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INDEX TO EPHEMERIDES

Comet 95P/(2060) Chiron	48
Comet C/2009 F4 (McNaught)	49
Comet C/2006 S3 (LONEOS)	50
Comet C/2010 R1 (LINEAR)	51
Comet 158P/Kowal-LINEAR	52
Comet C/2012 A2 (LINEAR)	53
Comet C/2012 J1 (Catalina)	54
Comet 246P/NEAT	55
Comet C/2012 F6 (Lemmon)	56
Comet C/2013 F2 (Catalina)	57
Comet C/2010 S1 (LINEAR)	58
Comet C/2012 K6 (McNaught)	59
Comet P/2014 MG4 (Spacewatch-PANSTARRS)	60
Comet C/2013 E1 (McNaught)	61
Comet P/2012 B1 (PANSTARRS)	62
Comet C/2014 F1 (Hill)	63
Comet C/2014 S1 (PANSTARRS)	64
Comet C/2014 G1 (PANSTARRS)	65
Comet C/2013 G8 (PANSTARRS)	66
Comet 2P/Encke	67
Comet C/2012 A1 (PANSTARRS)	68
Comet C/2013 R1 (Lovejoy)	69
Comet C/2011 J2 (LINEAR)	70
Comet C/2013 H2 (Boattini)	71
Comet 292P/Li	72
Comet C/2012 X1 (LINEAR)	73
Comet C/2014 W3 (PANSTARRS)	74
Comet 290P/Jager	75
Comet C/2013 G7 (McNaught)	76
Comet 117P/Helin-Roman-Alu	77
Comet 17P/Holmes	78
Comet 119P/Parker-Hartley	79
Comet 311P/PANSTARRS	80
Comet 156P/Russell-LINEAR	81
Comet 191P/McNaught	82
Comet 134P/Kowal-Vavrova	83
Comet 4P/Faye	84
Comet 16P/Brooks	85
Comet C/2013 Y2 (PANSTARRS)	86
Comet C/2014 E2 (Jacques)	87
Comet C/2012 U1 (PANSTARRS)	88
Comet C/2014 M2 (Christensen)	89
Comet P/2014 L2 (NEOWISE)	90

Comet 106P/Schuster	91
Comet P/2014 W1 (PANSTARRS)	91
Comet C/2013 P4 (PANSTARRS)	93
Comet C/2013 TW5 (Spacewatch)	94
Comet C/2012 K8 (Lemmon)	95
Comet C/2012 K1 (PANSTARRS)	96
Comet P/2011 S1 (Gibbs)	97
Comet 284P/McNaught	98
Comet C/2014 U3 (Kowalski)	99
Comet 170P/Christensen	100
Comet C/2013 V5 (Oukaimeden)	101
Comet C/2014 N2 (PANSTARRS)	102
Comet 303P/NEAT	103
Comet C/2013 V2 (Borisov)	104
Comet 32P/Comas Sola	105
Comet 108P/Ciffreo	106
Comet 70P/Kojima	107
Comet C/2014 R4 (Gibbs)	108
Comet C/2013 A1 (Siding Spring)	109
Comet C/2013 U2 (Holvorcem)	110
Comet 135P/Shoemaker-Levy	111
Comet 80P/Peters-Hartley	112
Comet 269P/Jedicke	113
Comet P/2014 W12 (Gibbs)	114
Comet C/2013 G3 (PANSTARRS)	115
Comet 40P/Vaisala	116
Comet C/2014 Q3 (Borisov)	117
Comet C/2014 R1 (Borisov)	118
Comet 305P/Skiff	119
Comet C/2013 P3 (Palomar)	120
Comet 193P/LINEAR-NEAT	121
Comet C/2014 L5 (Lemmon)	122
Comet 110P/Hartley	123
Comet 307P/LINEAR	124
Comet 15P/Finlay	125
Comet P/2014 M4 (PANSTARRS)	126
Comet 287P/Christensen	127
Comet C/2013 W2 (PANSTARRS)	128
Comet C/2014 W7 (Christensen)	129
Comet C/2014 F2 (Tenagra)	130
Comet C/2014 Q6 (PANSTARRS)	131
Comet P/2014 X1 (Elenin)	132
Comet 201P/LONEOS	133
Comet C/2013 G9 (Tenagra)	134
Comet P/2014 V1 (PANSTARRS)	135

Comet	C/2014 Q2 (Lovejoy)	136
Comet	7P/Pons–Winnecke	137
Comet	C/2014 G3 (PANSTARRS)	138
Comet	C/2014 W9 (PANSTARRS)	139
Comet	309P/LINEAR	140
Comet	299P/Catalina–PANSTARRS	141
Comet	C/2014 AA52 (Catalina)	142
Comet	92P/Sanguin	143
Comet	6P/d' Arrest	144
Comet	C/2014 W10 (PANSTARRS)	145
Comet	C/2014 N3 (NEOWISE)	146
Comet	C/2014 W6 (Catalina)	147
Comet	44P/Reinmuth	148
Comet	P/2008 WZ96 (LINEAR)	149
Comet	86P/Wild	150
Comet	88P/Howell	151
Comet	C/2012 F3 (PANSTARRS)	152
Comet	C/2014 XB8 (PANSTARRS)	153
Comet	42P/Neujmin	154
Comet	310P/Hill	155
Comet	174P/(60558) Echeclus	156
Comet	218P/LINEAR	157
Comet	113P/Spitaler	158
Comet	268P/Bernardi	159
Comet	308P/Lagerkvist–Carsenty	160
Comet	P/2007 S1 (Zhao)	161
Comet	205P/Giacobini	162
Comet	P/2008 QP20 (LINEAR–Hill)	163
Comet	57P/du Toit–Neujmin–Delporte	164
Comet	19P/Borrelly	165
Comet	34D/Gale	166
Comet	P/2009 Q4 (Boattini)	167
Comet	P/2010 B2 (WISE)	168
Comet	220P/McNaught	169
Comet	148P/Anderson–LINEAR	170
Comet	196P/Tichy	171
Comet	P/2012 F5 (Gibbs)	172
Comet	C/2014 W11 (PANSTARRS)	173
Comet	P/2009 WX51 (Catalina)	174
Comet	233P/La Sagra	175
Comet	P/2008 S1 (Catalina–McNaught)	176
Comet	C/2014 Q1 (PANSTARRS)	177
Comet	221P/LINEAR	178
Comet	162P/Siding Spring	179
Comet	P/2004 FY140 (LINEAR)	180

Comet 140P/Bowell-Skiff	181
Comet 51P/Harrington	182
Comet P/2010 K2 (WISE)	183
Comet 67P/Churyumov-Gerasimenko	184
Comet P/2009 L2 (Yang-Gao)	185
Comet P/2004 R1 (McNaught)	186
Comet C/2012 LP26 (Palomar)	187
Comet 141P/Machholz	188
Comet C/2014 M1 (PANSTARRS)	189
Comet C/2013 C2 (Tenagra)	190
Comet C/2014 A4 (SONEAR)	191
Comet C/2014 W8 (PANSTARRS)	192
Comet 61P/Shajn-Schaldach	193
Comet C/2013 V4 (Catalina)	194
Comet 151P/Helin	195
Comet P/2001 H5 (NEAT)	196
Comet P/2007 V2 (Hill)	197
Comet P/1994 N2 (McNaught-Hartley)	198
Comet 22P/Kopff	199
Comet P/2005 RV25 = 2014 U5 (LONEOS-Christensen)	200
Comet P/2008 Y2 (Gibbs)	201
Comet 214P/LINEAR	202
Comet 10P/Tempel	203
Comet C/2013 US10 (Catalina)	204
Comet 230P/LINEAR	205
Comet 249P/LINEAR	206
Comet P/2010 R2 (La Sagra)	207
Comet P/2003 WC7 (LINEAR-Catalina)	208
Comet C/2014 S2 (PANSTARRS)	209
Comet P/2002 Q1 (Van Ness)	210
Comet 204P/LINEAR-NEAT	211
Comet 180P/NEAT	212
Comet P/1998 QP54 (LONEOS-Tucker)	213
Comet P/2014 W4 (PANSTARRS)	214
Comet 116P/Wild	215
Comet C/2014 Y1 (PANSTARRS)	216
Comet 211P/Hill	217
Comet 50P/Arend	218
Comet C/2014 W5 (Lemmon-PANSTARRS)	219
Comet 147P/Kushida-Muramatsu	220
Comet P/2010 V1 (Ikeya-Murakami) [Orbit 1]	221
Comet 194P/LINEAR	222
Comet C/2014 W2 (PANSTARRS)	223
Comet P/2010 V1 (Ikeya-Murakami) [Orbit 2]	224
Comet 252P/LINEAR	225

Comet 127P/Holt-Olmstead	226
Comet 104P/Kowal	227
Comet 100P/Hartley	228
Comet 190P/Mueller	229
Comet C/2013 X1 (PANSTARRS)	230
Comet 53P/Van Biesbroeck	231
Comet 302P/Lemmon-PANSTARRS	232
Comet 77P/Longmore	233
Comet C/2011 KP36 (Spacewatch)	234
Comet 216P/LINEAR	235
Comet 157P/Tritton	236
Comet 118P/Shoemaker-Levy	237
Comet 81P/Wild	238
Comet 150P/LONEOS	239
Comet 9P/Tempel	240
Comet C/2014 R3 (PANSTARRS)	241
Comet 43P/Wolf-Harrington	242
Comet P/1999 V1 (Catalina)	243
Comet 314P/Montani	244
Comet 94P/Russell	245
Comet 315P/LONEOS	246
Comet C/2014 OE4 (PANSTARRS)	247
Comet 188P/LINEAR-Mueller	248
Comet 176P/LINEAR	249
Comet 172P/Yeung	250
Comet P/2001 F1 (NEAT)	251
Comet C/2014 B1 (Schwartz)	252
Comet 65P/Gunn	253
Comet 74P/Smirnova-Chernykh	254
Comet C/2010 U3 (Boattini)	255
Comet 29P/Schwassmann-Wachmann	256

Comet 95P/(2060) Chiron

Epoch 1996 Feb. 7.0 TT = JDT 2450120.5

T 1996 Feb. 14.74490 TT

		(2000.0)	P	Sato Q
q	8.4539295			
n	0.01942786	Peri. 339.55375	-0.98660439	+0.15200968
a	13.7041716	Node 209.38441	-0.12782230	-0.94583868
e	0.3831127	Incl. 6.92994	-0.10135700	-0.28684883
P	50.73			

From 1267 observations 1895 Apr. 24–2014 Oct. 30, mean residual 0".47.

Comet C/2009 F4 (McNaught)

Epoch 2011 Dec. 25.0 TT = JDT 2455920.5

T 2011 Dec. 31.89156 TT

		(2000.0)	P	Sato Q
q	5.4548627			
z	-0.0002917	Peri. 260.38340	+0.04749537	+0.61014596
	+/-0.0000003	Node 53.58442	+0.16282320	+0.77643869
e	1.0015914	Incl. 79.34756	-0.98551144	+0.15768598

From 1123 observations 2009 Mar. 19–2014 Nov. 28, mean residual 0".63.

Comet C/2006 S3 (LONEOS)

Epoch 2012 Apr. 23.0 TT = JDT 2456040.5

T 2012 Apr. 16.32780 TT

		(2000.0)	P	Sato Q
q	5.1311656			
z	-0.0006882	Peri. 140.12981	-0.21556120	-0.96492721
	+/-0.0000001	Node 38.37080	-0.94614153	+0.24434439
e	1.0035314	Incl. 166.03265	-0.24155656	-0.09597547

From 5774 observations 2006 Aug. 29–2015 Jan. 23, mean residual 0".64.

Comet C/2010 R1 (LINEAR)

Epoch 2012 June 2.0 TT = JDT 2456080.5

T 2012 May 18.89668 TT

		(2000.0)	P	Sato Q
q	5.6214203			
z	-0.0006519	Peri. 114.49620	-0.63355755	-0.76579324
	+/-0.0000007	Node 343.64940	-0.77181018	+0.63550472
e	1.0036648	Incl. 156.93340	+0.05398027	+0.09846051

From 1492 observations 2010 Sept. 4–2014 Mar. 30, mean residual 0".65.

Comet 158P/Kowal-LINEAR

Epoch 2012 Sept. 30.0 TT = JDT 2456200.5

T 2012 Sept. 27.48187 TT

		(2000.0)	P	Sato Q
q	4.5764212			
n	0.09607371	Peri. 232.84946	+0.97919840	-0.18018869
a	4.7213515	Node 137.30457	+0.20025401	+0.93228758
e	0.0306968	Incl. 7.90734	-0.03269276	+0.31364294
P	10.26			

From 537 observations 1979 July 24–2014 Nov. 24, mean residual 0".74.

Comet C/2012 A2 (LINEAR)

Epoch 2012 Nov. 9.0 TT = JDT 2456240.5

T 2012 Nov. 5.09119 TT

		(2000.0)	P	Sato Q
q	3.5374723			
z	+0.0010306	Peri. 101.66960	+0.08481558	+0.98342905
	+/-0.0000003	Node 191.40402	+0.23708622	+0.13627206
e	0.9963543	Incl. 125.86864	+0.96777913	-0.11957101

From 2576 observations 2011 Apr. 2–2014 Oct. 21, mean residual 0".51.

Comet C/2012 J1 (Catalina)

Epoch 2012 Dec. 19.0 TT = JDT 2456280.5

T 2012 Dec. 7.24019 TT

		(2000.0)	P	Sato Q
q	3.1587102			
z	-0.0004529	Peri. 147.27405	+0.84721841	-0.26315975
	+/-0.0000003	Node 235.21725	+0.27903571	+0.95964398
e	1.0014305	Incl. 34.18596	+0.45206198	-0.09914825

From 4366 observations 2012 May 13–2014 Mar. 21, mean residual 0".37.

Comet 246P/NEAT

Epoch 2013 Jan. 28.0 TT = JDT 2456320.5

T 2013 Jan. 28.70977 TT

		(2000.0)	P	Sato	Q
q	2.8797635				
n	0.12191754	Peri.	176.18903	-0.25681636	+0.92800676
a	4.0280229	Node	78.78048	-0.89382599	-0.12184571
e	0.2850677	Incl.	15.97178	-0.36758735	-0.35207537
P	8.08				

From 2753 observations 2002 Jan. 6–2014 Nov. 24, mean residual 0".57.

Comet C/2012 F6 (Lemmon)

Epoch 2013 Mar. 9.0 TT = JDT 2456360.5

T 2013 Mar. 24.51477 TT

		(2000.0)	P	Sato	Q
q	0.7312481				
z	+0.0020269	Peri.	304.98792	+0.46128421	+0.76193559
	+/-0.0000002	Node	332.71475	-0.00393713	-0.51061767
e	0.9985178	Incl.	82.60800	-0.88724370	+0.39840150

From 3141 observations 2012 Jan. 22–2014 Oct. 13, mean residual 0".45.

Comet C/2013 F2 (Catalina)

Epoch 2013 Apr. 18.0 TT = JDT 2456400.5

T 2013 Apr. 18.86146 TT

		(2000.0)	P	Sato	Q
q	6.2178172				
z	+0.0001112	Peri.	122.97838	-0.41630242	-0.87730636
	+/-0.0000037	Node	344.27087	+0.19209207	+0.17184898
e	0.9993086	Incl.	61.75015	+0.88870295	-0.44810877

From 167 observations 2012 Dec. 28–2014 Apr. 23, mean residual 0".61.

Comet C/2010 S1 (LINEAR)

Epoch 2013 May 28.0 TT = JDT 2456440.5

T 2013 May 20.29766 TT

		(2000.0)	P	Sato	Q
q	5.8999045				
z	-0.0003259	Peri.	118.61456	+0.53547247	-0.22396558
	+/-0.0000002	Node	93.43035	-0.69559925	-0.66377830
e	1.0019228	Incl.	125.33579	+0.47896859	-0.71360898

From 8309 observations 2010 Sept. 21–2014 Oct. 22, mean residual 0".52.

Comet C/2012 K6 (McNaught)

Epoch 2013 May 28.0 TT = JDT 2456440.5

T 2013 May 21.49615 TT

		(2000.0)	P	Sato	Q
q	3.3530819				
z	+0.0001570	Peri.	338.83322	-0.71568392	-0.62148138
	+/-0.0000004	Node	206.89892	-0.49561717	+0.13042455
e	0.9994734	Incl.	135.21934	-0.49209769	+0.77249617

From 1048 observations 2012 May 27–2014 Oct. 24, mean residual 0".45.

Comet C/2013 E1 (McNaught)

Epoch 2013 May 28.0 TT = JDT 2456440.5

T 2013 June 12.10847 TT

		(2000.0)	P	Sato	Q
q	7.7816398				
z	-0.0003002	Peri.	311.42472	-0.96221118	-0.07785892
	+/-0.0000025	Node	134.02830	+0.09916644	+0.79225671
e	1.0023360	Incl.	158.72055	-0.25360533	+0.60520021

From 169 observations 2012 Apr. 2–2014 Mar. 30, mean residual 0".55.

Comet P/2014 MG4 (Spacewatch-PANSTARRS)

Epoch 2013 May 28.0 TT = JDT 2456440.5

T 2013 June 13.55958 TT

		(2000.0)	P	Sato	Q
q	3.7144128				
n	0.08784705	Peri.	298.86457	-0.32139959	+0.93915282
a	5.0116947	Node	311.86077	-0.80220504	-0.33805333
e	0.2588509	Incl.	9.36724	-0.50315939	-0.06092552
P	11.22				

From 95 observations 2014 June 20–Nov. 23, mean residual 0".48.

Comet P/2012 B1 (PANSTARRS)

Epoch 2013 July 7.0 TT = JDT 2456480.5

T 2013 July 23.11029 TT

		(2000.0)	P	Sato Q
q	3.8251557			
n	0.05958138	Peri. 162.17666	-0.94742227	+0.31023705
a	6.4922566	Node 36.19690	-0.30736565	-0.81421199
e	0.4108126	Incl. 7.62723	-0.08897983	-0.49072580
P	16.54			

From 1154 observations 1997 June 1–2014 Oct. 3, mean residual 0".50.

Comet C/2014 F1 (Hill)

Epoch 2013 Sept. 25.0 TT = JDT 2456560.5

T 2013 Oct. 4.87555 TT

		(2000.0)	P	Sato Q
q	3.4963639			
z	+0.0002031	Peri. 8.25140	-0.53514916	-0.19627326
	+/-0.0000311	Node 239.90464	-0.81911006	-0.11728498
e	0.9992899	Incl. 108.25680	-0.20657708	+0.97350965

From 181 observations 2014 Mar. 29–July 18, mean residual 0".68.

Comet C/2014 S1 (PANSTARRS)

Epoch 2013 Nov. 4.0 TT = JDT 2456600.5

T 2013 Oct. 31.58029 TT

		(2000.0)	P	Sato Q
q	8.1401748			
z	+0.0000447	Peri. 288.92010	+0.38866598	+0.91527104
	+/-0.0001098	Node 352.67780	+0.75361147	-0.38192482
e	0.9996360	Incl. 123.79553	-0.53010236	+0.12811072

From 37 observations 2014 Sept. 19–Nov. 24, mean residual 0".42.

Comet C/2014 G1 (PANSTARRS)

Epoch 2013 Nov. 4.0 TT = JDT 2456600.5

T 2013 Nov. 6.76599 TT

		(2000.0)	P	Sato Q
q	5.4685277			
z	+0.0010081	Peri. 77.05626	-0.14733103	-0.98468388
	+/-0.0000973	Node 337.92035	-0.97610248	+0.12952691
e	0.9944871	Incl. 165.64005	-0.15974203	+0.11670665

From 73 observations 2014 Mar. 30–June 29, mean residual 0".56.

Comet C/2013 G8 (PANSTARRS)

Epoch 2013 Nov. 4.0 TT = JDT 2456600.5

T 2013 Nov. 14.97978 TT

		(2000.0)	P	Sato Q
q	5.1411780			
z	+0.0003279	Peri. 80.16930	+0.68103959	+0.60972237
	+/-0.0000021	Node 241.02090	-0.70679925	+0.69209529
e	0.9983144	Incl. 27.61494	+0.19136326	+0.38631947

From 144 observations 2013 Apr. 14–2014 Oct. 25, mean residual 0".50.

Comet 2P/Encke

Epoch 2013 Nov. 4.0 TT = JDT 2456600.5

T 2013 Nov. 21.69466 TT

		(2000.0)	P	Sato Q
q	0.3361274			
n	0.29903367	Peri. 186.53592	-0.94510557	-0.31479071
a	2.2147395	Node 334.57281	+0.30828497	-0.77005386
e	0.8482316	Incl. 11.77892	+0.10833206	-0.55490888
P	3.30			

From 2491 observations 1985 July 26–2014 Sept. 24, mean residual 0".64.
Nongravitational parameters A1 = +0.01, A2 = +0.0021.

Comet C/2012 A1 (PANSTARRS)

Epoch 2013 Dec. 14.0 TT = JDT 2456640.5

T 2013 Dec. 2.21373 TT

		(2000.0)	P	Sato Q
q	7.6025440			
z	-0.0002155	Peri. 191.93447	-0.03048072	+0.52641074
	+/-0.0000018	Node 277.97146	+0.97306752	+0.20995785
e	1.0016387	Incl. 120.91012	+0.22849622	-0.82389892

From 284 observations 2012 Jan. 2–2014 Nov. 20, mean residual 0".59

Comet C/2013 R1 (Lovejoy)

Epoch 2013 Dec. 14.0 TT = JDT 2456640.5

T 2013 Dec. 22.73309 TT

		(2000.0)	P	Sato Q
q	0.8118261			
z	+0.0019352	Peri. 67.16626	-0.25259185	-0.46477177
	+/-0.0000005	Node 70.71123	+0.12869962	-0.88542323
e	0.9984289	Incl. 64.04102	+0.95897537	-0.00359126

From 3400 observations 2013 Sept. 7–2014 Sept. 14, mean residual 0".80.

Comet C/2011 J2 (LINEAR)

Epoch 2013 Dec. 14.0 TT = JDT 2456640.5

T 2013 Dec. 25.29250 TT

		(2000.0)	P	Sato Q
q	3.4434415			
z	-0.0001496	Peri. 85.29293	+0.07042286	+0.97005814
	+/-0.0000002	Node 163.94722	+0.16358610	-0.24109366
e	1.0005151	Incl. 122.79881	+0.98401230	-0.02934384

From 5608 observations 2011 Mar. 10–2015 Jan. 1, mean residual 0".54.

Comet C/2013 H2 (Boattini)

Epoch 2014 Jan. 23.0 TT = JDT 2456680.5

T 2014 Jan. 23.16298 TT

		(2000.0)	P	Sato Q
q	7.4986976			
z	-0.0002257	Peri. 35.99502	-0.46426774	-0.42427392
	+/-0.0000028	Node 262.74578	-0.87729584	+0.34089004
e	1.0016923	Incl. 128.39614	+0.12168599	+0.83891931

From 189 observations 2013 Apr. 22–2014 July 18, mean residual 0".63.

Comet 292P/Li

Epoch 2014 Jan. 23.0 TT = JDT 2456680.5

T 2014 Feb. 4.82786 TT

		(2000.0)	P	Sato Q
q	2.5223707			
n	0.06508398	Peri. 319.05746	+0.57209060	-0.70908015
a	6.1209663	Node 91.86376	+0.81798787	+0.45645460
e	0.5879130	Incl. 24.35751	+0.06006820	+0.53745190

P 15.14

From 474 observations 1998 Sept. 23–2014 Oct. 18, mean residual 0".59.

Comet C/2012 X1 (LINEAR)

Epoch 2014 Mar. 4.0 TT = JDT 2456720.5

T 2014 Feb. 21.62617 TT

		(2000.0)	P	Sato Q
q	1.5989107			
z	+0.0064854	Peri. 132.10829	-0.22407915	+0.73238108
	+/-0.0000014	Node 113.14662	-0.96330174	-0.26648565
e	0.9896305	Incl. 44.36731	+0.14777787	-0.62658069

From 2465 observations 2012 Dec. 8–2015 Jan. 15, mean residual 0".69.

Nongravitational parameters A1 = +5.19, A2 = +2.6066.

Comet C/2014 W3 (PANSTARRS)

Epoch 2014 Mar. 4.0 TT = JDT 2456720.5

T 2014 Feb. 26.71160 TT

		(2000.0)	P	Sato Q
q	6.0677523			
z	-0.0006822	Peri. 158.88174	-0.26405629	-0.09850264
	+/-0.0002778	Node 286.36837	+0.67754288	+0.68904255
e	1.0041396	Incl. 90.19413	+0.68644732	-0.71799554

From 29 observations 2014 Nov. 18–Dec. 18, mean residual 0".41.

Comet 290P/Jager

Epoch 2014 Mar. 4.0 TT = JDT 2456720.5

T 2014 Mar. 12.47493 TT

		(2000.0)	P	Sato Q
q	2.1562546			
n	0.06483606	Peri. 180.72402	-0.56075381	-0.78186028
a	6.1365597	Node 303.42393	+0.76129076	-0.35746424
e	0.6486216	Incl. 19.05540	+0.32556343	-0.51079725

P 15.20

From 3575 observations 1998 Oct. 24–2014 Dec. 9, mean residual 0".60.

Comet C/2013 G7 (McNaught)

Epoch 2014 Mar. 4.0 TT = JDT 2456720.5

T 2014 Mar. 18.66024 TT

		(2000.0)	P	Sato Q
q	4.6774842			
z	+0.0005470	Peri. 218.26004	-0.64198006	+0.25812580
	+/-0.0000018	Node 48.39988	-0.20263024	+0.85102749
e	0.9974414	Incl. 105.10376	-0.73946101	-0.45730000

From 294 observations 2012 May 21–2014 Dec. 18, mean residual 0".58.

Comet 117P/Helin-Roman-Alu

Epoch 2014 Apr. 13.0 TT = JDT 2456760.5

T 2014 Mar. 27.16323 TT

		(2000.0)	P	Sato Q
q	3.0563411			
n	0.11888530	Peri. 222.68286	+0.19406243	+0.97240703
a	4.0962264	Node 58.89723	-0.85433383	+0.23239686
e	0.2538642	Incl. 8.69738	-0.48213429	-0.02040267

From 3087 observations 1993 Jan. 24–2014 Dec. 22, mean residual 0".67.

Nongravitational parameters A1 = +13.39, A2 = +0.9075.

Comet 17P/Holmes

Epoch 2014 Apr. 13.0 TT = JDT 2456760.5

T 2014 Mar. 27.51017 TT

		(2000.0)	P	Sato Q
q	2.0565974			
n	0.14310114	Peri. 24.51392	+0.97592905	+0.12420233
a	3.6199896	Node 326.76461	-0.21061476	+0.75009096
e	0.4318775	Incl. 19.09163	+0.05660318	+0.64956704

From 4605 observations 2007 May 13–2015 Jan. 22, mean residual 0".61.

Nongravitational parameters A1 = -1.63, A2 = -2.7769.

Comet 119P/Parker-Hartley

Epoch 2014 Apr. 13.0 TT = JDT 2456760.5

T 2014 Apr. 2.59907 TT

		(2000.0)	P	Sato Q
q	3.0264998			
n	0.11139546	Peri. 181.30407	+0.41628494	-0.90557744
a	4.2778385	Node 244.10097	+0.83502374	+0.41622359
e	0.2925166	Incl. 5.19577	+0.35978076	+0.08177665

From 1433 observations 1989 Mar. 2–2015 Jan. 1, mean residual 0".67.

Nongravitational parameters A1 = +4.59, A2 = +1.0815.

Comet 311P/PANSTARRS

Epoch 2014 Apr. 13.0 TT = JDT 2456760.5

T 2014 Apr. 15.91632 TT

		(2000.0)	P	Sato Q
q	1.9361515			
n	0.30441658	Peri. 144.27645	+0.44300956	-0.89243327
a	2.1885536	Node 279.28903	+0.80111396	+0.43685987
e	0.1153283	Incl. 4.96845	+0.40244125	+0.11276660

From 137 observations 2010 Oct. 17–2014 Oct. 23, mean residual 0".56.

Comet 156P/Russell-LINEAR

Epoch 2014 Apr. 13.0 TT = JDT 2456760.5

T 2014 Apr. 16.56151 TT

		(2000.0)	P	Sato Q
q	1.5848652			
n	0.14466620	Peri. 357.80578	+0.79929618	-0.55796343
a	3.5938340	Node 38.98166	+0.55661109	+0.54741580
e	0.5590043	Incl. 20.77826	+0.22651647	+0.62370887

From 82 observations 1986 Sept. 3–2013 Aug. 5, mean residual 0".60.

Comet 191P/McNaught

Epoch 2014 May 23.0 TT = JDT 2456800.5

T 2014 May 6.21451 TT

		(2000.0)	P	Sato	Q
q	2.0441737				
n	0.14870434	Peri. 274.47632	+0.92313686	-0.35561169	
a	3.5284742	Node 106.40821	+0.38446980	+0.85271056	
e	0.4206636	Incl. 8.76318	+0.00114150	+0.38265522	
P	6.63				

From 562 observations 2000 Aug. 5–2015 Jan. 1, mean residual 0".63.

Comet 134P/Kowal–Vavrova

Epoch 2014 May 23.0 TT = JDT 2456800.5

T 2014 May 21.49330 TT

		(2000.0)	P	Sato	Q
q	2.5713157				
n	0.06336433	Peri. 18.58394	-0.75842916	+0.65112974	
a	6.2312161	Node 202.12051	-0.60717529	-0.72179822	
e	0.5873493	Incl. 4.34873	-0.23690372	-0.23460050	
P	15.55				

From 981 observations 1983 May 8–2014 Oct. 8, mean residual 0".57.

Nongravitational parameters A1 = +11.44, A2 = +0.0870.

Comet 4P/Faye

Epoch 2014 May 23.0 TT = JDT 2456800.5

T 2014 May 29.61854 TT

		(2000.0)	P	Sato	Q
q	1.6550475				
n	0.13120966	Peri. 205.06607	+0.71693085	-0.69520779	
a	3.8355311	Node 199.27517	+0.66319703	+0.70308516	
e	0.5684959	Incl. 9.05023	+0.21489497	+0.14952386	
P	7.51				

From 3530 observations 1992 Dec. 2–2014 Dec. 22, mean residual 0".85.

Nongravitational parameters A1 = +0.45, A2 = -0.0612.

Comet 16P/Brooks

Epoch 2014 May 23.0 TT = JDT 2456800.5

T 2014 June 7.55886 TT

		(2000.0)	P	Sato	Q
q	1.4663572				
n	0.16046958	Peri. 219.64972	+0.94514214	-0.32560391	
a	3.3538289	Node 159.30694	+0.31538145	+0.88863922	
e	0.5627812	Incl. 4.25827	+0.08509335	+0.32295888	
P	6.14				

From 314 observations 2001 July 16–2014 Dec. 23, mean residual 0".98.

Nongravitational parameters A1 = -0.12, A2 = -0.7434.

Comet C/2013 Y2 (PANSTARRS)

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 June 13.65593 TT

		(2000.0)	P	Sato	Q
q	1.9190531				
z	+0.0045923	Peri. 308.84804	-0.88746851	+0.13983009	
	+/-0.0000021	Node 243.39933	-0.08372529	-0.98592230	
e	0.9911871	Incl. 29.41490	-0.45319942	-0.09167746	

From 437 observations 2013 Dec. 30–2014 Sept. 10, mean residual 0".44.

Comet C/2014 E2 (Jacques)

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 July 2.51559 TT

		(2000.0)	P	Sato	Q
q	0.6639251				
z	+0.0014569	Peri. 344.04063	+0.32236237	+0.88591254	
	+/-0.0000013	Node 56.39088	+0.90640804	-0.39047334	
e	0.9990327	Incl. 156.39213	+0.27295965	+0.25037879	

From 4531 observations 2014 Mar. 13–Dec. 31, mean residual 0".54.

Nongravitational parameters A1 = +2.15, A2 = -0.5129.

Comet C/2012 U1 (PANSTARRS)

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 July 4.89509 TT

		(2000.0)	P	Sato Q
q	5.2637370			
z	+0.0000794	Peri. 70.07041	+0.06733995	-0.92350183
	+/-0.0000019	Node 26.98199	+0.25668405	-0.34972048
e	0.9995821	Incl. 56.33889	+0.96414658	+0.15760698

From 132 observations 2012 Oct. 17–2014 Aug. 25, mean residual 0".50.

Comet C/2014 M2 (Christensen)

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 July 11.16788 TT

		(2000.0)	P	Sato Q
q	6.9095880			
z	+0.0010566	Peri. 40.15983	+0.17606405	+0.85530236
	+/-0.0000151	Node 245.35173	-0.98313989	+0.12795761
e	0.9926993	Incl. 32.42188	-0.04937012	+0.50208040

From 51 observations 2014 June 25–Sept. 29, mean residual 0".57.

Comet P/2014 L2 (NEOWISE)

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 July 15.42704 TT

		(2000.0)	P	Sato Q
q	2.2345505			
n	0.06193363	Peri. 182.78168	+0.88437728	+0.46450170
a	6.3268134	Node 149.40572	-0.42649243	+0.84416673
e	0.6468126	Incl. 5.18430	-0.18968669	+0.26762043

P 15.91

From 996 observations 2014 June 7–Nov. 26, mean residual 0".49.

Comet 106P/Schuster

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 July 20.15107 TT

		(2000.0)	P	Sato Q
q	1.5460511			
n	0.13540775	Peri. 355.91559	+0.68550405	-0.67775344
a	3.7558397	Node 50.54371	+0.67736992	+0.45976480
e	0.5883607	Incl. 20.14873	+0.26693481	+0.57381757

P 7.28

From 257 observations 1977 Sept. 6–2014 Nov. 18, mean residual 0".75.

Nongravitational parameters A1 = +0.09, A2 = +0.0133.

Comet P/2014 W1 (PANSTARRS)

Epoch 2014 Aug. 11.0 TT = JDT 2456880.5

T 2014 July 31.31372 TT

		(2000.0)	P	Sato Q
q	2.6703938			
n	0.10635056	Peri. 150.30293	+0.78720462	-0.60007304
a	4.4120747	Node 247.26149	+0.53106231	+0.77685108
e	0.3947533	Incl. 8.86952	+0.31349914	+0.19082648

P 9.27

From 45 observations 2014 Nov. 17–Dec. 13, mean residual 0".45.

Comet C/2013 P4 (PANSTARRS)

Epoch 2014 Aug. 11.0 TT = JDT 2456880.5

T 2014 Aug. 12.37997 TT

		(2000.0)	P	Sato Q
q	5.9670418			
n	0.01736647	Peri. 113.55912	+0.98181177	-0.17553550
a	14.7682289	Node 256.61336	+0.13546434	+0.91464707
e	0.5959541	Incl. 4.26441	+0.13302277	+0.36415385

P 56.75

From 175 observations 2013 Aug. 15–2014 Nov. 15, mean residual 0".54.

Comet C/2013 TW5 (Spacewatch)

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2014 Aug. 18.20030 TT

		(2000.0)	P	Sato Q
q	5.8334510			
z	+0.0032892	Peri. 190.48435	-0.85034701	-0.40409736
	+/-0.0000012	Node 319.69552	+0.51261464	-0.49138769
e	0.9808128	Incl. 31.40560	+0.11889573	-0.77152022

From 303 observations 2013 Oct. 3–2014 Dec. 1, mean residual 0".37.

Comet C/2012 K8 (Lemmon)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2014 Aug. 19.36562 TT

		(2000.0)	P	Sato Q
q	6.4631408			
z	-0.0001262	Peri. 75.85572	-0.03137843	-0.70867703
	+/-0.0000008	Node 312.80651	-0.70282627	+0.51704238
e	1.0008155	Incl. 106.11219	+0.71066914	+0.48004588

From 831 observations 2012 May 30–2014 Oct. 30, mean residual 0".54.

Comet C/2012 K1 (PANSTARRS)

Epoch 2014 Aug. 11.0 TT = JDT 2456880.5

T 2014 Aug. 27.65651 TT

		(2000.0)	P	Sato Q
q	1.0545538			
z	-0.0001370	Peri. 203.10603	-0.47152624	+0.78070701
	+/-0.0000011	Node 317.73792	+0.87391112	+0.47594906
e	1.0001445	Incl. 142.42837	+0.11807776	-0.40493092

From 7175 observations 2012 May 14–2015 Jan. 15, mean residual 0".58.
Nongravitational parameters A1 = +2.18, A2 = +0.5019.

Comet P/2011 S1 (Gibbs)

Epoch 2014 Aug. 11.0 TT = JDT 2456880.5

T 2014 Aug. 27.37816 TT

		(2000.0)	P	Sato Q
q	6.8930790			
n	0.03878063	Peri. 193.56538	+0.60945337	-0.79227794
a	8.6442265	Node 218.89627	+0.73169342	+0.57633819
e	0.2025800	Incl. 2.68039	+0.30527254	+0.20032461

P 25.41
From 129 observations 2010 Sept. 29–2014 Nov. 29, mean residual 0".49.

Ccomet 284P/McNaught

Epoch 2014 Sept. 20.0 TT = JDT 2456920.5

T 2014 Sept. 2.49214 TT

		(2000.0)	P	Sato Q
q	2.2894563			
n	0.13998670	Peri. 202.86261	+0.97013448	+0.21081687
a	3.6734844	Node 144.29305	-0.17837089	+0.95521065
e	0.3767617	Incl. 11.86304	-0.16438647	+0.20767489

P 7.04
From 1628 observations 2007 Apr. 17–2014 Dec. 21, mean residual 0".58.

Comet C/2014 U3 (Kowalski)

Epoch 2014 Sept. 20.0 TT = JDT 2456920.5

T 2014 Sept. 3.53356 TT

		(2000.0)	P	Sato Q
q	2.5585084			
z	+0.0011387	Peri. 51.31151	-0.40299758	+0.90615308
	+/-0.0001460	Node 163.57918	+0.63315013	+0.17476022
e	0.9970866	Incl. 152.99224	+0.66084330	+0.38515642

From 47 observations 2014 Oct. 26–Dec. 26, mean residual 0".75.

Comet 170P/Christensen

Epoch 2014 Sept. 20.0 TT = JDT 2456920.5

T 2014 Sept. 17.96905 TT

		(2000.0)	P	Sato Q
q	2.9206587			
n	0.11451546	Peri. 225.82771	+0.98163053	-0.15862175
a	4.1997809	Node 142.91951	+0.18151478	+0.94760322
e	0.3045688	Incl. 10.12770	-0.05876987	+0.27728556

P 8.61
From 249 observations 2005 June 17–2014 Nov. 21, mean residual 0".59.

Comet C/2013 V5 (Oukaimeden)

Epoch 2014 Sept. 20.0 TT = JDT 2456920.5

T 2014 Sept. 28.22380 TT

		(2000.0)	P	Sato Q
q	0.6254859			
z	+0.0020954	Peri. 314.57526	+0.74284256	-0.52160730
	+/-0.0000006	Node 278.61561	-0.42775038	-0.85201363
e	0.9986894	Incl. 154.88445	-0.51498985	-0.04470564

From 1433 observations 2013 Nov. 12–2014 Dec. 27, mean residual 0".55.

Comet C/2014 N2 (PANSTARRS)

Epoch 2014 Sept. 20.0 TT = JDT 2456920.5

T 2014 Oct. 8.23223 TT

		(2000.0)	P	Sato Q
q	2.1843774			
z	+0.0002708	Peri. 237.86160	+0.08817639	-0.89764450
	+/-0.0000509	Node 143.80398	-0.46962869	+0.34483224
e	0.9994085	Incl. 133.01299	-0.87844967	-0.27445416

From 48 observations 2014 July 2-Oct. 11, mean residual 0".50.

Comet 303P/NEAT

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 13.56057 TT

		(2000.0)	P	Sato Q
q	2.4876543			
n	0.08644196	Peri. 357.01112	+0.96614768	+0.25674525
a	5.0658576	Node 348.02014	-0.23410004	+0.83122638
e	0.5089372	Incl. 7.00354	-0.10842431	+0.49309693

P 11.40

From 229 observations 2003 Oct. 17-2014 Nov. 10, mean residual 0".57.

Comet C/2013 V2 (Borisov)

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 14.36304 TT

		(2000.0)	P	Sato Q
q	3.5079209			
z	-0.0012400	Peri. 94.47193	-0.64067947	-0.61548862
	+/-0.0000008	Node 48.42736	+0.18243648	-0.70274621
e	1.0043497	Incl. 37.84844	+0.74581952	-0.35682142

From 969 observations 2012 Nov. 17-2015 Jan. 23, mean residual 0".52.

Comet 32P/Comas Sola

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 17.59779 TT

		(2000.0)	P	Sato Q
q	2.0011844			
n	0.10291160	Peri. 53.33797	-0.35115414	-0.92477397
a	4.5098264	Node 57.84880	+0.79431213	-0.37710689
e	0.5562613	Incl. 9.96943	+0.49574088	-0.05082823

P 9.58

From 2012 observations 1995 Aug. 1-2015 Jan. 26, mean residual 0".67.

Nongravitational parameters A1 = -0.23, A2 = -0.0936.

Comet 108P/Ciffreo

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 18.41539 TT

		(2000.0)	P	Sato Q
q	1.7088346			
n	0.13625843	Peri. 358.07330	+0.61846839	-0.76430819
a	3.7401911	Node 53.67093	+0.72396302	+0.46385819
e	0.5431157	Incl. 13.09766	+0.30557224	+0.44796046

P 7.23

From 1211 observations 1985 Nov. 8-2015 Jan. 22, mean residual 0".55.

Nongravitational parameters A1 = +0.11, A2 = -0.0356.

Comet 70P/Kojima

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 20.76489 TT

		(2000.0)	P	Sato Q
q	2.0067857			
n	0.13984433	Peri. 1.99016	-0.51876365	-0.84901761
a	3.6759772	Node 119.27265	+0.78277527	-0.51886364
e	0.4540810	Incl. 6.60043	+0.34372542	-0.09974778

P 7.05

From 560 observations 1977 Nov. 12-2015 Jan. 26, mean residual 0".66.

Nongravitational parameters A1 = +0.02, A2 = -0.0082.

Comet C/2014 R4 (Gibbs)

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 21.51357 TT

		(2000.0)	P	Sato Q
q	1.8179684			
z	+0.0002972	Peri. 180.84032	-0.17622509	-0.72562572
	+/-0.0000301	Node 279.53001	+0.90701233	+0.14284084
e	0.9994597	Incl. 42.41135	+0.38245699	-0.67310015

From 123 observations 2014 Aug. 20-Dec. 20, mean residual 0".70.

Comet C/2013 A1 (Siding Spring)

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 25.30018 TT

		(2000.0)	P	Sato Q
q	1.3987274			
z	-0.0004075	Peri. 2.42095	+0.49141489	-0.56131750
	+/-0.0000098	Node 300.97653	-0.81154162	-0.57262304
e	1.0005699	Incl. 129.04241	-0.31608795	+0.59751613

From 1762 observations 2012 Oct. 4-2015 Jan. 23, mean residual 0".69.

Nongravitational parameters A1 = +3.06, A2 = -2.1617.

Comet C/2013 U2 (Holvorcem)

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Oct. 25.87213 TT

		(2000.0)	P	Sato Q
q	5.1167367			
z	+0.0011118	Peri. 107.37533	-0.38135475	-0.92066987
	+/-0.0000019	Node 7.00162	+0.34187850	-0.22416254
e	0.9943113	Incl. 43.09400	+0.85888745	-0.31955930

From 258 observations 2013 Oct. 23-2014 Dec. 30, mean residual 0".45.

Cocmet 135P/Shoemaker-Levy

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Nov. 1.59557 TT

		(2000.0)	P	Sato Q
q	2.6796897			
n	0.13296647	Peri. 21.94766	-0.57398741	+0.81683042
a	3.8016718	Node 213.10341	-0.76612037	-0.56055230
e	0.2951286	Incl. 6.06199	-0.28913324	-0.13626879
P	7.41			

From 88 observations 1992 Mar. 30-1999 June 9, mean residual 0".81.

From CHB 2014.

Comet 80P/Peters-Hartley

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Nov. 10.03980 TT

		(2000.0)	P	Sato Q
q	1.6127184			
n	0.12219852	Peri. 339.13244	-0.46797998	+0.73473195
a	4.0218458	Node 259.88844	-0.72357588	-0.63759669
e	0.5990104	Incl. 29.92277	-0.50737824	+0.23160185
P	8.07			

From 28 observations 1982 July 16-2014 July 26, mean residual 0".97.

Nongravitational parameters A1 = +0.61, A2 = -0.0911.

Comet 269P/Jedicke

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Nov. 14.61086 TT

		(2000.0)	P	Sato Q
q	4.0793238			
n	0.04971064	Peri. 223.36861	-0.37176024	-0.92212595
a	7.3254869	Node 248.71774	+0.88004482	-0.31333490
e	0.4431327	Incl. 6.60228	+0.29549186	-0.22694705
P	19.83			

From 594 observations 1993 Oct. 12-2015 Jan. 23, mean residual 0".57.

Comet P/2014 W12 (Gibbs)

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Nov. 15.01855 TT

		(2000.0)	P	Sato	Q
q	1.6720798				
n	0.15542345	Peri.	36.89402	+0.90989065	+0.39426553
a	3.4260342	Node	299.40570	-0.40714199	+0.78900294
e	0.5119489	Incl.	8.51881	-0.07958896	+0.47119959
P	6.34				

From 62 observations 2014 Nov. 30–Dec. 25, mean residual 0".55.

Comet C/2013 G3 (PANSTARRS)

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Nov. 15.19499 TT

		(2000.0)	P	Sato	Q
q	3.8521711				
z	-0.0001283	Peri.	76.49806	-0.00978893	+0.90462581
+/-0.0000006		Node	208.12645	-0.78719266	+0.25579594
e	1.0004942	Incl.	64.66943	+0.61662946	+0.34091139

From 816 observations 2013 Apr. 10–2014 Nov. 25, mean residual 0".48.

Comet 40P/Vaisala

Epoch 2014 Oct. 30.0 TT = JDT 2456960.5

T 2014 Nov. 15.81271 TT

		(2000.0)	P	Sato	Q
q	1.8195605				
n	0.08978214	Peri.	47.27239	-0.98918816	+0.02922803
a	4.9394215	Node	133.84011	-0.06667313	-0.96243912
e	0.6316248	Incl.	11.49275	+0.13061959	-0.26991973
P	10.98				

From 925 observations 1950 Apr. 20–2015 Jan. 2, mean residual 0".71.

Nongravitational parameters A1 = +0.01, A2 = -0.0113.

Comet C/2014 Q3 (Borisov)

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Nov. 19.06970 TT

		(2000.0)	P	Sato	Q
q	1.6474034				
n	0.00650506	Peri.	47.38223	+0.30544843	-0.33314604
a	28.4207192	Node	63.12932	+0.26171035	-0.87135013
e	0.9420351	Incl.	89.94868	+0.91553752	+0.36022585
P	151.51				

From 692 observations 2014 Aug. 22–2015 Jan. 5, mean residual 0".57.

Comet C/2014 R1 (Borisov)

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Nov. 19.24185 TT

		(2000.0)	P	Sato	Q
q	1.3454451				
z	+0.0055113	Peri.	55.64838	-0.92589972	-0.33868689
+/-0.0000089		Node	104.05428	+0.26437614	-0.89734432
e	0.9925849	Incl.	9.93310	+0.26984248	-0.28295647

From 280 observations 2014 Sept. 5–2015 Jan. 29, mean residual 0".53.

Comet 305P/Skiff

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Nov. 19.75915 TT

		(2000.0)	P	Sato	Q
q	1.4031105				
n	0.09946689	Peri.	144.98952	+0.88092295	-0.43911215
a	4.6133564	Node	241.99249	+0.37563638	+0.87562358
e	0.6958591	Incl.	11.53241	+0.28787507	+0.20115633
P	9.91				

From 391 observations 2004 Oct. 7–2014 Dec. 20, mean residual 0".69.

Comet C/2013 P3 (Palomar)

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Nov. 23.87955 TT

		(2000.0)	P	Sato	Q
q	8.6464540				
z	-0.0001381	Peri.	177.18641	+0.99782465	+0.04579388
+/-0.0000012		Node	177.27553	-0.05997068	+0.33181466
e	1.0011942	Incl.	93.91006	+0.02737659	-0.94223243

From 349 observations 2013 Aug. 8–2014 Dec. 18, mean residual 0".39.

Comet 193P/LINEAR-NEAT

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Nov. 24.69582 TT

		(2000.0)	P	Sato	Q
q	2.1662182				
n	0.14571867	Peri.	8.44743	+0.95845030	+0.27444484
a	3.5765084	Node	335.19429	-0.27136057	+0.79308820
e	0.3943204	Incl.	10.68697	-0.08795713	+0.54377489
P	6.76				

From 330 observations 2001 Aug. 17–2014 Dec. 1, mean residual 0".69.

Nongravitational parameters A1 = +1.84, A2 = -0.1604.

Comet C/2014 L5 (Lemmon)

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Nov. 26.37298 TT

		(2000.0)	P	Sato	Q
q	6.2032045				
z	-0.0004555	Peri.	45.61265	+0.79402818	-0.35933642
+/-0.0000091		Node	35.68673	-0.15307614	-0.89878139
e	1.0028255	Incl.	122.80808	+0.58829154	+0.25113612

From 62 observations 2013 Oct. 12–2014 Nov. 30, mean residual 0".46.

Comet 110P/Hartley

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Dec. 17.79394 TT

		(2000.0)	P	Sato	Q
q	2.4753519				
n	0.14362361	Peri.	167.75059	-0.09943176	-0.97613483
a	3.6112052	Node	287.71439	+0.89497766	-0.00293261
e	0.3145358	Incl.	11.69342	+0.43488885	-0.21714557
P	6.86				

From 1841 observations 1988 Feb. 19–2015 Jan. 22, mean residual 0".61.

Nongravitational parameters A1 = -0.25, A2 = -0.0282.

Comet 307P/LINEAR

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Dec. 20.23583 TT

		(2000.0)	P	Sato	Q
q	1.8891405				
n	0.07054872	Peri.	222.14490	+0.93750002	-0.34679238
a	5.8006497	Node	158.09597	+0.33631314	+0.88170193
e	0.6743226	Incl.	4.42588	+0.08937109	+0.31990116
P	13.97				

From 188 observations 2000 Aug. 24–2014 Dec. 24, mean residual 0".61.

Comet 15P/Finlay

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Dec. 27.05500 TT

		(2000.0)	P	Sato	Q
q	0.9758977				
n	0.15132356	Peri.	347.55313	+0.99936924	-0.02159156
a	3.4876403	Node	13.77780	+0.03281076	+0.86513096
e	0.7201840	Incl.	6.79897	-0.01358596	+0.50108105
P	6.51				

From 548 observations 2002 Jan. 27–2015 Jan. 28, mean residual 0".76.

Nongravitational parameters A1 = +0.45, A2 = +0.0100.

Comet P/2014 M4 (PANSTARRS)

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Dec. 27.60637 TT

		(2000.0)	P	Sato	Q
q	2.3514040				
n	0.07031749	Peri.	145.28189	+0.63726090	-0.76845217
a	5.8133589	Node	265.05831	+0.69317818	+0.60453087
e	0.5955171	Incl.	3.34528	+0.33675296	+0.20981822
P	14.02				

From 75 observations 2014 June 30–Nov. 18, mean residual 0".65.

Comet 287P/Christensen

Epoch 2014 Dec. 9.0 TT = JDT 2457000.5

T 2014 Dec. 28.41961 TT

		(2000.0)	P	Sato	Q
q	3.0540400				
n	0.11536409	Peri. 189.08306	+0.84518817	+0.50182566	
a	4.1791597	Node 139.05760	-0.47105271	+0.86199671	
e	0.2692215	Incl. 16.30026	-0.25251989	+0.07164276	
P	8.54				

From 162 observations 2006 Aug. 30–2014 Nov. 9, mean residual 0".70.

Comet C/2014 W7 (Christensen)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2014 Dec. 31.61824 TT

		(2000.0)	P	Sato	Q
q	1.4882250				
n	0.02574251	Peri. 33.23682	-0.69526442	+0.53873243	
a	11.3597493	Node 151.25960	+0.21701932	-0.47371961	
e	0.8689914	Incl. 98.31384	+0.68520800	+0.69667575	
P	38.29				

From 39 observations 2014 Nov. 22–Dec. 31, mean residual 0".36.

Comet C/2014 F2 (Tenagra)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 2.36721 TT

		(2000.0)	P	Sato	Q
q	4.3144012				
z	+0.0067946	Peri. 86.05067	-0.48716761	+0.01100063	
	+/-0.0000038	Node 267.44790	-0.39020523	+0.89181469	
e	0.9706855	Incl. 119.06063	+0.78128586	+0.45226712	

From 240 observations 2014 Mar. 31–Oct. 2, mean residual 0".53.

Comet C/2013 W2 (PANSTARRS)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 4.36112 TT

		(2000.0)	P	Sato	Q
q	4.4522183				
n	0.02942093	Peri. 306.94017	-0.59928471	-0.80053595	
a	10.3919837	Node 179.87813	+0.75746769	-0.56711206	
e	0.5715719	Incl. 4.56698	+0.25903771	-0.19371657	
P	33.50				

From 50 observations 2013 Nov. 27–2014 Feb. 23, mean residual 0".45.

Comet C/2014 Q6 (PANSTARRS)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 6.38872 TT

		(2000.0)	P	Sato	Q
q	4.2228963				
z	+0.0000711	Peri. 2.53583	+0.85025557	+0.31749413	
	+/-0.0000206	Node 326.65498	-0.49538092	+0.21302622	
e	0.9996996	Incl. 49.79901	-0.17794161	+0.92402235	

From 35 observations 2014 Aug. 31–Dec. 12, mean residual 0".35.

Comet P/2014 X1 (Elenin)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 7.74187 TT

		(2000.0)	P	Sato	Q
q	1.8148915				
n	0.06295064	Peri. 34.36787	-0.05331006	-0.92132816	
a	6.2584858	Node 61.56966	+0.78932233	-0.27510892	
e	0.7100111	Incl. 25.97184	+0.61166028	+0.27471712	
P	15.66				

From 332 observations 2014 Sept. 4–2015 Jan. 27, mean residual 0".35.

Comet 201P/LONEOS

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 14.60823 TT

		(2000.0)	P	Sato	Q
q	1.3391881				
n	0.15324665	Peri. 25.05797	+0.49733765	-0.86467541	
a	3.4584014	Node 35.23939	+0.77391540	+0.40538009	
e	0.6127725	Incl. 7.03343	+0.39205895	+0.29665371	
P	6.43				

From 539 observations 2001 Aug. 9–2015 Jan. 6, mean residual 0".68.

Comet C/2013 G9 (Tenagra)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 14.75151 TT

			P	Sato	Q
q	5.3375744	(2000.0)			
z	-0.0001717	Peri.	204.94401	-0.94096165	-0.09716932
	+/-0.0000017	Node	35.68762	-0.13080804	+0.98788060
e	1.0009166	Incl.	146.23030	-0.31221857	-0.12103740

From 322 observations 2013 Apr. 15–2015 Jan. 17, mean residual 0".58.

Comet P/2014 V1 (PANSTARRS)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 28.57438 TT

			P	Sato	Q
q	2.5239434	(2000.0)			
n	0.10016524	Peri.	179.96275	+0.97279463	+0.21423092
a	4.5918887	Node	166.63908	-0.21265089	+0.97675377
e	0.4503474	Incl.	22.43236	-0.09192503	+0.00756185
P	9.84				

From 38 observations 2014 Nov. 9–16, mean residual 0".45.

Comet C/2014 Q2 (Lovejoy)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 30.06936 TT

			P	Sato	Q
q	1.2903567	(2000.0)			
z	+0.0017094	Peri.	12.39506	-0.12073252	-0.14528845
	+/-0.0000027	Node	94.97563	+0.80567899	-0.59224208
e	0.9977942	Incl.	80.30217	+0.57991812	+0.79255320

From 1673 observations 2014 July 1–2015 Jan. 28, mean residual 0".57.

Comet 7P/Pons-Winnecke

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Jan. 30.52417 TT

			P	Sato	Q
q	1.2392120	(2000.0)			
n	0.15591011	Peri.	172.50649	-0.06133656	+0.92321937
a	3.4189011	Node	93.41616	-0.93433888	+0.08057064
e	0.6375408	Incl.	22.33504	-0.35106793	-0.37573179
P	6.32				

From 389 observations 1994 Dec. 31–2014 Apr. 21, mean residual 0".71.

Comet C/2014 G3 (PANSTARRS)

Epoch 2015 Jan. 18.0 TT = JDT 2457040.5

T 2015 Feb. 2.46507 TT

			P	Sato	Q
q	4.6984822	(2000.0)			
n	0.00235474	Peri.	147.78886	-0.80493047	-0.59248245
a	55.9552159	Node	4.54126	-0.59305896	+0.80507426
e	0.9160314	Incl.	155.82370	-0.01918369	-0.02863515
P	418.56				

From 150 observations 2014 Apr. 10–July 3, mean residual 0".54.

Comet C/2014 W9 (PANSTARRS)

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Feb. 15.71111 TT

			P	Sato	Q
q	1.5874027	(2000.0)			
n	0.02646663	Peri.	167.77106	-0.98620302	+0.15138563
a	11.1515940	Node	21.28933	-0.16313150	-0.81998251
e	0.8576524	Incl.	10.63032	-0.02813734	-0.55200641
P	37.24				

From 39 observations 2014 Oct. 25–Dec. 30, mean residual 0".44.

Comet 309P/LINEAR

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Feb. 16.51427 TT

			P	Sato	Q
q	1.7404100	(2000.0)			
n	0.10535548	Peri.	50.97449	+0.47136417	-0.87990672
a	4.4398126	Node	11.37088	+0.68593582	+0.32311980
e	0.6079992	Incl.	17.66648	+0.55435357	+0.34836441
P	9.36				

From 316 observations 2005 Aug. 31–2014 Dec. 31, mean residual 0".57.

Comet 299P/Catalina-PANSTARRS

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Feb. 23.27723 TT

		(2000.0)	P	Sato	Q
q	3.1395371				
n	0.10774807	Peri. 323.51057	-0.56092993	+0.80765256	
a	4.3738416	Node 271.68024	-0.71001345	-0.58226896	
e	0.2822015	Incl. 10.47978	-0.42572118	-0.09306020	
P	9.15				

From 167 observations 1987 Jan. 31–2014 May 20, mean residual 0".60.

Comet C/2014 AA52 (Catalina)

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Feb. 27.64773 TT

		(2000.0)	P	Sato	Q
q	2.0025943				
z	-0.0002225	Peri. 292.26327	+0.44931964	+0.75645741	
+/-	-0.0000013	Node 330.49308	+0.37791211	-0.64299677	
e	1.0004456	Incl. 105.21142	-0.80950250	+0.11969686	

From 230 observations 2014 Jan. 4–Dec. 16, mean residual 0".44.

Comet 92P/Sanguin

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Mar. 1.21738 TT

		(2000.0)	P	Sato	Q
q	1.8255003				
n	0.07940064	Peri. 163.80190	+0.96668431	+0.25583143	
a	5.3610936	Node 181.45780	-0.25578823	+0.96421120	
e	0.6594911	Incl. 19.44366	-0.00968609	+0.06962065	
P	12.41				

From 842 observations 1977 Sept. 13–2014 Aug. 21, mean residual 0".65.

Nongravitational parameters A1 = +0.20, A2 = -0.0088.

Comet 6P/d'Arrest

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Mar. 2.43862 TT

		(2000.0)	P	Sato	Q
q	1.3615147				
n	0.15027225	Peri. 178.12224	+0.73324783	+0.64369680	
a	3.5038878	Node 138.93338	-0.62811886	+0.76461940	
e	0.6114274	Incl. 19.48186	-0.26041183	-0.03180573	
P	6.56				

From 1754 observations 2008 Apr. 25–2014 May 5, mean residual 0".56.

Comet C/2014 W10 (PANSTARRS)

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Mar. 5.99625 TT

		(2000.0)	P	Sato	Q
q	7.4194188				
n	0.01209010	Peri. 20.54392	+0.64095434	-0.44486292	
a	18.8010797	Node 40.86043	+0.49992610	-0.37643709	
e	0.6053727	Incl. 72.96620	+0.58245295	+0.81264512	
P	81.52				

From 14 observations 2014 Nov. 25–28, mean residual 0".27.

Comet C/2014 N3 (NEOWISE)

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Mar. 13.23971 TT

		(2000.0)	P	Sato	Q
q	3.8822460				
z	+0.0001418	Peri. 353.57240	+0.95234547	-0.05565670	
+/-	-0.0000032	Node 19.92686	+0.30403992	+0.09439860	
e	0.9994494	Incl. 61.63490	+0.02445072	+0.99397748	

From 339 observations 2014 July 4–2015 Jan. 1, mean residual 0".42.

Comet C/2014 W6 (Catalina)

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Mar. 19.09641 TT

		(2000.0)	P	Sato	Q
q	3.0871547				
z	-0.0002762	Peri. 209.87731	-0.91489062	+0.27046313	
+/-	-0.0000911	Node 338.12916	+0.20388281	-0.33121075	
e	1.0008526	Incl. 53.56696	-0.34843501	-0.90396301	

From 54 observations 2014 Nov. 20–2015 Jan. 15, mean residual 0".55.

Comet 44P/Reinmuth

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Mar. 24.14606 TT

		(2000.0)	P	Sato Q
q	2.1186373			
n	0.13881174	Peri. 58.28182	+0.96046137	+0.26040771
a	3.6941845	Node 286.46563	-0.27728930	+0.86296177
e	0.4264939	Incl. 5.89523	-0.02499215	+0.43299516
P	7.10			

From 776 observations 1993 Feb. 26–2014 Nov. 14, mean residual 0".68.

Nongravitational parameters A1 = +0.01, A2 = -0.0578.

Comet P/2008 WZ96 (LINEAR)

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Mar. 25.13849 TT

		(2000.0)	P	Sato Q
q	1.6469603			
n	0.16014462	Peri. 337.81993	+0.79760917	-0.59415904
a	3.3583644	Node 59.05056	+0.57000106	+0.68613870
e	0.5095945	Incl. 6.95824	+0.19727750	+0.41974840
P	6.15			

From 130 observations 2008 Nov. 30–2009 Apr. 13, mean residual 0".48.

From CHB 2014.

Comet 86P/Wild

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 3.40639 TT

		(2000.0)	P	Sato Q
q	2.2635317			
n	0.14406623	Peri. 179.16133	-0.31561356	+0.91417717
a	3.6038048	Node 72.41027	-0.87213339	-0.17388210
e	0.3719050	Incl. 15.47229	-0.37386017	-0.36612172
P	6.84			

From 76 observations 1980 May 10–2008 June 3, mean residual 0".81.

Nongravitational parameters A1 = -1.10, A2 = +0.0878.

Comet 88P/Howell

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 6.24095 TT

		(2000.0)	P	Sato Q
q	1.3585942			
n	0.17979929	Peri. 235.91836	+0.38252794	+0.92173396
a	3.1089285	Node 56.69757	-0.82053571	+0.37067797
e	0.5630024	Incl. 4.38250	-0.42472760	+0.11403659
P	5.48			

From 1332 observations 2003 Dec. 31–2014 June 23, mean residual 0".67.

Nongravitational parameters A1 = +1.10, A2 = -0.1762.

Comet C/2012 F3 (PANSTARRS)

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 6.68471 TT

		(2000.0)	P	Sato Q
q	3.4568325			
z	-0.0005094	Peri. 104.02437	-0.01875452	+0.99845839
+/-0.0000006		Node 164.61226	-0.97640395	-0.00704731
e	1.0017608	Incl. 11.35433	-0.21513622	-0.05505621

From 990 observations 2012 Jan. 19–2014 Sept. 5, mean residual 0".44.

Comet C/2014 XB8 (PANSTARRS)

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 6.89993 TT

		(2000.0)	P	Sato Q
q	3.0047525			
z	+0.0040460	Peri. 351.80964	+0.71012482	+0.63375880
+/-0.0044964		Node 37.51739	+0.67115399	-0.74096559
e	0.9878427	Incl. 149.75948	+0.21277935	+0.22208056

From 40 observations 2014 Dec. 15–30, mean residual 0".41.

Comet 42P/Neujmin

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 8.26041 TT

		(2000.0)	P	Sato	Q
q	2.0279660				
n	0.09153057	Peri. 147.13619	+0.46110344	+0.88667747	
a	4.8763172	Node 150.28017	-0.82838762	+0.44405628	
e	0.5841193	Incl. 3.98444	-0.31805277	+0.12890725	
P	10.77				

From 217 observations 1972 June 16–2004 Nov. 7, mean residual 0".69.

Nongravitational parameters A1 = +0.87, A2 = +0.1430.

Comet 310P/Hill

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 18.59591 TT

		(2000.0)	P	Sato	Q
q	2.3837497				
n	0.11638245	Peri. 31.41073	+0.76394431	-0.64430218	
a	4.1547452	Node 8.96587	+0.53461147	+0.60110942	
e	0.4262585	Incl. 13.18575	+0.36135809	+0.47280246	
P	8.47				

From 240 observations 2006 Aug. 29–2014 Nov. 10, mean residual 0".61.

Comet 174P/(60558) Echeclus

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 22.53249 TT

		(2000.0)	P	Sato	Q
q	5.8170673				
n	0.02822876	Peri. 162.93255	+0.91553924	+0.40213262	
a	10.6825466	Node 173.33594	-0.37731604	+0.86619983	
e	0.4554606	Incl. 4.34378	-0.13935749	+0.29662639	
P	34.92				

From 843 observations 1979 Sept. 23–2014 Nov. 25, mean residual 0".39.

Comet 218P/LINEAR

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 23.22133 TT

		(2000.0)	P	Sato	Q
q	1.1714953				
n	0.18094701	Peri. 59.81504	-0.56357683	+0.82605661	
a	3.0957682	Node 175.87658	-0.77327523	-0.52610533	
e	0.6215817	Incl. 2.71899	-0.29056252	-0.20209814	
P	5.45				

From 282 observations 2003 Apr. 29–2009 May 24, mean residual 0".64.

From CHB 2014.

Comet 113P/Spitaler

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 23.73976 TT

		(2000.0)	P	Sato	Q
q	2.1188406				
n	0.13951773	Peri. 50.01742	+0.43298583	-0.90105382	
a	3.6817118	Node 14.38680	+0.79331268	+0.36774765	
e	0.4244958	Incl. 5.77604	+0.42799329	+0.22992103	
P	7.06				

From 397 observations 1986 Sept. 30–2014 Oct. 22, mean residual 0".65.

Comet 268P/Bernardi

Epoch 2015 Apr. 8.0 TT = JDT 2457120.5

T 2015 Apr. 27.39560 TT

		(2000.0)	P	Sato	Q
q	2.4200645				
n	0.10097299	Peri. 0.43819	-0.61671068	-0.75594990	
a	4.5673668	Node 127.65542	+0.72138632	-0.65436625	
e	0.4701401	Incl. 16.10096	+0.31507098	+0.01856241	
P	9.76				

From 63 observations 2004 Sept. 22–2014 Dec. 24, mean residual 0".20.

Comet 308P/Lagerkvist-Carsenty

Epoch 2015 May 18.0 TT = JDT 2457160.5

T 2015 May 7.33286 TT

		(2000.0)	P	Sato	Q
q	4.2257119				
n	0.05763697	Peri. 334.05567	+0.79527937	-0.60153823	
a	6.6374610	Node 63.13055	+0.56988816	+0.69937484	
e	0.3633542	Incl. 4.84760	+0.20678059	+0.38603962	
P	17.10				

From 227 observations 1997 Oct. 5–2014 Dec. 22, mean residual 0".56.

Comet P/2007 S1 (Zhao)

Epoch 2015 May 18.0 TT = JDT 2457160.5

T 2015 May 10.50196 TT

		(2000.0)	P	Sato	Q
q	2.4942426				
n	0.13307618	Peri. 245.77893	+0.88550992	-0.46008684	
a	3.7995821	Node 141.52439	+0.45504422	+0.83064872	
e	0.3435482	Incl. 5.97335	+0.09384532	+0.31359655	
P	7.41				

From 72 observations 2007 Sept. 8–Oct. 16, mean residual 0".77.

Comet 205P/Giacobini

Epoch 2015 May 18.0 TT = JDT 2457160.5

T 2015 May 16.63972 TT

		(2000.0)	P	Sato	Q
q	1.5367984				
n	0.14725835	Peri. 154.27725	+0.89798452	+0.44002326	
a	3.5515349	Node 179.60331	-0.43533980	+0.88901511	
e	0.5672861	Incl. 15.28268	-0.06405513	+0.12661618	
P	6.69				

From 1310 observations 2008 Sept. 10–2009 Feb. 28, mean residual 0".65.

Nongravitational parameters A1 = -3.42, A2 = +2.13053.

Comet P/2008 QP20 (LINEAR-Hill)

Epoch 2015 May 18.0 TT = JDT 2457160.5

T 2015 May 17.26297 TT

		(2000.0)	P	Sato	Q
q	1.7233806				
n	0.15108215	Peri. 72.35450	+0.79026444	-0.60786691	
a	3.4913544	Node 324.96657	+0.49866366	+0.71130979	
e	0.5063862	Incl. 7.74177	+0.35611328	+0.35289688	
P	6.52				

From 478 observations 2008 Aug. 25–2009 Feb. 21, mean residual 0".59.

Comet 57P/du Toit-Neujmin-Delparte

Epoch 2015 May 18.0 TT = JDT 2457160.5

T 2015 May 22.26112 TT

		(2000.0)	P	Sato	Q
q	1.7288383				
n	0.15362961	Peri. 115.21091	+0.55931988	+0.82891698	
a	3.4526517	Node 188.80970	-0.77731042	+0.52126432	
e	0.4992723	Incl. 2.84791	-0.28801003	+0.20292891	
P	6.42				

From 547 observations 1983 Sept. 3–2009 Nov. 24, mean residual 0".71.

Nongravitational parameters A1 = +1.40, A2 = -0.0023.

Comet 19P/Borrelly

Epoch 2015 May 18.0 TT = JDT 2457160.5

T 2015 May 28.91688 TT

		(2000.0)	P	Sato	Q
q	1.3489585				
n	0.14421929	Peri. 353.45938	+0.34590708	-0.80065831	
a	3.6012545	Node 75.37718	+0.88212839	+0.09987671	
e	0.6254198	Incl. 30.36806	+0.31968390	+0.59073760	
P	6.83				

From 1832 observations 1994 June 12–2014 Oct. 21, mean residual 0".80.

Nongravitational parameters A1 = +0.39, A2 = -0.1185.

Comet 34D/Gale

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 7.53589 TT

q	1.2067509	(2000.0)	P	Sato	Q
n	0.08800822	Peri.	217.96649	+0.09518420	+0.98313480
a	5.0055741	Node	58.00910	-0.86232734	+0.15980565
e	0.7589186	Incl.	10.60996	-0.49732436	-0.08892765
P	11.20				

From 52 observations 1927–1938, mean residual 7".27.

From Muraoka's orbit (CHB 2004).

Comet P/2009 Q4 (Boattini)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 13.38235 TT

q	1.3169864	(2000.0)	P	Sato	Q
n	0.17749110	Peri.	320.13191	+0.03031441	-0.98808111
a	3.1358239	Node	127.59782	+0.95876157	-0.01394339
e	0.5800190	Incl.	10.98079	+0.28259034	+0.15330135
P	5.55				

From 765 observations 2009 Aug. 26–2010 May 28, mean residual 0".60.

Comet P/2010 B2 (WISE)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 13.44501 TT

q	1.6119593	(2000.0)	P	Sato	Q
n	0.17996974	Peri.	155.95035	-0.91908030	-0.39406353
a	3.1069652	Node	0.85235	+0.33166811	-0.77669527
e	0.4811788	Incl.	8.93837	+0.21280900	-0.49138417
P	5.48				

From 48 observations 2010 Jan. 22–Apr. 7, mean residual 0".48.

From CHB 2014.

Comet 220P/McNaught

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 13.75592 TT

q	1.5539794	(2000.0)	P	Sato	Q
n	0.17911186	Peri.	180.66965	+0.87271961	+0.48311554
a	3.1168781	Node	150.11344	-0.44727507	+0.84899043
e	0.5014308	Incl.	8.12525	-0.19571791	+0.21404351
P	5.50				

From 171 observations 2004 May 20–2009 Sept. 22, mean residual 0".71.

Comet 148P/Anderson-LINEAR

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 13.78084 TT

q	1.6919638	(2000.0)	P	Sato	Q
n	0.13995133	Peri.	6.69928	-0.11264127	-0.99155840
a	3.6741033	Node	89.78220	+0.90863707	-0.12894446
e	0.5394893	Incl.	3.68195	+0.40210773	+0.01361157
P	7.04				

From 118 observations 1963 Nov. 22–2014 Oct. 27, mean residual 0".88.

Nongravitational parameters A1 = +0.17, A2 = -0.01001.

Comet 196P/Tichy

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 14.84819 TT

q	2.1350141	(2000.0)	P	Sato	Q
n	0.13439586	Peri.	11.95863	+0.81162890	-0.56804821
a	3.7746682	Node	24.25626	+0.50489689	+0.56475721
e	0.4343836	Incl.	19.37778	+0.29383270	+0.59864056
P	7.33				

From 228 observations 2000 Sept. 24–2008 Feb. 23, mean residual 0".61.

Comet P/2012 F5 (Gibbs)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 16.42100 TT

			P	Sato
q	2.8802660	(2000.0)		Q
n	0.18931553	Peri.	178.16858	+0.81882930
a	3.0038522	Node	216.83608	+0.52449483
e	0.0411426	Incl.	9.73940	+0.23328898
P	5.21			+0.16610670

From 126 observations 2009 Sept. 17–2013 May 12, mean residual 0".76.

From CHB 2014.

Comet C/2014 W11 (PANSTARRS)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 17.28026 TT

			P	Sato
q	3.4269676	(2000.0)		Q
n	0.03217676	Peri.	225.63064	-0.93295478
a	9.7898146	Node	295.93678	+0.35966259
e	0.6499456	Incl.	12.70572	-0.01543393
P	30.63			-0.51550149

From 149 observations 2014 Nov. 3–2015 Jan. 28, mean residual 0".31.

Comet P/2009 WX51 (Catalina)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 25.27240 TT

			P	Sato
q	0.7962626	(2000.0)		Q
n	0.18274261	Peri.	118.08178	-0.85746269
a	3.0754559	Node	31.68150	+0.39384241
e	0.7410912	Incl.	9.60043	+0.33112821
P	5.39			-0.41345738

From 113 observations 2009 Nov. 22–2010 Apr. 17, mean residual 0".45.

Comet 233P/La Sagra

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 June 25.44111 TT

			P	Sato
q	1.7865357	(2000.0)		Q
n	0.18669010	Peri.	27.24826	-0.20305820
a	3.0319487	Node	74.96774	+0.85898411
e	0.4107632	Incl.	11.27860	+0.47001453
P	5.28			+0.07358862

From 59 observations 2005 Feb. 9–2010 Feb. 18, mean residual 0".68.

Comet P/2008 S1 (Catalina-McNaught)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 July 2.77274 TT

			P	Sato
q	1.1967414	(2000.0)		Q
n	0.14573377	Peri.	203.66552	+0.69459226
a	3.5762614	Node	111.36268	-0.61153097
e	0.6653652	Incl.	15.07381	-0.37890824
P	6.76			+0.05830515

From 63 observations 2008 Sept. 17–2009 Jan. 4, mean residual 0".61.

Comet C/2014 Q1 (PANSTARRS)

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 July 6.51228 TT

			P	Sato
q	0.3145604	(2000.0)		Q
z	+0.0009569	Peri.	120.05267	-0.59121912
+/-	-0.0000075	Node	8.76269	+0.26772653
e	0.9996990	Incl.	43.10781	+0.76077754

From 416 observations 2014 Aug. 16–2015 Jan. 15, mean residual 0".42.

Comet 221P/LINEAR

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 July 11.63659 TT

		(2000.0)	P	Sato Q
q	1.7582906			
n	0.15315703	Peri. 39.94803	-0.01485217	+0.98839497
a	3.4597503	Node 229.75727	-0.96051611	-0.05611402
e	0.4917868	Incl. 11.42323	-0.27782766	+0.14116163
P	6.44			

From 170 observations 2002 Apr. 14–2009 Sept. 27, mean residual 0".64.

Comet 162P/Siding Spring

Epoch 2015 June 27.0 TT = JDT 2457200.5

T 2015 July 11.99104 TT

		(2000.0)	P	Sato Q
q	1.2373503			
n	0.18446983	Peri. 356.40945	+0.88228035	-0.40400465
a	3.0562284	Node 31.21293	+0.44266265	+0.53753832
e	0.5951382	Incl. 27.78633	+0.16009736	+0.74015728
P	5.34			

From 1430 observations 1990 Mar. 23–2014 July 7, mean residual 0".43.

Comet P/2004 FY140 (LINEAR)

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 July 24.84123 TT

		(2000.0)	P	Sato Q
q	4.0592851			
n	0.09108177	Peri. 241.96556	-0.87638332	+0.48118091
a	4.8923225	Node 326.78530	-0.42774739	-0.79715235
e	0.1702744	Incl. 2.13695	-0.22132429	-0.36470957
P	10.82			

From 52 observations 2004 Mar. 27–July 12, mean residual 0".42.

From CHB 2014.

Comet 140P/Bowell–Skiff

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 8.63787 TT

		(2000.0)	P	Sato Q
q	1.9877693			
n	0.06011931	Peri. 172.94217	-0.91599697	-0.40073283
a	6.4534715	Node 343.39439	+0.36474621	-0.81209012
e	0.6919845	Incl. 3.82133	+0.16706212	-0.42417312
P	16.39			

From 111 observations 1983 Mar. 9–1999 May 8, mean residual 0".73.

Comet 51P/Harrington

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 12.42769 TT

		(2000.0)	P	Sato Q
q	1.6995600			
n	0.13769727	Peri. 269.28648	+0.98805259	+0.12216642
a	3.7140907	Node 83.69318	-0.07408749	+0.91107738
e	0.5424021	Incl. 5.42407	-0.13514111	+0.39371737
P	7.16			

From 737 observations 1994 May 1–2009 Feb. 21, mean residual 0".97.

Nongravitational parameters A1 = +4.13, A2 = +0.2422.

Comet P/2010 K2 (WISE)

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 12.79475 TT

		(2000.0)	P	Sato Q
q	1.2743319			
n	0.19337578	Peri. 334.79136	-0.32636377	+0.92254724
a	2.9616563	Node 275.60361	-0.82841791	-0.38405698
e	0.5697232	Incl. 11.93986	-0.45520374	+0.03750778
P	5.10			

From 55 observations 2010 May 27–July 21, mean residual 0".46.

Comet 67P/Churyumov-Gerasimenko

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 13.08334 TT

		(2000.0)	P	Sato	Q
q	1.2432625				
n	0.15301218	Peri.	12.79579	+0.45633952	-0.88481843
a	3.4619335	Node	50.13556	+0.80520289	+0.36564010
e	0.6408762	Incl.	7.04025	+0.37868529	+0.28879693
P	6.44				

From 3533 observations 1969 Nov. 8–2014 Nov. 15, mean residual 0".65.

Nongravitational parameters A1 = +0.06, A2 = +0.0500.

Comet P/2009 L2 (Yang-Gao)

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 15.03789 TT

		(2000.0)	P	Sato	Q
q	1.4312931				
n	0.14909411	Peri.	343.56109	-0.47032273	+0.83671501
a	3.5223220	Node	257.62481	-0.77389990	-0.54383017
e	0.5936507	Incl.	16.69140	-0.42411729	+0.06447279
P	6.61				

From 1081 observations 2009 June 15–Oct. 11, mean residual 0".51.

Comet P/2004 R1 (McNaught)

Epoch 2015 Aug. 26.0 TT = JDT 2457260.5

T 2015 Aug. 15.24400 TT

		(2000.0)	P	Sato	Q
q	0.9766613				
n	0.18049941	Peri.	0.75750	+0.44921442	+0.89011508
a	3.1008840	Node	295.93858	-0.82014907	+0.37674115
e	0.6850378	Incl.	4.90059	-0.35434717	+0.25643954
P	5.46				

From 42 observations 2004 Sept. 2–Nov. 9, mean residual 0".65.

Cocmet C/2012 LP26 (Palomar)

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 16.61086 TT

		(2000.0)	P	Sato	Q
q	6.5360102				
z	+0.0001179	Peri.	145.15656	+0.51119189	+0.83865840
	+/-0.0000018	Node	153.98761	-0.85326890	+0.52143693
e	0.9992294	Incl.	25.37972	-0.10302929	-0.15733916

From 145 observations 2012 May 23–2014 Oct. 21, mean residual 0".53.

Comet 141P/Machholz

Epoch 2015 Aug. 6.0 TT = JDT 2457240.5

T 2015 Aug. 24.95441 TT

		(2000.0)	P	Sato	Q
q	0.7609138				
n	0.18765866	Peri.	149.48343	+0.80259894	-0.56107423
a	3.0215073	Node	246.01369	+0.49267869	+0.81494071
e	0.7481675	Incl.	12.80927	+0.33630738	+0.14514597
P	5.25				

From 249 observations 1994 Oct. 2–2005 Apr. 13, mean residual 0".93.

Nongravitational parameters A1 = -0.03, A2 = +0.0204.

Comet C/2014 M1 (PANSTARRS)

Epoch 2015 Sept. 15.0 TT = JDT 2457280.5

T 2015 Aug. 26.40631 TT

		(2000.0)	P	Sato	Q
q	5.5770357				
z	-0.0004996	Peri.	336.73585	-0.22804076	-0.93350588
	+/-0.0001937	Node	234.67546	-0.83153093	+0.03888330
e	1.0027865	Incl.	160.17541	-0.50651132	+0.35644757

From 39 observations 2014 June 24–Aug. 29, mean residual 0".40.

Comet C/2013 C2 (Tenagra)

Epoch 2015 Sept. 15.0 TT = JDT 2457280.5

T 2015 Aug. 30.20203 TT

		(2000.0)	P	Sato Q
q	9.1311694			
n	0.01531131	Peri. 308.78646	-0.91036828	+0.24117669
a	16.0618065	Node 247.52510	-0.16359971	-0.95616152
e	0.4314980	Incl. 21.33912	-0.38008517	-0.16609924
P	64.37			

From 152 observations 2013 Feb. 14–2014 May 20, mean residual 0".52.

Comet C/2014 A4 (SONEAR)

Epoch 2015 Sept. 15.0 TT = JDT 2457280.5

T 2015 Sept. 5.84939 TT

		(2000.0)	P	Sato Q
q	4.1803322			
z	-0.0001955	Peri. 356.78473	+0.85255621	+0.30634964
+/-	-0.0000018	Node 29.72716	+0.49654239	-0.72758749
e	1.0008174	Incl. 121.35891	+0.16307531	+0.61381295

From 489 observations 2014 Jan. 12–2015 Jan. 23, mean residual 0".47.

Comet C/2014 W8 (PANSTARRS)

Epoch 2015 Sept. 15.0 TT = JDT 2457280.5

T 2015 Sept. 7.77492 TT

		(2000.0)	P	Sato Q
q	5.0556366			
z	+0.0061560	Peri. 227.39323	+0.09414945	-0.87522891
+/-	-0.0031468	Node 224.93414	+0.98947308	+0.02965286
e	0.9688773	Incl. 42.20284	-0.10990411	-0.48279920

From 30 observations 2014 Nov. 22–Dec. 18, mean residual 0".31.

Comet 61P/Shajn-Schaldach

Epoch 2015 Sept. 15.0 TT = JDT 2457280.5

T 2015 Oct. 2.16919 TT

		(2000.0)	P	Sato Q
q	2.1139079			
n	0.13953398	Peri. 221.90888	+0.90576660	-0.42267379
a	3.6814259	Node 163.01924	+0.41128346	+0.85939590
e	0.4257910	Incl. 6.00579	+0.10214093	+0.28772480
P	7.06			

From 641 observations 1985 July 25–2010 May 10, mean residual 0".73.

Nongravitational parameters A1 = +0.89, A2 = +0.3882.

Comet C/2013 V4 (Catalina)

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 7.61348 TT

		(2000.0)	P	Sato Q
q	5.1853213			
z	-0.0004953	Peri. 40.45120	+0.22783823	-0.60308961
+/-	-0.0000011	Node 55.62131	+0.46387291	-0.62304447
e	1.0025685	Incl. 67.85517	+0.85610260	+0.49809488

From 951 observations 2013 Oct. 23–2015 Jan. 24, mean residual 0".49.

Comet 151P/Helin

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 8.10822 TT

		(2000.0)	P	Sato Q
q	2.4737979			
n	0.07088879	Peri. 216.27001	+0.99874707	+0.00837339
a	5.7820830	Node 143.15630	+0.00870288	+0.94181610
e	0.5721615	Incl. 4.71959	-0.04928041	+0.33602428
P	13.90			

From 141 observations 1987 Sept. 18–2001 Dec. 17, mean residual 0".68.

Comet P/2001 H5 (NEAT)

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 21.75992 TT

		(2000.0)	P	Sato Q
q	2.4356926			
n	0.06551780	Peri. 224.73284	-0.96876182	+0.23614392
a	6.0939165	Node 328.69388	-0.16634069	-0.84526768
e	0.6003075	Incl. 8.38149	-0.18393288	-0.47933141
P	15.04			

From 43 observations 2001 Mar. 20–June 26, mean residual 0".55.

Comet P/2007 V2 (Hill)

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 23.07299 TT

		(2000.0)	P	Sato	Q
q	2.7797449				
n	0.11995186	Peri.	278.85664	+0.94644360	-0.32006365
a	4.0719090	Node	99.81866	+0.31057896	+0.86655785
e	0.3173362	Incl.	2.47033	+0.08823389	+0.38293178
P	8.22				

From 64 observations 2007 Oct. 14–2008 Feb. 10, mean residual 0".56.

Comet P/1994 N2 (McNaught-Hartley)

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 24.80688 TT

		(2000.0)	P	Sato	Q
q	2.4479153				
n	0.04782751	Peri.	313.23383	+0.96095312	+0.21086770
a	7.5165327	Node	35.72176	-0.06063753	+0.79225242
e	0.6743292	Incl.	17.87171	-0.26998553	+0.57260014
P	20.61				

From 77 observations 1994 July 5–1996 Jan. 21, mean residual 0".73.

Comet 22P/Kopff

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 25.09479 TT

		(2000.0)	P	Sato	Q
q	1.5582210				
n	0.15413486	Peri.	162.89865	+0.23892127	+0.96844830
a	3.4451024	Node	120.87336	-0.90029233	+0.24827609
e	0.5476997	Incl.	4.73722	-0.36385483	+0.02160707
P	6.39				

From 2492 observations 1995 Nov. 28–2014 Nov. 29, mean residual 0".70.

Nongravitational parameters A1 = +0.62, A2 = -0.5240.

Comet P/2005 RV25 = 2014 U5 (LONEOS-Christensen)

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Oct. 28.80267 TT

		(2000.0)	P	Sato	Q
q	3.5818030				
n	0.11028605	Peri.	191.80966	+0.19927441	-0.96710725
a	4.3064790	Node	246.85960	+0.91249735	+0.24194490
e	0.1682758	Incl.	9.89976	+0.35726503	-0.07852533
P	8.94				

From 107 observations 2005 Sept. 11–2014 Nov. 17, mean residual 0".74.

Comet P/2008 Y2 (Gibbs)

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Nov. 5.96522 TT

		(2000.0)	P	Sato	Q
q	1.6294084				
n	0.14540686	Peri.	162.33604	-0.68573135	-0.72522933
a	3.5816195	Node	330.86323	+0.65154793	-0.57380138
e	0.5450638	Incl.	7.28788	+0.32443459	-0.38051859
P	6.78				

From 362 observations 2008 Dec. 1–2009 Apr. 30, mean residual 0".51.

Comet 214P/LINEAR

Epoch 2015 Oct. 25.0 TT = JDT 2457320.5

T 2015 Nov. 12.70890 TT

		(2000.0)	P	Sato	Q
q	1.8515158				
n	0.14352786	Peri.	190.24716	-0.99839710	-0.01893298
a	3.6128110	Node	348.26651	+0.04795176	-0.78356408
e	0.4875138	Incl.	15.20518	-0.03006436	-0.62102244
P	6.87				

From 131 observations 2002 Jan. 15–2009 May 3, mean residual 0".65.

Comet 10P/Tempel

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Nov. 14.25500 TT

		(2000.0)	P	Sato	Q
q	1.4176479				
n	0.18374293	Peri.	195.54602	+0.68126375	+0.70844761
a	3.0642836	Node	117.80524	-0.64745613	+0.70063523
e	0.5373640	Incl.	12.02883	-0.34158492	+0.08492501
P	5.36				

From 2554 observations 1999 Feb. 14–2014 June 26, mean residual 0".67.

Comet C/2013 US10 (Catalina)

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Nov. 15.71576 TT

		(2000.0)	P	Sato	Q
q	0.8229298				
z	-0.0003874	Peri.	340.36095	-0.90561942	-0.42046712
	+/-0.0000026	Node	186.14479	-0.28585850	+0.50884990
e	1.0003188	Incl.	148.87839	-0.31327045	+0.75118518

From 800 observations 2013 Aug. 14–2015 Jan. 7, mean residual 0".41.

Comet 230P/LINEAR

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Nov. 18.07358 TT

		(2000.0)	P	Sato	Q
q	1.4852788				
n	0.15726242	Peri.	308.92063	+0.45659632	-0.85838062
a	3.3992733	Node	112.39447	+0.87432348	+0.38431079
e	0.5630599	Incl.	14.65295	+0.16455474	+0.33983517
P	6.27				

From 321 observations 1997 Jan. 10–2011 Apr. 30, mean residual 0".53.

Comet 249P/LINEAR

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Nov. 26.70320 TT

		(2000.0)	P	Sato	Q
q	0.4990119				
n	0.21451101	Peri.	65.62631	+0.56216758	+0.81747098
a	2.7637770	Node	239.16192	-0.80179793	+0.50158124
e	0.8194457	Incl.	8.39359	-0.20270099	+0.28312092
P	4.59				

From 381 observations 2006 Oct. 19–2012 Jan. 3, mean residual 0".47.

Comet P/2010 R2 (La Sagra)

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Nov. 29.91886 TT

		(2000.0)	P	Sato	Q
q	2.6198495				
n	0.18093245	Peri.	58.55851	+0.80012680	+0.47590371
a	3.0959343	Node	270.64974	-0.59420941	+0.71200900
e	0.1537774	Incl.	21.41643	+0.08192849	+0.51629337
P	5.45				

From 399 observations 2010 Aug. 12–2013 Apr. 18, mean residual 0".59.

Comet P/2003 WC7 (LINEAR–Catalina)

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Dec. 5.10478 TT

		(2000.0)	P	Sato	Q
q	1.6595540				
n	0.08356358	Peri.	342.37944	+0.30203045	-0.88032599
a	5.1815303	Node	88.77523	+0.91276690	+0.15635547
e	0.6797174	Incl.	21.46148	+0.27501672	+0.44786060
P	11.79				

From 101 observations 2003 Nov. 18–2004 Apr. 11, mean residual 0".65.

Comet C/2014 S2 (PANSTARRS)

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Dec. 9.80754 TT

		(2000.0)	P	Sato	Q
q	2.1006768				
z	+0.0058957	Peri.	87.80872	-0.02255144	-0.99155548
	+/-0.0000273	Node	8.12255	+0.03398400	-0.12842630
e	0.9876151	Incl.	64.67038	+0.99916791	-0.01801155

From 43 observations 2014 Sept. 2–Dec. 18, mean residual 0".35.

Comet P/2002 Q1 (Van Ness)

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Dec. 11.00873 TT

			(2000.0)	P	Sato	Q
q	1.5603064					
n	0.14635339	Peri.	185.09340	+0.99805902	-0.00372632	
a	3.5661603	Node	173.96007	-0.00994005	+0.97587821	
e	0.5624688	Incl.	36.21283	-0.06147666	-0.21828385	
P	6.73					

From 56 observations 2002 Aug. 17–Oct. 14, mean residual 0".79.

Comet 204P/LINEAR-NEAT

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Dec. 11.61361 TT

			(2000.0)	P	Sato	Q
q	1.9295964					
n	0.14102630	Peri.	355.08409	-0.24505374	-0.96342532	
a	3.6554090	Node	109.06931	+0.89337301	-0.26784283	
e	0.4721257	Incl.	6.58872	+0.37660765	+0.00847720	
P	6.99					

From 734 observations 2001 Oct. 13–2009 Apr. 28, mean residual 0".68.

Comet 180P/NEAT

Epoch 2015 Dec. 4.0 TT = JDT 2457360.5

T 2015 Dec. 12.70583 TT

			(2000.0)	P	Sato	Q
q	2.4892960					
n	0.12994953	Peri.	94.87300	-0.95727003	-0.01312835	
a	3.8602869	Node	84.58330	-0.11002233	-0.90731849	
e	0.3551526	Incl.	16.86953	+0.26744941	-0.42023898	
P	7.58					

From 352 observations 1955 May 14–2008 June 30, mean residual 0".72.

Comet P/1998 QP54 (LONEOS–Tucker)

Epoch 2016 Jan. 13.0 TT = JDT 2457400.5

T 2015 Dec. 25.99063 TT

			(2000.0)	P	Sato	Q
q	1.8866174					
n	0.11432761	Peri.	30.61410	+0.96980003	-0.22434009	
a	4.2043801	Node	341.59928	+0.11181153	+0.75765869	
e	0.5512733	Incl.	17.64923	+0.21676272	+0.61288240	
P	8.62					

From 221 observations 1998 Aug. 2–1999 Feb. 14, mean residual 0".79.

Comet P/2014 W4 (PANSTARRS)

Epoch 2016 Jan. 13.0 TT = JDT 2457400.5

T 2015 Dec. 29.98194 TT

			(2000.0)	P	Sato	Q
q	4.2626943					
n	0.05834566	Peri.	67.42607	-0.16923524	-0.97485557	
a	6.5836037	Node	33.36314	+0.77941309	-0.22240566	
e	0.3525287	Incl.	15.28422	+0.60322025	+0.01386884	
P	16.89					

From 32 observations 2014 Oct. 25–Dec. 11, mean residual 0".28.

Comet 116P/Wild

Epoch 2016 Jan. 13.0 TT = JDT 2457400.5

T 2016 Jan. 11.60396 TT

			(2000.0)	P	Sato	Q
q	2.1871029					
n	0.15147661	Peri.	173.32168	-0.96889888	+0.24642807	
a	3.4852906	Node	20.98626	-0.22984965	-0.86246901	
e	0.3724762	Incl.	3.60871	-0.09167382	-0.44206380	
P	6.51					

From 1669 observations 2006 Sept. 24–2014 Nov. 25, mean residual 0".61.

Nongravitational parameters A1 = +0.13, A2 = +1.5159.

Comet C/2014 Y1 (PANSTARRS)

Epoch 2016 Jan. 13.0 TT = JDT 2457400.5

T 2016 Jan. 17.70093 TT

		(2000.0)	P	Sato Q
q	2.2429949			
z	-0.0004761	Peri. 182.25783	-0.92940059	+0.35894664
	+/-0.0001081	Node 19.46929	-0.33445251	-0.72074166
e	1.0010679	Incl. 14.92788	-0.15606429	-0.59303353

From 84 observations 2014 Nov. 17–2015 Jan. 26, mean residual 0".43.

Comet 211P/Hill

Epoch 2016 Jan. 13.0 TT = JDT 2457400.5

T 2016 Jan. 27.32186 TT

		(2000.0)	P	Sato Q
q	2.3505092			
n	0.14683221	Peri. 4.42751	-0.52172986	-0.80312390
a	3.5584032	Node 117.26932	+0.77243767	-0.58788084
e	0.3394483	Incl. 18.88735	+0.36212981	+0.09689230
P	6.71			

From 251 observations 2003 Mar. 24–2010 Jan. 24, mean residual 0".74.

Comet 50P/Arend

Epoch 2016 Feb. 22.0 TT = JDT 2457440.5

T 2016 Feb. 8.18911 TT

		(2000.0)	P	Sato Q
q	1.9187904			
n	0.11940930	Peri. 49.22217	+0.71097386	-0.70267774
a	4.0842340	Node 355.17611	+0.50488430	+0.53735127
e	0.5301958	Incl. 19.13915	+0.48949773	+0.46636639
P	8.25			

From 1086 observations 1959 Sept. 25–2009 Mar. 19, mean residual 0".66.
Nongravitational parameters A1 = +0.51, A2 = +0.3960.

Comet C/2014 W5 (Lemmon–PANSTARRS)

T 2016 Feb. 10.66028 TT

		(2000.0)	P	Sato Q
q	2.5546270			
		Peri. 277.69628	+0.69391155	-0.51190795
		Node 245.52056	-0.20553533	-0.81482395
e	1.0	Incl. 146.19198	-0.69010289	-0.27205179

From 34 observations 2014 Nov. 16–22, mean residual 0".62.

Comet 147P/Kushida–Muramatsu

Epoch 2016 Feb. 22.0 TT = JDT 2457440.5

T 2016 Feb. 27.88514 TT

		(2000.0)	P	Sato Q
q	2.7464945			
n	0.13305696	Peri. 347.08489	+0.15953906	-0.98633052
a	3.7999480	Node 93.72391	+0.90936377	+0.13058165
e	0.2772284	Incl. 2.36762	+0.38419372	+0.10050145
P	7.41			

From 79 observations 1994 Dec. 8–2009 Feb. 28, mean residual 0".74.

Comet P/2010 V1 (Ikeya–Murakami) [Orbit 1]

Epoch 2016 Feb. 22.0 TT = JDT 2457440.5

T 2016 Feb. 28.84567 TT

		(2000.0)	P	Sato Q
q	1.5717831			
n	0.18333007	Peri. 152.31243	-0.91372075	-0.40620111
a	3.0688824	Node 3.77005	+0.33611761	-0.77037949
e	0.4878321	Incl. 9.38862	+0.22834042	-0.49144287
P	5.38			

From 424 observations 2010 Nov. 3–2011 Jan. 10, mean residual 0".64.

Comet 194P/LINEAR

Epoch 2016 Feb. 22.0 TT = JDT 2457440.5

T 2016 Mar. 2.45800 TT

		(2000.0)	P	Sato Q
q	1.6977249			
n	0.12323933	Peri. 130.71210	-0.54231748	-0.83974275
a	3.9991698	Node 351.99394	+0.70080322	-0.43446094
e	0.5754807	Incl. 11.13801	+0.46342916	-0.32569282
P	8.00			

From 199 observations 2000 Jan. 27–2008 May 6, mean residual 0".64.

Comet C/2014 W2 (PANSTARRS)

Epoch 2016 Feb. 22.0 TT = JDT 2457440.5

T 2016 Mar. 10.48001 TT

		(2000.0)	P	Sato Q
q	2.6705256			
z	+0.0005682	Peri. 85.00162	-0.10029300	-0.35271942
	+/-0.0000214	Node 69.96221	-0.27376540	-0.88917791
e	0.9984827	Incl. 82.00649	+0.95655309	-0.29146468

From 337 observations 2014 Oct. 24–2015 Jan. 25, mean residual 0".42.

Comet P/2010 V1 (Ikeya-Murakami) [Orbit 2]

Epoch 2016 Feb. 22.0 TT = JDT 2457440.5

T 2016 Mar. 12.41878 TT

		(2000.0)	P	Sato Q
q	1.5726766			
n	0.18219019	Peri. 152.42012	-0.91455202	-0.40432533
a	3.0816694	Node 3.78004	+0.33452849	-0.77108557
e	0.4896673	Incl. 9.38730	+0.22734399	-0.49188218

P 5.41

From 423 observations 2010 Nov. 3–2011 Jan. 22, mean residual 0".66.

Comet 252P/LINEAR

Epoch 2016 Apr. 2.0 TT = JDT 2457480.5

T 2016 Mar. 15.26185 TT

		(2000.0)	P	Sato Q
q	0.9960998			
n	0.18513996	Peri. 343.31774	-0.99410365	-0.10284179
a	3.0488492	Node 190.95239	+0.10799154	-0.96759504
e	0.6732866	Incl. 10.42314	-0.00978547	-0.23061528

P 5.32

From 140 observations 2000 Apr. 7–2011 June 10, mean residual 0".64.

Copmet 127P/Holt–Olmstead

Epoch 2016 Apr. 2.0 TT = JDT 2457480.5

T 2016 Mar. 17.79556 TT

		(2000.0)	P	Sato Q
q	2.2059015			
n	0.15379555	Peri. 6.70198	+0.93843063	-0.34051336
a	3.4501677	Node 13.64947	+0.30438634	+0.73516773
e	0.3606394	Incl. 14.30260	+0.16339187	+0.58615617

P 6.41

From 536 observations 1990 Sept. 16–2010 Feb. 14, mean residual 0".69.

Nongravitational parameters A1 = +0.41, A2 = -0.0085.

Comet 104P/Kowal

Epoch 2016 Apr. 2.0 TT = JDT 2457480.5

T 2016 Mar. 26.38558 TT

		(2000.0)	P	Sato Q
q	1.1794217			
n	0.16746359	Peri. 200.67391	+0.24442883	-0.95848883
a	3.2597862	Node 235.45299	+0.91280840	+0.27852691
e	0.6381905	Incl. 10.26744	+0.32716262	-0.06100759

P 5.89

From 400 observations 1992 Apr. 30–2004 Feb. 20, mean residual 0".72.

Nongravitational parameters A1 = +0.60, A2 = -0.6255.

Comet 100P/Hartley

Epoch 2016 Apr. 2.0 TT = JDT 2457480.5

T 2016 Apr. 2.02451 TT

		(2000.0)	P	Sato Q
q	2.0105594			
n	0.15529371	Peri. 181.86183	-0.77260885	+0.57726337
a	3.4279420	Node 37.72507	-0.57676898	-0.46420826
e	0.4134792	Incl. 25.58918	-0.26535468	-0.67177205

P 6.35

From 182 observations 1985 June 13–2010 July 12, mean residual 0".72.

Nongravitational parameters A1 = +0.20, A2 = -0.0059.

Comet 190P/Mueller

Epoch 2016 Apr. 2.0 TT = JDT 2457480.5

T 2016 Apr. 7.86441 TT

		(2000.0)	P	Sato	Q
q	2.0331945				
n	0.11277923	Peri. 50.41979	+0.89876191	-0.43815625	
a	4.2427747	Node 335.55443	+0.38974094	+0.81481721	
e	0.5207866	Incl. 2.17268	+0.20082091	+0.37959454	
P	8.74				

From 225 observations 1998 Sept. 14–2008 Feb. 8, mean residual 0".60.

Comet C/2013 X1 (PANSTARRS)

Epoch 2016 Apr. 2.0 TT = JDT 2457480.5

T 2016 Apr. 20.70816 TT

		(2000.0)	P	Sato	Q
q	1.3142572				
z	-0.0008222	Peri. 164.45316	+0.82526548	-0.52100872	
+/-	0.0000053	Node 130.95199	-0.54402398	-0.62985493	
e	1.0010806	Incl. 163.23005	-0.15157441	-0.57604920	

From 234 observations 2013 Nov. 29–2014 Dec. 31, mean residual 0".44.

Comet 53P/Van Biesbroeck

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 Apr. 29.93706 TT

		(2000.0)	P	Sato	Q
q	2.4271139				
n	0.07825946	Peri. 134.19724	+0.22945592	+0.97150456	
a	5.4130846	Node 148.92310	-0.92260823	+0.23653883	
e	0.5516209	Incl. 6.60840	-0.31007100	+0.01510880	
P	12.59				

From 1175 observations 1955 Jan. 15–2014 Mar. 10, mean residual 0".69.

Nongravitational parameters A1 = -1.66, A2 = +2.2781.

Comet 302P/Lemmon–PANSTARRS

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 Apr. 30.49477 TT

		(2000.0)	P	Sato	Q
q	3.3026760				
n	0.11130263	Peri. 208.26687	+0.86421886	+0.49512537	
a	4.2802168	Node 121.78147	-0.43954499	+0.82940281	
e	0.2283858	Incl. 6.03092	-0.24479780	+0.25873122	
P	8.86				

From 36 observations 2007 Aug. 16–2014 May 31, mean residual 0".51.

Comet 77P/Longmore

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 May 13.64644 TT

		(2000.0)	P	Sato	Q
q	2.3377197				
n	0.14328432	Peri. 196.72679	-0.85890334	+0.50118917	
a	3.6169037	Node 14.80348	-0.40989861	-0.54944273	
e	0.3536683	Incl. 24.34590	-0.30703124	-0.66852233	
P	6.88				

From 958 observations 1981 Jan. 8–2011 Sept. 27, mean residual 0".72.

Nongravitational parameters A1 = +0.11, A2 = +0.0465.

Comet C/2011 KP36 (Spacewatch)

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 May 26.89675 TT

		(2000.0)	P	Sato	Q
q	4.8833520				
n	0.00414000	Peri. 180.59752	+0.99445234	+0.09831693	
a	38.4121935	Node 173.40010	-0.09510841	+0.99227844	
e	0.8728697	Incl. 18.98679	-0.04493263	+0.07561264	
P	238.07				

From 518 observations 2011 May 21–2014 Nov. 20, mean residual 0".46.

Comet 216P/LINEAR

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 May 31.16315 TT

		(2000.0)	P	Sato	Q
q	2.1497471				
n	0.12913714	Peri. 151.59559	-0.87857026	-0.47761300	
a	3.8764598	Node 359.87321	+0.40303527	-0.74099297	
e	0.4454355	Incl. 9.04816	+0.25627499	-0.47203310	
P	7.63				

From 148 observations 2001 Feb. 1–2009 Apr. 29, mean residual 0".79.

Comet 157P/Tritton

Epoch 2016 June 21.0 TT = JDT 2457560.5

T 2016 June 10.36352 TT

		(2000.0)	P	Sato	Q
q	1.3580853				
n	0.15663163	Peri. 148.90091	+0.01557407	-0.99382987	
a	3.4083936	Node 299.99981	+0.88934719	+0.06396331	
e	0.6015468	Incl. 7.28499	+0.45696720	-0.09061398	
P	6.29				

From 962 observations 2003 Oct. 7–2010 May 28, mean residual 0".70.

Comet 118P/Shoemaker–Levy

Epoch 2016 June 21.0 TT = JDT 2457560.5

T 2016 June 16.97120 TT

		(2000.0)	P	Sato	Q
q	1.9800699				
n	0.15299074	Peri. 302.33753	-0.07528486	-0.99469282	
a	3.4622569	Node 151.72666	+0.95741046	-0.09176464	
e	0.4280985	Incl. 8.51432	+0.27874252	+0.04653440	
P	6.44				

From 1815 observations 1991 Feb. 12–2014 Aug. 3, mean residual 0".79.

Nongravitational parameters A1 = -0.12, A2 = +0.2846.

Comet 81P/Wild

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 July 20.31580 TT

		(2000.0)	P	Sato	Q
q	1.5921674				
n	0.15386315	Peri. 41.69739	-0.99854199	-0.03715414	
a	3.4491570	Node 136.12595	+0.02059932	-0.93281247	
e	0.5383894	Incl. 3.23900	+0.04989560	-0.35844171	
P	6.41				

From 4049 observations 1996 Aug. 17–2014 Nov. 20, mean residual 0".65.

Nongravitational parameters A1 = -0.05, A2 = +0.0160.

Comet 150P/LONEOS

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 July 24.93808 TT

		(2000.0)	P	Sato	Q
q	1.7597020				
n	0.12875256	Peri. 245.67829	-0.88079015	-0.35162860	
a	3.8841751	Node 272.42670	+0.45901717	-0.79847549	
e	0.5469561	Incl. 18.50613	-0.11624090	-0.48866576	
P	7.66				

From 301 observations 1978 Mar. 6–2014 Oct. 2, mean residual 0".56.

Comet 9P/Tempel

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 Aug. 2.58231 TT

		(2000.0)	P	Sato	Q
q	1.5425391				
n	0.17668236	Peri. 179.20622	-0.37510776	+0.91136610	
a	3.1453858	Node 68.74951	-0.85148727	-0.26650699	
e	0.5095867	Incl. 10.47400	-0.36641997	-0.31366519	
P	5.58				

From 5485 observations 1982 Dec. 11–2014 Dec. 24, mean residual 0".55.

Nongravitational parameters A1 = +0.01, A2 = -0.0037.

Comet C/2014 R3 (PANSTARRS)

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 Aug. 7.23054 TT

q	7.2795270	(2000.0)	P	Sato	Q
z	+0.0001111	Peri.	113.33059	-0.36217576	-0.82358695
	+/-0.0001346	Node	334.11617	-0.21769059	+0.53008015
e	0.9991912	Incl.	90.83904	+0.90633301	-0.20179092

From 44 observations 2014 Sept. 6-Oct. 28, mean residual 0".35.

Comet 43P/Wolf-Harrington

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 Aug. 19.68491 TT

q	1.3579462	(2000.0)	P	Sato	Q
n	0.16082018	Peri.	191.59794	+0.15627985	-0.95336975
a	3.3489528	Node	249.83304	+0.92678361	+0.23193065
e	0.5945162	Incl.	15.96525	+0.34153879	-0.19311728
P	6.13				

From 2456 observations 1996 June 15-2011 June 26, mean residual 0".74.

Nongravitational parameters A1 = +0.62, A2 = +0.2181.

Comet P/1999 V1 (Catalina)

Epoch 2016 Sept. 9.0 TT = JDT 2457640.5

T 2016 Aug. 30.84731 TT

q	2.9529944	(2000.0)	P	Sato	Q
n	0.05849793	Peri.	186.94249	-0.51574375	-0.82114130
a	6.5721741	Node	294.37509	+0.79838404	-0.35715461
e	0.5506823	Incl.	15.56467	+0.31079143	-0.44516013
P	16.85				

From 97 observations 1999 Nov. 5-2000 Apr. 24, mean residual 0".74.

Comet 314P/Montani

Epoch 2016 Oct. 19.0 TT = JDT 2457680.5

T 2016 Oct. 7.99878 TT

q	4.2338478	(2000.0)	P	Sato	Q
n	0.05037316	Peri.	213.75036	-0.52048611	-0.85105102
a	7.2611136	Node	267.70432	+0.79794528	-0.45588990
e	0.4169148	Incl.	3.97859	+0.30393673	-0.26053133
P	19.57				

From 105 observations 1997 Apr. 9-2014 Nov. 28, mean residual 0".60.

Comet 94P/Russell

Epoch 2016 Oct. 19.0 TT = JDT 2457680.5

T 2016 Oct. 27.66980 TT

q	2.2299882	(2000.0)	P	Sato	Q
n	0.14982441	Peri.	92.77354	-0.95409149	-0.28168261
a	3.5108667	Node	70.88170	+0.21363755	-0.87824413
e	0.3648326	Incl.	6.18553	+0.20992481	-0.38644813
P	6.58				

From 1007 observations 1984 Mar. 2-2014 Sept. 19, mean residual 0".65.

Comet P/2008 T1 (Boattini)

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Nov. 18.26711 TT

q	3.0630036	(2000.0)	P	Sato	Q
n	0.11246420	Peri.	35.80773	+0.84334454	+0.53631613
a	4.2506940	Node	291.72541	-0.50108580	+0.76220136
e	0.2794109	Incl.	2.07832	-0.19412112	+0.36251083
P	8.76				

From 236 observations 2008 Sept. 2-2009 Dec. 11, mean residual 0".64.

Comet 315P/LONEOS

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Dec. 6.83914 TT

		(2000.0)	P	Sato	Q
q	2.4204450				
n	0.08780352	Peri.	67.18868	-0.68638354	-0.66768536
a	5.0133509	Node	69.55219	+0.50163479	-0.72163080
e	0.5172002	Incl.	17.91511	+0.52653601	-0.18288042
P	11.23				

From 632 observations 2004 Nov. 3–2014 Dec. 8, mean residual 0".70.

Comet C/2014 OE4 (PANSTARRS)

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Dec. 10.59685 TT

		(2000.0)	P	Sato	Q
q	6.2370841				
z	-0.0000755	Peri.	65.81359	-0.08269808	+0.50433391
+/-	-0.0000445	Node	240.39985	-0.74792137	+0.53859584
e	1.0004708	Incl.	81.32200	+0.65861571	+0.67495321

From 45 observations 2014 May 8–Aug. 13, mean residual 0".23.

Comet 188P/LINEAR-Mueller

Epoch 2017 Feb. 16.0 TT = JDT 2457800.5

T 2017 Feb. 17.06643 TT

		(2000.0)	P	Sato	Q
q	2.5651445				
n	0.10738179	Peri.	26.77222	+0.90053760	-0.43476603
a	4.3837820	Node	358.98124	+0.35902429	+0.74781887
e	0.4148558	Incl.	10.51134	+0.24522150	+0.50174240
P	9.18				

From 867 observations 1998 Sept. 17–2009 Apr. 21, mean residual 0".67.

Comet 2P/Encke

Epoch 2017 Mar. 28.0 TT = JDT 2457840.5

T 2017 Mar. 10.09023 TT

		(2000.0)	P	Sato	Q
q	0.3358944				
n	0.29903886	Peri.	186.56290	-0.94518139	-0.31455303
a	2.2147139	Node	334.56006	+0.30811443	-0.77014179
e	0.8483351	Incl.	11.77819	+0.10815558	-0.55492163
P	3.30				

From 2491 observations 1985 July 26–2014 Sept. 24, mean residual 0".64.

Nongravitational parameters A1 = +0.01, A2 = +0.0021.

Comet 176P/LINEAR

Epoch 2017 Mar. 28.0 TT = JDT 2457840.5

T 2017 Mar. 12.14486 TT

		(2000.0)	P	Sato	Q
q	2.5798031				
n	0.17251310	Peri.	35.35669	+0.93151582	-0.36369945
a	3.1958619	Node	345.97077	+0.33273975	+0.85331620
e	0.1927676	Incl.	0.23452	+0.14684188	+0.37359626
P	5.71				

From 531 observations 1999 Aug. 17–2014 May 6, mean residual 0".45.

Comet 172P/Yeung

Epoch 2017 Mar. 28.0 TT = JDT 2457840.5

T 2017 Mar. 13.09561 TT

		(2000.0)	P	Sato	Q
q	3.3369187				
n	0.11414346	Peri.	209.12686	-0.50453979	+0.85757252
a	4.2089009	Node	30.88974	-0.74961818	-0.37761190
e	0.2071757	Incl.	11.23724	-0.42838323	-0.34925437
P	8.63				

From 361 observations 1993 Oct. 20–2013 Nov. 27, mean residual 0".55.

From CHB 2014.

Comet P/2001 F1 (NEAT)

Epoch 2017 May 7.0 TT = JDT 2457880.5

T 2017 May 5.68385 TT

		(2000.0)	P	Sato	Q
q	4.1845149				
n	0.05900816	Peri.	80.51569	-0.93891952	-0.10992040
a	6.5342337	Node	92.65346	-0.01666374	-0.93198368
e	0.3596013	Incl.	19.05405	+0.34373312	-0.34543296
P	16.70				

From 133 observations 2001 Feb. 24–2002 July 22, mean residual 0".69.

Comet C/2014 B1 (Schwartz)

Epoch 2017 Sept. 4.0 TT = JDT 2458000.5

T 2017 Sept. 10.03488 TT

		(2000.0)	P	Sato	Q
q	9.5648187				
z	-0.0002468	Peri.	345.77989	-0.84961245	-0.50510756
+/-	-0.0005268	Node	161.38020	+0.51832130	-0.85284580
e	1.0023609	Incl.	28.37541	+0.09747673	+0.13236466

From 53 observations 2014 Jan. 28–Mar. 26, mean residual 0".47.

Comet 65P/Gunn

Epoch 2017 Oct. 14.0 TT = JDT 2458040.5

T 2017 Oct. 16.81040 TT

		(2000.0)	P	Sato	Q
q	2.9100523				
n	0.12895861	Peri.	213.53864	+0.09060633	+0.98585940
a	3.8800365	Node	62.01990	-0.87503720	+0.14639450
e	0.2499936	Incl.	9.18517	-0.47550015	-0.08154683
P	7.64				

From 2710 observations 2004 June 23–2014 Dec. 2, mean residual 0".70.

Nongravitational parameters A1 = +0.72, A2 = -0.3051.

Comet 74P/Smirnova-Chernykh

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 26.71625 TT

		(2000.0)	P	Sato	Q
q	3.5364696				
n	0.11627446	Peri.	87.13584	-0.95562114	-0.27209491
a	4.1573172	Node	77.05567	+0.20252689	-0.88515297
e	0.1493385	Incl.	6.65392	+0.21394182	-0.37745011
P	8.48				

From 2493 observations 1995 May 8–2014 Dec. 10, mean residual 0".67.

Comet C/2010 U3 (Boattini)

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Feb. 26.59554 TT

		(2000.0)	P	Sato	Q
q	8.4457253				
z	+0.0001915	Peri.	88.08450	-0.36201987	-0.74306965
+/-	-0.0000027	Node	43.06717	+0.07257550	-0.62443050
e	0.9983829	Incl.	55.51205	+0.92934085	-0.24069492

From 289 observations 2010 Oct. 31–2014 Dec. 17, mean residual 0".70.

Comet 29P/Schwassmann-Wachmann

Epoch 2019 Mar. 18.0 TT = JDT 2458560.5

T 2019 Mar. 7.75055 TT

		(2000.0)	P	Sato	Q
q	5.7668178				
n	0.06662631	Peri.	47.77400	+0.99270167	-0.00956412
a	6.0261355	Node	312.39470	-0.05135585	+0.86841730
e	0.0430322	Incl.	9.36831	+0.10911452	+0.49574178
P	14.79				

From 19381 observations 1902 Mar. 5–2014 Nov. 6, mean residual 0".67.

References

D/1894 F1 (Denning) [Orbit 1]

Epoch 2014 July 2.0 TT = JDT 2456840.5

T 2014 June 28.16754 TT

			P	Sato Q
q	1.1676366	(2000.0)		
n	0.13195234	Peri. 198.37246	-0.71669578	-0.69703594
a	3.8211257	Node 297.41701	+0.64291891	-0.64811584
e	0.6944260	Incl. 1.42609	+0.27018963	-0.30673565
P	7.47			

From 120 observations 1894 Mar. 27–June 5, mean residual 2".6.

From Williams's orbit (1993).

Comet P/2015 A3 (PANSTARRS)

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Feb. 22.65772 TT

			P	Sato Q
q	1.1545426	(2000.0)		
n	0.04621363	Peri. 249.42743	+0.87780526	+0.46124962
a	7.6905247	Node 277.08719	+0.47351716	-0.79476509
e	0.8498747	Incl. 172.51598	+0.07238393	-0.39445815
P	21.33			

From 35 observations 2015 Jan. 8–24, mean residual 0".37.

D/1884 O1 (Barnard)

Epoch 2015 Feb. 27.0 TT = JDT 2457080.5

T 2015 Mar. 13.93824 TT

			P	Sato Q
q	1.3213749	(2000.0)		
n	0.18206357	Peri. 339.82215	+0.68054966	+0.72899126
a	3.0830981	Node 332.90301	-0.64810634	+0.55204095
e	0.5714133	Incl. 9.30470	-0.34177525	+0.40474996
P	5.41			

From 179 observations 1884 July 24–Nov. 8, mean residual is not available.

From Buckley's orbit (1979).

Comet D/1918 W1 (Schorr)

Epoch 2016 May 12.0 TT = JDT 2457520.5

T 2016 May 4.47255 TT

			P	Sato Q
q	2.8710267	(2000.0)		
n	0.11530635	Peri. 326.87383	+0.73008234	-0.67369379
a	4.1805546	Node 75.92108	+0.64983531	+0.63259847
e	0.3132426	Incl. 6.78095	+0.21140917	+0.38204168
P	8.55			

From 18 observations 1918 Nov. 23–Dec. 31, mean residual 1".44.

From Muraoka's orbit (CHB 2006).

Comet P/2011 A2 (Scotti)

Epoch 2016 June 21.0 TT = JDT 2457560.5

T 2016 June 13.96672 TT

			P	Sato Q
q	1.5528892	(2000.0)		
n	0.18013695	Peri. 94.64843	-0.85758344	-0.51038967
a	3.1050423	Node 54.67521	+0.43553990	-0.78644577
e	0.4998815	Incl. 4.47532	+0.27359759	-0.34785836
P	5.47			

From 232 observations 2011 Jan. 11–May 12, mean residual 0".61.

Comet P/2010 N1 (WISE)

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 July 13.82393 TT

			P	Sato Q
q	1.6549416	(2000.0)		
n	0.16535345	Peri. 160.85154	-0.04186907	+0.96615185
a	3.2874605	Node 106.10280	-0.94777295	+0.04222106
e	0.4965897	Incl. 15.36391	-0.31618572	-0.25449555
P	5.96			

From 52 observations 2010 Apr. 13–Aug. 9, mean residual 0".57.

Comet P/2009 K1 (Gibbs)

Epoch 2016 July 31.0 TT = JDT 2457600.5

T 2016 July 24.37288 TT

		(2000.0)	P	Sato	Q
q	1.3397447				
n	0.13893977	Peri.	27.43230	-0.93818237	+0.34591217
a	3.6919148	Node	172.77095	-0.33308914	-0.89231070
e	0.6371139	Incl.	5.74395	-0.09415659	-0.29004550
P	7.09				

From 121 observations 2009 Apr. 24–Sept. 18, mean residual 0".67.

Comet D/1978 R1 (Haneda-Campos) [Orbit 2]

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Nov. 9.94843 TT

		(2000.0)	P	Sato	Q
q	1.2871096				
n	0.15298541	Peri.	307.16505	+0.96885465	-0.23468813
a	3.4623373	Node	66.52960	+0.24559706	+0.86988069
e	0.6282541	Incl.	4.94121	+0.03166631	+0.43385374
P	6.44				

From 42 observations 1978 July 30–Nov. 22, mean residual 0".95.

Comet D/1978 R1 (Haneda-Campos) [Orbit 1]

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Nov. 11.19976 TT

		(2000.0)	P	Sato	Q
q	1.2869111				
n	0.15297822	Peri.	307.16575	+0.96886399	-0.23465469
a	3.4624458	Node	66.52689	+0.24556051	+0.86989173
e	0.6283231	Incl.	4.94035	+0.03166402	+0.43384968
P	6.44				

From 51 observations 1978 July 30–Nov. 29, mean residual 1".10.

Comet P/2008 J3 (McNaught)

Epoch 2016 Nov. 28.0 TT = JDT 2457720.5

T 2016 Nov. 22.89288 TT

		(2000.0)	P	Sato	Q
q	2.3019794				
n	0.12769065	Peri.	4.55984	+0.97001735	-0.23182837
a	3.9056799	Node	9.81022	+0.20724331	+0.63222278
e	0.4106073	Incl.	25.35065	+0.12695096	+0.73929017
P	7.72				

From 195 observations 2008 May 10–2010 Mar. 16, mean residual 0".74.

Comet P/2013 YG46 (Spacewatch)

Epoch 2017 Jan. 27.0 TT = JDT 2457780.5

T 2017 Jan. 28.82135 TT

		(2000.0)	P	Sato	Q
q	1.7891471				
n	0.16624012	Peri.	242.30830	+0.35594424	+0.92880542
a	3.2757606	Node	48.92786	-0.80201211	+0.36022821
e	0.4538224	Incl.	7.85831	-0.47966684	+0.08692606
P	5.93				

From 54 observations 2013 Dec. 26–2014 Feb. 20, mean residual 0".45.

Comet P/2003 SQ215 (NEAT-LONEOS)

Epoch 2017 Feb. 16.0 TT = JDT 2457800.5

T 2017 Feb. 2.33225 TT

		(2000.0)	P	Sato	Q
q	2.2802644				
n	0.07682636	Peri.	137.54318	+0.81823392	-0.56700354
a	5.4801934	Node	257.23605	+0.49787605	+0.78141746
e	0.5839080	Incl.	5.58218	+0.28742424	+0.26056429
P	12.83				

From 48 observations 2003 Sept. 18–2004 Feb. 20, mean residual 0".72.

Comet P/2006 G1 (McNaught)

Epoch 2017 Feb. 16.0 TT = JDT 2457800.5

T 2017 Feb. 3.19761 TT

		(2000.0)	P	Sato	Q
q	2.7815581				
n	0.08756010	Peri. 308.48516	-0.36165427	+0.89239395	
a	5.0226380	Node 298.26022	-0.73118324	-0.45109059	
e	0.4461958	Incl. 17.84298	-0.57842654	+0.01226049	
P	11.26				

From 126 observations 2006 Apr. 5–Aug. 29, mean residual 0".57.

Comet P/2007 T6 (Catalina)

Epoch 2017 Feb. 16.0 TT = JDT 2457800.5

T 2017 Feb. 15.44881 TT

		(2000.0)	P	Sato	Q
q	2.2207802				
n	0.10407943	Peri. 335.89935	+0.17134648	-0.91366534	
a	4.4760279	Node 102.51391	+0.95410314	+0.06061670	
e	0.5038502	Incl. 22.18238	+0.24561672	+0.40192196	
P	9.47				

From 285 observations 2007 Oct. 6–2008 June 10, mean residual 0".77.

Comet 18D/Perrine–Mrkos [Orbit 2]

Epoch 2017 Feb. 16.0 TT = JDT 2457800.5

T 2017 Feb. 26.21747 TT

		(2000.0)	P	Sato	Q
q	1.6463195				
n	0.12525851	Peri. 157.02101	+0.80515027	-0.53961337	
a	3.9560753	Node 237.95410	+0.48902276	+0.83879798	
e	0.5838503	Incl. 16.87627	+0.33554402	+0.07235577	
P	7.87				

From 22 observations 1961–1968, mean residual 2".39.

From Muraoka's orbit (CHB 2009).

Comet P/1999 XN120 (Catalina)

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 12.51782 TT

		(2000.0)	P	Sato	Q
q	3.2972310				
n	0.11524014	Peri. 162.03508	+0.04547400	-0.99538095	
a	4.1821556	Node 285.29287	+0.90544300	+0.07682547	
e	0.2115953	Incl. 5.02871	+0.42202499	-0.05757274	
P	8.55				

From 71 observations 1999 Nov. 3–2000 Mar. 30, mean residual 0".62.

Comet P/2000 S1 (Skiff)

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 24.83185 TT

		(2000.0)	P	Sato	Q
q	2.5360913				
n	0.05776139	Peri. 309.09008	+0.89781564	+0.40654708	
a	6.6279255	Node 28.15750	-0.20233096	+0.72219408	
e	0.6173627	Incl. 21.01823	-0.39113841	+0.55960270	
P	17.06				

From 168 observations 2000 Aug. 26–Dec. 22, mean residual 0".76.

D/1894 F1 (Denning) [Orbit 2]

Epoch 2017 June 16.0 TT = JDT 2457920.5

T 2017 June 26.03781 TT

		(2000.0)	P	Sato	Q
q	1.6166561				
n	0.10271599	Peri. 102.66382	-0.62952973	-0.77674993	
a	4.5155504	Node 26.38012	+0.69547485	-0.57409463	
e	0.6419803	Incl. 2.41960	+0.34642034	-0.25898824	
P	9.60				

From 142 observations 1894 Mar. 27–June 5, mean residual 2".72.

From Muraoka's orbit (CHB 2006).

Comet 18D/Perrine-Mrkos [Orbit 3]
 Epoch 2017 July 26.0 TT = JDT 2457960.5
 T 2017 July 22.96903 TT

		(2000.0)	P	Sato Q
q	1.7571248			
n	0.11823719	Peri. 153.44229	+0.84511634	-0.48676486
a	4.1111815	Node 237.43124	+0.43189198	+0.86531999
e	0.5725986	Incl. 15.20247	+0.31503602	+0.11950435
P	8.34			

From 36 observations 1955 Oct. 20–1968 Dec. 26, mean residual 2".01.
 Nongravitational parameters A1 = +2.98, A2 = -0.4907.

Comet P/2010 P4 (WISE)
 Epoch 2017 Sept. 4.0 TT = JDT 2458000.5
 T 2017 Aug. 18.34103 TT

		(2000.0)	P	Sato Q
q	1.8607315			
n	0.13816727	Peri. 354.15556	+0.99766950	+0.06635310
a	3.7056631	Node 2.23359	-0.03313391	+0.67485725
e	0.4978681	Incl. 24.07862	-0.05964659	+0.73495915
P	7.13			

From 61 observations 2010 Aug. 6–2011 Jan. 2, mean residual 0".58.

Comet P/2010 H2 (Vales)
 Epoch 2017 Sept. 4.0 TT = JDT 2458000.5
 T 2017 Sept. 15.86843 TT

		(2000.0)	P	Sato Q
q	3.0965370			
n	0.13065115	Peri. 129.52406	-0.94975271	+0.22069691
a	3.8464541	Node 64.26633	-0.30377265	-0.82084709
e	0.1949632	Incl. 14.26389	+0.07544513	-0.52678547
P	7.54			

From 1598 observations 2010 Apr. 16–July 14, mean residual 0".47.

Comet P/2004 T1 (LINEAR-NEAT)
 Epoch 2017 Oct. 14.0 TT = JDT 2458040.5
 T 2017 Oct. 13.26078 TT

		(2000.0)	P	Sato Q
q	1.7159662			
n	0.15202516	Peri. 336.34483	+0.87874792	-0.45320714
a	3.4769017	Node 51.45919	+0.46274066	+0.73215206
e	0.5064669	Incl. 11.03285	+0.11693233	+0.50848466
P	6.48			

From 455 observations 2004 July 16–2005 Mar. 7, mean residual 0".66.

Comet 18D/Perrine-Mrkos [Orbit 1]
 Epoch 2017 Oct. 14.0 TT = JDT 2458040.5
 T 2017 Oct. 21.23154 TT

		(2000.0)	P	Sato Q
q	1.7927378			
n	0.11460626	Peri. 152.14641	+0.86482030	-0.46347516
a	4.1975624	Node 236.76433	+0.40699929	+0.87231422
e	0.5729098	Incl. 13.34594	+0.29400242	+0.15575199
P	8.60			

From 27 observations 1955 to 1969, mean residual 3".02.

Nongravitational parameters A1 = +1.15, A2 = -0.4481.

From Muraoka's orbit (CHB 2009).

Comet P/2010 D1 (WISE)
 Epoch 2018 Jan. 2.0 TT = JDT 2458120.5
 T 2017 Dec. 18.88891 TT

		(2000.0)	P	Sato Q
q	2.6896035			
n	0.11590298	Peri. 226.13847	+0.88809412	-0.45636032
a	4.1661955	Node 160.80754	+0.45493089	+0.85552136
e	0.3544222	Incl. 9.62967	+0.06577784	+0.24457812
P	8.50			

From 16 observations 2009 Nov. 9–2010 Feb. 20, mean residual 0".57.

Comet P/2009 S2 (McNaught)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2017 Dec. 20.99894 TT

		(2000.0)	P	Sato	Q
q	2.2140042				
n	0.11570575	Peri.	230.39337	+0.91111469	+0.07431251
a	4.1709286	Node	121.57366	-0.02697091	+0.99225290
e	0.4691819	Incl.	28.41389	-0.41126948	+0.09955822
P	8.52				

From 71 observations 2008 May 30–2010 Jan. 26, mean residual 0".61.

Comet P/1998 VS24 (LINEAR)

Epoch 2018 Jan. 2.0 TT = JDT 2458120.5

T 2018 Jan. 19.18926 TT

		(2000.0)	P	Sato	Q
q	3.4386887				
n	0.10207450	Peri.	244.94979	+0.71806205	-0.69527502
a	4.5344492	Node	159.05304	+0.66593646	+0.67330157
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.

Comet P/2010 J5 (McNaught)

Epoch 2018 Feb. 11.0 TT = JDT 2458160.5

T 2018 Jan. 29.26033 TT

		(2000.0)	P	Sato	Q
q	3.7508630				
n	0.11767789	Peri.	146.68855	-0.84197859	+0.52675272
a	4.1241976	Node	65.52147	-0.51875746	-0.73106099
e	0.0905230	Incl.	7.36290	-0.14819833	-0.43368352
P	8.38				

From 112 observations 2005 Nov. 1–2011 Aug. 26, mean residual 0".58.

Comet P/2006 F1 (Kowalski)

Epoch 2018 Mar. 23.0 TT = JDT 2458200.5

T 2018 Mar. 14.88476 TT

		(2000.0)	P	Sato	Q
q	4.1082508				
n	0.09766923	Peri.	186.14776	+0.64868032	+0.70020306
a	4.6697921	Node	124.74765	-0.68188806	+0.70874252
e	0.1202498	Incl.	21.28038	-0.33799781	-0.08602162
P	10.09				

From 216 observations 2005 May 10–2007 Sept. 1, mean residual 0".71.

Comet P/2008 T4 (Hill)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 May 29.66538 TT

		(2000.0)	P	Sato	Q
q	2.5265382				
n	0.10440508	Peri.	1.53794	+0.69292570	-0.71686734
a	4.4667155	Node	44.60897	+0.66033414	+0.58799318
e	0.4343633	Incl.	6.30881	+0.28950440	+0.37465348
P	9.44				

From 263 observations 2008 Sept. 28–2009 Feb. 27, mean residual 0".59.

Comet P/2001 T3 (NEAT)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 10.93847 TT

		(2000.0)	P	Sato	Q
q	2.4853449				
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.

Comet P/2002 EJ57 (LINEAR)

Epoch 2018 June 11.0 TT = JDT 2458280.5

T 2018 June 18.53987 TT

			P	Sato Q
q	2.6272068	(2000.0)		
n	0.06000514	Peri.	167.02122	-0.73714449
a	6.4616551	Node	330.43210	+0.61196693
e	0.5934158	Incl.	4.97681	+0.28655625
P	16.43			-0.36934247

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

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
a	5.5251553	Node	257.97849	+0.17788997
e	0.6257506	Incl.	15.48437	+0.33211554
P	12.99			+0.26138346

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

Comet P/2001 R6 (LINEAR–Skiff)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 4.24891 TT

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

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

Comet P/2010 A1 (Hill)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 14.26134 TT

			P	Sato Q
q	1.9574079	(2000.0)		
n	0.10715595	Peri.	13.29608	+0.49345816
a	4.3899394	Node	47.31539	+0.78073394
e	0.5541151	Incl.	10.30829	+0.38334522
P	9.20			+0.35074239

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

Comet P/2008 O2 (McNaught)

Epoch 2018 Oct. 9.0 TT = JDT 2458400.5

T 2018 Oct. 19.88832 TT

			P	Sato Q
q	3.8151751	(2000.0)		
n	0.10332246	Peri.	26.94344	+0.98858995
a	4.4978630	Node	325.84392	-0.14970294
e	0.1517805	Incl.	9.51113	+0.01670140
P	9.54			+0.52574385

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

Comet P/2006 D1 (Hill)

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2018 Dec. 21.44783 TT

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

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

Comet P/2007 V1 (Larson)

Epoch 2018 Dec. 28.0 TT = JDT 2458480.5

T 2019 Jan. 12.10062 TT

		(2000.0)	P	Sato	Q
q	2.6767413				
n	0.08871963	Peri.	51.60586	+0.50882626	-0.86048347
a	4.9787798	Node	7.93494	+0.72014879	+0.40906041
e	0.4623700	Incl.	10.75813	+0.47167950	+0.30370672
P	11.11				

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

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 P/2008 Y1 (Boattini)

Epoch 2019 Aug. 25.0 TT = JDT 2458720.5

T 2019 Sept. 10.64729 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/2000 S4 (LINEAR–Spacewatch)

Epoch 2019 Oct. 4.0 TT = JDT 2458760.5

T 2019 Sept. 23.39159 TT

		(2000.0)	P	Sato	Q
q	2.2654184				
n	0.05199774	Peri.	173.08431	+0.97546992	+0.21406094
a	7.1090747	Node	173.79822	-0.21778760	+0.97241450
e	0.6813343	Incl.	28.37800	-0.03204672	-0.09267126
P	18.95				

From 35 observations 2000 Sept. 1–Nov. 21, mean residual 0".67.

Comet P/2005 GF8 (LONEOS)

Epoch 2019 Oct. 4.0 TT = JDT 2458760.5

T 2019 Sept. 30.71597 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 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	-0.05490616
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/2003 F2 (NEAT)

Epoch 2019 Nov. 13.0 TT = JDT 2458800.5

T 2019 Nov. 11.96905 TT

		(2000.0)	P	Sato
q				Q
n	0.05969567	Peri. 191.82454	-0.98184012	+0.18968342
a	6.4839673	Node 359.09124	-0.15349811	-0.80419643
e	0.5419491	Incl. 11.60601	-0.11148234	-0.56328350
P	16.51			

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

Comet P/2006 H1 (McNaught)

Epoch 2019 Dec. 23.0 TT = JDT 2458840.5

T 2019 Dec. 7.45448 TT

		(2000.0)	P	Sato
q				Q
n	0.07103453	Peri. 309.27800	+0.63169207	+0.77521930
a	5.7741721	Node 359.89445	-0.62537704	+0.50928087
e	0.5804320	Incl. 12.80409	-0.45811426	+0.37372187
P	13.88			

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

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Comet 95P/(2060) Chiron

Epoch = 2015 June 27.0 TT
 T = 1996 Feb. 17.74644 TT
 Peri. = 339.40411
 Node = 209.25247 2000.0
 Incl. = 6.94179
 q = 8.4211883 AU
 e = 0.3824775
 a = 13.6370550 AU
 n = 0.01957146
 P = 50.36 years

H = 5.8 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	V	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	22 53.33	-02 06.9	18.530	18.010	+0.17	+0.8	56.8
Jan. 18	22 55.00	-01 59.4	18.673	18.017	+0.19	+0.9	47.1
Jan. 28	22 56.88	-01 50.0	18.796	18.025	+0.21	+1.1	37.5
Feb. 7	22 58.94	-01 39.2	18.897	18.032	+0.22	+1.2	28.0
Feb. 17	23 01.12	-01 27.1	18.973	18.039	+0.23	+1.3	18.6
Feb. 27	23 03.39	-01 14.1	19.022	18.046	+0.23	+1.4	9.7
Mar. 9	23 05.68	-01 00.4	19.043	18.054	+0.23	+1.4	4.5
Mar. 19	23 07.96	-00 46.4	19.037	18.061	+0.22	+1.4	11.0
Mar. 29	23 10.18	-00 32.3	19.003	18.068	+0.21	+1.4	19.9
Apr. 8	23 12.28	-00 18.5	18.944	18.075	+0.20	+1.3	29.0
Apr. 18	23 14.24	-00 05.2	18.860	18.082	+0.18	+1.2	38.2
Apr. 28	23 16.00	+00 07.2	18.755	18.089	+0.15	+1.1	47.4
May 8	23 17.53	+00 18.4	18.631	18.096	+0.13	+1.0	56.6
May 18	23 18.81	+00 28.3	18.492	18.103	+0.10	+0.8	65.9
May 28	23 19.79	+00 36.6	18.342	18.110	+0.07	+0.6	75.2
June 7	23 20.47	+00 43.0	18.185	18.117	+0.04	+0.4	84.6
June 17	23 20.83	+00 47.4	18.025	18.124	0.00	+0.2	94.0
June 27	23 20.86	+00 49.8	17.867	18.130	-0.03	0.0	103.5
July 7	23 20.56	+00 49.9	17.715	18.137	-0.06	-0.2	113.0
July 17	23 19.94	+00 47.9	17.575	18.144	-0.09	-0.4	122.7
July 27	23 19.03	+00 43.7	17.450	18.151	-0.12	-0.6	132.4
Aug. 6	23 17.86	+00 37.6	17.345	18.157	-0.14	-0.8	142.2
Aug. 16	23 16.48	+00 29.7	17.263	18.164	-0.15	-0.9	152.1
Aug. 26	23 14.93	+00 20.3	17.207	18.171	-0.16	-1.1	161.9
Sept. 5	23 13.28	+00 09.8	17.180	18.177	-0.17	-1.1	171.2
Sept. 15	23 11.59	-00 01.6	17.182	18.184	-0.17	-1.2	174.5
Sept. 25	23 09.94	-00 13.2	17.215	18.190	-0.16	-1.1	166.2
Oct. 5	23 08.39	-00 24.6	17.276	18.197	-0.14	-1.1	156.3
Oct. 15	23 07.01	-00 35.5	17.366	18.203	-0.12	-1.0	146.2
Oct. 25	23 05.85	-00 45.4	17.481	18.210	-0.09	-0.8	136.0
Nov. 4	23 04.96	-00 53.9	17.618	18.216	-0.06	-0.7	125.8
Nov. 14	23 04.38	-01 00.6	17.772	18.222	-0.02	-0.5	115.7
Nov. 24	23 04.14	-01 05.4	17.940	18.229	+0.01	-0.3	105.5
Dec. 4	23 04.25	-01 08.1	18.115	18.235	+0.05	0.0	95.4
Dec. 14	23 04.71	-01 08.6	18.294	18.241	+0.08	+0.2	85.4
Dec. 24	23 05.50	-01 06.9	18.470	18.248	+0.11	+0.4	75.5
Jan. 3	23 06.61	-01 02.9	18.638	18.254	+0.14	+0.6	65.6
Jan. 13	23 08.01	-00 56.9	18.795	18.260	+0.17	+0.8	55.8
Jan. 23	23 09.66	-00 49.0	18.935	18.266	+0.19	+1.0	46.1
Feb. 2	23 11.52	-00 39.5	19.055	18.272	+0.20	+1.1	36.5
Feb. 12	23 13.55	-00 28.4	19.153	18.278	+0.22	+1.2	27.0
Feb. 22	23 15.71	-00 16.2	19.225	18.284	+0.22	+1.3	17.6
Mar. 3	23 17.94	-00 03.1	19.270	18.290	+0.23	+1.4	8.7
Mar. 13	23 20.19	+00 10.6	19.287	18.296	+0.22	+1.4	4.4
Mar. 23	23 22.43	+00 24.6	19.277	18.302	+0.22	+1.4	11.8

Comet C/2009 F4 (McNaught)

Epoch = 2015 June 27.0 TT
 T = 2011 Dec. 31.51811 TT
 Peri. = 260.39323
 Node = 53.56319 2000.0
 Incl. = 79.38843
 q = 5.4559638 AU
 e = 0.9990534

$$m1 = 3.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	03 10.22	-02 38.7	8.922	9.387	-0.20	+3.6	115.5
Jan. 18	03 08.26	-02 02.7	9.124	9.438	-0.12	+3.9	105.7
Jan. 28	03 07.05	-01 24.1	9.335	9.489	-0.05	+4.0	96.0
Feb. 7	03 06.58	-00 43.8	9.551	9.541	+0.02	+4.1	86.5
Feb. 17	03 06.82	-00 02.4	9.766	9.592	+0.09	+4.2	77.0
Feb. 27	03 07.70	+00 39.4	9.975	9.644	+0.15	+4.2	67.8
Mar. 9	03 09.17	+01 21.1	10.174	9.696	+0.20	+4.1	58.7
Mar. 19	03 11.15	+02 02.3	10.360	9.747	+0.24	+4.0	49.8
Mar. 29	03 13.56	+02 42.3	10.528	9.799	+0.28	+3.9	41.2
Apr. 8	03 16.32	+03 21.1	10.676	9.851	+0.30	+3.7	32.9
Apr. 18	03 19.35	+03 58.1	10.803	9.902	+0.32	+3.5	25.0
Apr. 28	03 22.57	+04 33.2	10.906	9.954	+0.33	+3.3	18.2
May 8	03 25.90	+05 06.1	10.984	10.006	+0.34	+3.1	13.7
May 18	03 29.27	+05 36.8	11.037	10.058	+0.33	+2.8	13.9
May 28	03 32.61	+06 05.0	11.064	10.110	+0.32	+2.6	18.7
June 7	03 35.83	+06 30.7	11.067	10.162	+0.30	+2.3	25.6
June 17	03 38.87	+06 53.8	11.047	10.213	+0.28	+2.1	33.3
June 27	03 41.65	+07 14.3	11.005	10.265	+0.25	+1.8	41.5
July 7	03 44.10	+07 32.3	10.942	10.317	+0.21	+1.5	49.9
July 17	03 46.17	+07 47.7	10.863	10.369	+0.16	+1.3	58.6
July 27	03 47.78	+08 00.6	10.769	10.421	+0.11	+1.1	67.4
Aug. 6	03 48.88	+08 11.1	10.664	10.473	+0.05	+0.8	76.5
Aug. 16	03 49.41	+08 19.5	10.552	10.525	-0.01	+0.6	85.7
Aug. 26	03 49.33	+08 25.8	10.439	10.577	-0.07	+0.5	95.1
Sept. 5	03 48.62	+08 30.3	10.327	10.629	-0.14	+0.3	104.8
Sept. 15	03 47.27	+08 33.3	10.223	10.681	-0.20	+0.2	114.6
Sept. 25	03 45.29	+08 35.1	10.132	10.733	-0.26	+0.1	124.6
Oct. 5	03 42.72	+08 36.1	10.058	10.785	-0.31	+0.1	134.8
Oct. 15	03 39.64	+08 36.8	10.005	10.837	-0.35	+0.1	145.0
Oct. 25	03 36.13	+08 37.7	9.980	10.889	-0.38	+0.1	155.1
Nov. 4	03 32.33	+08 39.1	9.983	10.942	-0.40	+0.2	164.4
Nov. 14	03 28.38	+08 41.5	10.017	10.994	-0.40	+0.4	170.1
Nov. 24	03 24.43	+08 45.5	10.085	11.046	-0.38	+0.6	166.1
Dec. 4	03 20.63	+08 51.3	10.184	11.098	-0.35	+0.8	157.0
Dec. 14	03 17.12	+08 59.2	10.313	11.150	-0.31	+1.0	146.8
Dec. 24	03 14.03	+09 09.5	10.470	11.202	-0.26	+1.3	136.3
Jan. 3	03 11.45	+09 22.2	10.650	11.254	-0.20	+1.5	125.8
Jan. 13	03 09.45	+09 37.3	10.849	11.306	-0.14	+1.7	115.4
Jan. 23	03 08.07	+09 54.6	11.062	11.358	-0.08	+1.9	105.1
Feb. 2	03 07.31	+10 14.1	11.283	11.410	-0.01	+2.1	94.9
Feb. 12	03 07.18	+10 35.3	11.507	11.462	+0.04	+2.3	84.9
Feb. 22	03 07.62	+10 58.0	11.728	11.514	+0.10	+2.4	75.1
Mar. 3	03 08.60	+11 22.0	11.943	11.566	+0.15	+2.5	65.4
Mar. 13	03 10.07	+11 46.9	12.145	11.617	+0.19	+2.5	55.9
Mar. 23	03 11.96	+12 12.3	12.332	11.669	+0.22	+2.6	46.6

Comet C/2006 S3 (LONEOS)

Epoch = 2015 June 27.0 TT
 T = 2012 Apr. 14.74617 TT
 Peri. = 140.00204
 Node = 38.35674 2000.0
 Incl. = 166.02421
 q = 5.1295355 AU
 e = 1.0013660

$$m1 = 4.0 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	12 04.23	-10 34.0	8.537	8.791	-0.34	+0.5	15.7 101.8
Jan. 18	12 00.81	-10 29.4	8.419	8.844	-0.42	+1.0	15.7 112.6
Jan. 28	11 56.60	-10 19.0	8.315	8.897	-0.49	+1.6	15.7 123.6
Feb. 7	11 51.69	-10 02.8	8.230	8.951	-0.55	+2.2	15.7 134.6
Feb. 17	11 46.19	-09 40.9	8.171	9.004	-0.59	+2.7	15.7 145.7
Feb. 27	11 40.27	-09 14.0	8.141	9.057	-0.62	+3.1	15.7 156.4
Mar. 9	11 34.12	-08 42.7	8.145	9.110	-0.62	+3.4	15.8 165.7
Mar. 19	11 27.94	-08 08.3	8.184	9.164	-0.60	+3.6	15.8 169.2
Mar. 29	11 21.96	-07 32.1	8.259	9.217	-0.56	+3.7	15.8 162.8
Apr. 8	11 16.36	-06 55.5	8.367	9.270	-0.51	+3.6	15.9 153.0
Apr. 18	11 11.30	-06 20.0	8.507	9.324	-0.44	+3.3	15.9 142.5
Apr. 28	11 06.90	-05 46.6	8.674	9.377	-0.37	+3.0	16.0 132.0
May 8	11 03.23	-05 16.5	8.864	9.431	-0.29	+2.6	16.0 121.5
May 18	11 00.32	-04 50.3	9.071	9.485	-0.21	+2.2	16.1 111.2
May 28	10 58.18	-04 28.5	9.290	9.538	-0.14	+1.7	16.2 101.2
June 7	10 56.77	-04 11.3	9.515	9.592	-0.07	+1.3	16.3 91.3
June 17	10 56.06	-03 58.8	9.740	9.645	-0.01	+0.8	16.3 81.6
June 27	10 55.97	-03 50.8	9.962	9.699	+0.05	+0.4	16.4 72.2
July 7	10 56.43	-03 47.3	10.174	9.753	+0.09	-0.1	16.5 62.9
July 17	10 57.38	-03 47.8	10.373	9.806	+0.13	-0.4	16.5 53.7
July 27	10 58.72	-03 52.0	10.555	9.860	+0.17	-0.8	16.6 44.8
Aug. 6	11 00.39	-03 59.6	10.717	9.914	+0.19	-1.1	16.6 35.9
Aug. 16	11 02.29	-04 10.1	10.856	9.968	+0.21	-1.3	16.7 27.3
Aug. 26	11 04.36	-04 23.1	10.971	10.021	+0.22	-1.5	16.7 19.1
Sept. 5	11 06.51	-04 38.2	11.058	10.075	+0.22	-1.7	16.7 12.2
Sept. 15	11 08.67	-04 54.9	11.119	10.129	+0.21	-1.8	16.8 9.7
Sept. 25	11 10.76	-05 12.6	11.151	10.183	+0.19	-1.8	16.8 14.4
Oct. 5	11 12.71	-05 31.1	11.156	10.236	+0.17	-1.9	16.8 22.1
Oct. 15	11 14.43	-05 49.6	11.135	10.290	+0.14	-1.8	16.8 30.7
Oct. 25	11 15.84	-06 07.7	11.088	10.344	+0.10	-1.7	16.8 39.8
Nov. 4	11 16.88	-06 24.8	11.019	10.398	+0.06	-1.6	16.8 49.2
Nov. 14	11 17.48	-06 40.4	10.930	10.451	+0.01	-1.3	16.8 58.8
Nov. 24	11 17.56	-06 53.9	10.826	10.505	-0.05	-1.1	16.8 68.5
Dec. 4	11 17.07	-07 04.6	10.710	10.559	-0.11	-0.8	16.8 78.5
Dec. 14	11 15.96	-07 12.1	10.589	10.613	-0.18	-0.4	16.8 88.7
Dec. 24	11 14.21	-07 15.9	10.467	10.666	-0.24	0.0	16.8 99.1
Jan. 3	11 11.81	-07 15.4	10.350	10.720	-0.30	+0.5	16.8 109.6
Jan. 13	11 08.78	-07 10.4	10.245	10.774	-0.36	+1.0	16.8 120.2
Jan. 23	11 05.18	-07 00.7	10.157	10.827	-0.41	+1.4	16.8 130.9
Feb. 2	11 01.10	-06 46.4	10.092	10.881	-0.45	+1.9	16.8 141.6
Feb. 12	10 56.63	-06 27.7	10.054	10.935	-0.47	+2.2	16.8 151.9
Feb. 22	10 51.93	-06 05.3	10.047	10.988	-0.48	+2.5	16.8 161.3
Mar. 3	10 47.15	-05 39.8	10.073	11.042	-0.47	+2.8	16.8 167.3
Mar. 13	10 42.44	-05 12.2	10.133	11.096	-0.45	+2.9	16.9 165.0
Mar. 23	10 37.95	-04 43.5	10.226	11.149	-0.41	+2.9	16.9 156.9

Comet C/2010 R1 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2012 May 17.67097 TT
 Peri. = 114.50486
 Node = 343.67667 2000.0
 Incl. = 156.92322
 q = 5.6260273 AU
 e = 1.0004534

$$m1 = 6.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	10 48.00	+04 07.1	8.129	8.734	-0.51	+1.6	20.0	125.3
Jan. 18	10 42.94	+04 22.7	8.041	8.783	-0.57	+2.0	20.0	136.7
Jan. 28	10 37.23	+04 42.3	7.980	8.832	-0.62	+2.3	20.0	148.2
Feb. 7	10 31.04	+05 05.2	7.950	8.882	-0.65	+2.5	20.0	159.8
Feb. 17	10 24.56	+05 30.3	7.954	8.931	-0.65	+2.6	20.0	170.9
Feb. 27	10 18.02	+05 56.6	7.995	8.981	-0.64	+2.6	20.0	174.3
Mar. 9	10 11.65	+06 22.8	8.072	9.030	-0.60	+2.5	20.1	164.1
Mar. 19	10 05.63	+06 47.9	8.184	9.080	-0.55	+2.3	20.1	152.8
Mar. 29	10 00.17	+07 10.8	8.327	9.130	-0.48	+2.0	20.2	141.6
Apr. 8	09 55.38	+07 30.8	8.497	9.180	-0.40	+1.7	20.3	130.6
Apr. 18	09 51.35	+07 47.4	8.690	9.230	-0.32	+1.3	20.3	119.8
Apr. 28	09 48.14	+08 00.3	8.900	9.280	-0.24	+0.9	20.4	109.2
May 8	09 45.74	+08 09.4	9.120	9.330	-0.16	+0.5	20.5	99.0
May 18	09 44.12	+08 14.6	9.344	9.380	-0.09	+0.2	20.6	88.9
May 28	09 43.24	+08 16.1	9.569	9.431	-0.02	-0.2	20.6	79.1
June 7	09 43.02	+08 14.1	9.787	9.481	+0.04	-0.5	20.7	69.6
June 17	09 43.39	+08 08.9	9.996	9.531	+0.09	-0.8	20.8	60.2
June 27	09 44.27	+08 00.6	10.190	9.582	+0.13	-1.1	20.9	50.9
July 7	09 45.57	+07 49.8	10.366	9.633	+0.16	-1.3	20.9	41.9
July 17	09 47.20	+07 36.5	10.521	9.683	+0.19	-1.5	21.0	32.9
July 27	09 49.09	+07 21.3	10.652	9.734	+0.21	-1.7	21.0	24.1
Aug. 6	09 51.14	+07 04.4	10.758	9.784	+0.21	-1.8	21.1	15.5
Aug. 16	09 53.29	+06 46.1	10.837	9.835	+0.21	-1.9	21.1	7.9
Aug. 26	09 55.43	+06 26.9	10.889	9.886	+0.21	-2.0	21.1	6.8
Sept. 5	09 57.50	+06 07.1	10.913	9.937	+0.19	-2.0	21.2	13.9
Sept. 15	09 59.43	+05 47.2	10.909	9.988	+0.17	-2.0	21.2	22.5
Sept. 25	10 01.11	+05 27.5	10.880	10.039	+0.14	-1.9	21.2	31.5
Oct. 5	10 02.49	+05 08.4	10.826	10.089	+0.10	-1.8	21.2	40.8
Oct. 15	10 03.48	+04 50.6	10.749	10.140	+0.05	-1.6	21.2	50.2
Oct. 25	10 04.01	+04 34.3	10.654	10.191	0.00	-1.4	21.2	59.9
Nov. 4	10 04.02	+04 20.1	10.545	10.243	-0.06	-1.2	21.2	69.7
Nov. 14	10 03.43	+04 08.4	10.424	10.294	-0.12	-0.9	21.2	79.7
Nov. 24	10 02.20	+03 59.7	10.298	10.345	-0.19	-0.5	21.2	90.0
Dec. 4	10 00.31	+03 54.3	10.173	10.396	-0.26	-0.2	21.2	100.4
Dec. 14	09 57.74	+03 52.6	10.053	10.447	-0.32	+0.2	21.2	111.0
Dec. 24	09 54.50	+03 54.7	9.946	10.498	-0.38	+0.6	21.2	121.8
Jan. 3	09 50.66	+04 00.6	9.857	10.549	-0.44	+1.0	21.2	132.8
Jan. 13	09 46.28	+04 10.2	9.792	10.600	-0.48	+1.3	21.2	143.7
Jan. 23	09 41.50	+04 23.1	9.755	10.652	-0.50	+1.6	21.2	154.5
Feb. 2	09 36.45	+04 38.9	9.750	10.703	-0.52	+1.8	21.2	164.6
Feb. 12	09 31.30	+04 56.8	9.779	10.754	-0.51	+1.9	21.3	170.7
Feb. 22	09 26.22	+05 16.0	9.843	10.805	-0.48	+2.0	21.3	166.1
Mar. 3	09 21.37	+05 35.8	9.940	10.857	-0.45	+2.0	21.3	156.5
Mar. 13	09 16.90	+05 55.3	10.070	10.908	-0.40	+1.8	21.4	146.0
Mar. 23	09 12.92	+06 13.8	10.228	10.959	-0.34	+1.7	21.4	135.4

Comet 158P/Kowal-LINEAR

Epoch = 2015 June 27.0 TT
 T = 2012 Nov. 15.48239 TT
 Peri. = 237.95095
 Node = 137.27231 2000.0
 Incl. = 7.90792
 q = 4.5867474 AU
 e = 0.0308212
 a = 4.7326122 AU
 n = 0.09573102
 P = 10.30 years

$$m1 = 2.2 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	06 02.03	+16 37.1	3.754	4.699	-0.52	+1.4	18.5	162.0
Jan. 18	05 56.81	+16 50.7	3.816	4.702	-0.42	+1.5	18.6	151.2
Jan. 28	05 52.65	+17 06.1	3.904	4.704	-0.28	+1.7	18.6	140.3
Feb. 7	05 49.83	+17 23.0	4.016	4.706	-0.13	+1.8	18.7	129.6
Feb. 17	05 48.50	+17 40.8	4.146	4.709	+0.02	+1.8	18.7	119.3
Feb. 27	05 48.72	+17 59.1	4.289	4.711	+0.17	+1.8	18.8	109.4
Mar. 9	05 50.45	+18 17.2	4.442	4.714	+0.32	+1.8	18.9	99.8
Mar. 19	05 53.60	+18 34.8	4.599	4.716	+0.45	+1.6	19.0	90.6
Mar. 29	05 58.05	+18 51.1	4.756	4.718	+0.56	+1.5	19.1	81.8
Apr. 8	06 03.68	+19 05.7	4.910	4.721	+0.66	+1.2	19.1	73.3
Apr. 18	06 10.32	+19 18.2	5.058	4.723	+0.75	+1.0	19.2	65.1
Apr. 28	06 17.84	+19 28.1	5.196	4.726	+0.83	+0.7	19.3	57.1
May 8	06 26.10	+19 35.0	5.323	4.728	+0.89	+0.4	19.3	49.4
May 18	06 34.98	+19 38.8	5.436	4.731	+0.94	0.0	19.4	41.8
May 28	06 44.36	+19 39.2	5.534	4.733	+0.98	-0.3	19.4	34.4
June 7	06 54.12	+19 36.1	5.615	4.735	+1.00	-0.7	19.5	27.2
June 17	07 04.17	+19 29.5	5.679	4.738	+1.02	-1.0	19.5	20.0
June 27	07 14.41	+19 19.4	5.725	4.740	+1.03	-1.3	19.5	13.0
July 7	07 24.74	+19 06.0	5.752	4.743	+1.04	-1.7	19.5	6.3
July 17	07 35.09	+18 49.5	5.760	4.745	+1.03	-1.9	19.5	3.1
July 27	07 45.37	+18 30.0	5.748	4.748	+1.01	-2.2	19.5	9.0
Aug. 6	07 55.50	+18 08.0	5.718	4.750	+0.99	-2.4	19.5	15.9
Aug. 16	08 05.40	+17 43.9	5.668	4.752	+0.96	-2.6	19.5	23.0
Aug. 26	08 14.98	+17 18.2	5.600	4.755	+0.92	-2.7	19.5	30.3
Sept. 5	08 24.16	+16 51.5	5.515	4.757	+0.87	-2.7	19.5	37.7
Sept. 15	08 32.85	+16 24.4	5.414	4.760	+0.81	-2.7	19.4	45.2
Sept. 25	08 40.95	+15 57.7	5.298	4.762	+0.74	-2.6	19.4	53.0
Oct. 5	08 48.35	+15 32.1	5.169	4.764	+0.66	-2.3	19.3	61.0
Oct. 15	08 54.96	+15 08.7	5.029	4.767	+0.57	-2.0	19.3	69.2
Oct. 25	09 00.63	+14 48.2	4.880	4.769	+0.46	-1.6	19.2	77.7
Nov. 4	09 05.26	+14 31.8	4.727	4.771	+0.35	-1.1	19.1	86.6
Nov. 14	09 08.72	+14 20.4	4.572	4.774	+0.22	-0.6	19.1	95.7
Nov. 24	09 10.90	+14 14.8	4.420	4.776	+0.08	+0.1	19.0	105.3
Dec. 4	09 11.70	+14 15.9	4.274	4.778	-0.06	+0.8	18.9	115.2
Dec. 14	09 11.08	+14 24.1	4.140	4.781	-0.20	+1.5	18.9	125.6
Dec. 24	09 09.04	+14 39.3	4.023	4.783	-0.33	+2.2	18.8	136.3
Jan. 3	09 05.70	+15 01.1	3.928	4.785	-0.45	+2.7	18.8	147.3
Jan. 13	09 01.25	+15 28.4	3.858	4.787	-0.53	+3.1	18.7	158.7
Jan. 23	08 56.00	+15 59.5	3.817	4.790	-0.56	+3.3	18.7	170.2
Feb. 2	08 50.35	+16 32.3	3.807	4.792	-0.56	+3.2	18.7	177.8
Feb. 12	08 44.76	+17 04.7	3.829	4.794	-0.51	+3.0	18.7	166.5
Feb. 22	08 39.67	+17 34.8	3.881	4.796	-0.42	+2.6	18.8	155.1
Mar. 3	08 35.47	+18 01.0	3.961	4.798	-0.30	+2.1	18.8	144.0
Mar. 13	08 32.45	+18 22.3	4.065	4.800	-0.17	+1.6	18.9	133.2
Mar. 23	08 30.80	+18 38.1	4.189	4.803	-0.02	+1.0	18.9	122.8

Comet C/2012 A2 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2012 Nov. 5.44321 TT
 Peri. = 101.73534
 Node = 191.41768 2000.0
 Incl. = 125.89155
 q = 3.5388898 AU
 e = 0.9967416

$$m1 = 6.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	00 01.69	-12 26.1	7.781	7.480	+0.15	19.6	68.7
Jan. 18	00 03.20	-12 24.4	8.002	7.544	+0.21	19.7	59.1
Jan. 28	00 05.35	-12 19.5	8.207	7.608	+0.27	19.8	49.8
Feb. 7	00 08.03	-12 12.6	8.393	7.673	+0.31	19.9	40.8
Feb. 17	00 11.13	-12 04.5	8.556	7.737	+0.34	19.9	32.1
Feb. 27	00 14.55	-11 56.1	8.696	7.801	+0.36	20.0	23.9
Mar. 9	00 18.18	-11 48.2	8.809	7.865	+0.38	20.1	17.0
Mar. 19	00 21.95	-11 41.7	8.896	7.929	+0.38	20.1	13.1
Mar. 29	00 25.75	-11 37.2	8.955	7.994	+0.38	20.2	14.7
Apr. 8	00 29.51	-11 35.5	8.988	8.058	+0.36	20.2	20.5
Apr. 18	00 33.13	-11 37.1	8.994	8.122	+0.34	20.3	28.0
Apr. 28	00 36.53	-11 42.7	8.977	8.186	+0.31	20.3	36.1
May 8	00 39.64	-11 52.8	8.937	8.249	+0.27	20.3	44.6
May 18	00 42.38	-12 07.9	8.878	8.313	+0.23	20.3	53.3
May 28	00 44.66	-12 28.4	8.802	8.377	+0.18	20.4	62.1
June 7	00 46.41	-12 54.6	8.714	8.441	+0.12	20.4	71.1
June 17	00 47.57	-13 26.8	8.617	8.504	+0.05	20.4	80.3
June 27	00 48.07	-14 04.8	8.515	8.568	-0.02	20.4	89.5
July 7	00 47.84	-14 48.5	8.415	8.631	-0.10	20.4	98.9
July 17	00 46.86	-15 37.5	8.319	8.695	-0.18	20.4	108.4
July 27	00 45.10	-16 30.9	8.235	8.758	-0.25	20.4	118.0
Aug. 6	00 42.57	-17 27.8	8.167	8.821	-0.33	20.4	127.5
Aug. 16	00 39.30	-18 26.6	8.119	8.884	-0.39	20.4	136.8
Aug. 26	00 35.38	-19 25.9	8.096	8.947	-0.45	20.5	145.5
Sept. 5	00 30.92	-20 23.8	8.101	9.010	-0.49	20.5	152.9
Sept. 15	00 26.06	-21 18.5	8.137	9.073	-0.51	20.5	157.3
Sept. 25	00 20.99	-22 08.3	8.205	9.136	-0.51	20.6	157.0
Oct. 5	00 15.92	-22 51.8	8.304	9.199	-0.49	20.6	152.0
Oct. 15	00 11.02	-23 28.2	8.433	9.262	-0.45	20.7	144.3
Oct. 25	00 06.50	-23 56.7	8.590	9.324	-0.40	20.8	135.4
Nov. 4	00 02.50	-24 17.4	8.771	9.387	-0.33	20.8	125.9
Nov. 14	23 59.16	-24 30.6	8.971	9.449	-0.26	20.9	116.2
Nov. 24	23 56.56	-24 36.8	9.185	9.512	-0.18	21.0	106.4
Dec. 4	23 54.73	-24 37.0	9.409	9.574	-0.10	21.1	96.7
Dec. 14	23 53.68	-24 32.1	9.636	9.636	-0.03	21.2	87.1
Dec. 24	23 53.39	-24 23.0	9.861	9.698	+0.04	21.2	77.6
Jan. 3	23 53.80	-24 10.8	10.079	9.760	+0.11	21.3	68.4
Jan. 13	23 54.86	-23 56.5	10.286	9.822	+0.16	21.4	59.4
Jan. 23	23 56.50	-23 40.8	10.478	9.884	+0.21	21.5	50.7
Feb. 2	23 58.61	-23 24.8	10.651	9.946	+0.25	21.5	42.4
Feb. 12	00 01.13	-23 09.0	10.803	10.007	+0.28	21.6	34.7
Feb. 22	00 03.96	-22 54.4	10.930	10.069	+0.31	21.6	28.1
Mar. 3	00 07.02	-22 41.5	11.033	10.130	+0.32	21.7	23.3
Mar. 13	00 10.23	-22 30.9	11.110	10.192	+0.33	21.7	21.6
Mar. 23	00 13.50	-22 23.2	11.160	10.253	+0.33	21.7	23.4

Comet C/2012 J1 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2012 Dec. 7.01747 TT
 Peri. = 147.45770
 Node = 235.08910 2000.0
 Incl. = 34.09031
 q = 3.1627153 AU
 e = 1.0022905

$$m1 = 5.2 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	07 31.93	-13 40.3	6.508	7.324	-0.43	+0.2	143.7
Jan. 18	07 27.62	-13 38.5	6.566	7.392	-0.41	+1.1	144.9
Jan. 28	07 23.53	-13 27.6	6.650	7.460	-0.36	+1.9	143.0
Feb. 7	07 19.90	-13 08.9	6.759	7.527	-0.30	+2.5	138.6
Feb. 17	07 16.91	-12 43.8	6.893	7.595	-0.22	+3.0	132.5
Feb. 27	07 14.69	-12 14.3	7.047	7.663	-0.14	+3.2	125.3
Mar. 9	07 13.32	-11 42.0	7.220	7.730	-0.05	+3.3	117.6
Mar. 19	07 12.85	-11 08.8	7.407	7.797	+0.04	+3.3	109.6
Mar. 29	07 13.25	-10 36.1	7.604	7.865	+0.12	+3.1	101.5
Apr. 8	07 14.50	-10 05.4	7.807	7.932	+0.20	+2.8	93.5
Apr. 18	07 16.52	-09 37.6	8.013	7.999	+0.27	+2.4	85.6
Apr. 28	07 19.25	-09 13.5	8.217	8.066	+0.33	+2.0	77.9
May 8	07 22.59	-08 53.8	8.416	8.133	+0.39	+1.5	70.3
May 18	07 26.46	-08 38.9	8.608	8.199	+0.43	+1.0	63.1
May 28	07 30.76	-08 29.0	8.789	8.266	+0.46	+0.5	56.1
June 7	07 35.41	-08 24.2	8.956	8.333	+0.49	0.0	49.5
June 17	07 40.32	-08 24.7	9.109	8.399	+0.51	-0.6	43.4
June 27	07 45.41	-08 30.3	9.244	8.465	+0.52	-1.1	37.9
July 7	07 50.60	-08 41.0	9.361	8.532	+0.52	-1.5	33.5
July 17	07 55.81	-08 56.5	9.459	8.598	+0.52	-2.0	30.4
July 27	08 00.98	-09 16.6	9.537	8.664	+0.50	-2.4	29.2
Aug. 6	08 06.01	-09 41.1	9.594	8.730	+0.48	-2.9	30.0
Aug. 16	08 10.85	-10 09.6	9.631	8.796	+0.46	-3.2	32.7
Aug. 26	08 15.42	-10 41.7	9.648	8.861	+0.42	-3.5	37.0
Sept. 5	08 19.66	-11 17.1	9.646	8.927	+0.38	-3.8	42.4
Sept. 15	08 23.49	-11 55.2	9.626	8.993	+0.34	-4.0	48.6
Sept. 25	08 26.84	-12 35.4	9.590	9.058	+0.28	-4.2	55.4
Oct. 5	08 29.65	-13 17.0	9.540	9.123	+0.22	-4.2	62.6
Oct. 15	08 31.86	-13 59.4	9.478	9.188	+0.16	-4.2	70.2
Oct. 25	08 33.41	-14 41.6	9.409	9.254	+0.09	-4.1	78.0
Nov. 4	08 34.26	-15 22.7	9.334	9.319	+0.01	-3.9	86.1
Nov. 14	08 34.39	-16 01.6	9.258	9.383	-0.06	-3.6	94.2
Nov. 24	08 33.79	-16 37.4	9.186	9.448	-0.13	-3.1	102.5
Dec. 4	08 32.47	-17 08.7	9.120	9.513	-0.20	-2.6	110.7
Dec. 14	08 30.50	-17 34.7	9.066	9.577	-0.25	-2.0	118.7
Dec. 24	08 27.95	-17 54.2	9.028	9.642	-0.30	-1.2	126.2
Jan. 3	08 24.95	-18 06.7	9.008	9.706	-0.33	-0.5	133.0
Jan. 13	08 21.64	-18 11.6	9.011	9.770	-0.35	+0.3	138.6
Jan. 23	08 18.19	-18 08.9	9.038	9.834	-0.34	+1.0	142.2
Feb. 2	08 14.77	-17 59.0	9.091	9.898	-0.32	+1.6	143.3
Feb. 12	08 11.55	-17 42.5	9.170	9.962	-0.29	+2.2	141.6
Feb. 22	08 08.69	-17 20.5	9.274	10.026	-0.24	+2.6	137.6
Mar. 3	08 06.32	-16 54.3	9.401	10.090	-0.18	+2.9	131.8
Mar. 13	08 04.53	-16 25.2	9.550	10.153	-0.11	+3.1	125.0
Mar. 23	08 03.39	-15 54.7	9.716	10.217	-0.05	+3.1	117.6

Comet 246P/NEAT

Epoch = 2015 June 27.0 TT
 T = 2013 Jan. 28.17898 TT
 Peri. = 176.02636
 Node = 78.75927 2000.0
 Incl. = 15.97288
 q = 2.8766758 AU
 e = 0.2852368
 a = 4.0246557 AU
 n = 0.12207057
 P = 8.07 years

$$m1 = 4.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	00 25.34	-12 30.4	4.439	4.275	+0.58 +7.4	17.3	74.1
Jan. 18	00 31.10	-11 16.6	4.603	4.297	+0.66 +7.5	17.4	66.0
Jan. 28	00 37.70	-10 01.2	4.759	4.319	+0.73 +7.6	17.5	58.1
Feb. 7	00 45.02	-08 45.2	4.904	4.341	+0.79 +7.6	17.6	50.3
Feb. 17	00 52.92	-07 29.2	5.035	4.363	+0.84 +7.5	17.7	42.8
Feb. 27	01 01.29	-06 13.9	5.152	4.384	+0.87 +7.4	17.8	35.6
Mar. 9	01 10.04	-05 00.1	5.252	4.406	+0.90 +7.2	17.9	28.5
Mar. 19	01 19.06	-03 48.2	5.335	4.427	+0.92 +6.9	17.9	21.9
Mar. 29	01 28.28	-02 38.8	5.398	4.447	+0.93 +6.6	18.0	16.0
Apr. 8	01 37.61	-01 32.4	5.443	4.468	+0.94 +6.3	18.0	11.7
Apr. 18	01 46.99	-00 29.3	5.469	4.488	+0.93 +5.9	18.1	11.1
Apr. 28	01 56.34	+00 30.0	5.475	4.508	+0.92 +5.5	18.1	14.6
May 8	02 05.58	+01 25.1	5.462	4.528	+0.91 +5.1	18.1	20.1
May 18	02 14.64	+02 15.6	5.430	4.547	+0.88 +4.6	18.1	26.4
May 28	02 23.45	+03 01.3	5.381	4.566	+0.85 +4.1	18.1	33.2
June 7	02 31.92	+03 41.9	5.314	4.585	+0.80 +3.5	18.1	40.1
June 17	02 39.96	+04 17.0	5.232	4.604	+0.75 +2.9	18.1	47.3
June 27	02 47.46	+04 46.5	5.135	4.622	+0.69 +2.4	18.1	54.7
July 7	02 54.33	+05 10.2	5.025	4.640	+0.61 +1.8	18.1	62.2
July 17	03 00.45	+05 27.9	4.906	4.658	+0.52 +1.2	18.1	70.0
July 27	03 05.69	+05 39.5	4.778	4.675	+0.42 +0.6	18.0	78.1
Aug. 6	03 09.92	+05 45.1	4.645	4.692	+0.31 0.0	18.0	86.4
Aug. 16	03 13.03	+05 44.7	4.510	4.709	+0.18 -0.6	18.0	95.1
Aug. 26	03 14.87	+05 38.6	4.377	4.726	+0.05 -1.1	17.9	104.1
Sept. 5	03 15.36	+05 27.3	4.250	4.742	-0.09 -1.6	17.9	113.4
Sept. 15	03 14.43	+05 11.4	4.134	4.758	-0.24 -1.9	17.8	123.1
Sept. 25	03 12.08	+04 52.0	4.032	4.774	-0.37 -2.2	17.8	133.1
Oct. 5	03 08.39	+04 30.4	3.950	4.790	-0.48 -2.2	17.8	143.3
Oct. 15	03 03.54	+04 08.3	3.892	4.805	-0.57 -2.1	17.8	153.5
Oct. 25	02 57.82	+03 47.7	3.861	4.820	-0.62 -1.7	17.8	162.6
Nov. 4	02 51.60	+03 30.5	3.861	4.834	-0.63 -1.2	17.8	167.6
Nov. 14	02 45.29	+03 18.5	3.891	4.849	-0.59 -0.5	17.8	163.6
Nov. 24	02 39.35	+03 13.3	3.952	4.863	-0.52 +0.2	17.9	154.6
Dec. 4	02 34.16	+03 15.8	4.041	4.876	-0.41 +1.1	18.0	144.4
Dec. 14	02 30.01	+03 26.3	4.156	4.890	-0.29 +1.8	18.0	133.9
Dec. 24	02 27.12	+03 44.7	4.291	4.903	-0.15 +2.6	18.1	123.5
Jan. 3	02 25.60	+04 10.4	4.443	4.916	-0.02 +3.2	18.2	113.3
Jan. 13	02 25.45	+04 42.5	4.606	4.928	+0.12 +3.8	18.3	103.4
Jan. 23	02 26.63	+05 20.0	4.775	4.940	+0.24 +4.2	18.4	93.9
Feb. 2	02 29.06	+06 01.8	4.946	4.952	+0.36 +4.5	18.5	84.6
Feb. 12	02 32.63	+06 47.0	5.115	4.964	+0.46 +4.8	18.6	75.7
Feb. 22	02 37.20	+07 34.6	5.278	4.975	+0.55 +4.9	18.7	67.0
Mar. 3	02 42.66	+08 23.7	5.431	4.986	+0.62 +5.0	18.7	58.5
Mar. 13	02 48.89	+09 13.5	5.572	4.996	+0.69 +5.0	18.8	50.3
Mar. 23	02 55.76	+10 03.4	5.699	5.007	+0.74 +4.9	18.9	42.3

Comet C/2012 F6 (Lemmon)

Epoch = 2015 June 27.0 TT
 T = 2013 Mar. 24.55128 TT
 Peri. = 304.91871
 Node = 332.74327 2000.0
 Incl. = 82.61313
 q = 0.7293653 AU
 e = 0.9983193

$$m1 = 5.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	19 01.28	+64 47.3	7.600	7.615	+1.07	+2.3	18.6	87.2
Jan. 18	19 11.99	+65 09.8	7.699	7.698	+1.04	+3.2	18.7	86.3
Jan. 28	19 22.39	+65 42.2	7.798	7.781	+0.99	+4.2	18.8	85.4
Feb. 7	19 32.34	+66 23.8	7.899	7.863	+0.93	+5.0	18.8	84.4
Feb. 17	19 41.67	+67 13.8	7.999	7.945	+0.85	+5.7	18.9	83.3
Feb. 27	19 50.20	+68 11.3	8.099	8.027	+0.75	+6.4	19.0	82.3
Mar. 9	19 57.72	+69 15.2	8.199	8.108	+0.63	+6.9	19.1	81.3
Mar. 19	20 03.99	+70 24.5	8.298	8.189	+0.47	+7.3	19.1	80.3
Mar. 29	20 08.71	+71 37.8	8.395	8.270	+0.28	+7.6	19.2	79.4
Apr. 8	20 11.52	+72 53.7	8.491	8.350	+0.04	+7.7	19.3	78.5
Apr. 18	20 11.96	+74 10.6	8.585	8.430	-0.25	+7.6	19.3	77.8
Apr. 28	20 09.46	+75 26.8	8.676	8.509	-0.61	+7.3	19.4	77.2
May 8	20 03.37	+76 39.8	8.765	8.588	-1.04	+6.7	19.5	76.7
May 18	19 52.98	+77 47.3	8.851	8.667	-1.53	+5.9	19.5	76.3
May 28	19 37.68	+78 45.9	8.934	8.746	-2.04	+4.6	19.6	76.1
June 7	19 17.30	+79 32.3	9.014	8.824	-2.48	+3.1	19.6	76.0
June 17	18 52.49	+80 03.1	9.090	8.902	-2.74	+1.3	19.7	76.1
June 27	18 25.05	+80 15.8	9.164	8.979	-2.74	-0.6	19.7	76.4
July 7	17 57.69	+80 09.8	9.234	9.056	-2.47	-2.3	19.8	76.8
July 17	17 33.02	+79 46.5	9.301	9.133	-2.02	-3.8	19.8	77.4
July 27	17 12.84	+79 08.9	9.365	9.210	-1.51	-4.8	19.9	78.1
Aug. 6	16 57.74	+78 20.9	9.427	9.286	-1.02	-5.5	20.0	79.0
Aug. 16	16 47.51	+77 26.1	9.485	9.362	-0.60	-5.8	20.0	80.0
Aug. 26	16 41.53	+76 27.6	9.542	9.438	-0.24	-6.0	20.0	81.1
Sept. 5	16 39.09	+75 28.1	9.597	9.513	+0.04	-5.9	20.1	82.2
Sept. 15	16 39.53	+74 29.4	9.650	9.589	+0.28	-5.6	20.1	83.5
Sept. 25	16 42.29	+73 33.3	9.703	9.664	+0.46	-5.2	20.2	84.8
Oct. 5	16 46.90	+72 41.1	9.755	9.738	+0.61	-4.7	20.2	86.1
Oct. 15	16 53.00	+71 53.8	9.808	9.813	+0.73	-4.1	20.3	87.4
Oct. 25	17 00.29	+71 12.3	9.861	9.887	+0.82	-3.5	20.3	88.6
Nov. 4	17 08.50	+70 37.5	9.915	9.961	+0.89	-2.8	20.4	89.8
Nov. 14	17 17.43	+70 09.8	9.972	10.034	+0.95	-2.0	20.4	90.8
Nov. 24	17 26.89	+69 49.6	10.031	10.108	+0.98	-1.2	20.5	91.7
Dec. 4	17 36.71	+69 37.4	10.093	10.181	+1.00	-0.4	20.5	92.3
Dec. 14	17 46.75	+69 33.2	10.158	10.254	+1.01	+0.4	20.5	92.8
Dec. 24	17 56.83	+69 37.1	10.227	10.326	+1.00	+1.2	20.6	93.1
Jan. 3	18 06.82	+69 48.9	10.300	10.399	+0.97	+2.0	20.6	93.1
Jan. 13	18 16.56	+70 08.5	10.376	10.471	+0.93	+2.7	20.7	92.8
Jan. 23	18 25.89	+70 35.4	10.456	10.543	+0.88	+3.4	20.7	92.4
Feb. 2	18 34.65	+71 09.1	10.540	10.614	+0.80	+4.0	20.8	91.7
Feb. 12	18 42.65	+71 49.0	10.627	10.686	+0.70	+4.5	20.8	90.7
Feb. 22	18 49.66	+72 34.3	10.717	10.757	+0.58	+5.0	20.9	89.7
Mar. 3	18 55.46	+73 24.1	10.810	10.828	+0.43	+5.3	20.9	88.4
Mar. 13	18 59.76	+74 17.4	10.904	10.899	+0.25	+5.6	21.0	87.1
Mar. 23	19 02.22	+75 13.0	11.000	10.970	+0.03	+5.7	21.0	85.7

Comet C/2013 F2 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2013 Apr. 19.62116 TT
 Peri. = 123.10069
 Node = 344.26757 2000.0
 Incl. = 61.77305
 q = 6.2230532 AU
 e = 0.9970925

$$m1 = 6.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	11 24.34	+11 36.3	7.000	7.536	-0.28	-1.1	19.8	119.7
Jan. 18	11 21.53	+11 24.9	6.899	7.573	-0.36	-0.8	19.8	130.3
Jan. 28	11 17.90	+11 16.5	6.818	7.610	-0.43	-0.6	19.8	141.2
Feb. 7	11 13.56	+11 10.3	6.762	7.648	-0.49	-0.5	19.8	152.2
Feb. 17	11 08.70	+11 05.3	6.735	7.686	-0.52	-0.5	19.8	163.1
Feb. 27	11 03.51	+11 00.4	6.740	7.725	-0.53	-0.6	19.8	173.3
Mar. 9	10 58.25	+10 54.5	6.778	7.763	-0.51	-0.8	19.9	172.6
Mar. 19	10 53.16	+10 46.9	6.848	7.802	-0.47	-1.0	19.9	162.3
Mar. 29	10 48.44	+10 36.7	6.949	7.841	-0.41	-1.3	20.0	151.6
Apr. 8	10 44.30	+10 23.5	7.079	7.881	-0.34	-1.7	20.0	140.9
Apr. 18	10 40.87	+10 06.9	7.232	7.921	-0.26	-2.0	20.1	130.5
Apr. 28	10 38.23	+09 46.9	7.406	7.961	-0.18	-2.3	20.2	120.3
May 8	10 36.44	+09 23.4	7.595	8.001	-0.10	-2.7	20.2	110.3
May 18	10 35.49	+08 56.6	7.794	8.042	-0.01	-3.0	20.3	100.6
May 28	10 35.35	+08 26.6	7.999	8.083	+0.06	-3.3	20.4	91.1
June 7	10 35.97	+07 53.6	8.205	8.124	+0.13	-3.6	20.5	81.9
June 17	10 37.28	+07 17.9	8.407	8.165	+0.19	-3.8	20.5	72.9
June 27	10 39.20	+06 39.7	8.601	8.207	+0.25	-4.0	20.6	64.0
July 7	10 41.66	+05 59.2	8.785	8.248	+0.29	-4.3	20.7	55.3
July 17	10 44.56	+05 16.7	8.954	8.290	+0.33	-4.4	20.7	46.7
July 27	10 47.84	+04 32.4	9.106	8.333	+0.36	-4.6	20.8	38.3
Aug. 6	10 51.40	+03 46.5	9.239	8.375	+0.38	-4.7	20.9	29.9
Aug. 16	10 55.17	+02 59.3	9.351	8.418	+0.39	-4.8	20.9	21.6
Aug. 26	10 59.07	+02 11.0	9.440	8.461	+0.40	-4.9	20.9	13.5
Sept. 5	11 03.03	+01 22.0	9.505	8.504	+0.39	-5.0	21.0	6.2
Sept. 15	11 06.98	+00 32.4	9.546	8.547	+0.39	-5.0	21.0	6.2
Sept. 25	11 10.83	-00 17.5	9.562	8.590	+0.37	-5.0	21.0	13.6
Oct. 5	11 14.52	-01 07.2	9.554	8.634	+0.34	-4.9	21.1	21.9
Oct. 15	11 17.96	-01 56.5	9.522	8.678	+0.31	-4.8	21.1	30.5
Oct. 25	11 21.08	-02 45.0	9.468	8.721	+0.27	-4.7	21.1	39.3
Nov. 4	11 23.80	-03 32.2	9.394	8.766	+0.22	-4.6	21.1	48.3
Nov. 14	11 26.04	-04 17.9	9.303	8.810	+0.17	-4.4	21.1	57.5
Nov. 24	11 27.74	-05 01.5	9.197	8.854	+0.11	-4.1	21.1	66.8
Dec. 4	11 28.82	-05 42.5	9.080	8.899	+0.04	-3.8	21.1	76.3
Dec. 14	11 29.23	-06 20.5	8.958	8.944	-0.03	-3.4	21.1	86.0
Dec. 24	11 28.91	-06 54.9	8.834	8.988	-0.11	-3.0	21.1	95.9
Jan. 3	11 27.86	-07 25.4	8.713	9.033	-0.18	-2.6	21.1	106.0
Jan. 13	11 26.07	-07 51.4	8.602	9.079	-0.25	-2.1	21.1	116.2
Jan. 23	11 23.58	-08 12.7	8.505	9.124	-0.31	-1.6	21.1	126.4
Feb. 2	11 20.46	-08 29.1	8.427	9.169	-0.36	-1.1	21.1	136.7
Feb. 12	11 16.83	-08 40.5	8.373	9.215	-0.40	-0.7	21.1	146.8
Feb. 22	11 12.82	-08 47.3	8.346	9.260	-0.42	-0.3	21.1	156.4
Mar. 3	11 08.61	-08 49.9	8.349	9.306	-0.42	+0.1	21.1	164.0
Mar. 13	11 04.36	-08 48.9	8.383	9.352	-0.41	+0.4	21.1	166.3
Mar. 23	11 00.27	-08 45.4	8.449	9.398	-0.38	+0.5	21.2	161.1

Comet C/2010 S1 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2013 May 20.09771 TT
 Peri. = 118.58521
 Node = 93.43485 2000.0
 Incl. = 125.32303
 q = 5.8984879 AU
 e = 1.0030411

$$m1 = 2.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	18 43.71	-15 16.6	8.185	7.219	+0.37	-2.1	15.5	10.1
Jan. 18	18 47.39	-15 38.0	8.191	7.258	+0.35	-2.0	15.6	17.4
Jan. 28	18 50.85	-15 58.1	8.169	7.297	+0.31	-1.9	15.6	26.1
Feb. 7	18 53.95	-16 17.2	8.121	7.337	+0.26	-1.9	15.6	35.2
Feb. 17	18 56.60	-16 35.9	8.049	7.377	+0.21	-1.9	15.6	44.5
Feb. 27	18 58.67	-16 54.7	7.956	7.417	+0.14	-2.0	15.6	54.0
Mar. 9	19 00.06	-17 14.3	7.846	7.458	+0.06	-2.1	15.6	63.6
Mar. 19	19 00.67	-17 35.2	7.722	7.499	-0.03	-2.3	15.6	73.4
Mar. 29	19 00.40	-17 57.7	7.589	7.540	-0.12	-2.5	15.6	83.4
Apr. 8	18 59.17	-18 22.3	7.453	7.582	-0.22	-2.7	15.6	93.6
Apr. 18	18 56.93	-18 49.3	7.319	7.623	-0.33	-2.9	15.5	103.9
Apr. 28	18 53.64	-19 18.6	7.194	7.666	-0.43	-3.2	15.5	114.5
May 8	18 49.31	-19 50.1	7.082	7.708	-0.53	-3.3	15.5	125.2
May 18	18 44.01	-20 23.5	6.989	7.751	-0.62	-3.5	15.5	136.2
May 28	18 37.84	-20 58.2	6.922	7.794	-0.69	-3.5	15.5	147.3
June 7	18 30.98	-21 33.4	6.884	7.837	-0.73	-3.5	15.5	158.5
June 17	18 23.64	-22 08.4	6.878	7.880	-0.76	-3.4	15.6	169.8
June 27	18 16.08	-22 42.4	6.908	7.924	-0.75	-3.2	15.6	178.7
July 7	18 08.59	-23 14.8	6.972	7.968	-0.72	-3.0	15.6	167.6
July 17	18 01.43	-23 45.2	7.070	8.012	-0.66	-2.8	15.7	156.4
July 27	17 54.85	-24 13.4	7.200	8.056	-0.58	-2.6	15.7	145.3
Aug. 6	17 49.03	-24 39.5	7.358	8.101	-0.49	-2.4	15.8	134.5
Aug. 16	17 44.12	-25 03.7	7.539	8.145	-0.39	-2.3	15.9	123.8
Aug. 26	17 40.21	-25 26.4	7.738	8.190	-0.29	-2.1	16.0	113.3
Sept. 5	17 37.33	-25 47.7	7.950	8.235	-0.19	-2.0	16.1	103.0
Sept. 15	17 35.47	-26 08.2	8.170	8.281	-0.09	-2.0	16.1	92.9
Sept. 25	17 34.58	-26 28.0	8.390	8.326	0.00	-1.9	16.2	82.9
Oct. 5	17 34.59	-26 47.4	8.607	8.372	+0.08	-1.9	16.3	73.1
Oct. 15	17 35.43	-27 06.5	8.816	8.418	+0.16	-1.9	16.4	63.5
Oct. 25	17 36.99	-27 25.5	9.011	8.464	+0.22	-1.9	16.4	54.0
Nov. 4	17 39.17	-27 44.4	9.189	8.510	+0.27	-1.9	16.5	44.5
Nov. 14	17 41.87	-28 03.4	9.346	8.556	+0.31	-1.9	16.6	35.2
Nov. 24	17 44.97	-28 22.6	9.480	8.603	+0.34	-1.9	16.6	26.0
Dec. 4	17 48.36	-28 41.9	9.588	8.650	+0.36	-2.0	16.7	17.0
Dec. 14	17 51.94	-29 01.5	9.668	8.696	+0.36	-2.0	16.7	8.8
Dec. 24	17 55.58	-29 21.6	9.720	8.743	+0.36	-2.1	16.8	6.5
Jan. 3	17 59.19	-29 42.2	9.744	8.790	+0.35	-2.1	16.8	13.5
Jan. 13	18 02.64	-30 03.6	9.739	8.838	+0.32	-2.2	16.8	22.4
Jan. 23	18 05.82	-30 25.9	9.708	8.885	+0.28	-2.3	16.8	31.6
Feb. 2	18 08.62	-30 49.4	9.652	8.933	+0.23	-2.5	16.8	41.0
Feb. 12	18 10.94	-31 14.2	9.575	8.980	+0.17	-2.6	16.8	50.6
Feb. 22	18 12.67	-31 40.4	9.479	9.028	+0.10	-2.8	16.8	60.2
Mar. 3	18 13.69	-32 08.2	9.368	9.076	+0.02	-2.9	16.8	69.9
Mar. 13	18 13.93	-32 37.5	9.247	9.124	-0.06	-3.1	16.8	79.8
Mar. 23	18 13.30	-33 08.1	9.122	9.172	-0.16	-3.2	16.8	89.7

Comet C/2012 K6 (McNaught)

Epoch = 2015 June 27.0 TT
 T = 2013 May 21.18981 TT
 Peri. = 338.85349
 Node = 206.91702 2000.0
 Incl. = 135.22107
 q = 3.3548743 AU
 e = 0.9981487

$$m_1 = 8.6 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	12 18.05	+46 35.4	5.709	6.196	-0.54	+12.3	18.3	115.5
Jan. 18	12 12.60	+48 38.2	5.677	6.262	-0.76	+12.1	18.3	122.6
Jan. 28	12 05.03	+50 39.0	5.671	6.328	-0.97	+11.3	18.4	128.3
Feb. 7	11 55.34	+52 32.3	5.692	6.395	-1.16	+10.1	18.4	132.1
Feb. 17	11 43.73	+54 12.8	5.743	6.461	-1.31	+8.3	18.5	133.3
Feb. 27	11 30.60	+55 35.8	5.824	6.527	-1.40	+6.2	18.5	131.9
Mar. 9	11 16.62	+56 38.3	5.934	6.593	-1.41	+4.1	18.6	128.2
Mar. 19	11 02.56	+57 19.2	6.069	6.660	-1.33	+2.0	18.7	122.7
Mar. 29	10 49.24	+57 39.3	6.227	6.726	-1.19	+0.2	18.8	116.1
Apr. 8	10 37.32	+57 41.2	6.403	6.792	-1.01	-1.3	18.9	108.8
Apr. 18	10 27.24	+57 28.2	6.592	6.859	-0.80	-2.4	19.0	101.2
Apr. 28	10 19.24	+57 04.0	6.789	6.925	-0.59	-3.2	19.1	93.5
May 8	10 13.33	+56 32.1	6.990	6.991	-0.39	-3.7	19.2	85.9
May 18	10 09.41	+55 55.5	7.190	7.057	-0.21	-3.9	19.2	78.4
May 28	10 07.28	+55 16.5	7.385	7.124	-0.06	-3.9	19.3	71.2
June 7	10 06.71	+54 37.2	7.571	7.190	+0.08	-3.8	19.4	64.3
June 17	10 07.49	+53 59.0	7.745	7.256	+0.19	-3.6	19.5	57.9
June 27	10 09.38	+53 23.0	7.904	7.322	+0.28	-3.3	19.6	52.0
July 7	10 12.19	+52 50.2	8.046	7.388	+0.35	-2.9	19.6	46.8
July 17	10 15.73	+52 21.4	8.170	7.454	+0.41	-2.4	19.7	42.7
July 27	10 19.85	+51 57.1	8.273	7.520	+0.45	-1.9	19.8	39.7
Aug. 6	10 24.38	+51 37.9	8.355	7.586	+0.48	-1.3	19.8	38.4
Aug. 16	10 29.21	+51 24.5	8.415	7.652	+0.50	-0.7	19.9	38.7
Aug. 26	10 34.21	+51 17.4	8.455	7.717	+0.50	0.0	19.9	40.8
Sept. 5	10 39.25	+51 17.2	8.473	7.783	+0.50	+0.7	19.9	44.3
Sept. 15	10 44.21	+51 24.3	8.472	7.849	+0.48	+1.5	20.0	49.0
Sept. 25	10 48.98	+51 39.3	8.453	7.914	+0.44	+2.3	20.0	54.6
Oct. 5	10 53.42	+52 02.6	8.418	7.980	+0.40	+3.2	20.0	61.0
Oct. 15	10 57.41	+52 34.7	8.369	8.045	+0.34	+4.1	20.0	67.8
Oct. 25	11 00.78	+53 15.7	8.311	8.111	+0.26	+5.0	20.0	75.0
Nov. 4	11 03.37	+54 05.6	8.247	8.176	+0.16	+5.8	20.0	82.5
Nov. 14	11 04.99	+55 04.0	8.180	8.241	+0.04	+6.6	20.0	90.1
Nov. 24	11 05.44	+56 10.2	8.116	8.306	-0.09	+7.3	20.0	97.7
Dec. 4	11 04.50	+57 22.8	8.059	8.371	-0.26	+7.7	20.1	105.2
Dec. 14	11 01.94	+58 40.1	8.014	8.436	-0.44	+7.9	20.1	112.3
Dec. 24	10 57.56	+59 59.4	7.984	8.501	-0.64	+7.8	20.1	118.8
Jan. 3	10 51.20	+61 17.8	7.974	8.566	-0.84	+7.4	20.1	124.3
Jan. 13	10 42.79	+62 31.8	7.986	8.631	-1.04	+6.6	20.1	128.3
Jan. 23	10 32.42	+63 37.8	8.023	8.695	-1.20	+5.5	20.2	130.5
Feb. 2	10 20.38	+64 32.7	8.086	8.760	-1.32	+4.1	20.2	130.6
Feb. 12	10 07.18	+65 13.7	8.175	8.824	-1.37	+2.6	20.3	128.6
Feb. 22	09 53.51	+65 39.6	8.288	8.888	-1.34	+1.1	20.3	124.7
Mar. 3	09 40.14	+65 50.3	8.422	8.953	-1.24	-0.3	20.4	119.5
Mar. 13	09 27.78	+65 46.9	8.576	9.017	-1.08	-1.5	20.4	113.4
Mar. 23	09 17.01	+65 31.5	8.745	9.081	-0.89	-2.5	20.5	106.6

Comet P/2014 MG4 (Spacewatch-PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2013 June 13.04673 TT
 Peri. = 298.76466
 Node = 311.85209 2000.0
 Incl. = 9.36805
 q = 3.7127387 AU
 e = 0.2592711
 a = 5.0122774 AU
 n = 0.08783173
 P = 11.22 years

$$m1 = 6.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	21 31.72	-12 13.5	5.216	4.437	+0.97	19.7	34.2
Jan. 18	21 41.45	-11 17.9	5.315	4.457	+0.99	19.8	26.6
Jan. 28	21 51.34	-10 19.5	5.396	4.478	+0.99	19.8	19.1
Feb. 7	22 01.28	-09 18.7	5.459	4.498	+0.99	19.9	11.8
Feb. 17	22 11.19	-08 16.0	5.502	4.518	+0.98	19.9	4.9
Feb. 27	22 20.98	-07 11.8	5.525	4.539	+0.96	20.0	4.5
Mar. 9	22 30.59	-06 06.7	5.529	4.559	+0.94	20.0	11.2
Mar. 19	22 39.95	-05 01.2	5.513	4.580	+0.90	20.0	18.5
Mar. 29	22 48.97	-03 55.9	5.478	4.600	+0.86	20.0	25.9
Apr. 8	22 57.60	-02 51.3	5.425	4.621	+0.82	20.0	33.3
Apr. 18	23 05.75	-01 48.1	5.356	4.642	+0.76	20.0	40.8
Apr. 28	23 13.35	-00 46.7	5.270	4.662	+0.70	20.0	48.3
May 8	23 20.32	+00 12.0	5.171	4.683	+0.62	20.0	56.0
May 18	23 26.57	+01 07.6	5.061	4.704	+0.54	20.0	63.9
May 28	23 32.00	+01 59.3	4.940	4.724	+0.45	20.0	71.9
June 7	23 36.52	+02 46.4	4.813	4.745	+0.35	20.0	80.1
June 17	23 40.03	+03 28.2	4.682	4.765	+0.24	19.9	88.5
June 27	23 42.43	+04 03.9	4.551	4.786	+0.12	19.9	97.2
July 7	23 43.65	+04 32.7	4.422	4.806	0.00	19.9	106.2
July 17	23 43.62	+04 54.0	4.300	4.827	-0.13	19.8	115.6
July 27	23 42.33	+05 07.1	4.190	4.847	-0.25	19.8	125.2
Aug. 6	23 39.84	+05 11.7	4.095	4.868	-0.36	19.8	135.2
Aug. 16	23 36.24	+05 07.7	4.021	4.888	-0.45	19.8	145.4
Aug. 26	23 31.76	+04 55.7	3.970	4.908	-0.51	19.8	155.7
Sept. 5	23 26.67	+04 36.8	3.945	4.929	-0.54	19.8	165.6
Sept. 15	23 21.31	+04 12.5	3.950	4.949	-0.52	19.8	172.2
Sept. 25	23 16.07	+03 45.1	3.986	4.969	-0.47	19.8	167.3
Oct. 5	23 11.33	+03 16.9	4.050	4.989	-0.40	19.9	157.5
Oct. 15	23 07.37	+02 50.4	4.142	5.009	-0.29	20.0	147.1
Oct. 25	23 04.47	+02 27.5	4.260	5.029	-0.17	20.1	136.6
Nov. 4	23 02.76	+02 09.9	4.398	5.049	-0.04	20.2	126.3
Nov. 14	23 02.32	+01 58.9	4.553	5.068	+0.08	20.3	116.2
Nov. 24	23 03.14	+01 55.0	4.721	5.088	+0.20	20.4	106.4
Dec. 4	23 05.17	+01 58.6	4.896	5.108	+0.31	20.5	96.8
Dec. 14	23 08.31	+02 09.5	5.074	5.127	+0.41	20.6	87.5
Dec. 24	23 12.45	+02 27.4	5.251	5.146	+0.50	20.7	78.5
Jan. 3	23 17.47	+02 52.0	5.424	5.166	+0.58	20.8	69.7
Jan. 13	23 23.24	+03 22.5	5.588	5.185	+0.64	20.9	61.1
Jan. 23	23 29.65	+03 58.5	5.741	5.204	+0.69	20.9	52.7
Feb. 2	23 36.57	+04 39.2	5.879	5.223	+0.73	21.0	44.5
Feb. 12	23 43.91	+05 24.0	6.002	5.242	+0.77	21.1	36.5
Feb. 22	23 51.57	+06 12.1	6.107	5.260	+0.79	21.1	28.7
Mar. 3	23 59.45	+07 03.1	6.192	5.279	+0.80	21.2	21.1
Mar. 13	00 07.47	+07 56.1	6.257	5.297	+0.81	21.2	13.9
Mar. 23	00 15.55	+08 50.7	6.301	5.316	+0.81	21.3	8.0

Comet C/2013 E1 (McNaught)

Epoch = 2015 June 27.0 TT
 T = 2013 June 14.18300 TT
 Peri. = 311.59058
 Node = 134.03561 2000.0
 Incl. = 158.71660
 q = 7.7878188 AU
 e = 1.0002307

$$m1 = 5.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	10 06.89	+05 46.0	7.813	8.539	-0.57 +4.0	19.2	135.2
Jan. 18	10 01.18	+06 26.1	7.723	8.564	-0.63 +4.4	19.2	146.9
Jan. 28	09 54.89	+07 10.2	7.665	8.589	-0.67 +4.7	19.2	158.5
Feb. 7	09 48.24	+07 57.2	7.642	8.615	-0.68 +4.8	19.2	169.8
Feb. 17	09 41.45	+08 45.7	7.657	8.641	-0.67 +4.8	19.2	174.3
Feb. 27	09 34.75	+09 34.1	7.709	8.667	-0.64 +4.7	19.2	164.3
Mar. 9	09 28.39	+10 21.1	7.798	8.693	-0.58 +4.4	19.3	152.9
Mar. 19	09 22.57	+11 05.4	7.919	8.720	-0.51 +4.1	19.3	141.5
Mar. 29	09 17.43	+11 46.1	8.069	8.747	-0.43 +3.6	19.4	130.2
Apr. 8	09 13.10	+12 22.5	8.242	8.775	-0.35 +3.2	19.4	119.2
Apr. 18	09 09.63	+12 54.5	8.432	8.802	-0.26 +2.7	19.5	108.5
Apr. 28	09 07.03	+13 21.8	8.634	8.830	-0.18 +2.3	19.5	98.0
May 8	09 05.27	+13 44.6	8.840	8.858	-0.10 +1.9	19.6	87.8
May 18	09 04.32	+14 03.2	9.045	8.887	-0.02 +1.5	19.7	77.8
May 28	09 04.09	+14 17.8	9.244	8.916	+0.04 +1.1	19.7	68.1
June 7	09 04.51	+14 28.9	9.432	8.945	+0.10 +0.8	19.8	58.6
June 17	09 05.49	+14 36.9	9.605	8.974	+0.14 +0.5	19.8	49.2
June 27	09 06.93	+14 42.1	9.759	9.004	+0.18 +0.3	19.9	40.0
July 7	09 08.75	+14 45.2	9.892	9.034	+0.21 +0.1	19.9	30.9
July 17	09 10.85	+14 46.3	10.000	9.064	+0.23 0.0	20.0	21.8
July 27	09 13.15	+14 46.1	10.082	9.095	+0.24 -0.1	20.0	12.8
Aug. 6	09 15.55	+14 45.0	10.137	9.125	+0.24 -0.2	20.0	3.9
Aug. 16	09 17.97	+14 43.5	10.164	9.156	+0.23 -0.2	20.1	5.4
Aug. 26	09 20.32	+14 41.9	10.163	9.188	+0.22 -0.1	20.1	14.4
Sept. 5	09 22.51	+14 40.9	10.135	9.219	+0.20 0.0	20.1	23.5
Sept. 15	09 24.46	+14 41.0	10.080	9.251	+0.16 +0.2	20.1	32.8
Sept. 25	09 26.08	+14 42.5	10.001	9.283	+0.12 +0.4	20.1	42.2
Oct. 5	09 27.28	+14 46.2	9.901	9.315	+0.07 +0.6	20.1	51.7
Oct. 15	09 27.98	+14 52.5	9.782	9.347	+0.01 +0.9	20.1	61.5
Oct. 25	09 28.08	+15 01.8	9.648	9.380	-0.06 +1.3	20.0	71.5
Nov. 4	09 27.52	+15 14.6	9.505	9.413	-0.13 +1.7	20.0	81.6
Nov. 14	09 26.23	+15 31.2	9.358	9.446	-0.21 +2.1	20.0	92.1
Nov. 24	09 24.15	+15 51.7	9.212	9.479	-0.29 +2.5	20.0	102.7
Dec. 4	09 21.25	+16 16.2	9.074	9.512	-0.37 +2.8	20.0	113.6
Dec. 14	09 17.56	+16 44.5	8.950	9.546	-0.45 +3.2	20.0	124.8
Dec. 24	09 13.09	+17 16.0	8.847	9.580	-0.51 +3.4	19.9	136.1
Jan. 3	09 07.95	+17 50.0	8.769	9.614	-0.57 +3.6	19.9	147.7
Jan. 13	09 02.27	+18 25.6	8.722	9.648	-0.61 +3.6	19.9	159.3
Jan. 23	08 56.22	+19 01.7	8.710	9.683	-0.62 +3.5	20.0	170.9
Feb. 2	08 49.99	+19 37.1	8.734	9.718	-0.62 +3.4	20.0	176.7
Feb. 12	08 43.82	+20 10.9	8.794	9.752	-0.59 +3.1	20.0	165.4
Feb. 22	08 37.90	+20 42.2	8.890	9.788	-0.55 +2.8	20.1	153.9
Mar. 3	08 32.44	+21 10.4	9.018	9.823	-0.49 +2.5	20.1	142.5
Mar. 13	08 27.58	+21 35.1	9.174	9.858	-0.41 +2.1	20.2	131.3
Mar. 23	08 23.44	+21 56.2	9.353	9.894	-0.34 +1.8	20.2	120.3

Comet P/2012 B1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2013 July 23.64221 TT
 Peri. = 162.25904
 Node = 36.17783 2000.0
 Incl. = 7.62345
 q = 3.8256409 AU

e = 0.4118710
 a = 6.5047649 AU
 n = 0.05940960
 P = 16.59 years

$$m_1 = 2.8 + 5 \log(\Delta) + 17.5 \log(r(t-180))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	18 11.31	-28 31.7	5.711	4.771	+1.13 -0.3	17.7	15.5
Jan. 18	18 22.63	-28 34.3	5.691	4.800	+1.09 -0.1	17.7	22.9
Jan. 28	18 33.55	-28 35.3	5.651	4.829	+1.04 0.0	17.7	30.6
Feb. 7	18 43.96	-28 35.1	5.593	4.858	+0.98 +0.1	17.7	38.3
Feb. 17	18 53.75	-28 34.5	5.519	4.888	+0.91 +0.1	17.8	46.2
Feb. 27	19 02.82	-28 33.8	5.430	4.917	+0.82 0.0	17.8	54.2
Mar. 9	19 11.03	-28 34.0	5.328	4.947	+0.73 -0.1	17.8	62.4
Mar. 19	19 18.30	-28 35.4	5.215	4.977	+0.62 -0.4	17.8	70.8
Mar. 29	19 24.49	-28 39.0	5.095	5.007	+0.50 -0.6	17.8	79.3
Apr. 8	19 29.50	-28 45.1	4.971	5.037	+0.37 -0.9	17.7	88.0
Apr. 18	19 33.22	-28 54.2	4.846	5.067	+0.23 -1.2	17.7	97.0
Apr. 28	19 35.56	-29 06.5	4.724	5.097	+0.09 -1.5	17.7	106.2
May 8	19 36.46	-29 21.9	4.610	5.127	-0.06 -1.8	17.7	115.6
May 18	19 35.90	-29 40.1	4.507	5.157	-0.20 -2.0	17.7	125.3
May 28	19 33.91	-30 00.2	4.420	5.188	-0.33 -2.1	17.7	135.2
June 7	19 30.61	-30 21.0	4.352	5.218	-0.44 -2.0	17.7	145.2
June 17	19 26.20	-30 41.1	4.309	5.248	-0.52 -1.8	17.8	155.2
June 27	19 20.97	-30 59.1	4.292	5.279	-0.57 -1.4	17.8	164.7
July 7	19 15.28	-31 13.6	4.303	5.309	-0.57 -1.0	17.8	171.0
July 17	19 09.54	-31 23.6	4.343	5.340	-0.54 -0.5	17.9	167.4
July 27	19 04.17	-31 28.8	4.412	5.370	-0.46 0.0	18.0	158.5
Aug. 6	18 59.53	-31 29.1	4.508	5.401	-0.36 +0.4	18.1	148.7
Aug. 16	18 55.91	-31 25.1	4.629	5.431	-0.24 +0.8	18.2	138.7
Aug. 26	18 53.53	-31 17.4	4.771	5.462	-0.10 +1.1	18.3	128.8
Sept. 5	18 52.49	-31 06.8	4.931	5.492	+0.03 +1.3	18.4	119.1
Sept. 15	18 52.82	-30 54.0	5.104	5.523	+0.17 +1.5	18.5	109.6
Sept. 25	18 54.49	-30 39.5	5.285	5.553	+0.29 +1.6	18.7	100.3
Oct. 5	18 57.42	-30 23.6	5.472	5.583	+0.41 +1.7	18.8	91.2
Oct. 15	19 01.51	-30 06.6	5.659	5.614	+0.51 +1.8	18.9	82.3
Oct. 25	19 06.63	-29 48.6	5.843	5.644	+0.60 +1.9	19.0	73.6
Nov. 4	19 12.66	-29 29.6	6.021	5.674	+0.68 +2.0	19.1	65.0
Nov. 14	19 19.46	-29 09.4	6.189	5.705	+0.74 +2.1	19.2	56.6
Nov. 24	19 26.90	-28 48.1	6.344	5.735	+0.80 +2.2	19.3	48.3
Dec. 4	19 34.85	-28 25.7	6.485	5.765	+0.83 +2.4	19.4	40.1
Dec. 14	19 43.20	-28 02.2	6.607	5.795	+0.86 +2.5	19.5	31.9
Dec. 24	19 51.82	-27 37.6	6.710	5.825	+0.88 +2.5	19.6	24.0
Jan. 3	20 00.61	-27 12.2	6.793	5.855	+0.89 +2.6	19.6	16.3
Jan. 13	20 09.47	-26 46.1	6.853	5.885	+0.88 +2.6	19.7	9.4
Jan. 23	20 18.29	-26 19.6	6.891	5.915	+0.87 +2.7	19.8	6.7
Feb. 2	20 26.97	-25 53.1	6.907	5.945	+0.85 +2.6	19.8	11.5
Feb. 12	20 35.43	-25 26.9	6.900	5.974	+0.81 +2.5	19.9	18.9
Feb. 22	20 43.58	-25 01.6	6.871	6.004	+0.77 +2.4	19.9	26.7
Mar. 3	20 51.33	-24 37.7	6.822	6.033	+0.73 +2.2	19.9	34.7
Mar. 13	20 58.59	-24 15.7	6.753	6.063	+0.67 +2.0	19.9	42.9
Mar. 23	21 05.29	-23 56.2	6.668	6.092	+0.60 +1.6	19.9	51.2

Comet C/2014 F1 (Hill)

Epoch = 2015 June 27.0 TT
 T = 2013 Oct. 4.71886 TT
 Peri. = 8.23691
 Node = 239.88997 2000.0
 Incl. = 108.25033
 q = 3.4967555 AU
 e = 0.9984743

$$m1 = 11.0 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	16 01.96	+52 43.9	5.326	5.346	+0.79	+13.7	20.1	85.9
Jan. 18	16 09.89	+55 00.9	5.321	5.408	+0.70	+14.7	20.1	89.8
Jan. 28	16 16.91	+57 28.4	5.326	5.470	+0.58	+15.5	20.2	93.2
Feb. 7	16 22.69	+60 03.6	5.344	5.533	+0.41	+16.0	20.2	95.9
Feb. 17	16 26.81	+62 43.6	5.375	5.596	+0.19	+16.1	20.3	97.8
Feb. 27	16 28.71	+65 24.9	5.422	5.659	-0.10	+15.8	20.3	98.8
Mar. 9	16 27.69	+68 03.4	5.484	5.722	-0.48	+15.1	20.4	98.9
Mar. 19	16 22.86	+70 34.7	5.561	5.785	-0.98	+13.9	20.4	98.1
Mar. 29	16 13.10	+72 54.0	5.652	5.849	-1.58	+12.2	20.5	96.4
Apr. 8	15 57.29	+74 55.9	5.756	5.913	-2.27	+9.9	20.6	94.1
Apr. 18	15 34.64	+76 34.8	5.869	5.977	-2.92	+7.0	20.7	91.3
Apr. 28	15 05.47	+77 45.2	5.990	6.041	-3.33	+3.8	20.7	88.1
May 8	14 32.13	+78 23.6	6.116	6.105	-3.35	+0.7	20.8	84.7
May 18	13 58.63	+78 30.3	6.244	6.170	-2.95	-2.0	20.9	81.1
May 28	13 29.10	+78 09.9	6.372	6.234	-2.32	-4.0	21.0	77.6
June 7	13 05.92	+77 30.0	6.497	6.299	-1.64	-5.2	21.1	74.3
June 17	12 49.48	+76 37.8	6.617	6.363	-1.04	-5.8	21.1	71.2
June 27	12 39.06	+75 39.5	6.730	6.428	-0.55	-6.0	21.2	68.5
July 7	12 33.54	+74 39.6	6.835	6.493	-0.17	-5.8	21.3	66.3
July 17	12 31.87	+73 41.4	6.929	6.557	+0.13	-5.4	21.3	64.6
July 27	12 33.22	+72 47.0	7.012	6.622	+0.37	-4.9	21.4	63.5
Aug. 6	12 36.90	+71 58.0	7.084	6.687	+0.55	-4.2	21.4	63.1
Aug. 16	12 42.44	+71 15.6	7.143	6.752	+0.70	-3.5	21.5	63.5
Aug. 26	12 49.47	+70 40.9	7.191	6.817	+0.82	-2.6	21.5	64.5
Sept. 5	12 57.70	+70 14.5	7.227	6.882	+0.93	-1.7	21.6	66.2
Sept. 15	13 06.95	+69 57.1	7.252	6.947	+1.01	-0.8	21.6	68.5
Sept. 25	13 17.07	+69 49.4	7.267	7.012	+1.09	+0.2	21.7	71.4
Oct. 5	13 27.93	+69 51.8	7.274	7.077	+1.15	+1.3	21.7	74.7
Oct. 15	13 39.46	+70 04.6	7.275	7.142	+1.21	+2.4	21.7	78.4
Oct. 25	13 51.60	+70 28.2	7.272	7.207	+1.27	+3.4	21.7	82.3
Nov. 4	14 04.30	+71 02.5	7.268	7.272	+1.32	+4.5	21.8	86.3
Nov. 14	14 17.52	+71 47.5	7.264	7.337	+1.37	+5.5	21.8	90.3
Nov. 24	14 31.23	+72 43.0	7.264	7.402	+1.42	+6.5	21.8	94.2
Dec. 4	14 45.42	+73 48.1	7.270	7.466	+1.47	+7.4	21.9	97.7
Dec. 14	15 00.08	+75 02.2	7.285	7.531	+1.51	+8.2	21.9	100.8
Dec. 24	15 15.19	+76 24.0	7.311	7.596	+1.56	+8.8	21.9	103.2
Jan. 3	15 30.77	+77 52.3	7.349	7.661	+1.61	+9.3	22.0	104.9
Jan. 13	15 46.87	+79 25.5	7.402	7.725	+1.66	+9.6	22.0	105.6
Jan. 23	16 03.51	+81 01.9	7.469	7.790	+1.74	+9.8	22.1	105.5
Feb. 2	16 20.90	+82 40.1	7.551	7.855	+1.85	+9.8	22.1	104.4
Feb. 12	16 39.38	+84 18.4	7.647	7.919	+2.05	+9.7	22.2	102.5
Feb. 22	16 59.85	+85 55.5	7.756	7.984	+2.58	+9.4	22.2	99.8
Mar. 3	17 25.69	+87 30.0	7.876	8.048	+5.39	+9.0	22.3	96.5
Mar. 13	18 19.55	+89 00.1	8.004	8.112	+56.13	+2.6	22.3	92.7
Mar. 23	03 40.88	+89 26.4	8.140	8.177	+9.75	-8.0	22.4	88.6

Comet C/2014 S1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2013 Nov. 1.3399 TT
 Peri. = 288.94613
 Node = 352.65859 2000.0
 Incl. = 123.80651
 q = 8.1405356 AU
 e = 1.0014236

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	01 53.52	-28 02.1	8.528	8.545	-0.28	+5.5	20.0	87.7
Jan. 18	01 50.69	-27 07.0	8.692	8.564	-0.19	+5.7	20.1	79.3
Jan. 28	01 48.84	-26 10.2	8.853	8.582	-0.10	+5.7	20.1	70.9
Feb. 7	01 47.88	-25 13.2	9.007	8.601	-0.02	+5.6	20.2	62.8
Feb. 17	01 47.69	-24 17.1	9.149	8.621	+0.05	+5.4	20.2	55.0
Feb. 27	01 48.19	-23 22.9	9.275	8.641	+0.11	+5.1	20.3	47.8
Mar. 9	01 49.24	-22 31.4	9.383	8.661	+0.15	+4.8	20.3	41.2
Mar. 19	01 50.74	-21 43.3	9.471	8.681	+0.18	+4.4	20.3	35.6
Mar. 29	01 52.58	-20 59.3	9.536	8.702	+0.21	+4.0	20.3	31.7
Apr. 8	01 54.65	-20 19.7	9.577	8.723	+0.22	+3.5	20.4	29.9
Apr. 18	01 56.85	-19 45.0	9.594	8.745	+0.22	+2.9	20.4	30.5
Apr. 28	01 59.09	-19 15.6	9.588	8.766	+0.22	+2.4	20.4	33.5
May 8	02 01.25	-18 51.6	9.558	8.788	+0.20	+1.8	20.4	38.3
May 18	02 03.26	-18 33.3	9.506	8.811	+0.17	+1.2	20.4	44.4
May 28	02 05.00	-18 21.0	9.433	8.834	+0.14	+0.6	20.4	51.2
June 7	02 06.40	-18 14.6	9.343	8.857	+0.10	0.0	20.4	58.6
June 17	02 07.36	-18 14.2	9.238	8.880	+0.04	-0.6	20.3	66.4
June 27	02 07.79	-18 19.8	9.121	8.904	-0.02	-1.1	20.3	74.5
July 7	02 07.60	-18 30.9	8.996	8.928	-0.09	-1.6	20.3	82.9
July 17	02 06.71	-18 47.3	8.867	8.952	-0.17	-2.1	20.3	91.5
July 27	02 05.06	-19 08.4	8.740	8.977	-0.25	-2.5	20.3	100.3
Aug. 6	02 02.60	-19 33.3	8.618	9.002	-0.33	-2.8	20.2	109.2
Aug. 16	01 59.29	-20 01.0	8.507	9.027	-0.41	-2.9	20.2	118.0
Aug. 26	01 55.15	-20 30.0	8.411	9.053	-0.49	-2.9	20.2	126.8
Sept. 5	01 50.22	-20 58.8	8.337	9.079	-0.56	-2.7	20.2	135.1
Sept. 15	01 44.58	-21 25.8	8.286	9.105	-0.62	-2.3	20.2	142.5
Sept. 25	01 38.38	-21 49.2	8.264	9.131	-0.66	-1.8	20.2	148.1
Oct. 5	01 31.80	-22 07.5	8.272	9.158	-0.68	-1.2	20.2	150.7
Oct. 15	01 25.03	-22 19.3	8.312	9.185	-0.67	-0.4	20.2	149.4
Oct. 25	01 18.32	-22 23.7	8.384	9.212	-0.64	+0.3	20.2	144.6
Nov. 4	01 11.88	-22 20.4	8.485	9.239	-0.60	+1.1	20.3	137.4
Nov. 14	01 05.91	-22 09.2	8.613	9.267	-0.53	+1.8	20.3	129.0
Nov. 24	01 00.59	-21 50.7	8.764	9.295	-0.46	+2.5	20.4	119.8
Dec. 4	00 56.02	-21 25.7	8.935	9.324	-0.37	+3.1	20.4	110.4
Dec. 14	00 52.29	-20 55.0	9.118	9.352	-0.29	+3.5	20.5	100.8
Dec. 24	00 49.41	-20 19.8	9.309	9.381	-0.20	+3.9	20.5	91.1
Jan. 3	00 47.37	-19 41.2	9.503	9.410	-0.12	+4.1	20.6	81.6
Jan. 13	00 46.13	-19 00.1	9.694	9.439	-0.05	+4.3	20.6	72.2
Jan. 23	00 45.63	-18 17.6	9.876	9.469	+0.01	+4.3	20.7	62.9
Feb. 2	00 45.78	-17 34.4	10.046	9.498	+0.07	+4.3	20.7	53.9
Feb. 12	00 46.49	-16 51.3	10.199	9.528	+0.12	+4.2	20.8	45.1
Feb. 22	00 47.67	-16 09.0	10.333	9.559	+0.16	+4.1	20.8	36.7
Mar. 3	00 49.22	-15 28.1	10.443	9.589	+0.18	+3.9	20.9	29.1
Mar. 13	00 51.06	-14 49.0	10.529	9.620	+0.20	+3.7	20.9	22.6
Mar. 23	00 53.08	-14 12.3	10.590	9.651	+0.21	+3.4	20.9	18.7

Comet C/2014 G1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2013 Nov. 6.22124 TT
 Peri. = 77.04260
 Node = 337.95221 2000.0
 Incl. = 165.63804
 q = 5.4680440 AU
 e = 0.9930212

$$m1 = 8.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	15 07.21	-05 21.0	6.686	6.284	-0.06	+1.6	20.1	61.9
Jan. 18	15 06.66	-05 05.3	6.552	6.319	-0.16	+2.2	20.1	72.1
Jan. 28	15 05.11	-04 43.6	6.408	6.355	-0.27	+2.8	20.1	82.5
Feb. 7	15 02.44	-04 15.8	6.260	6.391	-0.39	+3.4	20.0	93.2
Feb. 17	14 58.56	-03 42.0	6.114	6.427	-0.52	+3.9	20.0	104.1
Feb. 27	14 53.41	-03 02.5	5.979	6.465	-0.64	+4.4	20.0	115.3
Mar. 9	14 47.00	-02 18.2	5.860	6.502	-0.76	+4.8	20.0	126.7
Mar. 19	14 39.41	-01 30.1	5.765	6.540	-0.86	+5.0	20.0	138.1
Mar. 29	14 30.82	-00 40.0	5.700	6.579	-0.93	+5.0	20.0	149.4
Apr. 8	14 21.49	+00 10.2	5.670	6.618	-0.98	+4.8	20.0	159.7
Apr. 18	14 11.73	+00 58.5	5.678	6.658	-0.98	+4.4	20.0	166.3
Apr. 28	14 01.91	+01 42.7	5.725	6.697	-0.95	+3.8	20.0	163.8
May 8	13 52.39	+02 21.0	5.810	6.738	-0.89	+3.1	20.1	154.9
May 18	13 43.50	+02 52.3	5.931	6.778	-0.80	+2.4	20.2	144.3
May 28	13 35.48	+03 15.9	6.083	6.820	-0.70	+1.6	20.3	133.4
June 7	13 28.52	+03 31.7	6.261	6.861	-0.58	+0.8	20.3	122.6
June 17	13 22.70	+03 40.1	6.459	6.903	-0.46	+0.2	20.4	111.9
June 27	13 18.06	+03 41.6	6.670	6.945	-0.35	-0.4	20.5	101.5
July 7	13 14.54	+03 37.2	6.889	6.988	-0.24	-1.0	20.6	91.4
July 17	13 12.10	+03 27.6	7.109	7.031	-0.15	-1.4	20.7	81.5
July 27	13 10.62	+03 13.8	7.324	7.074	-0.06	-1.7	20.8	71.8
Aug. 6	13 10.01	+02 56.8	7.531	7.117	+0.01	-2.0	20.9	62.4
Aug. 16	13 10.14	+02 37.1	7.723	7.161	+0.08	-2.1	21.0	53.1
Aug. 26	13 10.91	+02 15.8	7.899	7.205	+0.13	-2.2	21.1	44.0
Sept. 5	13 12.21	+01 53.3	8.053	7.250	+0.17	-2.3	21.1	35.0
Sept. 15	13 13.92	+01 30.5	8.184	7.295	+0.20	-2.3	21.2	26.2
Sept. 25	13 15.93	+01 07.9	8.288	7.340	+0.22	-2.2	21.2	17.8
Oct. 5	13 18.14	+00 46.2	8.366	7.385	+0.23	-2.0	21.3	10.6
Oct. 15	13 20.45	+00 25.8	8.415	7.431	+0.23	-1.8	21.3	8.7
Oct. 25	13 22.74	+00 07.4	8.435	7.476	+0.22	-1.6	21.4	14.5
Nov. 4	13 24.92	-00 08.4	8.427	7.522	+0.20	-1.3	21.4	22.8
Nov. 14	13 26.87	-00 21.1	8.392	7.569	+0.16	-0.9	21.4	31.8
Nov. 24	13 28.49	-00 30.2	8.331	7.615	+0.12	-0.5	21.4	41.2
Dec. 4	13 29.67	-00 35.2	8.247	7.662	+0.06	0.0	21.4	50.8
Dec. 14	13 30.29	-00 35.5	8.143	7.709	0.00	+0.5	21.4	60.7
Dec. 24	13 30.25	-00 30.8	8.024	7.756	-0.08	+1.0	21.4	70.8
Jan. 3	13 29.46	-00 20.7	7.895	7.803	-0.16	+1.6	21.4	81.1
Jan. 13	13 27.82	-00 05.0	7.761	7.851	-0.26	+2.1	21.4	91.7
Jan. 23	13 25.27	+00 16.2	7.628	7.899	-0.35	+2.7	21.4	102.4
Feb. 2	13 21.78	+00 42.9	7.503	7.947	-0.44	+3.2	21.4	113.4
Feb. 12	13 17.36	+01 14.5	7.392	7.995	-0.53	+3.6	21.4	124.6
Feb. 22	13 12.06	+01 50.3	7.302	8.043	-0.61	+3.9	21.4	136.0
Mar. 3	13 06.01	+02 29.0	7.239	8.091	-0.67	+4.0	21.4	147.3
Mar. 13	12 59.36	+03 09.2	7.207	8.140	-0.70	+4.0	21.4	158.4
Mar. 23	12 52.32	+03 49.5	7.210	8.189	-0.72	+3.9	21.4	168.2

Comet C/2013 G8 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2013 Nov. 14.56765 TT
 Peri. = 80.14480
 Node = 240.99610 2000.0
 Incl. = 27.62029
 q = 5.1400522 AU
 e = 0.9973460

$$m1 = 8.0 + 5 \log(\Delta) + 10.0 \log(r(t-100))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	23 23.37	+19 34.7	6.219	6.019	+0.68	-0.3	19.5	73.8
Jan. 18	23 30.17	+19 31.8	6.395	6.057	+0.73	+0.5	19.6	65.7
Jan. 28	23 37.47	+19 36.4	6.563	6.096	+0.77	+1.1	19.7	57.8
Feb. 7	23 45.15	+19 47.8	6.721	6.135	+0.80	+1.7	19.7	50.1
Feb. 17	23 53.13	+20 05.2	6.865	6.175	+0.82	+2.3	19.8	42.7
Feb. 27	00 01.31	+20 27.9	6.994	6.215	+0.83	+2.7	19.9	35.6
Mar. 9	00 09.63	+20 55.1	7.106	6.256	+0.84	+3.1	19.9	28.9
Mar. 19	00 18.00	+21 26.1	7.200	6.297	+0.84	+3.4	20.0	23.2
Mar. 29	00 26.35	+22 00.1	7.275	6.339	+0.83	+3.6	20.1	18.9
Apr. 8	00 34.61	+22 36.5	7.330	6.381	+0.81	+3.8	20.1	17.3
Apr. 18	00 42.71	+23 14.5	7.365	6.424	+0.79	+3.9	20.1	19.0
Apr. 28	00 50.59	+23 53.6	7.380	6.467	+0.76	+4.0	20.2	23.2
May 8	00 58.17	+24 33.1	7.375	6.510	+0.72	+3.9	20.2	28.9
May 18	01 05.39	+25 12.5	7.352	6.554	+0.68	+3.9	20.2	35.4
May 28	01 12.17	+25 51.2	7.311	6.599	+0.63	+3.8	20.2	42.4
June 7	01 18.43	+26 28.7	7.254	6.643	+0.57	+3.6	20.2	49.7
June 17	01 24.10	+27 04.5	7.183	6.688	+0.50	+3.3	20.2	57.3
June 27	01 29.10	+27 37.9	7.099	6.734	+0.42	+3.1	20.2	65.1
July 7	01 33.34	+28 08.4	7.005	6.779	+0.34	+2.7	20.2	73.1
July 17	01 36.77	+28 35.4	6.904	6.825	+0.25	+2.3	20.2	81.3
July 27	01 39.30	+28 58.2	6.800	6.872	+0.16	+1.8	20.2	89.8
Aug. 6	01 40.89	+29 16.0	6.696	6.918	+0.06	+1.2	20.2	98.5
Aug. 16	01 41.51	+29 28.2	6.596	6.965	-0.03	+0.6	20.2	107.4
Aug. 26	01 41.17	+29 33.9	6.503	7.013	-0.12	-0.1	20.2	116.5
Sept. 5	01 39.92	+29 32.6	6.423	7.060	-0.21	-0.9	20.2	125.7
Sept. 15	01 37.85	+29 23.8	6.360	7.108	-0.27	-1.7	20.2	135.1
Sept. 25	01 35.12	+29 07.3	6.318	7.156	-0.32	-2.4	20.3	144.3
Oct. 5	01 31.91	+28 43.3	6.299	7.204	-0.35	-3.1	20.3	152.9
Oct. 15	01 28.46	+28 12.6	6.308	7.253	-0.34	-3.6	20.3	159.9
Oct. 25	01 25.02	+27 36.3	6.346	7.302	-0.32	-4.0	20.4	162.7
Nov. 4	01 21.83	+26 56.1	6.414	7.351	-0.27	-4.2	20.4	159.4
Nov. 14	01 19.11	+26 13.7	6.511	7.400	-0.21	-4.2	20.5	152.1
Nov. 24	01 17.04	+25 31.2	6.636	7.449	-0.13	-4.1	20.5	143.2
Dec. 4	01 15.76	+24 50.5	6.785	7.499	-0.04	-3.7	20.6	133.6
Dec. 14	01 15.33	+24 13.0	6.956	7.549	+0.05	-3.3	20.7	123.8
Dec. 24	01 15.79	+23 40.0	7.144	7.599	+0.13	-2.8	20.8	114.1
Jan. 3	01 17.12	+23 12.4	7.345	7.649	+0.22	-2.2	20.9	104.4
Jan. 13	01 19.30	+22 50.6	7.554	7.699	+0.30	-1.6	21.0	94.8
Jan. 23	01 22.25	+22 34.8	7.766	7.750	+0.36	-1.0	21.1	85.5
Feb. 2	01 25.90	+22 24.7	7.976	7.801	+0.43	-0.5	21.1	76.2
Feb. 12	01 30.16	+22 20.2	8.181	7.852	+0.48	0.0	21.2	67.2
Feb. 22	01 34.95	+22 20.6	8.376	7.903	+0.52	+0.5	21.3	58.4
Mar. 3	01 40.18	+22 25.4	8.559	7.954	+0.56	+0.9	21.4	49.7
Mar. 13	01 45.77	+22 34.0	8.726	8.005	+0.59	+1.2	21.5	41.2
Mar. 23	01 51.63	+22 45.8	8.874	8.056	+0.61	+1.4	21.5	33.0

Comet 2P/Encke

Epoch = 2015 June 27.0 TT
 T = 2013 Nov. 21.79824 TT
 Peri. = 186.54512
 Node = 334.56860 2000.0
 Incl. = 11.78173
 q = 0.3359594 AU

e = 0.8483355
 a = 2.2151486 AU
 n = 0.29895084
 P = 3.30 years

H = 14.4 , G = 0.15

Oh TT 2015/16	R. A. (2000)		Decl.		Delta	r	Daily motion		V	Elong.
	h	m	°	'			m			°
Jan. 8	21	42.88	-14	12.3	4.569	3.819	+0.88	+5.1	21.2	36.1
Jan. 18	21	51.69	-13	20.9	4.686	3.847	+0.90	+5.4	21.2	28.2
Jan. 28	22	00.70	-12	27.2	4.782	3.875	+0.91	+5.5	21.2	20.4
Feb. 7	22	09.81	-11	31.9	4.856	3.900	+0.91	+5.6	21.1	12.6
Feb. 17	22	18.92	-10	35.5	4.907	3.924	+0.90	+5.7	21.0	5.0
Feb. 27	22	27.94	-09	38.3	4.935	3.946	+0.89	+5.7	21.0	2.7
Mar. 9	22	36.79	-08	41.0	4.939	3.967	+0.86	+5.7	21.1	10.3
Mar. 19	22	45.40	-07	44.1	4.921	3.986	+0.83	+5.6	21.3	18.0
Mar. 29	22	53.67	-06	48.3	4.880	4.003	+0.79	+5.4	21.3	25.7
Apr. 8	23	01.52	-05	54.1	4.817	4.019	+0.74	+5.2	21.4	33.4
Apr. 18	23	08.88	-05	02.3	4.735	4.034	+0.68	+4.9	21.4	41.2
Apr. 28	23	15.63	-04	13.4	4.634	4.046	+0.60	+4.5	21.4	49.0
May 8	23	21.68	-03	28.4	4.517	4.058	+0.52	+4.1	21.4	57.1
May 18	23	26.91	-02	47.8	4.386	4.067	+0.43	+3.5	21.4	65.3
May 28	23	31.17	-02	12.8	4.243	4.076	+0.32	+2.9	21.4	73.7
June 7	23	34.34	-01	44.0	4.092	4.082	+0.19	+2.1	21.3	82.3
June 17	23	36.26	-01	22.7	3.936	4.088	+0.05	+1.3	21.2	91.3
June 27	23	36.77	-01	09.7	3.780	4.091	-0.10	+0.4	21.1	100.6
July 7	23	35.72	-01	06.1	3.627	4.094	-0.27	-0.7	21.0	110.4
July 17	23	32.99	-01	12.6	3.483	4.094	-0.45	-1.7	20.9	120.6
July 27	23	28.53	-01	29.9	3.352	4.094	-0.62	-2.8	20.8	131.3
Aug. 6	23	22.37	-01	57.9	3.241	4.091	-0.77	-3.8	20.6	142.4
Aug. 16	23	14.68	-02	35.6	3.153	4.088	-0.89	-4.6	20.4	154.0
Aug. 26	23	05.80	-03	21.2	3.095	4.082	-0.96	-5.1	20.2	165.8
Sept. 5	22	56.23	-04	11.8	3.068	4.076	-0.97	-5.2	20.0	177.0
Sept. 15	22	46.53	-05	04.0	3.075	4.067	-0.92	-5.0	20.2	169.2
Sept. 25	22	37.35	-05	53.9	3.114	4.057	-0.81	-4.4	20.4	157.2
Oct. 5	22	29.25	-06	38.3	3.184	4.046	-0.66	-3.7	20.5	145.2
Oct. 15	22	22.64	-07	14.9	3.280	4.033	-0.48	-2.7	20.7	133.6
Oct. 25	22	17.80	-07	41.9	3.397	4.019	-0.30	-1.7	20.8	122.4
Nov. 4	22	14.83	-07	59.0	3.529	4.003	-0.11	-0.7	20.9	111.7
Nov. 14	22	13.70	-08	06.0	3.671	3.986	+0.06	+0.3	21.0	101.3
Nov. 24	22	14.32	-08	03.4	3.817	3.966	+0.22	+1.2	21.1	91.4
Dec. 4	22	16.52	-07	51.7	3.962	3.946	+0.36	+2.0	21.2	81.9
Dec. 14	22	20.11	-07	31.8	4.102	3.924	+0.48	+2.8	21.2	72.7
Dec. 24	22	24.92	-07	04.2	4.233	3.900	+0.58	+3.4	21.3	63.8
Jan. 3	22	30.76	-06	29.9	4.350	3.874	+0.67	+4.1	21.3	55.2
Jan. 13	22	37.47	-05	49.3	4.453	3.847	+0.74	+4.6	21.2	46.8
Jan. 23	22	44.90	-05	03.3	4.537	3.818	+0.80	+5.1	21.2	38.7
Feb. 2	22	52.91	-04	12.4	4.601	3.788	+0.85	+5.5	21.2	30.7
Feb. 12	23	01.39	-03	17.2	4.645	3.755	+0.88	+5.9	21.1	22.9
Feb. 22	23	10.23	-02	18.3	4.666	3.721	+0.91	+6.2	21.0	15.3
Mar. 3	23	19.35	-01	16.4	4.665	3.686	+0.93	+6.5	20.8	8.1
Mar. 13	23	28.66	-00	11.8	4.640	3.648	+0.94	+6.7	20.7	2.9
Mar. 23	23	38.09	+00	54.8	4.593	3.608	+0.95	+6.8	20.7	7.8

Comet C/2012 A1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2013 Dec. 3.84971 TT
 Peri. = 192.04668
 Node = 277.97723 2000.0
 Incl. = 120.91467
 q = 7.6042871 AU
 e = 1.0013622

$$m1 = 7.6 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	04 58.08	-12 37.8	7.313	8.001	-0.58 -1.0	18.7	131.6
Jan. 18	04 52.29	-12 47.6	7.435	8.020	-0.50 -0.2	18.7	123.5
Jan. 28	04 47.33	-12 49.9	7.577	8.040	-0.40 +0.4	18.8	114.8
Feb. 7	04 43.31	-12 46.2	7.734	8.060	-0.30 +0.8	18.8	105.9
Feb. 17	04 40.26	-12 38.0	7.901	8.080	-0.21 +1.1	18.9	96.9
Feb. 27	04 38.20	-12 27.0	8.072	8.101	-0.11 +1.2	18.9	88.2
Mar. 9	04 37.06	-12 14.5	8.243	8.123	-0.03 +1.3	19.0	79.6
Mar. 19	04 36.79	-12 01.9	8.407	8.145	+0.05 +1.1	19.1	71.4
Mar. 29	04 37.31	-11 50.5	8.562	8.167	+0.12 +0.9	19.1	63.6
Apr. 8	04 38.50	-11 41.1	8.703	8.189	+0.18 +0.6	19.1	56.2
Apr. 18	04 40.28	-11 34.7	8.828	8.212	+0.23 +0.3	19.2	49.5
Apr. 28	04 42.55	-11 32.1	8.934	8.236	+0.26 -0.2	19.2	43.7
May 8	04 45.19	-11 33.8	9.020	8.259	+0.29 -0.7	19.3	38.9
May 18	04 48.11	-11 40.3	9.084	8.283	+0.31 -1.2	19.3	35.7
May 28	04 51.21	-11 52.1	9.126	8.308	+0.32 -1.8	19.3	34.2
June 7	04 54.40	-12 09.6	9.145	8.332	+0.32 -2.3	19.3	34.8
June 17	04 57.59	-12 33.1	9.142	8.358	+0.31 -3.0	19.3	37.3
June 27	05 00.67	-13 02.8	9.119	8.383	+0.29 -3.6	19.3	41.4
July 7	05 03.55	-13 38.9	9.076	8.409	+0.26 -4.2	19.3	46.5
July 17	05 06.14	-14 21.4	9.015	8.435	+0.22 -4.9	19.3	52.5
July 27	05 08.34	-15 10.3	8.939	8.461	+0.17 -5.5	19.3	59.1
Aug. 6	05 10.05	-16 05.4	8.850	8.488	+0.11 -6.1	19.3	66.0
Aug. 16	05 11.18	-17 06.3	8.752	8.515	+0.05 -6.6	19.3	73.2
Aug. 26	05 11.63	-18 12.6	8.649	8.543	-0.03 -7.1	19.3	80.6
Sept. 5	05 11.32	-19 23.4	8.544	8.571	-0.12 -7.4	19.3	88.1
Sept. 15	05 10.16	-20 37.5	8.441	8.599	-0.21 -7.6	19.2	95.6
Sept. 25	05 08.10	-21 53.7	8.346	8.627	-0.30 -7.6	19.2	103.0
Oct. 5	05 05.10	-23 10.1	8.261	8.656	-0.39 -7.5	19.2	110.1
Oct. 15	05 01.16	-24 24.8	8.192	8.685	-0.48 -7.1	19.2	116.6
Oct. 25	04 56.32	-25 35.7	8.143	8.714	-0.56 -6.5	19.2	122.3
Nov. 4	04 50.70	-26 40.3	8.115	8.744	-0.63 -5.7	19.2	126.7
Nov. 14	04 44.43	-27 36.8	8.111	8.773	-0.67 -4.7	19.2	129.4
Nov. 24	04 37.74	-28 23.4	8.134	8.804	-0.69 -3.5	19.2	130.2
Dec. 4	04 30.85	-28 58.8	8.182	8.834	-0.68 -2.4	19.3	128.9
Dec. 14	04 24.02	-29 22.6	8.255	8.865	-0.65 -1.2	19.3	125.6
Dec. 24	04 17.53	-29 34.9	8.352	8.896	-0.59 -0.2	19.3	120.8
Jan. 3	04 11.58	-29 36.6	8.468	8.927	-0.52 +0.8	19.4	114.9
Jan. 13	04 06.35	-29 29.0	8.600	8.958	-0.44 +1.5	19.4	108.3
Jan. 23	04 01.99	-29 13.8	8.745	8.990	-0.34 +2.1	19.5	101.3
Feb. 2	03 58.55	-28 52.8	8.897	9.022	-0.25 +2.5	19.5	94.1
Feb. 12	03 56.07	-28 28.0	9.053	9.054	-0.16 +2.7	19.6	87.0
Feb. 22	03 54.51	-28 01.1	9.208	9.087	-0.07 +2.7	19.6	79.9
Mar. 3	03 53.83	-27 33.8	9.358	9.120	+0.01 +2.6	19.7	73.1
Mar. 13	03 53.95	-27 07.5	9.500	9.153	+0.08 +2.4	19.7	66.7
Mar. 23	03 54.79	-26 43.5	9.630	9.186	+0.15 +2.1	19.7	60.9

Comet C/2013 R1 (Lovejoy)

Epoch = 2015 June 27.0 TT
 T = 2013 Dec. 22.73309 TT
 Peri. = 67.16626
 Node = 70.71123 2000.0
 Incl. = 64.04102
 q = 0.8118261 AU
 e = 0.9984289

$$m1 = 6.6 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	17 32.16	-38 42.9	5.944	5.090	+0.82	-4.1	19.3	27.3
Jan. 18	17 40.34	-39 23.5	5.966	5.188	+0.75	-4.2	19.4	34.8
Jan. 28	17 47.85	-40 05.8	5.966	5.286	+0.67	-4.4	19.5	42.7
Feb. 7	17 54.55	-40 50.1	5.948	5.382	+0.57	-4.7	19.6	51.0
Feb. 17	18 00.29	-41 37.0	5.913	5.478	+0.46	-5.0	19.7	59.5
Feb. 27	18 04.91	-42 26.5	5.865	5.574	+0.33	-5.2	19.8	68.2
Mar. 9	18 08.25	-43 18.8	5.806	5.668	+0.19	-5.5	19.8	77.1
Mar. 19	18 10.16	-44 13.7	5.742	5.762	+0.03	-5.7	19.9	86.2
Mar. 29	18 10.48	-45 10.6	5.677	5.855	-0.14	-5.8	20.0	95.4
Apr. 8	18 09.09	-46 08.4	5.615	5.948	-0.32	-5.7	20.0	104.7
Apr. 18	18 05.91	-47 05.6	5.562	6.040	-0.50	-5.5	20.1	114.0
Apr. 28	18 00.94	-48 00.1	5.522	6.132	-0.67	-4.9	20.2	123.2
May 8	17 54.28	-48 49.6	5.501	6.223	-0.81	-4.2	20.2	132.1
May 18	17 46.14	-49 31.6	5.501	6.313	-0.92	-3.2	20.3	140.4
May 28	17 36.90	-50 04.0	5.527	6.403	-0.99	-2.1	20.4	147.3
June 7	17 27.04	-50 25.3	5.581	6.492	-0.99	-1.0	20.5	151.7
June 17	17 17.10	-50 35.0	5.663	6.581	-0.95	+0.1	20.6	152.4
June 27	17 07.62	-50 33.6	5.775	6.669	-0.85	+1.1	20.7	149.3
July 7	16 59.09	-50 22.8	5.914	6.757	-0.72	+1.8	20.8	143.3
July 17	16 51.85	-50 04.7	6.078	6.844	-0.57	+2.3	21.0	135.8
July 27	16 46.14	-49 41.7	6.265	6.931	-0.41	+2.5	21.1	127.6
Aug. 6	16 42.04	-49 16.3	6.469	7.017	-0.25	+2.6	21.2	119.0
Aug. 16	16 39.56	-48 50.4	6.688	7.103	-0.09	+2.5	21.4	110.3
Aug. 26	16 38.63	-48 25.7	6.917	7.188	+0.05	+2.2	21.5	101.5
Sept. 5	16 39.12	-48 03.2	7.152	7.273	+0.18	+1.9	21.6	92.9
Sept. 15	16 40.90	-47 43.9	7.387	7.357	+0.29	+1.6	21.8	84.4
Sept. 25	16 43.82	-47 28.1	7.620	7.441	+0.39	+1.2	21.9	76.0
Oct. 5	16 47.71	-47 16.1	7.846	7.525	+0.47	+0.8	22.0	67.8
Oct. 15	16 52.46	-47 07.8	8.062	7.608	+0.54	+0.5	22.1	59.7
Oct. 25	16 57.90	-47 03.3	8.265	7.691	+0.60	+0.1	22.3	51.9
Nov. 4	17 03.91	-47 02.2	8.450	7.773	+0.65	-0.2	22.4	44.5
Nov. 14	17 10.37	-47 04.6	8.617	7.856	+0.68	-0.6	22.5	37.5
Nov. 24	17 17.14	-47 10.2	8.763	7.937	+0.70	-0.9	22.6	31.4
Dec. 4	17 24.11	-47 18.8	8.886	8.018	+0.71	-1.2	22.6	26.8
Dec. 14	17 31.16	-47 30.4	8.986	8.099	+0.70	-1.5	22.7	24.4
Dec. 24	17 38.17	-47 45.0	9.061	8.180	+0.68	-1.7	22.8	25.0
Jan. 3	17 45.02	-48 02.5	9.112	8.260	+0.66	-2.0	22.9	28.4
Jan. 13	17 51.59	-48 22.9	9.140	8.340	+0.62	-2.3	22.9	33.8
Jan. 23	17 57.77	-48 46.3	9.145	8.419	+0.57	-2.6	23.0	40.4
Feb. 2	18 03.42	-49 12.6	9.130	8.499	+0.50	-2.9	23.0	47.8
Feb. 12	18 08.43	-49 42.0	9.096	8.577	+0.42	-3.2	23.1	55.6
Feb. 22	18 12.66	-50 14.2	9.048	8.656	+0.33	-3.5	23.1	63.8
Mar. 3	18 16.00	-50 49.2	8.987	8.734	+0.23	-3.7	23.1	72.1
Mar. 13	18 18.33	-51 26.7	8.919	8.812	+0.12	-3.9	23.2	80.6
Mar. 23	18 19.52	-52 06.0	8.847	8.890	0.00	-4.0	23.2	89.3

Comet C/2011 J2 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2013 Dec. 25.49479 TT
 Peri. = 85.32362
 Node = 163.94369 2000.0
 Incl. = 122.80365
 q = 3.4438909 AU
 e = 1.0010899

$$m1 = 7.2 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	22 45.32	+17 05.0	5.168	4.834	+0.47	-6.4	15.9	64.9
Jan. 18	22 50.02	+16 00.8	5.375	4.893	+0.51	-5.0	16.0	56.0
Jan. 28	22 55.17	+15 10.7	5.568	4.954	+0.54	-3.8	16.1	47.3
Feb. 7	23 00.61	+14 32.6	5.743	5.014	+0.56	-2.8	16.2	39.0
Feb. 17	23 06.21	+14 04.6	5.896	5.075	+0.57	-2.0	16.3	31.0
Feb. 27	23 11.86	+13 44.8	6.026	5.137	+0.56	-1.3	16.4	23.9
Mar. 9	23 17.45	+13 31.6	6.131	5.199	+0.54	-0.8	16.5	18.3
Mar. 19	23 22.87	+13 23.6	6.210	5.261	+0.52	-0.4	16.6	16.0
Mar. 29	23 28.04	+13 19.3	6.263	5.323	+0.48	-0.2	16.6	18.1
Apr. 8	23 32.85	+13 17.4	6.289	5.386	+0.44	-0.1	16.7	23.6
Apr. 18	23 37.21	+13 16.7	6.289	5.449	+0.38	-0.1	16.7	30.6
Apr. 28	23 41.03	+13 16.0	6.265	5.513	+0.32	-0.2	16.7	38.4
May 8	23 44.22	+13 14.1	6.219	5.576	+0.25	-0.4	16.8	46.7
May 18	23 46.68	+13 09.8	6.153	5.640	+0.16	-0.8	16.8	55.4
May 28	23 48.31	+13 02.0	6.070	5.704	+0.07	-1.3	16.8	64.3
June 7	23 49.01	+12 49.4	5.974	5.768	-0.03	-1.9	16.8	73.5
June 17	23 48.72	+12 30.9	5.869	5.833	-0.14	-2.6	16.8	83.0
June 27	23 47.35	+12 05.3	5.760	5.897	-0.25	-3.4	16.8	92.8
July 7	23 44.87	+11 31.4	5.652	5.962	-0.36	-4.3	16.8	102.9
July 17	23 41.27	+10 48.4	5.552	6.027	-0.47	-5.3	16.8	113.3
July 27	23 36.59	+09 55.7	5.465	6.092	-0.56	-6.2	16.8	124.1
Aug. 6	23 30.94	+08 53.3	5.397	6.157	-0.64	-7.1	16.8	135.0
Aug. 16	23 24.49	+07 41.9	5.355	6.222	-0.70	-7.9	16.8	146.2
Aug. 26	23 17.49	+06 22.8	5.343	6.288	-0.73	-8.5	16.8	157.2
Sept. 5	23 10.23	+04 58.1	5.366	6.353	-0.72	-8.8	16.9	167.2
Sept. 15	23 03.01	+03 30.5	5.424	6.418	-0.69	-8.7	16.9	170.5
Sept. 25	22 56.15	+02 03.1	5.519	6.484	-0.62	-8.4	17.0	162.7
Oct. 5	22 49.93	+00 38.6	5.650	6.549	-0.54	-7.9	17.1	151.9
Oct. 15	22 44.57	-00 40.4	5.812	6.615	-0.44	-7.2	17.2	140.7
Oct. 25	22 40.21	-01 52.2	6.003	6.680	-0.33	-6.3	17.3	129.6
Nov. 4	22 36.95	-02 55.6	6.215	6.746	-0.22	-5.4	17.4	118.6
Nov. 14	22 34.78	-03 50.1	6.444	6.811	-0.11	-4.6	17.5	107.7
Nov. 24	22 33.69	-04 35.6	6.684	6.877	-0.01	-3.7	17.6	97.2
Dec. 4	22 33.60	-05 12.6	6.927	6.943	+0.08	-2.9	17.7	86.8
Dec. 14	22 34.41	-05 41.7	7.169	7.008	+0.16	-2.2	17.8	76.7
Dec. 24	22 36.03	-06 03.6	7.404	7.074	+0.23	-1.6	17.9	66.7
Jan. 3	22 38.33	-06 19.2	7.627	7.139	+0.29	-1.0	18.0	57.0
Jan. 13	22 41.19	-06 29.6	7.834	7.205	+0.33	-0.6	18.1	47.4
Jan. 23	22 44.51	-06 35.5	8.021	7.270	+0.37	-0.2	18.2	37.9
Feb. 2	22 48.16	-06 37.9	8.186	7.336	+0.39	0.0	18.3	28.6
Feb. 12	22 52.05	-06 37.7	8.325	7.401	+0.40	+0.2	18.3	19.3
Feb. 22	22 56.08	-06 35.7	8.438	7.467	+0.41	+0.3	18.4	10.2
Mar. 3	23 00.14	-06 32.8	8.523	7.532	+0.40	+0.3	18.4	1.1
Mar. 13	23 04.15	-06 29.8	8.581	7.597	+0.39	+0.2	18.5	8.0
Mar. 23	23 08.01	-06 27.4	8.610	7.663	+0.36	+0.1	18.5	17.1

Comet C/2013 H2 (Boattini)

Epoch = 2015 June 27.0 TT
 T = 2014 Jan. 22.95526 TT
 Peri. = 35.98199
 Node = 262.73330 2000.0
 Incl. = 128.38987
 q = 7.4989542 AU
 e = 0.9997790

$$m1 = 5.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	15 38.48	+22 15.5	8.112	7.812	+0.15	+6.4	18.9	68.9
Jan. 18	15 40.00	+23 20.0	7.999	7.830	+0.08	+7.3	18.9	76.6
Jan. 28	15 40.76	+24 32.7	7.881	7.848	-0.01	+8.0	18.8	84.5
Feb. 7	15 40.65	+25 52.9	7.765	7.867	-0.11	+8.6	18.8	92.3
Feb. 17	15 39.55	+27 19.3	7.653	7.886	-0.22	+9.1	18.8	100.0
Feb. 27	15 37.38	+28 50.1	7.552	7.905	-0.33	+9.3	18.8	107.4
Mar. 9	15 34.06	+30 23.0	7.466	7.925	-0.45	+9.2	18.8	114.2
Mar. 19	15 29.59	+31 55.4	7.398	7.945	-0.56	+8.9	18.7	120.2
Mar. 29	15 23.99	+33 24.3	7.353	7.966	-0.66	+8.2	18.7	124.9
Apr. 8	15 17.38	+34 46.8	7.333	7.987	-0.75	+7.3	18.8	127.9
Apr. 18	15 09.92	+36 00.1	7.338	8.008	-0.81	+6.2	18.8	129.0
Apr. 28	15 01.87	+37 01.8	7.370	8.030	-0.84	+4.9	18.8	128.1
May 8	14 53.51	+37 50.3	7.427	8.052	-0.83	+3.5	18.8	125.3
May 18	14 45.18	+38 25.0	7.508	8.075	-0.80	+2.1	18.8	120.9
May 28	14 37.17	+38 45.8	7.610	8.098	-0.74	+0.8	18.9	115.5
June 7	14 29.78	+38 53.8	7.729	8.122	-0.66	-0.3	18.9	109.3
June 17	14 23.21	+38 50.5	7.862	8.145	-0.56	-1.3	19.0	102.7
June 27	14 17.61	+38 37.8	8.004	8.170	-0.45	-2.0	19.0	95.8
July 7	14 13.07	+38 17.6	8.150	8.194	-0.35	-2.6	19.1	88.9
July 17	14 09.62	+37 51.9	8.298	8.219	-0.24	-2.9	19.1	82.0
July 27	14 07.23	+37 22.8	8.443	8.244	-0.14	-3.1	19.2	75.3
Aug. 6	14 05.84	+36 52.0	8.581	8.270	-0.05	-3.1	19.2	68.9
Aug. 16	14 05.39	+36 21.1	8.709	8.296	+0.04	-3.0	19.3	62.8
Aug. 26	14 05.77	+35 51.3	8.824	8.322	+0.11	-2.7	19.3	57.3
Sept. 5	14 06.89	+35 24.1	8.924	8.349	+0.18	-2.4	19.4	52.5
Sept. 15	14 08.64	+35 00.5	9.007	8.376	+0.23	-1.9	19.4	48.6
Sept. 25	14 10.92	+34 41.5	9.071	8.404	+0.27	-1.4	19.4	45.9
Oct. 5	14 13.63	+34 27.9	9.114	8.431	+0.30	-0.7	19.5	44.6
Oct. 15	14 16.65	+34 20.7	9.138	8.459	+0.32	0.0	19.5	44.8
Oct. 25	14 19.89	+34 20.5	9.141	8.488	+0.33	+0.8	19.5	46.5
Nov. 4	14 23.23	+34 28.1	9.125	8.516	+0.33	+1.6	19.5	49.7
Nov. 14	14 26.56	+34 43.9	9.090	8.545	+0.32	+2.5	19.5	54.0
Nov. 24	14 29.77	+35 08.6	9.038	8.574	+0.30	+3.4	19.5	59.2
Dec. 4	14 32.73	+35 42.4	8.973	8.604	+0.26	+4.3	19.5	65.1
Dec. 14	14 35.31	+36 25.5	8.896	8.634	+0.21	+5.2	19.5	71.5
Dec. 24	14 37.39	+37 17.8	8.811	8.664	+0.14	+6.1	19.5	78.2
Jan. 3	14 38.82	+38 18.9	8.723	8.695	+0.06	+6.9	19.5	85.1
Jan. 13	14 39.46	+39 28.1	8.635	8.725	-0.03	+7.6	19.5	92.0
Jan. 23	14 39.18	+40 44.1	8.551	8.756	-0.13	+8.1	19.5	98.8
Feb. 2	14 37.84	+42 05.3	8.477	8.788	-0.25	+8.4	19.5	105.3
Feb. 12	14 35.33	+43 29.8	8.415	8.819	-0.38	+8.5	19.5	111.1
Feb. 22	14 31.58	+44 54.8	8.370	8.851	-0.50	+8.3	19.5	116.2
Mar. 3	14 26.56	+46 17.7	8.344	8.883	-0.63	+7.8	19.5	120.1
Mar. 13	14 20.29	+47 35.5	8.340	8.915	-0.74	+7.0	19.5	122.6
Mar. 23	14 12.92	+48 45.3	8.359	8.948	-0.83	+5.9	19.5	123.5

Comet 292P/Li

Epoch = 2015 June 27.0 TT
 T = 2014 Feb. 5.15678 TT
 Peri. = 319.19862
 Node = 91.71065 2000.0
 Incl. = 24.29232
 q = 2.5204453 AU
 e = 0.5897625
 a = 6.1438686 AU
 n = 0.06472040
 P = 15.23 years

$$m1 = 5.4 + 5 \log(\Delta) + 22.5 \log(r(t-60))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	09 42.81	+34 48.6	2.783	3.635	-0.56	+8.7	19.4	145.3
Jan. 18	09 37.19	+36 15.9	2.780	3.685	-0.70	+7.7	19.5	153.3
Jan. 28	09 30.21	+37 33.2	2.805	3.735	-0.76	+6.2	19.7	157.9
Feb. 7	09 22.57	+38 35.4	2.859	3.786	-0.75	+4.4	19.9	156.9
Feb. 17	09 15.07	+39 19.4	2.941	3.836	-0.66	+2.5	20.1	151.2
Feb. 27	09 08.48	+39 44.2	3.050	3.887	-0.51	+0.7	20.3	143.0
Mar. 9	09 03.39	+39 51.0	3.182	3.937	-0.32	-0.9	20.5	134.0
Mar. 19	09 00.16	+39 42.4	3.334	3.988	-0.12	-2.1	20.8	124.9
Mar. 29	08 58.95	+39 21.2	3.501	4.039	+0.08	-3.1	21.0	115.9
Apr. 8	08 59.70	+38 50.4	3.680	4.089	+0.26	-3.8	21.2	107.2
Apr. 18	09 02.28	+38 12.3	3.867	4.140	+0.42	-4.4	21.5	98.7
Apr. 28	09 06.48	+37 28.6	4.057	4.191	+0.56	-4.8	21.7	90.6
May 8	09 12.05	+36 40.9	4.248	4.241	+0.67	-5.1	21.9	82.8
May 18	09 18.79	+35 50.1	4.436	4.291	+0.77	-5.3	22.2	75.2
May 28	09 26.47	+34 57.1	4.620	4.342	+0.84	-5.5	22.4	67.9
June 7	09 34.91	+34 02.5	4.796	4.392	+0.90	-5.6	22.6	60.8
June 17	09 43.94	+33 06.7	4.963	4.442	+0.95	-5.6	22.8	54.0
June 27	09 53.43	+32 10.2	5.118	4.492	+0.98	-5.7	22.9	47.3
July 7	10 03.25	+31 13.5	5.261	4.542	+1.01	-5.7	.	40.9
July 17	10 13.31	+30 16.9	5.389	4.591	+1.02	-5.6	.	34.8
July 27	10 23.52	+29 21.1	5.502	4.641	+1.03	-5.5	.	29.1
Aug. 6	10 33.78	+28 26.3	5.598	4.690	+1.03	-5.3	.	24.0
Aug. 16	10 44.05	+27 33.2	5.676	4.739	+1.02	-5.1	.	20.2
Aug. 26	10 54.26	+26 42.3	5.737	4.788	+1.01	-4.8	.	18.3
Sept. 5	11 04.34	+25 54.3	5.779	4.836	+0.99	-4.5	.	19.0
Sept. 15	11 14.24	+25 09.7	5.802	4.885	+0.97	-4.0	.	22.1
Sept. 25	11 23.90	+24 29.3	5.806	4.933	+0.93	-3.6	.	27.0
Oct. 5	11 33.25	+23 53.8	5.792	4.981	+0.90	-3.0	.	32.8
Oct. 15	11 42.22	+23 24.0	5.760	5.028	+0.85	-2.3	.	39.4
Oct. 25	11 50.75	+23 00.6	5.711	5.076	+0.80	-1.6	.	46.3
Nov. 4	11 58.74	+22 44.3	5.647	5.123	+0.74	-0.8	.	53.7
Nov. 14	12 06.10	+22 36.1	5.570	5.170	+0.66	0.0	.	61.4
Nov. 24	12 12.73	+22 36.5	5.482	5.217	+0.58	+1.0	.	69.4
Dec. 4	12 18.52	+22 46.0	5.385	5.263	+0.48	+1.9	.	77.6
Dec. 14	12 23.36	+23 05.0	5.284	5.309	+0.38	+2.8	.	86.2
Dec. 24	12 27.11	+23 33.4	5.181	5.355	+0.26	+3.7	.	94.9
Jan. 3	12 29.69	+24 10.9	5.081	5.401	+0.13	+4.5	.	103.8
Jan. 13	12 30.98	+24 56.3	4.989	5.447	-0.01	+5.2	.	112.8
Jan. 23	12 30.92	+25 48.2	4.908	5.492	-0.14	+5.6	.	121.8
Feb. 2	12 29.52	+26 44.1	4.844	5.537	-0.27	+5.7	.	130.6
Feb. 12	12 26.82	+27 41.2	4.801	5.581	-0.38	+5.5	.	138.8
Feb. 22	12 22.97	+28 36.1	4.781	5.626	-0.48	+4.9	.	145.7
Mar. 3	12 18.22	+29 25.5	4.788	5.670	-0.54	+4.1	.	150.2
Mar. 13	12 12.85	+30 06.2	4.822	5.714	-0.56	+3.0	.	151.2
Mar. 23	12 07.25	+30 35.9	4.885	5.757	-0.55	+1.7	.	148.4

Comet C/2012 X1 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2014 Feb. 21.65047 TT
 Peri. = 132.09199
 Node = 113.13865 2000.0
 Incl. = 44.36401
 q = 1.5981829 AU
 e = 0.9898553

$$m1 = 4.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong.
Jan. 8	22 53.94	-40° 09.2	4.690	4.118	+1.17	+7.0	17.0	49.3
Jan. 18	23 05.63	-38 58.7	4.861	4.210	+1.18	+6.8	17.2	44.1
Jan. 28	23 17.42	-37 51.2	5.018	4.303	+1.18	+6.4	17.4	39.4
Feb. 7	23 29.19	-36 47.3	5.159	4.395	+1.17	+6.0	17.6	35.6
Feb. 17	23 40.90	-35 47.8	5.285	4.486	+1.16	+5.4	17.8	32.8
Feb. 27	23 52.49	-34 53.3	5.394	4.577	+1.14	+4.9	18.0	31.3
Mar. 9	00 03.88	-34 04.5	5.487	4.668	+1.12	+4.2	18.1	31.4
Mar. 19	00 15.05	-33 22.2	5.562	4.758	+1.09	+3.5	18.3	33.0
Mar. 29	00 25.93	-32 46.9	5.621	4.848	+1.05	+2.8	18.4	35.9
Apr. 8	00 36.47	-32 19.3	5.664	4.937	+1.02	+1.9	18.6	39.8
Apr. 18	00 46.62	-32 00.0	5.691	5.026	+0.97	+1.0	18.7	44.6
Apr. 28	00 56.32	-31 49.6	5.705	5.114	+0.92	+0.1	18.8	49.9
May 8	01 05.50	-31 48.4	5.705	5.202	+0.86	-0.9	18.9	55.6
May 18	01 14.11	-31 56.9	5.694	5.290	+0.79	-1.9	19.0	61.7
May 28	01 22.04	-32 15.5	5.674	5.377	+0.72	-2.9	19.1	68.0
June 7	01 29.23	-32 44.0	5.647	5.464	+0.63	-3.8	19.2	74.5
June 17	01 35.56	-33 22.5	5.615	5.550	+0.54	-4.8	19.3	81.2
June 27	01 40.95	-34 10.4	5.581	5.636	+0.43	-5.7	19.4	87.9
July 7	01 45.27	-35 07.1	5.548	5.722	+0.32	-6.4	19.5	94.7
July 17	01 48.43	-36 11.3	5.520	5.807	+0.19	-7.0	19.6	101.4
July 27	01 50.32	-37 21.3	5.499	5.892	+0.05	-7.4	19.7	107.9
Aug. 6	01 50.87	-38 34.8	5.488	5.976	-0.08	-7.4	19.7	114.2
Aug. 16	01 50.02	-39 49.3	5.491	6.060	-0.22	-7.2	19.8	119.9
Aug. 26	01 47.77	-41 01.5	5.510	6.143	-0.35	-6.7	19.9	124.8
Sept. 5	01 44.23	-42 08.3	5.548	6.227	-0.47	-5.8	20.0	128.6
Sept. 15	01 39.54	-43 06.3	5.606	6.309	-0.56	-4.6	20.1	130.8
Sept. 25	01 33.95	-43 52.7	5.685	6.392	-0.61	-3.3	20.3	131.3
Oct. 5	01 27.81	-44 25.3	5.785	6.474	-0.63	-1.7	20.4	130.0
Oct. 15	01 21.48	-44 42.7	5.906	6.556	-0.61	-0.2	20.5	127.0
Oct. 25	01 15.38	-44 44.8	6.047	6.637	-0.55	+1.3	20.6	122.7
Nov. 4	01 09.85	-44 32.1	6.205	6.718	-0.47	+2.6	20.8	117.3
Nov. 14	01 05.18	-44 06.0	6.378	6.799	-0.36	+3.8	20.9	111.2
Nov. 24	01 01.59	-43 28.5	6.563	6.879	-0.24	+4.7	21.0	104.6
Dec. 4	00 59.17	-42 41.8	6.756	6.959	-0.12	+5.4	21.2	97.8
Dec. 14	00 57.97	-41 48.0	6.955	7.039	0.00	+5.9	21.3	90.8
Dec. 24	00 57.95	-40 49.4	7.156	7.118	+0.11	+6.2	21.5	83.9
Jan. 3	00 59.03	-39 47.7	7.355	7.197	+0.21	+6.3	21.6	77.0
Jan. 13	01 01.12	-38 44.7	7.549	7.276	+0.30	+6.3	21.7	70.3
Jan. 23	01 04.09	-37 42.0	7.735	7.354	+0.37	+6.1	21.8	63.8
Feb. 2	01 07.84	-36 40.6	7.911	7.432	+0.44	+5.9	22.0	57.7
Feb. 12	01 12.22	-35 41.6	8.074	7.510	+0.49	+5.6	22.1	52.2
Feb. 22	01 17.14	-34 46.1	8.223	7.587	+0.53	+5.1	22.2	47.3
Mar. 3	01 22.48	-33 54.6	8.355	7.665	+0.57	+4.7	22.3	43.3
Mar. 13	01 28.14	-33 08.0	8.471	7.741	+0.59	+4.1	22.4	40.5
Mar. 23	01 34.03	-32 26.8	8.568	7.818	+0.60	+3.5	22.5	39.0

Comet C/2014 W3 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Feb. 28.74172 TT
 Peri. = 159.07993
 Node = 286.37412 2000.0
 Incl. = 90.12222
 q = 6.0707460 AU
 e = 1.0058612

$$m1 = 8.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	07 06.19	+14 05.8	5.477	6.451	-0.78	19.8	171.5
Jan. 18	06 58.38	+13 22.2	5.523	6.475	-0.73	19.8	164.1
Jan. 28	06 51.09	+12 41.2	5.604	6.499	-0.65	19.9	153.3
Feb. 7	06 44.64	+12 03.2	5.718	6.524	-0.54	19.9	142.1
Feb. 17	06 39.22	+11 28.2	5.859	6.549	-0.42	20.0	131.0
Feb. 27	06 34.97	+10 56.2	6.022	6.575	-0.30	20.1	120.1
Mar. 9	06 31.94	+10 26.7	6.201	6.602	-0.18	20.2	109.7
Mar. 19	06 30.12	+09 59.2	6.392	6.629	-0.07	20.2	99.5
Mar. 29	06 29.44	+09 33.1	6.587	6.657	+0.04	20.3	89.7
Apr. 8	06 29.82	+09 07.6	6.781	6.685	+0.13	20.4	80.3
Apr. 18	06 31.13	+08 42.2	6.971	6.714	+0.21	20.5	71.2
Apr. 28	06 33.25	+08 16.2	7.151	6.743	+0.28	20.6	62.4
May 8	06 36.07	+07 48.9	7.318	6.773	+0.34	20.6	53.9
May 18	06 39.46	+07 19.9	7.470	6.804	+0.38	20.7	45.8
May 28	06 43.30	+06 48.7	7.603	6.835	+0.42	20.8	38.2
June 7	06 47.49	+06 14.9	7.716	6.866	+0.44	20.8	31.1
June 17	06 51.91	+05 38.2	7.807	6.898	+0.46	20.8	24.9
June 27	06 56.48	+04 58.2	7.875	6.931	+0.46	20.9	20.3
July 7	07 01.08	+04 14.7	7.921	6.964	+0.46	20.9	18.4
July 17	07 05.64	+03 27.7	7.943	6.997	+0.44	20.9	20.1
July 27	07 10.04	+02 36.9	7.942	7.031	+0.42	21.0	24.5
Aug. 6	07 14.21	+01 42.3	7.920	7.065	+0.38	21.0	30.5
Aug. 16	07 18.05	+00 43.8	7.876	7.100	+0.34	21.0	37.5
Aug. 26	07 21.47	-00 18.3	7.814	7.135	+0.29	21.0	45.0
Sept. 5	07 24.37	-01 24.0	7.735	7.170	+0.23	21.0	52.8
Sept. 15	07 26.65	-02 33.0	7.641	7.206	+0.16	21.0	60.9
Sept. 25	07 28.23	-03 44.8	7.537	7.242	+0.08	21.0	69.2
Oct. 5	07 29.01	-04 58.9	7.425	7.279	-0.01	21.0	77.8
Oct. 15	07 28.91	-06 14.4	7.310	7.316	-0.10	21.0	86.4
Oct. 25	07 27.87	-07 30.4	7.196	7.353	-0.20	21.0	95.2
Nov. 4	07 25.84	-08 45.6	7.089	7.391	-0.30	20.9	104.0
Nov. 14	07 22.82	-09 58.6	6.992	7.429	-0.40	20.9	112.7
Nov. 24	07 18.85	-11 07.5	6.911	7.468	-0.48	20.9	121.0
Dec. 4	07 14.01	-12 10.7	6.850	7.507	-0.56	20.9	128.8
Dec. 14	07 08.46	-13 06.5	6.812	7.546	-0.61	20.9	135.4
Dec. 24	07 02.40	-13 53.4	6.802	7.585	-0.63	21.0	140.3
Jan. 3	06 56.09	-14 30.5	6.821	7.625	-0.63	21.0	142.6
Jan. 13	06 49.78	-14 57.3	6.868	7.665	-0.60	21.0	141.8
Jan. 23	06 43.75	-15 14.1	6.944	7.705	-0.55	21.1	138.1
Feb. 2	06 38.25	-15 21.8	7.047	7.746	-0.48	21.1	132.4
Feb. 12	06 33.47	-15 21.6	7.173	7.787	-0.39	21.2	125.5
Feb. 22	06 29.57	-15 15.4	7.318	7.828	-0.30	21.3	117.8
Mar. 3	06 26.62	-15 04.8	7.478	7.870	-0.20	21.3	109.8
Mar. 13	06 24.65	-14 51.6	7.649	7.911	-0.10	21.4	101.7
Mar. 23	06 23.65	-14 37.6	7.827	7.953	-0.01	21.5	93.7

Comet 290P/Jager

Epoch = 2015 June 27.0 TT
 T = 2014 Mar. 12.39797 TT
 Peri. = 180.71871
 Node = 303.42313 2000.0
 Incl. = 19.05589
 q = 2.1567276 AU
 e = 0.6480940
 a = 6.1287037 AU
 n = 0.06496077
 P = 15.17 years

$$m_1 = 5.6 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	14 28.43	-32 54.6	3.727	3.397	+0.94	-8.4	19.1	63.1
Jan. 18	14 37.81	-34 18.4	3.658	3.456	+0.79	-7.9	19.2	70.5
Jan. 28	14 45.74	-35 37.5	3.581	3.515	+0.62	-7.4	19.3	78.2
Feb. 7	14 51.97	-36 51.5	3.500	3.574	+0.43	-6.8	19.4	86.3
Feb. 17	14 56.30	-37 59.5	3.418	3.633	+0.22	-6.1	19.5	94.6
Feb. 27	14 58.50	-39 00.3	3.338	3.692	0.00	-5.2	19.6	103.2
Mar. 9	14 58.45	-39 52.1	3.263	3.751	-0.23	-4.1	19.7	112.1
Mar. 19	14 56.12	-40 32.8	3.198	3.810	-0.45	-2.7	19.7	121.2
Mar. 29	14 51.62	-40 59.7	3.148	3.869	-0.63	-1.1	19.8	130.3
Apr. 8	14 45.31	-41 10.6	3.116	3.928	-0.76	+0.7	20.0	139.1
Apr. 18	14 37.70	-41 04.0	3.106	3.986	-0.82	+2.4	20.1	147.1
Apr. 28	14 29.50	-40 39.8	3.120	4.044	-0.80	+4.0	20.2	153.2
May 8	14 21.47	-39 59.9	3.162	4.102	-0.72	+5.2	20.4	155.6
May 18	14 14.26	-39 07.9	3.231	4.160	-0.58	+6.0	20.5	153.4
May 28	14 08.43	-38 08.2	3.326	4.217	-0.41	+6.2	20.7	147.6
June 7	14 04.28	-37 05.9	3.447	4.275	-0.23	+6.1	20.9	140.1
June 17	14 01.96	-36 05.1	3.589	4.332	-0.05	+5.6	21.1	131.7
June 27	14 01.45	-35 09.3	3.750	4.388	+0.12	+4.9	21.3	123.1
July 7	14 02.66	-34 20.8	3.925	4.445	+0.28	+4.0	21.5	114.5
July 17	14 05.42	-33 40.7	4.112	4.501	+0.42	+3.1	21.7	106.1
July 27	14 09.57	-33 09.5	4.307	4.557	+0.54	+2.2	21.9	97.8
Aug. 6	14 14.93	-32 47.0	4.506	4.612	+0.64	+1.4	22.1	89.6
Aug. 16	14 21.34	-32 32.7	4.705	4.667	+0.73	+0.7	22.3	81.7
Aug. 26	14 28.65	-32 25.7	4.902	4.722	+0.81	0.0	22.5	73.8
Sept. 5	14 36.73	-32 25.3	5.094	4.776	+0.87	-0.5	22.7	66.2
Sept. 15	14 45.46	-32 30.3	5.277	4.831	+0.93	-1.0	22.9	58.6
Sept. 25	14 54.73	-32 40.1	5.450	4.884	+0.97	-1.4	.	51.2
Oct. 5	15 04.44	-32 53.6	5.610	4.938	+1.01	-1.6	.	43.9
Oct. 15	15 14.50	-33 10.0	5.755	4.991	+1.03	-1.9	.	36.7
Oct. 25	15 24.83	-33 28.8	5.883	5.044	+1.05	-2.0	.	29.7
Nov. 4	15 35.32	-33 49.2	5.993	5.096	+1.06	-2.1	.	23.2
Nov. 14	15 45.89	-34 10.7	6.083	5.148	+1.06	-2.2	.	17.6
Nov. 24	15 56.46	-34 32.9	6.152	5.200	+1.05	-2.2	.	14.2
Dec. 4	16 06.92	-34 55.3	6.200	5.252	+1.03	-2.3	.	14.6
Dec. 14	16 17.18	-35 17.8	6.226	5.303	+0.99	-2.2	.	18.7
Dec. 24	16 27.13	-35 40.3	6.230	5.353	+0.95	-2.2	.	24.8
Jan. 3	16 36.65	-36 02.5	6.214	5.404	+0.90	-2.2	.	31.9
Jan. 13	16 45.64	-36 24.6	6.177	5.454	+0.83	-2.2	.	39.5
Jan. 23	16 53.95	-36 46.5	6.122	5.504	+0.75	-2.2	.	47.4
Feb. 2	17 01.47	-37 08.3	6.050	5.553	+0.66	-2.2	.	55.6
Feb. 12	17 08.05	-37 30.2	5.964	5.602	+0.55	-2.2	.	64.0
Feb. 22	17 13.57	-37 52.1	5.866	5.651	+0.43	-2.2	.	72.6
Mar. 3	17 17.89	-38 13.9	5.761	5.699	+0.30	-2.2	.	81.5
Mar. 13	17 20.89	-38 35.6	5.651	5.747	+0.16	-2.1	.	90.5
Mar. 23	17 22.45	-38 56.5	5.542	5.795	+0.01	-2.0	.	99.8

Comet C/2013 G7 (McNaught)

Epoch = 2015 June 27.0 TT
 T = 2014 Mar. 18.76847 TT
 Peri. = 218.27762
 Node = 48.38742 2000.0
 Incl. = 105.09883
 q = 4.6780781 AU
 e = 0.9969883

$$m1 = 9.4 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong.
Jan. 8	09 45.74	-69 19.8	5.226	5.222	-3.16	-4.4	18.4	84.4
Jan. 18	09 14.14	-70 04.2	5.195	5.257	-3.44	-0.2	18.4	88.2
Jan. 28	08 39.79	-70 06.5	5.175	5.293	-3.34	+4.2	18.4	91.5
Feb. 7	08 06.34	-69 24.2	5.168	5.329	-2.93	+8.3	18.4	94.0
Feb. 17	07 37.06	-68 01.5	5.176	5.366	-2.34	+11.4	18.4	95.8
Feb. 27	07 13.66	-66 07.3	5.201	5.404	-1.73	+13.5	18.5	96.6
Mar. 9	06 56.34	-63 52.2	5.241	5.443	-1.20	+14.6	18.5	96.4
Mar. 19	06 44.37	-61 25.9	5.297	5.482	-0.76	+14.9	18.6	95.4
Mar. 29	06 36.79	-58 56.5	5.367	5.522	-0.41	+14.6	18.6	93.7
Apr. 8	06 32.64	-56 30.3	5.449	5.563	-0.15	+13.9	18.7	91.3
Apr. 18	06 31.13	-54 11.6	5.540	5.604	+0.05	+12.8	18.7	88.5
Apr. 28	06 31.63	-52 03.8	5.638	5.646	+0.20	+11.5	18.8	85.4
May 8	06 33.62	-50 08.9	5.739	5.689	+0.31	+10.1	18.9	82.1
May 18	06 36.73	-48 28.3	5.842	5.732	+0.39	+8.6	18.9	78.8
May 28	06 40.64	-47 02.7	5.943	5.776	+0.44	+7.0	19.0	75.6
June 7	06 45.08	-45 52.4	6.040	5.820	+0.48	+5.5	19.0	72.7
June 17	06 49.86	-44 57.3	6.131	5.865	+0.49	+4.0	19.1	70.2
June 27	06 54.79	-44 17.1	6.214	5.911	+0.49	+2.6	19.2	68.1
July 7	06 59.69	-43 51.5	6.288	5.956	+0.47	+1.2	19.2	66.5
July 17	07 04.42	-43 39.7	6.351	6.003	+0.44	-0.1	19.3	65.6
July 27	07 08.84	-43 41.2	6.403	6.050	+0.39	-1.4	19.3	65.3
Aug. 6	07 12.78	-43 55.1	6.443	6.097	+0.33	-2.5	19.3	65.7
Aug. 16	07 16.11	-44 20.5	6.472	6.144	+0.25	-3.6	19.4	66.9
Aug. 26	07 18.66	-44 56.5	6.489	6.192	+0.16	-4.5	19.4	68.6
Sept. 5	07 20.26	-45 41.7	6.497	6.241	+0.05	-5.3	19.4	71.0
Sept. 15	07 20.72	-46 34.6	6.495	6.290	-0.09	-5.9	19.5	73.8
Sept. 25	07 19.85	-47 33.4	6.487	6.339	-0.24	-6.2	19.5	77.1
Oct. 5	07 17.47	-48 35.9	6.474	6.389	-0.41	-6.3	19.5	80.7
Oct. 15	07 13.39	-49 39.3	6.457	6.438	-0.59	-6.1	19.5	84.5
Oct. 25	07 07.46	-50 40.5	6.441	6.489	-0.78	-5.5	19.5	88.3
Nov. 4	06 59.62	-51 35.9	6.427	6.539	-0.97	-4.6	19.6	92.1
Nov. 14	06 49.92	-52 21.5	6.419	6.590	-1.14	-3.2	19.6	95.6
Nov. 24	06 38.54	-52 53.5	6.419	6.641	-1.27	-1.5	19.6	98.7
Dec. 4	06 25.89	-53 08.3	6.430	6.692	-1.34	+0.5	19.6	101.2
Dec. 14	06 12.51	-53 03.3	6.454	6.744	-1.34	+2.6	19.7	103.0
Dec. 24	05 59.06	-52 37.4	6.492	6.796	-1.28	+4.6	19.7	103.9
Jan. 3	05 46.22	-51 51.0	6.545	6.848	-1.17	+6.5	19.7	103.9
Jan. 13	05 34.54	-50 45.8	6.614	6.900	-1.01	+8.1	19.8	102.9
Jan. 23	05 24.47	-49 25.0	6.698	6.953	-0.83	+9.3	19.8	101.0
Feb. 2	05 16.21	-47 52.4	6.797	7.006	-0.64	+10.1	19.9	98.2
Feb. 12	05 09.82	-46 11.8	6.907	7.059	-0.46	+10.5	20.0	94.8
Feb. 22	05 05.27	-44 27.0	7.028	7.112	-0.29	+10.5	20.0	90.9
Mar. 3	05 02.38	-42 41.6	7.156	7.165	-0.14	+10.3	20.1	86.6
Mar. 13	05 00.99	-40 58.2	7.289	7.219	-0.01	+9.9	20.2	82.1
Mar. 23	05 00.89	-39 19.3	7.423	7.272	+0.10	+9.3	20.2	77.5

Comet 117P/Helin-Roman-Alu

Epoch = 2015 June 27.0 TT
 T = 2014 Mar. 26.84271 TT
 Peri. = 222.62325
 Node = 58.88223 2000.0
 Incl. = 8.69745
 q = 3.0556353 AU
 e = 0.2539194
 a = 4.0955834 AU
 n = 0.11891330
 P = 8.29 years

$$m1 = 4.8 + 5 \log(\Delta) + 15.0 \log(r(t-160))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	22 04.87	-19 23.3	4.047	3.351	+1.31 +8.2	15.2	39.8
Jan. 18	22 18.02	-18 00.9	4.150	3.370	+1.33 +8.4	15.3	33.2
Jan. 28	22 31.28	-16 36.5	4.240	3.389	+1.33 +8.6	15.4	26.6
Feb. 7	22 44.57	-15 10.9	4.316	3.408	+1.33 +8.6	15.5	20.3
Feb. 17	22 57.82	-13 44.5	4.377	3.428	+1.32 +8.6	15.5	14.2
Feb. 27	23 10.98	-12 18.0	4.423	3.448	+1.30 +8.6	15.6	8.9
Mar. 9	23 23.99	-10 52.1	4.453	3.468	+1.28 +8.5	15.6	6.4
Mar. 19	23 36.80	-09 27.4	4.467	3.488	+1.26 +8.3	15.6	9.4
Mar. 29	23 49.39	-08 04.5	4.465	3.509	+1.23 +8.0	15.7	14.8
Apr. 8	00 01.68	-06 44.2	4.447	3.530	+1.20 +7.7	15.7	20.9
Apr. 18	00 13.64	-05 27.0	4.414	3.551	+1.16 +7.3	15.7	27.2
Apr. 28	00 25.21	-04 13.6	4.367	3.572	+1.11 +6.9	15.7	33.6
May 8	00 36.33	-03 04.6	4.305	3.594	+1.06 +6.4	15.7	40.2
May 18	00 46.94	-02 00.5	4.230	3.616	+1.00 +5.8	15.7	46.9
May 28	00 56.96	-01 02.1	4.144	3.637	+0.93 +5.2	15.7	53.7
June 7	01 06.28	-00 09.9	4.046	3.659	+0.85 +4.6	15.7	60.8
June 17	01 14.81	+00 35.6	3.939	3.681	+0.76 +3.8	15.7	68.0
June 27	01 22.42	+01 13.8	3.825	3.703	+0.66 +3.0	15.6	75.5
July 7	01 28.98	+01 44.2	3.706	3.725	+0.54 +2.2	15.6	83.2
July 17	01 34.34	+02 06.3	3.584	3.748	+0.40 +1.3	15.6	91.3
July 27	01 38.36	+02 19.8	3.463	3.770	+0.25 +0.5	15.5	99.7
Aug. 6	01 40.88	+02 24.4	3.345	3.792	+0.09 -0.4	15.5	108.6
Aug. 16	01 41.79	+02 20.2	3.234	3.814	-0.08 -1.3	15.4	117.9
Aug. 26	01 41.01	+02 07.7	3.135	3.837	-0.24 -2.0	15.4	127.7
Sept. 5	01 38.57	+01 47.8	3.052	3.859	-0.40 -2.6	15.4	137.8
Sept. 15	01 34.57	+01 22.0	2.989	3.881	-0.53 -2.9	15.4	148.3
Sept. 25	01 29.27	+00 52.8	2.951	3.904	-0.62 -3.0	15.4	159.0
Oct. 5	01 23.09	+00 22.8	2.940	3.926	-0.66 -2.8	15.4	168.8
Oct. 15	01 16.52	-00 04.7	2.958	3.948	-0.64 -2.2	15.5	171.7
Oct. 25	01 10.10	-00 26.7	3.007	3.970	-0.57 -1.4	15.6	163.3
Nov. 4	01 04.38	-00 40.9	3.085	3.992	-0.46 -0.5	15.7	152.7
Nov. 14	00 59.75	-00 45.6	3.189	4.014	-0.32 +0.6	15.8	141.9
Nov. 24	00 56.54	-00 40.0	3.316	4.036	-0.17 +1.6	15.9	131.3
Dec. 4	00 54.89	-00 24.4	3.461	4.058	-0.01 +2.5	16.0	121.0
Dec. 14	00 54.83	+00 00.7	3.621	4.080	+0.15 +3.4	16.2	111.1
Dec. 24	00 56.32	+00 34.4	3.790	4.101	+0.29 +4.1	16.3	101.5
Jan. 3	00 59.23	+01 15.4	3.964	4.123	+0.42 +4.7	16.4	92.3
Jan. 13	01 03.43	+02 02.7	4.140	4.144	+0.53 +5.2	16.6	83.4
Jan. 23	01 08.78	+02 55.0	4.313	4.165	+0.63 +5.6	16.7	74.8
Feb. 2	01 15.11	+03 51.4	4.481	4.186	+0.72 +5.9	16.8	66.5
Feb. 12	01 22.29	+04 50.7	4.639	4.207	+0.79 +6.1	16.9	58.4
Feb. 22	01 30.18	+05 52.1	4.787	4.228	+0.85 +6.3	17.0	50.5
Mar. 3	01 38.67	+06 54.8	4.922	4.249	+0.90 +6.3	17.1	42.9
Mar. 13	01 47.65	+07 57.9	5.042	4.269	+0.94 +6.3	17.2	35.3
Mar. 23	01 57.02	+09 00.8	5.145	4.290	+0.97 +6.2	17.3	27.9

Comet 17P/Holmes

Epoch = 2015 June 27.0 TT
 T = 2014 Mar. 27.56457 TT
 Peri. = 24.57096 e = 0.4316154
 Node = 326.76328 2000.0 a = 3.6203454 AU
 Incl. = 19.09201 n = 0.14308004
 q = 2.0577486 AU P = 6.89 years

$$m1 = 8.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° '	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	04 03.53	+45 31.5	2.132	2.911	-0.07 -9.3	16.6	135.0
Jan. 18	04 02.83	+43 58.6	2.261	2.955	+0.24 -8.6	16.8	126.5
Jan. 28	04 05.27	+42 32.8	2.408	2.998	+0.51 -7.6	17.1	117.9
Feb. 7	04 10.42	+41 16.6	2.567	3.041	+0.74 -6.6	17.3	109.5
Feb. 17	04 17.81	+40 10.6	2.735	3.084	+0.92 -5.7	17.5	101.3
Feb. 27	04 27.03	+39 14.1	2.909	3.127	+1.07 -4.8	17.7	93.3
Mar. 9	04 37.74	+38 25.7	3.087	3.170	+1.19 -4.2	18.0	85.6
Mar. 19	04 49.61	+37 43.8	3.264	3.212	+1.28 -3.7	18.2	78.2
Mar. 29	05 02.41	+37 06.7	3.439	3.255	+1.35 -3.4	18.4	71.0
Apr. 8	05 15.92	+36 32.9	3.609	3.297	+1.40 -3.2	18.6	64.1
Apr. 18	05 29.96	+36 00.8	3.773	3.339	+1.44 -3.1	18.7	57.3
Apr. 28	05 44.38	+35 29.5	3.928	3.380	+1.47 -3.2	18.9	50.6
May 8	05 59.04	+34 57.9	4.072	3.421	+1.48 -3.3	19.1	44.1
May 18	06 13.82	+34 25.4	4.206	3.462	+1.48 -3.4	19.2	37.8
May 28	06 28.63	+33 51.4	4.326	3.502	+1.47 -3.6	19.3	31.5
June 7	06 43.37	+33 15.6	4.432	3.542	+1.46 -3.8	19.5	25.4
June 17	06 57.96	+32 37.9	4.523	3.582	+1.44 -4.0	19.6	19.6
June 27	07 12.33	+31 58.1	4.598	3.621	+1.41 -4.2	19.7	14.2
July 7	07 26.40	+31 16.6	4.657	3.660	+1.37 -4.3	19.8	10.1
July 17	07 40.13	+30 33.3	4.698	3.698	+1.33 -4.5	19.9	9.3
July 27	07 53.44	+29 48.7	4.722	3.736	+1.28 -4.5	20.0	12.4
Aug. 6	08 06.28	+29 03.2	4.728	3.774	+1.23 -4.6	20.0	17.6
Aug. 16	08 18.59	+28 17.3	4.716	3.811	+1.17 -4.6	20.1	23.7
Aug. 26	08 30.30	+27 31.6	4.687	3.847	+1.10 -4.5	20.1	30.2
Sept. 5	08 41.35	+26 46.6	4.641	3.883	+1.03 -4.3	20.2	37.0
Sept. 15	08 51.66	+26 03.3	4.579	3.919	+0.95 -4.1	20.2	44.1
Sept. 25	09 01.13	+25 22.3	4.501	3.954	+0.85 -3.8	20.2	51.4
Oct. 5	09 09.67	+24 44.6	4.409	3.989	+0.75 -3.4	20.2	59.1
Oct. 15	09 17.17	+24 10.9	4.306	4.023	+0.63 -2.9	20.2	67.0
Oct. 25	09 23.48	+23 42.3	4.192	4.057	+0.50 -2.3	20.2	75.4
Nov. 4	09 28.49	+23 19.5	4.072	4.090	+0.35 -1.6	20.2	84.0
Nov. 14	09 32.02	+23 03.3	3.949	4.123	+0.19 -0.9	20.2	93.1
Nov. 24	09 33.94	+22 54.3	3.825	4.155	+0.02 -0.2	20.2	102.6
Dec. 4	09 34.11	+22 52.5	3.707	4.187	-0.17 +0.5	20.2	112.6
Dec. 14	09 32.45	+22 57.6	3.600	4.218	-0.35 +1.1	20.2	123.0
Dec. 24	09 28.94	+23 08.6	3.507	4.248	-0.52 +1.5	20.1	133.9
Jan. 3	09 23.71	+23 23.8	3.435	4.279	-0.67 +1.7	20.1	145.1
Jan. 13	09 17.01	+23 40.8	3.389	4.308	-0.78 +1.6	20.2	156.4
Jan. 23	09 09.25	+23 56.8	3.372	4.338	-0.83 +1.2	20.2	167.3
Feb. 2	09 01.00	+24 09.3	3.387	4.366	-0.82 +0.7	20.3	172.9
Feb. 12	08 52.85	+24 16.2	3.434	4.394	-0.74 0.0	20.3	165.0
Feb. 22	08 45.41	+24 16.5	3.512	4.422	-0.63 -0.7	20.4	154.0
Mar. 3	08 39.15	+24 09.8	3.618	4.449	-0.47 -1.3	20.5	142.9
Mar. 13	08 34.41	+23 56.6	3.748	4.476	-0.30 -1.9	20.6	132.1
Mar. 23	08 31.36	+23 37.7	3.899	4.502	-0.13 -2.4	20.8	121.6

Comet 119P/Parker-Hartley

Epoch = 2015 June 27.0 TT
 T = 2014 Apr. 3.79085 TT
 Peri. = 181.73576
 Node = 243.82110 2000.0
 Incl. = 5.18411
 q = 3.0253851 AU
 e = 0.2953874
 a = 4.2936858 AU
 n = 0.11077932
 P = 8.90 years

$$m1 = 9.6 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	08 28.95	+12 48.5	2.416	3.356	-0.69 +1.3	18.1	159.9
Jan. 18	08 22.09	+13 01.5	2.403	3.377	-0.72 +1.8	18.1	170.4
Jan. 28	08 14.93	+13 19.4	2.421	3.399	-0.67 +2.0	18.2	172.2
Feb. 7	08 08.25	+13 39.9	2.468	3.421	-0.56 +2.1	18.2	162.4
Feb. 17	08 02.68	+14 00.6	2.543	3.444	-0.39 +1.9	18.3	151.4
Feb. 27	07 58.73	+14 19.6	2.644	3.467	-0.20 +1.6	18.5	140.6
Mar. 9	07 56.69	+14 35.3	2.766	3.490	-0.01 +1.1	18.6	130.2
Mar. 19	07 56.63	+14 46.8	2.905	3.513	+0.19 +0.7	18.7	120.2
Mar. 29	07 58.52	+14 53.3	3.057	3.537	+0.37 +0.1	18.9	110.8
Apr. 8	08 02.19	+14 54.4	3.218	3.561	+0.53 -0.5	19.0	101.9
Apr. 18	08 07.45	+14 49.8	3.383	3.585	+0.66 -1.0	19.2	93.4
Apr. 28	08 14.08	+14 39.4	3.551	3.610	+0.78 -1.6	19.3	85.3
May 8	08 21.86	+14 23.2	3.717	3.634	+0.87 -2.2	19.5	77.5
May 18	08 30.60	+14 01.1	3.879	3.659	+0.95 -2.8	19.6	70.0
May 28	08 40.11	+13 33.4	4.036	3.684	+1.01 -3.3	19.7	62.8
June 7	08 50.23	+13 00.2	4.184	3.709	+1.06 -3.8	19.8	55.8
June 17	09 00.83	+12 21.7	4.323	3.735	+1.10 -4.3	19.9	48.9
June 27	09 11.79	+11 38.4	4.451	3.760	+1.12 -4.8	20.0	42.2
July 7	09 23.00	+10 50.5	4.566	3.785	+1.14 -5.2	20.1	35.5
July 17	09 34.37	+09 58.5	4.668	3.811	+1.15 -5.6	20.2	29.0
July 27	09 45.82	+09 02.7	4.755	3.836	+1.15 -5.9	20.3	22.5
Aug. 6	09 57.29	+08 03.7	4.826	3.862	+1.14 -6.2	20.4	16.1
Aug. 16	10 08.71	+07 01.8	4.881	3.888	+1.13 -6.4	20.4	9.9
Aug. 26	10 20.02	+05 57.8	4.920	3.913	+1.11 -6.6	20.5	4.8
Sept. 5	10 31.17	+04 52.0	4.941	3.939	+1.09 -6.7	20.5	5.9
Sept. 15	10 42.10	+03 45.1	4.944	3.965	+1.07 -6.7	20.5	11.8
Sept. 25	10 52.76	+02 37.7	4.930	3.990	+1.03 -6.7	20.6	18.4
Oct. 5	11 03.07	+01 30.5	4.898	4.016	+0.99 -6.7	20.6	25.2
Oct. 15	11 12.98	+00 23.9	4.849	4.042	+0.94 -6.5	20.6	32.3
Oct. 25	11 22.41	-00 41.1	4.784	4.067	+0.88 -6.3	20.6	39.6
Nov. 4	11 31.25	-01 43.8	4.703	4.092	+0.82 -6.0	20.6	47.1
Nov. 14	11 39.43	-02 43.5	4.608	4.118	+0.74 -5.6	20.6	54.8
Nov. 24	11 46.83	-03 39.2	4.500	4.143	+0.65 -5.1	20.6	62.8
Dec. 4	11 53.32	-04 30.2	4.382	4.168	+0.55 -4.5	20.6	71.1
Dec. 14	11 58.77	-05 15.3	4.257	4.193	+0.43 -3.8	20.5	79.7
Dec. 24	12 03.05	-05 53.6	4.127	4.218	+0.30 -3.0	20.5	88.6
Jan. 3	12 06.02	-06 24.0	3.996	4.243	+0.16 -2.1	20.5	97.8
Jan. 13	12 07.57	-06 45.5	3.868	4.268	+0.01 -1.2	20.4	107.5
Jan. 23	12 07.63	-06 57.1	3.748	4.293	-0.15 -0.1	20.4	117.5
Feb. 2	12 06.18	-06 58.3	3.641	4.317	-0.29 +1.0	20.3	127.9
Feb. 12	12 03.28	-06 48.6	3.551	4.341	-0.42 +2.0	20.3	138.7
Feb. 22	11 59.12	-06 28.6	3.483	4.365	-0.51 +2.9	20.3	149.6
Mar. 3	11 54.01	-05 59.3	3.442	4.389	-0.57 +3.6	20.3	160.7
Mar. 13	11 48.32	-05 22.9	3.429	4.413	-0.58 +4.1	20.3	170.8
Mar. 23	11 42.53	-04 42.1	3.447	4.437	-0.54 +4.2	20.4	172.3

Comet 311P/PANSTARRS

Epoch = 2015 June 27.0 TT
 T = 2014 Apr. 15.55415 TT
 Peri. = 144.12052
 Node = 279.27105 2000.0
 Incl. = 4.96695
 q = 1.9350167 AU
 e = 0.1158073
 a = 2.1884559 AU
 n = 0.30443697
 P = 3.24 years

$$m1 = 13.6 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	12 06.75	-06 32.6	1.738	2.180	+0.50 -6.9	20.7	102.9
Jan. 18	12 11.80	-07 41.5	1.633	2.193	+0.22 -5.3	20.6	111.5
Jan. 28	12 14.02	-08 34.0	1.535	2.207	-0.09 -3.3	20.5	120.7
Feb. 7	12 13.14	-09 07.2	1.448	2.220	-0.41 -1.1	20.5	130.6
Feb. 17	12 09.09	-09 18.2	1.375	2.233	-0.70 +1.3	20.4	141.3
Feb. 27	12 02.09	-09 05.2	1.320	2.246	-0.92 +3.6	20.4	152.6
Mar. 9	11 52.90	-08 29.1	1.288	2.259	-1.02 +5.5	20.3	163.8
Mar. 19	11 42.67	-07 34.3	1.282	2.271	-0.99 +6.6	20.4	171.3
Mar. 29	11 32.78	-06 28.6	1.302	2.283	-0.82 +6.7	20.4	165.7
Apr. 8	11 24.55	-05 21.8	1.348	2.295	-0.57 +5.9	20.6	155.0
Apr. 18	11 18.84	-04 22.4	1.417	2.306	-0.27 +4.6	20.7	144.0
Apr. 28	11 16.11	-03 36.5	1.505	2.318	+0.03 +2.9	20.9	133.6
May 8	11 16.36	-03 07.4	1.608	2.328	+0.30 +1.2	21.1	124.0
May 18	11 19.36	-02 55.8	1.723	2.339	+0.54 -0.5	21.2	115.1
May 28	11 24.79	-03 00.9	1.846	2.349	+0.75 -2.0	21.4	106.8
June 7	11 32.27	-03 21.4	1.973	2.358	+0.92 -3.4	21.6	99.2
June 17	11 41.47	-03 55.3	2.103	2.367	+1.06 -4.6	21.8	92.0
June 27	11 52.11	-04 40.9	2.234	2.376	+1.18 -5.5	21.9	85.2
July 7	12 03.94	-05 36.3	2.363	2.384	+1.28 -6.4	22.1	78.8
July 17	12 16.77	-06 39.8	2.489	2.391	+1.37 -7.0	22.2	72.6
July 27	12 30.46	-07 50.0	2.612	2.399	+1.44 -7.5	22.3	66.7
Aug. 6	12 44.89	-09 05.3	2.729	2.405	+1.51 -7.9	22.5	60.9
Aug. 16	12 59.98	-10 24.4	2.840	2.411	+1.57 -8.2	22.6	55.3
Aug. 26	13 15.68	-11 46.0	2.944	2.417	+1.62 -8.3	22.7	49.7
Sept. 5	13 31.92	-13 08.7	3.039	2.422	+1.68 -8.3	22.7	44.3
Sept. 15	13 48.68	-14 31.6	3.126	2.426	+1.73 -8.2	22.8	38.9
Sept. 25	14 05.94	-15 53.3	3.203	2.430	+1.77 -7.9	22.9	33.5
Oct. 5	14 23.67	-17 12.8	3.269	2.434	+1.82 -7.6	22.9	28.1
Oct. 15	14 41.85	-18 29.0	3.325	2.436	+1.86 -7.2	23.0	22.8
Oct. 25	15 00.45	-19 40.8	3.369	2.439	+1.90 -6.6	23.0	17.4
Nov. 4	15 19.45	-20 47.2	3.401	2.440	+1.94 -6.0	23.0	12.1
Nov. 14	15 38.81	-21 47.2	3.421	2.441	+1.97 -5.3	.	6.8
Nov. 24	15 58.47	-22 40.1	3.428	2.442	+1.99 -4.5	.	2.3
Dec. 4	16 18.37	-23 24.9	3.422	2.442	+2.01 -3.6	.	4.9
Dec. 14	16 38.46	-24 01.0	3.404	2.441	+2.02 -2.7	.	10.2
Dec. 24	16 58.62	-24 28.1	3.373	2.440	+2.02 -1.8	.	15.7
Jan. 3	17 18.78	-24 45.6	3.329	2.438	+2.01 -0.8	.	21.2
Jan. 13	17 38.84	-24 53.4	3.273	2.436	+1.98 +0.2	.	26.8
Jan. 23	17 58.67	-24 51.7	3.205	2.433	+1.95 +1.1	.	32.5
Feb. 2	18 18.16	-24 40.6	3.126	2.429	+1.90 +2.0	.	38.2
Feb. 12	18 37.19	-24 20.7	3.036	2.425	+1.85 +2.8	.	44.0
Feb. 22	18 55.65	-23 52.4	2.937	2.421	+1.78 +3.6	.	49.9
Mar. 3	19 13.41	-23 16.8	2.829	2.416	+1.69 +4.2	.	55.8
Mar. 13	19 30.34	-22 34.8	2.714	2.410	+1.60 +4.7	.	61.9
Mar. 23	19 46.32	-21 47.5	2.592	2.404	+1.49 +5.1	.	68.0

Comet 156P/Russell-LINEAR

Epoch = 2015 June 27.0 TT
 T = 2014 Apr. 16.69074 TT
 Peri. = 357.87949
 Node = 38.87666 2000.0
 Incl. = 20.79003
 q = 1.5834806 AU
 e = 0.5596105
 a = 3.5956366 AU
 n = 0.14455742
 P = 6.82 years

H = 15.2 , G = 0.15

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	V	Elong.
2015/16	h m	° '			m		°
Jan. 8	11 25.27	+33 23.2	2.179	2.851	-0.37 +7.9	20.1	124.3
Jan. 18	11 21.60	+34 42.2	2.147	2.910	-0.67 +7.8	20.0	133.3
Jan. 28	11 14.88	+35 59.8	2.134	2.969	-0.93 +6.7	19.9	141.6
Feb. 7	11 05.62	+37 07.0	2.144	3.027	-1.10 +4.8	19.9	148.3
Feb. 17	10 54.66	+37 55.4	2.180	3.085	-1.15 +2.4	19.9	151.6
Feb. 27	10 43.12	+38 19.0	2.243	3.142	-1.09 -0.3	20.0	150.3
Mar. 9	10 32.21	+38 15.9	2.333	3.198	-0.93 -2.8	20.2	145.1
Mar. 19	10 22.93	+37 48.0	2.447	3.254	-0.70 -4.9	20.4	137.7
Mar. 29	10 15.90	+36 59.3	2.583	3.308	-0.45 -6.4	20.6	129.4
Apr. 8	10 11.41	+35 55.0	2.737	3.363	-0.20 -7.5	20.8	120.9
Apr. 18	10 09.40	+34 39.9	2.905	3.416	+0.03 -8.2	21.0	112.4
Apr. 28	10 09.67	+33 17.6	3.084	3.469	+0.23 -8.7	21.2	104.1
May 8	10 11.92	+31 51.1	3.269	3.521	+0.39 -8.9	21.4	96.0
May 18	10 15.83	+30 22.1	3.458	3.573	+0.53 -9.0	21.5	88.3
May 28	10 21.12	+28 52.0	3.646	3.623	+0.64 -9.0	21.7	80.7
June 7	10 27.52	+27 21.5	3.833	3.673	+0.73 -9.0	21.8	73.4
June 17	10 34.80	+25 51.3	4.014	3.723	+0.80 -9.0	21.9	66.2
June 27	10 42.79	+24 21.6	4.189	3.771	+0.85 -8.9	22.0	59.2
July 7	10 51.31	+22 52.9	4.354	3.819	+0.89 -8.8	22.0	52.4
July 17	11 00.26	+21 25.2	4.508	3.866	+0.93 -8.6	22.1	45.7
July 27	11 09.51	+19 58.9	4.648	3.913	+0.95 -8.5	22.1	39.1
Aug. 6	11 18.97	+18 34.2	4.775	3.958	+0.96 -8.3	22.1	32.6
Aug. 16	11 28.58	+17 11.4	4.886	4.003	+0.97 -8.1	22.1	26.3
Aug. 26	11 38.26	+15 50.8	4.979	4.048	+0.97 -7.8	22.1	20.4
Sept. 5	11 47.95	+14 32.7	5.055	4.091	+0.96 -7.5	22.1	15.3
Sept. 15	11 57.58	+13 17.5	5.112	4.134	+0.95 -7.2	22.1	12.2
Sept. 25	12 07.11	+12 05.7	5.149	4.176	+0.94 -6.8	22.2	12.7
Oct. 5	12 16.46	+10 57.7	5.167	4.218	+0.91 -6.4	22.3	16.6
Oct. 15	12 25.58	+09 53.9	5.164	4.259	+0.88 -5.9	22.3	22.3
Oct. 25	12 34.38	+08 55.0	5.142	4.299	+0.84 -5.4	22.4	29.0
Nov. 4	12 42.79	+08 01.5	5.101	4.338	+0.79 -4.8	22.5	36.1
Nov. 14	12 50.73	+07 13.8	5.041	4.377	+0.73 -4.1	22.5	43.6
Nov. 24	12 58.08	+06 32.8	4.964	4.415	+0.67 -3.4	22.6	51.4
Dec. 4	13 04.73	+05 58.8	4.872	4.453	+0.58 -2.6	22.6	59.5
Dec. 14	13 10.57	+05 32.6	4.767	4.489	+0.49 -1.8	22.6	67.9
Dec. 24	13 15.45	+05 14.5	4.652	4.525	+0.38 -1.0	22.5	76.6
Jan. 3	13 19.24	+05 05.0	4.530	4.561	+0.26 -0.1	22.5	85.6
Jan. 13	13 21.80	+05 04.2	4.405	4.596	+0.12 +0.8	22.5	94.9
Jan. 23	13 23.00	+05 12.3	4.282	4.630	-0.03 +1.6	22.4	104.6
Feb. 2	13 22.75	+05 28.5	4.166	4.663	-0.18 +2.4	22.3	114.6
Feb. 12	13 20.98	+05 52.2	4.061	4.696	-0.32 +3.0	22.2	124.9
Feb. 22	13 17.74	+06 21.8	3.973	4.728	-0.46 +3.3	22.2	135.4
Mar. 3	13 13.14	+06 55.2	3.906	4.760	-0.57 +3.5	22.1	145.9
Mar. 13	13 07.40	+07 29.9	3.866	4.791	-0.65 +3.3	21.9	156.0
Mar. 23	13 00.86	+08 02.9	3.854	4.821	-0.69 +2.8	21.9	164.3

Comet 191P/McNaught

Epoch = 2015 June 27.0 TT
 T = 2014 May 6.60915 TT
 Peri. = 274.63219
 Node = 106.40052 2000.0
 Incl. = 8.75802
 q = 2.0456965 AU
 e = 0.4210944
 a = 3.5337307 AU
 n = 0.14837266
 P = 6.64 years

$$m1 = 9.0 + 5 \log(\Delta) + 20.0 \log(r(t-50))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	06 36.16	+22 00.7	1.742	2.717	-0.82 +3.9	18.2	171.1
Jan. 18	06 28.00	+22 40.0	1.818	2.759	-0.61 +3.4	18.4	159.1
Jan. 28	06 21.87	+23 14.0	1.921	2.802	-0.36 +2.9	18.7	147.5
Feb. 7	06 18.31	+23 42.8	2.046	2.844	-0.09 +2.4	19.0	136.5
Feb. 17	06 17.44	+24 06.8	2.191	2.886	+0.18 +1.9	19.3	126.2
Feb. 27	06 19.20	+24 26.2	2.350	2.929	+0.41 +1.5	19.5	116.5
Mar. 9	06 23.32	+24 41.3	2.519	2.971	+0.62 +1.1	19.8	107.4
Mar. 19	06 29.50	+24 52.2	2.696	3.014	+0.79 +0.6	20.1	98.8
Mar. 29	06 37.42	+24 58.6	2.876	3.056	+0.94 +0.2	20.4	90.7
Apr. 8	06 46.77	+25 00.4	3.057	3.098	+1.05 -0.3	20.6	83.0
Apr. 18	06 57.28	+24 57.4	3.237	3.140	+1.14 -0.8	20.9	75.5
Apr. 28	07 08.71	+24 49.3	3.412	3.182	+1.21 -1.3	21.1	68.4
May 8	07 20.84	+24 36.1	3.581	3.223	+1.27 -1.8	21.4	61.5
May 18	07 33.51	+24 17.9	3.742	3.264	+1.30 -2.3	21.6	54.7
May 28	07 46.56	+23 54.7	3.894	3.305	+1.33 -2.8	21.8	48.1
June 7	07 59.85	+23 26.6	4.036	3.346	+1.34 -3.3	22.0	41.6
June 17	08 13.28	+22 54.1	4.165	3.386	+1.35 -3.7	22.2	35.2
June 27	08 26.76	+22 17.4	4.280	3.426	+1.34 -4.0	22.3	28.9
July 7	08 40.20	+21 36.9	4.381	3.465	+1.33 -4.4	22.5	22.6
July 17	08 53.54	+20 53.1	4.468	3.504	+1.32 -4.7	22.6	16.4
July 27	09 06.72	+20 06.6	4.538	3.543	+1.30 -4.9	22.8	10.3
Aug. 6	09 19.67	+19 17.9	4.591	3.581	+1.27 -5.0	22.9	4.8
Aug. 16	09 32.36	+18 27.7	4.627	3.619	+1.24 -5.1	23.0	4.8
Aug. 26	09 44.72	+17 36.7	4.646	3.656	+1.20 -5.1	.	10.4
Sept. 5	09 56.72	+16 45.5	4.647	3.693	+1.16 -5.0	.	16.9
Sept. 15	10 08.30	+15 55.0	4.630	3.730	+1.11 -4.9	.	23.6
Sept. 25	10 19.39	+15 06.1	4.596	3.766	+1.06 -4.7	.	30.5
Oct. 5	10 29.94	+14 19.5	4.545	3.801	+0.99 -4.3	.	37.6
Oct. 15	10 39.88	+13 36.3	4.477	3.836	+0.92 -3.9	.	44.9
Oct. 25	10 49.10	+12 57.6	4.395	3.871	+0.84 -3.3	.	52.5
Nov. 4	10 57.53	+12 24.3	4.299	3.905	+0.75 -2.7	.	60.3
Nov. 14	11 05.03	+11 57.6	4.192	3.938	+0.65 -1.9	.	68.5
Nov. 24	11 11.49	+11 38.6	4.076	3.971	+0.53 -1.0	.	76.9
Dec. 4	11 16.76	+11 28.5	3.954	4.004	+0.39 0.0	.	85.7
Dec. 14	11 20.70	+11 28.1	3.830	4.036	+0.25 +1.0	.	94.9
Dec. 24	11 23.16	+11 38.3	3.707	4.067	+0.09 +2.1	.	104.6
Jan. 3	11 24.02	+11 59.2	3.591	4.098	-0.08 +3.2	.	114.6
Jan. 13	11 23.21	+12 30.7	3.485	4.129	-0.25 +4.1	.	125.0
Jan. 23	11 20.71	+13 11.6	3.396	4.159	-0.41 +4.8	.	135.8
Feb. 2	11 16.65	+13 59.8	3.329	4.188	-0.54 +5.2	.	146.8
Feb. 12	11 11.25	+14 52.2	3.287	4.217	-0.64 +5.3	.	157.7
Feb. 22	11 04.90	+15 45.0	3.275	4.245	-0.68 +4.9	.	167.5
Mar. 3	10 58.07	+16 34.3	3.293	4.273	-0.68 +4.2	.	170.2
Mar. 13	10 51.30	+17 16.7	3.343	4.301	-0.62 +3.3	.	162.4
Mar. 23	10 45.13	+17 49.5	3.422	4.328	-0.52 +2.2	.	152.0

Comet 134P/Kowal-Vavrova

Epoch = 2015 June 27.0 TT
 T = 2014 May 21.56953 TT
 Peri. = 18.61090 e = 0.5877548
 Node = 202.10634 2000.0 a = 6.2374230 AU
 Incl. = 4.34849 n = 0.06326977
 q = 2.5713477 AU P = 15.58 years

$$m1 = 6.4 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	18 52.79	-19 36.7	4.138	3.162	+1.63 +2.7	18.2	5.7
Jan. 18	19 09.09	-19 09.7	4.164	3.205	+1.57 +3.3	18.4	11.5
Jan. 28	19 24.82	-18 36.9	4.174	3.250	+1.51 +3.8	18.5	17.7
Feb. 7	19 39.89	-17 59.2	4.170	3.295	+1.43 +4.2	18.6	24.2
Feb. 17	19 54.22	-17 17.4	4.152	3.342	+1.35 +4.5	18.7	30.7
Feb. 27	20 07.75	-16 32.7	4.120	3.388	+1.26 +4.7	18.7	37.5
Mar. 9	20 20.39	-15 45.9	4.075	3.435	+1.17 +4.8	18.8	44.3
Mar. 19	20 32.06	-14 58.3	4.017	3.483	+1.06 +4.7	18.9	51.4
Mar. 29	20 42.69	-14 10.9	3.947	3.531	+0.95 +4.6	19.0	58.6
Apr. 8	20 52.18	-13 24.9	3.868	3.579	+0.83 +4.3	19.0	66.0
Apr. 18	21 00.44	-12 41.5	3.781	3.628	+0.69 +4.0	19.1	73.6
Apr. 28	21 07.36	-12 01.8	3.688	3.677	+0.55 +3.5	19.1	81.5
May 8	21 12.86	-11 27.0	3.592	3.726	+0.40 +2.9	19.2	89.8
May 18	21 16.82	-10 58.4	3.495	3.776	+0.23 +2.2	19.2	98.3
May 28	21 19.17	-10 36.8	3.401	3.826	+0.07 +1.4	19.3	107.2
June 7	21 19.86	-10 23.3	3.314	3.875	-0.10 +0.5	19.3	116.5
June 17	21 18.88	-10 18.3	3.238	3.925	-0.26 -0.4	19.3	126.2
June 27	21 16.30	-10 22.1	3.177	3.975	-0.40 -1.2	19.4	136.3
July 7	21 12.32	-10 34.2	3.136	4.025	-0.51 -1.9	19.5	146.7
July 17	21 07.21	-10 53.6	3.118	4.075	-0.58 -2.5	19.5	157.3
July 27	21 01.37	-11 18.6	3.127	4.125	-0.61 -2.9	19.6	167.7
Aug. 6	20 55.28	-11 47.2	3.164	4.175	-0.59 -3.0	19.8	174.6
Aug. 16	20 49.41	-12 17.1	3.231	4.225	-0.52 -2.9	19.9	167.6
Aug. 26	20 44.23	-12 46.2	3.325	4.275	-0.41 -2.6	20.1	157.2
Sept. 5	20 40.11	-13 12.6	3.447	4.325	-0.28 -2.2	20.2	146.7
Sept. 15	20 37.31	-13 35.0	3.592	4.375	-0.13 -1.7	20.4	136.3
Sept. 25	20 35.97	-13 52.4	3.757	4.424	+0.02 -1.2	20.6	126.3
Oct. 5	20 36.12	-14 04.3	3.938	4.474	+0.16 -0.6	20.8	116.5
Oct. 15	20 37.71	-14 10.5	4.130	4.523	+0.29 0.0	21.0	107.0
Oct. 25	20 40.66	-14 10.9	4.331	4.573	+0.42 +0.5	21.1	97.8
Nov. 4	20 44.81	-14 05.5	4.535	4.622	+0.52 +1.1	21.3	88.8
Nov. 14	20 50.03	-13 54.6	4.739	4.671	+0.61 +1.6	21.5	80.0
Nov. 24	20 56.17	-13 38.3	4.939	4.719	+0.69 +2.1	21.7	71.5
Dec. 4	21 03.06	-13 17.1	5.133	4.768	+0.75 +2.6	21.8	63.1
Dec. 14	21 10.57	-12 51.1	5.316	4.817	+0.80 +3.0	22.0	54.8
Dec. 24	21 18.57	-12 20.9	5.487	4.865	+0.84 +3.4	22.1	46.7
Jan. 3	21 26.93	-11 46.8	5.642	4.913	+0.86 +3.8	22.3	38.6
Jan. 13	21 35.53	-11 09.2	5.781	4.961	+0.88 +4.0	22.4	30.7
Jan. 23	21 44.28	-10 28.8	5.901	5.008	+0.88 +4.3	22.5	22.8
Feb. 2	21 53.08	-09 46.0	6.001	5.056	+0.88 +4.5	22.6	15.0
Feb. 12	22 01.84	-09 01.3	6.080	5.103	+0.86 +4.6	22.7	7.4
Feb. 22	22 10.48	-08 15.4	6.137	5.150	+0.84 +4.7	22.8	3.0
Mar. 3	22 18.91	-07 28.9	6.173	5.196	+0.82 +4.7	22.9	9.2
Mar. 13	22 27.08	-06 42.3	6.186	5.243	+0.78 +4.6	22.9	16.8
Mar. 23	22 34.89	-05 56.3	6.179	5.289	+0.74 +4.5	23.0	24.6

Comet 4P/Faye

Epoch = 2015 June 27.0 TT
 T = 2014 May 29.78158 TT
 Peri. = 205.13249 e = 0.5693489
 Node = 199.17742 2000.0 a = 3.8391053 AU
 Incl. = 9.06197 n = 0.13102647
 q = 1.6533149 AU P = 7.52 years

$$m1 = 8.0 + 5 \log(\Delta) + 15.0 \log(r(t-15))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	09 56.46	+00 11.5	1.843	2.630	-0.61 +2.2	15.4	134.8
Jan. 18	09 50.33	+00 33.6	1.819	2.691	-0.78 +4.1	15.5	145.9
Jan. 28	09 42.49	+01 15.0	1.818	2.752	-0.87 +5.7	15.7	157.0
Feb. 7	09 33.83	+02 11.7	1.844	2.812	-0.85 +6.6	15.9	166.3
Feb. 17	09 25.32	+03 17.9	1.899	2.872	-0.74 +6.9	16.1	167.6
Feb. 27	09 17.88	+04 27.2	1.983	2.932	-0.57 +6.6	16.3	159.6
Mar. 9	09 12.21	+05 33.4	2.094	2.991	-0.36 +5.9	16.5	149.3
Mar. 19	09 08.65	+06 32.2	2.229	3.050	-0.13 +4.9	16.8	138.8
Mar. 29	09 07.34	+07 20.9	2.385	3.108	+0.09 +3.7	17.1	128.7
Apr. 8	09 08.20	+07 58.1	2.556	3.166	+0.28 +2.6	17.4	119.1
Apr. 18	09 10.99	+08 23.7	2.739	3.224	+0.45 +1.4	17.6	110.0
Apr. 28	09 15.48	+08 38.0	2.931	3.281	+0.59 +0.4	17.9	101.3
May 8	09 21.39	+08 41.8	3.127	3.337	+0.71 -0.6	18.2	93.1
May 18	09 28.47	+08 36.0	3.325	3.393	+0.80 -1.5	18.4	85.2
May 28	09 36.50	+08 21.4	3.521	3.448	+0.88 -2.2	18.6	77.6
June 7	09 45.27	+07 59.0	3.713	3.502	+0.94 -2.9	18.9	70.2
June 17	09 54.63	+07 29.6	3.900	3.556	+0.98 -3.6	19.1	63.0
June 27	10 04.44	+06 54.1	4.078	3.609	+1.01 -4.1	19.3	56.0
July 7	10 14.58	+06 13.3	4.246	3.662	+1.04 -4.5	19.5	49.1
July 17	10 24.94	+05 27.9	4.403	3.714	+1.05 -4.9	19.6	42.2
July 27	10 35.46	+04 38.5	4.546	3.765	+1.06 -5.3	19.8	35.5
Aug. 6	10 46.04	+03 46.0	4.674	3.815	+1.06 -5.5	19.9	28.7
Aug. 16	10 56.65	+02 50.9	4.786	3.865	+1.06 -5.7	20.1	22.0
Aug. 26	11 07.21	+01 53.9	4.881	3.915	+1.05 -5.8	20.2	15.3
Sept. 5	11 17.68	+00 55.6	4.957	3.963	+1.03 -5.9	20.3	8.7
Sept. 15	11 28.00	-00 03.4	5.015	4.011	+1.01 -5.9	20.4	3.4
Sept. 25	11 38.12	-01 02.4	5.053	4.059	+0.99 -5.8	20.5	6.8
Oct. 5	11 47.97	-02 00.7	5.071	4.105	+0.95 -5.7	20.6	13.5
Oct. 15	11 57.50	-02 57.9	5.070	4.152	+0.91 -5.5	20.7	20.7
Oct. 25	12 06.64	-03 53.0	5.048	4.197	+0.87 -5.3	20.8	28.1
Nov. 4	12 15.30	-04 45.6	5.007	4.242	+0.81 -4.9	20.8	35.7
Nov. 14	12 23.41	-05 34.9	4.948	4.286	+0.74 -4.5	20.9	43.6
Nov. 24	12 30.84	-06 20.0	4.873	4.329	+0.67 -4.0	20.9	51.6
Dec. 4	12 37.50	-07 00.3	4.782	4.372	+0.58 -3.5	20.9	59.9
Dec. 14	12 43.27	-07 35.0	4.678	4.415	+0.47 -2.8	20.9	68.6
Dec. 24	12 47.99	-08 03.2	4.565	4.456	+0.36 -2.1	20.9	77.5
Jan. 3	12 51.56	-08 24.0	4.446	4.497	+0.23 -1.3	20.9	86.7
Jan. 13	12 53.84	-08 36.7	4.324	4.538	+0.09 -0.4	20.9	96.3
Jan. 23	12 54.73	-08 40.4	4.204	4.577	-0.06 +0.6	20.9	106.2
Feb. 2	12 54.17	-08 34.7	4.091	4.616	-0.20 +1.6	20.9	116.5
Feb. 12	12 52.15	-08 19.1	3.991	4.655	-0.34 +2.5	20.9	127.2
Feb. 22	12 48.75	-07 54.0	3.909	4.693	-0.46 +3.4	21.0	138.2
Mar. 3	12 44.16	-07 20.0	3.849	4.730	-0.55 +4.1	21.0	149.5
Mar. 13	12 38.66	-06 38.9	3.816	4.767	-0.60 +4.6	21.0	161.0
Mar. 23	12 32.61	-05 52.8	3.813	4.803	-0.62 +4.8	21.1	172.4

Comet 16P/Brooks

Epoch = 2015 June 27.0 TT
 T = 2014 June 7.82258 TT
 Peri. = 219.76729
 Node = 159.27679 2000.0
 Incl. = 4.26279
 q = 1.4667547 AU
 e = 0.5633527
 a = 3.3591292 AU
 n = 0.16008993
 P = 6.16 years

$$m1 = 10.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	08 22.04	+14 43.5	1.547	2.502	-1.07	+4.8	18.7	162.3
Jan. 18	08 11.34	+15 31.9	1.585	2.565	-1.03	+4.9	19.0	173.9
Jan. 28	08 01.00	+16 21.0	1.651	2.628	-0.88	+4.5	19.2	170.5
Feb. 7	07 52.18	+17 06.1	1.746	2.690	-0.65	+3.9	19.5	158.8
Feb. 17	07 45.67	+17 44.6	1.868	2.751	-0.38	+3.1	19.8	147.2
Feb. 27	07 41.84	+18 15.3	2.012	2.812	-0.11	+2.3	20.2	136.2
Mar. 9	07 40.75	+18 37.9	2.175	2.872	+0.14	+1.5	20.5	125.9
Mar. 19	07 42.18	+18 52.6	2.352	2.931	+0.37	+0.7	20.8	116.2
Mar. 29	07 45.83	+18 59.7	2.539	2.990	+0.55	0.0	21.1	107.1
Apr. 8	07 51.36	+18 59.8	2.733	3.048	+0.71	-0.7	21.5	98.6
Apr. 18	07 58.42	+18 53.2	2.930	3.105	+0.83	-1.3	21.7	90.4
Apr. 28	08 06.74	+18 40.1	3.128	3.161	+0.93	-1.9	22.0	82.7
May 8	08 16.04	+18 21.0	3.323	3.217	+1.00	-2.5	22.3	75.2
May 18	08 26.09	+17 56.2	3.514	3.271	+1.06	-3.0	22.5	68.0
May 28	08 36.71	+17 25.9	3.698	3.325	+1.10	-3.5	22.8	60.9
June 7	08 47.75	+16 50.8	3.873	3.378	+1.13	-4.0	23.0	54.0
June 17	08 59.08	+16 11.0	4.038	3.430	+1.15	-4.4	.	47.3
June 27	09 10.59	+15 27.2	4.190	3.482	+1.16	-4.8	.	40.6
July 7	09 22.18	+14 39.7	4.329	3.532	+1.16	-5.1	.	34.0
July 17	09 33.79	+13 49.0	4.454	3.582	+1.16	-5.3	.	27.4
July 27	09 45.35	+12 55.6	4.562	3.631	+1.14	-5.6	.	20.8
Aug. 6	09 56.80	+12 00.1	4.654	3.679	+1.13	-5.7	.	14.1
Aug. 16	10 08.08	+11 02.9	4.728	3.726	+1.11	-5.8	.	7.5
Aug. 26	10 19.16	+10 04.7	4.783	3.772	+1.08	-5.9	.	0.8
Sept. 5	10 29.97	+09 06.1	4.819	3.818	+1.05	-5.8	.	6.1
Sept. 15	10 40.46	+08 07.7	4.836	3.862	+1.01	-5.8	.	13.1
Sept. 25	10 50.59	+07 10.1	4.833	3.906	+0.97	-5.6	.	20.1
Oct. 5	11 00.28	+06 14.0	4.811	3.949	+0.92	-5.4	.	27.4
Oct. 15	11 09.47	+05 20.2	4.770	3.992	+0.86	-5.1	.	34.8
Oct. 25	11 18.08	+04 29.5	4.711	4.033	+0.79	-4.7	.	42.4
Nov. 4	11 26.01	+03 42.8	4.636	4.074	+0.72	-4.2	.	50.3
Nov. 14	11 33.16	+03 00.8	4.545	4.114	+0.63	-3.6	.	58.4
Nov. 24	11 39.42	+02 24.7	4.441	4.153	+0.52	-2.9	.	66.8
Dec. 4	11 44.64	+01 55.2	4.327	4.192	+0.41	-2.2	.	75.6
Dec. 14	11 48.71	+01 33.5	4.206	4.229	+0.28	-1.3	.	84.6
Dec. 24	11 51.47	+01 20.6	4.082	4.266	+0.13	-0.3	.	94.1
Jan. 3	11 52.82	+01 17.1	3.958	4.302	-0.02	+0.7	.	104.0
Jan. 13	11 52.64	+01 23.9	3.840	4.338	-0.17	+1.7	.	114.2
Jan. 23	11 50.89	+01 41.0	3.734	4.373	-0.33	+2.7	.	124.9
Feb. 2	11 47.63	+02 08.0	3.644	4.406	-0.47	+3.6	.	136.0
Feb. 12	11 42.98	+02 44.0	3.576	4.440	-0.58	+4.3	.	147.5
Feb. 22	11 37.20	+03 26.9	3.534	4.472	-0.65	+4.7	.	159.1
Mar. 3	11 30.69	+04 14.0	3.522	4.504	-0.68	+4.8	.	171.0
Mar. 13	11 23.88	+05 02.1	3.542	4.535	-0.66	+4.6	.	176.9
Mar. 23	11 17.27	+05 48.0	3.594	4.565	-0.60	+4.1	.	165.3

Comet C/2013 Y2 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 June 13.69348 TT
 Peri. = 308.86724
 Node = 243.39322 2000.0
 Incl. = 29.41000
 q = 1.9192644 AU
 e = 0.9914557

$$m1 = 11.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	18 04.22	-14 04.2	4.022	3.106	+1.46	+5.6	19.1	18.6
Jan. 18	18 18.86	-13 08.4	4.058	3.191	+1.37	+6.2	19.3	24.8
Jan. 28	18 32.52	-12 06.8	4.078	3.277	+1.26	+6.7	19.4	31.3
Feb. 7	18 45.13	-10 59.8	4.085	3.363	+1.15	+7.2	19.5	38.0
Feb. 17	18 56.62	-09 47.9	4.077	3.449	+1.03	+7.6	19.6	45.0
Feb. 27	19 06.93	-08 32.0	4.056	3.536	+0.90	+7.9	19.7	52.2
Mar. 9	19 15.97	-07 12.6	4.024	3.623	+0.77	+8.2	19.8	59.5
Mar. 19	19 23.67	-05 50.7	3.982	3.710	+0.63	+8.4	19.9	67.1
Mar. 29	19 29.93	-04 27.1	3.932	3.798	+0.47	+8.4	20.0	75.0
Apr. 8	19 34.67	-03 03.1	3.877	3.885	+0.32	+8.3	20.0	83.0
Apr. 18	19 37.84	-01 39.8	3.820	3.972	+0.15	+8.1	20.1	91.3
Apr. 28	19 39.36	-00 18.9	3.765	4.059	-0.01	+7.7	20.2	99.8
May 8	19 39.24	+00 58.0	3.715	4.146	-0.17	+7.1	20.2	108.4
May 18	19 37.51	+02 08.9	3.674	4.233	-0.32	+6.3	20.3	117.2
May 28	19 34.27	+03 11.7	3.647	4.320	-0.45	+5.3	20.4	125.9
June 7	19 29.74	+04 04.4	3.637	4.407	-0.56	+4.1	20.4	134.3
June 17	19 24.18	+04 45.4	3.648	4.493	-0.62	+2.8	20.5	142.0
June 27	19 17.96	+05 13.4	3.683	4.579	-0.64	+1.5	20.6	148.2
July 7	19 11.51	+05 28.1	3.744	4.665	-0.63	+0.2	20.8	151.8
July 17	19 05.24	+05 30.1	3.832	4.751	-0.57	-0.9	20.9	151.6
July 27	18 59.55	+05 20.6	3.946	4.836	-0.48	-1.9	21.0	147.8
Aug. 6	18 54.76	+05 01.8	4.085	4.921	-0.37	-2.6	21.2	141.7
Aug. 16	18 51.08	+04 35.8	4.247	5.006	-0.24	-3.1	21.3	134.2
Aug. 26	18 48.66	+04 05.2	4.429	5.090	-0.11	-3.3	21.5	126.1
Sept. 5	18 47.54	+03 32.3	4.627	5.175	+0.02	-3.3	21.7	117.8
Sept. 15	18 47.71	+02 59.0	4.839	5.259	+0.14	-3.2	21.8	109.4
Sept. 25	18 49.11	+02 27.1	5.059	5.342	+0.25	-2.9	22.0	101.0
Oct. 5	18 51.62	+01 57.9	5.285	5.426	+0.35	-2.5	22.2	92.7
Oct. 15	18 55.14	+01 32.5	5.513	5.509	+0.44	-2.1	22.3	84.6
Oct. 25	18 59.55	+01 11.6	5.739	5.592	+0.52	-1.6	22.5	76.5
Nov. 4	19 04.70	+00 55.9	5.960	5.674	+0.58	-1.0	22.6	68.7
Nov. 14	19 10.48	+00 45.6	6.172	5.756	+0.63	-0.4	22.8	60.9
Nov. 24	19 16.77	+00 41.2	6.373	5.838	+0.67	+0.1	22.9	53.4
Dec. 4	19 23.44	+00 42.5	6.560	5.920	+0.69	+0.7	23.0	46.1
Dec. 14	19 30.38	+00 49.7	6.732	6.001	+0.71	+1.3	.	39.2
Dec. 24	19 37.49	+01 02.7	6.885	6.082	+0.72	+1.8	.	32.9
Jan. 3	19 44.66	+01 21.2	7.018	6.163	+0.71	+2.4	.	27.5
Jan. 13	19 51.79	+01 45.0	7.131	6.244	+0.70	+2.9	.	23.7
Jan. 23	19 58.79	+02 13.8	7.222	6.324	+0.68	+3.3	.	22.4
Feb. 2	20 05.56	+02 47.1	7.292	6.403	+0.65	+3.7	.	23.9
Feb. 12	20 12.02	+03 24.6	7.340	6.483	+0.61	+4.1	.	27.8
Feb. 22	20 18.09	+04 05.7	7.367	6.562	+0.56	+4.4	.	33.3
Mar. 3	20 23.68	+04 49.9	7.373	6.641	+0.50	+4.7	.	39.7
Mar. 13	20 28.71	+05 36.5	7.362	6.720	+0.44	+4.8	.	46.8
Mar. 23	20 33.11	+06 25.0	7.333	6.798	+0.37	+4.9	.	54.2

Comet C/2014 E2 (Jacques)

Epoch = 2015 June 27.0 TT
 T = 2014 July 2.53773 TT
 Peri. = 344.05348
 Node = 56.41291 2000.0
 Incl. = 156.38938
 q = 0.6637466 AU
 e = 0.9991330

$$m1 = 8.4 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	19 58.57	-03° 10.9	3.989	3.099	+0.65	+1.4	17.5	21.9
Jan. 18	20 05.11	-02 56.7	4.143	3.220	+0.62	+2.1	17.8	17.8
Jan. 28	20 11.27	-02 36.0	4.268	3.340	+0.57	+2.6	18.1	17.3
Feb. 7	20 16.92	-02 09.9	4.364	3.458	+0.50	+3.1	18.3	20.6
Feb. 17	20 21.96	-01 39.3	4.432	3.575	+0.43	+3.4	18.5	26.5
Feb. 27	20 26.26	-01 05.2	4.473	3.690	+0.34	+3.7	18.7	33.7
Mar. 9	20 29.69	-00 28.5	4.489	3.804	+0.24	+3.8	18.9	41.6
Mar. 19	20 32.12	+00 09.9	4.481	3.917	+0.13	+3.9	19.1	50.0
Mar. 29	20 33.42	+00 49.0	4.454	4.028	0.00	+3.9	19.2	58.8
Apr. 8	20 33.44	+01 27.7	4.409	4.138	-0.14	+3.7	19.3	67.9
Apr. 18	20 32.06	+02 04.7	4.353	4.247	-0.29	+3.4	19.4	77.3
Apr. 28	20 29.16	+02 38.7	4.289	4.354	-0.45	+2.9	19.5	87.0
May 8	20 24.64	+03 08.1	4.224	4.461	-0.61	+2.3	19.6	97.0
May 18	20 18.50	+03 31.3	4.164	4.567	-0.77	+1.5	19.7	107.2
May 28	20 10.76	+03 46.5	4.115	4.671	-0.92	+0.6	19.8	117.6
June 7	20 01.60	+03 52.2	4.083	4.775	-1.03	-0.5	19.9	127.9
June 17	19 51.29	+03 47.3	4.075	4.877	-1.11	-1.6	20.1	138.0
June 27	19 40.22	+03 31.3	4.096	4.979	-1.13	-2.7	20.2	146.9
July 7	19 28.87	+03 04.6	4.150	5.080	-1.11	-3.6	20.3	153.5
July 17	19 17.75	+02 28.3	4.239	5.180	-1.04	-4.4	20.5	155.4
July 27	19 07.34	+01 44.5	4.362	5.279	-0.93	-4.9	20.6	151.9
Aug. 6	18 58.02	+00 55.5	4.518	5.378	-0.80	-5.2	20.8	144.6
Aug. 16	18 50.06	+00 03.6	4.705	5.475	-0.64	-5.3	21.0	135.7
Aug. 26	18 43.63	-00 48.9	4.916	5.572	-0.49	-5.1	21.2	126.1
Sept. 5	18 38.76	-01 40.3	5.148	5.668	-0.34	-4.9	21.4	116.4
Sept. 15	18 35.40	-02 29.1	5.395	5.764	-0.19	-4.5	21.6	106.6
Sept. 25	18 33.48	-03 14.4	5.650	5.859	-0.06	-4.1	21.8	97.0
Oct. 5	18 32.84	-03 55.4	5.910	5.953	+0.05	-3.6	21.9	87.6
Oct. 15	18 33.34	-04 31.7	6.168	6.046	+0.15	-3.1	22.1	78.3
Oct. 25	18 34.84	-05 03.2	6.421	6.139	+0.23	-2.6	22.3	69.2
Nov. 4	18 37.16	-05 29.5	6.663	6.231	+0.30	-2.1	22.5	60.3
Nov. 14	18 40.18	-05 50.9	6.890	6.323	+0.36	-1.6	22.6	51.6
Nov. 24	18 43.73	-06 07.3	7.100	6.414	+0.40	-1.2	22.7	43.1
Dec. 4	18 47.69	-06 18.8	7.289	6.504	+0.42	-0.7	22.9	34.9
Dec. 14	18 51.93	-06 25.6	7.454	6.594	+0.44	-0.2	23.0	27.2
Dec. 24	18 56.32	-06 28.0	7.595	6.683	+0.44	+0.2	.	20.7
Jan. 3	19 00.74	-06 26.1	7.709	6.772	+0.43	+0.6	.	16.6
Jan. 13	19 05.08	-06 20.4	7.795	6.861	+0.41	+0.9	.	16.9
Jan. 23	19 09.23	-06 11.1	7.855	6.948	+0.39	+1.2	.	21.4
Feb. 2	19 13.09	-05 58.6	7.888	7.036	+0.35	+1.5	.	28.2
Feb. 12	19 16.54	-05 43.5	7.896	7.122	+0.30	+1.7	.	36.1
Feb. 22	19 19.49	-05 26.1	7.881	7.209	+0.24	+1.9	.	44.5
Mar. 3	19 21.85	-05 07.0	7.845	7.295	+0.17	+2.0	.	53.2
Mar. 13	19 23.53	-04 46.9	7.791	7.380	+0.09	+2.1	.	62.2
Mar. 23	19 24.44	-04 26.2	7.723	7.465	+0.01	+2.0	.	71.4

Comet C/2012 U1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 July 5.21081 TT
 Peri. = 70.11186
 Node = 26.97977 2000.0
 Incl. = 56.33910
 q = 5.2644200 AU
 e = 0.9993212

$$m_1 = 7.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	12 46.71	+76 01.2	4.982	5.446	-0.11	+5.0	18.2	113.3
Jan. 18	12 45.56	+76 51.0	4.988	5.466	-0.71	+4.5	18.3	114.2
Jan. 28	12 38.51	+77 36.0	5.008	5.486	-1.32	+3.5	18.3	114.3
Feb. 7	12 25.26	+78 10.7	5.040	5.508	-1.88	+1.9	18.3	113.5
Feb. 17	12 06.47	+78 29.3	5.084	5.530	-2.23	-0.3	18.4	112.0
Feb. 27	11 44.16	+78 26.6	5.141	5.553	-2.26	-2.7	18.4	109.7
Mar. 9	11 21.52	+77 59.6	5.208	5.577	-2.00	-5.1	18.4	106.8
Mar. 19	11 01.52	+77 08.8	5.287	5.602	-1.55	-7.2	18.5	103.4
Mar. 29	10 46.06	+75 57.2	5.374	5.627	-1.04	-8.8	18.6	99.6
Apr. 8	10 35.65	+74 29.0	5.470	5.654	-0.58	-10.0	18.6	95.5
Apr. 18	10 29.84	+72 48.6	5.572	5.681	-0.19	-10.9	18.7	91.1
Apr. 28	10 27.89	+70 59.4	5.679	5.709	+0.11	-11.5	18.7	86.6
May 8	10 28.98	+69 04.6	5.790	5.738	+0.34	-11.8	18.8	82.0
May 18	10 32.39	+67 06.4	5.902	5.767	+0.52	-12.0	18.9	77.4
May 28	10 37.56	+65 06.6	6.015	5.797	+0.65	-12.0	18.9	72.8
June 7	10 44.04	+63 06.7	6.126	5.828	+0.74	-11.9	19.0	68.3
June 17	10 51.48	+61 07.7	6.235	5.860	+0.82	-11.7	19.1	63.9
June 27	10 59.64	+59 10.7	6.339	5.892	+0.87	-11.4	19.1	59.7
July 7	11 08.31	+57 16.5	6.437	5.926	+0.90	-11.1	19.2	55.8
July 17	11 17.33	+55 25.7	6.529	5.959	+0.93	-10.7	19.2	52.2
July 27	11 26.60	+53 39.0	6.611	5.994	+0.94	-10.2	19.3	49.0
Aug. 6	11 36.00	+51 57.0	6.684	6.028	+0.95	-9.7	19.3	46.3
Aug. 16	11 45.46	+50 20.2	6.746	6.064	+0.95	-9.1	19.4	44.4
Aug. 26	11 54.92	+48 49.1	6.797	6.100	+0.94	-8.5	19.4	43.3
Sept. 5	12 04.29	+47 24.4	6.835	6.137	+0.92	-7.8	19.5	43.1
Sept. 15	12 13.54	+46 06.4	6.860	6.174	+0.91	-7.1	19.5	43.9
Sept. 25	12 22.60	+44 55.9	6.872	6.212	+0.88	-6.3	19.5	45.7
Oct. 5	12 31.40	+43 53.3	6.870	6.250	+0.85	-5.4	19.5	48.4
Oct. 15	12 39.88	+42 59.0	6.855	6.289	+0.81	-4.5	19.6	51.9
Oct. 25	12 47.96	+42 13.7	6.827	6.329	+0.76	-3.6	19.6	56.3
Nov. 4	12 55.57	+41 37.7	6.787	6.369	+0.70	-2.6	19.6	61.2
Nov. 14	13 02.61	+41 11.2	6.737	6.409	+0.64	-1.7	19.6	66.6
Nov. 24	13 08.98	+40 54.6	6.677	6.450	+0.56	-0.7	19.6	72.5
Dec. 4	13 14.58	+40 47.8	6.610	6.491	+0.47	+0.3	19.6	78.8
Dec. 14	13 19.27	+40 50.6	6.539	6.533	+0.37	+1.2	19.6	85.3
Dec. 24	13 22.94	+41 02.4	6.466	6.575	+0.25	+2.0	19.6	92.1
Jan. 3	13 25.47	+41 22.1	6.394	6.617	+0.13	+2.6	19.6	98.9
Jan. 13	13 26.73	+41 48.6	6.326	6.660	-0.01	+3.1	19.6	105.7
Jan. 23	13 26.64	+42 19.8	6.267	6.704	-0.15	+3.3	19.6	112.4
Feb. 2	13 25.15	+42 53.2	6.219	6.747	-0.29	+3.3	19.7	118.7
Feb. 12	13 22.25	+43 26.3	6.186	6.792	-0.42	+2.9	19.7	124.3
Feb. 22	13 18.03	+43 55.7	6.171	6.836	-0.54	+2.3	19.7	128.9
Mar. 3	13 12.66	+44 18.6	6.176	6.881	-0.63	+1.4	19.7	132.1
Mar. 13	13 06.40	+44 32.2	6.203	6.926	-0.68	+0.2	19.8	133.6
Mar. 23	12 59.57	+44 34.3	6.253	6.971	-0.70	-1.1	19.8	133.1

Comet C/2014 M2 (Christensen)

Epoch = 2015 June 27.0 TT
 T = 2014 July 10.88739 TT
 Peri. = 40.14994
 Node = 245.33584 2000.0
 Incl. = 32.41570
 q = 6.9092781 AU
 e = 0.9930028

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	19 26.48	+00 54.2	7.901	7.009	+0.73	+3.1	20.3	23.4
Jan. 18	19 33.76	+01 25.5	7.916	7.020	+0.72	+3.6	20.4	22.9
Jan. 28	19 40.96	+02 01.7	7.912	7.032	+0.70	+4.1	20.4	25.0
Feb. 7	19 47.97	+02 42.5	7.888	7.045	+0.67	+4.5	20.4	29.3
Feb. 17	19 54.71	+03 27.5	7.846	7.058	+0.64	+4.9	20.4	34.8
Feb. 27	20 01.10	+04 16.5	7.786	7.071	+0.60	+5.2	20.4	41.2
Mar. 9	20 07.06	+05 09.0	7.710	7.085	+0.54	+5.5	20.3	48.1
Mar. 19	20 12.51	+06 04.3	7.620	7.100	+0.49	+5.8	20.3	55.2
Mar. 29	20 17.37	+07 01.9	7.518	7.115	+0.42	+5.9	20.3	62.6
Apr. 8	20 21.57	+08 01.0	7.408	7.131	+0.35	+6.0	20.3	70.2
Apr. 18	20 25.05	+09 00.8	7.290	7.147	+0.27	+6.0	20.3	77.9
Apr. 28	20 27.74	+10 00.3	7.170	7.164	+0.19	+5.8	20.2	85.6
May 8	20 29.61	+10 58.5	7.050	7.181	+0.10	+5.6	20.2	93.4
May 18	20 30.63	+11 54.3	6.933	7.199	+0.02	+5.2	20.2	101.2
May 28	20 30.80	+12 46.5	6.823	7.217	-0.07	+4.7	20.2	109.0
June 7	20 30.13	+13 33.7	6.723	7.236	-0.14	+4.1	20.1	116.7
June 17	20 28.69	+14 14.7	6.637	7.256	-0.21	+3.4	20.1	124.1
June 27	20 26.57	+14 48.4	6.567	7.276	-0.27	+2.5	20.1	131.0
July 7	20 23.90	+15 13.9	6.517	7.296	-0.30	+1.7	20.1	137.2
July 17	20 20.86	+15 30.5	6.489	7.317	-0.32	+0.7	20.1	142.0
July 27	20 17.64	+15 38.0	6.483	7.338	-0.32	-0.1	20.1	145.0
Aug. 6	20 14.45	+15 36.6	6.502	7.360	-0.30	-0.9	20.1	145.4
Aug. 16	20 11.49	+15 27.2	6.545	7.382	-0.25	-1.7	20.2	143.3
Aug. 26	20 08.96	+15 10.6	6.612	7.405	-0.19	-2.2	20.2	139.1
Sept. 5	20 07.04	+14 48.6	6.700	7.429	-0.12	-2.6	20.2	133.3
Sept. 15	20 05.83	+14 22.6	6.809	7.452	-0.04	-2.8	20.3	126.6
Sept. 25	20 05.44	+13 54.4	6.935	7.476	+0.05	-2.9	20.3	119.3
Oct. 5	20 05.91	+13 25.7	7.075	7.501	+0.13	-2.8	20.4	111.6
Oct. 15	20 07.25	+12 58.0	7.226	7.526	+0.22	-2.5	20.5	103.8
Oct. 25	20 09.44	+12 32.7	7.385	7.552	+0.30	-2.2	20.5	95.9
Nov. 4	20 12.44	+12 10.9	7.547	7.578	+0.37	-1.7	20.6	88.0
Nov. 14	20 16.17	+11 53.6	7.710	7.604	+0.44	-1.2	20.6	80.2
Nov. 24	20 20.57	+11 41.4	7.870	7.631	+0.50	-0.7	20.7	72.5
Dec. 4	20 25.55	+11 34.8	8.023	7.658	+0.55	-0.1	20.8	65.0
Dec. 14	20 31.01	+11 34.1	8.167	7.686	+0.59	+0.5	20.8	57.7
Dec. 24	20 36.87	+11 39.4	8.298	7.714	+0.62	+1.1	20.9	50.7
Jan. 3	20 43.04	+11 50.8	8.416	7.742	+0.64	+1.7	20.9	44.2
Jan. 13	20 49.42	+12 08.2	8.517	7.771	+0.65	+2.3	21.0	38.4
Jan. 23	20 55.93	+12 31.2	8.601	7.800	+0.65	+2.8	21.0	33.5
Feb. 2	21 02.47	+12 59.7	8.666	7.829	+0.65	+3.3	21.0	30.1
Feb. 12	21 08.97	+13 33.2	8.712	7.859	+0.64	+3.8	21.1	28.6
Feb. 22	21 15.35	+14 11.3	8.738	7.889	+0.62	+4.2	21.1	29.2
Mar. 3	21 21.52	+14 53.4	8.744	7.920	+0.59	+4.6	21.1	31.9
Mar. 13	21 27.41	+15 39.2	8.732	7.951	+0.55	+4.9	21.1	36.2
Mar. 23	21 32.95	+16 27.9	8.701	7.982	+0.51	+5.1	21.1	41.5

Comet P/2014 L2 (NEOWISE)

Epoch = 2015 June 27.0 TT
 T = 2014 July 15.36032 TT
 Peri. = 182.75921
 Node = 149.40735 2000.0
 Incl. = 5.18451
 q = 2.2343446 AU
 e = 0.6465071
 a = 6.3207623 AU
 n = 0.06202259
 P = 15.89 years

$$m_1 = 6.6 + 5 \log(\Delta) + 20.0 \log(r(t-20))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	00 40.90	-00 35.5	2.697	2.740	+1.22 +8.4	17.2	82.0
Jan. 18	00 53.08	+00 48.7	2.873	2.790	+1.28 +8.6	17.5	75.2
Jan. 28	01 05.86	+02 14.8	3.048	2.841	+1.32 +8.7	17.8	68.6
Feb. 7	01 19.08	+03 41.5	3.220	2.893	+1.36 +8.6	18.1	62.1
Feb. 17	01 32.67	+05 07.6	3.388	2.946	+1.39 +8.5	18.3	55.7
Feb. 27	01 46.53	+06 32.1	3.549	3.000	+1.41 +8.2	18.6	49.3
Mar. 9	02 00.60	+07 54.1	3.703	3.054	+1.42 +7.9	18.8	43.1
Mar. 19	02 14.81	+09 12.8	3.847	3.110	+1.43 +7.5	19.1	36.9
Mar. 29	02 29.11	+10 27.7	3.981	3.166	+1.43 +7.0	19.3	30.8
Apr. 8	02 43.44	+11 38.0	4.104	3.222	+1.43 +6.5	19.5	24.7
Apr. 18	02 57.75	+12 43.3	4.214	3.279	+1.42 +6.0	19.7	18.7
Apr. 28	03 11.98	+13 43.3	4.310	3.336	+1.41 +5.4	19.9	12.8
May 8	03 26.09	+14 37.8	4.392	3.393	+1.39 +4.9	20.1	7.2
May 18	03 40.01	+15 26.4	4.459	3.451	+1.37 +4.3	20.3	4.0
May 28	03 53.68	+16 09.1	4.510	3.508	+1.34 +3.7	20.5	7.6
June 7	04 07.04	+16 45.9	4.546	3.566	+1.30 +3.1	20.6	13.4
June 17	04 20.02	+17 16.8	4.565	3.624	+1.25 +2.5	20.8	19.6
June 27	04 32.54	+17 42.0	4.569	3.682	+1.20 +2.0	20.9	26.0
July 7	04 44.51	+18 01.6	4.556	3.740	+1.13 +1.4	21.1	32.6
July 17	04 55.85	+18 16.1	4.529	3.798	+1.06 +1.0	21.2	39.4
July 27	05 06.45	+18 25.6	4.486	3.856	+0.98 +0.5	21.3	46.4
Aug. 6	05 16.21	+18 30.7	4.430	3.914	+0.88 +0.1	21.4	53.6
Aug. 16	05 25.01	+18 31.8	4.362	3.972	+0.77 -0.2	21.5	61.0
Aug. 26	05 32.72	+18 29.4	4.282	4.029	+0.65 -0.5	21.6	68.8
Sept. 5	05 39.20	+18 24.2	4.195	4.086	+0.51 -0.7	21.7	76.9
Sept. 15	05 44.33	+18 16.8	4.101	4.144	+0.36 -0.9	21.8	85.4
Sept. 25	05 47.96	+18 07.8	4.005	4.201	+0.20 -1.0	21.8	94.3
Oct. 5	05 50.00	+17 57.8	3.911	4.257	+0.03 -1.0	21.9	103.5
Oct. 15	05 50.34	+17 47.4	3.821	4.314	-0.14 -1.0	22.0	113.3
Oct. 25	05 48.96	+17 37.2	3.742	4.370	-0.30 -1.0	22.0	123.5
Nov. 4	05 45.93	+17 27.6	3.678	4.426	-0.45 -0.9	22.1	134.1
Nov. 14	05 41.41	+17 18.9	3.635	4.482	-0.57 -0.7	22.2	145.1
Nov. 24	05 35.70	+17 11.6	3.617	4.538	-0.65 -0.6	22.3	156.2
Dec. 4	05 29.20	+17 05.8	3.627	4.593	-0.68 -0.4	22.4	167.1
Dec. 14	05 22.40	+17 02.0	3.668	4.648	-0.66 -0.2	22.6	173.9
Dec. 24	05 15.82	+17 00.4	3.741	4.703	-0.59 +0.1	22.7	166.4
Jan. 3	05 09.92	+17 01.5	3.845	4.757	-0.48 +0.4	22.9	155.5
Jan. 13	05 05.09	+17 05.3	3.977	4.812	-0.35 +0.7	23.0	144.4
Jan. 23	05 01.59	+17 11.9	4.135	4.865	-0.20 +0.9	.	133.6
Feb. 2	04 59.55	+17 21.3	4.312	4.919	-0.05 +1.2	.	123.0
Feb. 12	04 59.00	+17 33.0	4.505	4.972	+0.09 +1.4	.	112.8
Feb. 22	04 59.90	+17 46.5	4.709	5.025	+0.22 +1.5	.	103.0
Mar. 3	05 02.14	+18 01.4	4.918	5.078	+0.35 +1.6	.	93.6
Mar. 13	05 05.60	+18 17.1	5.130	5.130	+0.45 +1.6	.	84.5
Mar. 23	05 10.13	+18 32.8	5.339	5.182	+0.54 +1.5	.	75.6

Comet 106P/Schuster

Epoch = 2015 June 27.0 TT
 T = 2014 July 20.21200 TT
 Peri. = 355.96277
 Node = 50.48444 2000.0
 Incl. = 20.15042
 q = 1.5454212 AU

e = 0.5887494
 a = 3.7578576 AU
 n = 0.13529869
 P = 7.28 years

$$m1 = 9.4 + 5 \log(\Delta) + 25.0 \log(r(t+10))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m	' "		°
Jan. 8	10 42.79	+41 48.4	1.509	2.292	-0.66	+10.8	19.6	132.6
Jan. 18	10 36.21	+43 36.4	1.517	2.356	-1.04	+8.8	19.9	139.9
Jan. 28	10 25.86	+45 04.2	1.545	2.421	-1.27	+5.6	20.2	145.4
Feb. 7	10 13.13	+46 00.2	1.596	2.486	-1.33	+1.8	20.6	147.6
Feb. 17	09 59.85	+46 18.1	1.671	2.550	-1.20	-2.0	20.9	145.9
Feb. 27	09 47.87	+45 58.2	1.769	2.615	-0.93	-5.2	21.3	141.1
Mar. 9	09 38.56	+45 06.5	1.888	2.679	-0.60	-7.5	21.7	134.5
Mar. 19	09 32.53	+43 51.5	2.026	2.743	-0.27	-9.1	22.1	127.0
Mar. 29	09 29.85	+42 20.8	2.180	2.806	+0.04	-10.0	22.5	119.2
Apr. 8	09 30.22	+40 40.9	2.346	2.869	+0.29	-10.5	22.9	111.5
Apr. 18	09 33.15	+38 56.3	2.522	2.931	+0.50	-10.7	.	104.0
Apr. 28	09 38.17	+37 09.5	2.705	2.993	+0.67	-10.7	.	96.6
May 8	09 44.84	+35 22.4	2.892	3.054	+0.79	-10.7	.	89.5
May 18	09 52.78	+33 35.9	3.080	3.115	+0.89	-10.6	.	82.6
May 28	10 01.70	+31 50.3	3.268	3.175	+0.96	-10.4	.	75.8
June 7	10 11.33	+30 06.1	3.452	3.234	+1.02	-10.3	.	69.2
June 17	10 21.51	+28 23.4	3.632	3.293	+1.06	-10.1	.	62.7
June 27	10 32.07	+26 42.3	3.805	3.351	+1.08	-9.9	.	56.4
July 7	10 42.90	+25 03.0	3.970	3.408	+1.10	-9.7	.	50.1
July 17	10 53.91	+23 25.5	4.124	3.465	+1.11	-9.5	.	43.9
July 27	11 05.01	+21 50.1	4.266	3.520	+1.11	-9.3	.	37.9
Aug. 6	11 16.15	+20 17.1	4.396	3.575	+1.11	-9.1	.	31.9
Aug. 16	11 27.28	+18 46.5	4.511	3.630	+1.11	-8.8	.	26.2
Aug. 26	11 38.34	+17 18.9	4.611	3.683	+1.10	-8.4	.	20.8
Sept. 5	11 49.30	+15 54.5	4.693	3.736	+1.08	-8.1	.	16.3
Sept. 15	12 00.12	+14 33.6	4.759	3.788	+1.06	-7.7	.	13.6
Sept. 25	12 10.74	+13 16.8	4.806	3.840	+1.04	-7.2	.	13.9
Oct. 5	12 21.12	+12 04.6	4.835	3.891	+1.01	-6.7	.	17.3
Oct. 15	12 31.22	+10 57.3	4.844	3.941	+0.97	-6.2	.	22.4
Oct. 25	12 40.95	+09 55.5	4.835	3.990	+0.93	-5.6	.	28.6
Nov. 4	12 50.26	+08 59.9	4.807	4.039	+0.88	-4.9	.	35.3
Nov. 14	12 59.05	+08 11.0	4.761	4.086	+0.82	-4.2	.	42.5
Nov. 24	13 07.24	+07 29.4	4.699	4.134	+0.75	-3.4	.	50.0
Dec. 4	13 14.71	+06 55.6	4.621	4.180	+0.66	-2.5	.	57.8
Dec. 14	13 21.34	+06 30.4	4.530	4.226	+0.57	-1.6	.	66.0
Dec. 24	13 27.00	+06 14.0	4.429	4.271	+0.45	-0.7	.	74.4
Jan. 3	13 31.55	+06 07.0	4.320	4.315	+0.33	+0.2	.	83.2
Jan. 13	13 34.83	+06 09.5	4.207	4.359	+0.19	+1.2	.	92.3
Jan. 23	13 36.72	+06 21.3	4.094	4.402	+0.04	+2.1	.	101.8
Feb. 2	13 37.10	+06 41.9	3.987	4.444	-0.12	+2.8	.	111.5
Feb. 12	13 35.90	+07 10.4	3.889	4.486	-0.28	+3.5	.	121.6
Feb. 22	13 33.12	+07 45.0	3.807	4.527	-0.43	+3.8	.	131.8
Mar. 3	13 28.87	+08 23.4	3.744	4.567	-0.55	+3.9	.	142.1
Mar. 13	13 23.34	+09 02.8	3.706	4.607	-0.65	+3.7	.	151.9
Mar. 23	13 16.85	+09 39.8	3.696	4.646	-0.70	+3.2	.	160.1

Comet P/2014 W1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 July 31.56842 TT
 Peri. = 150.37969
 Node = 247.25273 2000.0
 Incl. = 8.86731
 q = 2.6710257 AU

e = 0.3949465
 a = 4.4145281 AU
 n = 0.10626192
 P = 9.28 years

$$m1 = 11.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion		m1	Elong.
					m	' "		°
Jan. 8	04 13.74	+18 47.2	2.063	2.868	0.00	-2.1	20.0	137.7
Jan. 18	04 13.71	+18 26.2	2.186	2.891	+0.23	-1.1	20.2	127.5
Jan. 28	04 16.04	+18 14.8	2.323	2.916	+0.45	-0.3	20.4	117.8
Feb. 7	04 20.58	+18 11.8	2.473	2.941	+0.65	+0.3	20.6	108.7
Feb. 17	04 27.07	+18 15.3	2.630	2.968	+0.82	+0.8	20.8	100.2
Feb. 27	04 35.28	+18 23.3	2.792	2.995	+0.97	+1.1	21.0	92.0
Mar. 9	04 44.95	+18 33.8	2.955	3.023	+1.09	+1.1	21.2	84.3
Mar. 19	04 55.83	+18 45.1	3.118	3.052	+1.19	+1.0	21.3	77.0
Mar. 29	05 07.73	+18 55.6	3.279	3.082	+1.27	+0.8	21.5	69.9
Apr. 8	05 20.45	+19 04.0	3.434	3.112	+1.34	+0.5	21.7	63.1
Apr. 18	05 33.81	+19 09.1	3.584	3.142	+1.39	+0.1	21.8	56.5
Apr. 28	05 47.69	+19 10.2	3.725	3.174	+1.42	-0.4	22.0	50.0
May 8	06 01.93	+19 06.5	3.858	3.206	+1.45	-0.9	22.1	43.7
May 18	06 16.42	+18 57.7	3.980	3.238	+1.46	-1.4	22.3	37.6
May 28	06 31.06	+18 43.3	4.091	3.271	+1.47	-2.0	22.4	31.5
June 7	06 45.74	+18 23.3	4.190	3.304	+1.46	-2.6	22.5	25.5
June 17	07 00.38	+17 57.7	4.277	3.337	+1.45	-3.1	22.6	19.6
June 27	07 14.90	+17 26.6	4.349	3.371	+1.43	-3.6	22.7	13.9
July 7	07 29.23	+16 50.1	4.407	3.405	+1.41	-4.1	22.8	8.6
July 17	07 43.29	+16 08.7	4.450	3.439	+1.37	-4.6	22.9	5.2
July 27	07 57.03	+15 22.6	4.479	3.474	+1.33	-5.0	23.0	7.4
Aug. 6	08 10.38	+14 32.4	4.491	3.509	+1.29	-5.4	23.0	12.6
Aug. 16	08 23.28	+13 38.5	4.489	3.543	+1.24	-5.7	.	18.6
Aug. 26	08 35.67	+12 41.6	4.470	3.578	+1.18	-5.9	.	24.9
Sept. 5	08 47.49	+11 42.3	4.436	3.613	+1.12	-6.1	.	31.4
Sept. 15	08 58.66	+10 41.2	4.388	3.649	+1.04	-6.2	.	38.1
Sept. 25	09 09.10	+09 39.2	4.324	3.684	+0.96	-6.2	.	45.0
Oct. 5	09 18.72	+08 37.1	4.248	3.719	+0.87	-6.1	.	52.1
Oct. 15	09 27.44	+07 35.7	4.159	3.754	+0.77	-6.0	.	59.6
Oct. 25	09 35.13	+06 36.2	4.060	3.789	+0.65	-5.7	.	67.3
Nov. 4	09 41.68	+05 39.5	3.952	3.824	+0.53	-5.3	.	75.4
Nov. 14	09 46.95	+04 47.0	3.839	3.860	+0.39	-4.7	.	83.8
Nov. 24	09 50.80	+03 59.8	3.722	3.895	+0.23	-4.0	.	92.6
Dec. 4	09 53.13	+03 19.3	3.607	3.929	+0.07	-3.2	.	101.8
Dec. 14	09 53.82	+02 47.0	3.496	3.964	-0.10	-2.3	.	111.5
Dec. 24	09 52.83	+02 24.1	3.395	3.999	-0.26	-1.3	.	121.6
Jan. 3	09 50.19	+02 11.5	3.309	4.034	-0.41	-0.2	.	132.0
Jan. 13	09 46.04	+02 10.0	3.242	4.068	-0.54	+0.9	.	142.7
Jan. 23	09 40.67	+02 19.4	3.199	4.102	-0.62	+1.9	.	153.3
Feb. 2	09 34.48	+02 38.5	3.184	4.137	-0.65	+2.7	.	163.1
Feb. 12	09 27.96	+03 05.6	3.198	4.171	-0.63	+3.2	.	168.7
Feb. 22	09 21.66	+03 38.1	3.243	4.204	-0.56	+3.5	.	164.4
Mar. 3	09 16.08	+04 13.0	3.319	4.238	-0.45	+3.5	.	155.0
Mar. 13	09 11.61	+04 47.6	3.421	4.271	-0.31	+3.2	.	144.7
Mar. 23	09 08.53	+05 19.4	3.548	4.305	-0.16	+2.7	.	134.4

Comet C/2013 P4 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Aug. 12.05771 TT
 Peri. = 113.55029
 Node = 256.59776 2000.0
 Incl. = 4.26532
 q = 5.9668286 AU
 e = 0.5951313
 a = 14.7376880 AU
 n = 0.01742048
 P = 56.58 years

$$m1 = 3.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	00 44.15	+08 29.7	6.004	6.021	+0.41	+1.8	18.6	86.3
Jan. 18	00 48.30	+08 47.6	6.170	6.029	+0.49	+2.3	18.7	77.2
Jan. 28	00 53.23	+09 10.9	6.331	6.037	+0.56	+2.8	18.7	68.3
Feb. 7	00 58.87	+09 38.8	6.483	6.045	+0.62	+3.2	18.8	59.7
Feb. 17	01 05.10	+10 10.8	6.624	6.054	+0.67	+3.5	18.8	51.2
Feb. 27	01 11.84	+10 46.0	6.752	6.063	+0.72	+3.8	18.9	42.9
Mar. 9	01 19.00	+11 23.8	6.863	6.073	+0.75	+4.0	18.9	34.7
Mar. 19	01 26.50	+12 03.6	6.956	6.084	+0.78	+4.1	19.0	26.8
Mar. 29	01 34.25	+12 44.6	7.030	6.094	+0.79	+4.2	19.0	18.9
Apr. 8	01 42.18	+13 26.3	7.084	6.105	+0.80	+4.2	19.0	11.2
Apr. 18	01 50.21	+14 08.1	7.118	6.117	+0.81	+4.1	19.1	4.1
Apr. 28	01 58.28	+14 49.5	7.131	6.129	+0.80	+4.1	19.1	5.2
May 8	02 06.30	+15 30.0	7.123	6.142	+0.79	+3.9	19.1	12.4
May 18	02 14.22	+16 09.3	7.096	6.155	+0.77	+3.8	19.1	20.0
May 28	02 21.94	+16 46.8	7.048	6.168	+0.75	+3.6	19.1	27.6
June 7	02 29.39	+17 22.4	6.983	6.182	+0.71	+3.3	19.1	35.2
June 17	02 36.50	+17 55.5	6.900	6.196	+0.67	+3.1	19.1	43.0
June 27	02 43.17	+18 26.1	6.802	6.210	+0.62	+2.8	19.1	50.9
July 7	02 49.32	+18 53.7	6.690	6.226	+0.55	+2.5	19.0	58.9
July 17	02 54.86	+19 18.2	6.567	6.241	+0.48	+2.1	19.0	67.0
July 27	02 59.69	+19 39.4	6.436	6.257	+0.40	+1.8	19.0	75.4
Aug. 6	03 03.72	+19 56.9	6.299	6.273	+0.31	+1.4	19.0	83.9
Aug. 16	03 06.86	+20 10.7	6.159	6.290	+0.22	+1.0	18.9	92.7
Aug. 26	03 09.03	+20 20.4	6.022	6.307	+0.12	+0.5	18.9	101.8
Sept. 5	03 10.18	+20 25.9	5.889	6.324	+0.01	+0.1	18.9	111.2
Sept. 15	03 10.29	+20 27.0	5.767	6.342	-0.09	-0.3	18.8	120.9
Sept. 25	03 09.37	+20 23.7	5.659	6.360	-0.19	-0.8	18.8	130.8
Oct. 5	03 07.51	+20 16.0	5.569	6.378	-0.27	-1.2	18.8	141.1
Oct. 15	03 04.81	+20 04.3	5.502	6.397	-0.33	-1.5	18.8	151.6
Oct. 25	03 01.49	+19 49.0	5.462	6.416	-0.37	-1.8	18.8	162.3
Nov. 4	02 57.78	+19 30.9	5.450	6.436	-0.38	-2.0	18.8	172.9
Nov. 14	02 53.95	+19 11.1	5.469	6.456	-0.36	-2.0	18.8	175.0
Nov. 24	02 50.30	+18 51.0	5.519	6.476	-0.32	-1.9	18.9	164.4
Dec. 4	02 47.10	+18 31.8	5.599	6.496	-0.25	-1.7	18.9	153.6
Dec. 14	02 44.57	+18 14.9	5.706	6.517	-0.17	-1.4	19.0	142.8
Dec. 24	02 42.88	+18 01.3	5.837	6.538	-0.07	-1.0	19.1	132.2
Jan. 3	02 42.15	+17 51.7	5.988	6.560	+0.03	-0.5	19.1	121.8
Jan. 13	02 42.42	+17 46.8	6.155	6.582	+0.13	0.0	19.2	111.7
Jan. 23	02 43.72	+17 46.5	6.332	6.604	+0.23	+0.4	19.3	101.8
Feb. 2	02 45.98	+17 50.8	6.516	6.626	+0.32	+0.9	19.4	92.2
Feb. 12	02 49.17	+17 59.3	6.700	6.649	+0.40	+1.2	19.5	82.8
Feb. 22	02 53.20	+18 11.5	6.882	6.672	+0.48	+1.5	19.6	73.7
Mar. 3	02 57.97	+18 27.0	7.057	6.695	+0.54	+1.8	19.6	64.8
Mar. 13	03 03.40	+18 45.0	7.222	6.719	+0.60	+2.0	19.7	56.1
Mar. 23	03 09.40	+19 05.0	7.374	6.743	+0.65	+2.1	19.8	47.6

Comet C/2013 TW5 (Spacewatch)

Epoch = 2015 June 27.0 TT
 T = 2014 Aug. 18.28634 TT
 Peri. = 190.44797
 Node = 319.70654 2000.0
 Incl. = 31.40973
 q = 5.8313560 AU
 e = 0.9827840

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	11 00.05	-08 22.1	5.409	5.918	-0.17	-4.5	17.5	116.8
Jan. 18	10 58.32	-09 07.2	5.291	5.930	-0.27	-3.8	17.5	126.5
Jan. 28	10 55.61	-09 45.0	5.193	5.943	-0.35	-3.0	17.5	136.2
Feb. 7	10 52.06	-10 14.9	5.117	5.957	-0.42	-2.2	17.4	145.7
Feb. 17	10 47.90	-10 36.8	5.067	5.972	-0.45	-1.4	17.4	154.2
Feb. 27	10 43.38	-10 50.8	5.045	5.987	-0.46	-0.7	17.4	160.5
Mar. 9	10 38.81	-10 57.9	5.053	6.004	-0.43	-0.1	17.4	161.8
Mar. 19	10 34.50	-10 59.2	5.090	6.021	-0.38	+0.3	17.5	157.4
Mar. 29	10 30.72	-10 56.5	5.155	6.038	-0.30	+0.5	17.5	149.8
Apr. 8	10 27.70	-10 51.5	5.246	6.057	-0.21	+0.5	17.6	141.0
Apr. 18	10 25.60	-10 46.2	5.361	6.076	-0.11	+0.4	17.6	131.8
Apr. 28	10 24.51	-10 42.1	5.494	6.096	0.00	+0.1	17.7	122.7
May 8	10 24.48	-10 40.8	5.642	6.117	+0.10	-0.2	17.8	113.7
May 18	10 25.47	-10 43.3	5.801	6.138	+0.20	-0.7	17.9	104.9
May 28	10 27.45	-10 50.4	5.967	6.160	+0.29	-1.2	17.9	96.3
June 7	10 30.34	-11 02.6	6.136	6.183	+0.37	-1.8	18.0	88.0
June 17	10 34.05	-11 20.3	6.304	6.207	+0.44	-2.3	18.1	79.9
June 27	10 38.48	-11 43.5	6.469	6.231	+0.51	-2.9	18.2	72.0
July 7	10 43.54	-12 12.2	6.628	6.256	+0.56	-3.4	18.3	64.4
July 17	10 49.14	-12 46.3	6.777	6.281	+0.60	-3.9	18.3	57.0
July 27	10 55.19	-13 25.5	6.915	6.307	+0.64	-4.4	18.4	49.8
Aug. 6	11 01.60	-14 09.6	7.040	6.334	+0.67	-4.9	18.5	42.9
Aug. 16	11 08.30	-14 58.2	7.149	6.361	+0.69	-5.3	18.5	36.3
Aug. 26	11 15.21	-15 51.1	7.242	6.389	+0.70	-5.7	18.6	30.2
Sept. 5	11 22.25	-16 47.8	7.318	6.417	+0.71	-6.0	18.6	24.9
Sept. 15	11 29.35	-17 48.1	7.375	6.446	+0.71	-6.3	18.7	21.1
Sept. 25	11 36.45	-18 51.5	7.412	6.476	+0.70	-6.6	18.7	19.6
Oct. 5	11 43.46	-19 57.6	7.430	6.506	+0.69	-6.8	18.7	21.0
Oct. 15	11 50.32	-21 06.1	7.429	6.537	+0.66	-7.0	18.7	24.8
Oct. 25	11 56.94	-22 16.4	7.409	6.568	+0.63	-7.2	18.8	30.2
Nov. 4	12 03.23	-23 28.2	7.371	6.600	+0.59	-7.3	18.8	36.5
Nov. 14	12 09.12	-24 41.0	7.315	6.632	+0.54	-7.3	18.8	43.5
Nov. 24	12 14.50	-25 54.1	7.244	6.665	+0.48	-7.3	18.8	50.9
Dec. 4	12 19.27	-27 06.9	7.159	6.698	+0.41	-7.2	18.8	58.6
Dec. 14	12 23.33	-28 18.8	7.063	6.732	+0.33	-7.0	18.8	66.5
Dec. 24	12 26.59	-29 28.9	6.959	6.766	+0.24	-6.7	18.8	74.7
Jan. 3	12 28.94	-30 36.3	6.849	6.801	+0.14	-6.4	18.8	83.1
Jan. 13	12 30.32	-31 39.8	6.738	6.836	+0.03	-5.8	18.8	91.5
Jan. 23	12 30.65	-32 38.3	6.630	6.872	-0.07	-5.2	18.8	100.1
Feb. 2	12 29.93	-33 30.5	6.528	6.908	-0.18	-4.5	18.8	108.7
Feb. 12	12 28.17	-34 15.0	6.437	6.944	-0.27	-3.6	18.8	117.2
Feb. 22	12 25.48	-34 50.7	6.360	6.981	-0.35	-2.6	18.8	125.5
Mar. 3	12 22.00	-35 16.6	6.301	7.018	-0.41	-1.5	18.8	133.3
Mar. 13	12 17.95	-35 32.1	6.264	7.056	-0.44	-0.5	18.8	140.1
Mar. 23	12 13.58	-35 37.1	6.251	7.094	-0.44	+0.5	18.8	145.4

Comet C/2012 K8 (Lemmon)

Epoch = 2015 June 27.0 TT
 T = 2014 Aug. 19.36562 TT
 Peri. = 75.85572
 Node = 312.80651 2000.0
 Incl. = 106.11219
 q = 6.4631408 AU
 e = 1.0008155

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	17 17.79	+45 29.0	6.756	6.534	+0.36	+7.1	17.5	72.8
Jan. 18	17 21.38	+46 40.0	6.712	6.544	+0.29	+8.4	17.5	76.0
Jan. 28	17 24.28	+48 03.8	6.663	6.555	+0.20	+9.5	17.5	79.5
Feb. 7	17 26.24	+49 39.3	6.613	6.566	+0.07	+10.6	17.5	83.0
Feb. 17	17 26.98	+51 24.9	6.564	6.579	-0.08	+11.4	17.5	86.5
Feb. 27	17 26.18	+53 18.7	6.520	6.592	-0.27	+11.9	17.5	89.8
Mar. 9	17 23.50	+55 17.8	6.482	6.605	-0.50	+12.1	17.5	92.8
Mar. 19	17 18.54	+57 18.9	6.454	6.619	-0.76	+11.9	17.5	95.2
Mar. 29	17 10.93	+59 17.9	6.437	6.634	-1.06	+11.2	17.5	97.1
Apr. 8	17 00.32	+61 09.8	6.433	6.650	-1.38	+10.0	17.5	98.2
Apr. 18	16 46.52	+62 49.6	6.443	6.666	-1.69	+8.2	17.5	98.5
Apr. 28	16 29.62	+64 11.9	6.467	6.683	-1.95	+6.0	17.5	98.0
May 8	16 10.13	+65 11.9	6.506	6.700	-2.11	+3.5	17.5	96.8
May 18	15 48.98	+65 46.5	6.557	6.718	-2.15	+0.8	17.6	94.8
May 28	15 27.51	+65 54.5	6.620	6.736	-2.04	-1.7	17.6	92.2
June 7	15 07.09	+65 37.3	6.693	6.756	-1.83	-3.9	17.6	89.2
June 17	14 48.81	+64 58.2	6.774	6.775	-1.54	-5.6	17.7	85.8
June 27	14 33.36	+64 01.8	6.860	6.796	-1.24	-6.9	17.7	82.1
July 7	14 20.98	+62 53.1	6.949	6.817	-0.94	-7.6	17.7	78.4
July 17	14 11.55	+61 36.7	7.037	6.838	-0.67	-8.0	17.8	74.6
July 27	14 04.81	+60 16.6	7.123	6.860	-0.44	-8.0	17.8	71.0
Aug. 6	14 00.40	+58 56.2	7.204	6.883	-0.24	-7.8	17.9	67.7
Aug. 16	13 57.95	+57 38.0	7.278	6.906	-0.08	-7.4	17.9	64.7
Aug. 26	13 57.13	+56 24.2	7.343	6.930	+0.05	-6.8	17.9	62.2
Sept. 5	13 57.63	+55 16.5	7.396	6.954	+0.16	-6.0	18.0	60.4
Sept. 15	13 59.19	+54 16.2	7.438	6.979	+0.24	-5.2	18.0	59.4
Sept. 25	14 01.58	+53 24.6	7.466	7.004	+0.30	-4.2	18.0	59.1
Oct. 5	14 04.58	+52 42.5	7.480	7.030	+0.34	-3.2	18.0	59.8
Oct. 15	14 08.02	+52 10.8	7.480	7.056	+0.37	-2.1	18.1	61.4
Oct. 25	14 11.72	+51 50.2	7.466	7.083	+0.38	-0.9	18.1	63.8
Nov. 4	14 15.49	+51 41.4	7.440	7.110	+0.37	+0.3	18.1	67.0
Nov. 14	14 19.17	+51 44.8	7.402	7.138	+0.34	+1.6	18.1	70.8
Nov. 24	14 22.57	+52 00.8	7.354	7.166	+0.29	+2.9	18.1	75.2
Dec. 4	14 25.50	+52 29.3	7.299	7.195	+0.22	+4.1	18.1	80.1
Dec. 14	14 27.74	+53 10.2	7.240	7.224	+0.13	+5.3	18.1	85.2
Dec. 24	14 29.05	+54 02.8	7.178	7.254	+0.01	+6.3	18.1	90.5
Jan. 3	14 29.17	+55 06.1	7.119	7.284	-0.14	+7.2	18.1	95.8
Jan. 13	14 27.81	+56 18.3	7.064	7.315	-0.32	+7.9	18.1	100.9
Jan. 23	14 24.65	+57 37.0	7.019	7.345	-0.53	+8.2	18.1	105.6
Feb. 2	14 19.39	+58 59.1	6.986	7.377	-0.76	+8.2	18.1	109.7
Feb. 12	14 11.75	+60 20.8	6.968	7.409	-1.02	+7.7	18.1	112.9
Feb. 22	14 01.57	+61 37.5	6.968	7.441	-1.27	+6.7	18.1	115.1
Mar. 3	13 48.84	+62 44.5	6.987	7.473	-1.50	+5.3	18.2	115.9
Mar. 13	13 33.84	+63 37.2	7.026	7.506	-1.67	+3.5	18.2	115.4
Mar. 23	13 17.15	+64 11.7	7.085	7.539	-1.75	+1.4	18.2	113.6

Comet C/2012 K1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Aug. 27.66596 TT
 Peri. = 203.11389
 Node = 317.73926 2000.0
 Incl. = 142.42778
 q = 1.0547167 AU
 e = 1.0003103

$$m1 = 6.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	00 07.48	-31 28.3	2.520	2.282	-0.02 +16.1	12.2	64.8
Jan. 18	00 07.31	-28 47.6	2.796	2.400	+0.19 +13.6	12.6	56.7
Jan. 28	00 09.17	-26 31.8	3.055	2.517	+0.32 +11.6	13.0	48.8
Feb. 7	00 12.32	-24 35.8	3.295	2.634	+0.40 +10.0	13.4	41.2
Feb. 17	00 16.33	-22 55.8	3.511	2.750	+0.45 +8.6	13.7	34.1
Feb. 27	00 20.87	-21 29.7	3.702	2.864	+0.48 +7.4	14.0	27.9
Mar. 9	00 25.69	-20 15.8	3.866	2.978	+0.49 +6.3	14.3	23.1
Mar. 19	00 30.61	-19 13.2	4.002	3.091	+0.49 +5.2	14.5	20.6
Mar. 29	00 35.48	-18 21.3	4.110	3.203	+0.46 +4.1	14.7	21.5
Apr. 8	00 40.13	-17 39.9	4.191	3.314	+0.43 +3.1	14.9	25.3
Apr. 18	00 44.43	-17 09.0	4.243	3.424	+0.38 +2.0	15.1	31.1
Apr. 28	00 48.24	-16 48.9	4.270	3.532	+0.32 +0.9	15.2	38.1
May 8	00 51.41	-16 40.0	4.272	3.640	+0.24 -0.3	15.4	45.8
May 18	00 53.81	-16 42.5	4.252	3.747	+0.14 -1.5	15.5	53.9
May 28	00 55.24	-16 57.2	4.214	3.854	+0.03 -2.7	15.6	62.6
June 7	00 55.54	-17 24.2	4.161	3.959	-0.10 -4.0	15.7	71.6
June 17	00 54.51	-18 03.9	4.097	4.063	-0.25 -5.2	15.8	80.9
June 27	00 51.97	-18 56.2	4.028	4.167	-0.42 -6.4	15.8	90.7
July 7	00 47.74	-20 00.1	3.960	4.269	-0.61 -7.4	15.9	100.8
July 17	00 41.66	-21 14.0	3.899	4.371	-0.80 -8.1	16.0	111.2
July 27	00 33.66	-22 35.3	3.852	4.472	-0.99 -8.4	16.0	121.8
Aug. 6	00 23.80	-23 59.6	3.826	4.572	-1.15 -8.3	16.1	132.4
Aug. 16	00 12.26	-25 22.3	3.827	4.672	-1.28 -7.5	16.2	142.5
Aug. 26	23 59.44	-26 37.6	3.861	4.770	-1.35 -6.3	16.3	151.1
Sept. 5	23 45.91	-27 40.7	3.930	4.868	-1.36 -4.7	16.4	155.9
Sept. 15	23 32.32	-28 27.9	4.037	4.966	-1.30 -3.0	16.6	154.8
Sept. 25	23 19.36	-28 57.4	4.180	5.062	-1.17 -1.2	16.7	148.5
Oct. 5	23 07.63	-29 09.6	4.356	5.158	-1.01 +0.3	16.9	139.6
Oct. 15	22 57.53	-29 06.3	4.561	5.253	-0.82 +1.6	17.1	129.6
Oct. 25	22 49.29	-28 50.0	4.789	5.348	-0.63 +2.6	17.3	119.4
Nov. 4	22 42.97	-28 23.7	5.036	5.442	-0.45 +3.4	17.5	109.1
Nov. 14	22 38.50	-27 50.0	5.293	5.535	-0.28 +3.9	17.6	99.0
Nov. 24	22 35.73	-27 11.0	5.556	5.628	-0.13 +4.2	17.8	89.1
Dec. 4	22 34.46	-26 28.6	5.819	5.720	0.00 +4.4	18.0	79.4
Dec. 14	22 34.48	-25 44.2	6.076	5.812	+0.11 +4.5	18.2	69.9
Dec. 24	22 35.60	-24 58.9	6.323	5.903	+0.20 +4.5	18.3	60.6
Jan. 3	22 37.60	-24 13.5	6.556	5.993	+0.27 +4.5	18.5	51.5
Jan. 13	22 40.31	-23 28.6	6.770	6.083	+0.33 +4.4	18.6	42.6
Jan. 23	22 43.56	-22 45.0	6.964	6.173	+0.36 +4.2	18.7	34.0
Feb. 2	22 47.21	-22 03.0	7.134	6.262	+0.39 +4.0	18.8	25.9
Feb. 12	22 51.10	-21 23.2	7.278	6.350	+0.40 +3.7	18.9	18.6
Feb. 22	22 55.13	-20 46.1	7.396	6.438	+0.40 +3.4	19.0	13.5
Mar. 3	22 59.17	-20 12.0	7.486	6.526	+0.39 +3.1	19.1	13.4
Mar. 13	23 03.11	-19 41.4	7.549	6.613	+0.37 +2.7	19.2	18.3
Mar. 23	23 06.85	-19 14.8	7.586	6.699	+0.34 +2.2	19.3	25.4

Comet P/2011 S1 (Gibbs)

Epoch = 2015 June 27.0 TT
 T = 2014 Aug. 28.28333 TT
 Peri. = 193.61355
 Node = 218.90514 2000.0
 Incl. = 2.68139
 q = 6.8932443 AU
 e = 0.2018344
 a = 8.6363585 AU
 n = 0.03883364
 P = 25.38 years

$$m1 = 2.8 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	03 27.02	+17 41.2	6.272	6.904	-0.07	-0.3	19.4	126.7
Jan. 18	03 26.27	+17 38.2	6.413	6.906	+0.03	+0.1	19.4	116.3
Jan. 28	03 26.53	+17 39.0	6.568	6.908	+0.13	+0.5	19.5	106.2
Feb. 7	03 27.78	+17 43.6	6.731	6.910	+0.22	+0.8	19.5	96.4
Feb. 17	03 29.99	+17 51.5	6.896	6.912	+0.31	+1.1	19.6	86.8
Feb. 27	03 33.10	+18 02.5	7.061	6.914	+0.39	+1.4	19.6	77.5
Mar. 9	03 37.02	+18 16.0	7.220	6.916	+0.47	+1.5	19.7	68.4
Mar. 19	03 41.68	+18 31.5	7.369	6.919	+0.53	+1.7	19.7	59.6
Mar. 29	03 46.99	+18 48.4	7.507	6.922	+0.59	+1.8	19.8	51.0
Apr. 8	03 52.84	+19 06.3	7.629	6.924	+0.63	+1.8	19.8	42.5
Apr. 18	03 59.16	+19 24.6	7.734	6.927	+0.67	+1.8	19.9	34.2
Apr. 28	04 05.85	+19 42.8	7.820	6.930	+0.70	+1.8	19.9	26.1
May 8	04 12.83	+20 00.5	7.885	6.933	+0.72	+1.7	19.9	18.1
May 18	04 20.01	+20 17.4	7.929	6.936	+0.73	+1.6	19.9	10.2
May 28	04 27.31	+20 33.2	7.952	6.940	+0.73	+1.4	19.9	2.5
June 7	04 34.65	+20 47.6	7.952	6.943	+0.73	+1.3	19.9	5.8
June 17	04 41.95	+21 00.4	7.930	6.947	+0.72	+1.1	19.9	13.5
June 27	04 49.13	+21 11.6	7.887	6.950	+0.70	+0.9	19.9	21.4
July 7	04 56.10	+21 21.0	7.823	6.954	+0.67	+0.8	19.9	29.3
July 17	05 02.78	+21 28.6	7.740	6.958	+0.63	+0.6	19.9	37.2
July 27	05 09.08	+21 34.5	7.639	6.962	+0.58	+0.4	19.9	45.3
Aug. 6	05 14.91	+21 38.7	7.521	6.966	+0.53	+0.3	19.8	53.5
Aug. 16	05 20.18	+21 41.3	7.390	6.970	+0.46	+0.1	19.8	61.9
Aug. 26	05 24.79	+21 42.4	7.248	6.975	+0.39	0.0	19.8	70.4
Sept. 5	05 28.64	+21 42.2	7.097	6.979	+0.30	-0.1	19.7	79.2
Sept. 15	05 31.66	+21 40.9	6.942	6.984	+0.21	-0.2	19.7	88.2
Sept. 25	05 33.76	+21 38.7	6.786	6.988	+0.11	-0.3	19.6	97.5
Oct. 5	05 34.88	+21 35.7	6.634	6.993	+0.01	-0.4	19.6	107.1
Oct. 15	05 34.98	+21 32.0	6.490	6.998	-0.09	-0.4	19.5	116.9
Oct. 25	05 34.07	+21 27.7	6.359	7.003	-0.19	-0.5	19.5	127.1
Nov. 4	05 32.19	+21 23.0	6.245	7.008	-0.28	-0.5	19.5	137.5
Nov. 14	05 29.43	+21 17.9	6.154	7.014	-0.35	-0.5	19.4	148.1
Nov. 24	05 25.97	+21 12.4	6.088	7.019	-0.40	-0.6	19.4	159.0
Dec. 4	05 22.02	+21 06.7	6.052	7.024	-0.42	-0.6	19.4	169.9
Dec. 14	05 17.82	+21 01.0	6.046	7.030	-0.41	-0.5	19.4	177.6
Dec. 24	05 13.68	+20 55.6	6.073	7.036	-0.38	-0.5	19.4	167.4
Jan. 3	05 09.85	+20 50.8	6.129	7.041	-0.33	-0.4	19.5	156.4
Jan. 13	05 06.59	+20 47.0	6.215	7.047	-0.25	-0.3	19.5	145.5
Jan. 23	05 04.09	+20 44.4	6.326	7.053	-0.16	-0.1	19.5	134.7
Feb. 2	05 02.50	+20 43.4	6.458	7.059	-0.06	+0.1	19.6	124.2
Feb. 12	05 01.90	+20 44.1	6.607	7.066	+0.04	+0.2	19.6	113.9
Feb. 22	05 02.32	+20 46.3	6.768	7.072	+0.14	+0.4	19.7	103.9
Mar. 3	05 03.75	+20 49.9	6.936	7.078	+0.24	+0.5	19.8	94.2
Mar. 13	05 06.13	+20 54.7	7.105	7.085	+0.33	+0.6	19.8	84.8
Mar. 23	05 09.41	+21 00.4	7.273	7.092	+0.41	+0.6	19.9	75.6

Comet 284P/McNaught

Epoch = 2015 June 27.0 TT
 T = 2014 Sept. 2.42684 TT
 Peri. = 202.84489
 Node = 144.29319 2000.0
 Incl. = 11.86316
 q = 2.2893918 AU
 e = 0.3765516
 a = 3.6721432 AU
 n = 0.14006340
 P = 7.04 years

$$m1 = 9.2 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	00 30.99	-08 04.4	2.478	2.451	+1.39	+10.5	17.0	77.0
Jan. 18	00 44.85	-06 19.8	2.619	2.476	+1.45	+10.7	17.2	70.8
Jan. 28	00 59.36	-04 33.1	2.757	2.501	+1.50	+10.7	17.4	64.8
Feb. 7	01 14.38	-02 45.7	2.892	2.528	+1.54	+10.7	17.5	58.9
Feb. 17	01 29.81	-00 59.2	3.022	2.557	+1.58	+10.4	17.7	53.2
Feb. 27	01 45.60	+00 45.2	3.147	2.586	+1.61	+10.1	17.9	47.6
Mar. 9	02 01.65	+02 26.4	3.266	2.616	+1.63	+9.7	18.0	42.1
Mar. 19	02 17.93	+04 03.3	3.377	2.647	+1.65	+9.2	18.2	36.8
Mar. 29	02 34.38	+05 35.1	3.479	2.679	+1.66	+8.6	18.3	31.5
Apr. 8	02 50.95	+07 01.0	3.572	2.711	+1.66	+7.9	18.5	26.3
Apr. 18	03 07.60	+08 20.3	3.656	2.745	+1.67	+7.2	18.6	21.2
Apr. 28	03 24.28	+09 32.4	3.729	2.778	+1.67	+6.5	18.7	16.5
May 8	03 40.93	+10 37.0	3.791	2.813	+1.66	+5.7	18.8	12.2
May 18	03 57.51	+11 33.7	3.841	2.848	+1.64	+4.9	18.9	9.3
May 28	04 13.95	+12 22.4	3.879	2.883	+1.62	+4.0	19.0	9.0
June 7	04 30.20	+13 02.8	3.905	2.918	+1.60	+3.2	19.1	11.7
June 17	04 46.18	+13 35.0	3.917	2.954	+1.56	+2.4	19.2	16.0
June 27	05 01.82	+13 59.2	3.917	2.990	+1.52	+1.6	19.3	21.0
July 7	05 17.04	+14 15.6	3.904	3.026	+1.47	+0.9	19.4	26.3
July 17	05 31.76	+14 24.4	3.877	3.063	+1.41	+0.2	19.4	32.0
July 27	05 45.89	+14 26.3	3.838	3.099	+1.34	-0.5	19.5	37.8
Aug. 6	05 59.32	+14 21.6	3.786	3.135	+1.26	-1.0	19.5	44.0
Aug. 16	06 11.95	+14 11.1	3.721	3.172	+1.17	-1.6	19.6	50.3
Aug. 26	06 23.66	+13 55.6	3.646	3.208	+1.07	-2.0	19.6	56.9
Sept. 5	06 34.31	+13 35.8	3.560	3.245	+0.95	-2.3	19.6	63.9
Sept. 15	06 43.77	+13 13.0	3.466	3.281	+0.81	-2.5	19.6	71.1
Sept. 25	06 51.87	+12 48.1	3.364	3.317	+0.66	-2.6	19.6	78.7
Oct. 5	06 58.45	+12 22.4	3.258	3.354	+0.49	-2.5	19.6	86.8
Oct. 15	07 03.33	+11 57.4	3.149	3.389	+0.30	-2.3	19.6	95.3
Oct. 25	07 06.34	+11 34.6	3.042	3.425	+0.10	-1.9	19.6	104.2
Nov. 4	07 07.35	+11 15.5	2.941	3.461	-0.11	-1.4	19.6	113.7
Nov. 14	07 06.27	+11 01.6	2.849	3.496	-0.31	-0.7	19.6	123.7
Nov. 24	07 03.12	+10 54.4	2.772	3.531	-0.50	0.0	19.6	134.1
Dec. 4	06 58.09	+10 54.9	2.714	3.566	-0.66	+0.9	19.7	144.9
Dec. 14	06 51.51	+11 03.6	2.681	3.601	-0.76	+1.7	19.7	155.6
Dec. 24	06 43.92	+11 20.4	2.676	3.635	-0.79	+2.4	19.7	165.1
Jan. 3	06 36.00	+11 44.3	2.701	3.669	-0.76	+3.0	19.8	168.2
Jan. 13	06 28.42	+12 14.0	2.757	3.703	-0.66	+3.4	19.9	161.5
Jan. 23	06 21.87	+12 47.8	2.842	3.736	-0.51	+3.6	20.1	151.4
Feb. 2	06 16.81	+13 23.9	2.954	3.769	-0.33	+3.7	20.2	140.7
Feb. 12	06 13.54	+14 00.8	3.089	3.802	-0.13	+3.6	20.3	130.2
Feb. 22	06 12.21	+14 37.1	3.242	3.834	+0.06	+3.5	20.5	120.0
Mar. 3	06 12.78	+15 11.8	3.409	3.866	+0.24	+3.2	20.7	110.3
Mar. 13	06 15.13	+15 43.9	3.585	3.897	+0.40	+2.9	20.8	100.9
Mar. 23	06 19.10	+16 12.8	3.765	3.929	+0.54	+2.5	21.0	92.0

Comet C/2014 U3 (Kowalski)

Epoch = 2015 June 27.0 TT
 T = 2014 Sept. 3.54688 TT
 Peri. = 51.32101
 Node = 163.58240 2000.0
 Incl. = 152.99289
 q = 2.5587181 AU
 e = 0.9968851

$$m1 = 12.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	02 37.25	+52 46.9	2.269	2.890	-2.11	-26.6	19.0	120.0
Jan. 18	02 16.12	+48 21.1	2.478	2.939	-1.18	-22.4	19.3	108.3
Jan. 28	02 04.37	+44 37.4	2.711	2.992	-0.59	-17.9	19.5	96.8
Feb. 7	01 58.47	+41 38.7	2.956	3.046	-0.22	-13.8	19.8	85.8
Feb. 17	01 56.31	+39 20.3	3.202	3.103	+0.03	-10.5	20.0	75.3
Feb. 27	01 56.63	+37 35.4	3.442	3.162	+0.20	-7.8	20.3	65.4
Mar. 9	01 58.60	+36 17.8	3.670	3.222	+0.31	-5.6	20.5	56.0
Mar. 19	02 01.67	+35 22.0	3.879	3.284	+0.38	-3.8	20.7	47.2
Mar. 29	02 05.45	+34 43.5	4.067	3.348	+0.42	-2.5	20.9	38.8
Apr. 8	02 09.65	+34 18.9	4.230	3.413	+0.44	-1.4	21.1	31.2
Apr. 18	02 14.03	+34 05.3	4.367	3.479	+0.44	-0.5	21.2	24.6
Apr. 28	02 18.40	+34 00.5	4.475	3.547	+0.42	+0.2	21.4	20.1
May 8	02 22.58	+34 02.8	4.555	3.615	+0.38	+0.8	21.5	18.9
May 18	02 26.40	+34 10.6	4.607	3.685	+0.33	+1.2	21.6	21.5
May 28	02 29.69	+34 22.8	4.630	3.755	+0.26	+1.5	21.7	27.0
June 7	02 32.26	+34 38.2	4.626	3.826	+0.17	+1.8	21.8	33.9
June 17	02 33.94	+34 55.7	4.597	3.898	+0.06	+1.9	21.8	41.8
June 27	02 34.51	+35 14.4	4.545	3.971	-0.08	+1.8	21.9	50.1
July 7	02 33.73	+35 32.8	4.472	4.043	-0.23	+1.7	21.9	59.0
July 17	02 31.39	+35 49.5	4.384	4.117	-0.42	+1.3	22.0	68.3
July 27	02 27.22	+36 02.5	4.284	4.191	-0.62	+0.7	22.0	77.9
Aug. 6	02 21.03	+36 09.2	4.177	4.265	-0.84	-0.3	22.0	88.0
Aug. 16	02 12.65	+36 06.5	4.071	4.339	-1.06	-1.6	22.0	98.6
Aug. 26	02 02.04	+35 50.8	3.973	4.414	-1.27	-3.3	22.0	109.5
Sept. 5	01 49.37	+35 18.1	3.889	4.489	-1.44	-5.3	22.1	120.7
Sept. 15	01 35.00	+34 25.3	3.829	4.564	-1.54	-7.5	22.1	132.1
Sept. 25	01 19.58	+33 10.5	3.799	4.640	-1.57	-9.6	22.2	143.0
Oct. 5	01 03.91	+31 34.6	3.806	4.715	-1.51	-11.3	22.2	152.3
Oct. 15	00 48.82	+29 41.3	3.854	4.791	-1.37	-12.4	22.3	157.5
Oct. 25	00 35.08	+27 37.0	3.945	4.867	-1.19	-12.8	22.5	155.4
Nov. 4	00 23.19	+25 29.1	4.076	4.943	-0.98	-12.5	22.6	147.6
Nov. 14	00 13.44	+23 24.6	4.244	5.018	-0.76	-11.5	22.7	137.5
Nov. 24	00 05.88	+21 29.1	4.444	5.094	-0.55	-10.3	22.9	126.6
Dec. 4	00 00.43	+19 46.4	4.668	5.170	-0.36	-8.8	.	115.5
Dec. 14	23 56.87	+18 18.1	4.910	5.246	-0.19	-7.3	.	104.7
Dec. 24	23 54.99	+17 04.8	5.161	5.322	-0.05	-5.9	.	94.1
Jan. 3	23 54.52	+16 05.9	5.416	5.397	+0.07	-4.6	.	83.7
Jan. 13	23 55.23	+15 20.2	5.667	5.473	+0.17	-3.4	.	73.7
Jan. 23	23 56.91	+14 46.5	5.910	5.549	+0.24	-2.3	.	64.0
Feb. 2	23 59.35	+14 23.2	6.140	5.624	+0.30	-1.4	.	54.5
Feb. 12	00 02.37	+14 08.8	6.352	5.700	+0.35	-0.7	.	45.2
Feb. 22	00 05.82	+14 01.9	6.543	5.775	+0.37	-0.1	.	36.3
Mar. 3	00 09.56	+14 01.1	6.710	5.851	+0.39	+0.4	.	27.7
Mar. 13	00 13.45	+14 05.4	6.852	5.926	+0.39	+0.8	.	19.8
Mar. 23	00 17.38	+14 13.5	6.966	6.001	+0.39	+1.1	.	13.3

Comet 170P/Christensen

Epoch = 2015 June 27.0 TT
 T = 2014 Sept. 17.89784 TT
 Peri. = 225.81512
 Node = 142.91982 2000.0
 Incl. = 10.12779
 q = 2.9206484 AU
 e = 0.3042797
 a = 4.1980210 AU
 n = 0.11458748
 P = 8.60 years

$$m1 = 9.0 + 5 \log(\Delta) + 15.0 \log(r(t-120))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	01 06.47	-03 40.7	2.875	2.985	+0.89	+7.7	18.3	86.8
Jan. 18	01 15.33	-02 24.1	3.020	2.997	+1.00	+8.1	18.4	79.3
Jan. 28	01 25.33	-01 03.3	3.164	3.010	+1.10	+8.3	18.5	72.0
Feb. 7	01 36.30	+00 20.2	3.303	3.023	+1.18	+8.5	18.6	65.1
Feb. 17	01 48.09	+01 44.9	3.437	3.038	+1.25	+8.5	18.7	58.4
Feb. 27	02 00.59	+03 09.6	3.564	3.053	+1.31	+8.3	18.8	51.8
Mar. 9	02 13.67	+04 33.1	3.682	3.069	+1.36	+8.1	18.8	45.5
Mar. 19	02 27.25	+05 54.4	3.791	3.085	+1.40	+7.8	18.9	39.3
Mar. 29	02 41.24	+07 12.5	3.889	3.103	+1.43	+7.4	19.0	33.3
Apr. 8	02 55.56	+08 26.7	3.975	3.121	+1.46	+7.0	19.1	27.4
Apr. 18	03 10.16	+09 36.2	4.050	3.140	+1.48	+6.4	19.1	21.7
Apr. 28	03 24.96	+10 40.4	4.113	3.159	+1.49	+5.8	19.2	16.3
May 8	03 39.88	+11 38.9	4.162	3.179	+1.50	+5.2	19.2	11.5
May 18	03 54.88	+12 31.1	4.198	3.200	+1.50	+4.6	19.3	8.1
May 28	04 09.88	+13 16.7	4.221	3.221	+1.49	+3.9	19.3	8.2
June 7	04 24.81	+13 55.6	4.230	3.243	+1.48	+3.2	19.3	11.8
June 17	04 39.59	+14 27.5	4.225	3.265	+1.46	+2.5	19.4	16.7
June 27	04 54.14	+14 52.6	4.206	3.288	+1.42	+1.8	19.4	22.2
July 7	05 08.38	+15 10.8	4.175	3.311	+1.38	+1.2	19.4	27.9
July 17	05 22.22	+15 22.4	4.129	3.334	+1.33	+0.5	19.4	33.9
July 27	05 35.55	+15 27.6	4.071	3.358	+1.27	-0.1	19.4	40.1
Aug. 6	05 48.27	+15 27.0	4.001	3.383	+1.20	-0.6	19.4	46.4
Aug. 16	06 00.27	+15 20.9	3.919	3.407	+1.11	-1.1	19.4	53.0
Aug. 26	06 11.41	+15 10.2	3.827	3.432	+1.01	-1.5	19.4	59.8
Sept. 5	06 21.56	+14 55.5	3.726	3.457	+0.90	-1.8	19.4	66.9
Sept. 15	06 30.57	+14 37.8	3.617	3.482	+0.77	-2.0	19.4	74.3
Sept. 25	06 38.27	+14 18.2	3.502	3.508	+0.62	-2.1	19.3	82.1
Oct. 5	06 44.50	+13 57.6	3.384	3.534	+0.46	-2.0	19.3	90.3
Oct. 15	06 49.08	+13 37.5	3.266	3.560	+0.28	-1.8	19.3	98.9
Oct. 25	06 51.85	+13 19.2	3.152	3.586	+0.09	-1.5	19.2	108.0
Nov. 4	06 52.70	+13 04.0	3.045	3.612	-0.11	-1.1	19.2	117.6
Nov. 14	06 51.57	+12 53.2	2.949	3.639	-0.31	-0.5	19.2	127.6
Nov. 24	06 48.49	+12 48.1	2.870	3.665	-0.48	+0.1	19.2	138.1
Dec. 4	06 43.69	+12 49.2	2.813	3.692	-0.62	+0.8	19.2	148.9
Dec. 14	06 37.51	+12 57.0	2.780	3.719	-0.70	+1.4	19.2	159.5
Dec. 24	06 30.50	+13 11.2	2.777	3.746	-0.72	+2.0	19.3	168.3
Jan. 3	06 23.30	+13 31.1	2.804	3.772	-0.67	+2.5	19.3	168.5
Jan. 13	06 16.56	+13 55.7	2.861	3.799	-0.57	+2.8	19.4	159.8
Jan. 23	06 10.88	+14 23.7	2.947	3.826	-0.42	+3.0	19.5	149.3
Feb. 2	06 06.69	+14 53.8	3.058	3.853	-0.24	+3.1	19.7	138.6
Feb. 12	06 04.25	+15 24.7	3.192	3.880	-0.06	+3.1	19.8	128.1
Feb. 22	06 03.68	+15 55.4	3.342	3.906	+0.13	+3.0	19.9	118.1
Mar. 3	06 04.94	+16 25.1	3.505	3.933	+0.30	+2.8	20.1	108.4
Mar. 13	06 07.91	+16 52.8	3.677	3.960	+0.45	+2.5	20.2	99.2
Mar. 23	06 12.44	+17 17.8	3.852	3.986	+0.59	+2.2	20.4	90.4

Comet C/2013 V5 (Oukaimeden)

Epoch = 2015 June 27.0 TT
 T = 2014 Sept. 28.20498 TT
 Peri. = 314.58495
 Node = 278.62249 2000.0
 Incl. = 154.88474
 q = 0.6256484 AU
 e = 0.9986228

$$m1 = 11.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	16 02.44	-02° 06.3	2.428	1.960	-0.13 +13.5	16.0	50.8
Jan. 18	16 01.12	+00 08.4	2.388	2.102	-0.35 +15.5	16.3	61.4
Jan. 28	15 57.59	+02 43.0	2.331	2.241	-0.63 +17.7	16.5	72.5
Feb. 7	15 51.31	+05 39.8	2.267	2.378	-0.95 +19.9	16.7	84.1
Feb. 17	15 41.77	+08 58.7	2.204	2.512	-1.33 +21.7	16.9	96.3
Feb. 27	15 28.50	+12 35.7	2.153	2.643	-1.72 +22.5	17.1	108.7
Mar. 9	15 11.31	+16 21.0	2.127	2.773	-2.08 +21.8	17.3	121.1
Mar. 19	14 50.52	+19 59.1	2.134	2.900	-2.35 +19.2	17.5	132.4
Mar. 29	14 27.06	+23 10.8	2.184	3.025	-2.45 +14.9	17.7	141.0
Apr. 8	14 02.59	+25 40.3	2.279	3.149	-2.36 +10.0	18.0	144.5
Apr. 18	13 38.98	+27 19.9	2.419	3.270	-2.11 +5.2	18.3	142.1
Apr. 28	13 17.85	+28 11.6	2.599	3.390	-1.77 +1.2	18.6	135.3
May 8	13 00.19	+28 23.8	2.813	3.508	-1.39 -1.7	18.9	126.5
May 18	12 46.28	+28 07.2	3.051	3.625	-1.03 -3.6	19.2	117.1
May 28	12 35.97	+27 31.2	3.307	3.740	-0.71 -4.8	19.5	107.6
June 7	12 28.82	+26 43.1	3.574	3.854	-0.45 -5.5	19.8	98.3
June 17	12 24.36	+25 48.3	3.846	3.966	-0.23 -5.8	20.1	89.3
June 27	12 22.10	+24 50.2	4.118	4.078	-0.05 -5.9	20.4	80.6
July 7	12 21.62	+23 51.3	4.385	4.188	+0.10 -5.8	20.6	72.2
July 17	12 22.58	+22 53.0	4.642	4.296	+0.21 -5.7	20.9	64.1
July 27	12 24.67	+21 56.4	4.887	4.404	+0.30 -5.4	21.1	56.2
Aug. 6	12 27.65	+21 02.5	5.117	4.510	+0.37 -5.1	21.3	48.6
Aug. 16	12 31.33	+20 11.7	5.328	4.616	+0.42 -4.7	21.5	41.3
Aug. 26	12 35.54	+19 24.6	5.518	4.720	+0.46 -4.3	21.6	34.5
Sept. 5	12 40.12	+18 41.7	5.687	4.824	+0.48 -3.8	21.8	28.4
Sept. 15	12 44.95	+18 03.6	5.831	4.926	+0.50 -3.3	22.0	23.7
Sept. 25	12 49.92	+17 30.6	5.950	5.028	+0.50 -2.7	22.1	21.2
Oct. 5	12 54.90	+17 03.4	6.044	5.129	+0.49 -2.1	22.2	21.8
Oct. 15	12 59.81	+16 42.5	6.113	5.229	+0.47 -1.4	22.3	25.3
Oct. 25	13 04.52	+16 28.6	6.156	5.328	+0.44 -0.7	22.4	31.0
Nov. 4	13 08.92	+16 22.0	6.174	5.426	+0.40 +0.2	22.5	37.9
Nov. 14	13 12.91	+16 23.6	6.170	5.524	+0.34 +1.0	22.6	45.6
Nov. 24	13 16.35	+16 33.8	6.146	5.620	+0.28 +1.9	22.6	53.9
Dec. 4	13 19.14	+16 53.0	6.104	5.716	+0.20 +2.9	22.7	62.5
Dec. 14	13 21.13	+17 21.7	6.047	5.812	+0.11 +3.8	22.8	71.6
Dec. 24	13 22.19	+17 59.7	5.982	5.906	0.00 +4.7	22.8	80.9
Jan. 3	13 22.21	+18 46.9	5.911	6.000	-0.11 +5.6	22.8	90.5
Jan. 13	13 21.08	+19 42.6	5.842	6.094	-0.24 +6.3	22.9	100.2
Jan. 23	13 18.70	+20 45.4	5.779	6.186	-0.36 +6.8	22.9	110.1
Feb. 2	13 15.06	+21 53.3	5.729	6.279	-0.49 +7.1	23.0	119.9
Feb. 12	13 10.16	+23 04.0	5.697	6.370	-0.60 +7.0	23.0	129.5
Feb. 22	13 04.11	+24 14.3	5.689	6.461	-0.70 +6.7	.	138.3
Mar. 3	12 57.10	+25 21.0	5.709	6.551	-0.77 +6.0	.	145.7
Mar. 13	12 49.39	+26 20.9	5.760	6.641	-0.81 +5.0	.	150.3
Mar. 23	12 41.30	+27 11.2	5.843	6.730	-0.81 +3.9	.	150.8

Comet C/2014 N2 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 8.24527 TT
 Peri. = 237.87275
 Node = 143.80485 2000.0
 Incl. = 133.01310
 q = 2.1846662 AU
 e = 0.9992979

$$m1 = 13.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	15 45.50	-58 21.7	2.912	2.427	-0.87	-11.0	19.6	51.6
Jan. 18	15 36.79	-60 12.2	2.821	2.478	-1.49	-12.0	19.6	59.9
Jan. 28	15 21.87	-62 12.6	2.715	2.533	-2.39	-12.0	19.6	68.9
Feb. 7	14 57.95	-64 12.5	2.602	2.592	-3.60	-9.9	19.6	78.5
Feb. 17	14 21.95	-65 51.3	2.490	2.653	-4.92	-4.2	19.6	88.4
Feb. 27	13 32.70	-66 33.0	2.389	2.717	-5.74	+5.8	19.6	98.5
Mar. 9	12 35.31	-65 34.7	2.310	2.784	-5.44	+18.1	19.7	108.1
Mar. 19	11 40.93	-62 33.4	2.265	2.852	-4.26	+28.8	19.7	116.6
Mar. 29	10 58.33	-57 45.1	2.262	2.923	-2.93	+35.2	19.8	122.5
Apr. 8	10 28.99	-51 52.9	2.309	2.995	-1.87	+37.1	20.0	124.8
Apr. 18	10 10.33	-45 42.3	2.404	3.069	-1.10	+35.4	20.2	123.1
Apr. 28	09 59.35	-39 47.8	2.544	3.144	-0.57	+31.8	20.4	118.0
May 8	09 53.66	-34 29.9	2.721	3.220	-0.20	+27.3	20.7	110.8
May 18	09 51.62	-29 56.8	2.926	3.298	+0.05	+22.8	20.9	102.6
May 28	09 52.16	-26 08.8	3.151	3.376	+0.23	+18.6	21.2	94.0
June 7	09 54.49	-23 02.4	3.386	3.455	+0.36	+15.0	21.4	85.3
June 17	09 58.11	-20 32.2	3.626	3.534	+0.45	+11.9	21.7	76.8
June 27	10 02.64	-18 32.9	3.863	3.615	+0.52	+9.3	21.9	68.4
July 7	10 07.81	-16 59.4	4.093	3.695	+0.56	+7.2	22.1	60.2
July 17	10 13.40	-15 47.6	4.311	3.776	+0.59	+5.4	22.3	52.3
July 27	10 19.25	-14 53.7	4.514	3.858	+0.60	+3.9	22.5	44.6
Aug. 6	10 25.23	-14 14.6	4.698	3.939	+0.60	+2.7	22.7	37.3
Aug. 16	10 31.23	-13 47.8	4.860	4.021	+0.59	+1.7	22.9	30.5
Aug. 26	10 37.13	-13 31.0	5.000	4.103	+0.57	+0.9	23.0	24.7
Sept. 5	10 42.84	-13 22.4	5.114	4.185	+0.54	+0.2	.	20.6
Sept. 15	10 48.27	-13 20.3	5.202	4.268	+0.50	-0.3	.	19.5
Sept. 25	10 53.31	-13 23.2	5.264	4.350	+0.46	-0.6	.	21.9
Oct. 5	10 57.86	-13 29.6	5.299	4.432	+0.40	-0.9	.	27.1
Oct. 15	11 01.82	-13 38.3	5.309	4.514	+0.32	-0.9	.	33.8
Oct. 25	11 05.07	-13 47.8	5.293	4.596	+0.24	-0.9	.	41.6
Nov. 4	11 07.47	-13 56.7	5.254	4.679	+0.14	-0.7	.	50.0
Nov. 14	11 08.89	-14 03.6	5.196	4.761	+0.03	-0.3	.	58.9
Nov. 24	11 09.20	-14 06.8	5.120	4.842	-0.09	+0.2	.	68.3
Dec. 4	11 08.27	-14 04.7	5.032	4.924	-0.23	+0.9	.	78.1
Dec. 14	11 05.98	-13 55.4	4.937	5.006	-0.37	+1.8	.	88.3
Dec. 24	11 02.25	-13 37.1	4.841	5.087	-0.52	+2.9	.	98.9
Jan. 3	10 57.07	-13 07.9	4.751	5.169	-0.66	+4.1	.	109.9
Jan. 13	10 50.49	-12 26.5	4.673	5.250	-0.78	+5.4	.	121.2
Jan. 23	10 42.69	-11 32.0	4.615	5.331	-0.88	+6.7	.	132.6
Feb. 2	10 33.94	-10 24.6	4.585	5.412	-0.93	+7.9	.	143.9
Feb. 12	10 24.61	-09 05.8	4.586	5.492	-0.95	+8.8	.	154.3
Feb. 22	10 15.14	-07 38.0	4.625	5.573	-0.91	+9.3	.	161.8
Mar. 3	10 06.00	-06 04.7	4.701	5.653	-0.84	+9.5	.	162.1
Mar. 13	09 57.57	-04 30.0	4.816	5.733	-0.74	+9.3	.	155.1
Mar. 23	09 50.18	-02 57.4	4.967	5.813	-0.61	+8.7	.	145.2

Comet 303P/NEAT

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 13.49861 TT
 Peri. = 356.99381
 Node = 348.02064 2000.0
 Incl. = 7.00372
 q = 2.4875327 AU
 e = 0.5087192
 a = 5.0633623 AU
 n = 0.08650587
 P = 11.39 years

H = 14.6 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		V	Elong. °
Jan. 8	23 22.62	-01 20.5	2.855	2.576	+1.50	+10.9	19.9	63.8
Jan. 18	23 37.65	+00 28.6	2.985	2.597	+1.54	+11.1	20.0	57.8
Jan. 28	23 53.09	+02 20.1	3.110	2.620	+1.58	+11.3	20.1	51.9
Feb. 7	00 08.84	+04 12.9	3.231	2.644	+1.60	+11.3	20.1	46.1
Feb. 17	00 24.85	+06 06.0	3.345	2.671	+1.62	+11.3	20.1	40.4
Feb. 27	00 41.05	+07 58.7	3.452	2.699	+1.63	+11.1	20.2	34.8
Mar. 9	00 57.39	+09 49.8	3.550	2.729	+1.65	+10.9	20.2	29.3
Mar. 19	01 13.85	+11 38.7	3.641	2.760	+1.65	+10.6	20.2	23.8
Mar. 29	01 30.39	+13 24.4	3.721	2.792	+1.66	+10.2	20.2	18.4
Apr. 8	01 46.96	+15 06.4	3.792	2.826	+1.66	+9.8	20.2	13.1
Apr. 18	02 03.55	+16 43.9	3.852	2.861	+1.66	+9.3	20.1	8.1
Apr. 28	02 20.11	+18 16.5	3.900	2.898	+1.65	+8.7	20.1	4.4
May 8	02 36.59	+19 43.6	3.937	2.935	+1.64	+8.1	20.1	5.8
May 18	02 52.95	+21 05.1	3.962	2.973	+1.62	+7.5	20.3	10.5
May 28	03 09.13	+22 20.5	3.975	3.012	+1.59	+6.9	20.4	15.8
June 7	03 25.07	+23 29.8	3.975	3.052	+1.56	+6.3	20.5	21.4
June 17	03 40.69	+24 32.9	3.962	3.093	+1.52	+5.7	20.6	27.1
June 27	03 55.90	+25 30.1	3.937	3.134	+1.47	+5.1	20.7	33.0
July 7	04 10.59	+26 21.5	3.900	3.176	+1.41	+4.6	20.8	39.1
July 17	04 24.68	+27 07.4	3.851	3.219	+1.33	+4.1	20.8	45.4
July 27	04 38.00	+27 48.5	3.790	3.262	+1.24	+3.7	20.9	51.8
Aug. 6	04 50.44	+28 25.1	3.719	3.305	+1.14	+3.3	20.9	58.5
Aug. 16	05 01.84	+28 58.0	3.639	3.349	+1.02	+3.0	20.9	65.5
Aug. 26	05 12.00	+29 27.8	3.550	3.393	+0.87	+2.8	20.9	72.9
Sept. 5	05 20.75	+29 55.4	3.456	3.437	+0.71	+2.6	20.9	80.5
Sept. 15	05 27.88	+30 21.3	3.357	3.481	+0.53	+2.5	20.8	88.6
Sept. 25	05 33.17	+30 45.9	3.258	3.526	+0.33	+2.4	20.8	97.2
Oct. 5	05 36.44	+31 09.6	3.161	3.571	+0.11	+2.2	20.7	106.2
Oct. 15	05 37.51	+31 32.0	3.071	3.616	-0.12	+2.0	20.6	115.7
Oct. 25	05 36.31	+31 52.4	2.991	3.661	-0.34	+1.7	20.6	125.7
Nov. 4	05 32.87	+32 09.5	2.927	3.706	-0.55	+1.2	20.5	136.1
Nov. 14	05 27.40	+32 21.5	2.883	3.751	-0.71	+0.5	20.3	146.9
Nov. 24	05 20.33	+32 26.7	2.865	3.797	-0.80	-0.3	20.2	157.7
Dec. 4	05 12.30	+32 24.0	2.874	3.842	-0.83	-1.1	20.1	167.3
Dec. 14	05 04.04	+32 13.3	2.914	3.887	-0.77	-1.8	20.1	170.0
Dec. 24	04 56.33	+31 55.7	2.984	3.932	-0.65	-2.2	20.3	162.2
Jan. 3	04 49.83	+31 33.6	3.083	3.977	-0.48	-2.4	20.5	151.8
Jan. 13	04 45.00	+31 09.3	3.209	4.022	-0.29	-2.4	20.8	141.0
Jan. 23	04 42.11	+30 45.4	3.358	4.066	-0.09	-2.2	20.9	130.4
Feb. 2	04 41.22	+30 23.7	3.526	4.111	+0.10	-1.8	21.1	120.2
Feb. 12	04 42.26	+30 05.2	3.707	4.155	+0.28	-1.5	21.3	110.4
Feb. 22	04 45.10	+29 50.5	3.897	4.200	+0.44	-1.1	21.4	101.0
Mar. 3	04 49.52	+29 39.3	4.092	4.244	+0.58	-0.8	21.6	92.0
Mar. 13	04 55.34	+29 31.1	4.288	4.288	+0.70	-0.6	21.7	83.3
Mar. 23	05 02.35	+29 25.4	4.482	4.331	+0.80	-0.4	21.8	74.9

Comet C/2013 V2 (Borisov)

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 14.36710 TT
 Peri. = 94.48942
 Node = 48.41274 2000.0
 Incl. = 37.85317
 q = 3.5080755 AU
 e = 1.0038073

$$m1 = 9.2 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong.
Jan. 8	13 25.78	+32 44.9	3.298	3.595	+0.56	+1.4	16.0	99.6
Jan. 18	13 31.38	+32 58.8	3.213	3.616	+0.35	+2.2	15.9	106.4
Jan. 28	13 34.87	+33 20.7	3.136	3.639	+0.12	+2.6	15.9	113.2
Feb. 7	13 36.11	+33 47.1	3.070	3.665	-0.10	+2.7	15.9	120.1
Feb. 17	13 35.07	+34 14.2	3.017	3.692	-0.33	+2.3	15.9	126.6
Feb. 27	13 31.78	+34 36.9	2.980	3.721	-0.53	+1.3	15.9	132.5
Mar. 9	13 26.52	+34 49.5	2.962	3.752	-0.68	-0.2	15.9	137.3
Mar. 19	13 19.73	+34 47.2	2.965	3.786	-0.77	-2.1	15.9	140.4
Mar. 29	13 12.02	+34 25.9	2.992	3.820	-0.79	-4.2	15.9	141.1
Apr. 8	13 04.12	+33 43.6	3.042	3.857	-0.74	-6.3	16.0	139.4
Apr. 18	12 56.68	+32 40.5	3.115	3.895	-0.64	-8.2	16.1	135.4
Apr. 28	12 50.28	+31 18.5	3.212	3.935	-0.50	-9.8	16.2	130.0
May 8	12 45.33	+29 40.9	3.328	3.976	-0.33	-10.9	16.3	123.6
May 18	12 41.99	+27 51.6	3.463	4.018	-0.17	-11.7	16.4	116.6
May 28	12 40.33	+25 54.1	3.613	4.062	0.00	-12.2	16.6	109.3
June 7	12 40.28	+23 51.8	3.775	4.108	+0.14	-12.5	16.7	102.0
June 17	12 41.71	+21 47.1	3.947	4.154	+0.27	-12.5	16.8	94.7
June 27	12 44.45	+19 42.1	4.124	4.202	+0.39	-12.4	17.0	87.4
July 7	12 48.33	+17 38.2	4.305	4.251	+0.49	-12.2	17.1	80.2
July 17	12 53.19	+15 36.4	4.486	4.301	+0.57	-11.9	17.2	73.0
July 27	12 58.90	+13 37.3	4.666	4.352	+0.64	-11.6	17.3	66.0
Aug. 6	13 05.29	+11 41.6	4.840	4.404	+0.70	-11.2	17.5	59.0
Aug. 16	13 12.27	+09 49.5	5.008	4.457	+0.75	-10.8	17.6	52.0
Aug. 26	13 19.73	+08 01.3	5.166	4.510	+0.78	-10.4	17.7	45.1
Sept. 5	13 27.57	+06 17.2	5.313	4.565	+0.81	-10.0	17.8	38.3
Sept. 15	13 35.71	+04 37.4	5.447	4.620	+0.84	-9.5	17.9	31.6
Sept. 25	13 44.06	+03 01.9	5.566	4.676	+0.85	-9.1	18.0	25.0
Oct. 5	13 52.56	+01 30.9	5.669	4.733	+0.86	-8.6	18.0	18.8
Oct. 15	14 01.12	+00 04.6	5.754	4.790	+0.86	-8.2	18.1	13.6
Oct. 25	14 09.67	-01 17.0	5.820	4.848	+0.85	-7.7	18.2	11.1
Nov. 4	14 18.14	-02 33.7	5.867	4.907	+0.83	-7.2	18.2	13.2
Nov. 14	14 26.43	-03 45.5	5.894	4.966	+0.80	-6.7	18.3	18.5
Nov. 24	14 34.47	-04 52.2	5.901	5.025	+0.77	-6.2	18.3	25.2
Dec. 4	14 42.16	-05 53.9	5.889	5.085	+0.72	-5.7	18.3	32.5
Dec. 14	14 49.39	-06 50.5	5.857	5.146	+0.67	-5.2	18.4	40.3
Dec. 24	14 56.07	-07 42.1	5.808	5.206	+0.60	-4.7	18.4	48.3
Jan. 3	15 02.07	-08 28.7	5.743	5.268	+0.52	-4.2	18.4	56.7
Jan. 13	15 07.29	-09 10.5	5.665	5.329	+0.43	-3.7	18.4	65.3
Jan. 23	15 11.59	-09 47.5	5.576	5.391	+0.33	-3.3	18.4	74.1
Feb. 2	15 14.88	-10 20.0	5.480	5.453	+0.22	-2.8	18.4	83.3
Feb. 12	15 17.06	-10 48.3	5.381	5.516	+0.10	-2.4	18.4	92.7
Feb. 22	15 18.03	-11 12.5	5.282	5.579	-0.03	-2.1	18.4	102.4
Mar. 3	15 17.76	-11 33.1	5.190	5.642	-0.15	-1.7	18.4	112.3
Mar. 13	15 16.24	-11 50.4	5.108	5.705	-0.27	-1.4	18.4	122.6
Mar. 23	15 13.53	-12 04.7	5.042	5.768	-0.38	-1.2	18.4	133.0

Comet 32P/Comas Sola

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 17.49119 TT
 Peri. = 53.31422
 Node = 57.82667 2000.0
 Incl. = 9.97013
 q = 2.0007805 AU

e = 0.5561087
 a = 4.5073659 AU
 n = 0.10299588
 P = 9.57 years

$$m1 = 9.0 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	11 46.43	+16 56.2	1.508	2.133	+0.53	+2.1	14.0	116.2
Jan. 18	11 51.73	+17 17.5	1.447	2.166	+0.19	+3.6	14.0	124.8
Jan. 28	11 53.67	+17 53.3	1.399	2.200	-0.14	+4.5	14.0	134.1
Feb. 7	11 52.26	+18 38.4	1.366	2.238	-0.44	+4.7	14.0	143.7
Feb. 17	11 47.83	+19 25.8	1.352	2.277	-0.67	+4.1	14.1	153.1
Feb. 27	11 41.13	+20 06.4	1.360	2.319	-0.78	+2.5	14.2	160.9
Mar. 9	11 33.28	+20 31.9	1.393	2.363	-0.78	+0.5	14.4	163.7
Mar. 19	11 25.53	+20 36.8	1.451	2.408	-0.65	-1.7	14.6	159.2
Mar. 29	11 19.00	+20 19.4	1.533	2.455	-0.45	-3.8	14.8	151.0
Apr. 8	11 14.49	+19 41.2	1.637	2.503	-0.22	-5.5	15.1	141.9
Apr. 18	11 12.33	+18 45.7	1.760	2.552	+0.02	-6.9	15.3	132.9
Apr. 28	11 12.57	+17 36.6	1.900	2.602	+0.25	-7.9	15.6	124.2
May 8	11 15.04	+16 17.6	2.053	2.653	+0.44	-8.6	15.9	115.9
May 18	11 19.43	+14 51.3	2.216	2.705	+0.60	-9.1	16.1	108.0
May 28	11 25.46	+13 19.9	2.387	2.758	+0.74	-9.5	16.4	100.5
June 7	11 32.82	+11 45.0	2.563	2.811	+0.84	-9.7	16.7	93.3
June 17	11 41.27	+10 07.7	2.743	2.864	+0.93	-9.9	16.9	86.4
June 27	11 50.61	+08 28.9	2.923	2.918	+1.00	-9.9	17.1	79.7
July 7	12 00.63	+06 49.4	3.103	2.972	+1.06	-10.0	17.4	73.1
July 17	12 11.22	+05 09.8	3.280	3.026	+1.10	-9.9	17.6	66.7
July 27	12 22.25	+03 30.6	3.452	3.080	+1.14	-9.8	17.8	60.4
Aug. 6	12 33.64	+01 52.4	3.619	3.134	+1.17	-9.7	18.0	54.1
Aug. 16	12 45.31	+00 15.4	3.778	3.188	+1.19	-9.5	18.2	47.9
Aug. 26	12 57.21	-01 19.7	3.928	3.242	+1.21	-9.3	18.4	41.6
Sept. 5	13 09.28	-02 52.7	4.067	3.296	+1.22	-9.0	18.5	35.4
Sept. 15	13 21.47	-04 23.2	4.194	3.350	+1.23	-8.8	18.7	29.1
Sept. 25	13 33.74	-05 50.7	4.307	3.404	+1.23	-8.4	18.8	22.7
Oct. 5	13 46.03	-07 14.9	4.406	3.457	+1.23	-8.1	19.0	16.3
Oct. 15	13 58.32	-08 35.4	4.489	3.511	+1.22	-7.7	19.1	10.0
Oct. 25	14 10.55	-09 52.0	4.555	3.564	+1.21	-7.2	19.2	4.2
Nov. 4	14 22.65	-11 04.3	4.603	3.616	+1.19	-6.8	19.3	5.0
Nov. 14	14 34.57	-12 12.0	4.634	3.669	+1.17	-6.3	19.4	11.3
Nov. 24	14 46.23	-13 15.0	4.646	3.721	+1.13	-5.8	19.5	18.2
Dec. 4	14 57.54	-14 13.0	4.640	3.772	+1.09	-5.3	19.5	25.3
Dec. 14	15 08.42	-15 05.9	4.615	3.824	+1.03	-4.8	19.6	32.6
Dec. 24	15 18.74	-15 53.7	4.573	3.874	+0.97	-4.3	19.7	40.2
Jan. 3	15 28.40	-16 36.3	4.515	3.925	+0.89	-3.8	19.7	47.9
Jan. 13	15 37.25	-17 13.8	4.442	3.975	+0.79	-3.3	19.7	55.9
Jan. 23	15 45.15	-17 46.3	4.356	4.025	+0.68	-2.8	19.8	64.1
Feb. 2	15 51.96	-18 14.0	4.259	4.074	+0.55	-2.3	19.8	72.6
Feb. 12	15 57.50	-18 37.0	4.154	4.123	+0.41	-1.9	19.8	81.4
Feb. 22	16 01.63	-18 55.5	4.045	4.171	+0.26	-1.4	19.8	90.4
Mar. 3	16 04.20	-19 09.7	3.936	4.220	+0.09	-1.0	19.8	99.8
Mar. 13	16 05.11	-19 19.7	3.830	4.267	-0.08	-0.6	19.8	109.6
Mar. 23	16 04.29	-19 25.6	3.733	4.314	-0.25	-0.2	19.8	119.7

Comet 108P/Ciffreo

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 18.48183 TT
 Peri. = 358.11929 e = 0.5434646
 Node = 53.64460 2000.0 a = 3.7430291 AU
 Incl. = 13.09616 n = 0.13610349
 q = 1.7088253 AU P = 7.24 years

$$m1 = 11.0 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	05 00.12	+39 06.1	0.976	1.878	+0.11 +1.6	15.7	146.9
Jan. 18	05 01.26	+39 22.1	1.070	1.918	+0.53 +0.1	16.1	138.0
Jan. 28	05 06.52	+39 23.0	1.180	1.961	+0.89 -0.9	16.5	129.7
Feb. 7	05 15.44	+39 14.0	1.303	2.007	+1.19 -1.6	16.9	121.9
Feb. 17	05 27.34	+38 57.8	1.437	2.055	+1.43 -2.2	17.3	114.6
Feb. 27	05 41.61	+38 35.6	1.580	2.105	+1.60 -2.8	17.6	107.8
Mar. 9	05 57.64	+38 07.6	1.731	2.157	+1.73 -3.4	18.0	101.3
Mar. 19	06 14.91	+37 33.6	1.887	2.210	+1.81 -4.0	18.4	95.0
Mar. 29	06 33.05	+36 53.5	2.049	2.264	+1.86 -4.6	18.8	89.0
Apr. 8	06 51.70	+36 07.2	2.213	2.319	+1.89 -5.3	19.1	83.2
Apr. 18	07 10.58	+35 14.6	2.380	2.375	+1.89 -5.9	19.5	77.6
Apr. 28	07 29.51	+34 15.8	2.546	2.432	+1.88 -6.4	19.8	72.0
May 8	07 48.31	+33 11.4	2.712	2.489	+1.86 -7.0	20.1	66.6
May 18	08 06.86	+32 01.6	2.875	2.546	+1.82 -7.5	20.4	61.2
May 28	08 25.09	+30 47.1	3.035	2.604	+1.78 -7.9	20.7	55.8
June 7	08 42.92	+29 28.5	3.190	2.661	+1.74 -8.2	21.0	50.5
June 17	09 00.33	+28 06.4	3.338	2.719	+1.70 -8.5	21.2	45.2
June 27	09 17.30	+26 41.5	3.479	2.776	+1.65 -8.7	21.5	39.9
July 7	09 33.81	+25 14.4	3.612	2.834	+1.61 -8.9	21.7	34.6
July 17	09 49.86	+23 45.9	3.734	2.891	+1.56 -8.9	21.9	29.3
July 27	10 05.45	+22 16.6	3.845	2.947	+1.51 -8.9	22.1	24.1
Aug. 6	10 20.60	+20 47.2	3.944	3.003	+1.47 -8.9	22.3	19.0
Aug. 16	10 35.30	+19 18.2	4.031	3.059	+1.43 -8.8	22.5	14.3
Aug. 26	10 49.57	+17 50.5	4.102	3.115	+1.38 -8.6	22.7	10.7
Sept. 5	11 03.39	+16 24.6	4.159	3.170	+1.34 -8.3	22.9	9.6
Sept. 15	11 16.76	+15 01.1	4.201	3.224	+1.29 -8.0	23.0	12.1
Sept. 25	11 29.67	+13 40.9	4.226	3.278	+1.24 -7.6	.	16.7
Oct. 5	11 42.08	+12 24.5	4.235	3.332	+1.19 -7.2	.	22.4
Oct. 15	11 53.97	+11 12.7	4.227	3.385	+1.13 -6.6	.	28.5
Oct. 25	12 05.29	+10 06.2	4.203	3.437	+1.07 -6.0	.	35.1
Nov. 4	12 15.97	+09 05.9	4.162	3.489	+1.00 -5.3	.	42.0
Nov. 14	12 25.94	+08 12.4	4.106	3.540	+0.92 -4.6	.	49.2
Nov. 24	12 35.09	+07 26.6	4.036	3.590	+0.82 -3.7	.	56.7
Dec. 4	12 43.32	+06 49.3	3.954	3.640	+0.72 -2.8	.	64.5
Dec. 14	12 50.50	+06 21.3	3.861	3.690	+0.60 -1.8	.	72.7
Dec. 24	12 56.46	+06 03.2	3.761	3.738	+0.46 -0.8	.	81.2
Jan. 3	13 01.07	+05 55.6	3.655	3.786	+0.31 +0.3	.	90.1
Jan. 13	13 04.16	+05 58.9	3.549	3.834	+0.14 +1.4	.	99.4
Jan. 23	13 05.59	+06 12.8	3.446	3.881	-0.03 +2.4	.	109.0
Feb. 2	13 05.26	+06 36.9	3.352	3.927	-0.21 +3.3	.	119.1
Feb. 12	13 03.14	+07 09.8	3.270	3.972	-0.38 +4.0	.	129.5
Feb. 22	12 59.29	+07 49.4	3.208	4.017	-0.54 +4.3	.	140.2
Mar. 3	12 53.93	+08 32.6	3.168	4.062	-0.65 +4.3	.	150.7
Mar. 13	12 47.38	+09 15.8	3.155	4.105	-0.72 +3.9	.	160.4
Mar. 23	12 40.13	+09 55.2	3.172	4.148	-0.74 +3.2	.	166.7

Comet 70P/Kojima

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 20.64453 TT
 Peri. = 1.94624 e = 0.4538586
 Node = 119.26974 2000.0 a = 3.6739828 AU
 Incl. = 6.60014 n = 0.13995822
 q = 2.0065141 AU P = 7.04 years

$$m1 = 10.6 + 5 \log(\Delta) + 15.0 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	12 06.40	+04 38.1	1.592	2.107	+0.81	+0.1	16.2	107.5
Jan. 18	12 14.46	+04 38.8	1.512	2.133	+0.52	+2.2	16.1	115.7
Jan. 28	12 19.66	+05 00.3	1.442	2.161	+0.21	+4.2	16.0	124.7
Feb. 7	12 21.79	+05 41.9	1.384	2.191	-0.09	+5.9	16.0	134.5
Feb. 17	12 20.85	+06 40.7	1.341	2.223	-0.37	+7.0	16.0	144.8
Feb. 27	12 17.11	+07 50.9	1.318	2.257	-0.58	+7.3	16.0	155.5
Mar. 9	12 11.29	+09 03.9	1.318	2.293	-0.69	+6.6	16.1	165.5
Mar. 19	12 04.38	+10 10.3	1.343	2.330	-0.68	+5.1	16.2	170.2
Mar. 29	11 57.56	+11 01.6	1.393	2.369	-0.57	+3.1	16.3	163.9
Apr. 8	11 51.89	+11 32.6	1.468	2.409	-0.38	+0.9	16.5	154.1
Apr. 18	11 48.08	+11 41.5	1.565	2.450	-0.15	-1.2	16.8	144.0
Apr. 28	11 46.55	+11 29.3	1.681	2.492	+0.08	-3.0	17.0	134.4
May 8	11 47.33	+10 58.9	1.813	2.534	+0.29	-4.6	17.3	125.3
May 18	11 50.27	+10 13.2	1.958	2.578	+0.49	-5.8	17.6	116.8
May 28	11 55.14	+09 15.4	2.113	2.622	+0.65	-6.7	17.8	108.8
June 7	12 01.64	+08 08.0	2.275	2.666	+0.79	-7.5	18.1	101.3
June 17	12 09.50	+06 53.4	2.442	2.711	+0.90	-8.0	18.4	94.1
June 27	12 18.49	+05 33.3	2.612	2.756	+0.99	-8.4	18.6	87.2
July 7	12 28.40	+04 09.3	2.783	2.802	+1.07	-8.7	18.9	80.6
July 17	12 39.06	+02 42.7	2.953	2.847	+1.13	-8.8	19.1	74.1
July 27	12 50.35	+01 14.5	3.120	2.893	+1.18	-8.9	19.3	67.8
Aug. 6	13 02.14	-00 14.3	3.284	2.939	+1.22	-8.8	19.6	61.5
Aug. 16	13 14.36	-01 42.8	3.441	2.984	+1.26	-8.7	19.8	55.4
Aug. 26	13 26.93	-03 10.2	3.591	3.030	+1.29	-8.6	20.0	49.3
Sept. 5	13 39.79	-04 36.0	3.733	3.075	+1.31	-8.3	20.2	43.2
Sept. 15	13 52.90	-05 59.4	3.864	3.121	+1.33	-8.0	20.4	37.0
Sept. 25	14 06.20	-07 19.8	3.984	3.166	+1.34	-7.7	20.5	30.9
Oct. 5	14 19.64	-08 36.7	4.091	3.211	+1.35	-7.3	20.7	24.8
Oct. 15	14 33.18	-09 49.6	4.185	3.255	+1.36	-6.8	20.8	18.6
Oct. 25	14 46.77	-10 58.1	4.263	3.300	+1.36	-6.3	21.0	12.6
Nov. 4	15 00.36	-12 01.6	4.326	3.344	+1.35	-5.8	21.1	7.0
Nov. 14	15 13.88	-12 59.8	4.372	3.388	+1.34	-5.3	21.2	5.0
Nov. 24	15 27.27	-13 52.4	4.401	3.431	+1.32	-4.7	21.3	9.5
Dec. 4	15 40.43	-14 39.3	4.412	3.474	+1.29	-4.1	21.4	15.7
Dec. 14	15 53.31	-15 20.2	4.406	3.516	+1.25	-3.5	21.5	22.5
Dec. 24	16 05.77	-15 55.1	4.382	3.559	+1.20	-2.9	21.6	29.5
Jan. 3	16 17.73	-16 23.9	4.341	3.600	+1.13	-2.3	21.7	36.6
Jan. 13	16 29.06	-16 47.0	4.284	3.642	+1.06	-1.7	21.7	44.0
Jan. 23	16 39.63	-17 04.4	4.212	3.682	+0.97	-1.2	21.8	51.6
Feb. 2	16 49.30	-17 16.6	4.127	3.723	+0.86	-0.7	21.8	59.4
Feb. 12	16 57.92	-17 23.9	4.030	3.763	+0.74	-0.3	21.8	67.4
Feb. 22	17 05.32	-17 26.9	3.923	3.802	+0.60	+0.1	21.8	75.7
Mar. 3	17 11.36	-17 26.1	3.811	3.841	+0.45	+0.4	21.9	84.3
Mar. 13	17 15.86	-17 22.1	3.696	3.880	+0.28	+0.7	21.9	93.2
Mar. 23	17 18.69	-17 15.6	3.581	3.918	+0.10	+0.8	21.9	102.4

Comet C/2014 R4 (Gibbs)

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 21.47876 TT
 Peri. = 180.83058
 Node = 279.52279 2000.0
 Incl. = 42.40776
 q = 1.8178218 AU
 e = 0.9993396

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	09 28.67	-29 13.8	1.404	2.070	-1.10 -24.9	16.7	119.1
Jan. 18	09 17.64	-33 22.7	1.433	2.131	-1.31 -18.2	16.9	122.7
Jan. 28	09 04.59	-36 24.6	1.480	2.197	-1.34 -11.3	17.1	124.9
Feb. 7	08 51.19	-38 17.7	1.546	2.267	-1.20 -5.1	17.3	125.7
Feb. 17	08 39.15	-39 08.7	1.627	2.341	-0.93 -0.1	17.6	125.3
Feb. 27	08 29.84	-39 09.2	1.723	2.418	-0.58 +3.5	17.8	123.7
Mar. 9	08 24.01	-38 34.1	1.833	2.497	-0.22 +5.7	18.1	121.3
Mar. 19	08 21.78	-37 36.8	1.954	2.578	+0.11 +6.8	18.4	118.2
Mar. 29	08 22.92	-36 28.7	2.086	2.661	+0.41 +7.0	18.6	114.6
Apr. 8	08 27.00	-35 18.2	2.227	2.746	+0.65 +6.7	18.9	110.7
Apr. 18	08 33.51	-34 11.3	2.377	2.832	+0.85 +5.9	19.2	106.5
Apr. 28	08 42.00	-33 11.9	2.535	2.919	+1.00 +4.9	19.5	102.2
May 8	08 52.03	-32 22.5	2.699	3.006	+1.12 +3.8	19.7	97.8
May 18	09 03.26	-31 44.2	2.868	3.095	+1.21 +2.7	20.0	93.3
May 28	09 15.41	-31 17.6	3.042	3.184	+1.28 +1.5	20.2	88.7
June 7	09 28.23	-31 02.7	3.219	3.273	+1.33 +0.4	20.5	84.1
June 17	09 41.53	-30 59.0	3.398	3.363	+1.36 -0.7	20.7	79.4
June 27	09 55.18	-31 06.1	3.578	3.453	+1.39 -1.7	21.0	74.8
July 7	10 09.03	-31 23.1	3.758	3.543	+1.40 -2.6	21.2	70.1
July 17	10 23.01	-31 49.2	3.936	3.633	+1.40 -3.4	21.4	65.5
July 27	10 37.04	-32 23.7	4.110	3.723	+1.40 -4.2	21.6	60.9
Aug. 6	10 51.05	-33 05.5	4.281	3.814	+1.39 -4.8	21.8	56.4
Aug. 16	11 05.00	-33 54.0	4.445	3.904	+1.38 -5.4	22.0	52.0
Aug. 26	11 18.84	-34 48.4	4.602	3.993	+1.37 -6.0	22.1	47.8
Sept. 5	11 32.54	-35 48.0	4.750	4.083	+1.35 -6.4	22.3	43.9
Sept. 15	11 46.06	-36 51.9	4.888	4.173	+1.33 -6.8	22.4	40.4
Sept. 25	11 59.36	-37 59.8	5.014	4.262	+1.30 -7.1	22.6	37.5
Oct. 5	12 12.40	-39 10.8	5.128	4.351	+1.27 -7.4	22.7	35.4
Oct. 15	12 25.14	-40 24.6	5.228	4.440	+1.24 -7.6	22.9	34.3
Oct. 25	12 37.51	-41 40.5	5.314	4.528	+1.19 -7.8	23.0	34.4
Nov. 4	12 49.44	-42 58.2	5.385	4.617	+1.14 -7.9	.	35.8
Nov. 14	13 00.86	-44 17.2	5.440	4.705	+1.08 -8.0	.	38.4
Nov. 24	13 11.66	-45 37.1	5.480	4.792	+1.01 -8.0	.	42.0
Dec. 4	13 21.73	-46 57.3	5.505	4.880	+0.92 -8.0	.	46.6
Dec. 14	13 30.93	-48 17.5	5.515	4.967	+0.82 -8.0	.	51.8
Dec. 24	13 39.09	-49 37.0	5.511	5.053	+0.70 -7.8	.	57.6
Jan. 3	13 46.04	-50 55.3	5.495	5.140	+0.56 -7.6	.	63.9
Jan. 13	13 51.59	-52 11.4	5.470	5.226	+0.39 -7.3	.	70.6
Jan. 23	13 55.53	-53 24.3	5.436	5.311	+0.21 -6.8	.	77.5
Feb. 2	13 57.68	-54 32.5	5.398	5.397	+0.02 -6.2	.	84.7
Feb. 12	13 57.87	-55 34.4	5.358	5.482	-0.19 -5.3	.	92.0
Feb. 22	13 56.01	-56 27.8	5.319	5.567	-0.39 -4.3	.	99.4
Mar. 3	13 52.13	-57 10.4	5.286	5.651	-0.57 -2.9	.	106.7
Mar. 13	13 46.40	-57 39.7	5.262	5.735	-0.72 -1.4	.	113.8
Mar. 23	13 39.17	-57 53.8	5.250	5.819	-0.82 +0.3	.	120.4

Comet C/2013 A1 (Siding Spring)

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 25.27969 TT
 Peri. = 2.41131
 Node = 300.97643 2000.0
 Incl. = 129.04240
 q = 1.3987120 AU
 e = 1.0003725

$$m_1 = 8.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	18 00.62	+03 15.5	2.521	1.757	+0.28	+20.8	12.5	31.3
Jan. 18	18 03.40	+06 43.0	2.497	1.843	+0.18	+23.0	12.6	39.2
Jan. 28	18 05.21	+10 32.8	2.450	1.933	+0.04	+25.7	12.8	47.8
Feb. 7	18 05.60	+14 50.0	2.389	2.026	-0.16	+28.9	13.0	56.9
Feb. 17	18 04.00	+19 38.5	2.319	2.123	-0.44	+32.2	13.1	66.2
Feb. 27	17 59.61	+25 00.2	2.250	2.221	-0.82	+35.2	13.2	75.6
Mar. 9	17 51.42	+30 51.9	2.191	2.321	-1.33	+37.1	13.4	84.8
Mar. 19	17 38.08	+37 02.9	2.152	2.423	-2.02	+36.9	13.5	93.3
Mar. 29	17 17.92	+43 12.3	2.142	2.524	-2.85	+33.6	13.7	100.6
Apr. 8	16 49.42	+48 48.3	2.170	2.627	-3.72	+26.6	13.9	105.9
Apr. 18	16 12.19	+53 14.3	2.238	2.730	-4.36	+16.6	14.1	108.6
Apr. 28	15 28.62	+56 00.4	2.346	2.833	-4.43	+5.8	14.4	108.6
May 8	14 44.28	+56 58.2	2.491	2.935	-3.92	-3.3	14.7	106.1
May 18	14 05.12	+56 25.1	2.666	3.038	-3.08	-9.4	15.0	101.8
May 28	13 34.36	+54 51.4	2.864	3.140	-2.22	-12.6	15.3	96.3
June 7	13 12.13	+52 45.7	3.078	3.243	-1.51	-13.8	15.6	90.1
June 17	12 57.03	+50 28.0	3.302	3.344	-0.96	-13.8	15.8	83.6
June 27	12 47.44	+48 10.1	3.529	3.446	-0.55	-13.2	16.1	77.0
July 7	12 41.94	+45 58.3	3.754	3.546	-0.25	-12.3	16.4	70.5
July 17	12 39.47	+43 55.7	3.974	3.647	-0.02	-11.2	16.6	64.1
July 27	12 39.25	+42 03.6	4.183	3.746	+0.14	-10.1	16.8	58.1
Aug. 6	12 40.69	+40 22.6	4.379	3.846	+0.27	-9.0	17.1	52.4
Aug. 16	12 43.37	+38 52.6	4.560	3.944	+0.36	-7.9	17.3	47.3
Aug. 26	12 46.97	+37 33.7	4.722	4.042	+0.43	-6.8	17.4	43.0
Sept. 5	12 51.22	+36 26.0	4.864	4.140	+0.47	-5.7	17.6	39.8
Sept. 15	12 55.94	+35 29.3	4.985	4.237	+0.50	-4.5	17.8	37.9
Sept. 25	13 00.94	+34 44.0	5.085	4.334	+0.51	-3.4	17.9	37.6
Oct. 5	13 06.06	+34 10.2	5.161	4.430	+0.51	-2.2	18.0	39.1
Oct. 15	13 11.17	+33 48.4	5.216	4.525	+0.49	-0.9	18.1	42.1
Oct. 25	13 16.12	+33 39.2	5.248	4.620	+0.46	+0.4	18.2	46.4
Nov. 4	13 20.76	+33 42.9	5.261	4.714	+0.42	+1.7	18.3	51.9
Nov. 14	13 24.93	+34 00.1	5.255	4.808	+0.35	+3.1	18.4	58.2
Nov. 24	13 28.47	+34 31.3	5.233	4.901	+0.27	+4.5	18.5	65.2
Dec. 4	13 31.19	+35 16.7	5.199	4.994	+0.17	+5.9	18.6	72.6
Dec. 14	13 32.90	+36 16.0	5.156	5.086	+0.05	+7.3	18.6	80.4
Dec. 24	13 33.35	+37 28.9	5.109	5.177	-0.10	+8.5	18.7	88.5
Jan. 3	13 32.32	+38 53.6	5.062	5.269	-0.27	+9.5	18.7	96.7
Jan. 13	13 29.59	+40 28.3	5.022	5.359	-0.47	+10.1	18.8	104.8
Jan. 23	13 24.93	+42 09.2	4.994	5.449	-0.67	+10.3	18.9	112.7
Feb. 2	13 18.21	+43 52.1	4.982	5.539	-0.88	+9.9	18.9	119.8
Feb. 12	13 09.38	+45 31.6	4.992	5.628	-1.08	+9.0	19.0	125.9
Feb. 22	12 58.56	+47 01.8	5.027	5.717	-1.24	+7.5	19.1	130.3
Mar. 3	12 46.12	+48 17.3	5.090	5.805	-1.35	+5.6	19.2	132.4
Mar. 13	12 32.57	+49 13.6	5.181	5.893	-1.39	+3.5	19.3	132.0
Mar. 23	12 18.65	+49 48.3	5.301	5.980	-1.35	+1.3	19.4	129.1

Comet C/2013 U2 (Holvorcem)

Epoch = 2015 June 27.0 TT
 T = 2014 Oct. 26.31911 TT
 Peri. = 107.45093
 Node = 6.96951 2000.0
 Incl. = 43.10902
 q = 5.1173617 AU
 e = 0.9950296

$$m1 = 7.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	10 54.60	+56 26.9	4.489	5.148	-0.48	+2.8	17.6	127.6
Jan. 18	10 49.79	+56 55.2	4.446	5.157	-0.68	+1.9	17.6	132.0
Jan. 28	10 42.96	+57 14.0	4.424	5.166	-0.84	+0.5	17.6	134.9
Feb. 7	10 34.61	+57 19.1	4.423	5.177	-0.92	-1.2	17.6	135.9
Feb. 17	10 25.44	+57 07.3	4.445	5.189	-0.92	-3.0	17.6	134.9
Feb. 27	10 16.27	+56 37.0	4.490	5.202	-0.84	-4.8	17.6	131.8
Mar. 9	10 07.89	+55 48.6	4.556	5.217	-0.70	-6.5	17.7	127.2
Mar. 19	10 00.89	+54 43.6	4.642	5.232	-0.52	-7.9	17.7	121.5
Mar. 29	09 55.68	+53 24.7	4.746	5.248	-0.33	-9.0	17.8	115.1
Apr. 8	09 52.42	+51 55.2	4.865	5.265	-0.13	-9.7	17.8	108.3
Apr. 18	09 51.07	+50 18.0	4.995	5.283	+0.04	-10.2	17.9	101.2
Apr. 28	09 51.52	+48 35.6	5.135	5.302	+0.20	-10.5	18.0	94.1
May 8	09 53.55	+46 50.4	5.281	5.323	+0.34	-10.6	18.1	86.9
May 18	09 56.95	+45 03.9	5.429	5.344	+0.45	-10.7	18.2	79.8
May 28	10 01.49	+43 17.4	5.578	5.366	+0.55	-10.6	18.2	72.8
June 7	10 06.98	+41 31.8	5.723	5.389	+0.62	-10.4	18.3	65.9
June 17	10 13.23	+39 47.6	5.863	5.413	+0.69	-10.2	18.4	59.1
June 27	10 20.08	+38 05.4	5.996	5.438	+0.73	-10.0	18.4	52.5
July 7	10 27.40	+36 25.5	6.119	5.463	+0.77	-9.7	18.5	46.1
July 17	10 35.06	+34 48.1	6.231	5.490	+0.79	-9.5	18.6	39.9
July 27	10 42.97	+33 13.5	6.329	5.517	+0.81	-9.2	18.6	34.1
Aug. 6	10 51.03	+31 42.0	6.413	5.545	+0.81	-8.8	18.7	28.8
Aug. 16	10 59.17	+30 13.7	6.481	5.574	+0.81	-8.5	18.7	24.4
Aug. 26	11 07.30	+28 48.9	6.531	5.604	+0.81	-8.1	18.8	21.6
Sept. 5	11 15.36	+27 27.9	6.564	5.635	+0.79	-7.7	18.8	21.0
Sept. 15	11 23.28	+26 11.0	6.579	5.666	+0.77	-7.2	18.8	22.9
Sept. 25	11 30.99	+24 58.6	6.575	5.698	+0.74	-6.8	18.8	26.8
Oct. 5	11 38.42	+23 51.0	6.553	5.731	+0.71	-6.2	18.9	32.2
Oct. 15	11 45.50	+22 48.5	6.513	5.765	+0.66	-5.7	18.9	38.4
Oct. 25	11 52.13	+21 51.7	6.455	5.799	+0.61	-5.1	18.9	45.3
Nov. 4	11 58.24	+21 00.7	6.382	5.834	+0.55	-4.5	18.9	52.7
Nov. 14	12 03.75	+20 16.1	6.294	5.869	+0.48	-3.8	18.9	60.5
Nov. 24	12 08.53	+19 38.1	6.194	5.905	+0.40	-3.1	18.9	68.6
Dec. 4	12 12.50	+19 06.8	6.085	5.942	+0.31	-2.4	18.9	77.0
Dec. 14	12 15.56	+18 42.5	5.970	5.980	+0.20	-1.8	18.8	85.8
Dec. 24	12 17.60	+18 24.9	5.853	6.018	+0.10	-1.1	18.8	94.9
Jan. 3	12 18.55	+18 13.5	5.738	6.056	-0.02	-0.6	18.8	104.3
Jan. 13	12 18.35	+18 07.9	5.630	6.095	-0.14	-0.1	18.8	113.9
Jan. 23	12 16.98	+18 06.9	5.534	6.135	-0.25	+0.2	18.8	123.7
Feb. 2	12 14.47	+18 09.0	5.454	6.175	-0.35	+0.4	18.8	133.6
Feb. 12	12 10.92	+18 12.6	5.395	6.216	-0.44	+0.3	18.8	143.4
Feb. 22	12 06.50	+18 15.8	5.362	6.257	-0.51	+0.1	18.8	152.7
Mar. 3	12 01.44	+18 16.6	5.356	6.298	-0.54	-0.3	18.8	160.4
Mar. 13	11 56.02	+18 13.4	5.380	6.340	-0.55	-0.9	18.9	163.7
Mar. 23	11 50.56	+18 04.7	5.436	6.383	-0.52	-1.5	18.9	160.3

Comet 135P/Shoemaker-Levy

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 1.66395 TT
 Peri. = 21.96851
 Node = 213.09699 2000.0
 Incl. = 6.06150
 q = 2.6797227 AU
 e = 0.2953687
 a = 3.8030140 AU
 n = 0.13289609
 P = 7.42 years

$$m1 = 4.2 + 5 \log(\Delta) + 25.0 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	17 22.43	-20 14.8	3.555	2.707	+1.86 0.0	17.7	26.1
Jan. 18	17 41.00	-20 15.0	3.500	2.716	+1.81 +0.9	17.6	31.9
Jan. 28	17 59.11	-20 06.0	3.435	2.725	+1.75 +1.8	17.6	37.9
Feb. 7	18 16.64	-19 48.4	3.360	2.736	+1.68 +2.6	17.6	43.9
Feb. 17	18 33.44	-19 22.9	3.277	2.748	+1.59 +3.3	17.5	50.0
Feb. 27	18 49.38	-18 50.3	3.185	2.761	+1.49 +3.8	17.5	56.3
Mar. 9	19 04.31	-18 11.9	3.087	2.775	+1.38 +4.3	17.5	62.7
Mar. 19	19 18.10	-17 28.7	2.982	2.790	+1.25 +4.6	17.4	69.3
Mar. 29	19 30.59	-16 42.2	2.872	2.805	+1.10 +4.8	17.4	76.1
Apr. 8	19 41.61	-15 53.9	2.760	2.822	+0.94 +4.9	17.3	83.2
Apr. 18	19 51.02	-15 05.3	2.646	2.840	+0.76 +4.7	17.3	90.6
Apr. 28	19 58.61	-14 18.3	2.533	2.858	+0.56 +4.4	17.2	98.3
May 8	20 04.23	-13 34.5	2.424	2.877	+0.35 +3.9	17.2	106.5
May 18	20 07.72	-12 55.8	2.320	2.897	+0.12 +3.2	17.2	115.0
May 28	20 08.94	-12 24.0	2.226	2.917	-0.10 +2.3	17.1	124.1
June 7	20 07.89	-12 00.6	2.145	2.939	-0.32 +1.4	17.1	133.7
June 17	20 04.67	-11 46.6	2.080	2.960	-0.51 +0.4	17.1	143.7
June 27	19 59.56	-11 42.7	2.036	2.983	-0.65 -0.6	17.1	153.9
July 7	19 53.08	-11 48.4	2.016	3.006	-0.72 -1.4	17.2	163.8
July 17	19 45.89	-12 02.6	2.022	3.029	-0.71 -2.1	17.3	170.7
July 27	19 38.78	-12 23.3	2.054	3.053	-0.63 -2.5	17.4	167.3
Aug. 6	19 32.53	-12 48.0	2.114	3.078	-0.48 -2.7	17.5	158.0
Aug. 16	19 27.73	-13 14.5	2.197	3.102	-0.29 -2.6	17.7	147.9
Aug. 26	19 24.83	-13 40.7	2.303	3.128	-0.08 -2.4	17.9	137.9
Sept. 5	19 24.01	-14 04.7	2.428	3.153	+0.13 -2.0	18.1	128.2
Sept. 15	19 25.30	-14 25.1	2.568	3.179	+0.33 -1.6	18.3	118.9
Sept. 25	19 28.62	-14 41.0	2.720	3.205	+0.51 -1.0	18.5	110.0
Oct. 5	19 33.76	-14 51.4	2.880	3.231	+0.68 -0.4	18.7	101.5
Oct. 15	19 40.53	-14 55.9	3.045	3.258	+0.82 +0.2	18.9	93.3
Oct. 25	19 48.70	-14 54.0	3.212	3.284	+0.93 +0.9	19.1	85.3
Nov. 4	19 58.04	-14 45.5	3.378	3.311	+1.03 +1.5	19.3	77.6
Nov. 14	20 08.36	-14 30.2	3.542	3.338	+1.11 +2.2	19.5	70.1
Nov. 24	20 19.47	-14 08.2	3.700	3.365	+1.17 +2.9	19.7	62.8
Dec. 4	20 31.20	-13 39.5	3.850	3.392	+1.22 +3.5	19.9	55.6
Dec. 14	20 43.39	-13 04.5	3.991	3.420	+1.25 +4.1	20.0	48.5
Dec. 24	20 55.93	-12 23.5	4.121	3.447	+1.27 +4.7	20.2	41.5
Jan. 3	21 08.67	-11 36.8	4.239	3.474	+1.29 +5.2	20.3	34.6
Jan. 13	21 21.54	-10 45.1	4.342	3.501	+1.29 +5.6	20.5	27.7
Jan. 23	21 34.43	-09 48.9	4.430	3.529	+1.28 +6.0	20.6	21.0
Feb. 2	21 47.26	-08 48.8	4.502	3.556	+1.27 +6.3	20.7	14.3
Feb. 12	21 59.97	-07 45.4	4.557	3.583	+1.25 +6.6	20.8	8.1
Feb. 22	22 12.48	-06 39.5	4.596	3.610	+1.23 +6.8	20.9	4.1
Mar. 3	22 24.74	-05 31.9	4.617	3.637	+1.20 +6.9	21.0	7.9
Mar. 13	22 36.70	-04 23.1	4.620	3.664	+1.16 +6.9	21.1	14.1
Mar. 23	22 48.29	-03 14.0	4.606	3.691	+1.12 +6.9	21.2	20.7

Comet 80P/Peters-Hartley

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 10.04718 TT
 Peri. = 339.13580 e = 0.5991245
 Node = 259.88474 2000.0 a = 4.0228921 AU
 Incl. = 29.92110 n = 0.12215085
 q = 1.6126789 AU P = 8.07 years

$$m1 = 9.0 + 5 \log(\Delta) + 25.0 \log(r(t-20))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	18 30.52	-18 58.8	2.681	1.725	+2.68	+13.2	16.7	10.8
Jan. 18	18 57.28	-16 46.8	2.697	1.763	+2.53	+14.5	16.9	14.8
Jan. 28	19 22.60	-14 21.6	2.709	1.806	+2.38	+15.6	17.1	18.9
Feb. 7	19 46.44	-11 45.4	2.719	1.853	+2.24	+16.5	17.3	23.1
Feb. 17	20 08.86	-09 00.4	2.725	1.903	+2.10	+17.2	17.6	27.4
Feb. 27	20 29.87	-06 08.6	2.726	1.956	+1.96	+17.7	17.9	31.9
Mar. 9	20 49.51	-03 11.9	2.722	2.012	+1.83	+18.0	18.2	36.4
Mar. 19	21 07.81	-00 11.7	2.714	2.069	+1.70	+18.2	18.5	41.1
Mar. 29	21 24.77	+02 50.5	2.699	2.129	+1.56	+18.3	18.7	45.9
Apr. 8	21 40.39	+05 53.5	2.680	2.189	+1.43	+18.3	19.0	50.8
Apr. 18	21 54.66	+08 56.2	2.654	2.251	+1.28	+18.1	19.3	55.9
Apr. 28	22 07.51	+11 57.6	2.624	2.314	+1.14	+17.9	19.6	61.2
May 8	22 18.86	+14 56.4	2.588	2.377	+0.97	+17.5	19.9	66.7
May 18	22 28.61	+17 51.7	2.548	2.441	+0.80	+17.0	20.1	72.4
May 28	22 36.60	+20 41.9	2.505	2.505	+0.61	+16.4	20.4	78.3
June 7	22 42.65	+23 25.4	2.460	2.569	+0.39	+15.5	20.6	84.5
June 17	22 46.57	+26 00.1	2.414	2.633	+0.16	+14.3	20.9	90.9
June 27	22 48.16	+28 22.7	2.369	2.697	-0.09	+12.7	21.1	97.5
July 7	22 47.28	+30 29.7	2.329	2.761	-0.34	+10.7	21.3	104.3
July 17	22 43.88	+32 16.7	2.294	2.825	-0.58	+8.2	21.6	111.2
July 27	22 38.07	+33 38.6	2.269	2.888	-0.78	+5.2	21.8	118.0
Aug. 6	22 30.26	+34 30.8	2.256	2.951	-0.92	+1.9	22.0	124.5
Aug. 16	22 21.06	+34 49.9	2.259	3.014	-0.97	-1.5	22.3	130.2
Aug. 26	22 11.37	+34 35.0	2.279	3.076	-0.92	-4.6	22.5	134.7
Sept. 5	22 02.13	+33 48.5	2.320	3.137	-0.79	-7.3	22.8	137.3
Sept. 15	21 54.19	+32 35.9	2.383	3.198	-0.60	-9.1	.	137.6
Sept. 25	21 48.19	+31 04.8	2.467	3.259	-0.37	-10.1	.	135.5
Oct. 5	21 44.45	+29 23.8	2.572	3.319	-0.14	-10.3	.	131.4
Oct. 15	21 43.05	+27 40.9	2.696	3.378	+0.09	-9.8	.	125.8
Oct. 25	21 43.91	+26 02.4	2.838	3.436	+0.29	-8.9	.	119.4
Nov. 4	21 46.78	+24 33.3	2.994	3.495	+0.46	-7.7	.	112.4
Nov. 14	21 51.43	+23 16.6	3.162	3.552	+0.62	-6.3	.	105.2
Nov. 24	21 57.59	+22 13.9	3.338	3.609	+0.74	-4.8	.	97.9
Dec. 4	22 04.99	+21 25.8	3.519	3.665	+0.84	-3.4	.	90.6
Dec. 14	22 13.40	+20 52.2	3.703	3.720	+0.92	-2.0	.	83.4
Dec. 24	22 22.63	+20 32.5	3.887	3.775	+0.99	-0.7	.	76.2
Jan. 3	22 32.49	+20 25.6	4.067	3.829	+1.03	+0.5	.	69.2
Jan. 13	22 42.84	+20 30.6	4.241	3.883	+1.07	+1.6	.	62.3
Jan. 23	22 53.54	+20 46.2	4.407	3.935	+1.09	+2.5	.	55.6
Feb. 2	23 04.49	+21 11.2	4.563	3.988	+1.11	+3.3	.	49.1
Feb. 12	23 15.60	+21 44.4	4.706	4.039	+1.12	+4.0	.	42.9
Feb. 22	23 26.77	+22 24.9	4.836	4.090	+1.12	+4.6	.	37.0
Mar. 3	23 37.94	+23 11.4	4.950	4.140	+1.11	+5.2	.	31.7
Mar. 13	23 49.04	+24 03.0	5.048	4.190	+1.10	+5.6	.	27.3
Mar. 23	00 00.00	+24 58.9	5.129	4.239	+1.08	+5.9	.	24.1

Comet 269P/Jedicke

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 13.95089 TT
 Peri. = 223.68945
 Node = 248.26819 2000.0
 Incl. = 6.57551
 q = 4.0780239 AU
 e = 0.4478218
 a = 7.3853403 AU
 n = 0.04910755
 P = 20.07 years

$$m1 = 1.2 + 5 \log(\Delta) + 20.0 \log(r(t-100))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	08 17.24	+12 49.2	3.142	4.090	-0.53 +0.6	15.9	162.3
Jan. 18	08 11.95	+12 55.1	3.119	4.095	-0.55 +1.0	15.9	171.5
Jan. 28	08 06.49	+13 05.1	3.126	4.100	-0.51 +1.3	15.9	170.4
Feb. 7	08 01.40	+13 17.7	3.163	4.107	-0.42 +1.4	15.9	160.7
Feb. 17	07 57.18	+13 31.2	3.228	4.114	-0.30 +1.3	16.0	150.1
Feb. 27	07 54.20	+13 44.2	3.318	4.122	-0.15 +1.1	16.0	139.5
Mar. 9	07 52.72	+13 55.4	3.430	4.130	+0.01 +0.8	16.1	129.3
Mar. 19	07 52.85	+14 03.8	3.559	4.139	+0.17 +0.5	16.2	119.4
Mar. 29	07 54.59	+14 08.6	3.701	4.150	+0.33 +0.1	16.3	110.0
Apr. 8	07 57.86	+14 09.3	3.852	4.160	+0.47 -0.4	16.4	101.0
Apr. 18	08 02.53	+14 05.4	4.008	4.172	+0.59 -0.9	16.4	92.4
Apr. 28	08 08.46	+13 56.6	4.166	4.184	+0.70 -1.4	16.5	84.1
May 8	08 15.46	+13 42.7	4.322	4.197	+0.79 -1.9	16.6	76.2
May 18	08 23.38	+13 23.7	4.475	4.211	+0.87 -2.4	16.7	68.5
May 28	08 32.07	+12 59.6	4.621	4.225	+0.93 -2.9	16.8	61.1
June 7	08 41.38	+12 30.4	4.758	4.240	+0.98 -3.4	16.9	53.9
June 17	08 51.19	+11 56.3	4.885	4.255	+1.02 -3.9	17.0	46.8
June 27	09 01.37	+11 17.5	5.001	4.272	+1.05 -4.3	17.0	39.9
July 7	09 11.84	+10 34.3	5.103	4.288	+1.07 -4.7	17.1	33.2
July 17	09 22.50	+09 46.9	5.192	4.306	+1.08 -5.1	17.2	26.5
July 27	09 33.26	+08 55.8	5.265	4.324	+1.08 -5.4	17.2	19.9
Aug. 6	09 44.06	+08 01.5	5.322	4.342	+1.08 -5.7	17.3	13.6
Aug. 16	09 54.83	+07 04.2	5.363	4.362	+1.07 -6.0	17.3	7.8
Aug. 26	10 05.50	+06 04.5	5.387	4.381	+1.05 -6.2	17.3	5.4
Sept. 5	10 16.01	+05 02.9	5.393	4.402	+1.03 -6.3	17.4	9.5
Sept. 15	10 26.30	+03 59.9	5.382	4.422	+1.00 -6.4	17.4	15.7
Sept. 25	10 36.31	+02 56.2	5.354	4.444	+0.96 -6.4	17.4	22.5
Oct. 5	10 45.95	+01 52.4	5.309	4.465	+0.92 -6.3	17.4	29.5
Oct. 15	10 55.17	+00 49.1	5.247	4.488	+0.87 -6.2	17.4	36.7
Oct. 25	11 03.88	-00 13.0	5.170	4.510	+0.81 -6.0	17.4	44.2
Nov. 4	11 11.99	-01 13.0	5.079	4.534	+0.74 -5.7	17.4	51.8
Nov. 14	11 19.40	-02 10.2	4.975	4.557	+0.66 -5.4	17.4	59.7
Nov. 24	11 26.01	-03 03.8	4.861	4.581	+0.57 -4.9	17.4	67.9
Dec. 4	11 31.70	-03 52.7	4.738	4.606	+0.47 -4.3	17.4	76.3
Dec. 14	11 36.36	-04 36.0	4.610	4.630	+0.35 -3.7	17.4	85.1
Dec. 24	11 39.87	-05 12.8	4.480	4.656	+0.23 -2.9	17.4	94.1
Jan. 3	11 42.14	-05 42.0	4.353	4.681	+0.10 -2.1	17.3	103.5
Jan. 13	11 43.10	-06 02.8	4.231	4.707	-0.04 -1.1	17.3	113.3
Jan. 23	11 42.72	-06 14.3	4.121	4.733	-0.17 -0.2	17.3	123.3
Feb. 2	11 41.06	-06 16.1	4.026	4.760	-0.28 +0.8	17.3	133.7
Feb. 12	11 38.24	-06 08.1	3.951	4.787	-0.38 +1.7	17.3	144.3
Feb. 22	11 34.47	-05 51.1	3.900	4.814	-0.44 +2.5	17.3	154.9
Mar. 3	11 30.06	-05 26.3	3.877	4.842	-0.47 +3.1	17.4	165.1
Mar. 13	11 25.38	-04 55.7	3.883	4.869	-0.46 +3.4	17.4	171.9
Mar. 23	11 20.82	-04 21.8	3.920	4.897	-0.41 +3.5	17.5	167.4

Comet P/2014 W12 (Gibbs)

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 14.99618 TT
 Peri. = 36.88621 e = 0.5118181
 Node = 299.40334 2000.0 a = 3.4250184 AU
 Incl. = 8.51885 n = 0.15549259
 q = 1.6720320 AU P = 6.34 years

$$m1 = 12.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	22 32.75	-02 24.3	2.172	1.748	+2.51 +15.8	17.9	52.0
Jan. 18	22 57.87	+00 13.5	2.265	1.777	+2.48 +15.8	18.1	48.7
Jan. 28	23 22.62	+02 51.7	2.361	1.811	+2.44 +15.6	18.3	45.4
Feb. 7	23 46.99	+05 27.9	2.460	1.847	+2.40 +15.2	18.6	41.9
Feb. 17	00 11.00	+08 00.3	2.560	1.887	+2.37 +14.7	18.8	38.4
Feb. 27	00 34.68	+10 27.2	2.660	1.930	+2.34 +14.0	19.0	34.7
Mar. 9	00 58.06	+12 47.1	2.759	1.975	+2.31 +13.2	19.2	31.0
Mar. 19	01 21.14	+14 58.8	2.857	2.023	+2.28 +12.3	19.5	27.1
Mar. 29	01 43.97	+17 01.4	2.952	2.072	+2.26 +11.3	19.7	23.2
Apr. 8	02 06.52	+18 54.0	3.043	2.123	+2.23 +10.2	19.9	19.2
Apr. 18	02 28.81	+20 36.2	3.128	2.175	+2.20 +9.1	20.1	15.1
Apr. 28	02 50.82	+22 07.6	3.207	2.228	+2.17 +8.0	20.3	11.1
May 8	03 12.51	+23 28.0	3.278	2.281	+2.13 +6.9	20.6	7.4
May 18	03 33.85	+24 37.4	3.341	2.336	+2.09 +5.9	20.7	5.3
May 28	03 54.80	+25 36.1	3.394	2.391	+2.05 +4.8	20.9	6.7
June 7	04 15.28	+26 24.2	3.437	2.446	+2.00 +3.8	21.1	10.4
June 17	04 35.23	+27 02.3	3.469	2.501	+1.94 +2.9	21.3	15.0
June 27	04 54.58	+27 31.0	3.488	2.557	+1.87 +2.0	21.4	20.0
July 7	05 13.24	+27 50.9	3.496	2.612	+1.79 +1.2	21.6	25.2
July 17	05 31.14	+28 02.8	3.491	2.667	+1.70 +0.5	21.7	30.6
July 27	05 48.18	+28 07.8	3.473	2.722	+1.61 -0.1	21.8	36.3
Aug. 6	06 04.25	+28 06.8	3.442	2.777	+1.50 -0.6	21.9	42.3
Aug. 16	06 19.26	+28 00.9	3.398	2.831	+1.38 -1.0	22.0	48.5
Aug. 26	06 33.09	+27 51.3	3.342	2.885	+1.25 -1.2	22.1	55.0
Sept. 5	06 45.61	+27 39.3	3.276	2.938	+1.11 -1.3	22.2	61.9
Sept. 15	06 56.67	+27 26.1	3.199	2.991	+0.94 -1.3	22.3	69.1
Sept. 25	07 06.11	+27 13.0	3.113	3.044	+0.76 -1.2	22.3	76.7
Oct. 5	07 13.74	+27 01.3	3.022	3.096	+0.56 -0.9	22.4	84.8
Oct. 15	07 19.36	+26 52.0	2.926	3.147	+0.34 -0.6	22.4	93.4
Oct. 25	07 22.75	+26 46.1	2.831	3.198	+0.10 -0.2	22.4	102.5
Nov. 4	07 23.76	+26 43.9	2.740	3.248	-0.15 +0.1	22.5	112.3
Nov. 14	07 22.25	+26 45.4	2.658	3.298	-0.41 +0.4	22.5	122.6
Nov. 24	07 18.19	+26 49.6	2.589	3.347	-0.64 +0.5	22.5	133.6
Dec. 4	07 11.80	+26 55.0	2.540	3.395	-0.83 +0.4	22.6	145.0
Dec. 14	07 03.46	+26 59.3	2.516	3.443	-0.96 +0.1	22.7	156.9
Dec. 24	06 53.86	+27 00.3	2.520	3.490	-1.00 -0.4	22.7	168.8
Jan. 3	06 43.87	+26 56.7	2.555	3.536	-0.95 -0.9	22.9	175.6
Jan. 13	06 34.35	+26 48.0	2.622	3.582	-0.82 -1.3	23.0	165.2
Jan. 23	06 26.14	+26 35.0	2.720	3.627	-0.64 -1.6	.	153.5
Feb. 2	06 19.77	+26 19.0	2.844	3.671	-0.42 -1.7	.	142.0
Feb. 12	06 15.57	+26 01.7	2.992	3.715	-0.20 -1.7	.	131.0
Feb. 22	06 13.62	+25 44.3	3.158	3.758	+0.02 -1.7	.	120.5
Mar. 3	06 13.81	+25 27.3	3.338	3.800	+0.22 -1.6	.	110.5
Mar. 13	06 15.96	+25 11.0	3.526	3.841	+0.39 -1.6	.	101.0
Mar. 23	06 19.85	+24 55.3	3.719	3.882	+0.54 -1.6	.	91.9

Comet C/2013 G3 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 15.21386 TT
 Peri. = 76.50356
 Node = 208.11897 2000.0
 Incl. = 64.67008
 q = 3.8521836 AU
 e = 1.0006859

$$m1 = 8.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	18 51.97	+30 11.8	4.395	3.881	+1.76 +5.1	17.5	52.8
Jan. 18	19 09.53	+31 02.9	4.404	3.892	+1.75 +6.0	17.5	53.0
Jan. 28	19 27.01	+32 03.2	4.413	3.906	+1.73 +6.9	17.5	53.4
Feb. 7	19 44.28	+33 11.7	4.421	3.921	+1.70 +7.6	17.6	53.9
Feb. 17	20 01.23	+34 27.6	4.429	3.939	+1.65 +8.2	17.6	54.5
Feb. 27	20 17.76	+35 49.8	4.435	3.958	+1.60 +8.7	17.6	55.4
Mar. 9	20 33.74	+37 17.3	4.441	3.979	+1.53 +9.2	17.6	56.4
Mar. 19	20 49.09	+38 48.9	4.443	4.001	+1.46 +9.5	17.7	57.7
Mar. 29	21 03.68	+40 23.5	4.443	4.025	+1.37 +9.6	17.7	59.3
Apr. 8	21 17.41	+41 59.8	4.440	4.051	+1.28 +9.7	17.7	61.1
Apr. 18	21 30.17	+43 36.9	4.431	4.079	+1.17 +9.7	17.7	63.2
Apr. 28	21 41.84	+45 13.5	4.419	4.108	+1.04 +9.5	17.8	65.7
May 8	21 52.28	+46 48.3	4.401	4.139	+0.91 +9.2	17.8	68.5
May 18	22 01.35	+48 20.1	4.377	4.171	+0.75 +8.7	17.8	71.7
May 28	22 08.90	+49 47.5	4.349	4.205	+0.59 +8.1	17.8	75.2
June 7	22 14.78	+51 08.7	4.316	4.240	+0.41 +7.3	17.8	79.0
June 17	22 18.86	+52 21.9	4.278	4.276	+0.22 +6.3	17.9	83.1
June 27	22 21.02	+53 24.7	4.238	4.314	+0.02 +5.0	17.9	87.5
July 7	22 21.22	+54 14.7	4.196	4.353	-0.17 +3.4	17.9	92.1
July 17	22 19.54	+54 49.2	4.154	4.393	-0.34 +1.6	17.9	96.9
July 27	22 16.17	+55 05.2	4.115	4.435	-0.47 -0.5	17.9	101.7
Aug. 6	22 11.50	+55 00.2	4.081	4.477	-0.55 -2.8	18.0	106.6
Aug. 16	22 06.02	+54 32.4	4.054	4.520	-0.57 -5.2	18.0	111.3
Aug. 26	22 00.35	+53 40.8	4.037	4.565	-0.52 -7.5	18.0	115.6
Sept. 5	21 55.13	+52 26.2	4.034	4.610	-0.43 -9.6	18.1	119.2
Sept. 15	21 50.88	+50 50.6	4.046	4.657	-0.29 -11.3	18.1	121.9
Sept. 25	21 48.01	+48 57.6	4.077	4.704	-0.13 -12.6	18.2	123.4
Oct. 5	21 46.74	+46 51.7	4.128	4.752	+0.04 -13.4	18.2	123.4
Oct. 15	21 47.14	+44 38.1	4.200	4.801	+0.20 -13.6	18.3	121.8
Oct. 25	21 49.18	+42 22.1	4.293	4.851	+0.35 -13.4	18.4	118.8
Nov. 4	21 52.72	+40 08.4	4.406	4.902	+0.49 -12.7	18.5	114.6
Nov. 14	21 57.59	+38 01.1	4.537	4.953	+0.60 -11.8	18.6	109.3
Nov. 24	22 03.62	+36 03.5	4.685	5.005	+0.70 -10.6	18.7	103.3
Dec. 4	22 10.61	+34 17.6	4.845	5.057	+0.78 -9.3	18.9	96.8
Dec. 14	22 18.39	+32 44.9	5.016	5.110	+0.84 -7.9	19.0	89.9
Dec. 24	22 26.80	+31 25.9	5.193	5.164	+0.89 -6.5	19.1	82.9
Jan. 3	22 35.70	+30 20.5	5.373	5.218	+0.93 -5.2	19.2	75.7
Jan. 13	22 44.96	+29 28.3	5.552	5.273	+0.95 -4.0	19.3	68.6
Jan. 23	22 54.46	+28 48.3	5.728	5.328	+0.96 -2.9	19.5	61.5
Feb. 2	23 04.10	+28 19.7	5.895	5.384	+0.97 -1.9	19.6	54.6
Feb. 12	23 13.81	+28 01.2	6.053	5.440	+0.97 -1.0	19.7	47.9
Feb. 22	23 23.49	+27 51.6	6.198	5.497	+0.96 -0.2	19.8	41.5
Mar. 3	23 33.07	+27 49.9	6.327	5.554	+0.94 +0.5	19.9	35.8
Mar. 13	23 42.49	+27 54.8	6.440	5.611	+0.92 +1.0	19.9	30.9
Mar. 23	23 51.68	+28 05.2	6.535	5.669	+0.89 +1.5	20.0	27.4

Comet 40P/Vaisala

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 15.83409 TT
 Peri. = 47.28445
 Node = 133.84000 2000.0
 Incl. = 11.49273
 q = 1.8196966 AU

e = 0.6316053
 a = 4.9395298 AU
 n = 0.08977919
 P = 10.98 years

$$m_1 = 9.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	15 30.78	-09 35.9	2.283	1.897	+2.29 -4.5	16.5	54.9
Jan. 18	15 53.72	-10 21.3	2.233	1.927	+2.18 -3.0	16.5	59.3
Jan. 28	16 15.48	-10 51.8	2.182	1.962	+2.04 -1.6	16.6	64.0
Feb. 7	16 35.84	-11 08.0	2.128	2.001	+1.87 -0.3	16.7	69.1
Feb. 17	16 54.55	-11 11.3	2.072	2.043	+1.68 +0.8	16.8	74.5
Feb. 27	17 11.36	-11 03.3	2.014	2.088	+1.47 +1.7	16.9	80.3
Mar. 9	17 26.02	-10 45.9	1.954	2.137	+1.23 +2.4	17.0	86.5
Mar. 19	17 38.29	-10 21.5	1.892	2.188	+0.96 +2.9	17.1	93.2
Mar. 29	17 47.90	-09 52.8	1.832	2.241	+0.68 +3.0	17.2	100.5
Apr. 8	17 54.65	-09 22.5	1.774	2.296	+0.37 +2.9	17.4	108.4
Apr. 18	17 58.37	-08 53.7	1.721	2.352	+0.06 +2.4	17.5	116.9
Apr. 28	17 58.99	-08 29.6	1.677	2.410	-0.24 +1.7	17.6	126.0
May 8	17 56.63	-08 13.1	1.645	2.469	-0.50 +0.6	17.8	135.6
May 18	17 51.61	-08 06.7	1.630	2.530	-0.71 -0.6	17.9	145.5
May 28	17 44.56	-08 12.4	1.636	2.591	-0.82 -1.8	18.1	155.2
June 7	17 36.35	-08 30.6	1.665	2.652	-0.84 -3.0	18.3	163.1
June 17	17 27.96	-09 00.7	1.719	2.714	-0.76 -4.0	18.6	165.4
June 27	17 20.33	-09 40.7	1.800	2.777	-0.61 -4.7	18.8	160.1
July 7	17 14.23	-10 28.1	1.905	2.840	-0.41 -5.2	19.1	151.4
July 17	17 10.10	-11 20.4	2.033	2.903	-0.19 -5.5	19.4	142.0
July 27	17 08.17	-12 15.2	2.181	2.966	+0.03 -5.5	19.8	132.7
Aug. 6	17 08.45	-13 10.3	2.346	3.029	+0.23 -5.4	20.1	123.7
Aug. 16	17 10.79	-14 04.3	2.525	3.092	+0.42 -5.2	20.4	115.0
Aug. 26	17 15.01	-14 55.8	2.713	3.155	+0.59 -4.8	20.7	106.6
Sept. 5	17 20.87	-15 43.9	2.909	3.217	+0.73 -4.4	21.0	98.5
Sept. 15	17 28.15	-16 27.8	3.110	3.280	+0.85 -3.9	21.3	90.7
Sept. 25	17 36.65	-17 07.0	3.312	3.342	+0.95 -3.4	21.6	83.0
Oct. 5	17 46.16	-17 41.1	3.513	3.404	+1.03 -2.9	21.8	75.5
Oct. 15	17 56.51	-18 09.7	3.710	3.465	+1.10 -2.3	22.1	68.2
Oct. 25	18 07.54	-18 32.6	3.902	3.527	+1.16 -1.7	22.3	60.9
Nov. 4	18 19.10	-18 49.7	4.085	3.587	+1.20 -1.1	22.6	53.6
Nov. 14	18 31.06	-19 00.9	4.259	3.648	+1.22 -0.5	22.8	46.4
Nov. 24	18 43.31	-19 06.4	4.419	3.708	+1.24 0.0	23.0	39.3
Dec. 4	18 55.72	-19 06.3	4.566	3.768	+1.25 +0.5	.	32.1
Dec. 14	19 08.20	-19 00.8	4.697	3.827	+1.24 +1.0	.	24.9
Dec. 24	19 20.64	-18 50.4	4.811	3.885	+1.23 +1.5	.	17.7
Jan. 3	19 32.94	-18 35.4	4.906	3.944	+1.21 +1.9	.	10.6
Jan. 13	19 45.03	-18 16.4	4.982	4.002	+1.18 +2.2	.	4.1
Jan. 23	19 56.81	-17 53.9	5.038	4.059	+1.14 +2.5	.	5.3
Feb. 2	20 08.21	-17 28.7	5.074	4.116	+1.09 +2.7	.	12.2
Feb. 12	20 19.14	-17 01.3	5.089	4.172	+1.04 +2.9	.	19.5
Feb. 22	20 29.52	-16 32.7	5.085	4.228	+0.98 +2.9	.	27.0
Mar. 3	20 39.27	-16 03.6	5.061	4.283	+0.91 +2.9	.	34.7
Mar. 13	20 48.33	-15 34.8	5.020	4.338	+0.83 +2.8	.	42.4
Mar. 23	20 56.59	-15 07.3	4.961	4.392	+0.74 +2.5	.	50.3

Comet C/2014 Q3 (Borisov)

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 19.06986 TT
 Peri. = 47.38539 e = 0.9419949
 Node = 63.13150 2000.0 a = 28.4020681 AU
 Incl. = 89.94734 n = 0.00651147
 q = 1.6474648 AU P = 151.36 years

$$m1 = 9.2 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	19 18.99	+45 11.0	1.894	1.769	+0.77	-10.7	13.7	67.5
Jan. 18	19 26.66	+43 23.6	2.012	1.819	+0.61	-6.0	14.0	64.5
Jan. 28	19 32.76	+42 23.3	2.111	1.876	+0.45	-2.2	14.2	62.7
Feb. 7	19 37.22	+42 01.5	2.190	1.939	+0.27	+1.0	14.5	62.3
Feb. 17	19 39.89	+42 11.9	2.248	2.007	+0.05	+3.8	14.7	63.2
Feb. 27	19 40.43	+42 49.7	2.287	2.080	-0.20	+6.0	15.0	65.4
Mar. 9	19 38.41	+43 50.0	2.307	2.156	-0.51	+7.8	15.2	68.8
Mar. 19	19 33.27	+45 07.8	2.311	2.235	-0.90	+8.9	15.4	73.1
Mar. 29	19 24.31	+46 36.7	2.304	2.317	-1.35	+9.1	15.6	78.2
Apr. 8	19 10.78	+48 07.7	2.291	2.401	-1.87	+8.1	15.8	83.9
Apr. 18	18 52.11	+49 28.7	2.276	2.486	-2.40	+5.5	15.9	89.9
Apr. 28	18 28.13	+50 24.0	2.266	2.573	-2.84	+1.2	16.1	95.9
May 8	17 59.72	+50 36.2	2.268	2.661	-3.08	-4.5	16.3	101.6
May 18	17 28.97	+49 51.3	2.287	2.750	-3.02	-10.8	16.5	106.5
May 28	16 58.73	+48 03.1	2.329	2.839	-2.70	-16.6	16.7	110.0
June 7	16 31.70	+45 17.3	2.397	2.929	-2.23	-20.9	16.9	111.8
June 17	16 09.43	+41 48.4	2.494	3.020	-1.71	-23.4	17.2	111.6
June 27	15 52.36	+37 54.0	2.620	3.110	-1.23	-24.3	17.5	109.5
July 7	15 40.10	+33 50.6	2.771	3.201	-0.82	-24.0	17.7	105.8
July 17	15 31.94	+29 50.1	2.945	3.291	-0.48	-23.0	18.0	100.9
July 27	15 27.15	+26 00.6	3.137	3.382	-0.21	-21.4	18.3	95.1
Aug. 6	15 25.07	+22 26.3	3.343	3.472	+0.01	-19.7	18.6	88.7
Aug. 16	15 25.14	+19 09.1	3.558	3.562	+0.18	-18.0	18.9	82.1
Aug. 26	15 26.92	+16 09.2	3.778	3.652	+0.31	-16.3	19.1	75.2
Sept. 5	15 30.05	+13 26.2	3.998	3.742	+0.42	-14.7	19.4	68.2
Sept. 15	15 34.27	+10 58.9	4.214	3.831	+0.51	-13.3	19.6	61.2
Sept. 25	15 39.33	+08 46.3	4.423	3.920	+0.57	-11.9	19.8	54.1
Oct. 5	15 45.06	+06 47.3	4.621	4.009	+0.62	-10.7	20.1	47.2
Oct. 15	15 51.28	+05 00.7	4.805	4.097	+0.66	-9.5	20.3	40.4
Oct. 25	15 57.87	+03 25.8	4.972	4.185	+0.68	-8.4	20.5	34.0
Nov. 4	16 04.67	+02 01.6	5.121	4.273	+0.69	-7.4	20.6	28.2
Nov. 14	16 11.60	+00 47.4	5.250	4.360	+0.69	-6.5	20.8	23.5
Nov. 24	16 18.51	-00 17.5	5.355	4.446	+0.68	-5.6	20.9	20.8
Dec. 4	16 25.29	-01 13.5	5.438	4.533	+0.66	-4.8	21.1	21.2
Dec. 14	16 31.85	-02 01.4	5.497	4.619	+0.62	-4.0	21.2	24.5
Dec. 24	16 38.04	-02 41.6	5.531	4.704	+0.57	-3.3	21.3	29.9
Jan. 3	16 43.75	-03 14.6	5.542	4.789	+0.51	-2.6	21.4	36.6
Jan. 13	16 48.85	-03 41.1	5.531	4.874	+0.44	-2.0	21.5	44.1
Jan. 23	16 53.22	-04 01.5	5.500	4.958	+0.35	-1.5	21.6	52.2
Feb. 2	16 56.72	-04 16.6	5.450	5.041	+0.25	-1.0	21.7	60.7
Feb. 12	16 59.23	-04 27.0	5.385	5.125	+0.14	-0.6	21.7	69.6
Feb. 22	17 00.61	-04 33.4	5.309	5.208	+0.02	-0.3	21.8	78.7
Mar. 3	17 00.77	-04 36.7	5.227	5.290	-0.12	-0.1	21.8	88.2
Mar. 13	16 59.61	-04 37.8	5.142	5.372	-0.25	0.0	21.9	98.0
Mar. 23	16 57.07	-04 37.6	5.061	5.454	-0.39	0.0	21.9	108.1

Comet C/2014 R1 (Borisov)

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 19.24507 TT
 Peri. = 55.65435
 Node = 104.05481 2000.0
 Incl. = 9.93287
 q = 1.3455757 AU
 e = 0.9925898

$$m1 = 9.0 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m	' "		°
Jan. 8	15 29.01	-10° 35.0	1.864	1.529	+2.59	-7.9	12.7	55.0
Jan. 18	15 54.89	-11 53.7	1.876	1.602	+2.34	-5.9	12.9	58.6
Jan. 28	16 18.31	-12 52.9	1.885	1.682	+2.08	-4.2	13.2	62.9
Feb. 7	16 39.11	-13 35.1	1.887	1.768	+1.81	-2.8	13.5	67.8
Feb. 17	16 57.19	-14 03.3	1.883	1.859	+1.52	-1.7	13.7	73.4
Feb. 27	17 12.37	-14 20.4	1.873	1.954	+1.22	-0.9	14.0	79.6
Mar. 9	17 24.54	-14 29.4	1.856	2.052	+0.90	-0.4	14.2	86.6
Mar. 19	17 33.56	-14 33.3	1.836	2.153	+0.57	-0.1	14.5	94.3
Mar. 29	17 39.29	-14 34.6	1.814	2.254	+0.24	-0.1	14.7	102.7
Apr. 8	17 41.68	-14 35.6	1.794	2.357	-0.09	-0.2	14.9	111.8
Apr. 18	17 40.76	-14 37.9	1.780	2.461	-0.40	-0.5	15.1	121.7
Apr. 28	17 36.74	-14 42.9	1.777	2.565	-0.67	-0.8	15.4	132.3
May 8	17 30.07	-14 51.2	1.791	2.669	-0.86	-1.2	15.6	143.4
May 18	17 21.46	-15 02.8	1.825	2.773	-0.96	-1.5	15.8	154.7
May 28	17 11.82	-15 17.5	1.885	2.877	-0.97	-1.8	16.1	165.7
June 7	17 02.15	-15 35.1	1.972	2.981	-0.88	-2.0	16.4	172.8
June 17	16 53.33	-15 55.1	2.087	3.085	-0.73	-2.2	16.7	166.8
June 27	16 46.05	-16 17.5	2.230	3.188	-0.53	-2.5	17.0	156.6
July 7	16 40.71	-16 42.1	2.397	3.291	-0.33	-2.7	17.4	146.2
July 17	16 37.46	-17 08.6	2.586	3.393	-0.12	-2.8	17.7	136.1
July 27	16 36.28	-17 36.6	2.794	3.495	+0.07	-2.9	18.0	126.4
Aug. 6	16 37.02	-18 05.8	3.017	3.596	+0.25	-3.0	18.3	117.2
Aug. 16	16 39.48	-18 35.3	3.251	3.696	+0.40	-3.0	18.7	108.3
Aug. 26	16 43.46	-19 04.9	3.493	3.796	+0.53	-2.9	19.0	99.7
Sept. 5	16 48.73	-19 33.7	3.740	3.895	+0.64	-2.8	19.2	91.3
Sept. 15	16 55.12	-20 01.3	3.987	3.994	+0.73	-2.6	19.5	83.1
Sept. 25	17 02.43	-20 27.2	4.233	4.092	+0.81	-2.4	19.8	75.1
Oct. 5	17 10.50	-20 51.0	4.474	4.190	+0.87	-2.1	20.0	67.2
Oct. 15	17 19.20	-21 12.2	4.707	4.286	+0.92	-1.9	20.3	59.4
Oct. 25	17 28.39	-21 30.8	4.930	4.383	+0.96	-1.6	20.5	51.6
Nov. 4	17 37.94	-21 46.3	5.140	4.478	+0.98	-1.2	20.7	43.9
Nov. 14	17 47.76	-21 58.8	5.335	4.573	+1.00	-0.9	20.9	36.1
Nov. 24	17 57.72	-22 08.1	5.513	4.668	+1.00	-0.6	21.1	28.3
Dec. 4	18 07.72	-22 14.4	5.672	4.762	+1.00	-0.3	21.2	20.5
Dec. 14	18 17.68	-22 17.6	5.811	4.855	+0.98	0.0	21.4	12.7
Dec. 24	18 27.48	-22 18.1	5.927	4.948	+0.96	+0.2	21.5	4.8
Jan. 3	18 37.04	-22 16.1	6.021	5.040	+0.92	+0.4	21.7	3.4
Jan. 13	18 46.27	-22 12.0	6.093	5.132	+0.88	+0.6	21.8	11.3
Jan. 23	18 55.07	-22 06.1	6.141	5.223	+0.83	+0.7	21.9	19.5
Feb. 2	19 03.34	-21 59.0	6.166	5.314	+0.77	+0.8	22.0	27.7
Feb. 12	19 11.00	-21 51.1	6.170	5.404	+0.70	+0.8	22.1	36.0
Feb. 22	19 17.96	-21 43.1	6.155	5.493	+0.62	+0.8	22.2	44.5
Mar. 3	19 24.11	-21 35.5	6.121	5.582	+0.53	+0.7	22.3	53.1
Mar. 13	19 29.39	-21 28.9	6.071	5.671	+0.43	+0.5	22.3	61.9
Mar. 23	19 33.69	-21 23.9	6.009	5.759	+0.33	+0.3	22.4	70.8

Comet 305P/Skiff

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 19.78802 TT
 Peri. = 145.02069
 Node = 241.98078 2000.0
 Incl. = 11.53063
 q = 1.4033040 AU

e = 0.6959954
 a = 4.6160617 AU
 n = 0.09937947
 P = 9.92 years

$$m1 = 12.8 + 5 \log(\Delta) + 25.0 \log(r(t-40))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	01 25.30	+08 39.8	1.067	1.522	+3.09	+6.8	16.7	95.8
Jan. 18	01 56.15	+09 47.8	1.173	1.571	+2.96	+6.9	17.0	93.1
Jan. 28	02 25.74	+10 56.4	1.291	1.626	+2.83	+6.6	17.4	90.2
Feb. 7	02 54.04	+12 02.0	1.421	1.687	+2.71	+6.0	17.8	87.0
Feb. 17	03 21.12	+13 02.2	1.561	1.751	+2.60	+5.3	18.3	83.6
Feb. 27	03 47.11	+13 55.2	1.710	1.819	+2.50	+4.4	18.9	79.9
Mar. 9	04 12.09	+14 39.6	1.867	1.890	+2.41	+3.5	19.4	76.0
Mar. 19	04 36.15	+15 14.7	2.029	1.963	+2.32	+2.5	20.0	71.9
Mar. 29	04 59.37	+15 40.0	2.195	2.038	+2.24	+1.5	20.6	67.7
Apr. 8	05 21.79	+15 55.5	2.364	2.114	+2.17	+0.6	21.2	63.3
Apr. 18	05 43.46	+16 01.1	2.534	2.191	+2.10	-0.4	21.7	58.8
Apr. 28	06 04.41	+15 57.3	2.704	2.268	+2.02	-1.3	22.3	54.2
May 8	06 24.66	+15 44.4	2.871	2.345	+1.96	-2.1	22.8	49.5
May 18	06 44.22	+15 22.9	3.035	2.423	+1.89	-2.9	.	44.7
May 28	07 03.11	+14 53.4	3.193	2.500	+1.82	-3.7	.	39.8
June 7	07 21.33	+14 16.6	3.344	2.578	+1.76	-4.4	.	34.9
June 17	07 38.91	+13 33.0	3.487	2.655	+1.69	-5.0	.	29.9
June 27	07 55.84	+12 43.4	3.620	2.731	+1.63	-5.5	.	24.8
July 7	08 12.12	+11 48.5	3.742	2.807	+1.57	-6.0	.	19.8
July 17	08 27.78	+10 48.8	3.852	2.883	+1.50	-6.4	.	15.0
July 27	08 42.80	+09 45.1	3.949	2.957	+1.44	-6.7	.	10.7
Aug. 6	08 57.19	+08 38.0	4.032	3.031	+1.38	-7.0	.	8.4
Aug. 16	09 10.94	+07 28.1	4.099	3.105	+1.31	-7.2	.	9.6
Aug. 26	09 24.03	+06 16.1	4.150	3.178	+1.24	-7.3	.	13.8
Sept. 5	09 36.45	+05 02.6	4.185	3.250	+1.17	-7.4	.	19.2
Sept. 15	09 48.16	+03 48.3	4.203	3.321	+1.10	-7.5	.	25.2
Sept. 25	09 59.12	+02 33.7	4.204	3.391	+1.02	-7.4	.	31.7
Oct. 5	10 09.28	+01 19.8	4.189	3.461	+0.93	-7.3	.	38.4
Oct. 15	10 18.58	+00 07.1	4.157	3.530	+0.83	-7.1	.	45.5
Oct. 25	10 26.91	-01 03.4	4.111	3.598	+0.73	-6.8	.	52.9
Nov. 4	10 34.19	-02 10.9	4.050	3.666	+0.61	-6.4	.	60.6
Nov. 14	10 40.31	-03 14.5	3.978	3.732	+0.48	-5.8	.	68.6
Nov. 24	10 45.14	-04 12.8	3.896	3.798	+0.34	-5.2	.	77.0
Dec. 4	10 48.55	-05 04.7	3.807	3.863	+0.19	-4.4	.	85.9
Dec. 14	10 50.42	-05 48.9	3.716	3.928	+0.02	-3.5	.	95.1
Dec. 24	10 50.65	-06 23.7	3.626	3.991	-0.15	-2.4	.	104.7
Jan. 3	10 49.20	-06 47.7	3.543	4.054	-0.31	-1.2	.	114.7
Jan. 13	10 46.09	-06 59.6	3.471	4.116	-0.46	+0.1	.	125.1
Jan. 23	10 41.46	-06 58.4	3.416	4.178	-0.59	+1.4	.	135.7
Feb. 2	10 35.59	-06 43.9	3.383	4.238	-0.67	+2.7	.	146.3
Feb. 12	10 28.85	-06 16.9	3.376	4.298	-0.71	+3.8	.	156.3
Feb. 22	10 21.73	-05 39.3	3.399	4.357	-0.70	+4.5	.	163.8
Mar. 3	10 14.76	-04 53.9	3.453	4.416	-0.63	+5.0	.	164.4
Mar. 13	10 08.42	-04 04.2	3.538	4.474	-0.53	+5.0	.	157.8
Mar. 23	10 03.11	-03 13.7	3.652	4.531	-0.40	+4.8	.	148.4

Comet C/2013 P3 (Palomar)

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 23.52999 TT
 Peri. = 177.16714
 Node = 177.27587 2000.0
 Incl. = 93.91709
 q = 8.6462770 AU
 e = 1.0012280

$$m1 = 4.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong.
Jan. 8	23 27.96	-03 06.0	9.032	8.650	+0.27 -1.6	18.3	64.3
Jan. 18	23 30.71	-03 22.3	9.185	8.652	+0.32 -1.2	18.4	54.6
Jan. 28	23 33.93	-03 34.5	9.322	8.655	+0.36 -0.9	18.4	45.1
Feb. 7	23 37.55	-03 43.4	9.439	8.658	+0.39 -0.6	18.4	35.7
Feb. 17	23 41.49	-03 49.6	9.534	8.661	+0.42 -0.4	18.5	26.5
Feb. 27	23 45.66	-03 53.9	9.604	8.664	+0.43 -0.3	18.5	17.4
Mar. 9	23 49.99	-03 57.3	9.648	8.668	+0.44 -0.3	18.5	8.7
Mar. 19	23 54.40	-04 00.3	9.666	8.673	+0.44 -0.4	18.5	3.2
Mar. 29	23 58.82	-04 03.9	9.658	8.677	+0.43 -0.5	18.5	10.3
Apr. 8	00 03.16	-04 08.6	9.623	8.683	+0.42 -0.7	18.5	19.0
Apr. 18	00 07.36	-04 15.4	9.563	8.688	+0.40 -0.9	18.5	27.8
Apr. 28	00 11.34	-04 24.8	9.481	8.694	+0.37 -1.3	18.5	36.7
May 8	00 15.04	-04 37.6	9.377	8.700	+0.33 -1.7	18.5	45.6
May 18	00 18.38	-04 54.3	9.255	8.707	+0.29 -2.1	18.4	54.5
May 28	00 21.30	-05 15.6	9.117	8.714	+0.24 -2.6	18.4	63.6
June 7	00 23.73	-05 42.0	8.969	8.722	+0.19 -3.2	18.4	72.7
June 17	00 25.60	-06 14.0	8.813	8.729	+0.13 -3.8	18.3	82.0
June 27	00 26.86	-06 51.8	8.653	8.738	+0.06 -4.4	18.3	91.4
July 7	00 27.46	-07 35.6	8.496	8.746	-0.01 -5.0	18.3	101.0
July 17	00 27.36	-08 25.3	8.345	8.755	-0.08 -5.5	18.2	110.7
July 27	00 26.54	-09 20.5	8.206	8.765	-0.15 -6.0	18.2	120.5
Aug. 6	00 25.02	-10 20.5	8.083	8.774	-0.22 -6.4	18.2	130.4
Aug. 16	00 22.82	-11 24.4	7.982	8.784	-0.28 -6.6	18.1	140.2
Aug. 26	00 20.01	-12 30.8	7.906	8.795	-0.33 -6.7	18.1	149.8
Sept. 5	00 16.70	-13 38.0	7.860	8.806	-0.37 -6.6	18.1	158.5
Sept. 15	00 13.02	-14 44.3	7.844	8.817	-0.39 -6.4	18.1	164.3
Sept. 25	00 09.14	-15 47.9	7.862	8.829	-0.39 -5.9	18.1	163.6
Oct. 5	00 05.24	-16 47.2	7.911	8.841	-0.37 -5.3	18.2	157.0
Oct. 15	00 01.50	-17 40.6	7.992	8.853	-0.34 -4.7	18.2	147.9
Oct. 25	23 58.10	-18 27.3	8.101	8.865	-0.29 -3.9	18.2	138.1
Nov. 4	23 55.20	-19 06.6	8.234	8.879	-0.23 -3.2	18.3	128.0
Nov. 14	23 52.91	-19 38.5	8.387	8.892	-0.16 -2.5	18.3	117.8
Nov. 24	23 51.32	-20 03.1	8.555	8.906	-0.08 -1.8	18.4	107.7
Dec. 4	23 50.49	-20 20.9	8.732	8.920	-0.01 -1.2	18.4	97.8
Dec. 14	23 50.42	-20 32.7	8.914	8.934	+0.07 -0.7	18.5	88.0
Dec. 24	23 51.10	-20 39.4	9.094	8.949	+0.14 -0.2	18.5	78.5
Jan. 3	23 52.49	-20 41.8	9.267	8.964	+0.20 +0.1	18.6	69.1
Jan. 13	23 54.54	-20 41.0	9.430	8.980	+0.26 +0.3	18.6	60.0
Jan. 23	23 57.18	-20 37.8	9.579	8.995	+0.31 +0.5	18.6	51.2
Feb. 2	00 00.32	-20 33.2	9.709	9.012	+0.36 +0.5	18.7	42.9
Feb. 12	00 03.91	-20 28.1	9.818	9.028	+0.39 +0.5	18.7	35.0
Feb. 22	00 07.84	-20 23.2	9.905	9.045	+0.42 +0.4	18.7	28.1
Mar. 3	00 12.05	-20 19.4	9.967	9.062	+0.44 +0.2	18.8	22.9
Mar. 13	00 16.45	-20 17.5	10.005	9.080	+0.45 -0.1	18.8	20.4
Mar. 23	00 20.97	-20 18.2	10.017	9.097	+0.46 -0.4	18.8	21.5

Comet 193P/LINEAR-NEAT

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 24.64469 TT
 Peri. = 8.43025 e = 0.3941763
 Node = 335.19415 2000.0 a = 3.5755046 AU
 Incl. = 10.68707 n = 0.14578004
 q = 2.1661254 AU P = 6.76 years

$$m_1 = 9.4 + 5 \log(\Delta) + 20.0 \log(r(t-50))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	22 35.72	-04 57.0	2.661	2.190	+1.86 +13.7	18.2	51.6
Jan. 18	22 54.32	-02 40.0	2.758	2.202	+1.88 +14.0	18.3	46.6
Jan. 28	23 13.07	-00 20.4	2.852	2.216	+1.89 +14.1	18.4	41.7
Feb. 7	23 31.92	+02 00.8	2.941	2.233	+1.89 +14.2	18.5	36.9
Feb. 17	23 50.85	+04 22.4	3.025	2.251	+1.90 +14.1	18.6	32.2
Feb. 27	00 09.85	+06 43.4	3.103	2.272	+1.90 +13.9	18.7	27.5
Mar. 9	00 28.89	+09 02.7	3.175	2.294	+1.91 +13.6	18.8	22.9
Mar. 19	00 47.98	+11 19.1	3.241	2.318	+1.91 +13.3	18.9	18.5
Mar. 29	01 07.12	+13 31.9	3.299	2.344	+1.92 +12.8	19.0	14.1
Apr. 8	01 26.30	+15 39.9	3.350	2.372	+1.92 +12.2	19.1	10.2
Apr. 18	01 45.52	+17 42.3	3.393	2.400	+1.92 +11.6	19.2	7.2
Apr. 28	02 04.75	+19 38.5	3.427	2.431	+1.92 +10.9	19.3	6.7
May 8	02 23.98	+21 27.8	3.453	2.462	+1.92 +10.2	19.4	9.2
May 18	02 43.17	+23 09.6	3.469	2.494	+1.91 +9.4	19.5	13.1
May 28	03 02.27	+24 43.6	3.475	2.528	+1.90 +8.6	19.6	17.5
June 7	03 21.22	+26 09.5	3.472	2.562	+1.87 +7.8	19.7	22.3
June 17	03 39.97	+27 27.3	3.458	2.597	+1.84 +7.0	19.8	27.2
June 27	03 58.40	+28 37.0	3.435	2.633	+1.80 +6.2	19.9	32.4
July 7	04 16.41	+29 39.0	3.401	2.670	+1.75 +5.5	20.0	37.7
July 17	04 33.91	+30 33.6	3.356	2.707	+1.68 +4.8	20.1	43.2
July 27	04 50.73	+31 21.5	3.302	2.744	+1.60 +4.2	20.2	49.0
Aug. 6	05 06.73	+32 03.5	3.238	2.782	+1.50 +3.7	20.2	55.0
Aug. 16	05 21.74	+32 40.6	3.165	2.820	+1.38 +3.3	20.3	61.2
Aug. 26	05 35.57	+33 13.8	3.084	2.859	+1.24 +3.1	20.4	67.8
Sept. 5	05 48.01	+33 44.3	2.995	2.898	+1.08 +2.9	20.4	74.7
Sept. 15	05 58.82	+34 13.5	2.902	2.937	+0.89 +2.9	20.5	82.0
Sept. 25	06 07.72	+34 42.3	2.805	2.975	+0.67 +2.9	20.5	89.8
Oct. 5	06 14.47	+35 11.7	2.707	3.014	+0.43 +3.0	20.6	98.0
Oct. 15	06 18.76	+35 42.1	2.612	3.053	+0.16 +3.1	20.6	106.8
Oct. 25	06 20.33	+36 13.2	2.523	3.092	-0.13 +3.0	20.7	116.1
Nov. 4	06 19.03	+36 43.5	2.444	3.131	-0.42 +2.7	20.7	125.9
Nov. 14	06 14.80	+37 10.7	2.381	3.170	-0.69 +2.0	20.8	136.2
Nov. 24	06 07.90	+37 31.1	2.337	3.209	-0.90 +1.0	20.8	146.7
Dec. 4	05 58.91	+37 41.3	2.318	3.247	-1.02 -0.3	20.9	156.8
Dec. 14	05 48.68	+37 38.4	2.326	3.286	-1.04 -1.7	21.0	164.5
Dec. 24	05 38.33	+37 21.5	2.365	3.324	-0.94 -2.9	21.2	164.8
Jan. 3	05 28.93	+36 52.5	2.432	3.362	-0.76 -3.8	21.4	157.4
Jan. 13	05 21.34	+36 14.8	2.528	3.399	-0.52 -4.2	21.5	147.5
Jan. 23	05 16.13	+35 32.7	2.649	3.436	-0.27 -4.3	21.7	137.2
Feb. 2	05 13.47	+34 50.1	2.790	3.473	-0.01 -4.1	22.0	127.0
Feb. 12	05 13.35	+34 09.5	2.948	3.510	+0.22 -3.7	22.2	117.1
Feb. 22	05 15.57	+33 32.6	3.118	3.546	+0.43 -3.3	22.4	107.7
Mar. 3	05 19.85	+32 59.8	3.295	3.582	+0.61 -2.9	22.6	98.7
Mar. 13	05 25.92	+32 30.9	3.477	3.618	+0.76 -2.6	22.8	90.1
Mar. 23	05 33.49	+32 05.1	3.659	3.653	+0.88 -2.4	23.0	81.8

Comet C/2014 L5 (Lemmon)

Epoch = 2015 June 27.0 TT
 T = 2014 Nov. 26.28502 TT
 Peri. = 45.60921
 Node = 35.69502 2000.0
 Incl. = 122.81283
 q = 6.2031148 AU
 e = 1.0028555

$$m1 = 7.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	22 26.60	+31 29.3	6.464	6.210	+0.10 -1.2	19.8	70.8
Jan. 18	22 27.59	+31 16.9	6.595	6.214	+0.16 -0.1	19.8	63.2
Jan. 28	22 29.24	+31 15.7	6.712	6.218	+0.21 +1.0	19.9	56.2
Feb. 7	22 31.36	+31 25.2	6.812	6.223	+0.24 +2.0	19.9	49.9
Feb. 17	22 33.77	+31 45.0	6.892	6.229	+0.26 +2.9	19.9	44.7
Feb. 27	22 36.34	+32 14.5	6.951	6.236	+0.25 +3.9	20.0	40.9
Mar. 9	22 38.88	+32 53.0	6.988	6.244	+0.24 +4.7	20.0	38.7
Mar. 19	22 41.27	+33 39.9	7.002	6.252	+0.21 +5.5	20.0	38.3
Mar. 29	22 43.34	+34 34.6	6.994	6.261	+0.16 +6.2	20.0	39.9
Apr. 8	22 44.94	+35 36.1	6.965	6.271	+0.10 +6.8	20.0	43.0
Apr. 18	22 45.92	+36 43.8	6.916	6.281	+0.02 +7.3	20.0	47.4
Apr. 28	22 46.10	+37 56.6	6.850	6.292	-0.08 +7.7	20.0	52.8
May 8	22 45.30	+39 13.5	6.768	6.304	-0.20 +8.0	19.9	58.7
May 18	22 43.34	+40 33.0	6.675	6.317	-0.33 +8.1	19.9	65.1
May 28	22 40.01	+41 53.5	6.573	6.330	-0.49 +7.9	19.9	71.8
June 7	22 35.14	+43 12.9	6.465	6.344	-0.66 +7.6	19.9	78.7
June 17	22 28.57	+44 28.6	6.357	6.359	-0.84 +6.9	19.9	85.5
June 27	22 20.17	+45 37.4	6.252	6.374	-1.02 +5.9	19.8	92.3
July 7	22 09.95	+46 36.0	6.155	6.391	-1.19 +4.5	19.8	98.8
July 17	21 58.01	+47 20.6	6.070	6.407	-1.34 +2.7	19.8	104.9
July 27	21 44.64	+47 47.7	6.000	6.425	-1.43 +0.7	19.8	110.4
Aug. 6	21 30.32	+47 54.6	5.950	6.443	-1.47 -1.5	19.8	114.9
Aug. 16	21 15.65	+47 39.7	5.922	6.462	-1.43 -3.6	19.8	118.1
Aug. 26	21 01.31	+47 03.2	5.919	6.481	-1.34 -5.6	19.8	119.9
Sept. 5	20 47.93	+46 07.2	5.940	6.502	-1.19 -7.2	19.8	119.9
Sept. 15	20 36.00	+44 55.0	5.986	6.522	-1.01 -8.4	19.8	118.3
Sept. 25	20 25.87	+43 31.1	6.055	6.544	-0.82 -9.1	19.9	115.1
Oct. 5	20 17.66	+42 00.2	6.145	6.566	-0.63 -9.3	19.9	110.7
Oct. 15	20 11.37	+40 27.0	6.252	6.589	-0.45 -9.1	20.0	105.5
Oct. 25	20 06.90	+38 55.7	6.373	6.612	-0.28 -8.6	20.0	99.6
Nov. 4	20 04.06	+37 29.4	6.504	6.636	-0.14 -7.9	20.1	93.3
Nov. 14	20 02.67	+36 10.9	6.640	6.660	-0.02 -6.9	20.1	86.9
Nov. 24	20 02.49	+35 02.0	6.777	6.685	+0.08 -5.8	20.2	80.5
Dec. 4	20 03.32	+34 03.9	6.910	6.711	+0.16 -4.7	20.3	74.3
Dec. 14	20 04.95	+33 17.3	7.037	6.737	+0.22 -3.5	20.3	68.4
Dec. 24	20 07.20	+32 42.6	7.152	6.763	+0.27 -2.3	20.4	63.0
Jan. 3	20 09.88	+32 19.7	7.255	6.791	+0.29 -1.1	20.4	58.3
Jan. 13	20 12.81	+32 08.5	7.342	6.818	+0.30 0.0	20.5	54.5
Jan. 23	20 15.85	+32 08.6	7.411	6.847	+0.30 +1.1	20.5	51.8
Feb. 2	20 18.84	+32 19.4	7.462	6.876	+0.28 +2.1	20.5	50.4
Feb. 12	20 21.63	+32 40.3	7.494	6.905	+0.24 +3.0	20.6	50.2
Feb. 22	20 24.07	+33 10.5	7.507	6.935	+0.20 +3.9	20.6	51.5
Mar. 3	20 26.03	+33 49.2	7.502	6.965	+0.13 +4.6	20.6	53.9
Mar. 13	20 27.35	+34 35.3	7.480	6.996	+0.05 +5.2	20.6	57.4
Mar. 23	20 27.89	+35 27.7	7.443	7.027	-0.04 +5.7	20.6	61.8

Comet 110P/Hartley

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 17.75463 TT
 Peri. = 167.73965
 Node = 287.70590 2000.0
 Incl. = 11.68878
 q = 2.4751150 AU

e = 0.3150963
 a = 3.6138146 AU
 n = 0.14346807
 P = 6.87 years

$$m1 = 5.6 + 5 \log(\Delta) + 22.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	06 36.17	+25 13.2	1.503	2.479	-0.80	15.4	170.8
Jan. 18	06 28.22	+24 20.0	1.539	2.483	-0.58	15.4	159.1
Jan. 28	06 22.44	+23 26.7	1.600	2.488	-0.30	15.5	147.6
Feb. 7	06 19.48	+22 36.2	1.683	2.495	+0.01	15.7	136.8
Feb. 17	06 19.55	+21 50.1	1.784	2.503	+0.30	15.8	126.7
Feb. 27	06 22.55	+21 08.6	1.899	2.513	+0.57	16.0	117.4
Mar. 9	06 28.21	+20 30.7	2.024	2.524	+0.79	16.2	108.7
Mar. 19	06 36.15	+19 55.1	2.157	2.537	+0.99	16.4	100.6
Mar. 29	06 46.03	+19 19.8	2.294	2.551	+1.14	16.6	93.1
Apr. 8	06 57.47	+18 43.4	2.433	2.566	+1.27	16.7	86.0
Apr. 18	07 10.18	+18 04.3	2.573	2.582	+1.37	16.9	79.3
Apr. 28	07 23.88	+17 21.3	2.711	2.600	+1.45	17.1	72.9
May 8	07 38.34	+16 33.7	2.846	2.618	+1.50	17.3	66.8
May 18	07 53.35	+15 40.7	2.977	2.638	+1.54	17.4	60.9
May 28	08 08.77	+14 42.1	3.103	2.658	+1.57	17.6	55.2
June 7	08 24.44	+13 37.7	3.224	2.680	+1.58	17.8	49.6
June 17	08 40.26	+12 27.4	3.337	2.702	+1.59	17.9	44.2
June 27	08 56.14	+11 11.6	3.442	2.726	+1.59	18.1	38.8
July 7	09 12.00	+09 50.5	3.539	2.750	+1.58	18.2	33.5
July 17	09 27.78	+08 24.5	3.627	2.774	+1.57	18.4	28.3
July 27	09 43.44	+06 54.1	3.705	2.800	+1.55	18.5	23.2
Aug. 6	09 58.93	+05 19.8	3.772	2.826	+1.53	18.6	18.1
Aug. 16	10 14.24	+03 42.1	3.828	2.852	+1.51	18.8	13.3
Aug. 26	10 29.33	+02 01.6	3.873	2.879	+1.48	18.9	9.2
Sept. 5	10 44.17	+00 18.9	3.905	2.907	+1.46	19.0	7.1
Sept. 15	10 58.76	-01 25.4	3.924	2.935	+1.43	19.1	9.0
Sept. 25	11 13.05	-03 10.7	3.931	2.963	+1.40	19.2	13.3
Oct. 5	11 27.02	-04 56.3	3.924	2.992	+1.36	19.3	18.5
Oct. 15	11 40.63	-06 41.8	3.903	3.021	+1.32	19.4	24.2
Oct. 25	11 53.83	-08 26.4	3.869	3.050	+1.27	19.4	30.1
Nov. 4	12 06.56	-10 09.6	3.822	3.080	+1.22	19.5	36.4
Nov. 14	12 18.75	-11 50.8	3.762	3.109	+1.15	19.6	42.8
Nov. 24	12 30.29	-13 29.2	3.689	3.139	+1.08	19.6	49.5
Dec. 4	12 41.09	-15 04.4	3.605	3.169	+0.99	19.7	56.5
Dec. 14	12 51.00	-16 35.6	3.511	3.199	+0.89	19.7	63.7
Dec. 24	12 59.85	-18 02.2	3.409	3.229	+0.76	19.7	71.2
Jan. 3	13 07.48	-19 23.2	3.300	3.259	+0.62	19.7	79.0
Jan. 13	13 13.67	-20 37.8	3.187	3.289	+0.45	19.8	87.2
Jan. 23	13 18.21	-21 44.8	3.073	3.319	+0.27	19.8	95.7
Feb. 2	13 20.91	-22 42.6	2.961	3.349	+0.07	19.8	104.7
Feb. 12	13 21.59	-23 29.7	2.855	3.379	-0.14	19.8	114.0
Feb. 22	13 20.18	-24 03.9	2.760	3.409	-0.34	19.8	123.7
Mar. 3	13 16.74	-24 23.3	2.679	3.438	-0.53	19.8	133.6
Mar. 13	13 11.47	-24 26.2	2.617	3.468	-0.66	19.8	143.6
Mar. 23	13 04.83	-24 11.8	2.579	3.497	-0.74	19.9	153.2

Comet 307P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 20.24369 TT
 Peri. = 222.15092
 Node = 158.09551 2000.0
 Incl. = 4.42592
 q = 1.8892115 AU
 e = 0.6742418
 a = 5.7994288 AU
 n = 0.07057099
 P = 13.97 years

$$m1 = 10.8 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	00 04.19	-03 13.1	1.946	1.899	+2.17	+13.6	17.8	72.6
Jan. 18	00 25.88	-00 56.7	2.044	1.912	+2.21	+13.9	18.0	68.3
Jan. 28	00 47.96	+01 22.2	2.146	1.930	+2.24	+13.9	18.2	64.1
Feb. 7	01 10.31	+03 40.8	2.250	1.954	+2.25	+13.6	18.4	60.0
Feb. 17	01 32.85	+05 56.4	2.358	1.982	+2.27	+13.0	18.6	56.0
Feb. 27	01 55.52	+08 06.8	2.468	2.015	+2.27	+12.3	18.8	51.9
Mar. 9	02 18.25	+10 10.0	2.580	2.052	+2.27	+11.4	19.1	47.9
Mar. 19	02 40.98	+12 04.1	2.693	2.093	+2.27	+10.4	19.4	43.9
Mar. 29	03 03.69	+13 48.0	2.806	2.137	+2.26	+9.3	19.6	39.8
Apr. 8	03 26.28	+15 20.5	2.919	2.184	+2.24	+8.1	19.9	35.6
Apr. 18	03 48.71	+16 41.1	3.029	2.234	+2.22	+6.8	20.2	31.4
Apr. 28	04 10.92	+17 49.3	3.136	2.286	+2.19	+5.6	20.5	27.1
May 8	04 32.82	+18 45.1	3.239	2.341	+2.15	+4.3	20.7	22.7
May 18	04 54.36	+19 28.6	3.337	2.398	+2.11	+3.2	21.0	18.2
May 28	05 15.46	+20 00.2	3.429	2.456	+2.06	+2.0	21.3	13.7
June 7	05 36.06	+20 20.4	3.512	2.516	+2.00	+1.0	21.5	9.1
June 17	05 56.08	+20 29.9	3.587	2.576	+1.94	0.0	21.8	4.8
June 27	06 15.48	+20 29.7	3.653	2.638	+1.87	-0.9	22.0	3.1
July 7	06 34.18	+20 20.5	3.707	2.701	+1.80	-1.7	22.3	7.0
July 17	06 52.14	+20 03.4	3.751	2.764	+1.72	-2.4	22.5	12.0
July 27	07 09.32	+19 39.5	3.781	2.828	+1.63	-3.0	22.7	17.4
Aug. 6	07 25.65	+19 09.8	3.799	2.893	+1.55	-3.4	22.9	23.0
Aug. 16	07 41.11	+18 35.5	3.804	2.958	+1.45	-3.8	.	28.8
Aug. 26	07 55.63	+17 57.7	3.795	3.022	+1.35	-4.0	.	34.9
Sept. 5	08 09.14	+17 17.6	3.773	3.088	+1.25	-4.1	.	41.3
Sept. 15	08 21.61	+16 36.4	3.737	3.153	+1.13	-4.1	.	47.9
Sept. 25	08 32.93	+15 55.4	3.689	3.218	+1.01	-4.0	.	54.9
Oct. 5	08 43.02	+15 15.9	3.629	3.283	+0.88	-3.7	.	62.2
Oct. 15	08 51.78	+14 39.1	3.559	3.348	+0.73	-3.3	.	69.8
Oct. 25	08 59.08	+14 06.5	3.480	3.413	+0.57	-2.7	.	77.9
Nov. 4	09 04.79	+13 39.4	3.396	3.478	+0.40	-2.0	.	86.4
Nov. 14	09 08.79	+13 19.1	3.309	3.542	+0.21	-1.2	.	95.4
Nov. 24	09 10.93	+13 07.0	3.224	3.607	+0.02	-0.3	.	104.9
Dec. 4	09 11.16	+13 03.8	3.144	3.671	-0.17	+0.6	.	115.0
Dec. 14	09 09.43	+13 10.0	3.075	3.734	-0.36	+1.5	.	125.5
Dec. 24	09 05.84	+13 25.5	3.022	3.798	-0.52	+2.4	.	136.6
Jan. 3	09 00.62	+13 49.2	2.991	3.861	-0.65	+3.0	.	148.1
Jan. 13	08 54.13	+14 19.4	2.985	3.923	-0.72	+3.4	.	159.8
Jan. 23	08 46.91	+14 53.4	3.009	3.986	-0.73	+3.5	.	171.6
Feb. 2	08 39.57	+15 28.6	3.065	4.047	-0.69	+3.4	.	175.0
Feb. 12	08 32.69	+16 02.4	3.152	4.109	-0.59	+3.0	.	163.8
Feb. 22	08 26.83	+16 32.5	3.269	4.170	-0.45	+2.5	.	152.3
Mar. 3	08 22.34	+16 57.8	3.413	4.231	-0.29	+2.0	.	141.2
Mar. 13	08 19.45	+17 17.4	3.579	4.291	-0.12	+1.4	.	130.4
Mar. 23	08 18.23	+17 31.1	3.764	4.351	+0.04	+0.8	.	120.2

Comet 15P/Finlay

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 27.05918 TT
 Peri. = 347.56587
 Node = 13.77300 2000.0
 Incl. = 6.79903
 q = 0.9760031 AU
 e = 0.7201825
 a = 3.4879988 AU
 n = 0.15130023
 P = 6.51 years

$$m1 = 11.8 + 5 \log(\Delta) + 15.0 \log(r(t-20))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	22 17.06	-10 21.3	1.397	0.992	+4.47 +33.8	12.4	45.2
Jan. 18	23 01.78	-04 43.6	1.394	1.028	+4.38 +34.6	12.4	47.4
Jan. 28	23 45.60	+01 02.7	1.417	1.082	+4.26 +33.3	12.5	49.6
Feb. 7	00 28.22	+06 35.8	1.466	1.149	+4.12 +30.2	12.8	51.5
Feb. 17	01 09.44	+11 38.2	1.540	1.227	+3.96 +26.1	13.2	52.8
Feb. 27	01 49.09	+15 59.4	1.637	1.313	+3.79 +21.6	13.8	53.3
Mar. 9	02 27.00	+19 35.3	1.754	1.403	+3.61 +17.2	14.4	53.0
Mar. 19	03 03.09	+22 26.9	1.887	1.496	+3.42 +13.1	15.0	52.0
Mar. 29	03 37.34	+24 38.3	2.031	1.591	+3.24 +9.6	15.5	50.3
Apr. 8	04 09.71	+26 14.4	2.184	1.686	+3.06 +6.6	16.1	47.9
Apr. 18	04 40.27	+27 20.4	2.343	1.782	+2.88 +4.1	16.7	45.1
Apr. 28	05 09.10	+28 01.4	2.503	1.877	+2.72 +2.0	17.2	41.8
May 8	05 36.26	+28 21.4	2.663	1.971	+2.56 +0.3	17.7	38.1
May 18	06 01.86	+28 24.1	2.821	2.064	+2.41 -1.2	18.2	34.2
May 28	06 26.00	+28 12.6	2.973	2.156	+2.28 -2.3	18.6	29.9
June 7	06 48.77	+27 49.4	3.119	2.246	+2.15 -3.3	19.0	25.5
June 17	07 10.28	+27 16.7	3.256	2.335	+2.03 -4.0	19.4	20.8
June 27	07 30.60	+26 36.3	3.382	2.422	+1.92 -4.6	19.7	16.1
July 7	07 49.80	+25 49.8	3.497	2.508	+1.82 -5.1	20.0	11.2
July 17	08 07.96	+24 58.7	3.598	2.592	+1.72 -5.5	20.3	6.8
July 27	08 25.13	+24 04.0	3.685	2.674	+1.62 -5.7	20.6	4.7
Aug. 6	08 41.35	+23 07.1	3.757	2.756	+1.53 -5.8	20.9	7.9
Aug. 16	08 56.66	+22 08.9	3.812	2.835	+1.44 -5.8	21.1	13.1
Aug. 26	09 11.06	+21 10.4	3.850	2.913	+1.35 -5.8	21.3	19.0
Sept. 5	09 24.58	+20 12.8	3.871	2.990	+1.26 -5.6	21.5	25.2
Sept. 15	09 37.19	+19 16.8	3.875	3.065	+1.17 -5.3	21.7	31.7
Sept. 25	09 48.86	+18 23.7	3.861	3.139	+1.07 -4.9	21.9	38.5
Oct. 5	09 59.56	+17 34.3	3.831	3.211	+0.96 -4.4	22.0	45.6
Oct. 15	10 09.21	+16 49.8	3.784	3.282	+0.85 -3.8	22.1	53.0
Oct. 25	10 17.71	+16 11.4	3.723	3.351	+0.73 -3.1	22.3	60.7
Nov. 4	10 24.97	+15 40.2	3.650	3.420	+0.59 -2.3	22.4	68.9
Nov. 14	10 30.85	+15 17.3	3.566	3.487	+0.43 -1.3	22.4	77.4
Nov. 24	10 35.19	+15 03.9	3.475	3.552	+0.27 -0.3	22.5	86.4
Dec. 4	10 37.85	+15 01.0	3.381	3.617	+0.08 +0.8	22.6	95.8
Dec. 14	10 38.68	+15 09.0	3.288	3.680	-0.11 +1.9	22.6	105.8
Dec. 24	10 37.54	+15 28.3	3.201	3.742	-0.31 +3.0	22.7	116.3
Jan. 3	10 34.41	+15 57.9	3.127	3.803	-0.51 +3.8	22.8	127.2
Jan. 13	10 29.34	+16 36.4	3.070	3.863	-0.68 +4.4	22.8	138.7
Jan. 23	10 22.56	+17 20.7	3.036	3.922	-0.81 +4.7	22.9	150.4
Feb. 2	10 14.48	+18 07.4	3.030	3.979	-0.88 +4.5	23.0	162.0
Feb. 12	10 05.64	+18 52.4	3.056	4.036	-0.89 +3.9	.	172.0
Feb. 22	09 56.71	+19 31.8	3.114	4.091	-0.84 +3.1	.	169.6
Mar. 3	09 48.34	+20 03.0	3.205	4.146	-0.73 +2.1	.	158.9
Mar. 13	09 41.08	+20 24.4	3.326	4.199	-0.57 +1.1	.	147.6
Mar. 23	09 35.34	+20 35.6	3.472	4.251	-0.40 +0.2	.	136.5

Comet P/2014 M4 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 27.65569 TT
 Peri. = 145.29891
 Node = 265.05771 2000.0
 Incl. = 3.34502
 q = 2.3515170 AU
 e = 0.5956035
 a = 5.8148797 AU
 n = 0.07028991
 P = 14.02 years

$$m1 = 12.2 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	01 49.73	+13 31.9	1.927	2.354	+1.18 +4.3	19.2	103.1
Jan. 18	02 01.52	+14 15.2	2.045	2.359	+1.34 +5.1	19.3	95.9
Jan. 28	02 14.97	+15 06.5	2.169	2.367	+1.49 +5.7	19.5	89.1
Feb. 7	02 29.82	+16 03.2	2.295	2.378	+1.60 +5.9	19.6	82.6
Feb. 17	02 45.87	+17 02.5	2.423	2.393	+1.71 +6.0	19.8	76.5
Feb. 27	03 02.93	+18 02.2	2.552	2.410	+1.79 +5.8	20.0	70.6
Mar. 9	03 20.82	+19 00.1	2.680	2.431	+1.86 +5.4	20.1	64.9
Mar. 19	03 39.39	+19 54.4	2.806	2.453	+1.91 +4.9	20.3	59.4
Mar. 29	03 58.52	+20 43.4	2.930	2.479	+1.95 +4.2	20.4	54.0
Apr. 8	04 18.05	+21 25.9	3.051	2.507	+1.98 +3.5	20.6	48.8
Apr. 18	04 37.87	+22 00.8	3.168	2.537	+2.00 +2.6	20.8	43.6
Apr. 28	04 57.87	+22 27.2	3.280	2.570	+2.00 +1.8	20.9	38.5
May 8	05 17.92	+22 44.8	3.387	2.604	+2.00 +0.8	21.1	33.4
May 18	05 37.91	+22 53.2	3.487	2.641	+1.98 -0.1	21.2	28.4
May 28	05 57.75	+22 52.4	3.580	2.679	+1.96 -1.0	21.4	23.3
June 7	06 17.33	+22 42.5	3.664	2.719	+1.92 -1.9	21.5	18.3
June 17	06 36.57	+22 24.0	3.740	2.761	+1.88 -2.7	21.7	13.2
June 27	06 55.39	+21 57.3	3.807	2.804	+1.83 -3.4	21.8	8.0
July 7	07 13.71	+21 23.0	3.863	2.848	+1.78 -4.1	22.0	2.9
July 17	07 31.50	+20 42.0	3.908	2.893	+1.72 -4.7	22.1	2.8
July 27	07 48.67	+19 55.0	3.941	2.939	+1.65 -5.2	22.2	8.1
Aug. 6	08 05.19	+19 02.8	3.963	2.987	+1.58 -5.6	22.3	13.7
Aug. 16	08 21.02	+18 06.5	3.972	3.035	+1.51 -6.0	22.4	19.4
Aug. 26	08 36.10	+17 06.9	3.967	3.084	+1.43 -6.2	22.5	25.3
Sept. 5	08 50.39	+16 05.0	3.950	3.133	+1.35 -6.3	22.6	31.4
Sept. 15	09 03.85	+15 02.0	3.920	3.184	+1.26 -6.3	22.7	37.7
Sept. 25	09 16.40	+13 58.7	3.877	3.234	+1.16 -6.2	22.8	44.2
Oct. 5	09 27.99	+12 56.4	3.821	3.285	+1.05 -6.0	22.9	51.0
Oct. 15	09 38.52	+11 56.1	3.754	3.337	+0.94 -5.7	22.9	58.2
Oct. 25	09 47.90	+10 59.1	3.676	3.389	+0.81 -5.3	23.0	65.6
Nov. 4	09 56.02	+10 06.6	3.590	3.441	+0.67 -4.7	23.0	73.4
Nov. 14	10 02.75	+09 19.8	3.498	3.493	+0.52 -4.0	.	81.6
Nov. 24	10 07.95	+08 40.2	3.401	3.546	+0.36 -3.1	.	90.3
Dec. 4	10 11.51	+08 08.8	3.304	3.599	+0.18 -2.2	.	99.4
Dec. 14	10 13.29	+07 46.8	3.211	3.651	-0.01 -1.2	.	109.0
Dec. 24	10 13.23	+07 35.2	3.125	3.704	-0.19 -0.1	.	119.1
Jan. 3	10 11.35	+07 34.3	3.053	3.757	-0.36 +1.0	.	129.7
Jan. 13	10 07.74	+07 43.9	2.998	3.810	-0.51 +1.9	.	140.7
Jan. 23	10 02.69	+08 02.8	2.966	3.863	-0.61 +2.6	.	152.1
Feb. 2	09 56.58	+08 29.2	2.961	3.916	-0.66 +3.1	.	163.6
Feb. 12	09 49.95	+09 00.4	2.985	3.969	-0.66 +3.3	.	174.3
Feb. 22	09 43.37	+09 33.2	3.041	4.021	-0.60 +3.2	.	171.4
Mar. 3	09 37.40	+10 04.8	3.126	4.074	-0.49 +2.8	.	160.3
Mar. 13	09 32.48	+10 32.7	3.241	4.126	-0.35 +2.2	.	149.2
Mar. 23	09 28.95	+10 55.0	3.380	4.178	-0.20 +1.6	.	138.4

Comet 287P/Christensen

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 28.26783 TT
 Peri. = 189.05189
 Node = 139.05722 2000.0
 Incl. = 16.30025
 q = 3.0539341 AU
 e = 0.2691308
 a = 4.1784961 AU
 n = 0.11539157
 P = 8.54 years

$$m1 = 3.8 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	21 32.39	-17 14.1	3.834	3.054	+1.56 +5.2	18.8	32.8
Jan. 18	21 47.97	-16 22.4	3.905	3.056	+1.57 +5.7	18.9	26.5
Jan. 28	22 03.67	-15 25.5	3.962	3.058	+1.57 +6.1	18.9	20.3
Feb. 7	22 19.42	-14 24.1	4.007	3.061	+1.57 +6.5	19.0	14.3
Feb. 17	22 35.15	-13 19.4	4.038	3.065	+1.57 +6.7	19.0	8.7
Feb. 27	22 50.81	-12 12.2	4.055	3.070	+1.55 +6.9	19.0	4.8
Mar. 9	23 06.34	-11 03.7	4.059	3.075	+1.54 +6.9	19.0	6.7
Mar. 19	23 21.71	-09 54.7	4.049	3.081	+1.52 +6.8	19.1	11.8
Mar. 29	23 36.88	-08 46.5	4.026	3.089	+1.49 +6.7	19.1	17.5
Apr. 8	23 51.81	-07 39.9	3.990	3.097	+1.47 +6.4	19.1	23.4
Apr. 18	00 06.46	-06 36.1	3.942	3.105	+1.43 +6.0	19.1	29.3
Apr. 28	00 20.79	-05 36.1	3.881	3.115	+1.40 +5.5	19.1	35.3
May 8	00 34.75	-04 40.8	3.810	3.125	+1.35 +4.9	19.1	41.4
May 18	00 48.28	-03 51.4	3.729	3.136	+1.30 +4.3	19.1	47.5
May 28	01 01.31	-03 08.9	3.638	3.148	+1.24 +3.5	19.1	53.8
June 7	01 13.75	-02 34.1	3.539	3.160	+1.18 +2.6	19.0	60.2
June 17	01 25.51	-02 08.2	3.433	3.173	+1.09 +1.6	19.0	66.8
June 27	01 36.45	-01 52.0	3.322	3.187	+1.00 +0.6	19.0	73.5
July 7	01 46.45	-01 46.5	3.207	3.201	+0.89 -0.6	19.0	80.6
July 17	01 55.35	-01 52.4	3.089	3.216	+0.76 -1.8	18.9	87.9
July 27	02 02.95	-02 10.3	2.972	3.231	+0.61 -3.0	18.9	95.5
Aug. 6	02 09.09	-02 40.4	2.858	3.247	+0.45 -4.2	18.9	103.4
Aug. 16	02 13.56	-03 22.7	2.750	3.264	+0.26 -5.3	18.8	111.8
Aug. 26	02 16.20	-04 16.1	2.651	3.281	+0.07 -6.3	18.8	120.4
Sept. 5	02 16.91	-05 18.9	2.566	3.299	-0.13 -6.9	18.8	129.4
Sept. 15	02 15.66	-06 28.2	2.496	3.317	-0.31 -7.1	18.8	138.4
Sept. 25	02 12.56	-07 39.7	2.448	3.336	-0.46 -6.8	18.8	147.2
Oct. 5	02 07.91	-08 48.2	2.423	3.355	-0.57 -6.0	18.9	154.7
Oct. 15	02 02.17	-09 48.2	2.424	3.374	-0.62 -4.6	18.9	158.9
Oct. 25	01 55.96	-10 34.7	2.453	3.394	-0.60 -2.9	19.0	157.6
Nov. 4	01 49.93	-11 03.9	2.509	3.414	-0.52 -1.0	19.1	151.6
Nov. 14	01 44.69	-11 14.3	2.590	3.434	-0.39 +0.8	19.3	143.3
Nov. 24	01 40.74	-11 05.8	2.694	3.455	-0.23 +2.6	19.4	134.2
Dec. 4	01 38.39	-10 40.2	2.817	3.476	-0.06 +4.0	19.6	124.9
Dec. 14	01 37.79	-09 59.8	2.955	3.498	+0.12 +5.2	19.7	115.8
Dec. 24	01 38.96	-09 07.5	3.105	3.519	+0.28 +6.2	19.9	106.9
Jan. 3	01 41.79	-08 06.0	3.263	3.541	+0.44 +6.8	20.1	98.3
Jan. 13	01 46.16	-06 57.6	3.425	3.563	+0.57 +7.3	20.3	90.0
Jan. 23	01 51.89	-05 44.6	3.588	3.586	+0.69 +7.6	20.4	82.0
Feb. 2	01 58.82	-04 28.8	3.749	3.608	+0.80 +7.7	20.6	74.3
Feb. 12	02 06.77	-03 11.7	3.905	3.631	+0.88 +7.7	20.8	66.8
Feb. 22	02 15.62	-01 54.6	4.054	3.654	+0.96 +7.6	20.9	59.6
Mar. 3	02 25.20	-00 38.6	4.194	3.677	+1.02 +7.4	21.0	52.5
Mar. 13	02 35.41	+00 35.3	4.324	3.700	+1.07 +7.1	21.2	45.7
Mar. 23	02 46.13	+01 46.4	4.442	3.723	+1.11 +6.7	21.3	39.2

Comet C/2013 W2 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 31.29345 TT
 Peri. = 307.15168
 Node = 179.10108 2000.0
 Incl. = 4.64349
 q = 4.4480757 AU
 e = 0.5770452
 a = 10.5166692 AU
 n = 0.02889926
 P = 34.10 years

$$m1 = 6.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	08 56.05	+12 33.0	3.544	4.448	-0.40 +1.8	18.5	153.9
Jan. 18	08 52.09	+12 50.6	3.493	4.449	-0.45 +2.2	18.4	164.8
Jan. 28	08 47.58	+13 12.6	3.470	4.451	-0.46 +2.4	18.4	174.5
Feb. 7	08 42.98	+13 37.0	3.478	4.454	-0.42 +2.5	18.4	170.7
Feb. 17	08 38.73	+14 01.9	3.516	4.458	-0.35 +2.3	18.5	160.2
Feb. 27	08 35.26	+14 25.4	3.582	4.462	-0.24 +2.0	18.5	149.4
Mar. 9	08 32.90	+14 45.9	3.673	4.468	-0.10 +1.6	18.6	138.8
Mar. 19	08 31.87	+15 02.2	3.785	4.474	+0.04 +1.1	18.7	128.6
Mar. 29	08 32.26	+15 13.6	3.915	4.481	+0.18 +0.6	18.7	118.8
Apr. 8	08 34.10	+15 19.6	4.057	4.489	+0.32 0.0	18.8	109.3
Apr. 18	08 37.32	+15 19.9	4.209	4.498	+0.45 -0.5	18.9	100.3
Apr. 28	08 41.82	+15 14.4	4.365	4.507	+0.56 -1.1	19.0	91.6
May 8	08 47.47	+15 03.3	4.523	4.518	+0.66 -1.7	19.1	83.3
May 18	08 54.10	+14 46.7	4.679	4.529	+0.75 -2.2	19.2	75.3
May 28	09 01.60	+14 24.7	4.831	4.541	+0.82 -2.7	19.3	67.5
June 7	09 09.81	+13 57.7	4.976	4.553	+0.88 -3.2	19.4	60.0
June 17	09 18.61	+13 25.8	5.112	4.567	+0.93 -3.6	19.4	52.6
June 27	09 27.89	+12 49.5	5.237	4.581	+0.96 -4.0	19.5	45.4
July 7	09 37.53	+12 09.1	5.350	4.596	+0.99 -4.4	19.6	38.3
July 17	09 47.46	+11 25.0	5.450	4.612	+1.01 -4.7	19.6	31.3
July 27	09 57.57	+10 37.6	5.534	4.628	+1.02 -5.0	19.7	24.4
Aug. 6	10 07.80	+09 47.4	5.603	4.646	+1.03 -5.3	19.7	17.5
Aug. 16	10 18.08	+08 54.9	5.655	4.663	+1.03 -5.4	19.8	10.6
Aug. 26	10 28.33	+08 00.5	5.690	4.682	+1.02 -5.6	19.8	3.9
Sept. 5	10 38.50	+07 05.0	5.707	4.701	+1.00 -5.6	19.9	3.7
Sept. 15	10 48.53	+06 08.7	5.706	4.721	+0.98 -5.6	19.9	10.5
Sept. 25	10 58.35	+05 12.5	5.688	4.742	+0.95 -5.6	19.9	17.6
Oct. 5	11 07.90	+04 16.8	5.651	4.763	+0.92 -5.4	19.9	24.9
Oct. 15	11 17.10	+03 22.4	5.598	4.785	+0.88 -5.2	19.9	32.3
Oct. 25	11 25.88	+02 30.0	5.528	4.807	+0.83 -5.0	19.9	39.9
Nov. 4	11 34.16	+01 40.4	5.443	4.830	+0.77 -4.6	19.9	47.6
Nov. 14	11 41.84	+00 54.3	5.343	4.854	+0.70 -4.2	19.9	55.6
Nov. 24	11 48.84	+00 12.6	5.232	4.878	+0.62 -3.7	19.9	63.8
Dec. 4	11 55.03	-00 24.0	5.112	4.902	+0.53 -3.1	19.9	72.3
Dec. 14	12 00.33	-00 54.6	4.985	4.928	+0.43 -2.4	19.9	81.0
Dec. 24	12 04.60	-01 18.4	4.854	4.953	+0.32 -1.6	19.9	90.0
Jan. 3	12 07.78	-01 34.8	4.724	4.979	+0.20 -0.8	19.8	99.4
Jan. 13	12 09.76	-01 43.1	4.598	5.006	+0.07 0.0	19.8	109.1
Jan. 23	12 10.50	-01 43.1	4.481	5.033	-0.05 +0.8	19.8	119.1
Feb. 2	12 10.02	-01 34.7	4.378	5.061	-0.16 +1.6	19.8	129.4
Feb. 12	12 08.38	-01 18.5	4.293	5.089	-0.27 +2.3	19.8	140.0
Feb. 22	12 05.72	-00 55.3	4.231	5.118	-0.34 +2.9	19.8	150.9
Mar. 3	12 02.28	-00 26.7	4.195	5.146	-0.39 +3.2	19.8	161.9
Mar. 13	11 58.33	+00 05.3	4.188	5.176	-0.41 +3.3	19.8	173.0
Mar. 23	11 54.22	+00 38.3	4.211	5.205	-0.39 +3.2	19.9	175.9

Comet C/2014 W7 (Christensen)

Epoch = 2015 June 27.0 TT
 T = 2014 Dec. 31.62407 TT
 Peri. = 33.24220
 Node = 151.25988 2000.0
 Incl. = 98.31368
 q = 1.4883006 AU
 e = 0.8689856
 a = 11.3598246 AU
 n = 0.02574226
 P = 38.29 years

$$m1 = 3.8 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	14 49.48	+39 29.7	1.168	1.491	+6.55	+62.4	8.5	87.4
Jan. 18	15 54.94	+49 54.1	1.165	1.506	+8.34	+45.5	8.6	88.6
Jan. 28	17 18.37	+57 28.9	1.232	1.531	+9.00	+21.6	8.9	86.6
Feb. 7	18 48.39	+61 05.3	1.355	1.566	+7.83	+3.4	9.3	82.4
Feb. 17	20 06.66	+61 39.8	1.511	1.611	+5.90	-4.8	9.9	77.2
Feb. 27	21 05.69	+60 51.9	1.682	1.665	+4.28	-6.6	10.5	71.8
Mar. 9	21 48.49	+59 46.3	1.855	1.725	+3.15	-5.5	11.1	66.8
Mar. 19	22 19.99	+58 51.0	2.020	1.791	+2.38	-3.6	11.7	62.4
Mar. 29	22 43.75	+58 14.6	2.172	1.863	+1.82	-1.7	12.2	58.8
Apr. 8	23 01.96	+57 58.0	2.306	1.939	+1.39	+0.2	12.8	56.3
Apr. 18	23 15.89	+57 59.7	2.419	2.018	+1.03	+1.8	13.3	55.0
Apr. 28	23 26.18	+58 17.4	2.511	2.100	+0.69	+3.1	13.9	54.8
May 8	23 33.07	+58 48.0	2.582	2.184	+0.35	+4.1	14.3	56.0
May 18	23 36.57	+59 28.8	2.631	2.270	-0.02	+4.8	14.8	58.4
May 28	23 36.35	+60 16.3	2.660	2.357	-0.43	+5.0	15.2	61.8
June 7	23 32.02	+61 06.0	2.671	2.445	-0.90	+4.6	15.6	66.2
June 17	23 23.05	+61 51.9	2.667	2.534	-1.40	+3.4	16.0	71.4
June 27	23 09.02	+62 25.9	2.652	2.623	-1.90	+1.2	16.4	77.3
July 7	22 49.98	+62 37.4	2.629	2.713	-2.32	-2.3	16.7	83.7
July 17	22 26.74	+62 14.7	2.605	2.802	-2.56	-6.8	17.1	90.4
July 27	22 01.18	+61 06.3	2.584	2.892	-2.53	-12.1	17.4	97.1
Aug. 6	21 35.87	+59 05.5	2.574	2.981	-2.27	-17.3	17.7	103.7
Aug. 16	21 13.21	+56 12.5	2.579	3.070	-1.84	-21.8	18.0	109.6
Aug. 26	20 54.76	+52 34.4	2.606	3.159	-1.37	-25.0	18.4	114.3
Sept. 5	20 41.03	+48 24.4	2.658	3.248	-0.93	-26.7	18.7	117.4
Sept. 15	20 31.78	+43 57.5	2.740	3.336	-0.53	-26.9	19.1	118.3
Sept. 25	20 26.43	+39 28.5	2.851	3.424	-0.21	-25.9	19.4	116.9
Oct. 5	20 24.30	+35 09.9	2.990	3.511	+0.05	-24.0	19.8	113.5
Oct. 15	20 24.76	+31 10.1	3.155	3.598	+0.25	-21.5	20.2	108.5
Oct. 25	20 27.27	+27 34.8	3.341	3.684	+0.41	-18.9	20.6	102.4
Nov. 4	20 31.39	+24 26.1	3.543	3.770	+0.54	-16.2	21.0	95.5
Nov. 14	20 36.75	+21 44.3	3.756	3.855	+0.63	-13.6	21.3	88.3
Nov. 24	20 43.07	+19 28.3	3.976	3.940	+0.70	-11.2	21.7	80.8
Dec. 4	20 50.09	+17 36.2	4.197	4.024	+0.75	-9.1	22.0	73.2
Dec. 14	20 57.63	+16 05.6	4.415	4.107	+0.79	-7.1	22.4	65.6
Dec. 24	21 05.52	+14 54.2	4.626	4.190	+0.81	-5.4	22.7	58.1
Jan. 3	21 13.61	+13 59.7	4.826	4.273	+0.82	-4.0	23.0	50.7
Jan. 13	21 21.79	+13 20.0	5.012	4.354	+0.82	-2.7	.	43.7
Jan. 23	21 29.95	+12 53.1	5.181	4.436	+0.80	-1.6	.	37.1
Feb. 2	21 37.99	+12 37.2	5.330	4.516	+0.78	-0.7	.	31.2
Feb. 12	21 45.81	+12 30.5	5.458	4.596	+0.75	+0.1	.	26.6
Feb. 22	21 53.34	+12 31.6	5.563	4.676	+0.72	+0.7	.	23.9
Mar. 3	22 00.49	+12 39.1	5.645	4.755	+0.67	+1.2	.	23.8
Mar. 13	22 07.19	+12 51.6	5.703	4.833	+0.62	+1.6	.	26.5
Mar. 23	22 13.35	+13 07.8	5.737	4.911	+0.55	+1.9	.	31.2

Comet C/2014 F2 (Tenagra)

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 2.46993 TT
 Peri. = 86.06736
 Node = 267.44912 2000.0
 Incl. = 119.06033
 q = 4.3145617 AU
 e = 0.9706764

$$m1 = 8.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	15 35.77	+44 31.7	4.316	4.315	+0.29	+17.6	18.3	83.4
Jan. 18	15 38.64	+47 28.0	4.212	4.316	+0.11	+19.8	18.3	89.5
Jan. 28	15 39.79	+50 46.1	4.119	4.320	-0.13	+21.6	18.2	95.1
Feb. 7	15 38.48	+54 22.4	4.043	4.324	-0.47	+22.9	18.2	100.0
Feb. 17	15 33.74	+58 11.1	3.987	4.330	-0.96	+23.3	18.2	103.8
Feb. 27	15 24.11	+62 03.8	3.956	4.338	-1.64	+22.5	18.2	106.2
Mar. 9	15 07.67	+65 48.5	3.953	4.347	-2.56	+20.1	18.2	107.0
Mar. 19	14 42.04	+69 09.8	3.977	4.358	-3.68	+15.9	18.2	106.0
Mar. 29	14 05.28	+71 49.2	4.029	4.370	-4.70	+9.9	18.2	103.5
Apr. 8	13 18.31	+73 28.0	4.105	4.384	-5.12	+2.8	18.3	99.6
Apr. 18	12 27.12	+73 56.0	4.202	4.399	-4.65	-3.7	18.4	94.7
Apr. 28	11 40.62	+73 19.1	4.316	4.416	-3.62	-8.3	18.4	89.1
May 8	11 04.43	+71 56.4	4.441	4.434	-2.54	-10.8	18.5	83.1
May 18	10 39.07	+70 08.3	4.572	4.453	-1.65	-11.8	18.6	76.9
May 28	10 22.55	+68 09.9	4.704	4.474	-1.00	-11.9	18.7	70.8
June 7	10 12.51	+66 11.0	4.834	4.496	-0.54	-11.4	18.7	64.8
June 17	10 07.08	+64 16.9	4.956	4.519	-0.22	-10.6	18.8	59.1
June 27	10 04.89	+62 30.5	5.068	4.544	+0.01	-9.7	18.9	53.9
July 7	10 04.98	+60 53.6	5.165	4.570	+0.17	-8.7	19.0	49.4
July 17	10 06.65	+59 26.9	5.247	4.597	+0.28	-7.6	19.0	45.8
July 27	10 09.42	+58 10.9	5.310	4.625	+0.35	-6.5	19.1	43.4
Aug. 6	10 12.90	+57 06.0	5.354	4.655	+0.39	-5.3	19.1	42.3
Aug. 16	10 16.79	+56 12.5	5.377	4.685	+0.41	-4.2	19.2	42.8
Aug. 26	10 20.84	+55 30.9	5.379	4.717	+0.40	-2.9	19.2	44.8
Sept. 5	10 24.81	+55 01.6	5.361	4.750	+0.37	-1.6	19.2	48.3
Sept. 15	10 28.49	+54 45.2	5.322	4.783	+0.31	-0.3	19.2	52.9
Sept. 25	10 31.64	+54 42.4	5.266	4.818	+0.23	+1.1	19.2	58.5
Oct. 5	10 33.98	+54 53.8	5.193	4.854	+0.13	+2.6	19.2	64.9
Oct. 15	10 35.23	+55 19.9	5.106	4.891	-0.02	+4.1	19.2	72.0
Oct. 25	10 35.00	+56 01.1	5.010	4.928	-0.21	+5.6	19.2	79.6
Nov. 4	10 32.86	+56 57.0	4.908	4.967	-0.46	+6.9	19.2	87.6
Nov. 14	10 28.23	+58 06.5	4.805	5.006	-0.78	+8.0	19.2	96.0
Nov. 24	10 20.47	+59 26.8	4.708	5.046	-1.16	+8.7	19.2	104.4
Dec. 4	10 08.86	+60 53.4	4.623	5.087	-1.61	+8.6	19.2	112.8
Dec. 14	09 52.72	+62 19.3	4.555	5.129	-2.10	+7.5	19.2	120.8
Dec. 24	09 31.67	+63 34.8	4.510	5.171	-2.56	+5.4	19.2	127.7
Jan. 3	09 06.10	+64 29.1	4.495	5.215	-2.87	+2.3	19.2	133.0
Jan. 13	08 37.43	+64 52.4	4.511	5.258	-2.93	-1.3	19.3	135.6
Jan. 23	08 08.11	+64 39.2	4.561	5.303	-2.73	-4.9	19.3	135.0
Feb. 2	07 40.83	+63 50.5	4.646	5.348	-2.32	-7.8	19.4	131.4
Feb. 12	07 17.59	+62 32.7	4.762	5.394	-1.83	-9.7	19.5	125.4
Feb. 22	06 59.28	+60 55.3	4.906	5.440	-1.35	-10.8	19.6	118.0
Mar. 3	06 45.82	+59 07.7	5.073	5.487	-0.92	-11.1	19.7	109.7
Mar. 13	06 36.65	+57 17.1	5.258	5.535	-0.56	-10.8	19.8	101.0
Mar. 23	06 31.05	+55 28.9	5.455	5.583	-0.28	-10.3	20.0	92.2

Comet C/2014 Q6 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 6.31531 TT
 Peri. = 2.52426
 Node = 326.65480 2000.0
 Incl. = 49.79904
 q = 4.2227881 AU
 e = 0.9995956

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	21 31.20	-12 47.5	5.003	4.223	+0.87	+10.6	19.8	33.9
Jan. 18	21 39.86	-11 01.6	5.083	4.224	+0.89	+10.8	19.8	26.4
Jan. 28	21 48.74	-09 13.9	5.145	4.227	+0.90	+11.0	19.8	19.1
Feb. 7	21 57.71	-07 24.3	5.190	4.231	+0.90	+11.2	19.8	12.2
Feb. 17	22 06.70	-05 32.7	5.216	4.237	+0.89	+11.4	19.9	6.9
Feb. 27	22 15.61	-03 39.1	5.225	4.245	+0.87	+11.6	19.9	7.5
Mar. 9	22 24.36	-01 43.4	5.215	4.254	+0.85	+11.8	19.9	13.1
Mar. 19	22 32.86	+00 14.3	5.188	4.265	+0.82	+12.0	19.9	19.8
Mar. 29	22 41.04	+02 14.0	5.144	4.278	+0.78	+12.2	19.9	26.9
Apr. 8	22 48.81	+04 15.6	5.085	4.292	+0.73	+12.3	19.9	34.0
Apr. 18	22 56.09	+06 19.0	5.012	4.307	+0.67	+12.5	19.8	41.2
Apr. 28	23 02.78	+08 23.9	4.926	4.325	+0.60	+12.6	19.8	48.5
May 8	23 08.77	+10 30.2	4.830	4.343	+0.52	+12.7	19.8	55.8
May 18	23 13.96	+12 37.5	4.725	4.363	+0.43	+12.8	19.8	63.2
May 28	23 18.22	+14 45.4	4.614	4.385	+0.32	+12.8	19.7	70.7
June 7	23 21.43	+16 53.1	4.499	4.408	+0.20	+12.7	19.7	78.4
June 17	23 23.45	+18 59.9	4.384	4.433	+0.07	+12.4	19.7	86.1
June 27	23 24.14	+21 04.3	4.272	4.458	-0.08	+12.0	19.6	93.9
July 7	23 23.38	+23 04.7	4.166	4.485	-0.23	+11.4	19.6	101.8
July 17	23 21.09	+24 59.0	4.069	4.514	-0.38	+10.6	19.6	109.7
July 27	23 17.24	+26 44.6	3.985	4.544	-0.53	+9.4	19.6	117.5
Aug. 6	23 11.91	+28 18.7	3.917	4.575	-0.66	+8.0	19.6	124.9
Aug. 16	23 05.27	+29 38.5	3.870	4.607	-0.76	+6.3	19.6	131.8
Aug. 26	22 57.65	+30 41.6	3.844	4.640	-0.82	+4.5	19.6	137.5
Sept. 5	22 49.49	+31 26.7	3.843	4.674	-0.82	+2.7	19.6	141.5
Sept. 15	22 41.30	+31 53.6	3.868	4.710	-0.77	+1.0	19.7	143.0
Sept. 25	22 33.63	+32 03.8	3.917	4.746	-0.67	-0.4	19.7	141.8
Oct. 5	22 26.95	+32 00.3	3.992	4.784	-0.53	-1.4	19.8	138.2
Oct. 15	22 21.64	+31 46.6	4.089	4.823	-0.37	-2.0	19.9	132.8
Oct. 25	22 17.92	+31 26.9	4.206	4.862	-0.20	-2.2	20.0	126.4
Nov. 4	22 15.90	+31 05.3	4.341	4.903	-0.03	-2.0	20.1	119.3
Nov. 14	22 15.56	+30 45.2	4.489	4.944	+0.13	-1.6	20.2	111.9
Nov. 24	22 16.81	+30 29.5	4.647	4.986	+0.27	-0.9	20.3	104.5
Dec. 4	22 19.52	+30 20.2	4.812	5.029	+0.40	-0.1	20.4	97.0
Dec. 14	22 23.53	+30 18.8	4.981	5.073	+0.51	+0.7	20.5	89.8
Dec. 24	22 28.67	+30 26.2	5.149	5.118	+0.61	+1.7	20.6	82.7
Jan. 3	22 34.77	+30 42.7	5.316	5.163	+0.69	+2.6	20.8	75.8
Jan. 13	22 41.68	+31 08.4	5.477	5.209	+0.76	+3.5	20.9	69.2
Jan. 23	22 49.25	+31 43.1	5.630	5.256	+0.81	+4.3	21.0	62.9
Feb. 2	22 57.36	+32 26.5	5.774	5.303	+0.85	+5.2	21.1	57.0
Feb. 12	23 05.88	+33 18.1	5.907	5.351	+0.88	+5.9	21.1	51.6
Feb. 22	23 14.72	+34 17.3	6.028	5.399	+0.91	+6.6	21.2	46.8
Mar. 3	23 23.77	+35 23.4	6.135	5.449	+0.92	+7.2	21.3	42.7
Mar. 13	23 32.96	+36 35.9	6.228	5.498	+0.92	+7.8	21.4	39.5
Mar. 23	23 42.19	+37 54.1	6.307	5.549	+0.92	+8.3	21.4	37.4

Comet P/2014 X1 (Elenin)

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 7.73091 TT
 Peri. = 34.37110
 Node = 61.55749 2000.0
 Incl. = 25.97111
 q = 1.8147815 AU
 e = 0.7100818
 a = 6.2596329 AU
 n = 0.06293334
 P = 15.66 years

$$m1 = 12.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	04 46.33	+50 52.5	0.951	1.815	-0.17	+11.4	17.2	139.5
Jan. 18	04 44.61	+52 46.9	1.013	1.818	+0.48	+7.6	17.4	131.2
Jan. 28	04 49.44	+54 03.3	1.088	1.828	+1.14	+4.7	17.6	123.7
Feb. 7	05 00.81	+54 50.1	1.173	1.844	+1.71	+2.1	17.8	117.0
Feb. 17	05 17.95	+55 11.5	1.266	1.865	+2.19	-0.2	18.1	111.1
Feb. 27	05 39.80	+55 09.1	1.365	1.893	+2.52	-2.6	18.3	105.9
Mar. 9	06 05.05	+54 43.1	1.471	1.926	+2.73	-5.0	18.6	101.1
Mar. 19	06 32.36	+53 53.4	1.582	1.963	+2.82	-7.3	18.9	96.6
Mar. 29	07 00.61	+52 40.7	1.698	2.005	+2.82	-9.4	19.2	92.4
Apr. 8	07 28.81	+51 07.0	1.820	2.051	+2.75	-11.2	19.6	88.3
Apr. 18	07 56.29	+49 14.8	1.947	2.101	+2.64	-12.7	19.9	84.3
Apr. 28	08 22.64	+47 07.4	2.079	2.154	+2.50	-13.9	20.2	80.4
May 8	08 47.64	+44 48.4	2.216	2.210	+2.36	-14.8	20.6	76.4
May 18	09 11.23	+42 20.8	2.358	2.268	+2.22	-15.3	20.9	72.4
May 28	09 33.48	+39 47.7	2.502	2.328	+2.10	-15.6	21.2	68.4
June 7	09 54.46	+37 11.6	2.649	2.390	+1.98	-15.7	21.5	64.2
June 17	10 14.31	+34 34.6	2.798	2.454	+1.88	-15.6	21.9	60.0
June 27	10 33.15	+31 58.4	2.947	2.519	+1.79	-15.4	22.2	55.7
July 7	10 51.10	+29 24.3	3.095	2.585	+1.72	-15.1	22.5	51.3
July 17	11 08.27	+26 53.4	3.241	2.652	+1.65	-14.7	22.8	46.8
July 27	11 24.77	+24 26.6	3.384	2.719	+1.59	-14.2	23.0	42.3
Aug. 6	11 40.66	+22 04.5	3.521	2.787	+1.54	-13.7	.	37.7
Aug. 16	11 56.02	+19 47.6	3.651	2.856	+1.49	-13.1	.	33.0
Aug. 26	12 10.91	+17 36.5	3.774	2.925	+1.44	-12.5	.	28.5
Sept. 5	12 25.36	+15 31.4	3.887	2.994	+1.40	-11.9	.	24.1
Sept. 15	12 39.41	+13 32.8	3.988	3.063	+1.37	-11.2	.	20.1
Sept. 25	12 53.07	+11 40.9	4.078	3.133	+1.33	-10.5	.	17.1
Oct. 5	13 06.34	+09 56.0	4.154	3.202	+1.29	-9.8	.	15.7
Oct. 15	13 19.23	+08 18.4	4.215	3.271	+1.25	-9.0	.	16.5
Oct. 25	13 31.69	+06 48.5	4.261	3.340	+1.20	-8.2	.	19.6
Nov. 4	13 43.70	+05 26.4	4.291	3.409	+1.15	-7.4	.	24.1
Nov. 14	13 55.21	+04 12.4	4.304	3.478	+1.09	-6.6	.	29.6
Nov. 24	14 06.14	+03 06.9	4.300	3.546	+1.03	-5.7	.	35.8
Dec. 4	14 16.43	+02 09.9	4.280	3.614	+0.95	-4.8	.	42.4
Dec. 14	14 25.97	+01 21.6	4.245	3.682	+0.87	-3.9	.	49.5
Dec. 24	14 34.65	+00 42.3	4.195	3.750	+0.77	-3.0	.	56.9
Jan. 3	14 42.35	+00 12.0	4.132	3.817	+0.66	-2.1	.	64.7
Jan. 13	14 48.93	-00 09.5	4.059	3.883	+0.53	-1.3	.	72.8
Jan. 23	14 54.23	-00 22.3	3.977	3.950	+0.39	-0.4	.	81.3
Feb. 2	14 58.13	-00 26.7	3.891	4.016	+0.23	+0.3	.	90.1
Feb. 12	15 00.47	-00 23.3	3.803	4.081	+0.07	+1.0	.	99.3
Feb. 22	15 01.16	-00 13.1	3.719	4.146	-0.10	+1.6	.	108.9
Mar. 3	15 00.15	+00 02.7	3.644	4.211	-0.27	+2.0	.	118.7
Mar. 13	14 57.45	+00 22.6	3.581	4.275	-0.43	+2.2	.	128.8
Mar. 23	14 53.18	+00 44.4	3.537	4.339	-0.56	+2.1	.	139.0

Comet 201P/LONEOS

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 14.62090 TT
 Peri. = 25.07023
 Node = 35.23090 2000.0
 Incl. = 7.03358
 q = 1.3391481 AU
 e = 0.6129100
 a = 3.4595265 AU
 n = 0.15317190
 P = 6.43 years

$$m_1 = 12.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	00 25.97	+06 01.6	1.075	1.341	+2.90	+24.8	15.2	81.2
Jan. 18	00 54.95	+10 09.6	1.111	1.340	+3.11	+24.3	15.3	79.3
Jan. 28	01 26.07	+14 12.4	1.154	1.348	+3.30	+22.8	15.4	77.7
Feb. 7	01 59.11	+18 00.8	1.206	1.366	+3.46	+20.5	15.6	76.4
Feb. 17	02 33.76	+21 25.9	1.268	1.394	+3.59	+17.5	15.8	75.2
Feb. 27	03 09.63	+24 20.5	1.342	1.429	+3.65	+13.9	16.2	73.9
Mar. 9	03 46.17	+26 39.3	1.426	1.473	+3.66	+10.1	16.5	72.5
Mar. 19	04 22.78	+28 20.1	1.523	1.522	+3.61	+6.3	16.9	70.9
Mar. 29	04 58.88	+29 23.2	1.630	1.577	+3.50	+2.8	17.3	69.0
Apr. 8	05 33.89	+29 51.3	1.747	1.636	+3.35	-0.3	17.8	66.8
Apr. 18	06 07.42	+29 48.4	1.873	1.699	+3.18	-2.9	18.2	64.4
Apr. 28	06 39.23	+29 19.1	2.006	1.765	+2.99	-5.1	18.6	61.6
May 8	07 09.17	+28 28.5	2.145	1.832	+2.81	-6.8	19.1	58.5
May 18	07 37.25	+27 20.7	2.288	1.902	+2.63	-8.1	19.5	55.2
May 28	08 03.55	+25 59.7	2.434	1.972	+2.46	-9.1	19.9	51.7
June 7	08 28.19	+24 28.9	2.580	2.043	+2.31	-9.8	20.3	47.9
June 17	08 51.33	+22 50.7	2.726	2.115	+2.18	-10.3	20.7	43.9
June 27	09 13.11	+21 07.4	2.870	2.187	+2.06	-10.7	21.0	39.7
July 7	09 33.67	+19 20.7	3.010	2.258	+1.95	-10.9	21.4	35.4
July 17	09 53.15	+17 32.0	3.144	2.330	+1.85	-11.0	21.7	30.8
July 27	10 11.69	+15 42.5	3.271	2.401	+1.77	-10.9	22.0	26.1
Aug. 6	10 29.36	+13 53.0	3.389	2.471	+1.69	-10.9	22.3	21.3
Aug. 16	10 46.27	+12 04.4	3.497	2.541	+1.62	-10.7	22.6	16.3
Aug. 26	11 02.48	+10 17.4	3.594	2.610	+1.56	-10.5	22.8	11.2
Sept. 5	11 18.05	+08 32.6	3.679	2.679	+1.50	-10.2	22.9	6.3
Sept. 15	11 33.02	+06 50.5	3.749	2.746	+1.44	-9.9	.	3.6
Sept. 25	11 47.43	+05 11.7	3.805	2.813	+1.38	-9.5	.	7.3
Oct. 5	12 01.26	+03 36.8	3.846	2.879	+1.33	-9.1	.	12.8
Oct. 15	12 14.53	+02 06.1	3.870	2.944	+1.27	-8.6	.	18.9
Oct. 25	12 27.21	+00 40.4	3.878	3.008	+1.20	-8.0	.	25.3
Nov. 4	12 39.25	-00 40.0	3.869	3.072	+1.14	-7.5	.	31.9
Nov. 14	12 50.61	-01 54.5	3.843	3.134	+1.06	-6.8	.	38.8
Nov. 24	13 01.19	-03 02.6	3.802	3.195	+0.97	-6.1	.	46.0
Dec. 4	13 10.90	-04 03.7	3.745	3.256	+0.87	-5.4	.	53.4
Dec. 14	13 19.63	-04 57.2	3.675	3.315	+0.76	-4.5	.	61.2
Dec. 24	13 27.21	-05 42.6	3.592	3.374	+0.63	-3.7	.	69.4
Jan. 3	13 33.51	-06 19.3	3.501	3.431	+0.48	-2.7	.	77.9
Jan. 13	13 38.34	-06 46.7	3.403	3.488	+0.32	-1.8	.	86.7
Jan. 23	13 41.53	-07 04.2	3.302	3.544	+0.14	-0.7	.	96.1
Feb. 2	13 42.92	-07 11.6	3.203	3.599	-0.05	+0.3	.	105.8
Feb. 12	13 42.40	-07 08.5	3.109	3.653	-0.25	+1.3	.	116.1
Feb. 22	13 39.93	-06 55.1	3.027	3.706	-0.43	+2.3	.	126.8
Mar. 3	13 35.60	-06 32.1	2.962	3.758	-0.60	+3.1	.	138.0
Mar. 13	13 29.63	-06 01.0	2.919	3.809	-0.72	+3.7	.	149.5
Mar. 23	13 22.41	-05 23.9	2.902	3.859	-0.79	+4.0	.	161.3

Comet C/2013 G9 (Tenagra)

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 14.98831 TT
 Peri. = 204.97479
 Node = 35.69282 2000.0
 Incl. = 146.23393
 q = 5.3377963 AU
 e = 1.0010657

$$m_1 = 5.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	13 16.16	-22 07.1	5.396	5.338	-0.51	-4.0	16.7	81.4
Jan. 18	13 11.11	-22 47.5	5.210	5.338	-0.69	-3.4	16.7	92.1
Jan. 28	13 04.26	-23 21.8	5.028	5.339	-0.88	-2.6	16.6	103.1
Feb. 7	12 55.49	-23 47.5	4.857	5.341	-1.07	-1.5	16.5	114.4
Feb. 17	12 44.83	-24 02.3	4.705	5.343	-1.24	-0.1	16.4	125.8
Feb. 27	12 32.44	-24 03.4	4.580	5.347	-1.38	+1.4	16.4	137.0
Mar. 9	12 18.68	-23 49.1	4.489	5.352	-1.46	+3.0	16.3	147.5
Mar. 19	12 04.09	-23 18.7	4.436	5.358	-1.47	+4.5	16.3	155.7
Mar. 29	11 49.35	-22 33.3	4.425	5.365	-1.42	+5.7	16.3	158.3
Apr. 8	11 35.14	-21 35.9	4.457	5.373	-1.31	+6.5	16.3	153.8
Apr. 18	11 22.05	-20 30.6	4.530	5.382	-1.15	+6.8	16.4	145.0
Apr. 28	11 10.51	-19 22.2	4.638	5.393	-0.97	+6.7	16.4	134.6
May 8	11 00.77	-18 15.4	4.777	5.404	-0.79	+6.2	16.5	123.8
May 18	10 52.88	-17 13.6	4.939	5.416	-0.61	+5.4	16.6	113.0
May 28	10 46.79	-16 19.3	5.117	5.429	-0.44	+4.5	16.7	102.6
June 7	10 42.35	-15 34.2	5.304	5.443	-0.30	+3.5	16.8	92.4
June 17	10 39.37	-14 58.8	5.494	5.458	-0.17	+2.5	16.9	82.7
June 27	10 37.65	-14 33.4	5.679	5.474	-0.07	+1.6	17.0	73.3
July 7	10 37.00	-14 17.6	5.856	5.490	+0.02	+0.7	17.0	64.2
July 17	10 37.20	-14 10.8	6.019	5.508	+0.09	-0.2	17.1	55.5
July 27	10 38.10	-14 12.7	6.166	5.527	+0.14	-1.0	17.2	47.2
Aug. 6	10 39.52	-14 22.4	6.292	5.546	+0.18	-1.7	17.2	39.5
Aug. 16	10 41.31	-14 39.3	6.395	5.567	+0.20	-2.4	17.3	32.4
Aug. 26	10 43.32	-15 02.9	6.474	5.588	+0.21	-3.0	17.3	26.5
Sept. 5	10 45.42	-15 32.5	6.527	5.611	+0.20	-3.5	17.4	22.7
Sept. 15	10 47.47	-16 07.4	6.554	5.634	+0.19	-4.0	17.4	22.0
Sept. 25	10 49.33	-16 47.2	6.553	5.658	+0.15	-4.4	17.4	24.7
Oct. 5	10 50.86	-17 31.1	6.526	5.682	+0.11	-4.7	17.4	30.0
Oct. 15	10 51.92	-18 18.5	6.474	5.708	+0.04	-5.0	17.4	36.9
Oct. 25	10 52.34	-19 08.7	6.399	5.734	-0.04	-5.2	17.4	44.6
Nov. 4	10 51.98	-20 00.6	6.303	5.761	-0.13	-5.3	17.4	53.0
Nov. 14	10 50.67	-20 53.4	6.190	5.789	-0.24	-5.2	17.4	61.8
Nov. 24	10 48.22	-21 45.6	6.064	5.818	-0.37	-5.0	17.4	71.0
Dec. 4	10 44.48	-22 35.5	5.929	5.847	-0.52	-4.6	17.3	80.5
Dec. 14	10 39.32	-23 21.3	5.791	5.877	-0.67	-3.9	17.3	90.2
Dec. 24	10 32.63	-24 00.4	5.657	5.908	-0.82	-3.0	17.3	100.0
Jan. 3	10 24.41	-24 30.4	5.533	5.939	-0.97	-1.8	17.3	109.9
Jan. 13	10 14.73	-24 48.3	5.426	5.972	-1.09	-0.4	17.2	119.5
Jan. 23	10 03.83	-24 51.8	5.342	6.004	-1.18	+1.3	17.2	128.5
Feb. 2	09 52.04	-24 39.2	5.287	6.038	-1.22	+2.9	17.2	136.3
Feb. 12	09 39.83	-24 09.8	5.265	6.072	-1.21	+4.5	17.2	141.8
Feb. 22	09 27.72	-23 24.6	5.280	6.106	-1.15	+5.9	17.3	143.9
Mar. 3	09 16.22	-22 26.0	5.331	6.142	-1.05	+6.8	17.3	141.9
Mar. 13	09 05.74	-21 17.6	5.417	6.178	-0.91	+7.4	17.4	136.6
Mar. 23	08 56.60	-20 03.3	5.536	6.214	-0.76	+7.6	17.4	129.2

Comet P/2014 V1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 28.52985 TT
 Peri. = 179.94970
 Node = 166.63946 2000.0
 Incl. = 22.43305
 q = 2.5238859 AU
 e = 0.4502229
 a = 4.5907440 AU
 n = 0.10020271
 P = 9.84 years

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

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	21 52.92	-10 54.2	3.208	2.528	+1.86 +4.3	19.2	39.5
Jan. 18	22 11.50	-10 11.1	3.282	2.525	+1.87 +5.1	19.2	33.8
Jan. 28	22 30.25	-09 19.8	3.348	2.524	+1.88 +5.8	19.3	28.3
Feb. 7	22 49.08	-08 21.6	3.405	2.525	+1.89 +6.4	19.3	22.8
Feb. 17	23 07.94	-07 18.1	3.453	2.528	+1.88 +6.7	19.3	17.5
Feb. 27	23 26.78	-06 10.7	3.492	2.533	+1.88 +7.0	19.4	12.3
Mar. 9	23 45.56	-05 00.9	3.521	2.540	+1.87 +7.1	19.4	7.5
Mar. 19	00 04.26	-03 50.1	3.541	2.549	+1.86 +7.0	19.4	4.3
Mar. 29	00 22.84	-02 39.9	3.551	2.560	+1.84 +6.8	19.5	5.9
Apr. 8	00 41.28	-01 31.5	3.552	2.573	+1.83 +6.5	19.5	10.3
Apr. 18	00 59.56	-00 26.3	3.544	2.588	+1.81 +6.1	19.5	15.2
Apr. 28	01 17.64	+00 34.3	3.526	2.605	+1.78 +5.5	19.6	20.3
May 8	01 35.49	+01 29.3	3.499	2.624	+1.76 +4.8	19.6	25.4
May 18	01 53.07	+02 17.5	3.464	2.644	+1.72 +4.0	19.6	30.6
May 28	02 10.32	+02 57.9	3.420	2.666	+1.68 +3.2	19.7	35.9
June 7	02 27.17	+03 29.5	3.368	2.689	+1.64 +2.2	19.7	41.2
June 17	02 43.54	+03 51.4	3.308	2.714	+1.58 +1.2	19.7	46.7
June 27	02 59.34	+04 03.0	3.241	2.741	+1.51 +0.1	19.7	52.3
July 7	03 14.44	+04 03.5	3.168	2.768	+1.43 -1.1	19.7	58.1
July 17	03 28.72	+03 52.5	3.088	2.797	+1.33 -2.3	19.7	64.1
July 27	03 42.03	+03 29.5	3.004	2.827	+1.22 -3.5	19.8	70.2
Aug. 6	03 54.21	+02 54.6	2.917	2.858	+1.09 -4.7	19.8	76.7
Aug. 16	04 05.06	+02 07.7	2.827	2.891	+0.93 -5.9	19.8	83.4
Aug. 26	04 14.38	+01 09.2	2.736	2.924	+0.76 -6.9	19.8	90.4
Sept. 5	04 21.97	-00 00.0	2.647	2.958	+0.57 -7.9	19.8	97.8
Sept. 15	04 27.63	-01 18.6	2.563	2.992	+0.35 -8.6	19.8	105.5
Sept. 25	04 31.15	-02 44.2	2.486	3.028	+0.13 -8.9	19.8	113.4
Oct. 5	04 32.44	-04 13.6	2.419	3.064	-0.10 -8.9	19.8	121.6
Oct. 15	04 31.47	-05 42.9	2.366	3.101	-0.31 -8.4	19.8	129.8
Oct. 25	04 28.34	-07 06.5	2.332	3.138	-0.49 -7.2	19.9	137.6
Nov. 4	04 23.39	-08 19.0	2.318	3.176	-0.63 -5.6	20.0	144.2
Nov. 14	04 17.12	-09 15.0	2.328	3.214	-0.69 -3.5	20.0	148.7
Nov. 24	04 10.21	-09 50.0	2.363	3.253	-0.68 -1.2	20.2	149.6
Dec. 4	04 03.39	-10 02.3	2.424	3.292	-0.60 +1.0	20.3	146.7
Dec. 14	03 57.36	-09 51.8	2.509	3.332	-0.47 +3.1	20.4	140.9
Dec. 24	03 52.67	-09 21.0	2.617	3.371	-0.30 +4.8	20.6	133.6
Jan. 3	03 49.67	-08 33.5	2.744	3.411	-0.11 +6.0	20.8	125.6
Jan. 13	03 48.53	-07 33.3	2.888	3.451	+0.07 +6.9	21.0	117.3
Jan. 23	03 49.26	-06 24.4	3.044	3.491	+0.25 +7.4	21.2	109.0
Feb. 2	03 51.77	-05 10.5	3.209	3.532	+0.41 +7.6	21.4	100.9
Feb. 12	03 55.89	-03 54.4	3.380	3.572	+0.56 +7.6	21.5	93.1
Feb. 22	04 01.47	-02 38.5	3.554	3.612	+0.68 +7.4	21.7	85.4
Mar. 3	04 08.29	-01 24.7	3.728	3.653	+0.79 +7.0	21.9	78.0
Mar. 13	04 16.18	-00 14.3	3.898	3.693	+0.88 +6.6	22.1	70.8
Mar. 23	04 24.99	+00 51.5	4.064	3.734	+0.95 +6.0	22.2	63.9

Comet C/2014 Q2 (Lovejoy)

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 30.06767 TT
 Peri. = 12.39563
 Node = 94.97572 2000.0
 Incl. = 80.30138
 q = 1.2903759 AU
 e = 0.9977355

$$m_1 = 7.2 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	04 14.98	-02 28.8	0.469	1.333	-6.06	137.7	7.1	129.7
Jan. 18	03 14.37	+20 28.7	0.541	1.303	-4.33	+88.5	7.3	114.3
Jan. 28	02 31.06	+35 13.4	0.698	1.291	-2.85	+52.3	7.8	98.8
Feb. 7	02 02.60	+43 56.4	0.887	1.296	-1.81	+34.4	8.3	87.4
Feb. 17	01 44.49	+49 40.8	1.081	1.318	-1.11	+26.1	8.9	79.0
Feb. 27	01 33.39	+54 01.9	1.269	1.357	-0.64	+22.3	9.4	72.7
Mar. 9	01 27.02	+57 44.7	1.442	1.410	-0.30	+20.8	9.9	67.9
Mar. 19	01 24.00	+61 12.3	1.599	1.476	-0.06	+20.6	10.3	64.5
Mar. 29	01 23.36	+64 37.8	1.738	1.551	+0.10	+21.1	10.8	62.3
Apr. 8	01 24.31	+68 08.8	1.860	1.635	+0.19	+22.1	11.2	61.3
Apr. 18	01 26.19	+71 49.9	1.965	1.725	+0.19	+23.4	11.6	61.3
Apr. 28	01 28.04	+75 44.4	2.057	1.820	-0.02	+24.9	12.0	62.2
May 8	01 27.82	+79 53.3	2.137	1.919	-0.98	+26.3	12.4	63.8
May 18	01 17.98	+84 16.3	2.210	2.021	-13.22	+26.1	12.7	65.9
May 28	23 05.82	+88 37.7	2.278	2.125	-47.76	-15.9	13.1	68.4
June 7	15 08.21	+85 58.2	2.345	2.230	-2.21	-30.0	13.4	70.9
June 17	14 46.06	+80 58.3	2.414	2.336	+0.03	-31.0	13.7	73.3
June 27	14 46.33	+75 48.5	2.490	2.442	+0.54	-31.3	14.0	75.5
July 7	14 51.71	+70 35.7	2.575	2.549	+0.75	-31.1	14.3	77.1
July 17	14 59.17	+65 24.8	2.670	2.656	+0.86	-30.4	14.6	78.2
July 27	15 07.80	+60 20.8	2.778	2.763	+0.93	-29.3	14.9	78.6
Aug. 6	15 17.14	+55 28.2	2.898	2.869	+0.98	-27.8	15.2	78.2
Aug. 16	15 26.98	+50 50.5	3.031	2.975	+1.02	-26.0	15.5	77.2
Aug. 26	15 37.19	+46 30.6	3.175	3.081	+1.05	-24.0	15.8	75.5
Sept. 5	15 47.68	+42 30.7	3.329	3.186	+1.07	-21.9	16.1	73.1
Sept. 15	15 58.36	+38 51.5	3.490	3.291	+1.08	-19.8	16.4	70.3
Sept. 25	16 09.20	+35 33.8	3.656	3.395	+1.09	-17.6	16.7	67.1
Oct. 5	16 20.11	+32 37.4	3.825	3.498	+1.09	-15.6	16.9	63.7
Oct. 15	16 31.06	+30 01.7	3.993	3.601	+1.09	-13.5	17.2	60.1
Oct. 25	16 41.98	+27 46.2	4.158	3.703	+1.08	-11.6	17.4	56.5
Nov. 4	16 52.81	+25 50.1	4.318	3.805	+1.07	-9.8	17.6	53.0
Nov. 14	17 03.50	+24 12.2	4.469	3.905	+1.05	-8.0	17.8	49.9
Nov. 24	17 13.98	+22 51.9	4.610	4.006	+1.02	-6.4	18.1	47.2
Dec. 4	17 24.17	+21 48.1	4.738	4.105	+0.98	-4.8	18.2	45.3
Dec. 14	17 34.00	+20 59.9	4.853	4.204	+0.94	-3.4	18.4	44.2
Dec. 24	17 43.39	+20 26.3	4.952	4.302	+0.89	-2.0	18.6	44.2
Jan. 3	17 52.24	+20 06.4	5.035	4.400	+0.82	-0.7	18.8	45.4
Jan. 13	18 00.48	+19 59.2	5.101	4.497	+0.75	+0.5	18.9	47.6
Jan. 23	18 07.99	+20 03.8	5.150	4.593	+0.67	+1.5	19.0	50.9
Feb. 2	18 14.68	+20 18.9	5.183	4.689	+0.58	+2.5	19.2	55.0
Feb. 12	18 20.44	+20 43.6	5.201	4.784	+0.47	+3.3	19.3	59.9
Feb. 22	18 25.16	+21 16.5	5.206	4.878	+0.36	+4.0	19.4	65.4
Mar. 3	18 28.74	+21 56.1	5.198	4.972	+0.23	+4.5	19.5	71.4
Mar. 13	18 31.07	+22 40.7	5.182	5.066	+0.10	+4.8	19.6	77.8
Mar. 23	18 32.04	+23 28.5	5.159	5.158	-0.04	+4.9	19.7	84.4

Comet 7P/Pons-Winnecke

Epoch = 2015 June 27.0 TT
 T = 2015 Jan. 30.52394 TT
 Peri. = 172.50593
 Node = 93.41422 2000.0
 Incl. = 22.33456
 q = 1.2391813 AU
 e = 0.6375903
 a = 3.4192829 AU
 n = 0.15588399
 P = 6.32 years

$$m_1 = 13.4 + 5 \log(\Delta) + 10.0 \log(r(t+70))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	17 38.49	-17 14.3	2.114	1.270	+3.88 -11.5	16.4	23.1
Jan. 18	18 17.32	-19 09.2	2.087	1.249	+3.97 -8.4	16.5	23.6
Jan. 28	18 57.06	-20 33.4	2.069	1.240	+4.00 -5.1	16.7	24.3
Feb. 7	19 37.10	-21 24.4	2.062	1.243	+3.97 -1.7	16.9	25.2
Feb. 17	20 16.79	-21 41.8	2.064	1.258	+3.87 +1.4	17.1	26.3
Feb. 27	20 55.48	-21 28.0	2.074	1.284	+3.72 +4.0	17.3	27.8
Mar. 9	21 32.63	-20 47.6	2.089	1.321	+3.53 +6.1	17.5	29.6
Mar. 19	22 07.88	-19 46.4	2.109	1.367	+3.31 +7.6	17.7	31.8
Mar. 29	22 41.02	-18 30.9	2.132	1.421	+3.10 +8.4	17.9	34.2
Apr. 8	23 11.98	-17 07.2	2.155	1.481	+2.88 +8.6	18.1	36.9
Apr. 18	23 40.79	-15 41.0	2.177	1.546	+2.67 +8.4	18.2	39.8
Apr. 28	00 07.52	-14 16.9	2.195	1.615	+2.48 +7.8	18.4	43.1
May 8	00 32.28	-12 58.7	2.210	1.686	+2.29 +6.9	18.6	46.7
May 18	00 55.17	-11 49.2	2.219	1.760	+2.11 +5.8	18.7	50.6
May 28	01 16.25	-10 50.9	2.222	1.836	+1.93 +4.5	18.9	54.8
June 7	01 35.56	-10 05.5	2.217	1.912	+1.76 +3.1	19.0	59.4
June 17	01 53.12	-09 34.0	2.205	1.989	+1.57 +1.6	19.1	64.4
June 27	02 08.85	-09 17.7	2.185	2.066	+1.38 +0.1	19.2	69.7
July 7	02 22.70	-09 17.1	2.158	2.143	+1.18 -1.5	19.3	75.5
July 17	02 34.54	-09 32.5	2.124	2.219	+0.96 -3.1	19.4	81.7
July 27	02 44.18	-10 03.8	2.086	2.295	+0.73 -4.7	19.5	88.4
Aug. 6	02 51.44	-10 50.5	2.046	2.371	+0.46 -6.1	19.5	95.6
Aug. 16	02 56.09	-11 51.3	2.005	2.445	+0.18 -7.2	19.6	103.3
Aug. 26	02 57.90	-13 03.6	1.967	2.519	-0.11 -8.0	19.7	111.4
Sept. 5	02 56.76	-14 23.3	1.937	2.592	-0.41 -8.2	19.7	119.9
Sept. 15	02 52.63	-15 45.0	1.919	2.664	-0.69 -7.6	19.8	128.5
Sept. 25	02 45.73	-17 01.2	1.917	2.735	-0.92 -6.3	19.9	136.7
Oct. 5	02 36.56	-18 04.0	1.935	2.805	-1.06 -4.2	20.0	143.7
Oct. 15	02 25.93	-18 46.2	1.977	2.874	-1.11 -1.7	20.1	148.2
Oct. 25	02 14.84	-19 02.7	2.045	2.941	-1.05 +1.1	20.3	148.8
Nov. 4	02 04.32	-18 52.1	2.140	3.008	-0.91 +3.6	20.4	145.2
Nov. 14	01 55.23	-18 16.3	2.259	3.074	-0.71 +5.7	20.6	138.8
Nov. 24	01 48.15	-17 19.1	2.401	3.138	-0.48 +7.3	20.8	130.9
Dec. 4	01 43.33	-16 05.7	2.563	3.202	-0.25 +8.5	21.0	122.5
Dec. 14	01 40.80	-14 40.9	2.740	3.264	-0.04 +9.2	21.2	113.8
Dec. 24	01 40.42	-13 08.8	2.928	3.326	+0.15 +9.6	21.4	105.3
Jan. 3	01 41.96	-11 32.7	3.125	3.386	+0.32 +9.8	21.6	96.9
Jan. 13	01 45.18	-09 54.9	3.325	3.446	+0.46 +9.8	21.8	88.7
Jan. 23	01 49.82	-08 17.4	3.526	3.504	+0.58 +9.6	22.0	80.7
Feb. 2	01 55.65	-06 41.4	3.724	3.561	+0.68 +9.4	22.2	72.9
Feb. 12	02 02.48	-05 07.8	3.917	3.618	+0.76 +9.0	22.4	65.3
Feb. 22	02 10.12	-03 37.4	4.102	3.673	+0.83 +8.7	22.5	57.9
Mar. 3	02 18.41	-02 10.8	4.276	3.727	+0.88 +8.2	22.7	50.7
Mar. 13	02 27.24	-00 48.4	4.438	3.781	+0.92 +7.8	22.8	43.6
Mar. 23	02 36.47	+00 29.4	4.585	3.833	+0.95 +7.3	22.9	36.8

Comet C/2014 G3 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Feb. 2.58200 TT
 Peri. = 147.80540 e = 0.9159298
 Node = 4.54210 2000.0 a = 55.8890225 AU
 Incl. = 155.82329 n = 0.00235893
 q = 4.6986013 AU P = 417.82 years

$$m1 = 8.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	15 17.45	-05 06.3	5.122	4.703	-0.11	+0.5	18.9	59.7
Jan. 18	15 16.33	-05 01.1	4.948	4.700	-0.25	+1.3	18.8	69.8
Jan. 28	15 13.85	-04 48.5	4.762	4.699	-0.41	+2.1	18.7	80.4
Feb. 7	15 09.73	-04 27.8	4.570	4.699	-0.60	+2.9	18.6	91.4
Feb. 17	15 03.76	-03 58.9	4.381	4.700	-0.81	+3.7	18.5	102.8
Feb. 27	14 55.70	-03 21.6	4.202	4.702	-1.02	+4.5	18.4	114.7
Mar. 9	14 45.48	-02 36.4	4.041	4.706	-1.24	+5.2	18.4	127.0
Mar. 19	14 33.11	-01 44.4	3.908	4.711	-1.43	+5.6	18.3	139.7
Mar. 29	14 18.86	-00 48.0	3.810	4.717	-1.57	+5.8	18.2	152.3
Apr. 8	14 03.21	+00 09.8	3.754	4.724	-1.64	+5.6	18.2	163.9
Apr. 18	13 46.83	+01 05.4	3.745	4.732	-1.63	+4.9	18.2	168.3
Apr. 28	13 30.53	+01 54.8	3.783	4.742	-1.54	+4.0	18.2	160.1
May 8	13 15.09	+02 35.1	3.866	4.753	-1.40	+3.0	18.3	148.1
May 18	13 01.11	+03 04.7	3.989	4.765	-1.21	+1.8	18.4	135.6
May 28	12 49.01	+03 22.8	4.145	4.778	-1.01	+0.7	18.5	123.4
June 7	12 38.95	+03 30.1	4.324	4.792	-0.80	-0.2	18.6	111.6
June 17	12 30.93	+03 27.7	4.520	4.808	-0.61	-1.1	18.7	100.4
June 27	12 24.83	+03 16.8	4.724	4.824	-0.44	-1.8	18.8	89.5
July 7	12 20.45	+02 59.0	4.929	4.842	-0.29	-2.4	18.9	79.2
July 17	12 17.56	+02 35.3	5.129	4.861	-0.16	-2.8	19.0	69.1
July 27	12 15.94	+02 07.1	5.318	4.880	-0.06	-3.2	19.1	59.4
Aug. 6	12 15.39	+01 35.1	5.492	4.901	+0.03	-3.5	19.2	49.9
Aug. 16	12 15.68	+01 00.2	5.647	4.923	+0.10	-3.7	19.3	40.6
Aug. 26	12 16.66	+00 23.3	5.780	4.946	+0.15	-3.8	19.4	31.5
Sept. 5	12 18.14	-00 15.2	5.887	4.970	+0.18	-3.9	19.4	22.4
Sept. 15	12 19.97	-00 54.6	5.968	4.995	+0.20	-4.0	19.5	13.4
Sept. 25	12 22.01	-01 34.3	6.020	5.021	+0.21	-3.9	19.5	4.3
Oct. 5	12 24.10	-02 13.8	6.043	5.047	+0.20	-3.9	19.5	4.8
Oct. 15	12 26.10	-02 52.5	6.037	5.075	+0.18	-3.7	19.6	14.0
Oct. 25	12 27.87	-03 29.9	6.002	5.103	+0.14	-3.5	19.6	23.3
Nov. 4	12 29.25	-04 05.4	5.940	5.133	+0.08	-3.3	19.6	32.7
Nov. 14	12 30.08	-04 38.2	5.851	5.163	+0.01	-2.9	19.6	42.3
Nov. 24	12 30.19	-05 07.6	5.740	5.194	-0.08	-2.5	19.5	52.2
Dec. 4	12 29.40	-05 32.9	5.610	5.226	-0.19	-2.0	19.5	62.4
Dec. 14	12 27.53	-05 53.1	5.465	5.259	-0.31	-1.4	19.5	72.8
Dec. 24	12 24.38	-06 07.3	5.311	5.292	-0.46	-0.7	19.5	83.6
Jan. 3	12 19.81	-06 14.4	5.154	5.326	-0.61	+0.1	19.4	94.8
Jan. 13	12 13.68	-06 13.3	5.001	5.361	-0.78	+1.0	19.4	106.3
Jan. 23	12 05.92	-06 03.2	4.860	5.397	-0.93	+2.0	19.4	118.3
Feb. 2	11 56.58	-05 43.6	4.740	5.433	-1.08	+2.9	19.3	130.6
Feb. 12	11 45.83	-05 14.2	4.648	5.470	-1.19	+3.8	19.3	143.2
Feb. 22	11 33.98	-04 36.0	4.591	5.508	-1.25	+4.5	19.3	155.8
Mar. 3	11 21.48	-03 50.6	4.574	5.546	-1.26	+5.0	19.3	167.6
Mar. 13	11 08.85	-03 00.5	4.599	5.585	-1.22	+5.2	19.4	171.6
Mar. 23	10 56.66	-02 08.6	4.669	5.624	-1.13	+5.1	19.4	161.8

Comet C/2014 W9 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Feb. 15.71682 TT
 Peri. = 167.77606 e = 0.8576508
 Node = 21.28880 2000.0 a = 11.1518147 AU
 Incl. = 10.63023 n = 0.02646584
 q = 1.5874519 AU P = 37.24 years

$$m_1 = 12.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	13 28.31	-01 02.0	1.402	1.661	+2.51	-19.8	17.4	86.4
Jan. 18	13 53.45	-04 20.3	1.307	1.628	+2.48	-20.0	17.1	89.4
Jan. 28	14 18.28	-07 40.4	1.223	1.605	+2.42	-19.9	16.8	92.6
Feb. 7	14 42.46	-10 59.6	1.150	1.591	+2.31	-19.6	16.6	96.0
Feb. 17	15 05.53	-14 15.4	1.086	1.588	+2.14	-19.0	16.5	99.8
Feb. 27	15 26.88	-17 25.3	1.031	1.594	+1.90	-18.3	16.4	104.1
Mar. 9	15 45.90	-20 28.1	0.984	1.610	+1.60	-17.5	16.4	109.0
Mar. 19	16 01.85	-23 22.7	0.946	1.636	+1.21	-16.5	16.4	114.8
Mar. 29	16 14.00	-26 08.0	0.917	1.670	+0.78	-15.4	16.5	121.4
Apr. 8	16 21.78	-28 42.0	0.897	1.713	+0.31	-13.9	16.7	128.8
Apr. 18	16 24.87	-31 01.1	0.889	1.763	-0.15	-11.8	16.9	137.1
Apr. 28	16 23.40	-32 59.5	0.895	1.819	-0.51	-9.1	17.1	146.0
May 8	16 18.30	-34 31.0	0.918	1.881	-0.73	-6.1	17.4	154.8
May 18	16 11.00	-35 31.5	0.960	1.948	-0.76	-3.0	17.8	162.2
May 28	16 03.36	-36 01.5	1.022	2.018	-0.63	-0.5	18.2	165.0
June 7	15 57.07	-36 06.4	1.106	2.092	-0.39	+1.2	18.6	161.2
June 17	15 53.18	-35 54.5	1.211	2.169	-0.10	+2.1	19.1	153.8
June 27	15 52.22	-35 33.7	1.335	2.248	+0.20	+2.3	19.6	145.6
July 7	15 54.18	-35 10.5	1.477	2.329	+0.46	+2.2	20.1	137.4
July 17	15 58.76	-34 48.5	1.635	2.411	+0.69	+1.9	20.6	129.3
July 27	16 05.64	-34 29.7	1.808	2.495	+0.88	+1.5	21.0	121.6
Aug. 6	16 14.41	-34 14.4	1.992	2.579	+1.03	+1.2	21.5	114.2
Aug. 16	16 24.71	-34 02.3	2.187	2.664	+1.16	+1.0	21.9	106.9
Aug. 26	16 36.26	-33 52.5	2.389	2.750	+1.25	+0.8	22.4	99.9
Sept. 5	16 48.81	-33 44.2	2.598	2.835	+1.33	+0.8	22.8	93.0
Sept. 15	17 02.13	-33 36.2	2.810	2.921	+1.39	+0.8	.	86.2
Sept. 25	17 16.07	-33 27.7	3.024	3.007	+1.44	+1.0	.	79.5
Oct. 5	17 30.46	-33 18.0	3.238	3.093	+1.47	+1.2	.	72.8
Oct. 15	17 45.18	-33 06.3	3.449	3.179	+1.49	+1.4	.	66.1
Oct. 25	18 00.11	-32 52.3	3.655	3.264	+1.50	+1.7	.	59.4
Nov. 4	18 15.14	-32 35.7	3.855	3.349	+1.50	+2.0	.	52.8
Nov. 14	18 30.18	-32 16.1	4.046	3.434	+1.50	+2.2	.	46.1
Nov. 24	18 45.15	-31 53.6	4.226	3.519	+1.48	+2.5	.	39.4
Dec. 4	18 59.95	-31 28.3	4.393	3.603	+1.46	+2.8	.	32.7
Dec. 14	19 14.52	-31 00.4	4.546	3.687	+1.43	+3.0	.	26.0
Dec. 24	19 28.78	-30 30.2	4.683	3.770	+1.39	+3.2	.	19.5
Jan. 3	19 42.66	-29 58.1	4.802	3.853	+1.34	+3.4	.	13.5
Jan. 13	19 56.10	-29 24.6	4.903	3.935	+1.29	+3.4	.	9.1
Jan. 23	20 09.04	-28 50.3	4.985	4.017	+1.24	+3.4	.	9.4
Feb. 2	20 21.42	-28 15.9	5.047	4.099	+1.18	+3.4	.	14.2
Feb. 12	20 33.18	-27 42.0	5.089	4.180	+1.11	+3.3	.	20.6
Feb. 22	20 44.26	-27 09.5	5.111	4.260	+1.03	+3.0	.	27.6
Mar. 3	20 54.59	-26 39.0	5.115	4.340	+0.95	+2.8	.	35.0
Mar. 13	21 04.12	-26 11.5	5.100	4.419	+0.86	+2.4	.	42.6
Mar. 23	21 12.76	-25 47.6	5.068	4.498	+0.77	+1.9	.	50.4

Comet 309P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 Feb. 16.52893 TT
 Peri. = 50.98418
 Node = 11.36767 2000.0
 Incl. = 17.66662
 q = 1.7404374 AU
 e = 0.6080915
 a = 4.4409279 AU
 n = 0.10531579
 P = 9.36 years

$$m_1 = 15.0 + 5 \log(\Delta) + 10.0 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	00 10.08	+11 11.5	1.676	1.786	+1.80	+17.5	18.9	79.8
Jan. 18	00 28.07	+14 06.7	1.744	1.766	+2.00	+17.7	18.9	75.0
Jan. 28	00 48.05	+17 03.9	1.812	1.752	+2.18	+17.6	18.9	70.6
Feb. 7	01 09.88	+20 00.2	1.881	1.743	+2.36	+17.2	18.9	66.6
Feb. 17	01 33.51	+22 52.3	1.950	1.740	+2.54	+16.4	18.9	63.0
Feb. 27	01 58.88	+25 36.7	2.021	1.744	+2.70	+15.3	19.0	59.6
Mar. 9	02 25.90	+28 09.3	2.094	1.753	+2.85	+13.7	19.0	56.4
Mar. 19	02 54.44	+30 26.3	2.170	1.768	+2.99	+11.8	19.1	53.4
Mar. 29	03 24.34	+32 24.1	2.248	1.788	+3.10	+9.5	19.2	50.5
Apr. 8	03 55.30	+33 59.6	2.330	1.814	+3.17	+7.1	19.3	47.7
Apr. 18	04 26.99	+35 10.4	2.415	1.844	+3.20	+4.5	19.4	44.8
Apr. 28	04 59.01	+35 55.5	2.504	1.879	+3.19	+1.9	19.5	41.9
May 8	05 30.90	+36 14.7	2.595	1.918	+3.13	-0.6	19.7	39.0
May 18	06 02.24	+36 09.0	2.688	1.961	+3.04	-2.8	19.8	36.0
May 28	06 32.68	+35 40.6	2.782	2.007	+2.92	-4.9	20.0	32.8
June 7	07 01.92	+34 52.0	2.877	2.056	+2.79	-6.6	20.1	29.6
June 17	07 29.79	+33 46.2	2.970	2.108	+2.64	-8.0	20.3	26.2
June 27	07 56.21	+32 26.3	3.062	2.161	+2.49	-9.1	20.5	22.8
July 7	08 21.13	+30 55.3	3.150	2.217	+2.35	-9.9	20.6	19.4
July 17	08 44.62	+29 15.8	3.234	2.274	+2.21	-10.5	20.8	16.0
July 27	09 06.73	+27 30.4	3.311	2.332	+2.08	-10.9	20.9	12.9
Aug. 6	09 27.53	+25 41.1	3.382	2.392	+1.96	-11.1	21.1	10.6
Aug. 16	09 47.15	+23 49.7	3.443	2.452	+1.85	-11.2	21.3	10.0
Aug. 26	10 05.64	+21 57.8	3.495	2.514	+1.74	-11.1	21.4	11.6
Sept. 5	10 23.08	+20 06.8	3.536	2.575	+1.65	-10.9	21.5	14.9
Sept. 15	10 39.55	+18 17.8	3.566	2.637	+1.55	-10.6	21.7	19.3
Sept. 25	10 55.07	+16 31.9	3.582	2.700	+1.46	-10.2	21.8	24.3
Oct. 5	11 09.67	+14 50.0	3.585	2.762	+1.37	-9.7	21.9	29.8
Oct. 15	11 23.37	+13 13.0	3.575	2.825	+1.28	-9.1	22.0	35.6
Oct. 25	11 36.13	+11 41.9	3.550	2.887	+1.18	-8.5	22.1	41.9
Nov. 4	11 47.92	+10 17.3	3.513	2.949	+1.07	-7.7	22.1	48.4
Nov. 14	11 58.66	+09 00.1	3.462	3.012	+0.96	-6.9	22.2	55.4
Nov. 24	12 08.27	+07 51.1	3.399	3.074	+0.84	-6.0	22.3	62.7
Dec. 4	12 16.62	+06 51.1	3.325	3.135	+0.70	-5.0	22.3	70.4
Dec. 14	12 23.58	+06 00.9	3.243	3.197	+0.54	-4.0	22.3	78.5
Dec. 24	12 28.97	+05 21.1	3.155	3.258	+0.37	-2.9	22.4	87.1
Jan. 3	12 32.63	+04 52.3	3.065	3.318	+0.18	-1.7	22.4	96.2
Jan. 13	12 34.40	+04 34.8	2.976	3.379	-0.02	-0.6	22.4	105.8
Jan. 23	12 34.15	+04 28.5	2.893	3.438	-0.23	+0.4	22.4	115.9
Feb. 2	12 31.84	+04 32.9	2.821	3.498	-0.43	+1.4	22.5	126.5
Feb. 12	12 27.53	+04 46.6	2.765	3.556	-0.61	+2.1	22.5	137.6
Feb. 22	12 21.45	+05 07.4	2.731	3.615	-0.74	+2.5	22.5	149.0
Mar. 3	12 14.01	+05 32.2	2.723	3.673	-0.82	+2.5	22.6	160.5
Mar. 13	12 05.76	+05 57.6	2.744	3.730	-0.84	+2.2	22.7	171.3
Mar. 23	11 57.39	+06 20.0	2.797	3.787	-0.79	+1.6	22.8	172.1

Comet 299P/Catalina-PANSTARRS

Epoch = 2015 June 27.0 TT
 T = 2015 Feb. 23.33116 TT
 Peri. = 323.51959
 Node = 271.68135 2000.0
 Incl. = 10.47928
 q = 3.1395619 AU
 e = 0.2823588
 a = 4.3748351 AU
 n = 0.10771137
 P = 9.15 years

$$m1 = 7.8 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	15 44.44	-26 16.7	3.726	3.149	+1.48 -4.1	18.1	47.7
Jan. 18	15 59.27	-26 57.5	3.615	3.145	+1.42 -3.5	18.1	54.4
Jan. 28	16 13.50	-27 32.4	3.495	3.143	+1.34 -2.9	18.0	61.3
Feb. 7	16 26.93	-28 01.4	3.368	3.141	+1.24 -2.3	17.9	68.3
Feb. 17	16 39.37	-28 24.5	3.236	3.140	+1.12 -1.8	17.8	75.6
Feb. 27	16 50.59	-28 42.2	3.100	3.140	+0.98 -1.2	17.7	83.2
Mar. 9	17 00.35	-28 54.7	2.963	3.140	+0.81 -0.8	17.6	91.0
Mar. 19	17 08.43	-29 02.4	2.827	3.142	+0.61 -0.3	17.5	99.1
Mar. 29	17 14.56	-29 05.4	2.695	3.144	+0.40 +0.2	17.4	107.6
Apr. 8	17 18.54	-29 03.8	2.570	3.148	+0.17 +0.6	17.3	116.6
Apr. 18	17 20.20	-28 57.5	2.456	3.152	-0.07 +1.2	17.2	126.0
Apr. 28	17 19.48	-28 45.7	2.356	3.157	-0.30 +1.8	17.1	135.8
May 8	17 16.50	-28 27.7	2.274	3.162	-0.49 +2.5	17.1	146.1
May 18	17 11.55	-28 02.9	2.214	3.169	-0.64 +3.2	17.0	156.7
May 28	17 05.17	-27 31.2	2.180	3.176	-0.71 +3.8	17.0	167.5
June 7	16 58.11	-26 53.2	2.171	3.184	-0.70 +4.2	17.0	175.8
June 17	16 51.15	-26 11.0	2.191	3.193	-0.61 +4.4	17.1	168.7
June 27	16 45.09	-25 27.2	2.237	3.203	-0.45 +4.2	17.1	158.1
July 7	16 40.54	-24 44.8	2.309	3.213	-0.27 +3.8	17.2	147.5
July 17	16 37.89	-24 06.4	2.402	3.224	-0.05 +3.3	17.3	137.4
July 27	16 37.34	-23 33.7	2.515	3.236	+0.16 +2.6	17.5	127.6
Aug. 6	16 38.90	-23 07.4	2.642	3.249	+0.36 +2.0	17.6	118.4
Aug. 16	16 42.47	-22 47.3	2.780	3.262	+0.54 +1.5	17.7	109.6
Aug. 26	16 47.89	-22 32.7	2.927	3.276	+0.71 +1.0	17.9	101.1
Sept. 5	16 54.97	-22 22.3	3.078	3.290	+0.85 +0.7	18.0	93.1
Sept. 15	17 03.52	-22 14.9	3.232	3.305	+0.98 +0.6	18.1	85.3
Sept. 25	17 13.34	-22 09.1	3.385	3.321	+1.09 +0.6	18.3	77.8
Oct. 5	17 24.24	-22 03.5	3.535	3.337	+1.18 +0.7	18.4	70.5
Oct. 15	17 36.08	-21 56.9	3.681	3.354	+1.26 +0.9	18.5	63.4
Oct. 25	17 48.68	-21 48.2	3.819	3.371	+1.32 +1.2	18.6	56.3
Nov. 4	18 01.91	-21 36.5	3.949	3.389	+1.37 +1.6	18.7	49.4
Nov. 14	18 15.63	-21 21.0	4.069	3.408	+1.41 +2.0	18.8	42.6
Nov. 24	18 29.72	-21 01.0	4.178	3.426	+1.43 +2.5	18.9	35.8
Dec. 4	18 44.05	-20 36.2	4.273	3.446	+1.45 +3.0	19.0	29.1
Dec. 14	18 58.53	-20 06.3	4.355	3.465	+1.45 +3.5	19.1	22.4
Dec. 24	19 13.03	-19 31.2	4.421	3.485	+1.44 +4.0	19.2	15.8
Jan. 3	19 27.46	-18 50.9	4.472	3.506	+1.43 +4.5	19.2	9.4
Jan. 13	19 41.73	-18 05.6	4.507	3.526	+1.40 +5.0	19.3	3.9
Jan. 23	19 55.75	-17 15.6	4.525	3.547	+1.37 +5.4	19.3	5.8
Feb. 2	20 09.43	-16 21.3	4.527	3.569	+1.33 +5.8	19.4	11.9
Feb. 12	20 22.70	-15 23.1	4.512	3.591	+1.28 +6.1	19.4	18.6
Feb. 22	20 35.47	-14 21.8	4.482	3.613	+1.22 +6.4	19.4	25.3
Mar. 3	20 47.68	-13 17.8	4.435	3.635	+1.16 +6.6	19.4	32.2
Mar. 13	20 59.24	-12 12.0	4.374	3.657	+1.08 +6.7	19.5	39.1
Mar. 23	21 10.09	-11 05.1	4.299	3.680	+1.00 +6.7	19.5	46.2

Comet C/2014 AA52 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2015 Feb. 27.64996 TT
 Peri. = 292.26321
 Node = 330.49299 2000.0
 Incl. = 105.21121
 q = 2.0025865 AU
 e = 1.0005690

$$m_1 = 9.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m	' "		°
Jan. 8	02 37.96	-72 15.4	2.124	2.095	-5.70	+36.7	14.6	74.8
Jan. 18	01 40.92	-66 08.9	2.190	2.062	-2.68	+38.4	14.6	69.5
Jan. 28	01 14.07	-59 45.0	2.277	2.037	-1.30	+35.9	14.7	63.4
Feb. 7	01 01.05	-53 46.1	2.374	2.018	-0.61	+32.2	14.7	57.2
Feb. 17	00 54.91	-48 23.7	2.473	2.007	-0.24	+28.5	14.8	51.2
Feb. 27	00 52.51	-43 38.6	2.566	2.003	-0.03	+25.1	14.9	45.6
Mar. 9	00 52.19	-39 28.1	2.646	2.006	+0.09	+22.0	14.9	41.0
Mar. 19	00 53.04	-35 48.0	2.710	2.016	+0.14	+19.4	15.0	37.7
Mar. 29	00 54.48	-32 34.5	2.752	2.034	+0.16	+17.0	15.1	36.2
Apr. 8	00 56.07	-29 44.1	2.772	2.059	+0.14	+15.0	15.1	36.7
Apr. 18	00 57.47	-27 13.8	2.768	2.090	+0.09	+13.2	15.2	39.3
Apr. 28	00 58.38	-25 01.5	2.739	2.127	+0.01	+11.6	15.3	43.7
May 8	00 58.47	-23 05.2	2.686	2.171	-0.11	+10.2	15.3	49.5
May 18	00 57.40	-21 23.6	2.612	2.219	-0.27	+8.8	15.3	56.4
May 28	00 54.74	-19 55.6	2.518	2.272	-0.47	+7.5	15.4	64.4
June 7	00 50.01	-18 40.2	2.409	2.330	-0.74	+6.4	15.4	73.3
June 17	00 42.64	-17 36.3	2.289	2.392	-1.07	+5.4	15.4	83.2
June 27	00 31.93	-16 42.6	2.164	2.457	-1.47	+4.6	15.4	94.2
July 7	00 17.21	-15 56.8	2.044	2.525	-1.93	+4.1	15.4	106.3
July 17	23 57.92	-15 15.6	1.939	2.596	-2.39	+4.1	15.4	119.6
July 27	23 33.98	-14 34.1	1.860	2.670	-2.78	+4.7	15.4	134.2
Aug. 6	23 06.18	-13 47.2	1.820	2.745	-2.98	+5.6	15.5	149.9
Aug. 16	22 36.36	-12 51.2	1.828	2.822	-2.93	+6.5	15.6	166.2
Aug. 26	22 07.08	-11 46.5	1.891	2.901	-2.63	+6.9	15.8	177.3
Sept. 5	21 40.78	-10 37.0	2.007	2.981	-2.18	+6.9	16.1	161.8
Sept. 15	21 18.96	-09 27.8	2.169	3.063	-1.69	+6.6	16.3	147.1
Sept. 25	21 02.09	-08 22.1	2.369	3.145	-1.22	+6.1	16.6	133.5
Oct. 5	20 49.88	-07 21.3	2.596	3.228	-0.82	+5.7	17.0	121.1
Oct. 15	20 41.71	-06 24.7	2.841	3.312	-0.48	+5.4	17.3	109.6
Oct. 25	20 36.88	-05 31.2	3.097	3.396	-0.22	+5.2	17.6	98.9
Nov. 4	20 34.72	-04 39.2	3.356	3.481	-0.01	+5.2	17.8	88.9
Nov. 14	20 34.67	-03 47.5	3.614	3.566	+0.16	+5.3	18.1	79.4
Nov. 24	20 36.27	-02 54.6	3.864	3.651	+0.29	+5.5	18.4	70.3
Dec. 4	20 39.13	-01 59.9	4.103	3.737	+0.38	+5.7	18.6	61.6
Dec. 14	20 42.95	-01 02.4	4.328	3.823	+0.45	+6.1	18.8	53.3
Dec. 24	20 47.48	-00 01.7	4.536	3.909	+0.50	+6.4	19.0	45.4
Jan. 3	20 52.48	+01 02.6	4.724	3.995	+0.53	+6.8	19.2	38.0
Jan. 13	20 57.78	+02 10.7	4.890	4.081	+0.54	+7.2	19.4	31.2
Jan. 23	21 03.22	+03 22.9	5.032	4.167	+0.54	+7.6	19.5	25.6
Feb. 2	21 08.63	+04 39.1	5.151	4.253	+0.53	+8.0	19.6	21.9
Feb. 12	21 13.91	+05 59.3	5.246	4.338	+0.50	+8.4	19.8	21.0
Feb. 22	21 18.90	+07 23.5	5.316	4.424	+0.46	+8.8	19.9	23.2
Mar. 3	21 23.50	+08 51.5	5.362	4.510	+0.41	+9.2	20.0	27.9
Mar. 13	21 27.57	+10 23.1	5.386	4.595	+0.34	+9.5	20.1	33.9
Mar. 23	21 30.99	+11 57.9	5.389	4.680	+0.26	+9.8	20.2	40.8

Comet 92P/Sanguin

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 1.20626 TT
 Peri. = 163.79634
 Node = 181.45790 2000.0
 Incl. = 19.44410
 q = 1.8254705 AU
 e = 0.6594254
 a = 5.3599725 AU
 n = 0.07942555
 P = 12.41 years

$$m1 = 9.6 + 5 \log(\Delta) + 17.5 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	20 37.31	-09 21.0	2.761	1.903	+2.62 +4.8	17.6	23.7
Jan. 18	21 03.52	-08 33.2	2.771	1.877	+2.65 +6.1	17.4	20.0
Jan. 28	21 30.01	-07 32.0	2.780	1.855	+2.66 +7.3	17.3	16.4
Feb. 7	21 56.63	-06 19.1	2.788	1.840	+2.66 +8.3	17.1	12.8
Feb. 17	22 23.28	-04 56.6	2.798	1.830	+2.66 +9.0	17.0	9.3
Feb. 27	22 49.84	-03 26.7	2.808	1.826	+2.64 +9.5	16.9	5.9
Mar. 9	23 16.22	-01 51.9	2.818	1.827	+2.62 +9.7	16.7	2.9
Mar. 19	23 42.38	-00 14.7	2.829	1.835	+2.59 +9.7	16.6	2.5
Mar. 29	00 08.24	+01 22.2	2.839	1.848	+2.55 +9.4	16.6	5.4
Apr. 8	00 33.76	+02 56.4	2.850	1.867	+2.51 +8.9	16.5	8.7
Apr. 18	00 58.91	+04 25.8	2.859	1.891	+2.47 +8.2	16.5	12.3
Apr. 28	01 23.62	+05 48.3	2.867	1.920	+2.42 +7.4	16.5	15.9
May 8	01 47.86	+07 02.1	2.873	1.953	+2.37 +6.4	16.5	19.7
May 18	02 11.56	+08 05.9	2.876	1.991	+2.31 +5.3	16.5	23.6
May 28	02 34.65	+08 58.5	2.876	2.033	+2.24 +4.1	16.6	27.6
June 7	02 57.06	+09 39.1	2.871	2.078	+2.16 +2.8	16.6	31.8
June 17	03 18.70	+10 07.1	2.861	2.126	+2.08 +1.5	16.7	36.1
June 27	03 39.47	+10 22.3	2.846	2.178	+1.98 +0.2	16.8	40.6
July 7	03 59.26	+10 24.7	2.825	2.231	+1.87 -1.0	16.9	45.4
July 17	04 17.97	+10 14.4	2.797	2.287	+1.75 -2.3	17.1	50.4
July 27	04 35.46	+09 51.8	2.763	2.345	+1.61 -3.4	17.2	55.6
Aug. 6	04 51.61	+09 17.5	2.722	2.404	+1.47 -4.5	17.3	61.2
Aug. 16	05 06.27	+08 32.2	2.675	2.464	+1.30 -5.5	17.5	67.1
Aug. 26	05 19.28	+07 36.8	2.622	2.526	+1.12 -6.4	17.6	73.4
Sept. 5	05 30.49	+06 32.3	2.565	2.589	+0.92 -7.2	17.7	80.0
Sept. 15	05 39.70	+05 20.1	2.505	2.652	+0.70 -7.8	17.9	87.1
Sept. 25	05 46.75	+04 01.8	2.444	2.716	+0.47 -8.2	18.0	94.6
Oct. 5	05 51.45	+02 39.6	2.385	2.780	+0.22 -8.4	18.2	102.6
Oct. 15	05 53.69	+01 16.1	2.330	2.845	-0.03 -8.1	18.3	111.0
Oct. 25	05 53.38	-00 05.3	2.284	2.910	-0.28 -7.5	18.4	119.8
Nov. 4	05 50.61	-01 20.5	2.252	2.975	-0.50 -6.5	18.6	128.8
Nov. 14	05 45.62	-02 25.1	2.236	3.040	-0.68 -5.0	18.8	137.6
Nov. 24	05 38.85	-03 14.7	2.241	3.105	-0.79 -3.1	18.9	145.4
Dec. 4	05 30.99	-03 45.7	2.271	3.170	-0.82 -1.1	19.2	151.1
Dec. 14	05 22.80	-03 56.5	2.328	3.235	-0.77 +0.9	19.4	152.9
Dec. 24	05 15.09	-03 47.0	2.412	3.300	-0.66 +2.7	19.6	150.0
Jan. 3	05 08.54	-03 19.7	2.521	3.365	-0.49 +4.2	19.9	143.7
Jan. 13	05 03.61	-02 37.9	2.655	3.429	-0.30 +5.2	20.2	135.7
Jan. 23	05 00.59	-01 45.6	2.810	3.493	-0.11 +5.9	20.5	127.1
Feb. 2	04 59.53	-00 46.9	2.981	3.557	+0.08 +6.2	20.7	118.4
Feb. 12	05 00.38	+00 14.9	3.166	3.620	+0.26 +6.2	21.0	109.7
Feb. 22	05 02.97	+01 17.1	3.360	3.683	+0.41 +6.0	21.3	101.3
Mar. 3	05 07.12	+02 17.4	3.560	3.746	+0.55 +5.7	21.6	93.1
Mar. 13	05 12.61	+03 14.5	3.761	3.808	+0.66 +5.3	21.8	85.1
Mar. 23	05 19.25	+04 07.0	3.962	3.869	+0.76 +4.7	22.1	77.4

Comet 6P/d' Arrest

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 2.38212 TT
 Peri. = 178.09521
 Node = 138.92965 2000.0
 Incl. = 19.48246
 q = 1.3611511 AU
 e = 0.6113330
 a = 3.5021010 AU
 n = 0.15038727
 P = 6.55 years

$$m1 = 9.8 + 5 \log(\Delta) + 20.0 \log(r(t-60))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	18 50.87	-15 11.2	2.454	1.491	+3.38	-1.2	17.1	9.1
Jan. 18	19 24.71	-15 23.5	2.410	1.449	+3.47	+1.0	16.7	9.4
Jan. 28	19 59.44	-15 13.5	2.373	1.414	+3.53	+3.3	16.3	10.1
Feb. 7	20 34.70	-14 40.8	2.342	1.387	+3.55	+5.4	16.0	11.1
Feb. 17	21 10.17	-13 46.5	2.320	1.370	+3.53	+7.4	15.7	12.2
Feb. 27	21 45.48	-12 32.8	2.305	1.362	+3.48	+9.0	15.4	13.5
Mar. 9	22 20.32	-11 03.0	2.298	1.363	+3.41	+10.2	15.1	15.0
Mar. 19	22 54.45	-09 21.2	2.298	1.375	+3.32	+10.9	14.8	16.7
Mar. 29	23 27.66	-07 31.7	2.305	1.395	+3.22	+11.3	14.6	18.5
Apr. 8	23 59.82	-05 39.2	2.317	1.424	+3.10	+11.1	14.5	20.6
Apr. 18	00 30.84	-03 47.8	2.334	1.461	+2.98	+10.7	14.4	22.8
Apr. 28	01 00.66	-02 01.2	2.354	1.505	+2.86	+9.9	14.3	25.2
May 8	01 29.25	-00 22.5	2.375	1.555	+2.74	+8.8	14.4	27.8
May 18	01 56.60	+01 05.8	2.396	1.610	+2.61	+7.6	14.5	30.6
May 28	02 22.69	+02 22.0	2.415	1.670	+2.48	+6.3	14.6	33.7
June 7	02 47.49	+03 25.0	2.431	1.732	+2.35	+4.9	14.8	37.0
June 17	03 11.00	+04 14.2	2.442	1.797	+2.22	+3.5	15.0	40.6
June 27	03 33.15	+04 49.2	2.448	1.864	+2.08	+2.1	15.3	44.5
July 7	03 53.91	+05 10.4	2.447	1.933	+1.93	+0.8	15.6	48.7
July 17	04 13.21	+05 18.0	2.438	2.003	+1.78	-0.5	15.9	53.3
July 27	04 30.96	+05 12.7	2.421	2.073	+1.61	-1.7	16.2	58.2
Aug. 6	04 47.07	+04 55.2	2.396	2.144	+1.43	-2.9	16.5	63.5
Aug. 16	05 01.42	+04 26.6	2.363	2.215	+1.24	-3.9	16.8	69.2
Aug. 26	05 13.84	+03 47.8	2.322	2.286	+1.03	-4.8	17.0	75.3
Sept. 5	05 24.19	+03 00.3	2.276	2.357	+0.81	-5.5	17.3	82.0
Sept. 15	05 32.27	+02 05.5	2.224	2.427	+0.56	-6.0	17.6	89.1
Sept. 25	05 37.86	+01 05.5	2.170	2.497	+0.29	-6.3	17.8	96.8
Oct. 5	05 40.79	+00 02.9	2.117	2.566	+0.01	-6.2	18.1	105.1
Oct. 15	05 40.90	-00 59.4	2.069	2.635	-0.28	-5.8	18.3	113.8
Oct. 25	05 38.15	-01 57.1	2.029	2.703	-0.55	-4.9	18.5	123.0
Nov. 4	05 32.69	-02 45.8	2.002	2.770	-0.78	-3.5	18.8	132.4
Nov. 14	05 24.89	-03 20.8	1.995	2.836	-0.95	-1.7	19.0	141.4
Nov. 24	05 15.43	-03 37.7	2.010	2.902	-1.02	+0.4	19.3	149.1
Dec. 4	05 05.19	-03 34.1	2.051	2.966	-1.00	+2.4	19.5	153.5
Dec. 14	04 55.16	-03 09.8	2.121	3.030	-0.89	+4.3	19.8	152.8
Dec. 24	04 46.23	-02 26.8	2.218	3.093	-0.72	+5.8	20.2	147.5
Jan. 3	04 39.06	-01 28.8	2.341	3.155	-0.50	+6.8	20.5	139.6
Jan. 13	04 34.04	-00 20.4	2.487	3.216	-0.27	+7.5	20.8	130.7
Jan. 23	04 31.32	+00 54.4	2.652	3.276	-0.05	+7.7	21.2	121.6
Feb. 2	04 30.80	+02 11.9	2.832	3.336	+0.15	+7.7	21.5	112.5
Feb. 12	04 32.32	+03 29.3	3.022	3.394	+0.33	+7.5	21.8	103.7
Feb. 22	04 35.67	+04 44.6	3.219	3.451	+0.49	+7.2	22.1	95.2
Mar. 3	04 40.58	+05 56.3	3.419	3.508	+0.62	+6.7	22.4	86.9
Mar. 13	04 46.82	+07 03.4	3.618	3.564	+0.74	+6.2	22.7	78.9
Mar. 23	04 54.18	+08 05.1	3.814	3.618	+0.83	+5.6	23.0	71.2

Comet C/2014 W10 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 6.00080 TT
 Peri. = 20.54356
 Node = 40.86332 2000.0
 Incl. = 72.97253
 q = 7.4194148 AU

e = 0.6051872
 a = 18.7922347 AU
 n = 0.01209864
 P = 81.46 years

$$m1 = 3.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	m1	Mot./PA ' °	Elong. °
Jan. 8	01 59.59	+30 34.0	7.024	7.425	+0.03 -3.9	20.3	1.9/293	110.4
Jan. 18	01 58.24	+30 41.4	7.180	7.423	+0.03 -3.8	20.3	1.2/343	100.5
Jan. 28	01 57.98	+30 52.7	7.342	7.422	+0.03 -3.7	20.4	1.9/32	90.8
Feb. 7	01 58.73	+31 08.5	7.503	7.421	+0.03 -3.6	20.4	3.0/46	81.4
Feb. 17	02 00.42	+31 29.0	7.660	7.420	+0.03 -3.6	20.5	4.1/52	72.3
Feb. 27	02 02.95	+31 54.4	7.809	7.419	+0.03 -3.5	20.5	5.1/54	63.5
Mar. 9	02 06.19	+32 24.6	7.944	7.419	+0.02 -3.4	20.6	6.0/54	55.0
Mar. 19	02 10.06	+32 59.3	8.064	7.420	+0.02 -3.4	20.6	6.7/54	46.9
Mar. 29	02 14.44	+33 38.4	8.166	7.420	+0.02 -3.4	20.6	7.4/54	39.3
Apr. 8	02 19.24	+34 21.5	8.248	7.421	+0.02 -3.3	20.6	7.9/53	32.3
Apr. 18	02 24.35	+35 08.3	8.308	7.422	+0.01 -3.3	20.7	8.2/52	26.4
Apr. 28	02 29.68	+35 58.7	8.346	7.424	+0.01 -3.3	20.7	8.5/50	22.2
May 8	02 35.14	+36 52.4	8.362	7.426	0.00 -3.3	20.7	8.7/49	20.6
May 18	02 40.64	+37 49.0	8.355	7.428	0.00 -3.3	20.7	8.7/47	22.1
May 28	02 46.07	+38 48.5	8.326	7.431	0.00 -3.3	20.7	8.7/44	26.2
June 7	02 51.33	+39 50.7	8.277	7.433	-0.01 -3.3	20.7	8.6/41	31.8
June 17	02 56.33	+40 55.5	8.207	7.437	-0.01 -3.3	20.6	8.5/37	38.3
June 27	03 00.95	+42 02.6	8.120	7.440	-0.02 -3.4	20.6	8.3/33	45.3
July 7	03 05.06	+43 11.9	8.017	7.444	-0.02 -3.4	20.6	8.1/28	52.6
July 17	03 08.54	+44 23.1	7.900	7.448	-0.03 -3.5	20.6	7.8/21	60.2
July 27	03 11.23	+45 36.0	7.773	7.453	-0.03 -3.5	20.5	7.6/14	68.0
Aug. 6	03 12.98	+46 50.0	7.639	7.457	-0.03 -3.6	20.5	7.5/5	75.9
Aug. 16	03 13.63	+48 04.5	7.501	7.462	-0.04 -3.6	20.5	7.4/355	83.9
Aug. 26	03 13.02	+49 18.4	7.363	7.468	-0.04 -3.7	20.4	7.5/345	92.1
Sept. 5	03 10.99	+50 30.7	7.229	7.474	-0.04 -3.7	20.4	7.7/334	100.2
Sept. 15	03 07.43	+51 39.5	7.103	7.480	-0.03 -3.8	20.4	7.9/324	108.3
Sept. 25	03 02.29	+52 43.1	6.989	7.486	-0.03 -3.9	20.3	8.2/314	116.2
Oct. 5	02 55.59	+53 39.3	6.892	7.493	-0.02 -3.9	20.3	8.5/304	123.7
Oct. 15	02 47.50	+54 25.9	6.814	7.500	-0.01 -3.9	20.3	8.7/295	130.5
Oct. 25	02 38.31	+55 01.1	6.760	7.507	0.00 -4.0	20.3	8.7/286	136.0
Nov. 4	02 28.47	+55 23.8	6.730	7.514	+0.02 -4.0	20.3	8.5/278	139.7
Nov. 14	02 18.47	+55 33.6	6.728	7.522	+0.03 -4.0	20.3	8.1/270	141.0
Nov. 24	02 08.90	+55 31.5	6.752	7.531	+0.04 -4.0	20.3	7.5/262	139.5
Dec. 4	02 00.25	+55 19.5	6.802	7.539	+0.06 -3.9	20.3	6.6/254	135.7
Dec. 14	01 52.90	+54 60.0	6.877	7.548	+0.07 -3.9	20.4	5.5/245	130.1
Dec. 24	01 47.13	+54 36.2	6.972	7.557	+0.07 -3.8	20.4	4.4/235	123.3
Jan. 3	01 43.03	+54 11.1	7.086	7.566	+0.08 -3.7	20.4	3.2/222	115.9
Jan. 13	01 40.61	+53 47.3	7.213	7.576	+0.08 -3.7	20.5	2.1/200	108.1
Jan. 23	01 39.81	+53 27.1	7.349	7.586	+0.08 -3.6	20.5	1.6/158	100.3
Feb. 2	01 40.48	+53 12.2	7.490	7.596	+0.08 -3.5	20.6	2.0/115	92.4
Feb. 12	01 42.49	+53 03.7	7.633	7.607	+0.07 -3.5	20.6	2.9/92	84.8
Feb. 22	01 45.68	+53 02.4	7.773	7.618	+0.07 -3.4	20.7	3.8/81	77.4
Mar. 3	01 49.88	+53 08.4	7.906	7.629	+0.06 -3.4	20.7	4.8/73	70.3
Mar. 13	01 54.97	+53 21.8	8.030	7.641	+0.05 -3.3	20.8	5.6/68	63.6
Mar. 23	02 00.79	+53 42.6	8.142	7.652	+0.05 -3.3	20.8	6.3/63	57.5

Comet C/2014 N3 (NEOWISE)

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 13.21552 TT
 Peri. = 353.56816
 Node = 19.92689 2000.0
 Incl. = 61.63778
 q = 3.8822224 AU
 e = 0.9993344

$$m1 = 6.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m	' "		°
Jan. 8	00 13.27	-14 55.1	4.139	3.922	+0.36	+15.1	15.2	70.5
Jan. 18	00 16.87	-12 24.6	4.270	3.911	+0.47	+14.8	15.3	62.3
Jan. 28	00 21.55	-09 56.4	4.394	3.901	+0.56	+14.6	15.3	54.2
Feb. 7	00 27.12	-07 30.8	4.509	3.894	+0.63	+14.3	15.4	46.3
Feb. 17	00 33.40	-05 07.8	4.611	3.888	+0.69	+14.1	15.4	38.6
Feb. 27	00 40.27	-02 47.3	4.700	3.884	+0.73	+13.8	15.5	30.9
Mar. 9	00 47.60	-00 29.0	4.773	3.882	+0.77	+13.6	15.5	23.4
Mar. 19	00 55.26	+01 47.1	4.830	3.883	+0.79	+13.4	15.5	16.0
Mar. 29	01 03.18	+04 01.4	4.868	3.885	+0.81	+13.3	15.5	8.7
Apr. 8	01 11.24	+06 14.1	4.889	3.889	+0.81	+13.1	15.5	1.7
Apr. 18	01 19.37	+08 25.4	4.892	3.895	+0.81	+13.0	15.6	6.0
Apr. 28	01 27.49	+10 35.7	4.876	3.903	+0.80	+13.0	15.6	13.1
May 8	01 35.49	+12 45.3	4.843	3.913	+0.78	+12.9	15.6	20.3
May 18	01 43.31	+14 54.4	4.794	3.924	+0.75	+12.9	15.5	27.5
May 28	01 50.83	+17 03.6	4.728	3.938	+0.71	+12.9	15.5	34.7
June 7	01 57.94	+19 13.1	4.648	3.953	+0.66	+13.0	15.5	42.0
June 17	02 04.53	+21 23.3	4.555	3.971	+0.59	+13.1	15.5	49.5
June 27	02 10.45	+23 34.7	4.452	3.990	+0.51	+13.3	15.5	57.0
July 7	02 15.53	+25 47.5	4.339	4.011	+0.41	+13.4	15.4	64.7
July 17	02 19.58	+28 02.0	4.221	4.033	+0.28	+13.6	15.4	72.5
July 27	02 22.37	+30 18.1	4.100	4.058	+0.13	+13.7	15.3	80.5
Aug. 6	02 23.66	+32 35.3	3.978	4.084	-0.05	+13.7	15.3	88.7
Aug. 16	02 23.18	+34 52.6	3.861	4.111	-0.25	+13.6	15.3	97.1
Aug. 26	02 20.63	+37 08.2	3.752	4.140	-0.48	+13.1	15.2	105.6
Sept. 5	02 15.81	+39 19.3	3.656	4.171	-0.73	+12.3	15.2	114.1
Sept. 15	02 08.56	+41 22.1	3.576	4.203	-0.97	+11.0	15.2	122.5
Sept. 25	01 58.90	+43 11.7	3.517	4.236	-1.17	+9.2	15.2	130.4
Oct. 5	01 47.17	+44 43.5	3.483	4.271	-1.32	+7.0	15.2	137.2
Oct. 15	01 33.94	+45 53.5	3.476	4.307	-1.38	+4.6	15.2	142.2
Oct. 25	01 20.11	+46 39.6	3.498	4.345	-1.34	+2.3	15.3	144.4
Nov. 4	01 06.70	+47 02.7	3.548	4.383	-1.21	+0.4	15.4	143.3
Nov. 14	00 54.65	+47 06.3	3.627	4.423	-1.00	-1.0	15.5	139.2
Nov. 24	00 44.68	+46 56.0	3.730	4.464	-0.75	-1.8	15.6	133.2
Dec. 4	00 37.19	+46 38.0	3.856	4.506	-0.49	-2.0	15.7	126.0
Dec. 14	00 32.29	+46 18.0	3.999	4.550	-0.24	-1.7	15.8	118.3
Dec. 24	00 29.90	+46 00.8	4.157	4.594	-0.01	-1.1	15.9	110.5
Jan. 3	00 29.80	+45 49.9	4.323	4.639	+0.19	-0.2	16.0	102.7
Jan. 13	00 31.74	+45 47.4	4.495	4.685	+0.37	+0.7	16.2	95.0
Jan. 23	00 35.45	+45 54.6	4.669	4.732	+0.52	+1.7	16.3	87.6
Feb. 2	00 40.66	+46 12.0	4.841	4.780	+0.65	+2.7	16.4	80.6
Feb. 12	00 47.17	+46 39.3	5.009	4.828	+0.76	+3.7	16.5	73.8
Feb. 22	00 54.79	+47 16.3	5.170	4.878	+0.85	+4.6	16.6	67.5
Mar. 3	01 03.34	+48 02.2	5.321	4.928	+0.94	+5.4	16.8	61.6
Mar. 13	01 12.70	+48 56.4	5.462	4.978	+1.01	+6.2	16.9	56.2
Mar. 23	01 22.76	+49 58.1	5.591	5.030	+1.07	+6.8	17.0	51.4

Comet C/2014 W6 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 19.10602 TT
 Peri. = 209.88009
 Node = 338.12982 2000.0
 Incl. = 53.56749
 q = 3.0871821 AU
 e = 1.0006848

$$m1 = 10.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	11 54.03	-11 27.4	2.783	3.162	-0.22	-17.9	17.8	103.6
Jan. 18	11 51.87	-14 26.5	2.630	3.143	-0.48	-18.1	17.7	112.6
Jan. 28	11 47.11	-17 27.1	2.495	3.126	-0.75	-17.8	17.5	121.6
Feb. 7	11 39.59	-20 24.8	2.381	3.112	-1.03	-16.8	17.4	130.4
Feb. 17	11 29.33	-23 13.2	2.293	3.101	-1.26	-15.1	17.3	138.3
Feb. 27	11 16.71	-25 44.5	2.234	3.093	-1.42	-12.7	17.3	144.4
Mar. 9	11 02.53	-27 51.7	2.207	3.089	-1.46	-9.9	17.2	147.2
Mar. 19	10 47.88	-29 30.4	2.211	3.087	-1.39	-7.0	17.2	146.0
Mar. 29	10 34.02	-30 40.1	2.245	3.089	-1.20	-4.5	17.3	141.4
Apr. 8	10 22.07	-31 25.3	2.305	3.093	-0.93	-2.7	17.3	134.8
Apr. 18	10 12.76	-31 52.6	2.387	3.101	-0.63	-1.7	17.4	127.4
Apr. 28	10 06.46	-32 09.8	2.485	3.112	-0.33	-1.4	17.5	119.9
May 8	10 03.19	-32 24.0	2.597	3.126	-0.04	-1.6	17.6	112.5
May 18	10 02.75	-32 40.2	2.716	3.142	+0.21	-2.2	17.7	105.6
May 28	10 04.86	-33 02.6	2.841	3.162	+0.44	-3.1	17.9	99.0
June 7	10 09.22	-33 33.4	2.968	3.184	+0.63	-4.1	18.0	92.9
June 17	10 15.51	-34 14.0	3.095	3.209	+0.80	-5.1	18.1	87.2
June 27	10 23.48	-35 05.1	3.220	3.237	+0.94	-6.2	18.2	81.9
July 7	10 32.91	-36 06.8	3.343	3.268	+1.07	-7.2	18.4	77.0
July 17	10 43.62	-37 18.6	3.463	3.300	+1.19	-8.2	18.5	72.4
July 27	10 55.49	-38 40.3	3.578	3.336	+1.29	-9.1	18.6	68.1
Aug. 6	11 08.40	-40 10.9	3.688	3.373	+1.39	-9.9	18.7	64.2
Aug. 16	11 22.30	-41 49.6	3.794	3.413	+1.48	-10.6	18.8	60.6
Aug. 26	11 37.14	-43 35.6	3.895	3.455	+1.58	-11.2	18.9	57.3
Sept. 5	11 52.90	-45 27.5	3.991	3.498	+1.67	-11.7	19.0	54.2
Sept. 15	12 09.60	-47 24.3	4.081	3.544	+1.77	-12.0	19.1	51.5
Sept. 25	12 27.26	-49 24.7	4.167	3.591	+1.87	-12.3	19.3	49.1
Oct. 5	12 45.94	-51 27.3	4.247	3.640	+1.98	-12.4	19.4	47.0
Oct. 15	13 05.70	-53 30.9	4.322	3.690	+2.09	-12.3	19.4	45.3
Oct. 25	13 26.62	-55 33.8	4.392	3.742	+2.22	-12.1	19.5	44.1
Nov. 4	13 48.77	-57 34.6	4.456	3.796	+2.35	-11.7	19.6	43.3
Nov. 14	14 12.25	-59 31.7	4.514	3.850	+2.49	-11.2	19.7	43.0
Nov. 24	14 37.12	-61 23.7	4.566	3.906	+2.63	-10.5	19.8	43.3
Dec. 4	15 03.41	-63 09.0	4.612	3.963	+2.77	-9.7	19.9	44.1
Dec. 14	15 31.13	-64 46.3	4.650	4.021	+2.90	-8.8	20.0	45.4
Dec. 24	16 00.16	-66 14.5	4.683	4.080	+3.02	-7.8	20.1	47.3
Jan. 3	16 30.31	-67 32.7	4.708	4.140	+3.10	-6.8	20.1	49.7
Jan. 13	17 01.29	-68 40.8	4.725	4.200	+3.14	-5.8	20.2	52.5
Jan. 23	17 32.66	-69 38.8	4.736	4.262	+3.13	-4.9	20.3	55.8
Feb. 2	18 03.96	-70 27.6	4.740	4.324	+3.07	-4.1	20.3	59.5
Feb. 12	18 34.64	-71 08.5	4.738	4.387	+2.95	-3.5	20.4	63.5
Feb. 22	19 04.18	-71 43.5	4.730	4.451	+2.79	-3.1	20.5	67.8
Mar. 3	19 32.11	-72 14.6	4.716	4.515	+2.59	-3.0	20.5	72.3
Mar. 13	19 58.05	-72 44.2	4.699	4.579	+2.36	-3.0	20.6	77.0
Mar. 23	20 21.63	-73 14.6	4.678	4.645	+2.10	-3.3	20.6	81.9

Comet 44P/Reinmuth

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 24.12995 TT
 Peri. = 58.27803
 Node = 286.46337 2000.0
 Incl. = 5.89519
 q = 2.1186163 AU
 e = 0.4264593
 a = 3.6939249 AU
 n = 0.13882637
 P = 7.10 years

$$m_1 = 12.4 + 5 \log(\Delta) + 7.5 \log(r(t-60))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	20 37.76	-16 19.9	3.089	2.195	+2.19 +9.9	17.6	20.5
Jan. 18	20 59.62	-14 40.5	3.106	2.177	+2.18 +11.0	17.6	15.9
Jan. 28	21 21.47	-12 50.9	3.117	2.161	+2.18 +11.9	17.6	11.5
Feb. 7	21 43.23	-10 52.1	3.122	2.147	+2.16 +12.7	17.5	7.3
Feb. 17	22 04.87	-08 45.3	3.121	2.136	+2.15 +13.4	17.5	3.7
Feb. 27	22 26.35	-06 31.7	3.115	2.127	+2.13 +13.9	17.5	3.6
Mar. 9	22 47.65	-04 13.0	3.104	2.122	+2.11 +14.2	17.4	6.9
Mar. 19	23 08.76	-01 50.6	3.088	2.119	+2.09 +14.5	17.4	10.9
Mar. 29	23 29.70	+00 34.0	3.068	2.119	+2.07 +14.5	17.3	14.9
Apr. 8	23 50.44	+02 59.0	3.043	2.122	+2.06 +14.4	17.3	19.0
Apr. 18	00 11.02	+05 23.1	3.014	2.127	+2.04 +14.2	17.3	23.1
Apr. 28	00 31.41	+07 44.7	2.981	2.136	+2.02 +13.8	17.2	27.2
May 8	00 51.62	+10 02.3	2.943	2.147	+2.00 +13.2	17.2	31.4
May 18	01 11.63	+12 14.7	2.901	2.160	+1.98 +12.6	17.2	35.6
May 28	01 31.39	+14 20.7	2.854	2.176	+1.95 +11.9	17.1	39.9
June 7	01 50.87	+16 19.2	2.802	2.195	+1.91 +11.0	17.1	44.4
June 17	02 09.99	+18 09.6	2.745	2.216	+1.87 +10.1	17.1	49.0
June 27	02 28.64	+19 51.0	2.684	2.239	+1.81 +9.2	17.0	53.8
July 7	02 46.71	+21 23.1	2.617	2.264	+1.73 +8.3	17.0	58.8
July 17	03 04.03	+22 45.7	2.545	2.291	+1.64 +7.3	16.9	64.1
July 27	03 20.42	+23 58.6	2.469	2.320	+1.52 +6.4	16.9	69.6
Aug. 6	03 35.65	+25 02.2	2.389	2.350	+1.38 +5.5	16.9	75.5
Aug. 16	03 49.47	+25 56.8	2.305	2.383	+1.21 +4.6	16.8	81.8
Aug. 26	04 01.56	+26 42.7	2.219	2.416	+1.01 +3.8	16.8	88.6
Sept. 5	04 11.63	+27 20.6	2.133	2.451	+0.77 +3.0	16.7	95.9
Sept. 15	04 19.31	+27 50.7	2.047	2.487	+0.50 +2.2	16.7	103.8
Sept. 25	04 24.27	+28 13.0	1.966	2.524	+0.20 +1.4	16.6	112.3
Oct. 5	04 26.26	+28 27.0	1.892	2.561	-0.11 +0.5	16.6	121.6
Oct. 15	04 25.11	+28 31.9	1.829	2.600	-0.42 -0.6	16.5	131.6
Oct. 25	04 20.94	+28 26.1	1.782	2.639	-0.67 -1.8	16.5	142.3
Nov. 4	04 14.19	+28 08.4	1.755	2.679	-0.85 -3.0	16.5	153.5
Nov. 14	04 05.66	+27 38.6	1.753	2.720	-0.92 -4.0	16.6	164.8
Nov. 24	03 56.46	+26 58.4	1.778	2.761	-0.87 -4.7	16.7	173.4
Dec. 4	03 47.76	+26 11.6	1.831	2.802	-0.72 -4.8	16.8	167.7
Dec. 14	03 40.57	+25 23.4	1.913	2.844	-0.50 -4.5	16.9	156.7
Dec. 24	03 35.60	+24 38.8	2.021	2.886	-0.25 -3.7	17.1	145.5
Jan. 3	03 33.14	+24 01.6	2.151	2.928	+0.01 -2.8	17.3	134.8
Jan. 13	03 33.23	+23 33.7	2.299	2.970	+0.25 -1.8	17.5	124.6
Jan. 23	03 35.73	+23 15.6	2.462	3.012	+0.46 -0.9	17.7	114.9
Feb. 2	03 40.36	+23 06.6	2.635	3.054	+0.65 -0.1	17.9	105.8
Feb. 12	03 46.85	+23 05.3	2.815	3.096	+0.81 +0.5	18.1	97.1
Feb. 22	03 54.93	+23 10.1	2.998	3.138	+0.94 +0.9	18.2	88.9
Mar. 3	04 04.33	+23 19.1	3.181	3.180	+1.05 +1.2	18.4	81.0
Mar. 13	04 14.83	+23 30.8	3.362	3.222	+1.14 +1.3	18.6	73.4
Mar. 23	04 26.24	+23 43.6	3.538	3.264	+1.21 +1.3	18.7	66.1

Comet P/2008 WZ96 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2015 Mar. 25.14322 TT
 Peri. = 337.82299
 Node = 59.05032 2000.0
 Incl. = 6.95822
 q = 1.6469749 AU
 e = 0.5095765
 a = 3.3582708 AU
 n = 0.16015132
 P = 6.15 years

$$m1 = 14.4 + 5 \log(\Delta) + 10.0 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	m1	Mot. /PA ' °	Elong. °
Jan. 8	22 25.96	-14 56.1	2.338	1.797	-1.16 -7.3	19.1	37.2/ 65	45.8
Jan. 18	22 49.00	-12 17.1	2.369	1.762	-1.17 -8.0	19.0	38.7/ 65	41.8
Jan. 28	23 12.59	-09 27.4	2.396	1.731	-1.19 -8.7	18.9	40.0/ 64	38.1
Feb. 7	23 36.66	-06 28.8	2.422	1.705	-1.20 -9.3	18.9	41.1/ 63	34.6
Feb. 17	00 01.20	-03 23.6	2.447	1.683	-1.22 -9.8	18.8	42.0/ 63	31.3
Feb. 27	00 26.20	-00 14.3	2.471	1.666	-1.24 -10.1	18.7	42.7/ 63	28.2
Mar. 9	00 51.67	+02 56.1	2.497	1.654	-1.26 -10.3	18.7	43.1/ 64	25.3
Mar. 19	01 17.63	+06 04.6	2.524	1.648	-1.28 -10.2	18.7	43.4/ 65	22.4
Mar. 29	01 44.10	+09 07.9	2.552	1.647	-1.31 -10.0	18.7	43.4/ 66	19.7
Apr. 8	02 11.07	+12 02.7	2.583	1.652	-1.33 -9.6	18.6	43.3/ 67	17.1
Apr. 18	02 38.53	+14 45.9	2.616	1.663	-1.34 -8.9	18.7	42.9/ 69	14.4
Apr. 28	03 06.43	+17 14.7	2.651	1.678	-1.36 -8.2	18.7	42.3/ 71	11.8
May 8	03 34.68	+19 26.6	2.688	1.699	-1.36 -7.3	18.7	41.6/ 73	9.1
May 18	04 03.18	+21 19.8	2.726	1.724	-1.36 -6.3	18.8	40.8/ 75	6.4
May 28	04 31.76	+22 52.9	2.764	1.754	-1.35 -5.2	18.9	39.9/ 78	3.7
June 7	05 00.25	+24 05.5	2.802	1.788	-1.33 -4.1	18.9	38.8/ 81	1.5
June 17	05 28.46	+24 57.4	2.839	1.826	-1.30 -3.1	19.0	37.8/ 84	3.0
June 27	05 56.18	+25 29.6	2.874	1.866	-1.26 -2.1	19.1	36.6/ 86	6.1
July 7	06 23.22	+25 43.1	2.905	1.910	-1.21 -1.2	19.2	35.4/ 89	9.5
July 17	06 49.44	+25 39.7	2.932	1.956	-1.15 -0.3	19.4	34.2/ 92	13.1
July 27	07 14.69	+25 21.5	2.954	2.004	-1.09 +0.4	19.5	33.0/ 94	16.9
Aug. 6	07 38.86	+24 50.7	2.969	2.054	-1.03 +1.0	19.6	31.7/ 96	20.9
Aug. 16	08 01.90	+24 09.4	2.976	2.105	-0.97 +1.5	19.7	30.4/ 98	25.2
Aug. 26	08 23.75	+23 20.1	2.975	2.158	-0.92 +1.9	19.8	29.0/100	29.8
Sept. 5	08 44.37	+22 25.1	2.966	2.211	-0.86 +2.3	19.9	27.6/101	34.6
Sept. 15	09 03.76	+21 26.6	2.946	2.265	-0.81 +2.6	20.0	26.1/102	39.7
Sept. 25	09 21.88	+20 26.7	2.916	2.320	-0.77 +2.8	20.1	24.4/103	45.1
Oct. 5	09 38.70	+19 27.6	2.877	2.375	-0.73 +3.0	20.1	22.7/104	50.8
Oct. 15	09 54.19	+18 31.2	2.827	2.431	-0.70 +3.2	20.2	20.7/104	56.9
Oct. 25	10 08.27	+17 39.7	2.767	2.486	-0.68 +3.4	20.3	18.6/103	63.4
Nov. 4	10 20.85	+16 55.0	2.699	2.542	-0.66 +3.5	20.3	16.2/102	70.3
Nov. 14	10 31.81	+16 19.1	2.624	2.597	-0.65 +3.7	20.4	13.5/100	77.6
Nov. 24	10 40.98	+15 54.0	2.542	2.653	-0.64 +4.0	20.4	10.5/ 97	85.4
Dec. 4	10 48.19	+15 41.4	2.458	2.708	-0.65 +4.2	20.4	7.3/ 89	93.8
Dec. 14	10 53.22	+15 42.9	2.373	2.762	-0.67 +4.5	20.4	4.1/ 67	102.7
Dec. 24	10 55.86	+15 59.2	2.293	2.817	-0.69 +4.8	20.4	3.1/ 2	112.3
Jan. 3	10 55.95	+16 30.4	2.220	2.871	-0.73 +5.1	20.5	5.8/321	122.5
Jan. 13	10 53.42	+17 15.0	2.161	2.924	-0.77 +5.4	20.5	9.0/307	133.2
Jan. 23	10 48.38	+18 09.6	2.121	2.977	-0.82 +5.7	20.5	11.8/301	144.4
Feb. 2	10 41.21	+19 09.2	2.104	3.029	-0.86 +5.8	20.6	13.6/296	155.7
Feb. 12	10 32.53	+20 07.4	2.114	3.081	-0.90 +5.8	20.7	14.0/292	165.9
Feb. 22	10 23.21	+20 58.0	2.154	3.132	-0.92 +5.6	20.8	13.2/287	169.5
Mar. 3	10 14.19	+21 36.2	2.225	3.183	-0.91 +5.3	20.9	11.2/282	162.1
Mar. 13	10 06.32	+21 59.3	2.323	3.233	-0.89 +4.9	21.1	8.5/275	151.6
Mar. 23	10 00.23	+22 07.0	2.447	3.282	-0.86 +4.5	21.3	5.6/264	140.9

Comet 86P/Wild

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 3.41923 TT
 Peri. = 179.16573
 Node = 72.40982 2000.0
 Incl. = 15.47181
 q = 2.2635414 AU
 e = 0.3719875
 a = 3.6042935 AU
 n = 0.14403693
 P = 6.84 years

$$m_1 = 9.8 + 5 \log(\Delta) + 20.0 \log(r(t-90))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	16 03.42	-14 38.4	2.917	2.339	+1.93	-7.8	20.3	45.7
Jan. 18	16 22.73	-15 56.8	2.813	2.323	+1.92	-7.1	20.1	51.0
Jan. 28	16 41.94	-17 08.0	2.704	2.309	+1.90	-6.4	19.9	56.4
Feb. 7	17 00.90	-18 12.3	2.591	2.296	+1.86	-5.8	19.7	61.8
Feb. 17	17 19.48	-19 10.6	2.475	2.286	+1.80	-5.3	19.5	67.4
Feb. 27	17 37.47	-20 03.8	2.357	2.277	+1.72	-5.0	19.3	73.2
Mar. 9	17 54.70	-20 53.4	2.238	2.270	+1.62	-4.8	19.1	79.1
Mar. 19	18 10.93	-21 41.3	2.119	2.266	+1.50	-4.9	19.0	85.3
Mar. 29	18 25.91	-22 29.9	2.001	2.264	+1.34	-5.2	18.8	91.8
Apr. 8	18 39.36	-23 21.6	1.886	2.264	+1.16	-5.8	18.6	98.6
Apr. 18	18 50.97	-24 19.4	1.776	2.266	+0.94	-6.7	18.4	105.8
Apr. 28	19 00.37	-25 25.9	1.672	2.270	+0.69	-7.7	18.2	113.6
May 8	19 07.23	-26 43.3	1.577	2.276	+0.40	-8.9	18.0	121.8
May 18	19 11.20	-28 12.8	1.494	2.285	+0.08	-10.0	17.9	130.6
May 28	19 11.99	-29 53.2	1.425	2.295	-0.24	-10.8	17.7	139.9
June 7	19 09.59	-31 40.9	1.375	2.308	-0.53	-10.8	17.6	149.5
June 17	19 04.24	-33 29.3	1.345	2.322	-0.75	-10.0	17.5	158.9
June 27	18 56.71	-35 09.7	1.339	2.338	-0.85	-8.4	17.5	165.9
July 7	18 48.19	-36 34.0	1.357	2.356	-0.81	-6.3	17.6	165.8
July 17	18 40.07	-37 37.2	1.400	2.376	-0.64	-4.1	17.6	158.7
July 27	18 33.71	-38 18.0	1.465	2.397	-0.36	-2.1	17.7	149.7
Aug. 6	18 30.06	-38 38.9	1.550	2.420	-0.05	-0.5	17.9	140.4
Aug. 16	18 29.57	-38 43.8	1.653	2.444	+0.28	+0.7	18.1	131.4
Aug. 26	18 32.33	-38 36.4	1.770	2.469	+0.58	+1.7	18.3	122.9
Sept. 5	18 38.10	-38 19.8	1.899	2.496	+0.84	+2.4	18.5	114.9
Sept. 15	18 46.51	-37 55.7	2.036	2.524	+1.06	+3.1	18.7	107.2
Sept. 25	18 57.16	-37 25.2	2.181	2.553	+1.25	+3.7	18.9	99.9
Oct. 5	19 09.62	-36 48.7	2.330	2.583	+1.39	+4.3	19.1	93.0
Oct. 15	19 23.53	-36 06.2	2.482	2.614	+1.50	+4.9	19.3	86.3
Oct. 25	19 38.56	-35 17.6	2.635	2.646	+1.58	+5.5	19.5	79.8
Nov. 4	19 54.41	-34 23.1	2.787	2.678	+1.64	+6.1	19.7	73.4
Nov. 14	20 10.83	-33 22.5	2.938	2.711	+1.68	+6.6	19.9	67.2
Nov. 24	20 27.64	-32 16.2	3.084	2.745	+1.70	+7.2	20.1	61.0
Dec. 4	20 44.63	-31 04.5	3.225	2.779	+1.71	+7.7	20.3	55.0
Dec. 14	21 01.69	-29 47.8	3.360	2.814	+1.70	+8.1	20.5	49.0
Dec. 24	21 18.70	-28 26.8	3.487	2.849	+1.69	+8.5	20.7	43.1
Jan. 3	21 35.57	-27 02.1	3.605	2.884	+1.67	+8.8	20.8	37.3
Jan. 13	21 52.23	-25 34.4	3.712	2.920	+1.64	+9.0	21.0	31.6
Jan. 23	22 08.63	-24 04.7	3.808	2.956	+1.61	+9.1	21.2	26.0
Feb. 2	22 24.72	-22 33.7	3.893	2.992	+1.58	+9.1	21.3	20.8
Feb. 12	22 40.48	-21 02.2	3.964	3.028	+1.54	+9.1	21.5	16.2
Feb. 22	22 55.88	-19 31.2	4.021	3.064	+1.50	+9.0	21.6	12.8
Mar. 3	23 10.89	-18 01.5	4.065	3.101	+1.46	+8.8	21.7	11.8
Mar. 13	23 25.51	-16 33.9	4.094	3.137	+1.42	+8.5	21.8	13.8
Mar. 23	23 39.70	-15 09.3	4.108	3.173	+1.37	+8.1	22.0	17.8

Comet 88P/Howell

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 6.23719 TT
 Peri. = 235.91558
 Node = 56.69655 2000.0
 Incl. = 4.38250
 q = 1.3585751 AU
 e = 0.5630548
 a = 3.1092574 AU
 n = 0.17977076
 P = 5.48 years

$$m1 = 6.4 + 5 \log(\Delta) + 22.5 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	16 44.46	-22 05.7	2.367	1.655	+3.24 -6.3	14.9	34.6
Jan. 18	17 16.89	-23 09.1	2.267	1.599	+3.42 -4.0	14.5	37.2
Jan. 28	17 51.04	-23 49.3	2.173	1.547	+3.56 -1.3	14.0	39.6
Feb. 7	18 26.66	-24 02.1	2.087	1.500	+3.67 +1.8	13.6	41.6
Feb. 17	19 03.38	-23 44.3	2.009	1.458	+3.73 +5.0	13.2	43.3
Feb. 27	19 40.69	-22 54.2	1.942	1.422	+3.73 +8.2	12.8	44.8
Mar. 9	20 18.01	-21 32.1	1.885	1.394	+3.68 +11.2	12.4	46.1
Mar. 19	20 54.81	-19 40.3	1.838	1.373	+3.58 +13.7	12.0	47.3
Mar. 29	21 30.61	-17 23.4	1.801	1.362	+3.44 +15.6	11.6	48.4
Apr. 8	22 05.04	-14 47.3	1.773	1.359	+3.29 +16.9	11.3	49.6
Apr. 18	22 37.90	-11 58.6	1.753	1.365	+3.11 +17.5	11.1	50.9
Apr. 28	23 09.05	-09 03.9	1.738	1.380	+2.94 +17.5	10.8	52.5
May 8	23 38.44	-06 09.2	1.726	1.403	+2.76 +17.0	10.7	54.4
May 18	00 06.08	-03 19.6	1.717	1.434	+2.59 +16.1	10.6	56.6
May 28	00 31.98	-00 39.1	1.707	1.472	+2.42 +14.9	10.6	59.2
June 7	00 56.14	+01 49.5	1.695	1.516	+2.24 +13.5	10.6	62.2
June 17	01 18.56	+04 04.1	1.680	1.565	+2.06 +11.9	10.7	65.7
June 27	01 39.14	+06 03.5	1.660	1.618	+1.87 +10.4	10.8	69.7
July 7	01 57.79	+07 47.2	1.635	1.675	+1.66 +8.8	11.0	74.3
July 17	02 14.36	+09 15.0	1.604	1.735	+1.43 +7.2	11.2	79.5
July 27	02 28.61	+10 27.0	1.569	1.797	+1.17 +5.7	11.4	85.3
Aug. 6	02 40.30	+11 23.5	1.528	1.861	+0.88 +4.2	11.7	91.8
Aug. 16	02 49.10	+12 05.0	1.485	1.925	+0.56 +2.7	12.0	99.1
Aug. 26	02 54.66	+12 31.8	1.442	1.991	+0.21 +1.2	12.2	107.3
Sept. 5	02 56.72	+12 44.2	1.400	2.057	-0.16 -0.2	12.5	116.4
Sept. 15	02 55.07	+12 42.6	1.366	2.124	-0.53 -1.5	12.8	126.5
Sept. 25	02 49.79	+12 27.8	1.343	2.190	-0.84 -2.6	13.1	137.5
Oct. 5	02 41.37	+12 01.6	1.338	2.256	-1.07 -3.4	13.4	149.4
Oct. 15	02 30.71	+11 27.3	1.354	2.322	-1.16 -3.8	13.8	161.8
Oct. 25	02 19.13	+10 49.7	1.396	2.388	-1.11 -3.5	14.2	174.1
Nov. 4	02 08.06	+10 14.8	1.467	2.453	-0.94 -2.7	14.6	171.9
Nov. 14	01 58.67	+09 47.8	1.565	2.517	-0.69 -1.5	15.0	159.9
Nov. 24	01 51.74	+09 32.4	1.689	2.580	-0.42 -0.2	15.5	148.1
Dec. 4	01 47.58	+09 30.3	1.835	2.643	-0.14 +1.1	16.0	137.1
Dec. 14	01 46.18	+09 41.2	1.999	2.705	+0.11 +2.3	16.4	126.7
Dec. 24	01 47.31	+10 04.0	2.178	2.766	+0.33 +3.3	16.9	116.9
Jan. 3	01 50.64	+10 36.9	2.368	2.826	+0.52 +4.1	17.3	107.7
Jan. 13	01 55.86	+11 17.9	2.564	2.885	+0.68 +4.7	17.7	98.9
Jan. 23	02 02.66	+12 05.1	2.764	2.943	+0.81 +5.2	18.1	90.6
Feb. 2	02 10.75	+12 56.9	2.965	3.001	+0.92 +5.5	18.5	82.6
Feb. 12	02 19.93	+13 51.7	3.163	3.057	+1.01 +5.7	18.8	74.8
Feb. 22	02 29.99	+14 48.2	3.357	3.112	+1.08 +5.7	19.2	67.3
Mar. 3	02 40.76	+15 45.3	3.543	3.167	+1.14 +5.7	19.5	60.1
Mar. 13	02 52.12	+16 41.8	3.720	3.220	+1.18 +5.5	19.8	52.9
Mar. 23	03 03.95	+17 37.1	3.886	3.273	+1.22 +5.3	20.1	46.0

Comet C/2012 F3 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 6.68320 TT
 Peri. = 104.02471
 Node = 164.61123 2000.0
 Incl. = 11.35441
 q = 3.4568301 AU
 e = 1.0019159

$$m1 = 5.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	17 09.74	-13 42.4	4.361	3.553	+1.51	-0.6	14.5	30.8
Jan. 18	17 24.87	-13 48.5	4.268	3.533	+1.49	+0.1	14.4	37.0
Jan. 28	17 39.74	-13 47.3	4.165	3.515	+1.45	+0.8	14.4	43.4
Feb. 7	17 54.22	-13 39.0	4.054	3.499	+1.40	+1.5	14.3	49.8
Feb. 17	18 08.19	-13 24.0	3.935	3.486	+1.33	+2.1	14.2	56.4
Feb. 27	18 21.49	-13 02.9	3.811	3.475	+1.25	+2.6	14.1	63.0
Mar. 9	18 33.99	-12 36.5	3.682	3.467	+1.16	+3.1	14.0	69.8
Mar. 19	18 45.55	-12 05.8	3.551	3.461	+1.05	+3.4	13.9	76.8
Mar. 29	18 56.01	-11 32.1	3.418	3.458	+0.92	+3.5	13.9	83.9
Apr. 8	19 05.23	-10 56.7	3.287	3.457	+0.78	+3.6	13.8	91.3
Apr. 18	19 13.07	-10 21.1	3.158	3.458	+0.63	+3.4	13.7	98.9
Apr. 28	19 19.37	-09 47.1	3.035	3.462	+0.47	+3.1	13.6	106.8
May 8	19 24.06	-09 16.4	2.920	3.469	+0.30	+2.5	13.5	115.0
May 18	19 27.06	-08 51.0	2.816	3.478	+0.13	+1.8	13.5	123.5
May 28	19 28.34	-08 32.5	2.726	3.489	-0.03	+1.0	13.4	132.3
June 7	19 28.03	-08 22.7	2.653	3.503	-0.17	0.0	13.4	141.3
June 17	19 26.29	-08 22.5	2.600	3.519	-0.28	-1.0	13.3	150.4
June 27	19 23.46	-08 32.4	2.570	3.538	-0.35	-2.0	13.3	159.0
July 7	19 19.97	-08 52.1	2.565	3.558	-0.37	-2.8	13.4	165.6
July 17	19 16.31	-09 20.4	2.585	3.581	-0.33	-3.5	13.4	166.4
July 27	19 13.00	-09 55.5	2.632	3.606	-0.25	-4.0	13.5	160.6
Aug. 6	19 10.52	-10 35.1	2.705	3.633	-0.13	-4.2	13.6	152.2
Aug. 16	19 09.21	-11 16.7	2.801	3.662	+0.01	-4.1	13.7	143.2
Aug. 26	19 09.35	-11 58.1	2.919	3.694	+0.17	-3.9	13.8	134.1
Sept. 5	19 11.03	-12 37.4	3.055	3.727	+0.32	-3.6	13.9	125.1
Sept. 15	19 14.28	-13 13.0	3.206	3.761	+0.48	-3.1	14.1	116.3
Sept. 25	19 19.03	-13 43.8	3.370	3.798	+0.61	-2.5	14.2	107.8
Oct. 5	19 25.17	-14 08.8	3.542	3.836	+0.74	-1.9	14.4	99.5
Oct. 15	19 32.56	-14 27.5	3.721	3.876	+0.85	-1.2	14.5	91.4
Oct. 25	19 41.03	-14 39.6	3.902	3.918	+0.94	-0.5	14.7	83.6
Nov. 4	19 50.42	-14 44.8	4.085	3.961	+1.01	+0.2	14.8	75.8
Nov. 14	20 00.57	-14 43.3	4.265	4.005	+1.08	+0.8	15.0	68.3
Nov. 24	20 11.33	-14 35.0	4.440	4.051	+1.12	+1.5	15.1	60.8
Dec. 4	20 22.55	-14 20.3	4.608	4.098	+1.16	+2.1	15.2	53.4
Dec. 14	20 34.12	-13 59.6	4.768	4.146	+1.18	+2.6	15.4	46.1
Dec. 24	20 45.91	-13 33.2	4.916	4.195	+1.19	+3.1	15.5	38.8
Jan. 3	20 57.82	-13 01.8	5.052	4.245	+1.19	+3.6	15.6	31.6
Jan. 13	21 09.74	-12 25.9	5.173	4.297	+1.19	+4.0	15.7	24.4
Jan. 23	21 21.59	-11 46.1	5.279	4.349	+1.17	+4.3	15.8	17.3
Feb. 2	21 33.29	-11 03.2	5.369	4.403	+1.15	+4.5	15.9	10.2
Feb. 12	21 44.77	-10 17.9	5.441	4.457	+1.12	+4.7	16.0	4.0
Feb. 22	21 55.96	-09 31.0	5.495	4.512	+1.08	+4.8	16.0	5.6
Mar. 3	22 06.80	-08 43.3	5.531	4.568	+1.04	+4.8	16.1	12.3
Mar. 13	22 17.23	-07 55.4	5.549	4.624	+1.00	+4.7	16.2	19.5
Mar. 23	22 27.18	-07 08.2	5.550	4.682	+0.94	+4.6	16.2	26.8

Comet C/2014 XB8 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 6.90113 TT
 Peri. = 351.80975
 Node = 37.51746 2000.0
 Incl. = 149.76042
 q = 3.0047492 AU
 e = 0.9879435

$$m1 = 13.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m			°
Jan. 8	03 27.25	-00 45.9	2.518	3.129	-1.91	+8.2	20.4	120.1
Jan. 18	03 08.15	+00 36.0	2.674	3.103	-1.47	+8.5	20.5	106.7
Jan. 28	02 53.41	+02 00.6	2.853	3.080	-1.09	+8.4	20.6	93.9
Feb. 7	02 42.53	+03 25.1	3.041	3.060	-0.77	+8.3	20.7	81.8
Feb. 17	02 34.87	+04 48.1	3.228	3.043	-0.51	+8.1	20.8	70.4
Feb. 27	02 29.82	+06 09.0	3.407	3.029	-0.30	+7.9	20.9	59.6
Mar. 9	02 26.79	+07 27.8	3.570	3.018	-0.15	+7.7	21.0	49.3
Mar. 19	02 25.34	+08 44.7	3.713	3.011	-0.03	+7.5	21.0	39.4
Mar. 29	02 25.06	+09 59.7	3.832	3.006	+0.06	+7.3	21.1	29.7
Apr. 8	02 25.61	+11 13.2	3.923	3.005	+0.11	+7.2	21.1	20.3
Apr. 18	02 26.72	+12 25.3	3.986	3.007	+0.14	+7.1	21.2	11.1
Apr. 28	02 28.13	+13 36.5	4.018	3.012	+0.15	+7.0	21.2	2.1
May 8	02 29.60	+14 46.9	4.019	3.020	+0.13	+7.0	21.2	7.1
May 18	02 30.91	+15 56.8	3.991	3.032	+0.09	+7.0	21.2	16.1
May 28	02 31.80	+17 06.5	3.933	3.047	+0.02	+7.0	21.2	25.2
June 7	02 32.02	+18 16.3	3.847	3.064	-0.07	+7.0	21.2	34.4
June 17	02 31.27	+19 26.3	3.737	3.085	-0.21	+7.0	21.2	43.8
June 27	02 29.20	+20 36.7	3.604	3.109	-0.38	+7.0	21.1	53.5
July 7	02 25.39	+21 47.1	3.454	3.135	-0.60	+7.0	21.1	63.5
July 17	02 19.35	+22 56.8	3.291	3.164	-0.89	+6.7	21.0	74.0
July 27	02 10.49	+24 04.1	3.121	3.196	-1.23	+6.2	20.9	85.0
Aug. 6	01 58.23	+25 05.8	2.953	3.231	-1.62	+5.1	20.8	96.6
Aug. 16	01 41.99	+25 56.4	2.796	3.267	-2.05	+3.2	20.8	108.9
Aug. 26	01 21.46	+26 28.0	2.660	3.306	-2.45	+0.3	20.7	121.8
Sept. 5	00 56.92	+26 31.0	2.558	3.348	-2.75	-3.4	20.7	135.0
Sept. 15	00 29.43	+25 56.8	2.501	3.391	-2.85	-7.4	20.7	147.3
Sept. 25	00 00.94	+24 42.7	2.496	3.436	-2.72	-10.7	20.7	155.8
Oct. 5	23 33.72	+22 55.3	2.549	3.483	-2.41	-12.7	20.9	155.3
Oct. 15	23 09.64	+20 48.1	2.657	3.532	-1.99	-13.1	21.0	146.6
Oct. 25	22 49.76	+18 37.0	2.812	3.583	-1.55	-12.2	21.2	134.8
Nov. 4	22 34.26	+16 34.6	3.005	3.635	-1.14	-10.6	21.4	122.5
Nov. 14	22 22.83	+14 48.3	3.224	3.688	-0.79	-8.7	21.6	110.4
Nov. 24	22 14.89	+13 21.3	3.460	3.743	-0.51	-6.7	21.8	98.9
Dec. 4	22 09.80	+12 13.9	3.703	3.799	-0.28	-4.9	22.0	88.0
Dec. 14	22 07.00	+11 24.7	3.946	3.856	-0.10	-3.3	22.2	77.6
Dec. 24	22 05.99	+10 52.1	4.180	3.915	+0.03	-1.8	22.4	67.7
Jan. 3	22 06.34	+10 34.1	4.402	3.974	+0.14	-0.5	22.6	58.3
Jan. 13	22 07.71	+10 28.7	4.605	4.034	+0.21	+0.6	22.8	49.3
Jan. 23	22 09.82	+10 34.5	4.788	4.095	+0.26	+1.5	22.9	40.9
Feb. 2	22 12.40	+10 49.9	4.946	4.157	+0.29	+2.4	.	33.3
Feb. 12	22 15.27	+11 13.7	5.078	4.220	+0.29	+3.1	.	26.8
Feb. 22	22 18.21	+11 44.7	5.182	4.284	+0.29	+3.7	.	22.3
Mar. 3	22 21.06	+12 21.9	5.258	4.348	+0.26	+4.3	.	21.1
Mar. 13	22 23.67	+13 04.4	5.306	4.412	+0.22	+4.7	.	23.5
Mar. 23	22 25.86	+13 51.4	5.327	4.477	+0.16	+5.1	.	28.7

Comet 42P/Neujmin

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 8.25370 TT
 Peri. = 147.13314
 Node = 150.27995 2000.0
 Incl. = 3.98448
 q = 2.0279535 AU
 e = 0.5841766
 a = 4.8769586 AU
 n = 0.09151251
 P = 10.77 years

$$m_1 = 8.8 + 5 \log(\Delta) + 25.0 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	17 54.85	-20 47.7	3.099	2.189	+2.47	+0.1	20.7	18.5
Jan. 18	18 19.57	-20 46.3	3.029	2.157	+2.50	+1.6	20.5	22.9
Jan. 28	18 44.56	-20 30.2	2.956	2.128	+2.51	+3.1	20.2	27.2
Feb. 7	19 09.63	-19 59.3	2.880	2.102	+2.50	+4.5	20.0	31.4
Feb. 17	19 34.64	-19 14.0	2.803	2.080	+2.48	+5.9	19.7	35.6
Feb. 27	19 59.41	-18 15.2	2.724	2.062	+2.44	+7.1	19.5	39.7
Mar. 9	20 23.79	-17 04.1	2.645	2.047	+2.39	+8.2	19.3	43.8
Mar. 19	20 47.65	-15 42.4	2.566	2.037	+2.32	+9.0	19.0	47.8
Mar. 29	21 10.87	-14 12.1	2.487	2.030	+2.25	+9.7	18.8	51.9
Apr. 8	21 33.34	-12 35.3	2.408	2.028	+2.16	+10.1	18.7	56.1
Apr. 18	21 54.97	-10 54.5	2.330	2.030	+2.07	+10.2	18.5	60.3
Apr. 28	22 15.65	-09 12.1	2.251	2.036	+1.96	+10.1	18.3	64.7
May 8	22 35.29	-07 30.6	2.173	2.046	+1.85	+9.8	18.2	69.3
May 18	22 53.80	-05 52.5	2.095	2.061	+1.72	+9.2	18.1	74.1
May 28	23 11.03	-04 20.3	2.017	2.079	+1.58	+8.4	18.0	79.1
June 7	23 26.85	-02 56.4	1.939	2.101	+1.42	+7.3	17.9	84.5
June 17	23 41.07	-01 43.0	1.862	2.126	+1.24	+6.0	17.9	90.3
June 27	23 53.47	-00 42.6	1.787	2.155	+1.04	+4.6	17.8	96.6
July 7	00 03.82	+00 03.0	1.714	2.187	+0.80	+2.9	17.8	103.5
July 17	00 11.87	+00 31.9	1.645	2.222	+0.55	+1.1	17.8	111.0
July 27	00 17.36	+00 42.4	1.583	2.260	+0.28	-0.8	17.9	119.2
Aug. 6	00 20.14	+00 34.0	1.530	2.299	0.00	-2.7	17.9	128.2
Aug. 16	00 20.15	+00 07.1	1.489	2.342	-0.26	-4.3	18.0	137.9
Aug. 26	00 17.57	-00 36.1	1.466	2.386	-0.47	-5.5	18.1	148.4
Sept. 5	00 12.89	-01 31.0	1.462	2.432	-0.61	-6.1	18.3	159.4
Sept. 15	00 06.83	-02 31.6	1.482	2.480	-0.65	-5.9	18.5	170.6
Sept. 25	00 00.36	-03 30.3	1.527	2.529	-0.59	-5.0	18.8	175.8
Oct. 5	23 54.45	-04 20.4	1.599	2.579	-0.46	-3.7	19.1	165.4
Oct. 15	23 49.86	-04 56.9	1.695	2.630	-0.27	-2.0	19.4	154.4
Oct. 25	23 47.14	-05 17.1	1.815	2.683	-0.06	-0.4	19.7	143.8
Nov. 4	23 46.52	-05 20.7	1.955	2.736	+0.15	+1.2	20.1	133.7
Nov. 14	23 47.99	-05 08.6	2.112	2.790	+0.34	+2.6	20.5	124.1
Nov. 24	23 51.42	-04 42.5	2.283	2.844	+0.52	+3.8	20.9	115.0
Dec. 4	23 56.57	-04 04.4	2.464	2.899	+0.66	+4.8	21.3	106.3
Dec. 14	00 03.20	-03 16.5	2.652	2.954	+0.79	+5.6	21.6	98.0
Dec. 24	00 11.08	-02 20.6	2.844	3.010	+0.89	+6.2	22.0	90.0
Jan. 3	00 19.99	-01 18.3	3.039	3.065	+0.97	+6.7	22.4	82.3
Jan. 13	00 29.73	-00 11.3	3.232	3.121	+1.04	+7.0	22.7	74.8
Jan. 23	00 40.15	+00 59.2	3.422	3.177	+1.10	+7.3	23.0	67.5
Feb. 2	00 51.10	+02 11.9	3.606	3.233	+1.14	+7.4	.	60.3
Feb. 12	01 02.48	+03 25.8	3.783	3.289	+1.17	+7.4	.	53.3
Feb. 22	01 14.19	+04 39.9	3.950	3.345	+1.19	+7.3	.	46.4
Mar. 3	01 26.13	+05 53.4	4.106	3.401	+1.21	+7.2	.	39.6
Mar. 13	01 38.26	+07 05.4	4.250	3.457	+1.22	+7.0	.	32.8
Mar. 23	01 50.48	+08 15.4	4.379	3.513	+1.23	+6.7	.	26.2

Comet 310P/Hill

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 18.59611 TT
 Peri. = 31.41083
 Node = 8.96601 2000.0
 Incl. = 13.18581
 q = 2.3837505 AU

e = 0.4261918
 a = 4.1542636 AU
 n = 0.11640269
 P = 8.47 years

$$m1 = 10.6 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	23 18.82	-04 23.4	2.803	2.492	+1.40	+12.7	19.8	61.7
Jan. 18	23 32.82	-02 16.3	2.892	2.472	+1.48	+13.1	19.8	55.5
Jan. 28	23 47.64	-00 05.0	2.974	2.454	+1.55	+13.5	19.8	49.6
Feb. 7	00 03.18	+02 09.5	3.050	2.438	+1.62	+13.7	19.8	43.9
Feb. 17	00 19.36	+04 26.5	3.118	2.424	+1.68	+13.8	19.8	38.5
Feb. 27	00 36.13	+06 45.0	3.179	2.412	+1.73	+13.9	19.8	33.2
Mar. 9	00 53.44	+09 03.8	3.232	2.402	+1.78	+13.8	19.8	28.1
Mar. 19	01 11.27	+11 22.0	3.277	2.394	+1.83	+13.6	19.8	23.2
Mar. 29	01 29.62	+13 38.3	3.315	2.388	+1.88	+13.3	19.8	18.4
Apr. 8	01 48.45	+15 51.8	3.345	2.385	+1.93	+12.9	19.8	13.9
Apr. 18	02 07.76	+18 01.1	3.367	2.384	+1.98	+12.4	19.8	9.7
Apr. 28	02 27.54	+20 05.2	3.382	2.385	+2.02	+11.8	19.9	6.5
May 8	02 47.76	+22 03.0	3.390	2.388	+2.06	+11.0	19.9	5.7
May 18	03 08.40	+23 53.5	3.391	2.393	+2.10	+10.2	19.9	8.0
May 28	03 29.42	+25 35.7	3.384	2.401	+2.13	+9.3	19.9	11.7
June 7	03 50.75	+27 08.8	3.370	2.411	+2.16	+8.3	19.9	15.9
June 17	04 12.32	+28 32.2	3.350	2.422	+2.17	+7.3	19.9	20.2
June 27	04 34.04	+29 45.5	3.322	2.436	+2.17	+6.3	20.0	24.7
July 7	04 55.78	+30 48.5	3.287	2.452	+2.16	+5.3	20.0	29.3
July 17	05 17.42	+31 41.2	3.245	2.470	+2.14	+4.3	20.0	34.0
July 27	05 38.81	+32 24.2	3.196	2.489	+2.10	+3.4	20.1	38.9
Aug. 6	05 59.78	+32 58.0	3.140	2.510	+2.04	+2.6	20.1	43.9
Aug. 16	06 20.17	+33 23.6	3.078	2.533	+1.96	+1.9	20.1	49.1
Aug. 26	06 39.81	+33 42.5	3.008	2.558	+1.87	+1.4	20.1	54.5
Sept. 5	06 58.50	+33 56.1	2.932	2.584	+1.76	+1.0	20.2	60.2
Sept. 15	07 16.08	+34 06.3	2.850	2.611	+1.62	+0.9	20.2	66.2
Sept. 25	07 32.33	+34 15.1	2.763	2.640	+1.47	+1.0	20.2	72.5
Oct. 5	07 47.05	+34 24.6	2.672	2.670	+1.30	+1.2	20.2	79.1
Oct. 15	08 00.00	+34 37.0	2.578	2.701	+1.09	+1.7	20.2	86.2
Oct. 25	08 10.93	+34 54.4	2.483	2.733	+0.86	+2.4	20.2	93.7
Nov. 4	08 19.56	+35 18.4	2.390	2.766	+0.60	+3.2	20.2	101.6
Nov. 14	08 25.60	+35 50.1	2.300	2.800	+0.32	+3.9	20.2	110.2
Nov. 24	08 28.75	+36 29.4	2.219	2.835	+0.01	+4.5	20.3	119.2
Dec. 4	08 28.82	+37 14.6	2.150	2.870	-0.31	+4.8	20.3	128.6
Dec. 14	08 25.73	+38 02.4	2.096	2.906	-0.60	+4.5	20.3	138.4
Dec. 24	08 19.68	+38 47.1	2.063	2.943	-0.84	+3.6	20.4	148.0
Jan. 3	08 11.28	+39 22.7	2.054	2.981	-0.98	+2.1	20.5	156.4
Jan. 13	08 01.45	+39 43.3	2.071	3.018	-1.00	+0.2	20.6	161.1
Jan. 23	07 51.43	+39 45.5	2.117	3.056	-0.90	-1.6	20.7	159.1
Feb. 2	07 42.42	+39 29.1	2.190	3.095	-0.71	-3.3	20.9	152.1
Feb. 12	07 35.36	+38 56.6	2.288	3.134	-0.45	-4.5	21.1	143.1
Feb. 22	07 30.84	+38 11.9	2.409	3.173	-0.18	-5.3	21.3	133.6
Mar. 3	07 29.04	+37 19.4	2.549	3.212	+0.08	-5.7	21.5	124.1
Mar. 13	07 29.86	+36 22.1	2.704	3.252	+0.32	-6.0	21.7	115.0
Mar. 23	07 33.06	+35 22.4	2.869	3.291	+0.52	-6.1	21.9	106.3

Comet 174P/(60558) Echeclus

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 22.36653 TT
 Peri. = 162.91930
 Node = 173.33510 2000.0
 Incl. = 4.34401
 q = 5.8170516 AU
 e = 0.4554541
 a = 10.6823899 AU
 n = 0.02822939
 P = 34.91 years

H = 9.4 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		V	Elong. °
Jan. 8	21 35.14	-12 36.0	6.619	5.839	+0.79	+3.5	17.8	34.9
Jan. 18	21 43.06	-12 00.7	6.697	5.835	+0.82	+3.8	17.7	26.7
Jan. 28	21 51.22	-11 22.5	6.756	5.831	+0.83	+4.0	17.7	18.6
Feb. 7	21 59.52	-10 42.0	6.794	5.828	+0.84	+4.2	17.6	10.7
Feb. 17	22 07.90	-09 59.7	6.812	5.825	+0.84	+4.4	17.5	3.0
Feb. 27	22 16.25	-09 16.1	6.808	5.823	+0.83	+4.4	17.5	5.4
Mar. 9	22 24.51	-08 31.8	6.783	5.821	+0.81	+4.5	17.6	13.2
Mar. 19	22 32.59	-07 47.2	6.738	5.819	+0.78	+4.4	17.7	21.0
Mar. 29	22 40.44	-07 03.1	6.673	5.818	+0.75	+4.3	17.8	28.8
Apr. 8	22 47.96	-06 20.1	6.590	5.817	+0.71	+4.1	17.8	36.7
Apr. 18	22 55.10	-05 38.7	6.489	5.817	+0.67	+3.9	17.8	44.6
Apr. 28	23 01.77	-04 59.6	6.374	5.817	+0.61	+3.6	17.8	52.5
May 8	23 07.90	-04 23.4	6.246	5.818	+0.55	+3.3	17.8	60.6
May 18	23 13.42	-03 50.8	6.108	5.818	+0.48	+2.8	17.8	68.8
May 28	23 18.24	-03 22.4	5.962	5.820	+0.40	+2.3	17.7	77.1
June 7	23 22.29	-02 58.9	5.811	5.821	+0.32	+1.8	17.7	85.6
June 17	23 25.49	-02 40.9	5.658	5.823	+0.23	+1.2	17.6	94.3
June 27	23 27.77	-02 28.8	5.508	5.826	+0.13	+0.6	17.6	103.2
July 7	23 29.10	-02 23.1	5.364	5.828	+0.03	-0.1	17.5	112.4
July 17	23 29.44	-02 24.0	5.231	5.832	-0.06	-0.7	17.4	121.9
July 27	23 28.80	-02 31.5	5.111	5.835	-0.16	-1.4	17.3	131.6
Aug. 6	23 27.25	-02 45.2	5.010	5.839	-0.24	-1.9	17.2	141.6
Aug. 16	23 24.89	-03 04.4	4.931	5.844	-0.30	-2.4	17.1	151.9
Aug. 26	23 21.88	-03 28.1	4.877	5.848	-0.34	-2.7	17.0	162.4
Sept. 5	23 18.45	-03 54.7	4.851	5.853	-0.36	-2.8	16.8	173.0
Sept. 15	23 14.84	-04 22.5	4.855	5.859	-0.35	-2.7	16.8	176.3
Sept. 25	23 11.35	-04 49.7	4.888	5.865	-0.31	-2.5	17.0	165.5
Oct. 5	23 08.24	-05 14.4	4.951	5.871	-0.25	-2.1	17.1	154.8
Oct. 15	23 05.74	-05 35.2	5.040	5.878	-0.17	-1.5	17.2	144.2
Oct. 25	23 04.05	-05 50.6	5.152	5.885	-0.07	-0.9	17.3	133.8
Nov. 4	23 03.30	-06 00.0	5.285	5.892	+0.03	-0.3	17.4	123.6
Nov. 14	23 03.57	-06 02.9	5.434	5.900	+0.13	+0.4	17.5	113.6
Nov. 24	23 04.86	-05 59.1	5.594	5.908	+0.23	+1.0	17.6	103.8
Dec. 4	23 07.16	-05 48.7	5.761	5.917	+0.32	+1.7	17.7	94.3
Dec. 14	23 10.41	-05 32.1	5.930	5.926	+0.41	+2.2	17.8	85.0
Dec. 24	23 14.52	-05 09.7	6.097	5.935	+0.49	+2.8	17.8	75.9
Jan. 3	23 19.41	-04 42.1	6.259	5.945	+0.56	+3.2	17.8	67.0
Jan. 13	23 24.98	-04 09.8	6.412	5.955	+0.61	+3.6	17.9	58.3
Jan. 23	23 31.12	-03 33.5	6.553	5.965	+0.66	+4.0	17.9	49.8
Feb. 2	23 37.75	-02 54.0	6.679	5.976	+0.70	+4.2	17.9	41.4
Feb. 12	23 44.76	-02 11.6	6.789	5.987	+0.73	+4.4	17.9	33.2
Feb. 22	23 52.06	-01 27.3	6.880	5.998	+0.75	+4.6	17.8	25.0
Mar. 3	23 59.58	-00 41.5	6.951	6.010	+0.77	+4.7	17.8	17.0
Mar. 13	00 07.24	+00 05.2	7.001	6.022	+0.77	+4.7	17.7	9.1
Mar. 23	00 14.95	+00 52.0	7.031	6.034	+0.77	+4.7	17.6	1.4

Comet 218P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 23.22381 TT
 Peri. = 59.81957
 Node = 175.87463 2000.0
 Incl. = 2.71898
 q = 1.1715030 AU
 e = 0.6215781
 a = 3.0957590 AU
 n = 0.18094782
 P = 5.45 years

$$m1 = 14.4 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	12 40.65	-05 39.8	1.297	1.702	+2.43	-13.8	19.0	95.6
Jan. 18	13 04.94	-07 57.4	1.146	1.627	+2.66	-14.0	18.4	99.3
Jan. 28	13 31.57	-10 17.3	1.006	1.553	+2.97	-14.0	17.8	102.5
Feb. 7	14 01.29	-12 37.2	0.880	1.482	+3.37	-13.6	17.1	105.1
Feb. 17	14 34.95	-14 52.8	0.768	1.415	+3.84	-12.3	16.5	106.7
Feb. 27	15 13.33	-16 55.7	0.673	1.353	+4.36	-9.8	15.8	107.4
Mar. 9	15 56.97	-18 33.4	0.596	1.298	+4.85	-5.6	15.3	106.9
Mar. 19	16 45.44	-19 29.5	0.537	1.250	+5.14	0.0	14.8	105.4
Mar. 29	17 36.82	-19 29.3	0.498	1.213	+5.12	+6.0	14.4	103.2
Apr. 8	18 28.01	-18 29.2	0.475	1.187	+4.76	+10.8	14.1	100.9
Apr. 18	19 15.66	-16 40.9	0.467	1.173	+4.17	+13.4	14.0	99.2
Apr. 28	19 57.32	-14 26.8	0.470	1.173	+3.48	+13.8	14.0	98.6
May 8	20 32.08	-12 09.0	0.478	1.186	+2.77	+12.5	14.1	99.5
May 18	20 59.83	-10 04.1	0.489	1.212	+2.09	+10.1	14.3	102.0
May 28	21 20.73	-08 23.4	0.501	1.249	+1.44	+7.0	14.6	106.1
June 7	21 35.14	-07 13.4	0.511	1.295	+0.81	+3.5	14.9	111.9
June 17	21 43.22	-06 38.5	0.522	1.351	+0.20	-0.3	15.3	119.3
June 27	21 45.24	-06 41.2	0.535	1.412	-0.34	-3.9	15.7	128.3
July 7	21 41.86	-07 19.8	0.554	1.479	-0.77	-6.8	16.1	138.7
July 17	21 34.21	-08 28.0	0.583	1.550	-1.01	-8.7	16.6	150.3
July 27	21 24.08	-09 54.6	0.626	1.623	-1.05	-9.1	17.1	162.5
Aug. 6	21 13.62	-11 25.3	0.687	1.699	-0.90	-8.3	17.6	173.8
Aug. 16	21 04.64	-12 47.8	0.768	1.775	-0.62	-6.7	18.2	171.3
Aug. 26	20 58.44	-13 54.4	0.869	1.853	-0.29	-4.8	18.8	160.6
Sept. 5	20 55.52	-14 42.2	0.989	1.930	+0.03	-2.9	19.4	150.1
Sept. 15	20 55.80	-15 11.4	1.128	2.008	+0.32	-1.2	20.0	140.4
Sept. 25	20 58.96	-15 23.6	1.282	2.085	+0.56	+0.3	20.5	131.3
Oct. 5	21 04.52	-15 20.9	1.449	2.161	+0.75	+1.6	21.1	122.8
Oct. 15	21 12.02	-15 05.3	1.628	2.237	+0.90	+2.7	21.6	114.8
Oct. 25	21 21.07	-14 38.4	1.816	2.312	+1.02	+3.7	22.1	107.0
Nov. 4	21 31.30	-14 01.7	2.010	2.386	+1.11	+4.5	22.5	99.6
Nov. 14	21 42.42	-13 16.4	2.210	2.458	+1.18	+5.3	23.0	92.4
Nov. 24	21 54.24	-12 23.8	2.412	2.530	+1.23	+5.9	.	85.3
Dec. 4	22 06.53	-11 24.8	2.614	2.600	+1.26	+6.4	.	78.3
Dec. 14	22 19.17	-10 20.3	2.815	2.670	+1.29	+6.9	.	71.4
Dec. 24	22 32.05	-09 11.3	3.011	2.738	+1.30	+7.3	.	64.6
Jan. 3	22 45.06	-07 58.6	3.201	2.805	+1.31	+7.6	.	57.9
Jan. 13	22 58.13	-06 42.9	3.383	2.870	+1.31	+7.8	.	51.2
Jan. 23	23 11.22	-05 25.2	3.555	2.935	+1.30	+7.9	.	44.5
Feb. 2	23 24.24	-04 06.0	3.715	2.998	+1.29	+8.0	.	37.8
Feb. 12	23 37.19	-02 46.2	3.862	3.060	+1.28	+8.0	.	31.2
Feb. 22	23 50.00	-01 26.3	3.993	3.121	+1.27	+7.9	.	24.6
Mar. 3	00 02.65	-00 07.1	4.109	3.181	+1.25	+7.8	.	17.9
Mar. 13	00 15.12	+01 10.9	4.208	3.239	+1.22	+7.6	.	11.3
Mar. 23	00 27.35	+02 27.1	4.289	3.297	+1.20	+7.4	.	4.7

Comet 113P/Spitaler

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 23.74958 TT
 Peri. = 50.02188
 Node = 14.38603 2000.0
 Incl. = 5.77600
 q = 2.1188457 AU
 e = 0.4244915
 a = 3.6816931 AU
 n = 0.13951879
 P = 7.06 years

$$m_1 = 12.8 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	00 02.45	+01 29.0	2.330	2.266	+1.44	+11.0	19.1	74.0
Jan. 18	00 16.80	+03 18.7	2.418	2.241	+1.56	+11.6	19.1	67.8
Jan. 28	00 32.41	+05 14.6	2.502	2.218	+1.67	+12.0	19.1	62.0
Feb. 7	00 49.12	+07 14.9	2.582	2.197	+1.77	+12.3	19.1	56.5
Feb. 17	01 06.84	+09 18.0	2.656	2.178	+1.87	+12.4	19.1	51.2
Feb. 27	01 25.50	+11 22.2	2.726	2.162	+1.95	+12.4	19.2	46.2
Mar. 9	01 45.05	+13 25.7	2.790	2.148	+2.04	+12.1	19.2	41.4
Mar. 19	02 05.43	+15 26.8	2.850	2.137	+2.12	+11.7	19.2	36.7
Mar. 29	02 26.62	+17 23.5	2.904	2.128	+2.19	+11.0	19.2	32.3
Apr. 8	02 48.56	+19 14.0	2.954	2.122	+2.27	+10.3	19.2	28.0
Apr. 18	03 11.21	+20 56.5	2.999	2.119	+2.33	+9.3	19.3	23.8
Apr. 28	03 34.51	+22 29.3	3.039	2.119	+2.39	+8.2	19.3	19.8
May 8	03 58.37	+23 50.9	3.075	2.122	+2.43	+6.9	19.3	15.8
May 18	04 22.71	+24 59.9	3.106	2.127	+2.47	+5.5	19.4	12.0
May 28	04 47.40	+25 55.3	3.133	2.135	+2.49	+4.1	19.4	8.3
June 7	05 12.29	+26 36.2	3.155	2.146	+2.49	+2.6	19.4	5.1
June 17	05 37.23	+27 02.4	3.172	2.159	+2.48	+1.1	19.5	3.7
June 27	06 02.07	+27 13.7	3.184	2.175	+2.46	-0.3	19.5	5.8
July 7	06 26.62	+27 10.7	3.191	2.194	+2.41	-1.7	19.6	9.3
July 17	06 50.75	+26 53.9	3.192	2.214	+2.36	-2.9	19.6	13.2
July 27	07 14.31	+26 24.5	3.186	2.237	+2.29	-4.1	19.7	17.3
Aug. 6	07 37.17	+25 43.7	3.174	2.262	+2.21	-5.1	19.7	21.6
Aug. 16	07 59.25	+24 53.1	3.155	2.289	+2.12	-5.9	19.8	26.1
Aug. 26	08 20.45	+23 54.3	3.128	2.317	+2.02	-6.5	19.8	30.7
Sept. 5	08 40.69	+22 49.1	3.094	2.348	+1.93	-7.0	19.9	35.5
Sept. 15	08 59.94	+21 39.3	3.051	2.380	+1.82	-7.3	19.9	40.6
Sept. 25	09 18.13	+20 26.8	3.000	2.413	+1.71	-7.3	20.0	45.9
Oct. 5	09 35.20	+19 13.3	2.941	2.447	+1.59	-7.3	20.0	51.5
Oct. 15	09 51.09	+18 00.7	2.874	2.483	+1.46	-7.0	20.0	57.4
Oct. 25	10 05.72	+16 51.0	2.799	2.520	+1.33	-6.5	20.1	63.6
Nov. 4	10 18.98	+15 45.9	2.717	2.557	+1.18	-5.9	20.1	70.2
Nov. 14	10 30.75	+14 47.4	2.629	2.596	+1.01	-5.0	20.1	77.2
Nov. 24	10 40.86	+13 57.3	2.536	2.635	+0.83	-4.0	20.1	84.7
Dec. 4	10 49.14	+13 17.4	2.441	2.675	+0.62	-2.8	20.1	92.7
Dec. 14	10 55.37	+12 49.3	2.346	2.715	+0.40	-1.5	20.1	101.2
Dec. 24	10 59.33	+12 34.5	2.255	2.756	+0.15	-0.1	20.1	110.3
Jan. 3	11 00.85	+12 33.4	2.171	2.797	-0.10	+1.3	20.1	120.1
Jan. 13	10 59.81	+12 46.0	2.099	2.838	-0.35	+2.5	20.1	130.5
Jan. 23	10 56.26	+13 10.7	2.044	2.880	-0.58	+3.4	20.1	141.5
Feb. 2	10 50.49	+13 44.2	2.009	2.922	-0.75	+3.8	20.1	153.0
Feb. 12	10 43.01	+14 22.1	2.001	2.964	-0.84	+3.7	20.2	164.6
Feb. 22	10 34.62	+14 58.9	2.020	3.006	-0.84	+3.1	20.3	174.0
Mar. 3	10 26.23	+15 29.7	2.070	3.048	-0.75	+2.1	20.4	168.7
Mar. 13	10 18.71	+15 50.7	2.147	3.090	-0.59	+0.9	20.6	157.6
Mar. 23	10 12.76	+16 00.0	2.252	3.132	-0.40	-0.3	20.8	146.5

Comet 268P/Bernardi

Epoch = 2015 June 27.0 TT
 T = 2015 Apr. 27.33794 TT
 Peri. = 0.42008 e = 0.4702636
 Node = 127.65495 2000.0 a = 4.5683653 AU
 Incl. = 16.10005 n = 0.10093989
 q = 2.4200294 AU P = 9.76 years

$$m_1 = 14.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	05 54.12	+09 38.9	1.621	2.555	-0.58	+8.3	19.3	157.0
Jan. 18	05 48.35	+11 02.3	1.647	2.533	-0.36	+9.1	19.3	147.5
Jan. 28	05 44.76	+12 33.2	1.696	2.512	-0.09	+9.4	19.3	137.5
Feb. 7	05 43.89	+14 06.8	1.764	2.493	+0.20	+9.2	19.4	127.8
Feb. 17	05 45.94	+15 39.1	1.847	2.476	+0.49	+8.8	19.5	118.5
Feb. 27	05 50.88	+17 07.1	1.942	2.461	+0.77	+8.1	19.6	109.8
Mar. 9	05 58.54	+18 28.3	2.046	2.449	+1.01	+7.3	19.6	101.7
Mar. 19	06 08.63	+19 40.8	2.155	2.438	+1.22	+6.3	19.7	94.2
Mar. 29	06 20.87	+20 43.4	2.267	2.430	+1.41	+5.1	19.8	87.1
Apr. 8	06 34.94	+21 34.8	2.380	2.424	+1.56	+4.0	19.9	80.5
Apr. 18	06 50.55	+22 14.5	2.493	2.421	+1.69	+2.7	20.0	74.2
Apr. 28	07 07.43	+22 41.8	2.604	2.420	+1.79	+1.5	20.1	68.3
May 8	07 25.30	+22 56.5	2.712	2.421	+1.86	+0.2	20.2	62.7
May 18	07 43.95	+22 58.5	2.818	2.425	+1.92	-1.0	20.3	57.3
May 28	08 03.16	+22 48.1	2.919	2.431	+1.96	-2.2	20.4	52.1
June 7	08 22.74	+22 25.8	3.016	2.440	+1.98	-3.4	20.5	47.0
June 17	08 42.53	+21 52.1	3.108	2.450	+1.99	-4.4	20.6	42.1
June 27	09 02.40	+21 07.9	3.194	2.463	+1.98	-5.4	20.6	37.3
July 7	09 22.23	+20 14.3	3.274	2.478	+1.97	-6.2	20.7	32.5
July 17	09 41.94	+19 12.3	3.348	2.495	+1.95	-6.9	20.8	27.9
July 27	10 01.45	+18 03.2	3.415	2.514	+1.93	-7.5	20.9	23.3
Aug. 6	10 20.72	+16 48.1	3.474	2.536	+1.90	-8.0	20.9	18.8
Aug. 16	10 39.72	+15 28.4	3.526	2.559	+1.87	-8.3	21.0	14.5
Aug. 26	10 58.42	+14 05.4	3.570	2.583	+1.84	-8.5	21.1	10.7
Sept. 5	11 16.79	+12 40.4	3.604	2.610	+1.81	-8.6	21.2	8.0
Sept. 15	11 34.85	+11 14.7	3.630	2.638	+1.77	-8.5	21.2	8.0
Sept. 25	11 52.56	+09 49.6	3.646	2.667	+1.74	-8.3	21.3	10.8
Oct. 5	12 09.92	+08 26.3	3.651	2.698	+1.70	-8.0	21.3	15.1
Oct. 15	12 26.92	+07 06.0	3.647	2.730	+1.66	-7.6	21.4	19.9
Oct. 25	12 43.52	+05 50.1	3.631	2.764	+1.62	-7.1	21.4	25.2
Nov. 4	12 59.69	+04 39.6	3.605	2.798	+1.57	-6.4	21.5	30.7
Nov. 14	13 15.37	+03 35.6	3.568	2.834	+1.51	-5.6	21.5	36.5
Nov. 24	13 30.51	+02 39.3	3.520	2.870	+1.45	-4.8	21.5	42.5
Dec. 4	13 45.02	+01 51.6	3.462	2.907	+1.38	-3.8	21.5	48.7
Dec. 14	13 58.79	+01 13.5	3.394	2.945	+1.29	-2.8	21.5	55.2
Dec. 24	14 11.71	+00 45.8	3.317	2.984	+1.19	-1.7	21.6	62.0
Jan. 3	14 23.64	+00 29.2	3.233	3.024	+1.08	-0.5	21.6	69.0
Jan. 13	14 34.40	+00 24.3	3.142	3.064	+0.94	+0.7	21.5	76.4
Jan. 23	14 43.82	+00 31.3	3.048	3.104	+0.79	+1.9	21.5	84.0
Feb. 2	14 51.70	+00 50.4	2.952	3.145	+0.62	+3.1	21.5	92.0
Feb. 12	14 57.86	+01 21.1	2.857	3.187	+0.42	+4.1	21.5	100.4
Feb. 22	15 02.10	+02 02.4	2.767	3.228	+0.22	+5.0	21.5	109.1
Mar. 3	15 04.30	+02 52.9	2.685	3.270	+0.01	+5.7	21.5	118.0
Mar. 13	15 04.37	+03 49.9	2.615	3.312	-0.20	+6.0	21.5	127.2
Mar. 23	15 02.36	+04 50.1	2.562	3.355	-0.39	+5.9	21.5	136.4

Comet 308P/Lagerkvist-Carsenty

Epoch = 2015 June 27.0 TT
 T = 2015 May 7.31775 TT
 Peri. = 334.05418
 Node = 63.13012 2000.0
 Incl. = 4.84769
 q = 4.2257096 AU
 e = 0.3632921
 a = 6.6368104 AU
 n = 0.05764544
 P = 17.10 years

$$m1 = 0.2 + 5 \log(\Delta) + 25.0 \log(r(t-90))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	00 35.89	+00 23.8	4.306	4.268	+0.60 +5.1	19.3	81.3
Jan. 18	00 41.93	+01 14.7	4.447	4.261	+0.70 +5.6	19.4	72.8
Jan. 28	00 48.94	+02 10.5	4.583	4.255	+0.79 +6.0	19.4	64.6
Feb. 7	00 56.80	+03 10.4	4.711	4.250	+0.86 +6.3	19.5	56.7
Feb. 17	01 05.40	+04 13.3	4.827	4.245	+0.92 +6.5	19.5	49.0
Feb. 27	01 14.61	+05 18.5	4.932	4.240	+0.97 +6.7	19.5	41.4
Mar. 9	01 24.36	+06 25.2	5.022	4.236	+1.02 +6.7	19.5	34.1
Mar. 19	01 34.54	+07 32.5	5.097	4.233	+1.05 +6.7	19.5	26.9
Mar. 29	01 45.09	+08 39.7	5.156	4.230	+1.08 +6.7	19.5	19.8
Apr. 8	01 55.91	+09 46.3	5.198	4.228	+1.10 +6.5	19.5	12.9
Apr. 18	02 06.95	+10 51.6	5.224	4.227	+1.12 +6.3	19.5	6.2
Apr. 28	02 18.14	+11 55.0	5.232	4.226	+1.13 +6.1	19.5	2.0
May 8	02 29.41	+12 56.2	5.223	4.226	+1.13 +5.8	19.5	7.9
May 18	02 40.69	+13 54.5	5.197	4.226	+1.12 +5.5	19.5	14.5
May 28	02 51.92	+14 49.8	5.155	4.227	+1.11 +5.2	19.4	21.3
June 7	03 03.01	+15 41.6	5.098	4.229	+1.09 +4.8	19.4	28.0
June 17	03 13.88	+16 29.8	5.025	4.231	+1.06 +4.4	19.4	34.8
June 27	03 24.45	+17 14.1	4.938	4.233	+1.02 +4.0	19.3	41.7
July 7	03 34.61	+17 54.4	4.838	4.237	+0.96 +3.6	19.3	48.7
July 17	03 44.26	+18 30.6	4.726	4.241	+0.90 +3.2	19.2	55.9
July 27	03 53.27	+19 02.8	4.604	4.245	+0.82 +2.8	19.2	63.2
Aug. 6	04 01.50	+19 31.0	4.474	4.250	+0.73 +2.4	19.1	70.8
Aug. 16	04 08.82	+19 55.3	4.338	4.256	+0.62 +2.1	19.0	78.6
Aug. 26	04 15.06	+20 16.0	4.198	4.262	+0.50 +1.7	19.0	86.8
Sept. 5	04 20.07	+20 33.0	4.058	4.269	+0.36 +1.4	18.9	95.2
Sept. 15	04 23.70	+20 46.7	3.919	4.277	+0.21 +1.0	18.8	104.1
Sept. 25	04 25.80	+20 57.2	3.787	4.284	+0.05 +0.7	18.8	113.3
Oct. 5	04 26.30	+21 04.4	3.666	4.293	-0.11 +0.4	18.7	123.0
Oct. 15	04 25.17	+21 08.6	3.558	4.302	-0.27 +0.1	18.6	133.1
Oct. 25	04 22.46	+21 09.7	3.470	4.312	-0.41 -0.2	18.6	143.7
Nov. 4	04 18.40	+21 07.8	3.405	4.322	-0.51 -0.5	18.6	154.6
Nov. 14	04 13.30	+21 03.3	3.366	4.333	-0.57 -0.6	18.6	165.8
Nov. 24	04 07.60	+20 56.8	3.357	4.344	-0.58 -0.7	18.6	177.3
Dec. 4	04 01.84	+20 49.4	3.379	4.355	-0.53 -0.7	18.6	171.3
Dec. 14	03 56.53	+20 42.2	3.430	4.368	-0.44 -0.5	18.7	159.9
Dec. 24	03 52.13	+20 36.8	3.510	4.380	-0.31 -0.2	18.7	148.7
Jan. 3	03 49.00	+20 34.3	3.615	4.394	-0.16 +0.1	18.8	137.8
Jan. 13	03 47.36	+20 35.6	3.742	4.407	0.00 +0.6	18.9	127.2
Jan. 23	03 47.33	+20 41.3	3.886	4.421	+0.16 +1.0	19.0	117.0
Feb. 2	03 48.88	+20 51.3	4.043	4.436	+0.31 +1.4	19.1	107.3
Feb. 12	03 51.95	+21 05.4	4.207	4.451	+0.45 +1.8	19.2	97.9
Feb. 22	03 56.44	+21 23.0	4.375	4.466	+0.58 +2.0	19.4	88.9
Mar. 3	04 02.20	+21 43.4	4.543	4.482	+0.69 +2.2	19.5	80.2
Mar. 13	04 09.09	+22 05.6	4.708	4.499	+0.79 +2.3	19.6	71.8
Mar. 23	04 16.96	+22 29.0	4.867	4.515	+0.87 +2.4	19.7	63.8

Comet P/2007 S1 (Zhao)

Epoch = 2015 June 27.0 TT
 T = 2015 May 10.49590 TT
 Peri. = 245.77755
 Node = 141.52408 2000.0
 Incl. = 5.97334
 q = 2.4942405 AU
 e = 0.3435182
 a = 3.7994054 AU
 n = 0.13308546
 P = 7.41 years

$$m1 = 11.8 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	m1	Mot. /PA ' °	Elong. °
Jan. 8	22 35.66	-11 38.1	3.148	2.611	-0.79 -3.2	20.5	25.0/ 70	49.1
Jan. 18	22 51.58	-10 10.1	3.224	2.594	-0.78 -3.4	20.6	26.0/ 69	43.1
Jan. 28	23 07.98	-08 36.0	3.291	2.577	-0.77 -3.5	20.6	26.8/ 69	37.3
Feb. 7	23 24.76	-06 57.1	3.349	2.562	-0.77 -3.7	20.6	27.5/ 68	31.6
Feb. 17	23 41.86	-05 14.2	3.398	2.549	-0.77 -3.8	20.6	28.1/ 68	26.1
Feb. 27	23 59.23	-03 28.5	3.438	2.536	-0.77 -3.9	20.5	28.5/ 68	20.8
Mar. 9	00 16.83	-01 41.1	3.467	2.526	-0.77 -4.0	20.5	28.8/ 68	15.6
Mar. 19	00 34.64	+00 06.9	3.488	2.517	-0.77 -4.0	20.5	29.0/ 68	10.7
Mar. 29	00 52.63	+01 54.4	3.499	2.509	-0.77 -4.0	20.5	29.2/ 69	6.1
Apr. 8	01 10.77	+03 40.1	3.501	2.503	-0.78 -4.0	20.5	29.2/ 69	3.6
Apr. 18	01 29.06	+05 23.1	3.494	2.498	-0.79 -4.0	20.5	29.2/ 70	6.1
Apr. 28	01 47.47	+07 02.2	3.479	2.496	-0.79 -3.9	20.5	29.1/ 71	10.4
May 8	02 05.97	+08 36.5	3.455	2.494	-0.80 -3.8	20.4	28.9/ 72	15.1
May 18	02 24.53	+10 05.0	3.423	2.495	-0.81 -3.7	20.4	28.6/ 73	19.8
May 28	02 43.12	+11 26.7	3.382	2.497	-0.82 -3.5	20.4	28.2/ 74	24.6
June 7	03 01.66	+12 41.1	3.334	2.500	-0.83 -3.4	20.4	27.7/ 76	29.4
June 17	03 20.11	+13 47.3	3.279	2.506	-0.84 -3.2	20.4	27.2/ 77	34.3
June 27	03 38.36	+14 44.9	3.216	2.513	-0.86 -3.0	20.3	26.5/ 79	39.3
July 7	03 56.34	+15 33.5	3.146	2.521	-0.87 -2.7	20.3	25.7/ 81	44.4
July 17	04 13.92	+16 13.0	3.069	2.531	-0.88 -2.5	20.3	24.7/ 82	49.6
July 27	04 30.97	+16 43.3	2.985	2.542	-0.89 -2.3	20.3	23.6/ 84	55.0
Aug. 6	04 47.34	+17 04.8	2.896	2.555	-0.91 -2.1	20.2	22.3/ 86	60.6
Aug. 16	05 02.86	+17 17.7	2.801	2.570	-0.92 -1.9	20.2	20.7/ 88	66.4
Aug. 26	05 17.34	+17 22.8	2.702	2.585	-0.94 -1.7	20.1	18.9/ 90	72.6
Sept. 5	05 30.57	+17 20.9	2.598	2.602	-0.97 -1.6	20.1	16.8/ 92	79.0
Sept. 15	05 42.32	+17 13.2	2.493	2.621	-1.00 -1.5	20.1	14.4/ 95	85.9
Sept. 25	05 52.32	+17 01.0	2.386	2.640	-1.03 -1.4	20.0	11.6/ 97	93.2
Oct. 5	06 00.33	+16 45.8	2.281	2.661	-1.07 -1.3	20.0	8.4/101	101.1
Oct. 15	06 06.07	+16 29.2	2.179	2.682	-1.12 -1.3	19.9	4.9/109	109.5
Oct. 25	06 09.29	+16 13.0	2.085	2.705	-1.18 -1.3	19.9	1.6/151	118.5
Nov. 4	06 09.84	+15 58.8	2.001	2.729	-1.24 -1.4	19.8	3.3/251	128.3
Nov. 14	06 07.68	+15 48.3	1.932	2.753	-1.30 -1.5	19.8	6.8/265	138.6
Nov. 24	06 03.02	+15 42.7	1.882	2.779	-1.35 -1.6	19.8	9.6/270	149.5
Dec. 4	05 56.35	+15 42.6	1.856	2.805	-1.39 -1.8	19.9	11.5/273	160.6
Dec. 14	05 48.43	+15 48.4	1.856	2.832	-1.41 -1.9	19.9	11.9/276	170.5
Dec. 24	05 40.24	+15 59.9	1.885	2.859	-1.40 -2.1	20.0	10.9/279	170.3
Jan. 3	05 32.79	+16 16.6	1.943	2.888	-1.36 -2.1	20.2	8.7/284	160.4
Jan. 13	05 26.90	+16 37.9	2.027	2.917	-1.31 -2.1	20.3	5.9/295	149.4
Jan. 23	05 23.15	+17 02.9	2.135	2.946	-1.24 -2.1	20.5	3.4/325	138.6
Feb. 2	05 21.80	+17 30.6	2.263	2.976	-1.16 -2.0	20.7	3.3/ 27	128.3
Feb. 12	05 22.87	+17 59.9	2.407	3.006	-1.09 -1.8	20.9	5.6/ 58	118.5
Feb. 22	05 26.23	+18 29.5	2.562	3.036	-1.01 -1.6	21.1	8.2/ 69	109.3
Mar. 3	05 31.64	+18 58.3	2.726	3.067	-0.95 -1.4	21.3	10.6/ 75	100.6
Mar. 13	05 38.85	+19 25.2	2.894	3.099	-0.89 -1.2	21.5	12.6/ 79	92.4
Mar. 23	05 47.60	+19 49.1	3.064	3.130	-0.84 -1.0	21.7	14.3/ 81	84.5

Comet 205P/Giacobini

Epoch = 2015 June 27.0 TT
 T = 2015 May 16.64518 TT
 Peri. = 154.27961
 Node = 179.60440 2000.0
 Incl. = 15.28134
 q = 1.5368060 AU
 e = 0.5673294
 a = 3.5519076 AU
 n = 0.14723518
 P = 6.69 years

$$m_1 = 10.6 + 5 \log(\Delta) + 20.0 \log(r(t-70))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	18 09.04	-13 01.3	2.913	2.002	+2.53	+1.7	20.6	18.1
Jan. 18	18 34.39	-12 44.5	2.826	1.944	+2.61	+3.3	20.4	21.4
Jan. 28	19 00.52	-12 11.9	2.737	1.888	+2.68	+4.9	20.1	24.7
Feb. 7	19 27.35	-11 23.1	2.648	1.834	+2.74	+6.5	19.7	27.8
Feb. 17	19 54.80	-10 17.9	2.560	1.783	+2.80	+8.1	19.4	30.7
Feb. 27	20 22.76	-08 57.0	2.474	1.735	+2.84	+9.6	19.1	33.4
Mar. 9	20 51.13	-07 21.4	2.392	1.692	+2.87	+10.8	18.8	36.0
Mar. 19	21 19.85	-05 32.9	2.314	1.652	+2.90	+11.9	18.5	38.3
Mar. 29	21 48.82	-03 33.9	2.242	1.618	+2.91	+12.6	18.1	40.5
Apr. 8	22 17.97	-01 27.5	2.175	1.589	+2.93	+13.1	17.8	42.5
Apr. 18	22 47.23	+00 43.0	2.115	1.566	+2.93	+13.1	17.5	44.5
Apr. 28	23 16.52	+02 53.8	2.060	1.549	+2.92	+12.7	17.2	46.5
May 8	23 45.74	+05 01.0	2.011	1.539	+2.91	+12.0	16.9	48.4
May 18	00 14.82	+07 00.9	1.967	1.537	+2.88	+10.9	16.6	50.5
May 28	00 43.59	+08 49.8	1.926	1.541	+2.83	+9.5	16.4	52.8
June 7	01 11.93	+10 24.6	1.888	1.553	+2.77	+7.8	16.2	55.3
June 17	01 39.64	+11 43.0	1.853	1.571	+2.69	+6.0	16.0	58.0
June 27	02 06.52	+12 42.8	1.818	1.596	+2.58	+4.0	15.8	61.0
July 7	02 32.31	+13 22.8	1.783	1.626	+2.45	+2.0	15.7	64.4
July 17	02 56.79	+13 42.6	1.746	1.662	+2.29	-0.1	15.6	68.2
July 27	03 19.66	+13 42.0	1.708	1.703	+2.10	-2.1	15.5	72.4
Aug. 6	03 40.64	+13 21.5	1.668	1.748	+1.88	-4.0	15.5	77.1
Aug. 16	03 59.46	+12 41.9	1.626	1.797	+1.63	-5.7	15.5	82.3
Aug. 26	04 15.79	+11 44.5	1.581	1.848	+1.35	-7.4	15.5	88.1
Sept. 5	04 29.34	+10 30.9	1.536	1.903	+1.05	-8.8	15.6	94.5
Sept. 15	04 39.79	+09 03.0	1.490	1.959	+0.71	-10.0	15.7	101.7
Sept. 25	04 46.84	+07 23.4	1.448	2.018	+0.35	-10.7	15.8	109.5
Oct. 5	04 50.29	+05 36.0	1.411	2.077	-0.03	-11.1	16.0	118.0
Oct. 15	04 50.04	+03 45.4	1.383	2.138	-0.38	-10.7	16.2	127.1
Oct. 25	04 46.24	+01 58.4	1.368	2.200	-0.68	-9.6	16.4	136.6
Nov. 4	04 39.43	+00 22.8	1.372	2.262	-0.89	-7.6	16.6	145.8
Nov. 14	04 30.50	-00 53.7	1.397	2.325	-0.98	-5.1	16.9	153.4
Nov. 24	04 20.67	-01 44.7	1.447	2.388	-0.94	-2.3	17.2	157.1
Dec. 4	04 11.23	-02 07.4	1.522	2.450	-0.80	+0.5	17.6	154.8
Dec. 14	04 03.24	-02 02.9	1.622	2.513	-0.58	+2.8	18.0	148.2
Dec. 24	03 57.46	-01 34.8	1.745	2.576	-0.32	+4.6	18.4	139.8
Jan. 3	03 54.21	-00 48.8	1.888	2.638	-0.07	+5.9	18.8	130.8
Jan. 13	03 53.52	+00 09.9	2.047	2.700	+0.17	+6.6	19.2	121.9
Jan. 23	03 55.24	+01 16.3	2.220	2.762	+0.38	+7.0	19.7	113.3
Feb. 2	03 59.08	+02 26.5	2.402	2.823	+0.57	+7.1	20.1	105.0
Feb. 12	04 04.76	+03 37.6	2.590	2.883	+0.72	+7.0	20.5	97.0
Feb. 22	04 12.00	+04 47.2	2.783	2.943	+0.85	+6.6	20.8	89.4
Mar. 3	04 20.52	+05 53.7	2.976	3.002	+0.96	+6.2	21.2	82.0
Mar. 13	04 30.11	+06 55.8	3.167	3.061	+1.05	+5.7	21.5	74.8
Mar. 23	04 40.58	+07 52.6	3.355	3.119	+1.12	+5.1	21.9	67.9

Comet P/2008 QP20 (LINEAR-Hill)

Epoch = 2015 June 27.0 TT
 T = 2015 May 17.26250 TT
 Peri. = 72.35474
 Node = 324.96611 2000.0
 Incl. = 7.74176
 q = 1.7233806 AU

e = 0.5063714
 a = 3.4912495 AU
 n = 0.15108896
 P = 6.52 years

$$m1 = 11.2 + 5 \log(\Delta) + 25.0 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day		m1	Mot. /PA ' °	Elong. °
Jan. 8	21 32.98	-13 19.1	2.819	2.079	-0.86	-6.5	22.6	32.4/ 68	34.1
Jan. 18	21 53.41	-11 14.4	2.833	2.033	-0.88	-7.0	22.4	33.8/ 67	29.3
Jan. 28	22 14.40	-08 59.1	2.839	1.989	-0.91	-7.5	22.2	35.1/ 66	24.8
Feb. 7	22 35.89	-06 33.8	2.839	1.947	-0.94	-7.9	21.9	36.3/ 65	20.6
Feb. 17	22 57.89	-03 59.6	2.834	1.907	-0.97	-8.3	21.7	37.4/ 64	16.6
Feb. 27	23 20.39	-01 17.6	2.824	1.871	-1.01	-8.7	21.4	38.4/ 64	12.8
Mar. 9	23 43.41	+01 30.5	2.810	1.838	-1.04	-8.9	21.1	39.3/ 64	9.4
Mar. 19	00 06.99	+04 22.8	2.794	1.808	-1.09	-9.1	20.9	40.1/ 64	6.4
Mar. 29	00 31.18	+07 17.2	2.777	1.783	-1.13	-9.1	20.7	40.7/ 64	4.3
Apr. 8	00 56.02	+10 11.0	2.759	1.762	-1.18	-9.0	20.4	41.2/ 65	4.0
Apr. 18	01 21.56	+13 01.5	2.741	1.745	-1.23	-8.7	20.2	41.6/ 66	5.6
Apr. 28	01 47.84	+15 45.8	2.724	1.733	-1.28	-8.2	20.0	41.7/ 67	7.8
May 8	02 14.86	+18 20.7	2.709	1.726	-1.33	-7.6	19.8	41.7/ 69	10.3
May 18	02 42.59	+20 43.2	2.695	1.723	-1.37	-6.8	19.6	41.5/ 71	12.8
May 28	03 10.97	+22 50.5	2.682	1.726	-1.40	-5.8	19.5	41.1/ 73	15.4
June 7	03 39.87	+24 39.9	2.671	1.734	-1.43	-4.7	19.4	40.6/ 76	18.0
June 17	04 09.11	+26 09.5	2.660	1.747	-1.44	-3.5	19.3	39.9/ 78	20.7
June 27	04 38.46	+27 18.1	2.649	1.764	-1.44	-2.2	19.2	39.0/ 81	23.5
July 7	05 07.65	+28 05.1	2.639	1.786	-1.42	-1.0	19.2	38.1/ 84	26.4
July 17	05 36.42	+28 30.8	2.626	1.812	-1.39	+0.2	19.2	36.9/ 87	29.5
July 27	06 04.46	+28 36.4	2.611	1.843	-1.34	+1.3	19.3	35.7/ 90	32.8
Aug. 6	06 31.52	+28 23.5	2.594	1.876	-1.28	+2.3	19.3	34.4/ 93	36.4
Aug. 16	06 57.41	+27 54.4	2.572	1.913	-1.22	+3.2	19.4	32.9/ 96	40.2
Aug. 26	07 21.92	+27 11.8	2.544	1.953	-1.16	+4.0	19.5	31.3/ 99	44.3
Sept. 5	07 44.93	+26 18.3	2.512	1.995	-1.09	+4.6	19.7	29.6/101	48.7
Sept. 15	08 06.34	+25 16.9	2.472	2.040	-1.03	+5.1	19.8	27.7/103	53.4
Sept. 25	08 26.05	+24 10.4	2.426	2.086	-0.98	+5.6	20.0	25.6/105	58.5
Oct. 5	08 43.98	+23 01.5	2.373	2.134	-0.93	+6.0	20.1	23.3/106	64.0
Oct. 15	09 00.05	+21 52.8	2.314	2.184	-0.89	+6.3	20.3	20.7/108	70.0
Oct. 25	09 14.12	+20 47.0	2.248	2.234	-0.87	+6.6	20.5	17.9/109	76.4
Nov. 4	09 26.06	+19 46.4	2.177	2.286	-0.85	+6.9	20.6	14.6/111	83.4
Nov. 14	09 35.70	+18 53.4	2.102	2.338	-0.85	+7.2	20.8	11.0/113	91.0
Nov. 24	09 42.80	+18 10.2	2.026	2.392	-0.87	+7.5	21.0	7.0/117	99.2
Dec. 4	09 47.17	+17 38.4	1.951	2.445	-0.90	+7.8	21.1	2.8/133	108.2
Dec. 14	09 48.57	+17 19.4	1.882	2.499	-0.94	+8.1	21.3	2.5/256	117.9
Dec. 24	09 46.89	+17 13.4	1.823	2.553	-1.00	+8.4	21.5	6.7/275	128.4
Jan. 3	09 42.21	+17 19.2	1.779	2.607	-1.07	+8.6	21.7	10.6/278	139.6
Jan. 13	09 34.85	+17 34.1	1.755	2.661	-1.13	+8.7	21.9	13.5/279	151.5
Jan. 23	09 25.53	+17 54.1	1.756	2.715	-1.18	+8.6	22.1	14.8/278	163.9
Feb. 2	09 15.26	+18 14.3	1.785	2.769	-1.21	+8.3	22.4	14.4/277	176.0
Feb. 12	09 05.18	+18 30.6	1.844	2.822	-1.21	+7.8	22.7	12.6/275	170.7
Feb. 22	08 56.38	+18 40.0	1.932	2.875	-1.18	+7.2	23.0	9.6/271	158.6
Mar. 3	08 49.61	+18 41.5	2.046	2.928	-1.12	+6.6	.	6.2/264	147.1
Mar. 13	08 45.28	+18 35.1	2.183	2.981	-1.05	+6.1	.	2.9/242	136.1
Mar. 23	08 43.49	+18 21.3	2.340	3.033	-0.98	+5.6	.	2.2/157	125.8

Comet 57P/du Toit-Neujmin-Delporte

Epoch = 2015 June 27.0 TT
 T = 2015 May 22.25716 TT
 Peri. = 115.20934 e = 0.4992984
 Node = 188.80908 2000.0 a = 3.4528254 AU
 Incl. = 2.84793 n = 0.15361801
 q = 1.7288352 AU P = 6.42 years

$$m1 = 10.2 + 5 \log(\Delta) + 20.0 \log(r(t-50))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	16 59.53	-21 02.4	2.879	2.102	+2.49 -2.3	19.9	31.3
Jan. 18	17 24.44	-21 25.1	2.773	2.055	+2.56 -0.8	19.7	35.7
Jan. 28	17 49.99	-21 32.8	2.665	2.011	+2.61 +0.8	19.4	39.9
Feb. 7	18 16.05	-21 24.3	2.555	1.968	+2.64 +2.5	19.1	44.0
Feb. 17	18 42.49	-20 58.9	2.446	1.928	+2.66 +4.3	18.8	47.9
Feb. 27	19 09.14	-20 16.1	2.338	1.891	+2.67 +6.0	18.5	51.7
Mar. 9	19 35.82	-19 16.1	2.232	1.857	+2.66 +7.7	18.2	55.4
Mar. 19	20 02.38	-17 59.6	2.129	1.826	+2.63 +9.2	17.9	58.9
Mar. 29	20 28.64	-16 27.9	2.030	1.799	+2.58 +10.5	17.6	62.4
Apr. 8	20 54.44	-14 42.7	1.935	1.776	+2.52 +11.6	17.3	65.8
Apr. 18	21 19.67	-12 46.3	1.844	1.757	+2.45 +12.5	17.1	69.1
Apr. 28	21 44.15	-10 41.5	1.757	1.743	+2.36 +13.0	16.8	72.5
May 8	22 07.78	-08 31.5	1.675	1.734	+2.26 +13.2	16.6	76.0
May 18	22 30.43	-06 19.5	1.597	1.729	+2.15 +13.0	16.3	79.6
May 28	22 51.92	-04 09.1	1.522	1.730	+2.02 +12.5	16.1	83.5
June 7	23 12.09	-02 03.7	1.451	1.735	+1.86 +11.7	15.9	87.6
June 17	23 30.74	-00 06.8	1.383	1.745	+1.68 +10.5	15.7	92.1
June 27	23 47.58	+01 38.2	1.317	1.760	+1.48 +9.0	15.6	97.0
July 7	00 02.33	+03 08.2	1.255	1.779	+1.23 +7.2	15.5	102.6
July 17	00 14.64	+04 19.9	1.197	1.803	+0.95 +5.1	15.3	108.8
July 27	00 24.09	+05 10.6	1.143	1.831	+0.63 +2.7	15.3	115.9
Aug. 6	00 30.37	+05 37.9	1.096	1.862	+0.28 +0.2	15.2	123.8
Aug. 16	00 33.21	+05 40.1	1.057	1.896	-0.06 -2.3	15.2	132.7
Aug. 26	00 32.58	+05 17.1	1.031	1.934	-0.37 -4.5	15.3	142.7
Sept. 5	00 28.90	+04 31.7	1.020	1.974	-0.60 -6.2	15.4	153.5
Sept. 15	00 22.94	+03 29.6	1.029	2.017	-0.70 -7.0	15.5	165.0
Sept. 25	00 15.94	+02 20.1	1.060	2.062	-0.67 -6.7	15.7	176.8
Oct. 5	00 09.26	+01 13.3	1.114	2.109	-0.53 -5.5	16.0	171.4
Oct. 15	00 04.01	+00 18.1	1.192	2.157	-0.30 -3.8	16.3	159.9
Oct. 25	00 00.99	-00 19.5	1.293	2.206	-0.05 -1.8	16.7	149.1
Nov. 4	00 00.50	-00 37.5	1.413	2.257	+0.20 +0.1	17.0	138.8
Nov. 14	00 02.52	-00 36.1	1.551	2.308	+0.43 +1.9	17.4	129.3
Nov. 24	00 06.85	-00 17.1	1.702	2.360	+0.63 +3.4	17.8	120.3
Dec. 4	00 13.17	+00 16.8	1.865	2.412	+0.80 +4.6	18.2	111.9
Dec. 14	00 21.15	+01 02.9	2.037	2.465	+0.94 +5.6	18.6	103.8
Dec. 24	00 30.51	+01 59.0	2.215	2.518	+1.05 +6.4	19.0	96.2
Jan. 3	00 40.97	+03 02.6	2.397	2.572	+1.14 +6.9	19.4	88.8
Jan. 13	00 52.34	+04 11.8	2.580	2.625	+1.21 +7.3	19.7	81.7
Jan. 23	01 04.44	+05 25.0	2.763	2.678	+1.27 +7.5	20.1	74.7
Feb. 2	01 17.11	+06 40.5	2.944	2.732	+1.31 +7.7	20.4	68.0
Feb. 12	01 30.25	+07 57.0	3.120	2.784	+1.35 +7.6	20.7	61.3
Feb. 22	01 43.76	+09 13.4	3.289	2.837	+1.38 +7.5	21.0	54.8
Mar. 3	01 57.56	+10 28.7	3.451	2.890	+1.40 +7.3	21.3	48.4
Mar. 13	02 11.58	+11 41.9	3.603	2.942	+1.42 +7.0	21.5	42.1
Mar. 23	02 25.77	+12 52.4	3.744	2.993	+1.43 +6.7	21.8	35.8

Comet 19P/Borrelly

Epoch = 2015 June 27.0 TT
 T = 2015 May 28.91606 TT
 Peri. = 353.45865
 Node = 75.37712 2000.0
 Incl. = 30.36797
 q = 1.3489574 AU
 e = 0.6254251
 a = 3.6013022 AU
 n = 0.14421643
 P = 6.83 years

$$m_1 = 7.0 + 5 \log(\Delta) + 20.0 \log(r(t-60))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m ₁	Elong. °
Jan. 8	22 27.59	-34 32.5	2.635	2.042	+2.13 +17.1	17.0	43.8
Jan. 18	22 48.94	-31 41.2	2.624	1.970	+2.20 +18.5	16.7	39.7
Jan. 28	23 10.91	-28 36.3	2.606	1.899	+2.25 +19.9	16.4	36.0
Feb. 7	23 33.42	-25 17.6	2.582	1.829	+2.30 +21.3	16.1	32.5
Feb. 17	23 56.43	-21 45.1	2.554	1.761	+2.35 +22.6	15.8	29.4
Feb. 27	00 19.95	-17 59.4	2.524	1.696	+2.40 +23.8	15.5	26.4
Mar. 9	00 43.98	-14 01.7	2.493	1.633	+2.46 +24.8	15.2	23.7
Mar. 19	01 08.60	-09 53.3	2.462	1.574	+2.53 +25.7	14.8	21.1
Mar. 29	01 33.87	-05 36.7	2.434	1.520	+2.60 +26.2	14.5	18.5
Apr. 8	01 59.89	-01 14.6	2.409	1.472	+2.69 +26.4	14.2	15.9
Apr. 18	02 26.79	+03 09.4	2.388	1.430	+2.79 +26.2	13.8	13.4
Apr. 28	02 54.69	+07 31.1	2.372	1.396	+2.90 +25.5	13.5	10.8
May 8	03 23.72	+11 45.7	2.363	1.371	+3.03 +24.2	13.1	8.1
May 18	03 54.02	+15 48.0	2.359	1.355	+3.16 +22.5	12.8	5.4
May 28	04 25.65	+19 32.5	2.360	1.349	+3.30 +20.1	12.5	2.7
June 7	04 58.62	+22 53.9	2.368	1.353	+3.42 +17.3	12.2	0.3
June 17	05 32.85	+25 47.2	2.381	1.367	+3.53 +14.1	12.0	2.9
June 27	06 08.11	+28 08.7	2.399	1.391	+3.59 +10.7	11.8	5.6
July 7	06 44.02	+29 55.6	2.422	1.423	+3.61 +7.2	11.7	8.4
July 17	07 20.14	+31 07.2	2.448	1.464	+3.58 +3.7	11.6	11.1
July 27	07 55.91	+31 44.6	2.478	1.511	+3.49 +0.6	11.6	13.8
Aug. 6	08 30.83	+31 50.7	2.510	1.564	+3.36 -2.1	11.6	16.5
Aug. 16	09 04.48	+31 29.7	2.543	1.622	+3.21 -4.3	11.7	19.3
Aug. 26	09 36.55	+30 46.7	2.576	1.684	+3.03 -5.9	11.9	22.2
Sept. 5	10 06.85	+29 47.3	2.608	1.749	+2.85 -7.1	12.1	25.2
Sept. 15	10 35.35	+28 36.6	2.638	1.816	+2.67 -7.7	12.4	28.4
Sept. 25	11 02.05	+27 19.6	2.664	1.886	+2.50 -7.9	12.7	31.7
Oct. 5	11 27.02	+26 00.7	2.685	1.957	+2.33 -7.7	13.0	35.4
Oct. 15	11 50.36	+24 43.7	2.700	2.028	+2.18 -7.2	13.4	39.3
Oct. 25	12 12.14	+23 31.8	2.708	2.101	+2.03 -6.4	13.7	43.5
Nov. 4	12 32.43	+22 27.8	2.708	2.173	+1.89 -5.4	14.0	48.0
Nov. 14	12 51.28	+21 34.0	2.700	2.246	+1.74 -4.1	14.3	52.9
Nov. 24	13 08.69	+20 52.6	2.683	2.318	+1.59 -2.8	14.7	58.1
Dec. 4	13 24.63	+20 25.1	2.658	2.391	+1.44 -1.2	15.0	63.7
Dec. 14	13 39.02	+20 13.0	2.625	2.462	+1.27 +0.4	15.2	69.7
Dec. 24	13 51.75	+20 17.3	2.585	2.534	+1.09 +2.1	15.5	76.0
Jan. 3	14 02.66	+20 38.7	2.539	2.604	+0.89 +3.8	15.8	82.7
Jan. 13	14 11.57	+21 17.1	2.490	2.674	+0.67 +5.5	16.0	89.8
Jan. 23	14 18.22	+22 12.0	2.440	2.743	+0.42 +6.9	16.2	97.2
Feb. 2	14 22.41	+23 21.3	2.393	2.812	+0.15 +8.1	16.5	104.9
Feb. 12	14 23.89	+24 42.1	2.351	2.879	-0.14 +8.7	16.7	112.7
Feb. 22	14 22.51	+26 09.2	2.318	2.946	-0.42 +8.7	16.9	120.5
Mar. 3	14 18.26	+27 35.9	2.300	3.012	-0.69 +7.9	17.1	127.9
Mar. 13	14 11.33	+28 54.5	2.300	3.077	-0.91 +6.2	17.4	134.3
Mar. 23	14 02.21	+29 56.5	2.320	3.141	-1.05 +3.9	17.6	139.0

Comet 34D/Gale

Epoch = 2015 June 27.0 TT
 T = 2015 June 7.53589 TT
 Peri. = 217.96649
 Node = 58.00910 2000.0
 Incl. = 10.60996
 q = 1.2067509 AU
 e = 0.7589186
 a = 5.0055745 AU
 n = 0.08800821
 P = 11.20 years

$$m1 = 16.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	14 01.06	-02 59.0	2.201	2.218	-1.28 +10.6	21.4	27.9/108	78.1
Jan. 18	14 18.75	-04 26.1	2.002	2.128	-1.47 +11.8	21.0	28.8/108	83.5
Jan. 28	14 37.11	-05 52.3	1.806	2.038	-1.70 +13.2	20.6	29.9/107	88.8
Feb. 7	14 56.29	-07 18.3	1.617	1.949	-1.98 +14.8	20.1	31.3/107	93.8
Feb. 17	15 16.50	-08 45.4	1.436	1.861	-2.34 +16.6	19.7	33.0/106	98.6
Feb. 27	15 37.99	-10 15.2	1.265	1.773	-2.77 +18.6	19.2	35.4/106	103.0
Mar. 9	16 01.17	-11 50.5	1.105	1.688	-3.32 +20.6	18.7	38.7/106	107.1
Mar. 19	16 26.63	-13 34.8	0.957	1.605	-4.01 +22.6	18.2	43.0/107	110.5
Mar. 29	16 55.15	-15 32.5	0.825	1.526	-4.87 +24.0	17.6	48.9/107	113.3
Apr. 8	17 27.87	-17 47.6	0.708	1.452	-5.91 +24.0	17.1	56.4/107	115.2
Apr. 18	18 06.18	-20 21.4	0.610	1.384	-7.11 +21.2	16.5	65.1/107	116.0
Apr. 28	18 51.37	-23 07.6	0.532	1.325	-8.30 +13.3	16.1	73.5/105	115.4
May 8	19 43.92	-25 46.6	0.476	1.276	-9.13 -1.3	15.6	78.5/102	113.5
May 18	20 41.89	-27 47.4	0.442	1.239	-9.13 -21.5	15.4	77.4/ 98	110.7
May 28	21 40.37	-28 44.9	0.429	1.215	-8.14 -41.5	15.2	70.0/ 93	107.8
June 7	22 33.63	-28 39.7	0.434	1.207	-6.59 -55.8	15.2	58.5/ 88	105.7
June 17	23 17.85	-27 56.8	0.449	1.214	-5.13 -63.5	15.3	45.6/ 85	105.2
June 27	23 51.92	-27 04.2	0.470	1.235	-4.08 -66.6	15.5	33.1/ 84	106.5
July 7	00 16.40	-26 20.6	0.494	1.271	-3.50 -67.2	15.7	21.4/ 84	109.6
July 17	00 32.16	-25 55.2	0.519	1.319	-3.29 -66.6	16.0	10.5/ 87	114.5
July 27	00 39.92	-25 48.3	0.545	1.377	-3.34 -65.0	16.3	1.0/121	120.9
Aug. 6	00 40.53	-25 53.2	0.574	1.444	-3.55 -62.2	16.6	7.6/265	128.7
Aug. 16	00 34.95	-25 59.4	0.609	1.518	-3.80 -57.8	16.9	13.8/272	137.4
Aug. 26	00 24.76	-25 53.4	0.654	1.596	-3.97 -51.9	17.3	17.3/279	146.2
Sept. 5	00 12.17	-25 24.4	0.714	1.679	-3.98 -44.9	17.7	18.2/287	153.7
Sept. 15	23 59.45	-24 28.3	0.792	1.764	-3.80 -37.8	18.2	17.0/298	157.6
Sept. 25	23 48.56	-23 07.2	0.889	1.851	-3.48 -31.2	18.6	14.8/312	156.0
Oct. 5	23 40.65	-21 27.9	1.007	1.940	-3.08 -25.8	19.1	12.8/329	150.1
Oct. 15	23 36.03	-19 37.6	1.144	2.029	-2.68 -21.4	19.6	11.8/350	142.5
Oct. 25	23 34.62	-17 41.7	1.300	2.118	-2.31 -17.9	20.0	11.9/ 10	134.4
Nov. 4	23 35.99	-15 44.3	1.472	2.208	-1.98 -15.2	20.5	12.9/ 25	126.2
Nov. 14	23 39.67	-13 47.3	1.657	2.297	-1.70 -13.1	20.9	14.1/ 35	118.2
Nov. 24	23 45.23	-11 51.7	1.855	2.386	-1.47 -11.4	21.3	15.4/ 43	110.4
Dec. 4	23 52.28	-09 58.2	2.061	2.474	-1.28 -10.0	21.7	16.5/ 48	102.8
Dec. 14	00 00.51	-08 07.0	2.275	2.562	-1.11 -8.8	22.1	17.5/ 52	95.4
Dec. 24	00 09.68	-06 18.0	2.492	2.649	-0.98 -7.8	22.4	18.2/ 54	88.1
Jan. 3	00 19.55	-04 31.5	2.712	2.735	-0.87 -7.0	22.7	18.8/ 56	80.9
Jan. 13	00 29.99	-02 47.5	2.931	2.820	-0.77 -6.3	23.0	19.2/ 58	73.9
Jan. 23	00 40.87	-01 06.1	3.146	2.904	-0.69 -5.7	.	19.5/ 60	66.9
Feb. 2	00 52.07	+00 32.4	3.357	2.988	-0.62 -5.1	.	19.6/ 61	60.0
Feb. 12	01 03.51	+02 07.8	3.560	3.070	-0.56 -4.6	.	19.7/ 62	53.1
Feb. 22	01 15.12	+03 40.0	3.753	3.151	-0.51 -4.2	.	19.6/ 63	46.3
Mar. 3	01 26.82	+05 08.6	3.934	3.232	-0.47 -3.8	.	19.5/ 64	39.5
Mar. 13	01 38.58	+06 33.6	4.103	3.311	-0.43 -3.5	.	19.3/ 65	32.8
Mar. 23	01 50.33	+07 54.6	4.257	3.390	-0.40 -3.2	.	19.0/ 66	26.1

Comet P/2009 Q4 (Boattini)

Epoch = 2015 June 27.0 TT
 T = 2015 June 13.38235 TT
 Peri. = 320.13191
 Node = 127.59782 2000.0
 Incl. = 10.98079
 q = 1.3169864 AU

e = 0.5800190
 a = 3.1358238 AU
 n = 0.17749111
 P = 5.55 years

m1 = 16.4 + 5 log(Delta) + 7.5 log(r) (post-T & r>1.8AU)
 m1 = 12.0 + 5 log(Delta) + 25.0 log(r) (else)

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot. /PA	Elong.
2015/16	h m	° '			for T=+1 day			
Jan. 8	22 40.56	-15 36.3	2.601	2.092	-0.78 -2.1	22.1	27.6/ 69	49.0
Jan. 18	22 58.19	-13 53.5	2.620	2.023	-0.81 -2.6	21.7	29.7/ 68	43.5
Jan. 28	23 16.99	-12 00.2	2.627	1.954	-0.85 -3.2	21.4	31.8/ 68	38.4
Feb. 7	23 36.88	-09 56.7	2.625	1.885	-0.90 -3.9	21.0	33.8/ 67	33.7
Feb. 17	23 57.88	-07 43.5	2.613	1.818	-0.96 -4.5	20.6	35.9/ 67	29.4
Feb. 27	00 20.00	-05 21.4	2.593	1.752	-1.02 -5.2	20.2	37.9/ 67	25.5
Mar. 9	00 43.28	-02 51.4	2.566	1.687	-1.09 -5.9	19.7	40.0/ 67	22.0
Mar. 19	01 07.81	-00 14.8	2.534	1.625	-1.17 -6.6	19.3	42.0/ 67	18.9
Mar. 29	01 33.68	+02 26.6	2.499	1.566	-1.26 -7.2	18.9	44.0/ 68	16.3
Apr. 8	02 00.97	+05 10.1	2.463	1.511	-1.35 -7.7	18.4	45.9/ 69	14.0
Apr. 18	02 29.80	+07 52.8	2.428	1.461	-1.45 -8.0	18.0	47.8/ 70	12.1
Apr. 28	03 00.24	+10 30.9	2.395	1.417	-1.56 -8.2	17.7	49.4/ 72	10.5
May 8	03 32.30	+12 59.7	2.367	1.380	-1.66 -8.0	17.4	50.8/ 74	9.2
May 18	04 05.95	+15 14.2	2.345	1.351	-1.76 -7.6	17.1	51.8/ 76	8.1
May 28	04 41.02	+17 09.3	2.330	1.330	-1.85 -6.8	16.9	52.4/ 79	7.0
June 7	05 17.22	+18 40.2	2.324	1.319	-1.91 -5.8	16.8	52.7/ 82	6.0
June 17	05 54.15	+19 43.0	2.327	1.318	-1.94 -4.5	16.8	52.5/ 85	5.0
June 27	06 31.31	+20 15.6	2.338	1.326	-1.95 -3.0	16.9	51.8/ 88	3.9
July 7	07 08.16	+20 17.5	2.359	1.344	-1.91 -1.6	17.1	50.9/ 91	2.7
July 17	07 44.20	+19 50.5	2.387	1.371	-1.85 -0.2	17.3	49.5/ 95	1.5
July 27	08 19.03	+18 57.7	2.421	1.406	-1.76 +0.9	17.6	48.0/ 98	1.0
Aug. 6	08 52.33	+17 43.3	2.461	1.448	-1.66 +1.9	18.0	46.3/100	2.4
Aug. 16	09 23.97	+16 12.1	2.505	1.497	-1.55 +2.6	18.4	44.5/102	4.4
Aug. 26	09 53.88	+14 28.9	2.550	1.551	-1.43 +3.1	18.8	42.6/104	6.8
Sept. 5	10 22.09	+12 37.8	2.594	1.608	-1.32 +3.4	19.2	40.8/106	9.5
Sept. 15	10 48.72	+10 42.8	2.637	1.670	-1.22 +3.6	19.7	38.9/107	12.5
Sept. 25	11 13.84	+08 47.2	2.677	1.733	-1.12 +3.6	20.1	37.1/107	15.8
Oct. 5	11 37.57	+06 53.7	2.711	1.799	-1.03 +3.5	20.5	35.3/108	19.5
Oct. 15	12 00.04	+05 04.4	2.738	1.866	-0.96 +3.4	20.6	33.4/108	23.6
Oct. 25	12 21.31	+03 21.4	2.756	1.935	-0.88 +3.3	20.8	31.7/107	27.9
Nov. 4	12 41.45	+01 45.9	2.766	2.003	-0.82 +3.1	20.9	29.8/107	32.6
Nov. 14	13 00.50	+00 19.4	2.765	2.073	-0.77 +2.9	21.0	28.0/106	37.7
Nov. 24	13 18.44	-00 57.1	2.753	2.142	-0.72 +2.8	21.1	26.1/105	43.1
Dec. 4	13 35.26	-02 02.7	2.730	2.211	-0.68 +2.7	21.2	24.0/103	48.9
Dec. 14	13 50.89	-02 56.5	2.696	2.279	-0.64 +2.6	21.2	21.9/101	55.0
Dec. 24	14 05.21	-03 38.0	2.651	2.347	-0.62 +2.5	21.3	19.5/ 99	61.5
Jan. 3	14 18.11	-04 06.5	2.596	2.415	-0.60 +2.6	21.3	17.0/ 95	68.4
Jan. 13	14 29.42	-04 21.6	2.533	2.482	-0.58 +2.6	21.4	14.2/ 91	75.8
Jan. 23	14 38.92	-04 23.0	2.463	2.548	-0.58 +2.8	21.4	11.3/ 84	83.6
Feb. 2	14 46.41	-04 10.4	2.389	2.613	-0.58 +3.0	21.4	8.3/ 72	91.8
Feb. 12	14 51.65	-03 44.2	2.314	2.677	-0.59 +3.2	21.4	5.7/ 47	100.6
Feb. 22	14 54.42	-03 04.8	2.241	2.741	-0.61 +3.5	21.4	5.1/ 3	109.9
Mar. 3	14 54.60	-02 13.8	2.176	2.803	-0.64 +3.9	21.4	7.1/328	119.8
Mar. 13	14 52.11	-01 13.5	2.122	2.865	-0.68 +4.2	21.5	10.0/311	130.0
Mar. 23	14 47.13	-00 07.5	2.086	2.925	-0.72 +4.6	21.5	12.6/302	140.6

Comet P/2010 B2 (WISE)

Epoch = 2015 June 27.0 TT
 T = 2015 June 13.44501 TT
 Peri. = 155.95035
 Node = 0.85235 2000.0
 Incl. = 8.93837
 q = 1.6119593 AU

e = 0.4811788
 a = 3.1069650 AU
 n = 0.17996976
 P = 5.48 years

H = 17.0 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	V	Mot. /PA ' °	Elong. °
Jan. 8	03 47.22	+34 31.8	1.326	2.125	-1.97 -10.3	20.2	5.0/208	133.4
Jan. 18	03 45.37	+33 47.4	1.364	2.074	-1.83 -9.8	20.4	5.1/138	123.3
Jan. 28	03 48.06	+33 09.3	1.413	2.023	-1.72 -9.0	20.5	9.3/108	114.0
Feb. 7	03 55.07	+32 40.2	1.468	1.975	-1.65 -8.0	20.6	13.9/98	105.5
Feb. 17	04 05.97	+32 19.5	1.526	1.927	-1.60 -6.9	20.7	18.3/94	97.8
Feb. 27	04 20.38	+32 05.1	1.585	1.882	-1.58 -5.7	20.7	22.3/92	90.9
Mar. 9	04 37.87	+31 53.4	1.643	1.838	-1.59 -4.5	20.8	25.7/92	84.6
Mar. 19	04 58.03	+31 40.2	1.699	1.798	-1.60 -3.2	20.8	28.8/92	79.0
Mar. 29	05 20.54	+31 21.5	1.753	1.760	-1.63 -1.8	20.8	31.5/94	73.9
Apr. 8	05 45.00	+30 53.1	1.804	1.726	-1.65 -0.3	20.8	33.9/95	69.3
Apr. 18	06 11.04	+30 11.4	1.852	1.696	-1.67 +1.2	20.9	36.0/98	65.1
Apr. 28	06 38.30	+29 13.4	1.899	1.669	-1.68 +2.8	20.9	37.8/100	61.4
May 8	07 06.37	+27 57.0	1.944	1.648	-1.68 +4.4	20.9	39.3/103	57.9
May 18	07 34.91	+26 21.0	1.989	1.631	-1.66 +5.9	20.9	40.5/105	54.8
May 28	08 03.58	+24 25.3	2.035	1.619	-1.63 +7.4	20.9	41.5/107	51.9
June 7	08 32.08	+22 10.8	2.082	1.613	-1.59 +8.7	20.9	42.2/110	49.2
June 17	09 00.22	+19 39.2	2.131	1.612	-1.54 +9.8	20.9	42.7/112	46.6
June 27	09 27.86	+16 53.1	2.184	1.617	-1.48 +10.7	20.9	42.9/114	44.1
July 7	09 54.89	+13 55.2	2.239	1.627	-1.43 +11.3	20.9	43.0/115	41.7
July 17	10 21.30	+10 48.6	2.298	1.642	-1.37 +11.7	21.0	42.8/116	39.3
July 27	10 47.11	+07 36.5	2.360	1.663	-1.32 +11.9	21.0	42.4/117	36.8
Aug. 6	11 12.35	+04 22.0	2.425	1.687	-1.26 +11.9	21.1	41.9/117	34.3
Aug. 16	11 37.10	+01 07.8	2.494	1.717	-1.22 +11.6	21.1	41.2/118	31.7
Aug. 26	12 01.42	-02 03.5	2.565	1.750	-1.17 +11.2	21.1	40.4/118	28.9
Sept. 5	12 25.39	-05 09.6	2.637	1.786	-1.14 +10.7	21.2	39.6/117	26.0
Sept. 15	12 49.09	-08 08.8	2.710	1.826	-1.10 +10.0	21.2	38.7/117	23.0
Sept. 25	13 12.57	-10 59.4	2.782	1.869	-1.07 +9.3	21.2	37.7/116	19.7
Oct. 5	13 35.89	-13 40.0	2.853	1.914	-1.04 +8.6	21.3	36.8/115	16.3
Oct. 15	13 59.07	-16 09.6	2.921	1.961	-1.01 +7.8	21.3	35.8/113	12.8
Oct. 25	14 22.15	-18 27.5	2.984	2.009	-0.98 +7.0	21.3	34.8/112	9.2
Nov. 4	14 45.10	-20 33.0	3.043	2.059	-0.96 +6.2	21.3	33.8/111	6.0
Nov. 14	15 07.91	-22 25.7	3.095	2.110	-0.93 +5.4	21.3	32.7/109	4.7
Nov. 24	15 30.53	-24 05.6	3.139	2.162	-0.91 +4.6	21.5	31.7/107	7.0
Dec. 4	15 52.90	-25 32.6	3.174	2.215	-0.88 +3.9	21.6	30.6/105	11.1
Dec. 14	16 14.93	-26 47.1	3.199	2.268	-0.86 +3.2	21.8	29.4/103	15.8
Dec. 24	16 36.52	-27 49.5	3.214	2.321	-0.83 +2.5	22.0	28.3/102	20.8
Jan. 3	16 57.56	-28 40.7	3.217	2.375	-0.81 +1.9	22.1	27.0/100	26.2
Jan. 13	17 17.92	-29 21.5	3.208	2.428	-0.78 +1.4	22.2	25.7/98	31.8
Jan. 23	17 37.47	-29 53.3	3.188	2.482	-0.76 +0.9	22.3	24.3/97	37.6
Feb. 2	17 56.08	-30 17.2	3.155	2.535	-0.73 +0.4	22.4	22.7/96	43.6
Feb. 12	18 13.60	-30 35.0	3.111	2.588	-0.71 0.0	22.4	21.0/95	49.9
Feb. 22	18 29.89	-30 48.1	3.056	2.641	-0.69 -0.4	22.5	19.2/94	56.4
Mar. 3	18 44.80	-30 58.4	2.990	2.693	-0.68 -0.7	22.5	17.2/94	63.2
Mar. 13	18 58.16	-31 07.8	2.915	2.745	-0.67 -1.1	22.5	15.0/95	70.3
Mar. 23	19 09.79	-31 17.9	2.833	2.796	-0.67 -1.4	22.5	12.5/96	77.7

Comet 220P/McNaught

Epoch = 2015 June 27.0 TT
 T = 2015 June 13.75592 TT
 Peri. = 180.66965
 Node = 150.11344 2000.0
 Incl. = 8.12525
 q = 1.5539794 AU

e = 0.5014308
 a = 3.1168781 AU
 n = 0.17911187
 P = 5.50 years

$$m1 = 14.6 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	17 33.24	-17 39.5	2.973	2.115	+2.40	-1.1	21.0	24.2
Jan. 18	17 57.26	-17 50.5	2.870	2.060	+2.48	+0.3	20.8	28.5
Jan. 28	18 22.02	-17 47.6	2.763	2.006	+2.54	+1.8	20.6	32.7
Feb. 7	18 47.44	-17 29.8	2.654	1.953	+2.60	+3.3	20.4	36.7
Feb. 17	19 13.46	-16 56.6	2.543	1.902	+2.65	+4.9	20.1	40.5
Feb. 27	19 39.99	-16 07.5	2.432	1.853	+2.70	+6.5	19.9	44.0
Mar. 9	20 06.95	-15 02.7	2.323	1.806	+2.73	+8.0	19.6	47.4
Mar. 19	20 34.26	-13 42.6	2.216	1.761	+2.76	+9.4	19.4	50.6
Mar. 29	21 01.84	-12 08.3	2.114	1.720	+2.78	+10.7	19.2	53.6
Apr. 8	21 29.62	-10 21.2	2.016	1.682	+2.79	+11.8	18.9	56.3
Apr. 18	21 57.55	-08 23.4	1.924	1.648	+2.80	+12.6	18.7	58.9
Apr. 28	22 25.53	-06 17.5	1.838	1.619	+2.80	+13.1	18.5	61.4
May 8	22 53.51	-04 06.7	1.758	1.595	+2.79	+13.2	18.4	63.8
May 18	23 21.41	-01 54.3	1.684	1.576	+2.77	+13.0	18.2	66.2
May 28	23 49.10	+00 15.8	1.616	1.563	+2.74	+12.4	18.1	68.6
June 7	00 16.48	+02 19.7	1.554	1.555	+2.69	+11.4	18.0	71.0
June 17	00 43.37	+04 14.0	1.496	1.554	+2.62	+10.1	17.9	73.7
June 27	01 09.55	+05 54.9	1.442	1.559	+2.52	+8.5	17.8	76.6
July 7	01 34.76	+07 19.8	1.391	1.570	+2.40	+6.7	17.8	79.8
July 17	01 58.72	+08 26.3	1.342	1.587	+2.23	+4.6	17.7	83.4
July 27	02 21.03	+09 12.8	1.295	1.610	+2.03	+2.6	17.7	87.4
Aug. 6	02 41.33	+09 38.6	1.249	1.637	+1.78	+0.5	17.8	92.1
Aug. 16	02 59.18	+09 43.3	1.204	1.669	+1.49	-1.6	17.8	97.4
Aug. 26	03 14.09	+09 27.7	1.160	1.706	+1.15	-3.5	17.8	103.4
Sept. 5	03 25.63	+08 53.0	1.118	1.746	+0.77	-5.2	17.9	110.3
Sept. 15	03 33.34	+08 01.3	1.080	1.790	+0.36	-6.5	17.9	118.1
Sept. 25	03 36.89	+06 56.2	1.050	1.836	-0.06	-7.4	18.0	126.8
Oct. 5	03 36.24	+05 42.6	1.029	1.884	-0.46	-7.5	18.1	136.4
Oct. 15	03 31.68	+04 27.5	1.023	1.935	-0.76	-6.8	18.2	146.6
Oct. 25	03 24.06	+03 19.3	1.035	1.987	-0.93	-5.3	18.4	156.5
Nov. 4	03 14.75	+02 26.6	1.069	2.041	-0.95	-3.1	18.6	163.9
Nov. 14	03 05.27	+01 55.8	1.127	2.095	-0.82	-0.6	18.9	163.7
Nov. 24	02 57.11	+01 49.7	1.209	2.151	-0.59	+1.7	19.2	156.5
Dec. 4	02 51.24	+02 07.2	1.313	2.207	-0.31	+3.7	19.5	147.1
Dec. 14	02 48.14	+02 44.7	1.438	2.263	-0.02	+5.3	19.8	137.4
Dec. 24	02 47.91	+03 37.7	1.580	2.319	+0.24	+6.4	20.2	128.1
Jan. 3	02 50.33	+04 41.6	1.736	2.376	+0.48	+7.1	20.5	119.2
Jan. 13	02 55.08	+05 52.5	1.903	2.432	+0.68	+7.5	20.8	110.7
Jan. 23	03 01.85	+07 07.3	2.079	2.488	+0.84	+7.6	21.1	102.7
Feb. 2	03 10.27	+08 23.4	2.260	2.544	+0.98	+7.5	21.4	95.1
Feb. 12	03 20.09	+09 38.8	2.444	2.600	+1.10	+7.3	21.7	87.7
Feb. 22	03 31.05	+10 52.0	2.630	2.655	+1.19	+7.0	22.0	80.7
Mar. 3	03 42.94	+12 01.6	2.813	2.709	+1.27	+6.5	22.3	73.8
Mar. 13	03 55.59	+13 06.9	2.994	2.763	+1.33	+6.0	22.5	67.1
Mar. 23	04 08.85	+14 07.0	3.169	2.817	+1.37	+5.4	22.7	60.6

Comet 148P/Anderson-LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 June 13.78084 TT
 Peri. = 6.69928 e = 0.5394893
 Node = 89.78220 2000.0 a = 3.6741031 AU
 Incl. = 3.68195 n = 0.13995134
 q = 1.6919638 AU P = 7.04 years

$$m_1 = 11.4 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	00 04.89	-02 58.4	2.308	2.225	+1.33 +10.3	19.3	72.8
Jan. 18	00 18.22	-01 15.5	2.370	2.171	+1.49 +11.2	19.2	66.4
Jan. 28	00 33.14	+00 36.2	2.425	2.119	+1.63 +11.9	19.0	60.4
Feb. 7	00 49.48	+02 35.3	2.473	2.067	+1.77 +12.5	18.9	54.8
Feb. 17	01 07.19	+04 40.2	2.514	2.018	+1.90 +12.9	18.7	49.5
Feb. 27	01 26.22	+06 49.3	2.548	1.971	+2.03 +13.1	18.6	44.6
Mar. 9	01 46.52	+09 00.5	2.576	1.926	+2.16 +13.1	18.4	40.1
Mar. 19	02 08.10	+11 11.9	2.598	1.884	+2.29 +12.9	18.3	35.9
Mar. 29	02 30.98	+13 21.1	2.615	1.845	+2.42 +12.4	18.1	31.9
Apr. 8	02 55.13	+15 25.5	2.628	1.810	+2.54 +11.7	18.0	28.3
Apr. 18	03 20.57	+17 22.3	2.638	1.778	+2.67 +10.6	17.9	24.9
Apr. 28	03 47.25	+19 08.5	2.647	1.751	+2.78 +9.3	17.8	21.7
May 8	04 15.10	+20 41.1	2.654	1.729	+2.89 +7.6	17.7	18.7
May 18	04 44.00	+21 57.3	2.662	1.712	+2.98 +5.7	17.6	15.9
May 28	05 13.76	+22 54.4	2.670	1.700	+3.04 +3.6	17.6	13.2
June 7	05 44.13	+23 30.4	2.680	1.693	+3.07 +1.4	17.5	10.6
June 17	06 14.85	+23 44.1	2.692	1.692	+3.07 -0.9	17.5	8.1
June 27	06 45.59	+23 35.2	2.706	1.697	+3.05 -3.1	17.6	5.6
July 7	07 16.04	+23 04.0	2.721	1.707	+2.99 -5.2	17.6	3.2
July 17	07 45.94	+22 12.0	2.738	1.722	+2.91 -7.1	17.7	1.1
July 27	08 15.04	+21 01.3	2.757	1.743	+2.81 -8.7	17.8	2.5
Aug. 6	08 43.17	+19 34.6	2.776	1.768	+2.71 -10.0	17.9	5.2
Aug. 16	09 10.25	+17 54.7	2.795	1.798	+2.59 -11.0	18.1	8.1
Aug. 26	09 36.19	+16 04.7	2.812	1.832	+2.48 -11.7	18.2	11.3
Sept. 5	10 00.99	+14 07.5	2.828	1.869	+2.37 -12.2	18.4	14.6
Sept. 15	10 24.67	+12 05.7	2.840	1.910	+2.26 -12.4	18.6	18.2
Sept. 25	10 47.27	+10 02.0	2.847	1.954	+2.15 -12.3	18.8	22.1
Oct. 5	11 08.81	+07 58.6	2.849	2.001	+2.05 -12.1	18.9	26.2
Oct. 15	11 29.34	+05 57.4	2.844	2.049	+1.95 -11.7	19.1	30.6
Oct. 25	11 48.87	+04 00.3	2.832	2.100	+1.85 -11.2	19.3	35.3
Nov. 4	12 07.42	+02 08.7	2.812	2.152	+1.75 -10.5	19.5	40.3
Nov. 14	12 24.96	+00 24.0	2.782	2.206	+1.65 -9.7	19.6	45.6
Nov. 24	12 41.45	-01 12.6	2.744	2.261	+1.54 -8.7	19.8	51.2
Dec. 4	12 56.82	-02 40.1	2.696	2.316	+1.42 -7.7	19.9	57.2
Dec. 14	13 10.98	-03 57.5	2.640	2.372	+1.28 -6.6	20.1	63.6
Dec. 24	13 23.76	-05 04.0	2.575	2.429	+1.12 -5.5	20.2	70.4
Jan. 3	13 35.01	-05 58.8	2.504	2.486	+0.95 -4.2	20.3	77.6
Jan. 13	13 44.52	-06 41.2	2.427	2.544	+0.75 -2.9	20.4	85.4
Jan. 23	13 52.05	-07 10.7	2.347	2.601	+0.53 -1.6	20.5	93.6
Feb. 2	13 57.39	-07 26.7	2.267	2.659	+0.29 -0.2	20.6	102.4
Feb. 12	14 00.30	-07 29.0	2.190	2.716	+0.03 +1.1	20.7	111.8
Feb. 22	14 00.64	-07 17.7	2.121	2.773	-0.22 +2.4	20.8	121.8
Mar. 3	13 58.40	-06 53.6	2.065	2.830	-0.47 +3.5	20.9	132.5
Mar. 13	13 53.73	-06 18.4	2.026	2.887	-0.67 +4.3	21.0	143.7
Mar. 23	13 47.05	-05 35.1	2.009	2.943	-0.80 +4.7	21.1	155.2

Comet 196P/Tichy

Epoch = 2015 June 27.0 TT
 T = 2015 June 14.84819 TT
 Peri. = 11.95863
 Node = 24.25626 2000.0
 Incl. = 19.37778
 q = 2.1350141 AU
 e = 0.4343836
 a = 3.7746680 AU
 n = 0.13439588
 P = 7.33 years

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

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	22 15.27	-21 45.7	3.088	2.444	+1.67	+14.8	21.0	41.8
Jan. 18	22 31.96	-19 17.2	3.133	2.410	+1.70	+15.3	21.0	36.2
Jan. 28	22 49.00	-16 43.9	3.169	2.377	+1.73	+15.8	20.9	30.8
Feb. 7	23 06.31	-14 06.3	3.196	2.346	+1.75	+16.2	20.8	25.6
Feb. 17	23 23.85	-11 24.8	3.216	2.317	+1.78	+16.5	20.7	20.6
Feb. 27	23 41.61	-08 40.0	3.226	2.289	+1.80	+16.7	20.6	15.7
Mar. 9	23 59.57	-05 52.8	3.229	2.263	+1.82	+16.9	20.6	11.0
Mar. 19	00 17.73	-03 03.7	3.225	2.239	+1.84	+17.0	20.5	6.8
Mar. 29	00 36.11	-00 13.7	3.213	2.218	+1.86	+17.0	20.4	3.8
Apr. 8	00 54.71	+02 36.4	3.194	2.198	+1.89	+16.9	20.3	5.0
Apr. 18	01 13.58	+05 25.6	3.168	2.181	+1.92	+16.7	20.2	8.7
Apr. 28	01 32.74	+08 13.0	3.137	2.167	+1.95	+16.5	20.2	12.8
May 8	01 52.20	+10 57.7	3.100	2.155	+1.98	+16.1	20.1	17.0
May 18	02 12.00	+13 38.6	3.058	2.146	+2.01	+15.6	20.0	21.1
May 28	02 32.14	+16 14.8	3.011	2.140	+2.05	+15.1	20.0	25.3
June 7	02 52.64	+18 45.4	2.959	2.136	+2.08	+14.4	19.9	29.5
June 17	03 13.48	+21 09.6	2.903	2.135	+2.12	+13.7	19.9	33.8
June 27	03 34.64	+23 26.5	2.843	2.137	+2.14	+12.9	19.8	38.1
July 7	03 56.07	+25 35.5	2.780	2.142	+2.16	+12.1	19.8	42.4
July 17	04 17.70	+27 36.4	2.712	2.149	+2.17	+11.2	19.8	46.9
July 27	04 39.42	+29 28.8	2.642	2.160	+2.17	+10.4	19.8	51.4
Aug. 6	05 01.10	+31 13.0	2.568	2.173	+2.15	+9.6	19.7	56.1
Aug. 16	05 22.58	+32 49.5	2.491	2.188	+2.11	+9.0	19.7	61.0
Aug. 26	05 43.63	+34 19.2	2.412	2.206	+2.04	+8.4	19.7	66.2
Sept. 5	06 04.04	+35 43.5	2.330	2.227	+1.95	+8.1	19.7	71.5
Sept. 15	06 23.53	+37 04.2	2.247	2.249	+1.82	+7.9	19.7	77.2
Sept. 25	06 41.77	+38 23.5	2.163	2.274	+1.67	+8.0	19.7	83.2
Oct. 5	06 58.42	+39 43.7	2.080	2.301	+1.47	+8.4	19.7	89.5
Oct. 15	07 13.08	+41 07.2	1.998	2.329	+1.22	+8.9	19.7	96.3
Oct. 25	07 25.27	+42 36.1	1.919	2.359	+0.92	+9.5	19.7	103.5
Nov. 4	07 34.51	+44 11.4	1.847	2.391	+0.57	+10.1	19.8	111.1
Nov. 14	07 40.21	+45 52.7	1.783	2.425	+0.17	+10.4	19.8	119.1
Nov. 24	07 41.86	+47 36.9	1.731	2.459	-0.27	+10.1	19.8	127.3
Dec. 4	07 39.16	+49 17.9	1.695	2.495	-0.70	+8.9	19.9	135.4
Dec. 14	07 32.13	+50 46.6	1.677	2.532	-1.06	+6.6	20.0	142.7
Dec. 24	07 21.53	+51 52.7	1.681	2.570	-1.26	+3.5	20.1	148.2
Jan. 3	07 08.88	+52 28.0	1.709	2.608	-1.27	+0.1	20.2	150.3
Jan. 13	06 56.18	+52 28.9	1.760	2.648	-1.08	-3.1	20.4	148.3
Jan. 23	06 45.43	+51 58.3	1.836	2.688	-0.75	-5.5	20.6	143.0
Feb. 2	06 37.96	+51 03.5	1.933	2.729	-0.36	-7.1	20.9	136.0
Feb. 12	06 34.33	+49 52.9	2.049	2.770	+0.02	-7.9	21.1	128.1
Feb. 22	06 34.50	+48 33.8	2.182	2.812	+0.35	-8.2	21.4	120.1
Mar. 3	06 38.04	+47 11.6	2.327	2.854	+0.64	-8.2	21.6	112.2
Mar. 13	06 44.41	+45 49.1	2.482	2.896	+0.87	-8.1	21.9	104.5
Mar. 23	06 53.07	+44 27.9	2.644	2.938	+1.04	-8.0	22.1	97.0

Comet P/2012 F5 (Gibbs)

Epoch = 2015 June 27.0 TT
 T = 2015 June 16.42100 TT
 Peri. = 178.16858
 Node = 216.83608 2000.0
 Incl. = 9.73940
 q = 2.8802660 AU
 e = 0.0411426
 a = 3.0038523 AU
 n = 0.18931552
 P = 5.21 years

H = 16.8 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	V	Elong. °
Jan. 8	23 00.23	-01 07.4	3.283	2.898	+1.31 +5.6	22.6	58.8
Jan. 18	23 13.30	-00 11.5	3.397	2.896	+1.36 +6.3	22.6	52.0
Jan. 28	23 26.93	+00 51.2	3.500	2.894	+1.41 +6.8	22.6	45.4
Feb. 7	23 40.99	+01 59.3	3.593	2.892	+1.44 +7.2	22.6	38.9
Feb. 17	23 55.42	+03 11.8	3.673	2.891	+1.47 +7.6	22.6	32.6
Feb. 27	00 10.16	+04 27.5	3.742	2.889	+1.50 +7.8	22.6	26.4
Mar. 9	00 25.14	+05 45.5	3.797	2.887	+1.52 +7.9	22.5	20.4
Mar. 19	00 40.33	+07 04.6	3.840	2.886	+1.54 +7.9	22.4	14.4
Mar. 29	00 55.68	+08 23.8	3.868	2.885	+1.55 +7.8	22.3	8.6
Apr. 8	01 11.16	+09 42.2	3.883	2.884	+1.56 +7.7	22.2	3.2
Apr. 18	01 26.75	+10 59.0	3.884	2.883	+1.57 +7.4	22.2	3.7
Apr. 28	01 42.41	+12 13.1	3.871	2.882	+1.57 +7.1	22.4	9.2
May 8	01 58.10	+13 23.8	3.845	2.881	+1.57 +6.7	22.5	14.8
May 18	02 13.78	+14 30.3	3.807	2.881	+1.56 +6.2	22.5	20.5
May 28	02 29.42	+15 32.0	3.755	2.881	+1.55 +5.6	22.6	26.2
June 7	02 44.94	+16 28.2	3.691	2.880	+1.53 +5.0	22.6	31.9
June 17	03 00.28	+17 18.2	3.616	2.880	+1.51 +4.3	22.6	37.7
June 27	03 15.36	+18 01.7	3.530	2.880	+1.47 +3.6	22.6	43.6
July 7	03 30.09	+18 38.1	3.434	2.881	+1.43 +2.9	22.6	49.6
July 17	03 44.34	+19 07.1	3.328	2.881	+1.36 +2.1	22.6	55.7
July 27	03 57.97	+19 28.5	3.214	2.881	+1.29 +1.4	22.6	62.1
Aug. 6	04 10.83	+19 42.1	3.093	2.882	+1.19 +0.6	22.5	68.6
Aug. 16	04 22.74	+19 47.9	2.966	2.883	+1.07 -0.2	22.5	75.4
Aug. 26	04 33.46	+19 45.7	2.835	2.884	+0.93 -1.0	22.4	82.6
Sept. 5	04 42.79	+19 35.9	2.702	2.885	+0.77 -1.7	22.3	90.1
Sept. 15	04 50.45	+19 18.6	2.568	2.886	+0.57 -2.5	22.2	98.0
Sept. 25	04 56.17	+18 54.0	2.438	2.888	+0.35 -3.1	22.0	106.5
Oct. 5	04 59.68	+18 22.6	2.314	2.889	+0.11 -3.8	21.9	115.5
Oct. 15	05 00.76	+17 45.0	2.200	2.891	-0.15 -4.3	21.7	125.1
Oct. 25	04 59.27	+17 01.9	2.099	2.893	-0.40 -4.7	21.5	135.3
Nov. 4	04 55.30	+16 14.6	2.018	2.894	-0.62 -5.0	21.3	146.1
Nov. 14	04 49.13	+15 25.0	1.959	2.896	-0.78 -4.9	21.1	157.2
Nov. 24	04 41.35	+14 35.6	1.926	2.899	-0.85 -4.6	20.9	167.8
Dec. 4	04 32.84	+13 49.7	1.922	2.901	-0.83 -3.9	20.8	171.6
Dec. 14	04 24.54	+13 10.6	1.948	2.903	-0.71 -2.9	21.0	163.0
Dec. 24	04 17.42	+12 41.3	2.001	2.906	-0.53 -1.8	21.2	151.9
Jan. 3	04 12.16	+12 23.5	2.079	2.908	-0.30 -0.6	21.4	140.8
Jan. 13	04 09.19	+12 17.4	2.179	2.911	-0.05 +0.5	21.6	130.1
Jan. 23	04 08.69	+12 22.3	2.294	2.914	+0.19 +1.4	21.8	120.0
Feb. 2	04 10.61	+12 36.4	2.422	2.917	+0.42 +2.1	22.0	110.5
Feb. 12	04 14.77	+12 57.7	2.558	2.920	+0.62 +2.6	22.1	101.5
Feb. 22	04 20.96	+13 24.0	2.698	2.923	+0.80 +2.9	22.3	93.1
Mar. 3	04 28.93	+13 53.1	2.839	2.926	+0.95 +3.0	22.4	85.1
Mar. 13	04 38.45	+14 23.1	2.978	2.930	+1.08 +2.9	22.5	77.6
Mar. 23	04 49.29	+14 52.3	3.113	2.933	+1.20 +2.7	22.6	70.4

Comet C/2014 W11 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 June 17.28026 TT
 Peri. = 225.63064
 Node = 295.93678 2000.0
 Incl. = 12.70572
 q = 3.4269676 AU
 e = 0.6499456
 a = 9.7898144 AU
 n = 0.03217677
 P = 30.63 years

$$m1 = 6.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	09 18.67	+11 12.3	2.755	3.628	-0.44	-1.9	17.0	148.3
Jan. 18	09 14.27	+10 53.6	2.668	3.605	-0.55	-1.3	16.9	159.2
Jan. 28	09 08.81	+10 40.6	2.610	3.583	-0.60	-0.8	16.8	169.6
Feb. 7	09 02.85	+10 32.2	2.580	3.562	-0.58	-0.5	16.7	173.4
Feb. 17	08 57.02	+10 26.7	2.581	3.542	-0.51	-0.4	16.7	164.5
Feb. 27	08 51.96	+10 22.4	2.609	3.524	-0.38	-0.5	16.7	153.8
Mar. 9	08 48.20	+10 17.6	2.663	3.508	-0.21	-0.7	16.7	143.1
Mar. 19	08 46.09	+10 10.7	2.739	3.493	-0.02	-1.0	16.7	132.8
Mar. 29	08 45.85	+10 00.4	2.833	3.479	+0.17	-1.5	16.8	123.0
Apr. 8	08 47.52	+09 45.7	2.941	3.467	+0.35	-2.0	16.8	113.7
Apr. 18	08 51.01	+09 25.9	3.059	3.457	+0.52	-2.6	16.9	105.0
Apr. 28	08 56.19	+09 00.2	3.183	3.448	+0.67	-3.2	17.0	96.6
May 8	09 02.86	+08 28.5	3.311	3.440	+0.80	-3.8	17.0	88.8
May 18	09 10.84	+07 50.4	3.439	3.434	+0.91	-4.5	17.1	81.3
May 28	09 19.93	+07 05.9	3.566	3.430	+1.00	-5.1	17.2	74.1
June 7	09 29.96	+06 15.1	3.689	3.428	+1.08	-5.7	17.3	67.3
June 17	09 40.76	+05 18.0	3.808	3.427	+1.14	-6.3	17.3	60.7
June 27	09 52.20	+04 14.9	3.920	3.428	+1.20	-6.9	17.4	54.3
July 7	10 04.15	+03 06.1	4.024	3.430	+1.24	-7.4	17.5	48.1
July 17	10 16.52	+01 52.1	4.120	3.434	+1.27	-7.9	17.5	42.1
July 27	10 29.21	+00 33.2	4.207	3.440	+1.29	-8.3	17.6	36.2
Aug. 6	10 42.14	-00 50.0	4.284	3.447	+1.31	-8.7	17.6	30.4
Aug. 16	10 55.26	-02 17.1	4.349	3.456	+1.32	-9.0	17.7	24.8
Aug. 26	11 08.51	-03 47.4	4.404	3.466	+1.33	-9.3	17.7	19.3
Sept. 5	11 21.83	-05 20.4	4.446	3.478	+1.34	-9.5	17.8	14.3
Sept. 15	11 35.19	-06 55.5	4.477	3.492	+1.33	-9.7	17.8	10.3
Sept. 25	11 48.53	-08 32.0	4.494	3.507	+1.33	-9.7	17.8	9.0
Oct. 5	12 01.81	-10 09.4	4.499	3.523	+1.32	-9.8	17.9	11.3
Oct. 15	12 14.98	-11 47.1	4.490	3.541	+1.30	-9.7	17.9	15.9
Oct. 25	12 27.99	-13 24.4	4.468	3.561	+1.28	-9.6	17.9	21.4
Nov. 4	12 40.77	-15 00.7	4.433	3.581	+1.25	-9.5	17.9	27.4
Nov. 14	12 53.26	-16 35.5	4.385	3.603	+1.21	-9.3	18.0	33.7
Nov. 24	13 05.36	-18 08.1	4.324	3.627	+1.16	-9.0	18.0	40.2
Dec. 4	13 16.98	-19 38.1	4.252	3.651	+1.10	-8.7	18.0	47.0
Dec. 14	13 28.00	-21 04.9	4.168	3.677	+1.03	-8.3	18.0	54.0
Dec. 24	13 38.29	-22 27.9	4.075	3.704	+0.94	-7.9	18.0	61.3
Jan. 3	13 47.70	-23 46.8	3.974	3.732	+0.84	-7.4	18.0	68.8
Jan. 13	13 56.06	-25 00.8	3.867	3.762	+0.71	-6.9	18.0	76.5
Jan. 23	14 03.19	-26 09.3	3.756	3.792	+0.57	-6.2	18.0	84.6
Feb. 2	14 08.91	-27 11.6	3.644	3.823	+0.41	-5.5	17.9	92.9
Feb. 12	14 13.05	-28 06.8	3.534	3.855	+0.24	-4.7	17.9	101.6
Feb. 22	14 15.46	-28 53.7	3.430	3.889	+0.06	-3.7	17.9	110.5
Mar. 3	14 16.08	-29 31.1	3.335	3.923	-0.12	-2.6	17.9	119.8
Mar. 13	14 14.90	-29 57.3	3.253	3.958	-0.28	-1.4	17.9	129.2
Mar. 23	14 12.07	-30 11.2	3.189	3.993	-0.42	-0.1	17.9	138.8

Comet P/2009 WX51 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2015 June 25.27240 TT
 Peri. = 118.08178
 Node = 31.68150 2000.0
 Incl. = 9.60043
 q = 0.7962626 AU

e = 0.7410912
 a = 3.0754559 AU
 n = 0.18274261
 P = 5.39 years

H = 19.8 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	V	Mot. /PA °	Elong. °
Jan. 8	00 10.89	+00 17.3	2.372	2.329	-0.31 -4.2	.	14.2/ 57	75.5
Jan. 18	00 18.83	+01 34.3	2.418	2.237	-0.32 -4.4	.	17.3/ 59	67.6
Jan. 28	00 28.74	+03 02.8	2.453	2.143	-0.35 -4.6	.	20.2/ 60	60.3
Feb. 7	00 40.50	+04 42.1	2.473	2.046	-0.39 -4.9	.	23.0/ 61	53.5
Feb. 17	00 54.04	+06 31.3	2.479	1.948	-0.43 -5.3	.	25.7/ 62	47.2
Feb. 27	01 09.37	+08 29.7	2.470	1.847	-0.50 -5.7	.	28.4/ 63	41.4
Mar. 9	01 26.56	+10 36.7	2.445	1.744	-0.58 -6.2	.	31.2/ 64	36.1
Mar. 19	01 45.75	+12 51.4	2.405	1.639	-0.68 -6.7	.	34.3/ 65	31.3
Mar. 29	02 07.21	+15 12.6	2.351	1.532	-0.81 -7.3	.	37.5/ 66	27.2
Apr. 8	02 31.26	+17 38.5	2.284	1.424	-0.97 -7.8	.	41.2/ 68	23.6
Apr. 18	02 58.39	+20 06.0	2.206	1.316	-1.18 -8.1	23.0	45.4/ 70	20.7
Apr. 28	03 29.19	+22 30.6	2.119	1.209	-1.43 -8.2	22.7	50.1/ 73	18.6
May 8	04 04.32	+24 44.6	2.025	1.105	-1.75 -7.8	22.4	55.4/ 76	17.4
May 18	04 44.50	+26 36.3	1.928	1.007	-2.13 -6.5	22.1	61.3/ 81	17.1
May 28	05 30.14	+27 49.0	1.831	0.920	-2.54 -3.9	21.9	67.4/ 86	17.8
June 7	06 21.04	+28 01.7	1.738	0.851	-2.92 +0.3	21.8	73.4/ 92	19.5
June 17	07 15.96	+26 52.9	1.654	0.808	-3.21 +6.0	21.7	78.4/ 99	22.1
June 27	08 12.64	+24 09.8	1.584	0.797	-3.31 +12.5	21.7	81.6/105	25.5
July 7	09 08.45	+19 55.8	1.535	0.820	-3.25 +18.5	21.8	82.5/111	29.4
July 17	10 01.49	+14 32.0	1.515	0.872	-3.08 +22.8	22.0	80.9/115	33.5
July 27	10 50.80	+08 30.7	1.528	0.948	-2.85 +24.8	22.2	77.0/118	37.4
Aug. 6	11 36.22	+02 24.8	1.574	1.039	-2.62 +24.7	22.4	71.5/119	40.6
Aug. 16	12 18.03	-03 20.3	1.651	1.140	-2.40 +23.0	22.7	65.3/119	42.9
Aug. 26	12 56.62	-08 29.0	1.753	1.245	-2.18 +20.3	22.9	59.1/118	44.1
Sept. 5	13 32.42	-12 55.4	1.877	1.353	-1.99 +17.3	.	53.4/116	44.3
Sept. 15	14 05.84	-16 39.6	2.016	1.461	-1.80 +14.4	.	48.4/114	43.5
Sept. 25	14 37.23	-19 45.1	2.166	1.569	-1.63 +11.7	.	44.1/111	41.9
Oct. 5	15 06.85	-22 16.3	2.322	1.675	-1.48 +9.4	.	40.6/109	39.5
Oct. 15	15 34.96	-24 17.9	2.480	1.779	-1.34 +7.4	.	37.6/106	36.4
Oct. 25	16 01.73	-25 54.3	2.638	1.882	-1.21 +5.8	.	35.1/104	32.9
Nov. 4	16 27.27	-27 08.9	2.792	1.982	-1.09 +4.4	.	33.0/101	28.8
Nov. 14	16 51.70	-28 04.9	2.940	2.080	-0.98 +3.4	.	31.1/ 99	24.4
Nov. 24	17 15.08	-28 45.0	3.078	2.175	-0.89 +2.5	.	29.5/ 96	19.8
Dec. 4	17 37.45	-29 11.4	3.206	2.268	-0.80 +1.8	.	28.0/ 94	14.9
Dec. 14	17 58.84	-29 26.2	3.322	2.359	-0.72 +1.2	.	26.7/ 92	10.2
Dec. 24	18 19.25	-29 31.1	3.423	2.448	-0.65 +0.7	.	25.4/ 90	6.7
Jan. 3	18 38.68	-29 27.9	3.508	2.535	-0.59 +0.4	.	24.1/ 89	7.1
Jan. 13	18 57.14	-29 18.1	3.576	2.620	-0.53 +0.1	.	22.9/ 87	11.5
Jan. 23	19 14.59	-29 03.3	3.627	2.702	-0.48 -0.1	.	21.6/ 86	17.1
Feb. 2	19 31.02	-28 44.9	3.660	2.783	-0.44 -0.3	.	20.4/ 85	23.3
Feb. 12	19 46.40	-28 24.4	3.675	2.862	-0.40 -0.5	.	19.0/ 84	29.9
Feb. 22	20 00.67	-28 03.2	3.672	2.938	-0.37 -0.6	.	17.5/ 84	36.7
Mar. 3	20 13.81	-27 42.7	3.652	3.014	-0.34 -0.7	.	16.0/ 84	43.7
Mar. 13	20 25.74	-27 24.4	3.616	3.087	-0.32 -0.8	.	14.3/ 85	50.9
Mar. 23	20 36.37	-27 09.7	3.564	3.158	-0.30 -0.9	.	12.4/ 86	58.4

Comet 233P/La Sagra

Epoch = 2015 June 27.0 TT
 T = 2015 June 25.44111 TT
 Peri. = 27.24826
 Node = 74.96774 2000.0
 Incl. = 11.27860
 q = 1.7865357 AU
 e = 0.4107632
 a = 3.0319486 AU
 n = 0.18669011
 P = 5.28 years

H = 16.6 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	V	Elong. °
Jan. 8	00 34.54	-04 49.2	2.187	2.220	+1.16 +13.1	21.2	79.0
Jan. 18	00 46.13	-02 37.9	2.264	2.178	+1.32 +13.7	21.2	72.4
Jan. 28	00 59.37	-00 20.6	2.336	2.137	+1.47 +14.2	21.2	66.2
Feb. 7	01 14.09	+02 01.0	2.403	2.098	+1.61 +14.5	21.2	60.3
Feb. 17	01 30.17	+04 25.6	2.464	2.060	+1.74 +14.6	21.2	54.9
Feb. 27	01 47.55	+06 51.8	2.518	2.023	+1.86 +14.6	21.2	49.7
Mar. 9	02 06.15	+09 17.7	2.566	1.989	+1.98 +14.4	21.2	44.8
Mar. 19	02 25.95	+11 41.9	2.608	1.956	+2.10 +14.0	21.1	40.2
Mar. 29	02 46.96	+14 02.3	2.643	1.925	+2.22 +13.5	21.1	35.9
Apr. 8	03 09.14	+16 16.9	2.674	1.897	+2.34 +12.7	21.0	31.8
Apr. 18	03 32.51	+18 23.6	2.700	1.872	+2.45 +11.7	20.9	27.9
Apr. 28	03 57.04	+20 20.1	2.721	1.850	+2.56 +10.4	20.9	24.2
May 8	04 22.67	+22 04.1	2.739	1.830	+2.67 +8.9	20.8	20.7
May 18	04 49.35	+23 33.4	2.755	1.814	+2.76 +7.2	20.7	17.3
May 28	05 16.95	+24 45.8	2.767	1.802	+2.83 +5.4	20.6	14.2
June 7	05 45.29	+25 39.5	2.778	1.793	+2.89 +3.4	20.6	11.2
June 17	06 14.20	+26 13.3	2.787	1.788	+2.92 +1.3	20.5	8.4
June 27	06 43.43	+26 26.3	2.795	1.787	+2.93 -0.8	20.4	5.9
July 7	07 12.71	+26 18.5	2.801	1.789	+2.91 -2.8	20.4	4.3
July 17	07 41.81	+25 50.3	2.807	1.795	+2.87 -4.7	20.4	4.5
July 27	08 10.49	+25 03.2	2.811	1.805	+2.81 -6.4	20.5	6.4
Aug. 6	08 38.55	+23 58.8	2.814	1.819	+2.73 -7.9	20.6	9.0
Aug. 16	09 05.85	+22 39.4	2.815	1.836	+2.64 -9.2	20.7	11.9
Aug. 26	09 32.29	+21 07.6	2.814	1.856	+2.55 -10.2	20.8	15.0
Sept. 5	09 57.79	+19 25.9	2.810	1.880	+2.46 -10.9	20.8	18.3
Sept. 15	10 22.36	+17 37.0	2.803	1.906	+2.36 -11.3	20.9	21.8
Sept. 25	10 45.96	+15 43.7	2.792	1.935	+2.27 -11.5	21.0	25.4
Oct. 5	11 08.63	+13 48.3	2.776	1.966	+2.17 -11.5	21.1	29.3
Oct. 15	11 30.37	+11 53.2	2.754	1.999	+2.08 -11.3	21.2	33.5
Oct. 25	11 51.21	+10 00.6	2.726	2.034	+1.99 -10.8	21.2	37.8
Nov. 4	12 11.13	+08 12.3	2.692	2.072	+1.90 -10.2	21.3	42.5
Nov. 14	12 30.13	+06 30.2	2.650	2.110	+1.80 -9.4	21.3	47.4
Nov. 24	12 48.16	+04 55.8	2.601	2.150	+1.70 -8.5	21.4	52.6
Dec. 4	13 05.16	+03 30.6	2.545	2.191	+1.59 -7.5	21.4	58.1
Dec. 14	13 21.03	+02 15.9	2.481	2.233	+1.46 -6.3	21.4	64.0
Dec. 24	13 35.63	+01 12.7	2.410	2.275	+1.32 -5.1	21.4	70.3
Jan. 3	13 48.81	+00 21.9	2.334	2.319	+1.15 -3.8	21.4	76.9
Jan. 13	14 00.34	-00 15.6	2.252	2.362	+0.96 -2.4	21.4	84.0
Jan. 23	14 09.98	-00 39.5	2.168	2.406	+0.75 -1.0	21.3	91.6
Feb. 2	14 17.47	-00 49.5	2.084	2.451	+0.51 +0.4	21.2	99.7
Feb. 12	14 22.53	-00 45.7	2.001	2.495	+0.24 +1.7	21.2	108.4
Feb. 22	14 24.90	-00 29.2	1.924	2.540	-0.05 +2.8	21.1	117.7
Mar. 3	14 24.43	-00 01.5	1.857	2.584	-0.33 +3.6	20.9	127.6
Mar. 13	14 21.09	+00 34.4	1.805	2.628	-0.59 +4.0	20.8	137.9
Mar. 23	14 15.16	+01 14.5	1.772	2.673	-0.80 +3.9	20.7	148.5

Comet P/2008 S1 (Catalina-McNaught)

Epoch = 2015 June 27.0 TT
 T = 2015 July 2.77274 TT
 Peri. = 203.66552 e = 0.6653652
 Node = 111.36268 2000.0 a = 3.5762610 AU
 Incl. = 15.07381 n = 0.14573379
 q = 1.1967414 AU P = 6.76 years

$$m1 = 16.0 + 5 \log(\Delta) + 12.5 \log(r)$$

Oh TT 2015/16	R. A. (2000)		Decl.	Delta	r	Variation for T=+1 day		m1	Mot. /PA	Elong.
	h	m	°						°	°
Jan. 8	15	38.88	-06 45.9	2.747	2.312	-0.98	+5.8	22.7	29.2/100	54.1
Jan. 18	15	58.24	-07 35.3	2.571	2.233	-1.10	+6.2	22.4	30.2/ 98	59.2
Jan. 28	16	18.37	-08 16.8	2.393	2.152	-1.23	+6.7	22.1	31.3/ 96	64.1
Feb. 7	16	39.33	-08 49.9	2.214	2.072	-1.39	+7.1	21.7	32.5/ 95	68.8
Feb. 17	17	01.22	-09 14.0	2.037	1.991	-1.58	+7.5	21.3	33.9/ 93	73.2
Feb. 27	17	24.13	-09 28.8	1.864	1.910	-1.80	+7.9	20.9	35.7/ 91	77.3
Mar. 9	17	48.23	-09 34.0	1.697	1.829	-2.05	+8.2	20.4	37.7/ 90	81.1
Mar. 19	18	13.73	-09 29.7	1.536	1.749	-2.34	+8.5	20.0	40.2/ 89	84.5
Mar. 29	18	40.89	-09 16.4	1.385	1.671	-2.68	+8.6	19.5	43.2/ 88	87.5
Apr. 8	19	10.05	-08 54.7	1.243	1.594	-3.06	+8.6	19.0	46.9/ 87	89.8
Apr. 18	19	41.64	-08 25.8	1.114	1.521	-3.48	+8.3	18.5	51.2/ 87	91.6
Apr. 28	20	16.08	-07 51.3	0.999	1.451	-3.92	+7.6	18.0	56.2/ 87	92.7
May 8	20	53.79	-07 13.3	0.900	1.387	-4.34	+6.3	17.5	61.5/ 87	93.0
May 18	21	34.97	-06 34.2	0.817	1.329	-4.68	+4.3	17.1	66.2/ 87	92.6
May 28	22	19.32	-05 56.9	0.754	1.280	-4.85	+1.4	16.7	69.6/ 88	91.7
June 7	23	05.93	-05 24.6	0.710	1.241	-4.79	-2.2	16.4	70.6/ 89	90.3
June 17	23	53.13	-04 60.0	0.684	1.214	-4.47	-6.4	16.2	68.4/ 89	88.9
June 27	00	38.89	-04 45.9	0.676	1.199	-3.97	-10.8	16.1	63.5/ 90	87.8
July 7	01	21.39	-04 43.7	0.680	1.198	-3.40	-15.2	16.1	56.8/ 91	87.5
July 17	01	59.37	-04 54.5	0.693	1.211	-2.87	-19.2	16.2	49.0/ 93	88.0
July 27	02	32.13	-05 18.9	0.711	1.236	-2.44	-22.7	16.4	41.0/ 96	89.6
Aug. 6	02	59.48	-05 56.7	0.730	1.273	-2.15	-25.8	16.6	33.0/ 99	92.3
Aug. 16	03	21.36	-06 47.4	0.747	1.321	-1.98	-28.4	16.9	25.1/105	96.1
Aug. 26	03	37.71	-07 49.5	0.763	1.378	-1.93	-30.5	17.2	17.5/114	101.0
Sept. 5	03	48.52	-08 60.0	0.775	1.441	-1.98	-32.2	17.4	10.6/134	107.0
Sept. 15	03	53.68	-10 14.1	0.788	1.510	-2.11	-33.4	17.7	7.0/185	114.1
Sept. 25	03	53.23	-11 24.2	0.802	1.583	-2.30	-33.7	18.0	10.0/236	122.1
Oct. 5	03	47.61	-12 20.3	0.822	1.659	-2.51	-33.0	18.3	14.9/258	130.8
Oct. 15	03	37.69	-12 51.6	0.854	1.737	-2.68	-31.1	18.7	18.5/271	139.4
Oct. 25	03	25.06	-12 48.8	0.901	1.816	-2.76	-28.2	19.0	20.0/281	146.8
Nov. 4	03	11.71	-12 08.6	0.967	1.897	-2.73	-24.7	19.4	19.5/292	151.2
Nov. 14	02	59.47	-10 54.2	1.054	1.978	-2.59	-21.1	19.8	17.5/305	150.8
Nov. 24	02	49.75	-09 13.2	1.164	2.059	-2.37	-17.8	20.3	15.3/320	146.2
Dec. 4	02	43.21	-07 15.5	1.295	2.140	-2.13	-15.0	20.7	13.5/339	139.2
Dec. 14	02	39.93	-05 09.5	1.444	2.220	-1.89	-12.7	21.1	12.8/358	131.2
Dec. 24	02	39.70	-03 01.2	1.611	2.300	-1.66	-10.8	21.6	13.2/ 16	123.0
Jan. 3	02	42.11	-00 54.7	1.791	2.379	-1.47	-9.3	22.0	14.1/ 30	115.0
Jan. 13	02	46.73	+01 07.7	1.982	2.457	-1.30	-8.1	22.4	15.2/ 40	107.1
Jan. 23	02	53.20	+03 04.5	2.181	2.534	-1.15	-7.0	22.7	16.2/ 47	99.4
Feb. 2	03	01.16	+04 54.9	2.385	2.611	-1.03	-6.1	.	17.2/ 53	91.9
Feb. 12	03	10.35	+06 38.6	2.592	2.686	-0.93	-5.4	.	18.0/ 57	84.6
Feb. 22	03	20.52	+08 15.3	2.799	2.760	-0.84	-4.7	.	18.6/ 61	77.5
Mar. 3	03	31.49	+09 44.9	3.004	2.833	-0.76	-4.2	.	19.0/ 64	70.6
Mar. 13	03	43.10	+11 07.3	3.204	2.905	-0.69	-3.7	.	19.3/ 67	63.8
Mar. 23	03	55.21	+12 22.6	3.398	2.976	-0.64	-3.3	.	19.5/ 69	57.1

Comet C/2014 Q1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 July 6.51228 TT
 Peri. = 120.05267
 Node = 8.76269 2000.0
 Incl. = 43.10781
 q = 0.3145604 AU
 e = 0.9996990

$$m_1 = 7.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	22 56.57	-21 27.8	3.738	3.215	+0.60	+9.8	15.1	51.2
Jan. 18	23 02.59	-19 50.2	3.728	3.085	+0.73	+10.3	15.0	43.2
Jan. 28	23 09.85	-18 07.4	3.698	2.953	+0.84	+10.8	14.7	35.6
Feb. 7	23 18.23	-16 19.3	3.647	2.818	+0.94	+11.4	14.5	28.3
Feb. 17	23 27.65	-14 25.5	3.575	2.680	+1.04	+12.0	14.2	21.5
Feb. 27	23 38.07	-12 25.3	3.481	2.539	+1.14	+12.8	14.0	15.2
Mar. 9	23 49.45	-10 17.6	3.365	2.394	+1.24	+13.7	13.6	10.1
Mar. 19	00 01.85	-08 01.0	3.229	2.246	+1.35	+14.7	13.3	7.6
Mar. 29	00 15.37	-05 33.5	3.072	2.093	+1.48	+16.1	12.8	9.2
Apr. 8	00 30.18	-02 52.6	2.897	1.936	+1.64	+17.8	12.4	13.1
Apr. 18	00 46.60	+00 05.5	2.706	1.773	+1.85	+20.0	11.8	17.3
Apr. 28	01 05.12	+03 25.7	2.502	1.604	+2.14	+22.9	11.2	21.1
May 8	01 26.52	+07 14.9	2.287	1.428	+2.56	+26.7	10.5	24.3
May 18	01 52.17	+11 41.8	2.067	1.244	+3.22	+31.4	9.7	26.3
May 28	02 24.40	+16 56.3	1.849	1.051	+4.31	+36.6	8.8	27.0
June 7	03 07.47	+23 02.6	1.642	0.847	+6.18	+39.1	7.6	25.4
June 17	04 09.30	+29 33.8	1.465	0.633	+9.23	+27.2	6.0	21.1
June 27	05 41.62	+34 06.0	1.334	0.423	+11.79	-25.6	4.1	13.8
July 7	07 39.51	+29 49.8	1.247	0.315	+9.00	-88.8	2.7	11.0
July 17	09 09.50	+15 01.6	1.186	0.442	+5.91	-94.5	4.0	21.4
July 27	10 08.65	-00 43.2	1.208	0.654	+4.67	-78.5	5.8	32.8
Aug. 6	10 55.39	-13 48.0	1.306	0.867	+4.09	-60.3	7.2	41.6
Aug. 16	11 36.27	-23 51.1	1.455	1.070	+3.74	-45.3	8.3	47.3
Aug. 26	12 13.69	-31 24.0	1.635	1.262	+3.51	-34.1	9.3	50.5
Sept. 5	12 48.76	-37 04.8	1.833	1.445	+3.33	-26.0	10.1	51.8
Sept. 15	13 22.10	-41 24.7	2.041	1.621	+3.20	-20.1	10.8	51.6
Sept. 25	13 54.07	-44 46.0	2.253	1.789	+3.08	-15.8	11.5	50.3
Oct. 5	14 24.90	-47 23.9	2.466	1.951	+2.99	-12.5	12.1	48.4
Oct. 15	14 54.75	-49 29.3	2.676	2.108	+2.90	-10.0	12.6	45.9
Oct. 25	15 23.70	-51 09.6	2.880	2.260	+2.81	-8.1	13.0	43.2
Nov. 4	15 51.79	-52 30.1	3.076	2.408	+2.73	-6.5	13.5	40.4
Nov. 14	16 19.05	-53 35.0	3.262	2.552	+2.64	-5.2	13.8	37.7
Nov. 24	16 45.45	-54 27.4	3.437	2.693	+2.55	-4.3	14.2	35.3
Dec. 4	17 10.95	-55 10.0	3.599	2.831	+2.46	-3.5	14.5	33.6
Dec. 14	17 35.54	-55 45.0	3.746	2.966	+2.36	-2.9	14.8	32.7
Dec. 24	17 59.14	-56 14.4	3.878	3.098	+2.26	-2.6	15.1	32.8
Jan. 3	18 21.72	-56 40.1	3.993	3.227	+2.15	-2.4	15.3	34.2
Jan. 13	18 43.24	-57 04.0	4.092	3.355	+2.04	-2.4	15.5	36.7
Jan. 23	19 03.62	-57 27.8	4.174	3.480	+1.92	-2.5	15.7	40.2
Feb. 2	19 22.84	-57 53.0	4.239	3.603	+1.80	-2.8	15.9	44.5
Feb. 12	19 40.83	-58 21.5	4.289	3.725	+1.67	-3.3	16.1	49.6
Feb. 22	19 57.51	-58 54.7	4.323	3.844	+1.53	-3.9	16.2	55.1
Mar. 3	20 12.82	-59 34.0	4.345	3.962	+1.38	-4.7	16.4	61.1
Mar. 13	20 26.64	-60 20.7	4.356	4.079	+1.22	-5.5	16.5	67.4
Mar. 23	20 38.81	-61 15.8	4.358	4.194	+1.03	-6.4	16.6	74.0

Comet 221P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 July 11.63659 TT
 Peri. = 39.94803
 Node = 229.75727 2000.0
 Incl. = 11.42323
 q = 1.7582906 AU

e = 0.4917868
 a = 3.4597500 AU
 n = 0.15315705
 P = 6.44 years

$$m1 = 13.2 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	14 07.89	-19 48.9	2.496	2.362	+1.71	-7.5	20.8	70.7
Jan. 18	14 25.03	-21 03.5	2.331	2.311	+1.71	-6.6	20.5	76.6
Jan. 28	14 42.10	-22 09.6	2.166	2.261	+1.69	-5.6	20.2	82.6
Feb. 7	14 58.97	-23 05.6	2.002	2.212	+1.65	-4.4	19.9	88.7
Feb. 17	15 15.44	-23 49.7	1.842	2.165	+1.58	-3.0	19.6	95.0
Feb. 27	15 31.24	-24 20.1	1.687	2.118	+1.48	-1.5	19.2	101.4
Mar. 9	15 46.09	-24 34.7	1.539	2.073	+1.35	+0.3	18.9	108.0
Mar. 19	15 59.61	-24 31.6	1.398	2.030	+1.17	+2.3	18.5	115.0
Mar. 29	16 11.35	-24 08.4	1.267	1.989	+0.95	+4.5	18.2	122.4
Apr. 8	16 20.89	-23 22.9	1.148	1.951	+0.69	+7.0	17.9	130.2
Apr. 18	16 27.79	-22 13.4	1.042	1.915	+0.39	+9.5	17.5	138.7
Apr. 28	16 31.73	-20 38.8	0.952	1.882	+0.10	+11.8	17.2	147.8
May 8	16 32.71	-18 40.6	0.880	1.852	-0.16	+13.7	16.9	157.3
May 18	16 31.10	-16 23.9	0.827	1.826	-0.33	+14.5	16.7	166.8
May 28	16 27.78	-13 58.6	0.795	1.804	-0.37	+14.0	16.5	172.2
June 7	16 24.06	-11 38.5	0.784	1.786	-0.28	+12.1	16.5	166.3
June 17	16 21.30	-09 37.5	0.793	1.772	-0.06	+9.2	16.4	156.8
June 27	16 20.71	-08 05.8	0.820	1.763	+0.23	+5.9	16.5	147.4
July 7	16 23.03	-07 07.2	0.862	1.759	+0.55	+2.7	16.6	138.6
July 17	16 28.50	-06 40.2	0.918	1.759	+0.86	+0.1	16.7	130.8
July 27	16 37.09	-06 39.5	0.984	1.764	+1.14	-1.9	16.9	123.8
Aug. 6	16 48.50	-06 58.3	1.060	1.773	+1.38	-3.2	17.1	117.5
Aug. 16	17 02.35	-07 29.9	1.145	1.787	+1.59	-3.8	17.3	111.7
Aug. 26	17 18.27	-08 07.9	1.237	1.806	+1.76	-3.9	17.5	106.5
Sept. 5	17 35.88	-08 47.0	1.336	1.828	+1.89	-3.6	17.8	101.5
Sept. 15	17 54.82	-09 22.9	1.443	1.854	+2.00	-2.9	18.0	96.8
Sept. 25	18 14.79	-09 52.2	1.556	1.884	+2.07	-2.0	18.3	92.3
Oct. 5	18 35.51	-10 12.2	1.675	1.917	+2.12	-0.9	18.6	87.8
Oct. 15	18 56.71	-10 21.4	1.799	1.953	+2.15	+0.3	18.8	83.3
Oct. 25	19 18.20	-10 18.7	1.929	1.992	+2.16	+1.5	19.1	78.9
Nov. 4	19 39.77	-10 03.8	2.063	2.033	+2.15	+2.7	19.4	74.3
Nov. 14	20 01.28	-09 36.9	2.200	2.076	+2.13	+3.8	19.7	69.7
Nov. 24	20 22.60	-08 58.4	2.339	2.121	+2.10	+4.9	19.9	65.1
Dec. 4	20 43.61	-08 09.2	2.480	2.168	+2.07	+5.9	20.2	60.3
Dec. 14	21 04.26	-07 10.4	2.621	2.216	+2.02	+6.7	20.5	55.4
Dec. 24	21 24.49	-06 03.0	2.759	2.265	+1.98	+7.5	20.7	50.5
Jan. 3	21 44.27	-04 48.4	2.895	2.315	+1.93	+8.1	21.0	45.5
Jan. 13	22 03.58	-03 27.7	3.027	2.365	+1.88	+8.5	21.2	40.4
Jan. 23	22 22.42	-02 02.3	3.153	2.416	+1.84	+8.9	21.4	35.2
Feb. 2	22 40.79	-00 33.4	3.272	2.468	+1.79	+9.1	21.7	30.0
Feb. 12	22 58.70	+00 58.0	3.382	2.520	+1.75	+9.3	21.9	24.7
Feb. 22	23 16.15	+02 30.8	3.483	2.572	+1.70	+9.3	22.1	19.5
Mar. 3	23 33.16	+04 04.0	3.573	2.624	+1.66	+9.3	22.3	14.3
Mar. 13	23 49.74	+05 36.6	3.652	2.676	+1.61	+9.1	22.4	9.5
Mar. 23	00 05.88	+07 07.8	3.717	2.729	+1.57	+8.9	22.6	6.2

Comet 162P/Siding Spring

Epoch = 2015 June 27.0 TT
 T = 2015 July 11.99104 TT
 Peri. = 356.40945
 Node = 31.21293 2000.0
 Incl. = 27.78633
 q = 1.2373503 AU

e = 0.5951382
 a = 3.0562288 AU
 n = 0.18446980
 P = 5.34 years

H = 13.4 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		V	Elong. °
Jan. 8	19 09.96	-41 13.3	3.197	2.289	+2.71	+3.7	18.3	18.9
Jan. 18	19 37.03	-40 36.5	3.113	2.218	+2.78	+5.3	18.2	20.4
Jan. 28	20 04.83	-39 43.3	3.021	2.146	+2.83	+7.1	18.1	22.6
Feb. 7	20 33.17	-38 32.0	2.922	2.073	+2.87	+9.1	18.0	25.2
Feb. 17	21 01.89	-37 01.1	2.819	2.000	+2.89	+11.2	17.9	28.0
Feb. 27	21 30.82	-35 09.5	2.712	1.928	+2.90	+13.3	17.8	30.7
Mar. 9	21 59.83	-32 56.3	2.604	1.855	+2.90	+15.5	17.7	33.2
Mar. 19	22 28.82	-30 20.8	2.497	1.783	+2.89	+17.8	17.6	35.5
Mar. 29	22 57.70	-27 23.0	2.392	1.712	+2.87	+20.0	17.5	37.5
Apr. 8	23 26.42	-24 02.8	2.291	1.642	+2.86	+22.2	17.4	39.2
Apr. 18	23 55.01	-20 20.8	2.196	1.575	+2.85	+24.2	17.2	40.6
Apr. 28	00 23.50	-16 18.3	2.107	1.511	+2.85	+26.1	17.1	41.6
May 8	00 51.96	-11 57.0	2.026	1.450	+2.86	+27.8	17.0	42.4
May 18	01 20.52	-07 19.4	1.954	1.395	+2.88	+29.1	16.9	42.9
May 28	01 49.35	-02 28.9	1.891	1.346	+2.93	+29.9	16.8	43.3
June 7	02 18.63	+02 30.5	1.837	1.305	+3.00	+30.3	16.7	43.6
June 17	02 48.62	+07 33.4	1.792	1.273	+3.09	+30.0	16.6	43.9
June 27	03 19.55	+12 33.6	1.756	1.250	+3.21	+29.1	16.5	44.3
July 7	03 51.64	+17 24.3	1.729	1.239	+3.34	+27.4	16.5	44.9
July 17	04 25.09	+21 57.9	1.710	1.239	+3.48	+24.9	16.5	45.8
July 27	04 59.93	+26 07.0	1.697	1.250	+3.61	+21.8	16.5	47.0
Aug. 6	05 36.04	+29 45.2	1.691	1.273	+3.71	+18.3	16.6	48.6
Aug. 16	06 13.09	+32 47.8	1.690	1.305	+3.74	+14.5	16.6	50.5
Aug. 26	06 50.52	+35 13.0	1.691	1.346	+3.71	+10.9	16.7	52.7
Sept. 5	07 27.62	+37 01.6	1.695	1.395	+3.61	+7.6	16.8	55.4
Sept. 15	08 03.68	+38 17.7	1.698	1.450	+3.43	+5.0	16.8	58.4
Sept. 25	08 37.99	+39 07.6	1.700	1.511	+3.21	+3.1	16.9	61.7
Oct. 5	09 10.06	+39 38.6	1.700	1.575	+2.95	+2.0	17.0	65.5
Oct. 15	09 39.53	+39 59.0	1.696	1.642	+2.66	+1.7	17.1	69.7
Oct. 25	10 06.15	+40 16.4	1.687	1.712	+2.37	+2.1	17.1	74.3
Nov. 4	10 29.80	+40 37.8	1.674	1.783	+2.05	+3.2	17.2	79.4
Nov. 14	10 50.34	+41 09.5	1.657	1.855	+1.72	+4.7	17.2	85.0
Nov. 24	11 07.57	+41 56.3	1.637	1.927	+1.37	+6.5	17.2	91.1
Dec. 4	11 21.25	+43 01.2	1.615	2.000	+0.97	+8.5	17.2	97.6
Dec. 14	11 30.98	+44 26.0	1.593	2.073	+0.53	+10.3	17.2	104.6
Dec. 24	11 36.24	+46 08.8	1.576	2.146	+0.03	+11.5	17.2	111.8
Jan. 3	11 36.50	+48 04.1	1.566	2.217	-0.53	+11.8	17.2	119.1
Jan. 13	11 31.23	+50 02.3	1.566	2.289	-1.09	+10.7	17.2	126.1
Jan. 23	11 20.35	+51 48.9	1.583	2.359	-1.58	+7.9	17.2	132.2
Feb. 2	11 04.58	+53 07.8	1.618	2.429	-1.89	+3.8	17.2	136.5
Feb. 12	10 45.70	+53 45.5	1.674	2.498	-1.93	-1.0	17.3	138.2
Feb. 22	10 26.35	+53 35.2	1.752	2.565	-1.72	-5.5	17.5	136.9
Mar. 3	10 09.11	+52 40.0	1.852	2.632	-1.34	-9.1	17.7	133.2
Mar. 13	09 55.67	+51 09.2	1.973	2.697	-0.90	-11.5	17.9	127.6
Mar. 23	09 46.68	+49 14.5	2.112	2.762	-0.48	-12.8	18.2	121.1

Comet P/2004 FY140 (LINEAR)

Epoch = 2015 June 27.0 TT
 T = 2015 July 24.72545 TT
 Peri. = 241.94953
 Node = 326.78626 2000.0
 Incl. = 2.13697
 q = 4.0592881 AU
 e = 0.1703247
 a = 4.8926226 AU
 n = 0.09107339
 P = 10.82 years

H = 14.0 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	V	Mot./PA °	Elong. °
Jan. 8	13 00.66	-07 53.2	3.996	4.118	-0.47 +3.1	20.9	6.7/117	90.2
Jan. 18	13 04.67	-08 23.8	3.838	4.112	-0.50 +3.3	20.8	4.5/120	99.2
Jan. 28	13 07.30	-08 46.3	3.684	4.107	-0.52 +3.4	20.7	2.2/129	108.7
Feb. 7	13 08.44	-08 59.9	3.539	4.102	-0.54 +3.5	20.5	0.7/235	118.4
Feb. 17	13 08.03	-09 04.1	3.407	4.097	-0.57 +3.7	20.4	2.9/280	128.6
Feb. 27	13 06.08	-08 58.8	3.292	4.092	-0.59 +3.8	20.3	5.2/286	139.2
Mar. 9	13 02.73	-08 44.4	3.198	4.088	-0.61 +4.0	20.1	7.0/288	150.0
Mar. 19	12 58.22	-08 22.1	3.129	4.084	-0.62 +4.1	19.9	8.3/290	161.1
Mar. 29	12 52.94	-07 53.7	3.089	4.080	-0.63 +4.2	19.7	8.9/291	172.3
Apr. 8	12 47.36	-07 21.9	3.078	4.077	-0.63 +4.2	19.7	8.7/292	175.6
Apr. 18	12 41.96	-06 49.6	3.097	4.074	-0.62 +4.2	19.9	7.7/293	164.7
Apr. 28	12 37.23	-06 20.0	3.144	4.071	-0.61 +4.2	20.0	6.0/294	153.8
May 8	12 33.54	-05 55.8	3.216	4.069	-0.59 +4.1	20.2	3.9/295	143.1
May 18	12 31.15	-05 38.9	3.311	4.066	-0.57 +4.0	20.3	1.6/301	132.8
May 28	12 30.23	-05 30.6	3.424	4.064	-0.55 +3.8	20.4	0.8/ 96	122.9
June 7	12 30.79	-05 31.4	3.550	4.063	-0.53 +3.7	20.6	3.2/108	113.5
June 17	12 32.81	-05 41.3	3.687	4.061	-0.51 +3.5	20.7	5.4/110	104.5
June 27	12 36.20	-05 59.9	3.829	4.060	-0.49 +3.4	20.8	7.4/111	95.8
July 7	12 40.84	-06 26.5	3.975	4.060	-0.47 +3.2	20.9	9.2/112	87.5
July 17	12 46.61	-07 00.2	4.119	4.059	-0.46 +3.1	20.9	10.9/112	79.5
July 27	12 53.39	-07 40.2	4.260	4.059	-0.44 +3.0	21.0	12.3/112	71.8
Aug. 6	13 01.06	-08 25.5	4.395	4.060	-0.43 +2.9	21.0	13.5/112	64.3
Aug. 16	13 09.51	-09 15.3	4.523	4.060	-0.43 +2.8	21.0	14.5/112	56.9
Aug. 26	13 18.66	-10 08.7	4.640	4.061	-0.42 +2.7	21.1	15.4/112	49.7
Sept. 5	13 28.40	-11 04.9	4.746	4.062	-0.41 +2.6	21.1	16.2/111	42.7
Sept. 15	13 38.66	-12 03.0	4.838	4.063	-0.41 +2.5	21.0	16.8/111	35.6
Sept. 25	13 49.38	-13 02.3	4.917	4.065	-0.41 +2.4	21.0	17.3/111	28.7
Oct. 5	14 00.48	-14 02.1	4.979	4.067	-0.41 +2.3	21.0	17.6/110	21.8
Oct. 15	14 11.90	-15 01.7	5.026	4.070	-0.41 +2.2	20.9	17.9/110	14.8
Oct. 25	14 23.57	-16 00.5	5.055	4.072	-0.41 +2.1	20.8	18.0/109	8.0
Nov. 4	14 35.42	-16 57.8	5.066	4.075	-0.41 +2.0	20.7	18.0/108	1.8
Nov. 14	14 47.39	-17 53.1	5.060	4.078	-0.42 +1.9	20.8	17.9/108	6.5
Nov. 24	14 59.38	-18 45.9	5.036	4.082	-0.42 +1.8	20.9	17.6/107	13.5
Dec. 4	15 11.33	-19 35.7	4.994	4.086	-0.43 +1.7	21.0	17.3/106	20.6
Dec. 14	15 23.14	-20 22.3	4.934	4.090	-0.43 +1.6	21.0	16.8/105	27.9
Dec. 24	15 34.69	-21 05.2	4.858	4.094	-0.44 +1.5	21.1	16.1/105	35.2
Jan. 3	15 45.88	-21 44.4	4.767	4.099	-0.45 +1.4	21.1	15.3/104	42.7
Jan. 13	15 56.58	-22 19.6	4.661	4.104	-0.46 +1.3	21.1	14.3/103	50.4
Jan. 23	16 06.64	-22 50.9	4.542	4.109	-0.47 +1.2	21.1	13.1/103	58.2
Feb. 2	16 15.93	-23 18.4	4.414	4.115	-0.49 +1.2	21.0	11.7/102	66.1
Feb. 12	16 24.27	-23 42.1	4.276	4.120	-0.50 +1.1	21.0	10.1/102	74.3
Feb. 22	16 31.49	-24 02.3	4.134	4.127	-0.52 +1.0	20.9	8.3/102	82.7
Mar. 3	16 37.44	-24 19.2	3.989	4.133	-0.54 +1.0	20.9	6.3/103	91.4
Mar. 13	16 41.93	-24 32.9	3.844	4.139	-0.56 +0.9	20.8	4.1/105	100.3
Mar. 23	16 44.83	-24 43.4	3.704	4.146	-0.59 +0.9	20.7	1.8/115	109.6

Comet 140P/Bowell-Skiff

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 8.64994 TT
 Peri. = 172.94770
 Node = 343.39444 2000.0
 Incl. = 3.82132
 q = 1.9877551 AU
 e = 0.6919909
 a = 6.4535597 AU
 n = 0.06011808
 P = 16.39 years

$$m1 = 9.6 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° '	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	04 26.17	+27 07.2	2.013	2.850	-0.40	-2.3	19.1	141.7
Jan. 18	04 22.19	+26 44.3	2.045	2.788	-0.11	-1.9	18.9	130.7
Jan. 28	04 21.09	+26 25.2	2.094	2.726	+0.19	-1.3	18.8	120.3
Feb. 7	04 23.00	+26 11.8	2.154	2.666	+0.49	-0.7	18.7	110.6
Feb. 17	04 27.85	+26 04.4	2.222	2.606	+0.76	-0.2	18.6	101.5
Feb. 27	04 35.49	+26 02.3	2.293	2.548	+1.02	+0.2	18.5	93.2
Mar. 9	04 45.70	+26 04.0	2.364	2.491	+1.25	+0.4	18.4	85.5
Mar. 19	04 58.22	+26 07.6	2.434	2.436	+1.46	+0.3	18.3	78.3
Mar. 29	05 12.85	+26 10.7	2.500	2.383	+1.65	0.0	18.2	71.7
Apr. 8	05 29.34	+26 11.0	2.561	2.332	+1.81	-0.5	18.1	65.5
Apr. 18	05 47.49	+26 06.1	2.617	2.283	+1.96	-1.2	18.0	59.8
Apr. 28	06 07.10	+25 53.8	2.667	2.237	+2.08	-2.2	17.8	54.4
May 8	06 27.94	+25 32.1	2.712	2.194	+2.19	-3.3	17.7	49.5
May 18	06 49.84	+24 59.2	2.751	2.154	+2.27	-4.5	17.6	44.8
May 28	07 12.57	+24 13.7	2.786	2.118	+2.34	-5.9	17.5	40.4
June 7	07 35.94	+23 14.7	2.816	2.086	+2.38	-7.3	17.4	36.2
June 17	07 59.77	+22 01.5	2.844	2.058	+2.41	-8.7	17.4	32.3
June 27	08 23.86	+20 34.1	2.868	2.034	+2.42	-10.1	17.3	28.5
July 7	08 48.06	+18 52.9	2.891	2.015	+2.42	-11.4	17.2	24.9
July 17	09 12.24	+16 58.8	2.912	2.001	+2.40	-12.6	17.2	21.4
July 27	09 36.28	+14 52.9	2.933	1.992	+2.38	-13.6	17.2	18.0
Aug. 6	10 00.10	+12 36.9	2.952	1.988	+2.36	-14.4	17.2	14.7
Aug. 16	10 23.66	+10 12.6	2.972	1.989	+2.32	-15.1	17.2	11.3
Aug. 26	10 46.91	+07 42.0	2.992	1.996	+2.29	-15.5	17.2	8.0
Sept. 5	11 09.82	+05 07.2	3.011	2.007	+2.26	-15.7	17.3	4.6
Sept. 15	11 32.42	+02 30.4	3.029	2.023	+2.23	-15.7	17.4	1.1
Sept. 25	11 54.68	-00 06.5	3.046	2.045	+2.19	-15.5	17.5	2.7
Oct. 5	12 16.62	-02 41.4	3.061	2.070	+2.16	-15.1	17.6	6.4
Oct. 15	12 38.25	-05 12.6	3.074	2.100	+2.13	-14.6	17.7	10.3
Oct. 25	12 59.54	-07 38.4	3.083	2.135	+2.10	-13.9	17.8	14.4
Nov. 4	13 20.49	-09 57.3	3.088	2.172	+2.06	-13.1	17.9	18.8
Nov. 14	13 41.08	-12 08.3	3.088	2.214	+2.02	-12.2	18.1	23.3
Nov. 24	14 01.23	-14 10.4	3.081	2.258	+1.97	-11.2	18.2	28.1
Dec. 4	14 20.90	-16 02.8	3.067	2.305	+1.91	-10.2	18.4	33.1
Dec. 14	14 39.99	-17 45.2	3.046	2.355	+1.84	-9.2	18.5	38.4
Dec. 24	14 58.38	-19 17.3	3.017	2.407	+1.76	-8.2	18.7	43.9
Jan. 3	15 15.95	-20 39.3	2.979	2.461	+1.66	-7.2	18.8	49.8
Jan. 13	15 32.55	-21 51.4	2.933	2.517	+1.54	-6.3	19.0	55.9
Jan. 23	15 47.96	-22 54.2	2.879	2.575	+1.41	-5.4	19.1	62.4
Feb. 2	16 02.03	-23 48.4	2.818	2.634	+1.25	-4.6	19.2	69.2
Feb. 12	16 14.51	-24 34.9	2.750	2.694	+1.07	-4.0	19.3	76.4
Feb. 22	16 25.18	-25 14.5	2.677	2.755	+0.86	-3.4	19.4	83.9
Mar. 3	16 33.80	-25 48.0	2.603	2.817	+0.63	-2.8	19.5	92.0
Mar. 13	16 40.14	-26 16.2	2.528	2.879	+0.39	-2.3	19.7	100.5
Mar. 23	16 43.99	-26 39.4	2.456	2.943	+0.12	-1.8	19.8	109.5

Comet 51P/Harrington

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 12.43535 TT
 Peri. = 269.29030
 Node = 83.69368 2000.0
 Incl. = 5.42408
 q = 1.6995485 AU
 e = 0.5424086
 a = 3.7141181 AU
 n = 0.13769574
 P = 7.16 years

$$m1 = 10.6 + 5 \log(\Delta) + 17.5 \log(r(t-70))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	18 05.07	-23 31.9	3.501	2.570	+2.04 -0.3	21.6	16.0
Jan. 18	18 25.45	-23 34.9	3.401	2.512	+2.09 +0.7	21.4	21.5
Jan. 28	18 46.31	-23 28.2	3.292	2.455	+2.13 +1.7	21.2	26.9
Feb. 7	19 07.58	-23 11.3	3.174	2.398	+2.16 +2.7	20.9	32.2
Feb. 17	19 29.22	-22 44.0	3.049	2.341	+2.19 +3.8	20.7	37.3
Feb. 27	19 51.15	-22 06.2	2.919	2.285	+2.22 +4.8	20.4	42.3
Mar. 9	20 13.30	-21 17.9	2.784	2.230	+2.24 +5.9	20.2	47.1
Mar. 19	20 35.66	-20 19.4	2.647	2.176	+2.25 +6.8	19.9	51.8
Mar. 29	20 58.15	-19 11.0	2.509	2.124	+2.26 +7.8	19.6	56.3
Apr. 8	21 20.76	-17 53.3	2.371	2.073	+2.27 +8.6	19.3	60.6
Apr. 18	21 43.46	-16 27.2	2.234	2.023	+2.28 +9.4	19.0	64.8
Apr. 28	22 06.21	-14 53.5	2.101	1.976	+2.28 +10.0	18.7	68.9
May 8	22 29.00	-13 13.6	1.971	1.931	+2.28 +10.5	18.4	72.8
May 18	22 51.80	-11 28.7	1.846	1.889	+2.28 +10.8	18.0	76.7
May 28	23 14.56	-09 40.7	1.726	1.851	+2.26 +10.9	17.7	80.4
June 7	23 37.20	-07 51.5	1.613	1.816	+2.24 +10.8	17.4	84.1
June 17	23 59.63	-06 03.2	1.506	1.785	+2.21 +10.5	17.0	87.8
June 27	00 21.69	-04 18.5	1.406	1.758	+2.15 +9.9	16.7	91.6
July 7	00 43.18	-02 39.6	1.313	1.736	+2.06 +9.0	16.4	95.5
July 17	01 03.82	-01 09.2	1.227	1.719	+1.94 +7.9	16.0	99.6
July 27	01 23.24	+00 10.2	1.148	1.707	+1.78 +6.7	15.7	104.0
Aug. 6	01 41.02	+01 16.9	1.075	1.701	+1.56 +5.2	15.4	108.9
Aug. 16	01 56.63	+02 09.3	1.009	1.700	+1.28 +3.8	15.2	114.4
Aug. 26	02 09.48	+02 46.8	0.951	1.705	+0.96 +2.3	14.9	120.6
Sept. 5	02 19.04	+03 10.2	0.902	1.715	+0.58 +1.1	14.7	127.7
Sept. 15	02 24.80	+03 21.1	0.862	1.730	+0.18 +0.2	14.5	135.6
Sept. 25	02 26.56	+03 23.2	0.834	1.751	-0.20 -0.2	14.3	144.6
Oct. 5	02 24.58	+03 21.7	0.822	1.776	-0.49 +0.1	14.2	154.2
Oct. 15	02 19.64	+03 22.5	0.827	1.806	-0.65 +0.9	14.2	163.9
Oct. 25	02 13.14	+03 31.9	0.852	1.840	-0.65 +2.2	14.3	170.6
Nov. 4	02 06.68	+03 54.3	0.898	1.878	-0.50 +3.7	14.4	166.9
Nov. 14	02 01.68	+04 31.6	0.966	1.919	-0.26 +5.2	14.6	157.6
Nov. 24	01 59.11	+05 23.5	1.055	1.963	+0.03 +6.4	14.9	147.9
Dec. 4	01 59.37	+06 27.7	1.162	2.009	+0.31 +7.4	15.2	138.5
Dec. 14	02 02.43	+07 41.4	1.286	2.058	+0.57 +8.0	15.5	129.6
Dec. 24	02 08.08	+09 01.8	1.423	2.109	+0.79 +8.4	15.9	121.3
Jan. 3	02 15.95	+10 26.2	1.573	2.161	+0.97 +8.6	16.2	113.4
Jan. 13	02 25.68	+11 52.5	1.732	2.215	+1.13 +8.6	16.6	106.0
Jan. 23	02 36.97	+13 18.7	1.899	2.269	+1.26 +8.4	16.9	98.9
Feb. 2	02 49.52	+14 43.2	2.071	2.325	+1.36 +8.1	17.3	92.0
Feb. 12	03 03.12	+16 04.7	2.247	2.381	+1.44 +7.7	17.7	85.4
Feb. 22	03 17.56	+17 22.1	2.425	2.438	+1.51 +7.2	18.0	79.0
Mar. 3	03 32.67	+18 34.4	2.603	2.495	+1.57 +6.7	18.3	72.8
Mar. 13	03 48.33	+19 41.0	2.779	2.553	+1.61 +6.0	18.7	66.6
Mar. 23	04 04.42	+20 41.3	2.952	2.610	+1.64 +5.3	19.0	60.6

Comet P/2010 K2 (WISE)

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 12.79292 TT
 Peri. = 334.78965
 Node = 275.60372 2000.0
 Incl. = 11.93985
 q = 1.2743371 AU
 e = 0.5697258
 a = 2.9616861 AU
 n = 0.19337287
 P = 5.10 years

$$m1 = 18.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	10 22.45	-02 44.2	1.746	2.473	-1.32 +10.3	.	8.3/211	127.7
Jan. 18	10 19.55	-03 55.1	1.589	2.407	-1.47 +11.7	.	10.6/237	137.4
Jan. 28	10 13.59	-04 53.0	1.452	2.341	-1.60 +13.2	.	13.9/253	147.2
Feb. 7	10 04.67	-05 33.4	1.336	2.273	-1.72 +14.8	.	17.1/264	156.2
Feb. 17	09 53.29	-05 52.3	1.245	2.205	-1.79 +16.3	.	19.0/271	161.8
Feb. 27	09 40.54	-05 47.6	1.180	2.137	-1.80 +17.6	.	18.9/278	159.7
Mar. 9	09 28.00	-05 21.4	1.141	2.068	-1.75 +18.3	.	16.5/285	151.3
Mar. 19	09 17.30	-04 39.5	1.124	1.998	-1.64 +18.4	.	12.2/294	140.9
Mar. 29	09 09.81	-03 50.3	1.126	1.929	-1.51 +18.1	22.9	7.0/313	130.4
Apr. 8	09 06.36	-03 02.5	1.140	1.860	-1.38 +17.3	22.7	4.2/ 18	120.5
Apr. 18	09 07.20	-02 22.9	1.163	1.792	-1.28 +16.4	22.5	8.1/ 71	111.4
Apr. 28	09 12.29	-01 56.6	1.188	1.725	-1.21 +15.4	22.3	13.6/ 86	103.3
May 8	09 21.33	-01 46.8	1.213	1.659	-1.18 +14.5	22.1	19.0/ 92	96.2
May 18	09 33.97	-01 54.8	1.236	1.596	-1.18 +13.7	21.9	24.1/ 97	89.9
May 28	09 49.94	-02 21.8	1.254	1.535	-1.22 +13.0	21.7	28.8/ 99	84.5
June 7	10 08.94	-03 07.7	1.268	1.479	-1.29 +12.5	21.5	33.3/101	79.9
June 17	10 30.79	-04 11.9	1.277	1.427	-1.39 +12.0	21.2	37.6/103	76.0
June 27	10 55.36	-05 33.1	1.282	1.381	-1.52 +11.5	21.0	41.6/104	72.8
July 7	11 22.53	-07 09.2	1.285	1.342	-1.67 +10.9	20.9	45.4/104	70.2
July 17	11 52.24	-08 56.8	1.288	1.311	-1.85 +10.3	20.7	48.9/104	68.2
July 27	12 24.41	-10 51.7	1.292	1.289	-2.04 +9.3	20.6	51.9/104	66.7
Aug. 6	12 58.85	-12 48.1	1.300	1.277	-2.23 +8.1	20.6	54.3/103	65.6
Aug. 16	13 35.34	-14 39.4	1.315	1.275	-2.41 +6.5	20.6	56.0/101	64.9
Aug. 26	14 13.49	-16 18.8	1.340	1.283	-2.55 +4.5	20.7	56.9/100	64.4
Sept. 5	14 52.73	-17 39.9	1.375	1.302	-2.65 +2.2	20.8	56.9/ 97	64.1
Sept. 15	15 32.44	-18 37.8	1.423	1.330	-2.68 -0.2	21.0	56.1/ 95	63.7
Sept. 25	16 11.94	-19 09.6	1.484	1.366	-2.64 -2.6	21.3	54.7/ 92	63.2
Oct. 5	16 50.55	-19 14.8	1.558	1.409	-2.54 -4.7	21.6	52.8/ 89	62.4
Oct. 15	17 27.78	-18 54.8	1.646	1.459	-2.39 -6.4	21.9	50.7/ 87	61.3
Oct. 25	18 03.28	-18 12.5	1.745	1.514	-2.22 -7.7	22.3	48.3/ 84	59.9
Nov. 4	18 36.84	-17 11.1	1.855	1.574	-2.03 -8.6	22.7	46.1/ 82	58.0
Nov. 14	19 08.43	-15 54.1	1.974	1.636	-1.84 -9.1	.	43.9/ 79	55.7
Nov. 24	19 38.11	-14 24.8	2.100	1.701	-1.66 -9.2	.	41.8/ 77	53.1
Dec. 4	20 05.96	-12 45.7	2.231	1.768	-1.49 -9.2	.	39.9/ 75	50.0
Dec. 14	20 32.16	-10 59.3	2.366	1.835	-1.34 -8.9	.	38.2/ 74	46.7
Dec. 24	20 56.86	-09 07.5	2.502	1.904	-1.21 -8.5	.	36.5/ 72	43.0
Jan. 3	21 20.20	-07 11.8	2.637	1.973	-1.09 -8.1	.	35.1/ 71	39.1
Jan. 13	21 42.34	-05 13.6	2.770	2.043	-0.99 -7.6	.	33.7/ 69	34.9
Jan. 23	22 03.40	-03 13.9	2.899	2.112	-0.90 -7.1	.	32.4/ 68	30.6
Feb. 2	22 23.50	-01 13.7	3.022	2.181	-0.82 -6.6	.	31.3/ 67	26.1
Feb. 12	22 42.74	+00 46.2	3.137	2.249	-0.76 -6.1	.	30.1/ 67	21.6
Feb. 22	23 01.20	+02 45.1	3.244	2.317	-0.70 -5.6	.	29.0/ 66	17.1
Mar. 3	23 18.95	+04 42.4	3.340	2.383	-0.65 -5.1	.	28.0/ 66	12.9
Mar. 13	23 36.05	+06 37.5	3.424	2.449	-0.61 -4.7	.	27.0/ 65	9.6
Mar. 23	23 52.53	+08 29.9	3.496	2.515	-0.57 -4.3	.	25.9/ 65	8.6

Comet 67P/Churyumov-Gerasimenko

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 13.08318 TT
 Peri. = 12.79563
 Node = 50.13559 2000.0
 Incl. = 7.04024
 q = 1.2432626 AU
 e = 0.6408787
 a = 3.4619573 AU
 n = 0.15301060
 P = 6.44 years

$$m1 = 10.2 + 5 \log(\Delta) + 12.5 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	20 39.95	-23 44.0	3.500	2.596	+1.75	+7.2	18.8	19.7
Jan. 18	20 57.46	-22 31.9	3.466	2.523	+1.81	+8.1	18.6	14.0
Jan. 28	21 15.59	-21 11.2	3.417	2.449	+1.87	+9.0	18.5	8.9
Feb. 7	21 34.26	-19 41.5	3.354	2.374	+1.92	+9.9	18.3	5.3
Feb. 17	21 53.47	-18 02.6	3.278	2.298	+1.97	+10.8	18.1	6.0
Feb. 27	22 13.22	-16 14.1	3.191	2.222	+2.03	+11.8	17.9	9.7
Mar. 9	22 33.51	-14 16.0	3.095	2.145	+2.09	+12.8	17.7	14.0
Mar. 19	22 54.41	-12 07.9	2.990	2.068	+2.16	+13.8	17.4	18.2
Mar. 29	23 15.97	-09 50.0	2.879	1.991	+2.23	+14.8	17.2	22.2
Apr. 8	23 38.30	-07 22.3	2.763	1.914	+2.32	+15.8	16.9	25.9
Apr. 18	00 01.51	-04 44.7	2.646	1.837	+2.43	+16.7	16.6	29.3
Apr. 28	00 25.77	-01 57.9	2.528	1.762	+2.55	+17.5	16.4	32.3
May 8	00 51.23	+00 57.3	2.413	1.688	+2.69	+18.2	16.1	35.0
May 18	01 18.13	+03 59.6	2.302	1.616	+2.85	+18.7	15.7	37.2
May 28	01 46.66	+07 06.6	2.197	1.547	+3.04	+18.8	15.4	39.0
June 7	02 17.04	+10 15.1	2.101	1.482	+3.24	+18.5	15.1	40.4
June 17	02 49.47	+13 20.4	2.016	1.423	+3.46	+17.6	14.8	41.4
June 27	03 24.05	+16 16.3	1.942	1.369	+3.67	+15.9	14.5	42.1
July 7	04 00.77	+18 55.5	1.882	1.324	+3.87	+13.5	14.2	42.5
July 17	04 39.43	+21 10.3	1.835	1.287	+4.01	+10.3	13.9	42.7
July 27	05 19.55	+22 53.2	1.801	1.261	+4.09	+6.6	13.6	42.8
Aug. 6	06 00.44	+23 58.9	1.780	1.246	+4.08	+2.6	13.4	42.9
Aug. 16	06 41.27	+24 25.0	1.770	1.244	+3.99	-1.2	13.1	43.3
Aug. 26	07 21.12	+24 12.8	1.769	1.253	+3.81	-4.6	13.0	43.8
Sept. 5	07 59.25	+23 26.6	1.774	1.275	+3.59	-7.3	12.8	44.8
Sept. 15	08 35.10	+22 13.1	1.783	1.307	+3.33	-9.3	12.7	46.2
Sept. 25	09 08.36	+20 40.0	1.793	1.349	+3.06	-10.5	12.7	48.1
Oct. 5	09 38.92	+18 54.6	1.802	1.400	+2.79	-11.1	12.7	50.6
Oct. 15	10 06.81	+17 03.6	1.808	1.457	+2.53	-11.1	12.7	53.6
Oct. 25	10 32.09	+15 12.8	1.808	1.520	+2.28	-10.6	12.8	57.2
Nov. 4	10 54.88	+13 26.7	1.802	1.587	+2.04	-9.7	12.9	61.4
Nov. 14	11 15.25	+11 49.2	1.789	1.658	+1.79	-8.6	13.1	66.1
Nov. 24	11 33.19	+10 23.5	1.767	1.731	+1.55	-7.2	13.3	71.6
Dec. 4	11 48.70	+09 11.9	1.738	1.806	+1.29	-5.5	13.4	77.6
Dec. 14	12 01.65	+08 16.8	1.702	1.882	+1.02	-3.7	13.6	84.4
Dec. 24	12 11.84	+07 40.1	1.660	1.958	+0.72	-1.7	13.8	91.9
Jan. 3	12 19.07	+07 23.1	1.616	2.036	+0.40	+0.4	14.0	100.3
Jan. 13	12 23.08	+07 26.8	1.571	2.113	+0.06	+2.4	14.2	109.4
Jan. 23	12 23.64	+07 50.8	1.531	2.190	-0.29	+4.2	14.3	119.4
Feb. 2	12 20.70	+08 33.1	1.501	2.266	-0.63	+5.6	14.5	130.3
Feb. 12	12 14.44	+09 29.5	1.485	2.342	-0.90	+6.3	14.7	141.8
Feb. 22	12 05.44	+10 32.9	1.491	2.417	-1.08	+6.2	14.9	153.6
Mar. 3	11 54.68	+11 34.9	1.522	2.492	-1.13	+5.2	15.2	164.7
Mar. 13	11 43.39	+12 27.3	1.580	2.565	-1.05	+3.7	15.4	170.1
Mar. 23	11 32.87	+13 03.9	1.668	2.638	-0.88	+1.8	15.8	163.2

Comet P/2009 L2 (Yang-Gao)

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 15.03539 TT
 Peri. = 343.55911
 Node = 257.62502 2000.0
 Incl. = 16.69133
 q = 1.4312988 AU
 e = 0.5936623
 a = 3.5224366 AU
 n = 0.14908683
 P = 6.61 years

$$m1 = 13.4 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	10 03.22	-10 13.4	1.853	2.571	-1.31 +9.5	21.9	10.7/210	127.4
Jan. 18	09 59.55	-11 45.8	1.704	2.505	-1.43 +10.8	21.5	12.1/231	135.8
Jan. 28	09 53.13	-13 02.2	1.573	2.438	-1.55 +12.2	21.2	14.0/247	143.7
Feb. 7	09 44.24	-13 56.1	1.465	2.370	-1.63 +13.7	20.8	15.7/260	149.9
Feb. 17	09 33.56	-14 21.6	1.380	2.303	-1.68 +15.2	20.4	16.5/272	152.6
Feb. 27	09 22.24	-14 15.4	1.320	2.235	-1.67 +16.4	20.1	15.7/283	150.4
Mar. 9	09 11.75	-13 39.3	1.283	2.168	-1.62 +17.2	19.8	13.5/296	144.2
Mar. 19	09 03.44	-12 39.4	1.267	2.101	-1.53 +17.3	19.6	10.5/315	136.0
Mar. 29	08 58.40	-11 25.3	1.268	2.034	-1.44 +17.0	19.3	8.0/348	127.3
Apr. 8	08 57.23	-10 07.2	1.281	1.968	-1.35 +16.2	19.1	8.5/ 30	118.7
Apr. 18	09 00.07	-08 53.3	1.301	1.904	-1.29 +15.1	18.9	11.9/ 58	110.7
Apr. 28	09 06.85	-07 50.2	1.327	1.841	-1.25 +14.0	18.7	16.2/ 73	103.3
May 8	09 17.28	-07 02.0	1.354	1.780	-1.24 +12.8	18.4	20.7/ 82	96.7
May 18	09 31.04	-06 30.8	1.380	1.722	-1.27 +11.8	18.2	25.1/ 87	90.8
May 28	09 47.86	-06 17.8	1.406	1.667	-1.32 +10.7	18.0	29.2/ 91	85.5
June 7	10 07.43	-06 22.9	1.429	1.616	-1.39 +9.8	17.8	33.0/ 94	80.9
June 17	10 29.50	-06 45.5	1.450	1.570	-1.48 +8.9	17.6	36.5/ 96	76.8
June 27	10 53.88	-07 24.1	1.471	1.529	-1.59 +8.1	17.5	39.7/ 98	73.3
July 7	11 20.33	-08 16.7	1.492	1.494	-1.71 +7.2	17.3	42.5/ 99	70.2
July 17	11 48.67	-09 20.2	1.514	1.467	-1.82 +6.2	17.2	44.9/100	67.6
July 27	12 18.70	-10 31.5	1.539	1.447	-1.94 +5.2	17.1	46.9/100	65.3
Aug. 6	12 50.16	-11 46.3	1.569	1.435	-2.04 +4.0	17.1	48.4/100	63.2
Aug. 16	13 22.79	-13 00.4	1.606	1.431	-2.12 +2.7	17.2	49.3/ 99	61.4
Aug. 26	13 56.31	-14 09.5	1.649	1.436	-2.17 +1.3	17.2	49.8/ 98	59.8
Sept. 5	14 30.35	-15 09.6	1.701	1.450	-2.19 -0.2	17.4	49.7/ 97	58.2
Sept. 15	15 04.59	-15 57.5	1.762	1.471	-2.18 -1.7	17.6	49.2/ 95	56.6
Sept. 25	15 38.70	-16 30.5	1.832	1.501	-2.13 -3.1	17.8	48.4/ 93	54.9
Oct. 5	16 12.34	-16 47.3	1.912	1.536	-2.05 -4.3	18.1	47.3/ 91	53.1
Oct. 15	16 45.25	-16 47.2	1.999	1.578	-1.95 -5.4	18.4	46.0/ 89	51.2
Oct. 25	17 17.21	-16 30.3	2.095	1.626	-1.83 -6.3	18.7	44.5/ 87	49.0
Nov. 4	17 48.04	-15 57.6	2.197	1.677	-1.70 -6.9	19.0	43.0/ 85	46.5
Nov. 14	18 17.65	-15 10.1	2.305	1.733	-1.57 -7.3	19.4	41.5/ 82	43.9
Nov. 24	18 45.97	-14 09.3	2.417	1.792	-1.45 -7.6	19.7	40.1/ 80	40.9
Dec. 4	19 12.99	-12 56.9	2.531	1.853	-1.32 -7.6	20.1	38.6/ 78	37.7
Dec. 14	19 38.73	-11 34.4	2.647	1.916	-1.21 -7.5	20.5	37.2/ 76	34.3
Dec. 24	20 03.23	-10 03.3	2.761	1.981	-1.10 -7.4	20.8	35.9/ 75	30.8
Jan. 3	20 26.53	-08 25.3	2.873	2.047	-1.01 -7.1	21.1	34.6/ 73	27.0
Jan. 13	20 48.71	-06 41.6	2.981	2.113	-0.92 -6.8	21.5	33.3/ 71	23.2
Jan. 23	21 09.82	-04 53.5	3.084	2.181	-0.85 -6.4	21.8	32.1/ 70	19.5
Feb. 2	21 29.93	-03 02.1	3.179	2.248	-0.78 -6.1	22.1	30.9/ 69	16.0
Feb. 12	21 49.10	-01 08.5	3.266	2.316	-0.72 -5.7	22.4	29.7/ 67	13.1
Feb. 22	22 07.38	+00 46.3	3.344	2.383	-0.67 -5.3	22.6	28.6/ 66	11.6
Mar. 3	22 24.82	+02 41.6	3.410	2.451	-0.63 -4.9	22.9	27.4/ 65	12.3
Mar. 13	22 41.46	+04 36.5	3.465	2.518	-0.59 -4.5	.	26.3/ 64	14.9
Mar. 23	22 57.30	+06 30.5	3.507	2.584	-0.55 -4.1	.	25.1/ 63	18.8

Comet P/2004 R1 (McNaught)

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 15.24387 TT
 Peri. = 0.75670
 Node = 295.93865 2000.0
 Incl. = 4.90065
 q = 0.9766650 AU
 e = 0.6849732
 a = 3.1002600 AU
 n = 0.18055391
 P = 5.46 years

$$m1 = 18.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	m1	Mot. /PA ' °	Elong. °
Jan. 8	12 46.60	-09 53.5	2.425	2.658	-0.92 +6.0	.	13.2/123	92.6
Jan. 18	12 54.07	-11 05.5	2.212	2.581	-1.05 +6.8	.	11.2/127	100.6
Jan. 28	13 00.15	-12 12.3	2.003	2.502	-1.19 +7.6	.	8.7/134	108.9
Feb. 7	13 04.46	-13 12.6	1.801	2.421	-1.36 +8.7	.	6.0/150	117.6
Feb. 17	13 06.55	-14 04.3	1.610	2.339	-1.56 +10.0	.	4.1/193	126.8
Feb. 27	13 05.89	-14 44.4	1.432	2.256	-1.78 +11.6	22.9	6.2/246	136.6
Mar. 9	13 02.01	-15 09.3	1.270	2.171	-2.02 +13.5	22.5	10.9/267	146.9
Mar. 19	12 54.52	-15 14.5	1.128	2.084	-2.24 +15.8	22.1	16.2/277	157.7
Mar. 29	12 43.40	-14 55.1	1.009	1.996	-2.41 +18.2	21.6	20.9/282	167.6
Apr. 8	12 29.35	-14 08.6	0.915	1.906	-2.49 +20.4	21.2	23.9/287	168.6
Apr. 18	12 13.74	-12 56.5	0.845	1.816	-2.43 +21.9	20.8	23.8/292	158.3
Apr. 28	11 58.67	-11 27.5	0.797	1.725	-2.25 +22.2	20.5	20.5/296	145.6
May 8	11 46.23	-09 55.2	0.768	1.633	-1.97 +21.4	20.2	14.7/304	133.0
May 18	11 37.95	-08 33.4	0.751	1.541	-1.67 +19.7	19.9	7.8/321	121.3
May 28	11 34.69	-07 32.9	0.739	1.450	-1.38 +17.6	19.6	4.4/ 40	110.7
June 7	11 36.60	-06 58.8	0.727	1.361	-1.15 +15.4	19.2	10.3/ 87	101.5
June 17	11 43.51	-06 52.5	0.710	1.276	-0.97 +13.2	18.9	17.6/ 97	93.6
June 27	11 55.23	-07 12.8	0.686	1.196	-0.86 +11.0	18.6	24.7/100	87.0
July 7	12 11.59	-07 56.7	0.651	1.123	-0.80 +8.7	18.2	31.9/102	81.5
July 17	12 32.68	-08 59.9	0.607	1.062	-0.81 +6.2	17.8	39.8/102	77.2
July 27	12 59.05	-10 17.1	0.553	1.015	-0.93 +3.0	17.4	48.9/101	74.1
Aug. 6	13 31.80	-11 41.0	0.493	0.986	-1.26 -0.9	17.0	61.1/ 99	72.5
Aug. 16	14 13.15	-13 01.6	0.431	0.977	-2.00 -6.3	16.7	78.3/ 96	72.8
Aug. 26	15 06.68	-14 02.6	0.374	0.989	-3.51 -13.9	16.4	100.7/ 93	76.0
Sept. 5	16 15.94	-14 11.5	0.331	1.021	-6.06 -26.5	16.3	122.1/ 88	82.8
Sept. 15	17 39.47	-12 45.9	0.314	1.070	-8.98 -45.1	16.4	127.0/ 84	93.2
Sept. 25	19 04.92	-09 43.3	0.332	1.134	-10.39 -61.0	16.8	110.1/ 80	104.6
Oct. 5	20 17.62	-06 10.4	0.387	1.207	-9.67 -63.6	17.4	85.5/ 78	113.3
Oct. 15	21 13.47	-03 05.6	0.472	1.288	-8.02 -56.3	18.1	65.3/ 77	118.0
Oct. 25	21 55.89	-00 39.3	0.580	1.375	-6.40 -46.4	18.8	51.4/ 77	119.2
Nov. 4	22 29.23	+01 18.4	0.707	1.464	-5.10 -37.4	19.5	42.4/ 76	118.0
Nov. 14	22 56.72	+02 58.5	0.850	1.555	-4.10 -30.1	20.2	36.7/ 76	115.2
Nov. 24	23 20.49	+04 29.0	1.007	1.647	-3.34 -24.4	20.8	33.0/ 75	111.3
Dec. 4	23 41.81	+05 54.6	1.175	1.738	-2.77 -19.9	21.4	30.5/ 74	106.8
Dec. 14	00 01.50	+07 17.7	1.355	1.830	-2.32 -16.4	21.9	28.8/ 73	101.7
Dec. 24	00 20.11	+08 39.7	1.543	1.920	-1.98 -13.6	22.4	27.6/ 73	96.4
Jan. 3	00 37.96	+10 00.8	1.738	2.009	-1.70 -11.3	22.8	26.8/ 72	90.9
Jan. 13	00 55.28	+11 21.0	1.937	2.097	-1.48 -9.5	.	26.1/ 72	85.1
Jan. 23	01 12.24	+12 40.2	2.140	2.183	-1.30 -8.0	.	25.5/ 72	79.3
Feb. 2	01 28.91	+13 57.7	2.343	2.268	-1.16 -6.8	.	25.1/ 72	73.4
Feb. 12	01 45.38	+15 13.0	2.546	2.352	-1.03 -5.7	.	24.6/ 72	67.5
Feb. 22	02 01.70	+16 25.8	2.745	2.433	-0.93 -4.8	.	24.2/ 73	61.5
Mar. 3	02 17.88	+17 35.3	2.938	2.514	-0.84 -4.1	.	23.8/ 73	55.5
Mar. 13	02 33.95	+18 41.2	3.125	2.592	-0.77 -3.4	.	23.4/ 74	49.5
Mar. 23	02 49.90	+19 43.1	3.303	2.669	-0.71 -2.9	.	23.0/ 75	43.5

Comet C/2012 LP26 (Palomar)

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 16.63368 TT
 Peri. = 145.15841
 Node = 153.98761 2000.0
 Incl. = 25.37972
 q = 6.5360056 AU
 e = 0.9991508

$$m_1 = 6.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	18 54.83	-05 16.9	7.632	6.702	+0.80	+0.3	18.7	17.7
Jan. 18	19 02.79	-05 13.6	7.601	6.687	+0.78	+0.7	18.7	20.4
Jan. 28	19 10.63	-05 06.3	7.549	6.673	+0.76	+1.1	18.6	25.5
Feb. 7	19 18.26	-04 55.1	7.478	6.660	+0.73	+1.4	18.6	31.8
Feb. 17	19 25.60	-04 40.7	7.388	6.648	+0.69	+1.7	18.6	38.8
Feb. 27	19 32.54	-04 23.4	7.282	6.636	+0.65	+1.9	18.5	46.3
Mar. 9	19 39.01	-04 04.0	7.160	6.625	+0.59	+2.1	18.5	53.9
Mar. 19	19 44.92	-03 43.1	7.026	6.614	+0.53	+2.2	18.4	61.8
Mar. 29	19 50.20	-03 21.4	6.881	6.604	+0.46	+2.2	18.4	69.9
Apr. 8	19 54.76	-02 59.8	6.729	6.595	+0.38	+2.1	18.3	78.0
Apr. 18	19 58.54	-02 39.1	6.572	6.586	+0.29	+1.9	18.3	86.4
Apr. 28	20 01.47	-02 20.3	6.415	6.578	+0.21	+1.6	18.2	94.9
May 8	20 03.53	-02 04.3	6.261	6.571	+0.11	+1.2	18.2	103.6
May 18	20 04.67	-01 52.1	6.113	6.564	+0.02	+0.7	18.1	112.4
May 28	20 04.91	-01 44.6	5.975	6.558	-0.06	+0.2	18.0	121.3
June 7	20 04.29	-01 42.7	5.852	6.553	-0.14	-0.4	18.0	130.2
June 17	20 02.88	-01 46.9	5.747	6.549	-0.21	-1.1	18.0	139.1
June 27	20 00.80	-01 57.7	5.663	6.545	-0.26	-1.7	17.9	147.8
July 7	19 58.22	-02 15.2	5.603	6.542	-0.29	-2.4	17.9	155.5
July 17	19 55.33	-02 39.1	5.569	6.539	-0.30	-3.0	17.9	161.1
July 27	19 52.36	-03 08.8	5.564	6.537	-0.28	-3.4	17.9	162.1
Aug. 6	19 49.54	-03 43.3	5.586	6.536	-0.24	-3.8	17.9	157.9
Aug. 16	19 47.11	-04 21.3	5.635	6.536	-0.19	-4.0	17.9	150.6
Aug. 26	19 45.25	-05 01.5	5.710	6.536	-0.11	-4.1	17.9	142.0
Sept. 5	19 44.13	-05 42.5	5.808	6.537	-0.03	-4.0	18.0	133.0
Sept. 15	19 43.87	-06 23.0	5.926	6.539	+0.07	-3.9	18.0	123.8
Sept. 25	19 44.55	-07 01.7	6.060	6.541	+0.16	-3.6	18.1	114.6
Oct. 5	19 46.18	-07 37.6	6.207	6.544	+0.26	-3.2	18.1	105.4
Oct. 15	19 48.76	-08 10.0	6.362	6.548	+0.35	-2.8	18.2	96.4
Oct. 25	19 52.26	-08 38.2	6.522	6.553	+0.43	-2.4	18.2	87.4
Nov. 4	19 56.60	-09 01.9	6.681	6.558	+0.51	-1.9	18.3	78.6
Nov. 14	20 01.72	-09 20.7	6.837	6.564	+0.58	-1.4	18.3	69.9
Nov. 24	20 07.54	-09 34.6	6.986	6.570	+0.64	-0.9	18.4	61.3
Dec. 4	20 13.94	-09 43.6	7.125	6.577	+0.69	-0.4	18.4	52.9
Dec. 14	20 20.83	-09 47.8	7.250	6.585	+0.73	0.0	18.5	44.5
Dec. 24	20 28.13	-09 47.4	7.360	6.594	+0.76	+0.5	18.5	36.3
Jan. 3	20 35.73	-09 42.7	7.453	6.603	+0.78	+0.9	18.6	28.2
Jan. 13	20 43.54	-09 34.1	7.525	6.613	+0.79	+1.2	18.6	20.4
Jan. 23	20 51.47	-09 22.0	7.578	6.623	+0.80	+1.5	18.6	13.1
Feb. 2	20 59.43	-09 06.8	7.609	6.634	+0.79	+1.8	18.6	8.0
Feb. 12	21 07.34	-08 49.2	7.618	6.646	+0.78	+1.9	18.6	9.4
Feb. 22	21 15.11	-08 29.8	7.605	6.659	+0.76	+2.1	18.6	15.7
Mar. 3	21 22.67	-08 09.1	7.572	6.672	+0.73	+2.1	18.6	23.1
Mar. 13	21 29.94	-07 47.7	7.518	6.685	+0.69	+2.1	18.6	31.0
Mar. 23	21 36.85	-07 26.5	7.445	6.700	+0.65	+2.0	18.6	39.0

Comet 141P/Machholz

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 24.95422 TT
 Peri. = 149.48251
 Node = 246.01427 2000.0
 Incl. = 12.80927
 q = 0.7609153 AU
 e = 0.7481712
 a = 3.0215579 AU
 n = 0.18765394
 P = 5.25 years

$$m1 = 16.0 + 5 \log(\Delta) + 20.0 \log(r(t-10))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m ' "		m1	Elong. °
Jan. 8	17 45.49	-21 03.8	3.751	2.853	+1.60	+1.3	.	20.7
Jan. 18	18 01.47	-20 50.7	3.613	2.773	+1.63	+2.1	.	27.1
Jan. 28	18 17.80	-20 29.6	3.459	2.692	+1.66	+3.0	.	33.5
Feb. 7	18 34.45	-19 59.5	3.291	2.609	+1.69	+4.0	.	39.7
Feb. 17	18 51.38	-19 19.6	3.112	2.524	+1.72	+5.1	.	45.8
Feb. 27	19 08.60	-18 29.0	2.923	2.436	+1.75	+6.2	.	51.7
Mar. 9	19 26.09	-17 26.7	2.726	2.346	+1.78	+7.5	.	57.4
Mar. 19	19 43.90	-16 11.4	2.524	2.254	+1.82	+9.0	.	63.0
Mar. 29	20 02.09	-14 41.3	2.319	2.159	+1.87	+10.7	.	68.3
Apr. 8	20 20.76	-12 54.4	2.113	2.062	+1.94	+12.7	.	73.3
Apr. 18	20 40.12	-10 47.7	1.909	1.963	+2.03	+15.0	.	78.0
Apr. 28	21 00.43	-08 17.3	1.709	1.861	+2.17	+18.0	23.0	82.2
May 8	21 22.11	-05 17.7	1.515	1.757	+2.37	+21.6	22.3	85.7
May 18	21 45.83	-01 41.8	1.331	1.650	+2.67	+26.2	21.5	88.5
May 28	22 12.57	+02 39.9	1.159	1.541	+3.13	+31.8	20.7	90.1
June 7	22 43.91	+07 57.9	1.005	1.431	+3.83	+38.2	19.8	90.2
June 17	23 22.25	+14 19.6	0.874	1.319	+4.87	+43.6	18.8	88.2
June 27	00 10.99	+21 36.0	0.772	1.208	+6.30	+44.1	17.8	83.8
July 7	01 14.01	+28 57.3	0.708	1.099	+7.82	+34.1	16.9	76.9
July 17	02 32.17	+34 38.4	0.688	0.995	+8.57	+13.4	16.0	68.3
July 27	03 57.84	+36 52.3	0.714	0.902	+8.00	-8.4	15.2	59.8
Aug. 6	05 17.82	+35 28.0	0.780	0.826	+6.70	-22.6	14.6	52.8
Aug. 16	06 24.80	+31 42.4	0.875	0.776	+5.46	-28.8	14.0	47.9
Aug. 26	07 19.42	+26 54.0	0.988	0.761	+4.53	-30.4	13.8	44.8
Sept. 5	08 04.73	+21 49.9	1.106	0.784	+3.84	-29.6	13.8	43.2
Sept. 15	08 43.11	+16 53.9	1.221	0.840	+3.29	-27.7	14.3	43.0
Sept. 25	09 15.96	+12 17.0	1.325	0.920	+2.83	-25.4	15.1	43.9
Oct. 5	09 44.31	+08 02.6	1.416	1.016	+2.46	-23.2	16.0	45.9
Oct. 15	10 08.88	+04 10.9	1.491	1.121	+2.13	-21.0	17.0	48.8
Oct. 25	10 30.15	+00 40.5	1.550	1.231	+1.83	-19.1	17.9	52.5
Nov. 4	10 48.49	-02 30.3	1.593	1.342	+1.56	-17.3	18.8	57.0
Nov. 14	11 04.09	-05 23.2	1.620	1.454	+1.29	-15.6	19.6	62.3
Nov. 24	11 16.98	-07 59.2	1.631	1.564	+1.01	-14.0	20.3	68.3
Dec. 4	11 27.12	-10 18.8	1.629	1.672	+0.72	-12.3	20.9	75.1
Dec. 14	11 34.32	-12 21.8	1.614	1.778	+0.40	-10.5	21.5	82.5
Dec. 24	11 38.35	-14 06.7	1.591	1.882	+0.06	-8.4	22.0	90.8
Jan. 3	11 38.96	-15 31.1	1.563	1.984	-0.30	-6.0	22.5	99.9
Jan. 13	11 35.94	-16 31.6	1.534	2.083	-0.67	-3.2	22.9	109.7
Jan. 23	11 29.29	-17 03.5	1.510	2.179	-0.99	+0.1	.	120.3
Feb. 2	11 19.38	-17 02.8	1.498	2.273	-1.24	+3.6	.	131.4
Feb. 12	11 07.02	-16 27.1	1.503	2.365	-1.35	+6.9	.	142.6
Feb. 22	10 53.47	-15 18.6	1.533	2.454	-1.33	+9.4	.	152.7
Mar. 3	10 40.20	-13 44.6	1.591	2.541	-1.17	+10.9	.	159.1
Mar. 13	10 28.49	-11 56.0	1.678	2.626	-0.92	+11.1	.	158.2
Mar. 23	10 19.28	-10 04.9	1.793	2.709	-0.63	+10.4	.	151.2

Comet C/2014 M1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 26.40830 TT
 Peri. = 336.73489
 Node = 234.67414 2000.0
 Incl. = 160.17635
 q = 5.5770359 AU
 e = 1.0029017

$$m1 = 8.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	18 52.66	-35 14.7	6.774	5.823	+0.31	+1.2	20.2	13.8
Jan. 18	18 55.74	-35 02.4	6.719	5.803	+0.28	+0.9	20.2	19.8
Jan. 28	18 58.55	-34 53.2	6.636	5.783	+0.24	+0.6	20.1	27.8
Feb. 7	19 00.91	-34 47.2	6.525	5.764	+0.17	+0.3	20.1	36.7
Feb. 17	19 02.63	-34 44.6	6.390	5.747	+0.09	-0.1	20.0	45.9
Feb. 27	19 03.51	-34 45.5	6.233	5.730	-0.02	-0.5	20.0	55.5
Mar. 9	19 03.34	-34 50.0	6.058	5.713	-0.14	-0.8	19.9	65.2
Mar. 19	19 01.90	-34 58.1	5.869	5.698	-0.29	-1.1	19.8	75.3
Mar. 29	18 58.96	-35 09.5	5.673	5.684	-0.47	-1.4	19.7	85.6
Apr. 8	18 54.30	-35 23.4	5.474	5.670	-0.66	-1.5	19.6	96.2
Apr. 18	18 47.70	-35 38.7	5.280	5.657	-0.87	-1.5	19.5	107.1
Apr. 28	18 39.03	-35 53.6	5.098	5.646	-1.08	-1.2	19.5	118.3
May 8	18 28.23	-36 05.4	4.935	5.635	-1.28	-0.6	19.4	129.8
May 18	18 15.42	-36 11.3	4.798	5.625	-1.45	+0.3	19.3	141.5
May 28	18 00.89	-36 08.1	4.694	5.616	-1.57	+1.5	19.3	153.0
June 7	17 45.18	-35 53.3	4.628	5.608	-1.62	+2.8	19.2	163.3
June 17	17 28.96	-35 25.6	4.604	5.601	-1.59	+4.0	19.2	167.7
June 27	17 13.03	-34 45.4	4.622	5.594	-1.49	+5.0	19.2	161.3
July 7	16 58.10	-33 55.0	4.681	5.589	-1.34	+5.7	19.2	150.5
July 17	16 44.73	-32 57.8	4.778	5.585	-1.14	+6.0	19.3	139.0
July 27	16 33.28	-31 57.6	4.907	5.581	-0.94	+6.0	19.3	127.3
Aug. 6	16 23.90	-30 57.9	5.061	5.579	-0.73	+5.6	19.4	115.9
Aug. 16	16 16.57	-30 01.4	5.233	5.578	-0.54	+5.2	19.5	104.8
Aug. 26	16 11.18	-29 09.9	5.416	5.577	-0.36	+4.6	19.5	93.9
Sept. 5	16 07.53	-28 24.3	5.602	5.577	-0.21	+3.9	19.6	83.4
Sept. 15	16 05.42	-27 44.9	5.786	5.579	-0.08	+3.3	19.7	73.2
Sept. 25	16 04.63	-27 11.4	5.961	5.581	+0.03	+2.8	19.7	63.2
Oct. 5	16 04.94	-26 43.3	6.123	5.584	+0.12	+2.3	19.8	53.4
Oct. 15	16 06.16	-26 20.0	6.266	5.589	+0.19	+1.9	19.9	43.8
Oct. 25	16 08.11	-26 00.8	6.388	5.594	+0.25	+1.6	19.9	34.2
Nov. 4	16 10.60	-25 44.8	6.485	5.600	+0.29	+1.3	19.9	24.9
Nov. 14	16 13.48	-25 31.4	6.554	5.607	+0.31	+1.2	20.0	15.6
Nov. 24	16 16.57	-25 19.8	6.594	5.615	+0.32	+1.0	20.0	6.8
Dec. 4	16 19.73	-25 09.4	6.605	5.624	+0.31	+1.0	20.0	5.3
Dec. 14	16 22.80	-24 59.5	6.585	5.634	+0.28	+1.0	20.0	13.8
Dec. 24	16 25.61	-24 49.6	6.536	5.645	+0.24	+1.0	20.0	23.2
Jan. 3	16 28.00	-24 39.1	6.458	5.656	+0.18	+1.2	20.0	32.7
Jan. 13	16 29.80	-24 27.5	6.355	5.669	+0.10	+1.3	20.0	42.5
Jan. 23	16 30.84	-24 14.3	6.228	5.682	+0.01	+1.5	19.9	52.5
Feb. 2	16 30.94	-23 58.8	6.082	5.697	-0.10	+1.8	19.9	62.6
Feb. 12	16 29.92	-23 40.5	5.922	5.712	-0.23	+2.2	19.8	73.0
Feb. 22	16 27.61	-23 18.5	5.752	5.728	-0.38	+2.6	19.8	83.7
Mar. 3	16 23.86	-22 52.2	5.579	5.745	-0.53	+3.2	19.7	94.7
Mar. 13	16 18.55	-22 20.6	5.410	5.763	-0.69	+3.8	19.7	106.0
Mar. 23	16 11.64	-21 42.8	5.252	5.782	-0.85	+4.5	19.6	117.6

Comet C/2013 C2 (Tenagra)

Epoch = 2015 June 27.0 TT
 T = 2015 Aug. 29.59880 TT
 Peri. = 308.76231
 Node = 247.52331 2000.0
 Incl. = 21.33962
 q = 9.1311926 AU
 e = 0.4314192
 a = 16.0596218 AU
 n = 0.01531444
 P = 64.36 years

$$m1 = 4.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	12 22.52	-22 58.5	9.078	9.173	+0.06 -2.1	18.4	92.5
Jan. 18	12 23.14	-23 19.7	8.918	9.169	-0.01 -1.6	18.4	101.8
Jan. 28	12 23.04	-23 36.1	8.763	9.166	-0.08 -1.1	18.3	111.2
Feb. 7	12 22.25	-23 47.0	8.620	9.163	-0.14 -0.5	18.3	120.7
Feb. 17	12 20.81	-23 51.8	8.492	9.160	-0.20 +0.2	18.3	130.1
Feb. 27	12 18.82	-23 50.2	8.384	9.157	-0.24 +0.8	18.2	139.3
Mar. 9	12 16.41	-23 42.3	8.298	9.154	-0.27 +1.4	18.2	147.9
Mar. 19	12 13.73	-23 28.4	8.239	9.152	-0.28 +1.9	18.2	155.1
Mar. 29	12 10.94	-23 08.9	8.208	9.149	-0.27 +2.4	18.2	159.5
Apr. 8	12 08.22	-22 45.0	8.205	9.147	-0.25 +2.7	18.2	159.1
Apr. 18	12 05.75	-22 17.8	8.231	9.145	-0.21 +2.9	18.2	154.2
Apr. 28	12 03.66	-21 48.6	8.284	9.143	-0.16 +3.0	18.2	146.8
May 8	12 02.08	-21 19.0	8.362	9.141	-0.10 +2.9	18.2	138.4
May 18	12 01.10	-20 50.1	8.462	9.139	-0.03 +2.7	18.2	129.5
May 28	12 00.78	-20 23.2	8.581	9.138	+0.04 +2.4	18.3	120.5
June 7	12 01.15	-19 59.4	8.715	9.137	+0.10 +2.0	18.3	111.6
June 17	12 02.19	-19 39.4	8.859	9.135	+0.17 +1.6	18.3	102.6
June 27	12 03.91	-19 23.8	9.010	9.134	+0.23 +1.1	18.4	93.8
July 7	12 06.26	-19 12.8	9.163	9.133	+0.29 +0.6	18.4	85.1
July 17	12 09.19	-19 06.7	9.315	9.133	+0.35 +0.1	18.5	76.6
July 27	12 12.65	-19 05.3	9.461	9.132	+0.39 -0.3	18.5	68.2
Aug. 6	12 16.58	-19 08.7	9.598	9.132	+0.43 -0.8	18.5	59.9
Aug. 16	12 20.92	-19 16.5	9.724	9.131	+0.47 -1.2	18.5	51.7
Aug. 26	12 25.62	-19 28.4	9.835	9.131	+0.50 -1.6	18.6	43.7
Sept. 5	12 30.60	-19 44.1	9.928	9.131	+0.52 -1.9	18.6	36.0
Sept. 15	12 35.81	-20 03.3	10.003	9.131	+0.54 -2.2	18.6	28.5
Sept. 25	12 41.17	-20 25.4	10.056	9.132	+0.55 -2.5	18.6	21.7
Oct. 5	12 46.63	-20 50.0	10.087	9.132	+0.55 -2.7	18.6	16.4
Oct. 15	12 52.11	-21 16.8	10.095	9.133	+0.54 -2.8	18.6	14.5
Oct. 25	12 57.55	-21 45.2	10.080	9.134	+0.53 -2.9	18.6	17.1
Nov. 4	13 02.88	-22 14.6	10.041	9.135	+0.51 -3.0	18.6	22.8
Nov. 14	13 08.02	-22 44.8	9.980	9.136	+0.49 -3.0	18.6	30.0
Nov. 24	13 12.89	-23 15.1	9.896	9.137	+0.45 -3.0	18.6	37.9
Dec. 4	13 17.42	-23 44.9	9.793	9.138	+0.41 -2.9	18.6	46.2
Dec. 14	13 21.53	-24 13.9	9.672	9.140	+0.36 -2.8	18.5	54.8
Dec. 24	13 25.14	-24 41.4	9.536	9.142	+0.30 -2.5	18.5	63.6
Jan. 3	13 28.17	-25 06.9	9.389	9.143	+0.24 -2.3	18.5	72.6
Jan. 13	13 30.56	-25 29.7	9.233	9.145	+0.17 -2.0	18.4	81.8
Jan. 23	13 32.25	-25 49.2	9.074	9.148	+0.10 -1.6	18.4	91.2
Feb. 2	13 33.21	-26 04.9	8.916	9.150	+0.02 -1.1	18.4	100.7
Feb. 12	13 33.42	-26 16.2	8.763	9.152	-0.05 -0.6	18.3	110.3
Feb. 22	13 32.89	-26 22.5	8.620	9.155	-0.12 -0.1	18.3	120.0
Mar. 3	13 31.68	-26 23.5	8.492	9.158	-0.18 +0.5	18.3	129.7
Mar. 13	13 29.86	-26 18.9	8.384	9.161	-0.23 +1.0	18.2	139.3
Mar. 23	13 27.55	-26 08.7	8.298	9.164	-0.26 +1.5	18.2	148.6

Comet C/2014 A4 (SONEAR)

Epoch = 2015 June 27.0 TT
 T = 2015 Sept. 5.85667 TT
 Peri. = 356.78595
 Node = 29.72737 2000.0
 Incl. = 121.35764
 q = 4.1803279 AU
 e = 1.0007525

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	03 15.56	-20 11.9	4.241	4.638	-0.94	+11.4	15.4	107.9
Jan. 18	03 06.15	-18 18.2	4.351	4.603	-0.73	+11.9	15.4	98.7
Jan. 28	02 58.86	-16 19.2	4.474	4.569	-0.53	+12.0	15.5	89.3
Feb. 7	02 53.58	-14 18.9	4.604	4.537	-0.35	+11.9	15.5	79.9
Feb. 17	02 50.10	-12 19.8	4.735	4.505	-0.19	+11.6	15.5	70.6
Feb. 27	02 48.19	-10 23.8	4.861	4.475	-0.06	+11.2	15.5	61.6
Mar. 9	02 47.61	-08 32.1	4.976	4.446	+0.05	+10.7	15.6	52.8
Mar. 19	02 48.13	-06 45.2	5.076	4.419	+0.14	+10.2	15.6	44.3
Mar. 29	02 49.55	-05 03.5	5.159	4.392	+0.21	+9.6	15.6	36.1
Apr. 8	02 51.66	-03 27.0	5.221	4.368	+0.26	+9.1	15.6	28.6
Apr. 18	02 54.28	-01 55.6	5.259	4.344	+0.30	+8.6	15.6	21.9
Apr. 28	02 57.27	-00 29.2	5.274	4.322	+0.32	+8.2	15.6	17.2
May 8	03 00.44	+00 52.5	5.263	4.302	+0.32	+7.7	15.5	16.0
May 18	03 03.67	+02 09.8	5.226	4.283	+0.31	+7.3	15.5	19.0
May 28	03 06.79	+03 22.9	5.164	4.265	+0.29	+6.9	15.5	24.8
June 7	03 09.64	+04 32.1	5.077	4.250	+0.24	+6.6	15.4	31.9
June 17	03 12.07	+05 37.7	4.967	4.235	+0.18	+6.2	15.3	39.7
June 27	03 13.88	+06 40.2	4.836	4.223	+0.10	+6.0	15.3	47.9
July 7	03 14.88	+07 39.8	4.685	4.212	0.00	+5.7	15.2	56.6
July 17	03 14.85	+08 36.8	4.519	4.202	-0.13	+5.5	15.1	65.6
July 27	03 13.51	+09 31.5	4.340	4.194	-0.29	+5.3	15.0	75.1
Aug. 6	03 10.59	+10 24.1	4.154	4.188	-0.48	+5.1	14.9	85.0
Aug. 16	03 05.78	+11 14.6	3.965	4.184	-0.70	+4.8	14.8	95.4
Aug. 26	02 58.78	+12 02.9	3.782	4.181	-0.95	+4.5	14.7	106.4
Sept. 5	02 49.33	+12 48.1	3.610	4.180	-1.21	+4.1	14.6	118.1
Sept. 15	02 37.27	+13 29.2	3.458	4.181	-1.46	+3.5	14.5	130.4
Sept. 25	02 22.65	+14 04.6	3.335	4.183	-1.68	+2.8	14.4	143.4
Oct. 5	02 05.84	+14 32.5	3.249	4.188	-1.83	+1.9	14.4	156.9
Oct. 15	01 47.51	+14 51.5	3.207	4.193	-1.89	+1.0	14.4	170.2
Oct. 25	01 28.65	+15 01.5	3.212	4.201	-1.83	+0.3	14.4	172.7
Nov. 4	01 10.36	+15 04.1	3.265	4.210	-1.67	-0.2	14.4	159.7
Nov. 14	00 53.62	+15 02.2	3.363	4.221	-1.45	-0.3	14.5	146.1
Nov. 24	00 39.10	+14 59.4	3.498	4.233	-1.19	0.0	14.6	132.9
Dec. 4	00 27.16	+14 59.1	3.663	4.247	-0.93	+0.5	14.7	120.3
Dec. 14	00 17.84	+15 03.8	3.850	4.262	-0.69	+1.2	14.8	108.3
Dec. 24	00 10.97	+15 15.3	4.049	4.280	-0.47	+1.9	15.0	96.9
Jan. 3	00 06.28	+15 34.5	4.252	4.298	-0.28	+2.7	15.1	86.1
Jan. 13	00 03.46	+16 01.5	4.454	4.319	-0.13	+3.5	15.2	75.8
Jan. 23	00 02.19	+16 36.3	4.647	4.340	0.00	+4.2	15.3	66.0
Feb. 2	00 02.19	+17 18.5	4.826	4.363	+0.10	+4.9	15.4	56.7
Feb. 12	00 03.18	+18 07.7	4.989	4.388	+0.17	+5.6	15.5	47.9
Feb. 22	00 04.93	+19 03.5	5.130	4.414	+0.23	+6.2	15.6	39.6
Mar. 3	00 07.22	+20 05.5	5.249	4.441	+0.26	+6.8	15.7	32.1
Mar. 13	00 09.87	+21 13.1	5.344	4.470	+0.28	+7.3	15.7	25.8
Mar. 23	00 12.69	+22 26.2	5.413	4.500	+0.28	+7.8	15.8	21.4

Comet C/2014 W8 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Sept. 7.73457 TT
 Peri. = 227.38871
 Node = 224.93369 2000.0
 Incl. = 42.20251
 q = 5.0556501 AU
 e = 0.9689303

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	03 26.27	+04 03.2	4.787	5.373	-0.02 -2.4	20.7	121.9
Jan. 18	03 26.06	+03 39.7	4.902	5.348	+0.10 -1.6	20.7	112.0
Jan. 28	03 27.07	+03 24.1	5.027	5.324	+0.22 -0.9	20.8	102.3
Feb. 7	03 29.27	+03 15.3	5.158	5.301	+0.34 -0.3	20.8	93.0
Feb. 17	03 32.63	+03 12.2	5.290	5.280	+0.44 +0.1	20.8	84.0
Feb. 27	03 37.05	+03 13.3	5.419	5.259	+0.54 +0.4	20.9	75.4
Mar. 9	03 42.46	+03 17.4	5.543	5.239	+0.63 +0.6	20.9	67.2
Mar. 19	03 48.74	+03 23.0	5.657	5.219	+0.71 +0.6	20.9	59.3
Mar. 29	03 55.81	+03 29.1	5.760	5.201	+0.77 +0.5	21.0	51.7
Apr. 8	04 03.54	+03 34.5	5.850	5.184	+0.83 +0.4	21.0	44.5
Apr. 18	04 11.86	+03 38.1	5.925	5.168	+0.88 +0.1	21.0	37.8
Apr. 28	04 20.66	+03 39.2	5.983	5.153	+0.92 -0.2	21.0	31.6
May 8	04 29.85	+03 36.8	6.025	5.139	+0.95 -0.7	21.0	26.2
May 18	04 39.35	+03 30.3	6.050	5.126	+0.97 -1.1	21.0	22.0
May 28	04 49.07	+03 19.0	6.058	5.114	+0.99 -1.7	21.0	19.6
June 7	04 58.93	+03 02.2	6.048	5.104	+0.99 -2.3	21.0	19.6
June 17	05 08.85	+02 39.6	6.022	5.094	+0.99 -2.9	21.0	22.0
June 27	05 18.74	+02 10.7	5.979	5.085	+0.98 -3.6	20.9	26.0
July 7	05 28.52	+01 35.0	5.921	5.078	+0.96 -4.3	20.9	31.1
July 17	05 38.10	+00 52.4	5.849	5.071	+0.93 -5.0	20.9	36.7
July 27	05 47.40	+00 02.5	5.764	5.066	+0.89 -5.7	20.9	42.8
Aug. 6	05 56.31	-00 54.6	5.668	5.062	+0.84 -6.4	20.8	49.1
Aug. 16	06 04.74	-01 59.1	5.561	5.059	+0.78 -7.2	20.8	55.6
Aug. 26	06 12.58	-03 10.7	5.446	5.057	+0.71 -7.9	20.7	62.3
Sept. 5	06 19.72	-04 29.2	5.325	5.056	+0.63 -8.5	20.7	69.2
Sept. 15	06 26.06	-05 54.1	5.200	5.056	+0.54 -9.0	20.6	76.3
Sept. 25	06 31.46	-07 24.6	5.073	5.057	+0.44 -9.5	20.6	83.4
Oct. 5	06 35.83	-08 59.5	4.949	5.060	+0.32 -9.8	20.5	90.6
Oct. 15	06 39.05	-10 37.5	4.828	5.063	+0.20 -9.9	20.5	97.9
Oct. 25	06 41.03	-12 16.5	4.716	5.068	+0.07 -9.8	20.4	105.2
Nov. 4	06 41.73	-13 54.2	4.614	5.074	-0.06 -9.4	20.4	112.3
Nov. 14	06 41.13	-15 27.8	4.526	5.081	-0.18 -8.6	20.3	119.1
Nov. 24	06 39.30	-16 54.1	4.454	5.089	-0.29 -7.6	20.3	125.3
Dec. 4	06 36.40	-18 10.2	4.402	5.098	-0.38 -6.3	20.3	130.5
Dec. 14	06 32.63	-19 12.9	4.372	5.108	-0.43 -4.7	20.3	134.3
Dec. 24	06 28.32	-20 00.2	4.364	5.120	-0.45 -3.0	20.3	136.3
Jan. 3	06 23.84	-20 30.7	4.378	5.132	-0.43 -1.4	20.3	136.1
Jan. 13	06 19.57	-20 44.2	4.416	5.145	-0.37 +0.2	20.3	133.8
Jan. 23	06 15.89	-20 41.8	4.474	5.160	-0.28 +1.6	20.4	129.8
Feb. 2	06 13.11	-20 25.6	4.552	5.175	-0.17 +2.8	20.4	124.6
Feb. 12	06 11.44	-19 58.0	4.646	5.192	-0.04 +3.6	20.5	118.6
Feb. 22	06 11.03	-19 22.3	4.755	5.209	+0.09 +4.1	20.6	112.2
Mar. 3	06 11.93	-18 41.3	4.874	5.228	+0.22 +4.4	20.6	105.6
Mar. 13	06 14.13	-17 57.7	5.001	5.247	+0.34 +4.4	20.7	98.9
Mar. 23	06 17.56	-17 14.2	5.134	5.268	+0.46 +4.1	20.8	92.2

Comet 61P/Shajn-Schaldach

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 2.17167 TT
 Peri. = 221.91022
 Node = 163.01916 2000.0
 Incl. = 6.00577
 q = 2.1138982 AU
 e = 0.4258252
 a = 3.6816283 AU
 n = 0.13952247
 P = 7.06 years

$$m1 = 12.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	20 01.39	-17 32.7	3.804	2.850	+1.72 +4.4	19.4	12.0
Jan. 18	20 18.55	-16 48.4	3.784	2.808	+1.74 +5.2	19.4	6.3
Jan. 28	20 35.97	-15 56.2	3.750	2.767	+1.76 +6.0	19.3	2.6
Feb. 7	20 53.58	-14 56.4	3.703	2.726	+1.77 +6.7	19.2	6.5
Feb. 17	21 11.31	-13 49.3	3.644	2.685	+1.78 +7.4	19.1	11.9
Feb. 27	21 29.12	-12 35.5	3.573	2.645	+1.78 +8.0	19.0	17.4
Mar. 9	21 46.95	-11 15.6	3.492	2.605	+1.78 +8.5	18.9	22.8
Mar. 19	22 04.80	-09 50.4	3.401	2.567	+1.78 +9.0	18.8	28.2
Mar. 29	22 22.61	-08 20.7	3.301	2.528	+1.78 +9.3	18.6	33.4
Apr. 8	22 40.38	-06 47.5	3.194	2.491	+1.77 +9.6	18.5	38.6
Apr. 18	22 58.10	-05 11.6	3.081	2.455	+1.76 +9.7	18.3	43.7
Apr. 28	23 15.74	-03 34.2	2.962	2.420	+1.76 +9.8	18.2	48.8
May 8	23 33.29	-01 56.4	2.839	2.386	+1.74 +9.7	18.0	53.8
May 18	23 50.74	+00 19.5	2.713	2.354	+1.73 +9.5	17.9	58.8
May 28	00 08.03	+01 15.2	2.584	2.323	+1.71 +9.1	17.7	63.8
June 7	00 25.14	+02 46.4	2.455	2.293	+1.68 +8.6	17.6	68.9
June 17	00 41.98	+04 12.5	2.324	2.266	+1.65 +8.0	17.4	74.0
June 27	00 58.47	+05 32.1	2.195	2.240	+1.60 +7.1	17.2	79.3
July 7	01 14.46	+06 43.4	2.067	2.217	+1.53 +6.1	17.0	84.7
July 17	01 29.81	+07 44.9	1.941	2.195	+1.44 +5.0	16.9	90.3
July 27	01 44.25	+08 34.7	1.818	2.176	+1.33 +3.7	16.7	96.2
Aug. 6	01 57.55	+09 11.4	1.700	2.159	+1.18 +2.2	16.5	102.5
Aug. 16	02 09.36	+09 33.2	1.587	2.145	+0.99 +0.6	16.3	109.2
Aug. 26	02 19.28	+09 38.9	1.482	2.133	+0.77 -1.1	16.1	116.4
Sept. 5	02 26.96	+09 27.7	1.386	2.124	+0.50 -2.8	16.0	124.3
Sept. 15	02 31.99	+08 59.5	1.302	2.118	+0.21 -4.4	15.8	132.8
Sept. 25	02 34.12	+08 15.4	1.231	2.115	-0.07 -5.7	15.7	142.1
Oct. 5	02 33.39	+07 18.7	1.178	2.114	-0.33 -6.4	15.6	152.0
Oct. 15	02 30.09	+06 14.9	1.145	2.116	-0.51 -6.3	15.5	162.0
Oct. 25	02 25.04	+05 11.7	1.134	2.121	-0.57 -5.4	15.5	170.2
Nov. 4	02 19.35	+04 17.9	1.148	2.129	-0.51 -3.7	15.6	168.5
Nov. 14	02 14.23	+03 40.8	1.185	2.139	-0.35 -1.5	15.7	159.4
Nov. 24	02 10.77	+03 25.4	1.244	2.153	-0.11 +0.7	15.8	149.2
Dec. 4	02 09.64	+03 32.7	1.323	2.168	+0.15 +2.8	16.0	139.3
Dec. 14	02 11.14	+04 01.1	1.420	2.186	+0.42 +4.6	16.2	130.0
Dec. 24	02 15.29	+04 47.3	1.530	2.207	+0.66 +6.0	16.4	121.2
Jan. 3	02 21.87	+05 47.4	1.652	2.230	+0.87 +7.0	16.6	113.1
Jan. 13	02 30.61	+06 57.5	1.784	2.254	+1.06 +7.7	16.8	105.4
Jan. 23	02 41.22	+08 14.1	1.922	2.281	+1.22 +8.0	17.0	98.2
Feb. 2	02 53.39	+09 33.9	2.065	2.310	+1.35 +8.1	17.2	91.4
Feb. 12	03 06.89	+10 54.5	2.211	2.340	+1.46 +7.9	17.4	84.9
Feb. 22	03 21.49	+12 13.6	2.359	2.372	+1.55 +7.6	17.6	78.7
Mar. 3	03 37.00	+13 29.2	2.507	2.405	+1.63 +7.1	17.8	72.7
Mar. 13	03 53.26	+14 40.0	2.654	2.440	+1.69 +6.5	18.0	66.8
Mar. 23	04 10.13	+15 44.5	2.798	2.475	+1.73 +5.7	18.2	61.1

Comet C/2013 V4 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 7.56038 TT
 Peri. = 40.44554
 Node = 55.61993 2000.0
 Incl. = 67.85339
 q = 5.1853416 AU
 e = 1.0026343

$$m_1 = 7.2 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	03 01.34	+27 43.3	4.978	5.575	-0.35	+3.3	16.3	123.0
Jan. 18	02 57.81	+28 16.0	5.099	5.549	-0.20	+3.5	16.3	112.4
Jan. 28	02 55.78	+28 50.7	5.231	5.523	-0.05	+3.8	16.4	102.1
Feb. 7	02 55.24	+29 28.4	5.369	5.497	+0.09	+4.1	16.4	92.3
Feb. 17	02 56.11	+30 09.5	5.509	5.473	+0.22	+4.5	16.4	82.8
Feb. 27	02 58.28	+30 54.3	5.644	5.450	+0.34	+4.9	16.5	73.7
Mar. 9	03 01.64	+31 43.0	5.772	5.427	+0.44	+5.2	16.5	65.0
Mar. 19	03 06.06	+32 35.5	5.889	5.406	+0.54	+5.6	16.5	56.6
Mar. 29	03 11.43	+33 31.6	5.992	5.385	+0.62	+6.0	16.6	48.7
Apr. 8	03 17.63	+34 31.2	6.078	5.365	+0.69	+6.3	16.6	41.1
Apr. 18	03 24.54	+35 34.1	6.147	5.346	+0.75	+6.6	16.6	34.2
Apr. 28	03 32.09	+36 40.1	6.197	5.329	+0.81	+6.9	16.6	28.0
May 8	03 40.16	+37 49.1	6.227	5.312	+0.85	+7.2	16.6	22.9
May 18	03 48.68	+39 00.9	6.236	5.296	+0.89	+7.5	16.6	19.8
May 28	03 57.58	+40 15.7	6.226	5.281	+0.92	+7.8	16.6	19.4
June 7	04 06.75	+41 33.4	6.197	5.267	+0.94	+8.1	16.6	21.7
June 17	04 16.14	+42 54.1	6.148	5.255	+0.95	+8.4	16.5	26.1
June 27	04 25.65	+44 18.2	6.082	5.243	+0.95	+8.8	16.5	31.5
July 7	04 35.19	+45 45.9	6.000	5.232	+0.95	+9.2	16.5	37.7
July 17	04 44.68	+47 17.5	5.903	5.223	+0.93	+9.6	16.4	44.2
July 27	04 53.97	+48 53.5	5.794	5.214	+0.90	+10.1	16.4	51.0
Aug. 6	05 02.96	+50 34.3	5.674	5.207	+0.85	+10.6	16.3	57.9
Aug. 16	05 11.46	+52 20.5	5.546	5.201	+0.78	+11.2	16.3	65.1
Aug. 26	05 19.29	+54 12.3	5.413	5.195	+0.69	+11.8	16.2	72.3
Sept. 5	05 26.20	+56 10.0	5.279	5.191	+0.57	+12.4	16.2	79.5
Sept. 15	05 31.88	+58 13.6	5.146	5.188	+0.41	+12.9	16.1	86.8
Sept. 25	05 35.94	+60 22.4	5.017	5.186	+0.19	+13.3	16.1	94.1
Oct. 5	05 37.88	+62 35.2	4.898	5.185	-0.08	+13.5	16.0	101.2
Oct. 15	05 37.08	+64 50.0	4.790	5.186	-0.43	+13.3	16.0	108.0
Oct. 25	05 32.78	+67 03.4	4.698	5.187	-0.86	+12.7	15.9	114.3
Nov. 4	05 24.20	+69 10.6	4.624	5.189	-1.36	+11.5	15.9	119.8
Nov. 14	05 10.56	+71 05.8	4.572	5.193	-1.90	+9.6	15.9	124.2
Nov. 24	04 51.60	+72 42.1	4.542	5.198	-2.35	+7.1	15.9	127.1
Dec. 4	04 28.07	+73 53.2	4.536	5.203	-2.61	+4.2	15.9	128.2
Dec. 14	04 02.01	+74 35.5	4.552	5.210	-2.54	+1.4	15.9	127.5
Dec. 24	03 36.57	+74 49.6	4.591	5.218	-2.19	-0.9	15.9	125.0
Jan. 3	03 14.70	+74 40.8	4.650	5.227	-1.65	-2.4	15.9	121.2
Jan. 13	02 58.23	+74 16.8	4.726	5.237	-1.05	-3.1	16.0	116.4
Jan. 23	02 47.72	+73 45.7	4.816	5.248	-0.49	-3.1	16.0	110.9
Feb. 2	02 42.77	+73 14.3	4.916	5.261	0.00	-2.7	16.1	105.2
Feb. 12	02 42.74	+72 47.0	5.024	5.274	+0.42	-2.0	16.1	99.3
Feb. 22	02 46.91	+72 26.8	5.136	5.288	+0.77	-1.2	16.2	93.4
Mar. 3	02 54.66	+72 14.9	5.249	5.303	+1.09	-0.3	16.2	87.7
Mar. 13	03 05.57	+72 11.7	5.361	5.320	+1.38	+0.5	16.3	82.3
Mar. 23	03 19.33	+72 16.6	5.470	5.337	+1.64	+1.2	16.3	77.1

Comet 151P/Hein

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 8.11865 TT
 Peri. = 216.27351
 Node = 143.15621 2000.0
 Incl. = 4.71959
 q = 2.4737820 AU
 e = 0.5722012
 a = 5.7825828 AU
 n = 0.07087960
 P = 13.91 years

$$m_1 = 4.4 + 5 \log(\Delta) + 30.0 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	19 17.94	-20 09.0	4.259	3.277	+1.60 +2.7	.	2.3
Jan. 18	19 33.90	-19 41.9	4.207	3.230	+1.62 +3.4	.	5.7
Jan. 28	19 50.06	-19 08.2	4.141	3.183	+1.62 +4.0	.	11.8
Feb. 7	20 06.30	-18 28.0	4.061	3.138	+1.63 +4.6	.	18.0
Feb. 17	20 22.58	-17 41.7	3.968	3.093	+1.62 +5.2	23.0	24.1
Feb. 27	20 38.80	-16 49.6	3.864	3.049	+1.61 +5.7	22.8	30.2
Mar. 9	20 54.89	-15 52.4	3.748	3.005	+1.59 +6.2	22.5	36.2
Mar. 19	21 10.80	-14 50.8	3.624	2.963	+1.57 +6.5	22.3	42.2
Mar. 29	21 26.46	-13 45.5	3.491	2.922	+1.54 +6.8	22.0	48.2
Apr. 8	21 41.81	-12 37.6	3.352	2.882	+1.50 +7.0	21.7	54.1
Apr. 18	21 56.80	-11 27.9	3.207	2.843	+1.45 +7.0	21.5	60.1
Apr. 28	22 11.34	-10 17.7	3.058	2.805	+1.40 +6.9	21.2	66.1
May 8	22 25.35	-09 08.3	2.906	2.769	+1.34 +6.7	20.9	72.2
May 18	22 38.76	-08 00.9	2.754	2.735	+1.27 +6.4	20.6	78.3
May 28	22 51.45	-06 57.2	2.601	2.702	+1.18 +5.8	20.3	84.6
June 7	23 03.28	-05 58.9	2.451	2.671	+1.08 +5.1	20.0	91.1
June 17	23 14.10	-05 07.6	2.303	2.642	+0.96 +4.2	19.7	97.9
June 27	23 23.71	-04 25.3	2.161	2.614	+0.82 +3.1	19.3	104.9
July 7	23 31.91	-03 54.1	2.026	2.589	+0.66 +1.8	19.0	112.4
July 17	23 38.48	-03 35.7	1.899	2.567	+0.47 +0.4	18.7	120.3
July 27	23 43.17	-03 32.0	1.784	2.546	+0.27 -1.2	18.5	128.7
Aug. 6	23 45.83	-03 43.7	1.684	2.528	+0.05 -2.7	18.2	137.7
Aug. 16	23 46.37	-04 10.8	1.600	2.512	-0.15 -4.1	17.9	147.3
Aug. 26	23 44.91	-04 51.5	1.536	2.499	-0.31 -5.0	17.7	157.5
Sept. 5	23 41.83	-05 41.5	1.494	2.489	-0.41 -5.4	17.6	167.9
Sept. 15	23 37.72	-06 35.2	1.477	2.481	-0.43 -5.0	17.4	176.1
Sept. 25	23 33.42	-07 25.5	1.485	2.476	-0.36 -4.0	17.3	168.8
Oct. 5	23 29.81	-08 05.8	1.517	2.474	-0.22 -2.5	17.3	158.2
Oct. 15	23 27.61	-08 31.1	1.573	2.474	-0.02 -0.8	17.3	147.8
Oct. 25	23 27.39	-08 38.6	1.649	2.478	+0.20 +1.1	17.4	137.8
Nov. 4	23 29.37	-08 27.8	1.742	2.484	+0.42 +2.8	17.4	128.4
Nov. 14	23 33.58	-07 59.5	1.851	2.492	+0.63 +4.4	17.5	119.6
Nov. 24	23 39.90	-07 15.3	1.970	2.504	+0.82 +5.8	17.7	111.3
Dec. 4	23 48.06	-06 17.5	2.099	2.518	+0.98 +6.9	17.8	103.4
Dec. 14	23 57.84	-05 08.2	2.235	2.534	+1.11 +7.9	18.0	96.0
Dec. 24	00 08.97	-03 49.5	2.375	2.553	+1.22 +8.6	18.1	88.9
Jan. 3	00 21.22	-02 23.5	2.518	2.575	+1.32 +9.1	18.3	82.1
Jan. 13	00 34.39	-00 52.2	2.662	2.599	+1.39 +9.5	18.5	75.6
Jan. 23	00 48.32	+00 43.0	2.806	2.624	+1.45 +9.7	18.7	69.3
Feb. 2	01 02.86	+02 20.1	2.948	2.652	+1.50 +9.8	18.9	63.1
Feb. 12	01 17.91	+03 58.0	3.087	2.682	+1.55 +9.7	19.1	57.1
Feb. 22	01 33.36	+05 35.1	3.222	2.714	+1.58 +9.5	19.3	51.2
Mar. 3	01 49.14	+07 10.3	3.351	2.747	+1.60 +9.2	19.5	45.4
Mar. 13	02 05.17	+08 42.6	3.474	2.782	+1.62 +8.8	19.7	39.7
Mar. 23	02 21.41	+10 10.9	3.589	2.819	+1.64 +8.3	19.9	34.1

Comet P/2001 H5 (NEAT)

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 21.77442 TT
 Peri. = 224.73899
 Node = 328.69563 2000.0
 Incl. = 8.38197
 q = 2.4356178 AU
 e = 0.6007152
 a = 6.0999512 AU
 n = 0.06542060
 P = 15.07 years

$$m1 = 4.6 + 5 \log(\Delta) + 30.0 \log(r)$$

Oh TT 2015/16	R. A. (2000)		Decl.	Delta	r	Variation for T=+1 day		m1	Mot. /PA	Elong.
	h	m	°						°	°
Jan. 8	08	31.47	+24 52.4	2.411	3.361	-1.02	+5.3	22.3	9.9/277	162.2
Jan. 18	08	24.24	+25 03.6	2.333	3.311	-1.05	+5.3	22.0	10.9/274	172.5
Jan. 28	08	16.21	+25 10.7	2.284	3.261	-1.06	+5.1	21.8	10.8/271	171.3
Feb. 7	08	08.27	+25 11.1	2.265	3.212	-1.06	+5.0	21.6	9.5/266	160.6
Feb. 17	08	01.27	+25 03.6	2.273	3.163	-1.03	+4.7	21.4	7.4/258	149.2
Feb. 27	07	55.97	+24 47.9	2.307	3.115	-1.00	+4.6	21.2	4.8/241	138.2
Mar. 9	07	52.89	+24 24.7	2.360	3.068	-0.96	+4.4	21.1	3.1/196	127.6
Mar. 19	07	52.28	+23 55.1	2.429	3.022	-0.92	+4.4	20.9	4.4/143	117.6
Mar. 29	07	54.19	+23 19.6	2.509	2.976	-0.88	+4.3	20.8	7.2/124	108.3
Apr. 8	07	58.49	+22 38.9	2.595	2.932	-0.85	+4.4	20.7	10.1/117	99.5
Apr. 18	08	04.98	+21 52.9	2.685	2.889	-0.82	+4.5	20.6	12.8/113	91.3
Apr. 28	08	13.41	+21 01.5	2.776	2.847	-0.80	+4.6	20.4	15.3/112	83.7
May 8	08	23.52	+20 04.2	2.865	2.806	-0.78	+4.7	20.3	17.5/111	76.5
May 18	08	35.06	+19 00.7	2.950	2.767	-0.77	+4.9	20.2	19.5/111	69.7
May 28	08	47.82	+17 50.5	3.030	2.730	-0.76	+5.1	20.1	21.2/111	63.4
June 7	09	01.59	+16 33.3	3.103	2.694	-0.75	+5.3	20.0	22.7/111	57.3
June 17	09	16.20	+15 08.9	3.171	2.660	-0.75	+5.5	19.9	24.1/112	51.5
June 27	09	31.52	+13 37.3	3.231	2.628	-0.74	+5.8	19.7	25.3/113	46.0
July 7	09	47.42	+11 58.4	3.283	2.598	-0.74	+6.0	19.6	26.3/113	40.6
July 17	10	03.80	+10 12.6	3.329	2.570	-0.75	+6.2	19.5	27.3/114	35.5
July 27	10	20.59	+08 20.2	3.367	2.545	-0.75	+6.4	19.4	28.1/115	30.5
Aug. 6	10	37.71	+06 21.7	3.397	2.522	-0.75	+6.6	19.3	28.8/115	25.7
Aug. 16	10	55.15	+04 17.8	3.421	2.501	-0.76	+6.7	19.2	29.5/116	20.9
Aug. 26	11	12.84	+02 09.2	3.437	2.483	-0.77	+6.9	19.1	30.0/116	16.3
Sept. 5	11	30.78	-00 03.2	3.447	2.468	-0.78	+6.9	19.1	30.4/116	11.8
Sept. 15	11	48.95	-02 18.5	3.450	2.456	-0.79	+7.0	19.0	30.8/117	7.5
Sept. 25	12	07.34	-04 35.6	3.446	2.446	-0.80	+7.0	18.9	31.0/117	4.1
Oct. 5	12	25.93	-06 53.4	3.436	2.440	-0.81	+6.9	18.9	31.1/116	4.5
Oct. 15	12	44.73	-09 10.7	3.419	2.436	-0.83	+6.8	18.9	31.1/116	8.3
Oct. 25	13	03.73	-11 26.3	3.396	2.436	-0.84	+6.6	18.9	31.0/116	12.7
Nov. 4	13	22.89	-13 39.0	3.367	2.438	-0.86	+6.4	18.8	30.8/115	17.4
Nov. 14	13	42.20	-15 47.6	3.331	2.444	-0.88	+6.1	18.9	30.5/115	22.2
Nov. 24	14	01.61	-17 51.1	3.289	2.452	-0.90	+5.8	18.9	30.0/114	27.1
Dec. 4	14	21.05	-19 48.2	3.241	2.463	-0.92	+5.4	18.9	29.4/113	32.2
Dec. 14	14	40.46	-21 38.2	3.186	2.477	-0.94	+5.0	18.9	28.6/112	37.4
Dec. 24	14	59.71	-23 20.4	3.125	2.494	-0.96	+4.5	19.0	27.6/111	42.8
Jan. 3	15	18.68	-24 54.2	3.058	2.514	-0.98	+4.0	19.0	26.5/110	48.3
Jan. 13	15	37.22	-26 19.4	2.985	2.536	-1.00	+3.5	19.1	25.1/109	54.1
Jan. 23	15	55.12	-27 36.1	2.907	2.561	-1.01	+2.9	19.2	23.6/108	60.0
Feb. 2	16	12.19	-28 44.5	2.823	2.588	-1.03	+2.4	19.2	21.8/107	66.2
Feb. 12	16	28.18	-29 45.3	2.736	2.617	-1.06	+1.8	19.3	19.7/107	72.6
Feb. 22	16	42.83	-30 39.2	2.646	2.648	-1.08	+1.3	19.4	17.4/107	79.4
Mar. 3	16	55.86	-31 27.3	2.554	2.682	-1.11	+0.8	19.5	14.8/108	86.5
Mar. 13	17	06.98	-32 10.4	2.462	2.717	-1.14	+0.4	19.6	11.9/110	93.9
Mar. 23	17	15.89	-32 49.5	2.372	2.754	-1.18	0.0	19.7	8.8/114	101.8

Comet P/2007 V2 (Hill)

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 23.08469 TT
 Peri. = 278.85855
 Node = 99.81998 2000.0
 Incl. = 2.47034
 q = 2.7797285 AU
 e = 0.3174106
 a = 4.0723288 AU
 n = 0.11993331
 P = 8.22 years

$$m1 = 7.8 + 5 \log(\Delta) + 22.5 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Variation for T=+1 day	m1	Mot. /PA ' °	Elong. °
Jan. 8	20 45.46	-19 10.8	4.103	3.209	-0.57 -1.9	22.5	22.2/ 75	21.5
Jan. 18	21 00.54	-18 12.3	4.123	3.184	-0.57 -2.1	22.4	22.7/ 74	15.0
Jan. 28	21 15.80	-17 08.4	4.129	3.159	-0.58 -2.3	22.4	23.1/ 73	8.7
Feb. 7	21 31.14	-15 59.4	4.119	3.134	-0.58 -2.5	22.3	23.4/ 72	2.6
Feb. 17	21 46.50	-14 46.0	4.095	3.110	-0.59 -2.7	22.2	23.6/ 71	4.1
Feb. 27	22 01.83	-13 28.7	4.057	3.087	-0.59 -2.9	22.1	23.7/ 71	10.1
Mar. 9	22 17.06	-12 08.2	4.005	3.064	-0.60 -3.1	22.0	23.7/ 70	16.2
Mar. 19	22 32.16	-10 45.2	3.940	3.042	-0.61 -3.3	21.9	23.6/ 69	22.2
Mar. 29	22 47.07	-09 20.6	3.863	3.020	-0.62 -3.5	21.7	23.4/ 69	28.2
Apr. 8	23 01.76	-07 55.1	3.775	3.000	-0.64 -3.7	21.6	23.1/ 69	34.1
Apr. 18	23 16.19	-06 29.5	3.677	2.979	-0.65 -3.9	21.5	22.7/ 68	40.1
Apr. 28	23 30.30	-05 04.9	3.569	2.960	-0.67 -4.1	21.4	22.2/ 68	46.0
May 8	23 44.04	-03 42.1	3.452	2.941	-0.69 -4.3	21.2	21.5/ 68	52.0
May 18	23 57.36	-02 21.9	3.329	2.924	-0.72 -4.5	21.1	20.7/ 68	58.1
May 28	00 10.17	-01 05.6	3.199	2.907	-0.74 -4.7	20.9	19.7/ 69	64.3
June 7	00 22.38	+00 06.1	3.065	2.891	-0.77 -4.9	20.8	18.5/ 69	70.6
June 17	00 33.88	+01 12.1	2.928	2.876	-0.81 -5.2	20.6	17.0/ 70	77.1
June 27	00 44.52	+02 11.1	2.788	2.862	-0.85 -5.4	20.5	15.3/ 70	83.8
July 7	00 54.13	+03 02.3	2.648	2.849	-0.90 -5.7	20.3	13.3/ 71	90.7
July 17	01 02.53	+03 44.4	2.510	2.837	-0.95 -6.0	20.1	10.9/ 73	98.1
July 27	01 09.48	+04 16.2	2.375	2.826	-1.01 -6.3	20.0	8.2/ 75	105.8
Aug. 6	01 14.75	+04 36.9	2.247	2.816	-1.07 -6.7	19.8	5.1/ 80	114.0
Aug. 16	01 18.12	+04 45.6	2.128	2.808	-1.14 -7.1	19.6	1.9/101	122.7
Aug. 26	01 19.39	+04 41.7	2.021	2.800	-1.21 -7.6	19.5	2.1/220	132.1
Sept. 5	01 18.49	+04 25.7	1.929	2.794	-1.28 -8.0	19.3	5.2/239	142.0
Sept. 15	01 15.50	+03 58.8	1.858	2.789	-1.34 -8.4	19.2	7.9/244	152.5
Sept. 25	01 10.74	+03 23.6	1.809	2.785	-1.38 -8.7	19.1	9.7/246	163.4
Oct. 5	01 04.79	+02 44.4	1.785	2.782	-1.40 -8.8	19.1	10.3/248	173.9
Oct. 15	00 58.39	+02 06.3	1.789	2.780	-1.40 -8.8	19.1	9.5/250	172.2
Oct. 25	00 52.44	+01 34.5	1.819	2.780	-1.37 -8.6	19.1	7.4/254	161.3
Nov. 4	00 47.69	+01 13.5	1.876	2.781	-1.31 -8.3	19.2	4.5/261	150.2
Nov. 14	00 44.71	+01 06.1	1.955	2.783	-1.25 -7.9	19.2	1.5/301	139.5
Nov. 24	00 43.86	+01 13.6	2.053	2.786	-1.18 -7.5	19.4	3.0/ 43	129.3
Dec. 4	00 45.23	+01 35.7	2.167	2.790	-1.11 -7.0	19.5	6.4/ 56	119.7
Dec. 14	00 48.74	+02 11.2	2.293	2.796	-1.04 -6.6	19.6	9.5/ 60	110.6
Dec. 24	00 54.24	+02 58.6	2.428	2.803	-0.98 -6.2	19.7	12.3/ 62	102.0
Jan. 3	01 01.50	+03 55.9	2.568	2.811	-0.93 -5.9	19.9	14.7/ 64	93.9
Jan. 13	01 10.30	+05 01.3	2.710	2.820	-0.88 -5.5	20.0	16.7/ 65	86.1
Jan. 23	01 20.44	+06 12.9	2.853	2.830	-0.84 -5.2	20.1	18.4/ 65	78.7
Feb. 2	01 31.72	+07 29.0	2.993	2.841	-0.81 -4.9	20.3	19.8/ 66	71.7
Feb. 12	01 43.97	+08 48.0	3.130	2.854	-0.78 -4.6	20.4	21.0/ 67	64.8
Feb. 22	01 57.07	+10 08.6	3.262	2.867	-0.76 -4.4	20.5	21.9/ 68	58.2
Mar. 3	02 10.87	+11 29.2	3.387	2.882	-0.74 -4.1	20.7	22.6/ 69	51.8
Mar. 13	02 25.29	+12 48.9	3.504	2.897	-0.72 -3.8	20.8	23.1/ 70	45.6
Mar. 23	02 40.23	+14 06.3	3.612	2.913	-0.70 -3.6	20.9	23.5/ 71	39.5

Comet P/1994 N2 (McNaught-Hartley)

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 24.81733 TT
 Peri. = 313.23542 e = 0.6743350
 Node = 35.72374 2000.0 a = 7.5166017 AU
 Incl. = 17.87143 n = 0.04782685
 q = 2.4478941 AU P = 20.61 years

$$m1 = 6.0 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000)		Decl.	Delta	r	Variation for T=+1 day		m1	Mot. /PA	Elong.
	h	m	°						°	°
Jan. 8	18	29.35	-35 11.2	4.415	3.482	-0.65	+0.6	20.1	21.5/ 92	16.2
Jan. 18	18	46.91	-35 12.9	4.325	3.427	-0.68	+0.2	19.9	21.8/ 91	21.3
Jan. 28	19	04.72	-35 10.3	4.221	3.372	-0.72	-0.2	19.7	22.0/ 90	26.9
Feb. 7	19	22.67	-35 03.4	4.104	3.318	-0.76	-0.7	19.5	22.2/ 88	32.8
Feb. 17	19	40.68	-34 52.6	3.976	3.265	-0.80	-1.1	19.3	22.2/ 88	38.8
Feb. 27	19	58.64	-34 38.3	3.838	3.212	-0.84	-1.7	19.1	22.1/ 87	44.8
Mar. 9	20	16.47	-34 21.1	3.692	3.160	-0.88	-2.3	18.8	21.9/ 86	50.8
Mar. 19	20	34.08	-34 01.7	3.539	3.109	-0.92	-2.9	18.6	21.6/ 86	56.9
Mar. 29	20	51.36	-33 41.2	3.381	3.059	-0.96	-3.6	18.4	21.2/ 86	62.9
Apr. 8	21	08.23	-33 20.7	3.220	3.010	-1.01	-4.3	18.1	20.6/ 86	69.0
Apr. 18	21	24.58	-33 01.3	3.057	2.962	-1.06	-5.1	17.9	19.9/ 86	75.1
Apr. 28	21	40.30	-32 44.6	2.894	2.916	-1.11	-6.0	17.6	18.9/ 87	81.2
May 8	21	55.25	-32 31.9	2.733	2.871	-1.16	-6.9	17.3	17.8/ 89	87.5
May 18	22	09.29	-32 24.7	2.574	2.827	-1.22	-7.9	17.1	16.4/ 91	93.8
May 28	22	22.22	-32 24.7	2.421	2.786	-1.29	-9.0	16.8	14.7/ 94	100.2
June 7	22	33.83	-32 33.0	2.274	2.746	-1.37	-10.1	16.6	12.8/ 99	106.8
June 17	22	43.87	-32 50.6	2.135	2.707	-1.46	-11.2	16.3	10.6/105	113.6
June 27	22	52.03	-33 17.8	2.007	2.671	-1.56	-12.4	16.0	8.3/116	120.6
July 7	22	58.02	-33 53.6	1.891	2.638	-1.67	-13.5	15.8	6.1/134	127.6
July 17	23	01.53	-34 35.9	1.789	2.606	-1.78	-14.4	15.6	4.5/167	134.7
July 27	23	02.34	-35 20.2	1.703	2.577	-1.91	-15.2	15.4	4.6/210	141.5
Aug. 6	23	00.45	-36 00.1	1.636	2.551	-2.02	-15.6	15.2	6.0/242	147.5
Aug. 16	22	56.10	-36 27.9	1.589	2.527	-2.12	-15.6	15.1	7.4/264	151.8
Aug. 26	22	49.96	-36 35.3	1.563	2.506	-2.18	-15.3	15.0	8.6/283	153.0
Sept. 5	22	43.03	-36 15.8	1.560	2.489	-2.18	-14.7	14.9	9.4/301	150.7
Sept. 15	22	36.47	-35 26.3	1.578	2.474	-2.14	-13.9	14.9	10.1/321	145.6
Sept. 25	22	31.37	-34 07.6	1.617	2.463	-2.04	-13.3	14.9	11.0/341	138.9
Oct. 5	22	28.51	-32 23.6	1.674	2.454	-1.92	-12.7	14.9	12.4/358	131.5
Oct. 15	22	28.23	-30 19.6	1.749	2.450	-1.77	-12.3	15.0	14.2/ 13	123.9
Oct. 25	22	30.62	-28 01.1	1.838	2.448	-1.63	-12.1	15.1	16.2/ 24	116.4
Nov. 4	22	35.46	-25 32.7	1.939	2.450	-1.50	-11.9	15.2	18.2/ 32	109.0
Nov. 14	22	42.44	-22 57.8	2.051	2.455	-1.37	-11.7	15.4	20.1/ 38	101.9
Nov. 24	22	51.26	-20 19.1	2.171	2.463	-1.26	-11.5	15.5	21.7/ 43	95.1
Dec. 4	23	01.55	-17 38.5	2.297	2.475	-1.16	-11.3	15.7	23.1/ 46	88.4
Dec. 14	23	13.06	-14 57.0	2.427	2.489	-1.08	-11.1	15.8	24.3/ 49	82.0
Dec. 24	23	25.53	-12 15.7	2.561	2.507	-1.00	-10.9	16.0	25.2/ 51	75.8
Jan. 3	23	38.76	-09 35.5	2.696	2.528	-0.94	-10.6	16.2	25.9/ 53	69.7
Jan. 13	23	52.59	-06 56.9	2.831	2.552	-0.88	-10.3	16.4	26.5/ 54	63.7
Jan. 23	00	06.91	-04 20.6	2.964	2.578	-0.83	-9.9	16.6	26.8/ 55	57.8
Feb. 2	00	21.60	-01 47.2	3.095	2.607	-0.79	-9.6	16.8	27.0/ 56	52.0
Feb. 12	00	36.58	+00 42.7	3.222	2.639	-0.75	-9.2	17.0	27.1/ 57	46.3
Feb. 22	00	51.81	+03 08.8	3.344	2.673	-0.72	-8.8	17.2	27.0/ 58	40.6
Mar. 3	01	07.21	+05 30.4	3.460	2.709	-0.69	-8.4	17.4	26.9/ 59	35.0
Mar. 13	01	22.76	+07 47.1	3.569	2.747	-0.67	-7.9	17.5	26.7/ 60	29.4
Mar. 23	01	38.41	+09 58.5	3.669	2.787	-0.64	-7.5	17.7	26.3/ 61	23.9

Comet 22P/Kopff

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 25.09176 TT
 Peri. = 162.89647
 Node = 120.87336 2000.0
 Incl. = 4.73721
 q = 1.5582446 AU

e = 0.5477144
 a = 3.4452669 AU
 n = 0.15412382
 P = 6.39 years

$$m1 = 8.2 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	12 55.69	-01 29.6	2.726	2.958	+0.71	-2.3	17.4	93.8
Jan. 18	13 02.76	-01 52.2	2.529	2.900	+0.56	-1.1	17.2	102.1
Jan. 28	13 08.38	-02 02.9	2.338	2.842	+0.39	+0.3	16.8	110.9
Feb. 7	13 12.26	-02 00.1	2.155	2.784	+0.18	+1.8	16.5	120.1
Feb. 17	13 14.11	-01 42.5	1.984	2.725	-0.05	+3.3	16.2	129.8
Feb. 27	13 13.63	-01 09.1	1.829	2.665	-0.30	+4.9	15.9	140.0
Mar. 9	13 10.67	-00 20.5	1.693	2.605	-0.54	+6.2	15.6	150.8
Mar. 19	13 05.28	+00 41.2	1.581	2.545	-0.75	+7.0	15.3	161.7
Mar. 29	12 57.80	+01 51.5	1.493	2.484	-0.88	+7.2	15.0	171.2
Apr. 8	12 48.99	+03 03.1	1.433	2.424	-0.91	+6.5	14.7	169.3
Apr. 18	12 39.87	+04 07.7	1.400	2.363	-0.82	+4.9	14.5	158.7
Apr. 28	12 31.62	+04 57.0	1.390	2.303	-0.63	+2.8	14.3	147.3
May 8	12 25.31	+05 25.4	1.402	2.242	-0.37	+0.5	14.2	136.2
May 18	12 21.66	+05 30.1	1.430	2.182	-0.06	-1.9	14.1	125.9
May 28	12 21.08	+05 10.8	1.469	2.123	+0.26	-4.2	13.9	116.4
June 7	12 23.63	+04 29.0	1.515	2.065	+0.56	-6.2	13.8	107.8
June 17	12 29.19	+03 26.9	1.565	2.008	+0.84	-8.0	13.7	100.0
June 27	12 37.58	+02 06.8	1.616	1.952	+1.10	-9.6	13.6	92.9
July 7	12 48.54	+00 31.1	1.665	1.898	+1.33	-10.9	13.5	86.6
July 17	13 01.86	-01 17.9	1.712	1.847	+1.55	-12.0	13.4	80.9
July 27	13 17.37	-03 18.1	1.756	1.798	+1.76	-12.9	13.2	75.7
Aug. 6	13 34.93	-05 27.2	1.796	1.752	+1.95	-13.5	13.1	71.0
Aug. 16	13 54.47	-07 42.7	1.834	1.710	+2.15	-13.9	13.0	66.8
Aug. 26	14 15.93	-10 01.8	1.869	1.672	+2.33	-13.9	12.9	62.9
Sept. 5	14 39.28	-12 21.2	1.903	1.639	+2.52	-13.6	12.8	59.4
Sept. 15	15 04.49	-14 37.3	1.935	1.610	+2.70	-12.9	12.7	56.2
Sept. 25	15 31.53	-16 46.1	1.969	1.588	+2.88	-11.7	12.7	53.3
Oct. 5	16 00.29	-18 43.0	2.004	1.572	+3.04	-10.1	12.7	50.6
Oct. 15	16 30.64	-20 23.6	2.041	1.562	+3.17	-8.0	12.7	48.0
Oct. 25	17 02.34	-21 43.6	2.083	1.558	+3.27	-5.6	12.7	45.6
Nov. 4	17 35.05	-22 39.6	2.129	1.562	+3.33	-2.9	12.7	43.2
Nov. 14	18 08.39	-23 08.9	2.180	1.571	+3.35	-0.2	12.8	40.9
Nov. 24	18 41.88	-23 10.7	2.237	1.588	+3.32	+2.5	13.0	38.5
Dec. 4	19 15.08	-22 45.2	2.300	1.610	+3.25	+5.1	13.1	36.0
Dec. 14	19 47.59	-21 54.2	2.368	1.638	+3.15	+7.3	13.3	33.4
Dec. 24	20 19.09	-20 40.8	2.440	1.671	+3.03	+9.2	13.5	30.7
Jan. 3	20 49.35	-19 08.3	2.517	1.709	+2.89	+10.8	13.7	27.8
Jan. 13	21 18.27	-17 20.8	2.596	1.751	+2.75	+11.9	13.9	24.7
Jan. 23	21 45.81	-15 22.1	2.677	1.797	+2.62	+12.6	14.2	21.4
Feb. 2	22 11.99	-13 15.6	2.758	1.846	+2.49	+13.1	14.4	18.0
Feb. 12	22 36.89	-11 04.7	2.838	1.897	+2.37	+13.3	14.6	14.4
Feb. 22	23 00.60	-08 51.9	2.915	1.951	+2.26	+13.2	14.9	10.6
Mar. 3	23 23.21	-06 39.7	2.988	2.007	+2.16	+13.0	15.1	6.8
Mar. 13	23 44.82	-04 29.8	3.055	2.064	+2.07	+12.6	15.3	3.4
Mar. 23	00 05.52	-02 23.8	3.116	2.122	+1.99	+12.1	15.6	3.6

Comet P/2005 RV25 = 2014 U5 (LONEOS-Christensen)

Epoch = 2015 June 27.0 TT
 T = 2015 Oct. 28.64920 TT
 Peri. = 191.78569 e = 0.1683119
 Node = 246.85959 2000.0 a = 4.3067018 AU
 Incl. = 9.89952 n = 0.11027749
 q = 3.5818326 AU P = 8.94 years

$$m1 = 10.4 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	01 01.03	+12 35.9	3.577	3.738	+0.63	+1.0	21.8	91.7
Jan. 18	01 07.38	+12 46.1	3.717	3.729	+0.76	+1.9	21.8	83.1
Jan. 28	01 14.95	+13 05.3	3.854	3.719	+0.86	+2.7	21.9	74.8
Feb. 7	01 23.60	+13 32.1	3.986	3.710	+0.96	+3.3	21.9	66.8
Feb. 17	01 33.18	+14 05.3	4.111	3.701	+1.04	+3.8	22.0	59.0
Feb. 27	01 43.57	+14 43.6	4.225	3.692	+1.11	+4.2	22.0	51.6
Mar. 9	01 54.67	+15 25.5	4.328	3.683	+1.17	+4.4	22.1	44.3
Mar. 19	02 06.36	+16 10.0	4.418	3.675	+1.22	+4.6	22.1	37.2
Mar. 29	02 18.57	+16 55.9	4.494	3.667	+1.26	+4.6	22.1	30.3
Apr. 8	02 31.22	+17 42.2	4.555	3.660	+1.30	+4.6	22.1	23.6
Apr. 18	02 44.24	+18 27.8	4.601	3.653	+1.33	+4.4	22.2	17.0
Apr. 28	02 57.55	+19 12.1	4.630	3.646	+1.35	+4.2	22.2	10.6
May 8	03 11.10	+19 54.1	4.644	3.639	+1.37	+3.9	22.1	4.4
May 18	03 24.81	+20 33.2	4.642	3.633	+1.38	+3.6	22.1	3.1
May 28	03 38.62	+21 08.9	4.624	3.627	+1.38	+3.2	22.1	9.0
June 7	03 52.45	+21 40.5	4.591	3.621	+1.38	+2.7	22.1	15.2
June 17	04 06.23	+22 07.8	4.542	3.616	+1.36	+2.3	22.1	21.5
June 27	04 19.88	+22 30.3	4.478	3.611	+1.34	+1.8	22.0	27.9
July 7	04 33.30	+22 47.8	4.401	3.607	+1.31	+1.2	22.0	34.3
July 17	04 46.40	+23 00.3	4.310	3.603	+1.27	+0.7	21.9	40.8
July 27	04 59.05	+23 07.6	4.207	3.599	+1.21	+0.2	21.9	47.5
Aug. 6	05 11.15	+23 09.9	4.093	3.595	+1.14	-0.3	21.8	54.2
Aug. 16	05 22.54	+23 07.4	3.968	3.592	+1.05	-0.7	21.7	61.2
Aug. 26	05 33.08	+23 00.4	3.836	3.590	+0.95	-1.1	21.6	68.4
Sept. 5	05 42.61	+22 49.1	3.697	3.587	+0.83	-1.5	21.6	75.9
Sept. 15	05 50.94	+22 34.1	3.553	3.586	+0.69	-1.8	21.5	83.7
Sept. 25	05 57.87	+22 16.0	3.408	3.584	+0.53	-2.1	21.4	91.9
Oct. 5	06 03.21	+21 55.2	3.263	3.583	+0.36	-2.3	21.3	100.5
Oct. 15	06 06.78	+21 32.3	3.123	3.582	+0.16	-2.4	21.2	109.5
Oct. 25	06 08.39	+21 07.9	2.992	3.582	-0.04	-2.5	21.1	119.1
Nov. 4	06 07.97	+20 42.5	2.873	3.582	-0.25	-2.6	21.0	129.1
Nov. 14	06 05.50	+20 16.5	2.770	3.582	-0.43	-2.6	20.9	139.7
Nov. 24	06 01.16	+19 50.2	2.689	3.583	-0.59	-2.6	20.9	150.7
Dec. 4	05 55.29	+19 24.2	2.634	3.584	-0.69	-2.5	20.8	162.0
Dec. 14	05 48.42	+18 59.0	2.607	3.586	-0.72	-2.3	20.8	172.7
Dec. 24	05 41.25	+18 35.6	2.611	3.588	-0.68	-2.1	20.8	172.3
Jan. 3	05 34.49	+18 14.8	2.645	3.590	-0.57	-1.7	20.8	161.4
Jan. 13	05 28.79	+17 57.8	2.707	3.593	-0.41	-1.3	20.9	150.1
Jan. 23	05 24.68	+17 45.1	2.794	3.596	-0.22	-0.8	21.0	139.1
Feb. 2	05 22.44	+17 37.1	2.903	3.600	-0.02	-0.4	21.1	128.5
Feb. 12	05 22.20	+17 33.3	3.029	3.604	+0.18	0.0	21.2	118.3
Feb. 22	05 23.96	+17 33.2	3.167	3.608	+0.36	+0.3	21.3	108.7
Mar. 3	05 27.59	+17 35.7	3.313	3.612	+0.53	+0.4	21.4	99.6
Mar. 13	05 32.91	+17 39.8	3.463	3.617	+0.68	+0.4	21.5	90.9
Mar. 23	05 39.75	+17 44.2	3.613	3.623	+0.81	+0.4	21.6	82.6

Comet P/2008 Y2 (Gibbs)

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 5.97496 TT
 Peri. = 162.34071
 Node = 330.86305 2000.0
 Incl. = 7.28794
 q = 1.6293970 AU
 e = 0.5449494
 a = 3.5806941 AU
 n = 0.14546324
 P = 6.78 years

$$m1 = 12.8 + 5 \log(\Delta) + 25.0 \log(r(t-10))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	00 12.64	+07 43.0	3.073	3.041	-0.43 -3.9	.	12.5/ 70	78.9
Jan. 18	00 20.59	+08 24.8	3.159	2.984	-0.44 -3.9	.	14.8/ 69	70.8
Jan. 28	00 29.97	+09 16.6	3.237	2.927	-0.45 -3.8	.	16.9/ 69	63.2
Feb. 7	00 40.63	+10 16.9	3.305	2.870	-0.46 -3.8	.	18.7/ 68	55.9
Feb. 17	00 52.47	+11 24.8	3.361	2.812	-0.48 -3.8	.	20.4/ 68	48.9
Feb. 27	01 05.40	+12 39.0	3.404	2.754	-0.50 -3.8	.	21.8/ 68	42.3
Mar. 9	01 19.34	+13 58.2	3.435	2.696	-0.53 -3.8	.	23.2/ 69	36.0
Mar. 19	01 34.27	+15 21.3	3.452	2.637	-0.57 -3.8	.	24.5/ 69	30.0
Mar. 29	01 50.16	+16 47.1	3.455	2.578	-0.60 -3.7	.	25.6/ 69	24.3
Apr. 8	02 06.99	+18 14.3	3.445	2.519	-0.65 -3.7	.	26.7/ 70	18.9
Apr. 18	02 24.80	+19 41.5	3.423	2.460	-0.70 -3.6	.	27.8/ 71	13.8
Apr. 28	02 43.60	+21 07.5	3.389	2.401	-0.76 -3.5	.	28.8/ 72	9.2
May 8	03 03.42	+22 30.6	3.344	2.342	-0.82 -3.4	.	29.8/ 74	5.8
May 18	03 24.29	+23 49.2	3.289	2.284	-0.89 -3.1	.	30.9/ 75	5.3
May 28	03 46.26	+25 01.6	3.225	2.226	-0.96 -2.8	.	31.9/ 77	8.0
June 7	04 09.32	+26 05.9	3.154	2.169	-1.04 -2.3	.	32.9/ 79	11.6
June 17	04 33.51	+26 60.0	3.076	2.113	-1.12 -1.7	.	33.9/ 81	15.4
June 27	04 58.79	+27 41.7	2.993	2.059	-1.20 -1.0	.	35.0/ 84	19.1
July 7	05 25.11	+28 08.9	2.906	2.006	-1.28 -0.2	23.0	36.0/ 87	22.6
July 17	05 52.37	+28 19.4	2.816	1.954	-1.36 +0.8	22.6	37.1/ 90	26.0
July 27	06 20.44	+28 11.1	2.725	1.905	-1.43 +2.0	22.3	38.1/ 93	29.3
Aug. 6	06 49.12	+27 42.5	2.634	1.859	-1.49 +3.3	21.9	39.1/ 96	32.4
Aug. 16	07 18.23	+26 52.3	2.543	1.816	-1.53 +4.7	21.6	40.0/ 99	35.5
Aug. 26	07 47.51	+25 39.8	2.454	1.776	-1.56 +6.1	21.2	40.9/102	38.3
Sept. 5	08 16.74	+24 05.1	2.368	1.740	-1.58 +7.6	20.9	41.6/105	41.1
Sept. 15	08 45.72	+22 09.1	2.285	1.708	-1.58 +9.0	20.6	42.2/107	43.9
Sept. 25	09 14.23	+19 53.4	2.205	1.682	-1.57 +10.3	20.3	42.5/110	46.6
Oct. 5	09 42.14	+17 20.1	2.129	1.660	-1.56 +11.4	20.1	42.7/112	49.3
Oct. 15	10 09.33	+14 32.2	2.058	1.644	-1.53 +12.4	19.9	42.5/114	52.0
Oct. 25	10 35.70	+11 33.0	1.989	1.634	-1.51 +13.1	19.7	42.1/116	54.9
Nov. 4	11 01.20	+08 25.9	1.925	1.630	-1.48 +13.6	19.6	41.3/117	57.8
Nov. 14	11 25.77	+05 14.6	1.863	1.631	-1.46 +13.9	19.5	40.2/118	61.0
Nov. 24	11 49.34	+02 02.7	1.803	1.639	-1.44 +14.0	19.4	38.7/119	64.4
Dec. 4	12 11.84	-01 06.5	1.744	1.653	-1.43 +13.8	19.4	36.9/120	68.1
Dec. 14	12 33.16	-04 10.2	1.686	1.672	-1.42 +13.6	19.4	34.6/121	72.2
Dec. 24	12 53.14	-07 05.7	1.629	1.697	-1.43 +13.1	19.4	32.0/121	76.6
Jan. 3	13 11.58	-09 51.0	1.571	1.727	-1.45 +12.6	19.5	28.9/122	81.6
Jan. 13	13 28.20	-12 24.5	1.513	1.761	-1.48 +12.1	19.6	25.3/124	87.0
Jan. 23	13 42.66	-14 44.9	1.455	1.799	-1.53 +11.6	19.8	21.4/127	93.1
Feb. 2	13 54.58	-16 51.3	1.398	1.841	-1.60 +11.1	19.9	16.9/131	99.7
Feb. 12	14 03.51	-18 42.6	1.343	1.887	-1.69 +10.8	20.1	12.2/141	107.2
Feb. 22	14 09.00	-20 17.2	1.292	1.935	-1.80 +10.6	20.2	8.0/162	115.4
Mar. 3	14 10.75	-21 33.1	1.248	1.985	-1.93 +10.6	20.4	6.2/208	124.5
Mar. 13	14 08.61	-22 27.7	1.215	2.037	-2.06 +10.9	20.7	8.4/249	134.3
Mar. 23	14 02.92	-22 58.0	1.197	2.091	-2.17 +11.4	20.9	11.6/267	144.8

Comet 214P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 12.75229 TT
 Peri. = 190.26782
 Node = 348.26787 2000.0
 Incl. = 15.20463
 q = 1.8513714 AU
 e = 0.4875121
 a = 3.6125173 AU
 n = 0.14354536
 P = 6.87 years

$$m1 = 12.2 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	03 51.03	+41 09.7	2.267	3.030	-0.38	-6.1	.	133.6
Jan. 18	03 47.27	+40 09.0	2.318	2.980	-0.04	-5.8	.	123.8
Jan. 28	03 46.82	+39 10.7	2.384	2.930	+0.28	-5.2	.	114.3
Feb. 7	03 49.58	+38 18.6	2.460	2.880	+0.57	-4.4	.	105.2
Feb. 17	03 55.26	+37 34.4	2.541	2.829	+0.83	-3.6	.	96.5
Feb. 27	04 03.59	+36 58.2	2.625	2.779	+1.07	-2.9	.	88.4
Mar. 9	04 14.26	+36 29.1	2.707	2.728	+1.27	-2.4	.	80.7
Mar. 19	04 26.99	+36 05.3	2.785	2.678	+1.46	-2.1	23.0	73.5
Mar. 29	04 41.55	+35 44.7	2.858	2.628	+1.62	-2.0	22.9	66.7
Apr. 8	04 57.70	+35 25.1	2.924	2.577	+1.76	-2.1	22.8	60.2
Apr. 18	05 15.25	+35 04.2	2.981	2.528	+1.88	-2.4	22.6	54.1
Apr. 28	05 34.04	+34 39.9	3.029	2.478	+1.98	-3.0	22.5	48.4
May 8	05 53.88	+34 10.1	3.069	2.429	+2.07	-3.7	22.3	42.9
May 18	06 14.62	+33 32.9	3.099	2.381	+2.15	-4.6	22.2	37.7
May 28	06 36.09	+32 46.7	3.120	2.334	+2.20	-5.7	22.0	32.8
June 7	06 58.14	+31 50.2	3.132	2.287	+2.25	-6.8	21.9	28.1
June 17	07 20.63	+30 42.0	3.135	2.242	+2.28	-8.1	21.7	23.6
June 27	07 43.41	+29 21.5	3.131	2.198	+2.29	-9.3	21.5	19.4
July 7	08 06.35	+27 48.0	3.119	2.155	+2.30	-10.7	21.3	15.3
July 17	08 29.37	+26 01.4	3.101	2.115	+2.30	-12.0	21.2	11.6
July 27	08 52.35	+24 01.6	3.076	2.076	+2.29	-13.3	21.0	8.2
Aug. 6	09 15.23	+21 49.1	3.046	2.040	+2.28	-14.5	20.8	5.8
Aug. 16	09 37.99	+19 24.2	3.012	2.006	+2.26	-15.6	20.6	5.4
Aug. 26	10 00.57	+16 47.8	2.973	1.975	+2.24	-16.7	20.5	7.3
Sept. 5	10 22.99	+14 01.0	2.931	1.947	+2.23	-17.6	20.3	10.2
Sept. 15	10 45.26	+11 04.9	2.886	1.922	+2.21	-18.4	20.2	13.4
Sept. 25	11 07.39	+08 00.9	2.839	1.900	+2.20	-19.0	20.0	16.8
Oct. 5	11 29.43	+04 50.5	2.789	1.883	+2.20	-19.5	19.9	20.2
Oct. 15	11 51.42	+01 35.3	2.738	1.869	+2.20	-19.8	19.8	23.7
Oct. 25	12 13.40	-01 42.9	2.686	1.859	+2.20	-19.9	19.7	27.3
Nov. 4	12 35.40	-05 02.1	2.632	1.853	+2.21	-19.9	19.7	30.9
Nov. 14	12 57.48	-08 20.6	2.578	1.851	+2.22	-19.6	19.6	34.7
Nov. 24	13 19.64	-11 36.4	2.522	1.854	+2.22	-19.1	19.6	38.5
Dec. 4	13 41.89	-14 47.7	2.465	1.861	+2.23	-18.5	19.6	42.5
Dec. 14	14 04.21	-17 52.7	2.407	1.872	+2.23	-17.7	19.6	46.6
Dec. 24	14 26.55	-20 49.9	2.347	1.887	+2.23	-16.8	19.6	50.8
Jan. 3	14 48.83	-23 38.1	2.286	1.905	+2.21	-15.8	19.6	55.2
Jan. 13	15 10.92	-26 16.3	2.223	1.928	+2.17	-14.8	19.6	59.9
Jan. 23	15 32.61	-28 44.2	2.159	1.953	+2.11	-13.7	19.7	64.7
Feb. 2	15 53.71	-31 01.6	2.093	1.982	+2.02	-12.8	19.7	69.8
Feb. 12	16 13.92	-33 09.2	2.025	2.014	+1.90	-11.9	19.8	75.2
Feb. 22	16 32.88	-35 08.0	1.956	2.049	+1.73	-11.1	19.9	81.0
Mar. 3	16 50.22	-36 59.3	1.887	2.086	+1.53	-10.5	20.0	87.0
Mar. 13	17 05.47	-38 44.8	1.818	2.125	+1.27	-10.1	20.0	93.5
Mar. 23	17 18.12	-40 25.8	1.751	2.166	+0.96	-9.7	20.1	100.4

Comet 10P/Tempel

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 14.25957 TT
 Peri. = 195.54814
 Node = 117.80516 2000.0
 Incl. = 12.02890
 q = 1.4176581 AU
 e = 0.5373279
 a = 3.0640665 AU
 n = 0.18376246
 P = 5.36 years

H = 13.6 , G = 0.15 (r > 2.0 AU)
 m1 = 9.4 + 5 log(Delta) + 22.5 log(r) (r < 2.0 AU & pre -T)
 m1 = 10.2 + 5 log(Delta) + 17.5 log(r) (r < 2.0 AU & post-T)

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	Mag.	Elong.
2015/16	h m	° '			m		°
Jan. 8	14 12.41	-01 19.4	3.081	3.000	+1.03	-1.5	19.4
Jan. 18	14 22.69	-01 34.3	2.889	2.946	+0.94	-0.4	19.2
Jan. 28	14 32.11	-01 37.9	2.696	2.891	+0.83	+0.9	19.1
Feb. 7	14 40.44	-01 29.2	2.504	2.835	+0.70	+2.2	18.9
Feb. 17	14 47.40	-01 07.3	2.317	2.778	+0.53	+3.6	18.6
Feb. 27	14 52.67	-00 31.3	2.137	2.720	+0.33	+5.0	18.4
Mar. 9	14 55.92	+00 18.6	1.967	2.661	+0.09	+6.3	18.1
Mar. 19	14 56.83	+01 21.9	1.812	2.602	-0.17	+7.4	17.8
Mar. 29	14 55.10	+02 36.3	1.673	2.542	-0.45	+8.1	17.5
Apr. 8	14 50.64	+03 57.3	1.555	2.481	-0.70	+8.1	17.2
Apr. 18	14 43.60	+05 18.3	1.460	2.420	-0.91	+7.2	16.9
Apr. 28	14 34.49	+06 30.3	1.390	2.358	-1.02	+5.3	16.8
May 8	14 24.28	+07 23.7	1.344	2.296	-1.01	+2.7	16.7
May 18	14 14.15	+07 50.9	1.323	2.234	-0.88	-0.4	16.8
May 28	14 05.36	+07 47.1	1.321	2.171	-0.64	-3.5	16.8
June 7	13 58.94	+07 11.8	1.336	2.109	-0.34	-6.4	16.9
June 17	13 55.53	+06 07.6	1.363	2.046	-0.01	-8.9	17.0
June 27	13 55.43	+04 38.5	1.398	1.984	+0.32	-11.0	16.8
July 7	13 58.66	+02 48.8	1.437	1.923	+0.64	-12.6	16.6
July 17	14 05.08	+00 42.6	1.478	1.863	+0.94	-13.9	16.3
July 27	14 14.51	-01 36.7	1.518	1.804	+1.22	-14.9	16.1
Aug. 6	14 26.76	-04 06.1	1.556	1.748	+1.49	-15.7	15.8
Aug. 16	14 41.69	-06 42.8	1.591	1.693	+1.75	-16.1	15.6
Aug. 26	14 59.22	-09 23.9	1.623	1.642	+2.01	-16.2	15.3
Sept. 5	15 19.28	-12 06.3	1.652	1.594	+2.26	-16.0	15.0
Sept. 15	15 41.88	-14 46.4	1.678	1.551	+2.51	-15.4	14.8
Sept. 25	16 07.02	-17 20.0	1.702	1.512	+2.77	-14.2	14.6
Oct. 5	16 34.67	-19 42.2	1.726	1.480	+3.01	-12.5	14.4
Oct. 15	17 04.78	-21 47.4	1.751	1.453	+3.24	-10.3	14.3
Oct. 25	17 37.16	-23 30.0	1.777	1.434	+3.43	-7.4	14.2
Nov. 4	18 11.48	-24 44.5	1.807	1.422	+3.58	-4.2	14.1
Nov. 14	18 47.28	-25 26.2	1.841	1.418	+3.67	-0.6	14.1
Nov. 24	19 23.95	-25 32.3	1.881	1.421	+3.68	+3.0	14.2
Dec. 4	20 00.79	-25 02.2	1.928	1.433	+3.64	+6.5	14.4
Dec. 14	20 37.18	-23 57.5	1.983	1.452	+3.54	+9.5	14.5
Dec. 24	21 12.56	-22 22.2	2.044	1.478	+3.40	+12.1	14.7
Jan. 3	21 46.55	-20 21.6	2.114	1.510	+3.24	+14.0	15.0
Jan. 13	22 18.95	-18 01.7	2.190	1.549	+3.08	+15.3	15.2
Jan. 23	22 49.70	-15 28.5	2.273	1.592	+2.91	+16.1	15.5
Feb. 2	23 18.84	-12 47.6	2.362	1.639	+2.77	+16.4	15.8
Feb. 12	23 46.51	-10 03.9	2.454	1.691	+2.63	+16.3	16.1
Feb. 22	00 12.83	-07 21.2	2.549	1.745	+2.51	+15.8	16.5
Mar. 3	00 37.96	-04 42.7	2.645	1.801	+2.41	+15.2	16.8
Mar. 13	01 02.06	-02 10.7	2.741	1.860	+2.32	+14.4	17.1
Mar. 23	01 25.23	+00 12.9	2.835	1.920	+2.24	+13.4	17.4

Comet C/2013 US10 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 15.71503 TT
 Peri. = 340.35833
 Node = 186.14383 2000.0
 Incl. = 148.87821
 q = 0.8229527 AU
 e = 1.0003248

$$m1 = 4.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	22 26.36	-24 29.1	5.040	4.384	+0.35	+2.5	14.1	43.9
Jan. 18	22 29.81	-24 04.1	5.045	4.279	+0.43	+2.6	14.0	35.2
Jan. 28	22 34.13	-23 38.1	5.025	4.173	+0.50	+2.6	13.9	27.2
Feb. 7	22 39.15	-23 12.2	4.978	4.065	+0.56	+2.5	13.8	20.1
Feb. 17	22 44.75	-22 47.3	4.903	3.957	+0.61	+2.3	13.6	15.0
Feb. 27	22 50.83	-22 24.4	4.800	3.848	+0.64	+2.0	13.5	14.1
Mar. 9	22 57.25	-22 04.6	4.670	3.737	+0.67	+1.5	13.3	17.8
Mar. 19	23 03.94	-21 49.2	4.512	3.625	+0.68	+1.0	13.1	24.0
Mar. 29	23 10.79	-21 39.5	4.328	3.512	+0.69	+0.2	12.8	31.2
Apr. 8	23 17.70	-21 37.5	4.119	3.398	+0.69	-0.8	12.6	38.8
Apr. 18	23 24.58	-21 45.2	3.889	3.282	+0.67	-2.0	12.3	46.7
Apr. 28	23 31.32	-22 05.5	3.638	3.165	+0.65	-3.7	12.0	54.7
May 8	23 37.80	-22 42.0	3.371	3.047	+0.61	-5.8	11.7	62.9
May 18	23 43.87	-23 39.6	3.091	2.927	+0.54	-8.6	11.3	71.3
May 28	23 49.30	-25 05.3	2.801	2.806	+0.45	-12.3	10.9	79.9
June 7	23 53.78	-27 08.5	2.505	2.683	+0.30	-17.4	10.5	88.8
June 17	23 56.81	-30 02.7	2.211	2.558	+0.07	-24.5	10.0	98.0
June 27	23 57.51	-34 07.6	1.925	2.432	-0.33	-34.2	9.5	107.5
July 7	23 54.22	-39 49.6	1.657	2.304	-1.10	-47.0	8.9	117.0
July 17	23 43.22	-47 39.8	1.420	2.175	-2.86	-61.2	8.3	125.6
July 27	23 14.57	-57 51.8	1.234	2.044	-7.86	-66.5	7.8	130.4
Aug. 6	21 55.94	-68 56.4	1.119	1.912	-19.01	-28.3	7.3	127.3
Aug. 16	18 45.80	-73 39.8	1.090	1.779	-15.28	+42.5	6.9	115.4
Aug. 26	16 13.03	-66 35.2	1.143	1.645	-5.68	+58.4	6.7	99.4
Sept. 5	15 16.24	-56 51.0	1.252	1.511	-2.32	+49.8	6.5	83.1
Sept. 15	14 53.04	-48 33.0	1.389	1.378	-1.11	+39.5	6.3	68.1
Sept. 25	14 41.90	-41 58.4	1.530	1.248	-0.62	+31.8	6.1	54.4
Oct. 5	14 35.71	-36 40.7	1.657	1.125	-0.41	+27.0	5.8	41.6
Oct. 15	14 31.65	-32 11.2	1.755	1.013	-0.33	+24.6	5.5	29.4
Oct. 25	14 28.35	-28 05.6	1.812	0.919	-0.31	+24.1	5.1	18.0
Nov. 4	14 25.28	-24 04.5	1.817	0.852	-0.28	+25.3	4.8	9.2
Nov. 14	14 22.45	-19 51.7	1.762	0.824	-0.23	+28.0	4.6	12.5
Nov. 24	14 20.16	-15 11.5	1.647	0.838	-0.15	+32.9	4.5	23.4
Dec. 4	14 18.64	-09 42.1	1.480	0.892	-0.09	+41.9	4.6	35.8
Dec. 14	14 17.72	-02 42.9	1.277	0.978	-0.12	+58.7	4.6	49.2
Dec. 24	14 16.50	+07 03.8	1.060	1.085	-0.36	+88.8	4.7	64.0
Jan. 3	14 12.86	+21 52.1	0.863	1.205	-1.23	132.4	4.7	81.2
Jan. 13	14 00.52	+43 55.7	0.739	1.333	-5.28	153.6	4.8	100.5
Jan. 23	13 07.72	+69 31.8	0.751	1.465	-34.21	+69.2	5.2	114.5
Feb. 2	07 25.63	+81 03.9	0.907	1.598	-16.83	-61.3	6.0	115.3
Feb. 12	04 37.34	+70 50.6	1.151	1.733	-2.48	-48.5	6.9	108.0
Feb. 22	04 12.56	+62 45.5	1.439	1.866	-0.38	-31.8	7.7	98.7
Mar. 3	04 08.74	+57 27.0	1.744	1.999	+0.28	-21.3	8.4	89.5
Mar. 13	04 11.51	+53 54.0	2.053	2.130	+0.57	-14.6	9.0	80.6
Mar. 23	04 17.21	+51 28.0	2.357	2.260	+0.72	-10.2	9.6	72.1

Comet 230P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 18.06436 TT
 Peri. = 308.91338
 Node = 112.39619 2000.0
 Incl. = 14.65294
 q = 1.4852897 AU

e = 0.5631165
 a = 3.3997386 AU
 n = 0.15723013
 P = 6.27 years

$$m1 = 14.8 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	20 11.37	-22 24.8	4.059	3.109	+1.52 +3.3	21.5	13.2
Jan. 18	20 26.62	-21 52.2	4.027	3.052	+1.57 +3.8	21.5	6.9
Jan. 28	20 42.27	-21 13.8	3.977	2.994	+1.60 +4.4	21.4	2.9
Feb. 7	20 58.25	-20 30.1	3.911	2.936	+1.63 +4.9	21.3	7.2
Feb. 17	21 14.51	-19 41.1	3.829	2.876	+1.65 +5.4	21.2	13.2
Feb. 27	21 31.02	-18 47.4	3.732	2.816	+1.67 +5.8	21.0	19.2
Mar. 9	21 47.72	-17 49.5	3.622	2.755	+1.69 +6.2	20.9	25.1
Mar. 19	22 04.62	-16 47.7	3.499	2.694	+1.71 +6.5	20.7	30.9
Mar. 29	22 21.70	-15 43.0	3.366	2.632	+1.73 +6.7	20.6	36.6
Apr. 8	22 38.96	-14 35.8	3.223	2.570	+1.75 +6.9	20.4	42.1
Apr. 18	22 56.42	-13 27.0	3.072	2.507	+1.77 +6.9	20.2	47.6
Apr. 28	23 14.10	-12 17.6	2.916	2.444	+1.79 +6.9	20.0	52.9
May 8	23 32.03	-11 08.3	2.755	2.380	+1.82 +6.8	19.8	58.0
May 18	23 50.25	-10 00.2	2.592	2.317	+1.85 +6.6	19.6	63.1
May 28	00 08.79	-08 54.6	2.427	2.253	+1.89 +6.2	19.4	68.0
June 7	00 27.69	-07 52.6	2.263	2.190	+1.93 +5.7	19.1	72.8
June 17	00 47.01	-06 55.7	2.101	2.127	+1.97 +5.0	18.9	77.5
June 27	01 06.76	-06 05.4	1.943	2.064	+2.02 +4.2	18.6	82.0
July 7	01 26.97	-05 23.3	1.790	2.003	+2.07 +3.2	18.3	86.5
July 17	01 47.64	-04 51.1	1.642	1.943	+2.11 +2.1	18.0	90.7
July 27	02 08.72	-04 30.6	1.503	1.884	+2.14 +0.7	17.7	94.9
Aug. 6	02 30.16	-04 23.1	1.371	1.827	+2.17 -0.7	17.4	98.9
Aug. 16	02 51.81	-04 29.9	1.248	1.772	+2.16 -2.2	17.1	102.7
Aug. 26	03 13.44	-04 51.5	1.135	1.721	+2.13 -3.6	16.8	106.5
Sept. 5	03 34.79	-05 27.1	1.033	1.673	+2.06 -4.8	16.5	110.1
Sept. 15	03 55.43	-06 14.7	0.940	1.629	+1.94 -5.6	16.3	113.7
Sept. 25	04 14.86	-07 10.3	0.857	1.590	+1.77 -5.7	16.0	117.3
Oct. 5	04 32.52	-08 07.2	0.783	1.556	+1.52 -5.0	15.7	121.0
Oct. 15	04 47.72	-08 56.8	0.719	1.528	+1.21 -3.0	15.5	125.0
Oct. 25	04 59.82	-09 26.9	0.664	1.507	+0.85 +0.3	15.2	129.5
Nov. 4	05 08.32	-09 23.6	0.618	1.493	+0.46 +5.2	15.1	134.7
Nov. 14	05 12.88	-08 31.8	0.582	1.486	+0.09 +11.4	14.9	140.5
Nov. 24	05 13.79	-06 38.0	0.558	1.487	-0.18 +18.1	14.8	146.9
Dec. 4	05 11.98	-03 37.0	0.548	1.495	-0.30 +24.1	14.8	153.0
Dec. 14	05 08.94	+00 23.7	0.554	1.510	-0.24 +27.8	14.9	157.0
Dec. 24	05 06.57	+05 02.0	0.580	1.533	-0.01 +28.6	15.0	156.5
Jan. 3	05 06.45	+09 48.1	0.625	1.562	+0.31 +26.8	15.2	151.7
Jan. 13	05 09.51	+14 16.5	0.689	1.597	+0.66 +23.5	15.5	144.7
Jan. 23	05 16.14	+18 11.2	0.772	1.637	+1.00 +19.5	15.8	137.2
Feb. 2	05 26.12	+21 26.3	0.871	1.681	+1.29 +15.6	16.2	129.8
Feb. 12	05 38.99	+24 02.2	0.984	1.730	+1.53 +12.0	16.6	122.7
Feb. 22	05 54.25	+26 01.9	1.110	1.782	+1.70 +8.8	16.9	116.1
Mar. 3	06 11.30	+27 29.5	1.247	1.837	+1.84 +6.0	17.3	109.8
Mar. 13	06 29.65	+28 29.1	1.392	1.895	+1.92 +3.5	17.6	103.9
Mar. 23	06 48.90	+29 04.3	1.546	1.954	+1.97 +1.4	17.9	98.1

Comet 249P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 26.70075 TT
 Peri. = 65.60453
 Node = 239.17475 2000.0
 Incl. = 8.39268
 q = 0.4990971 AU
 e = 0.8194687
 a = 2.7646015 AU
 n = 0.21441505
 P = 4.60 years

H = 16.2 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	V	Elong. °
Jan. 8	10 35.59	-02 11.2	2.977	3.634	-0.50 -0.1	22.1	125.2
Jan. 18	10 30.55	-02 11.7	2.798	3.573	-0.72 +1.4	21.9	136.1
Jan. 28	10 23.37	-01 57.3	2.641	3.511	-0.91 +3.0	21.6	147.4
Feb. 7	10 14.25	-01 27.1	2.511	3.447	-1.06 +4.6	21.4	158.4
Feb. 17	10 03.63	-00 41.6	2.411	3.381	-1.14 +5.9	21.1	167.0
Feb. 27	09 52.21	+00 17.0	2.345	3.314	-1.13 +6.7	21.0	165.9
Mar. 9	09 40.87	+01 24.4	2.311	3.244	-1.04 +7.1	21.1	156.2
Mar. 19	09 30.49	+02 35.3	2.308	3.172	-0.87 +6.9	21.2	144.6
Mar. 29	09 21.83	+03 44.3	2.332	3.099	-0.64 +6.3	21.3	132.8
Apr. 8	09 15.42	+04 47.1	2.376	3.023	-0.39 +5.3	21.4	121.5
Apr. 18	09 11.50	+05 40.5	2.435	2.945	-0.14 +4.2	21.4	110.8
Apr. 28	09 10.13	+06 22.7	2.501	2.864	+0.11 +3.0	21.5	100.7
May 8	09 11.19	+06 52.8	2.570	2.781	+0.33 +1.8	21.5	91.2
May 18	09 14.51	+07 10.8	2.637	2.695	+0.54 +0.6	21.5	82.4
May 28	09 19.88	+07 16.7	2.697	2.607	+0.72 -0.6	21.5	74.1
June 7	09 27.09	+07 10.7	2.746	2.516	+0.89 -1.7	21.4	66.3
June 17	09 35.96	+06 53.3	2.784	2.422	+1.04 -2.9	21.4	59.0
June 27	09 46.34	+06 24.6	2.807	2.325	+1.18 -4.0	21.3	52.1
July 7	09 58.12	+05 44.8	2.814	2.224	+1.31 -5.1	21.2	45.6
July 17	10 11.24	+04 53.8	2.804	2.120	+1.44 -6.2	21.0	39.4
July 27	10 25.69	+03 51.7	2.777	2.012	+1.58 -7.3	20.8	33.7
Aug. 6	10 41.48	+02 38.3	2.731	1.900	+1.72 -8.5	20.6	28.3
Aug. 16	10 58.73	+01 13.3	2.669	1.784	+1.89 -9.7	20.3	23.3
Aug. 26	11 17.59	-00 23.9	2.589	1.663	+2.07 -11.0	20.1	18.7
Sept. 5	11 38.32	-02 13.6	2.492	1.537	+2.30 -12.3	19.7	14.6
Sept. 15	12 01.33	-04 16.5	2.381	1.407	+2.58 -13.6	19.4	11.0
Sept. 25	12 27.17	-06 32.9	2.256	1.271	+2.95 -15.0	19.0	8.1
Oct. 5	12 56.63	-09 02.6	2.119	1.129	+3.42 -16.1	18.5	6.0
Oct. 15	13 30.87	-11 43.8	1.974	0.984	+4.06 -16.7	18.1	4.7
Oct. 25	14 11.46	-14 31.3	1.823	0.836	+4.90 -16.1	17.6	4.7
Nov. 4	15 00.47	-17 12.6	1.669	0.693	+5.96 -13.0	17.1	6.6
Nov. 14	16 00.03	-19 22.8	1.511	0.570	+7.05 -6.0	16.8	10.9
Nov. 24	17 10.52	-20 22.4	1.348	0.503	+7.79 +4.7	16.8	17.4
Dec. 4	18 28.41	-19 35.8	1.192	0.524	+8.05 +16.3	17.2	25.7
Dec. 14	19 48.93	-16 52.7	1.075	0.622	+7.92 +26.7	17.6	34.8
Dec. 24	21 08.16	-12 26.0	1.024	0.757	+7.30 +32.4	17.9	44.3
Jan. 3	22 21.11	-07 01.9	1.046	0.904	+6.29 +31.9	18.2	52.8
Jan. 13	23 23.97	-01 43.1	1.132	1.051	+5.22 +27.4	18.5	59.1
Jan. 23	00 16.15	+02 51.2	1.266	1.195	+4.31 +22.2	18.9	62.7
Feb. 2	00 59.27	+06 32.8	1.433	1.334	+3.62 +17.6	19.2	63.8
Feb. 12	01 35.50	+09 29.0	1.620	1.467	+3.12 +14.1	19.6	63.1
Feb. 22	02 06.69	+11 49.9	1.820	1.596	+2.75 +11.4	19.9	61.0
Mar. 3	02 34.20	+13 43.7	2.026	1.719	+2.48 +9.3	20.2	57.9
Mar. 13	02 59.03	+15 16.5	2.234	1.838	+2.28 +7.6	20.4	54.1
Mar. 23	03 21.85	+16 32.5	2.440	1.952	+2.13 +6.2	20.7	49.8

Comet P/2010 R2 (La Sagra)

Epoch = 2015 June 27.0 TT
 T = 2015 Nov. 30.01058 TT
 Peri. = 58.57878
 Node = 270.65230 2000.0
 Incl. = 21.41751
 q = 2.6198161 AU

e = 0.1537567
 a = 3.0958190 AU
 n = 0.18094256
 P = 5.45 years

H = 17.6 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	V	Mot./PA °	Elong. °
Jan. 8	17 27.77	-27 56.6	3.775	2.911	-0.68 -2.9	.	23.4/ 86	24.7
Jan. 18	17 45.34	-27 37.0	3.696	2.896	-0.69 -3.3	.	23.1/ 84	30.9
Jan. 28	18 02.53	-27 09.5	3.605	2.881	-0.69 -3.7	23.4	22.6/ 82	37.1
Feb. 7	18 19.21	-26 34.3	3.502	2.867	-0.70 -4.1	23.4	22.0/ 80	43.5
Feb. 17	18 35.27	-25 51.3	3.388	2.853	-0.71 -4.6	23.4	21.3/ 77	49.9
Feb. 27	18 50.56	-25 01.1	3.264	2.839	-0.73 -5.0	23.3	20.4/ 75	56.4
Mar. 9	19 04.94	-24 03.9	3.132	2.825	-0.74 -5.5	23.3	19.4/ 72	63.1
Mar. 19	19 18.27	-23 00.3	2.994	2.812	-0.76 -6.0	23.2	18.2/ 68	69.9
Mar. 29	19 30.38	-21 50.9	2.851	2.799	-0.79 -6.5	23.1	16.7/ 64	76.9
Apr. 8	19 41.09	-20 36.3	2.705	2.786	-0.82 -7.0	23.0	15.1/ 59	84.1
Apr. 18	19 50.22	-19 17.1	2.559	2.774	-0.85 -7.5	22.9	13.3/ 52	91.5
Apr. 28	19 57.53	-17 54.3	2.414	2.761	-0.90 -8.0	22.8	11.4/ 42	99.3
May 8	20 02.83	-16 28.7	2.273	2.750	-0.95 -8.5	22.6	9.8/ 27	107.5
May 18	20 05.88	-15 01.1	2.139	2.738	-1.01 -9.1	22.4	8.9/ 6	116.0
May 28	20 06.47	-13 32.9	2.016	2.727	-1.08 -9.6	22.2	9.2/342	125.0
June 7	20 04.51	-12 05.5	1.907	2.717	-1.15 -10.1	22.0	10.7/322	134.5
June 17	20 00.01	-10 40.9	1.816	2.706	-1.22 -10.5	21.8	12.8/308	144.2
June 27	19 53.23	-09 21.4	1.746	2.697	-1.28 -10.9	21.6	14.5/299	153.9
July 7	19 44.74	-08 09.8	1.701	2.688	-1.32 -11.1	21.4	15.3/293	162.3
July 17	19 35.33	-07 08.7	1.682	2.679	-1.34 -11.2	21.3	14.7/289	165.7
July 27	19 26.02	-06 20.0	1.690	2.671	-1.33 -11.1	21.4	12.8/286	161.0
Aug. 6	19 17.80	-05 44.2	1.724	2.663	-1.29 -10.9	21.6	9.7/284	152.2
Aug. 16	19 11.48	-05 20.5	1.780	2.656	-1.23 -10.6	21.8	6.0/283	142.5
Aug. 26	19 07.60	-05 06.9	1.857	2.650	-1.16 -10.2	21.9	1.9/290	132.8
Sept. 5	19 06.38	-05 00.3	1.949	2.644	-1.09 -9.8	22.1	2.2/ 84	123.6
Sept. 15	19 07.83	-04 57.9	2.054	2.639	-1.02 -9.3	22.3	5.9/ 89	114.8
Sept. 25	19 11.79	-04 56.6	2.167	2.634	-0.96 -8.8	22.4	9.3/ 88	106.5
Oct. 5	19 18.02	-04 53.9	2.285	2.630	-0.90 -8.4	22.6	12.3/ 87	98.7
Oct. 15	19 26.24	-04 47.5	2.407	2.627	-0.85 -8.0	22.7	14.9/ 86	91.3
Oct. 25	19 36.21	-04 35.8	2.529	2.624	-0.81 -7.6	22.8	17.2/ 84	84.3
Nov. 4	19 47.63	-04 17.3	2.649	2.622	-0.78 -7.3	22.9	19.1/ 82	77.6
Nov. 14	20 00.29	-03 51.0	2.767	2.621	-0.75 -7.0	22.9	20.8/ 80	71.2
Nov. 24	20 13.98	-03 16.3	2.880	2.620	-0.72 -6.8	23.0	22.2/ 79	65.0
Dec. 4	20 28.50	-02 32.8	2.988	2.620	-0.71 -6.6	23.0	23.4/ 77	59.0
Dec. 14	20 43.69	-01 40.2	3.089	2.620	-0.69 -6.4	23.1	24.4/ 75	53.2
Dec. 24	20 59.40	-00 38.7	3.183	2.622	-0.68 -6.2	23.1	25.2/ 74	47.6
Jan. 3	21 15.52	+00 31.5	3.268	2.624	-0.67 -6.0	23.1	25.9/ 72	42.2
Jan. 13	21 31.95	+01 49.8	3.345	2.626	-0.66 -5.9	23.1	26.4/ 71	37.0
Jan. 23	21 48.59	+03 15.9	3.412	2.629	-0.65 -5.7	23.1	26.8/ 70	32.0
Feb. 2	22 05.37	+04 48.8	3.469	2.633	-0.65 -5.6	23.0	27.1/ 68	27.3
Feb. 12	22 22.25	+06 27.8	3.517	2.638	-0.65 -5.4	23.0	27.2/ 67	23.1
Feb. 22	22 39.17	+08 12.1	3.555	2.643	-0.65 -5.2	23.0	27.3/ 66	19.5
Mar. 3	22 56.10	+10 00.7	3.582	2.649	-0.65 -5.0	23.0	27.3/ 65	16.8
Mar. 13	23 13.02	+11 52.6	3.599	2.655	-0.66 -4.8	23.0	27.2/ 65	15.6
Mar. 23	23 29.91	+13 47.0	3.605	2.662	-0.66 -4.6	23.0	27.0/ 64	16.1

Comet P/2003 WC7 (LINEAR-Catalina)

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 5.09481 TT
 Peri. = 342.37254 e = 0.6797742
 Node = 88.77698 2000.0 a = 5.1825212 AU
 Incl. = 21.46119 n = 0.08353961
 q = 1.6595770 AU P = 11.80 years

$$m1 = 12.0 + 5 \log(\Delta) + 20.0 \log(r(t-40))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot. /PA	Elong.
2015/16	h m	°			for T=+1 day			
Jan. 8	21 22.73	-30 02.4	4.353	3.533	-0.43 -0.5	.	18.4/ 72	29.7
Jan. 18	21 36.03	-29 02.5	4.343	3.466	-0.45 -0.8	.	19.3/ 72	23.8
Jan. 28	21 49.89	-27 59.4	4.316	3.399	-0.47 -1.1	.	20.2/ 72	18.7
Feb. 7	22 04.20	-26 53.3	4.272	3.331	-0.49 -1.4	.	20.9/ 72	15.2
Feb. 17	22 18.91	-25 44.4	4.211	3.263	-0.51 -1.7	.	21.6/ 72	14.2
Feb. 27	22 33.97	-24 33.2	4.134	3.194	-0.54 -2.1	.	22.3/ 72	16.0
Mar. 9	22 49.32	-23 20.0	4.042	3.125	-0.56 -2.5	.	22.9/ 72	19.6
Mar. 19	23 04.94	-22 05.3	3.937	3.056	-0.59 -2.9	.	23.4/ 72	24.1
Mar. 29	23 20.81	-20 49.5	3.818	2.986	-0.63 -3.4	.	23.9/ 72	29.1
Apr. 8	23 36.91	-19 33.3	3.689	2.916	-0.66 -3.9	.	24.4/ 72	34.2
Apr. 18	23 53.25	-18 17.2	3.550	2.846	-0.70 -4.4	.	24.8/ 73	39.4
Apr. 28	00 09.82	-17 01.9	3.403	2.776	-0.75 -5.0	.	25.3/ 74	44.5
May 8	00 26.62	-15 48.1	3.250	2.706	-0.80 -5.6	.	25.7/ 74	49.6
May 18	00 43.67	-14 36.5	3.091	2.636	-0.85 -6.3	.	26.1/ 75	54.5
May 28	01 00.95	-13 28.0	2.930	2.567	-0.91 -7.1	.	26.4/ 76	59.4
June 7	01 18.48	-12 23.3	2.766	2.497	-0.98 -7.9	.	26.8/ 77	64.2
June 17	01 36.24	-11 23.2	2.602	2.429	-1.06 -8.8	22.7	27.0/ 79	68.9
June 27	01 54.21	-10 28.7	2.440	2.361	-1.14 -9.9	22.4	27.2/ 80	73.5
July 7	02 12.35	-09 40.4	2.279	2.294	-1.24 -11.0	22.0	27.3/ 82	78.0
July 17	02 30.62	-08 59.0	2.122	2.228	-1.35 -12.2	21.6	27.3/ 83	82.4
July 27	02 48.89	-08 25.0	1.969	2.164	-1.47 -13.6	21.2	27.1/ 85	86.8
Aug. 6	03 07.08	-07 58.6	1.821	2.101	-1.60 -15.2	20.8	26.7/ 86	91.1
Aug. 16	03 25.02	-07 39.7	1.679	2.041	-1.76 -16.9	20.3	26.0/ 88	95.4
Aug. 26	03 42.46	-07 27.5	1.543	1.983	-1.94 -18.8	19.9	24.9/ 89	99.8
Sept. 5	03 59.18	-07 20.2	1.415	1.929	-2.14 -21.0	19.5	23.3/ 89	104.2
Sept. 15	04 14.83	-07 15.4	1.293	1.878	-2.38 -23.3	19.0	21.1/ 88	108.9
Sept. 25	04 28.99	-07 08.7	1.180	1.831	-2.65 -25.8	18.6	18.3/ 86	113.8
Oct. 5	04 41.24	-06 54.4	1.074	1.788	-2.96 -28.5	18.1	14.9/ 79	119.1
Oct. 15	04 51.02	-06 24.4	0.977	1.751	-3.33 -31.1	17.7	11.6/ 61	124.9
Oct. 25	04 57.81	-05 28.1	0.891	1.720	-3.73 -33.7	17.2	10.8/ 28	131.5
Nov. 4	05 01.21	-03 53.2	0.816	1.694	-4.16 -35.9	16.8	14.6/359	139.0
Nov. 14	05 00.97	-01 27.1	0.755	1.676	-4.58 -37.7	16.4	21.3/346	147.4
Nov. 24	04 57.43	+01 58.8	0.712	1.664	-4.92 -39.0	16.1	27.7/342	156.3
Dec. 4	04 51.56	+06 21.9	0.690	1.660	-5.12 -39.6	15.9	31.9/342	163.9
Dec. 14	04 44.95	+11 25.1	0.692	1.662	-5.13 -39.7	15.8	32.4/346	165.2
Dec. 24	04 39.61	+16 39.7	0.718	1.673	-4.97 -39.0	15.8	29.9/354	158.4
Jan. 3	04 37.21	+21 37.1	0.769	1.690	-4.68 -37.4	15.9	26.3/ 5	149.0
Jan. 13	04 38.77	+25 58.8	0.841	1.714	-4.33 -34.8	16.0	23.3/ 19	139.6
Jan. 23	04 44.71	+29 37.8	0.932	1.744	-3.98 -31.4	16.3	21.9/ 36	131.0
Feb. 2	04 54.78	+32 34.8	1.038	1.780	-3.66 -27.7	16.5	22.0/ 50	123.2
Feb. 12	05 08.47	+34 53.3	1.156	1.821	-3.37 -23.8	16.9	22.9/ 62	116.1
Feb. 22	05 25.20	+36 37.8	1.285	1.867	-3.11 -20.1	17.2	23.9/ 70	109.7
Mar. 3	05 44.25	+37 52.1	1.423	1.917	-2.88 -16.6	17.6	24.9/ 77	103.7
Mar. 13	06 05.01	+38 39.5	1.568	1.971	-2.66 -13.4	18.0	25.7/ 83	98.1
Mar. 23	06 26.91	+39 03.0	1.719	2.028	-2.46 -10.5	18.4	26.2/ 88	92.7

Comet C/2014 S2 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 9.79704 TT
 Peri. = 87.80472
 Node = 8.12166 2000.0
 Incl. = 64.66984
 q = 2.1007134 AU
 e = 0.9876717

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	23 43.37	-04 06.8	4.476	4.198	+0.29	+8.6	19.5	67.4
Jan. 18	23 46.29	-02 40.7	4.543	4.115	+0.40	+9.1	19.4	58.5
Jan. 28	23 50.31	-01 09.4	4.597	4.032	+0.50	+9.6	19.4	49.8
Feb. 7	23 55.28	+00 26.8	4.634	3.949	+0.58	+10.1	19.3	41.4
Feb. 17	00 01.09	+02 07.9	4.652	3.866	+0.65	+10.6	19.2	33.4
Feb. 27	00 07.61	+03 53.9	4.652	3.783	+0.71	+11.1	19.1	25.6
Mar. 9	00 14.75	+05 44.8	4.630	3.700	+0.77	+11.6	19.0	18.2
Mar. 19	00 22.41	+07 40.9	4.588	3.618	+0.81	+12.1	18.9	11.4
Mar. 29	00 30.52	+09 42.3	4.526	3.536	+0.85	+12.7	18.8	6.6
Apr. 8	00 39.01	+11 49.6	4.443	3.455	+0.88	+13.4	18.6	8.1
Apr. 18	00 47.84	+14 03.2	4.341	3.374	+0.91	+14.1	18.5	13.7
Apr. 28	00 56.94	+16 23.9	4.221	3.293	+0.93	+14.9	18.3	20.0
May 8	01 06.29	+18 52.4	4.084	3.214	+0.96	+15.8	18.1	26.6
May 18	01 15.85	+21 29.9	3.933	3.135	+0.97	+16.8	17.9	33.1
May 28	01 25.58	+24 17.7	3.770	3.057	+0.99	+18.0	17.7	39.5
June 7	01 35.46	+27 17.4	3.597	2.980	+1.00	+19.4	17.5	45.8
June 17	01 45.47	+30 30.9	3.416	2.905	+1.01	+21.0	17.3	52.1
June 27	01 55.58	+34 00.5	3.231	2.831	+1.02	+22.8	17.1	58.2
July 7	02 05.77	+37 48.4	3.045	2.759	+1.02	+24.9	16.8	64.2
July 17	02 16.00	+41 57.5	2.861	2.689	+1.02	+27.3	16.6	70.0
July 27	02 26.21	+46 30.2	2.683	2.622	+1.02	+29.9	16.3	75.5
Aug. 6	02 36.38	+51 28.8	2.516	2.556	+1.00	+32.6	16.1	80.7
Aug. 16	02 46.40	+56 54.4	2.361	2.494	+0.97	+35.2	15.8	85.4
Aug. 26	02 56.10	+62 46.2	2.225	2.435	+0.91	+37.4	15.6	89.5
Sept. 5	03 05.16	+69 00.7	2.109	2.379	+0.75	+39.0	15.4	92.7
Sept. 15	03 12.67	+75 31.0	2.016	2.328	+0.22	+39.5	15.2	94.8
Sept. 25	03 14.82	+82 06.3	1.948	2.281	-6.86	+38.2	15.0	95.9
Oct. 5	02 06.20	+88 28.6	1.903	2.238	-58.25	-19.7	14.9	95.9
Oct. 15	16 23.66	+85 12.0	1.878	2.201	-0.63	-33.5	14.8	94.9
Oct. 25	16 17.40	+79 36.7	1.870	2.169	+0.50	-29.6	14.7	93.3
Nov. 4	16 22.44	+74 41.2	1.875	2.143	+0.71	-24.9	14.7	91.4
Nov. 14	16 29.50	+70 31.8	1.886	2.123	+0.73	-20.0	14.6	89.5
Nov. 24	16 36.82	+67 11.6	1.900	2.109	+0.69	-15.1	14.6	87.9
Dec. 4	16 43.68	+64 41.0	1.912	2.102	+0.60	-10.1	14.6	86.8
Dec. 14	16 49.65	+62 59.6	1.919	2.101	+0.45	-5.3	14.6	86.4
Dec. 24	16 54.14	+62 06.5	1.920	2.107	+0.23	-0.7	14.7	86.8
Jan. 3	16 56.49	+61 59.7	1.913	2.120	-0.08	+3.8	14.7	88.0
Jan. 13	16 55.73	+62 37.5	1.900	2.139	-0.54	+7.8	14.7	90.0
Jan. 23	16 50.34	+63 56.0	1.882	2.164	-1.23	+11.2	14.7	92.7
Feb. 2	16 38.04	+65 47.9	1.861	2.195	-2.27	+13.2	14.8	96.0
Feb. 12	16 15.32	+67 59.5	1.843	2.232	-3.77	+12.5	14.8	99.7
Feb. 22	15 37.66	+70 04.1	1.831	2.273	-5.50	+7.4	14.9	103.4
Mar. 3	14 42.62	+71 18.1	1.832	2.320	-6.57	-2.6	15.0	106.7
Mar. 13	13 36.92	+70 51.8	1.850	2.371	-6.00	-14.8	15.1	109.2
Mar. 23	12 36.88	+68 24.2	1.891	2.426	-4.36	-24.3	15.2	110.4

Comet P/2002 Q1 (Van Ness)

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 11.01715 TT
 Peri. = 185.09791
 Node = 173.96077 2000.0
 Incl. = 36.21226
 q = 1.5602725 AU

e = 0.5624572
 a = 3.5659883 AU
 n = 0.14636398
 P = 6.73 years

$$m1 = 12.4 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	16 50.51	+05 12.0	3.883	3.258	-0.54 +0.5	.	21.0/ 82	44.7
Jan. 18	17 04.49	+05 39.2	3.745	3.203	-0.57 +0.5	.	21.1/ 79	50.0
Jan. 28	17 18.38	+06 19.1	3.598	3.146	-0.61 +0.6	.	21.1/ 75	55.4
Feb. 7	17 32.08	+07 12.3	3.445	3.089	-0.66 +0.7	.	21.0/ 71	60.9
Feb. 17	17 45.47	+08 19.1	3.287	3.031	-0.71 +0.8	.	20.8/ 67	66.5
Feb. 27	17 58.42	+09 39.8	3.126	2.973	-0.77 +0.8	.	20.5/ 62	72.0
Mar. 9	18 10.78	+11 14.4	2.964	2.914	-0.84 +1.0	.	20.2/ 57	77.4
Mar. 19	18 22.41	+13 02.5	2.802	2.854	-0.91 +1.1	.	19.7/ 52	82.8
Mar. 29	18 33.10	+15 03.5	2.643	2.794	-0.99 +1.2	.	19.1/ 46	88.1
Apr. 8	18 42.67	+17 16.1	2.488	2.733	-1.09 +1.3	.	18.4/ 39	93.2
Apr. 18	18 50.89	+19 38.6	2.338	2.672	-1.20 +1.4	22.8	17.6/ 31	98.2
Apr. 28	18 57.48	+22 08.3	2.194	2.611	-1.32 +1.4	22.4	16.6/ 23	102.9
May 8	19 02.18	+24 41.2	2.059	2.549	-1.46 +1.4	22.1	15.5/ 13	107.4
May 18	19 04.70	+27 12.4	1.933	2.488	-1.61 +1.2	21.7	14.3/ 0	111.4
May 28	19 04.78	+29 35.1	1.816	2.426	-1.77 +0.8	21.4	13.0/346	115.0
June 7	19 02.27	+31 40.9	1.710	2.364	-1.93 +0.1	21.0	11.8/327	118.1
June 17	18 57.19	+33 20.3	1.615	2.302	-2.09 -0.9	20.7	11.0/305	120.4
June 27	18 49.89	+34 22.6	1.531	2.240	-2.21 -2.1	20.3	11.0/279	121.9
July 7	18 41.12	+34 38.1	1.458	2.180	-2.28 -3.4	20.0	12.0/252	122.5
July 17	18 31.96	+33 59.7	1.396	2.119	-2.30 -4.6	19.6	14.1/228	122.1
July 27	18 23.76	+32 23.6	1.345	2.060	-2.26 -5.4	19.3	17.0/207	120.9
Aug. 6	18 17.78	+29 51.9	1.306	2.002	-2.18 -5.5	19.0	20.5/191	118.7
Aug. 16	18 14.97	+26 30.2	1.278	1.946	-2.08 -4.8	18.7	24.2/177	115.9
Aug. 26	18 15.92	+22 28.2	1.261	1.892	-1.99 -3.3	18.4	27.9/165	112.3
Sept. 5	18 20.85	+17 57.6	1.254	1.840	-1.91 -1.0	18.2	31.4/156	108.3
Sept. 15	18 29.69	+13 10.2	1.260	1.791	-1.85 +1.8	18.0	34.6/147	103.9
Sept. 25	18 42.27	+08 18.3	1.276	1.745	-1.82 +4.7	17.8	37.2/140	99.3
Oct. 5	18 58.26	+03 33.4	1.302	1.703	-1.81 +7.5	17.6	39.2/133	94.5
Oct. 15	19 17.35	-00 54.9	1.339	1.666	-1.83 +9.9	17.5	40.8/127	89.7
Oct. 25	19 39.18	-04 58.3	1.385	1.633	-1.85 +11.8	17.4	41.8/121	85.0
Nov. 4	20 03.32	-08 30.7	1.440	1.606	-1.89 +13.0	17.3	42.4/115	80.3
Nov. 14	20 29.37	-11 28.1	1.503	1.585	-1.92 +13.6	17.3	42.7/110	75.9
Nov. 24	20 56.90	-13 48.6	1.572	1.570	-1.94 +13.6	17.3	42.7/105	71.6
Dec. 4	21 25.45	-15 32.1	1.645	1.562	-1.96 +13.1	17.4	42.6/100	67.5
Dec. 14	21 54.64	-16 40.1	1.723	1.561	-1.95 +12.3	17.4	42.4/ 96	63.7
Dec. 24	22 24.11	-17 15.3	1.804	1.566	-1.94 +11.3	17.6	42.1/ 92	60.1
Jan. 3	22 53.53	-17 21.1	1.886	1.578	-1.91 +10.1	17.7	41.9/ 88	56.7
Jan. 13	23 22.71	-17 01.6	1.970	1.597	-1.86 +8.9	17.9	41.5/ 85	53.6
Jan. 23	23 51.48	-16 21.0	2.054	1.621	-1.80 +7.8	18.2	41.2/ 83	50.7
Feb. 2	00 19.73	-15 23.5	2.139	1.652	-1.74 +6.7	18.4	40.8/ 81	48.0
Feb. 12	00 47.43	-14 13.4	2.225	1.687	-1.67 +5.6	18.7	40.3/ 80	45.5
Feb. 22	01 14.56	-12 54.5	2.310	1.728	-1.59 +4.7	19.0	39.8/ 79	43.2
Mar. 3	01 41.11	-11 30.8	2.396	1.772	-1.52 +4.0	19.3	39.2/ 78	41.0
Mar. 13	02 07.11	-10 05.3	2.482	1.820	-1.44 +3.3	19.6	38.6/ 78	38.9
Mar. 23	02 32.56	-08 41.4	2.568	1.870	-1.37 +2.8	19.9	37.8/ 78	37.0

Comet 204P/LINEAR-NEAT

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 11.59901 TT
 Peri. = 355.07671
 Node = 109.06959 2000.0
 Incl. = 6.58874
 q = 1.9296394 AU
 e = 0.4720878
 a = 3.6552279 AU
 n = 0.14103678
 P = 6.99 years

$$m1 = 11.6 + 5 \log(\Delta) + 20.0 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	23 17.03	-10 41.4	3.560	3.167	+1.03 +7.5	.	58.9
Jan. 18	23 27.29	-09 26.8	3.634	3.120	+1.12 +8.0	.	51.6
Jan. 28	23 38.48	-08 06.6	3.695	3.072	+1.20 +8.5	.	44.6
Feb. 7	23 50.47	-06 41.8	3.743	3.025	+1.27 +8.9	.	37.8
Feb. 17	00 03.19	-05 13.0	3.777	2.977	+1.34 +9.2	.	31.2
Feb. 27	00 16.55	-03 40.8	3.796	2.929	+1.39 +9.5	.	25.0
Mar. 9	00 30.50	-02 06.0	3.801	2.881	+1.45 +9.7	.	18.9
Mar. 19	00 44.99	-00 29.4	3.792	2.832	+1.50 +9.8	.	13.2
Mar. 29	01 00.01	+01 08.4	3.769	2.784	+1.55 +9.8	.	8.1
Apr. 8	01 15.51	+02 46.5	3.732	2.736	+1.60 +9.8	.	4.9
Apr. 18	01 31.51	+04 24.3	3.683	2.688	+1.65 +9.7	.	6.7
Apr. 28	01 47.99	+06 00.9	3.621	2.640	+1.70 +9.5	.	11.0
May 8	02 04.95	+07 35.5	3.549	2.593	+1.75 +9.2	.	15.9
May 18	02 22.40	+09 07.3	3.467	2.546	+1.79 +8.8	.	20.8
May 28	02 40.34	+10 35.4	3.375	2.500	+1.84 +8.4	.	25.6
June 7	02 58.77	+11 58.9	3.276	2.454	+1.89 +7.8	22.9	30.3
June 17	03 17.69	+13 17.0	3.169	2.409	+1.94 +7.2	22.7	35.0
June 27	03 37.08	+14 28.7	3.057	2.365	+1.98 +6.5	22.5	39.7
July 7	03 56.92	+15 33.3	2.939	2.322	+2.02 +5.7	22.2	44.2
July 17	04 17.17	+16 29.8	2.818	2.280	+2.06 +4.8	22.0	48.8
July 27	04 37.76	+17 17.6	2.694	2.240	+2.09 +3.9	21.7	53.3
Aug. 6	04 58.63	+17 56.2	2.567	2.201	+2.11 +2.9	21.4	57.8
Aug. 16	05 19.68	+18 25.0	2.440	2.164	+2.11 +1.9	21.2	62.3
Aug. 26	05 40.78	+18 44.0	2.311	2.129	+2.10 +0.9	20.9	66.9
Sept. 5	06 01.78	+18 53.3	2.184	2.096	+2.07 0.0	20.6	71.6
Sept. 15	06 22.53	+18 53.6	2.057	2.065	+2.03 -0.8	20.3	76.3
Sept. 25	06 42.80	+18 45.8	1.932	2.037	+1.96 -1.4	20.0	81.3
Oct. 5	07 02.40	+18 31.4	1.810	2.012	+1.87 -1.9	19.7	86.4
Oct. 15	07 21.05	+18 12.7	1.690	1.990	+1.74 -2.0	19.4	91.8
Oct. 25	07 38.45	+17 52.3	1.575	1.971	+1.58 -1.9	19.1	97.6
Nov. 4	07 54.30	+17 33.6	1.465	1.956	+1.39 -1.3	18.9	103.8
Nov. 14	08 08.21	+17 20.4	1.361	1.944	+1.15 -0.3	18.6	110.6
Nov. 24	08 19.75	+17 17.1	1.265	1.935	+0.88 +1.1	18.3	118.0
Dec. 4	08 28.53	+17 27.8	1.178	1.931	+0.56 +2.8	18.0	126.1
Dec. 14	08 34.14	+17 56.3	1.103	1.930	+0.22 +4.8	17.8	135.1
Dec. 24	08 36.34	+18 44.0	1.043	1.933	-0.11 +6.5	17.6	145.0
Jan. 3	08 35.22	+19 49.5	1.000	1.939	-0.39 +7.8	17.4	155.6
Jan. 13	08 31.30	+21 07.2	0.978	1.949	-0.56 +8.1	17.3	166.9
Jan. 23	08 25.72	+22 27.7	0.980	1.963	-0.57 +7.3	17.3	176.7
Feb. 2	08 19.97	+23 41.0	1.004	1.980	-0.44 +5.8	17.3	168.7
Feb. 12	08 15.55	+24 39.2	1.052	2.000	-0.19 +3.9	17.4	157.6
Feb. 22	08 13.64	+25 18.1	1.121	2.024	+0.12 +1.9	17.6	147.0
Mar. 3	08 14.81	+25 37.3	1.209	2.050	+0.43 +0.1	17.8	137.3
Mar. 13	08 19.11	+25 38.0	1.312	2.080	+0.72 -1.6	18.0	128.3
Mar. 23	08 26.30	+25 22.4	1.428	2.111	+0.96 -3.0	18.2	120.0

Comet 180P/NEAT

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 12.86690 TT
 Peri. = 94.89634
 Node = 84.61073 2000.0
 Incl. = 16.87267
 q = 2.4890134 AU

e = 0.3552705
 a = 3.8605545 AU
 n = 0.12993601
 P = 7.59 years

$$m_1 = 1.4 + 5 \log(\Delta) + 35.0 \log(r(t-20))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	06 10.70	+28 39.5	2.259	3.217	-0.84	+3.7	21.2	164.3
Jan. 18	06 02.29	+29 16.9	2.278	3.184	-0.67	+3.1	21.1	152.6
Jan. 28	05 55.54	+29 47.6	2.324	3.151	-0.44	+2.5	21.0	141.1
Feb. 7	05 51.10	+30 12.4	2.391	3.119	-0.18	+2.0	20.9	130.1
Feb. 17	05 49.30	+30 32.9	2.476	3.086	+0.10	+1.7	20.8	119.6
Feb. 27	05 50.25	+30 49.9	2.573	3.054	+0.36	+1.5	20.7	109.9
Mar. 9	05 53.87	+31 04.5	2.677	3.023	+0.61	+1.2	20.7	100.7
Mar. 19	05 59.95	+31 16.8	2.785	2.992	+0.83	+1.0	20.6	92.1
Mar. 29	06 08.28	+31 26.4	2.893	2.961	+1.03	+0.7	20.5	84.1
Apr. 8	06 18.58	+31 32.9	2.998	2.930	+1.20	+0.3	20.4	76.5
Apr. 18	06 30.59	+31 35.5	3.098	2.901	+1.35	-0.2	20.4	69.4
Apr. 28	06 44.10	+31 33.3	3.192	2.871	+1.48	-0.8	20.3	62.6
May 8	06 58.88	+31 25.5	3.277	2.843	+1.58	-1.4	20.2	56.2
May 18	07 14.72	+31 11.4	3.354	2.815	+1.67	-2.1	20.1	50.1
May 28	07 31.47	+30 50.4	3.421	2.787	+1.75	-2.8	20.0	44.3
June 7	07 48.93	+30 21.9	3.478	2.761	+1.80	-3.6	19.8	38.7
June 17	08 06.97	+29 45.6	3.525	2.735	+1.85	-4.4	19.7	33.4
June 27	08 25.46	+29 01.5	3.562	2.711	+1.88	-5.2	19.6	28.4
July 7	08 44.28	+28 09.4	3.588	2.687	+1.90	-6.0	19.5	23.6
July 17	09 03.32	+27 09.6	3.604	2.665	+1.92	-6.7	19.3	19.1
July 27	09 22.51	+26 02.4	3.610	2.643	+1.93	-7.4	19.2	15.2
Aug. 6	09 41.76	+24 48.4	3.606	2.623	+1.93	-8.0	19.1	12.2
Aug. 16	10 01.03	+23 28.1	3.592	2.604	+1.92	-8.6	19.0	10.7
Aug. 26	10 20.26	+22 02.4	3.569	2.586	+1.91	-9.0	18.8	11.4
Sept. 5	10 39.41	+20 32.1	3.537	2.569	+1.90	-9.4	18.7	13.9
Sept. 15	10 58.45	+18 58.2	3.497	2.554	+1.89	-9.6	18.6	17.4
Sept. 25	11 17.37	+17 21.9	3.448	2.541	+1.88	-9.8	18.4	21.4
Oct. 5	11 36.12	+15 44.2	3.391	2.529	+1.86	-9.8	18.3	25.8
Oct. 15	11 54.71	+14 06.5	3.327	2.518	+1.84	-9.6	18.2	30.4
Oct. 25	12 13.08	+12 30.1	3.255	2.509	+1.81	-9.4	18.1	35.2
Nov. 4	12 31.22	+10 56.3	3.177	2.502	+1.79	-9.0	17.9	40.1
Nov. 14	12 49.07	+09 26.3	3.092	2.496	+1.75	-8.5	17.8	45.2
Nov. 24	13 06.56	+08 01.8	3.002	2.492	+1.71	-7.8	17.7	50.4
Dec. 4	13 23.63	+06 43.7	2.906	2.490	+1.65	-7.0	17.6	55.8
Dec. 14	13 40.18	+05 33.6	2.805	2.489	+1.59	-6.1	17.5	61.4
Dec. 24	13 56.06	+04 32.5	2.700	2.490	+1.51	-5.1	17.4	67.2
Jan. 3	14 11.14	+03 41.3	2.592	2.493	+1.41	-4.0	17.3	73.2
Jan. 13	14 25.22	+03 00.9	2.482	2.497	+1.29	-2.9	17.2	79.5
Jan. 23	14 38.08	+02 31.8	2.370	2.503	+1.14	-1.8	17.2	86.1
Feb. 2	14 49.48	+02 14.2	2.259	2.511	+0.96	-0.6	17.1	93.0
Feb. 12	14 59.13	+02 07.9	2.150	2.520	+0.76	+0.4	17.0	100.3
Feb. 22	15 06.73	+02 12.0	2.045	2.531	+0.53	+1.3	16.9	108.0
Mar. 3	15 12.00	+02 24.9	1.947	2.544	+0.27	+2.0	16.9	116.1
Mar. 13	15 14.68	+02 44.5	1.858	2.558	0.00	+2.3	16.9	124.6
Mar. 23	15 14.64	+03 07.0	1.783	2.573	-0.27	+2.1	16.8	133.5

Comet P/1998 QP54 (LONEOS-Tucker)

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 26.00145 TT
 Peri. = 30.61993
 Node = 341.59932 2000.0
 Incl. = 17.64907
 q = 1.8865725 AU
 e = 0.5513367
 a = 4.2048737 AU
 n = 0.11430748
 P = 8.62 years

$$m1 = 11.2 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	18 12.07	-36 43.7	4.318	3.408	-0.59 -1.1	.	20.7/ 89	19.7
Jan. 18	18 29.28	-36 35.5	4.221	3.355	-0.62 -1.5	.	20.9/ 88	25.0
Jan. 28	18 46.55	-36 23.0	4.109	3.301	-0.65 -1.9	.	20.9/ 87	30.7
Feb. 7	19 03.78	-36 06.5	3.983	3.246	-0.68 -2.4	.	20.9/ 86	36.7
Feb. 17	19 20.89	-35 46.0	3.845	3.191	-0.71 -2.9	.	20.7/ 85	42.8
Feb. 27	19 37.76	-35 21.8	3.696	3.136	-0.74 -3.4	.	20.4/ 84	49.0
Mar. 9	19 54.28	-34 54.6	3.537	3.081	-0.78 -4.0	.	20.1/ 83	55.3
Mar. 19	20 10.36	-34 24.9	3.371	3.026	-0.81 -4.7	.	19.5/ 82	61.6
Mar. 29	20 25.89	-33 53.6	3.198	2.971	-0.86 -5.4	.	18.8/ 81	67.9
Apr. 8	20 40.73	-33 21.5	3.022	2.915	-0.90 -6.2	22.9	17.9/ 81	74.3
Apr. 18	20 54.78	-32 49.7	2.842	2.860	-0.96 -7.0	22.6	16.8/ 80	80.9
Apr. 28	21 07.87	-32 19.3	2.662	2.804	-1.02 -8.0	22.3	15.4/ 80	87.5
May 8	21 19.82	-31 51.6	2.483	2.749	-1.09 -9.0	22.0	13.8/ 81	94.3
May 18	21 30.44	-31 27.6	2.307	2.694	-1.17 -10.1	21.6	11.7/ 81	101.3
May 28	21 39.44	-31 08.6	2.136	2.640	-1.27 -11.4	21.3	9.2/ 82	108.6
June 7	21 46.53	-30 55.1	1.972	2.586	-1.38 -12.7	20.9	6.3/ 83	116.2
June 17	21 51.37	-30 47.6	1.818	2.532	-1.51 -14.0	20.6	2.8/ 85	124.2
June 27	21 53.55	-30 45.3	1.676	2.479	-1.66 -15.3	20.2	1.0/267	132.6
July 7	21 52.76	-30 45.8	1.549	2.427	-1.82 -16.5	19.9	5.1/270	141.4
July 17	21 48.78	-30 45.3	1.439	2.377	-1.98 -17.5	19.5	9.2/275	150.4
July 27	21 41.69	-30 37.3	1.350	2.327	-2.13 -18.2	19.2	12.6/280	159.0
Aug. 6	21 32.07	-30 14.5	1.284	2.279	-2.24 -18.4	18.9	15.0/286	165.0
Aug. 16	21 21.02	-29 30.2	1.241	2.232	-2.28 -18.3	18.6	16.0/295	163.9
Aug. 26	21 10.08	-28 20.6	1.223	2.187	-2.26 -18.0	18.4	15.4/307	156.4
Sept. 5	21 00.85	-26 46.8	1.228	2.144	-2.16 -17.7	18.3	14.2/323	146.8
Sept. 15	20 54.55	-24 53.5	1.254	2.104	-2.03 -17.5	18.2	13.2/344	137.0
Sept. 25	20 51.89	-22 46.4	1.296	2.066	-1.87 -17.4	18.1	13.6/ 7	127.5
Oct. 5	20 53.01	-20 30.9	1.352	2.032	-1.73 -17.4	18.0	15.5/ 25	118.7
Oct. 15	20 57.70	-18 10.3	1.418	2.000	-1.59 -17.4	18.0	18.3/ 38	110.6
Oct. 25	21 05.57	-15 46.0	1.491	1.972	-1.48 -17.5	18.0	21.3/ 46	103.1
Nov. 4	21 16.15	-13 18.5	1.570	1.947	-1.38 -17.4	18.0	24.1/ 52	96.3
Nov. 14	21 28.99	-10 47.5	1.652	1.926	-1.30 -17.4	18.0	26.7/ 55	90.1
Nov. 24	21 43.72	-08 12.4	1.736	1.910	-1.24 -17.3	18.0	29.0/ 57	84.3
Dec. 4	21 59.98	-05 33.1	1.822	1.898	-1.19 -17.1	18.1	30.9/ 58	78.9
Dec. 14	22 17.51	-02 49.6	1.909	1.890	-1.16 -16.8	18.1	32.5/ 59	73.9
Dec. 24	22 36.08	-00 02.2	1.997	1.887	-1.13 -16.5	18.2	33.8/ 60	69.2
Jan. 3	22 55.53	+02 48.2	2.084	1.888	-1.11 -16.0	18.3	34.8/ 60	64.8
Jan. 13	23 15.74	+05 40.7	2.173	1.894	-1.10 -15.5	18.4	35.6/ 61	60.5
Jan. 23	23 36.60	+08 33.7	2.262	1.904	-1.10 -14.9	18.6	36.1/ 61	56.5
Feb. 2	23 58.05	+11 25.8	2.351	1.919	-1.10 -14.2	18.7	36.4/ 62	52.6
Feb. 12	00 20.06	+14 15.1	2.440	1.938	-1.10 -13.4	18.9	36.5/ 62	48.8
Feb. 22	00 42.59	+16 60.0	2.530	1.961	-1.11 -12.5	19.1	36.4/ 63	45.1
Mar. 3	01 05.59	+19 38.4	2.620	1.988	-1.12 -11.6	19.3	36.2/ 64	41.5
Mar. 13	01 29.07	+22 08.8	2.709	2.018	-1.13 -10.5	19.5	35.8/ 66	37.9
Mar. 23	01 52.98	+24 29.4	2.797	2.052	-1.13 -9.5	19.7	35.3/ 67	34.3

Comet P/2014 W4 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2015 Dec. 29.72428 TT
 Peri. = 67.39201
 Node = 33.36324 2000.0
 Incl. = 15.28425
 q = 4.2628056 AU

e = 0.3524804
 a = 6.5832843 AU
 n = 0.05834991
 P = 16.89 years

$$m1 = 6.8 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	02 41.79	+22 51.7	4.059	4.599	+0.07	+0.7	19.8	117.7
Jan. 18	02 42.46	+22 58.9	4.184	4.582	+0.22	+1.3	19.8	107.8
Jan. 28	02 44.70	+23 11.8	4.318	4.565	+0.37	+1.8	19.9	98.2
Feb. 7	02 48.41	+23 30.2	4.456	4.548	+0.51	+2.4	19.9	89.1
Feb. 17	02 53.48	+23 53.7	4.593	4.532	+0.63	+2.8	20.0	80.3
Feb. 27	02 59.79	+24 21.8	4.727	4.516	+0.74	+3.2	20.0	71.8
Mar. 9	03 07.19	+24 53.7	4.853	4.501	+0.84	+3.5	20.0	63.6
Mar. 19	03 15.58	+25 28.7	4.970	4.485	+0.93	+3.7	20.1	55.7
Mar. 29	03 24.83	+26 05.9	5.076	4.471	+1.00	+3.9	20.1	48.1
Apr. 8	03 34.84	+26 44.5	5.167	4.457	+1.07	+3.9	20.1	40.7
Apr. 18	03 45.50	+27 23.7	5.245	4.443	+1.12	+3.9	20.1	33.6
Apr. 28	03 56.72	+28 03.1	5.306	4.430	+1.17	+3.9	20.1	26.7
May 8	04 08.42	+28 41.9	5.351	4.417	+1.21	+3.8	20.1	20.1
May 18	04 20.51	+29 19.6	5.379	4.404	+1.24	+3.6	20.1	14.0
May 28	04 32.91	+29 55.9	5.389	4.392	+1.26	+3.5	20.1	9.3
June 7	04 45.53	+30 30.5	5.383	4.381	+1.28	+3.3	20.1	8.3
June 17	04 58.31	+31 03.0	5.359	4.370	+1.28	+3.1	20.1	12.0
June 27	05 11.15	+31 33.5	5.318	4.360	+1.28	+2.8	20.0	17.5
July 7	05 23.96	+32 02.0	5.261	4.350	+1.27	+2.7	20.0	23.7
July 17	05 36.66	+32 28.5	5.189	4.340	+1.25	+2.5	19.9	30.2
July 27	05 49.14	+32 53.3	5.101	4.331	+1.22	+2.4	19.9	36.8
Aug. 6	06 01.30	+33 16.9	5.000	4.323	+1.17	+2.3	19.8	43.7
Aug. 16	06 13.03	+33 39.6	4.886	4.315	+1.12	+2.3	19.8	50.6
Aug. 26	06 24.20	+34 02.1	4.761	4.308	+1.05	+2.3	19.7	57.8
Sept. 5	06 34.67	+34 25.1	4.626	4.301	+0.96	+2.4	19.6	65.2
Sept. 15	06 44.29	+34 49.3	4.484	4.295	+0.86	+2.6	19.6	72.7
Sept. 25	06 52.88	+35 15.7	4.337	4.289	+0.74	+2.9	19.5	80.6
Oct. 5	07 00.29	+35 44.8	4.187	4.284	+0.60	+3.3	19.4	88.7
Oct. 15	07 06.31	+36 17.4	4.038	4.279	+0.44	+3.6	19.3	97.2
Oct. 25	07 10.74	+36 53.8	3.893	4.275	+0.27	+4.0	19.2	106.0
Nov. 4	07 13.42	+37 33.7	3.756	4.272	+0.08	+4.3	19.1	115.1
Nov. 14	07 14.18	+38 16.6	3.630	4.269	-0.12	+4.4	19.1	124.5
Nov. 24	07 12.95	+39 00.7	3.521	4.266	-0.32	+4.3	19.0	134.0
Dec. 4	07 09.80	+39 43.7	3.431	4.265	-0.49	+3.9	18.9	143.5
Dec. 14	07 04.90	+40 22.8	3.366	4.264	-0.62	+3.2	18.9	152.5
Dec. 24	06 58.68	+40 54.6	3.328	4.263	-0.70	+2.2	18.9	159.4
Jan. 3	06 51.72	+41 16.5	3.318	4.263	-0.70	+1.1	18.9	161.6
Jan. 13	06 44.71	+41 27.0	3.338	4.263	-0.63	-0.1	18.9	157.5
Jan. 23	06 38.38	+41 26.0	3.386	4.264	-0.50	-1.1	18.9	149.7
Feb. 2	06 33.34	+41 14.6	3.459	4.266	-0.33	-2.0	18.9	140.5
Feb. 12	06 30.03	+40 54.9	3.556	4.268	-0.13	-2.6	19.0	131.0
Feb. 22	06 28.70	+40 29.1	3.671	4.271	+0.07	-3.0	19.1	121.5
Mar. 3	06 29.41	+39 59.5	3.800	4.275	+0.27	-3.2	19.2	112.2
Mar. 13	06 32.10	+39 27.6	3.940	4.279	+0.45	-3.3	19.2	103.3
Mar. 23	06 36.62	+38 54.4	4.086	4.283	+0.61	-3.4	19.3	94.6

Comet 116P/Wild

Epoch = 2015 June 27.0 TT
 T = 2016 Jan. 11.72124 TT
 Peri. = 173.35999 e = 0.3727092
 Node = 20.99671 2000.0 a = 3.4859403 AU
 Incl. = 3.60813 n = 0.15143426
 q = 2.1866983 AU P = 6.51 years

$$m1 = 6.8 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	06 01.31	+28 24.0	2.234	3.185	-0.84 -0.4	17.3	162.4
Jan. 18	05 52.94	+28 19.7	2.253	3.149	-0.65 -0.9	17.3	150.7
Jan. 28	05 46.44	+28 11.0	2.299	3.112	-0.41 -1.1	17.2	139.3
Feb. 7	05 42.38	+27 59.9	2.365	3.075	-0.14 -1.2	17.2	128.3
Feb. 17	05 41.01	+27 48.1	2.447	3.038	+0.14 -1.1	17.2	117.9
Feb. 27	05 42.37	+27 36.8	2.541	3.001	+0.40 -1.0	17.2	108.2
Mar. 9	05 46.32	+27 26.4	2.641	2.964	+0.63 -1.0	17.2	99.1
Mar. 19	05 52.63	+27 16.4	2.744	2.927	+0.84 -1.0	17.2	90.5
Mar. 29	06 01.07	+27 06.2	2.846	2.890	+1.03 -1.2	17.1	82.5
Apr. 8	06 11.37	+26 54.5	2.945	2.853	+1.19 -1.4	17.1	74.9
Apr. 18	06 23.27	+26 40.3	3.038	2.817	+1.33 -1.8	17.1	67.8
Apr. 28	06 36.56	+26 22.4	3.125	2.781	+1.45 -2.3	17.0	61.1
May 8	06 51.03	+25 59.7	3.202	2.745	+1.55 -2.9	17.0	54.6
May 18	07 06.50	+25 31.1	3.271	2.709	+1.63 -3.5	16.9	48.5
May 28	07 22.80	+24 55.8	3.330	2.674	+1.70 -4.3	16.9	42.6
June 7	07 39.78	+24 13.2	3.378	2.639	+1.75 -5.0	16.8	37.0
June 17	07 57.32	+23 22.8	3.416	2.605	+1.80 -5.9	16.7	31.5
June 27	08 15.31	+22 24.1	3.443	2.572	+1.83 -6.7	16.7	26.3
July 7	08 33.63	+21 17.1	3.460	2.539	+1.86 -7.5	16.6	21.2
July 17	08 52.21	+20 01.7	3.467	2.507	+1.88 -8.4	16.5	16.2
July 27	09 10.98	+18 38.0	3.464	2.476	+1.89 -9.2	16.4	11.3
Aug. 6	09 29.88	+17 06.4	3.451	2.446	+1.90 -9.9	16.3	6.7
Aug. 16	09 48.87	+15 27.2	3.429	2.417	+1.90 -10.6	16.2	2.6
Aug. 26	10 07.91	+13 41.1	3.398	2.390	+1.91 -11.2	16.1	3.7
Sept. 5	10 26.97	+11 48.6	3.358	2.364	+1.91 -11.8	16.0	8.0
Sept. 15	10 46.06	+09 50.6	3.310	2.339	+1.91 -12.3	15.9	12.6
Sept. 25	11 05.16	+07 48.0	3.255	2.316	+1.91 -12.6	15.7	17.1
Oct. 5	11 24.25	+05 41.6	3.193	2.294	+1.91 -12.9	15.6	21.7
Oct. 15	11 43.35	+03 32.6	3.124	2.274	+1.91 -13.0	15.5	26.4
Oct. 25	12 02.44	+01 22.2	3.049	2.256	+1.91 -13.1	15.4	31.1
Nov. 4	12 21.52	-00 48.6	2.968	2.240	+1.91 -13.0	15.3	35.8
Nov. 14	12 40.58	-02 58.5	2.882	2.226	+1.90 -12.8	15.2	40.6
Nov. 24	12 59.58	-05 06.2	2.791	2.214	+1.89 -12.4	15.1	45.5
Dec. 4	13 18.47	-07 10.4	2.696	2.204	+1.87 -12.0	15.0	50.5
Dec. 14	13 37.21	-09 10.0	2.597	2.196	+1.85 -11.4	14.9	55.6
Dec. 24	13 55.68	-11 03.7	2.495	2.191	+1.81 -10.7	14.7	60.8
Jan. 3	14 13.78	-12 50.7	2.390	2.188	+1.76 -9.9	14.6	66.3
Jan. 13	14 31.35	-14 30.0	2.283	2.187	+1.68 -9.1	14.5	71.9
Jan. 23	14 48.18	-16 01.0	2.175	2.188	+1.59 -8.2	14.4	77.7
Feb. 2	15 04.04	-17 23.3	2.066	2.192	+1.46 -7.4	14.3	83.9
Feb. 12	15 18.64	-18 36.8	1.958	2.198	+1.30 -6.5	14.2	90.3
Feb. 22	15 31.64	-19 41.6	1.853	2.206	+1.10 -5.6	14.2	97.2
Mar. 3	15 42.68	-20 38.0	1.750	2.217	+0.87 -4.8	14.1	104.5
Mar. 13	15 51.35	-21 26.3	1.653	2.229	+0.59 -4.0	14.0	112.3
Mar. 23	15 57.25	-22 06.8	1.564	2.244	+0.28 -3.3	13.9	120.8

Comet C/2014 Y1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2016 Jan. 17.73179 TT
 Peri. = 182.26121
 Node = 19.48939 2000.0
 Incl. = 14.92309
 q = 2.2425174 AU
 e = 1.0014472

$$m1 = 8.4 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	07 52.07	+40 13.8	3.603	4.542	-0.77	+2.2	17.8	160.4
Jan. 18	07 44.35	+40 35.4	3.524	4.460	-0.79	+1.0	17.6	159.9
Jan. 28	07 36.42	+40 45.5	3.474	4.379	-0.74	-0.2	17.5	153.8
Feb. 7	07 29.00	+40 43.3	3.452	4.298	-0.63	-1.4	17.4	145.1
Feb. 17	07 22.74	+40 29.0	3.455	4.217	-0.46	-2.5	17.3	135.5
Feb. 27	07 18.18	+40 04.1	3.479	4.135	-0.25	-3.3	17.3	125.7
Mar. 9	07 15.67	+39 30.8	3.520	4.055	-0.03	-4.0	17.2	116.0
Mar. 19	07 15.36	+38 51.0	3.573	3.974	+0.19	-4.4	17.2	106.6
Mar. 29	07 17.26	+38 06.5	3.633	3.893	+0.40	-4.8	17.1	97.6
Apr. 8	07 21.28	+37 18.5	3.697	3.813	+0.60	-5.1	17.1	89.0
Apr. 18	07 27.25	+36 27.7	3.759	3.733	+0.77	-5.4	17.0	80.8
Apr. 28	07 34.98	+35 34.1	3.819	3.654	+0.93	-5.6	16.9	73.0
May 8	07 44.27	+34 37.7	3.872	3.575	+1.07	-6.0	16.9	65.6
May 18	07 54.93	+33 38.0	3.917	3.497	+1.19	-6.4	16.8	58.5
May 28	08 06.79	+32 34.4	3.952	3.419	+1.29	-6.8	16.7	51.8
June 7	08 19.66	+31 26.3	3.977	3.342	+1.38	-7.3	16.6	45.3
June 17	08 33.41	+30 13.3	3.990	3.266	+1.45	-7.9	16.5	39.2
June 27	08 47.92	+28 54.6	3.992	3.191	+1.51	-8.5	16.4	33.3
July 7	09 03.06	+27 30.0	3.982	3.118	+1.57	-9.1	16.3	27.7
July 17	09 18.75	+25 58.9	3.961	3.045	+1.62	-9.8	16.2	22.3
July 27	09 34.91	+24 21.0	3.928	2.974	+1.65	-10.5	16.1	17.4
Aug. 6	09 51.45	+22 36.3	3.885	2.905	+1.69	-11.2	16.0	13.0
Aug. 16	10 08.34	+20 44.6	3.832	2.838	+1.72	-11.9	15.8	9.6
Aug. 26	10 25.52	+18 46.0	3.769	2.773	+1.74	-12.5	15.7	8.4
Sept. 5	10 42.96	+16 40.6	3.698	2.710	+1.77	-13.2	15.6	9.9
Sept. 15	11 00.65	+14 28.7	3.619	2.650	+1.79	-13.8	15.4	13.2
Sept. 25	11 18.55	+12 10.7	3.534	2.593	+1.81	-14.4	15.3	17.2
Oct. 5	11 36.67	+09 47.2	3.443	2.539	+1.83	-14.9	15.1	21.5
Oct. 15	11 54.99	+07 18.7	3.348	2.489	+1.85	-15.3	15.0	25.9
Oct. 25	12 13.50	+04 46.0	3.248	2.442	+1.87	-15.6	14.8	30.3
Nov. 4	12 32.19	+02 10.1	3.146	2.400	+1.89	-15.8	14.7	34.8
Nov. 14	12 51.06	-00 28.1	3.042	2.362	+1.90	-15.9	14.5	39.4
Nov. 24	13 10.06	-03 07.5	2.936	2.329	+1.91	-15.9	14.4	44.0
Dec. 4	13 29.18	-05 46.9	2.830	2.301	+1.92	-15.8	14.3	48.6
Dec. 14	13 48.35	-08 25.2	2.725	2.278	+1.91	-15.6	14.2	53.3
Dec. 24	14 07.50	-11 01.2	2.620	2.260	+1.90	-15.3	14.0	58.1
Jan. 3	14 26.51	-13 34.0	2.516	2.249	+1.87	-14.9	13.9	63.1
Jan. 13	14 45.26	-16 02.7	2.414	2.243	+1.83	-14.4	13.8	68.2
Jan. 23	15 03.54	-18 26.5	2.314	2.243	+1.76	-13.9	13.7	73.5
Feb. 2	15 21.16	-20 45.3	2.218	2.249	+1.67	-13.4	13.6	79.1
Feb. 12	15 37.84	-22 58.8	2.124	2.261	+1.54	-12.9	13.6	84.9
Feb. 22	15 53.24	-25 07.4	2.035	2.279	+1.38	-12.4	13.5	91.1
Mar. 3	16 07.03	-27 11.5	1.950	2.302	+1.18	-12.0	13.5	97.6
Mar. 13	16 18.82	-29 11.6	1.872	2.330	+0.94	-11.6	13.4	104.6
Mar. 23	16 28.18	-31 07.7	1.802	2.364	+0.66	-11.2	13.4	112.0

Comet 211P/Hill

Epoch = 2015 June 27.0 TT
 T = 2016 Jan. 27.30980 TT
 Peri. = 4.42169
 Node = 117.26890 2000.0
 Incl. = 18.88799
 q = 2.3505725 AU

e = 0.3392837
 a = 3.5576124 AU
 n = 0.14688117
 P = 6.71 years

$$m1 = 11.0 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	00 59.38	-14 11.0	3.251	3.250	+0.65	+9.3	21.2	81.3
Jan. 18	01 05.88	-12 37.6	3.353	3.217	+0.79	+9.8	21.2	73.6
Jan. 28	01 13.75	-11 00.0	3.450	3.185	+0.91	+10.0	21.2	66.3
Feb. 7	01 22.85	-09 19.8	3.538	3.152	+1.02	+10.2	21.2	59.3
Feb. 17	01 33.01	-07 37.9	3.618	3.119	+1.11	+10.2	21.2	52.6
Feb. 27	01 44.12	-05 55.7	3.688	3.086	+1.19	+10.2	21.2	46.2
Mar. 9	01 56.06	-04 13.9	3.746	3.053	+1.27	+10.0	21.1	40.0
Mar. 19	02 08.76	-02 33.5	3.792	3.021	+1.34	+9.8	21.1	34.2
Mar. 29	02 22.13	-00 55.2	3.825	2.988	+1.40	+9.5	21.0	28.7
Apr. 8	02 36.10	+00 40.1	3.846	2.956	+1.45	+9.2	21.0	23.5
Apr. 18	02 50.62	+02 11.8	3.854	2.923	+1.50	+8.7	20.9	19.0
Apr. 28	03 05.66	+03 39.2	3.850	2.892	+1.55	+8.2	20.8	15.3
May 8	03 21.14	+05 01.6	3.833	2.860	+1.59	+7.7	20.8	13.2
May 18	03 37.04	+06 18.4	3.805	2.829	+1.63	+7.1	20.7	13.1
May 28	03 53.30	+07 29.1	3.764	2.798	+1.66	+6.4	20.6	15.0
June 7	04 09.89	+08 33.0	3.713	2.768	+1.69	+5.7	20.5	18.3
June 17	04 26.75	+09 30.0	3.651	2.738	+1.71	+4.9	20.4	22.2
June 27	04 43.83	+10 19.4	3.579	2.709	+1.72	+4.2	20.3	26.6
July 7	05 01.05	+11 01.2	3.497	2.680	+1.73	+3.4	20.1	31.2
July 17	05 18.37	+11 35.3	3.407	2.652	+1.73	+2.6	20.0	36.0
July 27	05 35.68	+12 01.5	3.308	2.625	+1.72	+1.9	19.9	40.9
Aug. 6	05 52.91	+12 20.1	3.201	2.599	+1.71	+1.1	19.7	45.9
Aug. 16	06 09.97	+12 31.6	3.088	2.574	+1.68	+0.5	19.6	51.0
Aug. 26	06 26.73	+12 36.5	2.968	2.549	+1.64	-0.1	19.5	56.3
Sept. 5	06 43.08	+12 35.6	2.842	2.526	+1.58	-0.5	19.3	61.7
Sept. 15	06 58.91	+12 30.2	2.712	2.504	+1.51	-0.9	19.1	67.4
Sept. 25	07 14.03	+12 21.7	2.578	2.483	+1.43	-1.0	19.0	73.3
Oct. 5	07 28.31	+12 11.9	2.441	2.464	+1.32	-0.9	18.8	79.5
Oct. 15	07 41.53	+12 03.0	2.303	2.446	+1.19	-0.5	18.6	86.0
Oct. 25	07 53.46	+11 57.9	2.165	2.429	+1.04	+0.2	18.5	93.0
Nov. 4	08 03.88	+11 59.7	2.029	2.413	+0.86	+1.2	18.3	100.3
Nov. 14	08 12.46	+12 11.9	1.897	2.400	+0.64	+2.7	18.1	108.3
Nov. 24	08 18.91	+12 38.7	1.772	2.388	+0.40	+4.5	17.9	116.9
Dec. 4	08 22.92	+13 23.7	1.657	2.377	+0.13	+6.6	17.7	126.2
Dec. 14	08 24.21	+14 30.2	1.556	2.368	-0.15	+8.9	17.6	136.4
Dec. 24	08 22.70	+15 59.4	1.473	2.361	-0.42	+11.0	17.4	147.3
Jan. 3	08 18.54	+17 49.5	1.412	2.356	-0.63	+12.5	17.3	159.0
Jan. 13	08 12.25	+19 54.5	1.376	2.352	-0.74	+13.0	17.3	171.1
Jan. 23	08 04.83	+22 05.0	1.368	2.351	-0.73	+12.5	17.2	176.1
Feb. 2	07 57.52	+24 10.2	1.388	2.351	-0.59	+11.1	17.3	163.9
Feb. 12	07 51.60	+26 01.1	1.435	2.353	-0.35	+9.1	17.4	152.1
Feb. 22	07 48.10	+27 32.4	1.505	2.357	-0.05	+7.0	17.5	140.9
Mar. 3	07 47.62	+28 42.6	1.594	2.362	+0.27	+5.0	17.6	130.6
Mar. 13	07 50.30	+29 32.2	1.699	2.369	+0.57	+3.1	17.8	121.0
Mar. 23	07 56.04	+30 03.0	1.814	2.378	+0.84	+1.4	17.9	112.3

Comet 50P/Arend

Epoch = 2015 June 27.0 TT
 T = 2016 Feb. 8.18448 TT
 Peri. = 49.22274
 Node = 355.17618 2000.0
 Incl. = 19.13868
 q = 1.9187535 AU
 e = 0.5303551
 a = 4.0855410 AU
 n = 0.11935200
 P = 8.26 years

$$m_1 = 13.0 + 5 \log(\Delta) + 10.0 \log(r(t-50))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	19 53.30	-34 15.4	4.536	3.594	+1.50 +5.4	22.1	14.7
Jan. 18	20 08.31	-33 21.4	4.496	3.544	+1.51 +5.7	22.1	12.9
Jan. 28	20 23.42	-32 24.3	4.438	3.493	+1.51 +6.0	22.0	14.5
Feb. 7	20 38.52	-31 24.2	4.363	3.442	+1.50 +6.3	21.9	18.5
Feb. 17	20 53.55	-30 21.4	4.272	3.391	+1.49 +6.5	21.8	23.7
Feb. 27	21 08.44	-29 16.1	4.165	3.339	+1.47 +6.7	21.7	29.5
Mar. 9	21 23.11	-28 08.8	4.045	3.287	+1.44 +6.9	21.5	35.4
Mar. 19	21 37.51	-26 59.9	3.912	3.235	+1.41 +7.0	21.4	41.6
Mar. 29	21 51.58	-25 50.0	3.767	3.182	+1.37 +7.0	21.2	47.7
Apr. 8	22 05.24	-24 39.7	3.612	3.129	+1.32 +7.0	21.1	54.0
Apr. 18	22 18.45	-23 29.6	3.448	3.076	+1.27 +6.9	20.9	60.3
Apr. 28	22 31.11	-22 20.6	3.278	3.023	+1.20 +6.7	20.7	66.6
May 8	22 43.14	-21 13.2	3.102	2.970	+1.13 +6.5	20.6	73.1
May 18	22 54.44	-20 08.4	2.923	2.917	+1.04 +6.1	20.4	79.7
May 28	23 04.87	-19 06.9	2.743	2.864	+0.94 +5.7	20.1	86.4
June 7	23 14.27	-18 09.7	2.562	2.811	+0.82 +5.2	19.9	93.3
June 17	23 22.44	-17 17.4	2.384	2.758	+0.67 +4.7	19.7	100.6
June 27	23 29.12	-16 30.8	2.211	2.705	+0.49 +4.0	19.5	108.1
July 7	23 34.05	-15 50.4	2.044	2.652	+0.28 +3.4	19.2	116.1
July 17	23 36.88	-15 16.3	1.886	2.601	+0.04 +2.8	18.9	124.5
July 27	23 37.28	-14 48.0	1.741	2.549	-0.23 +2.4	18.7	133.5
Aug. 6	23 34.97	-14 24.0	1.612	2.499	-0.52 +2.2	18.4	143.1
Aug. 16	23 29.80	-14 01.8	1.501	2.449	-0.79 +2.4	18.2	153.4
Aug. 26	23 21.92	-13 37.4	1.413	2.400	-1.00 +3.1	18.0	163.9
Sept. 5	23 11.91	-13 06.0	1.349	2.352	-1.11 +4.3	17.8	172.4
Sept. 15	23 00.78	-12 23.4	1.311	2.306	-1.09 +5.7	17.7	168.5
Sept. 25	22 49.92	-11 26.3	1.300	2.261	-0.92 +7.2	17.5	157.8
Oct. 5	22 40.69	-10 14.3	1.314	2.218	-0.65 +8.6	17.5	146.6
Oct. 15	22 34.15	-08 48.5	1.348	2.177	-0.32 +9.8	17.5	135.8
Oct. 25	22 30.95	-07 10.7	1.399	2.138	+0.03 +10.8	17.4	125.7
Nov. 4	22 31.24	-05 22.9	1.463	2.101	+0.36 +11.6	17.5	116.4
Nov. 14	22 34.87	-03 26.6	1.536	2.067	+0.67 +12.4	17.5	107.9
Nov. 24	22 41.56	-01 22.2	1.615	2.036	+0.94 +13.2	17.5	100.2
Dec. 4	22 50.93	+00 49.6	1.698	2.009	+1.17 +13.9	17.5	93.1
Dec. 14	23 02.62	+03 08.3	1.782	1.984	+1.37 +14.5	17.6	86.6
Dec. 24	23 16.35	+05 33.7	1.866	1.963	+1.55 +15.1	17.6	80.7
Jan. 3	23 31.82	+08 04.7	1.949	1.946	+1.70 +15.6	17.6	75.2
Jan. 13	23 48.86	+10 40.3	2.032	1.933	+1.85 +15.9	17.6	70.1
Jan. 23	00 07.33	+13 19.3	2.113	1.924	+1.98 +16.0	17.7	65.4
Feb. 2	00 27.08	+15 59.7	2.193	1.920	+2.10 +16.0	17.7	61.0
Feb. 12	00 48.07	+18 39.7	2.272	1.919	+2.22 +15.7	17.7	56.8
Feb. 22	01 10.24	+21 17.0	2.350	1.923	+2.33 +15.2	17.7	52.9
Mar. 3	01 33.54	+23 49.0	2.427	1.931	+2.44 +14.4	17.8	49.2
Mar. 13	01 57.93	+26 13.3	2.504	1.943	+2.54 +13.4	17.8	45.6
Mar. 23	02 23.35	+28 27.3	2.581	1.959	+2.64 +12.1	17.9	42.1

Comet C/2014 W5 (Lemmon-PANSTARRS)

T = 2016 Feb. 10.66028 TT
 Peri. = 277.69628
 Node = 245.52056 2000.0
 Incl. = 146.19198
 q = 2.5546270 AU
 e = 1.0

$$m_1 = 9.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	02 57.83	+08 57.3	4.206	4.738	-0.74	-5.2	19.5	117.2
Jan. 18	02 50.47	+08 05.3	4.307	4.662	-0.55	-4.2	19.5	105.2
Jan. 28	02 44.94	+07 23.0	4.418	4.586	-0.38	-3.3	19.4	93.6
Feb. 7	02 41.16	+06 49.7	4.533	4.511	-0.22	-2.5	19.4	82.5
Feb. 17	02 38.98	+06 24.3	4.643	4.435	-0.07	-1.9	19.4	71.8
Feb. 27	02 38.24	+06 05.4	4.743	4.360	+0.05	-1.4	19.4	61.6
Mar. 9	02 38.74	+05 51.4	4.827	4.285	+0.16	-1.0	19.3	51.9
Mar. 19	02 40.30	+05 41.0	4.891	4.211	+0.24	-0.8	19.3	42.5
Mar. 29	02 42.75	+05 32.6	4.932	4.137	+0.32	-0.8	19.2	33.5
Apr. 8	02 45.92	+05 24.7	4.947	4.063	+0.37	-0.9	19.2	25.1
Apr. 18	02 49.65	+05 16.1	4.935	3.990	+0.42	-1.1	19.1	17.6
Apr. 28	02 53.82	+05 05.3	4.895	3.917	+0.45	-1.4	19.0	12.2
May 8	02 58.27	+04 51.0	4.826	3.845	+0.46	-1.9	18.9	12.0
May 18	03 02.88	+04 31.8	4.729	3.773	+0.46	-2.6	18.7	17.0
May 28	03 07.51	+04 06.2	4.604	3.702	+0.45	-3.4	18.6	24.1
June 7	03 12.02	+03 32.3	4.453	3.632	+0.42	-4.4	18.4	32.0
June 17	03 16.24	+02 48.2	4.277	3.563	+0.38	-5.7	18.3	40.3
June 27	03 20.00	+01 51.6	4.080	3.495	+0.31	-7.2	18.1	48.8
July 7	03 23.08	+00 39.6	3.864	3.428	+0.21	-9.1	17.9	57.6
July 17	03 25.21	-00 51.2	3.633	3.363	+0.08	-11.4	17.7	66.7
July 27	03 26.06	-02 45.2	3.391	3.298	-0.09	-14.2	17.4	76.1
Aug. 6	03 25.20	-05 07.3	3.145	3.235	-0.31	-17.6	17.2	86.0
Aug. 16	03 22.08	-08 03.2	2.900	3.174	-0.61	-21.5	16.9	96.2
Aug. 26	03 15.96	-11 38.6	2.667	3.115	-1.00	-25.9	16.7	106.9
Sept. 5	03 05.95	-15 57.3	2.455	3.057	-1.50	-30.0	16.4	117.7
Sept. 15	02 50.98	-20 57.3	2.277	3.002	-2.10	-32.8	16.2	127.9
Sept. 25	02 29.98	-26 25.5	2.145	2.949	-2.76	-32.8	16.0	135.9
Oct. 5	02 02.38	-31 53.2	2.069	2.898	-3.36	-28.7	15.8	138.9
Oct. 15	01 28.82	-36 40.6	2.057	2.851	-3.69	-21.1	15.7	135.0
Oct. 25	00 51.93	-40 11.6	2.104	2.806	-3.62	-12.1	15.7	125.9
Nov. 4	00 15.72	-42 12.6	2.203	2.764	-3.19	-4.2	15.7	114.4
Nov. 14	23 43.87	-42 54.8	2.338	2.725	-2.56	+1.3	15.8	102.2
Nov. 24	23 18.31	-42 42.1	2.497	2.690	-1.92	+4.4	15.9	90.3
Dec. 4	22 59.15	-41 57.9	2.665	2.659	-1.36	+5.9	16.0	79.0
Dec. 14	22 45.57	-40 58.9	2.831	2.631	-0.91	+6.3	16.1	68.3
Dec. 24	22 36.46	-39 55.6	2.987	2.608	-0.57	+6.1	16.1	58.3
Jan. 3	22 30.74	-38 54.2	3.126	2.588	-0.32	+5.6	16.2	48.9
Jan. 13	22 27.58	-37 57.8	3.242	2.573	-0.13	+4.9	16.3	40.4
Jan. 23	22 26.26	-37 08.5	3.332	2.563	0.00	+4.1	16.3	33.0
Feb. 2	22 26.22	-36 27.5	3.392	2.556	+0.08	+3.2	16.3	27.3
Feb. 12	22 27.03	-35 56.0	3.421	2.555	+0.13	+2.1	16.3	24.4
Feb. 22	22 28.30	-35 35.1	3.418	2.558	+0.14	+0.9	16.3	25.1
Mar. 3	22 29.67	-35 26.0	3.384	2.565	+0.11	-0.5	16.3	29.2
Mar. 13	22 30.82	-35 30.6	3.319	2.577	+0.05	-2.0	16.3	35.6
Mar. 23	22 31.37	-35 50.9	3.226	2.593	-0.05	-3.9	16.3	43.4

Comet 147P/Kushida-Muramatsu

Epoch = 2015 June 27.0 TT
 T = 2016 Feb. 27.76736 TT
 Peri. = 347.05627
 Node = 93.72525 2000.0
 Incl. = 2.36757
 q = 2.7465938 AU

e = 0.2774075
 a = 3.8010273 AU
 n = 0.13300029
 P = 7.41 years

H = 15.6 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	V	Elong. °
Jan. 8	22 53.84	-09 15.2	3.928	3.445	+1.05	+6.8	54.1
Jan. 18	23 04.37	-08 06.9	4.018	3.420	+1.12	+7.3	46.7
Jan. 28	23 15.56	-06 53.7	4.094	3.394	+1.17	+7.7	39.6
Feb. 7	23 27.30	-05 36.5	4.157	3.369	+1.22	+8.1	32.7
Feb. 17	23 39.50	-04 15.9	4.205	3.344	+1.26	+8.3	25.9
Feb. 27	23 52.09	-02 52.7	4.237	3.319	+1.29	+8.5	19.3
Mar. 9	00 04.99	-01 27.4	4.255	3.294	+1.32	+8.7	12.8
Mar. 19	00 18.16	-00 00.8	4.256	3.269	+1.34	+8.7	6.6
Mar. 29	00 31.54	+01 26.3	4.242	3.245	+1.36	+8.7	1.8
Apr. 8	00 45.09	+02 53.4	4.213	3.221	+1.37	+8.6	6.4
Apr. 18	00 58.79	+04 19.7	4.170	3.197	+1.38	+8.5	12.4
Apr. 28	01 12.57	+05 44.6	4.112	3.173	+1.38	+8.3	18.4
May 8	01 26.42	+07 07.3	4.041	3.149	+1.39	+8.0	24.3
May 18	01 40.28	+08 27.5	3.958	3.126	+1.38	+7.7	30.3
May 28	01 54.12	+09 44.3	3.863	3.104	+1.37	+7.3	36.2
June 7	02 07.86	+10 57.2	3.757	3.081	+1.36	+6.9	42.2
June 17	02 21.45	+12 05.8	3.641	3.060	+1.33	+6.4	48.3
June 27	02 34.79	+13 09.4	3.516	3.038	+1.30	+5.8	54.4
July 7	02 47.79	+14 07.6	3.384	3.017	+1.25	+5.3	60.6
July 17	03 00.34	+15 00.2	3.245	2.997	+1.19	+4.6	67.0
July 27	03 12.27	+15 46.6	3.101	2.977	+1.12	+4.0	73.5
Aug. 6	03 23.42	+16 26.8	2.954	2.958	+1.02	+3.4	80.3
Aug. 16	03 33.59	+17 00.5	2.805	2.939	+0.89	+2.7	87.4
Aug. 26	03 42.52	+17 27.7	2.657	2.922	+0.75	+2.1	94.9
Sept. 5	03 49.98	+17 48.3	2.511	2.904	+0.57	+1.4	102.7
Sept. 15	03 55.66	+18 02.5	2.370	2.888	+0.36	+0.8	111.0
Sept. 25	03 59.28	+18 10.3	2.237	2.872	+0.13	+0.2	119.9
Oct. 5	04 00.61	+18 11.8	2.116	2.857	-0.11	-0.4	129.4
Oct. 15	03 59.51	+18 07.4	2.009	2.843	-0.35	-1.0	139.6
Oct. 25	03 56.02	+17 57.3	1.923	2.830	-0.56	-1.5	150.3
Nov. 4	03 50.45	+17 42.6	1.859	2.817	-0.71	-1.8	161.6
Nov. 14	03 43.39	+17 24.6	1.821	2.806	-0.77	-1.9	173.1
Nov. 24	03 35.72	+17 05.9	1.811	2.796	-0.73	-1.6	174.2
Dec. 4	03 28.43	+16 49.5	1.830	2.786	-0.60	-1.1	162.6
Dec. 14	03 22.43	+16 38.4	1.875	2.777	-0.40	-0.3	151.0
Dec. 24	03 18.45	+16 35.1	1.944	2.770	-0.16	+0.6	139.9
Jan. 3	03 16.88	+16 41.2	2.032	2.763	+0.10	+1.6	129.4
Jan. 13	03 17.87	+16 56.8	2.137	2.758	+0.35	+2.4	119.5
Jan. 23	03 21.38	+17 21.3	2.253	2.754	+0.58	+3.2	110.3
Feb. 2	03 27.21	+17 53.1	2.377	2.750	+0.79	+3.7	101.6
Feb. 12	03 35.14	+18 30.5	2.506	2.748	+0.98	+4.1	93.4
Feb. 22	03 44.93	+19 11.6	2.637	2.747	+1.14	+4.3	85.8
Mar. 3	03 56.33	+19 54.4	2.767	2.747	+1.28	+4.3	78.5
Mar. 13	04 09.13	+20 37.3	2.895	2.748	+1.40	+4.1	71.6
Mar. 23	04 23.15	+21 18.4	3.019	2.750	+1.50	+3.8	65.0

Comet P/2010 V1 (Ikeya-Murakami) [Orbit 1]

Epoch = 2015 June 27.0 TT
 T = 2016 Feb. 28.86217 TT
 Peri. = 152.31633 e = 0.4876905
 Node = 3.77120 2000.0 a = 3.0680901 AU
 Incl. = 9.38852 n = 0.18340109
 q = 1.5718117 AU P = 5.37 years

$$m1 = 13.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot. /PA	Elong.
2015/16	h m	°			for T=+1 day			
Jan. 8	00 26.91	+06 42.1	3.421	3.420	-0.34 -3.6	.	9.8/ 65	81.7
Jan. 18	00 32.88	+07 22.9	3.529	3.378	-0.34 -3.5	.	11.9/ 65	73.1
Jan. 28	00 40.20	+08 12.2	3.630	3.335	-0.34 -3.5	.	13.8/ 66	65.0
Feb. 7	00 48.69	+09 08.8	3.720	3.291	-0.34 -3.4	.	15.4/ 66	57.2
Feb. 17	00 58.22	+10 11.6	3.798	3.247	-0.35 -3.4	.	16.9/ 66	49.7
Feb. 27	01 08.69	+11 19.7	3.862	3.202	-0.36 -3.4	.	18.1/ 66	42.4
Mar. 9	01 20.00	+12 32.0	3.911	3.155	-0.38 -3.4	.	19.2/ 66	35.5
Mar. 19	01 32.08	+13 47.7	3.944	3.109	-0.39 -3.4	.	20.2/ 67	28.8
Mar. 29	01 44.87	+15 06.0	3.961	3.061	-0.41 -3.4	.	21.0/ 67	22.3
Apr. 8	01 58.33	+16 25.8	3.961	3.013	-0.44 -3.4	.	21.8/ 68	16.1
Apr. 18	02 12.42	+17 46.5	3.946	2.963	-0.47 -3.4	.	22.4/ 68	10.3
Apr. 28	02 27.14	+19 07.2	3.914	2.914	-0.50 -3.3	.	23.0/ 69	5.5
May 8	02 42.45	+20 27.3	3.867	2.863	-0.53 -3.3	.	23.6/ 70	5.1
May 18	02 58.36	+21 45.8	3.805	2.812	-0.57 -3.3	.	24.1/ 71	9.3
May 28	03 14.87	+23 02.2	3.729	2.760	-0.62 -3.2	.	24.6/ 72	14.5
June 7	03 31.98	+24 15.6	3.641	2.708	-0.67 -3.1	22.9	25.1/ 73	19.8
June 17	03 49.68	+25 25.4	3.540	2.655	-0.73 -2.9	22.7	25.5/ 74	25.1
June 27	04 07.98	+26 30.8	3.428	2.601	-0.79 -2.8	22.5	26.0/ 75	30.3
July 7	04 26.87	+27 31.1	3.307	2.548	-0.86 -2.5	22.3	26.4/ 77	35.4
July 17	04 46.35	+28 25.6	3.177	2.493	-0.94 -2.2	22.1	26.8/ 78	40.5
July 27	05 06.39	+29 13.8	3.040	2.439	-1.02 -1.7	21.8	27.1/ 80	45.6
Aug. 6	05 26.95	+29 54.9	2.896	2.384	-1.11 -1.2	21.6	27.5/ 82	50.6
Aug. 16	05 48.02	+30 28.5	2.748	2.329	-1.21 -0.6	21.3	27.8/ 83	55.5
Aug. 26	06 09.52	+30 54.2	2.596	2.274	-1.31 +0.2	21.0	28.2/ 85	60.5
Sept. 5	06 31.39	+31 11.6	2.441	2.220	-1.43 +1.1	20.7	28.4/ 87	65.4
Sept. 15	06 53.55	+31 20.6	2.286	2.165	-1.55 +2.3	20.4	28.6/ 88	70.3
Sept. 25	07 15.89	+31 21.4	2.131	2.111	-1.68 +3.6	20.1	28.7/ 90	75.3
Oct. 5	07 38.32	+31 14.1	1.977	2.058	-1.82 +5.1	19.8	28.8/ 91	80.2
Oct. 15	08 00.68	+30 59.3	1.826	2.006	-1.97 +7.0	19.4	28.6/ 93	85.2
Oct. 25	08 22.82	+30 38.0	1.679	1.955	-2.13 +9.1	19.1	28.3/ 94	90.3
Nov. 4	08 44.57	+30 11.0	1.536	1.906	-2.31 +11.5	18.7	27.6/ 95	95.4
Nov. 14	09 05.70	+29 40.1	1.400	1.858	-2.51 +14.4	18.4	26.6/ 96	100.7
Nov. 24	09 25.93	+29 06.6	1.271	1.813	-2.73 +17.6	18.0	25.2/ 97	106.1
Dec. 4	09 44.94	+28 32.4	1.150	1.770	-2.99 +21.3	17.6	23.2/ 97	111.7
Dec. 14	10 02.31	+27 59.4	1.038	1.730	-3.28 +25.4	17.3	20.4/ 98	117.6
Dec. 24	10 17.50	+27 28.8	0.936	1.694	-3.63 +29.9	16.9	16.8/ 99	123.9
Jan. 3	10 29.95	+27 01.1	0.844	1.662	-4.04 +34.7	16.5	12.3/102	130.7
Jan. 13	10 38.94	+26 35.1	0.765	1.634	-4.50 +39.4	16.2	7.2/113	138.0
Jan. 23	10 43.89	+26 06.8	0.699	1.611	-5.01 +43.6	15.9	3.9/167	145.9
Feb. 2	10 44.54	+25 29.1	0.647	1.593	-5.51 +46.7	15.7	7.3/219	154.1
Feb. 12	10 41.18	+24 32.7	0.612	1.580	-5.91 +48.2	15.5	11.9/225	162.0
Feb. 22	10 35.12	+23 08.2	0.594	1.573	-6.10 +47.8	15.4	14.9/219	166.8
Mar. 3	10 28.37	+21 12.0	0.595	1.572	-6.00 +46.1	15.4	16.2/208	164.2
Mar. 13	10 23.05	+18 48.0	0.614	1.577	-5.65 +43.6	15.5	16.6/191	156.7
Mar. 23	10 20.82	+16 05.3	0.651	1.587	-5.14 +40.8	15.7	17.2/173	148.2

Comet 194P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2016 Mar. 2.44161 TT
 Peri. = 130.70083
 Node = 351.99393 2000.0
 Incl. = 11.13796
 q = 1.6978535 AU
 e = 0.5754540
 a = 3.9992215 AU
 n = 0.12323693
 P = 8.00 years

$$m1 = 13.0 + 5 \log(\Delta) + 17.5 \log(r(t-40))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	23 15.84	-02 48.5	4.146	3.779	+0.75 +5.7	.	61.6
Jan. 18	23 23.36	-01 51.7	4.227	3.727	+0.84 +6.3	.	53.5
Jan. 28	23 31.80	-00 48.8	4.293	3.674	+0.92 +6.9	.	45.7
Feb. 7	23 41.01	+00 19.7	4.344	3.620	+0.99 +7.4	.	38.2
Feb. 17	23 50.92	+01 33.3	4.378	3.566	+1.05 +7.8	.	30.8
Feb. 27	00 01.43	+02 51.2	4.395	3.511	+1.10 +8.2	.	23.7
Mar. 9	00 12.46	+04 13.0	4.394	3.456	+1.15 +8.5	.	16.9
Mar. 19	00 23.97	+05 38.1	4.375	3.400	+1.19 +8.8	.	10.3
Mar. 29	00 35.90	+07 06.0	4.338	3.343	+1.23 +9.0	.	4.4
Apr. 8	00 48.21	+08 36.2	4.283	3.286	+1.27 +9.2	.	4.5
Apr. 18	01 00.88	+10 08.3	4.212	3.229	+1.30 +9.3	.	10.1
Apr. 28	01 13.88	+11 41.7	4.125	3.171	+1.33 +9.4	.	16.1
May 8	01 27.19	+13 16.1	4.024	3.112	+1.36 +9.5	.	22.1
May 18	01 40.80	+14 51.1	3.908	3.053	+1.39 +9.5	.	28.1
May 28	01 54.69	+16 26.2	3.780	2.994	+1.42 +9.5	.	34.0
June 7	02 08.86	+18 01.2	3.641	2.934	+1.44 +9.5	.	39.8
June 17	02 23.28	+19 35.7	3.492	2.874	+1.47 +9.4	.	45.6
June 27	02 37.95	+21 09.5	3.334	2.814	+1.49 +9.3	.	51.4
July 7	02 52.82	+22 42.4	3.170	2.754	+1.51 +9.2	.	57.1
July 17	03 07.87	+24 14.2	3.000	2.693	+1.52 +9.1	.	62.9
July 27	03 23.03	+25 44.9	2.826	2.633	+1.52 +9.0	.	68.7
Aug. 6	03 38.25	+27 14.4	2.650	2.572	+1.52 +8.9	23.0	74.5
Aug. 16	03 53.42	+28 43.1	2.473	2.512	+1.50 +8.8	22.7	80.4
Aug. 26	04 08.41	+30 11.2	2.297	2.452	+1.46 +8.8	22.3	86.5
Sept. 5	04 23.05	+31 39.3	2.123	2.393	+1.41 +8.9	22.0	92.7
Sept. 15	04 37.12	+33 08.2	1.954	2.334	+1.32 +9.0	21.6	99.0
Sept. 25	04 50.31	+34 38.5	1.790	2.275	+1.20 +9.3	21.3	105.6
Oct. 5	05 02.27	+36 11.3	1.634	2.218	+1.02 +9.6	20.9	112.5
Oct. 15	05 12.51	+37 47.3	1.488	2.163	+0.80 +9.9	20.5	119.7
Oct. 25	05 20.46	+39 26.3	1.353	2.108	+0.51 +10.1	20.1	127.1
Nov. 4	05 25.53	+41 07.0	1.232	2.056	+0.15 +9.9	19.7	134.9
Nov. 14	05 27.07	+42 45.7	1.127	2.005	-0.23 +8.9	19.3	142.6
Nov. 24	05 24.76	+44 14.8	1.039	1.957	-0.59 +7.0	18.9	149.9
Dec. 4	05 18.83	+45 24.3	0.971	1.912	-0.84 +3.9	18.6	155.3
Dec. 14	05 10.42	+46 03.2	0.924	1.870	-0.87 +0.1	18.3	157.0
Dec. 24	05 01.68	+46 04.0	0.897	1.832	-0.65 -3.7	18.1	153.8
Jan. 3	04 55.16	+45 27.3	0.889	1.798	-0.23 -6.7	17.8	147.4
Jan. 13	04 52.87	+44 20.5	0.899	1.768	+0.31 -8.6	17.7	139.7
Jan. 23	04 55.97	+42 54.3	0.924	1.743	+0.85 -9.6	17.6	131.9
Feb. 2	05 04.46	+41 17.9	0.961	1.723	+1.33 -10.1	17.5	124.6
Feb. 12	05 17.79	+39 36.6	1.009	1.709	+1.73 -10.4	17.5	117.8
Feb. 22	05 35.13	+37 52.2	1.066	1.700	+2.04 -10.8	17.5	111.6
Mar. 3	05 55.51	+36 04.3	1.131	1.698	+2.25 -11.3	17.5	106.0
Mar. 13	06 18.04	+34 11.2	1.204	1.701	+2.39 -11.9	17.5	101.0
Mar. 23	06 41.97	+32 11.8	1.284	1.710	+2.46 -12.7	17.6	96.3

Comet C/2014 W2 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2016 Mar. 10.46570 TT
 Peri. = 84.99467
 Node = 69.96089 2000.0
 Incl. = 82.00563
 q = 2.6706577 AU
 e = 0.9983940

$$m_1 = 3.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	03 59.24	+19 47.4	4.220	4.960	-0.71	+4.5	17.2	134.6
Jan. 18	03 52.10	+20 32.7	4.281	4.886	-0.56	+4.7	17.1	122.9
Jan. 28	03 46.52	+21 19.8	4.361	4.812	-0.39	+4.9	17.0	111.6
Feb. 7	03 42.63	+22 09.2	4.453	4.738	-0.22	+5.2	17.0	100.8
Feb. 17	03 40.43	+23 01.1	4.552	4.664	-0.06	+5.5	16.9	90.4
Feb. 27	03 39.87	+23 55.7	4.650	4.591	+0.10	+5.8	16.9	80.4
Mar. 9	03 40.85	+24 53.3	4.744	4.518	+0.24	+6.1	16.8	70.9
Mar. 19	03 43.23	+25 53.8	4.828	4.445	+0.37	+6.3	16.7	61.8
Mar. 29	03 46.88	+26 57.3	4.899	4.372	+0.48	+6.6	16.7	53.0
Apr. 8	03 51.68	+28 03.7	4.953	4.300	+0.58	+6.9	16.6	44.7
Apr. 18	03 57.50	+29 12.9	4.990	4.228	+0.67	+7.2	16.5	36.7
Apr. 28	04 04.24	+30 25.1	5.005	4.156	+0.76	+7.5	16.4	29.2
May 8	04 11.79	+31 40.2	5.000	4.085	+0.83	+7.8	16.3	22.4
May 18	04 20.09	+32 58.6	4.973	4.015	+0.90	+8.2	16.1	16.7
May 28	04 29.06	+34 20.4	4.924	3.945	+0.96	+8.6	16.0	13.3
June 7	04 38.64	+35 46.0	4.854	3.876	+1.01	+9.0	15.9	13.8
June 17	04 48.78	+37 16.1	4.763	3.807	+1.07	+9.5	15.7	17.7
June 27	04 59.46	+38 51.3	4.652	3.739	+1.12	+10.1	15.5	23.3
July 7	05 10.62	+40 32.5	4.523	3.673	+1.17	+10.8	15.4	29.6
July 17	05 22.28	+42 21.0	4.377	3.607	+1.21	+11.7	15.2	36.2
July 27	05 34.40	+44 18.1	4.218	3.542	+1.26	+12.7	15.0	42.9
Aug. 6	05 47.01	+46 25.6	4.046	3.479	+1.31	+14.0	14.8	49.8
Aug. 16	06 00.13	+48 45.4	3.866	3.417	+1.37	+15.4	14.5	56.7
Aug. 26	06 13.82	+51 19.9	3.681	3.356	+1.44	+17.1	14.3	63.6
Sept. 5	06 28.19	+54 11.3	3.493	3.297	+1.52	+19.1	14.1	70.5
Sept. 15	06 43.43	+57 22.4	3.308	3.239	+1.64	+21.3	13.9	77.3
Sept. 25	06 59.86	+60 55.2	3.130	3.184	+1.82	+23.6	13.6	83.9
Oct. 5	07 18.11	+64 51.0	2.964	3.130	+2.13	+25.9	13.4	90.1
Oct. 15	07 39.42	+69 09.6	2.814	3.079	+2.72	+27.8	13.2	95.8
Oct. 25	08 06.58	+73 47.3	2.684	3.029	+4.07	+28.7	13.0	100.6
Nov. 4	08 47.30	+78 34.7	2.580	2.982	+8.14	+27.1	12.8	104.2
Nov. 14	10 08.70	+83 05.9	2.503	2.938	+21.00	+14.8	12.6	106.3
Nov. 24	13 38.66	+85 33.5	2.454	2.897	+20.80	-13.5	12.5	106.7
Dec. 4	17 06.65	+83 18.8	2.433	2.859	+7.97	-23.7	12.4	105.5
Dec. 14	18 26.37	+79 22.1	2.435	2.823	+3.89	-23.1	12.3	102.9
Dec. 24	19 05.29	+75 30.8	2.457	2.791	+2.48	-20.2	12.2	99.4
Jan. 3	19 30.10	+72 08.8	2.493	2.763	+1.83	-16.5	12.2	95.3
Jan. 13	19 48.36	+69 23.7	2.537	2.738	+1.43	-12.6	12.2	91.1
Jan. 23	20 02.69	+67 17.8	2.584	2.717	+1.15	-8.8	12.2	87.0
Feb. 2	20 14.19	+65 50.3	2.630	2.700	+0.91	-5.1	12.2	83.4
Feb. 12	20 23.28	+64 59.5	2.670	2.686	+0.66	-1.7	12.2	80.3
Feb. 22	20 29.92	+64 42.7	2.702	2.677	+0.40	+1.4	12.2	78.0
Mar. 3	20 33.88	+64 56.9	2.725	2.672	+0.07	+4.2	12.2	76.4
Mar. 13	20 34.61	+65 38.8	2.736	2.671	-0.35	+6.5	12.2	75.7
Mar. 23	20 31.16	+66 44.2	2.738	2.674	-0.90	+8.3	12.2	75.8

Comet P/2010 V1 (Ikeya-Murakami) [Orbit 2]

Epoch = 2015 June 27.0 TT
 T = 2016 Mar. 12.43247 TT
 Peri. = 152.42179 e = 0.4895321
 Node = 3.78101 2000.0 a = 3.0809553 AU
 Incl. = 9.38723 n = 0.18225354
 q = 1.5727288 AU P = 5.41 years

$$m1 = 13.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Variation	m1	Mot. /PA	Elong.
2015/16	h m	°			for T=+1 day			
Jan. 8	00 23.69	+06 07.0	3.500	3.479	-0.33 -3.5	.	9.8/ 65	80.7
Jan. 18	00 29.65	+06 48.3	3.609	3.438	-0.33 -3.4	.	11.9/ 65	72.2
Jan. 28	00 36.91	+07 37.8	3.710	3.396	-0.33 -3.3	.	13.7/ 65	64.0
Feb. 7	00 45.30	+08 34.3	3.800	3.353	-0.33 -3.3	.	15.3/ 66	56.2
Feb. 17	00 54.70	+10 37.0	3.878	3.309	-0.34 -3.3	.	16.7/ 66	48.6
Feb. 27	01 05.00	+10 44.8	3.942	3.265	-0.35 -3.3	.	17.9/ 66	41.4
Mar. 9	01 16.11	+11 56.8	3.990	3.219	-0.36 -3.3	.	18.9/ 66	34.4
Mar. 19	01 27.95	+13 12.1	4.022	3.173	-0.38 -3.3	.	19.8/ 67	27.6
Mar. 29	01 40.47	+14 29.9	4.037	3.126	-0.40 -3.3	.	20.6/ 67	21.1
Apr. 8	01 53.61	+15 49.3	4.036	3.079	-0.42 -3.3	.	21.3/ 67	14.9
Apr. 18	02 07.35	+17 09.6	4.018	3.030	-0.45 -3.3	.	22.0/ 68	9.0
Apr. 28	02 21.66	+18 30.1	3.983	2.981	-0.48 -3.3	.	22.5/ 69	4.6
May 8	02 36.51	+19 50.0	3.933	2.931	-0.51 -3.3	.	23.0/ 69	5.8
May 18	02 51.92	+21 08.7	3.869	2.881	-0.55 -3.3	.	23.5/ 70	10.7
May 28	03 07.86	+22 25.5	3.789	2.830	-0.59 -3.2	.	23.9/ 71	16.1
June 7	03 24.33	+23 39.7	3.697	2.778	-0.64 -3.1	.	24.3/ 72	21.5
June 17	03 41.33	+24 50.8	3.592	2.725	-0.70 -3.0	22.9	24.7/ 73	27.0
June 27	03 58.85	+25 58.1	3.475	2.672	-0.76 -2.9	22.7	25.0/ 74	32.3
July 7	04 16.88	+27 01.0	3.349	2.619	-0.82 -2.6	22.5	25.3/ 76	37.7
July 17	04 35.41	+27 59.0	3.214	2.565	-0.90 -2.4	22.3	25.6/ 77	42.9
July 27	04 54.40	+28 51.6	3.071	2.511	-0.98 -2.0	22.0	25.8/ 78	48.2
Aug. 6	05 13.82	+29 38.3	2.922	2.456	-1.07 -1.6	21.8	26.1/ 80	53.4
Aug. 16	05 33.65	+30 19.0	2.768	2.401	-1.17 -1.1	21.5	26.2/ 81	58.6
Aug. 26	05 53.79	+30 53.3	2.609	2.346	-1.27 -0.4	21.2	26.3/ 83	63.8
Sept. 5	06 14.19	+31 21.3	2.449	2.291	-1.39 +0.4	20.9	26.4/ 84	69.1
Sept. 15	06 34.77	+31 43.0	2.287	2.236	-1.52 +1.4	20.6	26.3/ 85	74.3
Sept. 25	06 55.38	+31 59.0	2.126	2.182	-1.67 +2.5	20.3	26.1/ 86	79.7
Oct. 5	07 15.93	+32 09.8	1.966	2.128	-1.83 +3.9	20.0	25.8/ 87	85.1
Oct. 15	07 36.25	+32 16.4	1.809	2.074	-2.00 +5.5	19.6	25.2/ 88	90.6
Oct. 25	07 56.13	+32 20.1	1.656	2.022	-2.20 +7.4	19.3	24.4/ 88	96.2
Nov. 4	08 15.37	+32 22.4	1.509	1.970	-2.43 +9.7	18.9	23.2/ 88	102.0
Nov. 14	08 33.67	+32 25.4	1.368	1.920	-2.69 +12.3	18.5	21.5/ 87	108.0
Nov. 24	08 50.67	+32 31.1	1.236	1.872	-2.99 +15.3	18.1	19.3/ 86	114.2
Dec. 4	09 05.95	+32 41.3	1.114	1.826	-3.34 +18.7	17.8	16.5/ 83	120.7
Dec. 14	09 18.95	+32 57.9	1.002	1.782	-3.76 +22.4	17.4	12.9/ 79	127.6
Dec. 24	09 29.03	+33 20.6	0.902	1.742	-4.24 +26.3	17.0	8.6/ 72	134.9
Jan. 3	09 35.57	+33 47.1	0.815	1.704	-4.79 +29.9	16.6	3.9/ 51	142.5
Jan. 13	09 37.99	+34 11.4	0.744	1.671	-5.38 +32.8	16.3	2.4/297	150.2
Jan. 23	09 36.23	+34 22.5	0.689	1.642	-5.93 +34.4	16.0	6.6/257	157.2
Feb. 2	09 31.03	+34 06.6	0.652	1.617	-6.33 +34.4	15.8	10.3/238	161.6
Feb. 12	09 24.06	+33 11.6	0.633	1.598	-6.46 +33.1	15.7	12.8/219	160.5
Feb. 22	09 17.73	+31 32.1	0.632	1.584	-6.28 +31.3	15.6	14.7/199	154.8
Mar. 3	09 14.16	+29 13.0	0.648	1.575	-5.86 +29.8	15.6	16.8/178	147.2
Mar. 13	09 14.59	+26 25.3	0.679	1.573	-5.31 +28.9	15.7	19.6/160	139.4
Mar. 23	09 19.36	+23 20.8	0.724	1.576	-4.72 +28.4	15.9	22.6/148	132.0

Comet 252P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2016 Mar. 15.27557 TT
 Peri. = 343.29062
 Node = 190.98145 2000.0
 Incl. = 10.40449
 q = 0.9961916 AU
 e = 0.6735985
 a = 3.0520436 AU
 n = 0.18484937
 P = 5.33 years

$$m1 = 18.6 + 5 \log(\Delta) + 7.5 \log(r(t-60))$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° ' "			m		°
Jan. 8	00 44.79	+01 55.9	3.899	3.918	+0.40 +2.3	.	83.9
Jan. 18	00 48.82	+02 19.2	4.010	3.871	+0.53 +3.1	.	74.8
Jan. 28	00 54.14	+02 50.3	4.114	3.822	+0.65 +3.8	.	66.1
Feb. 7	01 00.60	+03 28.0	4.207	3.772	+0.75 +4.3	.	57.7
Feb. 17	01 08.07	+04 11.2	4.286	3.722	+0.84 +4.8	.	49.6
Feb. 27	01 16.44	+04 58.8	4.349	3.670	+0.92 +5.1	.	41.7
Mar. 9	01 25.60	+05 49.8	4.394	3.616	+0.99 +5.3	.	34.2
Mar. 19	01 35.46	+06 43.2	4.421	3.562	+1.05 +5.5	.	26.9
Mar. 29	01 45.94	+07 38.1	4.429	3.506	+1.10 +5.6	.	19.8
Apr. 8	01 56.97	+08 33.7	4.417	3.449	+1.15 +5.5	.	13.0
Apr. 18	02 08.51	+09 29.2	4.386	3.391	+1.20 +5.5	.	6.6
Apr. 28	02 20.51	+10 23.7	4.336	3.332	+1.24 +5.3	.	3.5
May 8	02 32.92	+11 16.7	4.266	3.271	+1.28 +5.1	.	8.2
May 18	02 45.72	+12 07.3	4.179	3.208	+1.31 +4.8	.	14.3
May 28	02 58.86	+12 54.9	4.074	3.145	+1.35 +4.4	.	20.5
June 7	03 12.32	+13 38.8	3.953	3.080	+1.38 +4.0	.	26.6
June 17	03 26.07	+14 18.3	3.817	3.013	+1.40 +3.4	.	32.8
June 27	03 40.07	+14 52.7	3.667	2.945	+1.42 +2.9	.	38.8
July 7	03 54.29	+15 21.4	3.505	2.876	+1.44 +2.2	.	44.9
July 17	04 08.68	+15 43.6	3.333	2.805	+1.45 +1.5	.	50.9
July 27	04 23.20	+15 58.6	3.150	2.733	+1.46 +0.7	.	57.0
Aug. 6	04 37.78	+16 05.5	2.961	2.659	+1.46 -0.2	.	63.0
Aug. 16	04 52.36	+16 03.8	2.765	2.583	+1.45 -1.1	.	69.1
Aug. 26	05 06.84	+15 52.4	2.565	2.506	+1.43 -2.2	.	75.2
Sept. 5	05 21.13	+15 30.4	2.363	2.428	+1.40 -3.3	.	81.4
Sept. 15	05 35.11	+14 57.0	2.161	2.347	+1.35 -4.6	.	87.7
Sept. 25	05 48.61	+14 10.9	1.960	2.265	+1.29 -6.0	.	94.1
Oct. 5	06 01.48	+13 11.1	1.763	2.182	+1.20 -7.5	23.0	100.7
Oct. 15	06 13.47	+11 55.9	1.571	2.097	+1.09 -9.2	22.7	107.4
Oct. 25	06 24.32	+10 23.8	1.387	2.011	+0.94 -11.1	22.3	114.2
Nov. 4	06 33.73	+08 33.0	1.212	1.924	+0.75 -13.2	21.9	121.2
Nov. 14	06 41.27	+06 21.5	1.049	1.835	+0.52 -15.4	21.5	128.3
Nov. 24	06 46.50	+03 47.4	0.900	1.746	+0.24 -17.8	21.0	135.4
Dec. 4	06 48.93	+00 49.6	0.765	1.656	-0.09 -20.1	20.6	141.9
Dec. 14	06 48.05	-02 31.3	0.647	1.567	-0.45 -22.0	20.1	147.0
Dec. 24	06 43.56	-06 10.9	0.545	1.478	-0.80 -23.0	19.6	149.1
Jan. 3	06 35.58	-10 00.8	0.460	1.391	-1.08 -22.7	19.0	146.8
Jan. 13	06 24.77	-13 47.3	0.388	1.307	-1.20 -21.0	18.5	140.6
Jan. 23	06 12.74	-17 17.6	0.328	1.228	-1.13 -19.1	18.0	132.0
Feb. 2	06 01.42	-20 29.0	0.274	1.156	-0.89 -18.6	17.4	122.4
Feb. 12	05 52.56	-23 35.0	0.223	1.094	-0.51 -22.6	16.8	113.0
Feb. 22	05 47.44	-27 20.9	0.170	1.044	-0.12 -38.7	16.0	104.3
Mar. 3	05 46.23	-33 47.6	0.116	1.011	+0.56 103.3	15.0	96.5
Mar. 13	05 51.84	-51 00.2	0.063	0.997	+68.56 -48.8	13.5	90.7
Mar. 23	17 17.42	-59 08.0	0.037	1.002	+1.62 295.2	12.1	97.5

Comet 127P/Holt-Olmstead

Epoch = 2015 June 27.0 TT
 T = 2016 Mar. 17.83410 TT
 Peri. = 6.71580
 Node = 13.65187 2000.0
 Incl. = 14.30188
 q = 2.2057738 AU
 e = 0.3607329
 a = 3.4504729 AU
 n = 0.15377514
 P = 6.41 years

$$m1 = 8.0 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	18 22.97	-34 16.1	4.328	3.397	+1.67	+0.3	.	16.4
Jan. 18	18 39.70	-34 12.8	4.255	3.363	+1.67	+0.7	.	21.9
Jan. 28	18 56.43	-34 05.6	4.167	3.328	+1.66	+1.1	.	27.8
Feb. 7	19 13.05	-33 55.0	4.064	3.294	+1.64	+1.4	.	34.0
Feb. 17	19 29.47	-33 41.2	3.948	3.259	+1.61	+1.6	.	40.4
Feb. 27	19 45.57	-33 25.1	3.820	3.224	+1.57	+1.8	.	46.8
Mar. 9	20 01.25	-33 07.3	3.681	3.188	+1.52	+1.8	.	53.3
Mar. 19	20 16.42	-32 48.8	3.534	3.153	+1.45	+1.8	.	59.8
Mar. 29	20 30.94	-32 30.9	3.379	3.117	+1.38	+1.6	23.0	66.4
Apr. 8	20 44.72	-32 14.6	3.219	3.082	+1.29	+1.3	22.8	73.2
Apr. 18	20 57.61	-32 01.5	3.055	3.046	+1.18	+0.8	22.5	80.0
Apr. 28	21 09.45	-31 53.1	2.889	3.010	+1.06	+0.2	22.3	87.0
May 8	21 20.07	-31 50.8	2.724	2.974	+0.92	-0.5	22.0	94.2
May 18	21 29.27	-31 56.1	2.562	2.939	+0.75	-1.4	21.7	101.7
May 28	21 36.77	-32 10.5	2.405	2.903	+0.55	-2.4	21.5	109.4
June 7	21 42.32	-32 34.6	2.255	2.867	+0.33	-3.4	21.2	117.4
June 17	21 45.59	-33 08.7	2.116	2.832	+0.07	-4.3	20.9	125.7
June 27	21 46.30	-33 51.5	1.991	2.797	-0.21	-4.8	20.7	134.2
July 7	21 44.23	-34 39.9	1.882	2.762	-0.49	-4.9	20.4	142.8
July 17	21 39.34	-35 29.0	1.794	2.727	-0.75	-4.3	20.2	151.0
July 27	21 31.88	-36 11.7	1.727	2.693	-0.93	-2.9	19.9	157.4
Aug. 6	21 22.55	-36 40.2	1.684	2.659	-1.02	-0.8	19.8	159.7
Aug. 16	21 12.39	-36 48.1	1.667	2.626	-0.97	+1.7	19.6	156.4
Aug. 26	21 02.72	-36 31.3	1.673	2.594	-0.79	+4.1	19.5	149.2
Sept. 5	20 54.80	-35 50.3	1.702	2.562	-0.53	+6.2	19.4	140.5
Sept. 15	20 49.50	-34 48.1	1.750	2.531	-0.22	+7.9	19.3	131.4
Sept. 25	20 47.34	-33 29.0	1.814	2.500	+0.10	+9.2	19.2	122.5
Oct. 5	20 48.38	-31 57.5	1.891	2.471	+0.40	+10.1	19.2	113.9
Oct. 15	20 52.42	-30 16.7	1.977	2.443	+0.67	+10.8	19.2	105.7
Oct. 25	20 59.17	-28 28.9	2.069	2.416	+0.90	+11.4	19.2	97.9
Nov. 4	21 08.20	-26 35.1	2.164	2.390	+1.10	+11.9	19.1	90.6
Nov. 14	21 19.16	-24 35.9	2.261	2.365	+1.25	+12.5	19.1	83.6
Nov. 24	21 31.70	-22 31.4	2.358	2.342	+1.38	+13.0	19.1	77.0
Dec. 4	21 45.51	-20 21.6	2.453	2.320	+1.48	+13.5	19.1	70.6
Dec. 14	22 00.34	-18 06.5	2.545	2.300	+1.57	+14.0	19.1	64.6
Dec. 24	22 16.00	-15 46.3	2.633	2.282	+1.63	+14.5	19.1	58.7
Jan. 3	22 32.30	-13 21.2	2.716	2.266	+1.68	+15.0	19.0	53.1
Jan. 13	22 49.13	-10 51.6	2.794	2.251	+1.73	+15.3	19.0	47.6
Jan. 23	23 06.39	-08 18.1	2.866	2.238	+1.76	+15.7	19.0	42.3
Feb. 2	23 24.01	-05 41.6	2.932	2.228	+1.79	+15.9	19.0	37.2
Feb. 12	23 41.94	-03 02.6	2.991	2.219	+1.82	+16.0	19.0	32.2
Feb. 22	00 00.15	-00 22.3	3.044	2.213	+1.85	+16.1	19.0	27.3
Mar. 3	00 18.63	+02 18.4	3.091	2.208	+1.87	+16.0	19.1	22.6
Mar. 13	00 37.38	+04 58.5	3.130	2.206	+1.90	+15.8	19.1	17.9
Mar. 23	00 56.39	+07 36.9	3.163	2.206	+1.93	+15.6	19.1	13.4

Comet 104P/Kowal

Epoch = 2015 June 27.0 TT
 T = 2016 Mar. 26.37190 TT
 Peri. = 200.66415
 Node = 235.45893 2000.0
 Incl. = 10.26723
 q = 1.1793907 AU
 e = 0.6383520
 a = 3.2611564 AU
 n = 0.16735806
 P = 5.89 years

$$m1 = 11.4 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	19 29.33	-14 49.2	4.903	3.933	+1.12 +3.0	.	8.3
Jan. 18	19 40.57	-14 19.7	4.858	3.885	+1.13 +3.5	.	7.5
Jan. 28	19 51.91	-13 45.1	4.792	3.835	+1.14 +4.0	.	12.4
Feb. 7	20 03.27	-13 05.5	4.705	3.785	+1.13 +4.4	.	18.8
Feb. 17	20 14.55	-12 21.1	4.600	3.734	+1.11 +4.9	.	25.7
Feb. 27	20 25.67	-11 32.3	4.476	3.682	+1.09 +5.3	.	32.7
Mar. 9	20 36.53	-10 39.3	4.336	3.629	+1.05 +5.7	.	39.8
Mar. 19	20 47.05	-09 42.6	4.180	3.574	+1.01 +6.0	.	46.9
Mar. 29	20 57.14	-08 42.7	4.012	3.519	+0.96 +6.3	.	54.0
Apr. 8	21 06.70	-07 40.0	3.832	3.462	+0.89 +6.5	.	61.2
Apr. 18	21 15.61	-06 35.3	3.643	3.405	+0.81 +6.6	.	68.5
Apr. 28	21 23.76	-05 29.3	3.447	3.346	+0.72 +6.7	.	75.8
May 8	21 30.99	-04 22.8	3.247	3.286	+0.62 +6.6	.	83.3
May 18	21 37.15	-03 16.7	3.044	3.225	+0.49 +6.4	.	91.0
May 28	21 42.03	-02 12.4	2.843	3.163	+0.34 +6.1	.	99.0
June 7	21 45.43	-01 11.2	2.645	3.100	+0.17 +5.6	.	107.2
June 17	21 47.10	-00 15.0	2.453	3.036	-0.03 +4.9	23.0	115.7
June 27	21 46.78	+00 33.9	2.272	2.970	-0.25 +3.9	22.6	124.7
July 7	21 44.28	+01 13.0	2.104	2.904	-0.48 +2.6	22.3	133.9
July 17	21 39.45	+01 39.1	1.954	2.836	-0.71 +1.0	21.9	143.5
July 27	21 32.31	+01 49.3	1.824	2.767	-0.91 -0.8	21.5	152.8
Aug. 6	21 23.19	+01 41.2	1.718	2.697	-1.05 -2.7	21.2	160.7
Aug. 16	21 12.69	+01 13.8	1.639	2.625	-1.09 -4.5	20.9	163.4
Aug. 26	21 01.77	+00 28.5	1.586	2.553	-1.02 -5.9	20.5	158.2
Sept. 5	20 51.58	-00 30.6	1.560	2.479	-0.84 -6.7	20.3	149.0
Sept. 15	20 43.18	-01 37.7	1.557	2.404	-0.57 -6.9	20.0	138.5
Sept. 25	20 37.46	-02 46.4	1.573	2.329	-0.25 -6.4	19.7	128.0
Oct. 5	20 34.94	-03 50.6	1.603	2.252	+0.09 -5.5	19.5	117.9
Oct. 15	20 35.82	-04 46.1	1.642	2.175	+0.43 -4.3	19.2	108.5
Oct. 25	20 40.08	-05 29.4	1.686	2.097	+0.75 -2.9	19.0	99.7
Nov. 4	20 47.54	-05 58.6	1.730	2.018	+1.04 -1.4	18.7	91.6
Nov. 14	20 57.96	-06 12.2	1.771	1.939	+1.32 +0.3	18.4	84.2
Nov. 24	21 11.11	-06 09.3	1.808	1.860	+1.56 +2.0	18.1	77.3
Dec. 4	21 26.74	-05 49.4	1.837	1.782	+1.79 +3.7	17.7	71.1
Dec. 14	21 44.68	-05 12.1	1.858	1.704	+2.01 +5.5	17.4	65.4
Dec. 24	22 04.77	-04 17.2	1.872	1.627	+2.21 +7.2	17.0	60.3
Jan. 3	22 26.91	-03 04.9	1.877	1.553	+2.41 +8.9	16.6	55.7
Jan. 13	22 51.05	-01 35.9	1.874	1.482	+2.61 +10.5	16.2	51.7
Jan. 23	23 17.16	+00 08.7	1.866	1.414	+2.81 +11.8	15.8	48.2
Feb. 2	23 45.26	+02 07.2	1.852	1.353	+3.01 +13.0	15.4	45.2
Feb. 12	00 15.41	+04 16.8	1.835	1.298	+3.22 +13.7	15.0	42.8
Feb. 22	00 47.63	+06 33.5	1.818	1.252	+3.43 +13.9	14.6	41.0
Mar. 3	01 21.93	+08 52.4	1.802	1.216	+3.63 +13.5	14.4	39.6
Mar. 13	01 58.28	+11 07.3	1.791	1.191	+3.82 +12.4	14.2	38.8
Mar. 23	02 36.47	+13 11.0	1.786	1.180	+3.97 +10.5	14.1	38.4

Comet 100P/Hartley

Epoch = 2015 June 27.0 TT
 T = 2016 Apr. 2.05129 TT
 Peri. = 181.86367
 Node = 37.74941 2000.0
 Incl. = 25.58343
 q = 2.0101311 AU

e = 0.4137492
 a = 3.4287904 AU
 n = 0.15523608
 P = 6.35 years

$$m1 = 9.2 + 5 \log(\Delta) + 25.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	06 37.40	+54 19.3	2.648	3.516	-1.33 +0.6	.	147.3
Jan. 18	06 24.07	+54 25.4	2.651	3.478	-1.15 -1.8	.	141.9
Jan. 28	06 12.56	+54 07.7	2.678	3.440	-0.85 -3.6	.	134.5
Feb. 7	06 04.01	+53 31.2	2.725	3.402	-0.50 -4.9	.	126.2
Feb. 17	05 58.99	+52 42.0	2.790	3.363	-0.14 -5.6	.	117.6
Feb. 27	05 57.63	+51 45.7	2.866	3.324	+0.21 -5.9	.	109.0
Mar. 9	05 59.76	+50 46.5	2.951	3.284	+0.52 -5.9	.	100.7
Mar. 19	06 04.99	+49 47.1	3.040	3.244	+0.80 -5.9	.	92.7
Mar. 29	06 12.95	+48 48.5	3.130	3.203	+1.03 -5.8	.	85.1
Apr. 8	06 23.22	+47 51.0	3.218	3.162	+1.22 -5.7	.	77.9
Apr. 18	06 35.43	+46 53.9	3.301	3.121	+1.38 -5.8	.	71.0
Apr. 28	06 49.28	+45 56.3	3.377	3.080	+1.52 -5.9	.	64.4
May 8	07 04.45	+44 57.3	3.446	3.038	+1.63 -6.2	.	58.2
May 18	07 20.70	+43 55.5	3.505	2.997	+1.71 -6.5	.	52.4
May 28	07 37.82	+42 50.1	3.555	2.955	+1.78 -7.0	.	46.8
June 7	07 55.60	+41 40.1	3.594	2.913	+1.83 -7.5	.	41.5
June 17	08 13.88	+40 24.9	3.622	2.870	+1.86 -8.1	.	36.5
June 27	08 32.53	+39 03.8	3.639	2.828	+1.89 -8.7	.	31.9
July 7	08 51.41	+37 36.7	3.645	2.786	+1.90 -9.4	.	27.7
July 17	09 10.44	+36 03.2	3.641	2.744	+1.91 -10.0	23.0	24.0
July 27	09 29.52	+34 23.3	3.625	2.702	+1.91 -10.6	22.8	21.0
Aug. 6	09 48.60	+32 37.3	3.599	2.660	+1.90 -11.2	22.6	18.9
Aug. 16	10 07.64	+30 45.4	3.563	2.619	+1.90 -11.7	22.4	18.0
Aug. 26	10 26.59	+28 47.9	3.518	2.578	+1.88 -12.2	22.2	18.3
Sept. 5	10 45.44	+26 45.5	3.463	2.537	+1.87 -12.7	22.0	19.8
Sept. 15	11 04.19	+24 38.5	3.399	2.497	+1.86 -13.1	21.8	22.2
Sept. 25	11 22.81	+22 27.7	3.327	2.457	+1.85 -13.4	21.6	25.2
Oct. 5	11 41.31	+20 13.8	3.247	2.419	+1.84 -13.6	21.3	28.7
Oct. 15	11 59.70	+17 57.5	3.160	2.381	+1.83 -13.8	21.1	32.6
Oct. 25	12 17.97	+15 39.7	3.066	2.344	+1.81 -13.9	20.9	36.6
Nov. 4	12 36.11	+13 20.9	2.966	2.308	+1.80 -13.9	20.6	40.8
Nov. 14	12 54.12	+11 02.0	2.860	2.274	+1.78 -13.8	20.4	45.2
Nov. 24	13 11.97	+08 43.7	2.748	2.241	+1.77 -13.7	20.2	49.8
Dec. 4	13 29.63	+06 26.6	2.633	2.210	+1.74 -13.6	19.9	54.4
Dec. 14	13 47.05	+04 11.1	2.513	2.180	+1.71 -13.4	19.7	59.2
Dec. 24	14 04.15	+01 57.5	2.389	2.152	+1.67 -13.2	19.4	64.2
Jan. 3	14 20.85	-00 14.2	2.264	2.127	+1.62 -13.0	19.2	69.4
Jan. 13	14 37.02	-02 24.2	2.136	2.103	+1.55 -12.9	18.9	74.7
Jan. 23	14 52.49	-04 33.2	2.008	2.082	+1.46 -12.9	18.7	80.3
Feb. 2	15 07.06	-06 42.5	1.880	2.063	+1.34 -13.1	18.4	86.2
Feb. 12	15 20.47	-08 53.6	1.754	2.047	+1.19 -13.5	18.2	92.4
Feb. 22	15 32.38	-11 08.7	1.630	2.034	+1.00 -14.2	18.0	99.0
Mar. 3	15 42.43	-13 30.7	1.511	2.024	+0.77 -15.2	17.8	106.1
Mar. 13	15 50.11	-16 02.4	1.399	2.016	+0.48 -16.4	17.5	113.7
Mar. 23	15 54.88	-18 46.7	1.297	2.012	+0.13 -17.8	17.4	122.0

Comet 190P/Mueller

Epoch = 2015 June 27.0 TT
 T = 2016 Apr. 7.88137 TT
 Peri. = 50.43042
 Node = 335.55492 2000.0
 Incl. = 2.17282
 q = 2.0330407 AU
 e = 0.5208763
 a = 4.2432480 AU
 n = 0.11276036
 P = 8.74 years

$$m_1 = 13.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	18 24.85	-24 52.1	4.851	3.893	+1.31	+1.0	.	11.6
Jan. 18	18 37.95	-24 42.0	4.764	3.846	+1.31	+1.4	23.0	18.8
Jan. 28	18 51.03	-24 28.1	4.659	3.798	+1.30	+1.7	22.9	26.0
Feb. 7	19 03.98	-24 10.7	4.537	3.751	+1.27	+2.1	22.8	33.1
Feb. 17	19 16.71	-23 49.9	4.400	3.702	+1.24	+2.4	22.7	40.3
Feb. 27	19 29.12	-23 26.4	4.249	3.654	+1.20	+2.6	22.6	47.5
Mar. 9	19 41.09	-23 00.6	4.086	3.605	+1.14	+2.7	22.4	54.7
Mar. 19	19 52.53	-22 33.1	3.912	3.556	+1.08	+2.8	22.3	62.0
Mar. 29	20 03.28	-22 04.8	3.730	3.506	+1.00	+2.8	22.1	69.4
Apr. 8	20 13.24	-21 36.7	3.543	3.457	+0.90	+2.7	21.9	76.9
Apr. 18	20 22.26	-21 09.6	3.351	3.407	+0.79	+2.5	21.7	84.6
Apr. 28	20 30.17	-20 44.8	3.159	3.356	+0.66	+2.1	21.6	92.4
May 8	20 36.78	-20 23.5	2.969	3.306	+0.51	+1.7	21.4	100.5
May 18	20 41.91	-20 06.9	2.783	3.255	+0.34	+1.1	21.1	109.0
May 28	20 45.33	-19 56.3	2.605	3.204	+0.15	+0.4	20.9	117.7
June 7	20 46.85	-19 52.5	2.437	3.153	-0.06	-0.4	20.7	127.0
June 17	20 46.28	-19 56.2	2.284	3.102	-0.27	-1.1	20.5	136.7
June 27	20 43.54	-20 07.2	2.149	3.052	-0.48	-1.7	20.3	146.9
July 7	20 38.70	-20 24.7	2.036	3.001	-0.67	-2.2	20.1	157.5
July 17	20 32.02	-20 46.4	1.947	2.950	-0.80	-2.3	19.9	168.6
July 27	20 24.06	-21 09.6	1.884	2.899	-0.84	-2.1	19.8	178.2
Aug. 6	20 15.63	-21 30.9	1.848	2.849	-0.80	-1.7	19.7	168.1
Aug. 16	20 07.65	-21 47.4	1.839	2.799	-0.66	-1.0	19.6	156.7
Aug. 26	20 01.08	-21 57.2	1.855	2.749	-0.44	-0.2	19.5	145.6
Sept. 5	19 56.65	-21 59.4	1.891	2.700	-0.18	+0.6	19.5	134.9
Sept. 15	19 54.83	-21 53.9	1.945	2.651	+0.10	+1.3	19.5	124.8
Sept. 25	19 55.85	-21 40.8	2.011	2.603	+0.38	+2.1	19.5	115.3
Oct. 5	19 59.69	-21 20.1	2.086	2.556	+0.65	+2.8	19.5	106.5
Oct. 15	20 06.17	-20 51.8	2.166	2.510	+0.89	+3.6	19.5	98.2
Oct. 25	20 15.08	-20 15.4	2.249	2.465	+1.10	+4.5	19.5	90.4
Nov. 4	20 26.12	-19 30.4	2.331	2.421	+1.29	+5.4	19.5	83.1
Nov. 14	20 39.02	-18 36.2	2.411	2.379	+1.45	+6.4	19.5	76.2
Nov. 24	20 53.51	-17 32.3	2.488	2.338	+1.58	+7.4	19.5	69.8
Dec. 4	21 09.33	-16 18.3	2.561	2.299	+1.70	+8.4	19.5	63.6
Dec. 14	21 26.28	-14 54.0	2.628	2.262	+1.79	+9.5	19.4	57.8
Dec. 24	21 44.17	-13 19.5	2.689	2.227	+1.87	+10.5	19.4	52.2
Jan. 3	22 02.83	-11 34.9	2.745	2.194	+1.93	+11.4	19.4	46.9
Jan. 13	22 22.15	-09 41.0	2.795	2.164	+1.99	+12.3	19.4	41.8
Jan. 23	22 42.00	-07 38.5	2.839	2.136	+2.03	+13.0	19.4	36.9
Feb. 2	23 02.30	-05 28.5	2.878	2.111	+2.07	+13.6	19.3	32.3
Feb. 12	23 23.02	-03 12.2	2.912	2.090	+2.11	+14.1	19.3	27.8
Feb. 22	23 44.10	-00 51.1	2.941	2.072	+2.14	+14.4	19.3	23.5
Mar. 3	00 05.51	+01 33.0	2.966	2.057	+2.17	+14.6	19.3	19.3
Mar. 13	00 27.25	+03 58.6	2.988	2.045	+2.21	+14.5	19.3	15.2
Mar. 23	00 49.31	+06 23.6	3.006	2.038	+2.24	+14.3	19.3	11.3

Comet C/2013 X1 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2016 Apr. 20.72479 TT
 Peri. = 164.45877
 Node = 130.94941 2000.0
 Incl. = 163.23004
 q = 1.3141856 AU
 e = 1.0009587

$$m_1 = 5.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	05 41.47	+36 46.8	4.713	5.621	-1.28	-1.1	16.5	155.3
Jan. 18	05 28.66	+36 36.1	4.705	5.531	-1.16	-1.9	16.4	144.0
Jan. 28	05 17.01	+36 17.2	4.730	5.440	-1.00	-2.4	16.3	132.2
Feb. 7	05 06.97	+35 52.7	4.781	5.349	-0.82	-2.7	16.3	120.5
Feb. 17	04 58.79	+35 25.4	4.852	5.257	-0.62	-2.7	16.2	109.0
Feb. 27	04 52.57	+34 58.1	4.935	5.165	-0.43	-2.5	16.2	97.9
Mar. 9	04 48.26	+34 32.6	5.024	5.072	-0.25	-2.2	16.2	87.2
Mar. 19	04 45.73	+34 10.3	5.110	4.979	-0.09	-1.8	16.1	76.8
Mar. 29	04 44.81	+33 52.0	5.190	4.885	+0.05	-1.4	16.1	66.9
Apr. 8	04 45.30	+33 38.0	5.256	4.790	+0.17	-1.0	16.0	57.3
Apr. 18	04 47.01	+33 28.3	5.306	4.695	+0.27	-0.6	15.9	48.1
Apr. 28	04 49.75	+33 22.7	5.335	4.600	+0.36	-0.2	15.9	39.2
May 8	04 53.34	+33 21.0	5.341	4.503	+0.43	+0.2	15.8	30.8
May 18	04 57.63	+33 22.9	5.322	4.406	+0.48	+0.5	15.7	22.8
May 28	05 02.46	+33 28.1	5.275	4.309	+0.52	+0.8	15.6	15.7
June 7	05 07.69	+33 36.3	5.202	4.211	+0.55	+1.1	15.4	11.1
June 17	05 13.17	+33 47.6	5.101	4.112	+0.56	+1.4	15.3	11.9
June 27	05 18.78	+34 01.9	4.972	4.013	+0.56	+1.8	15.1	17.3
July 7	05 24.35	+34 19.4	4.816	3.913	+0.54	+2.1	14.9	24.4
July 17	05 29.73	+34 40.5	4.634	3.812	+0.50	+2.5	14.7	32.1
July 27	05 34.73	+35 05.7	4.428	3.711	+0.44	+3.0	14.5	40.2
Aug. 6	05 39.11	+35 35.8	4.199	3.609	+0.35	+3.6	14.3	48.6
Aug. 16	05 42.60	+36 11.8	3.951	3.506	+0.22	+4.3	14.0	57.2
Aug. 26	05 44.82	+36 55.2	3.685	3.403	+0.04	+5.2	13.8	66.1
Sept. 5	05 45.27	+37 47.4	3.406	3.299	-0.20	+6.3	13.4	75.4
Sept. 15	05 43.24	+38 50.3	3.118	3.195	-0.55	+7.5	13.1	85.2
Sept. 25	05 37.72	+40 05.2	2.827	3.090	-1.04	+8.7	12.8	95.6
Oct. 5	05 27.29	+41 32.2	2.539	2.985	-1.74	+9.5	12.4	106.7
Oct. 15	05 09.89	+43 07.3	2.264	2.880	-2.69	+9.0	12.0	118.7
Oct. 25	04 42.94	+44 37.0	2.012	2.774	-3.88	+5.3	11.5	131.5
Nov. 4	04 04.16	+45 30.5	1.799	2.668	-5.01	-3.3	11.1	144.2
Nov. 14	03 14.03	+44 57.1	1.640	2.561	-5.51	-16.6	10.8	153.1
Nov. 24	02 18.91	+42 10.7	1.549	2.455	-5.02	-29.2	10.5	150.1
Dec. 4	01 28.67	+37 18.7	1.534	2.350	-3.92	-35.2	10.2	136.5
Dec. 14	00 49.47	+31 26.5	1.588	2.245	-2.77	-34.1	10.1	119.7
Dec. 24	00 21.77	+25 45.5	1.692	2.141	-1.86	-29.2	10.0	103.1
Jan. 3	00 03.17	+20 53.6	1.825	2.038	-1.21	-23.5	10.0	87.7
Jan. 13	23 51.11	+16 58.6	1.969	1.938	-0.76	-18.5	9.9	73.6
Jan. 23	23 43.55	+13 54.0	2.108	1.840	-0.45	-14.5	9.9	60.7
Feb. 2	23 39.02	+11 29.1	2.231	1.746	-0.25	-11.5	9.8	48.7
Feb. 12	23 36.52	+09 33.7	2.328	1.657	-0.12	-9.4	9.6	37.4
Feb. 22	23 35.31	+07 59.2	2.394	1.575	-0.05	-8.1	9.5	26.7
Mar. 3	23 34.85	+06 38.4	2.423	1.500	-0.01	-7.3	9.3	16.6
Mar. 13	23 34.76	+05 25.3	2.411	1.435	-0.01	-7.1	9.1	8.4
Mar. 23	23 34.67	+04 14.4	2.357	1.383	-0.04	-7.4	8.9	9.3

Comet 53P/Van Biesbroeck

Epoch = 2015 June 27.0 TT
 T = 2016 Apr. 29.90838 TT
 Peri. = 134.18211
 Node = 148.92388 2000.0
 Incl. = 6.60842
 q = 2.4273761 AU
 e = 0.5514583
 a = 5.4117066 AU
 n = 0.07828935
 P = 12.59 years

$$m_1 = 8.0 + 5 \log(\Delta) + 12.5 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	13 02.12	-02 35.0	4.067	4.215	+0.41	-0.8	19.2	91.9
Jan. 18	13 06.22	-02 43.5	3.866	4.167	+0.28	+0.1	19.0	101.0
Jan. 28	13 09.05	-02 42.5	3.669	4.119	+0.14	+1.1	18.8	110.5
Feb. 7	13 10.46	-02 31.6	3.482	4.070	-0.01	+2.1	18.6	120.3
Feb. 17	13 10.34	-02 10.5	3.309	4.022	-0.17	+3.1	18.5	130.6
Feb. 27	13 08.64	-01 39.5	3.154	3.973	-0.32	+4.0	18.3	141.1
Mar. 9	13 05.43	-00 59.8	3.021	3.925	-0.45	+4.7	18.1	151.9
Mar. 19	13 00.88	-00 13.2	2.914	3.876	-0.55	+5.0	18.0	162.8
Mar. 29	12 55.33	+00 37.0	2.835	3.827	-0.61	+5.0	17.9	172.4
Apr. 8	12 49.26	+01 27.2	2.787	3.778	-0.61	+4.6	17.8	170.7
Apr. 18	12 43.19	+02 13.4	2.767	3.729	-0.55	+3.8	17.7	160.6
Apr. 28	12 37.68	+02 51.8	2.776	3.680	-0.45	+2.8	17.6	149.7
May 8	12 33.22	+03 19.6	2.809	3.632	-0.30	+1.6	17.6	139.0
May 18	12 30.18	+03 35.2	2.863	3.583	-0.14	+0.3	17.6	128.7
May 28	12 28.78	+03 37.7	2.933	3.534	+0.03	-1.0	17.6	118.8
June 7	12 29.12	+03 27.5	3.014	3.486	+0.21	-2.2	17.5	109.5
June 17	12 31.20	+03 05.3	3.103	3.438	+0.38	-3.3	17.5	100.6
June 27	12 34.96	+02 32.1	3.195	3.390	+0.53	-4.3	17.5	92.2
July 7	12 40.28	+01 49.1	3.288	3.342	+0.68	-5.2	17.5	84.2
July 17	12 47.03	+00 57.6	3.379	3.294	+0.81	-5.9	17.5	76.6
July 27	12 55.10	-00 01.3	3.464	3.247	+0.93	-6.5	17.5	69.3
Aug. 6	13 04.36	-01 06.4	3.543	3.201	+1.04	-7.0	17.4	62.4
Aug. 16	13 14.72	-02 16.5	3.614	3.155	+1.14	-7.4	17.4	55.6
Aug. 26	13 26.08	-03 30.8	3.675	3.109	+1.23	-7.7	17.4	49.2
Sept. 5	13 38.38	-04 48.0	3.726	3.065	+1.32	-7.9	17.3	42.9
Sept. 15	13 51.55	-06 07.3	3.766	3.020	+1.40	-8.0	17.3	36.8
Sept. 25	14 05.54	-07 27.5	3.794	2.977	+1.48	-8.0	17.2	30.8
Oct. 5	14 20.31	-08 47.7	3.811	2.935	+1.55	-7.9	17.1	25.0
Oct. 15	14 35.83	-10 06.7	3.816	2.893	+1.62	-7.7	17.1	19.3
Oct. 25	14 52.07	-11 23.5	3.809	2.853	+1.69	-7.3	17.0	13.8
Nov. 4	15 08.97	-12 36.9	3.790	2.814	+1.76	-6.9	16.9	8.8
Nov. 14	15 26.52	-13 46.0	3.760	2.776	+1.81	-6.4	16.8	5.1
Nov. 24	15 44.67	-14 49.5	3.719	2.739	+1.87	-5.7	16.7	6.2
Dec. 4	16 03.36	-15 46.5	3.667	2.704	+1.92	-4.9	16.6	10.5
Dec. 14	16 22.53	-16 35.8	3.606	2.671	+1.96	-4.1	16.5	15.6
Dec. 24	16 42.11	-17 16.7	3.535	2.639	+1.99	-3.2	16.4	20.8
Jan. 3	17 02.00	-17 48.4	3.456	2.609	+2.01	-2.2	16.2	26.1
Jan. 13	17 22.10	-18 10.2	3.369	2.581	+2.02	-1.2	16.1	31.4
Jan. 23	17 42.29	-18 22.0	3.275	2.555	+2.02	-0.1	16.0	36.7
Feb. 2	18 02.44	-18 23.4	3.176	2.531	+2.00	+0.9	15.8	42.0
Feb. 12	18 22.43	-18 14.9	3.071	2.509	+1.97	+1.8	15.7	47.3
Feb. 22	18 42.09	-17 56.7	2.962	2.490	+1.92	+2.7	15.6	52.7
Mar. 3	19 01.30	-17 29.7	2.849	2.473	+1.86	+3.5	15.4	58.1
Mar. 13	19 19.91	-16 54.9	2.734	2.459	+1.78	+4.1	15.3	63.6
Mar. 23	19 37.74	-16 13.8	2.618	2.447	+1.69	+4.6	15.1	69.2

Comet 302P/Lemmon-PANSTARRS

Epoch = 2015 June 27.0 TT
 T = 2016 Apr. 30.80862 TT
 Peri. = 208.32241
 Node = 121.78222 2000.0
 Incl. = 6.03141
 q = 3.3024484 AU
 e = 0.2282018
 a = 4.2789014 AU
 n = 0.11135396
 P = 8.85 years

$$m_1 = 8.6 + 5 \log(\Delta) + 15.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	m1	Elong.
2015/16	h m	° '			m		°
Jan. 8	17 14.82	-19 15.6	4.709	3.869	+1.25 -1.3	20.8	28.1
Jan. 18	17 27.32	-19 28.5	4.612	3.850	+1.22 -0.8	20.7	35.2
Jan. 28	17 39.51	-19 36.9	4.499	3.831	+1.17 -0.4	20.6	42.5
Feb. 7	17 51.26	-19 41.0	4.373	3.812	+1.12 0.0	20.5	49.8
Feb. 17	18 02.44	-19 41.2	4.236	3.794	+1.05 +0.3	20.4	57.3
Feb. 27	18 12.91	-19 38.1	4.088	3.775	+0.96 +0.6	20.3	64.9
Mar. 9	18 22.52	-19 32.4	3.932	3.757	+0.86 +0.8	20.2	72.6
Mar. 19	18 31.12	-19 24.9	3.771	3.739	+0.74 +0.8	20.1	80.5
Mar. 29	18 38.53	-19 16.4	3.608	3.721	+0.61 +0.8	19.9	88.7
Apr. 8	18 44.59	-19 08.1	3.444	3.703	+0.45 +0.7	19.8	97.1
Apr. 18	18 49.14	-19 00.9	3.284	3.685	+0.29 +0.5	19.7	105.8
Apr. 28	18 52.00	-18 55.9	3.130	3.668	+0.11 +0.2	19.5	114.8
May 8	18 53.07	-18 53.9	2.987	3.651	-0.08 -0.2	19.4	124.2
May 18	18 52.27	-18 55.5	2.857	3.634	-0.27 -0.6	19.3	134.0
May 28	18 49.62	-19 01.2	2.746	3.617	-0.43 -1.0	19.2	144.2
June 7	18 45.29	-19 10.9	2.657	3.601	-0.57 -1.3	19.1	154.8
June 17	18 39.60	-19 24.1	2.592	3.585	-0.66 -1.6	19.0	165.5
June 27	18 33.03	-19 40.0	2.555	3.569	-0.68 -1.8	18.9	175.4
July 7	18 26.20	-19 57.7	2.546	3.554	-0.65 -1.9	18.9	171.1
July 17	18 19.74	-20 16.4	2.564	3.538	-0.55 -1.9	18.9	160.5
July 27	18 14.28	-20 35.2	2.609	3.524	-0.40 -1.9	18.9	149.8
Aug. 6	18 10.33	-20 53.9	2.677	3.509	-0.21 -1.8	18.9	139.3
Aug. 16	18 08.19	-21 12.1	2.765	3.495	-0.01 -1.7	19.0	129.3
Aug. 26	18 08.07	-21 29.4	2.869	3.482	+0.19 -1.6	19.0	119.6
Sept. 5	18 09.98	-21 45.6	2.986	3.468	+0.39 -1.5	19.1	110.4
Sept. 15	18 13.85	-22 00.2	3.110	3.455	+0.57 -1.2	19.1	101.6
Sept. 25	18 19.57	-22 12.5	3.239	3.443	+0.74 -0.9	19.2	93.1
Oct. 5	18 26.96	-22 21.9	3.370	3.431	+0.89 -0.6	19.3	85.0
Oct. 15	18 35.83	-22 27.8	3.500	3.420	+1.02 -0.2	19.3	77.2
Oct. 25	18 46.03	-22 29.5	3.626	3.409	+1.13 +0.3	19.4	69.6
Nov. 4	18 57.35	-22 26.4	3.745	3.398	+1.23 +0.8	19.4	62.2
Nov. 14	19 09.63	-22 18.0	3.857	3.388	+1.31 +1.4	19.5	55.0
Nov. 24	19 22.71	-22 03.9	3.959	3.378	+1.37 +2.0	19.5	47.9
Dec. 4	19 36.44	-21 43.9	4.050	3.369	+1.42 +2.6	19.6	41.0
Dec. 14	19 50.68	-21 17.8	4.129	3.361	+1.46 +3.2	19.6	34.2
Dec. 24	20 05.30	-20 45.6	4.195	3.353	+1.49 +3.8	19.6	27.5
Jan. 3	20 20.18	-20 07.5	4.246	3.345	+1.50 +4.4	19.6	20.8
Jan. 13	20 35.21	-19 23.8	4.283	3.339	+1.51 +4.9	19.6	14.3
Jan. 23	20 50.31	-18 35.0	4.305	3.332	+1.51 +5.4	19.6	7.8
Feb. 2	21 05.37	-17 41.4	4.312	3.327	+1.50 +5.8	19.6	1.6
Feb. 12	21 20.34	-16 43.7	4.303	3.322	+1.48 +6.1	19.6	5.3
Feb. 22	21 35.12	-15 42.8	4.280	3.317	+1.45 +6.4	19.6	11.7
Mar. 3	21 49.67	-14 39.3	4.241	3.313	+1.43 +6.5	19.5	18.0
Mar. 13	22 03.92	-13 34.0	4.189	3.310	+1.39 +6.6	19.5	24.4
Mar. 23	22 17.82	-12 28.0	4.124	3.307	+1.35 +6.6	19.5	30.8

Comet 77P/Longmore

Epoch = 2015 June 27.0 TT
 T = 2016 May 13.84422 TT
 Peri. = 196.78897
 Node = 14.82607 2000.0
 Incl. = 24.33538
 q = 2.3366800 AU

e = 0.3540981
 a = 3.6177011 AU
 n = 0.14323695
 P = 6.88 years

$$m1 = 7.4 + 5 \log(\Delta) + 17.5 \log(r(t-50))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	06 39.81	+55 43.4	2.777	3.634	-1.27 -1.2	19.7	146.0
Jan. 18	06 27.15	+55 31.4	2.782	3.602	-1.07 -3.5	19.7	141.3
Jan. 28	06 16.41	+54 56.6	2.810	3.570	-0.78 -5.3	19.6	134.4
Feb. 7	06 08.60	+54 04.0	2.860	3.537	-0.44 -6.4	19.6	126.6
Feb. 17	06 04.20	+52 59.6	2.927	3.505	-0.09 -7.1	19.6	118.2
Feb. 27	06 03.29	+51 48.7	3.008	3.472	+0.23 -7.3	19.6	109.9
Mar. 9	06 05.62	+50 35.5	3.097	3.438	+0.52 -7.3	19.6	101.7
Mar. 19	06 10.84	+49 22.3	3.193	3.405	+0.77 -7.2	19.6	93.7
Mar. 29	06 18.55	+48 10.5	3.290	3.371	+0.98 -7.0	19.6	86.0
Apr. 8	06 28.34	+47 00.2	3.386	3.337	+1.15 -6.9	19.6	78.7
Apr. 18	06 39.86	+45 51.0	3.479	3.303	+1.29 -6.9	19.6	71.7
Apr. 28	06 52.81	+44 42.1	3.566	3.269	+1.41 -6.9	19.5	64.9
May 8	07 06.89	+43 32.7	3.646	3.235	+1.50 -7.1	19.5	58.5
May 18	07 21.87	+42 21.8	3.717	3.201	+1.57 -7.3	19.5	52.3
May 28	07 37.56	+41 08.6	3.779	3.167	+1.62 -7.6	19.4	46.4
June 7	07 53.76	+39 52.4	3.830	3.133	+1.66 -8.0	19.4	40.8
June 17	08 10.34	+38 32.6	3.870	3.098	+1.68 -8.4	19.3	35.4
June 27	08 27.18	+37 08.9	3.898	3.064	+1.70 -8.8	19.3	30.3
July 7	08 44.15	+35 41.0	3.915	3.030	+1.70 -9.2	19.2	25.6
July 17	09 01.18	+34 08.7	3.919	2.996	+1.70 -9.6	19.1	21.4
July 27	09 18.20	+32 32.3	3.911	2.963	+1.69 -10.1	19.0	18.0
Aug. 6	09 35.14	+30 51.7	3.892	2.929	+1.68 -10.4	18.9	15.9
Aug. 16	09 51.97	+29 07.3	3.860	2.896	+1.67 -10.8	18.8	15.4
Aug. 26	10 08.65	+27 19.4	3.816	2.863	+1.65 -11.1	18.7	16.8
Sept. 5	10 25.15	+25 28.4	3.760	2.830	+1.63 -11.4	18.6	19.6
Sept. 15	10 41.44	+23 34.9	3.694	2.798	+1.61 -11.6	18.5	23.3
Sept. 25	10 57.51	+21 39.4	3.616	2.767	+1.58 -11.7	18.4	27.7
Oct. 5	11 13.33	+19 42.4	3.527	2.736	+1.55 -11.8	18.2	32.4
Oct. 15	11 28.87	+17 44.7	3.429	2.705	+1.52 -11.8	18.1	37.4
Oct. 25	11 44.10	+15 46.8	3.321	2.676	+1.49 -11.7	17.9	42.7
Nov. 4	11 58.98	+13 49.4	3.204	2.647	+1.45 -11.6	17.7	48.1
Nov. 14	12 13.45	+11 53.1	3.079	2.619	+1.40 -11.5	17.6	53.8
Nov. 24	12 27.43	+09 58.6	2.947	2.591	+1.34 -11.2	17.4	59.6
Dec. 4	12 40.84	+08 06.4	2.809	2.565	+1.27 -10.9	17.2	65.7
Dec. 14	12 53.54	+06 16.9	2.666	2.540	+1.18 -10.6	17.0	72.0
Dec. 24	13 05.38	+04 30.5	2.520	2.516	+1.08 -10.3	16.8	78.5
Jan. 3	13 16.17	+02 47.5	2.371	2.493	+0.95 -10.0	16.6	85.4
Jan. 13	13 25.65	+01 07.8	2.223	2.471	+0.79 -9.7	16.4	92.6
Jan. 23	13 33.53	-00 28.8	2.077	2.451	+0.59 -9.4	16.1	100.2
Feb. 2	13 39.47	-02 02.6	1.935	2.432	+0.36 -9.2	15.9	108.4
Feb. 12	13 43.08	-03 34.2	1.800	2.415	+0.09 -9.0	15.7	117.1
Feb. 22	13 43.97	-05 04.1	1.676	2.399	-0.21 -8.9	15.5	126.4
Mar. 3	13 41.84	-06 32.9	1.566	2.385	-0.53 -8.8	15.3	136.5
Mar. 13	13 36.50	-08 00.5	1.475	2.373	-0.83 -8.6	15.1	147.3
Mar. 23	13 28.18	-09 26.2	1.406	2.362	-1.07 -8.2	14.9	158.7

Comet C/2011 KP36 (Spacewatch)

Epoch = 2015 June 27.0 TT
 T = 2016 May 27.08458 TT
 Peri. = 180.62036
 Node = 173.40173 2000.0
 Incl. = 18.98570
 q = 4.8830055 AU

e = 0.8728517
 a = 38.4040172 AU
 n = 0.00414132
 P = 237.99 years

$$m1 = 6.6 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	19 54.64	-07 26.3	6.989	6.060	+0.85	+1.4	16.7	17.8
Jan. 18	20 03.11	-07 12.3	6.972	6.020	+0.86	+1.8	16.7	13.5
Jan. 28	20 11.67	-06 54.1	6.934	5.980	+0.85	+2.2	16.6	13.4
Feb. 7	20 20.21	-06 32.0	6.875	5.941	+0.84	+2.6	16.6	17.3
Feb. 17	20 28.66	-06 06.5	6.796	5.902	+0.83	+2.8	16.5	23.3
Feb. 27	20 36.92	-05 38.1	6.698	5.864	+0.80	+3.1	16.5	30.2
Mar. 9	20 44.91	-05 07.2	6.582	5.826	+0.76	+3.3	16.4	37.5
Mar. 19	20 52.56	-04 34.7	6.449	5.788	+0.72	+3.4	16.4	45.0
Mar. 29	20 59.77	-04 01.0	6.302	5.751	+0.67	+3.4	16.3	52.6
Apr. 8	21 06.45	-03 27.0	6.142	5.715	+0.61	+3.3	16.2	60.4
Apr. 18	21 12.54	-02 53.6	5.973	5.679	+0.54	+3.2	16.1	68.3
Apr. 28	21 17.94	-02 21.5	5.795	5.644	+0.46	+3.0	16.1	76.4
May 8	21 22.56	-01 51.7	5.614	5.609	+0.38	+2.6	16.0	84.6
May 18	21 26.34	-01 25.2	5.431	5.575	+0.29	+2.2	15.9	93.0
May 28	21 29.20	-01 03.1	5.249	5.542	+0.19	+1.7	15.8	101.5
June 7	21 31.08	-00 46.4	5.074	5.509	+0.09	+1.0	15.7	110.3
June 17	21 31.95	-00 36.2	4.908	5.477	-0.01	+0.3	15.6	119.3
June 27	21 31.81	-00 33.3	4.755	5.445	-0.11	-0.5	15.5	128.5
July 7	21 30.71	-00 38.4	4.618	5.415	-0.20	-1.4	15.4	137.8
July 17	21 28.74	-00 52.1	4.502	5.385	-0.27	-2.2	15.4	147.1
July 27	21 26.06	-01 14.1	4.410	5.355	-0.32	-3.0	15.3	156.2
Aug. 6	21 22.91	-01 43.9	4.344	5.326	-0.34	-3.6	15.2	164.0
Aug. 16	21 19.54	-02 20.4	4.306	5.298	-0.33	-4.1	15.2	167.3
Aug. 26	21 16.26	-03 01.9	4.296	5.271	-0.29	-4.4	15.2	163.1
Sept. 5	21 13.38	-03 46.4	4.314	5.245	-0.22	-4.5	15.2	154.9
Sept. 15	21 11.17	-04 31.6	4.359	5.219	-0.13	-4.4	15.2	145.5
Sept. 25	21 09.87	-05 15.5	4.428	5.195	-0.02	-4.1	15.2	135.9
Oct. 5	21 09.64	-05 56.2	4.517	5.171	+0.09	-3.6	15.2	126.2
Oct. 15	21 10.58	-06 32.1	4.623	5.147	+0.22	-3.0	15.3	116.6
Oct. 25	21 12.73	-07 02.1	4.742	5.125	+0.33	-2.3	15.3	107.2
Nov. 4	21 16.07	-07 25.4	4.870	5.104	+0.45	-1.6	15.3	98.0
Nov. 14	21 20.55	-07 41.7	5.003	5.083	+0.55	-0.9	15.4	89.0
Nov. 24	21 26.09	-07 50.7	5.136	5.064	+0.65	-0.2	15.4	80.3
Dec. 4	21 32.57	-07 52.4	5.267	5.045	+0.73	+0.5	15.5	71.7
Dec. 14	21 39.90	-07 47.2	5.392	5.028	+0.81	+1.2	15.5	63.4
Dec. 24	21 47.96	-07 35.4	5.507	5.011	+0.87	+1.8	15.6	55.2
Jan. 3	21 56.62	-07 17.5	5.612	4.995	+0.92	+2.4	15.6	47.1
Jan. 13	22 05.80	-06 53.9	5.703	4.981	+0.96	+2.9	15.6	39.2
Jan. 23	22 15.38	-06 25.3	5.779	4.967	+0.99	+3.3	15.6	31.5
Feb. 2	22 25.27	-05 52.4	5.839	4.954	+1.01	+3.7	15.6	23.8
Feb. 12	22 35.38	-05 15.8	5.882	4.942	+1.03	+3.9	15.7	16.3
Feb. 22	22 45.63	-04 36.4	5.906	4.932	+1.03	+4.2	15.7	9.0
Mar. 3	22 55.95	-03 54.7	5.912	4.922	+1.03	+4.3	15.6	2.9
Mar. 13	23 06.27	-03 11.7	5.899	4.913	+1.02	+4.4	15.6	6.7
Mar. 23	23 16.51	-02 28.0	5.869	4.906	+1.01	+4.4	15.6	13.7

Comet 216P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2016 May 31.19395 TT
 Peri. = 151.59830
 Node = 359.87374 2000.0
 Incl. = 9.04812
 q = 2.1498900 AU
 e = 0.4451657
 a = 3.8748325 AU
 n = 0.12921849
 P = 7.63 years

$$m1 = 10.2 + 5 \log(\Delta) + 20.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	01 01.78	+12 16.7	3.758	3.914	+0.42	+2.2	.	91.8
Jan. 18	01 06.00	+12 38.5	3.875	3.875	+0.56	+3.0	.	82.7
Jan. 28	01 11.60	+13 08.8	3.988	3.836	+0.68	+3.8	.	74.1
Feb. 7	01 18.45	+13 46.6	4.094	3.797	+0.80	+4.4	.	65.7
Feb. 17	01 26.41	+14 31.0	4.190	3.757	+0.89	+5.0	.	57.7
Feb. 27	01 35.35	+15 21.0	4.275	3.717	+0.98	+5.4	.	50.0
Mar. 9	01 45.16	+16 15.5	4.345	3.676	+1.06	+5.8	.	42.6
Mar. 19	01 55.76	+17 13.5	4.400	3.635	+1.13	+6.1	.	35.4
Mar. 29	02 07.06	+18 14.2	4.440	3.594	+1.19	+6.2	.	28.5
Apr. 8	02 18.99	+19 16.6	4.462	3.552	+1.25	+6.3	.	21.8
Apr. 18	02 31.49	+20 20.0	4.468	3.511	+1.30	+6.4	.	15.4
Apr. 28	02 44.52	+21 23.5	4.457	3.468	+1.35	+6.3	.	9.6
May 8	02 58.02	+22 26.5	4.429	3.426	+1.39	+6.2	.	5.6
May 18	03 11.96	+23 28.3	4.385	3.384	+1.43	+6.0	.	7.1
May 28	03 26.29	+24 28.3	4.325	3.341	+1.47	+5.8	.	12.1
June 7	03 40.96	+25 26.0	4.249	3.298	+1.50	+5.5	.	17.8
June 17	03 55.94	+26 20.9	4.160	3.255	+1.52	+5.2	.	23.7
June 27	04 11.16	+27 12.5	4.056	3.211	+1.54	+4.8	.	29.6
July 7	04 26.57	+28 00.7	3.940	3.168	+1.55	+4.4	.	35.5
July 17	04 42.10	+28 45.2	3.813	3.124	+1.56	+4.1	23.0	41.4
July 27	04 57.67	+29 25.9	3.675	3.081	+1.55	+3.7	22.8	47.5
Aug. 6	05 13.17	+30 02.8	3.529	3.038	+1.53	+3.3	22.6	53.5
Aug. 16	05 28.52	+30 36.2	3.374	2.994	+1.50	+3.0	22.4	59.7
Aug. 26	05 43.56	+31 06.4	3.213	2.951	+1.46	+2.8	22.1	66.0
Sept. 5	05 58.14	+31 34.0	3.048	2.908	+1.39	+2.6	21.9	72.5
Sept. 15	06 12.09	+31 59.9	2.879	2.865	+1.31	+2.5	21.6	79.2
Sept. 25	06 25.18	+32 25.1	2.708	2.823	+1.20	+2.6	21.4	86.1
Oct. 5	06 37.16	+32 50.7	2.538	2.781	+1.06	+2.7	21.1	93.3
Oct. 15	06 47.75	+33 18.1	2.371	2.739	+0.88	+3.0	20.8	100.8
Oct. 25	06 56.58	+33 48.5	2.209	2.698	+0.67	+3.5	20.5	108.7
Nov. 4	07 03.28	+34 23.1	2.054	2.657	+0.41	+3.9	20.3	117.1
Nov. 14	07 07.43	+35 02.3	1.910	2.617	+0.12	+4.3	20.0	126.0
Nov. 24	07 08.64	+35 45.3	1.781	2.578	-0.20	+4.4	19.7	135.3
Dec. 4	07 06.65	+36 29.5	1.669	2.540	-0.52	+4.1	19.4	145.0
Dec. 14	07 01.46	+37 10.4	1.578	2.503	-0.79	+3.1	19.2	154.6
Dec. 24	06 53.52	+37 41.6	1.511	2.467	-0.96	+1.5	18.9	162.6
Jan. 3	06 43.88	+37 56.9	1.470	2.433	-0.99	-0.5	18.8	164.9
Jan. 13	06 33.99	+37 52.3	1.455	2.399	-0.85	-2.5	18.6	159.1
Jan. 23	06 25.52	+37 27.5	1.465	2.368	-0.57	-4.1	18.5	149.8
Feb. 2	06 19.79	+36 46.5	1.497	2.338	-0.22	-5.2	18.5	139.8
Feb. 12	06 17.62	+35 54.4	1.547	2.309	+0.17	-5.8	18.4	130.0
Feb. 22	06 19.29	+34 55.9	1.613	2.283	+0.53	-6.1	18.4	120.8
Mar. 3	06 24.61	+33 54.4	1.689	2.258	+0.86	-6.3	18.4	112.2
Mar. 13	06 33.22	+32 51.1	1.774	2.236	+1.14	-6.5	18.4	104.2
Mar. 23	06 44.66	+31 45.7	1.863	2.216	+1.38	-6.8	18.5	96.9

Comet 157P/Tritton

Epoch = 2015 June 27.0 TT
 T = 2016 June 10.33523 TT
 Peri. = 148.88619
 Node = 300.00556 2000.0
 Incl. = 7.28553
 q = 1.3580670 AU
 e = 0.6016819
 a = 3.4095036 AU
 n = 0.15655514
 P = 6.30 years

$$m1 = 14.2 + 5 \log(\Delta) + 10.0 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	20 16.27	-19 11.0	5.155	4.212	+1.04 +4.0	.	14.8
Jan. 18	20 26.69	-18 31.0	5.144	4.170	+1.06 +4.3	.	7.2
Jan. 28	20 37.29	-17 47.7	5.112	4.127	+1.07 +4.6	.	0.8
Feb. 7	20 47.96	-17 01.3	5.058	4.083	+1.07 +4.9	.	7.9
Feb. 17	20 58.63	-16 12.0	4.983	4.039	+1.06 +5.2	.	15.3
Feb. 27	21 09.19	-15 20.2	4.888	3.993	+1.04 +5.4	.	22.7
Mar. 9	21 19.58	-14 26.4	4.774	3.947	+1.01 +5.5	.	30.1
Mar. 19	21 29.70	-13 31.1	4.643	3.900	+0.98 +5.6	.	37.4
Mar. 29	21 39.48	-12 34.7	4.495	3.852	+0.93 +5.7	.	44.8
Apr. 8	21 48.82	-11 37.9	4.333	3.803	+0.88 +5.7	.	52.2
Apr. 18	21 57.64	-10 41.3	4.159	3.753	+0.82 +5.6	.	59.6
Apr. 28	22 05.81	-09 45.7	3.974	3.702	+0.74 +5.4	.	67.2
May 8	22 13.24	-08 52.0	3.782	3.651	+0.65 +5.1	22.9	74.9
May 18	22 19.77	-08 00.9	3.584	3.598	+0.55 +4.7	22.7	82.7
May 28	22 25.26	-07 13.7	3.384	3.545	+0.43 +4.2	22.5	90.8
June 7	22 29.52	-06 31.4	3.184	3.491	+0.28 +3.6	22.3	99.1
June 17	22 32.36	-05 55.2	2.987	3.436	+0.12 +2.9	22.1	107.7
June 27	22 33.57	-05 26.6	2.797	3.380	-0.06 +2.0	21.9	116.8
July 7	22 32.95	-05 06.9	2.618	3.323	-0.26 +1.0	21.7	126.3
July 17	22 30.34	-04 57.4	2.453	3.265	-0.47 -0.2	21.5	136.3
July 27	22 25.65	-04 59.0	2.307	3.206	-0.67 -1.3	21.3	146.9
Aug. 6	22 18.99	-05 11.9	2.183	3.146	-0.84 -2.3	21.1	157.8
Aug. 16	22 10.63	-05 35.4	2.086	3.085	-0.95 -3.2	20.9	168.7
Aug. 26	22 01.16	-06 07.3	2.017	3.024	-0.98 -3.7	20.8	174.0
Sept. 5	21 51.38	-06 44.0	1.977	2.961	-0.92 -3.8	20.7	164.6
Sept. 15	21 42.17	-07 21.6	1.965	2.898	-0.77 -3.4	20.6	153.0
Sept. 25	21 34.42	-07 55.8	1.979	2.833	-0.56 -2.7	20.5	141.5
Oct. 5	21 28.82	-08 23.0	2.014	2.768	-0.30 -1.8	20.4	130.3
Oct. 15	21 25.77	-08 40.8	2.065	2.702	-0.03 -0.7	20.4	119.7
Oct. 25	21 25.48	-08 47.6	2.127	2.635	+0.24 +0.5	20.4	109.8
Nov. 4	21 27.89	-08 42.4	2.196	2.568	+0.50 +1.7	20.3	100.4
Nov. 14	21 32.87	-08 24.9	2.266	2.500	+0.73 +3.0	20.3	91.7
Nov. 24	21 40.20	-07 54.8	2.335	2.431	+0.94 +4.3	20.2	83.6
Dec. 4	21 49.64	-07 12.3	2.399	2.362	+1.13 +5.5	20.2	75.9
Dec. 14	22 00.98	-06 17.2	2.457	2.292	+1.30 +6.8	20.1	68.8
Dec. 24	22 14.02	-05 09.7	2.505	2.222	+1.46 +8.0	20.1	62.1
Jan. 3	22 28.59	-03 50.0	2.545	2.152	+1.60 +9.2	20.0	55.8
Jan. 13	22 44.57	-02 18.4	2.574	2.081	+1.73 +10.3	19.9	49.9
Jan. 23	23 01.88	-00 35.4	2.592	2.012	+1.86 +11.4	19.7	44.5
Feb. 2	23 20.46	+01 18.5	2.601	1.943	+1.99 +12.4	19.6	39.4
Feb. 12	23 40.32	+03 22.4	2.600	1.874	+2.12 +13.3	19.5	34.7
Feb. 22	00 01.47	+05 35.2	2.590	1.807	+2.25 +14.0	19.3	30.4
Mar. 3	00 23.99	+07 55.3	2.573	1.742	+2.40 +14.6	19.1	26.5
Mar. 13	00 47.98	+10 20.9	2.550	1.680	+2.56 +14.8	19.0	22.9
Mar. 23	01 13.54	+12 49.4	2.523	1.620	+2.73 +14.8	18.8	19.8

Comet 118P/Shoemaker-Levy

Epoch = 2015 June 27.0 TT
 T = 2016 June 16.90077 TT
 Peri. = 302.31242
 Node = 151.72719 2000.0
 Incl. = 8.51428
 q = 1.9802048 AU
 e = 0.4282769
 a = 3.4635732 AU
 n = 0.15290353
 P = 6.45 years

$$m1 = 8.2 + 5 \log(\Delta) + 17.5 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	21 24.06	-14 34.9	4.630	3.828	+1.10 +4.4	21.9	31.6
Jan. 18	21 35.09	-13 51.0	4.668	3.793	+1.14 +4.8	21.9	24.2
Jan. 28	21 46.49	-13 02.7	4.688	3.757	+1.17 +5.2	21.8	16.9
Feb. 7	21 58.16	-12 10.5	4.689	3.721	+1.19 +5.6	21.8	9.8
Feb. 17	22 10.04	-11 14.9	4.671	3.684	+1.20 +5.8	21.7	2.7
Feb. 27	22 22.05	-10 16.4	4.634	3.647	+1.21 +6.1	21.6	4.3
Mar. 9	22 34.12	-09 15.7	4.579	3.610	+1.21 +6.2	21.5	11.2
Mar. 19	22 46.19	-08 13.4	4.505	3.572	+1.20 +6.3	21.4	18.0
Mar. 29	22 58.21	-07 10.2	4.415	3.533	+1.19 +6.3	21.3	24.8
Apr. 8	23 10.13	-06 06.8	4.309	3.494	+1.18 +6.3	21.1	31.5
Apr. 18	23 21.89	-05 04.0	4.188	3.455	+1.15 +6.1	21.0	38.2
Apr. 28	23 33.44	-04 02.5	4.053	3.415	+1.13 +5.9	20.8	44.9
May 8	23 44.72	-03 03.3	3.907	3.375	+1.09 +5.6	20.7	51.6
May 18	23 55.65	-02 07.3	3.751	3.334	+1.05 +5.2	20.5	58.4
May 28	00 06.15	-01 15.4	3.585	3.293	+1.00 +4.7	20.3	65.3
June 7	00 16.13	-00 28.7	3.414	3.251	+0.93 +4.0	20.1	72.2
June 17	00 25.48	+00 11.7	3.237	3.209	+0.86 +3.3	19.9	79.4
June 27	00 34.04	+00 44.3	3.058	3.167	+0.76 +2.4	19.7	86.7
July 7	00 41.65	+01 08.0	2.878	3.124	+0.65 +1.3	19.5	94.4
July 17	00 48.12	+01 21.1	2.700	3.081	+0.51 +0.1	19.2	102.3
July 27	00 53.22	+01 22.1	2.528	3.038	+0.35 -1.2	19.0	110.6
Aug. 6	00 56.72	+01 09.7	2.363	2.995	+0.17 -2.7	18.7	119.4
Aug. 16	00 58.39	+00 42.5	2.210	2.951	-0.04 -4.2	18.5	128.7
Aug. 26	00 58.02	+00 00.0	2.072	2.908	-0.25 -5.7	18.2	138.6
Sept. 5	00 55.56	-00 57.0	1.953	2.864	-0.45 -6.9	18.0	148.9
Sept. 15	00 51.06	-02 06.3	1.856	2.820	-0.62 -7.7	17.8	159.5
Sept. 25	00 44.89	-03 23.2	1.785	2.776	-0.72 -7.8	17.6	169.3
Oct. 5	00 37.66	-04 41.4	1.741	2.733	-0.75 -7.2	17.4	170.8
Oct. 15	00 30.20	-05 53.1	1.725	2.689	-0.67 -5.8	17.3	161.5
Oct. 25	00 23.46	-06 51.2	1.735	2.646	-0.52 -3.9	17.2	150.4
Nov. 4	00 18.28	-07 30.5	1.768	2.603	-0.30 -1.8	17.1	139.4
Nov. 14	00 15.28	-07 48.4	1.821	2.560	-0.05 +0.4	17.0	128.8
Nov. 24	00 14.80	-07 44.5	1.889	2.518	+0.21 +2.4	17.0	118.8
Dec. 4	00 16.93	-07 20.1	1.967	2.476	+0.47 +4.3	16.9	109.5
Dec. 14	00 21.59	-06 37.4	2.051	2.435	+0.70 +5.9	16.9	100.8
Dec. 24	00 28.59	-05 38.8	2.138	2.395	+0.91 +7.2	16.9	92.7
Jan. 3	00 37.68	-04 26.7	2.226	2.356	+1.10 +8.3	16.8	85.1
Jan. 13	00 48.66	-03 03.3	2.311	2.318	+1.26 +9.3	16.8	78.1
Jan. 23	01 01.30	-01 30.7	2.393	2.281	+1.41 +10.0	16.7	71.5
Feb. 2	01 15.42	+00 09.0	2.470	2.245	+1.55 +10.5	16.7	65.3
Feb. 12	01 30.89	+01 54.0	2.542	2.211	+1.67 +10.8	16.6	59.5
Feb. 22	01 47.57	+03 42.3	2.607	2.179	+1.78 +11.0	16.5	54.0
Mar. 3	02 05.38	+05 32.1	2.667	2.148	+1.89 +11.0	16.5	48.9
Mar. 13	02 24.24	+07 21.6	2.720	2.120	+1.99 +10.7	16.4	44.0
Mar. 23	02 44.10	+09 08.9	2.767	2.094	+2.08 +10.3	16.3	39.3

Comet 81P/Wild

Epoch = 2015 June 27.0 TT
 T = 2016 July 20.35921 TT
 Peri. = 41.70539
 Node = 136.12642 2000.0
 Incl. = 3.23908
 q = 1.5923299 AU
 e = 0.5381866
 a = 3.4479941 AU
 n = 0.15394100
 P = 6.40 years

$$m1 = 7.6 + 5 \log(\Delta) + 15.0 \log(r(t+10))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	01 31.57	+05 56.8	3.988	4.210	+0.24	+2.2	19.9	96.2
Jan. 18	01 33.97	+06 18.7	4.111	4.172	+0.38	+2.9	19.9	86.7
Jan. 28	01 37.76	+06 48.2	4.231	4.134	+0.51	+3.6	19.9	77.6
Feb. 7	01 42.82	+07 24.1	4.345	4.095	+0.62	+4.1	19.9	68.9
Feb. 17	01 49.00	+08 05.3	4.450	4.055	+0.72	+4.5	19.9	60.5
Feb. 27	01 56.20	+08 50.7	4.542	4.015	+0.81	+4.9	19.9	52.3
Mar. 9	02 04.27	+09 39.3	4.620	3.973	+0.89	+5.1	19.8	44.5
Mar. 19	02 13.13	+10 30.2	4.682	3.932	+0.95	+5.2	19.8	36.9
Mar. 29	02 22.68	+11 22.4	4.727	3.889	+1.01	+5.3	19.7	29.5
Apr. 8	02 32.83	+12 15.1	4.753	3.846	+1.07	+5.3	19.7	22.3
Apr. 18	02 43.50	+13 07.7	4.761	3.802	+1.11	+5.2	19.6	15.3
Apr. 28	02 54.64	+13 59.3	4.749	3.757	+1.15	+5.0	19.5	8.6
May 8	03 06.16	+14 49.4	4.719	3.711	+1.19	+4.8	19.4	2.9
May 18	03 18.03	+15 37.3	4.670	3.665	+1.21	+4.5	19.3	5.9
May 28	03 30.17	+16 22.6	4.603	3.618	+1.24	+4.2	19.2	12.2
June 7	03 42.54	+17 04.7	4.518	3.571	+1.25	+3.9	19.1	18.6
June 17	03 55.06	+17 43.3	4.416	3.522	+1.26	+3.5	18.9	25.1
June 27	04 07.68	+18 17.9	4.299	3.473	+1.26	+3.0	18.8	31.5
July 7	04 20.32	+18 48.2	4.167	3.423	+1.26	+2.6	18.6	38.0
July 17	04 32.90	+19 14.1	4.021	3.373	+1.24	+2.1	18.4	44.5
July 27	04 45.32	+19 35.4	3.864	3.321	+1.22	+1.7	18.3	51.1
Aug. 6	04 57.48	+19 51.9	3.696	3.269	+1.18	+1.2	18.0	57.8
Aug. 16	05 09.27	+20 03.7	3.519	3.217	+1.12	+0.7	17.8	64.6
Aug. 26	05 20.51	+20 10.9	3.334	3.163	+1.05	+0.3	17.6	71.5
Sept. 5	05 31.06	+20 13.9	3.145	3.109	+0.96	-0.1	17.4	78.7
Sept. 15	05 40.70	+20 13.0	2.952	3.055	+0.85	-0.4	17.1	86.2
Sept. 25	05 49.20	+20 08.7	2.759	2.999	+0.71	-0.7	16.8	93.9
Oct. 5	05 56.29	+20 01.9	2.567	2.943	+0.54	-0.9	16.6	102.1
Oct. 15	06 01.65	+19 53.3	2.380	2.887	+0.33	-0.9	16.3	110.7
Oct. 25	06 04.94	+19 43.9	2.201	2.830	+0.09	-0.9	16.0	119.8
Nov. 4	06 05.84	+19 34.6	2.033	2.772	-0.18	-0.8	15.6	129.5
Nov. 14	06 04.04	+19 26.4	1.881	2.714	-0.46	-0.7	15.3	139.9
Nov. 24	05 59.39	+19 19.9	1.749	2.656	-0.74	-0.5	15.0	151.0
Dec. 4	05 52.04	+19 15.3	1.640	2.597	-0.96	-0.3	14.7	162.7
Dec. 14	05 42.47	+19 12.8	1.557	2.538	-1.08	0.0	14.5	173.9
Dec. 24	05 31.67	+19 12.5	1.503	2.479	-1.07	+0.2	14.2	170.7
Jan. 3	05 20.96	+19 14.8	1.478	2.420	-0.93	+0.6	14.0	158.6
Jan. 13	05 11.70	+19 20.9	1.478	2.361	-0.66	+1.1	13.9	146.4
Jan. 23	05 05.07	+19 32.0	1.500	2.302	-0.33	+1.7	13.7	134.8
Feb. 2	05 01.80	+19 48.8	1.539	2.244	+0.04	+2.2	13.6	123.9
Feb. 12	05 02.21	+20 11.3	1.590	2.186	+0.41	+2.7	13.5	113.9
Feb. 22	05 06.31	+20 38.3	1.648	2.128	+0.76	+3.0	13.4	104.9
Mar. 3	05 13.89	+21 08.1	1.709	2.072	+1.08	+3.0	13.3	96.6
Mar. 13	05 24.69	+21 38.3	1.770	2.017	+1.37	+2.8	13.2	89.2
Mar. 23	05 38.42	+22 06.2	1.828	1.964	+1.63	+2.3	13.1	82.4

Comet 150P/LONEOS

Epoch = 2015 June 27.0 TT
 T = 2016 July 24.94464 TT
 Peri. = 245.66285
 Node = 272.43201 2000.0
 Incl. = 18.50591
 q = 1.7600253 AU
 e = 0.5467784
 a = 3.8833659 AU
 n = 0.12879281
 P = 7.65 years

H = 14.4 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion		V	Elong.
					m	' "		°
Jan. 8	00 16.12	+20 33.1	4.338	4.366	+0.55	-1.2	21.5	85.2
Jan. 18	00 21.58	+20 21.3	4.448	4.325	+0.66	-0.1	21.6	76.5
Jan. 28	00 28.16	+20 19.8	4.552	4.282	+0.76	+0.8	21.6	68.1
Feb. 7	00 35.72	+20 27.9	4.646	4.240	+0.84	+1.7	21.6	60.0
Feb. 17	00 44.15	+20 44.7	4.729	4.196	+0.92	+2.4	21.6	52.1
Feb. 27	00 53.33	+21 09.0	4.799	4.152	+0.98	+3.1	21.5	44.6
Mar. 9	01 03.16	+21 40.0	4.852	4.108	+1.04	+3.7	21.5	37.4
Mar. 19	01 13.56	+22 16.5	4.889	4.062	+1.09	+4.1	21.4	30.5
Mar. 29	01 24.46	+22 57.7	4.908	4.017	+1.13	+4.5	21.3	24.0
Apr. 8	01 35.79	+23 42.5	4.908	3.970	+1.17	+4.8	21.2	18.3
Apr. 18	01 47.50	+24 30.0	4.890	3.923	+1.20	+5.0	21.2	14.0
Apr. 28	01 59.53	+25 19.5	4.853	3.876	+1.23	+5.1	21.1	12.3
May 8	02 11.83	+26 10.2	4.798	3.828	+1.25	+5.1	21.1	14.1
May 18	02 24.36	+27 01.4	4.726	3.779	+1.27	+5.1	21.1	18.3
May 28	02 37.05	+27 52.5	4.636	3.730	+1.28	+5.0	21.1	23.6
June 7	02 49.86	+28 42.8	4.530	3.680	+1.29	+4.9	21.1	29.4
June 17	03 02.74	+29 31.9	4.409	3.629	+1.28	+4.7	21.0	35.5
June 27	03 15.59	+30 19.3	4.273	3.578	+1.27	+4.5	21.0	41.7
July 7	03 28.33	+31 04.5	4.125	3.527	+1.25	+4.3	21.0	48.0
July 17	03 40.88	+31 47.4	3.965	3.475	+1.22	+4.0	20.9	54.5
July 27	03 53.10	+32 27.6	3.795	3.422	+1.18	+3.7	20.8	61.1
Aug. 6	04 04.85	+33 04.8	3.617	3.369	+1.11	+3.4	20.7	67.9
Aug. 16	04 15.97	+33 39.1	3.432	3.315	+1.03	+3.1	20.6	74.9
Aug. 26	04 26.22	+34 10.1	3.242	3.261	+0.92	+2.8	20.5	82.1
Sept. 5	04 35.38	+34 37.8	3.051	3.207	+0.78	+2.4	20.3	89.6
Sept. 15	04 43.16	+35 01.9	2.859	3.152	+0.60	+2.0	20.1	97.5
Sept. 25	04 49.20	+35 22.0	2.670	3.096	+0.40	+1.5	19.9	105.7
Oct. 5	04 53.18	+35 37.0	2.488	3.041	+0.15	+0.9	19.7	114.4
Oct. 15	04 54.69	+35 45.6	2.314	2.984	-0.13	0.0	19.5	123.6
Oct. 25	04 53.44	+35 45.3	2.154	2.928	-0.42	-1.2	19.2	133.4
Nov. 4	04 49.26	+35 32.8	2.012	2.871	-0.70	-2.9	18.9	143.6
Nov. 14	04 42.25	+35 04.2	1.891	2.815	-0.93	-4.8	18.6	154.1
Nov. 24	04 32.93	+34 15.9	1.795	2.758	-1.06	-6.9	18.3	163.9
Dec. 4	04 22.29	+33 06.6	1.728	2.701	-1.07	-8.8	18.1	168.4
Dec. 14	04 11.61	+31 38.2	1.689	2.644	-0.93	-10.1	18.1	162.1
Dec. 24	04 02.27	+29 56.9	1.680	2.587	-0.69	-10.6	18.3	151.5
Jan. 3	03 55.39	+28 11.4	1.695	2.530	-0.38	-10.1	18.4	140.2
Jan. 13	03 51.63	+26 30.0	1.732	2.474	-0.03	-9.1	18.5	129.2
Jan. 23	03 51.29	+24 58.9	1.786	2.418	+0.30	-7.8	18.6	118.7
Feb. 2	03 54.30	+23 41.3	1.850	2.363	+0.61	-6.4	18.7	109.1
Feb. 12	04 00.42	+22 37.5	1.921	2.309	+0.89	-5.1	18.8	100.1
Feb. 22	04 09.36	+21 46.1	1.995	2.255	+1.14	-4.2	18.8	91.9
Mar. 3	04 20.80	+21 04.6	2.068	2.203	+1.36	-3.5	18.9	84.3
Mar. 13	04 34.44	+20 29.7	2.139	2.153	+1.56	-3.1	18.9	77.4
Mar. 23	04 50.04	+19 58.2	2.205	2.104	+1.73	-3.1	18.9	71.0

Comet 9P/Tempel

Epoch = 2015 June 27.0 TT
 T = 2016 Aug. 2.52555 TT
 Peri. = 179.20241
 Node = 68.81222 2000.0
 Incl. = 10.47744
 q = 1.5409144 AU

e = 0.5100956
 a = 3.1453369 AU
 n = 0.17668648
 P = 5.58 years

$$m_1 = 8.4 + 5 \log(\Delta) + 17.5 \log(r(t-20))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	06 38.96	+30 27.5	3.099	4.067	-0.91 +1.4	21.6	168.7
Jan. 18	06 29.81	+30 41.0	3.107	4.036	-0.82 +0.7	21.6	157.9
Jan. 28	06 21.66	+30 47.6	3.146	4.003	-0.66 +0.1	21.6	146.4
Feb. 7	06 15.11	+30 48.2	3.210	3.970	-0.46 -0.4	21.5	135.1
Feb. 17	06 10.54	+30 44.6	3.295	3.936	-0.24 -0.7	21.5	124.2
Feb. 27	06 08.14	+30 38.1	3.396	3.901	-0.02 -0.8	21.5	113.7
Mar. 9	06 07.96	+30 30.0	3.508	3.866	+0.19 -0.9	21.5	103.7
Mar. 19	06 09.87	+30 21.3	3.624	3.829	+0.39 -0.9	21.5	94.3
Mar. 29	06 13.73	+30 12.1	3.742	3.792	+0.56 -1.0	21.5	85.2
Apr. 8	06 19.33	+30 02.4	3.856	3.754	+0.71 -1.0	21.5	76.7
Apr. 18	06 26.47	+29 52.0	3.964	3.715	+0.85 -1.2	21.5	68.5
Apr. 28	06 34.97	+29 40.4	4.063	3.676	+0.97 -1.3	21.5	60.6
May 8	06 44.63	+29 27.1	4.150	3.635	+1.07 -1.6	21.5	53.1
May 18	06 55.28	+29 11.6	4.224	3.594	+1.15 -1.8	21.4	45.9
May 28	07 06.80	+28 53.4	4.283	3.552	+1.22 -2.1	21.4	38.9
June 7	07 19.03	+28 32.0	4.326	3.510	+1.28 -2.5	21.3	32.2
June 17	07 31.86	+28 07.2	4.354	3.466	+1.33 -2.9	21.2	25.7
June 27	07 45.21	+27 38.6	4.364	3.422	+1.37 -3.2	21.1	19.4
July 7	07 58.95	+27 06.2	4.356	3.376	+1.41 -3.6	21.0	13.5
July 17	08 13.03	+26 29.8	4.332	3.330	+1.43 -4.0	20.9	8.6
July 27	08 27.37	+25 49.4	4.291	3.284	+1.45 -4.4	20.8	6.5
Aug. 6	08 41.90	+25 05.3	4.232	3.236	+1.47 -4.8	20.7	9.4
Aug. 16	08 56.56	+24 17.4	4.158	3.188	+1.48 -5.1	20.5	14.5
Aug. 26	09 11.32	+23 26.4	4.068	3.138	+1.48 -5.4	20.4	20.2
Sept. 5	09 26.10	+22 32.4	3.962	3.088	+1.48 -5.6	20.2	26.1
Sept. 15	09 40.89	+21 36.0	3.843	3.038	+1.47 -5.8	20.0	32.0
Sept. 25	09 55.63	+20 37.9	3.711	2.986	+1.46 -5.9	19.8	38.1
Oct. 5	10 10.27	+19 38.8	3.566	2.934	+1.45 -5.9	19.6	44.2
Oct. 15	10 24.78	+18 39.6	3.411	2.881	+1.43 -5.8	19.4	50.5
Oct. 25	10 39.09	+17 41.3	3.247	2.827	+1.41 -5.6	19.1	56.8
Nov. 4	10 53.16	+16 45.0	3.075	2.773	+1.38 -5.3	18.9	63.2
Nov. 14	11 06.91	+15 52.0	2.897	2.718	+1.33 -4.8	18.6	69.8
Nov. 24	11 20.24	+15 04.0	2.715	2.663	+1.28 -4.2	18.3	76.4
Dec. 4	11 33.05	+14 22.4	2.531	2.607	+1.21 -3.3	18.0	83.3
Dec. 14	11 45.19	+13 49.4	2.346	2.550	+1.13 -2.3	17.7	90.4
Dec. 24	11 56.46	+13 26.8	2.164	2.493	+1.02 -1.0	17.4	97.7
Jan. 3	12 06.65	+13 16.9	1.985	2.436	+0.88 +0.5	17.0	105.3
Jan. 13	12 15.44	+13 22.0	1.814	2.379	+0.70 +2.2	16.6	113.1
Jan. 23	12 22.48	+13 43.9	1.651	2.321	+0.49 +4.0	16.3	121.4
Feb. 2	12 27.39	+14 23.8	1.501	2.264	+0.23 +5.8	15.9	130.0
Feb. 12	12 29.69	+15 21.6	1.366	2.206	-0.07 +7.3	15.5	138.8
Feb. 22	12 29.01	+16 34.4	1.248	2.149	-0.38 +8.1	15.1	147.7
Mar. 3	12 25.18	+17 55.8	1.150	2.093	-0.68 +8.0	14.7	155.6
Mar. 13	12 18.35	+19 15.4	1.074	2.037	-0.90 +6.4	14.4	160.3
Mar. 23	12 09.31	+20 19.1	1.021	1.983	-0.99 +3.4	14.1	158.7

Comet C/2014 R3 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2016 Aug. 6.64355 TT
 Peri. = 113.29228
 Node = 334.11948 2000.0
 Incl. = 90.83817
 q = 7.2800494 AU
 e = 1.0002192

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

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m			°
Jan. 8	19 32.18	+50 23.7	8.375	8.140	+0.51	+2.6	19.8	72.8
Jan. 18	19 37.23	+50 50.2	8.368	8.112	+0.51	+3.8	19.8	71.7
Jan. 28	19 42.31	+51 27.7	8.352	8.085	+0.49	+4.8	19.8	71.0
Feb. 7	19 47.24	+52 16.1	8.329	8.058	+0.46	+5.9	19.8	70.8
Feb. 17	19 51.89	+53 14.9	8.299	8.032	+0.42	+6.9	19.8	71.0
Feb. 27	19 56.06	+54 23.5	8.263	8.006	+0.35	+7.8	19.8	71.6
Mar. 9	19 59.58	+55 41.0	8.221	7.980	+0.27	+8.5	19.7	72.5
Mar. 19	20 02.23	+57 06.5	8.175	7.955	+0.15	+9.2	19.7	73.8
Mar. 29	20 03.78	+58 38.6	8.126	7.930	+0.02	+9.7	19.7	75.2
Apr. 8	20 03.95	+60 15.8	8.075	7.905	-0.15	+10.0	19.7	76.7
Apr. 18	20 02.44	+61 56.3	8.023	7.881	-0.36	+10.1	19.6	78.3
Apr. 28	19 58.86	+63 37.7	7.973	7.857	-0.60	+10.0	19.6	79.8
May 8	19 52.85	+65 17.4	7.924	7.834	-0.89	+9.5	19.6	81.3
May 18	19 44.00	+66 52.4	7.878	7.811	-1.20	+8.7	19.6	82.5
May 28	19 31.96	+68 19.0	7.836	7.789	-1.54	+7.4	19.6	83.6
June 7	19 16.61	+69 33.2	7.798	7.767	-1.85	+5.8	19.5	84.5
June 17	18 58.10	+70 31.3	7.765	7.745	-2.10	+3.8	19.5	85.1
June 27	18 37.10	+71 09.7	7.738	7.724	-2.23	+1.7	19.5	85.4
July 7	18 14.80	+71 26.2	7.715	7.703	-2.21	-0.6	19.5	85.5
July 17	17 52.68	+71 20.5	7.697	7.683	-2.05	-2.6	19.5	85.4
July 27	17 32.19	+70 54.1	7.684	7.663	-1.78	-4.4	19.5	85.0
Aug. 6	17 14.43	+70 10.5	7.674	7.643	-1.45	-5.7	19.4	84.5
Aug. 16	16 59.94	+69 13.8	7.667	7.624	-1.11	-6.6	19.4	83.8
Aug. 26	16 48.83	+68 08.2	7.662	7.606	-0.79	-7.0	19.4	83.0
Sept. 5	16 40.90	+66 58.0	7.657	7.588	-0.51	-7.1	19.4	82.3
Sept. 15	16 35.79	+65 46.6	7.653	7.570	-0.27	-6.9	19.4	81.5
Sept. 25	16 33.10	+64 37.3	7.647	7.553	-0.07	-6.5	19.4	80.9
Oct. 5	16 32.43	+63 32.4	7.639	7.537	+0.10	-5.8	19.4	80.4
Oct. 15	16 33.42	+62 34.1	7.629	7.521	+0.23	-5.0	19.4	80.0
Oct. 25	16 35.77	+61 44.1	7.614	7.505	+0.34	-4.0	19.4	80.0
Nov. 4	16 39.17	+61 03.9	7.595	7.490	+0.42	-2.9	19.4	80.2
Nov. 14	16 43.39	+60 34.6	7.572	7.475	+0.48	-1.7	19.3	80.6
Nov. 24	16 48.21	+60 17.2	7.545	7.461	+0.52	-0.5	19.3	81.4
Dec. 4	16 53.39	+60 12.2	7.514	7.447	+0.54	+0.8	19.3	82.4
Dec. 14	16 58.74	+60 20.1	7.479	7.434	+0.53	+2.1	19.3	83.6
Dec. 24	17 04.04	+60 41.3	7.441	7.422	+0.50	+3.4	19.3	85.1
Jan. 3	17 09.06	+61 15.5	7.402	7.410	+0.45	+4.7	19.3	86.7
Jan. 13	17 13.56	+62 02.5	7.362	7.398	+0.37	+5.9	19.3	88.3
Jan. 23	17 17.25	+63 01.7	7.322	7.387	+0.25	+7.0	19.2	89.9
Feb. 2	17 19.80	+64 11.8	7.286	7.377	+0.10	+8.0	19.2	91.4
Feb. 12	17 20.81	+65 31.4	7.253	7.367	-0.10	+8.7	19.2	92.8
Feb. 22	17 19.80	+66 58.6	7.225	7.357	-0.36	+9.2	19.2	93.8
Mar. 3	17 16.17	+68 30.7	7.204	7.348	-0.70	+9.4	19.2	94.5
Mar. 13	17 09.21	+70 04.5	7.190	7.340	-1.11	+9.1	19.2	94.8
Mar. 23	16 58.11	+71 35.5	7.185	7.332	-1.60	+8.3	19.2	94.6

Comet 43P/Wolf-Harrington

Epoch = 2015 June 27.0 TT
 T = 2016 Aug. 19.65091 TT
 Peri. = 191.58454
 Node = 249.84669 2000.0
 Incl. = 15.96569
 q = 1.3577554 AU

e = 0.5946900
 a = 3.3499183 AU
 n = 0.16075065
 P = 6.13 years

$$m1 = 8.0 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	19 21.73	-13 19.6	5.411	4.443	+0.99	+2.9	23.0	9.2
Jan. 18	19 31.61	-12 50.9	5.373	4.407	+0.99	+3.3	22.9	10.0
Jan. 28	19 41.50	-12 17.5	5.313	4.371	+0.98	+3.8	22.8	15.3
Feb. 7	19 51.29	-11 39.6	5.232	4.334	+0.96	+4.2	22.7	22.0
Feb. 17	20 00.87	-10 57.6	5.132	4.296	+0.93	+4.6	22.6	29.2
Feb. 27	20 10.16	-10 11.6	5.012	4.257	+0.89	+5.0	22.5	36.5
Mar. 9	20 19.04	-09 22.1	4.875	4.218	+0.84	+5.3	22.4	44.0
Mar. 19	20 27.41	-08 29.4	4.723	4.177	+0.78	+5.5	22.2	51.5
Mar. 29	20 35.17	-07 34.2	4.558	4.136	+0.70	+5.7	22.1	59.2
Apr. 8	20 42.18	-06 37.0	4.381	4.094	+0.62	+5.9	21.9	66.9
Apr. 18	20 48.33	-05 38.4	4.196	4.051	+0.51	+5.9	21.7	74.8
Apr. 28	20 53.47	-04 39.4	4.006	4.007	+0.40	+5.9	21.6	82.9
May 8	20 57.46	-03 40.8	3.812	3.963	+0.27	+5.7	21.4	91.1
May 18	21 00.13	-02 43.7	3.620	3.918	+0.12	+5.4	21.2	99.6
May 28	21 01.32	-01 49.5	3.432	3.871	-0.04	+5.0	21.0	108.3
June 7	21 00.90	-00 59.8	3.251	3.824	-0.22	+4.4	20.8	117.3
June 17	20 58.75	-00 16.2	3.083	3.776	-0.39	+3.5	20.5	126.5
June 27	20 54.82	+00 19.2	2.930	3.727	-0.56	+2.5	20.3	135.8
July 7	20 49.19	+00 44.4	2.798	3.677	-0.71	+1.3	20.1	145.0
July 17	20 42.05	+00 57.7	2.689	3.627	-0.82	0.0	19.9	153.5
July 27	20 33.81	+00 57.8	2.606	3.575	-0.88	-1.3	19.8	159.5
Aug. 6	20 25.03	+00 44.9	2.552	3.523	-0.87	-2.5	19.6	160.1
Aug. 16	20 16.34	+00 19.9	2.526	3.469	-0.79	-3.5	19.5	154.9
Aug. 26	20 08.46	-00 14.7	2.527	3.415	-0.65	-4.1	19.3	146.4
Sept. 5	20 01.98	-00 55.9	2.552	3.360	-0.46	-4.4	19.2	136.9
Sept. 15	19 57.35	-01 40.1	2.598	3.304	-0.25	-4.4	19.2	127.1
Sept. 25	19 54.87	-02 23.9	2.661	3.246	-0.02	-4.1	19.1	117.4
Oct. 5	19 54.62	-03 04.5	2.734	3.188	+0.20	-3.5	19.0	108.0
Oct. 15	19 56.59	-03 39.7	2.814	3.129	+0.41	-2.8	18.9	99.0
Oct. 25	20 00.69	-04 07.5	2.897	3.069	+0.60	-1.9	18.8	90.4
Nov. 4	20 06.73	-04 26.8	2.979	3.009	+0.78	-1.0	18.7	82.2
Nov. 14	20 14.55	-04 36.7	3.056	2.947	+0.94	0.0	18.6	74.3
Nov. 24	20 23.96	-04 36.6	3.126	2.884	+1.08	+1.1	18.5	66.8
Dec. 4	20 34.79	-04 25.9	3.187	2.821	+1.21	+2.1	18.4	59.7
Dec. 14	20 46.88	-04 04.6	3.237	2.756	+1.32	+3.2	18.3	52.8
Dec. 24	21 00.09	-03 32.3	3.275	2.691	+1.42	+4.3	18.1	46.3
Jan. 3	21 14.30	-02 49.2	3.301	2.625	+1.51	+5.4	17.9	40.0
Jan. 13	21 29.41	-01 55.3	3.312	2.558	+1.59	+6.4	17.7	34.1
Jan. 23	21 45.35	-00 50.8	3.310	2.491	+1.67	+7.5	17.5	28.5
Feb. 2	22 02.06	+00 23.9	3.295	2.422	+1.75	+8.5	17.3	23.4
Feb. 12	22 19.51	+01 48.4	3.267	2.354	+1.82	+9.4	17.1	18.7
Feb. 22	22 37.71	+03 22.2	3.227	2.285	+1.90	+10.2	16.8	14.8
Mar. 3	22 56.66	+05 04.5	3.176	2.215	+1.98	+11.0	16.6	11.9
Mar. 13	23 16.42	+06 54.7	3.115	2.146	+2.06	+11.7	16.3	10.7
Mar. 23	23 37.05	+08 51.4	3.045	2.076	+2.16	+12.2	16.0	11.2

Comet P/1999 V1 (Catalina)

Epoch = 2015 June 27.0 TT
 T = 2016 Aug. 30.68911 TT
 Peri. = 186.89768
 Node = 294.37997 2000.0
 Incl. = 15.56385
 q = 2.9535353 AU
 e = 0.5507580
 a = 6.5744861 AU
 n = 0.05846707
 P = 16.86 years

$$m1 = 8.6 + 5 \log(\Delta) + 15.0 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. °	Delta	r	Variation for T=+1 day	m1	Mot. /PA °	Elong. °
Jan. 8	00 17.29	+18 53.3	4.942	4.949	-0.28 -2.1	22.7	7.1/ 89	84.7
Jan. 18	00 22.30	+18 53.8	5.050	4.905	-0.28 -2.0	22.6	8.6/ 84	75.9
Jan. 28	00 28.33	+19 03.0	5.152	4.861	-0.28 -2.0	22.6	10.0/ 80	67.4
Feb. 7	00 35.27	+19 20.2	5.246	4.817	-0.28 -1.9	22.6	11.2/ 77	59.3
Feb. 17	00 43.00	+19 44.7	5.327	4.772	-0.29 -1.8	22.6	12.3/ 75	51.3
Feb. 27	00 51.43	+20 15.8	5.394	4.728	-0.29 -1.8	22.6	13.2/ 73	43.7
Mar. 9	01 00.47	+20 52.6	5.446	4.684	-0.30 -1.7	22.5	14.0/ 72	36.4
Mar. 19	01 10.03	+21 34.4	5.481	4.640	-0.31 -1.7	22.5	14.7/ 71	29.4
Mar. 29	01 20.05	+22 20.3	5.498	4.596	-0.32 -1.7	22.4	15.2/ 71	22.9
Apr. 8	01 30.44	+23 09.5	5.497	4.551	-0.34 -1.6	22.4	15.6/ 70	17.3
Apr. 18	01 41.15	+24 01.4	5.477	4.507	-0.35 -1.6	22.3	15.9/ 70	13.5
Apr. 28	01 52.13	+24 55.2	5.439	4.463	-0.37 -1.5	22.2	16.1/ 69	12.7
May 8	02 03.30	+25 50.3	5.383	4.419	-0.39 -1.5	22.1	16.2/ 69	15.5
May 18	02 14.62	+26 46.1	5.309	4.374	-0.41 -1.4	22.0	16.2/ 69	20.3
May 28	02 26.02	+27 42.2	5.218	4.330	-0.43 -1.3	21.9	16.1/ 69	26.0
June 7	02 37.43	+28 38.0	5.112	4.286	-0.45 -1.3	21.8	15.9/ 69	32.1
June 17	02 48.78	+29 33.2	4.990	4.243	-0.48 -1.2	21.7	15.5/ 69	38.5
June 27	02 59.99	+30 27.4	4.855	4.199	-0.51 -1.1	21.6	15.1/ 69	45.0
July 7	03 10.96	+31 20.3	4.708	4.155	-0.54 -1.0	21.4	14.5/ 69	51.7
July 17	03 21.57	+32 11.7	4.550	4.112	-0.57 -0.9	21.3	13.7/ 68	58.5
July 27	03 31.69	+33 01.4	4.383	4.069	-0.61 -0.8	21.2	12.8/ 67	65.5
Aug. 6	03 41.17	+33 49.1	4.209	4.026	-0.65 -0.6	21.0	11.7/ 66	72.7
Aug. 16	03 49.83	+34 34.8	4.030	3.983	-0.69 -0.5	20.8	10.3/ 65	80.1
Aug. 26	03 57.46	+35 18.2	3.848	3.940	-0.74 -0.4	20.7	8.8/ 62	87.8
Sept. 5	04 03.85	+35 59.0	3.667	3.898	-0.79 -0.3	20.5	7.0/ 57	95.7
Sept. 15	04 08.76	+36 36.6	3.488	3.856	-0.84 -0.2	20.3	5.1/ 48	104.0
Sept. 25	04 11.93	+37 10.1	3.316	3.815	-0.90 -0.2	20.1	3.2/ 28	112.6
Oct. 5	04 13.16	+37 38.2	3.154	3.774	-0.95 -0.2	20.0	2.3/334	121.5
Oct. 15	04 12.31	+37 59.1	3.005	3.733	-1.01 -0.3	19.8	3.7/288	130.8
Oct. 25	04 09.35	+38 10.3	2.874	3.693	-1.06 -0.4	19.6	5.8/270	140.3
Nov. 4	04 04.46	+38 09.6	2.764	3.654	-1.10 -0.6	19.5	7.7/259	149.6
Nov. 14	03 58.05	+37 54.7	2.678	3.615	-1.12 -0.9	19.3	9.1/251	158.0
Nov. 24	03 50.78	+37 24.7	2.621	3.576	-1.13 -1.1	19.2	9.8/244	162.9
Dec. 4	03 43.47	+36 40.5	2.591	3.539	-1.11 -1.4	19.1	9.7/235	161.1
Dec. 14	03 36.94	+35 45.0	2.591	3.502	-1.09 -1.5	19.0	8.7/225	153.9
Dec. 24	03 31.93	+34 42.6	2.617	3.465	-1.05 -1.5	19.0	7.4/210	144.5
Jan. 3	03 28.96	+33 38.5	2.667	3.430	-1.00 -1.5	19.0	6.2/188	134.6
Jan. 13	03 28.29	+32 37.0	2.737	3.395	-0.96 -1.3	19.0	6.0/158	124.8
Jan. 23	03 30.00	+31 41.5	2.823	3.361	-0.92 -1.1	18.9	7.0/133	115.2
Feb. 2	03 34.00	+30 53.9	2.920	3.328	-0.88 -0.9	19.0	8.8/116	106.0
Feb. 12	03 40.14	+30 14.6	3.024	3.297	-0.85 -0.6	19.0	10.9/106	97.2
Feb. 22	03 48.20	+29 43.4	3.133	3.266	-0.83 -0.3	19.0	13.0/100	88.8
Mar. 3	03 57.97	+29 18.9	3.242	3.236	-0.81 0.0	19.0	14.9/ 97	80.9
Mar. 13	04 09.24	+28 59.7	3.348	3.208	-0.80 +0.3	19.0	16.6/ 95	73.3
Mar. 23	04 21.82	+28 44.2	3.451	3.180	-0.78 +0.6	19.0	18.1/ 94	66.1

Comet 314P/Montani

Epoch = 2015 June 27.0 TT
 T = 2016 Oct. 7.47097 TT
 Peri. = 213.67646
 Node = 267.70528 2000.0
 Incl. = 3.97796
 q = 4.2346247 AU
 e = 0.4170141
 a = 7.2636829 AU
 n = 0.05034644
 P = 19.58 years

$$m1 = 9.6 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	02 21.98	+17 01.2	4.901	5.342	+0.12	-0.2	20.3	111.6
Jan. 18	02 23.17	+16 58.8	5.026	5.314	+0.24	+0.4	20.4	101.7
Jan. 28	02 25.62	+17 02.6	5.157	5.286	+0.36	+1.0	20.4	92.1
Feb. 7	02 29.25	+17 12.3	5.289	5.258	+0.47	+1.5	20.4	82.8
Feb. 17	02 33.96	+17 27.3	5.418	5.231	+0.57	+2.0	20.5	73.9
Feb. 27	02 39.67	+17 47.0	5.540	5.203	+0.66	+2.3	20.5	65.2
Mar. 9	02 46.25	+18 10.4	5.653	5.176	+0.74	+2.6	20.5	56.8
Mar. 19	02 53.61	+18 36.7	5.753	5.149	+0.80	+2.9	20.5	48.6
Mar. 29	03 01.66	+19 05.3	5.838	5.123	+0.86	+3.0	20.5	40.7
Apr. 8	03 10.29	+19 35.2	5.907	5.096	+0.91	+3.1	20.5	32.9
Apr. 18	03 19.41	+20 05.7	5.959	5.070	+0.95	+3.1	20.5	25.3
Apr. 28	03 28.95	+20 36.3	5.992	5.043	+0.99	+3.0	20.5	17.9
May 8	03 38.82	+21 06.3	6.006	5.017	+1.01	+2.9	20.5	10.6
May 18	03 48.94	+21 35.1	6.001	4.992	+1.03	+2.7	20.5	3.6
May 28	03 59.24	+22 02.4	5.976	4.966	+1.04	+2.5	20.4	4.2
June 7	04 09.63	+22 27.7	5.932	4.941	+1.04	+2.3	20.4	11.2
June 17	04 20.05	+22 50.8	5.870	4.916	+1.03	+2.1	20.4	18.3
June 27	04 30.39	+23 11.4	5.790	4.891	+1.02	+1.8	20.3	25.4
July 7	04 40.57	+23 29.3	5.693	4.867	+0.99	+1.5	20.2	32.6
July 17	04 50.51	+23 44.6	5.580	4.843	+0.96	+1.2	20.2	39.8
July 27	05 00.09	+23 57.0	5.452	4.819	+0.91	+1.0	20.1	47.1
Aug. 6	05 09.20	+24 06.8	5.311	4.795	+0.85	+0.7	20.0	54.6
Aug. 16	05 17.73	+24 14.1	5.159	4.772	+0.78	+0.5	19.9	62.3
Aug. 26	05 25.53	+24 19.1	4.997	4.749	+0.69	+0.3	19.9	70.1
Sept. 5	05 32.48	+24 22.0	4.829	4.727	+0.59	+0.1	19.8	78.2
Sept. 15	05 38.42	+24 23.1	4.657	4.705	+0.48	0.0	19.7	86.5
Sept. 25	05 43.20	+24 22.8	4.484	4.683	+0.35	-0.2	19.6	95.2
Oct. 5	05 46.68	+24 21.3	4.313	4.661	+0.20	-0.2	19.5	104.3
Oct. 15	05 48.71	+24 18.8	4.149	4.640	+0.05	-0.3	19.4	113.7
Oct. 25	05 49.21	+24 15.4	3.996	4.620	-0.11	-0.4	19.3	123.5
Nov. 4	05 48.15	+24 11.1	3.858	4.599	-0.26	-0.5	19.2	133.7
Nov. 14	05 45.58	+24 05.8	3.739	4.580	-0.39	-0.7	19.1	144.4
Nov. 24	05 41.66	+23 59.2	3.644	4.560	-0.50	-0.8	19.0	155.3
Dec. 4	05 36.70	+23 51.2	3.577	4.541	-0.56	-0.9	18.9	166.6
Dec. 14	05 31.11	+23 41.7	3.539	4.523	-0.57	-1.1	18.9	178.0
Dec. 24	05 25.40	+23 31.0	3.532	4.505	-0.53	-1.1	18.9	170.5
Jan. 3	05 20.08	+23 19.9	3.555	4.488	-0.45	-1.1	18.9	159.0
Jan. 13	05 15.62	+23 08.9	3.607	4.471	-0.32	-1.0	18.9	147.8
Jan. 23	05 12.42	+22 59.1	3.685	4.454	-0.17	-0.8	18.9	136.9
Feb. 2	05 10.73	+22 51.2	3.783	4.438	-0.01	-0.6	19.0	126.3
Feb. 12	05 10.66	+22 45.5	3.898	4.423	+0.16	-0.3	19.0	116.2
Feb. 22	05 12.26	+22 42.1	4.025	4.408	+0.32	-0.1	19.1	106.4
Mar. 3	05 15.45	+22 40.7	4.159	4.393	+0.47	0.0	19.1	97.1
Mar. 13	05 20.14	+22 40.9	4.297	4.380	+0.61	+0.1	19.2	88.2
Mar. 23	05 26.20	+22 42.0	4.434	4.366	+0.73	+0.1	19.2	79.6

Comet 94P/Russell

Epoch = 2015 June 27.0 TT
 T = 2016 Oct. 27.70210 TT
 Peri. = 92.75866
 Node = 70.88850 2000.0
 Incl. = 6.18543
 q = 2.2304852 AU
 e = 0.3644823
 a = 3.5097137 AU
 n = 0.14989824
 P = 6.58 years

$$m_1 = 11.6 + 5 \log(\Delta) + 12.5 \log(r(t-30))$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m ₁	Elong. °
Jan. 8	01 01.96	+02 01.6	4.013	4.096	+0.40 +4.1	22.4	87.9
Jan. 18	01 05.99	+02 42.3	4.144	4.071	+0.53 +4.7	22.4	78.9
Jan. 28	01 11.26	+03 29.3	4.269	4.045	+0.64 +5.2	22.4	70.3
Feb. 7	01 17.63	+04 21.5	4.386	4.018	+0.73 +5.6	22.5	62.0
Feb. 17	01 24.96	+05 17.9	4.492	3.991	+0.82 +6.0	22.5	53.9
Feb. 27	01 33.14	+06 17.4	4.585	3.963	+0.89 +6.2	22.5	46.1
Mar. 9	01 42.06	+07 19.2	4.663	3.935	+0.96 +6.3	22.5	38.5
Mar. 19	01 51.61	+08 22.4	4.725	3.907	+1.01 +6.4	22.5	31.2
Mar. 29	02 01.72	+09 26.3	4.769	3.878	+1.06 +6.4	22.5	24.0
Apr. 8	02 12.30	+10 30.2	4.795	3.849	+1.10 +6.3	22.4	17.0
Apr. 18	02 23.28	+11 33.3	4.803	3.819	+1.13 +6.2	22.4	10.2
Apr. 28	02 34.60	+12 35.3	4.793	3.789	+1.16 +6.0	22.4	3.9
May 8	02 46.19	+13 35.4	4.764	3.759	+1.18 +5.8	22.3	4.3
May 18	02 58.00	+14 33.2	4.718	3.728	+1.20 +5.5	22.2	10.5
May 28	03 09.96	+15 28.2	4.654	3.697	+1.20 +5.2	22.2	17.0
June 7	03 22.00	+16 20.2	4.574	3.665	+1.21 +4.9	22.1	23.5
June 17	03 34.07	+17 08.7	4.477	3.633	+1.20 +4.5	22.0	30.0
June 27	03 46.08	+17 53.6	4.366	3.601	+1.19 +4.1	21.9	36.6
July 7	03 57.94	+18 34.6	4.241	3.568	+1.16 +3.7	21.8	43.2
July 17	04 09.56	+19 11.6	4.103	3.535	+1.13 +3.3	21.7	49.9
July 27	04 20.83	+19 44.6	3.954	3.502	+1.08 +2.9	21.5	56.7
Aug. 6	04 31.61	+20 13.8	3.796	3.468	+1.01 +2.5	21.4	63.7
Aug. 16	04 41.76	+20 39.2	3.630	3.434	+0.93 +2.2	21.3	70.9
Aug. 26	04 51.08	+21 01.2	3.457	3.400	+0.83 +1.9	21.1	78.3
Sept. 5	04 59.40	+21 20.2	3.282	3.365	+0.71 +1.6	20.9	86.0
Sept. 15	05 06.47	+21 36.6	3.104	3.330	+0.56 +1.4	20.8	94.1
Sept. 25	05 12.04	+21 51.0	2.929	3.295	+0.38 +1.3	20.6	102.5
Oct. 5	05 15.85	+22 03.9	2.759	3.260	+0.18 +1.2	20.4	111.4
Oct. 15	05 17.62	+22 15.8	2.597	3.225	-0.05 +1.1	20.2	120.9
Oct. 25	05 17.12	+22 27.0	2.448	3.189	-0.29 +1.0	20.0	130.9
Nov. 4	05 14.22	+22 37.3	2.315	3.153	-0.53 +0.9	19.8	141.6
Nov. 14	05 08.96	+22 46.3	2.204	3.118	-0.73 +0.7	19.7	152.8
Nov. 24	05 01.64	+22 53.4	2.119	3.082	-0.88 +0.5	19.5	164.6
Dec. 4	04 52.87	+22 58.0	2.061	3.046	-0.94 +0.2	19.4	176.7
Dec. 14	04 43.51	+23 00.1	2.034	3.010	-0.89 +0.1	19.3	171.0
Dec. 24	04 34.60	+23 00.7	2.036	2.974	-0.75 +0.1	19.3	158.8
Jan. 3	04 27.11	+23 01.5	2.065	2.938	-0.53 +0.3	19.2	146.9
Jan. 13	04 21.77	+23 04.4	2.118	2.902	-0.27 +0.7	19.2	135.5
Jan. 23	04 19.05	+23 11.3	2.190	2.867	+0.01 +1.2	19.2	124.7
Feb. 2	04 19.12	+23 23.0	2.276	2.832	+0.28 +1.7	19.2	114.6
Feb. 12	04 21.94	+23 39.6	2.371	2.797	+0.54 +2.1	19.3	105.2
Feb. 22	04 27.36	+24 00.5	2.472	2.762	+0.78 +2.4	19.3	96.4
Mar. 3	04 35.14	+24 24.5	2.574	2.728	+0.99 +2.6	19.3	88.1
Mar. 13	04 45.05	+24 50.1	2.675	2.694	+1.18 +2.6	19.3	80.4
Mar. 23	04 56.86	+25 15.7	2.772	2.660	+1.35 +2.4	19.3	73.2

Comet 315P/LONEOS

Epoch = 2015 June 27.0 TT
 T = 2016 Dec. 6.70797 TT
 Peri. = 67.13555
 Node = 69.55683 2000.0
 Incl. = 17.91207
 q = 2.4212383 AU
 e = 0.5172466
 a = 5.0154764 AU
 n = 0.08774771
 P = 11.23 years

H = 14.0 , G = 0.15 (r>3.6AU)
 m1 = 4.6 + 5 log(Delta) + 22.5 log(r) (r<3.6AU)

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion	Mag.	Elong.	
2015/16	h m	° '			m		°	
Jan. 8	00 40.36	-11 09.5	5.170	5.058	+0.35	+5.8	21.8	78.0
Jan. 18	00 43.81	-10 11.1	5.282	5.019	+0.45	+6.2	21.8	69.3
Jan. 28	00 48.27	-09 09.2	5.385	4.979	+0.53	+6.5	21.8	60.8
Feb. 7	00 53.61	-08 04.7	5.476	4.939	+0.61	+6.6	21.8	52.6
Feb. 17	00 59.73	-06 58.4	5.552	4.898	+0.68	+6.7	21.7	44.6
Feb. 27	01 06.52	-05 51.0	5.613	4.857	+0.74	+6.8	21.7	36.9
Mar. 9	01 13.89	-04 43.3	5.655	4.816	+0.78	+6.7	21.6	29.5
Mar. 19	01 21.74	-03 35.9	5.679	4.775	+0.82	+6.7	21.6	22.6
Mar. 29	01 29.99	-02 29.3	5.683	4.733	+0.86	+6.5	21.5	16.3
Apr. 8	01 38.55	-01 24.0	5.667	4.691	+0.88	+6.3	21.4	11.8
Apr. 18	01 47.36	-00 20.6	5.630	4.649	+0.90	+6.1	21.4	11.0
Apr. 28	01 56.34	+00 40.5	5.574	4.606	+0.91	+5.8	21.4	14.4
May 8	02 05.42	+01 38.9	5.499	4.563	+0.91	+5.5	21.4	19.9
May 18	02 14.53	+02 34.1	5.405	4.520	+0.91	+5.2	21.4	26.2
May 28	02 23.60	+03 25.8	5.294	4.477	+0.89	+4.8	21.4	32.9
June 7	02 32.54	+04 13.7	5.166	4.433	+0.87	+4.4	21.4	39.7
June 17	02 41.28	+04 57.3	5.023	4.389	+0.84	+3.9	21.4	46.7
June 27	02 49.70	+05 36.5	4.867	4.345	+0.80	+3.4	21.3	53.8
July 7	02 57.71	+06 10.9	4.699	4.301	+0.75	+2.9	21.3	61.1
July 17	03 05.20	+06 40.3	4.522	4.256	+0.68	+2.4	21.2	68.5
July 27	03 12.00	+07 04.5	4.337	4.211	+0.60	+1.9	21.1	76.2
Aug. 6	03 17.99	+07 23.4	4.147	4.166	+0.50	+1.4	21.0	84.1
Aug. 16	03 22.98	+07 37.0	3.955	4.121	+0.38	+0.8	20.9	92.2
Aug. 26	03 26.80	+07 45.4	3.764	4.075	+0.25	+0.3	20.7	100.7
Sept. 5	03 29.26	+07 48.8	3.578	4.030	+0.09	-0.1	20.6	109.6
Sept. 15	03 30.18	+07 47.6	3.399	3.984	-0.08	-0.5	20.4	118.9
Sept. 25	03 29.42	+07 42.4	3.233	3.938	-0.25	-0.8	20.2	128.6
Oct. 5	03 26.90	+07 34.3	3.084	3.892	-0.43	-1.0	20.0	138.7
Oct. 15	03 22.65	+07 24.5	2.955	3.846	-0.58	-1.0	19.8	149.1
Oct. 25	03 16.85	+07 14.9	2.852	3.799	-0.70	-0.7	19.6	159.5
Nov. 4	03 09.85	+07 07.5	2.776	3.753	-0.77	-0.3	19.4	168.2
Nov. 14	03 02.17	+07 04.6	2.731	3.706	-0.77	+0.4	19.3	168.6
Nov. 24	02 54.45	+07 08.2	2.716	3.660	-0.71	+1.2	19.4	160.0
Dec. 4	02 47.36	+07 20.1	2.731	3.614	-0.59	+2.1	19.5	149.3
Dec. 14	02 41.46	+07 41.4	2.771	3.567	-0.42	+3.1	19.2	138.4
Dec. 24	02 37.23	+08 12.4	2.833	3.521	-0.23	+4.0	19.2	127.6
Jan. 3	02 34.91	+08 52.8	2.913	3.475	-0.03	+4.9	19.1	117.2
Jan. 13	02 34.63	+09 41.8	3.005	3.429	+0.18	+5.7	19.0	107.3
Jan. 23	02 36.38	+10 38.6	3.104	3.383	+0.37	+6.3	19.0	97.9
Feb. 2	02 40.06	+11 41.7	3.207	3.337	+0.55	+6.8	18.9	88.9
Feb. 12	02 45.55	+12 50.0	3.309	3.292	+0.71	+7.2	18.8	80.4
Feb. 22	02 52.69	+14 02.3	3.407	3.247	+0.86	+7.5	18.8	72.4
Mar. 3	03 01.34	+15 17.3	3.498	3.202	+1.00	+7.7	18.7	64.7
Mar. 13	03 11.37	+16 33.9	3.581	3.158	+1.13	+7.7	18.6	57.3
Mar. 23	03 22.65	+17 51.1	3.654	3.114	+1.24	+7.7	18.5	50.3

Comet C/2014 OE4 (PANSTARRS)

Epoch = 2015 June 27.0 TT
 T = 2016 Dec. 10.30855 TT
 Peri. = 65.78449
 Node = 240.41255 2000.0
 Incl. = 81.33699
 q = 6.2376217 AU
 e = 1.0002284

$$m_1 = 6.2 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	16 28.20	-10 37.2	8.542	7.831	+0.43	+3.1	19.8	41.4
Jan. 18	16 32.47	-10 05.9	8.383	7.792	+0.38	+3.6	19.7	50.4
Jan. 28	16 36.27	-09 30.0	8.207	7.753	+0.32	+4.1	19.7	59.5
Feb. 7	16 39.50	-08 49.3	8.018	7.715	+0.26	+4.6	19.6	68.7
Feb. 17	16 42.06	-08 03.7	7.820	7.677	+0.18	+5.1	19.5	78.1
Feb. 27	16 43.87	-07 13.0	7.617	7.639	+0.10	+5.5	19.4	87.5
Mar. 9	16 44.84	-06 17.6	7.415	7.601	+0.01	+6.0	19.4	97.0
Mar. 19	16 44.93	-05 17.7	7.218	7.564	-0.08	+6.4	19.3	106.6
Mar. 29	16 44.08	-04 13.9	7.032	7.527	-0.18	+6.7	19.2	116.3
Apr. 8	16 42.31	-03 07.2	6.861	7.490	-0.27	+6.9	19.1	125.8
Apr. 18	16 39.66	-01 58.5	6.710	7.454	-0.35	+6.9	19.1	135.1
Apr. 28	16 36.18	-00 49.3	6.583	7.418	-0.41	+6.8	19.0	143.7
May 8	16 32.04	+00 18.8	6.484	7.383	-0.47	+6.5	18.9	151.1
May 18	16 27.38	+01 24.1	6.414	7.348	-0.50	+6.1	18.9	155.8
May 28	16 22.43	+02 24.9	6.375	7.313	-0.50	+5.5	18.9	156.2
June 7	16 17.41	+03 19.9	6.366	7.279	-0.49	+4.8	18.8	152.2
June 17	16 12.56	+04 08.0	6.387	7.245	-0.45	+4.0	18.8	145.3
June 27	16 08.10	+04 48.5	6.434	7.212	-0.39	+3.3	18.8	137.0
July 7	16 04.22	+05 21.3	6.505	7.178	-0.31	+2.5	18.8	128.2
July 17	16 01.07	+05 46.5	6.595	7.146	-0.23	+1.8	18.8	119.2
July 27	15 58.76	+06 05.0	6.699	7.114	-0.14	+1.2	18.9	110.2
Aug. 6	15 57.36	+06 17.4	6.813	7.082	-0.05	+0.8	18.9	101.3
Aug. 16	15 56.89	+06 25.0	6.932	7.050	+0.05	+0.4	18.9	92.5
Aug. 26	15 57.34	+06 28.9	7.053	7.020	+0.13	+0.1	18.9	84.0
Sept. 5	15 58.69	+06 30.2	7.169	6.989	+0.22	0.0	18.9	75.7
Sept. 15	16 00.88	+06 30.2	7.279	6.959	+0.30	0.0	18.9	67.7
Sept. 25	16 03.85	+06 29.8	7.377	6.930	+0.37	+0.1	18.9	60.0
Oct. 5	16 07.52	+06 30.4	7.462	6.901	+0.43	+0.2	19.0	52.6
Oct. 15	16 11.83	+06 32.7	7.531	6.872	+0.49	+0.5	19.0	45.8
Oct. 25	16 16.68	+06 37.9	7.581	6.844	+0.53	+0.9	19.0	39.6
Nov. 4	16 21.99	+06 46.9	7.611	6.817	+0.57	+1.4	18.9	34.5
Nov. 14	16 27.67	+07 00.4	7.621	6.790	+0.60	+1.9	18.9	30.9
Nov. 24	16 33.64	+07 19.3	7.608	6.764	+0.62	+2.5	18.9	29.2
Dec. 4	16 39.79	+07 44.3	7.575	6.738	+0.62	+3.2	18.9	29.9
Dec. 14	16 46.03	+08 16.3	7.520	6.713	+0.62	+3.9	18.9	32.7
Dec. 24	16 52.26	+08 55.7	7.445	6.688	+0.61	+4.7	18.8	37.2
Jan. 3	16 58.38	+09 43.1	7.352	6.664	+0.59	+5.6	18.8	42.8
Jan. 13	17 04.27	+10 38.9	7.242	6.640	+0.56	+6.5	18.7	49.1
Jan. 23	17 09.83	+11 43.6	7.119	6.617	+0.51	+7.4	18.7	55.9
Feb. 2	17 14.94	+12 57.1	6.984	6.595	+0.45	+8.2	18.6	63.0
Feb. 12	17 19.48	+14 19.4	6.841	6.573	+0.39	+9.1	18.6	70.2
Feb. 22	17 23.33	+15 50.3	6.693	6.552	+0.31	+9.9	18.5	77.6
Mar. 3	17 26.38	+17 29.0	6.546	6.532	+0.21	+10.6	18.4	84.8
Mar. 13	17 28.52	+19 14.6	6.401	6.512	+0.11	+11.1	18.4	92.0
Mar. 23	17 29.63	+21 05.5	6.263	6.492	0.00	+11.4	18.3	98.9

Comet 188P/LINEAR-Mueller

Epoch = 2015 June 27.0 TT
 T = 2017 Feb. 17.22967 TT
 Peri. = 26.83271
 Node = 358.98635 2000.0
 Incl. = 10.51133
 q = 2.5640333 AU
 e = 0.4149070
 a = 4.3822662 AU
 n = 0.10743751
 P = 9.17 years

$$m1 = 10.8 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	17 24.84	-31 57.1	5.739	4.876	+1.06 -1.5	21.5	26.1
Jan. 18	17 35.42	-32 12.2	5.634	4.846	+1.03 -1.4	21.4	33.7
Jan. 28	17 45.69	-32 26.7	5.510	4.816	+0.98 -1.4	21.3	41.4
Feb. 7	17 55.52	-32 40.8	5.370	4.786	+0.93 -1.4	21.2	49.3
Feb. 17	18 04.78	-32 54.8	5.216	4.755	+0.85 -1.5	21.2	57.3
Feb. 27	18 13.32	-33 09.3	5.050	4.724	+0.77 -1.5	21.1	65.4
Mar. 9	18 20.99	-33 24.8	4.874	4.693	+0.66 -1.7	21.0	73.7
Mar. 19	18 27.64	-33 41.6	4.692	4.661	+0.54 -1.9	20.8	82.1
Mar. 29	18 33.08	-34 00.3	4.507	4.630	+0.41 -2.1	20.7	90.8
Apr. 8	18 37.16	-34 21.1	4.323	4.597	+0.25 -2.3	20.6	99.6
Apr. 18	18 39.70	-34 44.2	4.143	4.565	+0.08 -2.5	20.5	108.7
Apr. 28	18 40.55	-35 09.2	3.971	4.532	-0.09 -2.6	20.4	118.0
May 8	18 39.61	-35 35.3	3.812	4.499	-0.28 -2.6	20.2	127.6
May 18	18 36.84	-36 01.4	3.670	4.466	-0.45 -2.4	20.1	137.3
May 28	18 32.29	-36 25.5	3.548	4.433	-0.61 -2.0	20.0	147.0
June 7	18 26.20	-36 45.5	3.450	4.399	-0.73 -1.4	19.9	156.3
June 17	18 18.92	-36 59.3	3.379	4.365	-0.79 -0.6	19.8	164.0
June 27	18 10.97	-37 05.0	3.337	4.330	-0.80 +0.3	19.8	166.1
July 7	18 02.99	-37 01.8	3.323	4.296	-0.74 +1.2	19.7	160.7
July 17	17 55.61	-36 50.2	3.337	4.261	-0.62 +1.9	19.7	152.0
July 27	17 49.39	-36 31.3	3.376	4.226	-0.46 +2.4	19.7	142.3
Aug. 6	17 44.78	-36 07.2	3.438	4.190	-0.27 +2.7	19.7	132.5
Aug. 16	17 42.05	-35 39.9	3.518	4.155	-0.07 +2.9	19.7	122.8
Aug. 26	17 41.32	-35 11.4	3.613	4.119	+0.13 +2.8	19.7	113.3
Sept. 5	17 42.60	-34 43.0	3.718	4.083	+0.32 +2.7	19.8	104.1
Sept. 15	17 45.79	-34 15.5	3.828	4.047	+0.50 +2.6	19.8	95.3
Sept. 25	17 50.79	-33 49.3	3.941	4.010	+0.66 +2.5	19.8	86.7
Oct. 5	17 57.40	-33 24.1	4.052	3.974	+0.81 +2.5	19.8	78.4
Oct. 15	18 05.48	-32 59.6	4.159	3.937	+0.94 +2.4	19.8	70.4
Oct. 25	18 14.86	-32 35.2	4.258	3.900	+1.05 +2.5	19.9	62.5
Nov. 4	18 25.36	-32 10.1	4.348	3.863	+1.15 +2.6	19.9	54.9
Nov. 14	18 36.84	-31 43.7	4.425	3.826	+1.23 +2.8	19.9	47.4
Nov. 24	18 49.15	-31 15.3	4.490	3.789	+1.30 +3.1	19.8	40.2
Dec. 4	19 02.15	-30 44.2	4.539	3.752	+1.36 +3.4	19.8	33.0
Dec. 14	19 15.70	-30 10.1	4.573	3.714	+1.40 +3.8	19.8	26.1
Dec. 24	19 29.70	-29 32.4	4.590	3.677	+1.43 +4.1	19.8	19.4
Jan. 3	19 44.01	-28 51.0	4.589	3.639	+1.45 +4.5	19.7	13.2
Jan. 13	19 58.54	-28 05.8	4.572	3.602	+1.46 +4.9	19.7	8.4
Jan. 23	20 13.18	-27 16.7	4.537	3.564	+1.47 +5.3	19.6	7.7
Feb. 2	20 27.85	-26 23.9	4.486	3.527	+1.46 +5.6	19.5	11.8
Feb. 12	20 42.46	-25 27.6	4.418	3.490	+1.45 +5.9	19.5	17.6
Feb. 22	20 56.92	-24 28.3	4.334	3.452	+1.43 +6.2	19.4	23.8
Mar. 3	21 11.18	-23 26.4	4.236	3.415	+1.40 +6.4	19.3	30.1
Mar. 13	21 25.15	-22 22.5	4.124	3.378	+1.36 +6.5	19.2	36.6
Mar. 23	21 38.77	-21 17.1	4.000	3.341	+1.32 +6.6	19.0	43.0

Comet 176P/LINEAR

Epoch = 2015 June 27.0 TT
 T = 2017 Mar. 12.62221 TT
 Peri. = 35.51954
 Node = 345.94784 2000.0
 Incl. = 0.23482
 q = 2.5786790 AU

e = 0.1928160
 a = 3.1946607 AU
 n = 0.17261040
 P = 5.71 years

H = 15.2 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m	V	Elong. °
Jan. 8	16 01.35	-20 49.8	4.325	3.691	+1.12 -3.1	21.9	44.7
Jan. 18	16 12.57	-21 20.3	4.201	3.681	+1.06 -2.6	21.9	52.2
Jan. 28	16 23.17	-21 46.5	4.065	3.671	+0.98 -2.2	21.8	59.9
Feb. 7	16 32.98	-22 08.5	3.919	3.661	+0.89 -1.8	21.8	67.7
Feb. 17	16 41.83	-22 26.4	3.765	3.650	+0.77 -1.4	21.7	75.8
Feb. 27	16 49.52	-22 40.7	3.606	3.639	+0.63 -1.1	21.6	84.1
Mar. 9	16 55.86	-22 51.5	3.444	3.628	+0.48 -0.8	21.5	92.6
Mar. 19	17 00.62	-22 59.3	3.283	3.616	+0.30 -0.5	21.4	101.5
Mar. 29	17 03.60	-23 04.2	3.127	3.604	+0.10 -0.2	21.3	110.7
Apr. 8	17 04.64	-23 06.4	2.980	3.591	-0.10 +0.1	21.1	120.3
Apr. 18	17 03.61	-23 05.9	2.845	3.578	-0.31 +0.4	21.0	130.4
Apr. 28	17 00.50	-23 02.4	2.728	3.565	-0.50 +0.7	20.8	140.9
May 8	16 55.46	-22 55.6	2.631	3.552	-0.67 +1.0	20.6	151.7
May 18	16 48.80	-22 45.4	2.559	3.538	-0.78 +1.4	20.4	162.9
May 28	16 41.03	-22 31.8	2.514	3.524	-0.82 +1.6	20.1	174.3
June 7	16 32.85	-22 15.7	2.499	3.510	-0.79 +1.7	20.1	174.2
June 17	16 24.96	-21 58.5	2.512	3.495	-0.69 +1.7	20.3	162.7
June 27	16 18.06	-21 42.0	2.552	3.480	-0.54 +1.4	20.5	151.6
July 7	16 12.70	-21 28.1	2.617	3.465	-0.35 +1.0	20.7	140.8
July 17	16 09.21	-21 18.4	2.702	3.449	-0.14 +0.4	20.8	130.4
July 27	16 07.81	-21 13.9	2.804	3.434	+0.07 -0.1	20.9	120.5
Aug. 6	16 08.49	-21 14.9	2.918	3.418	+0.27 -0.6	21.1	111.1
Aug. 16	16 11.19	-21 21.2	3.040	3.401	+0.46 -1.1	21.2	102.2
Aug. 26	16 15.79	-21 32.0	3.167	3.385	+0.63 -1.4	21.3	93.6
Sept. 5	16 22.11	-21 46.5	3.294	3.368	+0.79 -1.7	21.3	85.5
Sept. 15	16 30.00	-22 03.4	3.420	3.351	+0.93 -1.8	21.4	77.6
Sept. 25	16 39.28	-22 21.7	3.541	3.334	+1.05 -1.8	21.4	70.0
Oct. 5	16 49.81	-22 40.1	3.655	3.316	+1.16 -1.7	21.5	62.6
Oct. 15	17 01.45	-22 57.4	3.761	3.299	+1.26 -1.5	21.5	55.4
Oct. 25	17 14.06	-23 12.7	3.856	3.281	+1.34 -1.2	21.5	48.4
Nov. 4	17 27.50	-23 24.8	3.939	3.263	+1.42 -0.8	21.5	41.5
Nov. 14	17 41.68	-23 33.1	4.009	3.245	+1.48 -0.4	21.4	34.7
Nov. 24	17 56.46	-23 36.6	4.064	3.226	+1.53 +0.2	21.4	28.0
Dec. 4	18 11.73	-23 34.8	4.106	3.208	+1.57 +0.8	21.3	21.4
Dec. 14	18 27.40	-23 27.2	4.131	3.190	+1.59 +1.4	21.2	14.8
Dec. 24	18 43.35	-23 13.6	4.141	3.171	+1.61 +2.0	21.3	8.3
Jan. 3	18 59.47	-22 53.6	4.135	3.152	+1.62 +2.6	21.3	1.9
Jan. 13	19 15.68	-22 27.3	4.113	3.133	+1.62 +3.2	21.2	4.6
Jan. 23	19 31.86	-21 54.9	4.075	3.115	+1.61 +3.8	21.2	11.0
Feb. 2	19 47.93	-21 16.6	4.022	3.096	+1.59 +4.4	21.2	17.3
Feb. 12	20 03.81	-20 32.9	3.955	3.077	+1.56 +4.9	21.1	23.7
Feb. 22	20 19.40	-19 44.2	3.874	3.058	+1.52 +5.3	21.0	30.0
Mar. 3	20 34.64	-18 51.3	3.780	3.039	+1.48 +5.6	20.8	36.4
Mar. 13	20 49.44	-17 54.9	3.674	3.020	+1.43 +5.9	20.7	42.7
Mar. 23	21 03.73	-16 55.9	3.557	3.001	+1.37 +6.1	20.7	49.1

Comet 172P/Yeung

Epoch = 2015 June 27.0 TT
 T = 2017 Mar. 12.62444 TT
 Peri. = 208.73006
 Node = 32.31639 2000.0
 Incl. = 11.16938
 q = 3.2981349 AU

e = 0.2162891
 a = 4.2083566 AU
 n = 0.11416560
 P = 8.63 years

H = 14.0 , G = 0.15

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		V	Elong. °
Jan. 8	09 15.30	+30 38.1	3.519	4.410	-0.60	+3.7	20.4	151.8
Jan. 18	09 09.31	+31 15.3	3.452	4.393	-0.69	+3.2	20.3	160.8
Jan. 28	09 02.38	+31 47.6	3.415	4.376	-0.73	+2.4	20.2	165.7
Feb. 7	08 55.08	+32 11.9	3.409	4.359	-0.71	+1.4	20.2	162.4
Feb. 17	08 48.00	+32 26.0	3.432	4.342	-0.62	+0.3	20.3	153.9
Feb. 27	08 41.76	+32 29.0	3.483	4.324	-0.49	-0.8	20.4	144.0
Mar. 9	08 36.84	+32 21.4	3.559	4.307	-0.33	-1.7	20.6	133.9
Mar. 19	08 33.55	+32 04.1	3.654	4.289	-0.15	-2.5	20.7	123.8
Mar. 29	08 32.08	+31 38.7	3.765	4.271	+0.04	-3.2	20.8	114.1
Apr. 8	08 32.43	+31 06.7	3.887	4.253	+0.21	-3.7	20.9	104.7
Apr. 18	08 34.53	+30 29.2	4.015	4.235	+0.37	-4.2	20.9	95.7
Apr. 28	08 38.24	+29 47.4	4.146	4.217	+0.51	-4.6	21.0	87.1
May 8	08 43.37	+29 01.8	4.276	4.199	+0.64	-4.9	21.1	78.9
May 18	08 49.75	+28 12.9	4.401	4.181	+0.74	-5.2	21.1	70.9
May 28	08 57.19	+27 21.0	4.519	4.163	+0.83	-5.5	21.1	63.3
June 7	09 05.53	+26 26.2	4.628	4.144	+0.91	-5.7	21.1	55.9
June 17	09 14.61	+25 28.9	4.726	4.126	+0.97	-6.0	21.1	48.7
June 27	09 24.30	+24 28.9	4.811	4.107	+1.02	-6.2	21.1	41.7
July 7	09 34.47	+23 26.7	4.881	4.089	+1.06	-6.4	21.1	34.9
July 17	09 45.03	+22 22.2	4.937	4.070	+1.09	-6.6	21.0	28.2
July 27	09 55.89	+21 15.7	4.977	4.052	+1.11	-6.8	21.0	21.8
Aug. 6	10 06.95	+20 07.6	5.000	4.033	+1.12	-7.0	20.9	15.7
Aug. 16	10 18.16	+18 58.0	5.006	4.015	+1.13	-7.1	20.8	10.4
Aug. 26	10 29.44	+17 47.5	4.995	3.996	+1.13	-7.1	20.7	7.7
Sept. 5	10 40.73	+16 36.4	4.967	3.978	+1.13	-7.1	20.8	10.0
Sept. 15	10 51.98	+15 25.2	4.921	3.959	+1.11	-7.1	20.8	15.2
Sept. 25	11 03.13	+14 14.5	4.858	3.940	+1.10	-7.0	20.8	21.3
Oct. 5	11 14.11	+13 04.8	4.778	3.922	+1.07	-6.8	20.9	27.8
Oct. 15	11 24.86	+11 56.9	4.683	3.904	+1.04	-6.5	20.9	34.6
Oct. 25	11 35.29	+10 51.5	4.573	3.885	+1.00	-6.2	20.9	41.6
Nov. 4	11 45.34	+09 49.2	4.448	3.867	+0.96	-5.8	20.9	48.7
Nov. 14	11 54.90	+08 51.0	4.311	3.849	+0.90	-5.3	20.8	56.1
Nov. 24	12 03.87	+07 57.8	4.164	3.830	+0.82	-4.7	20.8	63.7
Dec. 4	12 12.10	+07 10.4	4.008	3.812	+0.74	-4.1	20.7	71.5
Dec. 14	12 19.47	+06 29.7	3.845	3.794	+0.63	-3.3	20.6	79.7
Dec. 24	12 25.81	+05 56.7	3.679	3.776	+0.51	-2.5	20.6	88.1
Jan. 3	12 30.94	+05 32.1	3.513	3.759	+0.37	-1.5	20.4	96.8
Jan. 13	12 34.67	+05 16.7	3.349	3.741	+0.22	-0.6	20.3	106.0
Jan. 23	12 36.84	+05 10.8	3.193	3.724	+0.05	+0.4	20.2	115.5
Feb. 2	12 37.30	+05 14.3	3.048	3.706	-0.13	+1.2	20.0	125.4
Feb. 12	12 35.97	+05 26.7	2.918	3.689	-0.31	+2.0	19.8	135.7
Feb. 22	12 32.88	+05 46.6	2.808	3.672	-0.47	+2.5	19.7	146.3
Mar. 3	12 28.20	+06 11.4	2.722	3.656	-0.59	+2.7	19.5	157.1
Mar. 13	12 22.26	+06 38.2	2.663	3.639	-0.67	+2.5	19.3	167.2
Mar. 23	12 15.56	+07 03.1	2.634	3.623	-0.69	+2.0	19.2	171.8

Comet P/2001 F1 (NEAT)

Epoch = 2015 June 27.0 TT
 T = 2017 May 6.26839 TT
 Peri. = 80.50625
 Node = 92.70422 2000.0
 Incl. = 19.06656
 q = 4.1850654 AU
 e = 0.3573622
 a = 6.5123237 AU
 n = 0.05930620
 P = 16.62 years

$$m1 = 4.6 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000)		Decl.	Delta	r	Variation for T=+1 day		m1	Mot./PA	Elong.
	h	m	°						°	°
Jan. 8	05	11.24	+19 05.9	4.819	5.699	-0.32	-2.0	21.2	6.0/285	151.1
Jan. 18	05	07.17	+19 21.4	4.884	5.674	-0.31	-2.0	21.2	4.6/292	140.1
Jan. 28	05	04.16	+19 38.3	4.973	5.648	-0.30	-2.0	21.2	3.1/306	129.3
Feb. 7	05	02.37	+19 56.7	5.081	5.622	-0.30	-2.0	21.3	2.1/341	118.8
Feb. 17	05	01.87	+20 16.5	5.203	5.596	-0.29	-1.9	21.3	2.4/ 29	108.6
Feb. 27	05	02.71	+20 37.4	5.333	5.570	-0.28	-1.9	21.3	3.7/ 54	98.7
Mar. 9	05	04.82	+20 59.2	5.468	5.545	-0.28	-1.9	21.3	5.2/ 64	89.3
Mar. 19	05	08.15	+21 21.4	5.603	5.519	-0.27	-1.8	21.3	6.6/ 70	80.1
Mar. 29	05	12.59	+21 43.9	5.733	5.493	-0.27	-1.8	21.3	7.9/ 73	71.2
Apr. 8	05	18.03	+22 06.0	5.855	5.468	-0.27	-1.7	21.3	9.1/ 76	62.7
Apr. 18	05	24.37	+22 27.4	5.966	5.442	-0.27	-1.6	21.4	10.1/ 78	54.3
Apr. 28	05	31.49	+22 47.7	6.064	5.416	-0.27	-1.6	21.4	10.9/ 80	46.2
May 8	05	39.28	+23 06.7	6.146	5.391	-0.27	-1.5	21.3	11.6/ 81	38.3
May 18	05	47.64	+23 24.0	6.211	5.365	-0.28	-1.5	21.3	12.2/ 82	30.6
May 28	05	56.47	+23 39.4	6.258	5.340	-0.28	-1.4	21.3	12.7/ 83	23.0
June 7	06	05.67	+23 52.7	6.285	5.315	-0.29	-1.3	21.3	13.0/ 85	15.6
June 17	06	15.16	+24 04.0	6.293	5.289	-0.29	-1.3	21.3	13.3/ 86	8.2
June 27	06	24.84	+24 13.1	6.280	5.264	-0.30	-1.2	21.2	13.4/ 86	1.2
July 7	06	34.62	+24 20.2	6.248	5.239	-0.31	-1.1	21.2	13.4/ 87	6.6
July 17	06	44.43	+24 25.5	6.195	5.214	-0.31	-1.1	21.1	13.3/ 88	13.9
July 27	06	54.18	+24 29.1	6.123	5.189	-0.32	-1.0	21.0	13.1/ 88	21.2
Aug. 6	07	03.77	+24 31.5	6.032	5.164	-0.33	-1.0	21.0	12.8/ 89	28.6
Aug. 16	07	13.12	+24 33.1	5.923	5.140	-0.34	-0.9	20.9	12.3/ 89	36.1
Aug. 26	07	22.13	+24 34.3	5.798	5.115	-0.35	-0.8	20.8	11.7/ 89	43.7
Sept. 5	07	30.69	+24 35.8	5.658	5.091	-0.37	-0.8	20.7	10.9/ 88	51.4
Sept. 15	07	38.71	+24 38.4	5.505	5.066	-0.38	-0.7	20.6	10.0/ 87	59.3
Sept. 25	07	46.06	+24 42.8	5.340	5.042	-0.39	-0.7	20.5	8.9/ 85	67.5
Oct. 5	07	52.61	+24 49.8	5.168	5.018	-0.41	-0.6	20.4	7.7/ 82	75.8
Oct. 15	07	58.22	+25 00.4	4.990	4.994	-0.43	-0.6	20.3	6.3/ 76	84.5
Oct. 25	08	02.77	+25 15.3	4.811	4.970	-0.45	-0.6	20.2	4.9/ 66	93.4
Nov. 4	08	06.10	+25 35.3	4.633	4.947	-0.47	-0.5	20.1	3.7/ 46	102.7
Nov. 14	08	08.08	+26 00.9	4.462	4.923	-0.49	-0.5	20.0	3.2/ 13	112.3
Nov. 24	08	08.61	+26 32.3	4.301	4.900	-0.51	-0.6	19.8	3.9/340	122.3
Dec. 4	08	07.64	+27 08.9	4.155	4.877	-0.53	-0.6	19.7	5.3/321	132.6
Dec. 14	08	05.16	+27 49.9	4.030	4.855	-0.55	-0.7	19.6	6.7/311	143.2
Dec. 24	08	01.31	+28 33.5	3.929	4.832	-0.57	-0.8	19.5	7.9/304	153.9
Jan. 3	07	56.33	+29 17.6	3.856	4.810	-0.58	-0.9	19.5	8.6/300	164.1
Jan. 13	07	50.58	+29 59.6	3.814	4.787	-0.59	-1.0	19.4	8.7/296	170.9
Jan. 23	07	44.53	+30 37.3	3.802	4.766	-0.59	-1.1	19.4	8.1/293	166.7
Feb. 2	07	38.72	+31 08.9	3.822	4.744	-0.59	-1.2	19.3	7.0/291	156.9
Feb. 12	07	33.63	+31 33.4	3.869	4.723	-0.58	-1.3	19.3	5.3/289	146.3
Feb. 22	07	29.71	+31 50.6	3.942	4.702	-0.56	-1.4	19.3	3.3/288	135.7
Mar. 3	07	27.24	+32 01.0	4.036	4.681	-0.55	-1.4	19.4	1.1/292	125.4
Mar. 13	07	26.42	+32 05.3	4.146	4.660	-0.53	-1.4	19.4	1.1/ 95	115.4
Mar. 23	07	27.28	+32 04.3	4.268	4.640	-0.51	-1.4	19.4	3.2/ 99	105.8

Comet C/2014 B1 (Schwartz)

Epoch = 2015 June 27.0 TT
 T = 2017 Sept. 7.26176 TT
 Peri. = 345.64338
 Node = 161.38569 2000.0
 Incl. = 28.36962
 q = 9.5685965 AU
 e = 1.0036305

$$m1 = 3.0 + 5 \log(\Delta) + 10.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° ' "			m	' "		°
Jan. 8	07 08.05	-03 07.0	10.070	10.966	-0.24	+1.3	18.4	154.5
Jan. 18	07 05.66	-02 54.4	10.053	10.940	-0.22	+1.7	18.4	153.2
Jan. 28	07 03.41	-02 37.6	10.063	10.914	-0.20	+2.0	18.4	148.3
Feb. 7	07 01.45	-02 17.2	10.101	10.888	-0.16	+2.3	18.4	141.3
Feb. 17	06 59.88	-01 53.9	10.163	10.862	-0.11	+2.5	18.4	133.1
Feb. 27	06 58.80	-01 28.5	10.246	10.837	-0.05	+2.7	18.4	124.4
Mar. 9	06 58.28	-01 02.0	10.347	10.812	+0.01	+2.7	18.4	115.5
Mar. 19	06 58.36	-00 35.1	10.461	10.787	+0.07	+2.6	18.4	106.5
Mar. 29	06 59.05	-00 08.7	10.584	10.762	+0.13	+2.5	18.4	97.6
Apr. 8	07 00.36	+00 16.6	10.711	10.737	+0.19	+2.4	18.5	88.8
Apr. 18	07 02.25	+00 40.3	10.839	10.713	+0.24	+2.1	18.5	80.1
Apr. 28	07 04.69	+01 01.7	10.963	10.688	+0.29	+1.9	18.5	71.6
May 8	07 07.63	+01 20.5	11.079	10.664	+0.34	+1.6	18.5	63.3
May 18	07 11.02	+01 36.4	11.185	10.641	+0.38	+1.3	18.5	55.2
May 28	07 14.80	+01 49.2	11.276	10.617	+0.41	+1.0	18.5	47.4
June 7	07 18.89	+01 58.9	11.352	10.594	+0.44	+0.6	18.5	39.9
June 17	07 23.25	+02 05.3	11.409	10.570	+0.46	+0.3	18.5	32.9
June 27	07 27.81	+02 08.4	11.446	10.547	+0.47	0.0	18.5	26.7
July 7	07 32.49	+02 08.4	11.462	10.525	+0.47	-0.3	18.5	21.8
July 17	07 37.24	+02 05.3	11.456	10.502	+0.47	-0.6	18.5	19.3
July 27	07 41.98	+01 59.3	11.428	10.480	+0.47	-0.9	18.5	20.1
Aug. 6	07 46.66	+01 50.7	11.377	10.458	+0.46	-1.1	18.5	23.9
Aug. 16	07 51.22	+01 39.6	11.305	10.436	+0.44	-1.3	18.5	29.5
Aug. 26	07 55.58	+01 26.4	11.212	10.414	+0.41	-1.5	18.4	36.3
Sept. 5	07 59.67	+01 11.5	11.099	10.393	+0.38	-1.6	18.4	43.7
Sept. 15	08 03.45	+00 55.2	10.968	10.372	+0.34	-1.7	18.4	51.5
Sept. 25	08 06.84	+00 38.1	10.822	10.351	+0.29	-1.7	18.3	59.6
Oct. 5	08 09.78	+00 20.6	10.663	10.330	+0.24	-1.7	18.3	68.0
Oct. 15	08 12.22	+00 03.3	10.495	10.310	+0.19	-1.6	18.2	76.6
Oct. 25	08 14.11	-00 13.1	10.321	10.289	+0.13	-1.5	18.2	85.4
Nov. 4	08 15.41	-00 28.0	10.144	10.269	+0.07	-1.3	18.1	94.5
Nov. 14	08 16.09	-00 40.8	9.971	10.250	+0.01	-1.0	18.1	103.7
Nov. 24	08 16.14	-00 50.6	9.804	10.230	-0.06	-0.6	18.1	113.0
Dec. 4	08 15.59	-00 57.0	9.649	10.211	-0.11	-0.2	18.0	122.4
Dec. 14	08 14.46	-00 59.4	9.509	10.192	-0.16	+0.2	18.0	131.8
Dec. 24	08 12.85	-00 57.3	9.391	10.173	-0.20	+0.7	17.9	140.9
Jan. 3	08 10.83	-00 50.6	9.296	10.155	-0.23	+1.1	17.9	149.4
Jan. 13	08 08.55	-00 39.1	9.228	10.136	-0.24	+1.6	17.9	156.3
Jan. 23	08 06.13	-00 23.2	9.189	10.118	-0.24	+2.0	17.9	159.7
Feb. 2	08 03.74	-00 03.3	9.180	10.101	-0.22	+2.3	17.9	158.1
Feb. 12	08 01.52	+00 19.9	9.199	10.083	-0.19	+2.6	17.9	152.2
Feb. 22	07 59.63	+00 45.7	9.247	10.066	-0.15	+2.7	17.9	144.2
Mar. 3	07 58.16	+01 13.0	9.320	10.049	-0.09	+2.8	17.9	135.3
Mar. 13	07 57.24	+01 40.9	9.414	10.032	-0.03	+2.8	17.9	126.1
Mar. 23	07 56.91	+02 08.6	9.527	10.016	+0.03	+2.7	17.9	116.8

Comet 65P/Gunn

Epoch = 2015 June 27.0 TT
 T = 2017 Oct. 10.75857 TT
 Peri. = 211.98018
 Node = 63.04779 2000.0
 Incl. = 9.15950
 q = 2.8995715 AU

e = 0.2555438
 a = 3.8948853 AU
 n = 0.12822186
 P = 7.69 years

$$m1 = 4.4 + 5 \log(\Delta) + 17.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	09 11.78	+26 55.3	3.746	4.643	-0.59	+3.9	18.9	153.0
Jan. 18	09 05.90	+27 34.1	3.681	4.631	-0.67	+3.6	18.9	163.0
Jan. 28	08 59.20	+28 09.9	3.647	4.618	-0.70	+3.0	18.8	169.3
Feb. 7	08 52.19	+28 40.1	3.644	4.605	-0.68	+2.2	18.8	165.3
Feb. 17	08 45.42	+29 02.5	3.672	4.592	-0.60	+1.3	18.8	155.9
Feb. 27	08 39.42	+29 16.0	3.729	4.578	-0.48	+0.4	18.8	145.4
Mar. 9	08 34.63	+29 20.3	3.810	4.564	-0.33	-0.4	18.8	134.8
Mar. 19	08 31.34	+29 16.3	3.912	4.550	-0.16	-1.2	18.9	124.4
Mar. 29	08 29.72	+29 04.7	4.030	4.535	+0.01	-1.8	18.9	114.5
Apr. 8	08 29.79	+28 46.7	4.159	4.520	+0.17	-2.3	19.0	104.9
Apr. 18	08 31.48	+28 23.2	4.294	4.505	+0.32	-2.8	19.0	95.7
Apr. 28	08 34.69	+27 55.2	4.432	4.490	+0.46	-3.2	19.0	86.8
May 8	08 39.26	+27 23.1	4.568	4.474	+0.58	-3.6	19.1	78.4
May 18	08 45.01	+26 47.6	4.699	4.459	+0.68	-3.9	19.1	70.2
May 28	08 51.80	+26 08.7	4.822	4.442	+0.77	-4.2	19.1	62.3
June 7	08 59.45	+25 26.9	4.934	4.426	+0.84	-4.5	19.2	54.7
June 17	09 07.83	+24 42.3	5.035	4.409	+0.90	-4.7	19.2	47.3
June 27	09 16.81	+23 55.2	5.121	4.392	+0.95	-5.0	19.2	40.1
July 7	09 26.28	+23 05.7	5.192	4.375	+0.98	-5.2	19.2	33.0
July 17	09 36.12	+22 14.0	5.246	4.357	+1.01	-5.4	19.2	26.2
July 27	09 46.25	+21 20.5	5.283	4.340	+1.03	-5.5	19.2	19.6
Aug. 6	09 56.59	+20 25.5	5.302	4.322	+1.05	-5.6	19.1	13.4
Aug. 16	10 07.07	+19 29.3	5.302	4.303	+1.05	-5.7	19.1	8.5
Aug. 26	10 17.60	+18 32.3	5.284	4.285	+1.05	-5.7	19.1	7.9
Sept. 5	10 28.13	+17 35.2	5.247	4.266	+1.05	-5.7	19.0	12.2
Sept. 15	10 38.60	+16 38.3	5.191	4.247	+1.03	-5.6	19.0	18.2
Sept. 25	10 48.94	+15 42.3	5.117	4.228	+1.01	-5.4	18.9	24.9
Oct. 5	10 59.07	+14 48.0	5.025	4.209	+0.99	-5.2	18.8	31.8
Oct. 15	11 08.92	+13 55.9	4.917	4.189	+0.95	-4.9	18.7	38.9
Oct. 25	11 18.42	+13 07.1	4.794	4.169	+0.90	-4.5	18.7	46.3
Nov. 4	11 27.46	+12 22.3	4.656	4.149	+0.85	-4.0	18.6	53.8
Nov. 14	11 35.95	+11 42.5	4.507	4.129	+0.78	-3.4	18.4	61.6
Nov. 24	11 43.76	+11 08.8	4.347	4.108	+0.70	-2.7	18.3	69.6
Dec. 4	11 50.76	+10 42.1	4.180	4.087	+0.60	-1.9	18.2	77.8
Dec. 14	11 56.81	+10 23.4	4.008	4.066	+0.49	-1.0	18.1	86.4
Dec. 24	12 01.72	+10 13.8	3.835	4.045	+0.36	0.0	17.9	95.3
Jan. 3	12 05.34	+10 14.0	3.664	4.024	+0.22	+1.0	17.8	104.5
Jan. 13	12 07.50	+10 24.5	3.500	4.002	+0.06	+2.1	17.7	114.0
Jan. 23	12 08.06	+10 45.2	3.346	3.981	-0.11	+3.0	17.5	124.0
Feb. 2	12 06.95	+11 15.4	3.208	3.959	-0.28	+3.8	17.4	134.2
Feb. 12	12 04.14	+11 53.4	3.090	3.937	-0.44	+4.3	17.3	144.7
Feb. 22	11 59.79	+12 36.4	2.996	3.915	-0.56	+4.5	17.2	155.0
Mar. 3	11 54.16	+13 21.0	2.929	3.893	-0.65	+4.2	17.1	164.3
Mar. 13	11 47.69	+14 02.9	2.892	3.870	-0.68	+3.5	17.0	168.3
Mar. 23	11 40.93	+14 38.0	2.884	3.848	-0.65	+2.5	16.9	162.8

Comet 74P/Smirnova-Chernykh

Epoch = 2015 June 27.0 TT
 T = 2018 Jan. 24.56754 TT
 Peri. = 86.75365
 Node = 77.05948 2000.0
 Incl. = 6.65205
 q = 3.5398184 AU
 e = 0.1490583
 a = 4.1598836 AU
 n = 0.11616688
 P = 8.48 years

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

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	00 47.72	-00 43.7	4.606	4.600	+0.43	+4.3	18.9	83.6
Jan. 18	00 52.07	-00 00.5	4.753	4.592	+0.54	+4.8	18.9	74.7
Jan. 28	00 57.43	+00 47.7	4.894	4.584	+0.63	+5.2	19.0	66.1
Feb. 7	01 03.68	+01 39.8	5.025	4.576	+0.70	+5.5	19.0	57.8
Feb. 17	01 10.70	+02 35.0	5.144	4.567	+0.77	+5.7	19.1	49.7
Feb. 27	01 18.38	+03 32.4	5.249	4.558	+0.82	+5.9	19.1	41.8
Mar. 9	01 26.61	+04 31.3	5.338	4.549	+0.87	+6.0	19.1	34.1
Mar. 19	01 35.30	+05 30.8	5.409	4.540	+0.91	+6.0	19.1	26.5
Mar. 29	01 44.37	+06 30.4	5.462	4.531	+0.94	+5.9	19.1	19.2
Apr. 8	01 53.72	+07 29.4	5.496	4.522	+0.96	+5.8	19.1	12.1
Apr. 18	02 03.29	+08 27.3	5.510	4.512	+0.97	+5.6	19.1	5.7
Apr. 28	02 13.01	+09 23.6	5.505	4.503	+0.98	+5.4	19.1	4.8
May 8	02 22.80	+10 17.7	5.481	4.493	+0.98	+5.2	19.1	10.7
May 18	02 32.58	+11 09.2	5.437	4.483	+0.97	+4.9	19.1	17.6
May 28	02 42.30	+11 57.9	5.375	4.473	+0.96	+4.5	19.0	24.5
June 7	02 51.85	+12 43.2	5.296	4.463	+0.93	+4.2	19.0	31.6
June 17	03 01.17	+13 25.1	5.200	4.453	+0.90	+3.8	18.9	38.7
June 27	03 10.15	+14 03.1	5.088	4.442	+0.85	+3.4	18.8	46.0
July 7	03 18.69	+14 37.2	4.963	4.432	+0.80	+3.0	18.8	53.3
July 17	03 26.68	+15 07.1	4.826	4.421	+0.73	+2.6	18.7	60.8
July 27	03 33.98	+15 32.8	4.679	4.410	+0.65	+2.1	18.6	68.6
Aug. 6	03 40.47	+15 54.1	4.524	4.399	+0.55	+1.7	18.5	76.5
Aug. 16	03 45.98	+16 11.0	4.364	4.388	+0.44	+1.3	18.4	84.7
Aug. 26	03 50.36	+16 23.6	4.202	4.377	+0.31	+0.8	18.3	93.3
Sept. 5	03 53.45	+16 31.8	4.041	4.366	+0.17	+0.4	18.2	102.1
Sept. 15	03 55.11	+16 35.7	3.885	4.355	+0.01	0.0	18.1	111.4
Sept. 25	03 55.21	+16 35.4	3.739	4.343	-0.15	-0.4	18.0	121.2
Oct. 5	03 53.70	+16 31.1	3.606	4.332	-0.31	-0.8	17.9	131.3
Oct. 15	03 50.60	+16 23.0	3.491	4.320	-0.45	-1.1	17.8	141.9
Oct. 25	03 46.06	+16 11.8	3.399	4.308	-0.57	-1.4	17.8	152.9
Nov. 4	03 40.37	+15 58.2	3.334	4.296	-0.64	-1.5	17.7	164.1
Nov. 14	03 33.93	+15 43.4	3.298	4.285	-0.67	-1.4	17.7	174.8
Nov. 24	03 27.25	+15 29.0	3.293	4.273	-0.64	-1.2	17.6	171.6
Dec. 4	03 20.88	+15 16.7	3.319	4.260	-0.56	-0.9	17.6	160.3
Dec. 14	03 15.33	+15 08.1	3.375	4.248	-0.43	-0.3	17.7	148.9
Dec. 24	03 11.00	+15 04.8	3.456	4.236	-0.28	+0.3	17.7	137.8
Jan. 3	03 08.18	+15 07.6	3.559	4.224	-0.12	+0.9	17.7	127.0
Jan. 13	03 07.01	+15 16.9	3.679	4.211	+0.05	+1.6	17.8	116.6
Jan. 23	03 07.53	+15 32.7	3.811	4.199	+0.21	+2.2	17.9	106.6
Feb. 2	03 09.67	+15 54.4	3.950	4.187	+0.37	+2.7	17.9	97.0
Feb. 12	03 13.35	+16 21.2	4.092	4.174	+0.51	+3.1	18.0	87.9
Feb. 22	03 18.44	+16 52.4	4.234	4.162	+0.63	+3.4	18.0	79.1
Mar. 3	03 24.78	+17 26.8	4.371	4.149	+0.75	+3.7	18.1	70.7
Mar. 13	03 32.23	+18 03.4	4.500	4.136	+0.84	+3.8	18.1	62.5
Mar. 23	03 40.68	+18 41.4	4.619	4.124	+0.93	+3.8	18.2	54.7

Comet C/2010 U3 (Boattini)

Epoch = 2015 June 27.0 TT
 T = 2019 Feb. 24.45311 TT
 Peri. = 88.00286
 Node = 43.05209 2000.0
 Incl. = 55.48988
 q = 8.4492127 AU
 e = 1.0030029

$$m1 = 8.0 + 5 \log(\Delta) + 5.0 \log(r)$$

Oh TT	R. A. (2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2015/16	h m	° '			m	'		°
Jan. 8	02 53.54	+36 00.7	11.515	12.072	-0.13	-0.5	18.7	122.5
Jan. 18	02 52.26	+35 55.7	11.619	12.033	-0.06	-0.4	18.7	112.7
Jan. 28	02 51.68	+35 52.2	11.735	11.995	+0.01	-0.1	18.7	103.0
Feb. 7	02 51.80	+35 50.8	11.857	11.957	+0.08	+0.1	18.8	93.4
Feb. 17	02 52.59	+35 51.8	11.982	11.919	+0.14	+0.4	18.8	84.0
Feb. 27	02 54.04	+35 55.8	12.103	11.880	+0.20	+0.7	18.8	74.7
Mar. 9	02 56.08	+36 02.7	12.216	11.843	+0.26	+1.0	18.8	65.7
Mar. 19	02 58.65	+36 12.7	12.318	11.805	+0.30	+1.3	18.8	57.0
Mar. 29	03 01.70	+36 25.7	12.405	11.767	+0.34	+1.6	18.8	48.5
Apr. 8	03 05.15	+36 41.7	12.473	11.729	+0.38	+1.9	18.8	40.4
Apr. 18	03 08.92	+37 00.5	12.522	11.692	+0.40	+2.1	18.8	32.9
Apr. 28	03 12.96	+37 22.0	12.548	11.654	+0.42	+2.4	18.8	26.3
May 8	03 17.17	+37 45.9	12.551	11.617	+0.43	+2.6	18.8	21.3
May 18	03 21.50	+38 12.1	12.530	11.579	+0.44	+2.8	18.8	19.1
May 28	03 25.85	+38 40.4	12.486	11.542	+0.43	+3.0	18.8	20.5
June 7	03 30.17	+39 10.5	12.417	11.505	+0.42	+3.2	18.8	24.9
June 17	03 34.37	+39 42.4	12.327	11.468	+0.40	+3.3	18.8	31.0
June 27	03 38.37	+40 15.9	12.214	11.431	+0.37	+3.5	18.7	38.1
July 7	03 42.09	+40 50.8	12.083	11.395	+0.34	+3.6	18.7	45.6
July 17	03 45.45	+41 26.9	11.934	11.358	+0.29	+3.7	18.7	53.4
July 27	03 48.37	+42 03.9	11.770	11.321	+0.24	+3.8	18.6	61.5
Aug. 6	03 50.75	+42 41.7	11.595	11.285	+0.18	+3.8	18.6	69.8
Aug. 16	03 52.52	+43 19.8	11.412	11.249	+0.11	+3.8	18.5	78.2
Aug. 26	03 53.59	+43 57.9	11.224	11.212	+0.03	+3.8	18.5	86.8
Sept. 5	03 53.90	+44 35.4	11.036	11.176	-0.05	+3.6	18.5	95.4
Sept. 15	03 53.40	+45 11.8	10.852	11.140	-0.14	+3.4	18.4	104.2
Sept. 25	03 52.04	+45 46.2	10.675	11.105	-0.22	+3.2	18.4	112.9
Oct. 5	03 49.85	+46 18.0	10.512	11.069	-0.30	+2.8	18.3	121.6
Oct. 15	03 46.85	+46 46.3	10.364	11.033	-0.37	+2.4	18.3	130.1
Oct. 25	03 43.13	+47 10.1	10.238	10.998	-0.43	+1.9	18.3	138.1
Nov. 4	03 38.84	+47 28.9	10.135	10.963	-0.47	+1.3	18.2	145.0
Nov. 14	03 34.16	+47 42.2	10.059	10.927	-0.49	+0.8	18.2	150.0
Nov. 24	03 29.30	+47 49.8	10.010	10.892	-0.48	+0.2	18.2	152.0
Dec. 4	03 24.51	+47 52.0	9.991	10.857	-0.45	-0.3	18.2	150.3
Dec. 14	03 20.01	+47 49.3	9.999	10.823	-0.40	-0.7	18.2	145.3
Dec. 24	03 16.04	+47 42.7	10.033	10.788	-0.33	-0.9	18.2	138.4
Jan. 3	03 12.76	+47 33.3	10.091	10.754	-0.25	-1.1	18.2	130.3
Jan. 13	03 10.31	+47 22.4	10.170	10.719	-0.15	-1.1	18.2	121.7
Jan. 23	03 08.77	+47 11.3	10.264	10.685	-0.06	-1.0	18.2	112.8
Feb. 2	03 08.17	+47 01.1	10.371	10.651	+0.03	-0.8	18.2	103.9
Feb. 12	03 08.52	+46 52.9	10.485	10.617	+0.13	-0.6	18.2	95.0
Feb. 22	03 09.78	+46 47.4	10.601	10.583	+0.21	-0.2	18.2	86.3
Mar. 3	03 11.89	+46 45.1	10.715	10.550	+0.29	+0.1	18.3	77.8
Mar. 13	03 14.79	+46 46.5	10.824	10.517	+0.36	+0.5	18.3	69.5
Mar. 23	03 18.39	+46 51.7	10.922	10.483	+0.42	+0.9	18.3	61.5

Comet 29P/Schwassmann-Wachmann

Epoch = 2015 June 27.0 TT
 T = 2019 Apr. 4.80831 TT
 Peri. = 49.80240
 Node = 312.40859 2000.0
 Incl. = 9.37707
 q = 5.7611484 AU

e = 0.0416593
 a = 6.0115869 AU
 n = 0.06686831
 P = 14.74 years

$$m1 = 4.0 + 5 \log(\Delta) + 7.5 \log(r)$$

Oh TT 2015/16	R. A. (2000) h m	Decl. ° ' "	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	17 09.07	-29 56.6	6.921	6.080	+0.83	-1.1	14.1	29.0
Jan. 18	17 17.37	-30 07.7	6.832	6.077	+0.79	-1.0	14.1	37.2
Jan. 28	17 25.22	-30 18.0	6.724	6.074	+0.73	-1.0	14.0	45.5
Feb. 7	17 32.51	-30 27.8	6.599	6.071	+0.66	-0.9	14.0	54.0
Feb. 17	17 39.11	-30 37.0	6.460	6.069	+0.58	-0.9	13.9	62.6
Feb. 27	17 44.91	-30 46.1	6.310	6.066	+0.49	-0.9	13.9	71.3
Mar. 9	17 49.78	-30 55.0	6.153	6.063	+0.38	-0.9	13.8	80.2
Mar. 19	17 53.61	-31 03.8	5.991	6.060	+0.27	-0.9	13.8	89.2
Mar. 29	17 56.31	-31 12.7	5.829	6.057	+0.15	-0.9	13.7	98.5
Apr. 8	17 57.79	-31 21.5	5.671	6.054	+0.02	-0.8	13.6	107.9
Apr. 18	17 58.00	-31 29.8	5.521	6.052	-0.11	-0.8	13.6	117.6
Apr. 28	17 56.93	-31 37.4	5.384	6.049	-0.23	-0.6	13.5	127.4
May 8	17 54.64	-31 43.4	5.264	6.046	-0.34	-0.4	13.5	137.4
May 18	17 51.24	-31 47.3	5.166	6.043	-0.43	-0.1	13.4	147.5
May 28	17 46.92	-31 48.3	5.092	6.040	-0.50	+0.2	13.4	157.4
June 7	17 41.97	-31 45.9	5.045	6.037	-0.53	+0.6	13.4	166.7
June 17	17 36.68	-31 39.7	5.027	6.034	-0.53	+1.0	13.4	171.7
June 27	17 31.42	-31 29.9	5.039	6.031	-0.49	+1.3	13.4	166.3
July 7	17 26.54	-31 17.0	5.079	6.028	-0.42	+1.5	13.4	157.0
July 17	17 22.33	-31 01.7	5.147	6.025	-0.33	+1.7	13.4	147.1
July 27	17 19.06	-30 44.9	5.239	6.023	-0.22	+1.7	13.4	137.1
Aug. 6	17 16.89	-30 27.7	5.351	6.020	-0.10	+1.7	13.5	127.3
Aug. 16	17 15.92	-30 10.8	5.481	6.017	+0.03	+1.6	13.5	117.6
Aug. 26	17 16.20	-29 54.9	5.623	6.014	+0.15	+1.5	13.6	108.1
Sept. 5	17 17.71	-29 40.3	5.774	6.011	+0.27	+1.3	13.6	98.8
Sept. 15	17 20.41	-29 27.3	5.928	6.008	+0.38	+1.1	13.7	89.7
Sept. 25	17 24.21	-29 15.8	6.083	6.005	+0.48	+1.0	13.8	80.8
Oct. 5	17 29.02	-29 05.6	6.234	6.002	+0.57	+0.9	13.8	72.1
Oct. 15	17 34.73	-28 56.5	6.378	5.999	+0.65	+0.8	13.9	63.5
Oct. 25	17 41.25	-28 48.0	6.511	5.996	+0.72	+0.8	13.9	55.0
Nov. 4	17 48.45	-28 39.8	6.631	5.993	+0.78	+0.8	13.9	46.7
Nov. 14	17 56.23	-28 31.5	6.734	5.990	+0.83	+0.9	14.0	38.4
Nov. 24	18 04.49	-28 22.8	6.820	5.987	+0.86	+0.9	14.0	30.2
Dec. 4	18 13.10	-28 13.5	6.886	5.985	+0.89	+1.0	14.0	22.1
Dec. 14	18 21.97	-28 03.2	6.931	5.982	+0.90	+1.1	14.0	14.2
Dec. 24	18 30.99	-27 52.0	6.954	5.979	+0.91	+1.2	14.0	7.0
Jan. 3	18 40.06	-27 39.8	6.954	5.976	+0.90	+1.3	14.0	5.4
Jan. 13	18 49.07	-27 26.5	6.932	5.973	+0.88	+1.4	14.0	11.9
Jan. 23	18 57.92	-27 12.4	6.887	5.970	+0.86	+1.5	14.0	19.8
Feb. 2	19 06.51	-26 57.6	6.821	5.967	+0.82	+1.5	14.0	27.8
Feb. 12	19 14.73	-26 42.4	6.734	5.964	+0.78	+1.5	14.0	36.0
Feb. 22	19 22.49	-26 27.2	6.629	5.961	+0.72	+1.5	13.9	44.3
Mar. 3	19 29.67	-26 12.4	6.507	5.958	+0.65	+1.4	13.9	52.7
Mar. 13	19 36.19	-25 58.4	6.371	5.956	+0.57	+1.3	13.8	61.2
Mar. 23	19 41.94	-25 45.7	6.224	5.953	+0.49	+1.1	13.8	69.8

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