	6.544	7.163	-0.09	+0.2	18.7	124.4
Sept. 9	01 45.88	+18 50.7	6.432	7.171	-0.17	-0.3	18.7	134.2
Sept. 19	01 43.87	+18 44.8	6.339	7.179	-0.24	-0.9	18.7	144.2
Sept. 29	01 41.27	+18 33.7	6.271	7.187	-0.29	-1.4	18.6	154.3
Oct. 9	01 38.23	+18 18.0	6.229	7.195	-0.32	-1.8	18.6	164.1
Oct. 19	01 34.97	+17 58.7	6.216	7.204	-0.33	-2.1	18.6	171.8
Oct. 29	01 31.73	+17 36.8	6.234	7.213	-0.32	-2.3	18.6	169.4
Nov. 8	01 28.71	+17 13.8	6.281	7.222	-0.28	-2.3	18.7	160.3
Nov. 18	01 26.16	+16 51.1	6.358	7.231	-0.22	-2.2	18.7	150.0
Nov. 28	01 24.23	+16 30.3	6.461	7.241	-0.15	-1.9	18.7	139.7
Dec. 8	01 23.07	+16 12.5	6.587	7.252	-0.07	-1.6	18.8	129.3
Dec. 18	01 22.75	+15 58.9	6.732	7.262	+0.02	-1.1	18.9	119.1
Dec. 28	01 23.33	+15 49.9	6.891	7.273	+0.11	-0.6	18.9	109.1
Jan. 7	01 24.78	+15 46.1	7.060	7.284	+0.19	-0.1	19.0	99.3
Jan. 17	01 27.10	+15 47.5	7.234	7.295	+0.28	+0.4	19.0	89.7
Jan. 27	01 30.21	+15 53.9	7.408	7.307	+0.35	+0.9	19.1	80.3
Feb. 6	01 34.05	+16 05.0	7.578	7.319	+0.42	+1.4	19.2	71.1
Feb. 16	01 38.55	+16 20.5	7.740	7.331	+0.48	+1.8	19.2	62.2
Feb. 26	01 43.63	+16 39.8	7.891	7.344	+0.54	+2.1	19.3	53.4
Mar. 8	01 49.19	+17 02.2	8.028	7.357	+0.58	+2.4	19.3	44.8
Mar. 18	01 55.15	+17 27.3	8.147	7.370	+0.62	+2.6	19.4	36.4
Mar. 28	02 01.44	+17 54.4	8.248	7.384	+0.64	+2.8	19.4	28.1

Comet 74P/Smirnova-Chernykh

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 27.26975 TT
 Peri. = 87.22637 e = 0.1496644
 Node = 77.05194 2000.0 a = 4.1591087 AU
 Incl. = 6.65401 n = 0.11619934
 q = 3.5366382 AU P = 8.48 years

$$m_1 = 5.6 + 5 \log(\Delta) + 15.0 \log(r(t-90))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° ' .			m	'		°
Jan. 2	11 56.71	+08 27.4	3.149	3.538	+0.37	-0.1	16.4	105.3
Jan. 12	11 59.70	+08 31.8	3.011	3.537	+0.20	+1.1	16.3	114.7
Jan. 22	12 00.91	+08 47.6	2.884	3.537	+0.02	+2.2	16.2	124.6
Feb. 1	12 00.27	+09 14.2	2.772	3.537	-0.16	+3.2	16.1	134.8
Feb. 11	11 57.82	+09 49.9	2.680	3.537	-0.34	+4.0	16.0	145.4
Feb. 21	11 53.72	+10 31.8	2.611	3.538	-0.49	+4.4	15.9	156.0
Mar. 3	11 48.34	+11 16.1	2.569	3.539	-0.59	+4.4	15.9	165.9
Mar. 13	11 42.19	+11 58.1	2.556	3.540	-0.63	+3.9	15.9	170.7
Mar. 23	11 35.88	+12 33.7	2.572	3.542	-0.61	+3.0	15.9	164.5
Apr. 2	11 30.06	+12 59.1	2.616	3.544	-0.53	+1.9	15.9	154.5
Apr. 12	11 25.26	+13 12.2	2.686	3.546	-0.41	+0.6	16.0	144.1
Apr. 22	11 21.90	+13 12.2	2.778	3.549	-0.25	-0.7	16.0	133.9
May 2	11 20.21	+12 59.3	2.889	3.552	-0.07	-2.0	16.1	124.1
May 12	11 20.26	+12 34.5	3.013	3.556	+0.10	-3.1	16.2	114.7
May 22	11 22.02	+11 59.1	3.148	3.560	+0.27	-4.1	16.3	105.8
June 1	11 25.36	+11 14.4	3.290	3.564	+0.41	-4.9	16.4	97.3
June 11	11 30.12	+10 21.8	3.434	3.568	+0.55	-5.6	16.5	89.2
June 21	11 36.14	+09 22.5	3.579	3.573	+0.67	-6.3	16.6	81.5
July 1	11 43.25	+08 17.5	3.721	3.578	+0.76	-6.8	16.7	74.1
July 11	11 51.30	+07 07.9	3.859	3.584	+0.85	-7.2	16.8	66.9
July 21	12 00.16	+05 54.4	3.990	3.589	+0.92	-7.5	16.9	59.9
July 31	12 09.69	+04 37.9	4.113	3.595	+0.99	-7.8	16.9	53.0
Aug. 10	12 19.81	+03 19.0	4.226	3.602	+1.04	-8.0	17.0	46.4
Aug. 20	12 30.42	+01 58.5	4.328	3.608	+1.09	-8.1	17.1	39.8
Aug. 30	12 41.45	+00 37.0	4.417	3.615	+1.12	-8.2	17.1	33.2
Sept. 9	12 52.82	+00 44.8	4.493	3.623	+1.15	-8.2	17.1	26.8
Sept. 19	13 04.49	-02 06.4	4.555	3.630	+1.18	-8.1	17.2	20.4
Sept. 29	13 16.39	-03 27.0	4.602	3.638	+1.20	-8.0	17.2	14.0
Oct. 9	13 28.47	-04 46.2	4.632	3.646	+1.22	-7.8	17.2	8.0
Oct. 19	13 40.68	-06 03.3	4.647	3.654	+1.23	-7.6	17.3	4.1
Oct. 29	13 52.95	-07 17.8	4.645	3.663	+1.23	-7.3	17.3	7.6
Nov. 8	14 05.23	-08 29.1	4.626	3.671	+1.23	-6.9	17.3	13.7
Nov. 18	14 17.44	-09 36.7	4.591	3.680	+1.21	-6.5	17.3	20.4
Nov. 28	14 29.50	-10 40.0	4.539	3.690	+1.19	-6.1	17.3	27.2
Dec. 8	14 41.33	-11 38.8	4.472	3.699	+1.17	-5.6	17.2	34.2
Dec. 18	14 52.82	-12 32.6	4.390	3.709	+1.13	-5.1	17.2	41.4
Dec. 28	15 03.85	-13 21.0	4.293	3.719	+1.07	-4.5	17.2	48.7
Jan. 7	15 14.30	-14 04.0	4.184	3.729	+1.01	-4.0	17.1	56.2
Jan. 17	15 24.02	-14 41.3	4.065	3.739	+0.93	-3.4	17.1	64.0
Jan. 27	15 32.85	-15 12.9	3.936	3.749	+0.83	-2.8	17.0	71.9
Feb. 6	15 40.62	-15 38.8	3.802	3.760	+0.71	-2.3	17.0	80.1
Feb. 16	15 47.13	-15 59.2	3.663	3.771	+0.58	-1.7	16.9	88.6
Feb. 26	15 52.22	-16 14.1	3.524	3.782	+0.42	-1.2	16.8	97.4
Mar. 8	15 55.71	-16 23.9	3.389	3.793	+0.25	-0.7	16.8	106.6
Mar. 18	15 57.45	-16 28.8	3.260	3.804	+0.07	-0.2	16.7	116.1
Mar. 28	15 57.36	-16 29.2	3.142	3.816	-0.11	+0.2	16.6	126.0

Comet 185P/Petrew

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 27.66533 TT
 Peri. = 181.91343 e = 0.6988850
 Node = 214.09916 2000.0 a = 3.1010916 AU
 Incl. = 13.99421 n = 0.18048129
 q = 0.9337852 AU P = 5.46 years

m1 = 11.8 + 5 log(Delta) + 25.0 log(r) (r < 1.5 AU)
 m1 = 15.0 + 5 log(Delta) + 7.5 log(r) (r > 1.5 AU)

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	21 31.17	-09 25.2	1.515	1.008	+4.06	+9.3	12.8	41.0
Jan. 12	22 13.12	-07 40.9	1.455	0.962	+4.36	+11.8	12.2	41.1
Jan. 22	22 57.96	-05 32.2	1.400	0.938	+4.63	+14.1	11.8	41.9
Feb. 1	23 45.18	-03 03.8	1.358	0.936	+4.83	+15.7	11.7	43.6
Feb. 11	00 34.06	+00 22.9	1.332	0.958	+4.95	+16.4	12.0	45.8
Feb. 21	01 23.69	+02 21.0	1.329	1.000	+4.96	+16.1	12.4	48.4
Mar. 3	02 12.96	+04 56.7	1.351	1.060	+4.87	+14.7	13.1	51.1
Mar. 13	03 00.81	+07 14.2	1.399	1.134	+4.67	+12.4	13.9	53.4
Mar. 23	03 46.36	+09 06.4	1.471	1.216	+4.40	+9.7	14.8	55.1
Apr. 2	04 29.00	+10 30.1	1.567	1.304	+4.09	+6.8	15.7	56.0
Apr. 12	05 08.43	+11 25.5	1.681	1.397	+3.77	+4.1	16.6	56.1
Apr. 22	05 44.70	+11 55.3	1.811	1.491	+3.46	+1.7	17.4	55.4
May 2	06 17.95	+12 02.8	1.953	1.586	+3.17	-0.3	18.0	54.0
May 12	06 48.47	+11 51.7	2.104	1.682	+2.91	-2.0	18.3	52.0
May 22	07 16.56	+11 25.2	2.261	1.777	+2.69	-3.4	18.6	49.4
June 1	07 42.52	+10 46.1	2.421	1.870	+2.49	-4.5	19.0	46.3
June 11	08 06.61	+09 56.8	2.582	1.963	+2.32	-5.4	19.3	42.8
June 21	08 29.09	+08 59.3	2.740	2.054	+2.17	-6.1	19.5	39.1
July 1	08 50.16	+07 55.1	2.895	2.143	+2.04	-6.7	19.8	35.0
July 11	09 09.98	+06 45.7	3.044	2.231	+1.92	-7.2	20.0	30.7
July 21	09 28.72	+05 32.1	3.185	2.317	+1.82	-7.6	20.3	26.2
July 31	09 46.48	+04 15.3	3.316	2.401	+1.73	-7.8	20.5	21.6
Aug. 10	10 03.37	+02 56.2	3.436	2.484	+1.64	-8.0	20.6	16.9
Aug. 20	10 19.47	+01 35.4	3.543	2.565	+1.57	-8.1	20.8	12.5
Aug. 30	10 34.83	+00 13.9	3.637	2.644	+1.50	-8.2	21.0	9.0
Sept. 9	10 49.50	-01 07.9	3.715	2.721	+1.43	-8.2	21.1	8.2
Sept. 19	11 03.49	-02 29.4	3.776	2.797	+1.36	-8.1	21.2	11.1
Sept. 29	11 16.83	-03 49.8	3.821	2.871	+1.30	-8.0	21.3	15.9
Oct. 9	11 29.49	-05 08.6	3.849	2.944	+1.23	-7.8	21.4	21.7
Oct. 19	11 41.46	-06 25.3	3.858	3.015	+1.16	-7.5	21.5	28.0
Oct. 29	11 52.68	-07 39.1	3.849	3.084	+1.08	-7.2	21.6	34.6
Nov. 8	12 03.09	-08 49.4	3.823	3.152	+0.99	-6.8	21.7	41.6
Nov. 18	12 12.61	-09 55.6	3.780	3.218	+0.90	-6.3	21.7	48.9
Nov. 28	12 21.11	-10 56.6	3.722	3.283	+0.79	-5.8	21.7	56.6
Dec. 8	12 28.49	-11 51.9	3.649	3.347	+0.67	-5.2	21.7	64.6
Dec. 18	12 34.57	-12 40.3	3.565	3.409	+0.53	-4.4	21.8	73.0
Dec. 28	12 39.20	-13 20.6	3.472	3.470	+0.38	-3.6	21.8	81.8
Jan. 7	12 42.20	-13 51.8	3.373	3.529	+0.20	-2.6	21.7	91.0
Jan. 17	12 43.41	-14 12.2	3.273	3.587	+0.02	-1.4	21.7	100.6
Jan. 27	12 42.72	-14 20.5	3.177	3.644	-0.18	-0.1	21.7	110.8
Feb. 6	12 40.09	-14 15.3	3.090	3.700	-0.37	+1.3	21.7	121.4
Feb. 16	12 35.57	-13 55.5	3.017	3.754	-0.55	+2.8	21.7	132.4
Feb. 26	12 29.41	-13 21.0	2.964	3.808	-0.69	+4.2	21.7	143.7
Mar. 8	12 21.98	-12 32.6	2.937	3.860	-0.79	+5.5	21.7	155.1
Mar. 18	12 13.84	-11 32.7	2.938	3.910	-0.83	+6.5	21.8	165.7
Mar. 28	12 05.60	-10 25.3	2.971	3.960	-0.81	+7.0	21.8	170.9

Comet 197P/LINEAR

Epoch = 2018 July 21.0 TT
 T = 2018 Jan. 28.84235 TT
 Peri. = 188.68974 e = 0.6301289
 Node = 66.39282 2000.0 a = 2.8657576 AU
 Incl. = 25.55653 n = 0.20316313
 q = 1.0599609 AU P = 4.85 years

$$m1 = 18.0 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2018/19	h m	° ' "			m		°
Jan. 2	16 47.06	-16 59.0	1.867	1.117	+4.11 -23.0	19.7	29.2
Jan. 12	17 29.36	-20 35.9	1.836	1.083	+4.37 -19.9	19.6	28.8
Jan. 22	18 14.15	-23 36.1	1.821	1.064	+4.59 -15.5	19.5	28.4
Feb. 1	19 00.72	-25 47.8	1.820	1.061	+4.72 -10.2	19.5	28.3
Feb. 11	19 47.96	-27 03.5	1.832	1.074	+4.71 -4.4	19.5	28.5
Feb. 21	20 34.48	-27 22.2	1.857	1.103	+4.56 +1.1	19.7	29.1
Mar. 3	21 18.94	-26 49.7	1.891	1.146	+4.29 +5.7	19.8	30.0
Mar. 13	22 00.43	-25 36.3	1.933	1.200	+3.96 +9.1	20.0	31.3
Mar. 23	22 38.48	-23 54.6	1.979	1.263	+3.61 +11.3	20.2	32.8
Apr. 2	23 13.03	-21 56.4	2.027	1.333	+3.27 +12.3	20.5	34.7
Apr. 12	23 44.29	-19 51.5	2.074	1.408	+2.96 +12.6	20.7	36.9
Apr. 22	00 12.57	-17 47.4	2.117	1.486	+2.68 +12.1	20.9	39.5
May 2	00 38.18	-15 49.5	2.155	1.567	+2.43 +11.3	21.1	42.5
May 12	01 01.44	-14 01.3	2.186	1.649	+2.21 +10.2	21.3	45.8
May 22	01 22.58	-12 25.3	2.207	1.731	+2.00 +8.9	21.5	49.5
June 1	01 41.74	-11 02.9	2.219	1.814	+1.81 +7.4	21.7	53.7
June 11	01 59.06	-09 55.2	2.221	1.895	+1.63 +5.9	21.8	58.3
June 21	02 14.55	-09 02.6	2.212	1.977	+1.45 +4.4	21.9	63.3
July 1	02 28.20	-08 25.6	2.192	2.057	+1.26 +2.9	.	68.9
July 11	02 39.93	-08 04.1	2.163	2.136	+1.06 +1.3	.	74.9
July 21	02 49.59	-07 58.1	2.125	2.214	+0.85 -0.2	.	81.4
July 31	02 57.01	-08 07.2	2.081	2.291	+0.61 -1.7	.	88.5
Aug. 10	03 01.96	-08 30.6	2.032	2.366	+0.35 -3.1	.	96.2
Aug. 20	03 04.19	-09 06.9	1.982	2.440	+0.06 -4.2	.	104.4
Aug. 30	03 03.48	-09 53.5	1.936	2.512	-0.24 -5.1	.	113.3
Sept. 9	02 59.70	-10 46.7	1.897	2.583	-0.55 -5.5	.	122.6
Sept. 19	02 52.87	-11 41.2	1.871	2.653	-0.84 -5.3	.	132.2
Sept. 29	02 43.34	-12 30.1	1.863	2.720	-1.08 -4.3	.	141.6
Oct. 9	02 31.74	-13 06.4	1.879	2.787	-1.24 -2.7	.	149.6
Oct. 19	02 19.07	-13 23.9	1.922	2.852	-1.28 -0.5	.	154.2
Oct. 29	02 06.47	-13 18.9	1.993	2.916	-1.21 +1.8	.	153.4
Nov. 8	01 55.00	-12 51.2	2.093	2.978	-1.05 +3.9	.	147.6
Nov. 18	01 45.47	-12 03.2	2.220	3.039	-0.83 +5.8	.	139.3
Nov. 28	01 38.33	-10 59.0	2.370	3.098	-0.58 +7.1	.	130.0
Dec. 8	01 33.70	-09 42.8	2.539	3.156	-0.33 +8.1	.	120.6
Dec. 18	01 31.51	-08 18.6	2.723	3.213	-0.09 +8.7	.	111.2
Dec. 28	01 31.52	-06 49.4	2.916	3.268	+0.11 +9.1	.	102.2
Jan. 7	01 33.46	-05 17.6	3.116	3.322	+0.29 +9.3	.	93.4
Jan. 17	01 37.05	-03 44.8	3.318	3.375	+0.44 +9.3	.	84.9
Jan. 27	01 42.02	-02 12.4	3.518	3.427	+0.56 +9.2	.	76.6
Feb. 6	01 48.15	+00 41.1	3.713	3.477	+0.67 +9.0	.	68.6
Feb. 16	01 55.23	+00 48.3	3.900	3.526	+0.75 +8.8	.	60.8
Feb. 26	02 03.08	+02 15.2	4.077	3.574	+0.82 +8.5	.	53.2
Mar. 8	02 11.57	+03 39.3	4.242	3.620	+0.88 +8.2	.	45.8
Mar. 18	02 20.55	+05 00.1	4.392	3.666	+0.92 +7.9	.	38.5
Mar. 28	02 29.92	+06 17.5	4.526	3.710	+0.95 +7.5	.	31.4

Comet 250P/Larson

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 2.24592 TT
 Peri. = 45.10405 e = 0.4067838
 Node = 73.68008 2000.0 a = 3.7307321 AU
 Incl. = 13.29093 n = 0.13677697
 q = 2.2131307 AU P = 7.21 years

$$m_1 = 14.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	07 43.20	+34 36.9	1.265	2.225	-0.70	+10.2	18.4	163.4
Jan. 12	07 35.54	+36 11.7	1.253	2.219	-0.81	+8.5	18.4	165.5
Jan. 22	07 27.52	+37 25.7	1.266	2.215	-0.75	+6.0	18.4	159.5
Feb. 1	07 20.84	+38 13.7	1.303	2.213	-0.54	+3.4	18.4	150.3
Feb. 11	07 16.85	+38 36.1	1.361	2.214	-0.22	+0.9	18.5	140.6
Feb. 21	07 16.34	+38 36.1	1.437	2.217	+0.16	-1.1	18.6	131.3
Mar. 3	07 19.55	+38 18.1	1.527	2.223	+0.52	-2.6	18.8	122.5
Mar. 13	07 26.23	+37 45.8	1.629	2.231	+0.84	-3.9	18.9	114.4
Mar. 23	07 35.94	+37 01.7	1.739	2.242	+1.12	-5.0	19.1	107.0
Apr. 2	07 48.14	+36 07.5	1.855	2.255	+1.33	-6.0	19.3	100.0
Apr. 12	08 02.26	+35 03.8	1.976	2.270	+1.50	-6.9	19.4	93.5
Apr. 22	08 17.83	+33 51.3	2.100	2.287	+1.62	-7.7	19.6	87.4
May 2	08 34.44	+32 30.3	2.225	2.306	+1.70	-8.5	19.8	81.7
May 12	08 51.73	+31 01.4	2.352	2.327	+1.76	-9.3	19.9	76.2
May 22	09 09.44	+29 25.1	2.479	2.350	+1.79	-10.0	20.1	70.9
June 1	09 27.34	+27 42.3	2.604	2.375	+1.79	-10.6	20.2	65.7
June 11	09 45.28	+25 53.7	2.729	2.402	+1.79	-11.1	20.4	60.7
June 21	10 03.16	+24 00.2	2.850	2.429	+1.78	-11.6	20.5	55.8
July 1	10 20.89	+22 02.9	2.969	2.459	+1.76	-11.9	20.7	51.0
July 11	10 38.42	+20 02.6	3.083	2.489	+1.74	-12.2	20.8	46.2
July 21	10 55.73	+18 00.2	3.193	2.521	+1.72	-12.3	20.9	41.4
July 31	11 12.80	+15 56.9	3.296	2.554	+1.69	-12.4	21.1	36.6
Aug. 10	11 29.62	+13 53.3	3.394	2.588	+1.67	-12.3	21.2	31.8
Aug. 20	11 46.22	+11 50.4	3.484	2.623	+1.65	-12.2	21.3	27.0
Aug. 30	12 02.58	+09 49.0	3.565	2.658	+1.62	-12.0	21.4	22.2
Sept. 9	12 18.72	+07 49.9	3.638	2.695	+1.60	-11.8	21.5	17.6
Sept. 19	12 34.64	+05 53.7	3.700	2.732	+1.58	-11.4	21.6	13.2
Sept. 29	12 50.34	+04 01.2	3.751	2.769	+1.56	-11.0	21.7	9.7
Oct. 9	13 05.81	+02 13.1	3.791	2.807	+1.54	-10.6	21.8	8.6
Oct. 19	13 21.05	+00 29.9	3.818	2.846	+1.51	-10.0	21.9	10.8
Oct. 29	13 36.02	-01 07.7	3.832	2.884	+1.48	-9.4	21.9	15.0
Nov. 8	13 50.68	-02 39.3	3.833	2.923	+1.45	-8.8	22.0	20.3
Nov. 18	14 05.00	-04 04.3	3.819	2.963	+1.41	-8.1	22.0	26.0
Nov. 28	14 18.89	-05 22.3	3.792	3.002	+1.36	-7.4	.	32.1
Dec. 8	14 32.30	-06 33.0	3.751	3.042	+1.31	-6.7	.	38.4
Dec. 18	14 45.10	-07 36.1	3.696	3.081	+1.24	-5.9	.	45.1
Dec. 28	14 57.19	-08 31.4	3.629	3.121	+1.16	-5.1	.	52.0
Jan. 7	15 08.43	-09 18.9	3.550	3.161	+1.07	-4.3	.	59.2
Jan. 17	15 18.66	-09 58.5	3.460	3.200	+0.96	-3.5	.	66.6
Jan. 27	15 27.72	-10 30.4	3.363	3.240	+0.83	-2.8	.	74.4
Feb. 6	15 35.42	-10 54.9	3.258	3.279	+0.69	-2.0	.	82.5
Feb. 16	15 41.54	-11 12.2	3.151	3.318	+0.52	-1.4	.	91.0
Feb. 26	15 45.92	-11 22.8	3.043	3.357	+0.33	-0.7	.	99.9
Mar. 8	15 48.35	-11 27.4	2.938	3.396	+0.13	-0.1	.	109.2
Mar. 18	15 48.72	-11 26.6	2.841	3.435	-0.08	+0.3	22.0	119.0
Mar. 28	15 46.98	-11 21.4	2.756	3.474	-0.29	+0.7	22.0	129.2

Comet 245P/WISE

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 8.66971 TT
 Peri. = 316.68716 e = 0.4577185
 Node = 316.67897 2000.0 a = 4.0388496 AU
 Incl. = 21.20112 n = 0.12142764
 q = 2.1901934 AU P = 8.12 years

$$m1 = 9.8 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2018/19	h m	° ' "			m		°
Jan. 2	17 49.14	-35 49.5	3.122	2.210	+2.77 +2.1	19.2	18.3
Jan. 12	18 16.66	-35 20.7	3.086	2.201	+2.73 +3.9	19.1	21.5
Jan. 22	18 43.67	-34 34.4	3.046	2.195	+2.66 +5.6	19.0	25.1
Feb. 1	19 09.92	-33 31.5	3.000	2.191	+2.57 +7.2	19.0	29.0
Feb. 11	19 35.21	-32 13.4	2.949	2.190	+2.47 +8.6	19.0	33.1
Feb. 21	19 59.38	-30 41.8	2.893	2.192	+2.35 +9.8	18.9	37.5
Mar. 3	20 22.29	-28 58.6	2.833	2.197	+2.22 +10.9	18.9	41.9
Mar. 13	20 43.89	-27 05.9	2.767	2.205	+2.09 +11.7	18.9	46.5
Mar. 23	21 04.11	-25 05.7	2.696	2.215	+1.94 +12.4	18.9	51.4
Apr. 2	21 22.90	-22 59.8	2.621	2.228	+1.80 +12.8	18.9	56.3
Apr. 12	21 40.23	-20 50.2	2.541	2.244	+1.65 +13.1	18.8	61.5
Apr. 22	21 56.05	-18 38.4	2.457	2.262	+1.50 +13.2	18.8	67.0
May 2	22 10.29	-16 26.0	2.370	2.282	+1.33 +13.2	18.8	72.7
May 12	22 22.86	-14 14.4	2.280	2.305	+1.16 +13.1	18.8	78.7
May 22	22 33.63	-12 05.0	2.187	2.330	+0.97 +12.8	18.8	85.1
June 1	22 42.45	-09 59.0	2.095	2.357	+0.77 +12.4	18.9	91.9
June 11	22 49.13	-07 57.7	2.003	2.386	+0.54 +11.8	18.9	99.2
June 21	22 53.46	-06 02.4	1.915	2.416	+0.29 +11.1	18.9	107.0
July 1	22 55.23	-04 14.7	1.834	2.448	+0.03 +10.3	18.9	115.4
July 11	22 54.29	-02 36.2	1.761	2.482	-0.25 +9.3	18.9	124.5
July 21	22 50.60	-01 09.1	1.702	2.517	-0.51 +8.0	19.0	134.1
July 31	22 44.36	+00 04.8	1.660	2.554	-0.75 +6.6	19.0	144.2
Aug. 10	22 36.03	+01 03.6	1.639	2.591	-0.92 +5.0	19.1	154.5
Aug. 20	22 26.40	+01 46.7	1.643	2.629	-1.00 +3.5	19.3	163.7
Aug. 30	22 16.48	+02 14.8	1.673	2.669	-0.97 +2.1	19.4	167.9
Sept. 9	22 07.30	+02 30.6	1.730	2.709	-0.84 +1.0	19.6	162.7
Sept. 19	21 59.75	+02 37.6	1.814	2.750	-0.64 +0.4	19.9	153.5
Sept. 29	21 54.43	+02 40.5	1.921	2.791	-0.40 +0.2	20.1	143.5
Oct. 9	21 51.57	+02 42.9	2.049	2.834	-0.15 +0.4	20.4	133.7
Oct. 19	21 51.20	+02 48.2	2.194	2.876	+0.09 +0.8	20.7	124.3
Oct. 29	21 53.14	+02 58.9	2.353	2.919	+0.31 +1.4	21.0	115.3
Nov. 8	21 57.12	+03 16.2	2.521	2.962	+0.50 +2.1	21.2	106.7
Nov. 18	22 02.88	+03 41.1	2.696	3.006	+0.66 +2.9	21.5	98.5
Nov. 28	22 10.11	+04 13.8	2.875	3.050	+0.79 +3.7	21.8	90.6
Dec. 8	22 18.55	+04 54.3	3.055	3.094	+0.90 +4.5	22.0	83.0
Dec. 18	22 27.99	+05 42.4	3.234	3.138	+0.99 +5.2	.	75.6
Dec. 28	22 38.21	+06 37.5	3.408	3.182	+1.06 +5.9	.	68.5
Jan. 7	22 49.06	+07 39.0	3.577	3.226	+1.11 +6.5	.	61.5
Jan. 17	23 00.40	+08 46.4	3.738	3.270	+1.16 +7.0	.	54.7
Jan. 27	23 12.09	+09 58.9	3.890	3.314	+1.19 +7.5	.	48.1
Feb. 6	23 24.05	+11 15.8	4.030	3.358	+1.21 +7.9	.	41.6
Feb. 16	23 36.20	+12 36.5	4.158	3.401	+1.22 +8.2	.	35.4
Feb. 26	23 48.45	+14 00.2	4.272	3.445	+1.23 +8.5	.	29.5
Mar. 8	00 00.76	+15 26.3	4.372	3.488	+1.23 +8.7	.	23.9
Mar. 18	00 13.05	+16 54.2	4.456	3.531	+1.23 +8.9	.	19.1
Mar. 28	00 25.28	+18 23.2	4.525	3.574	+1.22 +9.0	.	15.7

Comet P/2017 Y3 (Leonard)

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 11.23390 TT
 Peri. = 67.50944 e = 0.8716159
 Node = 153.87927 2000.0 a = 9.9361650 AU
 Incl. = 27.58637 n = 0.03146849
 q = 1.2756456 AU P = 31.32 years

$$m_1 = 15.5 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	'		°
Jan. 2	14 52.45	-03 27.8	1.590	1.396	+4.08	-0.6	18.7	60.3
Jan. 12	15 34.04	-03 23.8	1.519	1.345	+4.24	+1.6	18.3	60.7
Jan. 22	16 16.67	-02 57.5	1.471	1.308	+4.27	+3.8	18.1	60.6
Feb. 1	16 59.12	-02 10.6	1.446	1.284	+4.19	+5.7	17.9	60.3
Feb. 11	17 40.20	-01 07.3	1.441	1.276	+3.99	+7.0	17.9	60.0
Feb. 21	18 18.91	+00 06.9	1.451	1.283	+3.71	+7.8	17.9	59.9
Mar. 3	18 54.58	+01 26.5	1.473	1.306	+3.39	+8.1	18.1	60.3
Mar. 13	19 26.90	+02 46.8	1.500	1.343	+3.04	+7.9	18.3	61.3
Mar. 23	19 55.78	+04 04.5	1.527	1.393	+2.70	+7.5	18.6	63.0
Apr. 2	20 21.27	+05 17.0	1.551	1.454	+2.37	+6.9	18.9	65.4
Apr. 12	20 43.50	+06 22.1	1.570	1.524	+2.05	+6.0	19.2	68.6
Apr. 22	21 02.54	+07 18.1	1.581	1.601	+1.73	+5.0	19.6	72.7
May 2	21 18.48	+08 02.8	1.583	1.684	+1.42	+3.8	19.9	77.6
May 12	21 31.32	+08 34.1	1.577	1.771	+1.11	+2.3	20.2	83.3
May 22	21 41.03	+08 49.3	1.563	1.861	+0.80	+0.5	20.5	89.9
June 1	21 47.55	+08 45.1	1.545	1.954	+0.47	-1.6	20.8	97.4
June 11	21 50.83	+08 18.4	1.524	2.049	+0.15	-4.0	21.1	105.8
June 21	21 50.85	+07 26.0	1.506	2.145	-0.17	-6.8	21.4	115.1
July 1	21 47.81	+06 05.5	1.494	2.241	-0.46	-9.6	21.6	125.3
July 11	21 42.08	+04 17.2	1.495	2.338	-0.70	-12.3	21.9	136.3
July 21	21 34.31	+02 04.4	1.515	2.435	-0.85	-14.4	.	147.7
July 31	21 25.43	+00 25.5	1.559	2.532	-0.91	-15.5	.	158.8
Aug. 10	21 16.45	-03 02.1	1.630	2.629	-0.86	-15.6	.	167.3
Aug. 20	21 08.36	-05 34.9	1.731	2.725	-0.73	-14.7	.	166.4
Aug. 30	21 01.90	-07 54.6	1.861	2.821	-0.54	-13.0	.	157.6
Sept. 9	20 57.50	-09 55.7	2.017	2.916	-0.32	-11.0	.	147.3
Sept. 19	20 55.34	-11 36.1	2.197	3.011	-0.09	-8.9	.	136.9
Sept. 29	20 55.36	-12 55.6	2.397	3.104	+0.12	-6.9	.	126.9
Oct. 9	20 57.37	-13 55.8	2.613	3.198	+0.30	-5.0	.	117.4
Oct. 19	21 01.14	-14 38.8	2.841	3.290	+0.46	-3.4	.	108.2
Oct. 29	21 06.41	-15 06.6	3.076	3.382	+0.60	-2.0	.	99.3
Nov. 8	21 12.90	-15 21.5	3.316	3.473	+0.71	-0.8	.	90.7
Nov. 18	21 20.41	-15 25.1	3.557	3.563	+0.80	+0.2	.	82.4
Nov. 28	21 28.71	-15 19.2	3.796	3.652	+0.87	+1.1	.	74.2
Dec. 8	21 37.63	-15 05.2	4.029	3.741	+0.92	+1.8	.	66.2
Dec. 18	21 47.01	-14 44.3	4.254	3.829	+0.96	+2.4	.	58.3
Dec. 28	21 56.71	-14 17.9	4.468	3.916	+0.98	+2.9	.	50.5
Jan. 7	22 06.63	-13 47.0	4.669	4.002	+1.00	+3.3	.	42.7
Jan. 17	22 16.65	-13 12.5	4.854	4.088	+1.00	+3.6	.	35.0
Jan. 27	22 26.69	-12 35.4	5.022	4.173	+1.00	+3.8	.	27.4
Feb. 6	22 36.68	-11 56.7	5.171	4.257	+0.99	+3.9	.	19.9
Feb. 16	22 46.53	-11 17.2	5.300	4.341	+0.98	+4.0	.	12.5
Feb. 26	22 56.18	-10 37.7	5.407	4.423	+0.95	+3.9	.	5.6
Mar. 8	23 05.58	-09 59.0	5.493	4.505	+0.92	+3.8	.	5.0
Mar. 18	23 14.65	-09 22.0	5.557	4.587	+0.89	+3.6	.	11.7
Mar. 28	23 23.34	-08 47.4	5.599	4.667	+0.85	+3.3	.	19.1

Comet C/2015 01 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 19.09944 TT
 Peri. = 89.61040
 Node = 299.85814 2000.0
 Incl. = 127.21086
 q = 3.7296412 AU
 e = 0.9999488

$$m1 = 5.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	16 32.65	+23 17.1	4.200	3.754	+0.29	+9.9	13.9	56.9
Jan. 12	16 35.21	+25 05.6	4.077	3.745	+0.21	+12.1	13.8	63.6
Jan. 22	16 36.76	+27 17.3	3.943	3.738	+0.08	+14.5	13.7	70.9
Feb. 1	16 36.89	+29 53.3	3.805	3.733	-0.08	+16.9	13.6	78.4
Feb. 11	16 35.12	+32 53.7	3.667	3.730	-0.30	+19.4	13.5	86.0
Feb. 21	16 30.83	+36 17.2	3.538	3.730	-0.60	+21.5	13.5	93.4
Mar. 3	16 23.25	+39 59.7	3.423	3.731	-0.97	+23.0	13.4	100.4
Mar. 13	16 11.47	+43 53.2	3.330	3.735	-1.45	+23.5	13.3	106.4
Mar. 23	15 54.53	+47 45.0	3.266	3.740	-2.01	+22.4	13.3	111.0
Apr. 2	15 31.64	+51 17.5	3.235	3.748	-2.63	+19.4	13.3	113.5
Apr. 12	15 02.79	+54 10.8	3.241	3.758	-3.18	+14.4	13.3	113.7
Apr. 22	14 29.32	+56 06.9	3.283	3.770	-3.50	+8.0	13.3	111.5
May 2	13 54.18	+56 56.5	3.360	3.784	-3.46	+1.3	13.4	107.3
May 12	13 20.98	+56 42.5	3.466	3.800	-3.09	-4.5	13.5	101.6
May 22	12 52.48	+55 37.9	3.595	3.818	-2.53	-8.6	13.6	94.9
June 1	12 29.83	+53 59.6	3.742	3.838	-1.94	-11.1	13.7	87.7
June 11	12 12.85	+52 02.7	3.899	3.860	-1.41	-12.2	13.8	80.3
June 21	12 00.76	+49 58.5	4.060	3.883	-0.98	-12.5	13.9	72.8
July 1	11 52.61	+47 54.5	4.219	3.909	-0.63	-12.2	14.0	65.5
July 11	11 47.50	+45 55.0	4.372	3.936	-0.37	-11.6	14.2	58.4
July 21	11 44.75	+44 02.8	4.513	3.965	-0.17	-10.8	14.3	51.7
July 31	11 43.77	+42 19.3	4.639	3.996	-0.02	-9.8	14.3	45.6
Aug. 10	11 44.10	+40 45.1	4.748	4.028	+0.09	-8.9	14.4	40.3
Aug. 20	11 45.41	+39 20.7	4.835	4.062	+0.17	-7.9	14.5	36.1
Aug. 30	11 47.38	+38 06.5	4.901	4.097	+0.22	-6.9	14.6	33.5
Sept. 9	11 49.78	+37 02.7	4.943	4.133	+0.25	-5.8	14.6	32.9
Sept. 19	11 52.38	+36 09.6	4.960	4.172	+0.26	-4.7	14.7	34.5
Sept. 29	11 54.97	+35 27.8	4.953	4.211	+0.25	-3.5	14.7	38.1
Oct. 9	11 57.37	+34 57.8	4.923	4.252	+0.22	-2.3	14.7	43.3
Oct. 19	11 59.36	+34 40.3	4.869	4.294	+0.17	-1.0	14.8	49.8
Oct. 29	12 00.71	+34 35.9	4.795	4.337	+0.09	+0.3	14.8	57.1
Nov. 8	12 01.20	+34 45.5	4.704	4.381	-0.01	+1.8	14.8	65.2
Nov. 18	12 00.53	+35 09.6	4.598	4.426	-0.14	+3.2	14.8	73.9
Nov. 28	11 58.40	+35 48.4	4.483	4.473	-0.31	+4.7	14.8	83.1
Dec. 8	11 54.48	+36 41.6	4.365	4.520	-0.51	+6.1	14.8	92.7
Dec. 18	11 48.38	+37 47.8	4.249	4.568	-0.74	+7.2	14.7	102.8
Dec. 28	11 39.78	+39 04.0	4.143	4.618	-1.01	+8.0	14.7	113.1
Jan. 7	11 28.40	+40 25.4	4.055	4.668	-1.30	+8.2	14.7	123.3
Jan. 17	11 14.16	+41 45.5	3.991	4.719	-1.58	+7.6	14.7	133.1
Jan. 27	10 57.28	+42 55.9	3.960	4.770	-1.81	+6.2	14.8	141.5
Feb. 6	10 38.38	+43 48.7	3.965	4.823	-1.97	+4.0	14.8	147.1
Feb. 16	10 18.47	+44 17.5	4.010	4.876	-2.00	+1.4	14.9	147.9
Feb. 26	09 58.81	+44 19.7	4.095	4.929	-1.91	-1.2	15.0	143.8
Mar. 8	09 40.57	+43 56.4	4.218	4.984	-1.71	-3.6	15.1	136.4
Mar. 18	09 24.64	+43 11.9	4.374	5.039	-1.44	-5.4	15.2	127.2
Mar. 28	09 11.49	+42 12.1	4.557	5.094	-1.16	-6.6	15.4	117.4

Comet C/2017 T1 (Heinze)

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 21.71078 TT
 Peri. = 96.90663
 Node = 102.31702 2000.0
 Incl. = 96.83638
 q = 0.5806127 AU
 e = 1.0000051

$$m1 = 12.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m			°
Jan. 2	07 15.89	+49 54.8	0.235	1.197	-27.82	+339.4	10.4	152.5
Jan. 12	23 22.81	+55 21.3	0.310	1.037	-14.85	-169.4	10.4	91.2
Jan. 22	22 13.76	+36 37.2	0.544	0.882	-2.68	-65.0	10.9	62.9
Feb. 1	21 54.83	+28 16.0	0.793	0.739	-1.31	-39.1	11.0	47.6
Feb. 11	21 43.97	+22 07.5	1.024	0.628	-0.86	-36.4	10.8	36.4
Feb. 21	21 37.32	+15 46.3	1.216	0.581	-0.40	-40.4	10.9	28.2
Mar. 3	21 35.80	+08 49.7	1.349	0.617	+0.15	-42.4	11.4	25.1
Mar. 13	21 39.31	+01 49.6	1.419	0.720	+0.57	-41.3	12.1	28.3
Mar. 23	21 46.16	-04 57.3	1.441	0.860	+0.80	-40.2	12.9	35.8
Apr. 2	21 54.70	-11 39.2	1.431	1.015	+0.90	-40.6	13.6	45.2
Apr. 12	22 03.84	-18 33.2	1.401	1.174	+0.92	-42.8	14.2	55.5
Apr. 22	22 12.79	-25 56.5	1.362	1.333	+0.85	-46.5	14.7	66.6
May 2	22 20.78	-34 01.5	1.327	1.490	+0.71	-51.0	15.1	78.0
May 12	22 26.89	-42 51.0	1.305	1.644	+0.46	-55.1	15.5	89.6
May 22	22 29.54	-52 13.1	1.307	1.795	-0.02	-57.0	15.9	100.7
June 1	22 25.65	-61 38.6	1.343	1.943	-0.96	-55.2	16.3	110.3
June 11	22 08.09	-70 25.7	1.417	2.087	-3.06	-48.7	16.8	117.3
June 21	21 17.69	-77 40.5	1.529	2.229	-8.33	-35.5	17.2	120.9
July 1	19 14.37	-81 51.2	1.676	2.368	-16.60	-9.7	17.7	121.2
July 11	16 41.88	-81 23.6	1.851	2.504	-11.06	+14.1	18.1	118.7
July 21	15 26.94	-78 31.9	2.050	2.637	-4.14	+18.6	18.6	114.4
July 31	15 00.30	-75 33.2	2.265	2.768	-1.31	+16.5	19.0	109.1
Aug. 10	14 53.50	-73 01.9	2.492	2.897	-0.07	+13.4	19.4	103.2
Aug. 20	14 55.99	-71 02.0	2.726	3.024	+0.57	+10.4	19.8	97.2
Aug. 30	15 03.50	-69 30.5	2.963	3.149	+0.94	+7.8	20.1	91.1
Sept. 9	15 14.12	-68 23.0	3.201	3.272	+1.19	+5.6	20.5	85.1
Sept. 19	15 26.87	-67 35.4	3.435	3.393	+1.37	+3.8	20.8	79.2
Sept. 29	15 41.16	-67 04.1	3.663	3.512	+1.50	+2.4	21.1	73.5
Oct. 9	15 56.68	-66 46.0	3.884	3.630	+1.61	+1.2	21.3	68.0
Oct. 19	16 13.22	-66 38.8	4.094	3.746	+1.70	+0.2	21.6	62.9
Oct. 29	16 30.60	-66 40.4	4.292	3.861	+1.78	-0.6	21.8	58.1
Nov. 8	16 48.74	-66 49.2	4.476	3.974	+1.85	-1.2	22.0	53.9
Nov. 18	17 07.54	-67 04.0	4.646	4.086	+1.91	-1.8	.	50.4
Nov. 28	17 26.91	-67 23.7	4.799	4.197	+1.97	-2.2	.	47.6
Dec. 8	17 46.79	-67 47.8	4.936	4.307	+2.01	-2.6	.	45.8
Dec. 18	18 07.11	-68 15.8	5.055	4.415	+2.05	-3.0	.	45.1
Dec. 28	18 27.78	-68 47.4	5.157	4.523	+2.09	-3.4	.	45.5
Jan. 7	18 48.79	-69 22.6	5.243	4.629	+2.12	-3.7	.	47.0
Jan. 17	19 10.05	-70 01.5	5.313	4.734	+2.14	-4.1	.	49.6
Jan. 27	19 31.54	-70 44.4	5.367	4.838	+2.16	-4.5	.	53.0
Feb. 6	19 53.26	-71 31.6	5.408	4.942	+2.18	-5.0	.	57.0
Feb. 16	20 15.20	-72 23.5	5.438	5.044	+2.21	-5.5	.	61.6
Feb. 26	20 37.39	-73 20.5	5.458	5.146	+2.24	-6.0	.	66.6
Mar. 8	20 59.95	-74 22.9	5.470	5.246	+2.28	-6.5	.	71.8
Mar. 18	21 23.00	-75 31.0	5.479	5.346	+2.34	-7.1	.	77.1
Mar. 28	21 46.78	-76 44.5	5.485	5.445	+2.43	-7.7	.	82.5

Comet C/2017 S6 (Catalina)

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 26.93409 TT
 Peri. = 134.68940
 Node = 130.87546 2000.0
 Incl. = 152.82691
 q = 1.5429723 AU
 e = 1.0013332

$$m1 = 13.7 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	22 55.71	+23 24.8	1.678	1.723	-0.65	-36.4	17.2	75.8
Jan. 12	22 51.07	+18 04.9	1.870	1.668	-0.27	-27.1	17.3	62.7
Jan. 22	22 49.46	+14 05.3	2.052	1.621	-0.05	-20.5	17.4	50.8
Feb. 1	22 49.61	+11 01.5	2.213	1.584	+0.08	-16.0	17.4	39.6
Feb. 11	22 50.76	+08 35.8	2.344	1.559	+0.15	-13.0	17.5	29.2
Feb. 21	22 52.45	+06 36.0	2.441	1.545	+0.18	-10.9	17.5	19.6
Mar. 3	22 54.33	+04 52.7	2.500	1.544	+0.19	-9.7	17.6	11.9
Mar. 13	22 56.15	+03 18.7	2.520	1.555	+0.17	-9.1	17.6	10.8
Mar. 23	22 57.66	+01 48.2	2.500	1.578	+0.12	-9.1	17.7	17.5
Apr. 2	22 58.58	+00 15.2	2.442	1.613	+0.05	-9.7	17.7	26.7
Apr. 12	22 58.60	-01 26.3	2.349	1.658	-0.06	-10.9	17.8	36.7
Apr. 22	22 57.26	-03 23.7	2.224	1.712	-0.23	-13.0	17.8	47.4
May 2	22 53.93	-05 46.4	2.074	1.775	-0.47	-16.1	17.8	58.7
May 12	22 47.72	-08 46.2	1.906	1.844	-0.83	-20.6	17.8	71.0
May 22	22 37.27	-12 38.4	1.731	1.919	-1.35	-26.8	17.7	84.5
June 1	22 20.53	-17 39.6	1.562	1.999	-2.12	-34.4	17.7	99.6
June 11	21 54.62	-23 58.5	1.419	2.083	-3.23	-41.8	17.6	116.7
June 21	21 16.06	-31 13.3	1.326	2.171	-4.66	-44.0	17.7	135.5
July 1	20 23.22	-38 05.3	1.307	2.261	-5.95	-35.5	17.8	153.1
July 11	19 21.22	-42 46.2	1.374	2.353	-6.25	-18.3	18.1	159.4
July 21	18 22.42	-44 34.5	1.522	2.447	-5.25	-2.9	18.5	148.6
July 31	17 36.62	-44 21.8	1.730	2.542	-3.76	+5.0	18.9	133.9
Aug. 10	17 05.18	-43 18.3	1.980	2.638	-2.46	+7.2	19.4	120.1
Aug. 20	16 45.17	-42 06.6	2.254	2.735	-1.51	+6.8	19.8	107.6
Aug. 30	16 33.25	-41 04.3	2.540	2.833	-0.85	+5.5	20.2	96.2
Sept. 9	16 26.91	-40 16.0	2.829	2.930	-0.40	+4.0	20.6	85.7
Sept. 19	16 24.46	-39 41.9	3.113	3.028	-0.08	+2.7	21.0	75.9
Sept. 29	16 24.75	-39 20.2	3.387	3.126	+0.15	+1.6	21.3	66.6
Oct. 9	16 27.02	-39 09.0	3.647	3.224	+0.31	+0.6	21.6	57.6
Oct. 19	16 30.71	-39 06.6	3.888	3.322	+0.43	-0.2	21.9	49.1
Oct. 29	16 35.41	-39 11.5	4.109	3.420	+0.51	-0.8	.	40.9
Nov. 8	16 40.82	-39 22.6	4.305	3.517	+0.57	-1.4	.	33.1
Nov. 18	16 46.69	-39 39.0	4.476	3.614	+0.60	-1.9	.	26.1
Nov. 28	16 52.78	-40 00.3	4.619	3.711	+0.61	-2.4	.	20.5
Dec. 8	16 58.91	-40 26.0	4.734	3.808	+0.61	-2.8	.	17.8
Dec. 18	17 04.87	-40 56.0	4.820	3.904	+0.58	-3.2	.	19.2
Dec. 28	17 10.48	-41 30.3	4.877	3.999	+0.53	-3.7	.	24.1
Jan. 7	17 15.53	-42 08.9	4.907	4.095	+0.47	-4.1	.	30.9
Jan. 17	17 19.81	-42 52.1	4.911	4.189	+0.38	-4.6	.	38.8
Jan. 27	17 23.08	-43 39.9	4.890	4.284	+0.26	-5.0	.	47.3
Feb. 6	17 25.08	-44 32.5	4.849	4.378	+0.12	-5.5	.	56.2
Feb. 16	17 25.52	-45 29.7	4.791	4.471	-0.05	-5.9	.	65.4
Feb. 26	17 24.08	-46 30.8	4.720	4.564	-0.26	-6.3	.	74.9
Mar. 8	17 20.43	-47 34.7	4.642	4.657	-0.50	-6.5	.	84.7
Mar. 18	17 14.25	-48 39.2	4.563	4.749	-0.77	-6.4	.	94.7
Mar. 28	17 05.29	-49 41.1	4.488	4.840	-1.06	-5.9	.	104.8

Comet P/2017 W3 (Gibbs)

Epoch = 2018 July 21.0 TT
 T = 2018 Feb. 28.01332 TT
 Peri. = 326.97293 e = 0.5007446
 Node = 210.69853 2000.0 a = 7.6776888 AU
 Incl. = 18.32935 n = 0.04632957
 q = 3.8331276 AU P = 21.27 years

$$m_1 = 8.9 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	11 57.52	-13 53.9	3.619	3.849	+0.46	-3.8	19.0	96.1
Jan. 12	12 01.48	-14 27.1	3.472	3.844	+0.32	-2.7	18.9	104.9
Jan. 22	12 03.97	-14 49.0	3.332	3.840	+0.16	-1.5	18.8	114.1
Feb. 1	12 04.92	-14 57.9	3.203	3.837	+0.01	-0.1	18.7	123.6
Feb. 11	12 04.35	-14 52.4	3.088	3.835	-0.14	+1.4	18.6	133.4
Feb. 21	12 02.37	-14 31.6	2.993	3.833	-0.27	+2.9	18.6	143.5
Mar. 3	11 59.23	-13 55.4	2.920	3.833	-0.36	+4.4	18.5	153.5
Mar. 13	11 55.30	-13 05.4	2.874	3.834	-0.42	+5.7	18.5	162.7
Mar. 23	11 51.06	-12 04.0	2.855	3.836	-0.42	+6.6	18.5	168.0
Apr. 2	11 47.02	-10 55.5	2.866	3.839	-0.37	+7.1	18.5	164.6
Apr. 12	11 43.64	-09 44.4	2.905	3.842	-0.29	+7.1	18.5	156.0
Apr. 22	11 41.32	-08 35.5	2.970	3.847	-0.16	+6.6	18.6	146.3
May 2	11 40.32	-07 32.8	3.059	3.853	-0.02	+5.8	18.7	136.5
May 12	11 40.77	-06 39.2	3.169	3.860	+0.13	+4.8	18.7	126.8
May 22	11 42.70	-05 56.6	3.294	3.868	+0.27	+3.6	18.8	117.5
June 1	11 46.07	-05 25.7	3.431	3.876	+0.41	+2.4	18.9	108.6
June 11	11 50.76	-05 06.6	3.578	3.886	+0.54	+1.3	19.0	100.1
June 21	11 56.66	-04 58.5	3.729	3.897	+0.65	+0.2	19.1	91.9
July 1	12 03.62	-05 00.8	3.882	3.908	+0.75	-0.7	19.2	84.0
July 11	12 11.51	-05 12.2	4.035	3.921	+0.84	-1.6	19.3	76.3
July 21	12 20.21	-05 31.6	4.184	3.934	+0.91	-2.3	19.4	68.9
July 31	12 29.60	-05 57.9	4.327	3.948	+0.97	-3.0	19.5	61.7
Aug. 10	12 39.58	-06 29.9	4.464	3.963	+1.03	-3.5	19.6	54.6
Aug. 20	12 50.06	-07 06.5	4.591	3.979	+1.07	-3.9	19.7	47.6
Aug. 30	13 00.97	-07 46.5	4.707	3.996	+1.11	-4.2	19.8	40.7
Sept. 9	13 12.23	-08 29.1	4.811	4.014	+1.14	-4.4	19.9	33.9
Sept. 19	13 23.78	-09 13.2	4.901	4.032	+1.17	-4.5	19.9	27.0
Sept. 29	13 35.56	-09 57.9	4.977	4.051	+1.19	-4.5	20.0	20.2
Oct. 9	13 47.51	-10 42.3	5.037	4.071	+1.20	-4.4	20.0	13.4
Oct. 19	13 59.56	-11 25.7	5.080	4.092	+1.21	-4.2	20.1	6.5
Oct. 29	14 11.65	-12 07.1	5.106	4.113	+1.21	-4.0	20.1	1.2
Nov. 8	14 23.72	-12 46.0	5.116	4.135	+1.20	-3.7	20.2	7.6
Nov. 18	14 35.70	-13 21.4	5.107	4.158	+1.19	-3.3	20.2	14.7
Nov. 28	14 47.48	-13 52.9	5.081	4.182	+1.17	-2.9	20.2	21.9
Dec. 8	14 59.00	-14 19.8	5.038	4.206	+1.13	-2.4	20.2	29.2
Dec. 18	15 10.15	-14 41.6	4.978	4.230	+1.09	-1.9	20.2	36.7
Dec. 28	15 20.81	-14 57.8	4.904	4.256	+1.04	-1.3	20.2	44.3
Jan. 7	15 30.87	-15 08.1	4.815	4.281	+0.97	-0.7	20.2	52.1
Jan. 17	15 40.21	-15 12.2	4.714	4.308	+0.89	-0.1	20.2	60.1
Jan. 27	15 48.67	-15 09.9	4.602	4.335	+0.79	+0.6	20.2	68.2
Feb. 6	15 56.13	-15 01.0	4.483	4.362	+0.69	+1.2	20.2	76.6
Feb. 16	16 02.45	-14 45.6	4.360	4.390	+0.56	+1.9	20.1	85.3
Feb. 26	16 07.48	-14 23.9	4.235	4.419	+0.43	+2.5	20.1	94.2
Mar. 8	16 11.13	-13 56.0	4.112	4.447	+0.28	+3.1	20.1	103.3
Mar. 18	16 13.28	-13 22.4	3.996	4.477	+0.13	+3.6	20.0	112.8
Mar. 28	16 13.93	-12 44.0	3.891	4.506	-0.02	+4.1	20.0	122.5

Comet P/2006 F1 (Kowalski) [Orbit 1]

Epoch = 2018 July 21.0 TT
 T = 2018 Mar. 15.12792 TT
 Peri. = 186.18495 e = 0.1203748
 Node = 124.74654 2000.0 a = 4.6704701 AU
 Incl. = 21.27912 n = 0.09764796
 q = 4.1082632 AU P = 10.09 years

$$m_1 = 8.2 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	20 00.17	-19 42.7	5.045	4.114	-0.43 +1.0	20.9	17.2/86	16.9
Jan. 12	20 12.41	-19 28.7	5.079	4.112	-0.42 +0.9	20.9	17.5/85	9.5
Jan. 22	20 24.73	-19 10.9	5.094	4.111	-0.42 +0.8	20.9	17.6/84	2.2
Feb. 1	20 37.03	-18 49.9	5.091	4.110	-0.42 +0.7	20.9	17.5/83	5.0
Feb. 11	20 49.21	-18 26.2	5.068	4.109	-0.43 +0.6	20.9	17.4/82	12.3
Feb. 21	21 01.20	-18 00.8	5.027	4.109	-0.43 +0.5	20.9	17.1/81	19.5
Mar. 3	21 12.91	-17 34.4	4.969	4.108	-0.43 +0.4	20.9	16.7/81	26.8
Mar. 13	21 24.28	-17 07.9	4.893	4.108	-0.44 +0.3	20.9	16.2/81	34.1
Mar. 23	21 35.21	-16 42.4	4.802	4.108	-0.44 +0.3	20.8	15.5/81	41.4
Apr. 2	21 45.63	-16 18.8	4.697	4.109	-0.45 +0.2	20.8	14.7/81	48.8
Apr. 12	21 55.46	-15 58.3	4.579	4.109	-0.46 +0.1	20.7	13.8/82	56.3
Apr. 22	22 04.60	-15 42.1	4.450	4.110	-0.47 0.0	20.6	12.7/84	64.0
May 2	22 12.96	-15 31.3	4.313	4.111	-0.48 -0.1	20.6	11.4/86	71.7
May 12	22 20.44	-15 27.2	4.171	4.112	-0.50 -0.1	20.5	10.0/90	79.7
May 22	22 26.92	-15 30.9	4.024	4.113	-0.51 -0.2	20.4	8.5/96	87.9
June 1	22 32.27	-15 43.6	3.878	4.115	-0.53 -0.3	20.4	7.0/105	96.3
June 11	22 36.39	-16 06.2	3.735	4.116	-0.55 -0.4	20.3	5.6/120	105.0
June 21	22 39.15	-16 39.3	3.598	4.118	-0.58 -0.4	20.2	4.8/144	114.0
July 1	22 40.44	-17 23.0	3.473	4.120	-0.60 -0.5	20.1	5.0/172	123.4
July 11	22 40.23	-18 16.6	3.362	4.123	-0.63 -0.6	20.1	6.0/194	133.0
July 21	22 38.51	-19 18.6	3.269	4.125	-0.65 -0.6	20.0	7.5/208	142.9
July 31	22 35.41	-20 26.5	3.200	4.128	-0.68 -0.6	20.0	8.8/217	152.7
Aug. 10	22 31.13	-21 36.6	3.156	4.131	-0.69 -0.6	19.9	9.7/224	161.8
Aug. 20	22 26.01	-22 45.0	3.140	4.134	-0.70 -0.5	19.9	9.9/229	167.6
Aug. 30	22 20.53	-23 47.3	3.154	4.138	-0.71 -0.4	19.9	9.5/233	165.1
Sept. 9	22 15.17	-24 40.2	3.195	4.141	-0.70 -0.3	20.0	8.4/236	157.0
Sept. 19	22 10.45	-25 21.1	3.264	4.145	-0.69 -0.2	20.0	6.6/239	147.2
Sept. 29	22 06.78	-25 48.8	3.357	4.149	-0.67 -0.1	20.1	4.5/243	137.2
Oct. 9	22 04.48	-26 03.2	3.470	4.153	-0.65 0.0	20.2	2.1/250	127.3
Oct. 19	22 03.73	-26 05.0	3.600	4.157	-0.62 0.0	20.3	0.5/23	117.6
Oct. 29	22 04.61	-25 55.4	3.742	4.162	-0.60 0.0	20.4	2.8/57	108.2
Nov. 8	22 07.06	-25 35.9	3.892	4.166	-0.57 0.0	20.4	5.1/61	99.1
Nov. 18	22 11.00	-25 07.7	4.046	4.171	-0.55 -0.1	20.5	7.2/63	90.4
Nov. 28	22 16.28	-24 32.2	4.201	4.176	-0.52 -0.1	20.6	9.0/64	81.8
Dec. 8	22 22.75	-23 50.5	4.352	4.181	-0.50 -0.2	20.7	10.7/65	73.6
Dec. 18	22 30.24	-23 03.6	4.497	4.187	-0.48 -0.3	20.8	12.1/66	65.6
Dec. 28	22 38.60	-22 12.4	4.633	4.192	-0.47 -0.4	20.9	13.3/66	57.8
Jan. 7	22 47.68	-21 17.7	4.758	4.198	-0.45 -0.5	20.9	14.3/67	50.2
Jan. 17	22 57.34	-20 20.4	4.870	4.204	-0.44 -0.6	21.0	15.2/67	42.9
Jan. 27	23 07.47	-19 21.2	4.968	4.210	-0.43 -0.7	21.0	15.8/68	35.9
Feb. 6	23 17.96	-18 20.8	5.050	4.216	-0.42 -0.7	21.1	16.3/68	29.1
Feb. 16	23 28.72	-17 20.1	5.115	4.222	-0.41 -0.8	21.1	16.7/69	22.9
Feb. 26	23 39.65	-16 19.6	5.162	4.229	-0.40 -0.9	21.2	16.9/69	17.5
Mar. 8	23 50.70	-15 20.2	5.192	4.235	-0.39 -1.0	21.2	17.1/70	14.0
Mar. 18	00 01.78	-14 22.7	5.203	4.242	-0.39 -1.0	21.2	17.1/71	13.5
Mar. 28	00 12.84	-13 27.7	5.197	4.249	-0.39 -1.1	21.2	16.9/72	16.4

Comet 235P/LINEAR

Epoch = 2018 July 21.0 TT
 T = 2018 Mar. 17.71203 TT
 Peri. = 333.80356 e = 0.3158381
 Node = 204.46002 2000.0 a = 3.9936084 AU
 Incl. = 8.90347 n = 0.12349684
 q = 2.7322747 AU P = 7.98 years

$$m_1 = 5.6 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	11 50.84	-06 50.0	2.412	2.767	+0.68	-4.9	18.6	100.6
Jan. 12	11 56.85	-07 33.8	2.276	2.758	+0.50	-3.6	18.4	109.0
Jan. 22	12 00.94	-08 03.3	2.148	2.751	+0.30	-2.1	18.2	118.0
Feb. 1	12 02.94	-08 16.0	2.031	2.745	+0.08	-0.3	18.1	127.5
Feb. 11	12 02.77	-08 10.3	1.929	2.740	-0.14	+1.7	18.0	137.5
Feb. 21	12 00.49	-07 44.8	1.846	2.736	-0.33	+3.6	17.9	148.1
Mar. 3	11 56.43	-07 00.4	1.785	2.734	-0.48	+5.4	17.8	159.0
Mar. 13	11 51.15	-06 00.1	1.749	2.732	-0.57	+6.7	17.7	169.6
Mar. 23	11 45.42	-04 48.9	1.740	2.732	-0.56	+7.4	17.7	173.2
Apr. 2	11 40.11	-03 34.3	1.759	2.734	-0.48	+7.4	17.7	164.0
Apr. 12	11 35.97	-02 23.3	1.804	2.736	-0.33	+6.6	17.8	153.3
Apr. 22	11 33.58	-01 22.3	1.872	2.740	-0.13	+5.4	17.9	142.7
May 2	11 33.25	+00 35.3	1.960	2.745	+0.09	+3.8	18.0	132.7
May 12	11 35.06	+00 04.5	2.064	2.751	+0.30	+2.2	18.2	123.3
May 22	11 38.94	+00 09.8	2.181	2.759	+0.50	+0.5	18.3	114.5
June 1	11 44.70	+00 08.4	2.307	2.767	+0.67	-0.9	18.5	106.2
June 11	11 52.10	+00 07.2	2.440	2.777	+0.82	-2.3	18.6	98.4
June 21	12 00.95	+00 35.4	2.577	2.788	+0.95	-3.4	18.8	91.1
July 1	12 11.00	-01 14.4	2.715	2.800	+1.06	-4.4	18.9	84.1
July 11	12 22.08	-02 02.4	2.853	2.813	+1.16	-5.2	19.1	77.5
July 21	12 34.04	-02 57.8	2.989	2.827	+1.24	-5.9	19.3	71.0
July 31	12 46.73	-03 59.0	3.122	2.842	+1.30	-6.4	19.4	64.8
Aug. 10	13 00.05	-05 04.5	3.250	2.858	+1.36	-6.7	19.6	58.7
Aug. 20	13 13.92	-06 13.1	3.373	2.875	+1.41	-7.0	19.7	52.7
Aug. 30	13 28.25	-07 23.3	3.489	2.893	+1.46	-7.1	19.8	46.8
Sept. 9	13 42.98	-08 34.1	3.596	2.912	+1.49	-7.1	20.0	41.0
Sept. 19	13 58.08	-09 44.4	3.695	2.931	+1.53	-7.0	20.1	35.2
Sept. 29	14 13.47	-10 53.0	3.784	2.952	+1.55	-6.7	20.2	29.4
Oct. 9	14 29.13	-11 59.0	3.862	2.973	+1.58	-6.4	20.4	23.6
Oct. 19	14 45.00	-13 01.5	3.928	2.995	+1.60	-6.0	20.5	17.7
Oct. 29	15 01.02	-13 59.7	3.982	3.017	+1.61	-5.5	20.6	12.0
Nov. 8	15 17.15	-14 52.7	4.023	3.040	+1.62	-5.0	20.7	6.4
Nov. 18	15 33.31	-15 40.0	4.050	3.064	+1.62	-4.4	20.8	3.4
Nov. 28	15 49.43	-16 20.8	4.063	3.088	+1.61	-3.7	20.9	7.6
Dec. 8	16 05.44	-16 54.9	4.062	3.113	+1.59	-3.0	21.0	13.5
Dec. 18	16 21.23	-17 21.8	4.047	3.138	+1.56	-2.3	21.1	19.7
Dec. 28	16 36.71	-17 41.4	4.017	3.164	+1.53	-1.6	21.1	26.1
Jan. 7	16 51.78	-17 53.6	3.973	3.190	+1.48	-0.8	21.2	32.7
Jan. 17	17 06.30	-17 58.5	3.916	3.216	+1.42	-0.1	21.2	39.4
Jan. 27	17 20.14	-17 56.3	3.845	3.243	+1.34	+0.6	21.3	46.2
Feb. 6	17 33.19	-17 47.4	3.763	3.270	+1.25	+1.2	21.3	53.2
Feb. 16	17 45.29	-17 32.4	3.671	3.297	+1.15	+1.8	21.4	60.4
Feb. 26	17 56.28	-17 12.0	3.569	3.325	+1.03	+2.3	21.4	67.9
Mar. 8	18 06.02	-16 46.9	3.460	3.353	+0.90	+2.7	21.4	75.5
Mar. 18	18 14.34	-16 18.0	3.347	3.381	+0.75	+3.1	21.4	83.4
Mar. 28	18 21.08	-15 46.3	3.231	3.409	+0.58	+3.3	21.5	91.6

Comet C/2017 K1 (PANSTARRS)

Epoch = 2017 July 21.0 TT
 T = 2018 Mar. 19.98205 TT
 Peri. = 4.58534
 Node = 225.65464 2000.0
 Incl. = 153.98675
 q = 7.2767273 AU
 e = 0.9975323

H = 11.1 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		V	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	15 19.09	-18 40.8	7.900	7.293	+0.13	+1.3	20.4	49.0
Jan. 12	15 20.08	-18 26.9	7.746	7.289	+0.06	+1.6	20.4	59.0
Jan. 22	15 20.31	-18 09.3	7.576	7.286	-0.02	+2.0	20.3	69.2
Feb. 1	15 19.65	-17 47.5	7.395	7.283	-0.12	+2.4	20.3	79.6
Feb. 11	15 18.00	-17 20.9	7.209	7.281	-0.22	+2.9	20.3	90.3
Feb. 21	15 15.28	-16 48.9	7.023	7.279	-0.33	+3.5	20.2	101.1
Mar. 3	15 11.43	-16 11.3	6.844	7.278	-0.45	+4.1	20.1	112.2
Mar. 13	15 06.47	-15 27.6	6.680	7.277	-0.56	+4.7	20.0	123.6
Mar. 23	15 00.43	-14 38.1	6.536	7.277	-0.66	+5.3	19.9	135.1
Apr. 2	14 53.45	-13 43.3	6.420	7.277	-0.74	+5.8	19.8	146.9
Apr. 12	14 45.73	-12 43.9	6.335	7.278	-0.80	+6.1	19.7	158.7
Apr. 22	14 37.51	-11 41.4	6.287	7.280	-0.84	+6.4	19.6	170.2
May 2	14 29.10	-10 37.6	6.277	7.282	-0.84	+6.4	19.5	175.1
May 12	14 20.79	-09 34.4	6.306	7.285	-0.81	+6.2	19.7	164.5
May 22	14 12.89	-08 33.8	6.372	7.288	-0.76	+5.8	19.8	152.9
June 1	14 05.65	-07 37.5	6.471	7.292	-0.68	+5.3	19.9	141.4
June 11	13 59.24	-06 46.8	6.600	7.296	-0.59	+4.7	20.0	130.1
June 21	13 53.80	-06 02.6	6.752	7.301	-0.49	+4.0	20.1	119.1
July 1	13 49.39	-05 25.2	6.922	7.306	-0.38	+3.4	20.2	108.4
July 11	13 46.01	-04 54.6	7.103	7.312	-0.28	+2.7	20.2	97.9
July 21	13 43.63	-04 30.5	7.288	7.319	-0.18	+2.1	20.3	87.7
July 31	13 42.19	-04 12.1	7.473	7.326	-0.10	+1.5	20.3	77.8
Aug. 10	13 41.61	-03 58.9	7.652	7.333	-0.01	+1.1	20.4	68.0
Aug. 20	13 41.79	-03 50.0	7.819	7.342	+0.06	+0.7	20.4	58.5
Aug. 30	13 42.64	-03 44.7	7.971	7.350	+0.12	+0.4	20.4	49.1
Sept. 9	13 44.06	-03 42.0	8.104	7.359	+0.17	+0.2	20.4	39.9
Sept. 19	13 45.94	-03 41.1	8.214	7.369	+0.21	0.0	20.4	30.8
Sept. 29	13 48.19	-03 41.3	8.299	7.380	+0.24	0.0	20.3	22.0
Oct. 9	13 50.70	-03 41.6	8.357	7.390	+0.26	0.0	20.3	13.7
Oct. 19	13 53.36	-03 41.5	8.387	7.402	+0.27	+0.1	20.2	7.8
Oct. 29	13 56.09	-03 40.0	8.389	7.414	+0.27	+0.3	20.3	10.4
Nov. 8	13 58.77	-03 36.4	8.361	7.426	+0.26	+0.5	20.3	18.2
Nov. 18	14 01.30	-03 30.0	8.305	7.439	+0.24	+0.8	20.4	27.1
Nov. 28	14 03.56	-03 20.0	8.223	7.452	+0.21	+1.2	20.4	36.4
Dec. 8	14 05.44	-03 05.7	8.117	7.466	+0.16	+1.7	20.5	46.0
Dec. 18	14 06.83	-02 46.5	7.990	7.481	+0.11	+2.2	20.5	55.8
Dec. 28	14 07.61	-02 21.6	7.845	7.496	+0.04	+2.8	20.5	65.8
Jan. 7	14 07.66	-01 50.6	7.689	7.511	-0.04	+3.5	20.4	76.0
Jan. 17	14 06.89	-01 13.1	7.525	7.527	-0.13	+4.1	20.4	86.4
Jan. 27	14 05.20	+00 28.9	7.359	7.543	-0.22	+4.8	20.4	97.0
Feb. 6	14 02.52	+00 22.0	7.200	7.560	-0.32	+5.4	20.3	107.8
Feb. 16	13 58.83	+01 19.2	7.052	7.577	-0.42	+6.0	20.2	118.8
Feb. 26	13 54.14	+02 21.7	6.922	7.595	-0.52	+6.5	20.2	129.9
Mar. 8	13 48.51	+03 28.2	6.818	7.614	-0.61	+6.8	20.1	140.9
Mar. 18	13 42.07	+04 37.0	6.744	7.632	-0.68	+6.9	20.0	151.4
Mar. 28	13 35.02	+05 46.0	6.703	7.651	-0.73	+6.8	19.9	160.5

Comet 363P/Lemmon

Epoch = 2018 July 21.0 TT
 T = 2018 Mar. 22.93010 TT
 Peri. = 315.28688 e = 0.5570746
 Node = 169.91736 2000.0 a = 3.4044221 AU
 Incl. = 3.97529 n = 0.15690579
 q = 1.5079050 AU P = 6.28 years

$$m1 = 15.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		° .
Jan. 2	03 18.19	+10 36.4	0.923	1.716	+0.16	+2.9	18.9	128.3
Jan. 12	03 21.80	+11 16.2	0.952	1.671	+0.61	+5.2	18.8	119.3
Jan. 22	03 29.94	+12 16.4	0.989	1.630	+1.06	+7.0	18.8	111.4
Feb. 1	03 42.40	+13 32.0	1.030	1.594	+1.47	+8.2	18.7	104.6
Feb. 11	03 58.80	+14 56.5	1.073	1.564	+1.84	+8.7	18.7	98.7
Feb. 21	04 18.78	+16 24.0	1.119	1.540	+2.18	+8.7	18.7	93.6
Mar. 3	04 41.94	+17 47.9	1.168	1.522	+2.47	+7.9	18.7	89.3
Mar. 13	05 07.81	+19 02.0	1.218	1.511	+2.72	+6.6	18.7	85.6
Mar. 23	05 35.95	+20 00.7	1.273	1.508	+2.92	+4.8	18.8	82.3
Apr. 2	06 05.82	+20 39.2	1.332	1.512	+3.06	+2.6	18.9	79.4
Apr. 12	06 36.84	+20 54.2	1.397	1.522	+3.14	+0.1	19.1	76.8
Apr. 22	07 08.44	+20 43.9	1.468	1.540	+3.17	-2.4	19.2	74.4
May 2	07 40.04	+20 08.3	1.546	1.564	+3.14	-4.9	19.5	72.1
May 12	08 11.15	+19 09.0	1.631	1.595	+3.07	-7.1	19.7	69.8
May 22	08 41.44	+17 48.9	1.724	1.630	+2.97	-9.0	20.0	67.4
June 1	09 10.63	+16 11.3	1.824	1.671	+2.85	-10.6	20.3	65.0
June 11	09 38.60	+14 20.1	1.931	1.716	+2.73	-11.7	20.5	62.4
June 21	10 05.32	+12 18.9	2.045	1.765	+2.60	-12.5	20.9	59.7
July 1	10 30.83	+10 11.0	2.163	1.817	+2.49	-13.0	21.2	56.7
July 11	10 55.18	+07 59.3	2.286	1.871	+2.38	-13.3	21.5	53.6
July 21	11 18.52	+05 46.1	2.412	1.928	+2.28	-13.3	21.8	50.3
July 31	11 40.93	+03 33.4	2.539	1.986	+2.19	-13.2	.	46.7
Aug. 10	12 02.53	+01 22.9	2.667	2.046	+2.12	-12.9	.	43.0
Aug. 20	12 23.45	+00 44.4	2.794	2.107	+2.06	-12.5	.	39.0
Aug. 30	12 43.75	-02 47.2	2.919	2.168	+2.00	-12.0	.	34.9
Sept. 9	13 03.54	-04 44.7	3.039	2.230	+1.95	-11.4	.	30.5
Sept. 19	13 22.89	-06 36.4	3.154	2.293	+1.91	-10.8	.	25.9
Sept. 29	13 41.83	-08 21.6	3.261	2.355	+1.87	-10.1	.	21.2
Oct. 9	14 00.42	-09 59.8	3.361	2.418	+1.84	-9.4	.	16.2
Oct. 19	14 18.67	-11 30.7	3.450	2.480	+1.81	-8.7	.	11.2
Oct. 29	14 36.59	-12 53.9	3.528	2.542	+1.77	-7.9	.	6.0
Nov. 8	14 54.16	-14 09.1	3.594	2.604	+1.74	-7.1	.	2.4
Nov. 18	15 11.37	-15 16.3	3.646	2.665	+1.70	-6.3	.	6.2
Nov. 28	15 28.16	-16 15.2	3.684	2.726	+1.65	-5.4	.	11.9
Dec. 8	15 44.49	-17 05.9	3.707	2.786	+1.60	-4.6	.	18.0
Dec. 18	16 00.28	-17 48.6	3.714	2.846	+1.54	-3.8	.	24.3
Dec. 28	16 15.43	-18 23.3	3.706	2.905	+1.48	-3.0	.	30.8
Jan. 7	16 29.85	-18 50.4	3.682	2.963	+1.40	-2.3	.	37.5
Jan. 17	16 43.42	-19 10.3	3.643	3.021	+1.30	-1.6	.	44.5
Jan. 27	16 56.00	-19 23.6	3.591	3.078	+1.20	-1.0	.	51.6
Feb. 6	17 07.47	-19 30.8	3.525	3.134	+1.08	-0.4	.	59.1
Feb. 16	17 17.66	-19 32.7	3.447	3.190	+0.94	+0.1	.	66.8
Feb. 26	17 26.40	-19 30.0	3.360	3.244	+0.79	+0.5	.	74.8
Mar. 8	17 33.52	-19 23.6	3.266	3.298	+0.62	+0.8	.	83.1
Mar. 18	17 38.84	-19 14.2	3.168	3.351	+0.43	+1.1	.	91.8
Mar. 28	17 42.21	-19 02.7	3.070	3.404	+0.22	+1.2	.	100.9

Comet 358P/PANSTARRS

Epoch = 2017 July 21.0 TT
 T = 2018 Apr. 11.57505 TT
 Peri. = 299.88347 e = 0.2376146
 Node = 85.72010 2000.0 a = 3.1505687 AU
 Incl. = 11.05672 n = 0.17624656
 q = 2.4019476 AU P = 5.59 years

$$m1 = 12.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2018/19	h m	° ' "			m		°
Jan. 2	22 49.89	-17 41.3	2.866	2.461	+1.56 +11.6	20.6	56.3
Jan. 12	23 05.71	-15 42.9	2.954	2.450	+1.61 +12.1	20.6	50.5
Jan. 22	23 22.01	-13 40.3	3.036	2.440	+1.65 +12.5	20.6	44.9
Feb. 1	23 38.69	-11 34.3	3.110	2.431	+1.69 +12.8	20.7	39.5
Feb. 11	23 55.67	-09 25.8	3.176	2.423	+1.71 +12.9	20.7	34.2
Feb. 21	00 12.92	-07 15.8	3.233	2.417	+1.74 +13.0	20.7	29.0
Mar. 3	00 30.39	-05 05.4	3.283	2.411	+1.76 +13.0	20.7	24.0
Mar. 13	00 48.06	-02 55.6	3.323	2.407	+1.78 +12.9	20.7	19.2
Mar. 23	01 05.91	+00 47.3	3.355	2.404	+1.79 +12.7	20.7	14.7
Apr. 2	01 23.93	+01 18.4	3.378	2.403	+1.81 +12.4	20.8	10.5
Apr. 12	01 42.09	+03 20.6	3.392	2.402	+1.82 +12.0	20.8	7.4
Apr. 22	02 00.40	+05 18.3	3.398	2.403	+1.84 +11.5	20.8	6.7
May 2	02 18.82	+07 10.7	3.395	2.404	+1.85 +10.9	20.8	9.0
May 12	02 37.36	+08 57.0	3.383	2.408	+1.86 +10.3	20.8	12.7
May 22	02 55.96	+10 36.5	3.362	2.412	+1.86 +9.5	20.8	17.0
June 1	03 14.60	+12 08.5	3.333	2.417	+1.86 +8.8	20.8	21.4
June 11	03 33.23	+13 32.7	3.295	2.424	+1.86 +8.0	20.8	26.0
June 21	03 51.78	+14 48.6	3.249	2.432	+1.85 +7.1	20.7	30.8
July 1	04 10.18	+15 56.0	3.194	2.441	+1.83 +6.3	20.7	35.6
July 11	04 28.35	+16 54.9	3.131	2.451	+1.80 +5.4	20.7	40.6
July 21	04 46.18	+17 45.5	3.061	2.462	+1.76 +4.6	20.7	45.7
July 31	05 03.54	+18 28.1	2.982	2.474	+1.71 +3.8	20.7	51.1
Aug. 10	05 20.32	+19 03.3	2.897	2.487	+1.64 +3.1	20.6	56.6
Aug. 20	05 36.34	+19 32.0	2.804	2.501	+1.55 +2.5	20.6	62.3
Aug. 30	05 51.44	+19 55.3	2.705	2.515	+1.45 +2.1	20.6	68.4
Sept. 9	06 05.43	+20 14.4	2.602	2.531	+1.33 +1.7	20.5	74.8
Sept. 19	06 18.08	+20 31.0	2.494	2.548	+1.18 +1.6	20.5	81.5
Sept. 29	06 29.14	+20 46.9	2.383	2.565	+1.01 +1.6	20.4	88.7
Oct. 9	06 38.35	+21 04.0	2.272	2.583	+0.81 +1.9	20.4	96.4
Oct. 19	06 45.37	+21 24.4	2.163	2.601	+0.57 +2.3	20.3	104.7
Oct. 29	06 49.94	+21 49.9	2.059	2.621	+0.31 +2.9	20.2	113.7
Nov. 8	06 51.74	+22 22.0	1.963	2.640	+0.02 +3.6	20.2	123.3
Nov. 18	06 50.59	+23 01.3	1.880	2.661	-0.28 +4.3	20.1	133.7
Nov. 28	06 46.50	+23 46.9	1.815	2.682	-0.56 +4.8	20.1	144.8
Dec. 8	06 39.74	+24 36.5	1.771	2.703	-0.80 +5.1	20.1	156.5
Dec. 18	06 30.97	+25 26.6	1.753	2.725	-0.95 +4.9	20.1	168.5
Dec. 28	06 21.23	+26 13.1	1.764	2.747	-0.98 +4.3	20.2	176.9
Jan. 7	06 11.72	+26 53.1	1.805	2.769	-0.89 +3.6	20.3	166.1
Jan. 17	06 03.60	+27 25.3	1.873	2.792	-0.70 +2.8	20.5	154.2
Jan. 27	05 57.75	+27 50.3	1.967	2.815	-0.44 +2.2	20.6	142.8
Feb. 6	05 54.62	+28 09.4	2.082	2.838	-0.15 +1.6	20.8	132.0
Feb. 16	05 54.38	+28 24.1	2.214	2.861	+0.13 +1.3	21.0	121.9
Feb. 26	05 56.89	+28 35.4	2.359	2.885	+0.39 +1.0	21.2	112.4
Mar. 8	06 01.87	+28 43.7	2.512	2.908	+0.62 +0.7	21.4	103.5
Mar. 18	06 09.04	+28 49.2	2.670	2.932	+0.82 +0.4	21.5	95.1
Mar. 28	06 18.03	+28 51.4	2.831	2.956	+0.99 0.0	21.7	87.2

Comet 169P/NEAT

Epoch = 2017 July 21.0 TT
 T = 2018 Apr. 29.60109 TT
 Peri. = 218.08737 e = 0.7680309
 Node = 176.08601 2000.0 a = 2.6021949 AU
 Incl. = 11.29560 n = 0.23479798
 q = 0.6036288 AU P = 4.20 years

$$m_1 = 16.4 + 5 \log(\Delta) + 5.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	18 16.76	-15 57.3	2.831	1.872	+2.33	+0.3	20.0	10.3
Jan. 12	18 40.81	-15 48.3	2.705	1.765	+2.51	+1.7	19.8	13.7
Jan. 22	19 06.76	-15 23.3	2.569	1.653	+2.71	+3.5	19.5	17.0
Feb. 1	19 34.88	-14 39.7	2.427	1.538	+2.94	+5.5	19.3	19.9
Feb. 11	20 05.52	-13 33.8	2.282	1.418	+3.22	+8.0	19.0	22.3
Feb. 21	20 39.12	-12 01.7	2.137	1.296	+3.54	+10.8	18.6	23.8
Mar. 3	21 16.20	-09 59.0	1.999	1.170	+3.92	+14.1	18.2	24.4
Mar. 13	21 57.36	-07 21.6	1.873	1.042	+4.37	+17.8	17.9	23.7
Mar. 23	22 43.25	-04 07.1	1.765	0.915	+4.87	+21.5	17.4	21.6
Apr. 2	23 34.37	+00 17.5	1.682	0.795	+5.41	+24.6	17.0	18.1
Apr. 12	00 30.99	+03 57.3	1.629	0.691	+5.96	+26.2	16.7	13.1
Apr. 22	01 32.69	+08 17.9	1.606	0.621	+6.40	+25.4	16.4	7.2
May 2	02 37.77	+12 16.4	1.609	0.605	+6.58	+21.5	16.3	3.0
May 12	03 43.21	+15 24.3	1.637	0.649	+6.43	+15.2	16.5	7.4
May 22	04 45.76	+17 24.4	1.692	0.738	+6.00	+8.1	16.9	12.6
June 1	05 43.14	+18 16.2	1.773	0.851	+5.40	+1.8	17.3	16.5
June 11	06 34.33	+18 11.6	1.877	0.975	+4.77	-3.0	17.7	19.0
June 21	07 19.31	+17 26.0	2.000	1.103	+4.17	-6.2	18.1	20.1
July 1	07 58.61	+16 13.7	2.135	1.230	+3.65	-8.3	18.5	20.0
July 11	08 33.06	+14 45.3	2.276	1.355	+3.21	-9.4	18.8	18.9
July 21	09 03.51	+13 08.1	2.418	1.476	+2.85	-10.0	19.2	16.9
July 31	09 30.66	+11 26.8	2.558	1.593	+2.56	-10.2	19.5	14.1
Aug. 10	09 55.15	+09 44.3	2.692	1.707	+2.32	-10.2	19.7	10.8
Aug. 20	10 17.45	+08 02.6	2.816	1.816	+2.12	-10.1	19.9	7.0
Aug. 30	10 37.94	+06 23.0	2.930	1.922	+1.96	-9.8	20.2	3.1
Sept. 9	10 56.90	+04 46.3	3.030	2.025	+1.82	-9.5	20.3	3.0
Sept. 19	11 14.55	+03 13.2	3.116	2.124	+1.70	-9.1	20.5	7.6
Sept. 29	11 31.05	+01 44.4	3.185	2.220	+1.59	-8.6	20.6	12.9
Oct. 9	11 46.50	+00 20.3	3.237	2.313	+1.49	-8.1	20.8	18.7
Oct. 19	12 00.96	+00 58.5	3.271	2.402	+1.39	-7.6	20.9	24.7
Oct. 29	12 14.47	-02 11.4	3.287	2.489	+1.30	-6.9	21.0	31.1
Nov. 8	12 27.01	-03 17.8	3.284	2.573	+1.20	-6.3	21.0	37.8
Nov. 18	12 38.53	-04 17.0	3.263	2.655	+1.09	-5.5	21.1	44.8
Nov. 28	12 48.96	-05 08.3	3.225	2.734	+0.98	-4.7	21.1	52.2
Dec. 8	12 58.20	-05 50.9	3.172	2.810	+0.85	-3.7	21.2	59.9
Dec. 18	13 06.09	-06 23.8	3.104	2.885	+0.71	-2.7	21.2	68.1
Dec. 28	13 12.47	-06 46.1	3.025	2.957	+0.55	-1.6	21.2	76.6
Jan. 7	13 17.14	-06 56.6	2.937	3.027	+0.36	-0.4	21.1	85.7
Jan. 17	13 19.89	-06 54.3	2.845	3.094	+0.16	+1.0	21.1	95.3
Jan. 27	13 20.55	-06 38.1	2.753	3.160	-0.06	+2.4	21.1	105.4
Feb. 6	13 18.95	-06 07.5	2.666	3.224	-0.29	+3.9	21.1	116.1
Feb. 16	13 15.06	-05 22.2	2.591	3.286	-0.51	+5.3	21.1	127.4
Feb. 26	13 09.00	-04 23.4	2.534	3.346	-0.72	+6.5	21.0	139.2
Mar. 8	13 01.05	-03 13.5	2.499	3.404	-0.88	+7.5	21.0	151.4
Mar. 18	12 51.77	-01 56.5	2.494	3.461	-0.97	+7.9	21.1	163.8
Mar. 28	12 41.87	+00 37.9	2.520	3.515	-1.00	+7.7	21.1	175.3

Comet C/2015 XY1 (Lemmon)

Epoch = 2018 July 21.0 TT
 T = 2018 Apr. 29.78064 TT
 Peri. = 196.34441
 Node = 281.61794 2000.0
 Incl. = 148.84982
 q = 7.9280095 AU
 e = 1.0043498

$$m1 = 5.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	06 11.98	+18 07.4	6.990	7.961	-0.85	-1.8	18.2	170.1
Jan. 12	06 03.60	+17 49.4	7.031	7.955	-0.81	-1.8	18.2	158.7
Jan. 22	05 55.74	+17 31.9	7.108	7.951	-0.75	-1.7	18.3	146.9
Feb. 1	05 48.66	+17 15.1	7.218	7.946	-0.66	-1.6	18.3	135.1
Feb. 11	05 42.53	+16 59.3	7.353	7.942	-0.56	-1.5	18.3	123.6
Feb. 21	05 37.45	+16 44.8	7.510	7.939	-0.45	-1.4	18.4	112.4
Mar. 3	05 33.46	+16 31.6	7.680	7.936	-0.34	-1.2	18.4	101.4
Mar. 13	05 30.55	+16 19.7	7.858	7.933	-0.23	-1.1	18.5	90.8
Mar. 23	05 28.66	+16 08.9	8.036	7.931	-0.14	-1.0	18.5	80.4
Apr. 2	05 27.70	+15 58.9	8.209	7.930	-0.05	-1.0	18.6	70.4
Apr. 12	05 27.57	+15 49.5	8.372	7.929	+0.03	-0.9	18.6	60.6
Apr. 22	05 28.16	+15 40.2	8.521	7.928	+0.09	-0.9	18.6	51.1
May 2	05 29.35	+15 30.7	8.650	7.928	+0.15	-1.0	18.7	41.8
May 12	05 31.03	+15 20.7	8.758	7.928	+0.19	-1.0	18.7	32.8
May 22	05 33.09	+15 09.9	8.842	7.929	+0.22	-1.1	18.7	24.1
June 1	05 35.41	+14 57.9	8.900	7.930	+0.24	-1.3	18.7	16.1
June 11	05 37.89	+14 44.5	8.931	7.932	+0.25	-1.4	18.7	9.8
June 21	05 40.43	+14 29.5	8.934	7.934	+0.25	-1.6	18.8	9.8
July 1	05 42.91	+14 12.5	8.910	7.937	+0.24	-1.8	18.7	15.9
July 11	05 45.23	+13 53.6	8.859	7.940	+0.22	-2.0	18.7	23.9
July 21	05 47.31	+13 32.5	8.782	7.944	+0.19	-2.2	18.7	32.5
July 31	05 49.01	+13 09.2	8.682	7.948	+0.15	-2.5	18.7	41.3
Aug. 10	05 50.26	+12 43.5	8.561	7.953	+0.09	-2.7	18.7	50.3
Aug. 20	05 50.93	+12 15.4	8.422	7.958	+0.03	-2.9	18.6	59.6
Aug. 30	05 50.93	+11 44.9	8.268	7.963	-0.04	-3.2	18.6	69.1
Sept. 9	05 50.15	+11 12.2	8.104	7.969	-0.12	-3.4	18.6	78.8
Sept. 19	05 48.51	+10 37.3	7.935	7.976	-0.22	-3.6	18.5	88.7
Sept. 29	05 45.92	+10 00.6	7.767	7.982	-0.31	-3.8	18.5	98.9
Oct. 9	05 42.36	+09 22.3	7.604	7.990	-0.41	-3.9	18.4	109.3
Oct. 19	05 37.78	+08 42.9	7.455	7.998	-0.51	-4.0	18.4	119.9
Oct. 29	05 32.25	+08 03.1	7.324	8.006	-0.60	-4.0	18.4	130.6
Nov. 8	05 25.83	+07 23.6	7.218	8.015	-0.68	-3.9	18.3	141.2
Nov. 18	05 18.69	+06 45.4	7.143	8.024	-0.75	-3.7	18.3	151.3
Nov. 28	05 11.04	+06 09.5	7.101	8.033	-0.78	-3.4	18.3	159.6
Dec. 8	05 03.13	+05 36.7	7.097	8.044	-0.79	-3.1	18.3	162.9
Dec. 18	04 55.24	+05 08.0	7.130	8.054	-0.78	-2.6	18.3	158.6
Dec. 28	04 47.66	+04 43.9	7.199	8.065	-0.73	-2.1	18.4	149.9
Jan. 7	04 40.62	+04 24.8	7.302	8.076	-0.66	-1.6	18.4	139.6
Jan. 17	04 34.35	+04 10.6	7.434	8.088	-0.58	-1.2	18.4	128.9
Jan. 27	04 28.97	+04 01.1	7.590	8.101	-0.49	-0.7	18.5	118.1
Feb. 6	04 24.56	+03 55.7	7.763	8.113	-0.38	-0.3	18.5	107.5
Feb. 16	04 21.17	+03 53.9	7.947	8.126	-0.28	0.0	18.6	97.0
Feb. 26	04 18.75	+03 54.7	8.135	8.140	-0.19	+0.2	18.7	86.8
Mar. 8	04 17.27	+03 57.6	8.322	8.154	-0.10	+0.4	18.7	76.9
Mar. 18	04 16.63	+04 01.5	8.502	8.168	-0.02	+0.4	18.8	67.2
Mar. 28	04 16.74	+04 05.9	8.670	8.183	+0.05	+0.4	18.8	57.9

Comet 37P/Forbes

Epoch = 2018 July 21.0 TT
 T = 2018 May 4.12555 TT
 Peri. = 329.98141 e = 0.5341188
 Node = 314.59063 2000.0 a = 3.4564492 AU
 Incl. = 8.95648 n = 0.15337649
 q = 1.6102947 AU P = 6.43 years

$$m1 = 9.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	15 47.71	-26 54.2	2.620	1.987	+2.65	-8.8	17.1	41.1
Jan. 12	16 14.86	-28 16.2	2.502	1.936	+2.79	-7.4	16.8	45.0
Jan. 22	16 43.33	-29 22.7	2.384	1.887	+2.92	-5.7	16.5	48.8
Feb. 1	17 13.02	-30 10.4	2.269	1.841	+3.03	-3.6	16.2	52.4
Feb. 11	17 43.73	-30 36.4	2.156	1.798	+3.12	-1.3	15.9	55.8
Feb. 21	18 15.20	-30 38.1	2.048	1.758	+3.17	+1.3	15.6	59.0
Mar. 3	18 47.04	-30 13.4	1.945	1.722	+3.19	+4.0	15.4	62.1
Mar. 13	19 18.86	-29 21.6	1.848	1.690	+3.16	+6.7	15.1	65.1
Mar. 23	19 50.20	-28 03.0	1.757	1.663	+3.09	+9.3	14.9	68.0
Apr. 2	20 20.65	-26 19.1	1.672	1.641	+2.98	+11.7	14.7	70.8
Apr. 12	20 49.88	-24 12.7	1.593	1.625	+2.84	+13.7	14.5	73.6
Apr. 22	21 17.55	-21 47.5	1.519	1.615	+2.67	+15.4	14.4	76.5
May 2	21 43.45	-19 07.8	1.451	1.610	+2.49	+16.6	14.2	79.6
May 12	22 07.40	-16 18.1	1.387	1.612	+2.28	+17.3	14.1	82.9
May 22	22 29.24	-13 23.1	1.327	1.620	+2.06	+17.6	14.1	86.6
June 1	22 48.79	-10 27.3	1.270	1.634	+1.82	+17.5	14.0	90.6
June 11	23 05.89	-07 34.5	1.216	1.653	+1.57	+16.9	14.0	95.2
June 21	23 20.28	-04 48.9	1.165	1.678	+1.28	+16.0	14.1	100.4
July 1	23 31.69	-02 13.7	1.116	1.707	+0.97	+14.8	14.1	106.3
July 11	23 39.82	+00 07.6	1.072	1.742	+0.62	+13.2	14.2	113.0
July 21	23 44.31	+02 11.3	1.033	1.780	+0.24	+11.3	14.3	120.6
July 31	23 45.01	+03 54.2	1.002	1.822	-0.14	+9.0	14.4	129.2
Aug. 10	23 41.94	+05 12.7	0.981	1.867	-0.50	+6.4	14.5	138.7
Aug. 20	23 35.53	+06 04.1	0.975	1.915	-0.79	+3.6	14.7	148.9
Aug. 30	23 26.82	+06 28.2	0.988	1.965	-0.95	+1.0	14.9	159.3
Sept. 9	23 17.16	+06 28.3	1.021	2.017	-0.96	-1.1	15.2	167.8
Sept. 19	23 08.11	+06 10.8	1.078	2.071	-0.82	-2.4	15.5	168.0
Sept. 29	23 00.97	+05 44.6	1.157	2.126	-0.58	-2.8	15.9	159.9
Oct. 9	22 56.48	+05 17.9	1.259	2.182	-0.29	-2.4	16.2	150.1
Oct. 19	22 54.95	+04 57.2	1.380	2.239	+0.01	-1.6	16.6	140.4
Oct. 29	22 56.28	+04 46.5	1.519	2.297	+0.28	-0.4	17.0	131.1
Nov. 8	23 00.13	+04 47.4	1.672	2.355	+0.51	+0.8	17.4	122.2
Nov. 18	23 06.15	+05 00.6	1.838	2.413	+0.71	+2.0	17.8	113.9
Nov. 28	23 13.95	+05 25.3	2.012	2.472	+0.86	+3.1	18.2	105.9
Dec. 8	23 23.18	+06 00.6	2.193	2.530	+0.99	+4.1	18.6	98.3
Dec. 18	23 33.55	+06 45.2	2.379	2.589	+1.09	+4.9	18.9	90.9
Dec. 28	23 44.82	+07 37.9	2.567	2.647	+1.17	+5.6	19.2	83.7
Jan. 7	23 56.80	+08 37.2	2.755	2.705	+1.23	+6.2	19.6	76.7
Jan. 17	00 09.34	+09 41.9	2.941	2.762	+1.28	+6.7	19.9	69.9
Jan. 27	00 22.30	+10 50.8	3.122	2.819	+1.32	+7.1	20.1	63.2
Feb. 6	00 35.59	+12 02.8	3.298	2.876	+1.34	+7.3	20.4	56.6
Feb. 16	00 49.14	+13 16.9	3.465	2.932	+1.37	+7.5	20.7	50.1
Feb. 26	01 02.86	+14 32.0	3.623	2.987	+1.38	+7.5	20.9	43.7
Mar. 8	01 16.71	+15 47.4	3.771	3.042	+1.39	+7.5	21.1	37.4
Mar. 18	01 30.65	+17 02.4	3.905	3.097	+1.40	+7.4	21.3	31.1
Mar. 28	01 44.61	+18 16.0	4.027	3.151	+1.40	+7.3	21.5	25.0

Comet 143P/Kowal-Mrkos

Epoch = 2018 July 21.0 TT
 T = 2018 May 7.25128 TT
 Peri. = 320.85560 e = 0.4109107
 Node = 245.29989 2000.0 a = 4.2985196 AU
 Incl. = 4.69642 n = 0.11059251
 q = 2.5322119 AU P = 8.91 years

H = 13.4 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	V	Elong.
2018/19	h m	° '			m		°
Jan. 2	12 39.39	-09 28.2	2.512	2.674	+1.03	-7.7	18.6 88.5
Jan. 12	12 49.13	-10 42.0	2.363	2.653	+0.90	-6.9	18.4 96.0
Jan. 22	12 57.45	-11 46.6	2.219	2.634	+0.74	-5.9	18.3 103.8
Feb. 1	13 04.07	-12 40.3	2.081	2.616	+0.56	-4.7	18.1 112.1
Feb. 11	13 08.73	-13 21.3	1.951	2.600	+0.35	-3.3	17.9 120.9
Feb. 21	13 11.19	-13 47.4	1.834	2.585	+0.12	-1.7	17.7 130.2
Mar. 3	13 11.32	-13 57.0	1.733	2.572	-0.11	0.0	17.5 140.0
Mar. 13	13 09.21	-13 49.0	1.650	2.561	-0.33	+1.8	17.2 150.3
Mar. 23	13 05.17	-13 23.6	1.589	2.552	-0.49	+3.4	17.0 161.0
Apr. 2	12 59.84	-12 43.2	1.552	2.544	-0.57	+4.7	16.7 171.1
Apr. 12	12 54.10	-11 52.6	1.541	2.538	-0.56	+5.4	16.7 172.7
Apr. 22	12 48.86	-10 58.2	1.556	2.534	-0.46	+5.4	16.9 163.1
May 2	12 45.00	-10 06.9	1.595	2.532	-0.29	+4.7	17.1 152.6
May 12	12 43.10	-09 24.8	1.656	2.532	-0.07	+3.5	17.3 142.4
May 22	12 43.46	-08 55.8	1.736	2.534	+0.17	+2.1	17.5 132.7
June 1	12 46.16	-08 42.0	1.831	2.538	+0.39	+0.5	17.7 123.7
June 11	12 51.07	-08 43.4	1.938	2.544	+0.61	-0.9	17.9 115.3
June 21	12 58.00	-08 59.1	2.055	2.551	+0.80	-2.3	18.1 107.5
July 1	13 06.72	-09 27.6	2.178	2.560	+0.96	-3.5	18.2 100.1
July 11	13 16.97	-10 06.7	2.307	2.571	+1.10	-4.4	18.4 93.2
July 21	13 28.55	-10 54.5	2.438	2.584	+1.22	-5.2	18.5 86.6
July 31	13 41.27	-11 49.0	2.570	2.599	+1.33	-5.7	18.6 80.2
Aug. 10	13 54.98	-12 48.1	2.703	2.615	+1.42	-6.1	18.7 74.1
Aug. 20	14 09.54	-13 50.2	2.835	2.633	+1.50	-6.3	18.8 68.2
Aug. 30	14 24.84	-14 53.6	2.964	2.652	+1.57	-6.3	18.9 62.4
Sept. 9	14 40.79	-15 56.7	3.089	2.672	+1.63	-6.2	18.9 56.7
Sept. 19	14 57.31	-16 58.2	3.210	2.695	+1.68	-6.0	19.0 51.1
Sept. 29	15 14.32	-17 56.7	3.325	2.718	+1.72	-5.6	19.0 45.4
Oct. 9	15 31.74	-18 51.1	3.434	2.743	+1.76	-5.2	19.1 39.8
Oct. 19	15 49.50	-19 40.5	3.535	2.769	+1.79	-4.6	19.1 34.2
Oct. 29	16 07.53	-20 23.7	3.628	2.796	+1.81	-4.0	19.1 28.5
Nov. 8	16 25.75	-21 00.3	3.711	2.824	+1.83	-3.3	19.1 22.8
Nov. 18	16 44.08	-21 29.5	3.783	2.853	+1.83	-2.5	19.0 17.1
Nov. 28	17 02.41	-21 51.0	3.844	2.883	+1.83	-1.7	19.0 11.3
Dec. 8	17 20.66	-22 04.5	3.893	2.913	+1.82	-0.9	18.9 5.4
Dec. 18	17 38.73	-22 10.0	3.929	2.945	+1.79	-0.1	18.8 1.4
Dec. 28	17 56.51	-22 07.6	3.951	2.977	+1.76	+0.7	19.0 6.9
Jan. 7	18 13.91	-21 57.6	3.961	3.010	+1.72	+1.4	19.2 13.0
Jan. 17	18 30.83	-21 40.4	3.956	3.044	+1.66	+2.1	19.3 19.2
Jan. 27	18 47.15	-21 16.7	3.937	3.078	+1.60	+2.7	19.4 25.6
Feb. 6	19 02.80	-20 47.1	3.905	3.113	+1.52	+3.2	19.5 32.0
Feb. 16	19 17.66	-20 12.7	3.859	3.148	+1.44	+3.7	19.5 38.6
Feb. 26	19 31.64	-19 34.2	3.800	3.183	+1.35	+4.0	19.6 45.3
Mar. 8	19 44.65	-18 52.9	3.730	3.219	+1.24	+4.2	19.6 52.2
Mar. 18	19 56.58	-18 09.8	3.649	3.255	+1.13	+4.4	19.6 59.3
Mar. 28	20 07.32	-17 26.1	3.559	3.292	+1.00	+4.4	19.6 66.5

Comet 253P/PANSTARRS

Epoch = 2018 July 21.0 TT
 T = 2018 May 7.73682 TT
 Peri. = 230.72636 e = 0.4129720
 Node = 146.88164 2000.0 a = 3.4695817 AU
 Incl. = 4.94036 n = 0.15250652
 q = 2.0367416 AU P = 6.46 years

$$m_1 = 9.8 + 5 \log(\Delta) + 22.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	21 13.59	-16 17.2	2.988	2.249	+2.02	+7.8	20.1	34.6
Jan. 12	21 34.01	-14 54.4	3.021	2.219	+2.06	+8.8	20.0	29.5
Jan. 22	21 54.78	-13 21.6	3.047	2.191	+2.09	+9.8	19.9	24.6
Feb. 1	22 15.82	-11 39.6	3.065	2.164	+2.12	+10.7	19.8	19.8
Feb. 11	22 37.06	-09 49.6	3.077	2.140	+2.13	+11.4	19.7	15.2
Feb. 21	22 58.47	-07 52.6	3.081	2.118	+2.15	+12.0	19.6	10.8
Mar. 3	23 20.01	-05 50.1	3.080	2.099	+2.16	+12.5	19.5	6.6
Mar. 13	23 41.67	-03 43.5	3.074	2.082	+2.17	+12.8	19.4	2.7
Mar. 23	00 03.46	-01 34.5	3.062	2.067	+2.18	+13.0	19.3	2.6
Apr. 2	00 25.35	+00 35.3	3.046	2.055	+2.20	+13.0	19.3	6.2
Apr. 12	00 47.37	+02 44.2	3.026	2.046	+2.21	+12.8	19.2	10.1
Apr. 22	01 09.52	+04 50.5	3.002	2.040	+2.22	+12.4	19.2	13.9
May 2	01 31.77	+06 52.4	2.974	2.037	+2.23	+11.9	19.1	17.7
May 12	01 54.13	+08 48.5	2.943	2.037	+2.24	+11.2	19.1	21.5
May 22	02 16.56	+10 37.1	2.908	2.040	+2.25	+10.4	19.1	25.3
June 1	02 39.02	+12 16.8	2.870	2.045	+2.25	+9.4	19.1	29.2
June 11	03 01.45	+13 46.5	2.829	2.054	+2.24	+8.4	19.1	33.1
June 21	03 23.76	+15 05.2	2.784	2.065	+2.22	+7.2	19.1	37.0
July 1	03 45.84	+16 12.1	2.735	2.079	+2.19	+6.0	19.1	41.1
July 11	04 07.58	+17 06.8	2.682	2.096	+2.15	+4.8	19.2	45.4
July 21	04 28.83	+17 49.2	2.624	2.115	+2.09	+3.6	19.2	49.8
July 31	04 49.42	+18 19.5	2.562	2.137	+2.02	+2.4	19.3	54.4
Aug. 10	05 09.20	+18 38.3	2.496	2.161	+1.92	+1.3	19.3	59.2
Aug. 20	05 27.95	+18 46.4	2.425	2.187	+1.81	+0.3	19.4	64.4
Aug. 30	05 45.47	+18 45.1	2.349	2.214	+1.68	-0.6	19.4	69.9
Sept. 9	06 01.56	+18 35.8	2.269	2.244	+1.52	-1.3	19.5	75.7
Sept. 19	06 15.96	+18 20.2	2.186	2.275	+1.34	-1.8	19.5	82.0
Sept. 29	06 28.43	+18 00.4	2.101	2.308	+1.13	-2.1	19.6	88.8
Oct. 9	06 38.68	+17 38.4	2.015	2.343	+0.89	-2.2	19.6	96.1
Oct. 19	06 46.43	+17 16.6	1.930	2.378	+0.63	-2.1	19.7	104.1
Oct. 29	06 51.40	+16 57.2	1.850	2.415	+0.34	-1.7	19.7	112.8
Nov. 8	06 53.36	+16 42.4	1.776	2.452	+0.02	-1.2	19.8	122.2
Nov. 18	06 52.19	+16 34.0	1.714	2.491	-0.29	-0.4	19.9	132.4
Nov. 28	06 48.02	+16 33.1	1.669	2.530	-0.57	+0.3	20.0	143.4
Dec. 8	06 41.26	+16 39.8	1.643	2.570	-0.79	+1.1	20.1	154.9
Dec. 18	06 32.68	+16 53.5	1.643	2.610	-0.92	+1.7	20.3	166.4
Dec. 28	06 23.39	+17 12.6	1.671	2.651	-0.92	+2.1	20.4	173.9
Jan. 7	06 14.54	+17 35.4	1.727	2.692	-0.82	+2.4	20.7	166.1
Jan. 17	06 07.20	+18 00.4	1.811	2.733	-0.62	+2.6	20.9	154.9
Jan. 27	06 02.10	+18 26.3	1.919	2.775	-0.37	+2.6	21.2	143.7
Feb. 6	05 59.57	+18 52.3	2.049	2.817	-0.11	+2.6	21.5	133.1
Feb. 16	05 59.70	+19 17.4	2.197	2.858	+0.15	+2.4	21.8	123.1
Feb. 26	06 02.32	+19 40.9	2.358	2.900	+0.39	+2.2	.	113.7
Mar. 8	06 07.15	+20 01.9	2.528	2.942	+0.59	+1.9	.	104.8
Mar. 18	06 13.91	+20 19.6	2.704	2.984	+0.77	+1.6	.	96.4
Mar. 28	06 22.28	+20 33.4	2.883	3.026	+0.91	+1.1	.	88.5

Comet C/2016 R2 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 May 9.58137 TT
 Peri. = 33.19172
 Node = 80.56960 2000.0
 Incl. = 58.22420
 q = 2.6023351 AU
 e = 0.9962305

$$m1 = 3.7 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	04 22.92	+14 26.0	2.072	2.929	-1.13	+17.8	11.1	144.5
Jan. 12	04 12.57	+17 24.0	2.123	2.883	-0.90	+17.7	11.1	132.8
Jan. 22	04 04.82	+20 18.3	2.199	2.840	-0.62	+17.1	11.1	121.5
Feb. 1	04 00.04	+23 06.0	2.294	2.800	-0.31	+16.4	11.1	110.8
Feb. 11	03 58.30	+25 46.3	2.403	2.763	-0.01	+15.6	11.1	100.8
Feb. 21	03 59.54	+28 19.4	2.518	2.729	+0.28	+15.0	11.2	91.5
Mar. 3	04 03.57	+30 46.2	2.636	2.699	+0.55	+14.4	11.2	82.9
Mar. 13	04 10.19	+33 07.4	2.752	2.673	+0.80	+13.8	11.2	75.0
Mar. 23	04 19.24	+35 23.5	2.864	2.651	+1.03	+13.3	11.3	67.7
Apr. 2	04 30.54	+37 34.8	2.968	2.633	+1.25	+12.9	11.3	61.0
Apr. 12	04 43.99	+39 41.3	3.063	2.619	+1.46	+12.4	11.4	54.9
Apr. 22	04 59.54	+41 42.5	3.149	2.609	+1.67	+11.8	11.4	49.4
May 2	05 17.13	+43 37.8	3.224	2.604	+1.87	+11.2	11.4	44.5
May 12	05 36.75	+45 26.1	3.289	2.602	+2.07	+10.4	11.5	40.3
May 22	05 58.40	+47 06.2	3.344	2.606	+2.28	+9.5	11.5	36.8
June 1	06 22.05	+48 36.6	3.390	2.613	+2.47	+8.4	11.6	34.2
June 11	06 47.64	+49 55.4	3.426	2.625	+2.66	+7.2	11.6	32.3
June 21	07 15.08	+51 00.9	3.455	2.641	+2.84	+5.8	11.7	31.4
July 1	07 44.14	+51 51.4	3.476	2.661	+2.99	+4.2	11.7	31.4
July 11	08 14.56	+52 25.2	3.493	2.685	+3.10	+2.4	11.8	32.0
July 21	08 45.97	+52 41.4	3.504	2.713	+3.18	+0.6	11.8	33.3
July 31	09 17.90	+52 39.6	3.513	2.745	+3.20	-1.2	11.9	35.1
Aug. 10	09 49.89	+52 20.2	3.520	2.780	+3.19	-2.9	12.0	37.2
Aug. 20	10 21.52	+51 44.7	3.525	2.818	+3.13	-4.4	12.1	39.5
Aug. 30	10 52.37	+50 55.0	3.530	2.860	+3.03	-5.7	12.1	41.9
Sept. 9	11 22.17	+49 53.8	3.536	2.905	+2.91	-6.6	12.2	44.5
Sept. 19	11 50.72	+48 44.4	3.543	2.952	+2.78	-7.3	12.3	47.1
Sept. 29	12 17.88	+47 30.0	3.551	3.002	+2.64	-7.6	12.4	49.7
Oct. 9	12 43.63	+46 14.1	3.560	3.054	+2.50	-7.5	12.5	52.4
Oct. 19	13 07.95	+45 00.0	3.569	3.109	+2.35	-7.2	12.6	55.1
Oct. 29	13 30.85	+43 50.6	3.579	3.165	+2.21	-6.6	12.7	57.9
Nov. 8	13 52.37	+42 48.4	3.590	3.224	+2.08	-5.7	12.8	60.7
Nov. 18	14 12.49	+41 56.0	3.599	3.284	+1.94	-4.6	12.9	63.7
Nov. 28	14 31.22	+41 15.0	3.608	3.346	+1.80	-3.4	13.0	66.9
Dec. 8	14 48.55	+40 46.9	3.615	3.409	+1.65	-2.1	13.1	70.1
Dec. 18	15 04.41	+40 32.6	3.620	3.473	+1.50	-0.6	13.3	73.6
Dec. 28	15 18.73	+40 32.5	3.624	3.539	+1.34	+0.8	13.4	77.2
Jan. 7	15 31.41	+40 46.6	3.626	3.606	+1.17	+2.2	13.5	81.1
Jan. 17	15 42.32	+41 14.3	3.626	3.674	+0.99	+3.5	13.6	85.0
Jan. 27	15 51.30	+41 54.3	3.626	3.743	+0.79	+4.6	13.7	89.1
Feb. 6	15 58.20	+42 44.8	3.627	3.813	+0.57	+5.5	13.8	93.3
Feb. 16	16 02.83	+43 43.2	3.630	3.883	+0.33	+6.1	13.9	97.4
Feb. 26	16 05.03	+44 46.0	3.636	3.954	+0.08	+6.4	14.0	101.5
Mar. 8	16 04.68	+45 49.1	3.647	4.026	-0.18	+6.1	14.1	105.4
Mar. 18	16 01.75	+46 47.5	3.667	4.098	-0.43	+5.4	14.2	108.9
Mar. 28	15 56.35	+47 36.0	3.695	4.170	-0.67	+4.1	14.3	111.8

Comet 240P/NEAT

Epoch = 2018 July 21.0 TT
 T = 2018 May 15.85964 TT
 Peri. = 352.09191 e = 0.4489178
 Node = 74.92642 2000.0 a = 3.8719498 AU
 Incl. = 23.50412 n = 0.12936283
 q = 2.1337626 AU P = 7.62 years

$$m_1 = 9.0 + 5 \log(\Delta) + 15.0 \log(r(t-90))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	00 19.52	-18 31.6	2.402	2.371	+1.06	+17.8	17.4	76.3
Jan. 12	00 30.77	-15 31.9	2.482	2.340	+1.20	+18.1	17.4	70.2
Jan. 22	00 43.36	-12 29.8	2.559	2.310	+1.32	+18.3	17.3	64.3
Feb. 1	00 57.09	-09 26.6	2.633	2.282	+1.43	+18.3	17.3	58.7
Feb. 11	01 11.83	-06 23.5	2.704	2.256	+1.53	+18.3	17.3	53.2
Feb. 21	01 27.49	-03 21.7	2.770	2.232	+1.61	+18.1	17.2	48.0
Mar. 3	01 43.96	+00 22.1	2.832	2.211	+1.69	+17.8	17.2	42.9
Mar. 13	02 01.21	+02 34.0	2.888	2.192	+1.77	+17.4	17.1	38.0
Mar. 23	02 19.19	+05 25.6	2.940	2.175	+1.84	+16.9	17.1	33.2
Apr. 2	02 37.87	+08 11.5	2.987	2.162	+1.91	+16.2	17.0	28.5
Apr. 12	02 57.24	+10 50.6	3.028	2.150	+1.97	+15.5	16.9	23.9
Apr. 22	03 17.28	+13 21.9	3.063	2.142	+2.04	+14.6	16.9	19.5
May 2	03 37.96	+15 44.1	3.094	2.137	+2.10	+13.7	16.8	15.1
May 12	03 59.26	+17 56.4	3.118	2.134	+2.16	+12.6	16.8	10.7
May 22	04 21.16	+19 57.8	3.137	2.134	+2.22	+11.5	16.7	6.4
June 1	04 43.58	+21 47.5	3.150	2.138	+2.27	+10.3	16.7	2.1
June 11	05 06.48	+23 24.8	3.158	2.144	+2.31	+9.0	16.6	2.1
June 21	05 29.76	+24 49.3	3.160	2.153	+2.35	+7.7	16.6	6.4
July 1	05 53.33	+26 00.8	3.155	2.164	+2.37	+6.4	16.5	10.7
July 11	06 17.07	+26 59.3	3.145	2.179	+2.38	+5.2	16.5	15.0
July 21	06 40.87	+27 45.2	3.128	2.196	+2.38	+3.9	16.4	19.4
July 31	07 04.56	+28 19.3	3.105	2.216	+2.36	+2.8	16.4	23.9
Aug. 10	07 28.04	+28 42.5	3.076	2.237	+2.33	+1.8	16.4	28.5
Aug. 20	07 51.17	+28 56.1	3.040	2.262	+2.29	+0.9	16.4	33.2
Aug. 30	08 13.80	+29 01.8	2.997	2.288	+2.23	+0.2	16.3	38.0
Sept. 9	08 35.84	+29 01.5	2.948	2.316	+2.17	-0.3	16.3	43.0
Sept. 19	08 57.17	+28 57.2	2.893	2.347	+2.09	-0.6	16.3	48.2
Sept. 29	09 17.66	+28 51.4	2.831	2.378	+2.00	-0.6	16.3	53.6
Oct. 9	09 37.24	+28 46.4	2.764	2.412	+1.90	-0.3	16.3	59.3
Oct. 19	09 55.77	+28 44.9	2.692	2.447	+1.79	+0.2	16.3	65.2
Oct. 29	10 13.14	+28 49.7	2.615	2.483	+1.67	+0.9	16.3	71.4
Nov. 8	10 29.20	+29 03.4	2.535	2.520	+1.53	+2.0	16.3	77.9
Nov. 18	10 43.78	+29 28.6	2.453	2.559	+1.37	+3.3	16.3	84.7
Nov. 28	10 56.67	+30 07.7	2.372	2.598	+1.19	+4.7	16.3	91.9
Dec. 8	11 07.63	+31 02.5	2.292	2.638	+0.98	+6.4	16.3	99.4
Dec. 18	11 16.35	+32 13.9	2.217	2.679	+0.74	+8.0	16.3	107.2
Dec. 28	11 22.54	+33 41.2	2.151	2.721	+0.47	+9.5	16.3	115.3
Jan. 7	11 25.90	+35 21.9	2.096	2.763	+0.17	+10.6	16.3	123.5
Jan. 17	11 26.16	+37 10.8	2.056	2.805	-0.15	+11.1	16.4	131.4
Jan. 27	11 23.30	+39 00.1	2.035	2.848	-0.45	+10.6	16.5	138.5
Feb. 6	11 17.51	+40 40.3	2.036	2.892	-0.72	+9.1	16.6	143.9
Feb. 16	11 09.41	+42 01.4	2.060	2.935	-0.90	+6.7	16.7	146.5
Feb. 26	10 59.99	+42 55.5	2.109	2.979	-0.97	+3.7	16.8	145.6
Mar. 8	10 50.42	+43 18.5	2.181	3.023	-0.92	+0.5	17.0	141.6
Mar. 18	10 41.90	+43 10.2	2.276	3.067	-0.76	-2.4	17.2	135.5
Mar. 28	10 35.29	+42 34.5	2.390	3.110	-0.53	-4.9	17.4	128.4

Comet 66P/du Toit

Epoch = 2018 July 21.0 TT
 T = 2018 May 19.15753 TT
 Peri. = 257.21160
 Node = 21.89568 2000.0
 Incl. = 18.67506
 q = 1.2901175 AU
 e = 0.7868657
 a = 6.0530731 AU
 n = 0.06618205
 P = 14.89 years

$$m1 = 13.8 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	14 29.11	-12 32.4	2.415	2.143	+1.95	-14.8	19.9	62.3
Jan. 12	14 49.13	-15 03.9	2.227	2.055	+2.08	-15.5	19.4	67.1
Jan. 22	15 10.59	-17 42.7	2.042	1.967	+2.24	-16.3	19.0	71.6
Feb. 1	15 33.82	-20 29.5	1.863	1.881	+2.44	-17.2	18.6	75.7
Feb. 11	15 59.32	-23 25.2	1.692	1.796	+2.70	-18.0	18.1	79.5
Feb. 21	16 27.69	-26 29.1	1.532	1.715	+3.02	-18.8	17.7	82.7
Mar. 3	16 59.72	-29 38.7	1.386	1.636	+3.44	-19.1	17.2	85.3
Mar. 13	17 36.34	-32 47.7	1.256	1.563	+3.95	-18.5	16.7	87.2
Mar. 23	18 18.38	-35 44.1	1.144	1.495	+4.52	-16.3	16.3	88.3
Apr. 2	19 06.19	-38 08.8	1.054	1.434	+5.08	-11.8	15.9	88.6
Apr. 12	19 58.96	-39 38.9	0.985	1.382	+5.46	-5.2	15.5	88.1
Apr. 22	20 54.09	-39 55.3	0.937	1.340	+5.50	+2.8	15.2	87.2
May 2	21 47.85	-38 53.0	0.910	1.310	+5.16	+10.2	15.1	86.1
May 12	22 36.86	-36 44.9	0.898	1.294	+4.55	+15.5	15.0	85.2
May 22	23 19.21	-33 55.3	0.897	1.291	+3.84	+18.3	14.9	84.9
June 1	23 54.53	-30 48.1	0.903	1.302	+3.16	+18.9	15.0	85.3
June 11	00 23.36	-27 42.0	0.911	1.326	+2.55	+18.0	15.1	86.8
June 21	00 46.30	-24 49.1	0.918	1.363	+1.99	+16.3	15.3	89.4
July 1	01 03.91	-22 15.7	0.923	1.410	+1.48	+14.1	15.5	93.2
July 11	01 16.54	-20 04.5	0.924	1.468	+0.99	+11.9	15.7	98.2
July 21	01 24.21	-18 15.8	0.922	1.533	+0.49	+9.7	15.9	104.4
July 31	01 26.91	-16 47.4	0.918	1.604	0.00	+7.9	16.2	112.0
Aug. 10	01 24.61	-15 35.7	0.917	1.680	-0.50	+6.4	16.4	120.9
Aug. 20	01 17.44	-14 35.4	0.922	1.761	-0.96	+5.7	16.7	131.0
Aug. 30	01 06.12	-13 39.6	0.940	1.844	-1.32	+5.6	17.0	142.1
Sept. 9	00 51.91	-12 42.1	0.975	1.930	-1.51	+6.0	17.3	153.5
Sept. 19	00 36.62	-11 38.3	1.033	2.017	-1.51	+6.8	17.7	163.7
Sept. 29	00 22.18	-10 26.4	1.116	2.105	-1.34	+7.6	18.1	167.3
Oct. 9	00 10.06	-09 08.0	1.225	2.193	-1.05	+8.1	18.5	160.9
Oct. 19	00 01.10	-07 45.0	1.359	2.282	-0.71	+8.5	18.9	151.0
Oct. 29	23 55.54	-06 19.5	1.517	2.372	-0.38	+8.6	19.4	140.9
Nov. 8	23 53.14	-04 53.0	1.693	2.461	-0.08	+8.7	19.8	131.1
Nov. 18	23 53.52	-03 26.0	1.886	2.549	+0.17	+8.7	20.3	121.8
Nov. 28	23 56.24	-01 58.8	2.092	2.638	+0.38	+8.7	20.7	112.9
Dec. 8	00 00.84	+00 31.4	2.308	2.725	+0.55	+8.7	21.1	104.4
Dec. 18	00 06.99	+00 56.2	2.530	2.812	+0.69	+8.8	21.4	96.2
Dec. 28	00 14.35	+02 23.8	2.756	2.899	+0.79	+8.8	21.8	88.3
Jan. 7	00 22.68	+03 51.4	2.983	2.984	+0.88	+8.8	.	80.6
Jan. 17	00 31.78	+05 18.8	3.208	3.069	+0.94	+8.7	.	73.1
Jan. 27	00 41.46	+06 45.7	3.428	3.154	+1.00	+8.7	.	65.7
Feb. 6	00 51.61	+08 11.8	3.642	3.237	+1.04	+8.6	.	58.5
Feb. 16	01 02.11	+09 37.0	3.846	3.319	+1.06	+8.4	.	51.3
Feb. 26	01 12.85	+11 00.8	4.040	3.401	+1.09	+8.3	.	44.2
Mar. 8	01 23.77	+12 22.9	4.220	3.482	+1.10	+8.1	.	37.2
Mar. 18	01 34.79	+13 43.1	4.386	3.562	+1.10	+7.9	.	30.3
Mar. 28	01 45.84	+15 01.1	4.535	3.641	+1.10	+7.7	.	23.5

Comet 159P/LONEOS

Epoch = 2018 July 21.0 TT
 T = 2018 May 22.76067 TT
 Peri. = 4.75568 e = 0.3815979
 Node = 55.02418 2000.0 a = 5.8621976 AU
 Incl. = 23.46271 n = 0.06944059
 q = 3.6251953 AU P = 14.19 years

$$m_1 = 0.8 + 5 \log(\Delta) + 25.0 \log(r(t-330))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	01 36.00	+01 27.4	3.387	3.709	+0.21	+7.8	19.5	101.4
Jan. 12	01 38.87	+02 47.2	3.523	3.697	+0.37	+8.2	19.6	92.4
Jan. 22	01 43.28	+04 11.5	3.660	3.687	+0.52	+8.6	19.6	83.8
Feb. 1	01 49.08	+05 38.9	3.796	3.677	+0.65	+8.9	19.6	75.6
Feb. 11	01 56.11	+07 08.5	3.929	3.668	+0.76	+9.0	19.6	67.6
Feb. 21	02 04.23	+08 39.4	4.054	3.660	+0.87	+9.1	19.6	59.9
Mar. 3	02 13.30	+10 10.7	4.171	3.653	+0.95	+9.1	19.6	52.5
Mar. 13	02 23.20	+11 41.9	4.277	3.647	+1.03	+9.1	19.6	45.3
Mar. 23	02 33.83	+13 12.1	4.371	3.641	+1.10	+9.0	19.6	38.3
Apr. 2	02 45.09	+14 40.9	4.452	3.636	+1.16	+8.8	19.5	31.4
Apr. 12	02 56.90	+16 07.8	4.519	3.632	+1.21	+8.6	19.5	24.7
Apr. 22	03 09.18	+17 32.2	4.571	3.629	+1.25	+8.3	19.5	18.1
May 2	03 21.85	+18 53.9	4.608	3.627	+1.29	+8.0	19.4	11.7
May 12	03 34.86	+20 12.4	4.630	3.626	+1.32	+7.7	19.4	5.4
May 22	03 48.13	+21 27.7	4.637	3.625	+1.34	+7.3	19.3	1.8
June 1	04 01.60	+22 39.3	4.628	3.626	+1.35	+7.0	19.2	7.6
June 11	04 15.19	+23 47.4	4.604	3.627	+1.36	+6.6	19.2	13.9
June 21	04 28.83	+24 51.9	4.566	3.629	+1.36	+6.3	19.1	20.2
July 1	04 42.44	+25 53.0	4.513	3.632	+1.36	+5.9	19.0	26.5
July 11	04 55.93	+26 50.8	4.446	3.636	+1.34	+5.6	18.9	32.9
July 21	05 09.20	+27 45.9	4.367	3.640	+1.31	+5.4	18.8	39.5
July 31	05 22.14	+28 38.6	4.275	3.646	+1.27	+5.2	18.7	46.1
Aug. 10	05 34.64	+29 29.6	4.173	3.652	+1.22	+5.0	18.6	52.9
Aug. 20	05 46.55	+30 19.8	4.061	3.659	+1.15	+5.0	18.5	59.9
Aug. 30	05 57.72	+31 09.9	3.941	3.667	+1.07	+5.1	18.4	67.0
Sept. 9	06 07.99	+32 01.2	3.815	3.676	+0.97	+5.2	18.3	74.5
Sept. 19	06 17.14	+32 54.5	3.684	3.685	+0.85	+5.5	18.1	82.2
Sept. 29	06 24.97	+33 51.0	3.552	3.696	+0.70	+5.9	18.0	90.3
Oct. 9	06 31.24	+34 51.4	3.422	3.707	+0.53	+6.3	17.9	98.7
Oct. 19	06 35.71	+35 56.3	3.296	3.719	+0.34	+6.7	17.8	107.4
Oct. 29	06 38.15	+37 05.5	3.180	3.731	+0.12	+7.1	17.7	116.6
Nov. 8	06 38.36	+38 17.9	3.075	3.744	-0.11	+7.3	17.5	126.0
Nov. 18	06 36.23	+39 31.3	2.988	3.759	-0.34	+7.3	17.4	135.6
Nov. 28	06 31.84	+40 42.4	2.923	3.773	-0.56	+6.8	17.4	145.0
Dec. 8	06 25.44	+41 47.1	2.882	3.789	-0.73	+6.0	17.3	153.5
Dec. 18	06 17.59	+42 41.2	2.868	3.805	-0.84	+4.7	17.3	159.3
Dec. 28	06 09.08	+43 21.6	2.884	3.821	-0.85	+3.2	17.2	159.6
Jan. 7	06 00.81	+43 46.8	2.929	3.839	-0.78	+1.7	17.2	154.4
Jan. 17	05 53.65	+43 57.6	3.001	3.857	-0.62	+0.4	17.3	146.1
Jan. 27	05 48.31	+43 56.4	3.097	3.875	-0.42	-0.7	17.3	136.9
Feb. 6	05 45.19	+43 46.4	3.215	3.894	-0.18	-1.4	17.4	127.5
Feb. 16	05 44.50	+43 30.7	3.349	3.914	+0.06	-1.8	17.5	118.2
Feb. 26	05 46.19	+43 11.8	3.496	3.934	+0.29	-2.0	17.5	109.2
Mar. 8	05 50.10	+42 51.6	3.651	3.955	+0.51	-2.1	17.6	100.6
Mar. 18	05 56.02	+42 30.9	3.811	3.976	+0.69	-2.1	17.7	92.3
Mar. 28	06 03.68	+42 10.3	3.972	3.998	+0.85	-2.1	17.8	84.3

Comet 107P/(4015) Wilson-Harrington

Epoch = 2018 July 21.0 TT
 T = 2018 May 23.52679 TT
 Peri. = 95.40694 e = 0.6308007
 Node = 266.81519 2000.0 a = 2.6269730 AU
 Incl. = 2.79809 n = 0.23148383
 q = 0.9698766 AU P = 4.26 years

H = 15.8 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		V	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	17 32.72	-23 40.8	2.860	1.945	+2.54	-0.9	20.1	17.5
Jan. 12	17 58.74	-23 43.0	2.739	1.862	+2.68	+0.7	20.0	21.8
Jan. 22	18 26.25	-23 27.4	2.613	1.778	+2.84	+2.7	19.9	25.6
Feb. 1	18 55.30	-22 50.9	2.484	1.692	+2.99	+4.9	19.8	29.1
Feb. 11	19 25.94	-21 50.1	2.355	1.606	+3.15	+7.6	19.7	32.1
Feb. 21	19 58.18	-20 21.4	2.228	1.520	+3.31	+10.5	19.5	34.5
Mar. 3	20 32.02	-18 21.6	2.107	1.434	+3.47	+13.8	19.3	36.3
Mar. 13	21 07.46	-15 47.8	1.995	1.350	+3.63	+17.3	19.2	37.5
Mar. 23	21 44.47	-12 38.7	1.897	1.269	+3.78	+20.8	19.0	38.0
Apr. 2	22 22.96	-08 55.5	1.814	1.192	+3.93	+24.1	18.8	37.7
Apr. 12	23 02.87	-04 42.6	1.751	1.122	+4.07	+26.6	18.6	36.8
Apr. 22	23 44.10	+00 08.8	1.709	1.062	+4.19	+28.1	18.5	35.3
May 2	00 26.48	+04 33.2	1.689	1.014	+4.29	+28.1	18.4	33.5
May 12	01 09.81	+09 08.3	1.691	0.983	+4.37	+26.5	18.3	31.4
May 22	01 53.75	+13 21.1	1.713	0.970	+4.41	+23.5	18.2	29.5
June 1	02 37.81	+16 58.5	1.750	0.977	+4.39	+19.4	18.2	27.9
June 11	03 21.41	+19 51.9	1.800	1.003	+4.31	+14.8	18.3	26.7
June 21	04 03.83	+21 58.1	1.857	1.046	+4.15	+10.0	18.4	26.1
July 1	04 44.43	+23 18.2	1.919	1.102	+3.94	+5.6	18.6	26.2
July 11	05 22.71	+23 57.1	1.981	1.170	+3.69	+1.9	18.7	26.9
July 21	05 58.33	+24 01.3	2.041	1.245	+3.41	-1.2	18.9	28.3
July 31	06 31.14	+23 37.7	2.097	1.325	+3.13	-3.6	19.1	30.4
Aug. 10	07 01.17	+22 52.9	2.145	1.408	+2.85	-5.4	19.3	33.0
Aug. 20	07 28.51	+21 52.8	2.185	1.493	+2.59	-6.7	19.5	36.2
Aug. 30	07 53.31	+20 42.1	2.214	1.580	+2.35	-7.5	19.6	40.0
Sept. 9	08 15.72	+19 24.8	2.232	1.666	+2.12	-8.0	19.8	44.3
Sept. 19	08 35.87	+18 04.3	2.237	1.751	+1.89	-8.1	19.9	49.0
Sept. 29	08 53.86	+16 43.4	2.230	1.836	+1.68	-8.0	20.1	54.3
Oct. 9	09 09.74	+15 24.5	2.210	1.920	+1.47	-7.7	20.1	60.2
Oct. 19	09 23.50	+14 09.9	2.178	2.002	+1.26	-7.1	20.2	66.5
Oct. 29	09 35.08	+13 01.7	2.135	2.082	+1.03	-6.4	20.3	73.4
Nov. 8	09 44.36	+12 02.0	2.082	2.161	+0.79	-5.4	20.3	81.0
Nov. 18	09 51.16	+11 13.0	2.022	2.239	+0.53	-4.2	20.3	89.2
Nov. 28	09 55.26	+10 36.7	1.958	2.314	+0.25	-2.9	20.2	98.1
Dec. 8	09 56.43	+10 15.1	1.894	2.388	-0.05	-1.3	20.2	107.9
Dec. 18	09 54.48	+10 09.9	1.834	2.460	-0.37	+0.4	20.1	118.5
Dec. 28	09 49.36	+10 21.6	1.785	2.530	-0.68	+2.1	20.0	129.9
Jan. 7	09 41.26	+10 49.4	1.752	2.599	-0.96	+3.6	19.9	142.1
Jan. 17	09 30.73	+11 30.3	1.742	2.666	-1.15	+4.6	19.7	154.8
Jan. 27	09 18.72	+12 19.6	1.760	2.731	-1.24	+5.2	19.6	167.8
Feb. 6	09 06.39	+13 11.4	1.809	2.794	-1.20	+5.1	19.5	176.4
Feb. 16	08 54.99	+14 00.1	1.890	2.856	-1.05	+4.5	19.9	165.1
Feb. 26	08 45.49	+14 41.7	2.000	2.916	-0.82	+3.7	20.2	152.8
Mar. 8	08 38.49	+15 14.1	2.137	2.975	-0.55	+2.7	20.5	141.1
Mar. 18	08 34.21	+15 36.8	2.294	3.032	-0.28	+1.7	20.8	130.0
Mar. 28	08 32.57	+15 50.0	2.469	3.087	-0.03	+0.8	21.1	119.7

Comet 187P/LINEAR

Epoch = 2018 July 21.0 TT
 T = 2018 May 26.13005 TT
 Peri. = 133.20633 e = 0.1556759
 Node = 109.96061 2000.0 a = 4.5961502 AU
 Incl. = 13.60707 n = 0.10002597
 q = 3.8806404 AU P = 9.85 years

$$m_1 = -1.0 + 5 \log(\Delta) + 30.0 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	15 39.83	-08 26.4	4.508	3.912	+1.07	-2.9	20.1	47.6
Jan. 12	15 50.28	-08 52.1	4.390	3.908	+1.01	-2.2	20.0	54.9
Jan. 22	16 00.10	-09 11.4	4.261	3.904	+0.94	-1.6	19.9	62.4
Feb. 1	16 09.15	-09 24.2	4.123	3.900	+0.86	-0.9	19.8	70.1
Feb. 11	16 17.25	-09 30.8	3.979	3.897	+0.75	-0.3	19.8	78.1
Feb. 21	16 24.25	-09 31.6	3.831	3.894	+0.63	+0.2	19.7	86.3
Mar. 3	16 29.98	-09 27.1	3.682	3.891	+0.50	+0.7	19.6	94.7
Mar. 13	16 34.26	-09 17.9	3.536	3.889	+0.34	+1.1	19.5	103.5
Mar. 23	16 36.96	-09 05.0	3.395	3.887	+0.18	+1.5	19.4	112.5
Apr. 2	16 37.96	-08 49.6	3.264	3.885	0.00	+1.6	19.3	121.8
Apr. 12	16 37.22	-08 33.0	3.147	3.884	-0.17	+1.7	19.2	131.4
Apr. 22	16 34.78	-08 16.8	3.048	3.882	-0.33	+1.5	19.1	141.2
May 2	16 30.82	-08 02.7	2.970	3.882	-0.47	+1.2	19.0	150.9
May 12	16 25.63	-07 52.6	2.917	3.881	-0.57	+0.7	19.0	159.9
May 22	16 19.63	-07 48.1	2.891	3.881	-0.62	+0.1	19.0	166.1
June 1	16 13.35	-07 50.5	2.892	3.881	-0.62	-0.7	19.0	165.0
June 11	16 07.32	-08 00.7	2.922	3.881	-0.57	-1.5	19.0	157.8
June 21	16 02.05	-08 18.9	2.978	3.882	-0.47	-2.3	19.0	148.6
July 1	15 57.94	-08 44.8	3.058	3.883	-0.33	-3.0	19.1	138.9
July 11	15 55.28	-09 17.8	3.158	3.884	-0.18	-3.6	19.2	129.4
July 21	15 54.23	-09 56.7	3.276	3.885	-0.01	-4.2	19.2	120.1
July 31	15 54.83	-10 40.4	3.406	3.887	+0.15	-4.6	19.3	111.0
Aug. 10	15 57.05	-11 27.6	3.545	3.889	+0.31	-4.9	19.4	102.3
Aug. 20	16 00.83	-12 17.3	3.690	3.892	+0.46	-5.1	19.5	93.9
Aug. 30	16 06.02	-13 08.1	3.837	3.895	+0.59	-5.1	19.6	85.8
Sept. 9	16 12.53	-13 59.2	3.983	3.898	+0.72	-5.1	19.7	77.8
Sept. 19	16 20.21	-14 49.6	4.126	3.901	+0.83	-5.0	19.8	70.1
Sept. 29	16 28.94	-15 38.4	4.263	3.905	+0.93	-4.8	19.9	62.6
Oct. 9	16 38.59	-16 24.8	4.391	3.909	+1.01	-4.5	19.9	55.2
Oct. 19	16 49.06	-17 08.3	4.510	3.913	+1.09	-4.2	20.0	47.9
Oct. 29	17 00.22	-17 48.1	4.616	3.917	+1.15	-3.8	20.1	40.7
Nov. 8	17 11.97	-18 23.9	4.709	3.922	+1.20	-3.3	20.1	33.6
Nov. 18	17 24.20	-18 55.2	4.787	3.927	+1.25	-2.9	20.2	26.5
Nov. 28	17 36.81	-19 21.6	4.849	3.932	+1.28	-2.4	20.2	19.5
Dec. 8	17 49.70	-19 43.2	4.894	3.938	+1.30	-1.9	20.3	12.5
Dec. 18	18 02.76	-19 59.7	4.921	3.944	+1.31	-1.4	20.3	6.0
Dec. 28	18 15.88	-20 11.2	4.930	3.950	+1.31	-0.9	20.3	3.9
Jan. 7	18 28.97	-20 17.9	4.922	3.956	+1.30	-0.4	20.3	9.8
Jan. 17	18 41.92	-20 20.2	4.895	3.963	+1.28	0.0	20.3	16.7
Jan. 27	18 54.63	-20 18.4	4.851	3.970	+1.25	+0.4	20.3	23.8
Feb. 6	19 06.99	-20 13.1	4.789	3.977	+1.21	+0.7	20.3	31.0
Feb. 16	19 18.90	-20 05.1	4.712	3.984	+1.16	+0.9	20.3	38.3
Feb. 26	19 30.25	-19 55.0	4.620	3.992	+1.10	+1.1	20.3	45.7
Mar. 8	19 40.93	-19 43.9	4.514	4.000	+1.03	+1.1	20.3	53.2
Mar. 18	19 50.84	-19 32.7	4.397	4.008	+0.94	+1.1	20.2	60.9
Mar. 28	19 59.85	-19 22.4	4.270	4.016	+0.85	+0.9	20.2	68.7

Comet 357P/Hill

Epoch = 2018 July 21.0 TT
 T = 2018 May 28.94641 TT
 Peri. = 1.52145 e = 0.4342974
 Node = 44.60908 2000.0 a = 4.4661306 AU
 Incl. = 6.30859 n = 0.10442559
 q = 2.5265017 AU P = 9.44 years

$$m_1 = 9.6 + 5 \log(\Delta) + 17.5 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	23 15.00	-08 47.8	2.995	2.729	+1.23	+10.0	19.8	65.0
Jan. 12	23 27.69	-07 05.5	3.087	2.704	+1.32	+10.5	19.8	58.4
Jan. 22	23 41.27	-05 17.8	3.171	2.680	+1.40	+11.0	19.8	52.0
Feb. 1	23 55.60	-03 25.7	3.248	2.658	+1.47	+11.4	19.8	45.9
Feb. 11	00 10.59	-01 30.0	3.317	2.637	+1.53	+11.7	19.8	39.9
Feb. 21	00 26.16	+00 28.3	3.376	2.618	+1.59	+11.9	19.7	34.2
Mar. 3	00 42.25	+02 28.2	3.427	2.601	+1.63	+12.0	19.7	28.6
Mar. 13	00 58.80	+04 28.6	3.468	2.585	+1.68	+12.0	19.7	23.2
Mar. 23	01 15.80	+06 28.6	3.501	2.571	+1.72	+11.9	19.6	17.9
Apr. 2	01 33.20	+08 27.2	3.524	2.559	+1.76	+11.7	19.6	12.8
Apr. 12	01 50.98	+10 23.2	3.538	2.549	+1.80	+11.4	19.6	7.7
Apr. 22	02 09.12	+12 15.7	3.544	2.540	+1.83	+11.0	19.5	2.8
May 2	02 27.59	+14 03.6	3.540	2.534	+1.86	+10.5	19.5	2.2
May 12	02 46.36	+15 46.2	3.529	2.529	+1.89	+9.9	19.4	7.0
May 22	03 05.41	+17 22.4	3.509	2.527	+1.92	+9.2	19.4	11.8
June 1	03 24.66	+18 51.5	3.481	2.527	+1.94	+8.5	19.4	16.6
June 11	03 44.08	+20 12.9	3.446	2.528	+1.95	+7.7	19.3	21.4
June 21	04 03.58	+21 26.1	3.403	2.532	+1.95	+6.8	19.3	26.3
July 1	04 23.08	+22 30.6	3.352	2.537	+1.95	+6.0	19.3	31.2
July 11	04 42.48	+23 26.4	3.294	2.545	+1.93	+5.1	19.2	36.2
July 21	05 01.65	+24 13.5	3.229	2.555	+1.90	+4.2	19.2	41.3
July 31	05 20.47	+24 52.2	3.157	2.566	+1.86	+3.4	19.2	46.5
Aug. 10	05 38.79	+25 23.2	3.078	2.579	+1.80	+2.7	19.1	51.9
Aug. 20	05 56.45	+25 47.2	2.993	2.594	+1.72	+2.1	19.1	57.5
Aug. 30	06 13.27	+26 05.3	2.902	2.611	+1.63	+1.5	19.1	63.4
Sept. 9	06 29.07	+26 18.9	2.807	2.630	+1.52	+1.2	19.0	69.5
Sept. 19	06 43.64	+26 29.5	2.707	2.650	+1.38	+1.0	19.0	76.0
Sept. 29	06 56.76	+26 38.9	2.604	2.671	+1.22	+0.9	19.0	82.9
Oct. 9	07 08.19	+26 48.9	2.499	2.695	+1.04	+1.1	18.9	90.2
Oct. 19	07 17.64	+27 01.5	2.395	2.719	+0.83	+1.5	18.9	98.0
Oct. 29	07 24.86	+27 18.3	2.295	2.745	+0.59	+2.0	18.9	106.3
Nov. 8	07 29.58	+27 40.6	2.200	2.772	+0.32	+2.6	18.8	115.3
Nov. 18	07 31.56	+28 08.8	2.115	2.800	+0.04	+3.1	18.8	124.9
Nov. 28	07 30.71	+28 42.2	2.044	2.830	-0.24	+3.6	18.8	135.1
Dec. 8	07 27.08	+29 18.8	1.991	2.860	-0.50	+3.7	18.8	145.8
Dec. 18	07 21.05	+29 55.0	1.961	2.892	-0.71	+3.4	18.9	156.9
Dec. 28	07 13.31	+30 26.8	1.957	2.924	-0.83	+2.8	19.0	167.2
Jan. 7	07 04.82	+30 50.6	1.981	2.957	-0.85	+1.8	19.1	171.5
Jan. 17	06 56.68	+31 04.3	2.034	2.991	-0.75	+0.8	19.2	163.7
Jan. 27	06 49.90	+31 07.8	2.115	3.026	-0.58	-0.2	19.4	153.1
Feb. 6	06 45.16	+31 02.6	2.220	3.061	-0.34	-0.9	19.6	142.4
Feb. 16	06 42.88	+30 50.7	2.347	3.097	-0.09	-1.5	19.8	132.0
Feb. 26	06 43.13	+30 34.2	2.491	3.133	+0.16	-1.8	20.0	122.2
Mar. 8	06 45.79	+30 14.4	2.649	3.170	+0.39	-2.1	20.2	112.9
Mar. 18	06 50.62	+29 52.1	2.816	3.207	+0.59	-2.3	20.4	104.1
Mar. 28	06 57.31	+29 27.7	2.990	3.245	+0.76	-2.6	20.7	95.7

Comet 164P/Christensen

Epoch = 2018 July 21.0 TT
 T = 2018 May 31.40558 TT
 Peri. = 325.92901 e = 0.5397275
 Node = 88.30564 2000.0 a = 3.6614125 AU
 Incl. = 16.25288 n = 0.14067958
 q = 1.6852475 AU P = 7.01 years

$$m_1 = 14.0 + 5 \log(\Delta) + 7.5 \log(r(t-200))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	22 08.35	-24 45.9	2.758	2.182	+1.91	+11.7	20.1	45.3
Jan. 12	22 27.81	-22 43.9	2.780	2.128	+1.99	+12.8	20.1	40.4
Jan. 22	22 47.98	-20 31.7	2.795	2.077	+2.05	+13.8	20.0	35.7
Feb. 1	23 08.76	-18 09.6	2.802	2.026	+2.11	+14.7	20.0	31.3
Feb. 11	23 30.10	-15 38.2	2.803	1.978	+2.16	+15.6	19.9	27.3
Feb. 21	23 51.97	-12 58.5	2.798	1.932	+2.21	+16.4	19.8	23.5
Mar. 3	00 14.34	-10 11.6	2.789	1.889	+2.26	+17.0	19.8	20.1
Mar. 13	00 37.22	-07 19.0	2.777	1.849	+2.32	+17.5	19.7	17.0
Mar. 23	01 00.64	-04 22.4	2.762	1.813	+2.37	+17.8	19.6	14.2
Apr. 2	01 24.60	-01 23.8	2.746	1.780	+2.43	+17.9	19.6	11.9
Apr. 12	01 49.13	+01 34.6	2.731	1.752	+2.49	+17.7	19.5	9.9
Apr. 22	02 14.27	+04 30.2	2.715	1.728	+2.55	+17.3	19.4	8.6
May 2	02 40.02	+07 20.5	2.702	1.709	+2.61	+16.6	19.3	8.0
May 12	03 06.38	+10 02.7	2.690	1.696	+2.67	+15.7	19.2	8.2
May 22	03 33.34	+12 34.2	2.679	1.688	+2.73	+14.5	19.1	9.1
June 1	04 00.81	+14 52.4	2.671	1.685	+2.77	+13.0	19.1	10.7
June 11	04 28.73	+16 55.3	2.665	1.688	+2.81	+11.4	19.0	12.6
June 21	04 56.96	+18 41.1	2.659	1.697	+2.83	+9.6	18.9	14.8
July 1	05 25.33	+20 08.7	2.655	1.711	+2.84	+7.7	18.8	17.3
July 11	05 53.68	+21 17.5	2.651	1.731	+2.83	+5.9	18.7	20.0
July 21	06 21.79	+22 07.7	2.645	1.755	+2.79	+4.0	18.7	22.9
July 31	06 49.44	+22 40.2	2.638	1.784	+2.73	+2.3	18.6	26.1
Aug. 10	07 16.47	+22 56.5	2.629	1.817	+2.66	+0.8	18.5	29.5
Aug. 20	07 42.69	+22 58.6	2.616	1.854	+2.57	-0.5	18.4	33.2
Aug. 30	08 07.94	+22 48.7	2.598	1.894	+2.47	-1.5	18.3	37.2
Sept. 9	08 32.12	+22 29.6	2.575	1.938	+2.35	-2.3	18.2	41.4
Sept. 19	08 55.12	+22 04.1	2.547	1.984	+2.23	-2.8	18.1	45.9
Sept. 29	09 16.85	+21 35.1	2.512	2.032	+2.10	-3.0	18.0	50.7
Oct. 9	09 37.27	+21 05.5	2.471	2.082	+1.97	-2.9	17.9	55.9
Oct. 19	09 56.28	+20 38.5	2.422	2.135	+1.82	-2.4	17.8	61.5
Oct. 29	10 13.79	+20 17.0	2.367	2.188	+1.67	-1.7	17.7	67.4
Nov. 8	10 29.71	+20 03.8	2.307	2.243	+1.50	-0.7	17.6	73.8
Nov. 18	10 43.88	+20 01.9	2.241	2.298	+1.31	+0.5	17.5	80.7
Nov. 28	10 56.13	+20 14.0	2.172	2.355	+1.11	+2.1	17.4	88.0
Dec. 8	11 06.26	+20 42.4	2.102	2.411	+0.88	+3.8	17.3	95.9
Dec. 18	11 13.98	+21 28.8	2.034	2.469	+0.63	+5.7	17.2	104.3
Dec. 28	11 19.07	+22 33.7	1.970	2.526	+0.35	+7.5	17.2	113.3
Jan. 7	11 21.25	+23 55.7	1.916	2.584	+0.05	+9.0	17.1	122.7
Jan. 17	11 20.38	+25 31.3	1.876	2.641	-0.25	+10.1	17.1	132.5
Jan. 27	11 16.52	+27 13.8	1.853	2.699	-0.54	+10.3	17.1	142.1
Feb. 6	11 09.98	+28 54.3	1.853	2.756	-0.78	+9.6	17.2	150.8
Feb. 16	11 01.45	+30 22.8	1.879	2.814	-0.92	+7.8	17.3	156.6
Feb. 26	10 51.95	+31 30.6	1.932	2.870	-0.96	+5.4	17.4	157.1
Mar. 8	10 42.60	+32 12.8	2.013	2.927	-0.88	+2.7	17.5	152.1
Mar. 18	10 34.45	+32 27.9	2.118	2.983	-0.72	+0.1	17.7	144.3
Mar. 28	10 28.24	+32 18.6	2.246	3.039	-0.50	-2.1	17.9	135.4

Comet C/2017 M5 (TOTAS)

Epoch = 2018 July 21.0 TT
 T = 2018 June 2.79909 TT
 Peri. = 92.63813
 Node = 216.26599 2000.0
 Incl. = 15.88525
 q = 5.9900747 AU
 e = 1.0036205

$$m_1 = 6.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	19 27.66	-08 18.9	7.016	6.084	+0.88	+1.9	18.9	17.3
Jan. 12	19 36.48	-07 57.5	7.023	6.073	+0.88	+2.4	18.9	13.8
Jan. 22	19 45.31	-07 31.8	7.010	6.061	+0.88	+2.8	18.9	14.3
Feb. 1	19 54.04	-07 02.1	6.978	6.051	+0.87	+3.2	18.8	18.5
Feb. 11	20 02.61	-06 28.8	6.926	6.042	+0.84	+3.5	18.8	24.5
Feb. 21	20 10.91	-05 52.1	6.855	6.033	+0.81	+3.8	18.8	31.4
Mar. 3	20 18.86	-05 12.6	6.768	6.025	+0.77	+4.1	18.8	38.6
Mar. 13	20 26.39	-04 30.8	6.665	6.018	+0.73	+4.3	18.7	46.1
Mar. 23	20 33.40	-03 47.4	6.547	6.011	+0.67	+4.4	18.7	53.7
Apr. 2	20 39.81	-03 02.9	6.419	6.006	+0.61	+4.5	18.6	61.5
Apr. 12	20 45.56	-02 18.1	6.280	6.001	+0.53	+4.5	18.6	69.4
Apr. 22	20 50.55	-01 33.9	6.136	5.997	+0.46	+4.4	18.5	77.4
May 2	20 54.72	+00 51.0	5.987	5.994	+0.37	+4.2	18.5	85.6
May 12	20 58.02	+00 10.4	5.838	5.992	+0.28	+3.9	18.4	93.9
May 22	21 00.38	+00 26.9	5.692	5.991	+0.18	+3.5	18.4	102.4
June 1	21 01.79	+01 00.0	5.552	5.990	+0.09	+3.0	18.3	111.0
June 11	21 02.23	+01 27.8	5.422	5.990	-0.01	+2.5	18.2	119.7
June 21	21 01.75	+01 49.5	5.306	5.991	-0.10	+1.8	18.2	128.5
July 1	21 00.42	+02 04.1	5.207	5.993	-0.18	+1.1	18.2	137.3
July 11	20 58.37	+02 11.3	5.128	5.996	-0.24	+0.3	18.1	145.8
July 21	20 55.76	+02 10.8	5.073	6.000	-0.28	-0.5	18.1	153.5
July 31	20 52.82	+02 02.8	5.044	6.004	-0.30	-1.2	18.1	159.3
Aug. 10	20 49.79	+01 47.9	5.041	6.009	-0.30	-1.8	18.1	161.1
Aug. 20	20 46.93	+01 27.2	5.066	6.015	-0.27	-2.3	18.1	157.9
Aug. 30	20 44.49	+01 02.2	5.117	6.022	-0.21	-2.7	18.1	151.3
Sept. 9	20 42.67	+00 34.4	5.194	6.030	-0.14	-2.9	18.2	143.1
Sept. 19	20 41.66	+00 05.6	5.294	6.038	-0.05	-2.9	18.2	134.3
Sept. 29	20 41.57	+00 22.6	5.414	6.047	+0.04	-2.7	18.3	125.3
Oct. 9	20 42.47	+00 48.7	5.550	6.058	+0.15	-2.5	18.3	116.2
Oct. 19	20 44.38	-01 11.6	5.699	6.068	+0.25	-2.1	18.4	107.2
Oct. 29	20 47.28	-01 30.1	5.857	6.080	+0.34	-1.6	18.5	98.3
Nov. 8	20 51.11	-01 43.7	6.020	6.092	+0.43	-1.1	18.5	89.5
Nov. 18	20 55.81	-01 51.8	6.184	6.106	+0.51	-0.5	18.6	80.9
Nov. 28	21 01.29	-01 54.2	6.346	6.120	+0.59	+0.1	18.7	72.4
Dec. 8	21 07.43	-01 50.9	6.502	6.134	+0.65	+0.7	18.7	64.0
Dec. 18	21 14.16	-01 41.7	6.648	6.150	+0.70	+1.2	18.8	55.8
Dec. 28	21 21.35	-01 27.0	6.783	6.166	+0.74	+1.8	18.9	47.8
Jan. 7	21 28.92	-01 07.0	6.904	6.183	+0.77	+2.3	18.9	39.9
Jan. 17	21 36.77	+00 42.2	7.009	6.201	+0.80	+2.7	19.0	32.3
Jan. 27	21 44.81	+00 12.8	7.097	6.219	+0.81	+3.2	19.0	25.1
Feb. 6	21 52.94	+00 20.5	7.165	6.238	+0.82	+3.5	19.0	18.5
Feb. 16	22 01.09	+00 57.3	7.214	6.258	+0.81	+3.8	19.1	13.6
Feb. 26	22 09.18	+01 37.0	7.242	6.278	+0.80	+4.1	19.1	12.3
Mar. 8	22 17.13	+02 19.0	7.250	6.300	+0.78	+4.3	19.1	15.5
Mar. 18	22 24.87	+03 02.7	7.238	6.321	+0.76	+4.4	19.1	21.3
Mar. 28	22 32.33	+03 47.4	7.207	6.344	+0.73	+4.5	19.1	28.1

Comet P/2001 T3 (NEAT)

Epoch = 2018 July 21.0 TT
 T = 2018 June 10.92880 TT
 Peri. = 356.77967 e = 0.6144656
 Node = 55.16331 2000.0 a = 6.4464782 AU
 Incl. = 19.39752 n = 0.06021716
 q = 2.4853391 AU P = 16.37 years

$$m_1 = 6.4 + 5 \log(\Delta) + 22.5 \log(r(t-40))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	23 36.21	-17 23.6	3.061	2.825	-0.67 -6.6	19.5	20.5/48	67.0
Jan. 12	23 47.35	-15 04.7	3.139	2.787	-0.66 -6.8	19.4	22.1/50	60.4
Jan. 22	23 59.52	-12 42.2	3.212	2.751	-0.65 -7.1	19.4	23.5/52	54.0
Feb. 1	00 12.57	-10 17.2	3.278	2.717	-0.64 -7.3	19.3	24.7/54	47.8
Feb. 11	00 26.38	-07 50.1	3.337	2.684	-0.64 -7.5	19.2	25.8/55	41.9
Feb. 21	00 40.87	-05 21.8	3.387	2.654	-0.64 -7.7	19.1	26.7/56	36.2
Mar. 3	00 55.96	-02 53.0	3.430	2.626	-0.65 -7.9	19.0	27.5/57	30.7
Mar. 13	01 11.60	+00 24.5	3.464	2.600	-0.66 -8.0	18.9	28.1/58	25.3
Mar. 23	01 27.76	+02 02.9	3.490	2.577	-0.67 -8.1	18.8	28.6/59	20.1
Apr. 2	01 44.39	+04 28.4	3.508	2.556	-0.68 -8.1	18.7	29.1/60	15.1
Apr. 12	02 01.47	+06 51.1	3.517	2.537	-0.69 -8.2	18.6	29.4/61	10.3
Apr. 22	02 18.99	+09 10.2	3.519	2.522	-0.71 -8.1	18.5	29.6/62	6.0
May 2	02 36.92	+11 24.9	3.513	2.509	-0.73 -8.1	18.4	29.8/64	3.8
May 12	02 55.24	+13 34.3	3.500	2.498	-0.75 -7.9	18.3	29.8/65	6.4
May 22	03 13.93	+15 37.9	3.479	2.491	-0.78 -7.8	18.2	29.8/66	10.6
June 1	03 32.95	+17 34.8	3.452	2.487	-0.80 -7.6	18.1	29.7/68	15.1
June 11	03 52.25	+19 24.5	3.417	2.485	-0.83 -7.3	18.1	29.5/69	19.7
June 21	04 11.79	+21 06.6	3.376	2.487	-0.86 -7.0	18.0	29.1/70	24.5
July 1	04 31.47	+22 40.7	3.328	2.491	-0.88 -6.6	17.9	28.7/72	29.2
July 11	04 51.23	+24 06.9	3.274	2.499	-0.91 -6.2	17.9	28.3/73	34.1
July 21	05 10.96	+25 25.3	3.214	2.509	-0.94 -5.8	17.8	27.6/74	39.1
July 31	05 30.53	+26 36.2	3.148	2.522	-0.97 -5.3	17.8	26.9/75	44.2
Aug. 10	05 49.81	+27 40.3	3.076	2.538	-0.99 -4.8	17.8	26.0/76	49.5
Aug. 20	06 08.65	+28 38.7	2.999	2.556	-1.02 -4.3	17.7	25.0/77	55.0
Aug. 30	06 26.87	+29 32.7	2.917	2.577	-1.04 -3.8	17.7	23.8/77	60.6
Sept. 9	06 44.31	+30 23.7	2.831	2.601	-1.07 -3.2	17.7	22.5/77	66.6
Sept. 19	07 00.75	+31 13.7	2.741	2.626	-1.09 -2.7	17.7	20.9/76	72.9
Sept. 29	07 15.96	+32 04.8	2.648	2.655	-1.12 -2.1	17.7	19.1/74	79.5
Oct. 9	07 29.71	+32 59.1	2.555	2.685	-1.16 -1.5	17.7	17.1/70	86.4
Oct. 19	07 41.71	+33 58.8	2.462	2.717	-1.20 -0.9	17.7	15.0/65	93.8
Oct. 29	07 51.68	+35 05.8	2.373	2.751	-1.24 -0.3	17.7	12.9/56	101.7
Nov. 8	07 59.28	+36 21.3	2.289	2.787	-1.30 +0.3	17.7	11.0/43	109.9
Nov. 18	08 04.19	+37 45.3	2.215	2.825	-1.37 +0.8	17.8	9.6/24	118.7
Nov. 28	08 06.14	+39 16.0	2.153	2.864	-1.44 +1.2	17.8	9.3/2	127.7
Dec. 8	08 04.98	+40 49.8	2.108	2.905	-1.53 +1.5	17.9	9.9/341	136.8
Dec. 18	08 00.78	+42 20.5	2.083	2.947	-1.61 +1.5	18.0	10.7/324	145.5
Dec. 28	07 54.01	+43 40.9	2.082	2.990	-1.67 +1.3	18.1	11.2/310	152.7
Jan. 7	07 45.48	+44 44.1	2.107	3.035	-1.71 +0.9	18.3	10.9/298	156.6
Jan. 17	07 36.36	+45 25.0	2.159	3.080	-1.71 +0.4	18.5	9.8/287	155.2
Jan. 27	07 27.94	+45 42.3	2.238	3.127	-1.67 -0.1	18.7	8.0/274	149.5
Feb. 6	07 21.27	+45 38.1	2.341	3.174	-1.60 -0.5	19.0	5.9/256	141.7
Feb. 16	07 17.06	+45 16.4	2.465	3.222	-1.51 -0.7	19.2	4.1/224	133.1
Feb. 26	07 15.62	+44 41.9	2.608	3.271	-1.40 -0.8	19.5	4.0/179	124.4
Mar. 8	07 16.88	+43 58.8	2.765	3.320	-1.30 -0.8	19.7	5.5/148	115.8
Mar. 18	07 20.65	+43 10.1	2.934	3.370	-1.20 -0.7	20.0	7.5/133	107.5
Mar. 28	07 26.56	+42 18.0	3.111	3.420	-1.10 -0.5	20.3	9.4/125	99.5

Comet C/2017 X1 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 June 14.62927 TT
 Peri. = 283.13087 e = 0.8512098
 Node = 251.12728 2000.0 a = 31.3359697 AU
 Incl. = 31.31100 n = 0.00561875
 q = 4.6624852 AU P = 175.41 years

$$m1 = 5.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	10 04.03	-25 29.0	4.354	4.814	-0.08	-6.9	18.8	112.4
Jan. 12	10 02.64	-26 33.0	4.234	4.797	-0.21	-5.7	18.7	119.6
Jan. 22	10 00.08	-27 23.7	4.129	4.780	-0.31	-4.2	18.7	126.5
Feb. 1	09 56.56	-27 58.9	4.043	4.764	-0.39	-2.6	18.6	132.5
Feb. 11	09 52.40	-28 16.9	3.977	4.750	-0.44	-0.8	18.5	137.4
Feb. 21	09 47.98	-28 17.2	3.933	4.736	-0.44	+0.9	18.5	140.4
Mar. 3	09 43.73	-28 00.5	3.912	4.724	-0.40	+2.5	18.5	141.1
Mar. 13	09 40.09	-27 29.0	3.914	4.713	-0.32	+3.9	18.5	139.4
Mar. 23	09 37.40	-26 45.5	3.939	4.703	-0.20	+4.9	18.5	135.6
Apr. 2	09 35.95	-25 53.9	3.985	4.694	-0.07	+5.4	18.5	130.3
Apr. 12	09 35.89	-24 58.2	4.049	4.686	+0.07	+5.7	18.5	124.2
Apr. 22	09 37.28	-24 02.0	4.130	4.679	+0.22	+5.5	18.5	117.4
May 2	09 40.12	-23 08.6	4.224	4.674	+0.36	+5.1	18.6	110.5
May 12	09 44.31	-22 20.4	4.329	4.669	+0.49	+4.5	18.6	103.5
May 22	09 49.75	-21 39.3	4.442	4.666	+0.61	+3.7	18.7	96.4
June 1	09 56.32	-21 06.6	4.560	4.664	+0.71	+2.8	18.7	89.5
June 11	10 03.87	-20 42.9	4.681	4.663	+0.80	+1.9	18.8	82.7
June 21	10 12.28	-20 28.5	4.802	4.663	+0.88	+0.9	18.8	76.1
July 1	10 21.42	-20 23.4	4.920	4.664	+0.95	0.0	18.9	69.6
July 11	10 31.18	-20 27.2	5.035	4.667	+1.01	-0.9	18.9	63.2
July 21	10 41.46	-20 39.6	5.144	4.670	+1.05	-1.7	19.0	57.0
July 31	10 52.16	-20 59.8	5.246	4.675	+1.09	-2.4	19.0	51.0
Aug. 10	11 03.20	-21 27.4	5.339	4.681	+1.12	-3.1	19.1	45.2
Aug. 20	11 14.52	-22 01.6	5.422	4.688	+1.14	-3.8	19.1	39.7
Aug. 30	11 26.03	-22 41.7	5.494	4.696	+1.16	-4.3	19.2	34.5
Sept. 9	11 37.69	-23 26.9	5.553	4.705	+1.17	-4.8	19.2	29.8
Sept. 19	11 49.44	-24 16.5	5.598	4.716	+1.18	-5.2	19.2	26.0
Sept. 29	12 01.20	-25 09.9	5.630	4.727	+1.18	-5.5	19.3	23.4
Oct. 9	12 12.94	-26 06.2	5.647	4.740	+1.17	-5.8	19.3	22.6
Oct. 19	12 24.57	-27 04.8	5.648	4.754	+1.16	-6.0	19.3	23.8
Oct. 29	12 36.04	-28 04.9	5.634	4.768	+1.14	-6.1	19.3	26.8
Nov. 8	12 47.27	-29 05.9	5.605	4.784	+1.11	-6.1	19.3	31.1
Nov. 18	12 58.18	-30 07.1	5.560	4.801	+1.07	-6.1	19.3	36.5
Nov. 28	13 08.66	-31 07.8	5.501	4.819	+1.02	-6.0	19.3	42.4
Dec. 8	13 18.63	-32 07.4	5.428	4.838	+0.96	-5.9	19.3	49.0
Dec. 18	13 27.94	-33 05.2	5.341	4.858	+0.89	-5.6	19.3	55.9
Dec. 28	13 36.48	-34 00.4	5.244	4.879	+0.81	-5.4	19.3	63.1
Jan. 7	13 44.11	-34 52.3	5.138	4.901	+0.71	-5.0	19.3	70.7
Jan. 17	13 50.68	-35 39.9	5.024	4.923	+0.59	-4.5	19.3	78.5
Jan. 27	13 56.05	-36 22.4	4.907	4.947	+0.47	-3.9	19.3	86.6
Feb. 6	14 00.09	-36 58.6	4.788	4.972	+0.33	-3.2	19.2	95.0
Feb. 16	14 02.70	-37 27.2	4.672	4.997	+0.18	-2.4	19.2	103.6
Feb. 26	14 03.84	-37 46.8	4.563	5.023	+0.03	-1.4	19.2	112.4
Mar. 8	14 03.51	-37 56.0	4.464	5.051	-0.11	-0.3	19.2	121.3
Mar. 18	14 01.82	-37 53.4	4.379	5.079	-0.24	+1.0	19.2	130.2
Mar. 28	13 59.00	-37 38.0	4.313	5.107	-0.33	+2.3	19.2	138.9

Comet P/2017 P1 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 June 17.73798 TT
 Peri. = 122.21361 e = 0.3092451
 Node = 221.38399 2000.0 a = 7.8724561 AU
 Incl. = 7.70160 n = 0.04462094
 q = 5.4379376 AU P = 22.09 years

$$m1 = 10.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	21 29.70	-07 56.9	6.180	5.481	+0.78	+3.0	21.3	41.3
Jan. 12	21 37.70	-07 24.9	6.271	5.476	+0.82	+3.4	21.4	33.3
Jan. 22	21 46.00	-06 48.8	6.343	5.471	+0.84	+3.8	21.4	25.5
Feb. 1	21 54.51	-06 09.1	6.396	5.467	+0.86	+4.2	21.4	17.9
Feb. 11	22 03.15	-05 26.2	6.429	5.463	+0.87	+4.4	21.4	10.8
Feb. 21	22 11.82	-04 40.8	6.441	5.459	+0.87	+4.7	21.4	6.2
Mar. 3	22 20.44	-03 53.2	6.433	5.456	+0.86	+4.8	21.4	8.9
Mar. 13	22 28.95	-03 04.2	6.404	5.452	+0.84	+5.0	21.4	15.5
Mar. 23	22 37.26	-02 14.3	6.355	5.450	+0.82	+5.0	21.4	22.8
Apr. 2	22 45.30	-01 24.1	6.287	5.447	+0.79	+5.0	21.4	30.3
Apr. 12	22 53.00	+00 34.2	6.201	5.445	+0.75	+4.9	21.3	37.9
Apr. 22	23 00.29	+00 14.7	6.099	5.443	+0.70	+4.8	21.3	45.5
May 2	23 07.07	+01 01.9	5.983	5.441	+0.65	+4.6	21.2	53.3
May 12	23 13.29	+01 46.8	5.854	5.440	+0.59	+4.3	21.2	61.2
May 22	23 18.85	+02 28.7	5.715	5.439	+0.52	+4.0	21.1	69.2
June 1	23 23.66	+03 06.7	5.568	5.438	+0.44	+3.6	21.1	77.4
June 11	23 27.66	+03 40.2	5.417	5.438	+0.35	+3.1	21.0	85.8
June 21	23 30.74	+04 08.3	5.265	5.438	+0.26	+2.5	21.0	94.4
July 1	23 32.85	+04 30.4	5.115	5.438	+0.15	+1.8	20.9	103.2
July 11	23 33.93	+04 45.7	4.971	5.439	+0.05	+1.1	20.8	112.3
July 21	23 33.95	+04 53.6	4.836	5.440	-0.06	+0.4	20.8	121.7
July 31	23 32.93	+04 53.6	4.716	5.441	-0.16	-0.4	20.7	131.4
Aug. 10	23 30.94	+04 45.8	4.614	5.442	-0.25	-1.2	20.7	141.3
Aug. 20	23 28.10	+04 30.3	4.534	5.444	-0.32	-1.9	20.6	151.4
Aug. 30	23 24.62	+04 07.9	4.480	5.446	-0.37	-2.6	20.6	161.4
Sept. 9	23 20.75	+03 40.0	4.453	5.449	-0.40	-3.0	20.6	170.3
Sept. 19	23 16.78	+03 08.4	4.456	5.451	-0.39	-3.3	20.6	171.6
Sept. 29	23 13.03	+02 35.0	4.488	5.454	-0.35	-3.3	20.6	163.2
Oct. 9	23 09.79	+02 02.2	4.548	5.458	-0.29	-3.2	20.7	153.0
Oct. 19	23 07.30	+01 32.1	4.636	5.461	-0.20	-2.8	20.7	142.7
Oct. 29	23 05.75	+01 06.4	4.746	5.465	-0.10	-2.3	20.8	132.4
Nov. 8	23 05.27	+00 46.4	4.876	5.469	+0.01	-1.6	20.8	122.2
Nov. 18	23 05.91	+00 33.3	5.022	5.474	+0.13	-0.9	20.9	112.3
Nov. 28	23 07.66	+00 27.3	5.178	5.479	+0.23	-0.2	21.0	102.6
Dec. 8	23 10.48	+00 28.7	5.340	5.484	+0.34	+0.5	21.0	93.2
Dec. 18	23 14.29	+00 37.2	5.504	5.489	+0.43	+1.2	21.1	84.0
Dec. 28	23 19.00	+00 52.6	5.666	5.495	+0.52	+1.9	21.2	75.1
Jan. 7	23 24.51	+01 14.2	5.822	5.501	+0.59	+2.5	21.2	66.3
Jan. 17	23 30.70	+01 41.6	5.969	5.507	+0.65	+3.0	21.3	57.7
Jan. 27	23 37.48	+02 13.9	6.104	5.514	+0.71	+3.5	21.3	49.4
Feb. 6	23 44.73	+02 50.6	6.225	5.521	+0.75	+3.9	21.4	41.2
Feb. 16	23 52.38	+03 30.9	6.329	5.528	+0.78	+4.2	21.4	33.1
Feb. 26	00 00.32	+04 14.1	6.415	5.535	+0.81	+4.5	21.5	25.2
Mar. 8	00 08.47	+04 59.6	6.482	5.543	+0.82	+4.6	21.5	17.5
Mar. 18	00 16.76	+05 46.6	6.528	5.551	+0.83	+4.8	21.5	10.0
Mar. 28	00 25.10	+06 34.5	6.554	5.559	+0.84	+4.8	21.5	3.9

Comet P/2002 EJ57 (LINEAR)

Epoch = 2018 July 21.0 TT
 T = 2018 June 18.54474 TT
 Peri. = 167.02275 e = 0.5933681
 Node = 330.43192 2000.0 a = 6.4608999 AU
 Incl. = 4.97690 n = 0.06001566
 q = 2.6272080 AU P = 16.42 years

$$m_1 = 14.0 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT 2018/19	R. A. (2000) h m	Decl. ° '	Delta	r	Variation for T=+1 day		m1	Mot./PA	Elong. °
Jan. 2	05 50.56	+29 42.0	1.990	2.952	-1.54	+0.2	19.0	9.4/261	165.3
Jan. 12	05 44.02	+29 24.2	1.999	2.917	-1.50	-0.1	19.0	7.7/254	154.4
Jan. 22	05 39.26	+29 01.8	2.033	2.884	-1.45	-0.2	19.0	5.2/242	143.4
Feb. 1	05 36.92	+28 37.1	2.089	2.852	-1.39	-0.2	19.0	2.8/205	132.9
Feb. 11	05 37.29	+28 12.3	2.162	2.823	-1.33	-0.1	19.1	3.5/134	122.9
Feb. 21	05 40.44	+27 48.5	2.248	2.795	-1.27	0.0	19.1	6.6/110	113.5
Mar. 3	05 46.25	+27 26.0	2.344	2.768	-1.22	+0.3	19.2	9.8/103	104.8
Mar. 13	05 54.46	+27 04.2	2.445	2.744	-1.17	+0.6	19.2	12.8/100	96.6
Mar. 23	06 04.81	+26 42.0	2.550	2.722	-1.13	+0.9	19.3	15.5/98	89.0
Apr. 2	06 17.00	+26 18.0	2.656	2.702	-1.09	+1.3	19.4	17.8/98	81.9
Apr. 12	06 30.73	+25 50.9	2.760	2.684	-1.06	+1.7	19.4	19.8/98	75.1
Apr. 22	06 45.76	+25 19.2	2.863	2.669	-1.04	+2.1	19.5	21.5/99	68.8
May 2	07 01.83	+24 41.9	2.962	2.656	-1.01	+2.5	19.5	22.9/100	62.7
May 12	07 18.71	+23 57.9	3.057	2.645	-0.99	+2.9	19.6	24.1/101	57.0
May 22	07 36.22	+23 06.7	3.147	2.637	-0.96	+3.3	19.6	25.2/103	51.4
June 1	07 54.17	+22 07.8	3.231	2.631	-0.94	+3.6	19.7	26.0/104	46.1
June 11	08 12.41	+21 01.1	3.310	2.628	-0.91	+4.0	19.7	26.7/105	40.9
June 21	08 30.80	+19 46.7	3.383	2.627	-0.89	+4.3	19.8	27.2/107	35.8
July 1	08 49.24	+18 24.9	3.450	2.629	-0.87	+4.6	19.8	27.6/108	30.8
July 11	09 07.63	+16 56.1	3.510	2.634	-0.84	+4.8	19.9	27.9/109	25.9
July 21	09 25.91	+15 21.0	3.564	2.641	-0.82	+5.0	19.9	28.1/110	21.0
July 31	09 44.01	+13 40.2	3.610	2.650	-0.79	+5.2	20.0	28.2/111	16.2
Aug. 10	10 01.88	+11 54.7	3.649	2.662	-0.77	+5.3	20.0	28.2/112	11.3
Aug. 20	10 19.51	+10 05.3	3.679	2.676	-0.75	+5.4	20.0	28.1/113	6.4
Aug. 30	10 36.85	+08 12.9	3.702	2.693	-0.73	+5.5	20.1	27.9/114	1.5
Sept. 9	10 53.90	+06 18.5	3.716	2.712	-0.71	+5.5	20.1	27.7/115	3.7
Sept. 19	11 10.63	+04 22.9	3.721	2.733	-0.70	+5.5	20.1	27.3/115	8.9
Sept. 29	11 27.00	+02 27.2	3.716	2.756	-0.68	+5.4	20.2	26.9/115	14.1
Oct. 9	11 43.02	+00 32.3	3.702	2.781	-0.67	+5.4	20.2	26.3/116	19.5
Oct. 19	11 58.64	-01 21.0	3.678	2.808	-0.66	+5.3	20.2	25.6/116	25.1
Oct. 29	12 13.82	-03 11.7	3.644	2.837	-0.65	+5.2	20.2	24.9/116	30.9
Nov. 8	12 28.52	-04 59.1	3.599	2.868	-0.64	+5.1	20.2	23.9/116	36.8
Nov. 18	12 42.65	-06 42.3	3.544	2.900	-0.64	+5.0	20.2	22.9/116	42.9
Nov. 28	12 56.13	-08 20.5	3.480	2.934	-0.64	+4.8	20.2	21.6/116	49.3
Dec. 8	13 08.87	-09 53.2	3.406	2.969	-0.64	+4.7	20.2	20.2/116	56.0
Dec. 18	13 20.72	-11 19.6	3.324	3.006	-0.64	+4.6	20.2	18.6/116	62.9
Dec. 28	13 31.54	-12 39.1	3.235	3.044	-0.65	+4.5	20.2	16.7/117	70.1
Jan. 7	13 41.16	-13 51.2	3.140	3.083	-0.66	+4.4	20.2	14.6/118	77.7
Jan. 17	13 49.38	-14 55.2	3.041	3.124	-0.67	+4.3	20.1	12.2/119	85.6
Jan. 27	13 56.00	-15 50.5	2.941	3.165	-0.69	+4.3	20.1	9.6/122	93.9
Feb. 6	14 00.83	-16 36.6	2.843	3.207	-0.71	+4.3	20.1	6.8/127	102.7
Feb. 16	14 03.67	-17 12.6	2.749	3.251	-0.74	+4.4	20.0	3.9/141	112.0
Feb. 26	14 04.45	-17 37.9	2.665	3.295	-0.77	+4.4	20.0	2.0/196	121.7
Mar. 8	14 03.14	-17 51.8	2.594	3.339	-0.80	+4.6	20.0	3.5/258	131.8
Mar. 18	13 59.89	-17 54.0	2.541	3.385	-0.83	+4.8	20.0	6.0/274	142.4
Mar. 28	13 55.03	-17 44.9	2.510	3.431	-0.85	+4.9	20.0	8.1/281	153.2

Comet P/2011 CR42 (Catalina)

Epoch = 2018 July 21.0 TT
 T = 2018 June 22.51047 TT
 Peri. = 173.09944 e = 0.2815052
 Node = 58.72138 2000.0 a = 3.5096461 AU
 Incl. = 8.46475 n = 0.14990257
 q = 2.5216625 AU P = 6.57 years

$$m_1 = 11.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2018/19	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day		m1	Mot./PA	Elong. °
Jan. 2	13 50.18	-04 24.8	2.796	2.700	-0.82	+6.7	18.3	19.7/109	74.2
Jan. 12	14 02.23	-05 26.9	2.650	2.681	-0.88	+7.0	18.2	18.2/109	81.2
Jan. 22	14 13.28	-06 21.0	2.502	2.663	-0.93	+7.4	18.0	16.3/108	88.4
Feb. 1	14 23.06	-07 06.9	2.356	2.646	-1.00	+7.8	17.9	14.0/107	95.9
Feb. 11	14 31.32	-07 44.1	2.212	2.630	-1.07	+8.2	17.7	11.3/107	103.9
Feb. 21	14 37.73	-08 12.4	2.075	2.615	-1.16	+8.7	17.6	8.2/107	112.2
Mar. 3	14 42.00	-08 32.2	1.946	2.600	-1.25	+9.3	17.4	4.7/109	121.1
Mar. 13	14 43.87	-08 43.7	1.829	2.587	-1.34	+9.9	17.2	1.0/137	130.5
Mar. 23	14 43.14	-08 47.9	1.727	2.575	-1.44	+10.6	17.1	3.2/269	140.5
Apr. 2	14 39.86	-08 46.5	1.644	2.564	-1.52	+11.2	17.0	6.8/273	151.0
Apr. 12	14 34.32	-08 41.6	1.583	2.555	-1.59	+11.7	16.9	9.8/273	161.8
Apr. 22	14 27.12	-08 36.1	1.547	2.546	-1.63	+12.1	16.8	11.5/272	172.0
May 2	14 19.20	-08 33.8	1.537	2.539	-1.63	+12.2	16.8	11.7/270	172.2
May 12	14 11.58	-08 37.8	1.552	2.533	-1.60	+12.2	16.8	10.5/265	162.1
May 22	14 05.23	-08 51.0	1.593	2.528	-1.54	+11.9	16.8	8.1/256	151.4
June 1	14 00.90	-09 15.2	1.654	2.525	-1.46	+11.5	16.9	5.5/236	141.1
June 11	13 58.96	-09 50.7	1.734	2.523	-1.37	+10.9	17.0	4.2/191	131.3
June 21	13 59.59	-10 37.0	1.829	2.522	-1.29	+10.4	17.1	6.0/150	122.2
July 1	14 02.71	-11 32.9	1.936	2.522	-1.21	+9.8	17.3	8.9/133	113.7
July 11	14 08.12	-12 36.8	2.050	2.524	-1.14	+9.2	17.4	11.8/125	105.8
July 21	14 15.63	-13 47.0	2.171	2.527	-1.09	+8.6	17.5	14.5/120	98.3
July 31	14 24.99	-15 01.7	2.295	2.531	-1.04	+8.0	17.6	16.7/117	91.3
Aug. 10	14 35.97	-16 19.2	2.422	2.537	-1.00	+7.5	17.8	18.7/115	84.7
Aug. 20	14 48.42	-17 38.0	2.548	2.544	-0.97	+6.9	17.9	20.4/113	78.3
Aug. 30	15 02.14	-18 56.4	2.673	2.552	-0.95	+6.4	18.0	21.8/111	72.2
Sept. 9	15 17.00	-20 13.1	2.796	2.561	-0.92	+5.9	18.1	23.0/109	66.2
Sept. 19	15 32.89	-21 26.7	2.916	2.572	-0.91	+5.4	18.2	24.0/107	60.4
Sept. 29	15 49.68	-22 35.9	3.031	2.583	-0.90	+4.9	18.3	24.8/106	54.6
Oct. 9	16 07.27	-23 39.6	3.140	2.596	-0.88	+4.3	18.4	25.4/104	49.0
Oct. 19	16 25.57	-24 36.7	3.243	2.610	-0.87	+3.8	18.5	26.0/102	43.4
Oct. 29	16 44.45	-25 26.3	3.338	2.625	-0.86	+3.3	18.6	26.4/100	37.8
Nov. 8	17 03.83	-26 07.7	3.425	2.641	-0.85	+2.8	18.7	26.7/98	32.3
Nov. 18	17 23.59	-26 40.2	3.503	2.658	-0.84	+2.3	18.8	26.8/96	26.7
Nov. 28	17 43.60	-27 03.5	3.571	2.675	-0.83	+1.8	18.8	26.9/94	21.2
Dec. 8	18 03.76	-27 17.4	3.629	2.694	-0.82	+1.3	18.9	26.9/92	15.7
Dec. 18	18 23.93	-27 22.0	3.675	2.713	-0.81	+0.9	19.0	26.8/90	10.4
Dec. 28	18 44.00	-27 17.4	3.710	2.734	-0.79	+0.4	19.0	26.6/88	5.7
Jan. 7	19 03.86	-27 04.1	3.733	2.754	-0.77	0.0	19.1	26.4/86	4.8
Jan. 17	19 23.39	-26 42.9	3.743	2.776	-0.76	-0.4	19.1	26.0/85	9.0
Jan. 27	19 42.49	-26 14.6	3.741	2.798	-0.74	-0.8	19.1	25.5/83	14.4
Feb. 6	20 01.08	-25 40.1	3.726	2.821	-0.72	-1.1	19.2	25.0/81	20.1
Feb. 16	20 19.07	-25 00.6	3.699	2.844	-0.70	-1.4	19.2	24.3/80	26.0
Feb. 26	20 36.38	-24 17.4	3.659	2.868	-0.69	-1.7	19.2	23.6/79	32.0
Mar. 8	20 52.96	-23 31.8	3.608	2.892	-0.67	-2.0	19.2	22.7/78	38.1
Mar. 18	21 08.72	-22 45.2	3.545	2.917	-0.66	-2.2	19.2	21.7/78	44.3
Mar. 28	21 23.61	-21 58.9	3.472	2.942	-0.65	-2.5	19.2	20.5/77	50.7

Comet P/2013 CU129 = 2018 A2 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 June 24.36518 TT
 Peri. = 211.92894 e = 0.7227455
 Node = 46.22580 2000.0 a = 2.8776824 AU
 Incl. = 12.15497 n = 0.20190161
 q = 0.7978504 AU P = 4.88 years

H = 17.2 , G = 0.15 (r > 1.3 AU)
 m1 = 17.2 + 5 log(Delta) + 20.0 log(r) (r < 1.3 AU)

Oh TT 2018/19	R. A. (2000) h m	Decl. ° ,	Delta	r	Daily motion m ,	Mag.	Elong. °
Jan. 2	10 47.99	+26 46.8	1.620	2.340	+0.26 +7.9	21.1	126.2
Jan. 12	10 49.22	+28 17.8	1.443	2.251	-0.07 +10.6	20.7	135.3
Jan. 22	10 46.74	+30 15.7	1.283	2.161	-0.49 +13.2	20.3	144.4
Feb. 1	10 39.70	+32 36.5	1.145	2.068	-0.98 +15.0	19.8	152.3
Feb. 11	10 27.39	+35 09.6	1.029	1.973	-1.54 +15.3	19.5	156.2
Feb. 21	10 09.68	+37 35.3	0.939	1.876	-2.03 +13.2	19.2	153.1
Mar. 3	09 47.85	+39 27.6	0.874	1.776	-2.31 +8.5	19.1	144.3
Mar. 13	09 24.65	+40 25.1	0.830	1.674	-2.26 +2.3	19.1	133.1
Mar. 23	09 03.64	+40 19.3	0.801	1.571	-1.85 -3.9	19.1	121.4
Apr. 2	08 47.76	+39 16.8	0.781	1.465	-1.25 -8.9	19.1	110.2
Apr. 12	08 38.20	+37 30.3	0.763	1.359	-0.60 -12.6	19.0	99.8
Apr. 22	08 34.85	+35 10.3	0.740	1.254	-0.03 -15.6	18.5	90.5
May 2	08 36.67	+32 21.3	0.708	1.150	+0.41 -18.5	17.7	82.2
May 12	08 42.10	+29 01.3	0.663	1.051	+0.68 -22.0	16.7	74.6
May 22	08 49.29	+25 01.9	0.604	0.960	+0.72 -26.6	15.7	67.5
June 1	08 55.56	+20 08.0	0.530	0.883	+0.44 -33.2	14.7	60.5
June 11	08 56.93	+13 55.1	0.447	0.827	-0.34 -43.0	13.8	53.0
June 21	08 47.46	+05 45.7	0.362	0.800	-1.85 -57.1	13.1	44.6
July 1	08 18.70	-04 59.1	0.290	0.805	-4.28 -72.9	12.6	37.2
July 11	07 23.16	-17 34.6	0.246	0.842	-7.04 -73.9	12.7	39.8
July 21	06 04.79	-28 10.5	0.236	0.906	-8.39 -47.2	13.2	56.2
July 31	04 42.97	-33 39.7	0.253	0.988	-7.67 -17.6	14.1	76.7
Aug. 10	03 31.98	-35 12.7	0.285	1.082	-6.44 -1.3	15.2	96.2
Aug. 20	02 32.04	-34 40.9	0.326	1.184	-5.48 +7.9	16.2	114.2
Aug. 30	01 41.28	-32 52.5	0.378	1.288	-4.58 +14.0	17.3	130.5
Sept. 9	00 59.76	-30 13.3	0.447	1.394	-3.62 +17.8	17.3	144.0
Sept. 19	00 28.07	-27 06.9	0.535	1.500	-2.63 +19.2	17.7	152.5
Sept. 29	00 05.84	-23 55.6	0.644	1.605	-1.75 +18.8	18.1	153.6
Oct. 9	23 51.64	-20 53.4	0.773	1.708	-1.04 +17.5	18.7	148.7
Oct. 19	23 43.83	-18 05.1	0.922	1.809	-0.49 +16.0	19.3	141.1
Oct. 29	23 40.93	-15 30.9	1.087	1.908	-0.07 +14.7	19.9	132.9
Nov. 8	23 41.69	-13 09.1	1.268	2.004	+0.24 +13.6	20.3	124.6
Nov. 18	23 45.24	-10 57.1	1.461	2.099	+0.48 +12.7	20.8	116.6
Nov. 28	23 50.89	-08 52.8	1.664	2.191	+0.66 +12.1	21.2	108.8
Dec. 8	23 58.11	-06 54.6	1.874	2.280	+0.80 +11.5	21.5	101.2
Dec. 18	00 06.57	-05 01.1	2.090	2.368	+0.90 +11.1	21.8	93.7
Dec. 28	00 15.96	-03 11.5	2.308	2.453	+0.98 +10.8	.	86.5
Jan. 7	00 26.07	-01 25.3	2.527	2.536	+1.05 +10.5	.	79.3
Jan. 17	00 36.76	+00 17.9	2.743	2.617	+1.09 +10.2	.	72.3
Jan. 27	00 47.88	+01 58.2	2.954	2.696	+1.13 +9.9	.	65.3
Feb. 6	00 59.33	+03 35.5	3.158	2.773	+1.16 +9.6	.	58.4
Feb. 16	01 11.04	+05 09.9	3.354	2.848	+1.18 +9.3	.	51.6
Feb. 26	01 22.93	+06 41.0	3.538	2.921	+1.20 +8.9	.	44.9
Mar. 8	01 34.95	+08 08.9	3.709	2.992	+1.21 +8.6	.	38.1
Mar. 18	01 47.04	+09 33.3	3.866	3.062	+1.21 +8.2	.	31.4
Mar. 28	01 59.14	+10 53.9	4.007	3.129	+1.21 +7.9	.	24.8

Comet 82P/Gehrels

Epoch = 2018 July 21.0 TT
 T = 2018 June 28.56389 TT
 Peri. = 227.18686 e = 0.1224658
 Node = 239.31412 2000.0 a = 4.1414060 AU
 Incl. = 1.12827 n = 0.11694519
 q = 3.6342254 AU P = 8.43 years

$$m_1 = 7.0 + 5 \log(\Delta) + 20.0 \log(r(t-90))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	04 44.66	+21 46.9	2.784	3.677	-0.52	-1.1	20.7	151.3
Jan. 12	04 40.20	+21 37.4	2.863	3.672	-0.35	-0.8	20.7	140.0
Jan. 22	04 37.61	+21 31.6	2.965	3.668	-0.15	-0.4	20.8	129.2
Feb. 1	04 37.04	+21 29.8	3.084	3.664	+0.05	+0.1	20.8	118.9
Feb. 11	04 38.48	+21 32.3	3.215	3.660	+0.25	+0.5	20.9	109.1
Feb. 21	04 41.85	+21 38.5	3.355	3.656	+0.44	+0.8	21.0	99.8
Mar. 3	04 46.99	+21 47.6	3.499	3.653	+0.60	+1.0	21.1	91.0
Mar. 13	04 53.71	+21 58.7	3.643	3.650	+0.75	+1.2	21.1	82.6
Mar. 23	05 01.84	+22 10.7	3.785	3.647	+0.88	+1.2	21.2	74.5
Apr. 2	05 11.17	+22 22.6	3.921	3.645	+0.99	+1.1	21.3	66.8
Apr. 12	05 21.54	+22 33.2	4.050	3.642	+1.09	+1.0	21.3	59.3
Apr. 22	05 32.80	+22 41.9	4.170	3.640	+1.17	+0.7	21.4	52.2
May 2	05 44.78	+22 47.7	4.278	3.639	+1.23	+0.4	21.4	45.2
May 12	05 57.36	+22 50.0	4.374	3.637	+1.29	0.0	21.5	38.4
May 22	06 10.42	+22 48.4	4.457	3.636	+1.33	-0.4	21.5	31.8
June 1	06 23.84	+22 42.4	4.526	3.635	+1.36	-0.9	21.5	25.3
June 11	06 37.53	+22 31.8	4.580	3.635	+1.38	-1.3	21.6	18.9
June 21	06 51.39	+22 16.3	4.620	3.634	+1.39	-1.8	21.6	12.5
July 1	07 05.31	+21 56.1	4.643	3.634	+1.39	-2.3	21.6	6.3
July 11	07 19.23	+21 31.1	4.651	3.634	+1.39	-2.8	21.6	0.7
July 21	07 33.06	+21 01.6	4.643	3.635	+1.37	-3.2	21.6	6.4
July 31	07 46.72	+20 27.8	4.619	3.636	+1.35	-3.6	21.5	12.6
Aug. 10	08 00.14	+19 50.2	4.580	3.637	+1.33	-4.0	21.5	19.0
Aug. 20	08 13.24	+19 09.3	4.526	3.638	+1.29	-4.3	21.5	25.5
Aug. 30	08 25.94	+18 25.5	4.456	3.640	+1.25	-4.5	21.5	32.0
Sept. 9	08 38.17	+17 39.7	4.373	3.641	+1.19	-4.7	21.4	38.7
Sept. 19	08 49.83	+16 52.6	4.276	3.643	+1.13	-4.7	21.4	45.5
Sept. 29	09 00.83	+16 05.1	4.167	3.646	+1.06	-4.7	21.3	52.6
Oct. 9	09 11.08	+15 18.1	4.047	3.649	+0.98	-4.6	21.2	59.8
Oct. 19	09 20.44	+14 32.7	3.918	3.651	+0.88	-4.4	21.2	67.3
Oct. 29	09 28.79	+13 50.2	3.781	3.655	+0.77	-4.1	21.1	75.1
Nov. 8	09 35.99	+13 11.7	3.639	3.658	+0.65	-3.6	21.0	83.3
Nov. 18	09 41.87	+12 38.6	3.494	3.662	+0.51	-3.0	20.9	91.8
Nov. 28	09 46.28	+12 12.3	3.351	3.666	+0.35	-2.2	20.8	100.8
Dec. 8	09 49.06	+11 53.9	3.212	3.670	+0.18	-1.4	20.8	110.2
Dec. 18	09 50.08	+11 44.5	3.082	3.674	0.00	-0.4	20.7	120.0
Dec. 28	09 49.26	+11 44.8	2.964	3.679	-0.18	+0.6	20.6	130.4
Jan. 7	09 46.64	+11 54.7	2.865	3.684	-0.36	+1.5	20.5	141.2
Jan. 17	09 42.38	+12 13.4	2.788	3.689	-0.50	+2.3	20.5	152.5
Jan. 27	09 36.81	+12 39.1	2.738	3.694	-0.61	+2.9	20.4	164.1
Feb. 6	09 30.42	+13 09.3	2.716	3.700	-0.66	+3.1	20.4	175.7
Feb. 16	09 23.82	+13 40.8	2.725	3.706	-0.65	+3.1	20.5	172.1
Feb. 26	09 17.65	+14 10.4	2.764	3.712	-0.57	+2.8	20.5	160.6
Mar. 8	09 12.49	+14 35.8	2.830	3.718	-0.44	+2.2	20.6	149.2
Mar. 18	09 08.77	+14 54.9	2.922	3.724	-0.28	+1.5	20.6	138.3
Mar. 28	09 06.76	+15 06.8	3.034	3.731	-0.10	+0.8	20.7	127.9

Comet 361P/Spacewatch

Epoch = 2018 July 21.0 TT
 T = 2018 July 2.49492 TT
 Peri. = 219.20686 e = 0.4378179
 Node = 203.27715 2000.0 a = 4.9458112 AU
 Incl. = 13.88239 n = 0.08960821
 q = 2.7804465 AU P = 11.00 years

$$m1 = 11.9 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	00 00.09	+01 08.5	3.062	3.035	+0.98	+2.8	19.2	79.2
Jan. 12	00 10.45	+01 40.9	3.172	3.010	+1.10	+3.8	19.2	71.6
Jan. 22	00 21.93	+02 22.6	3.277	2.985	+1.20	+4.6	19.2	64.3
Feb. 1	00 34.39	+03 12.2	3.375	2.962	+1.29	+5.3	19.3	57.3
Feb. 11	00 47.69	+04 07.9	3.465	2.940	+1.37	+5.9	19.3	50.6
Feb. 21	01 01.75	+05 08.3	3.546	2.919	+1.44	+6.2	19.3	44.2
Mar. 3	01 16.46	+06 12.0	3.617	2.900	+1.50	+6.5	19.3	37.9
Mar. 13	01 31.75	+07 17.4	3.677	2.881	+1.56	+6.6	19.3	31.9
Mar. 23	01 47.57	+08 23.4	3.726	2.865	+1.61	+6.6	19.3	26.0
Apr. 2	02 03.84	+09 28.4	3.765	2.849	+1.65	+6.4	19.3	20.4
Apr. 12	02 20.53	+10 31.3	3.792	2.835	+1.69	+6.1	19.3	14.9
Apr. 22	02 37.58	+11 31.0	3.808	2.823	+1.72	+5.7	19.3	9.8
May 2	02 54.94	+12 26.2	3.813	2.812	+1.75	+5.2	19.3	5.5
May 12	03 12.57	+13 16.0	3.808	2.803	+1.77	+4.6	19.3	4.8
May 22	03 30.39	+13 59.4	3.792	2.795	+1.79	+4.0	19.3	8.4
June 1	03 48.35	+14 35.5	3.766	2.789	+1.80	+3.2	19.2	13.2
June 11	04 06.37	+15 03.7	3.731	2.784	+1.80	+2.4	19.2	18.2
June 21	04 24.37	+15 23.4	3.686	2.782	+1.80	+1.5	19.2	23.3
July 1	04 42.25	+15 33.9	3.632	2.780	+1.78	+0.5	19.1	28.4
July 11	04 59.93	+15 35.2	3.570	2.781	+1.75	-0.4	19.1	33.7
July 21	05 17.30	+15 26.9	3.499	2.783	+1.71	-1.4	19.1	39.0
July 31	05 34.21	+15 09.1	3.421	2.787	+1.66	-2.3	19.0	44.4
Aug. 10	05 50.58	+14 42.0	3.335	2.793	+1.60	-3.2	19.0	50.0
Aug. 20	06 06.24	+14 05.9	3.243	2.800	+1.52	-4.1	18.9	55.7
Aug. 30	06 21.06	+13 21.5	3.145	2.809	+1.43	-4.9	18.9	61.6
Sept. 9	06 34.88	+12 29.4	3.042	2.819	+1.32	-5.6	18.8	67.8
Sept. 19	06 47.53	+11 30.5	2.934	2.831	+1.19	-6.2	18.8	74.2
Sept. 29	06 58.84	+10 26.1	2.825	2.845	+1.05	-6.7	18.7	81.0
Oct. 9	07 08.62	+09 17.5	2.714	2.860	+0.88	-7.0	18.6	88.1
Oct. 19	07 16.64	+08 06.4	2.603	2.876	+0.70	-7.2	18.6	95.6
Oct. 29	07 22.73	+06 54.9	2.496	2.894	+0.49	-7.1	18.5	103.5
Nov. 8	07 26.69	+05 45.2	2.395	2.913	+0.27	-6.8	18.4	111.9
Nov. 18	07 28.38	+04 40.3	2.303	2.934	+0.04	-6.1	18.4	120.7
Nov. 28	07 27.77	+03 43.3	2.224	2.955	-0.19	-5.1	18.3	129.9
Dec. 8	07 24.96	+02 57.4	2.162	2.978	-0.39	-3.9	18.3	139.2
Dec. 18	07 20.25	+02 25.6	2.121	3.002	-0.56	-2.3	18.3	148.2
Dec. 28	07 14.19	+02 10.3	2.103	3.027	-0.65	-0.6	18.3	155.8
Jan. 7	07 07.48	+02 12.1	2.112	3.053	-0.68	+1.1	18.4	159.7
Jan. 17	07 00.95	+02 30.1	2.148	3.081	-0.61	+2.6	18.4	157.6
Jan. 27	06 55.36	+03 01.8	2.211	3.109	-0.48	+3.8	18.5	151.0
Feb. 6	06 51.29	+03 43.3	2.299	3.138	-0.30	+4.5	18.7	142.3
Feb. 16	06 49.16	+04 30.8	2.408	3.167	-0.10	+4.9	18.8	133.2
Feb. 26	06 49.12	+05 20.3	2.536	3.198	+0.11	+4.9	19.0	124.1
Mar. 8	06 51.13	+06 08.7	2.679	3.229	+0.31	+4.7	19.1	115.2
Mar. 18	06 55.09	+06 53.6	2.833	3.261	+0.50	+4.2	19.3	106.7
Mar. 28	07 00.79	+07 33.2	2.994	3.294	+0.66	+3.6	19.5	98.5

Comet 49P/Arend-Rigaux

Epoch = 2018 July 21.0 TT
 T = 2018 July 15.49727 TT
 Peri. = 332.88793 e = 0.5994300
 Node = 118.82418 2000.0 a = 3.5689298 AU
 Incl. = 19.04318 n = 0.14618307
 q = 1.4296062 AU P = 6.74 years

m1 = 10.8 + 5 log(Delta) + 20.0 log(r) (r < 1.9 AU)
 m1 = 15.0 + 5 log(Delta) + 5.0 log(r) (r > 1.9 AU)

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2018/19	h m	° '			m		°
Jan. 2	22 49.21	-22 12.2	2.840	2.415	+1.41 +9.5	19.2	55.0
Jan. 12	23 03.86	-20 33.6	2.872	2.347	+1.53 +10.3	19.1	49.0
Jan. 22	23 19.68	-18 46.8	2.892	2.279	+1.64 +11.1	19.1	43.3
Feb. 1	23 36.57	-16 52.2	2.901	2.211	+1.74 +11.9	19.0	38.0
Feb. 11	23 54.46	-14 49.9	2.899	2.143	+1.84 +12.6	19.0	33.2
Feb. 21	00 13.31	-12 40.6	2.887	2.075	+1.94 +13.3	18.9	28.7
Mar. 3	00 33.12	-10 24.6	2.865	2.008	+2.03 +13.9	18.8	24.7
Mar. 13	00 53.88	-08 02.7	2.836	1.942	+2.13 +14.5	18.7	21.2
Mar. 23	01 15.66	-05 35.7	2.799	1.878	+2.23 +14.9	18.5	18.2
Apr. 2	01 38.47	-03 04.8	2.757	1.816	+2.34 +15.3	18.2	15.7
Apr. 12	02 02.39	+00 31.3	2.713	1.755	+2.46 +15.4	17.9	13.8
Apr. 22	02 27.50	+02 03.1	2.666	1.698	+2.58 +15.4	17.5	12.4
May 2	02 53.84	+04 36.0	2.619	1.644	+2.70 +15.1	17.2	11.5
May 12	03 21.47	+07 05.1	2.574	1.595	+2.84 +14.6	16.9	11.1
May 22	03 50.41	+09 27.1	2.533	1.550	+2.97 +13.7	16.6	10.9
June 1	04 20.64	+11 38.8	2.496	1.512	+3.09 +12.5	16.4	10.8
June 11	04 52.07	+13 36.8	2.464	1.480	+3.20 +10.9	16.2	11.0
June 21	05 24.56	+15 17.5	2.439	1.455	+3.30 +9.0	16.0	11.2
July 1	05 57.87	+16 38.0	2.420	1.439	+3.37 +6.8	15.9	11.6
July 11	06 31.71	+17 36.0	2.408	1.430	+3.40 +4.5	15.8	12.2
July 21	07 05.74	+18 10.5	2.402	1.431	+3.40 +2.1	15.8	13.1
July 31	07 39.59	+18 21.4	2.402	1.440	+3.36 -0.2	15.9	14.2
Aug. 10	08 12.91	+18 09.9	2.407	1.457	+3.29 -2.3	16.0	15.8
Aug. 20	08 45.41	+17 38.5	2.415	1.483	+3.19 -4.1	16.1	17.7
Aug. 30	09 16.83	+16 50.1	2.425	1.515	+3.08 -5.6	16.3	19.9
Sept. 9	09 47.04	+15 48.4	2.437	1.555	+2.95 -6.8	16.6	22.5
Sept. 19	10 15.92	+14 37.1	2.448	1.599	+2.81 -7.5	16.8	25.4
Sept. 29	10 43.43	+13 20.2	2.457	1.649	+2.68 -7.9	17.1	28.6
Oct. 9	11 09.59	+12 01.1	2.464	1.703	+2.54 -7.9	17.4	32.2
Oct. 19	11 34.40	+10 43.1	2.466	1.761	+2.41 -7.6	17.7	36.1
Oct. 29	11 57.87	+09 29.2	2.462	1.822	+2.28 -7.1	18.0	40.3
Nov. 8	12 20.04	+08 21.9	2.452	1.884	+2.15 -6.3	18.3	44.9
Nov. 18	12 40.90	+07 23.7	2.435	1.949	+2.01 -5.2	18.4	49.8
Nov. 28	13 00.40	+06 36.5	2.411	2.015	+1.88 -4.0	18.4	55.0
Dec. 8	13 18.52	+06 02.2	2.379	2.082	+1.73 -2.7	18.5	60.7
Dec. 18	13 35.13	+05 42.2	2.339	2.149	+1.57 -1.1	18.5	66.7
Dec. 28	13 50.11	+05 37.9	2.293	2.217	+1.40 +0.5	18.5	73.2
Jan. 7	14 03.31	+05 50.4	2.240	2.285	+1.21 +2.2	18.5	80.0
Jan. 17	14 14.50	+06 20.2	2.184	2.353	+1.00 +3.9	18.6	87.3
Jan. 27	14 23.47	+07 07.4	2.127	2.421	+0.77 +5.7	18.6	95.1
Feb. 6	14 29.97	+08 11.5	2.070	2.489	+0.50 +7.3	18.6	103.3
Feb. 16	14 33.76	+09 30.5	2.018	2.557	+0.22 +8.6	18.6	111.9
Feb. 26	14 34.70	+11 01.0	1.974	2.623	-0.07 +9.5	18.6	120.9
Mar. 8	14 32.73	+12 38.1	1.944	2.690	-0.35 +9.8	18.6	129.9
Mar. 18	14 28.02	+14 14.6	1.930	2.755	-0.61 +9.3	18.6	138.5
Mar. 28	14 21.00	+15 42.3	1.938	2.821	-0.80 +8.0	18.7	145.9

Comet C/2016 N6 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 July 18.21093 TT
 Peri. = 162.80546
 Node = 298.97617 2000.0
 Incl. = 105.83223
 q = 2.6690896 AU
 e = 0.9987554

$$m1 = 7.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .5			m	'		°
Jan. 2	15 42.67	+53 33.5	3.268	3.354	+0.43	+16.0	14.8	86.4
Jan. 12	15 46.16	+56 30.4	3.118	3.295	+0.24	+19.8	14.6	91.5
Jan. 22	15 47.18	+60 06.1	2.977	3.237	-0.10	+23.7	14.5	96.4
Feb. 1	15 43.81	+64 19.4	2.850	3.181	-0.70	+27.2	14.3	100.6
Feb. 11	15 32.28	+69 03.8	2.744	3.128	-1.86	+29.6	14.1	103.7
Feb. 21	15 03.89	+74 02.0	2.664	3.076	-4.41	+29.3	14.0	105.3
Mar. 3	13 57.89	+78 28.6	2.616	3.027	-9.97	+21.4	13.9	104.9
Mar. 13	11 48.69	+80 31.7	2.602	2.980	-15.03	-1.4	13.8	102.6
Mar. 23	09 38.86	+78 27.1	2.621	2.936	-9.33	-23.2	13.8	98.4
Apr. 2	08 32.25	+73 53.1	2.670	2.895	-4.10	-30.7	13.7	92.7
Apr. 12	08 03.45	+68 39.3	2.746	2.856	-1.74	-31.6	13.8	86.0
Apr. 22	07 51.62	+63 28.2	2.842	2.821	-0.64	-30.3	13.8	78.6
May 2	07 48.00	+58 35.0	2.952	2.789	-0.08	-28.1	13.8	70.9
May 12	07 48.76	+54 04.3	3.068	2.761	+0.24	-25.8	13.8	63.0
May 22	07 52.08	+49 56.2	3.185	2.736	+0.43	-23.6	13.9	55.2
June 1	07 56.90	+46 08.8	3.297	2.715	+0.54	-21.7	13.9	47.4
June 11	08 02.64	+42 39.5	3.401	2.698	+0.61	-20.0	14.0	39.6
June 21	08 08.92	+39 25.4	3.491	2.684	+0.65	-18.7	14.0	32.1
July 1	08 15.47	+36 23.7	3.565	2.675	+0.66	-17.6	14.0	24.7
July 11	08 22.10	+33 31.8	3.620	2.670	+0.66	-16.7	14.1	17.8
July 21	08 28.64	+30 47.4	3.654	2.669	+0.64	-16.1	14.1	12.1
July 31	08 34.97	+28 08.3	3.667	2.672	+0.62	-15.7	14.1	9.8
Aug. 10	08 40.96	+25 32.6	3.657	2.680	+0.58	-15.5	14.1	13.1
Aug. 20	08 46.47	+22 58.5	3.624	2.691	+0.52	-15.4	14.1	19.4
Aug. 30	08 51.36	+20 24.3	3.569	2.707	+0.45	-15.5	14.1	26.8
Sept. 9	08 55.47	+17 48.1	3.493	2.726	+0.36	-15.8	14.1	34.7
Sept. 19	08 58.61	+15 08.3	3.397	2.749	+0.25	-16.2	14.0	43.0
Sept. 29	09 00.55	+12 23.0	3.283	2.776	+0.12	-16.9	14.0	51.7
Oct. 9	09 01.02	+09 30.5	3.156	2.806	-0.05	-17.7	14.0	60.7
Oct. 19	08 59.67	+06 28.9	3.019	2.840	-0.25	-18.7	13.9	70.2
Oct. 29	08 56.14	+03 16.9	2.878	2.877	-0.49	-19.8	13.9	80.0
Nov. 8	08 49.98	+00 06.2	2.739	2.917	-0.78	-20.9	13.8	90.3
Nov. 18	08 40.73	-03 39.5	2.610	2.960	-1.11	-21.8	13.8	100.8
Nov. 28	08 28.06	-07 18.9	2.501	3.006	-1.47	-22.0	13.8	111.5
Dec. 8	08 11.79	-10 56.8	2.419	3.054	-1.82	-21.3	13.8	121.7
Dec. 18	07 52.19	-14 21.2	2.373	3.105	-2.11	-19.2	13.8	130.6
Dec. 28	07 30.16	-17 18.3	2.371	3.157	-2.29	-15.7	13.9	136.5
Jan. 7	07 07.11	-19 36.0	2.414	3.212	-2.29	-11.3	14.0	137.9
Jan. 17	06 44.77	-21 08.8	2.501	3.269	-2.13	-6.8	14.1	134.8
Jan. 27	06 24.70	-21 59.2	2.626	3.327	-1.84	-3.0	14.3	128.3
Feb. 6	06 07.86	-22 15.4	2.783	3.387	-1.48	-0.1	14.5	120.2
Feb. 16	05 54.69	-22 07.5	2.963	3.449	-1.12	+1.7	14.7	111.5
Feb. 26	05 45.07	-21 45.6	3.158	3.512	-0.78	+2.7	15.0	102.8
Mar. 8	05 38.67	-21 17.0	3.360	3.576	-0.48	+3.0	15.2	94.4
Mar. 18	05 35.04	-20 47.6	3.565	3.641	-0.23	+2.8	15.4	86.4
Mar. 28	05 33.70	-20 21.3	3.766	3.707	-0.02	+2.4	15.6	79.0

Comet C/2017 T3 (ATLAS)

Epoch = 2018 July 21.0 TT
 T = 2018 July 19.14844 TT
 Peri. = 246.88851
 Node = 230.08754 2000.0
 Incl. = 88.10700
 q = 0.8253147 AU
 e = 0.9993685

$$m1 = 10.9 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	22 43.24	+56 37.6	2.902	3.120	+1.76	-19.6	16.9	93.5
Jan. 12	23 01.08	+53 25.4	2.879	3.002	+1.81	-18.6	16.8	87.5
Jan. 22	23 19.40	+50 24.5	2.866	2.881	+1.85	-17.4	16.6	81.0
Feb. 1	23 38.04	+47 36.8	2.860	2.760	+1.88	-16.0	16.5	74.2
Feb. 11	23 56.94	+45 02.9	2.857	2.636	+1.90	-14.6	16.3	67.2
Feb. 21	00 16.06	+42 42.4	2.854	2.511	+1.92	-13.4	16.2	60.1
Mar. 3	00 35.39	+40 33.7	2.846	2.385	+1.94	-12.3	16.0	53.0
Mar. 13	00 54.93	+38 34.6	2.831	2.257	+1.97	-11.5	15.8	46.0
Mar. 23	01 14.72	+36 42.3	2.805	2.127	+1.99	-11.0	15.6	39.1
Apr. 2	01 34.79	+34 53.4	2.767	1.996	+2.02	-10.9	15.4	32.4
Apr. 12	01 55.21	+33 04.0	2.714	1.864	+2.07	-11.1	15.1	25.8
Apr. 22	02 16.08	+31 09.7	2.644	1.730	+2.12	-11.9	14.8	19.6
May 2	02 37.51	+29 05.3	2.556	1.596	+2.18	-13.2	14.5	13.9
May 12	02 59.69	+26 44.7	2.450	1.463	+2.27	-15.2	14.1	9.4
May 22	03 22.89	+24 00.5	2.326	1.331	+2.39	-18.1	13.7	8.1
June 1	03 47.51	+20 43.1	2.184	1.204	+2.56	-22.0	13.2	11.0
June 11	04 14.22	+16 40.9	2.026	1.084	+2.82	-27.2	12.7	15.8
June 21	04 44.08	+11 39.6	1.857	0.978	+3.22	-34.0	12.2	21.0
July 1	05 18.77	+05 24.5	1.685	0.893	+3.83	-42.0	11.7	26.2
July 11	06 00.83	-02 12.0	1.526	0.840	+4.73	-49.8	11.2	31.1
July 21	06 53.19	-10 51.3	1.406	0.826	+5.89	-53.2	11.0	35.5
July 31	07 57.23	-19 23.5	1.352	0.855	+6.97	-46.6	11.0	39.2
Aug. 10	09 09.31	-26 00.5	1.383	0.921	+7.32	-30.1	11.3	41.8
Aug. 20	10 20.34	-29 40.0	1.492	1.015	+6.68	-12.7	11.8	42.7
Aug. 30	11 22.12	-30 49.5	1.658	1.127	+5.53	-1.3	12.4	41.8
Sept. 9	12 12.27	-30 33.9	1.857	1.250	+4.42	+4.1	13.0	39.2
Sept. 19	12 52.36	-29 42.6	2.071	1.380	+3.55	+6.0	13.5	35.3
Sept. 29	13 24.88	-28 41.0	2.285	1.512	+2.92	+6.2	14.0	30.6
Oct. 9	13 51.95	-27 39.9	2.493	1.646	+2.47	+5.9	14.5	25.3
Oct. 19	14 15.07	-26 42.7	2.687	1.779	+2.14	+5.5	14.9	19.5
Oct. 29	14 35.26	-25 49.8	2.863	1.912	+1.89	+5.1	15.3	13.7
Nov. 8	14 53.18	-25 00.2	3.019	2.044	+1.69	+4.8	15.6	8.6
Nov. 18	15 09.26	-24 12.6	3.152	2.175	+1.52	+4.7	15.9	7.3
Nov. 28	15 23.76	-23 25.5	3.261	2.304	+1.37	+4.7	16.2	11.8
Dec. 8	15 36.84	-22 37.6	3.345	2.431	+1.23	+4.9	16.4	18.6
Dec. 18	15 48.56	-21 47.6	3.404	2.557	+1.10	+5.2	16.6	26.1
Dec. 28	15 58.93	-20 54.3	3.440	2.682	+0.96	+5.6	16.8	34.0
Jan. 7	16 07.92	-19 56.6	3.452	2.804	+0.82	+6.1	16.9	42.3
Jan. 17	16 15.42	-18 53.4	3.443	2.926	+0.66	+6.7	17.1	51.0
Jan. 27	16 21.33	-17 43.9	3.415	3.045	+0.50	+7.3	17.2	60.0
Feb. 6	16 25.52	-16 27.2	3.372	3.163	+0.32	+8.1	17.3	69.4
Feb. 16	16 27.83	-15 02.5	3.319	3.280	+0.12	+8.9	17.4	79.2
Feb. 26	16 28.14	-13 29.3	3.259	3.396	-0.08	+9.8	17.4	89.4
Mar. 8	16 26.33	-11 47.7	3.199	3.510	-0.30	+10.6	17.5	100.0
Mar. 18	16 22.37	-09 58.1	3.146	3.623	-0.51	+11.3	17.6	110.9
Mar. 28	16 16.31	-08 02.2	3.106	3.734	-0.71	+11.8	17.7	122.2

Comet P/2007 T2 (Kowalski)

Epoch = 2018 July 21.0 TT
 T = 2018 July 21.73455 TT
 Peri. = 359.62718 e = 0.7846091
 Node = 3.40781 2000.0 a = 3.0480940 AU
 Incl. = 9.73871 n = 0.18520877
 q = 0.6565317 AU P = 5.32 years

$$m_1 = 19.2 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	15 47.65	-25 27.4	3.362	2.701	-0.63 +2.4	.	22.5/107	41.2
Jan. 12	16 03.84	-26 30.9	3.174	2.614	-0.73 +2.4	.	23.0/106	47.6
Jan. 22	16 20.63	-27 32.5	2.975	2.524	-0.83 +2.4	.	23.6/105	53.9
Feb. 1	16 38.05	-28 32.0	2.769	2.432	-0.97 +2.3	.	24.2/104	60.0
Feb. 11	16 56.19	-29 29.5	2.556	2.337	-1.12 +2.1	.	24.9/103	66.1
Feb. 21	17 15.16	-30 24.9	2.338	2.239	-1.32 +1.7	.	25.8/102	71.9
Mar. 3	17 35.14	-31 18.2	2.120	2.138	-1.56 +1.2	.	26.9/101	77.6
Mar. 13	17 56.41	-32 09.5	1.902	2.035	-1.86 +0.3	.	28.5/100	83.0
Mar. 23	18 19.39	-32 58.4	1.687	1.929	-2.23 -1.0	.	30.7/99	88.0
Apr. 2	18 44.73	-33 44.0	1.477	1.819	-2.71 -3.0	22.0	33.9/97	92.5
Apr. 12	19 13.45	-34 23.7	1.276	1.706	-3.33 -6.3	21.5	38.7/95	96.2
Apr. 22	19 47.12	-34 51.2	1.086	1.590	-4.12 -11.7	20.9	45.8/92	99.0
May 2	20 28.10	-34 51.4	0.910	1.471	-5.08 -20.7	20.3	56.9/88	100.1
May 12	21 19.64	-33 51.4	0.753	1.350	-6.11 -35.7	19.6	74.0/81	98.8
May 22	22 24.71	-30 45.6	0.625	1.226	-6.80 -58.4	18.8	98.5/73	94.0
June 1	23 42.51	-24 00.1	0.538	1.101	-6.38 -83.2	18.2	125.8/64	84.5
June 11	01 04.60	-13 06.9	0.508	0.978	-4.70 -91.0	17.7	138.3/58	71.2
June 21	02 19.75	+00 43.1	0.544	0.862	-2.82 -73.8	17.4	125.2/56	58.0
July 1	03 23.79	+09 51.6	0.637	0.760	-1.70 -50.3	17.3	102.2/58	48.3
July 11	04 19.64	+17 34.2	0.771	0.687	-1.40 -32.8	17.4	84.5/64	42.5
July 21	05 11.49	+22 42.3	0.929	0.657	-1.54 -20.6	17.7	73.7/71	39.1
July 31	06 01.08	+25 41.7	1.094	0.679	-1.68 -11.5	18.1	66.0/79	37.3
Aug. 10	06 47.45	+26 58.4	1.251	0.747	-1.62 -4.9	18.7	58.8/87	36.7
Aug. 20	07 29.08	+27 02.6	1.390	0.846	-1.40 -0.7	19.4	51.8/93	37.2
Aug. 30	08 05.43	+26 21.8	1.511	0.961	-1.15 +1.7	20.0	45.4/97	38.8
Sept. 9	08 36.80	+25 16.6	1.611	1.083	-0.92 +3.0	20.5	39.8/100	41.3
Sept. 19	09 03.78	+24 00.8	1.691	1.207	-0.73 +3.6	21.0	34.9/103	44.8
Sept. 29	09 26.97	+22 43.2	1.752	1.331	-0.57 +3.9	21.4	30.5/104	49.1
Oct. 9	09 46.85	+21 29.6	1.794	1.453	-0.46 +4.0	21.7	26.4/105	54.1
Oct. 19	10 03.75	+20 24.3	1.817	1.573	-0.37 +4.1	22.0	22.4/105	59.8
Oct. 29	10 17.84	+19 30.2	1.824	1.689	-0.31 +4.2	.	18.4/105	66.3
Nov. 8	10 29.18	+18 50.1	1.814	1.802	-0.28 +4.3	.	14.3/103	73.4
Nov. 18	10 37.69	+18 26.3	1.792	1.912	-0.26 +4.6	.	9.9/98	81.4
Nov. 28	10 43.21	+18 20.8	1.760	2.019	-0.27 +4.9	.	5.4/85	90.1
Dec. 8	10 45.49	+18 34.9	1.723	2.123	-0.30 +5.4	.	2.6/12	99.7
Dec. 18	10 44.24	+19 09.2	1.684	2.224	-0.36 +6.0	.	6.5/314	110.1
Dec. 28	10 39.28	+20 02.1	1.652	2.322	-0.44 +6.6	.	11.7/302	121.5
Jan. 7	10 30.60	+21 09.3	1.632	2.417	-0.54 +7.1	.	16.5/296	133.6
Jan. 17	10 18.60	+22 23.5	1.632	2.510	-0.65 +7.5	.	20.2/292	146.3
Jan. 27	10 04.20	+23 35.0	1.658	2.600	-0.76 +7.6	.	22.0/288	158.8
Feb. 6	09 48.74	+24 34.5	1.715	2.688	-0.85 +7.3	.	21.6/283	168.4
Feb. 16	09 33.79	+25 15.6	1.804	2.774	-0.89 +6.8	.	19.3/279	166.3
Feb. 26	09 20.73	+25 36.3	1.925	2.857	-0.90 +6.1	.	15.8/274	155.9
Mar. 8	09 10.42	+25 38.4	2.073	2.938	-0.87 +5.4	.	11.7/267	144.5
Mar. 18	09 03.24	+25 25.6	2.245	3.017	-0.82 +4.7	.	7.6/255	133.5
Mar. 28	08 59.12	+25 01.7	2.436	3.094	-0.76 +4.2	.	4.5/230	123.0

Comet 267P/LONEOS

Epoch = 2018 July 21.0 TT
 T = 2018 July 22.31835 TT
 Peri. = 114.07985
 Node = 228.68892 2000.0
 Incl. = 6.13803
 q = 1.2411189 AU
 e = 0.6136064
 a = 3.2120586 AU
 n = 0.17120990
 P = 5.76 years

H = 19.4 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		V	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	16 27.58	-21 08.7	3.203	2.435	+1.98	-3.1	.	32.8
Jan. 12	16 47.76	-21 35.8	3.056	2.363	+2.06	-2.2	.	38.2
Jan. 22	17 08.68	-21 53.0	2.901	2.291	+2.13	-1.1	.	43.6
Feb. 1	17 30.34	-21 58.7	2.740	2.217	+2.21	+0.1	.	48.7
Feb. 11	17 52.74	-21 51.4	2.575	2.143	+2.28	+1.5	.	53.7
Feb. 21	18 15.90	-21 29.6	2.408	2.069	+2.36	+3.0	.	58.4
Mar. 3	18 39.80	-20 51.6	2.241	1.994	+2.43	+4.8	.	62.8
Mar. 13	19 04.50	-19 55.5	2.077	1.920	+2.52	+6.7	.	67.0
Mar. 23	19 30.03	-18 39.4	1.916	1.846	+2.60	+8.8	.	70.8
Apr. 2	19 56.43	-17 01.3	1.761	1.772	+2.69	+11.1	.	74.2
Apr. 12	20 23.80	-14 59.2	1.614	1.700	+2.79	+13.6	.	77.2
Apr. 22	20 52.22	-12 31.2	1.476	1.630	+2.90	+16.3	.	79.6
May 2	21 21.82	-09 36.1	1.351	1.562	+3.03	+19.0	.	81.5
May 12	21 52.73	-06 13.8	1.239	1.498	+3.17	+21.7	.	82.8
May 22	22 25.06	-02 26.1	1.141	1.438	+3.31	+24.0	.	83.5
June 1	22 58.88	+01 41.8	1.059	1.383	+3.47	+25.6	22.0	83.7
June 11	23 34.19	+06 02.0	0.993	1.336	+3.61	+26.2	21.8	83.4
June 21	00 10.81	+10 22.2	0.943	1.297	+3.72	+25.5	21.7	82.8
July 1	00 48.41	+14 28.8	0.908	1.267	+3.80	+23.4	21.6	82.2
July 11	01 26.44	+18 08.5	0.885	1.249	+3.80	+20.0	21.6	81.8
July 21	02 04.10	+21 10.7	0.871	1.241	+3.71	+15.9	21.5	81.8
July 31	02 40.52	+23 29.9	0.865	1.246	+3.54	+11.5	21.5	82.6
Aug. 10	03 14.78	+25 05.7	0.861	1.261	+3.27	+7.3	21.5	84.1
Aug. 20	03 45.97	+26 00.9	0.859	1.288	+2.92	+3.5	21.5	86.6
Aug. 30	04 13.35	+26 21.3	0.855	1.325	+2.51	+0.4	21.5	90.1
Sept. 9	04 36.33	+26 13.6	0.849	1.370	+2.03	-2.1	21.5	94.7
Sept. 19	04 54.31	+25 43.9	0.840	1.423	+1.51	-4.0	21.5	100.5
Sept. 29	05 06.90	+24 57.8	0.830	1.481	+0.95	-5.3	21.4	107.6
Oct. 9	05 13.76	+23 59.5	0.819	1.544	+0.36	-6.4	21.4	115.9
Oct. 19	05 14.72	+22 52.1	0.812	1.611	-0.22	-7.1	21.3	125.7
Oct. 29	05 10.13	+21 38.1	0.813	1.681	-0.73	-7.7	21.2	136.8
Nov. 8	05 00.91	+20 20.1	0.827	1.753	-1.12	-7.9	21.1	149.0
Nov. 18	04 48.77	+19 02.3	0.861	1.826	-1.29	-7.5	21.0	161.9
Nov. 28	04 35.92	+17 50.8	0.916	1.900	-1.24	-6.6	20.9	173.9
Dec. 8	04 24.38	+16 51.7	0.996	1.975	-1.02	-5.0	21.3	170.3
Dec. 18	04 15.65	+16 09.6	1.101	2.049	-0.69	-3.2	21.8	158.6
Dec. 28	04 10.37	+15 45.5	1.228	2.124	-0.33	-1.5	.	147.3
Jan. 7	04 08.58	+15 37.8	1.375	2.198	0.00	0.0	.	136.8
Jan. 17	04 09.99	+15 43.7	1.539	2.271	+0.30	+1.2	.	127.0
Jan. 27	04 14.13	+15 59.5	1.715	2.344	+0.54	+2.0	.	117.9
Feb. 6	04 20.52	+16 21.9	1.902	2.416	+0.75	+2.5	.	109.4
Feb. 16	04 28.78	+16 48.1	2.097	2.487	+0.91	+2.7	.	101.3
Feb. 26	04 38.51	+17 15.5	2.295	2.557	+1.04	+2.7	.	93.7
Mar. 8	04 49.42	+17 42.3	2.497	2.627	+1.15	+2.6	.	86.3
Mar. 18	05 01.27	+18 07.1	2.698	2.695	+1.23	+2.3	.	79.2
Mar. 28	05 13.84	+18 28.5	2.896	2.762	+1.29	+1.9	.	72.3

Comet P/2005 JN (Spacewatch)

Epoch = 2018 July 21.0 TT
 T = 2018 July 23.42123 TT
 Peri. = 153.41719 e = 0.3494070
 Node = 70.76507 2000.0 a = 3.5000332 AU
 Incl. = 8.85737 n = 0.15052056
 q = 2.2770971 AU P = 6.55 years

$$m_1 = 13.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	12 35.37	+07 01.5	2.338	2.628	-1.03 +8.0	21.1	14.8/101	95.9
Jan. 12	12 44.51	+06 39.1	2.184	2.598	-1.11 +8.7	20.9	12.5/97	103.6
Jan. 22	12 52.02	+06 29.6	2.036	2.569	-1.20 +9.5	20.7	9.7/91	111.8
Feb. 1	12 57.59	+06 33.9	1.896	2.541	-1.30 +10.3	20.5	6.7/80	120.4
Feb. 11	13 00.93	+06 51.9	1.768	2.514	-1.41 +11.2	20.2	3.9/49	129.5
Feb. 21	13 01.75	+07 22.7	1.656	2.489	-1.53 +12.0	20.0	3.8/346	139.0
Mar. 3	12 59.96	+08 03.1	1.562	2.464	-1.64 +12.7	19.8	6.5/313	148.8
Mar. 13	12 55.71	+08 48.1	1.489	2.440	-1.74 +13.2	19.7	9.3/299	158.2
Mar. 23	12 49.44	+09 30.8	1.440	2.418	-1.80 +13.4	19.5	11.1/290	165.3
Apr. 2	12 42.02	+10 03.3	1.417	2.397	-1.83 +13.4	19.5	11.6/282	165.2
Apr. 12	12 34.49	+10 18.7	1.418	2.377	-1.82 +13.0	19.4	10.6/272	158.0
Apr. 22	12 27.95	+10 12.7	1.443	2.359	-1.76 +12.5	19.4	8.5/257	148.5
May 2	12 23.32	+09 43.8	1.488	2.343	-1.68 +11.9	19.4	6.4/230	138.8
May 12	12 21.12	+08 53.4	1.551	2.328	-1.58 +11.3	19.5	6.2/190	129.5
May 22	12 21.58	+07 44.1	1.628	2.315	-1.48 +10.8	19.5	8.4/160	120.8
June 1	12 24.66	+06 19.2	1.715	2.304	-1.38 +10.4	19.6	11.4/144	112.7
June 11	12 30.15	+04 41.9	1.810	2.295	-1.30 +10.1	19.7	14.4/136	105.1
June 21	12 37.80	+02 54.7	1.911	2.288	-1.22 +9.8	19.8	17.2/130	98.1
July 1	12 47.33	+01 00.2	2.015	2.282	-1.16 +9.5	19.9	19.6/127	91.6
July 11	12 58.49	+00 59.7	2.122	2.279	-1.11 +9.2	20.0	21.7/124	85.4
July 21	13 11.06	-03 03.1	2.229	2.277	-1.07 +8.9	20.1	23.5/122	79.6
July 31	13 24.87	-05 08.4	2.337	2.278	-1.04 +8.6	20.2	24.9/120	74.1
Aug. 10	13 39.77	-07 14.1	2.444	2.280	-1.01 +8.3	20.3	26.2/119	68.7
Aug. 20	13 55.65	-09 18.8	2.549	2.285	-0.99 +7.9	20.4	27.2/117	63.5
Aug. 30	14 12.42	-11 21.0	2.652	2.291	-0.97 +7.5	20.5	28.0/115	58.4
Sept. 9	14 30.00	-13 19.5	2.753	2.299	-0.96 +7.1	20.6	28.7/114	53.4
Sept. 19	14 48.34	-15 12.9	2.849	2.310	-0.95 +6.7	20.7	29.2/112	48.5
Sept. 29	15 07.36	-17 00.0	2.942	2.322	-0.95 +6.2	20.8	29.6/110	43.6
Oct. 9	15 27.02	-18 39.6	3.030	2.336	-0.94 +5.7	20.9	29.9/109	38.7
Oct. 19	15 47.25	-20 10.6	3.113	2.351	-0.94 +5.2	21.0	30.1/107	33.8
Oct. 29	16 07.98	-21 32.1	3.189	2.368	-0.93 +4.7	21.1	30.2/105	28.9
Nov. 8	16 29.13	-22 43.3	3.259	2.387	-0.93 +4.1	21.2	30.2/103	23.9
Nov. 18	16 50.60	-23 43.5	3.322	2.407	-0.92 +3.6	21.3	30.1/100	18.9
Nov. 28	17 12.29	-24 32.2	3.376	2.429	-0.91 +3.0	21.4	30.0/98	13.8
Dec. 8	17 34.08	-25 09.3	3.421	2.452	-0.90 +2.4	21.5	29.8/96	8.8
Dec. 18	17 55.85	-25 34.8	3.457	2.476	-0.89 +1.9	21.6	29.4/94	4.0
Dec. 28	18 17.46	-25 49.0	3.483	2.502	-0.87 +1.4	21.7	29.0/92	3.1
Jan. 7	18 38.81	-25 52.6	3.499	2.528	-0.86 +0.9	21.8	28.5/90	7.9
Jan. 17	18 59.75	-25 46.2	3.503	2.556	-0.84 +0.4	21.8	28.0/88	13.2
Jan. 27	19 20.19	-25 31.0	3.497	2.584	-0.82 0.0	21.9	27.3/86	18.7
Feb. 6	19 40.02	-25 08.0	3.480	2.613	-0.80 -0.4	22.0	26.6/84	24.3
Feb. 16	19 59.15	-24 38.8	3.451	2.643	-0.78 -0.8	22.0	25.7/83	30.1
Feb. 26	20 17.48	-24 04.7	3.412	2.674	-0.76 -1.1	.	24.8/82	35.9
Mar. 8	20 34.95	-23 27.3	3.361	2.705	-0.74 -1.4	.	23.7/81	41.9
Mar. 18	20 51.48	-22 48.3	3.301	2.737	-0.73 -1.7	.	22.4/80	48.0
Mar. 28	21 07.00	-22 09.4	3.231	2.769	-0.71 -1.9	.	21.1/80	54.3

Comet C/2016 M1 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 Aug. 10.17042 TT
 Peri. = 209.82523
 Node = 92.20267 2000.0
 Incl. = 90.99897
 q = 2.2104861 AU
 e = 0.9991339

$$m1 = 5.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	18 18.48	+07 58.1	4.089	3.294	+0.99	-8.7	13.2	31.8
Jan. 12	18 28.41	+06 34.6	4.005	3.218	+0.99	-7.9	13.1	32.4
Jan. 22	18 38.31	+05 18.6	3.902	3.143	+0.98	-7.2	12.9	34.7
Feb. 1	18 48.06	+04 08.7	3.779	3.068	+0.96	-6.7	12.8	38.4
Feb. 11	18 57.54	+03 03.1	3.638	2.996	+0.93	-6.4	12.6	43.2
Feb. 21	19 06.62	+01 59.7	3.479	2.925	+0.88	-6.3	12.4	48.8
Mar. 3	19 15.15	+00 56.1	3.303	2.855	+0.82	-6.5	12.2	55.2
Mar. 13	19 22.96	+00 11.0	3.112	2.788	+0.74	-7.0	11.9	62.0
Mar. 23	19 29.86	-01 25.4	2.908	2.723	+0.63	-8.0	11.7	69.5
Apr. 2	19 35.58	-02 52.1	2.693	2.660	+0.50	-9.6	11.4	77.4
Apr. 12	19 39.81	-04 37.7	2.471	2.600	+0.32	-11.9	11.1	85.9
Apr. 22	19 42.10	-06 50.6	2.247	2.543	+0.10	-15.2	10.8	95.2
May 2	19 41.85	-09 42.1	2.026	2.490	-0.19	-19.8	10.5	105.4
May 12	19 38.24	-13 25.8	1.815	2.440	-0.59	-25.8	10.2	116.6
May 22	19 30.07	-18 16.5	1.623	2.395	-1.12	-33.2	9.8	129.2
June 1	19 15.77	-24 24.3	1.463	2.353	-1.84	-41.0	9.5	143.0
June 11	18 53.39	-31 41.5	1.349	2.317	-2.76	-46.3	9.3	156.7
June 21	18 21.15	-39 26.2	1.293	2.285	-3.79	-45.2	9.1	163.2
July 1	17 39.21	-46 24.6	1.301	2.259	-4.61	-36.4	9.1	153.8
July 11	16 51.56	-51 31.3	1.368	2.238	-4.80	-23.5	9.2	139.0
July 21	16 05.72	-54 33.5	1.482	2.223	-4.21	-12.5	9.3	124.7
July 31	15 28.00	-56 06.1	1.625	2.214	-3.21	-6.1	9.5	111.9
Aug. 10	15 00.47	-56 53.6	1.784	2.210	-2.22	-3.6	9.7	100.7
Aug. 20	14 42.17	-57 28.2	1.950	2.213	-1.40	-3.5	9.9	91.1
Aug. 30	14 31.15	-58 07.5	2.113	2.222	-0.77	-4.5	10.1	82.7
Sept. 9	14 25.64	-58 59.3	2.268	2.237	-0.30	-6.0	10.3	75.4
Sept. 19	14 24.34	-60 07.2	2.411	2.258	+0.06	-7.7	10.4	69.1
Sept. 29	14 26.32	-61 32.4	2.540	2.284	+0.35	-9.5	10.6	63.9
Oct. 9	14 31.00	-63 14.8	2.653	2.315	+0.60	-11.2	10.8	59.7
Oct. 19	14 38.09	-65 14.7	2.749	2.352	+0.83	-12.9	10.9	56.6
Oct. 29	14 47.49	-67 32.0	2.828	2.393	+1.07	-14.7	11.0	54.6
Nov. 8	14 59.49	-70 06.3	2.891	2.439	+1.36	-16.4	11.2	53.7
Nov. 18	15 14.81	-72 57.6	2.939	2.488	+1.77	-18.0	11.3	53.9
Nov. 28	15 35.21	-76 04.9	2.974	2.541	+2.46	-19.5	11.4	55.1
Dec. 8	16 05.36	-79 25.7	2.999	2.598	+3.93	-20.6	11.5	57.1
Dec. 18	16 59.58	-82 51.8	3.016	2.658	+8.15	-20.0	11.6	59.6
Dec. 28	19 13.22	-85 44.2	3.030	2.720	+22.33	-10.5	11.8	62.5
Jan. 7	23 22.37	-85 29.4	3.045	2.785	+19.32	+15.4	11.9	65.6
Jan. 17	01 29.33	-82 01.4	3.063	2.853	+7.22	+24.9	12.0	68.5
Jan. 27	02 22.89	-77 38.6	3.088	2.922	+3.80	+27.5	12.1	71.1
Feb. 6	02 54.58	-72 58.3	3.124	2.993	+2.60	+28.4	12.2	73.3
Feb. 16	03 17.82	-68 13.0	3.173	3.066	+2.06	+28.5	12.4	74.8
Feb. 26	03 36.99	-63 30.2	3.236	3.140	+1.78	+27.9	12.5	75.6
Mar. 8	03 53.93	-58 55.7	3.314	3.215	+1.61	+26.8	12.7	75.6
Mar. 18	04 09.50	-54 34.6	3.407	3.291	+1.50	+25.2	12.8	74.9
Mar. 28	04 24.12	-50 30.8	3.512	3.368	+1.42	+23.3	13.0	73.5

Comet 105P/Singer Brewster

Epoch = 2018 July 21.0 TT
 T = 2018 Aug. 10.49967 TT
 Peri. = 46.53418 e = 0.4101839
 Node = 192.43220 2000.0 a = 3.4659513 AU
 Incl. = 9.17664 n = 0.15274619
 q = 2.0442739 AU P = 6.45 years

$$m1 = 15.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	12 18.73	-07 12.3	2.333	2.596	+0.97	-5.5	21.0	94.1
Jan. 12	12 27.85	-08 02.0	2.166	2.556	+0.84	-4.3	20.8	101.9
Jan. 22	12 35.52	-08 39.2	2.004	2.517	+0.68	-2.9	20.5	110.0
Feb. 1	12 41.47	-09 01.3	1.850	2.479	+0.49	-1.3	20.3	118.7
Feb. 11	12 45.39	-09 05.4	1.707	2.441	+0.27	+0.7	20.0	127.9
Feb. 21	12 47.03	-08 48.7	1.579	2.404	+0.03	+2.9	19.8	137.7
Mar. 3	12 46.27	-08 09.3	1.468	2.368	-0.21	+5.2	19.6	148.2
Mar. 13	12 43.23	-07 07.1	1.377	2.334	-0.42	+7.4	19.4	159.3
Mar. 23	12 38.32	-05 44.8	1.311	2.300	-0.56	+9.1	19.2	170.9
Apr. 2	12 32.38	-04 09.0	1.270	2.268	-0.61	+10.0	19.1	177.1
Apr. 12	12 26.43	-02 29.5	1.254	2.238	-0.55	+9.7	19.0	165.3
Apr. 22	12 21.59	+00 57.0	1.263	2.209	-0.39	+8.5	18.9	153.7
May 2	12 18.77	+00 19.0	1.293	2.182	-0.15	+6.4	18.9	142.8
May 12	12 18.53	+01 12.8	1.340	2.157	+0.13	+4.0	19.0	132.7
May 22	12 21.11	+01 41.7	1.402	2.135	+0.41	+1.5	19.0	123.5
June 1	12 26.48	+01 46.2	1.475	2.114	+0.68	-0.8	19.1	115.1
June 11	12 34.38	+01 28.3	1.554	2.096	+0.92	-2.9	19.2	107.5
June 21	12 44.58	+00 50.8	1.640	2.081	+1.13	-4.7	19.3	100.5
July 1	12 56.75	+00 03.2	1.728	2.068	+1.32	-6.2	19.3	94.2
July 11	13 10.63	-01 10.5	1.819	2.058	+1.47	-7.3	19.4	88.3
July 21	13 26.00	-02 28.2	1.911	2.050	+1.61	-8.2	19.5	82.9
July 31	13 42.64	-03 53.4	2.004	2.046	+1.73	-8.8	19.6	77.8
Aug. 10	14 00.39	-05 23.4	2.098	2.044	+1.83	-9.2	19.7	72.9
Aug. 20	14 19.13	-06 55.6	2.191	2.046	+1.92	-9.3	19.8	68.3
Aug. 30	14 38.75	-08 27.7	2.284	2.050	+2.01	-9.1	19.9	63.8
Sept. 9	14 59.15	-09 57.2	2.377	2.057	+2.08	-8.7	20.0	59.5
Sept. 19	15 20.25	-11 22.1	2.468	2.067	+2.14	-8.2	20.1	55.2
Sept. 29	15 41.94	-12 40.4	2.559	2.079	+2.20	-7.4	20.2	51.0
Oct. 9	16 04.14	-13 50.3	2.649	2.095	+2.25	-6.5	20.3	46.7
Oct. 19	16 26.77	-14 50.3	2.737	2.112	+2.28	-5.4	20.4	42.5
Oct. 29	16 49.69	-15 39.0	2.822	2.132	+2.30	-4.2	20.5	38.2
Nov. 8	17 12.81	-16 15.6	2.905	2.155	+2.32	-3.0	20.7	33.9
Nov. 18	17 36.01	-16 39.5	2.984	2.180	+2.32	-1.7	20.8	29.6
Nov. 28	17 59.14	-16 50.2	3.059	2.206	+2.31	-0.4	20.9	25.2
Dec. 8	18 22.09	-16 47.8	3.128	2.235	+2.28	+0.9	21.0	20.8
Dec. 18	18 44.75	-16 32.8	3.192	2.265	+2.24	+2.2	21.1	16.4
Dec. 28	19 07.00	-16 05.7	3.249	2.297	+2.20	+3.3	21.2	12.1
Jan. 7	19 28.75	-15 27.3	3.299	2.330	+2.14	+4.4	21.3	8.3
Jan. 17	19 49.91	-14 38.8	3.340	2.365	+2.08	+5.4	21.4	6.3
Jan. 27	20 10.41	-13 41.3	3.372	2.400	+2.01	+6.2	21.4	7.8
Feb. 6	20 30.21	-12 36.2	3.395	2.437	+1.94	+6.9	21.5	11.6
Feb. 16	20 49.26	-11 24.8	3.407	2.475	+1.86	+7.4	21.6	16.3
Feb. 26	21 07.51	-10 08.4	3.409	2.513	+1.78	+7.9	21.7	21.4
Mar. 8	21 24.97	-08 48.5	3.399	2.552	+1.70	+8.1	21.7	26.7
Mar. 18	21 41.57	-07 26.3	3.379	2.592	+1.61	+8.3	21.8	32.2
Mar. 28	21 57.31	-06 03.2	3.348	2.632	+1.53	+8.3	21.8	37.9

Comet 48P/Johnson

Epoch = 2018 July 21.0 TT
 T = 2018 Aug. 12.19153 TT
 Peri. = 216.55806 e = 0.4269688
 Node = 110.13373 2000.0 a = 3.4981223 AU
 Incl. = 12.20706 n = 0.15064392
 q = 2.0045332 AU P = 6.54 years

$$m1 = 7.8 + 5 \log(\Delta) + 17.5 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	17 14.92	-17 12.2	3.478	2.600	+1.90	-3.6	18.5	22.8
Jan. 12	17 34.06	-17 44.0	3.382	2.558	+1.93	-2.7	18.3	28.2
Jan. 22	17 53.51	-18 07.1	3.277	2.516	+1.96	-1.8	18.1	33.6
Feb. 1	18 13.18	-18 21.7	3.163	2.475	+1.98	-1.0	17.9	39.0
Feb. 11	18 33.00	-18 27.6	3.042	2.435	+1.99	-0.1	17.7	44.3
Feb. 21	18 52.88	-18 25.4	2.915	2.396	+1.99	+0.7	17.5	49.6
Mar. 3	19 12.71	-18 15.5	2.784	2.358	+1.98	+1.4	17.3	54.9
Mar. 13	19 32.42	-17 58.9	2.648	2.321	+1.96	+2.0	17.1	60.2
Mar. 23	19 51.92	-17 36.5	2.511	2.285	+1.93	+2.5	16.8	65.5
Apr. 2	20 11.10	-17 09.9	2.372	2.251	+1.90	+2.8	16.6	70.8
Apr. 12	20 29.89	-16 40.7	2.234	2.218	+1.85	+3.0	16.3	76.1
Apr. 22	20 48.17	-16 10.9	2.096	2.187	+1.80	+2.9	16.0	81.5
May 2	21 05.83	-15 43.0	1.961	2.158	+1.73	+2.6	15.8	87.0
May 12	21 22.75	-15 19.5	1.829	2.131	+1.64	+2.0	15.5	92.7
May 22	21 38.74	-15 03.6	1.701	2.106	+1.54	+1.0	15.2	98.6
June 1	21 53.62	-14 58.8	1.580	2.084	+1.42	-0.3	15.0	104.8
June 11	22 07.15	-15 08.6	1.465	2.064	+1.27	-1.9	14.7	111.3
June 21	22 19.03	-15 36.7	1.359	2.047	+1.08	-3.9	14.4	118.3
July 1	22 28.94	-16 26.2	1.263	2.032	+0.87	-6.2	14.2	125.7
July 11	22 36.52	-17 39.0	1.180	2.021	+0.62	-8.6	13.9	133.7
July 21	22 41.45	-19 14.5	1.111	2.012	+0.34	-10.7	13.7	142.2
July 31	22 43.57	-21 08.4	1.059	2.007	+0.06	-12.1	13.5	150.8
Aug. 10	22 42.97	-23 11.7	1.026	2.005	-0.20	-12.4	13.4	158.7
Aug. 20	22 40.13	-25 11.5	1.014	2.005	-0.37	-11.2	13.3	163.6
Aug. 30	22 36.04	-26 53.5	1.024	2.010	-0.43	-8.7	13.2	162.3
Sept. 9	22 31.89	-28 06.1	1.055	2.017	-0.37	-5.3	13.3	155.8
Sept. 19	22 28.94	-28 43.0	1.106	2.027	-0.19	-1.7	13.3	147.5
Sept. 29	22 28.14	-28 43.7	1.175	2.040	+0.06	+1.8	13.4	139.0
Oct. 9	22 29.93	-28 12.1	1.259	2.056	+0.33	+4.8	13.6	130.8
Oct. 19	22 34.43	-27 13.1	1.357	2.075	+0.59	+7.2	13.8	122.9
Oct. 29	22 41.42	-25 52.4	1.466	2.096	+0.82	+9.1	13.9	115.6
Nov. 8	22 50.52	-24 14.7	1.584	2.120	+1.01	+10.5	14.1	108.6
Nov. 18	23 01.38	-22 24.0	1.710	2.146	+1.17	+11.7	14.3	102.0
Nov. 28	23 13.63	-20 23.6	1.842	2.174	+1.29	+12.5	14.5	95.7
Dec. 8	23 26.94	-18 16.1	1.980	2.204	+1.38	+13.1	14.8	89.5
Dec. 18	23 41.09	-16 03.8	2.120	2.236	+1.45	+13.4	15.0	83.6
Dec. 28	23 55.86	-13 48.5	2.263	2.270	+1.50	+13.6	15.2	77.8
Jan. 7	00 11.09	-11 31.9	2.408	2.305	+1.55	+13.7	15.4	72.2
Jan. 17	00 26.69	-09 15.4	2.552	2.341	+1.58	+13.6	15.6	66.6
Jan. 27	00 42.54	-07 00.3	2.694	2.379	+1.60	+13.4	15.9	61.1
Feb. 6	00 58.60	-04 47.8	2.834	2.418	+1.62	+13.1	16.1	55.6
Feb. 16	01 14.81	-02 38.8	2.970	2.458	+1.63	+12.7	16.3	50.2
Feb. 26	01 31.13	+00 34.2	3.101	2.498	+1.64	+12.2	16.5	44.8
Mar. 8	01 47.53	+01 25.2	3.226	2.539	+1.64	+11.6	16.7	39.5
Mar. 18	02 03.99	+03 18.7	3.343	2.581	+1.65	+11.0	16.9	34.2
Mar. 28	02 20.46	+05 05.7	3.452	2.623	+1.65	+10.3	17.1	28.9

Comet 243P/NEAT

Epoch = 2018 July 21.0 TT
 T = 2018 Aug. 26.04192 TT
 Peri. = 283.56057 e = 0.3592440
 Node = 87.65894 2000.0 a = 3.8305658 AU
 Incl. = 7.64144 n = 0.13146486
 q = 2.4544580 AU P = 7.50 years

$$m_1 = 8.4 + 5 \log(\Delta) + 20.0 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	20 16.84	-23 34.7	3.774	2.871	+1.75	+4.9	20.7	20.1
Jan. 12	20 34.46	-22 42.8	3.784	2.841	+1.78	+5.6	20.6	14.3
Jan. 22	20 52.29	-21 43.7	3.780	2.812	+1.79	+6.3	20.5	8.8
Feb. 1	21 10.24	-20 37.8	3.764	2.783	+1.80	+6.9	20.4	4.6
Feb. 11	21 28.24	-19 25.8	3.736	2.755	+1.80	+7.5	20.3	5.7
Feb. 21	21 46.22	-18 08.1	3.696	2.728	+1.80	+8.0	20.2	10.4
Mar. 3	22 04.13	-16 45.6	3.644	2.702	+1.79	+8.5	20.1	15.6
Mar. 13	22 21.93	-15 19.0	3.582	2.677	+1.77	+8.8	20.0	20.9
Mar. 23	22 39.60	-13 49.4	3.510	2.653	+1.76	+9.1	19.8	26.2
Apr. 2	22 57.08	-12 17.6	3.429	2.630	+1.74	+9.3	19.7	31.5
Apr. 12	23 14.37	-10 44.7	3.340	2.608	+1.72	+9.3	19.6	36.8
Apr. 22	23 31.43	-09 11.7	3.244	2.588	+1.69	+9.3	19.4	42.1
May 2	23 48.23	-07 39.8	3.142	2.568	+1.66	+9.1	19.3	47.3
May 12	00 04.73	-06 10.0	3.034	2.550	+1.63	+8.8	19.1	52.6
May 22	00 20.88	-04 43.5	2.921	2.533	+1.59	+8.4	19.0	57.9
June 1	00 36.62	-03 21.5	2.804	2.518	+1.55	+7.9	18.8	63.3
June 11	00 51.87	-02 05.1	2.685	2.505	+1.49	+7.3	18.7	68.9
June 21	01 06.51	+00 55.4	2.563	2.492	+1.43	+6.5	18.5	74.5
July 1	01 20.42	+00 06.3	2.441	2.482	+1.34	+5.7	18.4	80.4
July 11	01 33.42	+00 59.1	2.318	2.473	+1.24	+4.7	18.2	86.5
July 21	01 45.30	+01 41.8	2.196	2.466	+1.12	+3.7	18.0	92.9
July 31	01 55.82	+02 13.8	2.077	2.460	+0.97	+2.6	17.9	99.7
Aug. 10	02 04.70	+02 34.3	1.962	2.457	+0.79	+1.4	17.7	106.9
Aug. 20	02 11.62	+02 42.9	1.854	2.455	+0.57	+0.2	17.6	114.7
Aug. 30	02 16.30	+02 40.0	1.754	2.455	+0.33	-0.9	17.4	123.0
Sept. 9	02 18.48	+02 26.4	1.666	2.456	+0.07	-1.9	17.3	131.9
Sept. 19	02 18.00	+02 04.0	1.593	2.460	-0.19	-2.6	17.2	141.4
Sept. 29	02 14.97	+01 36.4	1.538	2.465	-0.43	-2.9	17.1	151.4
Oct. 9	02 09.76	+01 08.0	1.505	2.471	-0.62	-2.7	17.1	161.1
Oct. 19	02 03.08	+00 44.2	1.496	2.480	-0.71	-1.9	17.1	168.4
Oct. 29	01 55.93	+00 30.5	1.513	2.490	-0.70	-0.6	17.1	166.6
Nov. 8	01 49.31	+00 30.9	1.556	2.502	-0.59	+0.9	17.2	158.0
Nov. 18	01 44.16	+00 47.7	1.622	2.515	-0.41	+2.6	17.3	147.9
Nov. 28	01 41.12	+01 20.9	1.711	2.530	-0.18	+4.2	17.5	137.8
Dec. 8	01 40.47	+02 09.1	1.818	2.546	+0.07	+5.6	17.7	128.1
Dec. 18	01 42.27	+03 10.0	1.940	2.564	+0.31	+6.7	17.9	118.9
Dec. 28	01 46.38	+04 21.1	2.073	2.583	+0.53	+7.6	18.0	110.2
Jan. 7	01 52.57	+05 39.7	2.215	2.604	+0.72	+8.2	18.2	102.0
Jan. 17	02 00.60	+07 03.7	2.363	2.625	+0.89	+8.6	18.4	94.2
Jan. 27	02 10.20	+08 31.0	2.514	2.648	+1.04	+8.8	18.6	86.8
Feb. 6	02 21.15	+09 59.6	2.666	2.672	+1.16	+8.9	18.8	79.7
Feb. 16	02 33.26	+11 28.3	2.817	2.697	+1.27	+8.8	19.0	72.9
Feb. 26	02 46.33	+12 55.4	2.965	2.723	+1.36	+8.6	19.2	66.3
Mar. 8	03 00.24	+14 19.9	3.109	2.750	+1.43	+8.3	19.4	59.9
Mar. 18	03 14.85	+15 40.7	3.248	2.777	+1.49	+7.8	19.6	53.7
Mar. 28	03 30.04	+16 56.8	3.379	2.806	+1.55	+7.3	19.7	47.6

Comet 125P/Spacewatch

Epoch = 2018 July 21.0 TT
 T = 2018 Aug. 27.95818 TT
 Peri. = 87.17962 e = 0.5135552
 Node = 153.17993 2000.0 a = 3.1250561 AU
 Incl. = 9.98883 n = 0.17840924
 q = 1.5201673 AU P = 5.52 years

$$m_1 = 11.6 + 5 \log(\Delta) + 20.0 \log(r(t-20))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	10 28.76	+05 46.8	1.892	2.580	+0.18	+0.8	21.6	124.5
Jan. 12	10 29.46	+06 03.7	1.733	2.522	-0.07	+2.8	21.2	134.6
Jan. 22	10 27.59	+06 42.4	1.590	2.465	-0.33	+5.1	20.8	145.4
Feb. 1	10 23.08	+07 44.1	1.469	2.407	-0.59	+7.4	20.5	157.0
Feb. 11	10 16.15	+09 07.8	1.372	2.349	-0.81	+9.4	20.1	169.2
Feb. 21	10 07.42	+10 48.2	1.302	2.291	-0.93	+10.6	19.8	177.8
Mar. 3	09 58.01	+12 36.5	1.260	2.232	-0.93	+10.8	19.5	165.1
Mar. 13	09 49.27	+14 21.7	1.244	2.174	-0.79	+10.0	19.3	152.5
Mar. 23	09 42.53	+15 54.2	1.251	2.117	-0.52	+8.2	19.1	140.5
Apr. 2	09 38.84	+17 06.9	1.275	2.060	-0.18	+6.0	18.9	129.3
Apr. 12	09 38.73	+17 56.9	1.313	2.003	+0.19	+3.7	18.7	119.2
Apr. 22	09 42.35	+18 23.2	1.359	1.948	+0.56	+1.4	18.5	110.1
May 2	09 49.54	+18 26.6	1.409	1.894	+0.90	-0.9	18.4	102.0
May 12	09 59.94	+18 08.2	1.459	1.842	+1.20	-3.0	18.2	94.8
May 22	10 13.19	+17 28.9	1.509	1.793	+1.47	-5.0	18.0	88.3
June 1	10 28.91	+16 29.6	1.556	1.746	+1.69	-7.0	17.9	82.7
June 11	10 46.73	+15 11.4	1.600	1.701	+1.89	-8.8	17.7	77.6
June 21	11 06.38	+13 35.0	1.640	1.661	+2.06	-10.6	17.5	73.2
July 1	11 27.61	+11 41.7	1.678	1.625	+2.20	-12.2	17.3	69.2
July 11	11 50.20	+09 32.9	1.713	1.593	+2.33	-13.7	17.2	65.8
July 21	12 14.04	+07 10.4	1.746	1.566	+2.45	-14.9	17.0	62.7
July 31	12 38.99	+04 36.6	1.780	1.546	+2.55	-15.9	16.9	60.0
Aug. 10	13 04.96	+01 54.5	1.814	1.531	+2.65	-16.5	16.8	57.5
Aug. 20	13 31.90	+00 52.4	1.851	1.522	+2.74	-16.8	16.7	55.3
Aug. 30	13 59.74	-03 40.2	1.892	1.520	+2.83	-16.7	16.7	53.2
Sept. 9	14 28.40	-06 24.5	1.937	1.525	+2.91	-16.1	16.7	51.3
Sept. 19	14 57.81	-09 00.8	1.988	1.536	+2.98	-15.0	16.7	49.3
Sept. 29	15 27.83	-11 24.8	2.046	1.553	+3.03	-13.6	16.8	47.4
Oct. 9	15 58.33	-13 32.6	2.110	1.577	+3.07	-11.8	16.9	45.3
Oct. 19	16 29.12	-15 21.0	2.182	1.605	+3.09	-9.7	17.1	43.1
Oct. 29	16 59.96	-16 47.7	2.259	1.639	+3.08	-7.4	17.3	40.7
Nov. 8	17 30.62	-17 51.7	2.342	1.677	+3.05	-5.1	17.6	38.0
Nov. 18	18 00.88	-18 32.6	2.430	1.719	+2.99	-2.8	17.8	35.2
Nov. 28	18 30.49	-18 51.2	2.521	1.764	+2.92	-0.7	18.1	32.1
Dec. 8	18 59.27	-18 49.0	2.614	1.813	+2.83	+1.3	18.4	28.7
Dec. 18	19 27.09	-18 28.0	2.707	1.863	+2.72	+3.0	18.7	25.1
Dec. 28	19 53.82	-17 50.6	2.799	1.916	+2.61	+4.5	19.0	21.3
Jan. 7	20 19.42	-16 59.2	2.888	1.970	+2.50	+5.8	19.3	17.2
Jan. 17	20 43.88	-15 56.5	2.973	2.026	+2.38	+6.8	19.6	13.0
Jan. 27	21 07.19	-14 44.6	3.051	2.083	+2.27	+7.6	19.9	8.5
Feb. 6	21 29.41	-13 26.0	3.123	2.140	+2.16	+8.2	20.2	4.0
Feb. 16	21 50.55	-12 02.6	3.185	2.198	+2.06	+8.5	20.5	1.4
Feb. 26	22 10.68	-10 36.4	3.238	2.256	+1.96	+8.7	20.8	6.0
Mar. 8	22 29.85	-09 08.9	3.280	2.314	+1.87	+8.8	21.0	11.1
Mar. 18	22 48.09	-07 41.7	3.311	2.372	+1.77	+8.7	21.3	16.3
Mar. 28	23 05.44	-06 16.1	3.329	2.430	+1.69	+8.4	21.5	21.7

Comet 21P/Giacobini-Zinner

Epoch = 2018 July 21.0 TT
 T = 2018 Sept. 10.50742 TT
 Peri. = 172.86264 e = 0.7104859
 Node = 195.39335 2000.0 a = 3.4981840 AU
 Incl. = 31.99752 n = 0.15063993
 q = 1.0127736 AU P = 6.54 years

$$m1 = 9.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	16 39.47	-03 50.7	3.697	2.967	+1.47	+1.4	19.5	36.7
Jan. 12	16 54.31	-03 31.6	3.538	2.891	+1.50	+2.6	19.3	42.5
Jan. 22	17 09.40	-02 59.9	3.369	2.814	+1.52	+3.9	19.0	48.4
Feb. 1	17 24.68	-02 14.4	3.191	2.735	+1.54	+5.4	18.7	54.2
Feb. 11	17 40.09	-01 13.8	3.007	2.654	+1.55	+7.0	18.3	60.0
Feb. 21	17 55.58	+00 03.5	2.818	2.573	+1.55	+8.7	18.0	65.6
Mar. 3	18 11.09	+01 39.0	2.627	2.489	+1.55	+10.6	17.6	71.1
Mar. 13	18 26.58	+03 34.0	2.437	2.405	+1.55	+12.7	17.3	76.4
Mar. 23	18 42.00	+05 50.4	2.249	2.319	+1.54	+14.9	16.8	81.4
Apr. 2	18 57.32	+08 29.6	2.066	2.231	+1.53	+17.2	16.4	86.0
Apr. 12	19 12.53	+11 33.1	1.889	2.142	+1.51	+19.8	15.9	90.3
Apr. 22	19 27.62	+15 02.3	1.721	2.052	+1.50	+22.4	15.5	94.0
May 2	19 42.63	+18 57.7	1.563	1.961	+1.50	+25.0	15.0	97.1
May 12	19 57.67	+23 19.3	1.416	1.869	+1.51	+27.6	14.4	99.4
May 22	20 12.89	+28 06.0	1.281	1.777	+1.54	+30.0	13.9	100.9
June 1	20 28.62	+33 15.0	1.157	1.684	+1.62	+32.0	13.3	101.5
June 11	20 45.42	+38 42.5	1.045	1.591	+1.77	+33.6	12.7	101.1
June 21	21 04.26	+44 22.6	0.943	1.500	+2.06	+34.4	12.1	99.8
July 1	21 26.96	+50 07.9	0.849	1.410	+2.59	+34.5	11.5	97.8
July 11	21 56.84	+55 49.1	0.762	1.324	+3.58	+33.3	10.8	95.2
July 21	22 40.07	+61 08.2	0.679	1.244	+5.43	+29.4	10.2	92.2
July 31	23 47.40	+65 21.6	0.600	1.171	+8.53	+18.4	9.5	89.0
Aug. 10	01 27.53	+66 43.2	0.526	1.108	+11.40	-7.8	8.9	85.9
Aug. 20	03 19.80	+62 30.9	0.460	1.059	+10.19	-47.6	8.3	82.9
Aug. 30	04 46.60	+51 42.4	0.411	1.026	+6.86	-83.9	7.8	80.6
Sept. 9	05 43.36	+35 56.0	0.389	1.013	+4.45	103.8	7.6	79.7
Sept. 19	06 20.93	+18 32.4	0.399	1.020	+3.04	101.1	7.7	80.8
Sept. 29	06 47.10	+02 53.9	0.439	1.047	+2.16	-83.7	8.1	83.4
Oct. 9	07 05.55	-09 35.2	0.498	1.091	+1.49	-64.6	8.7	86.8
Oct. 19	07 17.69	-19 08.1	0.566	1.150	+0.89	-49.1	9.3	90.5
Oct. 29	07 24.08	-26 23.7	0.636	1.221	+0.33	-37.3	9.9	94.5
Nov. 8	07 24.81	-31 53.2	0.705	1.299	-0.24	-27.8	10.5	98.7
Nov. 18	07 19.99	-35 52.3	0.771	1.384	-0.77	-19.2	11.2	103.0
Nov. 28	07 10.32	-38 27.0	0.837	1.473	-1.19	-10.9	11.7	107.4
Dec. 8	06 57.11	-39 38.9	0.903	1.563	-1.44	-2.7	12.3	111.7
Dec. 18	06 42.38	-39 29.5	0.973	1.656	-1.47	+5.2	12.8	115.5
Dec. 28	06 28.40	-38 06.9	1.050	1.749	-1.28	+11.8	13.3	118.6
Jan. 7	06 16.94	-35 44.8	1.136	1.841	-0.96	+16.8	13.9	120.5
Jan. 17	06 09.04	-32 40.8	1.234	1.934	-0.58	+20.0	14.4	120.9
Jan. 27	06 04.97	-29 13.6	1.345	2.025	-0.21	+21.4	14.8	119.9
Feb. 6	06 04.45	-25 38.7	1.470	2.115	+0.13	+21.4	15.3	117.5
Feb. 16	06 07.06	-22 08.3	1.609	2.204	+0.41	+20.4	15.8	114.0
Feb. 26	06 12.23	-18 50.7	1.761	2.292	+0.64	+18.8	16.2	109.7
Mar. 8	06 19.48	-15 50.8	1.924	2.379	+0.82	+16.9	16.7	104.8
Mar. 18	06 28.37	-13 11.1	2.097	2.464	+0.97	+14.8	17.1	99.4
Mar. 28	06 38.54	-10 52.5	2.278	2.548	+1.07	+12.7	17.5	93.9

Comet 79P/du Toit-Hartley

Epoch = 2018 July 21.0 TT
 T = 2018 Sept. 13.34225 TT
 Peri. = 281.84910 e = 0.6192151
 Node = 280.52680 2000.0 a = 2.9437478 AU
 Incl. = 3.14767 n = 0.19514309
 q = 1.1209347 AU P = 5.05 years

$$m_1 = 16.0 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	'		°
Jan. 2	04 17.75	+23 07.5	1.919	2.784	-0.94	-3.4	20.8	145.3
Jan. 12	04 09.55	+22 35.2	1.949	2.718	-0.66	-2.9	20.7	133.2
Jan. 22	04 04.32	+22 09.0	1.998	2.651	-0.35	-2.2	20.7	121.7
Feb. 1	04 02.30	+21 51.2	2.059	2.582	-0.02	-1.3	20.7	111.0
Feb. 11	04 03.46	+21 42.5	2.127	2.512	+0.28	-0.4	20.6	101.1
Feb. 21	04 07.62	+21 42.4	2.197	2.441	+0.57	+0.4	20.6	92.0
Mar. 3	04 14.55	+21 49.7	2.265	2.368	+0.83	+1.1	20.6	83.6
Mar. 13	04 23.99	+22 02.2	2.327	2.294	+1.07	+1.5	20.5	75.7
Mar. 23	04 35.74	+22 17.9	2.381	2.219	+1.29	+1.7	20.5	68.5
Apr. 2	04 49.61	+22 34.4	2.425	2.143	+1.50	+1.6	20.4	61.8
Apr. 12	05 05.44	+22 49.3	2.459	2.066	+1.69	+1.3	20.3	55.7
Apr. 22	05 23.13	+23 00.1	2.480	1.988	+1.87	+0.8	20.2	49.9
May 2	05 42.58	+23 04.4	2.490	1.910	+2.04	0.0	20.1	44.7
May 12	06 03.71	+22 59.5	2.487	1.831	+2.20	-1.1	19.9	39.9
May 22	06 26.49	+22 42.8	2.474	1.752	+2.36	-2.4	19.8	35.5
June 1	06 50.83	+22 11.8	2.451	1.673	+2.52	-4.0	19.6	31.5
June 11	07 16.69	+21 23.6	2.418	1.595	+2.67	-5.9	19.4	28.0
June 21	07 44.01	+20 15.7	2.379	1.519	+2.81	-8.0	19.2	25.0
July 1	08 12.72	+18 45.7	2.333	1.445	+2.94	-10.3	19.0	22.4
July 11	08 42.75	+16 51.7	2.284	1.375	+3.07	-12.8	18.8	20.2
July 21	09 14.05	+14 32.1	2.233	1.310	+3.20	-15.4	18.6	18.6
July 31	09 46.53	+11 46.9	2.183	1.252	+3.31	-17.9	18.4	17.4
Aug. 10	10 20.16	+08 37.1	2.137	1.202	+3.42	-20.2	18.2	16.7
Aug. 20	10 54.89	+05 05.5	2.098	1.163	+3.53	-22.2	18.1	16.4
Aug. 30	11 30.66	+01 17.3	2.067	1.136	+3.63	-23.5	18.0	16.5
Sept. 9	12 07.46	-02 40.4	2.048	1.122	+3.73	-24.0	17.9	16.8
Sept. 19	12 45.19	-06 38.7	2.042	1.123	+3.82	-23.5	17.9	17.3
Sept. 29	13 23.71	-10 27.6	2.051	1.139	+3.89	-22.0	18.0	17.8
Oct. 9	14 02.82	-13 57.7	2.075	1.167	+3.93	-19.6	18.1	18.1
Oct. 19	14 42.19	-17 00.6	2.115	1.208	+3.94	-16.5	18.2	18.1
Oct. 29	15 21.41	-19 30.3	2.168	1.259	+3.90	-13.0	18.4	17.8
Nov. 8	16 00.04	-21 24.0	2.234	1.319	+3.81	-9.3	18.6	17.0
Nov. 18	16 37.61	-22 41.2	2.309	1.384	+3.68	-5.8	18.9	15.7
Nov. 28	17 13.72	-23 24.1	2.393	1.455	+3.52	-2.5	19.1	14.0
Dec. 8	17 48.08	-23 36.3	2.480	1.529	+3.33	+0.3	19.4	11.7
Dec. 18	18 20.49	-23 22.0	2.570	1.605	+3.13	+2.7	19.6	9.0
Dec. 28	18 50.87	-22 45.8	2.658	1.683	+2.93	+4.6	19.8	5.8
Jan. 7	19 19.23	-21 52.2	2.744	1.762	+2.73	+6.2	20.0	2.2
Jan. 17	19 45.62	-20 44.9	2.824	1.841	+2.54	+7.3	20.2	1.8
Jan. 27	20 10.16	-19 27.3	2.896	1.920	+2.36	+8.2	20.4	6.0
Feb. 6	20 32.97	-18 02.5	2.959	1.998	+2.19	+8.8	20.6	10.6
Feb. 16	20 54.15	-16 32.7	3.011	2.076	+2.03	+9.2	20.8	15.4
Feb. 26	21 13.82	-15 00.2	3.052	2.153	+1.89	+9.3	20.9	20.5
Mar. 8	21 32.07	-13 26.5	3.079	2.229	+1.75	+9.4	21.1	25.9
Mar. 18	21 48.98	-11 53.3	3.093	2.304	+1.62	+9.2	21.2	31.5
Mar. 28	22 04.58	-10 21.8	3.094	2.377	+1.49	+9.0	21.3	37.3

Comet P/2005 R1 (NEAT)

Epoch = 2018 July 21.0 TT
 T = 2018 Sept. 14.33078 TT
 Peri. = 118.80194 e = 0.6257018
 Node = 257.97865 2000.0 a = 5.5244295 AU
 Incl. = 15.48436 n = 0.07590544
 q = 2.0677840 AU P = 12.98 years

$$m_1 = 11.2 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° ' "			for T=+1 day			°
Jan. 2	19 28.35	-14 37.5	4.012	3.060	-0.55 -3.0	.	23.1/78	12.5
Jan. 12	19 44.10	-13 44.4	3.971	3.002	-0.57 -3.2	.	24.0/76	8.4
Jan. 22	20 00.20	-12 42.5	3.916	2.945	-0.60 -3.5	.	24.7/74	8.0
Feb. 1	20 16.56	-11 31.7	3.847	2.888	-0.63 -3.8	.	25.4/73	11.4
Feb. 11	20 33.12	-10 11.7	3.766	2.831	-0.66 -4.1	22.0	26.0/71	16.2
Feb. 21	20 49.82	-08 42.6	3.673	2.776	-0.69 -4.4	21.8	26.6/69	21.4
Mar. 3	21 06.61	-07 04.6	3.570	2.721	-0.73 -4.7	21.6	27.1/68	26.6
Mar. 13	21 23.47	-05 17.8	3.459	2.667	-0.77 -5.1	21.3	27.6/66	31.9
Mar. 23	21 40.35	-03 22.6	3.340	2.614	-0.81 -5.4	21.1	28.0/65	37.0
Apr. 2	21 57.24	-01 19.4	3.215	2.563	-0.86 -5.8	20.9	28.3/63	42.1
Apr. 12	22 14.12	+00 51.4	3.086	2.512	-0.91 -6.1	20.6	28.7/62	47.0
Apr. 22	22 30.98	+03 09.1	2.954	2.464	-0.97 -6.4	20.4	28.9/61	51.9
May 2	22 47.81	+05 32.9	2.819	2.417	-1.04 -6.7	20.2	29.1/60	56.7
May 12	23 04.60	+08 02.0	2.685	2.372	-1.11 -6.9	19.9	29.2/59	61.3
May 22	23 21.34	+10 35.4	2.550	2.330	-1.19 -7.1	19.7	29.1/58	66.0
June 1	23 37.99	+13 11.8	2.417	2.289	-1.29 -7.2	19.4	28.9/57	70.6
June 11	23 54.54	+15 50.0	2.287	2.252	-1.39 -7.2	19.2	28.5/56	75.1
June 21	00 10.90	+18 28.2	2.160	2.217	-1.51 -7.1	18.9	27.9/56	79.7
July 1	00 26.99	+21 04.7	2.036	2.185	-1.64 -6.9	18.7	27.1/55	84.4
July 11	00 42.69	+23 37.4	1.917	2.157	-1.79 -6.6	18.5	25.9/55	89.2
July 21	00 57.77	+26 04.0	1.803	2.133	-1.95 -6.1	18.2	24.3/54	94.1
July 31	01 12.01	+28 21.8	1.695	2.112	-2.13 -5.6	18.0	22.3/54	99.3
Aug. 10	01 25.07	+30 28.0	1.592	2.095	-2.34 -5.0	17.8	19.8/53	104.8
Aug. 20	01 36.55	+32 18.9	1.496	2.082	-2.55 -4.5	17.6	16.6/53	110.7
Aug. 30	01 46.02	+33 50.7	1.408	2.073	-2.78 -4.1	17.5	12.9/52	117.1
Sept. 9	01 53.04	+34 59.0	1.329	2.068	-3.02 -3.8	17.3	8.6/52	124.0
Sept. 19	01 57.26	+35 38.3	1.261	2.068	-3.24 -4.0	17.2	3.9/57	131.5
Sept. 29	01 58.67	+35 43.5	1.206	2.072	-3.42 -4.5	17.1	1.5/183	139.5
Oct. 9	01 57.56	+35 10.9	1.167	2.081	-3.54 -5.3	17.1	6.1/207	147.7
Oct. 19	01 54.76	+33 59.4	1.147	2.094	-3.57 -6.3	17.1	10.0/204	155.3
Oct. 29	01 51.47	+32 14.2	1.148	2.110	-3.49 -7.2	17.2	12.6/198	160.5
Nov. 8	01 48.89	+30 05.7	1.172	2.131	-3.33 -7.7	17.3	13.8/190	160.2
Nov. 18	01 48.05	+27 47.8	1.220	2.155	-3.10 -7.6	17.5	13.7/178	154.7
Nov. 28	01 49.56	+25 35.0	1.291	2.183	-2.85 -7.0	17.7	13.2/163	146.7
Dec. 8	01 53.56	+23 37.7	1.383	2.215	-2.60 -6.2	17.9	12.9/145	137.9
Dec. 18	01 59.98	+22 01.7	1.494	2.249	-2.35 -5.2	18.2	13.5/128	129.2
Dec. 28	02 08.54	+20 48.8	1.621	2.287	-2.13 -4.2	18.5	14.8/114	120.8
Jan. 7	02 18.91	+19 57.7	1.761	2.327	-1.94 -3.3	18.8	16.4/104	112.8
Jan. 17	02 30.80	+19 25.4	1.913	2.369	-1.76 -2.4	19.2	18.0/97	105.2
Jan. 27	02 43.91	+19 08.3	2.072	2.414	-1.61 -1.7	19.5	19.4/93	97.9
Feb. 6	02 57.99	+19 02.9	2.238	2.460	-1.48 -1.1	19.8	20.6/90	90.9
Feb. 16	03 12.86	+19 05.8	2.408	2.509	-1.36 -0.5	20.1	21.6/88	84.2
Feb. 26	03 28.34	+19 14.0	2.580	2.559	-1.25 0.0	20.4	22.3/87	77.7
Mar. 8	03 44.28	+19 24.9	2.752	2.610	-1.16 +0.4	20.7	22.9/87	71.4
Mar. 18	04 00.57	+19 36.5	2.923	2.663	-1.08 +0.8	21.0	23.2/87	65.2
Mar. 28	04 17.09	+19 47.0	3.090	2.717	-1.00 +1.1	21.2	23.5/88	59.1

Comet 59P/Kearns-Kwee

Epoch = 2018 July 21.0 TT
 T = 2018 Sept. 16.77223 TT
 Peri. = 127.70384 e = 0.4752525
 Node = 312.82924 2000.0 a = 4.4950251 AU
 Incl. = 9.33926 n = 0.10342032
 q = 2.3587532 AU P = 9.53 years

$$m_1 = 8.6 + 5 \log(\Delta) + 17.5 \log(r(t-50))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	23 15.03	+03 05.3	3.217	3.021	+1.00	+5.5	20.1	69.8
Jan. 12	23 25.58	+04 04.8	3.304	2.980	+1.12	+6.4	20.0	62.5
Jan. 22	23 37.23	+05 13.0	3.382	2.939	+1.22	+7.3	20.0	55.5
Feb. 1	23 49.85	+06 28.9	3.451	2.899	+1.31	+8.0	19.9	48.8
Feb. 11	00 03.32	+07 51.4	3.510	2.860	+1.39	+8.6	19.8	42.4
Feb. 21	00 17.59	+09 19.6	3.557	2.821	+1.47	+9.1	19.8	36.3
Mar. 3	00 32.58	+10 52.4	3.593	2.783	+1.54	+9.5	19.7	30.4
Mar. 13	00 48.25	+12 28.8	3.618	2.746	+1.60	+9.8	19.6	24.7
Mar. 23	01 04.57	+14 07.6	3.631	2.711	+1.67	+10.0	19.5	19.4
Apr. 2	01 21.51	+15 47.6	3.633	2.676	+1.73	+10.0	19.4	14.4
Apr. 12	01 39.08	+17 27.8	3.624	2.643	+1.79	+10.0	19.3	10.0
Apr. 22	01 57.25	+19 06.8	3.605	2.611	+1.85	+9.8	19.2	7.1
May 2	02 16.02	+20 43.4	3.577	2.580	+1.91	+9.5	19.0	7.2
May 12	02 35.40	+22 16.4	3.540	2.551	+1.97	+9.1	18.9	10.1
May 22	02 55.35	+23 44.5	3.494	2.524	+2.03	+8.5	18.8	14.0
June 1	03 15.85	+25 06.4	3.441	2.498	+2.08	+7.8	18.7	18.3
June 11	03 36.87	+26 20.9	3.381	2.475	+2.13	+7.0	18.5	22.6
June 21	03 58.34	+27 26.8	3.314	2.453	+2.17	+6.1	18.4	27.1
July 1	04 20.18	+28 23.2	3.241	2.433	+2.20	+5.1	18.3	31.5
July 11	04 42.29	+29 09.1	3.163	2.416	+2.22	+4.0	18.1	36.0
July 21	05 04.52	+29 44.0	3.080	2.400	+2.22	+2.9	18.0	40.5
July 31	05 26.73	+30 07.4	2.992	2.387	+2.21	+1.7	17.9	45.2
Aug. 10	05 48.75	+30 19.3	2.900	2.377	+2.18	+0.6	17.7	49.9
Aug. 20	06 10.38	+30 20.1	2.804	2.368	+2.13	-0.5	17.6	54.7
Aug. 30	06 31.40	+30 10.3	2.705	2.363	+2.06	-1.5	17.5	59.7
Sept. 9	06 51.63	+29 50.9	2.602	2.360	+1.97	-2.4	17.3	65.0
Sept. 19	07 10.82	+29 23.4	2.497	2.359	+1.85	-3.1	17.2	70.4
Sept. 29	07 28.75	+28 49.3	2.390	2.361	+1.72	-3.7	17.1	76.2
Oct. 9	07 45.20	+28 10.6	2.282	2.365	+1.55	-4.0	16.9	82.3
Oct. 19	07 59.88	+27 29.3	2.173	2.372	+1.36	-4.2	16.8	88.8
Oct. 29	08 12.54	+26 47.7	2.066	2.381	+1.15	-4.1	16.7	95.8
Nov. 8	08 22.90	+26 07.8	1.961	2.393	+0.90	-3.8	16.6	103.3
Nov. 18	08 30.63	+25 31.7	1.862	2.407	+0.62	-3.3	16.5	111.5
Nov. 28	08 35.46	+25 00.7	1.770	2.423	+0.31	-2.8	16.4	120.4
Dec. 8	08 37.17	+24 35.7	1.689	2.442	-0.01	-2.2	16.3	130.0
Dec. 18	08 35.70	+24 16.1	1.624	2.462	-0.32	-1.7	16.2	140.3
Dec. 28	08 31.26	+24 00.3	1.577	2.485	-0.59	-1.5	16.2	151.3
Jan. 7	08 24.43	+23 45.6	1.553	2.510	-0.78	-1.5	16.2	162.8
Jan. 17	08 16.17	+23 29.2	1.555	2.536	-0.86	-1.8	16.3	174.1
Jan. 27	08 07.71	+23 08.7	1.585	2.564	-0.81	-2.3	16.4	172.1
Feb. 6	08 00.21	+22 43.4	1.642	2.594	-0.65	-2.8	16.5	160.8
Feb. 16	07 54.68	+22 13.4	1.725	2.625	-0.42	-3.2	16.7	149.6
Feb. 26	07 51.65	+21 39.8	1.830	2.657	-0.16	-3.5	16.9	139.0
Mar. 8	07 51.29	+21 03.5	1.954	2.691	+0.11	-3.8	17.1	129.0
Mar. 18	07 53.54	+20 24.9	2.094	2.726	+0.36	-4.0	17.4	119.6
Mar. 28	07 58.10	+19 44.0	2.245	2.763	+0.57	-4.2	17.6	110.9

Comet 133P/(7968) Elst-Pizarro

Epoch = 2018 July 21.0 TT
 T = 2018 Sept. 20.67594 TT
 Peri. = 131.47176
 Node = 160.13647 2000.0
 Incl. = 1.38922
 q = 2.6648125 AU

e = 0.1575109
 a = 3.1630231 AU
 n = 0.17520663
 P = 5.63 years

H = 15.8 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	V	Elong.
2018/19	h m	° ' "			m		°
Jan. 2	16 05.38	-19 45.4	3.572	2.864	+1.63	-4.2	21.6 38.1
Jan. 12	16 21.61	-20 24.4	3.468	2.850	+1.61	-3.5	21.6 44.4
Jan. 22	16 37.55	-20 56.4	3.354	2.837	+1.57	-2.8	21.5 50.9
Feb. 1	16 53.06	-21 21.3	3.231	2.825	+1.52	-2.1	21.5 57.4
Feb. 11	17 07.99	-21 39.4	3.101	2.812	+1.45	-1.5	21.5 64.0
Feb. 21	17 22.15	-21 51.2	2.965	2.800	+1.37	-0.8	21.4 70.8
Mar. 3	17 35.35	-21 57.2	2.824	2.789	+1.26	-0.3	21.3 77.8
Mar. 13	17 47.38	-21 58.3	2.681	2.777	+1.13	+0.1	21.2 85.0
Mar. 23	17 57.99	-21 55.5	2.537	2.767	+0.97	+0.5	21.1 92.5
Apr. 2	18 06.94	-21 49.9	2.396	2.756	+0.79	+0.7	20.9 100.3
Apr. 12	18 13.96	-21 42.8	2.258	2.747	+0.58	+0.7	20.8 108.5
Apr. 22	18 18.77	-21 35.3	2.128	2.737	+0.35	+0.7	20.6 117.2
May 2	18 21.15	-21 28.7	2.007	2.728	+0.10	+0.6	20.4 126.4
May 12	18 20.94	-21 23.6	1.901	2.720	-0.17	+0.4	20.2 136.1
May 22	18 18.11	-21 20.4	1.811	2.712	-0.42	+0.2	20.0 146.4
June 1	18 12.91	-21 19.1	1.742	2.705	-0.63	0.0	19.7 157.1
June 11	18 05.83	-21 19.1	1.696	2.698	-0.78	-0.1	19.5 168.2
June 21	17 57.67	-21 20.0	1.676	2.692	-0.84	-0.1	19.2 177.9
July 1	17 49.44	-21 21.4	1.683	2.686	-0.79	-0.2	19.5 168.5
July 11	17 42.14	-21 23.5	1.715	2.682	-0.64	-0.3	19.7 157.3
July 21	17 36.64	-21 27.0	1.770	2.677	-0.43	-0.4	19.9 146.6
July 31	17 33.52	-21 32.2	1.846	2.674	-0.17	-0.6	20.1 136.3
Aug. 10	17 33.02	-21 39.5	1.939	2.670	+0.10	-0.8	20.3 126.6
Aug. 20	17 35.21	-21 48.5	2.045	2.668	+0.36	-1.0	20.5 117.5
Aug. 30	17 39.93	-21 58.5	2.161	2.666	+0.60	-1.0	20.6 109.0
Sept. 9	17 46.97	-22 08.3	2.284	2.665	+0.82	-0.9	20.8 101.0
Sept. 19	17 56.07	-22 16.7	2.411	2.665	+1.01	-0.7	20.9 93.3
Sept. 29	18 06.97	-22 22.3	2.539	2.665	+1.18	-0.4	21.0 86.1
Oct. 9	18 19.40	-22 23.9	2.668	2.666	+1.32	+0.1	21.1 79.1
Oct. 19	18 33.14	-22 20.3	2.795	2.667	+1.44	+0.7	21.2 72.4
Oct. 29	18 47.96	-22 10.5	2.918	2.670	+1.53	+1.3	21.3 65.8
Nov. 8	19 03.66	-21 53.7	3.036	2.672	+1.61	+2.1	21.3 59.5
Nov. 18	19 20.06	-21 29.5	3.148	2.676	+1.67	+2.9	21.3 53.2
Nov. 28	19 36.98	-20 57.3	3.252	2.680	+1.72	+3.7	21.4 47.1
Dec. 8	19 54.28	-20 17.1	3.348	2.685	+1.75	+4.5	21.4 41.1
Dec. 18	20 11.83	-19 28.9	3.435	2.690	+1.76	+5.2	21.4 35.1
Dec. 28	20 29.50	-18 33.0	3.511	2.696	+1.77	+6.0	21.3 29.2
Jan. 7	20 47.20	-17 29.8	3.577	2.702	+1.77	+6.7	21.3 23.4
Jan. 17	21 04.83	-16 19.8	3.631	2.710	+1.76	+7.3	21.2 17.5
Jan. 27	21 22.32	-15 03.8	3.674	2.717	+1.74	+7.9	21.2 11.8
Feb. 6	21 39.62	-13 42.6	3.704	2.725	+1.72	+8.4	21.1 6.0
Feb. 16	21 56.67	-12 17.0	3.722	2.734	+1.69	+8.8	20.9 0.4
Feb. 26	22 13.44	-10 47.9	3.727	2.743	+1.66	+9.1	21.1 5.4
Mar. 8	22 29.88	-09 16.2	3.720	2.753	+1.63	+9.3	21.2 11.1
Mar. 18	22 45.98	-07 42.9	3.700	2.763	+1.59	+9.4	21.3 16.8
Mar. 28	23 01.69	-06 09.0	3.669	2.774	+1.55	+9.4	21.4 22.6

Comet P/2011 V1 (Boattini)

Epoch = 2018 July 21.0 TT
 T = 2018 Sept. 30.84240 TT
 Peri. = 269.24031 e = 0.5502065
 Node = 46.79167 2000.0 a = 3.8506477 AU
 Incl. = 7.38310 n = 0.13043778
 q = 1.7319963 AU P = 7.56 years

$$m_1 = 12.2 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot. /PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	15 21.86	-17 29.7	3.467	2.913	-0.70 +3.9	.	22.1/107	48.7
Jan. 12	15 36.64	-18 34.0	3.300	2.856	-0.76 +4.0	.	21.9/107	55.2
Jan. 22	15 51.41	-19 34.3	3.126	2.798	-0.83 +4.1	.	21.6/106	61.8
Feb. 1	16 06.07	-20 30.7	2.946	2.740	-0.92 +4.1	.	21.2/105	68.3
Feb. 11	16 20.51	-21 23.2	2.763	2.683	-1.01 +4.1	21.9	20.5/104	75.0
Feb. 21	16 34.57	-22 12.1	2.577	2.625	-1.12 +4.1	21.6	19.7/104	81.8
Mar. 3	16 48.07	-22 58.1	2.392	2.567	-1.25 +4.1	21.3	18.7/104	88.6
Mar. 13	17 00.82	-23 41.9	2.209	2.510	-1.39 +4.1	20.9	17.4/104	95.6
Mar. 23	17 12.56	-24 24.7	2.030	2.453	-1.56 +4.1	20.6	15.7/106	102.8
Apr. 2	17 23.01	-25 07.7	1.858	2.396	-1.75 +4.1	20.2	13.8/109	110.3
Apr. 12	17 31.83	-25 52.8	1.694	2.340	-1.97 +4.1	19.8	11.5/114	118.1
Apr. 22	17 38.63	-26 41.4	1.542	2.285	-2.22 +4.2	19.4	9.0/125	126.3
May 2	17 43.02	-27 34.9	1.402	2.231	-2.50 +4.4	19.0	6.9/146	134.9
May 12	17 44.61	-28 34.0	1.278	2.178	-2.81 +4.8	18.6	6.2/181	144.1
May 22	17 43.13	-29 37.8	1.171	2.126	-3.12 +5.6	18.3	7.8/212	153.6
June 1	17 38.65	-30 43.6	1.085	2.076	-3.41 +6.7	17.9	10.1/230	163.2
June 11	17 31.66	-31 46.8	1.020	2.028	-3.65 +8.3	17.6	11.8/240	170.6
June 21	17 23.26	-32 41.8	0.977	1.983	-3.78 +10.1	17.4	11.8/246	168.1
July 1	17 15.13	-33 24.5	0.956	1.940	-3.80 +11.7	17.1	9.8/249	159.0
July 11	17 08.99	-33 53.9	0.955	1.900	-3.71 +12.8	17.0	6.0/248	149.0
July 21	17 06.34	-34 11.6	0.971	1.864	-3.56 +13.2	16.9	1.3/197	139.4
July 31	17 08.09	-34 21.0	1.000	1.831	-3.39 +12.8	16.8	5.4/96	130.6
Aug. 10	17 14.50	-34 24.2	1.041	1.803	-3.23 +11.7	16.8	11.1/90	122.6
Aug. 20	17 25.47	-34 21.5	1.090	1.779	-3.09 +10.2	16.8	16.5/88	115.5
Aug. 30	17 40.54	-34 12.0	1.146	1.759	-2.97 +8.3	16.8	21.3/86	109.2
Sept. 9	17 59.11	-33 52.9	1.208	1.745	-2.87 +6.2	16.8	25.4/84	103.6
Sept. 19	18 20.58	-33 21.4	1.275	1.736	-2.77 +3.9	16.9	28.8/82	98.5
Sept. 29	18 44.26	-32 34.8	1.348	1.732	-2.66 +1.6	17.0	31.6/80	93.8
Oct. 9	19 09.46	-31 31.2	1.425	1.734	-2.55 -0.6	17.2	33.8/78	89.5
Oct. 19	19 35.60	-30 09.5	1.508	1.741	-2.42 -2.7	17.3	35.5/75	85.5
Oct. 29	20 02.13	-28 30.1	1.597	1.753	-2.28 -4.6	17.5	36.7/73	81.6
Nov. 8	20 28.60	-26 34.2	1.691	1.771	-2.13 -6.1	17.7	37.5/71	77.8
Nov. 18	20 54.71	-24 23.7	1.792	1.793	-1.98 -7.4	17.9	37.9/69	74.1
Nov. 28	21 20.21	-22 01.3	1.897	1.820	-1.83 -8.3	18.1	38.0/67	70.3
Dec. 8	21 44.99	-19 29.6	2.009	1.851	-1.69 -8.9	18.4	37.8/66	66.5
Dec. 18	22 08.99	-16 51.2	2.124	1.886	-1.56 -9.3	18.7	37.5/65	62.6
Dec. 28	22 32.20	-14 09.0	2.244	1.925	-1.43 -9.4	18.9	37.0/64	58.6
Jan. 7	22 54.65	-11 25.0	2.366	1.967	-1.32 -9.4	19.2	36.4/63	54.6
Jan. 17	23 16.41	-08 41.3	2.490	2.011	-1.22 -9.2	19.5	35.7/63	50.4
Jan. 27	23 37.53	-05 59.6	2.615	2.058	-1.13 -8.9	19.8	34.9/63	46.1
Feb. 6	23 58.08	-03 21.3	2.739	2.107	-1.05 -8.5	20.1	34.1/63	41.7
Feb. 16	00 18.13	+00 47.6	2.861	2.158	-0.98 -8.0	20.3	33.3/63	37.2
Feb. 26	00 37.72	+01 40.5	2.980	2.211	-0.92 -7.6	20.6	32.4/63	32.6
Mar. 8	00 56.92	+04 02.4	3.094	2.265	-0.87 -7.1	20.9	31.6/64	27.9
Mar. 18	01 15.76	+06 17.3	3.202	2.319	-0.82 -6.6	21.1	30.7/65	23.1
Mar. 28	01 34.27	+08 24.8	3.303	2.375	-0.78 -6.1	21.4	29.9/66	18.2

Comet 26P/Grigg-Skjellerup

Epoch = 2018 July 21.0 TT
 T = 2018 Oct. 1.82133 TT
 Peri. = 2.20098 e = 0.6409421
 Node = 211.53406 2000.0 a = 3.0142687 AU
 Incl. = 22.44969 n = 0.18833504
 q = 1.0822970 AU P = 5.23 years

H = 17.2 , G = 0.15 (r>1.3AU)
 m1 = 14.0 + 5 log(Delta) + 12.5 log(r(t-10)) (r<1.3AU)

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		Mag.	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	05 02.03	-02 59.0	2.103	2.950	-0.99	-1.1	20.5	143.2
Jan. 12	04 52.86	-03 00.3	2.115	2.884	-0.81	+1.0	20.5	133.7
Jan. 22	04 45.75	-02 42.1	2.148	2.817	-0.58	+2.8	20.6	123.8
Feb. 1	04 41.19	-02 07.9	2.196	2.749	-0.31	+4.2	20.7	114.1
Feb. 11	04 39.37	-01 21.5	2.253	2.679	-0.03	+5.2	20.7	104.7
Feb. 21	04 40.30	+00 26.7	2.315	2.608	+0.24	+5.8	20.8	95.8
Mar. 3	04 43.88	+00 33.0	2.377	2.536	+0.50	+6.1	20.8	87.6
Mar. 13	04 49.92	+01 34.6	2.435	2.462	+0.73	+6.2	20.8	79.8
Mar. 23	04 58.23	+02 35.7	2.486	2.387	+0.95	+6.0	20.8	72.6
Apr. 2	05 08.63	+03 34.3	2.529	2.310	+1.15	+5.6	20.7	66.0
Apr. 12	05 20.96	+04 28.5	2.562	2.233	+1.34	+5.1	20.7	59.8
Apr. 22	05 35.11	+05 16.9	2.584	2.154	+1.51	+4.5	20.6	54.1
May 2	05 50.98	+05 57.9	2.593	2.073	+1.68	+3.6	20.5	48.8
May 12	06 08.50	+06 30.2	2.592	1.992	+1.84	+2.7	20.4	44.0
May 22	06 27.64	+06 52.6	2.579	1.910	+2.00	+1.6	20.3	39.6
June 1	06 48.36	+07 03.7	2.555	1.828	+2.16	+0.4	20.1	35.6
June 11	07 10.68	+07 02.4	2.522	1.745	+2.32	-0.9	20.0	32.0
June 21	07 34.62	+06 47.5	2.481	1.663	+2.48	-2.3	19.8	28.7
July 1	08 00.19	+06 18.0	2.432	1.581	+2.65	-3.8	19.6	25.9
July 11	08 27.45	+05 33.2	2.379	1.501	+2.82	-5.3	19.4	23.3
July 21	08 56.43	+04 32.8	2.323	1.423	+3.00	-6.9	19.2	21.1
July 31	09 27.19	+03 17.1	2.267	1.349	+3.17	-8.4	19.0	19.1
Aug. 10	09 59.75	+01 47.0	2.211	1.280	+3.36	-9.7	18.8	17.3
Aug. 20	10 34.15	+00 04.6	2.160	1.218	+3.54	-10.8	18.7	15.8
Aug. 30	11 10.33	-01 46.9	2.115	1.165	+3.71	-11.5	18.5	14.5
Sept. 9	11 48.22	-03 43.2	2.078	1.123	+3.88	-11.7	18.4	13.5
Sept. 19	12 27.64	-05 38.9	2.051	1.096	+4.01	-11.3	18.3	13.0
Sept. 29	13 08.28	-07 28.0	2.035	1.083	+4.12	-10.3	18.2	13.0
Oct. 9	13 49.76	-09 04.8	2.033	1.086	+4.18	-8.8	18.3	13.5
Oct. 19	14 31.58	-10 24.1	2.044	1.106	+4.18	-6.8	18.3	14.2
Oct. 29	15 13.17	-11 22.1	2.069	1.140	+4.13	-4.5	18.4	15.1
Nov. 8	15 54.01	-11 56.5	2.108	1.186	+4.02	-2.1	18.6	15.9
Nov. 18	16 33.59	-12 06.9	2.160	1.243	+3.87	+0.3	18.7	16.4
Nov. 28	17 11.49	-11 54.0	2.224	1.309	+3.69	+2.5	18.9	16.6
Dec. 8	17 47.44	-11 20.2	2.296	1.380	+3.48	+4.4	19.0	16.5
Dec. 18	18 21.28	-10 28.1	2.376	1.456	+3.27	+6.1	19.2	16.0
Dec. 28	18 52.97	-09 20.8	2.461	1.535	+3.05	+7.5	19.3	15.4
Jan. 7	19 22.53	-08 01.1	2.548	1.616	+2.84	+8.5	19.5	14.8
Jan. 17	19 50.07	-06 31.8	2.634	1.698	+2.65	+9.4	19.6	14.4
Jan. 27	20 15.69	-04 55.3	2.717	1.781	+2.46	+10.0	19.8	14.6
Feb. 6	20 39.55	-03 13.7	2.795	1.864	+2.29	+10.4	20.0	15.5
Feb. 16	21 01.77	-01 28.7	2.866	1.946	+2.14	+10.6	20.1	17.4
Feb. 26	21 22.46	+00 18.3	2.928	2.028	+1.99	+10.8	20.3	20.2
Mar. 8	21 41.75	+02 06.0	2.980	2.108	+1.86	+10.8	20.5	23.6
Mar. 18	21 59.72	+03 53.5	3.020	2.188	+1.73	+10.7	20.6	27.6
Mar. 28	22 16.41	+05 39.7	3.048	2.266	+1.60	+10.5	20.8	32.2

Comet P/2001 R6 (LINEAR-Skiff)

Epoch = 2018 July 21.0 TT
 T = 2018 Oct. 4.25315 TT
 Peri. = 308.47674 e = 0.4758454
 Node = 67.33495 2000.0 a = 4.1802064 AU
 Incl. = 17.37943 n = 0.11532076
 q = 2.1910744 AU P = 8.55 years

$$m_1 = 10.4 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	19 36.05	-31 24.7	3.951	3.003	-0.68 +0.3	.	23.6/ 84	13.4
Jan. 12	19 54.55	-30 55.5	3.921	2.959	-0.70 -0.1	.	24.3/ 82	10.4
Jan. 22	20 13.38	-30 19.7	3.876	2.914	-0.73 -0.6	.	24.9/ 81	10.6
Feb. 1	20 32.44	-29 37.5	3.818	2.870	-0.75 -1.1	.	25.4/ 80	13.6
Feb. 11	20 51.65	-28 48.9	3.748	2.826	-0.78 -1.6	.	25.9/ 79	18.0
Feb. 21	21 10.94	-27 54.6	3.667	2.783	-0.80 -2.1	.	26.2/ 77	23.0
Mar. 3	21 30.23	-26 54.9	3.575	2.741	-0.82 -2.7	21.9	26.5/ 77	28.1
Mar. 13	21 49.48	-25 50.7	3.474	2.699	-0.85 -3.2	21.7	26.8/ 76	33.3
Mar. 23	22 08.65	-24 42.6	3.365	2.658	-0.87 -3.9	21.5	27.0/ 75	38.5
Apr. 2	22 27.69	-23 31.7	3.249	2.618	-0.90 -4.5	21.3	27.1/ 75	43.6
Apr. 12	22 46.56	-22 18.9	3.128	2.579	-0.92 -5.2	21.1	27.1/ 74	48.7
Apr. 22	23 05.24	-21 05.3	3.003	2.541	-0.95 -5.9	20.9	27.0/ 74	53.8
May 2	23 23.68	-19 52.2	2.874	2.504	-0.98 -6.6	20.7	26.8/ 74	58.8
May 12	23 41.84	-18 40.6	2.743	2.469	-1.01 -7.4	20.4	26.5/ 75	63.8
May 22	23 59.66	-17 32.0	2.612	2.435	-1.05 -8.2	20.2	26.0/ 75	68.8
June 1	00 17.06	-16 27.7	2.480	2.403	-1.08 -9.1	20.0	25.4/ 76	73.8
June 11	00 33.97	-15 29.0	2.349	2.373	-1.13 -10.1	19.8	24.6/ 77	78.9
June 21	00 50.23	-14 37.4	2.220	2.344	-1.17 -11.0	19.5	23.5/ 78	84.1
July 1	01 05.69	-13 54.1	2.094	2.318	-1.23 -12.1	19.3	22.1/ 80	89.4
July 11	01 20.17	-13 20.2	1.971	2.294	-1.29 -13.3	19.1	20.4/ 82	94.9
July 21	01 33.39	-12 56.8	1.852	2.272	-1.36 -14.5	18.9	18.2/ 85	100.7
July 31	01 45.07	-12 44.1	1.739	2.252	-1.44 -15.8	18.7	15.7/ 88	106.7
Aug. 10	01 54.85	-12 42.1	1.633	2.235	-1.53 -17.1	18.5	12.6/ 92	113.2
Aug. 20	02 02.33	-12 49.7	1.535	2.221	-1.64 -18.5	18.3	9.0/ 98	120.0
Aug. 30	02 07.16	-13 04.5	1.446	2.209	-1.76 -19.9	18.1	5.0/110	127.3
Sept. 9	02 08.99	-13 22.4	1.371	2.200	-1.89 -21.0	17.9	1.8/175	134.9
Sept. 19	02 07.67	-13 37.4	1.310	2.194	-2.02 -21.9	17.8	4.5/257	142.6
Sept. 29	02 03.38	-13 41.7	1.266	2.191	-2.13 -22.3	17.7	8.4/273	149.9
Oct. 9	01 56.66	-13 27.5	1.243	2.191	-2.20 -22.3	17.7	11.6/284	155.5
Oct. 19	01 48.53	-12 47.9	1.242	2.194	-2.21 -21.8	17.7	13.5/294	157.1
Oct. 29	01 40.29	-11 39.9	1.264	2.200	-2.17 -20.9	17.8	14.2/306	153.9
Nov. 8	01 33.18	-10 04.8	1.309	2.209	-2.07 -19.8	17.9	14.1/320	147.2
Nov. 18	01 28.20	-08 07.1	1.376	2.220	-1.93 -18.7	18.0	13.8/338	139.1
Nov. 28	01 25.90	-05 53.2	1.462	2.234	-1.78 -17.5	18.2	14.1/355	130.7
Dec. 8	01 26.42	-03 29.4	1.565	2.251	-1.63 -16.5	18.4	15.1/ 12	122.3
Dec. 18	01 29.66	-01 00.3	1.682	2.271	-1.50 -15.4	18.7	16.6/ 25	114.2
Dec. 28	01 35.37	+01 30.1	1.809	2.292	-1.38 -14.4	18.9	18.2/ 35	106.5
Jan. 7	01 43.21	+03 59.3	1.946	2.316	-1.27 -13.5	19.1	19.9/ 42	99.2
Jan. 17	01 52.90	+06 25.4	2.089	2.343	-1.18 -12.6	19.4	21.4/ 48	92.2
Jan. 27	02 04.15	+08 47.3	2.236	2.371	-1.11 -11.7	19.6	22.6/ 52	85.5
Feb. 6	02 16.72	+11 03.8	2.385	2.401	-1.05 -10.9	19.9	23.6/ 56	79.0
Feb. 16	02 30.42	+13 14.3	2.536	2.433	-0.99 -10.0	20.1	24.4/ 59	72.8
Feb. 26	02 45.06	+15 18.1	2.685	2.467	-0.95 -9.3	20.4	24.9/ 61	66.7
Mar. 8	03 00.53	+17 14.5	2.832	2.502	-0.91 -8.5	20.6	25.4/ 64	60.8
Mar. 18	03 16.70	+19 03.2	2.975	2.539	-0.88 -7.8	20.9	25.6/ 66	55.0
Mar. 28	03 33.45	+20 43.6	3.114	2.577	-0.85 -7.1	21.1	25.7/ 68	49.3

Comet P/2005 J1 (McNaught)

Epoch = 2018 July 21.0 TT
 T = 2018 Oct. 12.56016 TT
 Peri. = 338.92770 e = 0.5703520
 Node = 268.79743 2000.0 a = 3.5690258 AU
 Incl. = 31.76747 n = 0.14617717
 q = 1.5334248 AU P = 6.74 years

$$m_1 = 15.0 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	09 23.09	-17 46.8	2.291	2.962	-0.86 +9.3	.	14.7/212	124.5
Jan. 12	09 16.51	-19 45.2	2.156	2.902	-0.92 +10.3	.	15.7/226	131.4
Jan. 22	09 07.51	-21 25.6	2.042	2.841	-0.95 +11.3	.	16.7/238	136.9
Feb. 1	08 56.58	-22 40.6	1.951	2.780	-0.97 +12.4	.	17.2/250	140.1
Feb. 11	08 44.59	-23 24.8	1.885	2.718	-0.95 +13.4	.	16.9/261	140.3
Feb. 21	08 32.65	-23 35.7	1.843	2.656	-0.91 +14.2	.	15.7/272	137.3
Mar. 3	08 22.01	-23 15.5	1.822	2.593	-0.85 +14.6	.	13.6/285	132.1
Mar. 13	08 13.69	-22 30.4	1.821	2.531	-0.78 +14.7	.	10.9/301	125.5
Mar. 23	08 08.38	-21 28.6	1.834	2.467	-0.72 +14.5	.	8.3/324	118.3
Apr. 2	08 06.41	-20 19.0	1.858	2.404	-0.67 +14.1	.	7.1/359	111.0
Apr. 12	08 07.80	-19 09.1	1.889	2.341	-0.64 +13.5	.	8.1/34	103.9
Apr. 22	08 12.43	-18 04.8	1.923	2.278	-0.62 +12.8	.	10.8/57	97.1
May 2	08 20.03	-17 10.4	1.957	2.215	-0.62 +12.1	.	13.9/70	90.9
May 12	08 30.36	-16 28.5	1.990	2.153	-0.65 +11.4	.	17.2/79	85.1
May 22	08 43.17	-16 00.9	2.020	2.092	-0.68 +10.8	.	20.4/85	79.7
June 1	08 58.26	-15 48.4	2.045	2.031	-0.74 +10.1	21.9	23.5/89	74.8
June 11	09 15.46	-15 51.1	2.066	1.972	-0.80 +9.5	21.7	26.4/92	70.4
June 21	09 34.64	-16 08.5	2.083	1.915	-0.88 +8.9	21.5	29.2/95	66.2
July 1	09 55.69	-16 39.9	2.096	1.860	-0.97 +8.3	21.3	31.9/97	62.5
July 11	10 18.54	-17 23.5	2.107	1.807	-1.08 +7.6	21.1	34.5/98	59.0
July 21	10 43.15	-18 17.6	2.116	1.757	-1.19 +6.9	20.9	36.8/99	55.7
July 31	11 09.44	-19 19.5	2.124	1.711	-1.31 +6.0	20.7	39.0/100	52.7
Aug. 10	11 37.36	-20 25.8	2.134	1.669	-1.43 +5.0	20.5	41.0/100	49.7
Aug. 20	12 06.85	-21 32.8	2.145	1.631	-1.54 +3.8	20.4	42.7/99	46.9
Aug. 30	12 37.74	-22 36.5	2.160	1.599	-1.64 +2.4	20.2	44.2/98	44.2
Sept. 9	13 09.88	-23 32.3	2.179	1.573	-1.73 +0.8	20.1	45.3/96	41.5
Sept. 19	13 43.03	-24 16.2	2.204	1.553	-1.79 -1.0	20.1	46.1/95	38.8
Sept. 29	14 16.87	-24 44.5	2.233	1.540	-1.82 -2.8	20.0	46.5/92	36.0
Oct. 9	14 51.07	-24 54.2	2.268	1.534	-1.82 -4.7	20.0	46.6/90	33.2
Oct. 19	15 25.28	-24 43.6	2.309	1.535	-1.79 -6.5	20.1	46.5/87	30.4
Oct. 29	15 59.12	-24 11.7	2.354	1.543	-1.73 -8.0	20.2	46.1/85	27.6
Nov. 8	16 32.28	-23 18.7	2.402	1.558	-1.64 -9.4	20.3	45.5/82	24.7
Nov. 18	17 04.52	-22 05.6	2.454	1.580	-1.54 -10.5	20.4	44.8/79	21.8
Nov. 28	17 35.62	-20 34.0	2.508	1.608	-1.44 -11.3	20.6	43.9/77	19.0
Dec. 8	18 05.48	-18 45.7	2.563	1.642	-1.33 -11.9	20.8	43.0/74	16.4
Dec. 18	18 34.03	-16 42.8	2.618	1.680	-1.23 -12.2	21.0	42.0/72	14.0
Dec. 28	19 01.24	-14 27.4	2.672	1.724	-1.13 -12.2	21.3	41.0/70	12.2
Jan. 7	19 27.14	-12 01.5	2.725	1.771	-1.04 -12.1	21.5	39.9/68	11.2
Jan. 17	19 51.77	-09 26.9	2.775	1.822	-0.96 -11.9	21.8	38.8/66	11.4
Jan. 27	20 15.17	-06 45.4	2.822	1.875	-0.89 -11.5	22.0	37.7/64	12.9
Feb. 6	20 37.41	-03 58.6	2.865	1.931	-0.83 -11.0	.	36.5/62	15.2
Feb. 16	20 58.55	-01 07.9	2.903	1.989	-0.78 -10.5	.	35.3/61	18.3
Feb. 26	21 18.63	+01 45.5	2.935	2.048	-0.73 -9.9	.	34.1/59	21.7
Mar. 8	21 37.71	+04 40.4	2.962	2.109	-0.70 -9.3	.	32.8/58	25.4
Mar. 18	21 55.82	+07 35.9	2.982	2.171	-0.66 -8.7	.	31.5/56	29.4
Mar. 28	22 12.99	+10 31.0	2.994	2.233	-0.64 -8.0	.	30.1/55	33.6

Comet P/2010 A1 (Hill)

Epoch = 2018 July 21.0 TT
 T = 2018 Oct. 14.27099 TT
 Peri. = 13.30078 e = 0.5540709
 Node = 47.31528 2000.0 a = 4.3894619 AU
 Incl. = 10.30846 n = 0.10717343
 q = 1.9573888 AU P = 9.20 years

$$m_1 = 12.0 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	21 34.22	-23 03.2	3.791	3.075	-0.52 -2.7	.	20.5/67	37.9
Jan. 12	21 48.12	-21 39.3	3.817	3.020	-0.53 -3.0	.	21.7/66	31.4
Jan. 22	22 02.61	-20 10.1	3.827	2.966	-0.54 -3.4	.	22.7/66	25.1
Feb. 1	22 17.56	-18 35.7	3.824	2.911	-0.56 -3.7	.	23.7/66	19.2
Feb. 11	22 32.93	-16 56.3	3.806	2.857	-0.57 -4.0	.	24.6/66	13.7
Feb. 21	22 48.64	-15 12.3	3.775	2.803	-0.59 -4.4	.	25.4/65	9.1
Mar. 3	23 04.66	-13 24.0	3.730	2.749	-0.61 -4.8	.	26.1/65	6.9
Mar. 13	23 20.96	-11 31.7	3.674	2.696	-0.63 -5.2	.	26.7/65	8.8
Mar. 23	23 37.52	-09 36.0	3.605	2.643	-0.65 -5.6	.	27.4/65	12.8
Apr. 2	23 54.33	-07 37.2	3.526	2.590	-0.68 -6.0	22.0	27.9/65	17.5
Apr. 12	00 11.40	-05 36.1	3.438	2.539	-0.71 -6.4	21.8	28.5/65	22.3
Apr. 22	00 28.74	-03 33.1	3.341	2.488	-0.75 -6.8	21.5	29.0/65	27.0
May 2	00 46.34	-01 28.8	3.238	2.439	-0.79 -7.2	21.3	29.4/65	31.7
May 12	01 04.24	+00 36.0	3.128	2.391	-0.83 -7.6	21.1	29.8/65	36.4
May 22	01 22.45	+02 40.7	3.013	2.344	-0.88 -8.0	20.9	30.2/66	40.9
June 1	01 40.96	+04 44.5	2.895	2.299	-0.94 -8.4	20.6	30.5/66	45.3
June 11	01 59.82	+06 46.8	2.774	2.255	-1.00 -8.7	20.4	30.8/67	49.7
June 21	02 18.99	+08 46.7	2.651	2.214	-1.07 -9.0	20.2	31.0/68	54.1
July 1	02 38.47	+10 43.4	2.528	2.175	-1.15 -9.2	19.9	31.1/68	58.4
July 11	02 58.24	+12 36.3	2.404	2.138	-1.23 -9.4	19.7	31.2/69	62.7
July 21	03 18.23	+14 24.7	2.281	2.104	-1.32 -9.5	19.4	31.0/70	67.0
July 31	03 38.35	+16 08.0	2.160	2.073	-1.42 -9.6	19.2	30.7/71	71.4
Aug. 10	03 58.51	+17 46.0	2.040	2.045	-1.53 -9.5	19.0	30.2/72	75.9
Aug. 20	04 18.51	+19 18.6	1.923	2.021	-1.65 -9.3	18.8	29.5/72	80.6
Aug. 30	04 38.16	+20 46.0	1.809	2.000	-1.78 -9.0	18.6	28.4/73	85.4
Sept. 9	04 57.20	+22 09.2	1.699	1.984	-1.92 -8.6	18.4	27.0/72	90.5
Sept. 19	05 15.27	+23 29.2	1.594	1.971	-2.08 -8.0	18.2	25.2/72	96.0
Sept. 29	05 32.00	+24 48.0	1.493	1.962	-2.24 -7.4	18.0	22.9/70	101.9
Oct. 9	05 46.93	+26 07.7	1.399	1.958	-2.43 -6.6	17.8	20.2/66	108.3
Oct. 19	05 59.51	+27 30.6	1.312	1.958	-2.64 -5.8	17.7	17.0/60	115.3
Oct. 29	06 09.19	+28 58.7	1.235	1.962	-2.87 -4.9	17.6	13.8/49	123.1
Nov. 8	06 15.44	+30 32.5	1.169	1.970	-3.12 -4.2	17.5	11.0/29	131.5
Nov. 18	06 17.80	+32 10.4	1.117	1.983	-3.37 -3.7	17.4	9.9/1	140.7
Nov. 28	06 16.26	+33 47.6	1.082	1.999	-3.60 -3.6	17.4	10.4/335	150.3
Dec. 8	06 11.25	+35 16.4	1.067	2.020	-3.77 -4.1	17.5	11.4/315	159.6
Dec. 18	06 03.95	+36 28.0	1.075	2.044	-3.84 -4.9	17.6	11.2/302	166.0
Dec. 28	05 56.12	+37 16.6	1.107	2.071	-3.77 -5.8	17.8	9.5/292	164.6
Jan. 7	05 49.54	+37 40.8	1.162	2.102	-3.59 -6.4	18.0	6.4/281	157.0
Jan. 17	05 45.67	+37 44.3	1.239	2.136	-3.34 -6.6	18.2	2.5/256	147.7
Jan. 27	05 45.25	+37 32.7	1.335	2.172	-3.05 -6.3	18.5	2.6/134	138.4
Feb. 6	05 48.40	+37 11.3	1.449	2.211	-2.77 -5.6	18.8	6.5/113	129.6
Feb. 16	05 54.85	+36 44.0	1.576	2.253	-2.50 -4.7	19.2	10.2/107	121.2
Feb. 26	06 04.11	+36 12.6	1.716	2.296	-2.26 -3.7	19.5	13.3/104	113.4
Mar. 8	06 15.65	+35 38.0	1.864	2.341	-2.04 -2.6	19.8	15.8/103	106.0
Mar. 18	06 28.99	+34 59.9	2.020	2.388	-1.85 -1.7	20.1	17.8/103	99.0
Mar. 28	06 43.66	+34 18.2	2.181	2.436	-1.68 -0.8	20.5	19.4/103	92.4

Comet P/2008 02 (McNaught)

Epoch = 2018 July 21.0 TT
 T = 2018 Oct. 19.86126 TT
 Peri. = 26.93813 e = 0.1516524
 Node = 325.84498 2000.0 a = 4.4971916 AU
 Incl. = 9.51163 n = 0.10334560
 q = 3.8151817 AU P = 9.54 years

$$m_1 = -1.0 + 5 \log(\Delta) + 30.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	20 37.30	-20 24.4	4.806	3.939	-0.42 -2.6	20.3	17.8/72	25.2
Jan. 12	20 49.35	-19 26.5	4.854	3.931	-0.41 -2.7	20.3	18.2/71	18.0
Jan. 22	21 01.52	-18 25.2	4.885	3.923	-0.41 -2.8	20.3	18.5/70	10.9
Feb. 1	21 13.71	-17 21.1	4.898	3.916	-0.40 -2.9	20.2	18.6/69	4.0
Feb. 11	21 25.83	-16 14.2	4.893	3.908	-0.40 -3.0	20.2	18.7/69	3.4
Feb. 21	21 37.82	-15 05.2	4.870	3.901	-0.40 -3.1	20.2	18.6/68	10.3
Mar. 3	21 49.59	-13 54.5	4.830	3.895	-0.40 -3.2	20.1	18.4/67	17.3
Mar. 13	22 01.08	-12 42.6	4.773	3.888	-0.40 -3.3	20.1	18.1/66	24.2
Mar. 23	22 12.22	-11 30.1	4.700	3.882	-0.40 -3.4	20.0	17.6/66	31.2
Apr. 2	22 22.93	-10 17.6	4.612	3.876	-0.40 -3.5	20.0	17.0/65	38.2
Apr. 12	22 33.15	-09 05.8	4.510	3.870	-0.41 -3.7	19.9	16.3/64	45.2
Apr. 22	22 42.80	-07 55.3	4.395	3.865	-0.41 -3.8	19.8	15.5/63	52.4
May 2	22 51.80	-06 46.9	4.270	3.859	-0.42 -3.9	19.7	14.5/62	59.6
May 12	23 00.04	-05 41.3	4.136	3.854	-0.43 -4.1	19.7	13.3/61	67.0
May 22	23 07.43	-04 39.3	3.994	3.850	-0.45 -4.2	19.6	11.9/60	74.5
June 1	23 13.84	-03 41.8	3.848	3.845	-0.46 -4.4	19.5	10.3/58	82.3
June 11	23 19.16	-02 49.6	3.700	3.841	-0.48 -4.6	19.4	8.5/55	90.3
June 21	23 23.23	-02 03.6	3.552	3.837	-0.50 -4.7	19.3	6.5/50	98.6
July 1	23 25.94	-01 24.7	3.408	3.834	-0.52 -4.9	19.2	4.5/40	107.3
July 11	23 27.17	+00 53.9	3.271	3.831	-0.55 -5.2	19.1	2.7/12	116.3
July 21	23 26.82	+00 31.8	3.144	3.828	-0.57 -5.4	19.0	2.5/313	125.7
July 31	23 24.90	+00 19.1	3.033	3.825	-0.60 -5.6	18.9	4.2/280	135.6
Aug. 10	23 21.47	+00 15.6	2.941	3.823	-0.62 -5.8	18.8	6.3/269	145.9
Aug. 20	23 16.73	+00 21.0	2.872	3.821	-0.64 -5.9	18.8	8.1/263	156.5
Aug. 30	23 11.03	+00 33.9	2.828	3.819	-0.65 -6.0	18.7	9.2/260	167.1
Sept. 9	23 04.83	+00 52.2	2.813	3.818	-0.65 -6.1	18.7	9.6/258	175.3
Sept. 19	22 58.66	-01 13.4	2.827	3.817	-0.65 -6.0	18.7	9.2/256	168.5
Sept. 29	22 53.07	-01 34.3	2.869	3.816	-0.64 -5.9	18.7	7.9/255	157.9
Oct. 9	22 48.52	-01 52.3	2.938	3.815	-0.62 -5.8	18.8	5.9/255	147.0
Oct. 19	22 45.38	-02 04.9	3.031	3.815	-0.60 -5.6	18.9	3.5/255	136.4
Oct. 29	22 43.85	-02 10.4	3.144	3.815	-0.57 -5.4	18.9	0.9/263	126.2
Nov. 8	22 44.01	-02 07.7	3.272	3.816	-0.55 -5.1	19.0	1.8/65	116.3
Nov. 18	22 45.84	-01 56.2	3.412	3.816	-0.52 -4.9	19.1	4.4/68	106.7
Nov. 28	22 49.23	-01 36.1	3.560	3.818	-0.50 -4.7	19.2	6.8/68	97.6
Dec. 8	22 54.04	-01 07.4	3.710	3.819	-0.48 -4.5	19.3	8.9/68	88.8
Dec. 18	23 00.12	+00 30.7	3.861	3.821	-0.46 -4.3	19.4	10.9/68	80.3
Dec. 28	23 07.29	+00 13.5	4.008	3.823	-0.45 -4.2	19.5	12.5/67	72.1
Jan. 7	23 15.40	+01 04.4	4.149	3.825	-0.43 -4.1	19.6	14.0/67	64.2
Jan. 17	23 24.30	+02 01.4	4.282	3.827	-0.42 -3.9	19.6	15.2/67	56.5
Jan. 27	23 33.85	+03 03.7	4.404	3.830	-0.41 -3.8	19.7	16.1/66	49.0
Feb. 6	23 43.95	+04 10.6	4.514	3.833	-0.40 -3.7	19.8	17.0/66	41.6
Feb. 16	23 54.48	+05 21.3	4.610	3.837	-0.40 -3.6	19.8	17.6/66	34.5
Feb. 26	00 05.37	+06 35.1	4.691	3.841	-0.39 -3.5	19.9	18.1/65	27.5
Mar. 8	00 16.52	+07 51.4	4.756	3.845	-0.39 -3.5	19.9	18.5/65	20.8
Mar. 18	00 27.88	+09 09.3	4.805	3.849	-0.39 -3.4	20.0	18.7/65	14.3
Mar. 28	00 39.36	+10 28.3	4.837	3.854	-0.39 -3.3	20.0	18.8/65	8.6

Comet 300P/Catalina

Epoch = 2018 July 21.0 TT
 T = 2018 Nov. 2.07622 TT
 Peri. = 222.85228 e = 0.6915290
 Node = 95.67476 2000.0 a = 2.6997864 AU
 Incl. = 5.67593 n = 0.22218256
 q = 0.8328058 AU P = 4.44 years

$$m_1 = 17.4 + 5 \log(\Delta) + 10.0 \log(r(t-15))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	12 54.23	+00 30.4	3.068	3.205	+0.60	-1.8	.	89.0
Jan. 12	12 59.69	+00 17.8	2.857	3.146	+0.47	-0.6	.	97.8
Jan. 22	13 03.66	+00 17.5	2.650	3.084	+0.30	+0.7	.	107.0
Feb. 1	13 05.82	+00 31.1	2.449	3.022	+0.10	+2.2	.	116.6
Feb. 11	13 05.85	+01 00.0	2.258	2.957	-0.13	+3.8	.	126.8
Feb. 21	13 03.41	+01 45.4	2.083	2.891	-0.39	+5.4	.	137.5
Mar. 3	12 58.30	+02 47.0	1.928	2.822	-0.66	+7.0	.	148.8
Mar. 13	12 50.48	+04 02.6	1.797	2.752	-0.92	+8.2	.	160.1
Mar. 23	12 40.23	+05 27.7	1.694	2.680	-1.14	+8.8	.	169.7
Apr. 2	12 28.25	+06 54.7	1.621	2.607	-1.25	+8.5	.	167.7
Apr. 12	12 15.60	+08 14.6	1.579	2.531	-1.26	+7.3	.	156.7
Apr. 22	12 03.52	+09 18.9	1.564	2.453	-1.13	+5.3	.	144.5
May 2	11 53.23	+10 01.6	1.572	2.373	-0.89	+3.0	.	132.5
May 12	11 45.58	+10 20.2	1.598	2.291	-0.60	+0.5	.	121.2
May 22	11 41.04	+10 14.9	1.634	2.206	-0.27	-1.8	.	110.8
June 1	11 39.75	+09 47.6	1.676	2.120	+0.05	-3.9	22.0	101.2
June 11	11 41.58	+09 00.4	1.717	2.031	+0.35	-5.7	21.9	92.4
June 21	11 46.36	+07 55.4	1.755	1.940	+0.63	-7.4	21.8	84.4
July 1	11 53.83	+06 34.2	1.785	1.847	+0.89	-9.0	21.6	77.1
July 11	12 03.77	+04 58.0	1.805	1.752	+1.13	-10.4	21.5	70.5
July 21	12 16.07	+03 07.3	1.813	1.655	+1.35	-11.8	21.2	64.6
July 31	12 30.63	+01 02.6	1.809	1.556	+1.58	-13.2	21.0	59.2
Aug. 10	12 47.47	-01 16.1	1.791	1.456	+1.82	-14.6	20.7	54.4
Aug. 20	13 06.74	-03 48.9	1.759	1.356	+2.07	-16.0	20.4	50.2
Aug. 30	13 28.64	-06 35.5	1.713	1.257	+2.35	-17.4	20.0	46.7
Sept. 9	13 53.55	-09 35.3	1.654	1.159	+2.68	-18.7	19.7	43.8
Sept. 19	14 22.00	-12 46.7	1.582	1.067	+3.06	-19.7	19.2	41.7
Sept. 29	14 54.64	-16 05.8	1.501	0.983	+3.53	-20.1	18.7	40.4
Oct. 9	15 32.32	-19 25.5	1.411	0.913	+4.08	-19.6	18.3	40.1
Oct. 19	16 15.93	-22 33.0	1.318	0.861	+4.72	-17.4	17.8	40.8
Oct. 29	17 06.14	-25 08.3	1.226	0.835	+5.40	-12.8	17.3	42.6
Nov. 8	18 03.04	-26 44.5	1.144	0.838	+6.03	-5.2	17.0	45.5
Nov. 18	19 05.38	-26 52.0	1.082	0.869	+6.43	+5.1	16.8	49.4
Nov. 28	20 10.12	-25 10.4	1.047	0.924	+6.45	+16.3	16.8	54.0
Dec. 8	21 13.11	-21 43.4	1.047	0.998	+6.06	+25.5	17.0	58.7
Dec. 18	22 10.87	-17 02.2	1.083	1.083	+5.41	+30.5	17.4	63.0
Dec. 28	23 01.72	-11 50.2	1.156	1.177	+4.70	+31.4	17.9	66.2
Jan. 7	23 45.80	-06 43.3	1.258	1.275	+4.07	+29.5	18.4	68.0
Jan. 17	00 24.11	-02 01.7	1.386	1.374	+3.56	+26.4	19.0	68.5
Jan. 27	00 57.82	+02 06.8	1.533	1.475	+3.16	+23.0	19.5	67.7
Feb. 6	01 28.02	+05 42.5	1.694	1.574	+2.86	+19.9	20.1	65.9
Feb. 16	01 55.56	+08 48.1	1.866	1.672	+2.63	+17.1	20.6	63.2
Feb. 26	02 21.05	+11 27.4	2.043	1.769	+2.46	+14.6	21.1	60.0
Mar. 8	02 44.99	+13 44.0	2.224	1.864	+2.32	+12.5	21.5	56.2
Mar. 18	03 07.71	+15 40.9	2.404	1.957	+2.21	+10.7	21.9	52.0
Mar. 28	03 29.45	+17 20.3	2.583	2.047	+2.13	+9.1	.	47.6

Comet 64P/Swift-Gehrels

Epoch = 2018 July 21.0 TT
 T = 2018 Nov. 3.84803 TT
 Peri. = 97.14653 e = 0.6874072
 Node = 300.00038 2000.0 a = 4.4568688 AU
 Incl. = 8.94861 n = 0.10475127
 q = 1.3931851 AU P = 9.41 years

$$m_1 = 9.6 + 5 \log(\Delta) + 17.5 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	18 51.35	-25 06.5	4.329	3.346	+1.47	+2.8	.	2.2
Jan. 12	19 06.18	-24 36.2	4.251	3.276	+1.50	+3.3	.	6.8
Jan. 22	19 21.30	-24 00.0	4.156	3.206	+1.52	+3.9	22.0	13.3
Feb. 1	19 36.63	-23 17.9	4.043	3.134	+1.54	+4.6	21.8	19.8
Feb. 11	19 52.10	-22 29.4	3.916	3.062	+1.55	+5.2	21.6	26.3
Feb. 21	20 07.65	-21 34.6	3.774	2.989	+1.56	+5.8	21.3	32.6
Mar. 3	20 23.22	-20 33.3	3.620	2.915	+1.56	+6.5	21.1	38.9
Mar. 13	20 38.76	-19 25.5	3.454	2.841	+1.55	+7.1	20.8	45.1
Mar. 23	20 54.24	-18 11.2	3.280	2.766	+1.54	+7.8	20.5	51.2
Apr. 2	21 09.59	-16 50.5	3.098	2.691	+1.53	+8.4	20.2	57.2
Apr. 12	21 24.81	-15 23.2	2.911	2.615	+1.51	+9.1	19.9	63.1
Apr. 22	21 39.86	-13 49.5	2.720	2.538	+1.49	+9.7	19.5	68.9
May 2	21 54.69	-12 09.3	2.527	2.461	+1.47	+10.4	19.1	74.7
May 12	22 09.31	-10 22.3	2.335	2.384	+1.45	+11.1	18.7	80.4
May 22	22 23.67	-08 28.3	2.144	2.307	+1.42	+11.8	18.3	86.0
June 1	22 37.72	-06 26.9	1.957	2.230	+1.39	+12.6	17.9	91.6
June 11	22 51.45	-04 17.5	1.775	2.153	+1.35	+13.4	17.4	97.2
June 21	23 04.76	-01 59.5	1.600	2.077	+1.31	+14.3	17.0	102.8
July 1	23 17.59	+00 28.3	1.434	2.002	+1.25	+15.4	16.5	108.4
July 11	23 29.86	+03 07.2	1.277	1.928	+1.19	+16.5	16.0	114.0
July 21	23 41.38	+05 58.3	1.131	1.856	+1.11	+17.8	15.4	119.6
July 31	23 52.04	+09 03.0	0.997	1.786	+1.01	+19.3	14.9	125.2
Aug. 10	00 01.62	+12 22.6	0.876	1.719	+0.89	+20.8	14.3	130.8
Aug. 20	00 09.87	+15 56.5	0.770	1.656	+0.75	+22.1	13.7	136.2
Aug. 30	00 16.65	+19 42.7	0.679	1.597	+0.59	+23.1	13.2	141.3
Sept. 9	00 21.82	+23 35.2	0.603	1.544	+0.43	+23.2	12.6	145.8
Sept. 19	00 25.51	+27 22.9	0.543	1.497	+0.31	+22.0	12.1	149.3
Sept. 29	00 28.38	+30 51.3	0.498	1.458	+0.28	+19.1	11.6	151.3
Oct. 9	00 31.49	+33 43.2	0.467	1.428	+0.38	+14.5	11.2	151.7
Oct. 19	00 36.45	+35 43.9	0.450	1.406	+0.67	+9.0	10.9	151.0
Oct. 29	00 44.92	+36 47.4	0.445	1.395	+1.08	+3.2	10.7	149.5
Nov. 8	00 57.78	+36 54.8	0.452	1.394	+1.54	-2.1	10.6	147.6
Nov. 18	01 15.11	+36 14.8	0.473	1.404	+1.95	-6.0	10.6	145.5
Nov. 28	01 36.05	+35 02.1	0.506	1.423	+2.24	-8.5	10.7	142.8
Dec. 8	01 59.23	+33 31.2	0.554	1.452	+2.40	-9.5	10.8	139.6
Dec. 18	02 23.53	+31 56.2	0.618	1.490	+2.45	-9.3	11.1	135.7
Dec. 28	02 48.02	+30 27.5	0.697	1.536	+2.44	-8.3	11.5	131.4
Jan. 7	03 12.17	+29 09.8	0.791	1.588	+2.39	-7.1	11.9	126.6
Jan. 17	03 35.81	+28 05.1	0.901	1.646	+2.33	-5.8	12.4	121.6
Jan. 27	03 58.82	+27 12.1	1.024	1.708	+2.27	-4.8	12.9	116.5
Feb. 6	04 21.22	+26 28.2	1.161	1.774	+2.21	-4.0	13.4	111.2
Feb. 16	04 43.08	+25 50.8	1.309	1.844	+2.16	-3.5	14.0	105.9
Feb. 26	05 04.41	+25 17.2	1.468	1.916	+2.10	-3.3	14.5	100.6
Mar. 8	05 25.25	+24 44.8	1.636	1.989	+2.06	-3.2	15.0	95.2
Mar. 18	05 45.64	+24 11.8	1.811	2.064	+2.01	-3.4	15.5	89.9
Mar. 28	06 05.55	+23 36.9	1.991	2.140	+1.97	-3.6	16.0	84.5

Comet 38P/Stephan-Oterma

Epoch = 2018 July 21.0 TT
 T = 2018 Nov. 10.97800 TT
 Peri. = 359.58535 e = 0.8593056
 Node = 77.99990 2000.0 a = 11.2908048 AU
 Incl. = 18.35291 n = 0.02597866
 q = 1.5885530 AU P = 37.94 years

$$m_1 = 6.4 + 5 \log(\Delta) + 22.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	21 58.30	-28 21.4	4.451	3.788	+1.02	+7.0	.	42.7
Jan. 12	22 08.92	-27 09.3	4.457	3.704	+1.11	+7.4	.	35.8
Jan. 22	22 20.33	-25 54.0	4.447	3.621	+1.18	+7.7	.	29.3
Feb. 1	22 32.42	-24 35.5	4.419	3.536	+1.24	+8.0	22.0	23.4
Feb. 11	22 45.11	-23 14.1	4.374	3.452	+1.30	+8.3	21.7	18.4
Feb. 21	22 58.33	-21 50.0	4.312	3.367	+1.35	+8.6	21.4	15.0
Mar. 3	23 12.02	-20 23.4	4.234	3.282	+1.39	+8.8	21.1	14.1
Mar. 13	23 26.14	-18 54.5	4.141	3.196	+1.44	+9.0	20.8	15.8
Mar. 23	23 40.68	-17 23.7	4.033	3.110	+1.47	+9.2	20.5	19.4
Apr. 2	23 55.60	-15 51.3	3.912	3.024	+1.51	+9.3	20.2	23.8
Apr. 12	00 10.91	-14 17.5	3.779	2.938	+1.55	+9.4	19.8	28.6
Apr. 22	00 26.62	-12 42.7	3.636	2.852	+1.59	+9.5	19.4	33.5
May 2	00 42.73	-11 07.4	3.485	2.766	+1.63	+9.6	19.1	38.4
May 12	00 59.27	-09 31.7	3.326	2.681	+1.68	+9.6	18.6	43.2
May 22	01 16.27	-07 56.2	3.163	2.596	+1.73	+9.5	18.2	47.9
June 1	01 33.75	-06 21.1	2.996	2.511	+1.78	+9.5	17.8	52.5
June 11	01 51.76	-04 46.7	2.827	2.427	+1.83	+9.4	17.3	57.0
June 21	02 10.33	-03 13.5	2.657	2.345	+1.89	+9.2	16.8	61.3
July 1	02 29.50	-01 41.7	2.489	2.264	+1.95	+9.1	16.4	65.4
July 11	02 49.32	+00 11.4	2.323	2.184	+2.02	+8.9	15.9	69.4
July 21	03 09.79	+01 17.2	2.161	2.107	+2.08	+8.8	15.4	73.3
July 31	03 30.95	+02 44.1	2.004	2.032	+2.15	+8.6	14.8	77.0
Aug. 10	03 52.81	+04 09.7	1.853	1.961	+2.22	+8.5	14.3	80.5
Aug. 20	04 15.34	+05 34.6	1.710	1.893	+2.29	+8.5	13.8	84.0
Aug. 30	04 38.52	+06 59.8	1.574	1.831	+2.35	+8.6	13.3	87.4
Sept. 9	05 02.28	+08 26.9	1.446	1.773	+2.40	+8.9	12.8	90.7
Sept. 19	05 26.49	+09 58.0	1.328	1.722	+2.44	+9.4	12.3	94.1
Sept. 29	05 50.99	+11 36.1	1.220	1.678	+2.46	+10.3	11.9	97.6
Oct. 9	06 15.57	+13 24.6	1.121	1.642	+2.45	+11.6	11.5	101.4
Oct. 19	06 39.87	+15 27.8	1.033	1.615	+2.40	+13.3	11.2	105.5
Oct. 29	07 03.51	+17 50.2	0.956	1.597	+2.31	+15.5	10.9	110.0
Nov. 8	07 25.94	+20 36.0	0.890	1.589	+2.15	+18.0	10.7	115.2
Nov. 18	07 46.46	+23 47.9	0.837	1.591	+1.92	+20.6	10.6	121.1
Nov. 28	08 04.32	+27 25.4	0.797	1.603	+1.61	+23.0	10.5	127.6
Dec. 8	08 18.68	+31 22.9	0.773	1.625	+1.21	+24.4	10.6	134.7
Dec. 18	08 28.78	+35 27.8	0.766	1.656	+0.76	+24.2	10.7	141.9
Dec. 28	08 34.30	+39 21.5	0.777	1.695	+0.30	+21.9	11.0	148.5
Jan. 7	08 35.45	+42 43.2	0.807	1.742	-0.09	+17.7	11.4	153.1
Jan. 17	08 33.39	+45 15.1	0.858	1.796	-0.31	+12.0	11.8	154.3
Jan. 27	08 30.00	+46 49.1	0.928	1.855	-0.34	+6.2	12.3	151.8
Feb. 6	08 27.20	+47 26.9	1.017	1.920	-0.18	+1.0	12.8	146.8
Feb. 16	08 26.49	+47 17.0	1.125	1.989	+0.08	-3.1	13.4	140.6
Feb. 26	08 28.56	+46 31.4	1.248	2.062	+0.36	-6.1	14.0	133.9
Mar. 8	08 33.41	+45 20.5	1.386	2.138	+0.63	-8.1	14.5	127.2
Mar. 18	08 40.71	+43 52.6	1.538	2.216	+0.85	-9.5	15.1	120.5
Mar. 28	08 49.96	+42 13.9	1.702	2.296	+1.01	-10.3	15.7	114.0

Comet 247P/LINEAR

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 2.10933 TT
 Peri. = 47.45406 e = 0.6250307
 Node = 54.01077 2000.0 a = 3.9710371 AU
 Incl. = 13.66167 n = 0.12455127
 q = 1.4890170 AU P = 7.91 years

$$m_1 = 15.8 + 5 \log(\Delta) + 12.5 \log(r(t-30))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	22 31.07	-21 12.8	3.918	3.389	+0.95	+8.3	.	51.1
Jan. 12	22 40.99	-19 47.8	3.965	3.327	+1.04	+8.7	.	43.9
Jan. 22	22 51.76	-18 18.8	3.998	3.264	+1.12	+9.1	.	36.8
Feb. 1	23 03.26	-16 46.2	4.015	3.201	+1.19	+9.4	.	30.1
Feb. 11	23 15.39	-15 10.3	4.015	3.137	+1.25	+9.8	.	23.7
Feb. 21	23 28.08	-13 31.3	3.999	3.072	+1.30	+10.1	.	17.8
Mar. 3	23 41.27	-11 49.5	3.966	3.007	+1.34	+10.3	.	12.6
Mar. 13	23 54.92	-10 05.2	3.918	2.941	+1.39	+10.6	.	9.1
Mar. 23	00 09.00	-08 18.7	3.854	2.874	+1.43	+10.8	.	9.1
Apr. 2	00 23.49	-06 30.4	3.775	2.807	+1.47	+10.9	.	12.3
Apr. 12	00 38.38	-04 40.6	3.683	2.740	+1.51	+11.1	.	16.9
Apr. 22	00 53.69	-02 49.5	3.579	2.671	+1.55	+11.2	.	21.8
May 2	01 09.42	+00 57.6	3.463	2.603	+1.60	+11.2	.	26.7
May 12	01 25.61	+00 54.9	3.338	2.534	+1.65	+11.3	.	31.7
May 22	01 42.28	+02 47.5	3.204	2.465	+1.70	+11.3	.	36.5
June 1	01 59.48	+04 40.1	3.063	2.396	+1.75	+11.2	.	41.3
June 11	02 17.27	+06 32.3	2.916	2.327	+1.81	+11.2	.	45.9
June 21	02 35.70	+08 23.7	2.765	2.258	+1.88	+11.1	.	50.4
July 1	02 54.82	+10 14.0	2.612	2.190	+1.95	+11.0	.	54.8
July 11	03 14.74	+12 02.9	2.457	2.122	+2.04	+10.8	.	59.1
July 21	03 35.51	+13 50.1	2.303	2.055	+2.13	+10.6	22.0	63.2
July 31	03 57.22	+15 35.2	2.150	1.989	+2.23	+10.4	21.7	67.2
Aug. 10	04 19.99	+17 17.9	2.000	1.925	+2.34	+10.1	21.4	71.0
Aug. 20	04 43.89	+18 57.7	1.854	1.864	+2.46	+9.8	21.1	74.7
Aug. 30	05 09.02	+20 34.3	1.714	1.804	+2.59	+9.5	20.7	78.3
Sept. 9	05 35.48	+22 07.2	1.581	1.748	+2.72	+9.1	20.4	81.7
Sept. 19	06 03.30	+23 35.8	1.456	1.695	+2.86	+8.6	20.0	85.0
Sept. 29	06 32.51	+24 59.6	1.340	1.647	+3.00	+8.1	19.6	88.2
Oct. 9	07 03.05	+26 17.8	1.233	1.604	+3.12	+7.5	19.3	91.3
Oct. 19	07 34.71	+27 29.9	1.137	1.567	+3.22	+6.9	18.9	94.3
Oct. 29	08 07.18	+28 35.5	1.052	1.536	+3.28	+6.2	18.6	97.3
Nov. 8	08 39.96	+29 34.9	0.978	1.513	+3.27	+5.6	18.3	100.4
Nov. 18	09 12.29	+30 29.3	0.915	1.497	+3.18	+5.2	18.0	103.6
Nov. 28	09 43.31	+31 20.8	0.863	1.490	+2.99	+5.1	17.8	107.1
Dec. 8	10 12.01	+32 12.8	0.820	1.490	+2.70	+5.4	17.6	111.0
Dec. 18	10 37.29	+33 08.9	0.785	1.499	+2.30	+5.9	17.5	115.4
Dec. 28	10 58.15	+34 11.5	0.760	1.517	+1.81	+6.7	17.4	120.4
Jan. 7	11 13.63	+35 21.0	0.742	1.541	+1.22	+7.2	17.3	126.0
Jan. 17	11 22.99	+36 33.1	0.734	1.573	+0.59	+7.0	17.3	132.1
Jan. 27	11 26.05	+37 38.3	0.737	1.611	-0.03	+5.7	17.4	138.3
Feb. 6	11 23.23	+38 23.5	0.752	1.655	-0.56	+2.8	17.5	144.2
Feb. 16	11 16.00	+38 34.0	0.782	1.704	-0.88	-1.3	17.7	148.5
Feb. 26	11 06.65	+38 00.8	0.829	1.758	-0.96	-5.8	18.0	150.1
Mar. 8	10 57.53	+36 43.7	0.894	1.814	-0.82	-9.9	18.3	148.3
Mar. 18	10 50.56	+34 50.3	0.977	1.874	-0.53	-12.9	18.6	143.8
Mar. 28	10 46.67	+32 32.2	1.078	1.937	-0.21	-14.7	19.0	137.8

Comet P/2013 R3 (Catalina-PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 6.39471 TT
 Peri. = 11.05485 e = 0.2745422
 Node = 342.03489 2000.0 a = 3.0328841 AU
 Incl. = 0.86560 n = 0.18660375
 q = 2.2002294 AU P = 5.28 years

$$m_1 = 11.6 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	17 34.74	-23 57.8	3.793	2.868	-0.68 +0.4	.	24.5/ 93	17.1
Jan. 12	17 52.62	-24 04.9	3.717	2.840	-0.70 +0.1	.	24.5/ 91	23.2
Jan. 22	18 10.54	-24 04.6	3.629	2.812	-0.73 -0.2	.	24.5/ 89	29.3
Feb. 1	18 28.37	-23 56.7	3.528	2.783	-0.76 -0.6	.	24.4/ 87	35.3
Feb. 11	18 46.04	-23 41.6	3.417	2.755	-0.79 -0.9	22.0	24.2/ 86	41.4
Feb. 21	19 03.42	-23 19.7	3.295	2.727	-0.82 -1.3	21.8	23.8/ 84	47.5
Mar. 3	19 20.39	-22 51.4	3.166	2.699	-0.86 -1.7	21.6	23.3/ 82	53.6
Mar. 13	19 36.87	-22 17.6	3.029	2.671	-0.89 -2.2	21.5	22.7/ 81	59.8
Mar. 23	19 52.71	-21 39.2	2.887	2.644	-0.94 -2.6	21.3	21.9/ 79	66.0
Apr. 2	20 07.80	-20 57.3	2.740	2.616	-0.98 -3.1	21.1	21.0/ 78	72.3
Apr. 12	20 22.01	-20 13.3	2.591	2.589	-1.03 -3.6	20.9	19.8/ 77	78.8
Apr. 22	20 35.19	-19 28.4	2.440	2.562	-1.10 -4.2	20.7	18.3/ 76	85.4
May 2	20 47.15	-18 44.5	2.290	2.536	-1.16 -4.8	20.5	16.5/ 75	92.2
May 12	20 57.72	-18 03.3	2.142	2.510	-1.24 -5.4	20.2	14.4/ 74	99.3
May 22	21 06.64	-17 26.8	1.998	2.485	-1.34 -6.1	20.0	11.8/ 74	106.7
June 1	21 13.67	-16 57.0	1.860	2.461	-1.44 -6.8	19.8	8.8/ 73	114.5
June 11	21 18.55	-16 35.9	1.731	2.437	-1.56 -7.5	19.6	5.4/ 73	122.9
June 21	21 20.98	-16 25.3	1.614	2.413	-1.69 -8.2	19.3	1.5/ 73	131.8
July 1	21 20.80	-16 26.2	1.511	2.391	-1.83 -8.8	19.1	2.5/253	141.4
July 11	21 17.94	-16 38.5	1.425	2.370	-1.96 -9.4	18.9	6.4/254	151.6
July 21	21 12.63	-17 00.5	1.360	2.349	-2.08 -9.7	18.8	9.6/254	162.5
July 31	21 05.49	-17 28.8	1.318	2.330	-2.16 -9.7	18.6	11.6/255	173.8
Aug. 10	20 57.44	-17 58.5	1.300	2.311	-2.19 -9.4	18.5	11.9/256	174.6
Aug. 20	20 49.71	-18 24.6	1.307	2.294	-2.17 -8.9	18.5	10.3/257	163.1
Aug. 30	20 43.49	-18 43.0	1.337	2.278	-2.09 -8.4	18.5	7.2/260	152.0
Sept. 9	20 39.68	-18 51.4	1.388	2.264	-1.99 -7.8	18.5	3.2/266	141.4
Sept. 19	20 38.85	-18 48.5	1.456	2.251	-1.86 -7.3	18.6	1.6/ 54	131.5
Sept. 29	20 41.14	-18 34.3	1.538	2.239	-1.74 -6.9	18.7	6.0/ 70	122.3
Oct. 9	20 46.39	-18 08.9	1.630	2.228	-1.62 -6.7	18.8	10.2/ 72	113.7
Oct. 19	20 54.34	-17 32.5	1.731	2.220	-1.51 -6.5	18.9	14.0/ 72	105.8
Oct. 29	21 04.61	-16 45.2	1.837	2.213	-1.41 -6.4	19.0	17.2/ 72	98.4
Nov. 8	21 16.80	-15 47.4	1.946	2.207	-1.33 -6.4	19.1	20.0/ 72	91.5
Nov. 18	21 30.59	-14 39.3	2.058	2.203	-1.25 -6.4	19.2	22.3/ 71	84.9
Nov. 28	21 45.63	-13 21.3	2.170	2.201	-1.19 -6.4	19.3	24.3/ 70	78.7
Dec. 8	22 01.67	-11 54.0	2.281	2.200	-1.13 -6.5	19.4	25.9/ 69	72.7
Dec. 18	22 18.50	-10 18.2	2.391	2.201	-1.08 -6.5	19.5	27.3/ 68	67.0
Dec. 28	22 35.91	-08 34.8	2.498	2.204	-1.04 -6.5	19.6	28.3/ 68	61.4
Jan. 7	22 53.77	-06 44.8	2.602	2.209	-1.00 -6.4	19.7	29.2/ 67	56.0
Jan. 17	23 11.98	-04 49.4	2.702	2.215	-0.97 -6.4	19.8	29.9/ 67	50.8
Jan. 27	23 30.45	-02 49.9	2.797	2.222	-0.94 -6.3	19.9	30.4/ 66	45.6
Feb. 6	23 49.13	+00 47.6	2.887	2.232	-0.92 -6.2	20.0	30.7/ 66	40.6
Feb. 16	00 07.97	+01 16.4	2.971	2.242	-0.89 -6.0	20.1	31.0/ 66	35.6
Feb. 26	00 26.94	+03 20.6	3.049	2.255	-0.88 -5.9	20.2	31.1/ 67	30.7
Mar. 8	00 46.03	+05 23.9	3.120	2.268	-0.86 -5.6	20.3	31.1/ 67	25.8
Mar. 18	01 05.24	+07 24.9	3.184	2.283	-0.85 -5.4	20.4	31.0/ 67	21.0
Mar. 28	01 24.53	+09 22.5	3.240	2.300	-0.84 -5.1	20.5	30.9/ 68	16.3

Comet 60P/Tsuchinshan

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 11.23088 TT
 Peri. = 216.55438 e = 0.5377939
 Node = 267.58349 2000.0 a = 3.5105787 AU
 Incl. = 3.60645 n = 0.14984284
 q = 1.6226109 AU P = 6.58 years

$$m_1 = 11.4 + 5 \log(\Delta) + 22.5 \log(r(t-10))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	23 25.47	+00 05.0	3.434	3.246	+0.78	+4.0	.	70.8
Jan. 12	23 33.88	+00 39.2	3.520	3.193	+0.91	+4.9	.	62.8
Jan. 22	23 43.44	+01 32.1	3.595	3.139	+1.01	+5.7	.	55.2
Feb. 1	23 54.02	+02 32.6	3.657	3.084	+1.11	+6.4	.	47.9
Feb. 11	00 05.52	+03 39.8	3.706	3.029	+1.20	+7.1	.	40.9
Feb. 21	00 17.84	+04 52.9	3.741	2.974	+1.28	+7.6	.	34.1
Mar. 3	00 30.92	+06 10.8	3.760	2.918	+1.35	+8.0	.	27.5
Mar. 13	00 44.70	+07 32.8	3.764	2.861	+1.42	+8.4	.	21.3
Mar. 23	00 59.17	+08 58.0	3.753	2.804	+1.48	+8.7	.	15.2
Apr. 2	01 14.28	+10 25.3	3.727	2.746	+1.55	+8.8	.	9.4
Apr. 12	01 30.05	+11 54.0	3.687	2.689	+1.61	+8.9	.	4.1
Apr. 22	01 46.49	+13 23.1	3.633	2.630	+1.68	+8.9	.	3.1
May 2	02 03.60	+14 51.7	3.567	2.572	+1.75	+8.8	.	7.7
May 12	02 21.41	+16 18.6	3.489	2.513	+1.82	+8.6	.	12.7
May 22	02 39.96	+17 42.8	3.400	2.455	+1.90	+8.2	.	17.6
June 1	02 59.28	+19 03.1	3.302	2.396	+1.97	+7.8	.	22.4
June 11	03 19.39	+20 18.3	3.196	2.338	+2.06	+7.2	.	27.1
June 21	03 40.34	+21 27.0	3.083	2.280	+2.14	+6.5	.	31.6
July 1	04 02.13	+22 27.7	2.964	2.223	+2.23	+5.6	21.8	36.0
July 11	04 24.79	+23 18.8	2.841	2.166	+2.31	+4.5	21.5	40.2
July 21	04 48.29	+23 58.8	2.715	2.111	+2.40	+3.3	21.1	44.3
July 31	05 12.60	+24 25.9	2.587	2.056	+2.47	+1.9	20.8	48.3
Aug. 10	05 37.68	+24 38.4	2.458	2.003	+2.55	+0.4	20.4	52.2
Aug. 20	06 03.40	+24 34.9	2.330	1.952	+2.60	-1.3	20.0	55.9
Aug. 30	06 29.66	+24 13.9	2.203	1.903	+2.65	-3.1	19.7	59.6
Sept. 9	06 56.30	+23 34.4	2.080	1.857	+2.68	-5.0	19.3	63.1
Sept. 19	07 23.12	+22 35.7	1.959	1.813	+2.69	-6.9	18.9	66.6
Sept. 29	07 49.94	+21 17.8	1.844	1.773	+2.67	-8.8	18.5	70.1
Oct. 9	08 16.56	+19 41.2	1.733	1.737	+2.64	-10.7	18.2	73.5
Oct. 19	08 42.73	+17 47.1	1.627	1.705	+2.59	-12.3	17.9	76.9
Oct. 29	09 08.26	+15 37.5	1.527	1.678	+2.51	-13.7	17.5	80.4
Nov. 8	09 32.94	+13 15.2	1.433	1.655	+2.41	-14.8	17.2	84.0
Nov. 18	09 56.50	+10 43.6	1.346	1.639	+2.29	-15.5	17.0	87.8
Nov. 28	10 18.72	+08 06.7	1.263	1.628	+2.14	-15.8	16.7	91.8
Dec. 8	10 39.33	+05 29.0	1.187	1.623	+1.96	-15.6	16.5	96.3
Dec. 18	10 57.96	+02 55.2	1.116	1.624	+1.74	-15.0	16.4	101.1
Dec. 28	11 14.26	+00 30.4	1.050	1.631	+1.49	-13.8	16.2	106.6
Jan. 7	11 27.79	-01 40.3	0.991	1.644	+1.18	-12.1	16.2	112.8
Jan. 17	11 38.04	-03 31.7	0.938	1.663	+0.83	-9.9	16.1	119.8
Jan. 27	11 44.64	-04 59.0	0.893	1.687	+0.45	-7.2	16.1	127.8
Feb. 6	11 47.30	-05 57.6	0.859	1.716	+0.05	-4.1	16.2	136.7
Feb. 16	11 46.16	-06 24.6	0.838	1.749	-0.30	-0.9	16.3	146.7
Feb. 26	11 41.91	-06 20.5	0.833	1.787	-0.56	+2.0	16.5	157.2
Mar. 8	11 35.72	-05 49.8	0.847	1.828	-0.66	+4.2	16.7	167.5
Mar. 18	11 29.22	-05 01.8	0.882	1.873	-0.61	+5.3	17.0	172.1
Mar. 28	11 23.91	-04 08.4	0.939	1.920	-0.42	+5.2	17.4	164.7

Comet 46P/Wirtanen

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 13.22028 TT
 Peri. = 356.33269 e = 0.6585436
 Node = 82.16580 2000.0 a = 3.0908122 AU
 Incl. = 11.74536 n = 0.18138240
 q = 1.0553776 AU P = 5.43 years

$$m1 = 9.8 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	19 55.10	-26 35.0	4.375	3.437	+1.33	+3.1	.	15.4
Jan. 12	20 08.62	-26 02.4	4.347	3.380	+1.37	+3.5	.	9.2
Jan. 22	20 22.51	-25 25.9	4.298	3.321	+1.41	+3.9	.	5.9
Feb. 1	20 36.67	-24 45.7	4.230	3.260	+1.43	+4.2	.	8.9
Feb. 11	20 51.05	-24 02.0	4.144	3.199	+1.45	+4.5	.	14.7
Feb. 21	21 05.58	-23 15.2	4.039	3.136	+1.46	+4.8	.	21.0
Mar. 3	21 20.20	-22 25.6	3.919	3.072	+1.47	+5.1	.	27.3
Mar. 13	21 34.89	-21 33.6	3.782	3.006	+1.47	+5.3	.	33.7
Mar. 23	21 49.60	-20 39.9	3.632	2.940	+1.47	+5.4	.	40.0
Apr. 2	22 04.31	-19 45.0	3.470	2.871	+1.47	+5.5	.	46.2
Apr. 12	22 19.00	-18 49.8	3.298	2.802	+1.47	+5.5	.	52.4
Apr. 22	22 33.65	-17 55.1	3.117	2.731	+1.46	+5.4	.	58.6
May 2	22 48.25	-17 01.7	2.929	2.658	+1.46	+5.2	.	64.6
May 12	23 02.80	-16 10.7	2.736	2.584	+1.45	+4.9	.	70.7
May 22	23 17.27	-15 23.3	2.540	2.509	+1.44	+4.5	21.8	76.7
June 1	23 31.66	-14 41.0	2.343	2.432	+1.43	+3.9	21.3	82.7
June 11	23 45.95	-14 05.1	2.147	2.354	+1.42	+3.2	20.8	88.7
June 21	00 00.12	-13 37.7	1.953	2.274	+1.41	+2.2	20.2	94.7
July 1	00 14.11	-13 20.7	1.763	2.193	+1.39	+1.0	19.6	100.7
July 11	00 27.89	-13 16.7	1.580	2.111	+1.36	-0.4	18.9	106.8
July 21	00 41.34	-13 28.5	1.404	2.028	+1.32	-2.2	18.2	112.9
July 31	00 54.37	-13 59.2	1.237	1.944	+1.27	-4.2	17.5	119.0
Aug. 10	01 06.81	-14 52.1	1.081	1.859	+1.20	-6.7	16.7	125.0
Aug. 20	01 18.42	-16 10.6	0.937	1.773	+1.11	-9.3	15.9	130.9
Aug. 30	01 28.95	-17 56.8	0.807	1.688	+0.98	-12.2	15.0	136.3
Sept. 9	01 38.07	-20 11.7	0.690	1.602	+0.82	-15.0	14.1	140.8
Sept. 19	01 45.36	-22 52.0	0.587	1.518	+0.62	-17.1	13.2	143.8
Sept. 29	01 50.60	-25 48.6	0.497	1.436	+0.40	-18.0	12.2	144.5
Oct. 9	01 53.60	-28 45.9	0.420	1.357	+0.18	-16.9	11.2	142.6
Oct. 19	01 54.70	-31 18.8	0.354	1.283	+0.05	-12.8	10.2	138.6
Oct. 29	01 55.07	-32 56.4	0.294	1.215	+0.06	-5.4	9.3	133.6
Nov. 8	01 56.54	-33 01.5	0.240	1.156	+0.32	+6.5	8.3	128.9
Nov. 18	02 02.32	-30 35.8	0.188	1.109	+0.98	+26.4	7.3	125.8
Nov. 28	02 17.25	-23 39.8	0.138	1.075	+2.26	+65.8	6.3	126.9
Dec. 8	02 49.72	-06 58.8	0.097	1.058	+4.79	153.5	5.3	137.0
Dec. 18	03 57.24	+25 47.1	0.080	1.057	+9.55	215.9	4.9	156.2
Dec. 28	05 53.07	+52 49.0	0.104	1.074	+12.79	+85.0	5.7	149.8
Jan. 7	07 44.38	+59 50.4	0.152	1.107	+8.27	+7.0	6.8	142.1
Jan. 17	08 44.71	+59 11.9	0.210	1.154	+3.79	-12.1	8.0	140.6
Jan. 27	09 11.43	+56 44.8	0.276	1.212	+1.63	-17.0	9.1	141.3
Feb. 6	09 23.00	+53 43.8	0.349	1.280	+0.75	-19.2	10.2	142.1
Feb. 16	09 29.05	+50 25.4	0.432	1.354	+0.50	-20.4	11.3	141.8
Feb. 26	09 33.96	+46 59.3	0.526	1.433	+0.51	-20.7	12.3	139.9
Mar. 8	09 39.47	+43 32.7	0.631	1.515	+0.62	-20.5	13.3	136.6
Mar. 18	09 46.31	+40 10.7	0.750	1.599	+0.76	-19.8	14.3	132.2
Mar. 28	09 54.50	+36 57.0	0.881	1.684	+0.89	-18.9	15.2	127.2

Comet 137P/Shoemaker-Levy

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 13.38964 TT
 Peri. = 141.01484 e = 0.5727722
 Node = 233.08005 2000.0 a = 4.5180852 AU
 Incl. = 4.85381 n = 0.10262956
 q = 1.9302516 AU P = 9.60 years

H = 14.4 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		V	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	18 18.38	-20 58.6	4.408	3.435	+1.46	+1.1	20.5	7.4
Jan. 12	18 33.09	-20 44.5	4.325	3.379	+1.48	+1.7	20.6	13.9
Jan. 22	18 47.97	-20 24.3	4.227	3.324	+1.49	+2.4	20.6	20.6
Feb. 1	19 02.91	-19 57.8	4.113	3.267	+1.49	+3.0	20.6	27.2
Feb. 11	19 17.84	-19 25.2	3.985	3.211	+1.49	+3.6	20.6	33.7
Feb. 21	19 32.67	-18 46.4	3.844	3.155	+1.47	+4.2	20.5	40.2
Mar. 3	19 47.31	-18 01.7	3.693	3.098	+1.45	+4.8	20.5	46.7
Mar. 13	20 01.68	-17 11.5	3.531	3.042	+1.42	+5.3	20.4	53.2
Mar. 23	20 15.70	-16 16.3	3.362	2.985	+1.38	+5.8	20.3	59.7
Apr. 2	20 29.27	-15 16.6	3.187	2.929	+1.33	+6.2	20.2	66.1
Apr. 12	20 42.31	-14 13.0	3.008	2.873	+1.27	+6.5	20.1	72.6
Apr. 22	20 54.69	-13 06.5	2.826	2.816	+1.20	+6.8	19.9	79.2
May 2	21 06.30	-11 57.8	2.644	2.760	+1.11	+6.9	19.8	85.9
May 12	21 17.02	-10 48.3	2.463	2.705	+1.02	+7.0	19.6	92.7
May 22	21 26.65	-09 39.0	2.285	2.650	+0.90	+6.8	19.4	99.7
June 1	21 35.03	-08 31.7	2.113	2.596	+0.76	+6.6	19.2	106.9
June 11	21 41.93	-07 28.0	1.948	2.542	+0.60	+6.1	18.9	114.4
June 21	21 47.10	-06 30.1	1.793	2.489	+0.41	+5.4	18.7	122.3
July 1	21 50.32	-05 40.5	1.650	2.438	+0.21	+4.4	18.4	130.7
July 11	21 51.36	-05 01.6	1.521	2.387	-0.02	+3.2	18.1	139.6
July 21	21 50.13	-04 36.2	1.408	2.338	-0.25	+1.7	17.7	148.9
July 31	21 46.73	-04 26.3	1.316	2.291	-0.45	+0.1	17.4	158.5
Aug. 10	21 41.56	-04 32.5	1.245	2.245	-0.59	-1.5	17.1	167.4
Aug. 20	21 35.38	-04 53.8	1.197	2.202	-0.63	-2.8	16.9	170.8
Aug. 30	21 29.25	-05 26.4	1.172	2.160	-0.56	-3.7	17.0	163.9
Sept. 9	21 24.34	-06 04.9	1.170	2.122	-0.38	-3.9	17.1	154.1
Sept. 19	21 21.68	-06 42.9	1.187	2.086	-0.11	-3.5	17.3	144.1
Sept. 29	21 22.01	-07 14.3	1.223	2.053	+0.21	-2.6	17.4	134.5
Oct. 9	21 25.61	-07 34.6	1.272	2.024	+0.54	-1.3	17.6	125.6
Oct. 19	21 32.51	-07 40.7	1.333	1.998	+0.86	+0.3	17.7	117.4
Oct. 29	21 42.44	-07 30.6	1.403	1.976	+1.15	+1.9	17.9	110.0
Nov. 8	21 55.02	-07 03.8	1.479	1.958	+1.39	+3.6	18.0	103.1
Nov. 18	22 09.88	-06 20.1	1.562	1.945	+1.59	+5.3	18.1	96.8
Nov. 28	22 26.58	-05 20.6	1.649	1.936	+1.76	+6.8	18.2	91.0
Dec. 8	22 44.76	-04 06.4	1.739	1.931	+1.89	+8.2	18.3	85.5
Dec. 18	23 04.10	-02 39.3	1.834	1.931	+1.99	+9.3	18.5	80.4
Dec. 28	23 24.32	-01 01.3	1.931	1.935	+2.06	+10.3	18.5	75.5
Jan. 7	23 45.21	+00 45.1	2.031	1.944	+2.12	+11.0	18.6	70.8
Jan. 17	00 06.61	+02 37.6	2.134	1.957	+2.16	+11.5	18.7	66.3
Jan. 27	00 28.37	+04 33.7	2.238	1.975	+2.19	+11.7	18.8	61.8
Feb. 6	00 50.40	+06 31.0	2.345	1.996	+2.21	+11.7	18.9	57.5
Feb. 16	01 12.62	+08 27.2	2.452	2.022	+2.23	+11.5	19.0	53.2
Feb. 26	01 34.96	+10 20.2	2.560	2.051	+2.24	+11.0	19.0	48.9
Mar. 8	01 57.39	+12 08.1	2.668	2.083	+2.25	+10.4	19.1	44.7
Mar. 18	02 19.85	+13 49.2	2.776	2.119	+2.25	+9.7	19.2	40.4
Mar. 28	02 42.29	+15 22.2	2.881	2.157	+2.24	+8.8	19.2	36.1

Comet 198P/ODAS

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 13.93352 TT
 Peri. = 69.20820 e = 0.4431526
 Node = 358.37309 2000.0 a = 3.6022463 AU
 Incl. = 1.33685 n = 0.14415973
 q = 2.0059015 AU P = 6.84 years

$$m_1 = 11.8 + 5 \log(\Delta) + 17.5 \log(r(t-110))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	21 14.83	-16 34.0	3.928	3.171	+1.31	+6.2	.	34.8
Jan. 12	21 28.22	-15 29.4	3.961	3.127	+1.37	+6.8	.	28.0
Jan. 22	21 42.10	-14 18.9	3.978	3.082	+1.41	+7.4	.	21.4
Feb. 1	21 56.36	-13 02.8	3.980	3.038	+1.44	+7.9	.	14.9
Feb. 11	22 10.94	-11 41.4	3.966	2.993	+1.47	+8.4	.	8.6
Feb. 21	22 25.78	-10 15.1	3.936	2.949	+1.50	+8.9	.	2.4
Mar. 3	22 40.83	-08 44.4	3.892	2.904	+1.51	+9.3	.	3.7
Mar. 13	22 56.05	-07 09.8	3.834	2.859	+1.53	+9.7	.	9.6
Mar. 23	23 11.43	-05 31.8	3.763	2.814	+1.54	+10.0	.	15.4
Apr. 2	23 26.93	-03 51.0	3.679	2.770	+1.56	+10.2	.	21.1
Apr. 12	23 42.56	-02 07.9	3.584	2.725	+1.57	+10.4	.	26.6
Apr. 22	23 58.29	+00 23.3	3.478	2.681	+1.58	+10.5	.	32.1
May 2	00 14.13	+01 22.2	3.364	2.637	+1.59	+10.6	.	37.5
May 12	00 30.06	+03 07.9	3.242	2.594	+1.60	+10.6	.	42.8
May 22	00 46.08	+04 53.1	3.112	2.551	+1.61	+10.5	.	48.1
June 1	01 02.18	+06 37.0	2.978	2.508	+1.61	+10.3	.	53.4
June 11	01 18.33	+08 19.0	2.839	2.467	+1.62	+10.1	.	58.6
June 21	01 34.49	+09 58.2	2.696	2.426	+1.62	+9.7	.	63.8
July 1	01 50.62	+11 33.7	2.552	2.386	+1.61	+9.3	21.8	69.1
July 11	02 06.65	+13 05.0	2.406	2.347	+1.59	+8.9	21.6	74.4
July 21	02 22.45	+14 31.1	2.261	2.310	+1.56	+8.3	21.3	79.9
July 31	02 37.89	+15 51.4	2.117	2.274	+1.52	+7.7	21.0	85.5
Aug. 10	02 52.80	+17 05.1	1.975	2.239	+1.45	+7.0	20.8	91.3
Aug. 20	03 06.92	+18 11.8	1.836	2.207	+1.36	+6.3	20.5	97.3
Aug. 30	03 19.94	+19 10.9	1.702	2.176	+1.23	+5.5	20.2	103.7
Sept. 9	03 31.52	+20 02.3	1.575	2.147	+1.06	+4.7	19.9	110.6
Sept. 19	03 41.19	+20 45.4	1.455	2.120	+0.85	+3.9	19.6	117.9
Sept. 29	03 48.51	+21 20.2	1.345	2.096	+0.59	+3.0	19.3	125.9
Oct. 9	03 53.04	+21 46.3	1.247	2.075	+0.28	+2.1	19.0	134.6
Oct. 19	03 54.42	+22 03.2	1.164	2.056	-0.04	+1.2	18.7	144.1
Oct. 29	03 52.64	+22 10.5	1.098	2.040	-0.34	+0.2	18.5	154.4
Nov. 8	03 48.09	+22 07.9	1.052	2.027	-0.58	-0.8	18.3	165.4
Nov. 18	03 41.73	+21 56.4	1.029	2.017	-0.68	-1.5	18.1	176.3
Nov. 28	03 35.02	+21 39.5	1.030	2.010	-0.63	-1.8	18.0	170.9
Dec. 8	03 29.45	+21 21.8	1.054	2.006	-0.44	-1.6	17.9	159.6
Dec. 18	03 26.33	+21 08.7	1.099	2.006	-0.14	-0.9	17.9	148.7
Dec. 28	03 26.42	+21 04.3	1.163	2.009	+0.20	+0.1	17.9	138.6
Jan. 7	03 29.92	+21 10.3	1.244	2.015	+0.54	+1.2	18.0	129.2
Jan. 17	03 36.75	+21 26.3	1.338	2.025	+0.85	+2.1	18.1	120.6
Jan. 27	03 46.55	+21 50.4	1.442	2.037	+1.13	+2.7	18.1	112.8
Feb. 6	03 58.91	+22 19.8	1.555	2.053	+1.36	+3.1	18.2	105.5
Feb. 16	04 13.44	+22 51.4	1.675	2.071	+1.56	+3.2	18.3	98.8
Feb. 26	04 29.73	+23 22.3	1.800	2.092	+1.71	+2.9	18.4	92.5
Mar. 8	04 47.43	+23 49.9	1.928	2.116	+1.84	+2.5	18.6	86.6
Mar. 18	05 06.26	+24 12.1	2.060	2.142	+1.93	+1.8	18.7	80.9
Mar. 28	05 25.92	+24 27.0	2.193	2.170	+2.00	+1.0	18.8	75.5

Comet P/2006 D1 (Hill)

Epoch = 2018 July 21.0 TT
 T = 2018 Dec. 21.44950 TT
 Peri. = 119.42499 e = 0.6593852
 Node = 359.96723 2000.0 a = 5.5637676 AU
 Incl. = 17.36489 n = 0.07510184
 q = 1.8951016 AU P = 13.12 years

$$m_1 = 13.8 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	23 55.15	+04 50.2	3.717	3.668	-0.28 -4.4	.	8.6/60	79.6
Jan. 12	00 00.78	+05 37.5	3.804	3.606	-0.28 -4.3	.	10.8/61	71.0
Jan. 22	00 07.71	+06 33.2	3.882	3.543	-0.29 -4.3	.	12.8/62	62.8
Feb. 1	00 15.80	+07 36.6	3.950	3.480	-0.30 -4.3	.	14.6/62	55.0
Feb. 11	00 24.94	+08 47.1	4.005	3.416	-0.31 -4.4	.	16.1/63	47.5
Feb. 21	00 35.02	+10 03.8	4.045	3.353	-0.33 -4.4	.	17.5/63	40.3
Mar. 3	00 45.97	+11 26.2	4.071	3.289	-0.35 -4.5	.	18.8/63	33.4
Mar. 13	00 57.72	+12 53.3	4.081	3.225	-0.37 -4.6	.	19.9/63	26.8
Mar. 23	01 10.23	+14 24.8	4.075	3.161	-0.40 -4.6	.	20.9/63	20.6
Apr. 2	01 23.45	+15 59.7	4.053	3.097	-0.44 -4.7	.	21.9/64	14.9
Apr. 12	01 37.38	+17 37.5	4.015	3.033	-0.47 -4.8	.	22.7/64	10.0
Apr. 22	01 52.02	+19 17.5	3.963	2.970	-0.52 -4.9	.	23.5/65	7.4
May 2	02 07.37	+20 59.0	3.898	2.906	-0.56 -5.0	.	24.3/65	8.8
May 12	02 23.45	+22 41.3	3.819	2.843	-0.62 -5.0	.	25.0/66	12.8
May 22	02 40.30	+24 23.6	3.729	2.780	-0.68 -5.0	.	25.7/67	17.5
June 1	02 57.95	+26 05.2	3.627	2.717	-0.75 -4.9	.	26.4/67	22.4
June 11	03 16.45	+27 45.2	3.517	2.656	-0.83 -4.8	.	27.1/68	27.2
June 21	03 35.85	+29 22.6	3.399	2.595	-0.91 -4.6	.	27.7/70	32.1
July 1	03 56.17	+30 56.4	3.274	2.535	-1.01 -4.4	.	28.3/71	36.8
July 11	04 17.49	+32 25.4	3.144	2.476	-1.11 -3.9	.	29.0/73	41.5
July 21	04 39.80	+33 48.4	3.010	2.418	-1.23 -3.4	21.9	29.6/74	46.0
July 31	05 03.12	+35 04.1	2.874	2.362	-1.35 -2.6	21.7	30.1/76	50.5
Aug. 10	05 27.44	+36 11.1	2.736	2.307	-1.47 -1.7	21.4	30.7/78	54.9
Aug. 20	05 52.67	+37 08.0	2.599	2.255	-1.60 -0.5	21.2	31.1/80	59.2
Aug. 30	06 18.71	+37 53.5	2.462	2.205	-1.72 +1.0	20.9	31.5/83	63.5
Sept. 9	06 45.40	+38 26.7	2.328	2.157	-1.84 +2.7	20.6	31.8/85	67.7
Sept. 19	07 12.50	+38 46.8	2.197	2.113	-1.95 +4.6	20.4	31.8/88	71.9
Sept. 29	07 39.73	+38 53.4	2.069	2.072	-2.03 +6.8	20.1	31.7/90	76.1
Oct. 9	08 06.77	+38 47.0	1.946	2.034	-2.11 +9.2	19.9	31.3/92	80.4
Oct. 19	08 33.20	+38 28.6	1.828	2.000	-2.16 +11.8	19.6	30.6/94	84.7
Oct. 29	08 58.64	+38 00.0	1.716	1.970	-2.19 +14.6	19.4	29.5/96	89.2
Nov. 8	09 22.68	+37 23.4	1.609	1.945	-2.22 +17.4	19.2	27.8/98	93.9
Nov. 18	09 44.83	+36 41.8	1.508	1.925	-2.24 +20.3	19.0	25.6/100	98.8
Nov. 28	10 04.65	+35 58.2	1.413	1.910	-2.26 +23.2	18.8	22.7/101	104.1
Dec. 8	10 21.64	+35 15.5	1.324	1.900	-2.31 +26.1	18.6	19.1/102	109.8
Dec. 18	10 35.25	+34 35.9	1.244	1.895	-2.38 +28.9	18.4	14.8/105	116.1
Dec. 28	10 44.98	+34 00.1	1.171	1.896	-2.48 +31.4	18.3	9.8/110	123.1
Jan. 7	10 50.33	+33 26.9	1.109	1.903	-2.63 +33.5	18.2	4.8/133	130.7
Jan. 17	10 51.02	+32 52.0	1.060	1.914	-2.80 +34.9	18.2	4.5/211	138.9
Jan. 27	10 47.23	+32 08.5	1.027	1.931	-2.97 +35.3	18.1	9.2/236	147.5
Feb. 6	10 39.72	+31 08.4	1.012	1.953	-3.10 +34.6	18.2	13.7/238	155.6
Feb. 16	10 29.99	+29 44.8	1.019	1.979	-3.14 +33.0	18.3	16.5/234	161.1
Feb. 26	10 19.96	+27 56.4	1.049	2.010	-3.07 +30.6	18.5	17.4/226	160.8
Mar. 8	10 11.38	+25 47.3	1.103	2.045	-2.89 +27.9	18.7	16.9/215	154.9
Mar. 18	10 05.51	+23 25.1	1.180	2.084	-2.64 +25.3	18.9	15.7/201	146.6
Mar. 28	10 02.84	+20 57.7	1.278	2.126	-2.37 +23.0	19.2	14.8/185	138.0

Comet P/2007 V1 (Larson)

Epoch = 2018 July 21.0 TT
 T = 2019 Jan. 12.14965 TT
 Peri. = 51.61675 e = 0.4622747
 Node = 7.93673 2000.0 a = 4.9777528 AU
 Incl. = 10.75887 n = 0.08874708
 q = 2.6766636 AU P = 11.11 years

$$m_1 = 12.0 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	22 05.19	-16 36.5	4.266	3.658	-0.41 -3.4	.	16.6/63	46.4
Jan. 12	22 15.74	-15 18.6	4.328	3.618	-0.41 -3.5	.	17.7/63	39.0
Jan. 22	22 26.88	-13 56.7	4.376	3.578	-0.41 -3.6	.	18.6/63	31.9
Feb. 1	22 38.50	-12 31.1	4.408	3.539	-0.41 -3.8	.	19.4/63	24.9
Feb. 11	22 50.49	-11 02.2	4.425	3.500	-0.42 -3.9	22.0	20.1/63	18.1
Feb. 21	23 02.81	-09 30.2	4.425	3.461	-0.42 -4.1	22.0	20.7/63	11.5
Mar. 3	23 15.36	-07 55.8	4.409	3.423	-0.43 -4.2	21.9	21.1/63	5.4
Mar. 13	23 28.09	-06 19.2	4.377	3.385	-0.44 -4.4	21.8	21.5/63	3.3
Mar. 23	23 40.96	-04 40.9	4.329	3.347	-0.45 -4.6	21.7	21.7/63	8.6
Apr. 2	23 53.91	-03 01.4	4.267	3.310	-0.47 -4.7	21.6	21.9/63	14.7
Apr. 12	00 06.91	-01 21.2	4.191	3.274	-0.49 -4.9	21.5	22.0/63	20.8
Apr. 22	00 19.93	+00 19.3	4.101	3.237	-0.51 -5.1	21.4	21.9/63	26.9
May 2	00 32.90	+01 59.5	4.000	3.202	-0.53 -5.3	21.3	21.8/63	33.0
May 12	00 45.81	+03 39.1	3.887	3.167	-0.55 -5.5	21.2	21.6/63	39.0
May 22	00 58.60	+05 17.5	3.764	3.133	-0.58 -5.7	21.1	21.3/63	45.1
June 1	01 11.19	+06 54.4	3.632	3.099	-0.61 -5.9	20.9	20.9/63	51.2
June 11	01 23.54	+08 29.4	3.493	3.067	-0.65 -6.1	20.8	20.4/63	57.3
June 21	01 35.55	+10 02.0	3.348	3.035	-0.69 -6.3	20.7	19.6/62	63.6
July 1	01 47.10	+11 31.8	3.198	3.004	-0.73 -6.5	20.5	18.8/62	69.9
July 11	01 58.09	+12 58.8	3.044	2.974	-0.78 -6.7	20.3	17.7/61	76.4
July 21	02 08.33	+14 22.4	2.889	2.945	-0.84 -7.0	20.2	16.4/60	83.1
July 31	02 17.65	+15 42.4	2.733	2.918	-0.91 -7.2	20.0	14.8/58	90.1
Aug. 10	02 25.81	+16 58.7	2.580	2.891	-0.98 -7.5	19.8	13.0/55	97.4
Aug. 20	02 32.53	+18 10.7	2.430	2.866	-1.06 -7.9	19.6	10.8/50	105.1
Aug. 30	02 37.56	+19 18.2	2.288	2.842	-1.14 -8.3	19.5	8.6/41	113.2
Sept. 9	02 40.59	+20 20.4	2.155	2.820	-1.23 -8.7	19.3	6.4/23	121.9
Sept. 19	02 41.36	+21 16.2	2.034	2.798	-1.33 -9.3	19.1	5.2/352	131.1
Sept. 29	02 39.75	+22 04.2	1.930	2.779	-1.42 -9.9	19.0	5.9/317	140.8
Oct. 9	02 35.79	+22 42.7	1.845	2.761	-1.49 -10.5	18.8	7.8/295	150.9
Oct. 19	02 29.84	+23 10.1	1.783	2.744	-1.55 -11.1	18.7	9.6/283	161.1
Oct. 29	02 22.56	+23 25.7	1.747	2.730	-1.57 -11.7	18.7	10.6/275	169.5
Nov. 8	02 14.87	+23 30.4	1.738	2.717	-1.56 -12.1	18.6	10.3/270	168.9
Nov. 18	02 07.84	+23 27.2	1.755	2.705	-1.52 -12.2	18.6	8.7/266	159.9
Nov. 28	02 02.42	+23 20.4	1.799	2.696	-1.46 -12.1	18.7	5.9/263	149.5
Dec. 8	01 59.27	+23 14.7	1.865	2.688	-1.39 -11.8	18.7	2.4/262	139.2
Dec. 18	01 58.76	+23 14.1	1.950	2.683	-1.31 -11.2	18.8	1.4/76	129.2
Dec. 28	02 00.97	+23 21.4	2.051	2.679	-1.24 -10.6	18.9	5.2/77	119.8
Jan. 7	02 05.79	+23 37.5	2.163	2.677	-1.18 -9.9	19.0	8.7/76	110.9
Jan. 17	02 13.00	+24 02.5	2.284	2.677	-1.13 -9.1	19.1	11.9/76	102.6
Jan. 27	02 22.34	+24 35.4	2.410	2.679	-1.09 -8.4	19.3	14.7/75	94.8
Feb. 6	02 33.55	+25 14.8	2.540	2.683	-1.05 -7.7	19.4	17.0/76	87.4
Feb. 16	02 46.40	+25 58.8	2.670	2.688	-1.03 -7.0	19.5	19.0/76	80.4
Feb. 26	03 00.66	+26 45.6	2.800	2.696	-1.01 -6.3	19.6	20.6/77	73.8
Mar. 8	03 16.14	+27 33.3	2.927	2.705	-0.99 -5.6	19.7	21.9/77	67.4
Mar. 18	03 32.69	+28 20.3	3.051	2.716	-0.97 -5.0	19.8	23.0/78	61.3
Mar. 28	03 50.12	+29 04.7	3.170	2.729	-0.96 -4.3	20.0	23.8/80	55.4

Comet 171P/Spahr

Epoch = 2018 July 21.0 TT
 T = 2019 Jan. 13.73019 TT
 Peri. = 347.15645 e = 0.5019633
 Node = 101.69758 2000.0 a = 3.5584878 AU
 Incl. = 21.93273 n = 0.14682698
 q = 1.7722575 AU P = 6.71 years

$$m_1 = 11.1 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	21 53.29	-28 02.3	4.040	3.369	+1.22	+6.6	.	41.6
Jan. 12	22 05.80	-26 54.6	4.077	3.321	+1.29	+7.0	.	35.1
Jan. 22	22 18.95	-25 43.6	4.098	3.272	+1.35	+7.3	.	29.0
Feb. 1	22 32.63	-24 29.6	4.103	3.223	+1.39	+7.6	.	23.4
Feb. 11	22 46.75	-23 13.0	4.091	3.173	+1.43	+7.8	.	18.7
Feb. 21	23 01.26	-21 54.2	4.064	3.122	+1.47	+8.0	.	15.5
Mar. 3	23 16.09	-20 33.8	4.021	3.071	+1.50	+8.1	.	14.6
Mar. 13	23 31.21	-19 12.3	3.963	3.020	+1.53	+8.2	.	16.1
Mar. 23	23 46.58	-17 50.3	3.890	2.969	+1.55	+8.2	.	19.4
Apr. 2	00 02.18	-16 28.5	3.805	2.917	+1.57	+8.1	.	23.6
Apr. 12	00 17.99	-15 07.5	3.708	2.864	+1.59	+8.0	.	28.3
Apr. 22	00 34.00	-13 48.1	3.600	2.812	+1.61	+7.8	.	33.1
May 2	00 50.20	-12 31.2	3.482	2.759	+1.63	+7.5	.	38.1
May 12	01 06.59	-11 17.3	3.356	2.706	+1.65	+7.2	.	43.0
May 22	01 23.16	-10 07.5	3.223	2.653	+1.66	+6.7	.	47.9
June 1	01 39.87	-09 02.6	3.084	2.601	+1.68	+6.2	21.8	52.8
June 11	01 56.73	-08 03.4	2.941	2.548	+1.69	+5.6	21.6	57.7
June 21	02 13.69	-07 10.9	2.795	2.495	+1.70	+4.8	21.3	62.5
July 1	02 30.69	-06 26.1	2.647	2.443	+1.70	+4.0	21.0	67.4
July 11	02 47.69	-05 49.6	2.498	2.391	+1.70	+3.1	20.7	72.2
July 21	03 04.58	-05 22.5	2.349	2.340	+1.68	+2.2	20.3	77.0
July 31	03 21.24	-05 05.1	2.202	2.289	+1.65	+1.2	20.0	81.8
Aug. 10	03 37.54	-04 57.9	2.056	2.240	+1.60	+0.1	19.7	86.7
Aug. 20	03 53.27	-05 01.2	1.914	2.191	+1.53	-0.9	19.3	91.7
Aug. 30	04 08.20	-05 14.3	1.776	2.144	+1.44	-1.8	19.0	96.8
Sept. 9	04 22.06	-05 36.4	1.642	2.098	+1.31	-2.6	18.6	102.1
Sept. 19	04 34.47	-06 05.6	1.515	2.055	+1.15	-3.2	18.3	107.6
Sept. 29	04 45.06	-06 38.7	1.393	2.013	+0.94	-3.4	17.9	113.4
Oct. 9	04 53.37	-07 11.4	1.280	1.974	+0.69	-3.0	17.5	119.5
Oct. 19	04 58.90	-07 37.0	1.175	1.937	+0.38	-1.8	17.2	126.0
Oct. 29	05 01.25	-07 46.6	1.082	1.903	+0.05	+0.3	16.9	133.0
Nov. 8	05 00.11	-07 29.3	1.001	1.873	-0.31	+3.7	16.6	140.2
Nov. 18	04 55.57	-06 32.9	0.936	1.846	-0.62	+8.2	16.3	147.1
Nov. 28	04 48.26	-04 46.9	0.889	1.823	-0.84	+13.5	16.1	152.7
Dec. 8	04 39.43	-02 07.3	0.863	1.804	-0.90	+18.8	15.9	154.8
Dec. 18	04 30.81	+01 20.9	0.859	1.789	-0.78	+23.0	15.8	152.1
Dec. 28	04 24.18	+05 22.8	0.878	1.779	-0.50	+25.3	15.8	145.7
Jan. 7	04 20.85	+09 39.1	0.919	1.773	-0.12	+25.7	15.9	137.6
Jan. 17	04 21.59	+13 52.5	0.978	1.773	+0.31	+24.7	16.0	129.2
Jan. 27	04 26.57	+17 50.6	1.054	1.776	+0.72	+22.7	16.2	121.2
Feb. 6	04 35.57	+21 26.3	1.143	1.785	+1.11	+20.2	16.4	113.8
Feb. 16	04 48.22	+24 36.3	1.242	1.798	+1.45	+17.5	16.7	107.0
Feb. 26	05 04.02	+27 19.3	1.349	1.816	+1.73	+14.8	16.9	100.7
Mar. 8	05 22.49	+29 34.9	1.464	1.837	+1.98	+12.1	17.2	94.9
Mar. 18	05 43.16	+31 23.5	1.583	1.863	+2.17	+9.4	17.5	89.5
Mar. 28	06 05.53	+32 45.6	1.706	1.892	+2.31	+6.8	17.8	84.5

Comet C/2018 A3 (ATLAS)

Epoch = 2018 July 21.0 TT
 T = 2019 Jan. 15.02679 TT
 Peri. = 86.51702
 Node = 194.23786 2000.0
 Incl. = 139.51344
 q = 3.2805641 AU
 e = 0.9778013

$$m_1 = 5.2 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	'		°
Jan. 2	13 03.39	+06 33.9	4.645	4.736	-0.06	+8.3	18.7	89.3
Jan. 12	13 02.13	+08 05.4	4.402	4.675	-0.22	+10.2	18.5	100.1
Jan. 22	12 59.15	+09 56.1	4.166	4.615	-0.40	+12.2	18.3	111.2
Feb. 1	12 54.19	+12 06.7	3.947	4.555	-0.61	+14.1	18.1	122.6
Feb. 11	12 47.04	+14 36.4	3.752	4.496	-0.84	+15.9	17.9	134.1
Feb. 21	12 37.54	+17 21.9	3.590	4.437	-1.08	+17.2	17.7	145.1
Mar. 3	12 25.73	+20 17.1	3.466	4.379	-1.30	+17.7	17.5	154.1
Mar. 13	12 11.89	+23 13.1	3.387	4.322	-1.48	+17.3	17.4	157.6
Mar. 23	11 56.55	+25 59.6	3.354	4.266	-1.59	+15.8	17.3	153.1
Apr. 2	11 40.53	+28 27.3	3.365	4.211	-1.60	+13.5	17.2	143.5
Apr. 12	11 24.75	+30 29.9	3.417	4.156	-1.53	+10.8	17.1	132.1
Apr. 22	11 10.07	+32 05.1	3.501	4.102	-1.38	+8.0	17.1	120.4
May 2	10 57.20	+33 14.3	3.610	4.050	-1.17	+5.6	17.1	108.9
May 12	10 46.52	+34 01.2	3.734	3.998	-0.94	+3.6	17.1	97.8
May 22	10 38.20	+34 30.6	3.865	3.948	-0.70	+2.2	17.1	87.3
June 1	10 32.17	+34 47.1	3.995	3.899	-0.48	+1.1	17.1	77.2
June 11	10 28.26	+34 54.6	4.119	3.851	-0.28	+0.4	17.1	67.7
June 21	10 26.24	+34 56.6	4.231	3.805	-0.11	0.0	17.0	58.8
July 1	10 25.85	+34 55.7	4.326	3.760	+0.04	-0.2	17.0	50.4
July 11	10 26.84	+34 54.1	4.400	3.716	+0.17	-0.1	17.0	42.6
July 21	10 28.98	+34 53.6	4.452	3.674	+0.27	+0.1	16.9	35.6
July 31	10 32.08	+34 55.9	4.479	3.634	+0.35	+0.4	16.9	29.9
Aug. 10	10 35.95	+35 02.5	4.479	3.596	+0.42	+1.0	16.8	26.0
Aug. 20	10 40.42	+35 15.1	4.452	3.559	+0.47	+1.7	16.7	24.8
Aug. 30	10 45.35	+35 35.5	4.399	3.524	+0.51	+2.5	16.6	26.6
Sept. 9	10 50.59	+36 05.7	4.318	3.492	+0.54	+3.6	16.5	30.9
Sept. 19	10 55.99	+36 48.1	4.212	3.461	+0.54	+5.0	16.4	36.9
Sept. 29	11 01.41	+37 45.5	4.083	3.433	+0.54	+6.7	16.3	43.9
Oct. 9	11 06.66	+39 01.3	3.933	3.407	+0.51	+8.7	16.2	51.8
Oct. 19	11 11.53	+40 39.3	3.766	3.383	+0.46	+11.2	16.0	60.2
Oct. 29	11 15.73	+42 44.2	3.586	3.361	+0.37	+14.2	15.9	69.0
Nov. 8	11 18.87	+45 21.1	3.400	3.342	+0.23	+17.6	15.7	78.2
Nov. 18	11 20.33	+48 35.0	3.214	3.325	+0.02	+21.6	15.6	87.7
Nov. 28	11 19.16	+52 29.9	3.037	3.311	-0.32	+25.8	15.4	97.3
Dec. 8	11 13.69	+57 07.0	2.879	3.300	-0.88	+29.9	15.3	106.7
Dec. 18	11 00.86	+62 20.4	2.749	3.291	-1.88	+32.8	15.2	115.2
Dec. 28	10 34.68	+67 51.1	2.658	3.285	-3.74	+32.7	15.1	121.9
Jan. 7	09 43.59	+72 56.0	2.614	3.281	-7.10	+26.2	15.0	125.3
Jan. 17	08 13.84	+76 11.7	2.620	3.281	-10.93	+9.5	15.0	124.6
Jan. 27	06 24.07	+76 09.4	2.677	3.282	-9.88	-11.2	15.1	120.1
Feb. 6	05 03.98	+73 19.0	2.778	3.287	-5.77	-22.0	15.2	112.7
Feb. 16	04 20.32	+69 25.9	2.914	3.294	-2.96	-23.9	15.3	103.9
Feb. 26	03 58.22	+65 33.5	3.076	3.304	-1.46	-22.1	15.4	94.5
Mar. 8	03 47.69	+62 05.5	3.252	3.317	-0.64	-19.1	15.6	85.0
Mar. 18	03 43.62	+59 08.3	3.435	3.332	-0.17	-16.0	15.7	75.7
Mar. 28	03 43.35	+56 41.2	3.615	3.349	+0.12	-13.2	15.9	66.8

Comet C/2017 M4 (ATLAS)

Epoch = 2018 July 21.0 TT
 T = 2019 Jan. 18.33296 TT
 Peri. = 167.65481
 Node = 65.86859 2000.0
 Incl. = 105.65714
 q = 3.2515688 AU
 e = 1.0011934

$$m1 = 6.5 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	19 02.16	+40 06.2	5.139	4.776	+0.67	-5.4	16.8	63.1
Jan. 12	19 08.85	+39 19.7	5.106	4.713	+0.66	-3.8	16.8	61.3
Jan. 22	19 15.35	+38 49.0	5.060	4.651	+0.63	-2.2	16.7	60.3
Feb. 1	19 21.48	+38 33.7	5.000	4.589	+0.59	-0.7	16.6	60.1
Feb. 11	19 27.07	+38 33.1	4.925	4.528	+0.52	+0.7	16.5	60.9
Feb. 21	19 31.91	+38 46.6	4.836	4.468	+0.43	+2.1	16.4	62.6
Mar. 3	19 35.78	+39 13.2	4.733	4.408	+0.33	+3.3	16.3	65.1
Mar. 13	19 38.46	+39 51.8	4.617	4.349	+0.19	+4.5	16.2	68.3
Mar. 23	19 39.66	+40 41.0	4.489	4.291	+0.03	+5.4	16.1	72.2
Apr. 2	19 39.05	+41 38.7	4.352	4.233	-0.17	+6.2	16.0	76.6
Apr. 12	19 36.31	+42 42.5	4.208	4.177	-0.41	+6.6	15.8	81.4
Apr. 22	19 31.01	+43 48.9	4.060	4.121	-0.68	+6.6	15.7	86.4
May 2	19 22.79	+44 52.7	3.912	4.067	-1.00	+6.0	15.6	91.6
May 12	19 11.34	+45 47.9	3.767	4.013	-1.33	+4.7	15.4	96.7
May 22	18 56.51	+46 26.3	3.632	3.961	-1.66	+2.5	15.3	101.6
June 1	18 38.52	+46 38.4	3.509	3.910	-1.95	-0.6	15.1	105.9
June 11	18 18.09	+46 15.1	3.404	3.860	-2.14	-4.6	15.0	109.3
June 21	17 56.37	+45 09.0	3.321	3.811	-2.18	-9.1	14.9	111.4
July 1	17 34.87	+43 16.7	3.264	3.764	-2.08	-13.7	14.8	112.0
July 11	17 15.01	+40 40.8	3.235	3.719	-1.85	-17.8	14.8	110.8
July 21	16 57.83	+37 28.2	3.234	3.675	-1.55	-20.9	14.7	107.8
July 31	16 43.87	+33 49.6	3.261	3.633	-1.21	-22.9	14.7	103.4
Aug. 10	16 33.20	+29 56.2	3.314	3.592	-0.89	-23.8	14.7	97.7
Aug. 20	16 25.65	+25 57.9	3.387	3.554	-0.60	-23.8	14.7	91.1
Aug. 30	16 20.86	+22 02.9	3.477	3.517	-0.34	-23.1	14.7	83.9
Sept. 9	16 18.44	+18 16.7	3.579	3.482	-0.13	-22.0	14.7	76.4
Sept. 19	16 18.03	+14 42.5	3.685	3.450	+0.06	-20.7	14.7	68.7
Sept. 29	16 19.29	+11 22.2	3.793	3.419	+0.21	-19.3	14.7	60.9
Oct. 9	16 21.92	+08 16.1	3.895	3.391	+0.33	-17.8	14.8	53.1
Oct. 19	16 25.68	+05 23.8	3.989	3.366	+0.43	-16.5	14.8	45.4
Oct. 29	16 30.34	+02 44.7	4.070	3.343	+0.51	-15.2	14.8	37.9
Nov. 8	16 35.71	+00 17.6	4.135	3.322	+0.57	-14.1	14.8	30.7
Nov. 18	16 41.61	-01 58.7	4.181	3.304	+0.61	-13.1	14.8	24.2
Nov. 28	16 47.88	-04 05.5	4.206	3.288	+0.64	-12.2	14.8	19.0
Dec. 8	16 54.36	-06 04.2	4.207	3.275	+0.65	-11.5	14.8	16.6
Dec. 18	17 00.90	-07 56.2	4.185	3.265	+0.65	-10.9	14.7	18.2
Dec. 28	17 07.34	-09 43.2	4.139	3.258	+0.63	-10.5	14.7	23.1
Jan. 7	17 13.51	-11 26.6	4.069	3.253	+0.59	-10.2	14.7	29.9
Jan. 17	17 19.21	-13 08.3	3.976	3.252	+0.54	-10.2	14.6	37.5
Jan. 27	17 24.25	-14 50.3	3.861	3.253	+0.46	-10.3	14.6	45.8
Feb. 6	17 28.38	-16 34.7	3.728	3.256	+0.35	-10.7	14.5	54.5
Feb. 16	17 31.31	-18 23.9	3.578	3.263	+0.21	-11.3	14.4	63.7
Feb. 26	17 32.70	-20 20.5	3.417	3.272	+0.04	-12.2	14.3	73.3
Mar. 8	17 32.14	-22 27.1	3.249	3.285	-0.18	-13.3	14.2	83.3
Mar. 18	17 29.12	-24 45.9	3.080	3.299	-0.46	-14.6	14.1	93.9
Mar. 28	17 23.07	-27 18.0	2.916	3.317	-0.80	-15.9	14.0	104.9

Comet 131P/Mueller

Epoch = 2018 July 21.0 TT
 T = 2019 Jan. 24.27294 TT
 Peri. = 179.09038 e = 0.3431591
 Node = 214.19109 2000.0 a = 3.6804627 AU
 Incl. = 7.35395 n = 0.13958876
 q = 2.4174784 AU P = 7.06 years

$$m1 = 9.7 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	19 46.94	-15 21.6	4.244	3.308	+1.44	+3.5	21.9	15.6
Jan. 12	20 01.44	-14 43.3	4.240	3.275	+1.46	+4.2	21.9	9.8
Jan. 22	20 16.13	-13 58.4	4.220	3.243	+1.48	+4.9	21.8	5.8
Feb. 1	20 30.90	-13 07.1	4.184	3.210	+1.48	+5.5	21.7	7.5
Feb. 11	20 45.71	-12 09.6	4.132	3.177	+1.48	+6.1	21.6	12.7
Feb. 21	21 00.46	-11 06.5	4.066	3.144	+1.47	+6.6	21.5	18.6
Mar. 3	21 15.10	-09 58.2	3.985	3.112	+1.45	+7.1	21.3	24.6
Mar. 13	21 29.56	-08 45.4	3.892	3.079	+1.43	+7.5	21.2	30.7
Mar. 23	21 43.80	-07 28.7	3.786	3.047	+1.41	+7.9	21.1	36.8
Apr. 2	21 57.74	-06 08.9	3.670	3.015	+1.38	+8.1	20.9	42.9
Apr. 12	22 11.35	-04 46.6	3.543	2.983	+1.34	+8.3	20.8	49.0
Apr. 22	22 24.55	-03 22.9	3.409	2.952	+1.30	+8.4	20.6	55.1
May 2	22 37.28	-01 58.5	3.267	2.921	+1.24	+8.4	20.4	61.3
May 12	22 49.47	+00 34.5	3.120	2.890	+1.19	+8.3	20.2	67.6
May 22	23 01.02	+00 48.0	2.968	2.860	+1.11	+8.1	20.0	74.0
June 1	23 11.80	+02 07.8	2.814	2.830	+1.03	+7.8	19.9	80.5
June 11	23 21.71	+03 23.6	2.659	2.800	+0.94	+7.3	19.6	87.3
June 21	23 30.55	+04 33.8	2.504	2.772	+0.82	+6.6	19.4	94.3
July 1	23 38.15	+05 36.6	2.353	2.744	+0.68	+5.8	19.2	101.6
July 11	23 44.29	+06 30.1	2.206	2.716	+0.52	+4.8	19.0	109.2
July 21	23 48.74	+07 12.0	2.067	2.690	+0.34	+3.5	18.8	117.4
July 31	23 51.28	+07 39.8	1.937	2.664	+0.14	+1.9	18.6	126.0
Aug. 10	23 51.75	+07 51.1	1.821	2.639	-0.07	+0.1	18.4	135.3
Aug. 20	23 50.09	+07 43.5	1.721	2.616	-0.28	-1.8	18.2	145.0
Aug. 30	23 46.47	+07 16.3	1.641	2.593	-0.46	-3.8	18.0	155.3
Sept. 9	23 41.31	+06 30.2	1.584	2.571	-0.58	-5.6	17.9	165.5
Sept. 19	23 35.28	+05 28.5	1.551	2.551	-0.62	-6.8	17.8	172.5
Sept. 29	23 29.30	+04 17.6	1.545	2.532	-0.56	-7.3	17.7	167.1
Oct. 9	23 24.28	+03 05.0	1.564	2.514	-0.42	-7.1	17.7	156.8
Oct. 19	23 21.00	+01 58.4	1.608	2.497	-0.21	-6.1	17.7	146.1
Oct. 29	23 20.01	+01 04.3	1.672	2.482	+0.04	-4.6	17.7	135.8
Nov. 8	23 21.52	+00 26.5	1.753	2.468	+0.29	-2.8	17.8	126.0
Nov. 18	23 25.54	+00 06.8	1.847	2.456	+0.54	-0.9	17.9	116.7
Nov. 28	23 31.91	+00 05.4	1.952	2.446	+0.76	+0.8	17.9	108.1
Dec. 8	23 40.37	+00 21.1	2.063	2.437	+0.95	+2.5	18.0	100.1
Dec. 18	23 50.67	+00 52.4	2.179	2.429	+1.12	+3.9	18.1	92.5
Dec. 28	00 02.52	+01 37.3	2.298	2.424	+1.26	+5.1	18.2	85.3
Jan. 7	00 15.69	+02 33.5	2.416	2.420	+1.38	+6.2	18.3	78.5
Jan. 17	00 29.99	+03 39.2	2.533	2.418	+1.48	+7.0	18.4	72.0
Jan. 27	00 45.22	+04 52.2	2.648	2.418	+1.57	+7.6	18.5	65.8
Feb. 6	01 01.25	+06 10.4	2.759	2.419	+1.64	+8.0	18.6	59.8
Feb. 16	01 17.97	+07 32.1	2.865	2.422	+1.71	+8.3	18.7	54.1
Feb. 26	01 35.28	+08 55.4	2.967	2.427	+1.76	+8.4	18.8	48.5
Mar. 8	01 53.11	+10 18.7	3.062	2.433	+1.81	+8.3	18.9	43.1
Mar. 18	02 11.39	+11 40.3	3.150	2.441	+1.85	+8.0	19.0	37.8
Mar. 28	02 30.05	+12 58.8	3.232	2.451	+1.89	+7.6	19.1	32.6

Comet 223P/Skiff

Epoch = 2018 July 21.0 TT
 T = 2019 Jan. 27.29349 TT
 Peri. = 37.82930 e = 0.4152326
 Node = 346.79332 2000.0 a = 4.1570026 AU
 Incl. = 27.01578 n = 0.11628766
 q = 2.4308796 AU P = 8.48 years

$$m_1 = 12.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	19 50.77	-38 19.3	4.398	3.492	+1.63	+6.8	21.2	20.2
Jan. 12	20 07.07	-37 10.1	4.381	3.454	+1.63	+7.1	21.2	17.1
Jan. 22	20 23.33	-35 57.9	4.349	3.415	+1.62	+7.4	21.1	16.3
Feb. 1	20 39.44	-34 42.7	4.301	3.377	+1.60	+7.7	21.1	17.9
Feb. 11	20 55.34	-33 24.8	4.237	3.338	+1.57	+7.9	21.0	21.5
Feb. 21	21 10.94	-32 04.4	4.159	3.300	+1.54	+8.2	20.9	26.1
Mar. 3	21 26.19	-30 42.0	4.067	3.262	+1.50	+8.3	20.8	31.4
Mar. 13	21 41.03	-29 18.1	3.962	3.223	+1.46	+8.5	20.7	37.0
Mar. 23	21 55.40	-27 53.3	3.845	3.186	+1.41	+8.5	20.6	42.8
Apr. 2	22 09.23	-26 28.0	3.716	3.148	+1.35	+8.5	20.4	48.7
Apr. 12	22 22.48	-25 03.0	3.578	3.111	+1.29	+8.5	20.3	54.8
Apr. 22	22 35.06	-23 38.9	3.432	3.073	+1.22	+8.3	20.2	61.0
May 2	22 46.88	-22 16.3	3.279	3.037	+1.14	+8.1	20.0	67.4
May 12	22 57.86	-20 56.0	3.120	3.000	+1.05	+7.9	19.8	73.9
May 22	23 07.85	-19 38.5	2.957	2.965	+0.94	+7.6	19.7	80.6
June 1	23 16.71	-18 24.5	2.793	2.929	+0.82	+7.2	19.5	87.5
June 11	23 24.25	-17 14.5	2.628	2.895	+0.67	+6.8	19.3	94.8
June 21	23 30.24	-16 09.1	2.466	2.861	+0.50	+6.3	19.1	102.4
July 1	23 34.43	-15 08.3	2.308	2.828	+0.31	+5.8	18.9	110.4
July 11	23 36.55	-14 12.3	2.158	2.795	+0.09	+5.4	18.7	118.9
July 21	23 36.29	-13 20.6	2.019	2.764	-0.16	+5.0	18.5	128.0
July 31	23 33.46	-12 32.2	1.894	2.733	-0.43	+4.7	18.4	137.8
Aug. 10	23 27.96	-11 45.6	1.788	2.703	-0.69	+4.6	18.2	148.3
Aug. 20	23 19.94	-10 58.6	1.704	2.675	-0.92	+4.8	18.0	159.3
Aug. 30	23 09.94	-10 08.8	1.646	2.648	-1.08	+5.2	17.9	170.7
Sept. 9	22 58.81	-09 14.2	1.616	2.622	-1.13	+5.8	17.8	175.6
Sept. 19	22 47.69	-08 13.4	1.615	2.597	-1.06	+6.4	17.8	164.4
Sept. 29	22 37.76	-07 06.3	1.642	2.574	-0.89	+7.1	17.8	152.8
Oct. 9	22 29.96	-05 53.2	1.693	2.552	-0.64	+7.6	17.8	141.5
Oct. 19	22 24.90	-04 34.9	1.766	2.532	-0.34	+8.1	17.9	130.8
Oct. 29	22 22.80	-03 11.7	1.855	2.513	-0.05	+8.6	17.9	120.8
Nov. 8	22 23.59	-01 44.0	1.956	2.496	+0.23	+9.0	18.0	111.6
Nov. 18	22 27.07	+00 11.3	2.065	2.481	+0.48	+9.5	18.1	102.9
Nov. 28	22 32.92	+01 26.5	2.179	2.468	+0.70	+10.1	18.2	94.9
Dec. 8	22 40.82	+03 09.6	2.296	2.457	+0.89	+10.6	18.3	87.4
Dec. 18	22 50.49	+04 58.4	2.412	2.448	+1.05	+11.2	18.4	80.4
Dec. 28	23 01.66	+06 52.6	2.526	2.440	+1.19	+11.7	18.5	73.7
Jan. 7	23 14.12	+08 52.1	2.636	2.435	+1.31	+12.2	18.6	67.5
Jan. 17	23 27.70	+10 56.6	2.742	2.432	+1.41	+12.7	18.6	61.5
Jan. 27	23 42.24	+13 05.4	2.842	2.431	+1.50	+13.1	18.7	55.9
Feb. 6	23 57.65	+15 17.8	2.936	2.432	+1.59	+13.4	18.8	50.6
Feb. 16	00 13.86	+17 32.9	3.023	2.435	+1.66	+13.6	18.9	45.5
Feb. 26	00 30.80	+19 49.8	3.104	2.440	+1.73	+13.7	18.9	40.7
Mar. 8	00 48.45	+22 07.3	3.177	2.447	+1.80	+13.7	19.0	36.1
Mar. 18	01 06.78	+24 24.4	3.244	2.456	+1.87	+13.6	19.1	31.9
Mar. 28	01 25.79	+26 39.6	3.303	2.467	+1.94	+13.4	19.1	28.1

Comet C/2017 B3 (LINEAR)

Epoch = 2018 July 21.0 TT
 T = 2019 Feb. 2.40456 TT
 Peri. = 284.72936
 Node = 2.18187 2000.0
 Incl. = 54.17941
 q = 3.9213454 AU
 e = 1.0022090

$$m1 = 6.1 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	13 54.60	-47 12.5	5.543	5.162	+0.64	-12.1	16.9	62.4
Jan. 12	14 00.67	-49 15.9	5.374	5.109	+0.56	-12.6	16.8	69.3
Jan. 22	14 05.74	-51 23.2	5.202	5.058	+0.44	-12.9	16.7	76.2
Feb. 1	14 09.49	-53 33.5	5.030	5.007	+0.29	-13.1	16.6	83.0
Feb. 11	14 11.60	-55 45.5	4.861	4.956	+0.10	-13.2	16.5	89.8
Feb. 21	14 11.62	-57 57.3	4.697	4.907	-0.13	-13.1	16.4	96.4
Mar. 3	14 09.11	-60 06.2	4.543	4.858	-0.41	-12.6	16.3	102.7
Mar. 13	14 03.58	-62 08.7	4.400	4.810	-0.74	-11.7	16.1	108.6
Mar. 23	13 54.65	-64 00.4	4.272	4.762	-1.09	-10.4	16.0	113.8
Apr. 2	13 42.20	-65 36.0	4.160	4.716	-1.43	-8.5	15.9	118.3
Apr. 12	13 26.56	-66 50.7	4.066	4.670	-1.71	-6.1	15.8	121.6
Apr. 22	13 08.71	-67 40.3	3.991	4.626	-1.85	-3.5	15.8	123.8
May 2	12 50.25	-68 03.5	3.935	4.582	-1.81	-0.9	15.7	124.5
May 12	12 32.98	-68 01.9	3.898	4.539	-1.60	+1.4	15.6	123.9
May 22	12 18.49	-67 40.3	3.878	4.498	-1.25	+3.0	15.6	122.1
June 1	12 07.77	-67 05.3	3.874	4.457	-0.85	+4.0	15.5	119.2
June 11	12 01.16	-66 23.6	3.884	4.418	-0.43	+4.3	15.5	115.6
June 21	11 58.62	-65 41.4	3.905	4.379	-0.04	+4.0	15.5	111.4
July 1	11 59.81	-65 03.6	3.936	4.342	+0.31	+3.4	15.5	106.9
July 11	12 04.35	-64 33.6	3.975	4.307	+0.63	+2.5	15.4	102.3
July 21	12 11.92	-64 13.7	4.018	4.272	+0.91	+1.4	15.4	97.5
July 31	12 22.23	-64 05.0	4.066	4.239	+1.17	+0.2	15.4	92.8
Aug. 10	12 35.08	-64 07.6	4.115	4.207	+1.42	-0.9	15.4	88.2
Aug. 20	12 50.39	-64 21.1	4.164	4.177	+1.66	-1.9	15.4	83.8
Aug. 30	13 08.11	-64 44.4	4.213	4.148	+1.91	-2.8	15.4	79.4
Sept. 9	13 28.32	-65 15.7	4.261	4.121	+2.16	-3.5	15.4	75.3
Sept. 19	13 51.11	-65 52.8	4.306	4.096	+2.43	-3.9	15.4	71.3
Sept. 29	14 16.60	-66 33.1	4.349	4.072	+2.70	-4.1	15.4	67.5
Oct. 9	14 44.92	-67 13.3	4.388	4.049	+2.99	-3.9	15.4	63.9
Oct. 19	15 16.10	-67 49.9	4.425	4.029	+3.27	-3.3	15.4	60.5
Oct. 29	15 50.00	-68 19.1	4.458	4.010	+3.53	-2.3	15.4	57.3
Nov. 8	16 26.29	-68 36.8	4.488	3.993	+3.74	-1.0	15.4	54.3
Nov. 18	17 04.30	-68 39.9	4.515	3.977	+3.86	+0.6	15.4	51.6
Nov. 28	17 43.12	-68 25.8	4.537	3.964	+3.89	+2.4	15.4	49.2
Dec. 8	18 21.72	-67 53.4	4.556	3.952	+3.81	+4.2	15.4	47.1
Dec. 18	18 59.12	-67 03.0	4.571	3.942	+3.64	+6.0	15.4	45.3
Dec. 28	19 34.55	-65 56.2	4.581	3.934	+3.42	+7.5	15.4	44.0
Jan. 7	20 07.59	-64 35.5	4.587	3.928	+3.16	+8.7	15.3	43.2
Jan. 17	20 38.04	-63 03.9	4.588	3.924	+2.90	+9.6	15.3	42.9
Jan. 27	21 05.91	-61 24.6	4.583	3.922	+2.65	+10.2	15.3	43.1
Feb. 6	21 31.38	-59 40.5	4.572	3.921	+2.42	+10.6	15.3	43.9
Feb. 16	21 54.63	-57 54.4	4.554	3.923	+2.21	+10.6	15.3	45.3
Feb. 26	22 15.86	-56 08.8	4.530	3.927	+2.02	+10.4	15.3	47.3
Mar. 8	22 35.30	-54 25.9	4.499	3.932	+1.85	+10.1	15.3	49.8
Mar. 18	22 53.08	-52 47.6	4.461	3.940	+1.69	+9.5	15.3	52.8
Mar. 28	23 09.34	-51 15.5	4.414	3.949	+1.55	+8.8	15.3	56.3

Comet 123P/West-Hartley

Epoch = 2018 July 21.0 TT
 T = 2019 Feb. 5.08936 TT
 Peri. = 103.00193 e = 0.4487725
 Node = 46.50093 2000.0 a = 3.8584316 AU
 Incl. = 15.35985 n = 0.13004327
 q = 2.1268736 AU P = 7.58 years

$$m1 = 8.4 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2018/19	h m	° '			m		°
Jan. 2	01 50.57	+10 56.0	3.031	3.467	+0.05 +3.2	20.3	108.3
Jan. 12	01 51.97	+11 31.9	3.136	3.425	+0.25 +4.1	20.2	98.6
Jan. 22	01 55.27	+12 16.3	3.245	3.382	+0.43 +4.9	20.2	89.5
Feb. 1	02 00.34	+13 08.3	3.352	3.339	+0.60 +5.6	20.2	80.8
Feb. 11	02 07.01	+14 06.6	3.455	3.295	+0.75 +6.1	20.2	72.5
Feb. 21	02 15.13	+15 10.3	3.551	3.251	+0.89 +6.6	20.1	64.6
Mar. 3	02 24.56	+16 18.1	3.637	3.208	+1.01 +7.0	20.1	57.1
Mar. 13	02 35.17	+17 28.9	3.712	3.164	+1.12 +7.2	20.0	49.9
Mar. 23	02 46.87	+18 41.8	3.775	3.120	+1.23 +7.4	19.9	42.9
Apr. 2	02 59.57	+19 55.6	3.824	3.076	+1.32 +7.4	19.9	36.3
Apr. 12	03 13.20	+21 09.3	3.859	3.032	+1.41 +7.3	19.8	29.9
Apr. 22	03 27.70	+22 22.2	3.880	2.988	+1.50 +7.2	19.7	23.8
May 2	03 43.03	+23 33.1	3.886	2.944	+1.58 +7.0	19.6	18.0
May 12	03 59.14	+24 41.4	3.879	2.901	+1.65 +6.6	19.4	12.4
May 22	04 16.01	+25 46.0	3.858	2.857	+1.73 +6.2	19.3	7.5
June 1	04 33.59	+26 46.3	3.823	2.814	+1.80 +5.8	19.2	4.8
June 11	04 51.86	+27 41.4	3.776	2.771	+1.86 +5.2	19.0	7.1
June 21	05 10.77	+28 30.6	3.717	2.729	+1.92 +4.6	18.9	11.6
July 1	05 30.27	+29 13.3	3.646	2.687	+1.98 +3.9	18.7	16.5
July 11	05 50.33	+29 49.0	3.566	2.646	+2.03 +3.2	18.6	21.5
July 21	06 10.87	+30 17.1	3.475	2.605	+2.08 +2.4	18.4	26.4
July 31	06 31.82	+30 37.3	3.377	2.566	+2.12 +1.6	18.2	31.4
Aug. 10	06 53.11	+30 49.5	3.271	2.527	+2.14 +0.8	18.0	36.4
Aug. 20	07 14.65	+30 53.8	3.158	2.489	+2.16 0.0	17.8	41.3
Aug. 30	07 36.34	+30 50.3	3.039	2.452	+2.17 -0.8	17.6	46.3
Sept. 9	07 58.08	+30 39.6	2.916	2.417	+2.17 -1.4	17.4	51.2
Sept. 19	08 19.75	+30 22.4	2.790	2.383	+2.16 -2.0	17.2	56.3
Sept. 29	08 41.25	+29 59.8	2.660	2.350	+2.14 -2.5	17.0	61.3
Oct. 9	09 02.46	+29 33.2	2.529	2.319	+2.10 -2.8	16.8	66.5
Oct. 19	09 23.24	+29 04.1	2.398	2.290	+2.05 -3.0	16.6	71.7
Oct. 29	09 43.45	+28 34.6	2.267	2.263	+1.98 -2.9	16.4	77.1
Nov. 8	10 02.94	+28 06.8	2.137	2.238	+1.90 -2.6	16.2	82.7
Nov. 18	10 21.51	+27 43.3	2.010	2.215	+1.80 -2.0	16.0	88.4
Nov. 28	10 38.94	+27 26.4	1.886	2.195	+1.67 -1.2	15.8	94.4
Dec. 8	10 54.96	+27 18.9	1.767	2.177	+1.51 -0.1	15.5	100.7
Dec. 18	11 09.21	+27 23.2	1.655	2.162	+1.32 +1.1	15.4	107.3
Dec. 28	11 21.34	+27 40.8	1.550	2.149	+1.08 +2.5	15.2	114.2
Jan. 7	11 30.89	+28 12.6	1.455	2.139	+0.79 +3.9	15.0	121.4
Jan. 17	11 37.38	+28 57.1	1.371	2.132	+0.47 +5.0	14.8	129.0
Jan. 27	11 40.44	+29 50.4	1.302	2.128	+0.11 +5.6	14.7	136.7
Feb. 6	11 39.84	+30 45.2	1.248	2.127	-0.26 +5.2	14.6	144.1
Feb. 16	11 35.77	+31 31.0	1.214	2.129	-0.57 +3.6	14.6	150.3
Feb. 26	11 28.98	+31 56.0	1.200	2.133	-0.79 +1.0	14.6	153.8
Mar. 8	11 20.69	+31 50.8	1.207	2.141	-0.85 -2.4	14.6	153.3
Mar. 18	11 12.49	+31 10.0	1.237	2.151	-0.76 -6.0	14.7	148.9
Mar. 28	11 05.82	+29 54.9	1.287	2.164	-0.54 -9.2	14.8	142.3

Comet P/1996 R2 (Lagerkvist)

Epoch = 2018 July 21.0 TT
 T = 2019 Feb. 11.46473 TT
 Peri. = 333.29039 e = 0.3133057
 Node = 40.04909 2000.0 a = 3.7721544 AU
 Incl. = 2.60097 n = 0.13453023
 q = 2.5903169 AU P = 7.33 years

$$m_1 = 2.7 + 5 \log(\Delta) + 30.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	18 57.22	-24 36.1	4.381	3.399	-0.53 -0.6	21.8	21.0/85	2.5
Jan. 12	19 12.63	-24 13.9	4.348	3.370	-0.54 -0.8	21.7	21.3/83	5.3
Jan. 22	19 28.09	-23 46.3	4.298	3.340	-0.56 -1.0	21.6	21.4/82	11.7
Feb. 1	19 43.51	-23 13.7	4.233	3.311	-0.57 -1.3	21.4	21.5/81	18.3
Feb. 11	19 58.80	-22 36.4	4.152	3.282	-0.58 -1.6	21.3	21.4/79	24.8
Feb. 21	20 13.88	-21 54.7	4.057	3.253	-0.60 -1.8	21.1	21.2/78	31.3
Mar. 3	20 28.65	-21 09.4	3.949	3.224	-0.62 -2.1	20.9	20.9/77	37.8
Mar. 13	20 43.05	-20 21.1	3.830	3.196	-0.64 -2.4	20.8	20.5/76	44.4
Mar. 23	20 56.98	-19 30.7	3.699	3.167	-0.66 -2.7	20.6	20.0/75	50.9
Apr. 2	21 10.36	-18 39.1	3.560	3.139	-0.68 -3.0	20.4	19.3/74	57.5
Apr. 12	21 23.11	-17 47.4	3.413	3.111	-0.71 -3.3	20.2	18.4/74	64.2
Apr. 22	21 35.12	-16 56.7	3.260	3.083	-0.74 -3.7	19.9	17.3/73	71.0
May 2	21 46.28	-16 08.2	3.103	3.056	-0.77 -4.1	19.7	16.0/73	77.9
May 12	21 56.46	-15 23.4	2.944	3.029	-0.81 -4.4	19.5	14.5/73	85.1
May 22	22 05.51	-14 43.6	2.784	3.002	-0.86 -4.9	19.2	12.7/73	92.4
June 1	22 13.26	-14 10.3	2.626	2.976	-0.91 -5.3	19.0	10.5/74	100.0
June 11	22 19.52	-13 45.2	2.473	2.950	-0.97 -5.8	18.8	8.1/76	108.0
June 21	22 24.07	-13 29.6	2.327	2.925	-1.04 -6.2	18.5	5.2/79	116.4
July 1	22 26.72	-13 24.8	2.191	2.900	-1.11 -6.7	18.3	2.3/94	125.3
July 11	22 27.30	-13 31.4	2.068	2.876	-1.19 -7.2	18.0	1.6/214	134.7
July 21	22 25.72	-13 49.3	1.962	2.853	-1.26 -7.6	17.8	4.6/239	144.7
July 31	22 22.07	-14 16.8	1.877	2.830	-1.33 -7.9	17.6	7.5/245	155.1
Aug. 10	22 16.64	-14 51.2	1.814	2.808	-1.39 -8.0	17.4	9.7/248	165.9
Aug. 20	22 09.98	-15 28.2	1.777	2.787	-1.42 -8.0	17.3	10.8/250	175.5
Aug. 30	22 02.88	-16 02.7	1.766	2.767	-1.43 -7.8	17.2	10.6/253	170.1
Sept. 9	21 56.23	-16 30.0	1.782	2.747	-1.41 -7.5	17.1	9.0/256	159.2
Sept. 19	21 50.88	-16 46.7	1.823	2.729	-1.36 -7.1	17.1	6.3/261	148.3
Sept. 29	21 47.50	-16 50.6	1.884	2.711	-1.30 -6.7	17.1	3.1/276	137.8
Oct. 9	21 46.46	-16 41.3	1.964	2.695	-1.24 -6.4	17.1	1.7/15	127.8
Oct. 19	21 47.90	-16 18.9	2.059	2.679	-1.17 -6.1	17.1	5.0/54	118.3
Oct. 29	21 51.76	-15 44.3	2.164	2.665	-1.10 -5.9	17.1	8.4/61	109.5
Nov. 8	21 57.82	-14 58.3	2.276	2.652	-1.04 -5.7	17.2	11.6/64	101.1
Nov. 18	22 05.86	-14 01.9	2.393	2.640	-0.98 -5.6	17.2	14.5/65	93.2
Nov. 28	22 15.58	-12 55.8	2.512	2.629	-0.94 -5.6	17.3	17.0/65	85.7
Dec. 8	22 26.71	-11 40.9	2.631	2.620	-0.90 -5.5	17.3	19.1/65	78.6
Dec. 18	22 39.05	-10 18.0	2.747	2.611	-0.86 -5.5	17.4	20.9/65	71.7
Dec. 28	22 52.35	-08 47.9	2.860	2.605	-0.83 -5.5	17.5	22.5/65	65.1
Jan. 7	23 06.45	-07 11.6	2.969	2.599	-0.81 -5.5	17.5	23.8/65	58.8
Jan. 17	23 21.21	-05 29.9	3.071	2.595	-0.78 -5.5	17.6	24.8/65	52.6
Jan. 27	23 36.51	-03 43.8	3.167	2.592	-0.77 -5.4	17.6	25.7/65	46.7
Feb. 6	23 52.25	-01 54.3	3.255	2.591	-0.75 -5.4	17.7	26.4/65	40.8
Feb. 16	00 08.36	+00 02.4	3.335	2.590	-0.74 -5.3	17.7	26.9/65	35.2
Feb. 26	00 24.78	+01 50.7	3.406	2.592	-0.73 -5.3	17.8	27.3/65	29.6
Mar. 8	00 41.48	+03 44.2	3.468	2.594	-0.73 -5.2	17.8	27.6/66	24.1
Mar. 18	00 58.40	+05 36.9	3.521	2.599	-0.72 -5.0	17.9	27.8/66	18.8
Mar. 28	01 15.52	+07 27.9	3.564	2.604	-0.72 -4.9	17.9	27.9/67	13.5

Comet C/2010 U3 (Boattini)

Epoch = 2018 July 21.0 TT
 T = 2019 Feb. 26.59857 TT
 Peri. = 88.08295
 Node = 43.07302 2000.0
 Incl. = 55.51234
 q = 8.4455150 AU
 e = 0.9992537

$$m1 = 10.7 + 5 \log(\Delta) + 2.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	06 19.13	+76 44.9	8.187	8.802	-1.27	+1.1	17.6	126.1
Jan. 12	06 06.69	+76 50.3	8.200	8.786	-1.19	-0.1	17.6	123.9
Jan. 22	05 55.58	+76 44.1	8.230	8.770	-0.99	-1.2	17.6	120.4
Feb. 1	05 46.83	+76 27.9	8.277	8.754	-0.72	-2.1	17.6	116.0
Feb. 11	05 41.03	+76 04.2	8.337	8.739	-0.41	-2.7	17.7	111.0
Feb. 21	05 38.42	+75 35.3	8.408	8.724	-0.09	-3.1	17.7	105.5
Mar. 3	05 38.94	+75 03.3	8.488	8.710	+0.21	-3.3	17.7	99.7
Mar. 13	05 42.32	+74 30.0	8.573	8.695	+0.48	-3.4	17.7	93.8
Mar. 23	05 48.26	+73 56.6	8.661	8.682	+0.72	-3.3	17.7	87.9
Apr. 2	05 56.42	+73 23.8	8.749	8.668	+0.92	-3.2	17.8	82.1
Apr. 12	06 06.46	+72 52.2	8.834	8.655	+1.10	-3.1	17.8	76.5
Apr. 22	06 18.10	+72 21.8	8.915	8.642	+1.24	-3.0	17.8	71.1
May 2	06 31.06	+71 52.9	8.988	8.630	+1.36	-2.8	17.8	66.1
May 12	06 45.09	+71 25.2	9.054	8.618	+1.45	-2.7	17.8	61.5
May 22	07 00.00	+70 58.6	9.109	8.607	+1.53	-2.6	17.8	57.5
June 1	07 15.58	+70 33.0	9.153	8.596	+1.59	-2.5	17.8	54.0
June 11	07 31.67	+70 08.3	9.185	8.585	+1.63	-2.4	17.8	51.1
June 21	07 48.12	+69 44.4	9.205	8.574	+1.66	-2.3	17.9	49.1
July 1	08 04.79	+69 21.5	9.211	8.564	+1.67	-2.2	17.9	48.0
July 11	08 21.56	+68 59.6	9.205	8.555	+1.68	-2.1	17.9	47.8
July 21	08 38.32	+68 38.9	9.186	8.546	+1.67	-2.0	17.8	48.4
July 31	08 54.98	+68 19.7	9.154	8.537	+1.66	-1.8	17.8	50.0
Aug. 10	09 11.47	+68 02.4	9.110	8.528	+1.64	-1.6	17.8	52.3
Aug. 20	09 27.69	+67 47.5	9.055	8.520	+1.61	-1.3	17.8	55.4
Aug. 30	09 43.59	+67 35.4	8.989	8.513	+1.57	-1.0	17.8	59.0
Sept. 9	09 59.10	+67 26.6	8.915	8.506	+1.53	-0.7	17.8	63.1
Sept. 19	10 14.15	+67 21.7	8.832	8.499	+1.48	-0.3	17.8	67.5
Sept. 29	10 28.66	+67 21.3	8.744	8.492	+1.42	+0.2	17.7	72.3
Oct. 9	10 42.58	+67 25.7	8.651	8.486	+1.36	+0.7	17.7	77.3
Oct. 19	10 55.81	+67 35.6	8.555	8.481	+1.28	+1.3	17.7	82.4
Oct. 29	11 08.23	+67 51.0	8.460	8.476	+1.19	+1.9	17.7	87.6
Nov. 8	11 19.74	+68 12.3	8.366	8.471	+1.09	+2.4	17.6	92.7
Nov. 18	11 30.18	+68 39.3	8.276	8.466	+0.98	+3.0	17.6	97.8
Nov. 28	11 39.36	+69 11.6	8.193	8.463	+0.84	+3.5	17.6	102.6
Dec. 8	11 47.09	+69 48.8	8.118	8.459	+0.68	+3.9	17.6	107.0
Dec. 18	11 53.11	+70 29.6	8.053	8.456	+0.50	+4.2	17.5	111.0
Dec. 28	11 57.18	+71 12.9	8.001	8.453	+0.29	+4.4	17.5	114.3
Jan. 7	11 59.04	+71 56.6	7.962	8.451	+0.05	+4.3	17.5	116.8
Jan. 17	11 58.46	+72 38.7	7.938	8.449	-0.20	+4.0	17.5	118.3
Jan. 27	11 55.34	+73 16.7	7.929	8.447	-0.45	+3.5	17.5	118.8
Feb. 6	11 49.71	+73 47.8	7.935	8.446	-0.69	+2.6	17.5	118.2
Feb. 16	11 41.88	+74 09.5	7.957	8.446	-0.88	+1.6	17.5	116.6
Feb. 26	11 32.47	+74 19.6	7.992	8.446	-1.00	+0.3	17.5	114.1
Mar. 8	11 22.29	+74 16.7	8.041	8.446	-1.02	-1.0	17.5	110.9
Mar. 18	11 12.30	+74 00.3	8.101	8.446	-0.95	-2.4	17.6	107.0
Mar. 28	11 03.38	+73 30.7	8.171	8.447	-0.81	-3.6	17.6	102.8

Comet 29P/Schwassmann-Wachmann

Epoch = 2018 July 21.0 TT
 T = 2019 Mar. 8.69683 TT
 Peri. = 47.83192 e = 0.0425645
 Node = 312.40372 2000.0 a = 6.0231876 AU
 Incl. = 9.37007 n = 0.06667523
 q = 5.7668136 AU P = 14.78 years

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	21 36.00	-11 46.6	6.504	5.801	+0.69	+3.8	.	41.2
Jan. 12	21 43.03	-11 07.0	6.601	5.799	+0.72	+4.1	.	32.9
Jan. 22	21 50.37	-10 24.6	6.678	5.798	+0.75	+4.4	.	24.7
Feb. 1	21 57.93	-09 39.5	6.734	5.797	+0.76	+4.6	.	16.6
Feb. 11	22 05.61	-08 52.4	6.769	5.795	+0.77	+4.8	.	8.7
Feb. 21	22 13.33	-08 03.5	6.781	5.794	+0.77	+5.0	.	2.8
Mar. 3	22 21.00	-07 13.4	6.772	5.792	+0.76	+5.1	.	8.2
Mar. 13	22 28.55	-06 22.6	6.740	5.791	+0.74	+5.1	.	15.9
Mar. 23	22 35.89	-05 31.5	6.688	5.790	+0.72	+5.1	.	23.8
Apr. 2	22 42.94	-04 40.7	6.615	5.788	+0.69	+5.0	.	31.7
Apr. 12	22 49.64	-03 50.8	6.524	5.787	+0.65	+4.9	.	39.6
Apr. 22	22 55.90	-03 02.2	6.416	5.786	+0.60	+4.8	.	47.6
May 2	23 01.63	-02 15.6	6.293	5.785	+0.54	+4.5	.	55.7
May 12	23 06.78	-01 31.5	6.157	5.784	+0.48	+4.2	.	63.9
May 22	23 11.23	+00 50.7	6.011	5.783	+0.40	+3.9	.	72.2
June 1	23 14.92	+00 13.6	5.858	5.782	+0.32	+3.5	.	80.7
June 11	23 17.76	+00 19.0	5.702	5.781	+0.23	+3.0	.	89.4
June 21	23 19.68	+00 46.6	5.545	5.780	+0.14	+2.5	.	98.3
July 1	23 20.62	+01 08.4	5.392	5.779	+0.04	+1.9	.	107.4
July 11	23 20.53	+01 24.1	5.247	5.778	-0.07	+1.2	.	116.8
July 21	23 19.41	+01 33.3	5.115	5.777	-0.17	+0.5	.	126.5
July 31	23 17.31	+01 35.7	4.998	5.776	-0.26	-0.1	.	136.4
Aug. 10	23 14.32	+01 31.4	4.902	5.775	-0.34	-0.8	.	146.5
Aug. 20	23 10.58	+01 21.1	4.831	5.774	-0.41	-1.3	.	156.7
Aug. 30	23 06.32	+01 05.5	4.786	5.774	-0.44	-1.8	.	166.7
Sept. 9	23 01.81	+00 46.0	4.771	5.773	-0.45	-2.1	.	173.5
Sept. 19	22 57.35	+00 24.2	4.786	5.772	-0.43	-2.2	.	168.0
Sept. 29	22 53.22	+00 01.9	4.830	5.772	-0.38	-2.2	.	158.1
Oct. 9	22 49.69	+00 19.0	4.902	5.771	-0.31	-2.0	.	147.7
Oct. 19	22 46.99	+00 37.1	5.000	5.771	-0.22	-1.6	.	137.2
Oct. 29	22 45.27	+00 50.8	5.119	5.770	-0.11	-1.1	.	126.9
Nov. 8	22 44.63	+00 59.2	5.255	5.770	0.00	-0.5	.	116.8
Nov. 18	22 45.09	-01 01.6	5.404	5.769	+0.11	+0.1	.	106.9
Nov. 28	22 46.64	+00 57.8	5.561	5.769	+0.21	+0.7	.	97.2
Dec. 8	22 49.21	+00 47.5	5.721	5.768	+0.31	+1.4	.	87.8
Dec. 18	22 52.74	+00 31.0	5.881	5.768	+0.40	+2.0	.	78.6
Dec. 28	22 57.11	+00 08.5	6.035	5.768	+0.48	+2.6	.	69.7
Jan. 7	23 02.23	+00 19.5	6.182	5.768	+0.55	+3.1	.	60.9
Jan. 17	23 07.99	+00 52.7	6.316	5.767	+0.61	+3.6	.	52.3
Jan. 27	23 14.28	+01 30.4	6.436	5.767	+0.65	+4.0	.	43.9
Feb. 6	23 21.00	+02 12.2	6.539	5.767	+0.69	+4.4	.	35.7
Feb. 16	23 28.06	+02 57.5	6.623	5.767	+0.72	+4.7	.	27.7
Feb. 26	23 35.37	+03 45.7	6.688	5.767	+0.74	+5.0	.	19.9
Mar. 8	23 42.84	+04 36.2	6.732	5.767	+0.75	+5.2	.	12.5
Mar. 18	23 50.39	+05 28.5	6.754	5.767	+0.76	+5.3	.	6.7
Mar. 28	23 57.95	+06 22.0	6.754	5.767	+0.75	+5.4	.	7.6

Comet 78P/Gehrels

Epoch = 2018 July 21.0 TT
 T = 2019 Apr. 2.73153 TT
 Peri. = 192.69562 e = 0.4614283
 Node = 210.54696 2000.0 a = 3.7391710 AU
 Incl. = 6.24888 n = 0.13631419
 q = 2.0138117 AU P = 7.23 years

$$m1 = 5.1 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	19 06.09	-17 44.1	4.671	3.696	+1.30	+2.2	19.8	6.6
Jan. 12	19 19.15	-17 20.1	4.632	3.654	+1.31	+2.7	19.7	5.4
Jan. 22	19 32.34	-16 50.6	4.574	3.612	+1.32	+3.2	19.6	10.7
Feb. 1	19 45.55	-16 15.8	4.499	3.569	+1.32	+3.8	19.4	17.2
Feb. 11	19 58.71	-15 35.8	4.406	3.526	+1.31	+4.3	19.3	23.8
Feb. 21	20 11.74	-14 51.0	4.298	3.483	+1.29	+4.7	19.1	30.6
Mar. 3	20 24.54	-14 01.7	4.174	3.439	+1.26	+5.1	18.9	37.4
Mar. 13	20 37.03	-13 08.6	4.037	3.395	+1.23	+5.5	18.7	44.1
Mar. 23	20 49.15	-12 12.1	3.888	3.350	+1.19	+5.8	18.6	50.9
Apr. 2	21 00.77	-11 13.1	3.729	3.306	+1.13	+6.0	18.3	57.8
Apr. 12	21 11.84	-10 12.2	3.561	3.261	+1.07	+6.2	18.1	64.7
Apr. 22	21 22.23	-09 10.3	3.387	3.215	+1.00	+6.2	17.9	71.6
May 2	21 31.83	-08 08.4	3.208	3.170	+0.91	+6.1	17.7	78.7
May 12	21 40.51	-07 07.8	3.027	3.124	+0.81	+6.0	17.4	86.0
May 22	21 48.11	-06 09.7	2.846	3.078	+0.69	+5.6	17.1	93.5
June 1	21 54.46	-05 15.6	2.667	3.032	+0.56	+5.1	16.9	101.2
June 11	21 59.36	-04 27.2	2.492	2.985	+0.40	+4.4	16.6	109.3
June 21	22 02.60	-03 46.7	2.326	2.939	+0.22	+3.5	16.3	117.7
July 1	22 03.98	-03 16.0	2.169	2.893	+0.03	+2.4	16.0	126.6
July 11	22 03.35	-02 57.4	2.027	2.847	-0.18	+1.1	15.7	135.9
July 21	22 00.63	-02 53.1	1.902	2.801	-0.38	-0.4	15.4	145.8
July 31	21 55.93	-03 04.2	1.797	2.755	-0.57	-2.0	15.2	155.8
Aug. 10	21 49.59	-03 31.0	1.716	2.709	-0.70	-3.5	14.9	165.6
Aug. 20	21 42.22	-04 11.8	1.660	2.664	-0.76	-4.7	14.7	170.9
Aug. 30	21 34.67	-05 02.9	1.630	2.619	-0.73	-5.5	14.5	165.1
Sept. 9	21 27.89	-05 59.0	1.626	2.575	-0.60	-5.7	14.4	155.0
Sept. 19	21 22.78	-06 54.5	1.646	2.531	-0.39	-5.3	14.2	144.3
Sept. 29	21 20.02	-07 43.9	1.686	2.488	-0.13	-4.5	14.2	133.9
Oct. 9	21 19.97	-08 23.5	1.742	2.446	+0.15	-3.3	14.1	124.1
Oct. 19	21 22.79	-08 50.3	1.811	2.405	+0.44	-1.9	14.0	114.8
Oct. 29	21 28.36	-09 03.0	1.887	2.365	+0.70	-0.5	14.0	106.2
Nov. 8	21 36.49	-09 00.8	1.969	2.327	+0.94	+1.0	13.9	98.1
Nov. 18	21 46.90	-08 43.6	2.054	2.290	+1.16	+2.5	13.9	90.6
Nov. 28	21 59.30	-08 11.6	2.139	2.254	+1.34	+4.0	13.8	83.6
Dec. 8	22 13.41	-07 25.5	2.223	2.220	+1.50	+5.4	13.8	77.0
Dec. 18	22 28.98	-06 26.0	2.304	2.189	+1.63	+6.6	13.7	70.8
Dec. 28	22 45.79	-05 14.2	2.382	2.159	+1.74	+7.8	13.7	65.0
Jan. 7	23 03.64	-03 51.2	2.456	2.132	+1.84	+8.9	13.6	59.4
Jan. 17	23 22.40	-02 18.5	2.526	2.107	+1.92	+9.8	13.6	54.2
Jan. 27	23 41.93	+00 37.5	2.591	2.084	+1.99	+10.5	13.5	49.1
Feb. 6	00 02.14	+01 10.0	2.652	2.065	+2.06	+11.0	13.5	44.3
Feb. 16	00 22.97	+03 02.2	2.709	2.049	+2.11	+11.4	13.5	39.7
Feb. 26	00 44.36	+04 57.0	2.761	2.035	+2.17	+11.6	13.5	35.3
Mar. 8	01 06.26	+06 52.6	2.810	2.025	+2.22	+11.5	13.5	31.0
Mar. 18	01 28.65	+08 46.9	2.854	2.018	+2.26	+11.3	13.5	26.9
Mar. 28	01 51.49	+10 37.7	2.896	2.014	+2.31	+10.8	13.5	22.9

Comet 232P/Hill

Epoch = 2018 July 21.0 TT
 T = 2019 Apr. 6.66213 TT
 Peri. = 53.56677 e = 0.3349066
 Node = 56.03085 2000.0 a = 4.4871295 AU
 Incl. = 14.63103 n = 0.10369341
 q = 2.9843602 AU P = 9.51 years

$$m1 = 1.9 + 5 \log(\Delta) + 30.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	00 53.51	-02 34.4	3.726	3.854	+0.35	+6.2	.	90.0
Jan. 12	00 57.65	-01 29.6	3.848	3.825	+0.49	+6.8	.	81.3
Jan. 22	01 03.13	+00 19.1	3.968	3.796	+0.62	+7.3	.	72.9
Feb. 1	01 09.80	+00 55.9	4.081	3.768	+0.73	+7.7	.	64.8
Feb. 11	01 17.51	+02 14.4	4.185	3.739	+0.82	+8.0	.	57.0
Feb. 21	01 26.16	+03 35.5	4.278	3.711	+0.91	+8.2	.	49.4
Mar. 3	01 35.63	+04 58.3	4.359	3.683	+0.99	+8.3	.	42.1
Mar. 13	01 45.80	+06 22.1	4.425	3.655	+1.05	+8.4	22.0	35.0
Mar. 23	01 56.60	+07 46.3	4.477	3.628	+1.11	+8.4	21.9	28.0
Apr. 2	02 07.94	+09 10.0	4.513	3.600	+1.16	+8.3	21.9	21.3
Apr. 12	02 19.77	+10 32.8	4.533	3.573	+1.21	+8.2	21.8	14.7
Apr. 22	02 32.01	+11 54.2	4.537	3.546	+1.25	+8.0	21.7	8.4
May 2	02 44.61	+13 13.5	4.525	3.519	+1.28	+7.8	21.6	3.0
May 12	02 57.52	+14 30.5	4.497	3.493	+1.31	+7.5	21.5	5.3
May 22	03 10.68	+15 44.6	4.454	3.467	+1.33	+7.2	21.3	11.2
June 1	03 24.04	+16 55.5	4.396	3.441	+1.34	+6.9	21.2	17.3
June 11	03 37.53	+18 03.0	4.323	3.416	+1.35	+6.6	21.1	23.5
June 21	03 51.10	+19 06.8	4.237	3.391	+1.36	+6.2	20.9	29.6
July 1	04 04.66	+20 07.0	4.138	3.367	+1.35	+5.8	20.8	35.8
July 11	04 18.13	+21 03.5	4.027	3.343	+1.34	+5.4	20.6	42.1
July 21	04 31.43	+21 56.3	3.905	3.319	+1.32	+5.1	20.5	48.4
July 31	04 44.43	+22 45.8	3.774	3.296	+1.28	+4.8	20.3	54.9
Aug. 10	04 57.02	+23 32.5	3.634	3.274	+1.23	+4.5	20.2	61.5
Aug. 20	05 09.03	+24 16.7	3.488	3.252	+1.16	+4.3	20.0	68.3
Aug. 30	05 20.31	+24 59.3	3.336	3.231	+1.08	+4.2	19.8	75.3
Sept. 9	05 30.65	+25 41.2	3.181	3.211	+0.97	+4.2	19.6	82.6
Sept. 19	05 39.82	+26 23.3	3.024	3.191	+0.84	+4.3	19.4	90.3
Sept. 29	05 47.58	+27 06.9	2.869	3.172	+0.69	+4.5	19.2	98.3
Oct. 9	05 53.64	+27 52.9	2.717	3.154	+0.50	+4.8	19.0	106.8
Oct. 19	05 57.71	+28 42.0	2.574	3.137	+0.29	+5.1	18.8	115.7
Oct. 29	05 59.52	+29 34.7	2.441	3.120	+0.05	+5.5	18.7	125.1
Nov. 8	05 58.86	+30 30.4	2.323	3.104	-0.21	+5.7	18.5	135.1
Nov. 18	05 55.66	+31 27.3	2.224	3.089	-0.46	+5.7	18.3	145.4
Nov. 28	05 50.08	+32 22.7	2.148	3.075	-0.67	+5.3	18.2	155.9
Dec. 8	05 42.60	+33 12.8	2.098	3.062	-0.82	+4.6	18.1	165.5
Dec. 18	05 34.03	+33 54.1	2.077	3.050	-0.88	+3.6	18.0	169.3
Dec. 28	05 25.40	+34 24.7	2.085	3.039	-0.82	+2.4	18.0	162.8
Jan. 7	05 17.78	+34 44.2	2.121	3.028	-0.67	+1.4	18.0	152.6
Jan. 17	05 12.11	+34 54.5	2.182	3.019	-0.43	+0.6	18.0	142.0
Jan. 27	05 08.97	+34 58.4	2.265	3.011	-0.16	+0.1	18.0	131.7
Feb. 6	05 08.65	+34 58.6	2.365	3.004	+0.13	-0.1	18.1	121.8
Feb. 16	05 11.17	+34 57.3	2.478	2.998	+0.40	-0.2	18.2	112.5
Feb. 26	05 16.36	+34 55.6	2.599	2.993	+0.66	-0.2	18.3	103.7
Mar. 8	05 23.95	+34 53.6	2.726	2.989	+0.88	-0.2	18.3	95.5
Mar. 18	05 33.67	+34 51.0	2.856	2.987	+1.08	-0.3	18.4	87.7
Mar. 28	05 45.21	+34 47.2	2.986	2.985	+1.24	-0.5	18.5	80.3

Comet P/2011 W2 (Rinner)

Epoch = 2018 July 21.0 TT
 T = 2019 Apr. 9.64502 TT
 Peri. = 221.22679 e = 0.3925294
 Node = 231.95940 2000.0 a = 3.8080804 AU
 Incl. = 13.75840 n = 0.13263096
 q = 2.3132969 AU P = 7.43 years

$$m_1 = 1.7 + 5 \log(\Delta) + 40.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	22 07.34	+00 12.5	4.144	3.645	-0.40 -1.8	.	15.3/79	53.4
Jan. 12	22 17.70	+00 45.1	4.221	3.608	-0.40 -1.7	.	16.5/77	46.1
Jan. 22	22 28.71	+01 25.7	4.284	3.572	-0.41 -1.7	.	17.6/75	38.9
Feb. 1	22 40.26	+02 13.6	4.332	3.536	-0.41 -1.7	.	18.4/74	32.0
Feb. 11	22 52.25	+03 07.9	4.365	3.499	-0.42 -1.8	.	19.2/73	25.4
Feb. 21	23 04.62	+04 07.9	4.381	3.462	-0.44 -1.8	.	19.8/71	19.1
Mar. 3	23 17.30	+05 12.9	4.381	3.425	-0.45 -1.8	.	20.3/71	13.5
Mar. 13	23 30.22	+06 22.1	4.364	3.388	-0.46 -1.8	.	20.7/70	9.5
Mar. 23	23 43.36	+07 34.7	4.331	3.350	-0.48 -1.8	.	21.0/69	9.1
Apr. 2	23 56.66	+08 49.8	4.282	3.313	-0.50 -1.9	.	21.2/69	12.4
Apr. 12	00 10.08	+10 06.8	4.217	3.275	-0.52 -1.9	.	21.4/69	17.5
Apr. 22	00 23.61	+11 24.8	4.139	3.238	-0.55 -1.9	.	21.4/69	23.0
May 2	00 37.18	+12 43.1	4.046	3.200	-0.57 -1.9	.	21.4/69	28.8
May 12	00 50.79	+14 01.0	3.941	3.162	-0.60 -1.8	.	21.3/69	34.6
May 22	01 04.38	+15 17.6	3.824	3.125	-0.64 -1.8	.	21.0/69	40.5
June 1	01 17.90	+16 32.2	3.696	3.087	-0.67 -1.8	.	20.7/69	46.5
June 11	01 31.30	+17 44.0	3.559	3.050	-0.72 -1.7	.	20.3/70	52.5
June 21	01 44.50	+18 52.2	3.414	3.013	-0.76 -1.6	.	19.7/70	58.6
July 1	01 57.41	+19 56.0	3.262	2.976	-0.81 -1.5	.	18.9/71	64.8
July 11	02 09.92	+20 54.6	3.105	2.939	-0.87 -1.4	.	18.0/72	71.2
July 21	02 21.86	+21 47.1	2.944	2.903	-0.94 -1.3	.	16.8/73	77.7
July 31	02 33.08	+22 32.6	2.780	2.867	-1.01 -1.1	.	15.4/74	84.5
Aug. 10	02 43.36	+23 10.0	2.616	2.832	-1.09 -1.0	21.9	13.7/76	91.6
Aug. 20	02 52.43	+23 38.3	2.454	2.797	-1.18 -0.8	21.5	11.6/79	99.0
Aug. 30	03 00.02	+23 56.1	2.296	2.762	-1.27 -0.7	21.2	9.2/83	106.8
Sept. 9	03 05.81	+24 01.9	2.144	2.728	-1.38 -0.7	20.8	6.4/91	115.1
Sept. 19	03 09.47	+23 53.9	2.001	2.695	-1.49 -0.7	20.4	3.7/116	124.1
Sept. 29	03 10.77	+23 30.3	1.871	2.663	-1.60 -0.7	20.1	3.3/181	133.6
Oct. 9	03 09.58	+22 49.4	1.758	2.632	-1.71 -0.9	19.7	6.2/215	143.9
Oct. 19	03 05.99	+21 50.1	1.665	2.601	-1.80 -1.1	19.4	9.6/224	154.8
Oct. 29	03 00.45	+20 33.6	1.596	2.572	-1.87 -1.4	19.1	12.3/226	166.3
Nov. 8	02 53.71	+19 03.2	1.554	2.544	-1.89 -1.6	18.9	13.8/226	177.3
Nov. 18	02 46.80	+17 25.6	1.539	2.517	-1.87 -1.7	18.7	13.6/224	169.2
Nov. 28	02 40.82	+15 49.4	1.552	2.491	-1.82 -1.6	18.5	11.8/219	157.3
Dec. 8	02 36.66	+14 22.7	1.590	2.467	-1.74 -1.3	18.4	8.9/208	145.7
Dec. 18	02 34.97	+13 12.1	1.649	2.444	-1.64 -1.0	18.3	6.0/183	134.8
Dec. 28	02 36.01	+12 20.7	1.726	2.423	-1.55 -0.7	18.3	5.5/137	124.6
Jan. 7	02 39.78	+11 49.1	1.815	2.403	-1.46 -0.3	18.2	8.0/105	115.1
Jan. 17	02 46.15	+11 35.7	1.914	2.385	-1.38 0.0	18.2	11.3/92	106.3
Jan. 27	02 54.86	+11 37.6	2.019	2.369	-1.32 +0.2	18.2	14.6/86	98.2
Feb. 6	03 05.63	+11 51.8	2.127	2.355	-1.26 +0.4	18.2	17.5/84	90.7
Feb. 16	03 18.24	+12 14.8	2.236	2.343	-1.21 +0.6	18.2	20.0/82	83.7
Feb. 26	03 32.40	+12 43.4	2.344	2.333	-1.17 +0.8	18.3	22.1/82	77.2
Mar. 8	03 47.93	+13 14.8	2.450	2.325	-1.14 +1.0	18.3	23.9/82	71.0
Mar. 18	04 04.64	+13 46.4	2.553	2.319	-1.12 +1.2	18.3	25.3/83	65.2
Mar. 28	04 22.33	+14 15.6	2.653	2.315	-1.09 +1.5	18.4	26.6/84	59.7

Comet P/2014 C1 (TOTAS)

Epoch = 2018 July 21.0 TT
 T = 2019 Apr. 13.72441 TT
 Peri. = 24.12978 e = 0.4465547
 Node = 167.85373 2000.0 a = 3.0439176 AU
 Incl. = 2.68082 n = 0.18559007
 q = 1.6846419 AU P = 5.31 years

$$m1 = 15.5 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	02 53.44	+13 21.0	2.881	3.522	-0.52 -2.0	.	3.6/264	123.6
Jan. 12	02 51.95	+13 21.4	2.981	3.486	-0.50 -1.9	.	0.8/319	113.0
Jan. 22	02 52.54	+13 31.3	3.091	3.449	-0.47 -1.8	.	2.9/59	103.1
Feb. 1	02 55.14	+13 49.8	3.205	3.411	-0.46 -1.8	.	5.8/67	93.6
Feb. 11	02 59.57	+14 15.8	3.319	3.373	-0.45 -1.7	.	8.4/69	84.6
Feb. 21	03 05.69	+14 47.8	3.430	3.334	-0.44 -1.6	.	10.7/71	76.1
Mar. 3	03 13.32	+15 24.4	3.535	3.295	-0.44 -1.6	.	12.7/72	68.0
Mar. 13	03 22.29	+16 04.2	3.631	3.254	-0.44 -1.5	.	14.5/74	60.3
Mar. 23	03 32.47	+16 45.9	3.715	3.213	-0.44 -1.5	.	16.1/75	52.9
Apr. 2	03 43.73	+17 28.2	3.787	3.172	-0.45 -1.4	.	17.4/76	45.8
Apr. 12	03 55.96	+18 09.9	3.845	3.129	-0.46 -1.3	.	18.6/77	38.9
Apr. 22	04 09.06	+18 50.0	3.888	3.086	-0.48 -1.2	.	19.6/79	32.3
May 2	04 22.96	+19 27.5	3.916	3.042	-0.50 -1.1	.	20.5/80	26.0
May 12	04 37.57	+20 01.3	3.929	2.998	-0.52 -1.0	.	21.3/81	19.8
May 22	04 52.83	+20 30.7	3.926	2.953	-0.54 -0.9	.	22.1/83	13.8
June 1	05 08.68	+20 54.9	3.908	2.908	-0.56 -0.8	.	22.7/85	8.0
June 11	05 25.05	+21 13.2	3.875	2.861	-0.59 -0.6	.	23.3/86	2.9
June 21	05 41.90	+21 24.9	3.827	2.815	-0.62 -0.4	.	23.9/88	4.1
July 1	05 59.15	+21 29.5	3.766	2.768	-0.65 -0.2	.	24.4/90	9.3
July 11	06 16.77	+21 26.5	3.691	2.720	-0.68 +0.1	.	24.8/92	14.6
July 21	06 34.68	+21 15.5	3.604	2.672	-0.72 +0.4	.	25.3/93	20.0
July 31	06 52.82	+20 56.3	3.506	2.623	-0.76 +0.7	.	25.7/95	25.3
Aug. 10	07 11.15	+20 28.6	3.396	2.575	-0.80 +1.1	.	26.1/97	30.5
Aug. 20	07 29.60	+19 52.4	3.277	2.526	-0.85 +1.5	.	26.4/99	35.7
Aug. 30	07 48.12	+19 07.8	3.150	2.477	-0.89 +1.9	21.9	26.7/101	40.9
Sept. 9	08 06.67	+18 14.9	3.014	2.427	-0.95 +2.4	21.7	27.0/102	46.1
Sept. 19	08 25.17	+17 14.0	2.873	2.378	-1.00 +3.0	21.6	27.2/104	51.3
Sept. 29	08 43.58	+16 05.6	2.726	2.329	-1.07 +3.5	21.3	27.4/105	56.6
Oct. 9	09 01.86	+14 50.2	2.575	2.280	-1.14 +4.2	21.1	27.5/107	61.8
Oct. 19	09 19.94	+13 28.7	2.422	2.232	-1.21 +4.9	20.9	27.5/108	67.1
Oct. 29	09 37.77	+12 02.1	2.267	2.184	-1.30 +5.6	20.7	27.4/109	72.5
Nov. 8	09 55.29	+10 31.3	2.111	2.137	-1.40 +6.4	20.4	27.2/110	78.0
Nov. 18	10 12.41	+08 58.0	1.957	2.091	-1.52 +7.3	20.2	26.7/111	83.5
Nov. 28	10 29.04	+07 23.7	1.806	2.046	-1.66 +8.3	19.9	26.0/111	89.2
Dec. 8	10 45.06	+05 50.3	1.658	2.002	-1.81 +9.4	19.6	25.0/112	95.1
Dec. 18	11 00.28	+04 20.3	1.515	1.960	-2.00 +10.6	19.3	23.7/112	101.2
Dec. 28	11 14.52	+02 56.3	1.379	1.919	-2.21 +12.0	19.0	21.9/111	107.5
Jan. 7	11 27.50	+01 41.5	1.250	1.881	-2.47 +13.5	18.7	19.5/111	114.2
Jan. 17	11 38.86	+00 39.4	1.131	1.846	-2.77 +15.3	18.4	16.4/109	121.4
Jan. 27	11 48.25	+00 06.2	1.023	1.813	-3.11 +17.3	18.1	12.7/106	129.1
Feb. 6	11 55.23	+00 31.3	0.927	1.783	-3.49 +19.6	17.8	8.3/99	137.5
Feb. 16	11 59.45	+00 32.9	0.846	1.757	-3.89 +22.0	17.6	4.2/73	146.7
Feb. 26	12 00.83	+00 10.2	0.781	1.734	-4.27 +24.3	17.4	3.6/357	156.6
Mar. 8	11 59.61	+00 34.4	0.734	1.716	-4.60 +26.2	17.2	6.5/327	167.2
Mar. 18	11 56.64	+01 33.2	0.706	1.701	-4.79 +27.2	17.1	8.1/320	177.9
Mar. 28	11 53.25	+02 34.2	0.699	1.691	-4.82 +27.1	17.0	7.3/321	170.5

Comet 186P/Garradd

Epoch = 2018 July 21.0 TT
 T = 2019 May 5.05725 TT
 Peri. = 283.69966 e = 0.1229222
 Node = 327.18742 2000.0 a = 5.0047426 AU
 Incl. = 28.41171 n = 0.08803015
 q = 4.3895486 AU P = 11.20 years

$$m_1 = 8.4 + 5 \log(\Delta) + 10.0 \log(r(t-360))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	13 03.94	-29 19.0	4.734	4.595	+0.45	-9.1	18.7	75.9
Jan. 12	13 07.89	-30 48.8	4.583	4.587	+0.33	-8.8	18.6	84.1
Jan. 22	13 10.53	-32 15.7	4.431	4.580	+0.19	-8.5	18.5	92.4
Feb. 1	13 11.70	-33 38.2	4.283	4.572	+0.03	-7.9	18.4	100.9
Feb. 11	13 11.25	-34 54.4	4.141	4.565	-0.14	-7.2	18.4	109.4
Feb. 21	13 09.09	-36 02.1	4.009	4.558	-0.31	-6.2	18.3	118.0
Mar. 3	13 05.26	-36 58.7	3.893	4.551	-0.47	-5.0	18.2	126.4
Mar. 13	12 59.91	-37 41.7	3.794	4.544	-0.61	-3.5	18.2	134.3
Mar. 23	12 53.33	-38 08.9	3.717	4.537	-0.71	-1.8	18.1	141.2
Apr. 2	12 45.99	-38 19.1	3.664	4.530	-0.75	-0.1	18.1	146.4
Apr. 12	12 38.47	-38 12.5	3.636	4.524	-0.74	+1.5	18.0	148.8
Apr. 22	12 31.35	-37 50.8	3.635	4.517	-0.67	+2.9	18.0	147.8
May 2	12 25.19	-37 17.1	3.659	4.511	-0.55	+3.9	18.0	143.7
May 12	12 20.39	-36 35.5	3.707	4.505	-0.39	+4.4	18.1	137.6
May 22	12 17.22	-35 50.5	3.776	4.499	-0.22	+4.5	18.1	130.4
June 1	12 15.82	-35 06.1	3.863	4.493	-0.04	+4.3	18.1	122.7
June 11	12 16.17	-34 25.6	3.965	4.487	+0.13	+3.7	18.2	114.8
June 21	12 18.20	-33 51.7	4.078	4.481	+0.29	+3.0	18.2	106.9
July 1	12 21.78	-33 26.0	4.199	4.476	+0.44	+2.1	18.3	99.2
July 11	12 26.77	-33 09.4	4.324	4.471	+0.57	+1.1	18.3	91.6
July 21	12 33.02	-33 02.2	4.451	4.465	+0.69	+0.2	18.4	84.3
July 31	12 40.39	-33 04.4	4.576	4.460	+0.79	-0.7	18.4	77.1
Aug. 10	12 48.75	-33 15.4	4.697	4.455	+0.89	-1.6	18.5	70.1
Aug. 20	12 57.99	-33 34.7	4.811	4.451	+0.97	-2.4	18.5	63.4
Aug. 30	13 08.01	-34 01.5	4.918	4.446	+1.04	-3.1	18.6	56.8
Sept. 9	13 18.73	-34 35.1	5.014	4.442	+1.11	-3.7	18.6	50.5
Sept. 19	13 30.07	-35 14.6	5.099	4.438	+1.17	-4.2	18.6	44.4
Sept. 29	13 41.96	-35 59.2	5.171	4.434	+1.22	-4.7	18.7	38.7
Oct. 9	13 54.34	-36 48.0	5.229	4.430	+1.26	-5.1	18.7	33.4
Oct. 19	14 07.15	-37 40.4	5.272	4.426	+1.30	-5.4	18.7	28.9
Oct. 29	14 20.34	-38 35.6	5.299	4.422	+1.34	-5.6	18.7	25.4
Nov. 8	14 33.83	-39 32.9	5.311	4.419	+1.36	-5.8	18.7	23.4
Nov. 18	14 47.57	-40 31.8	5.305	4.416	+1.38	-5.9	18.7	23.5
Nov. 28	15 01.48	-41 31.6	5.283	4.413	+1.40	-6.0	18.7	25.4
Dec. 8	15 15.47	-42 32.0	5.245	4.410	+1.40	-6.1	18.6	29.0
Dec. 18	15 29.45	-43 32.5	5.191	4.407	+1.39	-6.1	18.6	33.8
Dec. 28	15 43.31	-44 33.1	5.122	4.405	+1.37	-6.0	18.6	39.3
Jan. 7	15 56.92	-45 33.4	5.039	4.403	+1.34	-6.0	18.5	45.3
Jan. 17	16 10.13	-46 33.6	4.942	4.401	+1.29	-6.0	18.5	51.7
Jan. 27	16 22.78	-47 33.6	4.834	4.399	+1.23	-6.0	18.4	58.4
Feb. 6	16 34.68	-48 33.7	4.717	4.397	+1.14	-6.0	18.4	65.3
Feb. 16	16 45.62	-49 33.9	4.592	4.395	+1.03	-6.0	18.3	72.4
Feb. 26	16 55.37	-50 34.4	4.461	4.394	+0.90	-6.1	18.2	79.7
Mar. 8	17 03.67	-51 35.2	4.328	4.393	+0.74	-6.1	18.2	87.2
Mar. 18	17 10.24	-52 35.9	4.195	4.392	+0.55	-6.0	18.1	94.8
Mar. 28	17 14.81	-53 35.9	4.066	4.391	+0.34	-5.9	18.0	102.5

Comet 231P/LINEAR-NEAT

Epoch = 2018 July 21.0 TT
 T = 2019 June 14.00881 TT
 Peri. = 42.70300 e = 0.2478524
 Node = 133.02885 2000.0 a = 4.0187325 AU
 Incl. = 12.33254 n = 0.12234055
 q = 3.0226800 AU P = 8.06 years

$$m_1 = 13.1 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	05 09.88	+10 28.5	2.917	3.820	-0.61	+2.1	19.8	153.2
Jan. 12	05 04.30	+10 52.5	2.968	3.798	-0.48	+2.8	19.8	142.9
Jan. 22	05 00.21	+11 22.9	3.043	3.777	-0.31	+3.3	19.8	132.4
Feb. 1	04 57.92	+11 58.4	3.137	3.755	-0.12	+3.8	19.9	122.1
Feb. 11	04 57.54	+12 37.6	3.246	3.733	+0.07	+4.1	19.9	112.2
Feb. 21	04 59.08	+13 19.2	3.365	3.711	+0.26	+4.2	20.0	102.8
Mar. 3	05 02.46	+14 01.9	3.489	3.689	+0.43	+4.3	20.1	93.7
Mar. 13	05 07.54	+14 44.4	3.615	3.667	+0.60	+4.2	20.1	85.1
Mar. 23	05 14.16	+15 25.7	3.739	3.645	+0.74	+4.0	20.2	76.9
Apr. 2	05 22.15	+16 04.7	3.859	3.624	+0.87	+3.7	20.2	69.1
Apr. 12	05 31.35	+16 40.6	3.971	3.602	+0.98	+3.4	20.3	61.5
Apr. 22	05 41.61	+17 12.7	4.074	3.580	+1.08	+3.0	20.3	54.2
May 2	05 52.78	+17 40.3	4.165	3.559	+1.16	+2.5	20.3	47.2
May 12	06 04.73	+18 03.0	4.245	3.538	+1.23	+2.0	20.4	40.4
May 22	06 17.34	+18 20.3	4.312	3.517	+1.29	+1.4	20.4	33.8
June 1	06 30.50	+18 31.9	4.365	3.496	+1.34	+0.8	20.4	27.4
June 11	06 44.10	+18 37.6	4.403	3.475	+1.38	+0.2	20.4	21.1
June 21	06 58.05	+18 37.5	4.426	3.455	+1.41	-0.3	20.4	15.0
July 1	07 12.25	+18 31.3	4.434	3.434	+1.43	-0.9	20.4	9.1
July 11	07 26.63	+18 19.4	4.428	3.414	+1.45	-1.5	20.3	4.2
July 21	07 41.11	+18 01.8	4.405	3.395	+1.45	-2.1	20.3	5.2
July 31	07 55.60	+17 38.9	4.368	3.375	+1.45	-2.6	20.3	10.5
Aug. 10	08 10.05	+17 11.1	4.316	3.356	+1.44	-3.0	20.2	16.4
Aug. 20	08 24.38	+16 39.0	4.250	3.337	+1.42	-3.4	20.2	22.4
Aug. 30	08 38.51	+16 03.2	4.170	3.319	+1.40	-3.8	20.1	28.6
Sept. 9	08 52.38	+15 24.4	4.077	3.300	+1.37	-4.0	20.0	34.8
Sept. 19	09 05.91	+14 43.6	3.971	3.283	+1.33	-4.2	20.0	41.2
Sept. 29	09 19.03	+14 01.7	3.853	3.265	+1.29	-4.2	19.9	47.8
Oct. 9	09 31.64	+13 19.8	3.726	3.248	+1.23	-4.1	19.8	54.5
Oct. 19	09 43.64	+12 39.4	3.588	3.232	+1.16	-3.9	19.7	61.4
Oct. 29	09 54.92	+12 01.7	3.444	3.216	+1.08	-3.5	19.6	68.5
Nov. 8	10 05.36	+11 28.6	3.293	3.201	+0.99	-3.0	19.5	76.0
Nov. 18	10 14.78	+11 01.6	3.139	3.186	+0.88	-2.3	19.4	83.7
Nov. 28	10 23.04	+10 42.8	2.983	3.171	+0.75	-1.4	19.2	91.8
Dec. 8	10 29.93	+10 34.2	2.829	3.157	+0.61	-0.2	19.1	100.3
Dec. 18	10 35.25	+10 37.7	2.679	3.144	+0.44	+1.1	19.0	109.3
Dec. 28	10 38.79	+10 54.9	2.537	3.131	+0.25	+2.5	18.8	118.7
Jan. 7	10 40.39	+11 27.1	2.408	3.119	+0.05	+4.1	18.7	128.7
Jan. 17	10 39.94	+12 14.4	2.295	3.108	-0.16	+5.5	18.6	139.3
Jan. 27	10 37.50	+13 15.1	2.204	3.097	-0.35	+6.7	18.5	150.2
Feb. 6	10 33.27	+14 26.2	2.136	3.087	-0.51	+7.5	18.4	161.4
Feb. 16	10 27.72	+15 42.3	2.097	3.077	-0.60	+7.6	18.4	171.7
Feb. 26	10 21.52	+16 57.1	2.086	3.069	-0.63	+7.2	18.3	171.5
Mar. 8	10 15.44	+18 04.5	2.105	3.061	-0.57	+6.1	18.4	161.2
Mar. 18	10 10.26	+18 59.3	2.150	3.053	-0.44	+4.7	18.4	150.1
Mar. 28	10 06.62	+19 38.7	2.219	3.047	-0.26	+3.0	18.5	139.4

Comet 31P/Schwassmann-Wachmann

Epoch = 2018 July 21.0 TT
 T = 2019 July 6.17925 TT
 Peri. = 18.36407 e = 0.1933104
 Node = 114.11336 2000.0 a = 4.2460236 AU
 Incl. = 4.54647 n = 0.11264981
 q = 3.4252231 AU P = 8.75 years

$$m_1 = 6.6 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m ₁	Elong.
2018/19	h m	° ' .			m	'		°
Jan. 2	02 21.55	+09 05.5	3.487	4.000	+0.03	+1.6	19.8	114.7
Jan. 12	02 22.56	+09 25.4	3.615	3.984	+0.19	+2.4	19.9	104.9
Jan. 22	02 25.19	+09 53.1	3.749	3.967	+0.35	+3.2	19.9	95.6
Feb. 1	02 29.34	+10 27.4	3.886	3.951	+0.49	+3.7	20.0	86.6
Feb. 11	02 34.88	+11 07.1	4.020	3.935	+0.62	+4.2	20.0	78.0
Feb. 21	02 41.65	+11 50.9	4.151	3.919	+0.74	+4.6	20.1	69.7
Mar. 3	02 49.54	+12 37.8	4.273	3.903	+0.84	+4.8	20.1	61.7
Mar. 13	02 58.39	+13 26.6	4.386	3.887	+0.93	+4.9	20.1	54.0
Mar. 23	03 08.10	+14 16.2	4.488	3.871	+1.01	+5.0	20.1	46.6
Apr. 2	03 18.55	+15 05.7	4.575	3.855	+1.08	+4.9	20.2	39.4
Apr. 12	03 29.64	+15 54.3	4.649	3.840	+1.14	+4.8	20.2	32.4
Apr. 22	03 41.28	+16 41.1	4.707	3.824	+1.19	+4.6	20.2	25.5
May 2	03 53.39	+17 25.6	4.749	3.809	+1.23	+4.3	20.1	18.8
May 12	04 05.88	+18 07.0	4.775	3.794	+1.27	+4.0	20.1	12.3
May 22	04 18.69	+18 45.0	4.784	3.779	+1.29	+3.6	20.1	6.0
June 1	04 31.73	+19 19.0	4.777	3.764	+1.31	+3.2	20.1	2.7
June 11	04 44.92	+19 48.8	4.753	3.749	+1.33	+2.7	20.0	7.8
June 21	04 58.19	+20 14.1	4.713	3.735	+1.33	+2.3	20.0	14.0
July 1	05 11.46	+20 34.8	4.657	3.721	+1.32	+1.8	19.9	20.4
July 11	05 24.63	+20 50.8	4.586	3.707	+1.31	+1.3	19.9	26.8
July 21	05 37.63	+21 02.3	4.500	3.693	+1.29	+0.9	19.8	33.3
July 31	05 50.34	+21 09.2	4.401	3.679	+1.25	+0.5	19.7	39.8
Aug. 10	06 02.67	+21 12.1	4.289	3.666	+1.21	+0.1	19.6	46.5
Aug. 20	06 14.50	+21 11.3	4.166	3.653	+1.15	-0.3	19.5	53.3
Aug. 30	06 25.68	+21 07.3	4.032	3.640	+1.08	-0.5	19.4	60.4
Sept. 9	06 36.10	+21 00.9	3.890	3.627	+0.99	-0.7	19.3	67.6
Sept. 19	06 45.58	+20 52.9	3.740	3.615	+0.89	-0.9	19.2	75.1
Sept. 29	06 53.96	+20 44.2	3.586	3.603	+0.77	-0.9	19.1	82.9
Oct. 9	07 01.06	+20 35.8	3.430	3.592	+0.63	-0.8	19.0	91.1
Oct. 19	07 06.65	+20 28.9	3.275	3.580	+0.47	-0.6	18.9	99.7
Oct. 29	07 10.56	+20 24.6	3.124	3.569	+0.29	-0.2	18.7	108.7
Nov. 8	07 12.61	+20 23.9	2.981	3.558	+0.10	+0.2	18.6	118.3
Nov. 18	07 12.64	+20 27.5	2.849	3.548	-0.11	+0.6	18.5	128.3
Nov. 28	07 10.64	+20 35.8	2.735	3.538	-0.31	+1.1	18.4	138.9
Dec. 8	07 06.68	+20 48.5	2.641	3.529	-0.49	+1.5	18.3	150.0
Dec. 18	07 01.05	+21 04.8	2.572	3.519	-0.64	+1.8	18.2	161.5
Dec. 28	06 54.26	+21 23.3	2.532	3.510	-0.72	+1.9	18.2	173.1
Jan. 7	06 46.96	+21 42.5	2.522	3.502	-0.73	+1.9	18.1	174.6
Jan. 17	06 39.92	+22 01.1	2.542	3.494	-0.66	+1.8	18.1	162.9
Jan. 27	06 33.89	+22 18.2	2.590	3.486	-0.52	+1.6	18.2	151.3
Feb. 6	06 29.43	+22 33.4	2.664	3.479	-0.34	+1.4	18.2	140.2
Feb. 16	06 26.95	+22 46.4	2.760	3.472	-0.13	+1.2	18.3	129.5
Feb. 26	06 26.62	+22 57.4	2.872	3.466	+0.09	+1.0	18.3	119.3
Mar. 8	06 28.44	+23 06.2	2.997	3.460	+0.30	+0.8	18.4	109.7
Mar. 18	06 32.31	+23 12.6	3.130	3.454	+0.49	+0.5	18.5	100.6
Mar. 28	06 38.04	+23 16.2	3.268	3.449	+0.67	+0.2	18.6	92.0

Comet P/2007 T4 (Gibbs)

Epoch = 2018 July 21.0 TT
 T = 2019 July 23.71532 TT
 Peri. = 42.45288 e = 0.6179370
 Node = 37.05707 2000.0 a = 5.2469912 AU
 Incl. = 23.86069 n = 0.08200467
 q = 2.0046812 AU P = 12.02 years

$$m1 = 12.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	21 27.71	-36 07.2	5.525	4.772	-0.28 -1.6	.	13.2/ 61	36.6
Jan. 12	21 37.42	-35 02.1	5.545	4.722	-0.28 -1.7	.	13.9/ 62	30.3
Jan. 22	21 47.58	-33 57.1	5.545	4.671	-0.28 -1.9	.	14.4/ 63	24.8
Feb. 1	21 58.06	-32 52.5	5.527	4.619	-0.28 -2.0	.	14.8/ 64	20.8
Feb. 11	22 08.76	-31 48.5	5.489	4.567	-0.29 -2.2	.	15.2/ 65	19.0
Feb. 21	22 19.61	-30 45.7	5.431	4.515	-0.29 -2.4	.	15.4/ 66	20.0
Mar. 3	22 30.51	-29 44.4	5.354	4.462	-0.30 -2.6	.	15.4/ 67	23.4
Mar. 13	22 41.39	-28 45.1	5.260	4.409	-0.31 -2.8	.	15.4/ 68	28.2
Mar. 23	22 52.19	-27 48.5	5.147	4.355	-0.32 -3.0	.	15.3/ 69	33.9
Apr. 2	23 02.83	-26 55.1	5.019	4.301	-0.33 -3.2	.	15.0/ 70	40.0
Apr. 12	23 13.24	-26 05.6	4.876	4.247	-0.34 -3.5	.	14.6/ 71	46.4
Apr. 22	23 23.35	-25 20.8	4.720	4.192	-0.35 -3.7	.	14.1/ 73	53.0
May 2	23 33.08	-24 41.5	4.552	4.137	-0.37 -4.0	.	13.4/ 74	59.8
May 12	23 42.34	-24 08.4	4.375	4.082	-0.38 -4.3	.	12.6/ 77	66.7
May 22	23 51.03	-23 42.5	4.191	4.026	-0.40 -4.6	.	11.6/ 79	73.7
June 1	23 59.02	-23 24.6	4.002	3.970	-0.43 -4.9	.	10.5/ 83	80.9
June 11	00 06.20	-23 15.6	3.810	3.913	-0.45 -5.3	.	9.2/ 88	88.2
June 21	00 12.37	-23 16.3	3.618	3.856	-0.48 -5.7	.	7.7/ 95	95.8
July 1	00 17.37	-23 27.3	3.430	3.799	-0.51 -6.0	.	6.1/106	103.6
July 11	00 20.99	-23 48.6	3.247	3.741	-0.55 -6.4	.	4.7/125	111.6
July 21	00 23.00	-24 20.2	3.073	3.684	-0.59 -6.8	.	3.9/159	119.7
July 31	00 23.18	-25 00.5	2.911	3.626	-0.63 -7.1	.	4.6/195	128.0
Aug. 10	00 21.37	-25 47.5	2.766	3.567	-0.67 -7.4	.	6.4/219	136.2
Aug. 20	00 17.46	-26 37.3	2.640	3.509	-0.71 -7.6	.	8.4/234	144.0
Aug. 30	00 11.52	-27 24.7	2.536	3.450	-0.74 -7.6	.	10.3/245	150.4
Sept. 9	00 03.81	-28 03.7	2.458	3.391	-0.76 -7.6	21.9	11.7/254	153.9
Sept. 19	23 54.88	-28 27.9	2.405	3.332	-0.77 -7.5	21.7	12.4/264	153.1
Sept. 29	23 45.47	-28 32.0	2.380	3.273	-0.76 -7.3	21.6	12.3/274	148.1
Oct. 9	23 36.45	-28 13.0	2.379	3.214	-0.74 -7.1	21.5	11.7/286	140.6
Oct. 19	23 28.66	-27 30.2	2.401	3.155	-0.71 -6.9	21.4	10.7/301	132.0
Oct. 29	23 22.74	-26 25.5	2.443	3.097	-0.67 -6.9	21.3	9.9/320	122.9
Nov. 8	23 19.08	-25 01.7	2.500	3.038	-0.63 -6.9	21.2	9.8/341	113.8
Nov. 18	23 17.85	-23 22.4	2.568	2.979	-0.59 -6.9	21.2	10.7/ 1	104.9
Nov. 28	23 19.01	-21 30.8	2.643	2.921	-0.56 -7.0	21.1	12.2/ 16	96.3
Dec. 8	23 22.41	-19 29.4	2.722	2.863	-0.54 -7.2	21.0	14.1/ 27	88.1
Dec. 18	23 27.83	-17 20.2	2.800	2.806	-0.52 -7.4	21.0	16.2/ 35	80.2
Dec. 28	23 35.04	-15 04.6	2.876	2.749	-0.51 -7.7	20.9	18.2/ 40	72.7
Jan. 7	23 43.82	-12 43.6	2.948	2.693	-0.50 -7.9	20.8	20.1/ 44	65.5
Jan. 17	23 53.99	-10 17.7	3.013	2.638	-0.50 -8.2	20.7	21.8/ 47	58.6
Jan. 27	00 05.36	-07 47.7	3.070	2.583	-0.51 -8.5	20.6	23.4/ 50	52.0
Feb. 6	00 17.82	-05 14.0	3.118	2.530	-0.52 -8.7	20.5	24.9/ 51	45.7
Feb. 16	00 31.26	-02 36.9	3.157	2.478	-0.53 -9.0	20.4	26.2/ 53	39.7
Feb. 26	00 45.60	+00 03.0	3.186	2.428	-0.55 -9.3	20.3	27.5/ 54	33.9
Mar. 8	01 00.81	+02 45.1	3.205	2.379	-0.57 -9.5	20.2	28.6/ 55	28.4
Mar. 18	01 16.86	+05 29.1	3.215	2.333	-0.60 -9.8	20.1	29.6/ 56	23.1
Mar. 28	01 33.75	+08 13.9	3.216	2.288	-0.64 -10.0	19.9	30.6/ 57	18.0

Comet 200P/Larsen

Epoch = 2018 July 21.0 TT
 T = 2019 July 28.45513 TT
 Peri. = 133.96457 e = 0.3313871
 Node = 234.80110 2000.0 a = 4.9318514 AU
 Incl. = 12.10578 n = 0.08998893
 q = 3.2974995 AU P = 10.95 years

$$m1 = -0.5 + 5 \log(\Delta) + 30.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' "			m	' "		°
Jan. 2	18 40.91	-16 04.6	5.327	4.354	+1.14	+2.0	.	7.1
Jan. 12	18 52.35	-15 42.6	5.286	4.326	+1.14	+2.5	.	11.3
Jan. 22	19 03.74	-15 15.8	5.226	4.299	+1.13	+2.9	.	17.7
Feb. 1	19 14.99	-14 44.3	5.148	4.272	+1.11	+3.4	22.0	24.7
Feb. 11	19 25.98	-14 08.3	5.052	4.245	+1.08	+3.8	21.9	31.8
Feb. 21	19 36.63	-13 28.1	4.940	4.218	+1.04	+4.2	21.7	39.1
Mar. 3	19 46.82	-12 44.2	4.813	4.191	+0.99	+4.6	21.6	46.4
Mar. 13	19 56.45	-11 57.0	4.673	4.164	+0.93	+4.9	21.4	53.8
Mar. 23	20 05.42	-11 07.1	4.522	4.137	+0.86	+5.1	21.3	61.3
Apr. 2	20 13.61	-10 15.2	4.362	4.111	+0.77	+5.3	21.1	68.9
Apr. 12	20 20.90	-09 22.1	4.196	4.084	+0.67	+5.3	20.9	76.7
Apr. 22	20 27.16	-08 28.7	4.026	4.058	+0.56	+5.3	20.8	84.6
May 2	20 32.27	-07 36.1	3.855	4.031	+0.44	+5.2	20.6	92.8
May 12	20 36.11	-06 45.2	3.686	4.005	+0.31	+4.9	20.4	101.1
May 22	20 38.54	-05 57.5	3.522	3.979	+0.16	+4.5	20.2	109.7
June 1	20 39.48	-05 14.4	3.367	3.953	+0.01	+4.0	20.0	118.6
June 11	20 38.87	-04 37.2	3.224	3.928	-0.15	+3.3	19.9	127.7
June 21	20 36.71	-04 07.5	3.098	3.903	-0.30	+2.5	19.7	137.0
July 1	20 33.12	-03 46.6	2.991	3.878	-0.43	+1.6	19.5	146.2
July 11	20 28.32	-03 35.5	2.907	3.853	-0.53	+0.5	19.4	155.1
July 21	20 22.66	-03 34.6	2.848	3.828	-0.60	-0.5	19.3	162.2
July 31	20 16.62	-03 43.6	2.817	3.804	-0.61	-1.4	19.2	164.3
Aug. 10	20 10.71	-04 01.2	2.813	3.780	-0.56	-2.2	19.1	159.7
Aug. 20	20 05.47	-04 25.6	2.835	3.756	-0.47	-2.7	19.0	151.6
Aug. 30	20 01.38	-04 54.3	2.883	3.733	-0.33	-3.0	19.0	142.3
Sept. 9	19 58.77	-05 25.0	2.952	3.710	-0.17	-3.1	18.9	132.8
Sept. 19	19 57.88	-05 55.0	3.039	3.688	+0.01	-2.9	18.9	123.4
Sept. 29	19 58.80	-06 22.4	3.140	3.666	+0.19	-2.5	18.9	114.2
Oct. 9	20 01.52	-06 45.4	3.252	3.644	+0.37	-2.0	18.9	105.3
Oct. 19	20 05.95	-07 02.7	3.370	3.623	+0.53	-1.4	18.9	96.7
Oct. 29	20 11.97	-07 13.2	3.491	3.602	+0.68	-0.7	18.9	88.4
Nov. 8	20 19.40	-07 16.4	3.612	3.582	+0.82	+0.1	18.9	80.4
Nov. 18	20 28.09	-07 11.6	3.731	3.562	+0.93	+0.9	18.9	72.6
Nov. 28	20 37.86	-06 58.7	3.844	3.543	+1.03	+1.7	18.9	65.1
Dec. 8	20 48.56	-06 37.7	3.950	3.525	+1.11	+2.6	18.9	57.8
Dec. 18	21 00.03	-06 08.6	4.046	3.507	+1.18	+3.4	18.9	50.7
Dec. 28	21 12.13	-05 31.6	4.132	3.489	+1.24	+4.1	18.9	43.8
Jan. 7	21 24.74	-04 47.1	4.206	3.473	+1.28	+4.8	18.8	37.1
Jan. 17	21 37.75	-03 55.5	4.268	3.457	+1.32	+5.5	18.8	30.5
Jan. 27	21 51.06	-02 57.4	4.315	3.441	+1.34	+6.1	18.8	24.3
Feb. 6	22 04.57	-01 53.4	4.348	3.426	+1.36	+6.7	18.7	18.3
Feb. 16	22 18.23	+00 44.0	4.367	3.412	+1.37	+7.2	18.7	13.1
Feb. 26	22 31.94	+00 29.9	4.372	3.399	+1.37	+7.6	18.6	9.5
Mar. 8	22 45.67	+01 47.6	4.361	3.387	+1.37	+8.0	18.6	9.5
Mar. 18	22 59.36	+03 08.4	4.337	3.375	+1.36	+8.2	18.5	13.0
Mar. 28	23 12.95	+04 31.4	4.298	3.364	+1.35	+8.4	18.5	18.0

Comet P/2012 K3 (Gibbs)

Epoch = 2018 July 21.0 TT
 T = 2019 Aug. 17.67028 TT
 Peri. = 172.18639 e = 0.4238918
 Node = 125.85349 2000.0 a = 3.6237573 AU
 Incl. = 13.19133 n = 0.14287802
 q = 2.0876763 AU P = 6.90 years

$$m_1 = 12.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	12 18.34	+08 19.3	3.802	4.093	-0.46 +2.0	.	5.3/73	100.3
Jan. 12	12 21.13	+08 40.0	3.621	4.061	-0.48 +2.1	.	4.0/47	109.8
Jan. 22	12 22.42	+09 12.4	3.449	4.028	-0.51 +2.2	.	3.9/9	119.6
Feb. 1	12 22.08	+09 56.4	3.291	3.994	-0.54 +2.3	.	5.3/340	129.8
Feb. 11	12 20.07	+10 50.6	3.152	3.961	-0.56 +2.4	.	7.3/324	140.2
Feb. 21	12 16.41	+11 52.8	3.035	3.926	-0.59 +2.4	.	9.3/315	150.5
Mar. 3	12 11.29	+12 59.4	2.945	3.891	-0.61 +2.4	.	10.8/308	160.1
Mar. 13	12 05.07	+14 05.8	2.883	3.856	-0.62 +2.3	.	11.6/304	166.2
Mar. 23	11 58.21	+15 07.0	2.852	3.820	-0.62 +2.1	.	11.6/299	163.9
Apr. 2	11 51.32	+15 58.4	2.851	3.784	-0.61 +2.0	.	10.6/295	155.5
Apr. 12	11 44.98	+16 36.7	2.878	3.747	-0.60 +1.8	.	8.9/290	145.5
Apr. 22	11 39.72	+16 59.8	2.928	3.710	-0.58 +1.6	.	6.6/283	135.2
May 2	11 35.94	+17 07.3	2.998	3.672	-0.56 +1.5	.	4.1/269	125.2
May 12	11 33.84	+17 00.0	3.084	3.634	-0.53 +1.4	.	2.2/227	115.5
May 22	11 33.53	+16 39.1	3.179	3.596	-0.51 +1.4	.	2.9/161	106.2
June 1	11 34.99	+16 06.3	3.281	3.557	-0.49 +1.4	.	5.2/138	97.4
June 11	11 38.10	+15 23.2	3.385	3.518	-0.48 +1.4	.	7.5/130	89.0
June 21	11 42.75	+14 31.4	3.488	3.478	-0.47 +1.5	.	9.7/125	81.1
July 1	11 48.78	+13 32.1	3.587	3.439	-0.46 +1.6	.	11.7/123	73.4
July 11	11 56.04	+12 26.6	3.680	3.398	-0.45 +1.7	.	13.4/121	66.1
July 21	12 04.40	+11 15.7	3.764	3.358	-0.45 +1.8	.	15.0/119	59.1
July 31	12 13.72	+10 00.5	3.838	3.317	-0.45 +1.9	.	16.4/118	52.4
Aug. 10	12 23.91	+08 41.6	3.900	3.276	-0.45 +2.0	.	17.7/117	45.8
Aug. 20	12 34.88	+07 19.7	3.950	3.234	-0.45 +2.2	.	18.8/116	39.5
Aug. 30	12 46.55	+05 55.8	3.987	3.193	-0.46 +2.3	.	19.9/115	33.4
Sept. 9	12 58.87	+04 30.3	4.010	3.151	-0.47 +2.4	.	20.8/114	27.5
Sept. 19	13 11.78	+03 04.0	4.019	3.109	-0.48 +2.6	.	21.6/114	21.9
Sept. 29	13 25.25	+01 37.8	4.013	3.067	-0.50 +2.7	.	22.4/113	16.7
Oct. 9	13 39.25	+00 12.1	3.993	3.025	-0.52 +2.8	.	23.0/112	12.3
Oct. 19	13 53.73	-01 12.0	3.959	2.982	-0.54 +3.0	.	23.6/111	9.9
Oct. 29	14 08.68	-02 33.8	3.910	2.940	-0.56 +3.1	22.0	24.1/109	10.7
Nov. 8	14 24.07	-03 52.5	3.848	2.898	-0.59 +3.2	21.9	24.6/108	14.2
Nov. 18	14 39.87	-05 07.3	3.773	2.856	-0.62 +3.3	21.7	25.0/107	18.9
Nov. 28	14 56.04	-06 17.3	3.686	2.814	-0.65 +3.4	21.6	25.3/105	24.1
Dec. 8	15 12.55	-07 21.6	3.587	2.772	-0.68 +3.5	21.4	25.5/104	29.5
Dec. 18	15 29.33	-08 19.5	3.477	2.730	-0.72 +3.6	21.2	25.7/102	35.0
Dec. 28	15 46.33	-09 10.2	3.358	2.689	-0.77 +3.6	21.1	25.7/100	40.6
Jan. 7	16 03.48	-09 53.1	3.231	2.648	-0.82 +3.7	20.9	25.7/99	46.3
Jan. 17	16 20.69	-10 27.6	3.096	2.608	-0.87 +3.7	20.7	25.5/97	52.0
Jan. 27	16 37.85	-10 53.4	2.956	2.569	-0.93 +3.8	20.5	25.3/95	57.7
Feb. 6	16 54.86	-11 10.2	2.811	2.530	-0.99 +3.8	20.3	24.8/93	63.5
Feb. 16	17 11.56	-11 18.1	2.662	2.492	-1.06 +3.8	20.1	24.2/91	69.3
Feb. 26	17 27.82	-11 17.5	2.512	2.454	-1.14 +3.9	19.8	23.5/89	75.2
Mar. 8	17 43.47	-11 08.9	2.362	2.418	-1.22 +3.9	19.6	22.5/87	81.2
Mar. 18	17 58.30	-10 53.3	2.212	2.383	-1.32 +4.0	19.4	21.2/85	87.3
Mar. 28	18 12.12	-10 32.2	2.065	2.350	-1.43 +4.0	19.1	19.6/83	93.6

Comet P/2005 GF8 (LONEOS)

Epoch = 2018 July 21.0 TT
 T = 2019 Sept. 30.79297 TT
 Peri. = 285.38774 e = 0.5164201
 Node = 314.90816 2000.0 a = 5.8547129 AU
 Incl. = 1.19236 n = 0.06957379
 q = 2.8312215 AU P = 14.17 years

$$m_1 = 14.0 + 5 \log(\Delta) + 5.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot./PA	Elong.
2018/19	h m	° '			for T=+1 day			°
Jan. 2	09 41.67	+13 48.6	4.170	4.947	-0.41 +2.2	20.6	4.5/288	138.2
Jan. 12	09 38.16	+14 04.9	4.034	4.905	-0.42 +2.2	20.5	6.4/288	149.3
Jan. 22	09 33.53	+14 26.3	3.924	4.864	-0.43 +2.2	20.4	7.8/288	160.6
Feb. 1	09 28.07	+14 51.2	3.844	4.822	-0.44 +2.2	20.3	8.8/287	172.2
Feb. 11	09 22.16	+15 17.7	3.795	4.780	-0.44 +2.2	20.3	9.1/287	176.2
Feb. 21	09 16.24	+15 43.5	3.777	4.738	-0.43 +2.1	20.3	8.7/287	164.6
Mar. 3	09 10.77	+16 06.7	3.790	4.696	-0.43 +2.0	20.3	7.6/286	153.2
Mar. 13	09 06.16	+16 25.6	3.830	4.653	-0.42 +2.0	20.3	6.0/286	142.0
Mar. 23	09 02.72	+16 39.2	3.893	4.611	-0.41 +1.9	20.3	4.0/285	131.2
Apr. 2	09 00.69	+16 46.8	3.975	4.568	-0.39 +1.8	20.3	1.8/283	120.8
Apr. 12	09 00.16	+16 48.0	4.071	4.526	-0.38 +1.8	20.3	0.5/117	110.9
Apr. 22	09 01.15	+16 42.9	4.176	4.483	-0.37 +1.7	20.4	2.7/108	101.3
May 2	09 03.61	+16 31.6	4.286	4.440	-0.36 +1.7	20.4	4.9/108	92.2
May 12	09 07.43	+16 14.3	4.396	4.398	-0.36 +1.7	20.4	6.8/107	83.5
May 22	09 12.49	+15 51.1	4.503	4.355	-0.35 +1.7	20.5	8.6/108	75.1
June 1	09 18.66	+15 22.4	4.604	4.312	-0.35 +1.7	20.5	10.2/108	67.1
June 11	09 25.80	+14 48.3	4.697	4.269	-0.35 +1.8	20.5	11.7/108	59.3
June 21	09 33.78	+14 09.0	4.778	4.226	-0.35 +1.8	20.5	12.9/109	51.8
July 1	09 42.49	+13 24.8	4.847	4.183	-0.35 +1.9	20.5	14.0/109	44.5
July 11	09 51.82	+12 35.9	4.902	4.140	-0.35 +2.0	20.5	15.0/110	37.4
July 21	10 01.67	+11 42.5	4.941	4.098	-0.36 +2.1	20.5	15.9/111	30.4
July 31	10 11.95	+10 45.0	4.965	4.055	-0.36 +2.1	20.5	16.6/111	23.6
Aug. 10	10 22.59	+09 43.7	4.972	4.013	-0.37 +2.2	20.5	17.2/112	16.8
Aug. 20	10 33.53	+08 39.0	4.962	3.970	-0.38 +2.4	20.5	17.7/112	10.1
Aug. 30	10 44.70	+07 31.1	4.935	3.928	-0.39 +2.5	20.4	18.1/112	3.5
Sept. 9	10 56.04	+06 20.6	4.891	3.886	-0.40 +2.6	20.4	18.5/113	3.2
Sept. 19	11 07.51	+05 07.9	4.830	3.844	-0.41 +2.7	20.3	18.7/113	9.8
Sept. 29	11 19.03	+03 53.5	4.752	3.802	-0.43 +2.8	20.3	18.8/113	16.5
Oct. 9	11 30.58	+02 38.0	4.659	3.761	-0.44 +3.0	20.2	18.9/114	23.2
Oct. 19	11 42.07	+01 22.0	4.549	3.720	-0.46 +3.1	20.1	18.8/114	30.0
Oct. 29	11 53.46	+00 06.1	4.426	3.679	-0.48 +3.3	20.1	18.6/114	36.8
Nov. 8	12 04.68	-01 09.0	4.290	3.639	-0.51 +3.4	20.0	18.2/114	43.7
Nov. 18	12 15.63	-02 22.6	4.141	3.599	-0.53 +3.6	19.9	17.7/114	50.8
Nov. 28	12 26.23	-03 33.8	3.982	3.559	-0.56 +3.7	19.8	17.0/114	58.0
Dec. 8	12 36.38	-04 41.8	3.815	3.520	-0.59 +3.9	19.6	16.1/114	65.4
Dec. 18	12 45.92	-05 45.8	3.641	3.482	-0.63 +4.1	19.5	15.0/114	72.9
Dec. 28	12 54.72	-06 44.8	3.463	3.444	-0.67 +4.3	19.4	13.6/114	80.7
Jan. 7	13 02.62	-07 37.8	3.282	3.406	-0.72 +4.5	19.2	11.9/114	88.8
Jan. 17	13 09.39	-08 23.8	3.103	3.370	-0.77 +4.8	19.1	10.0/115	97.1
Jan. 27	13 14.86	-09 01.8	2.928	3.334	-0.82 +5.1	18.9	7.7/116	105.8
Feb. 6	13 18.81	-09 30.7	2.760	3.298	-0.88 +5.4	18.8	5.1/118	114.9
Feb. 16	13 21.04	-09 49.5	2.603	3.264	-0.94 +5.7	18.6	2.2/125	124.3
Feb. 26	13 21.43	-09 57.5	2.461	3.231	-1.00 +6.1	18.5	1.0/259	134.3
Mar. 8	13 19.95	-09 54.3	2.336	3.198	-1.06 +6.5	18.4	3.8/284	144.7
Mar. 18	13 16.72	-09 40.1	2.234	3.166	-1.11 +6.8	18.2	6.4/288	155.5
Mar. 28	13 12.06	-09 16.5	2.157	3.136	-1.15 +7.1	18.2	8.3/290	166.5

Comet 68P/Klemola

Epoch = 2018 July 21.0 TT
 T = 2019 Nov. 9.03489 TT
 Peri. = 153.07939 e = 0.6381794
 Node = 175.20211 2000.0 a = 4.9471926 AU
 Incl. = 11.12746 n = 0.08957067
 q = 1.7899962 AU P = 11.00 years

$$m_1 = 10.5 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	'		°
Jan. 2	13 32.52	-06 00.6	5.447	5.324	+0.42	-1.1	21.4	77.7
Jan. 12	13 36.29	-06 08.7	5.239	5.278	+0.32	-0.4	21.3	86.9
Jan. 22	13 39.07	-06 09.8	5.030	5.232	+0.22	+0.3	21.2	96.4
Feb. 1	13 40.75	-06 03.4	4.823	5.186	+0.10	+1.1	21.1	106.2
Feb. 11	13 41.23	-05 49.1	4.624	5.138	-0.02	+1.9	20.9	116.3
Feb. 21	13 40.41	-05 26.7	4.438	5.091	-0.15	+2.7	20.8	126.7
Mar. 3	13 38.30	-04 56.5	4.269	5.042	-0.28	+3.4	20.7	137.3
Mar. 13	13 34.94	-04 19.3	4.122	4.994	-0.40	+4.1	20.6	148.2
Mar. 23	13 30.49	-03 36.6	4.001	4.945	-0.50	+4.5	20.5	159.1
Apr. 2	13 25.20	-02 50.2	3.909	4.895	-0.56	+4.7	20.4	169.5
Apr. 12	13 19.38	-02 02.8	3.848	4.845	-0.60	+4.7	20.3	173.6
Apr. 22	13 13.44	-01 17.1	3.818	4.794	-0.58	+4.4	20.2	164.7
May 2	13 07.79	+00 35.9	3.818	4.743	-0.53	+3.8	20.2	153.9
May 12	13 02.79	+00 01.4	3.845	4.692	-0.45	+3.0	20.1	143.0
May 22	12 58.77	+00 24.5	3.896	4.639	-0.34	+2.1	20.1	132.4
June 1	12 55.94	+00 41.0	3.966	4.587	-0.21	+1.1	20.1	122.2
June 11	12 54.42	+00 47.7	4.050	4.534	-0.08	+0.1	20.1	112.3
June 21	12 54.29	+00 44.7	4.144	4.480	+0.06	+0.8	20.1	102.8
July 1	12 55.51	+00 32.7	4.243	4.426	+0.20	-1.7	20.1	93.7
July 11	12 58.05	+00 12.5	4.343	4.371	+0.32	-2.4	20.1	84.9
July 21	13 01.82	+00 15.1	4.440	4.316	+0.44	-3.1	20.1	76.4
July 31	13 06.72	+00 49.1	4.530	4.260	+0.55	-3.7	20.1	68.3
Aug. 10	13 12.67	-01 28.5	4.611	4.204	+0.65	-4.2	20.1	60.4
Aug. 20	13 19.57	-02 12.5	4.681	4.147	+0.74	-4.6	20.0	52.7
Aug. 30	13 27.34	-03 00.2	4.738	4.090	+0.82	-4.9	20.0	45.3
Sept. 9	13 35.90	-03 50.7	4.779	4.033	+0.90	-5.2	20.0	38.0
Sept. 19	13 45.18	-04 43.2	4.804	3.974	+0.96	-5.3	19.9	30.8
Sept. 29	13 55.10	-05 37.0	4.811	3.916	+1.03	-5.4	19.8	23.9
Oct. 9	14 05.63	-06 31.2	4.800	3.856	+1.08	-5.4	19.8	17.1
Oct. 19	14 16.70	-07 25.0	4.770	3.797	+1.13	-5.3	19.7	10.9
Oct. 29	14 28.26	-08 17.7	4.722	3.737	+1.18	-5.2	19.6	6.4
Nov. 8	14 40.26	-09 08.5	4.656	3.676	+1.22	-4.9	19.5	7.7
Nov. 18	14 52.65	-09 56.7	4.571	3.615	+1.26	-4.6	19.4	13.2
Nov. 28	15 05.36	-10 41.4	4.468	3.554	+1.29	-4.3	19.3	19.5
Dec. 8	15 18.35	-11 21.9	4.349	3.492	+1.31	-3.8	19.1	26.2
Dec. 18	15 31.55	-11 57.4	4.214	3.430	+1.33	-3.3	19.0	32.9
Dec. 28	15 44.87	-12 27.3	4.065	3.367	+1.34	-2.7	18.8	39.7
Jan. 7	15 58.24	-12 50.9	3.903	3.304	+1.34	-2.0	18.6	46.5
Jan. 17	16 11.56	-13 07.5	3.731	3.241	+1.32	-1.3	18.5	53.3
Jan. 27	16 24.73	-13 16.5	3.549	3.177	+1.30	-0.5	18.3	60.2
Feb. 6	16 37.61	-13 17.6	3.360	3.113	+1.27	+0.4	18.1	67.2
Feb. 16	16 50.07	-13 10.3	3.166	3.049	+1.22	+1.2	17.8	74.2
Feb. 26	17 01.95	-12 54.3	2.970	2.985	+1.15	+2.1	17.6	81.3
Mar. 8	17 13.07	-12 29.4	2.773	2.921	+1.06	+3.0	17.4	88.5
Mar. 18	17 23.21	-11 55.7	2.578	2.857	+0.95	+3.8	17.1	95.9
Mar. 28	17 32.18	-11 13.5	2.387	2.793	+0.82	+4.7	16.9	103.4

Comet C/2017 T2 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2020 May 4.74498 TT
 Peri. = 93.00457
 Node = 64.37678 2000.0
 Incl. = 57.23850
 q = 1.6140239 AU
 e = 1.0000202

$$m1 = 4.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° ' .			m	' .		°
Jan. 2	02 56.70	-15 35.7	8.171	8.578	-0.26	+3.4	18.7	111.3
Jan. 12	02 54.46	-14 58.8	8.235	8.503	-0.18	+4.0	18.7	102.5
Jan. 22	02 53.03	-14 16.8	8.307	8.428	-0.10	+4.4	18.7	93.7
Feb. 1	02 52.43	-13 31.0	8.382	8.353	-0.02	+4.7	18.6	84.9
Feb. 11	02 52.64	-12 42.4	8.455	8.277	+0.07	+5.0	18.6	76.3
Feb. 21	02 53.64	-11 52.3	8.523	8.201	+0.14	+5.1	18.6	67.8
Mar. 3	02 55.38	-11 01.5	8.580	8.125	+0.21	+5.1	18.6	59.6
Mar. 13	02 57.78	-10 11.0	8.625	8.048	+0.27	+5.0	18.5	51.8
Mar. 23	03 00.78	-09 21.4	8.654	7.971	+0.33	+4.9	18.5	44.3
Apr. 2	03 04.29	-08 33.5	8.664	7.894	+0.38	+4.7	18.5	37.4
Apr. 12	03 08.24	-07 47.9	8.655	7.817	+0.42	+4.4	18.4	31.4
Apr. 22	03 12.55	-07 05.0	8.624	7.739	+0.45	+4.1	18.4	26.7
May 2	03 17.13	-06 25.3	8.571	7.661	+0.47	+3.8	18.3	24.0
May 12	03 21.90	-05 49.1	8.495	7.583	+0.49	+3.4	18.2	23.9
May 22	03 26.80	-05 16.8	8.397	7.504	+0.49	+3.0	18.2	26.4
June 1	03 31.72	-04 48.7	8.278	7.426	+0.49	+2.6	18.1	30.9
June 11	03 36.59	-04 24.9	8.137	7.346	+0.48	+2.1	18.0	36.6
June 21	03 41.33	-04 05.7	7.976	7.267	+0.46	+1.7	17.9	43.1
July 1	03 45.83	-03 51.2	7.798	7.187	+0.43	+1.2	17.8	50.0
July 11	03 50.02	-03 41.6	7.603	7.107	+0.40	+0.7	17.7	57.4
July 21	03 53.78	-03 36.9	7.395	7.027	+0.35	+0.2	17.6	65.0
July 31	03 57.01	-03 37.0	7.176	6.946	+0.29	-0.3	17.5	72.9
Aug. 10	03 59.61	-03 41.7	6.949	6.865	+0.22	-0.7	17.4	81.1
Aug. 20	04 01.45	-03 51.0	6.718	6.784	+0.14	-1.2	17.3	89.4
Aug. 30	04 02.44	-04 04.2	6.486	6.702	+0.05	-1.5	17.1	98.0
Sept. 9	04 02.46	-04 20.7	6.258	6.620	-0.05	-1.8	17.0	106.8
Sept. 19	04 01.43	-04 39.7	6.037	6.537	-0.16	-2.0	16.9	115.8
Sept. 29	03 59.29	-05 00.0	5.829	6.455	-0.28	-2.0	16.7	124.9
Oct. 9	03 56.01	-05 20.1	5.639	6.371	-0.39	-1.9	16.6	133.8
Oct. 19	03 51.65	-05 38.3	5.470	6.288	-0.49	-1.6	16.5	142.4
Oct. 29	03 46.32	-05 52.6	5.326	6.204	-0.58	-1.1	16.4	149.7
Nov. 8	03 40.20	-06 01.1	5.211	6.120	-0.65	-0.5	16.3	154.5
Nov. 18	03 33.56	-06 02.0	5.126	6.035	-0.68	+0.4	16.2	154.9
Nov. 28	03 26.75	-05 54.0	5.072	5.950	-0.68	+1.3	16.1	150.5
Dec. 8	03 20.08	-05 36.3	5.048	5.865	-0.64	+2.3	16.0	143.1
Dec. 18	03 13.93	-05 08.6	5.051	5.779	-0.58	+3.3	15.9	134.1
Dec. 28	03 08.59	-04 31.4	5.079	5.693	-0.48	+4.2	15.9	124.5
Jan. 7	03 04.27	-03 45.7	5.126	5.607	-0.37	+5.0	15.8	114.6
Jan. 17	03 01.15	-02 52.6	5.187	5.520	-0.24	+5.7	15.8	104.7
Jan. 27	02 59.29	-01 53.5	5.257	5.433	-0.12	+6.2	15.8	95.0
Feb. 6	02 58.70	+00 49.6	5.331	5.345	+0.01	+6.6	15.7	85.5
Feb. 16	02 59.36	+00 17.7	5.403	5.257	+0.13	+6.9	15.7	76.3
Feb. 26	03 01.20	+01 27.5	5.469	5.168	+0.24	+7.1	15.6	67.3
Mar. 8	03 04.12	+02 38.8	5.526	5.079	+0.35	+7.2	15.6	58.6
Mar. 18	03 08.04	+03 50.9	5.569	4.990	+0.44	+7.2	15.5	50.1

Comet C/2017 K2 (PANSTARRS)

Epoch = 2018 July 21.0 TT
 T = 2022 Dec. 20.91981 TT
 Peri. = 236.06555
 Node = 88.24928 2000.0
 Incl. = 87.54532
 q = 1.8069127 AU
 e = 1.0003212

$$m1 = -1.9 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2018/19	h m	° '			m	'		°
Jan. 2	17 46.55	+55 52.6	14.916	14.776	+0.47	+0.4	18.6	79.9
Jan. 12	17 51.14	+55 59.3	14.844	14.716	+0.45	+1.0	18.6	80.6
Jan. 22	17 55.48	+56 11.9	14.770	14.657	+0.42	+1.6	18.5	81.5
Feb. 1	17 59.45	+56 30.0	14.692	14.597	+0.37	+2.1	18.5	82.6
Feb. 11	18 02.96	+56 53.1	14.612	14.538	+0.32	+2.6	18.5	83.7
Feb. 21	18 05.89	+57 20.6	14.531	14.478	+0.26	+3.0	18.4	85.0
Mar. 3	18 08.16	+57 51.7	14.448	14.418	+0.19	+3.3	18.4	86.3
Mar. 13	18 09.66	+58 25.3	14.364	14.358	+0.10	+3.5	18.4	87.6
Mar. 23	18 10.31	+59 00.6	14.281	14.298	+0.02	+3.6	18.3	88.9
Apr. 2	18 10.04	+59 36.3	14.199	14.237	-0.08	+3.5	18.3	90.2
Apr. 12	18 08.81	+60 11.2	14.118	14.177	-0.18	+3.4	18.2	91.3
Apr. 22	18 06.60	+60 43.9	14.040	14.117	-0.27	+3.1	18.2	92.4
May 2	18 03.43	+61 13.2	13.964	14.056	-0.37	+2.7	18.2	93.2
May 12	17 59.37	+61 37.9	13.891	13.995	-0.45	+2.2	18.1	93.9
May 22	17 54.53	+61 56.6	13.822	13.935	-0.52	+1.5	18.1	94.3
June 1	17 49.07	+62 08.5	13.756	13.874	-0.57	+0.8	18.1	94.6
June 11	17 43.21	+62 12.7	13.695	13.813	-0.60	0.0	18.0	94.6
June 21	17 37.18	+62 08.9	13.638	13.752	-0.60	-0.8	18.0	94.3
July 1	17 31.24	+61 56.9	13.585	13.690	-0.58	-1.6	18.0	93.8
July 11	17 25.63	+61 36.9	13.535	13.629	-0.53	-2.4	17.9	93.1
July 21	17 20.56	+61 09.4	13.490	13.567	-0.47	-3.1	17.9	92.2
July 31	17 16.23	+60 35.4	13.448	13.506	-0.39	-3.7	17.9	91.1
Aug. 10	17 12.74	+59 55.7	13.409	13.444	-0.30	-4.2	17.8	89.8
Aug. 20	17 10.19	+59 11.6	13.372	13.382	-0.20	-4.6	17.8	88.4
Aug. 30	17 08.62	+58 24.3	13.337	13.320	-0.10	-4.9	17.8	86.9
Sept. 9	17 08.01	+57 35.1	13.303	13.258	-0.01	-5.0	17.8	85.3
Sept. 19	17 08.34	+56 45.3	13.269	13.196	+0.08	-5.0	17.7	83.7
Sept. 29	17 09.55	+55 56.0	13.235	13.134	+0.17	-4.8	17.7	82.0
Oct. 9	17 11.57	+55 08.5	13.199	13.071	+0.24	-4.6	17.7	80.5
Oct. 19	17 14.31	+54 23.9	13.161	13.009	+0.31	-4.3	17.6	79.1
Oct. 29	17 17.68	+53 43.0	13.120	12.946	+0.37	-3.8	17.6	77.8
Nov. 8	17 21.59	+53 06.7	13.075	12.883	+0.42	-3.3	17.6	76.7
Nov. 18	17 25.93	+52 35.8	13.026	12.820	+0.45	-2.8	17.5	75.8
Nov. 28	17 30.61	+52 10.9	12.972	12.757	+0.48	-2.1	17.5	75.3
Dec. 8	17 35.52	+51 52.4	12.913	12.694	+0.50	-1.5	17.5	75.0
Dec. 18	17 40.55	+51 40.7	12.849	12.631	+0.51	-0.8	17.4	75.0
Dec. 28	17 45.60	+51 36.1	12.779	12.567	+0.50	-0.1	17.4	75.4
Jan. 7	17 50.57	+51 38.4	12.703	12.504	+0.49	+0.6	17.3	76.1
Jan. 17	17 55.34	+51 47.6	12.622	12.440	+0.46	+1.3	17.3	77.1
Jan. 27	17 59.79	+52 03.5	12.536	12.376	+0.42	+1.9	17.2	78.4
Feb. 6	18 03.84	+52 25.5	12.446	12.312	+0.38	+2.5	17.2	79.9
Feb. 16	18 07.34	+52 53.1	12.353	12.248	+0.32	+3.0	17.2	81.6
Feb. 26	18 10.21	+53 25.5	12.256	12.183	+0.25	+3.5	17.1	83.5
Mar. 8	18 12.34	+54 01.8	12.158	12.119	+0.17	+3.8	17.1	85.4
Mar. 18	18 13.61	+54 40.9	12.059	12.054	+0.08	+4.0	17.0	87.4
Mar. 28	18 13.96	+55 21.4	11.960	11.990	-0.02	+4.1	17.0	89.3

Orbital elements:

Comet 95P/(2060) Chiron

Epoch 1996 Feb. 7.0 TT = JDT 2450120.5

T 1996 Feb. 14.74506 TT

		(2000.0)	P	Sato	Q
q	8.4539294				
n	0.01942785	Peri.	339.55382	-0.98660438	+0.15200978
a	13.7041742	Node	209.38436	-0.12782244	-0.94583865
e	0.3831128	Incl.	6.92994	-0.10135690	-0.28684886
P	50.73				

From 1991 observations 1941 Jan. 23–2018 Jan. 12, mean residual 0".43.

Comet 174P/(60558) Echeclus

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 22.53267 TT

		(2000.0)	P	Sato	Q
q	5.8170651				
n	0.02822877	Peri.	162.93187	+0.91553944	+0.40213218
a	10.6825462	Node	173.33665	-0.37731574	+0.86619941
e	0.4554608	Incl.	4.34369	-0.13935695	+0.29662820
P	34.92				

From 3230 observations 1979 Sept. 23–2018 Jan. 20, mean residual 0".41.

Comet C/2011 KP36 (Spacewatch)

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 May 26.89712 TT

		(2000.0)	P	Sato	Q
q	4.8833089				
n	0.00414023	Peri.	180.59783	+0.99445338	+0.09830700
a	38.4107622	Node	173.40038	-0.09509861	+0.99227936
e	0.8728661	Incl.	18.98676	-0.04493026	+0.07561352
P	238.06				

From 3247 observations 2011 May 21–2018 Jan. 25, mean residual 0".40.

Comet C/2014 R3 (PANSTARRS)

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 Aug. 7.88924 TT

		(2000.0)	P	Sato	Q
q	7.2754031				
z	+0.0000146	Peri.	113.40060	-0.36315954	-0.82312059
	+/-0.0000006	Node	334.11221	-0.21699872	+0.53038883
e	0.9998935	Incl.	90.83744	+0.90610524	-0.20287974

From 594 observations 2014 Sept. 6–2018 Jan. 26, mean residual 0".45.

Comet C/2014 OE4 (PANSTARRS)

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Dec. 10.75227 TT

		(2000.0)	P	Sato	Q
q	6.2442996				
z	+0.0000871	Peri.	65.74359	-0.08368027	+0.50406464
	+/-0.0000004	Node	240.40003	-0.74841322	+0.53775780
e	0.9994560	Incl.	81.34885	+0.65793257	+0.67582201

From 1352 observations 2014 May 8–2018 Jan. 18, mean residual 0".46.

Comet 103P/Hartley

Epoch 2017 May 7.0 TT = JDT 2457880.5

T 2017 Apr. 20.50993 TT

		(2000.0)	P	Sato	Q
q	1.0659805				
n	0.15200248	Peri.	181.30223	+0.75481297	-0.63850934
a	3.4772474	Node	219.72427	+0.60391802	+0.76585921
e	0.6934413	Incl.	13.59379	+0.25600860	+0.07593084
P	6.48				

From 5664 observations 2010 Mar. 13–2018 Jan. 15, mean residual 0".55.

Nongravitational parameters A1 = +0.19, A2 = +0.1053.

Comet C/2017 D3 (ATLAS)

Epoch 2017 May 7.0 TT = JDT 2457880.5

T 2017 Apr. 26.86440 TT

		(2000.0)	P	Sato	Q
q	4.9713506				
z	-0.0004242	Peri.	340.77176	-0.91588541	-0.39041436
+/-	-0.0000021	Node	186.60240	-0.16806332	+0.16152930
e	1.0021087	Incl.	125.64445	-0.36456637	+0.90635805

From 308 observations 2017 Feb. 10–2018 Jan. 27, mean residual 0".61.

Comet C/2015 ER61 (PANSTARRS)

Epoch 2017 May 7.0 TT = JDT 2457880.5

T 2017 May 9.94337 TT

		(2000.0)	P	Sato	Q
q	1.0421344				
z	+0.0025810	Peri.	68.19262	+0.54600339	+0.83284517
+/-	-0.0000016	Node	235.22106	-0.80369570	+0.49009116
e	0.9973102	Incl.	6.34871	-0.23654497	+0.25725394

From 2698 observations 2015 Jan. 21–2018 Jan. 22, mean residual 0".55.
Nongravitational parameters A1 = -0.00, A2 = -0.6272.

Comet 47P/Ashbrook–Jackson

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 10.16616 TT

		(2000.0)	P	Sato	Q
q	2.8182253				
n	0.11757362	Peri.	357.66696	+0.99568520	+0.09202918
a	4.1266355	Node	356.97455	-0.08106970	+0.80029000
e	0.3170646	Incl.	13.03028	-0.04515178	+0.59250869

P 8.38
From 2249 observations 1948 Oct. 7–2018 Jan. 18, mean residual 0".77.
Nongravitational parameters A1 = +0.11, A2 = -0.0062.

Comet C/2015 V2 (Johnson)

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 12.33950 TT

		(2000.0)	P	Sato	Q
q	1.6369840				
z	-0.0010442	Peri.	164.89554	-0.49024232	+0.49432179
+/-	-0.0000010	Node	69.84901	-0.85774655	-0.12743802
e	1.0017093	Incl.	49.87640	-0.15470399	-0.85988692

From 5783 observations 2015 Jan. 11–2018 Jan. 18, mean residual 0".45.
Nongravitational parameters A1 = +2.34, A2 = -0.9673.

Comet 90P/Gehrels

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 19.21682 TT

		(2000.0)	P	Sato	Q
q	2.9749622				
n	0.06593562	Peri.	29.25704	+0.73875875	-0.67287707
a	6.0681453	Node	13.25135	+0.58124547	+0.60727216
e	0.5097411	Incl.	9.63521	+0.34115864	+0.42244168

P 14.95
From 364 observations 1972 Dec. 2–2018 Jan. 14, mean residual 0".71.

Comet 352P/Skiff

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 21.60469 TT

		(2000.0)	P	Sato	Q
q	2.5360446				
n	0.05777500	Peri.	309.08488	+0.89777392	+0.40664102
a	6.6268846	Node	28.15669	-0.20240795	+0.72217037
e	0.6173097	Incl.	21.01825	-0.39119435	+0.55956505

P 17.06
From 388 observations 2017 June 5–2018 Jan. 14, mean residual 0".51.

Comet 71P/Clark

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 30.20550 TT

		(2000.0)	P	Sato	Q
q	1.5862132				
n	0.17738710	Peri.	208.91762	-0.03419701	+0.98937315
a	3.1370495	Node	59.44627	-0.88248549	+0.03647744
e	0.4943614	Incl.	9.44528	-0.46909479	-0.14074856
P	5.56				

From 1033 observations 2012 May 22–2018 Jan. 2, mean residual 0".74.

Nongravitational parameters A1 = +1.39, A2 = +0.2481.

Comet 217P/LINEAR

Epoch 2017 July 26.0 TT = JDT 2457960.5

T 2017 July 16.56440 TT

		(2000.0)	P	Sato	Q
q	1.2353817				
n	0.12522692	Peri.	246.95188	+0.95785935	-0.22283203
a	3.9567406	Node	125.45410	+0.26627603	+0.92548679
e	0.6877779	Incl.	12.85629	-0.10771508	+0.30630064
P	7.87				

From 2912 observations 2001 June 21–2018 Jan. 20, mean residual 0".56.

Nongravitational parameters A1 = +0.19, A2 = +0.0102.

Comet 30P/Reinmuth

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Aug. 19.17756 TT

		(2000.0)	P	Sato	Q
q	1.8766961				
n	0.13471063	Peri.	13.29198	-0.67994253	-0.72290638
a	3.7687859	Node	119.70415	+0.65916472	-0.67596926
e	0.5020423	Incl.	8.12884	+0.32121647	-0.14308017
P	7.32				

From 1586 observations 2009 Aug. 20–2018 Jan. 20, mean residual 0".65.

Nongravitational parameters A1 = -0.62, A2 = -0.7648.

Comet C/2015 VL62 (Lemmon–Yeung–PANSTARRS)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Aug. 28.59773 TT

		(2000.0)	P	Sato	Q
q	2.7202990				
z	-0.0006716	Peri.	128.36390	+0.80634737	-0.53708706
+/-	-0.0000004	Node	94.55068	-0.58984779	-0.69953978
e	1.0018269	Incl.	165.61388	-0.04339927	-0.47136142

From 2049 observations 2015 Nov. 2–2017 Nov. 19, mean residual 0".53.

Comet 145P/Shoemaker–Levy

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Aug. 31.89998 TT

		(2000.0)	P	Sato	Q
q	1.9041157				
n	0.11673101	Peri.	10.36722	+0.79833040	-0.59574539
a	4.1464703	Node	26.81020	+0.53760745	+0.63911549
e	0.5407864	Incl.	11.25976	+0.27137943	+0.48643480
P	8.44				

From 608 observations 1991 Sept. 17–2018 Jan. 18, mean residual 0".58.

Nongravitational parameters A1 = +0.01, A2 = -0.0189.

Comet C/2016 T3 (PANSTARRS)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Sept. 6.98036 TT

		(2000.0)	P	Sato	Q
q	2.6494861				
z	+0.0070386	Peri.	194.67813	-0.26320788	-0.88443822
+/-	-0.0000029	Node	271.74844	+0.91943932	-0.10900997
e	0.9813512	Incl.	22.67630	+0.29215227	-0.45374648

From 366 observations 2016 Oct. 10–2018 Jan. 25, mean residual 0".62.

Comet C/2014 B1 (Schwartz)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Sept. 10.53150 TT

		(2000.0)	P	Sato	Q
q	9.5566041				
z	-0.0003929	Peri.	345.84149	-0.85029158	-0.50400470
	+/-0.0000009	Node	161.39567	+0.51719435	-0.85353077
e	1.0037552	Incl.	28.37228	+0.09754088	+0.13215326

From 607 observations 2014 Jan. 28–2018 Jan. 20, mean residual 0".49.

Comet C/2016 N4 (MASTER)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Sept. 16.59973 TT

		(2000.0)	P	Sato	Q
q	3.1990996				
z	+0.0001945	Peri.	55.95582	+0.58262413	-0.80666482
	+/-0.0000005	Node	354.03141	-0.14120889	+0.01973130
e	0.9993778	Incl.	72.55731	+0.80038064	+0.59067973

From 1526 observations 2016 July 15–2018 Jan. 18, mean residual 0".48.

Comet 213P/Van Ness

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Sept. 24.37842 TT

		(2000.0)	P	Sato	Q
q	1.9833341				
n	0.16094332	Peri.	5.55855	+0.72867932	+0.67135863
a	3.3472444	Node	311.31689	-0.63507878	+0.58846417
e	0.4074726	Incl.	10.37751	-0.25632284	+0.45054135
P	6.12				

From 593 observations 2011 Nov. 7–2018 Jan. 13, mean residual 0".74.
Nongravitational parameters A1 = +0.83, A2 = -2.3521.

Comet 355P/LINEAR-NEAT

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Oct. 12.67908 TT

		(2000.0)	P	Sato	Q
q	1.7159715				
n	0.15204336	Peri.	336.33688	+0.87879608	-0.45311501
a	3.4766242	Node	51.46106	+0.46266330	+0.73220734
e	0.5064260	Incl.	11.03228	+0.11687657	+0.50848716
P	6.48				

From 754 observations 2004 July 16–2018 Jan. 12, mean residual 0".72.

Comet C/2017 01 (ASASSN)

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Oct. 14.78533 TT

		(2000.0)	P	Sato	Q
q	1.4986833				
z	+0.0023970	Peri.	20.90796	+0.72168422	-0.63351936
	+/-0.0000013	Node	25.80938	+0.50849164	+0.21172542
e	0.9964077	Incl.	39.84824	+0.46968942	+0.74419458

From 2736 observations 2017 July 19–2018 Jan. 28, mean residual 0".47.

Comet 65P/Gunn

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Oct. 16.78932 TT

		(2000.0)	P	Sato	Q
q	2.9100789				
n	0.12895644	Peri.	213.53755	+0.09055174	+0.98586436
a	3.8800800	Node	62.01784	-0.87504204	+0.14634682
e	0.2499951	Incl.	9.18538	-0.47550165	-0.08157255
P	7.64				

From 1446 observations 2014 Dec. 2–2017 Oct. 3, mean residual 0".56.

Comet C/2018 A1 (PANSTARRS)

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Oct. 20.41215 TT

		(2000.0)	P	Sato	Q
q	2.4190418				
n	0.00776180	Peri.	96.37367	+0.13231081	-0.93842979
a	25.2635575	Node	336.62694	+0.21961671	+0.34171205
e	0.9042478	Incl.	53.55491	+0.96657247	+0.05081743
P	126.98				

From 58 observations 2018 Jan. 6–28, mean residual 0".37.

Comet 96P/Machholz

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Oct. 27.96026 TT

		(2000.0)	P	Sato	Q
q	0.1239485				
n	0.18638464	Peri.	14.79279	-0.20613645	-0.49003502
a	3.0352605	Node	94.25448	+0.78919573	-0.59499117
e	0.9591638	Incl.	58.13772	+0.57851349	+0.63706451
P	5.29				

From 387 observations 2012 Apr. 20–2017 Oct. 2, mean residual 0".62.

Comet C/2017 W2 (Leonard)

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Nov. 1.88563 TT

		(2000.0)	P	Sato	Q
q	3.9572733				
n	0.01943208	Peri.	169.14922	-0.68705324	-0.02543903
a	13.7021866	Node	312.80913	+0.57023389	+0.60050445
e	0.7111940	Incl.	98.17784	+0.45032339	-0.79921665
P	50.72				

From 127 observations 2017 Nov. 26–2018 Jan. 24, mean residual 0".51.

Comet 183P/Korlevic-Juric

Epoch 2017 Nov. 23.0 TT = JDT 2458080.5

T 2017 Nov. 11.31489 TT

		(2000.0)	P	Sato	Q
q	3.8723586				
n	0.10364348	Peri.	161.25704	-0.97303525	-0.22832049
a	4.4885706	Node	5.84588	+0.14812424	-0.72735930
e	0.1372847	Incl.	18.75248	+0.17680951	-0.64716166
P	9.51				

From 248 observations 1954 Feb. 26–2018 Jan. 20, mean residual 0".81.

Comet 62P/Tsuchinshan

Epoch 2017 Nov. 23.0 TT = JDT 2458080.5

T 2017 Nov. 16.12046 TT

		(2000.0)	P	Sato	Q
q	1.3838111				
n	0.15463246	Peri.	30.34969	-0.50170934	-0.84844177
a	3.4377076	Node	90.24388	+0.75590430	-0.52478294
e	0.5974611	Incl.	9.70796	+0.42059057	-0.06891613
P	6.37				

From 1111 observations 2004 Sept. 14–2018 Jan. 28, mean residual 0".72.

Nongravitational parameters A1 = +0.57, A2 = -0.10312.

Comet 24P/Schaumasse

Epoch 2017 Nov. 23.0 TT = JDT 2458080.5

T 2017 Nov. 16.92608 TT

		(2000.0)	P	Sato	Q
q	1.2063362				
n	0.11944187	Peri.	58.05831	-0.72203593	-0.66229609
a	4.0834915	Node	79.62917	+0.54604064	-0.72309305
e	0.7045822	Incl.	11.73543	+0.42485730	-0.19621500
P	8.25				

From 602 observations 2000 Oct. 7–2018 Jan. 27, mean residual 0".72.

Nongravitational parameters A1 = -0.14, A2 = -0.2072.

Comet C/2016 A1 (PANSTARRS)

Epoch 2017 Nov. 23.0 TT = JDT 2458080.5

T 2017 Nov. 23.36710 TT

		(2000.0)	P	Sato	Q
q	5.3277957				
z	-0.0003764	Peri.	10.31968	-0.53513856	+0.51120416
+/-	-0.0000006	Node	128.17454	+0.70123462	-0.17511714
e	1.0020051	Incl.	121.18573	+0.47105915	+0.84142991

From 1208 observations 2016 Jan. 1–2018 Jan. 27, mean residual 0".48.

Comet 139P/Vaisala-Oterma

Epoch 2017 Nov. 23.0 TT = JDT 2458080.5

T 2017 Dec. 10.82876 TT

		(2000.0)	P	Sato	Q
q	3.4144098				
n	0.10221916	Peri.	166.06776	+0.66538155	-0.74563439
a	4.5301700	Node	242.20709	+0.68094586	+0.62600915
e	0.2462954	Incl.	2.33294	+0.30590869	+0.22834600
P	9.64				

From 443 observations 1939 Oct. 7–2018 Jan. 14, mean residual 0".68.

Comet C/2015 V1 (PANSTARRS)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2017 Dec. 17.73562 TT

		(2000.0)	P	Sato	Q
q	4.2667952				
z	-0.0001240	Peri.	179.63901	+0.95387916	+0.22988817
+/-	-0.0000004	Node	197.19414	+0.27375725	-0.40230190
e	1.0005290	Incl.	139.22915	+0.12317272	-0.88617414

From 1898 observations 2015 Nov. 2–2018 Jan. 28, mean residual 0".47.

Comet C/2017 K6 (Jacques)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2018 Jan. 3.13791 TT

		(2000.0)	P	Sato	Q
q	2.0027549				
z	+0.0008943	Peri.	303.83903	+0.49565904	-0.22851081
+/-	-0.0000016	Node	85.05433	+0.75134688	+0.59675753
e	0.9982090	Incl.	57.25099	-0.43566041	+0.76919650

From 238 observations 2017 May 29–2018 Jan. 25, mean residual 0".59.

Comet C/2017 K4 (ATLAS)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2018 Jan. 8.03142 TT

		(2000.0)	P	Sato	Q
q	2.6480834				
n	0.00661547	Peri.	15.10804	+0.68513485	+0.68370616
a	28.1036218	Node	298.89806	-0.69453125	+0.50917933
e	0.9057743	Incl.	16.67885	-0.21958272	+0.52276409

P 148.99

From 238 observations 2017 May 26–Nov. 12, mean residual 0".40.

Comet P/1998 VS24 (LINEAR)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2018 Jan. 19.18924 TT

		(2000.0)	P	Sato	Q
q	3.4386887				
n	0.10207450	Peri.	244.94979	+0.71806206	-0.69527502
a	4.5344492	Node	159.05304	+0.66593645	+0.67330158
e	0.2416524	Incl.	5.02236	+0.20227587	+0.25151070

P 9.66

From 47 observations 1998 Oct. 14–1999 Jan. 14, mean residual 0".66.

From CHB 2017.

Comet 130P/McNaught-Hughes

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2018 Jan. 21.75932 TT

		(2000.0)	P	Sato	Q
q	1.8236358				
n	0.15847039	Peri.	245.90865	+0.71652829	+0.69043226
a	3.3819769	Node	70.25643	-0.59547946	+0.67967947
e	0.4607781	Incl.	6.06534	-0.36330623	+0.24766732

P 6.22

From 842 observations 1991 Sept. 14–2017 Sept. 15, mean residual 0".61.

Comet 74P/Smirnova-Chernykh

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 26.70598 TT

		(2000.0)	P	Sato	Q
q	3.5364746				
n	0.11627488	Peri.	87.13503	-0.95561723	-0.27210872
a	4.1573071	Node	77.05564	+0.20253977	-0.88515002
e	0.1493352	Incl.	6.65391	+0.21394708	-0.37744708
P	8.48				

From 4171 observations 1981 Sept. 26–2018 Jan. 23, mean residual 0".65.

Nongravitational parameters Y1 = +0.04, Y2 = -0.0161.

Comet C/2016 Q4 (Kowalski)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 27.10627 TT

		(2000.0)	P	Sato	Q
q	7.0852552				
n	0.01428967	Peri.	99.43466	+0.97461446	-0.18488107
a	16.8185266	Node	271.29607	+0.12110235	+0.90970127
e	0.5787232	Incl.	7.25632	+0.18831057	+0.37183678
P	68.97				

From 78 observations 2016 July 11–Nov. 19, mean residual 0".68.

Comet 185P/Petriew

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 27.67077 TT

		(2000.0)	P	Sato	Q
q	0.9338181				
n	0.18042884	Peri.	181.91853	+0.80939107	-0.57140699
a	3.1016926	Node	214.09930	+0.54197888	+0.81569255
e	0.6989327	Incl.	13.99421	+0.22615259	+0.09022043
P	5.46				

From 886 observations 2001 Aug. 19–2018 Jan. 13, mean residual 0".70.

Nongravitational parameters A1 = +0.06, A2 = +0.0200.

Comet 197P/LINEAR

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 28.83849 TT

		(2000.0)	P	Sato	Q
q	1.0599022				
n	0.20318032	Peri.	188.68352	-0.27105380	+0.87764913
a	2.8655959	Node	66.39361	-0.85520362	-0.03109971
e	0.6301285	Incl.	25.55645	-0.44176533	-0.47829364
P	4.85				

From 304 observations 2003 May 23–2013 Sept. 25, mean residual 0".73.

Nongravitational parameters A1 = +0.03, A2 = +0.0197.

From CHB 2017.

Comet 350P/McNaught

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 29.26028 TT

		(2000.0)	P	Sato	Q
q	3.7508609				
n	0.11768081	Peri.	146.70037	-0.84187163	+0.52692294
a	4.1241293	Node	65.52125	-0.51890635	-0.73095431
e	0.0905084	Incl.	7.36312	-0.14828472	-0.43365655
P	8.38				

From 125 observations 2005 Nov. 1–2017 Apr. 20, mean residual 0".62.

Comet 250P/Larson

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 2.22167 TT

		(2000.0)	P	Sato	Q
q	2.2130566				
n	0.13676449	Peri.	45.09438	-0.46315324	-0.85837677
a	3.7309590	Node	73.67986	+0.73453415	-0.51106984
e	0.4068397	Incl.	13.29089	+0.49593210	-0.04468703
P	7.21				

From 348 observations 1995 Dec. 22–2018 Jan. 25, mean residual 0".64.

Comet 245P/WISE

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 8.65073 TT

		(2000.0)	P	Sato	Q
q	2.1901384				
n	0.12141777	Peri.	316.67891	+0.09044538	+0.96449966
a	4.0390685	Node	316.67978	-0.78621493	-0.08377123
e	0.4577615	Incl.	21.20102	-0.61129838	+0.25044518
P	8.12				

From 75 observations 2002 Aug. 27–2010 Oct. 11, mean residual 0".50.
From CHB 2017.

Comet P/2017 Y3 (Leonard)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 11.23826 TT

		(2000.0)	P	Sato	Q
q	1.2756331				
n	0.03144556	Peri.	67.50936	-0.70397792	+0.68033423
a	9.9409947	Node	153.88128	-0.69029326	-0.72295119
e	0.8716795	Incl.	27.58616	+0.16706379	-0.12036159
P	31.34				

From 62 observations 2017 Dec. 26–2018 Jan. 20, mean residual 0".48.

Comet C/2015 01 (PANSTARRS)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 19.04553 TT

		(2000.0)	P	Sato	Q
q	3.7295494				
z	-0.0000198	Peri.	89.59782	-0.52098364	-0.50148458
+/-	-0.0000005	Node	299.85556	-0.59857834	+0.79153456
e	1.0000737	Incl.	127.21097	+0.60850638	+0.34926532

From 1809 observations 2015 June 15–2018 Jan. 24, mean residual 0".46.

Comet C/2017 T1 (Heinze)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 21.71232 TT

		(2000.0)	P	Sato	Q
q	0.5806514				
z	-0.0001042	Peri.	96.92074	+0.14111479	+0.19773960
+/-	-0.0000152	Node	102.31596	-0.47696337	-0.84505228
e	1.0000605	Incl.	96.83430	+0.86752093	-0.49677530

From 894 observations 2017 Sept. 28–2018 Jan. 28, mean residual 0".66.

Nongravitational parameters A1 = +4.52, A2 = -2.1690..

Comet C/2017 S6 (Catalina)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 26.93275 TT

		(2000.0)	P	Sato	Q
q	1.5429344				
z	-0.0008887	Peri.	134.68662	+0.93845397	-0.00779193
+/-	-0.0000221	Node	130.87477	-0.23725988	-0.74110456
e	1.0013713	Incl.	152.82678	+0.25102169	-0.67134441

From 242 observations 2017 Sept. 30–2018 Jan. 19, mean residual 0".70.

Comet P/2017 W3 (Gibbs)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 27.80827 TT

		(2000.0)	P	Sato	Q
q	3.8330150				
n	0.04643636	Peri.	326.94464	-0.98502253	-0.06287276
a	7.6659139	Node	210.69638	+0.08416537	-0.98800556
e	0.4999924	Incl.	18.33128	-0.15048853	-0.14103909
P	21.22				

From 80 observations 2017 Nov. 27–2018 Jan. 23, mean residual 0".54.

Comet P/2006 F1 (Kowalski) [Orbit 1]

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Mar. 14.86435 TT

		(2000.0)	P	Sato	Q
q	4.1082280				
n	0.09767040	Peri.	186.15153	+0.64872449	+0.70016185
a	4.6697547	Node	124.74751	-0.68184291	+0.70878582
e	0.1202476	Incl.	21.28039	-0.33800412	-0.08600028
P	10.09				

From 216 observations 2005 May 10–2009 Dec. 16, mean residual 0".71.

Comet C/2017 K1 (PANSTARRS)

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Mar. 18.77436 TT

		(2000.0)	P	Sato Q
q	7.2763523			
z	+0.0001672	Peri. 4.49920	-0.74723039	-0.58591271
	+/-0.0003235	Node 225.65591	-0.62259270	+0.45213613
e	0.9987837	Incl. 153.99024	-0.23243295	+0.67251708

From 34 observations 2017 May 21-July 15, mean residual 0".42.

Comet 235P/LINEAR

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Mar. 17.64563 TT

		(2000.0)	P	Sato Q
q	2.7322584			
n	0.12360225	Peri. 333.79016	-0.99732947	-0.03502344
a	3.9913375	Node 204.45938	+0.05077345	-0.96326305
e	0.3154529	Incl. 8.90428	-0.05249743	-0.26626612
P	7.97			

From 137 observations 2002 Jan. 12-2018 Jan. 15, mean residual 0".79.

Comet 363P/Lemmon

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Mar. 22.92012 TT

		(2000.0)	P	Sato Q
q	1.5078623			
n	0.15691737	Peri. 315.27983	-0.57669086	-0.81687230
a	3.4042546	Node 169.91752	+0.76761532	-0.54688208
e	0.5570654	Incl. 3.97536	+0.27963259	-0.18341112
P	6.28			

From 95 observations 2011 Nov. 3-2018 Jan. 14, mean residual 0".62.

Comet 358P/PANSTARRS

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Apr. 11.62436 TT

		(2000.0)	P	Sato Q
q	2.4019772			
n	0.17625636	Peri. 299.89671	+0.88564686	-0.42315046
a	3.1504519	Node 85.72175	+0.46393147	+0.78863128
e	0.2375769	Incl. 11.05644	+0.01993057	+0.44609907
P	5.59			

From 182 observations 2001 Dec. 9-2017 Aug. 17, mean residual 0".44.

Comet 169P/NEAT

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 Apr. 29.60177 TT

		(2000.0)	P	Sato Q
q	0.6036373			
n	0.23477228	Peri. 218.08852	+0.82651013	-0.56276309
a	2.6023848	Node 176.08649	+0.55249553	+0.80642343
e	0.7680445	Incl. 11.29554	+0.10784105	+0.18160110
P	4.20			

From 1160 observations 1989 Mar. 7-2017 May 27, mean residual 0".47.

Comet C/2015 XY1 (Lemmon)

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 Apr. 29.90005 TT

		(2000.0)	P	Sato Q
q	7.9280360			
z	-0.0005259	Peri. 196.35081	+0.04276967	+0.86105027
	+/-0.0000012	Node 281.61656	+0.96478143	+0.09616605
e	1.0041691	Incl. 148.84774	+0.25955261	-0.49934409

From 376 observations 2015 Dec. 4-2018 Jan. 24, mean residual 0".48.

Comet 37P/Forbes

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 May 4.12311 TT

		(2000.0)	P	Sato Q
q	1.6102865			
n	0.15337303	Peri. 329.97973	+0.25591612	+0.96032030
a	3.4565012	Node 314.59082	-0.85306255	+0.17039265
e	0.5341282	Incl. 8.95648	-0.45474304	+0.22079691
P	6.43			

From 617 observations 1987 Sept. 1-2018 Jan. 14, mean residual 0".86.

Nongravitational parameters A1 = +0.58, A2 = -0.0347.

Comet 143P/Kowal-Mrkos

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 May 7.30255 TT

		(2000.0)	P	Sato	Q
q	2.5322562				
n	0.11065434	Peri.	320.86807	-0.89555476	+0.43869054
a	4.2969182	Node	245.30322	-0.38492120	-0.84768371
e	0.4106808	Incl.	4.69592	-0.22319798	-0.29830008
P	8.91				

From 516 observations 1984 Apr. 23–2018 Jan. 18, mean residual 0".51.

Comet 253P/PANSTARRS

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 May 7.74775 TT

		(2000.0)	P	Sato	Q
q	2.0367554				
n	0.15252082	Peri.	230.72953	+0.95155223	-0.30386595
a	3.4693647	Node	146.88317	+0.30192276	+0.89435043
e	0.4129313	Incl.	4.94041	+0.05823219	+0.32833335
P	6.46				

From 339 observations 1998 Sept. 14–2012 Feb. 23, mean residual 0".58.
From CHB 2017.

Comet C/2016 R2 (PANSTARRS)

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 May 9.58543 TT

		(2000.0)	P	Sato	Q
q	2.6023392				
z	+0.0014051	Peri.	33.19313	-0.14727627	-0.52443185
	+/-0.0000005	Node	80.56888	+0.61561464	-0.71222355
e	0.9963435	Incl.	58.22354	+0.77416297	+0.46659281

From 1818 observations 2016 Aug. 30–2018 Jan. 28, mean residual 0".46.

Comet 240P/NEAT

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 May 15.87890 TT

		(2000.0)	P	Sato	Q
q	2.1337777				
n	0.12934582	Peri.	352.09915	+0.37930841	-0.84132817
a	3.8722893	Node	74.92641	+0.86923376	+0.18137298
e	0.4489622	Incl.	23.50375	+0.31710851	+0.50918637
P	7.62				

From 1899 observations 2002 Oct. 5–2018 Jan. 13, mean residual 0".74.

Nongravitational parameters A1 = +1.87, A2 = +0.1285.

Comet 66P/du Toit

Epoch 2018 May 2.0 TT = JDT 2458240.5

T 2018 May 19.15696 TT

		(2000.0)	P	Sato	Q
q	1.2901124				
n	0.06617234	Peri.	257.21055	+0.13912686	+0.98304864
a	6.0536650	Node	21.89620	-0.73799952	+0.18333146
e	0.7868874	Incl.	18.67509	-0.66030328	+0.00222617
P	14.89				

From 117 observations 1974 Mar. 22–2018 Jan. 23, mean residual 0".90.

Nongravitational parameters A1 = +0.32, A2 = -0.0126.

Comet 159P/LONEOS

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 May 22.79970 TT

		(2000.0)	P	Sato	Q
q	3.6252082				
n	0.06943706	Peri.	4.76219	+0.50884977	-0.79664103
a	5.8623962	Node	55.02420	+0.77608848	+0.26053698
e	0.3816166	Incl.	23.46272	+0.37250313	+0.54542053
P	14.19				

From 245 observations 1989 Dec. 17–2018 Jan. 14, mean residual 0".60.

Comet 107P/(4015) Wilson-Harrington
Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 May 23.52707 TT				Sato	
q	(2000.0)	P		Q	
n	0.23149236	Peri.	95.40719	+0.99806245	-0.03867425
a	2.6269085	Node	266.81566	+0.01631487	+0.91861576
e	0.6307896	Incl.	2.79806	+0.06004305	+0.39325486
P	4.26				

From 854 observations 1949 Nov. 21–2017 May 15, mean residual 0".46.

Comet 187P/LINEAR
Epoch 2018 May 22.0 TT = JDT 2458260.5

T 2018 May 26.77592 TT				Sato	
q	(2000.0)	P		Q	
n	0.09992816	Peri.	133.26522	-0.43081100	+0.87497229
a	4.5991489	Node	109.99129	-0.88104312	-0.35478781
e	0.1562166	Incl.	13.59944	-0.19535841	-0.32946790
P	9.86				

From 173 observations 1999 May 12–2018 Jan. 20, mean residual 0".73.

Comet 357P/Hill
Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 May 28.96047 TT				Sato	
q	(2000.0)	P		Q	
n	0.10442534	Peri.	1.52550	+0.69307858	-0.71671972
a	4.4661376	Node	44.60919	+0.66020891	+0.58813539
e	0.4342962	Incl.	6.30865	+0.28942403	+0.37471269
P	9.44				

From 269 observations 2008 Sept. 28–2017 Aug. 18, mean residual 0".60.

Comet 164P/Christensen
Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 May 31.40969 TT				Sato	
q	(2000.0)	P		Q	
n	0.14067386	Peri.	325.93113	+0.56205749	-0.77835074
a	3.6615118	Node	88.30580	+0.80745414	+0.44309043
e	0.5397381	Incl.	16.25274	+0.17919036	+0.44479321
P	7.01				

From 908 observations 1998 Jan. 24–2017 Aug. 14, mean residual 0".67.
Nongravitational parameters A1 = -0.19, A2 = +0.0320.

Comet C/2017 M5 (TOTAS)
Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 2.76834 TT				Sato	
q	(2000.0)	P		Q	
z	-0.0005877	Peri.	92.63519	+0.60541444	+0.77926788
	+/-0.0000467	Node	216.26608	-0.79455280	+0.57986753
e	1.0035202	Incl.	15.88525	-0.04646720	+0.23768722

From 120 observations 2017 June 23–Oct. 26, mean residual 0".55.

Comet P/2001 T3 (NEAT)
Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 10.93847 TT				Sato	
q	(2000.0)	P		Q	
n	0.06021593	Peri.	356.78276	+0.61378810	-0.74091424
a	6.4465659	Node	55.16332	+0.73153767	+0.40393408
e	0.6144699	Incl.	19.39753	+0.29684474	+0.53654762
P	16.37				

From 146 observations 2001 Aug. 20–2002 Feb. 7, mean residual 0".61.
From CHB 2015.

Comet C/2017 X1 (PANSTARRS)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 14.59295 TT

		(2000.0)	P	Sato	Q
q	4.6624784				
n	0.00561868	Peri.	283.12601	-0.86076372	-0.13142660
a	31.3362240	Node	251.12730	+0.25109189	-0.94999983
e	0.8512112	Incl.	31.31100	-0.44276257	-0.28324435
P	175.42				

From 47 observations 2017 Dec. 12–2018 Jan. 14, mean residual 0".28.

Comet P/2017 P1 (PANSTARRS)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 17.74780 TT

		(2000.0)	P	Sato	Q
q	5.4379378				
n	0.04463140	Peri.	122.21454	+0.95426121	+0.28554532
a	7.8712263	Node	221.38398	-0.29891367	+0.90525424
e	0.3091372	Incl.	7.70161	-0.00601369	+0.31460868
P	22.08				

From 41 observations 2017 June 25–Aug. 24, mean residual 0".34.

Comet P/2002 EJ57 (LINEAR)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 18.54027 TT

		(2000.0)	P	Sato	Q
q	2.6272067				
n	0.06000513	Peri.	167.02121	-0.73714434	-0.67437798
a	6.4616554	Node	330.43210	+0.61196707	-0.63937510
e	0.5934158	Incl.	4.97681	+0.28655633	-0.36934241
P	16.43				

From 57 observations 2002 Feb. 16–May 12, mean residual 0".59.

From CHB 2017.

Comet P/2011 CR42 (Catalina)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 22.57823 TT

		(2000.0)	P	Sato	Q
q	2.5216698				
n	0.14989969	Peri.	173.11830	-0.61674849	+0.77704196
a	3.5096911	Node	58.72138	-0.72903995	-0.50359601
e	0.2815123	Incl.	8.46476	-0.29685358	-0.37761998
P	6.58				

From 119 observations 2011 Feb. 10–2013 Oct. 30, mean residual 0".59.

From CHB 2017.

Comet P/2013 CU129 = 2018 A2 (PANSTARRS)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 24.36587 TT

		(2000.0)	P	Sato	Q
q	0.7978525				
n	0.20191332	Peri.	211.92768	-0.21380826	+0.96497017
a	2.8775711	Node	46.22839	-0.84612897	-0.10514703
e	0.7227341	Incl.	12.15533	-0.48821286	-0.24036778
P	4.88				

From 172 observations 2013 Feb. 1–2018 Jan. 22, mean residual 0".62.

Comet 82P/Gehrels

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 28.61291 TT

		(2000.0)	P	Sato	Q
q	3.6342261				
n	0.11693154	Peri.	227.19618	-0.28403299	-0.95866498
a	4.1417284	Node	239.31218	+0.88534169	-0.25544711
e	0.1225339	Incl.	1.12824	+0.36809693	-0.12533248
P	8.43				

From 107 observations 1975 Oct. 27–2011 Mar. 23, mean residual 0".70.

From CHB 2017.

Comet 361P/Spacewatch

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 2.49492 TT

		(2000.0)	P	Sato	Q
q	2.7804465				
n	0.08960821	Peri.	219.20686	+0.46929271	-0.87793760
a	4.9458111	Node	203.27715	+0.85846551	+0.47874971
e	0.4378179	Incl.	13.88239	+0.20688480	+0.00492832
P	11.00				

From 156 observations 2006 Oct. 11–2018 Jan. 14, mean residual 0".47.

Comet 49P/Arend-Rigaux

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 15.49727 TT

		(2000.0)	P	Sato	Q
q	1.4296062				
n	0.14618304	Peri.	332.88793	-0.05172829	-0.95687555
a	3.5689302	Node	118.82418	+0.96518826	-0.12138974
e	0.5994300	Incl.	19.04318	+0.25638995	+0.26391989
P	6.74				

From 2915 observations 1951 Apr. 6–2017 Dec. 17, mean residual 0".62.

Nongravitational parameters A1 = +0.01, A2 = -0.0010.

Comet C/2016 N6 (PANSTARRS)

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 18.21093 TT

		(2000.0)	P	Sato	Q
q	2.6690896				
z	+0.0004663	Peri.	162.80546	-0.53334923	+0.08479255
	+/-0.0000006	Node	298.97617	+0.61778458	+0.71869718
e	0.9987554	Incl.	105.83223	+0.57782421	-0.69013375

From 1315 observations 2016 June 27–2018 Jan. 25, mean residual 0".41.

Comet C/2017 T3 (ATLAS)

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 19.14844 TT

		(2000.0)	P	Sato	Q
q	0.8253147				
z	+0.0007651	Peri.	246.88851	+0.22854455	-0.60006752
	+/-0.0000103	Node	230.08754	+0.65976811	-0.48356894
e	0.9993685	Incl.	88.10700	-0.71587250	-0.63724411

From 381 observations 2017 Sept. 11–2018 Jan. 28, mean residual 0".52.

Comet P/2007 T2 (Kowalski)

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 21.73455 TT

		(2000.0)	P	Sato	Q
q	0.6565317				
n	0.18520875	Peri.	359.62718	+0.99859181	-0.05208930
a	3.0480942	Node	3.40781	+0.04910060	+0.83571274
e	0.7846091	Incl.	9.73871	+0.02008806	+0.54669088
P	5.32				

From 114 observations 2007 Oct. 9–2008 Jan. 18, mean residual 0".77.

From CHB 2017.

Comet 267P/LONEOS

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 22.31835 TT

		(2000.0)	P	Sato	Q
q	1.2411189				
n	0.17120990	Peri.	114.07985	+0.95118568	+0.29798555
a	3.2120587	Node	228.68892	-0.30744508	+0.89223950
e	0.6136064	Incl.	6.13803	-0.02689475	+0.33928348
P	5.76				

From 189 observations 2006 Aug. 29–2012 Nov. 12, mean residual 0".52.

From CHB 2017.

Comet P/2005 JN (Spacewatch)

Epoch 2018 July 21.0 TT = JDT 2458320.5

T 2018 July 23.42123 TT

			P	Sato	Q
q	2.2770971	(2000.0)			
n	0.15052055	Peri.	153.41719	-0.71208789	+0.68687378
a	3.5000334	Node	70.76507	-0.66845360	-0.59995394
e	0.3494070	Incl.	8.85737	-0.21471055	-0.41019468
P	6.55				

From 27 observations 2005 Apr. 4–May 25, mean residual 0".60.

From CHB 2016.

Comet C/2016 M1 (PANSTARRS)

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Aug. 10.17237 TT

			P	Sato	Q
q	2.2104861	(2000.0)			
z	+0.0004090	Peri.	209.82607	+0.02467834	-0.03424775
	+/-0.0000006	Node	92.20318	-0.59785759	+0.80049041
e	0.9990960	Incl.	90.99986	-0.80122237	-0.59836627

From 2096 observations 2016 June 22–2018 Jan. 26, mean residual 0".43.

Comet 105P/Singer Brewster

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Aug. 10.31746 TT

			P	Sato	Q
q	2.0445318	(2000.0)			
n	0.15259431	Peri.	46.47479	-0.51846711	+0.85440857
a	3.4682508	Node	192.42942	-0.82332118	-0.50963771
e	0.4105006	Incl.	9.17504	-0.23094173	-0.10126895
P	6.46				

From 303 observations 1986 May 3–2012 Nov. 6, mean residual 0".71.

Nongravitational parameters A1 = +0.19, A2 = -0.1260.

From CHB 2017.

Comet 48P/Johnson

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Aug. 12.19890 TT

			P	Sato	Q
q	2.0045329	(2000.0)			
n	0.15063714	Peri.	216.56129	+0.82311275	+0.53204677
a	3.4982271	Node	110.13357	-0.45793927	+0.82861482
e	0.4269861	Incl.	12.20701	-0.33582292	+0.17413705
P	6.54				

From 1234 observations 1956 Sept. 3–2017 May 3, mean residual 0".66.

Nongravitational parameters A1 = +0.14, A2 = +0.4118.

Comet 243P/NEAT

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Aug. 26.03778 TT

			P	Sato	Q
q	2.4544592	(2000.0)			
n	0.13144830	Peri.	283.55976	+0.97226719	-0.19246841
a	3.8308875	Node	87.65861	+0.23023800	+0.88747211
e	0.3592975	Incl.	7.64145	-0.04107271	+0.41874714
P	7.50				

From 337 observations 2003 Aug. 1–2012 Jan. 26, mean residual 0".69.

From CHB 2017.

Comet 125P/Spacewatch

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Aug. 27.95396 TT

			P	Sato	Q
q	1.5201719	(2000.0)			
n	0.17840963	Peri.	87.17858	-0.48776602	+0.86945890
a	3.1250515	Node	153.17822	-0.85392073	-0.45656951
e	0.5135530	Incl.	9.98876	-0.18139375	-0.18864120
P	5.52				

From 462 observations 1991 Sept. 8–2013 Sept. 14, mean residual 0".63.

Nongravitational parameters A1 = +0.05, A2 = +0.0225.

From CHB 2017.

Comet 21P/Giacobini-Zinner

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Sept. 10.50756 TT

			P	Sato	Q
q	1.0127723	(2000.0)			
n	0.15064106	Peri.	172.86304	+0.98462546	-0.10358323
a	3.4981665	Node	195.39313	+0.12225975	+0.98376451
e	0.7104848	Incl.	31.99767	+0.12476082	-0.14655341
P	6.54				

From 772 observations 2005 Mar. 5–2013 Apr. 1, mean residual 0".73.

Nongravitational parameters A1 = +0.52, A2 = +0.1554.

Comet 79P/du Toit-Hartley

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Sept. 13.34197 TT

			P	Sato	Q
q	1.1209307	(2000.0)			
n	0.19512843	Peri.	281.85020	-0.92325620	+0.38037285
a	2.9438952	Node	280.52545	-0.32764088	-0.85294014
e	0.6192355	Incl.	3.14769	-0.20062262	-0.35750472
P	5.05				

From 201 observations 1986 Dec. 27–2013 Apr. 4, mean residual 0".74.

Nongravitational parameters A1 = -0.13, A2 = +0.0007.

Comet P/2005 R1 (NEAT)

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Sept. 14.32838 TT

			P	Sato	Q
q	2.0677858	(2000.0)			
n	0.07589049	Peri.	118.80130	+0.92631227	-0.27159090
a	5.5251553	Node	257.97849	+0.17788997	+0.92623813
e	0.6257506	Incl.	15.48437	+0.33211554	+0.26138346
P	12.99				

From 355 observations 2005 July 5–2006 Jan. 28, mean residual 0".59.

From CHB 2015.

Comet 59P/Kearns-Kwee

Epoch 2018 Aug. 30.0 TT = JDT 2458360.5

T 2018 Sept. 16.76186 TT

			P	Sato	Q
q	2.3587636	(2000.0)			
n	0.10342086	Peri.	127.70151	+0.15684656	-0.98042551
a	4.4950096	Node	312.82807	+0.84736220	+0.19549348
e	0.4752484	Incl.	9.33934	+0.50732283	-0.02341194
P	9.53				

From 946 observations 1989 Sept. 10–2017 Dec. 19, mean residual 0".73.

Nongravitational parameters A1 = +1.62, A2 = -0.1885.

Comet 133P/(7968) Elst-Pizarro

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Sept. 20.75208 TT

			P	Sato	Q
q	2.6648023	(2000.0)			
n	0.17525514	Peri.	131.49049	+0.36862836	+0.92954035
a	3.1624394	Node	160.13595	-0.85993117	+0.34436223
e	0.1573586	Incl.	1.38923	-0.35303188	+0.13179298
P	5.62				

From 734 observations 1979 July 24–2017 Apr. 22, mean residual 0".42.

Comet P/2011 V1 (Boattini)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Sept. 30.85326 TT

			P	Sato	Q
q	1.7319792	(2000.0)			
n	0.13045836	Peri.	269.24625	+0.71375370	+0.69410605
a	3.8502427	Node	46.79139	-0.58058416	+0.66114095
e	0.5501636	Incl.	7.38309	-0.39176228	+0.28479719
P	7.55				

From 25 observations 2011 Oct. 22–Nov. 20, mean residual 0".40.

From CHB 2017.

Comet 26P/Grigg-Skjellerup

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 1.82059 TT

		(2000.0)	P	Sato	Q
q	1.0822949				
n	0.18832324	Peri.	2.20046	-0.83314312	+0.51573673
a	3.0143946	Node	211.53390	-0.51307426	-0.85556569
e	0.6409578	Incl.	22.44969	-0.20646391	+0.04497745
P	5.23				

From 533 observations 1972 Feb. 12–2014 Sept. 30, mean residual 0".72.

Nongravitational parameters A1 = +0.02, A2 = +0.0029.

From CHB 2017.

Comet P/2001 R6 (LINEAR-Skiff)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 4.24891 TT

		(2000.0)	P	Sato	Q
q	2.1910765				
n	0.11529116	Peri.	308.47544	+0.92918791	-0.24624704
a	4.1809218	Node	67.33511	+0.35562777	+0.79880548
e	0.4759346	Incl.	17.37940	-0.10069117	+0.54888269
P	8.55				

From 99 observations 2001 Aug. 19–2002 Feb. 1, mean residual 0".69.

From CHB 2015

Comet P/2005 J1 (McNaught)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 12.55253 TT

		(2000.0)	P	Sato	Q
q	1.5334417				
n	0.14616381	Peri.	338.92433	-0.32526988	+0.78557929
a	3.5692433	Node	268.79575	-0.77471511	-0.54056597
e	0.5703735	Incl.	31.76831	-0.54223243	+0.30108738
P	6.74				

From 94 observations 2005 May 3–Aug. 7, mean residual 0".57.

From CHB 2016.

Comet P/2010 A1 (Hill)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 14.26029 TT

		(2000.0)	P	Sato	Q
q	1.9574081				
n	0.10715598	Peri.	13.29609	+0.49345806	-0.85976506
a	4.3899385	Node	47.31538	+0.78073398	+0.37119248
e	0.5541149	Incl.	10.30829	+0.38334528	+0.35074234
P	9.20				

From 159 observations 2010 Jan. 6–Mar. 17, mean residual 0".70

From CHB 2017.

Comet P/2008 O2 (McNaught)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 19.88836 TT

		(2000.0)	P	Sato	Q
q	3.8151751				
n	0.10332246	Peri.	26.94344	+0.98858996	+0.11867180
a	4.4978631	Node	325.84392	-0.14970291	+0.84232441
e	0.1517805	Incl.	9.51113	+0.01670141	+0.52574385
P	9.54				

From 405 observations 2008 July 28–2009 Dec. 9, mean residual 0".64.

From CHB 2017.

Comet 300P/Catalina

Epoch 2018 Nov. 18.0 TT = JDT 2458440.5

T 2018 Nov. 2.07846 TT

		(2000.0)	P	Sato	Q
q	0.8328174				
n	0.22223353	Peri.	222.85456	+0.74596381	+0.65867411
a	2.6993736	Node	95.67368	-0.58114782	+0.71596774
e	0.6914775	Incl.	5.67606	-0.32527711	+0.23138412
P	4.44				

From 638 observations 2005 May 6–2014 Aug. 2, mean residual 0".63.

From CHB 2017.

Comet 64P/Swift-Gehrels

Epoch 2018 Nov. 18.0 TT = JDT 2458440.5

T 2018 Nov. 3.84715 TT

				Sato	
q	(2000.0)	P		Q	
n	0.10471951	Peri.	97.14941	+0.78662966	-0.60255029
a	4.4577698	Node	299.99760	+0.48710121	+0.73971000
e	0.6874708	Incl.	8.94850	+0.37940241	+0.29960351
P	9.41				

From 204 observations 1981 July 31–2010 May 4, mean residual 0".71.

Nongravitational parameters A1 = +0.66, A2 = +0.2283.

From CHB 2017.

Comet 38P/Stephan-Oterma

Epoch 2018 Nov. 18.0 TT = JDT 2458440.5

T 2018 Nov. 10.97237 TT

				Sato	
q	(2000.0)	P		Q	
n	0.02596744	Peri.	359.58178	+0.21468659	-0.92685080
a	11.2940573	Node	77.99977	+0.89700086	+0.06235682
e	0.8593432	Incl.	18.35296	+0.38639245	+0.37021509
P	37.96				

From 172 observations 1942 Nov. 6–2017 July 28, mean residual 0".88.

Nongravitational parameters A1 = +0.03, A2 = -0.0073.

Comet 247P/LINEAR

Epoch 2018 Nov. 18.0 TT = JDT 2458440.5

T 2018 Dec. 2.10400 TT

				Sato	
q	(2000.0)	P		Q	
n	0.12454438	Peri.	47.44961	-0.18182683	-0.96458199
a	3.9711836	Node	54.01080	+0.81874212	-0.25614192
e	0.6250335	Incl.	13.66147	+0.54461027	+0.06303094
P	7.91				

From 953 observations 2002 Nov. 5–2011 Apr. 5, mean residual 0".50.

From CHB 2017.

Comet P/2013 R3 (Catalina-PANSTARRS)

Epoch 2018 Nov. 18.0 TT = JDT 2458440.5

T 2018 Dec. 6.42237 TT

				Sato	
q	(2000.0)	P		Q	
n	0.18658952	Peri.	11.06542	+0.99275096	+0.12009918
a	3.0330382	Node	342.03476	-0.11139301	+0.90484209
e	0.2745955	Incl.	0.86561	-0.04513449	+0.40845682
P	5.28				

From 314 observations 2013 Sept. 15–2014 Jan. 3, mean residual 0".52.

From CHB 2017.

Comet 60P/Tsuchinshan

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2018 Dec. 11.23024 TT

				Sato	
q	(2000.0)	P		Q	
n	0.14986375	Peri.	216.55266	-0.55998263	-0.82611716
a	3.5102522	Node	267.58347	+0.77426239	-0.49481647
e	0.5377402	Incl.	3.60652	+0.29485115	-0.26960545
P	6.58				

From 334 observations 1978 Dec. 1–2012 May 28, mean residual 0".74.

From CHB 2017.

Comet 46P/Wirtanen

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2018 Dec. 13.22881 TT

				Sato	
q	(2000.0)	P		Q	
n	0.18108383	Peri.	356.35372	+0.19782181	-0.95926818
a	3.0942087	Node	82.15954	+0.90442220	+0.09927973
e	0.6589141	Incl.	11.74602	+0.37800399	+0.26447702
P	5.44				

From 1209 observations 2007 Aug. 4–2014 Apr. 29, mean residual 0".70.

Nongravitational parameters A1 = -0.73, A2 = -0.4284.

Comet 137P/Shoemaker-Levy

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2018 Dec. 13.38977 TT

		(2000.0)	P	Sato	Q
q	1.9302200				
n	0.10259453	Peri.	141.01635	+0.96808261	-0.24132957
a	4.5191134	Node	233.08030	+0.20352982	+0.91447971
e	0.5728764	Incl.	4.85382	+0.14625892	+0.32478748
P	9.61				

From 287 observations 1990 Sept. 16–2017 June 30, mean residual 0".53.

Comet 198P/ODAS

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2018 Dec. 13.91781 TT

		(2000.0)	P	Sato	Q
q	2.0059352				
n	0.14411472	Peri.	69.25114	+0.38145314	-0.92438793
a	3.6029964	Node	358.32467	+0.83920221	+0.34660980
e	0.4432592	Incl.	1.33579	+0.38759923	+0.15927526
P	6.84				

From 190 observations 1998 Dec. 15–2011 July 30, mean residual 0".81.

Nongravitational parameters A1 = -3.59, A2 = +1.3931.

Comet P/2006 D1 (Hill)

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2018 Dec. 21.44783 TT

		(2000.0)	P	Sato	Q
q	1.8951424				
n	0.07511958	Peri.	119.42596	-0.49077703	-0.87128518
a	5.5628917	Node	359.96407	+0.65957887	-0.37138685
e	0.6593242	Incl.	17.36471	+0.56929221	-0.32083319
P	13.12				

From 80 observations 2005 Dec. 5–2006 Apr. 7, mean residual 0".55.

From CHB 2015.

Comet P/2007 V1 (Larson)

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2019 Jan. 12.10070 TT

		(2000.0)	P	Sato	Q
q	2.6767413				
n	0.08871962	Peri.	51.60586	+0.50882634	-0.86048343
a	4.9787799	Node	7.93494	+0.72014875	+0.40906047
e	0.4623700	Incl.	10.75813	+0.47167948	+0.30370676
P	11.11				

From 185 observations 2007 Sept. 10–2008 Mar. 3, mean residual 0".63.

Comet 171P/Spahr

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2019 Jan. 13.71466 TT

		(2000.0)	P	Sato	Q
q	1.7723303				
n	0.14680629	Peri.	347.14968	+0.00438225	-0.93069579
a	3.5588221	Node	101.69599	+0.94734658	-0.11324996
e	0.5019896	Incl.	21.93308	+0.32018004	+0.34782149
P	6.71				

From 318 observations 1998 Nov. 13–2012 Apr. 12, mean residual 0".66.

Nongravitational parameters A1 = +0.11, A2 = -0.1839.

Comet C/2018 A3 (ATLAS)

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2019 Jan. 15.01953 TT

		(2000.0)	P	Sato	Q
q	3.2805606				
z	+0.0067151	Peri.	86.51835	-0.24561048	+0.95612114
	+/-0.0016191	Node	194.24041	+0.40362750	+0.25066696
e	0.9779707	Incl.	139.51430	+0.88134008	+0.15165235

From 103 observations 2018 Jan. 10–26, mean residual 0".40.

Comet C/2017 M4 (ATLAS)

Epoch 2019 Feb. 6.0 TT = JDT 2458520.5

T 2019 Jan. 18.18483 TT

		(2000.0)	P	Sato	Q
q	3.2516458				
z	-0.0007183	Peri.	167.62372	-0.34655749	-0.32820689
	+/-0.0000028	Node	65.86746	-0.92162906	+0.29354274
e	1.0023356	Incl.	105.65769	-0.17463616	-0.89783790

From 788 observations 2017 June 16–2018 Jan. 13, mean residual 0".42.

Comet 131P/Mueller

Epoch 2019 Feb. 6.0 TT = JDT 2458520.5

T 2019 Jan. 24.22485 TT

		(2000.0)	P	Sato	Q
q	2.4175063				
n	0.13953733	Peri.	179.07662	+0.83603191	-0.54394558
a	3.6813670	Node	214.19216	+0.50258077	+0.81177825
e	0.3433129	Incl.	7.35376	+0.22014363	+0.21246005
P	7.06				

From 447 observations 1990 Sept. 15–2013 Feb. 9, mean residual 0".72.

Nongravitational parameters A1 = +0.95, A2 = -0.2320.

Comet C/2017 B3 (LINEAR)

Epoch 2019 Feb. 6.0 TT = JDT 2458520.5

T 2019 Feb. 2.50187 TT

		(2000.0)	P	Sato	Q
q	3.9211500				
z	-0.0005412	Peri.	284.74947	+0.27591300	+0.96068875
	+/-0.0000034	Node	2.17746	-0.19810466	+0.08820197
e	1.0021223	Incl.	54.17920	-0.94054588	+0.26324425

From 213 observations 2017 Jan. 26–2018 Jan. 27, mean residual 0".49.

Comet 123P/West-Hartley

Epoch 2019 Feb. 6.0 TT = JDT 2458520.5

T 2019 Feb. 5.11228 TT

		(2000.0)	P	Sato	Q
q	2.1268792				
n	0.13008766	Peri.	103.00986	-0.83646838	-0.51323073
a	3.8575537	Node	46.49945	+0.34089307	-0.76180796
e	0.4486456	Incl.	15.35958	+0.42908340	-0.39527567
P	7.58				

From 2188 observations 1989 Mar. 14–2017 Dec. 15, mean residual 0".70.

Nongravitational parameters A1 = +0.11, A2 = +0.0141.

Comet P/1996 R2 (Lagerkvist)

Epoch 2019 Feb. 6.0 TT = JDT 2458520.5

T 2019 Feb. 11.44968 TT

		(2000.0)	P	Sato	Q
q	2.5902784				
n	0.13448738	Peri.	333.28687	+0.97272894	-0.23009950
a	3.7729556	Node	40.05092	+0.22009482	+0.87596443
e	0.3134617	Incl.	2.60090	+0.07318931	+0.42395817
P	7.33				

From 125 observations 1996 Aug. 12–1997 Jan. 12, mean residual 0".62.

Comet C/2010 U3 (Boattini)

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Feb. 26.62476 TT

		(2000.0)	P	Sato	Q
q	8.4455287				
z	+0.0001957	Peri.	88.08647	-0.36204944	-0.74305722
	+/-0.0000006	Node	43.06717	+0.07255930	-0.62443290
e	0.9983470	Incl.	55.51165	+0.92933059	-0.24072708

From 1271 observations 2009 Sept. 16–2018 Jan. 20, mean residual 0".64.

Comet 29P/Schwassmann-Wachmann

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Mar. 7.75412 TT

		(2000.0)	P	Sato	Q
q	5.7668176				
n	0.06662630	Peri.	47.77429	+0.99270162	-0.00956730
a	6.0261360	Node	312.39459	-0.05135311	+0.86841761
e	0.0430323	Incl.	9.36831	+0.10911625	+0.49574118
P	14.79				

From 24519 observations 1902 Mar. 5–2018 Jan. 19, mean residual 0".66.

Comet 78P/Gehrels

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Apr. 2.69623 TT

		(2000.0)	P	Sato	Q
q	2.0138261				
n	0.13626128	Peri.	192.68395	+0.72924917	-0.68200816
a	3.7401390	Node	210.54806	+0.63690909	+0.70612442
e	0.4615638	Incl.	6.24876	+0.25008488	+0.19040266
P	7.23				

From 5323 observations 1981 Aug. 26–2014 Apr. 1, mean residual 0".60.

Nongravitational parameters A1 = +0.82, A2 = +0.1841.

Comet 232P/Hill

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Apr. 6.60139 TT

		(2000.0)	P	Sato	Q
q	2.9845168				
n	0.10372365	Peri.	53.55138	-0.31351771	-0.92618895
a	4.4862574	Node	56.03021	+0.77022923	-0.37705970
e	0.3347424	Incl.	14.63055	+0.55538597	+0.00008240
P	9.50				

From 233 observations 1999 Dec. 12–2010 May 2, mean residual 0".71.

Comet P/2011 W2 (Rinner)

Epoch 2019 Apr. 27.0 TT = JDT 2458600.5

T 2019 Apr. 9.57467 TT

		(2000.0)	P	Sato	Q
q	2.3134898				
n	0.13262748	Peri.	221.20191	-0.04026188	-0.98147694
a	3.8081469	Node	231.95935	+0.96771517	+0.00837580
e	0.3924894	Incl.	13.75799	+0.24880984	-0.19139715
P	7.43				

From 624 observations 2011 Nov. 28–2012 Mar. 24, mean residual 0".61.

Comet P/2014 C1 (TOTAS)

Epoch 2019 Apr. 27.0 TT = JDT 2458600.5

T 2019 Apr. 13.76401 TT

		(2000.0)	P	Sato	Q
q	1.6845414				
n	0.18562917	Peri.	24.15199	-0.97804320	+0.20816966
a	3.0434902	Node	167.85081	-0.19800997	-0.91350451
e	0.4465100	Incl.	2.68089	-0.06498891	-0.34953528
P	5.31				

From 49 observations 2014 Feb. 1–May 8, mean residual 0".54.

Comet 186P/Garradd

Epoch 2019 Apr. 27.0 TT = JDT 2458600.5

T 2019 May 4.94887 TT

		(2000.0)	P	Sato	Q
q	4.3894648				
n	0.08790514	Peri.	283.79823	-0.26417877	+0.92914634
a	5.0094864	Node	327.06893	-0.59294786	-0.36796940
e	0.1237695	Incl.	28.40963	-0.76067234	-0.03585522
P	11.21				

From 212 observations 1975 May 31–2018 Jan. 15, mean residual 0".64.

Comet 231P/LINEAR-NEAT

Epoch 2019 June 6.0 TT = JDT 2458640.5

T 2019 June 14.26748 TT

		(2000.0)	P	Sato	Q
q	3.0224871				
n	0.12241777	Peri.	42.75323	-0.98583866	-0.06114844
a	4.0170422	Node	133.02956	+0.01959796	-0.96677920
e	0.2475839	Incl.	12.33410	+0.16654745	-0.24819115
P	8.05				

From 298 observations 1950 Apr. 20–2012 July 20, mean residual 0".69.

Nongravitational parameters A1 = -4.50, A2 = -0.3645.

Comet 31P/Schwassmann-Wachmann

Epoch 2019 July 16.0 TT = JDT 2458680.5

T 2019 July 6.15576 TT

		(2000.0)	P	Sato	Q
q	3.4253836				
n	0.11272690	Peri.	18.35580	-0.67426794	-0.73493300
a	4.2440876	Node	114.11176	+0.66723008	-0.64826990
e	0.1929046	Incl.	4.54712	+0.31649136	-0.19904677
P	8.74				

From 834 observations 1989 June 2–2017 Dec. 19, mean residual 0".85.
Nongravitational parameters A1 = +2.72, A2 = -0.4478.

Comet P/2007 T4 (Gibbs)

Epoch 2019 July 16.0 TT = JDT 2458680.5

T 2019 July 23.65264 TT

		(2000.0)	P	Sato	Q
q	2.0050243				
n	0.08193580	Peri.	42.42394	+0.21727170	-0.94518569
a	5.2499310	Node	37.05887	+0.75131903	+0.00251523
e	0.6180856	Incl.	23.85877	+0.62314743	+0.32652363
P	12.03				

From 64 observations 2007 Oct. 12–2008 Apr. 25, mean residual 0".70.

Comet 200P/Larsen

Epoch 2019 July 16.0 TT = JDT 2458680.5

T 2019 July 28.49052 TT

		(2000.0)	P	Sato	Q
q	3.2972260				
n	0.08993064	Peri.	133.97712	+0.97520718	-0.14000909
a	4.9339825	Node	234.80208	+0.08846486	+0.95649127
e	0.3317313	Incl.	12.10567	+0.20284212	+0.25597248
P	10.96				

From 535 observations 1997 Nov. 3–2009 Jan. 21, mean residual 0".63.

Comet P/2012 K3 (Gibbs)

Epoch 2019 Aug. 25.0 TT = JDT 2458720.5

T 2019 Aug. 17.42496 TT

		(2000.0)	P	Sato	Q
q	2.0891020				
n	0.14280036	Peri.	172.11364	+0.47123048	+0.86236836
a	3.6250710	Node	125.80992	-0.82117568	+0.50554783
e	0.4237073	Incl.	13.19403	-0.32188871	-0.02724335
P	6.90				

From 136 observations 2012 May 21–Sept. 9, mean residual 0".56.

Comet P/2008 Y1 (Boattini)

Epoch 2019 Aug. 25.0 TT = JDT 2458720.5

T 2019 Sept. 10.64727 TT

		(2000.0)	P	Sato	Q
q	1.2678134				
n	0.09354592	Peri.	162.80752	+0.46373943	-0.87277377
a	4.8060265	Node	259.33646	+0.79354713	+0.48564624
e	0.7362034	Incl.	8.91860	+0.39399073	+0.04912916
P	10.54				

From 160 observations 2008 Dec. 22–2009 Apr. 13, mean residual 0".63.

Comet P/2010 U2 (Hill)

Epoch 2019 Sept. 14.0 TT = JDT 2458740.5

T 2019 Sept. 15.25039 TT

		(2000.0)	P	Sato	Q
q	2.5676541				
n	0.11104358	Peri.	44.32897	+0.74846972	-0.66300513
a	4.2868710	Node	357.08124	+0.49898697	+0.57767091
e	0.4010424	Incl.	16.82682	+0.43681241	+0.47615177
P	8.88				

From 271 observations 2010 Oct. 1–2011 Mar. 7, mean residual 0".62.

Comet P/2005 GF8 (LONEOS)

Epoch 2019 Oct. 4.0 TT = JDT 2458760.5

T 2019 Sept. 30.71596 TT

		(2000.0)	P	Sato	Q
q	2.8308946				
n	0.06941511	Peri.	285.40276	-0.49545468	+0.86850867
a	5.8636320	Node	314.88775	-0.78876352	-0.45694213
e	0.5172114	Incl.	1.19232	-0.36383619	-0.19208481
P	14.20				

From 214 observations 2005 Apr. 2–Sept. 15, mean residual 0".61.

Comet 68P/Klemola

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Nov. 9.03755 TT

		(2000.0)	P	Sato	Q
q	1.7938507				
n	0.08952470	Peri.	153.05858	+0.85007477	+0.52640286
a	4.9488863	Node	175.08210	-0.51124712	+0.83232147
e	0.6375244	Incl.	11.11083	-0.12648825	+0.17361162
P	11.01				

From 484 observations 1976 Oct. 25–2010 Jan. 15, mean residual 0".71.

Nongravitational parameters A1 = +0.02, A2 = -0.0087.

Comet C/2017 T2 (PANSTARRS)

Epoch 2020 Apr. 21.0 TT = JDT 2458960.5

T 2020 May 4.85347 TT

		(2000.0)	P	Sato	Q
q	1.6150200				
z	+0.0001562	Peri.	92.98969	-0.50989862	-0.40641198
	+/-0.0000483	Node	64.37665	-0.16271841	-0.81988265
e	0.9997477	Incl.	57.23227	+0.84470475	-0.40326387

From 119 observations 2017 Sept. 15–2018 Jan. 20, mean residual 0".36.

Comet C/2017 K2 (PANSTARRS)

Epoch 2022 Dec. 7.0 TT = JDT 2459920.5

T 2022 Dec. 19.75075 TT

		(2000.0)	P	Sato	Q
q	1.7967778				
z	-0.0004535	Peri.	236.20185	+0.01818534	+0.04923357
	+/-0.0000107	Node	88.23517	-0.18086816	+0.98247074
e	1.0008149	Incl.	87.56309	-0.98333921	-0.17979793

From 460 observations 2013 May 12–2018 Jan. 23, mean residual 0".52.

References:

Comet C/2017 E3 (PANSTARRS)

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 May 31.58323 TT

		(2000.0)	P	Sato	Q
q	5.9152648				
z	-0.0008400	Peri.	333.66463	-0.77474555	-0.14230586
	+/-0.0000017	Node	220.75858	-0.26824404	-0.80833159
e	1.0049691	Incl.	70.66505	-0.57255085	+0.57126971

From 209 observations 2017 Mar. 7–2018 Jan. 20, mean residual 0".49.

Comet C/2017 Y1 (PANSTARRS)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Aug. 31.29374 TT

		(2000.0)	P	Sato	Q
q	3.7153850				
z	+0.0006515	Peri.	134.38230	-0.10250687	-0.75212807
	+/-0.0001429	Node	307.53422	+0.50361178	+0.52513233
e	0.9975793	Incl.	55.17888	+0.85782721	-0.39817007

From 61 observations 2017 Dec. 24–2018 Jan. 25, mean residual 0".39.

Comet C/2017 U2 (Fuls)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Sept. 2.94644 TT

		(2000.0)	P	Sato	Q
q	6.7004081				
z	+0.0002684	Peri.	148.19756	+0.75901368	+0.41482706
	+/-0.0002367	Node	149.73160	-0.56241731	+0.02945707
e	0.9982014	Incl.	95.40109	+0.32800153	-0.90942333

From 34 observations 2017 Sept. 8-Oct. 27, mean residual 0".32.

Comet P/2018 A5 (PANSTARRS)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Sept. 23.83961 TT

		(2000.0)	P	Sato	Q
q	2.6938352				
n	0.07341166	Peri.	359.68451	+0.04292079	-0.91564988
a	5.6488411	Node	87.82922	+0.91751040	-0.12219516
e	0.5231172	Incl.	23.57604	+0.39538902	+0.38295383

P 13.43

From 30 observations 2017 Nov. 21-2018 Jan. 17, mean residual 0".26.

Comet C/2017 U5 (PANSTARRS)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2017 Dec. 19.09174 TT

		(2000.0)	P	Sato	Q
q	4.3267335				
n	0.01414032	Peri.	262.14951	+0.40283762	-0.91039467
a	16.9367389	Node	163.11415	+0.91413592	+0.39506034
e	0.7445356	Incl.	18.95648	+0.04557810	+0.12291815

P 69.70

From 81 observations 2017 Oct. 30-Dec. 24, mean residual 0".40.

Comet C/2017 AB5 (PANSTARRS)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Feb. 23.40656 TT

		(2000.0)	P	Sato	Q
q	9.2192618				
z	+0.0001303	Peri.	78.65004	-0.41671691	-0.83305408
	+/-0.0000429	Node	42.71374	+0.47113666	-0.54020527
e	0.9987988	Incl.	32.43537	+0.77741705	-0.11916025

From 29 observations 2017 Dec. 9-2018 Jan. 20, mean residual 0".33.

Comet P/2006 F1 (Kowalski) [Orbit 2]

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Mar. 14.88780 TT

		(2000.0)	P	Sato	Q
q	4.1082524				
n	0.09766908	Peri.	186.14747	+0.64867570	+0.70020714
a	4.6697968	Node	124.74757	-0.68189248	+0.70873821
e	0.1202503	Incl.	21.28039	-0.33799777	-0.08602393

P 10.09

From 216 observations 2005 May 10-2016 Aug. 30, mean residual 0".70.

From CHB 2017.

Comet P/2018 A4 (PANSTARRS)

T 2018 May 24.57874 TT

		(2000.0)	P	Sato	Q
q	2.3850753				
n	0.06560467	Peri.	355.80425	-0.08229213	-0.99518328
a	6.0885363	Node	98.91004	+0.91593244	-0.09659182
e	0.6082679	Incl.	3.09122	+0.39280502	+0.01674069

P 15.02

From 41 observations 2018 Jan. 12-16, mean residual 0".31.

Comet C/2017 U4 (PANSTARRS)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Sept. 25.71477 TT

		(2000.0)	P	Sato	Q
q	7.7231669				
z	-0.0004110	Peri.	159.18520	+0.07946024	+0.93749733
	+/-0.0003690	Node	245.95761	+0.85410967	+0.11121473
e	1.0031740	Incl.	158.22368	+0.51398710	-0.32974238

From 60 observations 2017 Oct. 27-Dec. 26, mean residual 0".46.

Comet 3D/Biela [Orbit 2]

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 3.61567 TT

		(2000.0)	P	Sato	Q
q	0.8078392				
n	0.14926486	Peri.	274.44599	-0.31062480	-0.94996314
a	3.5196353	Node	193.78805	+0.91764959	-0.29067469
e	0.7704764	Incl.	7.93410	+0.24785373	-0.11436020
P	6.60				

From 19 observations 1846–1852, mean residual 3".41.

From Muraoka's orbit (CHB 2004).

Comet D/1886 K1 (Brooks)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 12.0348 TT

		(2000.0)	P	Sato	Q
q	1.880668				
n	0.1474341	Peri.	208.4584	-0.3856237	+0.9148314
a	3.548712	Node	39.1984	-0.8064845	-0.2710814
e	0.470042	Incl.	10.9368	-0.4481932	-0.2993300
P	6.69				

From 39 observations 1886 May 25–July 3, mean residual 5".0.

From Buckley's orbit (1979).

Comet 239P/LINEAR

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2019 Jan. 10.15772 TT

		(2000.0)	P	Sato	Q
q	1.6494754				
n	0.10426232	Peri.	220.37803	-0.43066445	-0.88225506
a	4.4707918	Node	255.90827	+0.87031750	-0.35021048
e	0.6310552	Incl.	11.30559	+0.23890496	-0.31460870
P	9.45				

From 69 observations 1999 Nov. 14–2010 Feb. 2, mean residual 0".58.

Comet P/2012 01 (McNaught)

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Mar. 2.47374 TT

		(2000.0)	P	Sato	Q
q	1.4352596				
n	0.14811219	Peri.	238.17919	+0.86035058	+0.49303634
a	3.5378726	Node	91.98849	-0.41292081	+0.82289054
e	0.5943156	Incl.	7.43220	-0.29881981	+0.28242933
P	6.65				

From 94 observations 2012 July 18–Nov. 18, mean residual 0".59.

Comet P/2017 U3 (PANSTARRS)

Epoch 2019 Apr. 27.0 TT = JDT 2458600.5

T 2019 Apr. 20.45318 TT

		(2000.0)	P	Sato	Q
q	4.4440276				
n	0.08991229	Peri.	297.33475	-0.22426271	-0.97198127
a	4.9346535	Node	165.11148	+0.96260465	-0.23220861
e	0.0994246	Incl.	15.90622	+0.15198201	+0.03649071
P	10.96				

From 48 observations 2017 Oct. 1–Nov. 12, mean residual 0".51.

Comet C/2016 X1 (Lemmon)

Epoch 2019 Apr. 27.0 TT = JDT 2458600.5

T 2019 Apr. 29.85492 TT

		(2000.0)	P	Sato	Q
q	7.5635751				
z	+0.0005616	Peri.	224.56899	-0.44353586	-0.78468564
+/-	-0.0000142	Node	256.42669	+0.89500906	-0.36229570
e	0.9957523	Incl.	26.45577	+0.04727283	-0.50300126

From 63 observations 2016 Nov. 26–2018 Jan. 19, mean residual 0".59.

Comet P/2012 O2 (McNaught)

Epoch 2019 Apr. 27.0 TT = JDT 2458600.5

T 2019 May 6.03131 TT

		(2000.0)	P	Sato	Q
q	1.6917077				
n	0.14301634	Peri.	183.34564	+0.55508837	+0.75154916
a	3.6214203	Node	120.68264	-0.75320958	+0.63597498
e	0.5328607	Incl.	24.48556	-0.35291958	-0.17524177
P	6.89				

From 81 observations 2012 May 20–Sept. 21, mean residual 0".38.

Comet P/2000 R2 (LINEAR)

Epoch 2019 June 6.0 TT = JDT 2458640.5

T 2019 June 15.58176 TT

		(2000.0)	P	Sato	Q
q	1.6250650				
n	0.15282088	Peri.	176.57127	+0.91973658	+0.38651439
a	3.4648218	Node	160.25516	-0.36479621	+0.90605687
e	0.5309816	Incl.	11.69735	-0.14494260	+0.17224277
P	6.45				

From 54 observations 2000 Sept. 3–Nov. 29, mean residual 0".64.

Comet P/1999 R028 (LONEOS)

Epoch 2019 July 16.0 TT = JDT 2458680.5

T 2019 June 30.87941 TT

		(2000.0)	P	Sato	Q
q	1.1233564				
n	0.15535464	Peri.	232.07608	+0.98266715	-0.16252256
a	3.4270457	Node	137.06810	+0.18232428	+0.93427568
e	0.6722085	Incl.	7.52266	-0.03351295	+0.31735686
P	6.34				

From 109 observations 1999 Sept. 7–Nov. 13, mean residual 0".73.

Comet P/2006 F4 (Spacewatch)

Epoch 2019 July 16.0 TT = JDT 2458680.5

T 2019 Aug. 3.06623 TT

		(2000.0)	P	Sato	Q
q	2.3338882				
n	0.14885388	Peri.	31.16914	-0.81797061	+0.57506206
a	3.5261107	Node	184.03305	-0.56203511	-0.80448322
e	0.3381126	Incl.	12.38922	-0.12264014	-0.14869559
P	6.62				

From 46 observations 2006 Mar. 26–May 31, mean residual 0".68.

Comet C/2018 A6 (Gibbs)

Epoch 2019 Aug. 5.0 TT = JDT 2458700.5

T 2019 Aug. 9.38378 TT

		(2000.0)	P	Sato	Q
q	3.0953662				
n	0.02659920	Peri.	265.46659	-0.15672978	+0.93268466
a	11.1145102	Node	340.41661	+0.19648548	-0.29290629
e	0.7215022	Incl.	75.74747	-0.96789939	-0.21048809
P	37.05				

From 67 observations 2018 Jan. 15–23, mean residual 0".54.

Comet P/2000 S4 (LINEAR–Spacewatch)

Epoch 2019 Oct. 4.0 TT = JDT 2458760.5

T 2019 Sept. 21.18299 TT

		(2000.0)	P	Sato	Q
q	2.2653969				
n	0.05201524	Peri.	173.08328	+0.97548256	+0.21401228
a	7.1074800	Node	173.80266	-0.21773558	+0.97242629
e	0.6812658	Incl.	28.37769	-0.03201559	-0.09265985
P	18.95				

From 35 observations 2000 Sept. 1–Nov. 21, mean residual 0".70.

Comet P/2014 U2 (Kowalski)

Epoch 2019 Oct. 4.0 TT = JDT 2458760.5

T 2019 Oct. 11.52228 TT

		(2000.0)	P	Sato	Q
q	1.1163383				
n	0.19935126	Peri.	37.64570	+0.84867234	-0.52876563
a	2.9021737	Node	354.23310	+0.44925766	+0.73335048
e	0.6153441	Incl.	7.28103	+0.27914659	+0.42732187
P	4.94				

From 160 observations 2014 Oct. 18–2015 Jan. 18, mean residual 0".59.

Comet P/2009 SK280 (Spacewatch-Hill)

Epoch 2019 Oct. 4.0 TT = JDT 2458760.5

T 2019 Oct. 23.96850 TT

		(2000.0)	P	Sato	Q
q	4.2087510				
n	0.09426334	Peri.	327.96216	+0.98363892	-0.05490617
a	4.7816102	Node	36.41850	+0.14777834	+0.79064032
e	0.1198047	Incl.	16.79881	-0.10303414	+0.60981407
P	10.46				

From 88 observations 2009 Sept. 17–2011 Dec. 23, mean residual 0".52.

Comet P/2006 S1 (Christensen)

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Oct. 25.49862 TT

		(2000.0)	P	Sato	Q
q	1.4191975				
n	0.14781888	Peri.	133.62467	+0.94058859	+0.32454117
a	3.5425511	Node	207.88738	-0.33886844	+0.91581371
e	0.5993855	Incl.	12.32367	+0.02147763	+0.23655504
P	6.67				

From 304 observations 2006 Aug. 23–Dec. 16, mean residual 0".60.

Comet 76P/West-Kohoutek-Ikemura

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Oct. 26.13976 TT

		(2000.0)	P	Sato	Q
q	1.6048040				
n	0.15213560	Peri.	0.02187	+0.10202885	-0.85752104
a	3.4752188	Node	84.12513	+0.91261714	-0.12102723
e	0.5382150	Incl.	30.45704	+0.39587885	+0.50001007
P	6.48				

From 611 observations 1993 July 20–2013 Mar. 1, mean residual 0".77.

Nongravitational parameters A1 = -0.37, A2 = -0.1763.

From CHB 2017.

Comet P/2003 F2 (NEAT)

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Nov. 11.96964 TT

		(2000.0)	P	Sato	Q
q	2.9699870				
n	0.05969567	Peri.	191.82456	-0.98184006	+0.18968374
a	6.4839676	Node	359.09124	-0.15349837	-0.80419639
e	0.5419491	Incl.	11.60601	-0.11148252	-0.56328345
P	16.51				

From 74 observations 2003 Mar. 27–May 28, mean residual 0".64.

Comet P/2013 T2 (Schwartz)

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Nov. 30.52533 TT

		(2000.0)	P	Sato	Q
q	1.7403342				
n	0.15130456	Peri.	345.44678	+0.97137592	+0.23753577
a	3.4879322	Node	0.82322	-0.19820809	+0.81594645
e	0.5010413	Incl.	9.45589	-0.13092886	+0.52707508
P	6.51				

From 118 observations 2013 Sept. 14–Dec. 11, mean residual 0".53.

Comet P/2006 H1 (McNaught)

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Dec. 7.45661 TT

		(2000.0)	P	Sato	Q
q	2.4226573				
n	0.07100440	Peri. 309.27580	+0.63170270	+0.77521065	
a	5.7758053	Node 359.89751	-0.62536978	+0.50929823	
e	0.5805507	Incl. 12.80357	-0.45810953	+0.37371616	
P	13.88				

From 213 observations 2006 Apr. 29–Nov. 26, mean residual 0".58.

Remarks.

Non-gravitational parameters Y1 and Y2 indicate that the Yabushita-style non-gravitational effect based on CO sublimation is taken into account (MN 283, 347).

彗星年表 2018

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