THE COMET HANDBOOK FOR 2009

彗 星 年 表

2009

Calculated by Kenji Muraoka

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INDEX TO EPHEMERIDES

Comet 29P/Schwassmann-Wachmann
Epoch 2004 July 14.0 TT = JDT 2453200.5
T 2004 July 10.83344 TT Muraoka
q 5.7235812 (2000.0) P Q
n 0.06726259 Peri. 48.95650 +0.99214576 -0.03564782
a 5.9880719 Node 312.71566 -0.02847811 +0.86898897
e 0.0441696 Incl. 9.39207 +0.12180227 +0.49354575
P 14.65
From 2461 observations 1902-2002, mean residual 0".94.

Comet P/2005 Y2 (McNaught)
Epoch 2004 Dec. 21.0 TT = JDT 2453360.5
T 2004 Dec. 27.93046 TT Muraoka
q 3.3547953 (2000.0) P Q
n 0.06254465 Peri. 194.57332 +0.31487947 +0.89085405
a 6.2855399 Node 94.62266 -0.83462042 +0.42417292
e 0.4662678 Incl. 19.17949 -0.45195095 -0.16265421
P 15.76 (P = +/- 0.02 day)
From 138 observations 2003 May 30-2009 Jan. 2, mean residual 0".67.

Comet 136P/Mueller
Epoch 2007 Oct. 27.0 TT = JDT 2454400.5
T 2007 Oct. 22.21942 TT Muraoka
q 2.9606506 (2000.0) P Q
n 0.11502207 Peri. 224.86267 +0.99267553 -0.04877383
a 4.1874399 Node 137.56248 +0.07833218 +0.95635992
e 0.2929688 Incl. 9.42735 -0.09197476 +0.28809168
P 8.57
From 220 observations 1990-2008, mean residual 0".86. Nongravitational parameters Y1 = -0.42 +/- 0.34, Y2 = -0.0058 +/- 0.0063.

Comet 139P/Vaisala-Oterma
Epoch 2008 Apr. 4.0 TT = JDT 2454560.5
T 2008 Apr. 19.34208 TT Muraoka
q 3.4028382 (2000.0) P Q
n 0.10270122 Peri. 165.52004 +0.66930008 -0.74211756
a 4.5159833 Node 242.45276 +0.67757524 +0.62955502
e 0.2464901 Incl. 2.32966 +0.30484291 +0.23004781
P 9.60
From 269 observations 1939-2008, mean residual 0".70.

Comet 205P/Giacobini
Epoch 2008 Sept. 11.0 TT = JDT 2454720.5
T 2008 Sept. 10.04145 TT Muraoka
q 1.5264494 (2000.0) P Q
n 0.14800415 Peri. 154.21815 +0.89772870 +0.44054543
a 3.5395941 Node 179.63000 -0.43589648 +0.88880273
e 0.5687502 Incl. 15.30458 -0.06385483 +0.12629105
P 6.66
From 1278 observations 1896-2009, mean residual 0".80. Nongravitational parameters A1 = +1.28 +/- 0.01, A2 = +0.0319 +/- 0.0001.

Comet C/2007 S2 (Lemmon)
Epoch 2008 Sept. 11.0 TT = JDT 2454720.5
T 2008 Sept. 14.76617 TT Muraoka
q 5.5579802 (2000.0) P Q
n 0.02218445 Peri. 210.45767 -0.81635503 -0.51563870
a 12.5440253 Node 296.25219 +0.57092049 -0.65242123
e 0.5569221 Incl. 16.86249 +0.08725973 -0.55539470
P 44.43 (dP = +/- 0.49 day)
From 260 observations 2007 Sept. 25-2009 Jan. 7, mean residual 0".48.

Comet C/2006 OF2 (Broughton)
Epoch 2008 Sept. 11.0 TT = JDT 2454720.5
T 2008 Sept. 15.68342 TT Muraoka
q 2.4314481 (2000.0) P Q
z -0.0003529 Peri. 95.61183 +0.49677372 -0.80146819
+/-0.0000004 Node 318.50800 +0.45177901 +0.56638185
e 1.0008581 Incl. 30.17047 +0.74102064 +0.19199047
From 3123 observations 2006 June 23-2009 Jan. 8, mean residual 0".52.
orig. 1/a = +0.0000145, fut. 1/a = -0.0006716.

Comet 147P/Kushida-Muramatu
Epoch 2008 Sept. 11.0 TT = JDT 2454720.5
T 2008 Sept. 22.88689 TT　　Muraoka

q	2.7569593	(2000.0)	P	Q
n	0.13269182	Peri.	346.86087	+0.16281326	-0.98579530
a	3.8069159	Node	93.75766	+0.90893461	+0.13360260
e	0.2758024	Incl.	2.36776	+0.38383553	+0.10177411
P	7.43				

From 49 observations 1999-2008, mean residual 1".11. Nongravitational parameters Y1 = +2.27 +/- 1.03, Y2 = +1.1385 +/- 0.4533, Y3 = +0.23 +/- 0.05.

Comet C/2008 A1 (McNaught)
Epoch 2008 Sept. 11.0 TT = JDT 2454720.5
T 2008 Sept. 29.12736 TT　　Muraoka

q	1.0730640	(2000.0)	P	Q
z	-0.0001781	Peri.	348.47713	+0.10874025	+0.15326132
+/-	0.0000024	Node	277.88377	-0.81496458	-0.55202183
e	1.0001911	Incl.	82.54912	-0.56921726	+0.81962361

From 742 observations 2008 Jan. 10-2009 Jan. 2, mean residual 0".53.
Nongravitational parameters A1 = +5.28 +/- 0.05, A2 = +0.4244 +/- 0.0376.
orig. 1/a = +0.0001029, fut. 1/a = +0.0003110.

Comet 187P/LINEAR
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Oct. 6.56992 TT　　Muraoka

q	3.6931128	(2000.0)	P	Q
n	0.10489935	Peri.	131.99255	-0.41876720	+0.88101632
a	4.4526736	Node	112.00144	-0.88746452	-0.34568221
e	0.1705853	Incl.	13.73246	-0.19245976	-0.32297685
P	9.40				

From 160 observations 1999-2008, mean residual 0".72.

Comet C/2008 X3 (LINEAR)
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Oct. 10.58136 TT　　Muraoka

q	1.9020000	(2000.0)	P	Q
n	0.00342054	Peri.	140.79677	-0.62167209	-0.70213918
a	43.6254455	Node	337.75029	+0.25294095	+0.23951792
e	0.9564016	Incl.	66.47231	+0.74131281	-0.67054585
P	288.14 (dP = +/- 222.5 days)				

From 102 observations 2008 Dec. 4-2009 Jan. 31, mean residual 0".70.

Comet P/2001 CV8 (LINEAR)
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Oct. 11.22373 TT　　Muraoka

q	2.1599329	(2000.0)	P	Q
n	0.12867206	Peri.	151.62378	-0.87896506	-0.47688608
a	3.8857949	Node	359.89267	+0.40245361	-0.74144478
e	0.4441464	Incl.	9.03542	+0.25583494	-0.47205857
P	7.66 (dP = +/- 0.09 day)				

From 135 observations 2001 Feb. 1-May 16, mean residual 0".76.

Comet 172P/Yeung
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Oct. 12.83539 TT　　Muraoka

q	2.2404665	(2000.0)	P	Q
n	0.14983753	Peri.	178.99782	-0.77597180	+0.61752221
a	3.5106616	Node	40.08835	-0.58009830	-0.61860082
e	0.3618108	Incl.	11.51801	-0.24769685	-0.48579763
P	6.58				

From 306 observations 1993-2008, mean residual 0".57.

Comet P/2008 Q2 (Ory)
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Oct. 19.00119 TT　　Muraoka

q	1.3823265	(2000.0)	P	Q
n	0.16883959	Peri.	329.58224	+0.86296041	-0.50352928
a	3.2420511	Node	60.70920	+0.47272042	+0.77528252
e	0.5736259	Incl.	2.75523	+0.17842289	+0.38130733
P	5.84 (dP = +/- 0.03 day)				

From 977 observations 2008 Aug. 27-2009 Jan. 4, mean residual 0".50.

Comet P/2008 QP20 (LINEAR-Hill)
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Nov. 2.69726 TT Muraoka

q	1.7231372	(2000.0)	P	Q
n	0.15115111	Peri. 72.03865	+0.79166568	-0.60607627
a	3.4902925	Node 325.15184	+0.49702073	+0.71223232
e	0.5063058	Incl. 7.74976	+0.35529683	+0.35411392

P 6.52 (dP = +/- 0.03 day)
From 422 observations 2008 Aug. 25-2009 Jan. 1, mean residual 0".54.

Comet 207P/NEAT
Epoch 2008 Oct. 21.0 TT = JDT 2454760.5
T 2008 Nov. 6.25526 TT Muraoka

q	0.9441498	(2000.0)	P	Q
n	0.12857975	Peri. 271.17336	-0.36661761	-0.92828899
a	3.8876546	Node 200.67442	+0.90823747	-0.34259389
e	0.7571415	Incl. 10.15005	+0.20173305	-0.14459938

P 7.67
From 95 observations 2000-2008, mean residual 0".76.

Comet C/2007 G1 (LINEAR)
Epoch 2008 Nov. 30.0 TT = JDT 2454800.5
T 2008 Nov. 16.31521 TT Muraoka

q	2.6470944	(2000.0)	P	Q
z	-0.0006498	Peri. 223.98422	-0.11749596	+0.15314167
	+/-0.0000006	Node 78.99511	-0.37543701	+0.90785876
e	1.0017200	Incl. 88.33076	-0.91937030	-0.39030770

From 1771 observations 2007 Apr. 10-2008 Oct. 24, mean residual 0".53.
orig. 1/a = +0.0002479, fut. 1/a = +0.0001684.

Comet C/2008 R3 (LINEAR)
Epoch 2008 Nov. 30.0 TT = JDT 2454800.5
T 2008 Nov. 22.49584 TT Muraoka

q	1.9090221	(2000.0)	P	Q
n	0.01246864	Peri. 84.16223	+0.72568517	+0.06450077
a	18.4185992	Node 270.55261	-0.35797723	+0.88562170
e	0.8963536	Incl. 43.23786	+0.58756560	+0.45990634

P 79.05 (dP = +/- 20.2 days)
From 448 observations 2008 Sept. 7-Dec. 30, mean residual 0".48.

Comet 150P/LONEOS
Epoch 2008 Nov. 30.0 TT = JDT 2454800.5
T 2008 Nov. 26.00060 TT Muraoka

q	1.7676926	(2000.0)	P	Q
n	0.12834699	Peri. 245.67082	-0.88079020	-0.35171666
a	3.8923533	Node 272.42919	+0.45904982	-0.79844608
e	0.5458550	Incl. 18.50025	-0.11611151	-0.48865043

P 7.68
From 261 observations 1978-2008, mean residual 0".53.

Comet C/2007 M2 (Catalina)
Epoch 2008 Nov. 30.0 TT = JDT 2454800.5
T 2008 Dec. 8.58229 TT Muraoka

q	3.5409984	(2000.0)	P	Q
z	+0.0002419	Peri. 220.67150	-0.76246238	+0.64533920
	+/-0.0000019	Node 357.28488	+0.19504448	+0.16030155
e	0.9991433	Incl. 80.95153	-0.61693498	-0.74688736

From 321 observations 2007 June 20-2008 Dec. 26, mean residual 0".61.
orig. 1/a = +0.0005840, fut. 1/a = +0.0009608.

Comet 204P/LINEAR-NEAT
Epoch 2008 Nov. 30.0 TT = JDT 2454800.5
T 2008 Dec. 9.26776 TT Muraoka

q	1.9402274	(2000.0)	P	Q
n	0.14049055	Peri. 355.03755	-0.24489951	-0.96348111
a	3.6646962	Node 109.10652	+0.89344046	-0.26764410
e	0.4705626	Incl. 6.58121	+0.37654796	+0.00841329

P 7.02
From 506 observations 2001-2008, mean residual 0".73.

Comet 210P/Cristensen
Epoch 2008 Nov. 30.0 TT = JDT 2454800.5
T 2008 Dec. 19.97210 TT Muraoka
q 0.5349292 (2000.0) P Q
n 0.17403181 Peri. 345.77905 +0.17549765 -0.96844839
a 3.1772420 Node 93.88713 +0.91968803 +0.09715262
e 0.8316372 Incl. 10.21541 +0.35124706 +0.22949747
P 5.66 (dP = +/- 0.012 day)
From 224 observations 2003-2008, mean residual 0".79.

Comet P/2008 T4 (Hill)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2008 Dec. 23.96238 TT Muraoka
q 2.5117973 (2000.0) P Q
n 0.10509299 Peri. 1.26188 +0.69544200 -0.71439206
a 4.4472024 Node 44.68319 +0.65831724 +0.59017449
e 0.4351961 Incl. 6.32660 +0.28806047 +0.37594954
P 9.38 (dP = +/- 0.11 day)
From 224 observations 2008 Sept. 28-Dec. 30, mean residual 0".57.

Comet C/2008 Q1 (Maticic)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2008 Dec. 30.11523 TT Muraoka
q 2.9592393 (2000.0) P Q
z +0.0016563 Peri. 104.47645 -0.17165115 -0.97487227
+/-0.0000107 Node 9.30903 -0.79517378 +0.05201952
e 0.9950986 Incl. 118.62679 +0.58157935 -0.21660567
From 549 observations 2008 Aug. 18-Nov. 20, mean residual 0".46.
orig. 1/a = +0.0017400, fut. 1/a = +0.0018045.

Comet 214P/LINEAR
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 5.61484 TT Muraoka
q 1.8437332 (2000.0) P Q
n 0.14392861 Peri. 190.26845 -0.99839859 -0.01868039
a 3.6061016 Node 348.25905 +0.04779546 -0.78349364
e 0.4887185 Incl. 15.21327 -0.03026306 -0.62111895
P 6.85 (dP = +/- 0.005 day)
From 114 observations 2002 Feb. 7-2009 Feb. 1, mean residual 0".62.

Comet C/2007 N3 (Lulin)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 10.64031 TT Muraoka
q 1.2122646 (2000.0) P Q
z +0.0000153 Peri. 136.86664 -0.92920618 -0.36941582
+/-0.0000009 Node 338.53961 -0.34631740 +0.86061038
e 0.9999815 Incl. 178.37359 -0.12899665 +0.35054490
From 1525 observations 2007 July 11-2008 Dec. 25, mean residual 0".45.
orig. 1/a = +0.0000308, fut. 1/a = +0.0008259.

Comet P/2008 Y3 (McNaught)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 11.90957 TT Muraoka
q 4.4343160 (2000.0) P Q
n 0.04333324 Peri. 238.27130 -0.59302689 -0.51126687
a 8.0276532 Node 262.93557 +0.76568131 -0.59708212
e 0.4476199 Incl. 38.81380 -0.24910086 -0.61814167
P 22.74 (dP = +/- 0.91 day)
From 92 observations 2007 Dec. 18-2009 Jan. 29, mean residual 0".54.

Comet C/2008 G1 (Gibbs)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 12.08821 TT Muraoka
q 3.9895386 (2000.0) P Q
z +0.0027097 Peri. 63.72287 -0.20349274 +0.80272436
+/-0.0000063 Node 215.91752 -0.77548437 +0.21735699
e 0.9891896 Incl. 72.85683 +0.59767441 +0.55532831
From 160 observations 2008 Apr. 7-Aug. 27, mean residual 0".61.
orig. 1/a = +0.0037869, fut. 1/a = +0.0036036.

Comet 68P/Klemola
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 20.96931 TT Muraoka

q	1.7590312	(2000.0)	P	Q
n	0.09101490	Peri. 153.97851	+0.86059966	+0.50903887
a	4.8947186	Node 175.32978	-0.49446400	+0.84256027
e	0.6406267	Incl. 11.14418	-0.12195728	+0.17598756

P 10.83
From 510 observations 1965-2008, mean residual 0".78. Nongravitational parameters A1 = +0.06 +/- 0.01, A2 = -0.0023 +/- 0.0000.

Comet 195P/Hill
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 21.09031 TT Muraoka

q	4.4385771	(2000.0)	P	Q
n	0.05977248	Peri. 249.61841	-0.51732556	-0.67236790
a	6.4784112	Node 243.24963	+0.81813929	-0.57004363
e	0.3148664	Incl. 36.36180	-0.25104255	-0.47219876

P 16.49
From 163 observations 1993-2008, mean residual 0".61.

Comet P/2008 Y2 (Gibbs)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 22.40701 TT Muraoka

q	1.6384369	(2000.0)	P	Q
n	0.14489719	Peri. 162.34102	-0.68617067	-0.72482773
a	3.5900134	Node 330.89323	+0.65120188	-0.57431102
e	0.5436126	Incl. 7.27518	+0.32420044	-0.38051493

P 6.80 (dP = +/- 0.31 day)
From 132 observations 2008 Dec. 1-2009 Feb. 1, mean residual 0".47.

Comet P/2008 WZ96 (LINEAR)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 23.94105 TT Muraoka

q	1.6460244	(2000.0)	P	Q
n	0.16053383	Peri. 337.63773	+0.79880488	-0.59253997
a	3.3529341	Node 59.11654	+0.56865826	+0.68732795
e	0.5090794	Incl. 6.95746	+0.19631235	+0.42009127

P 6.14 (dP = +/- 2.90 days)
From 97 observations 2008 Nov. 30-2009 Feb. 1, mean residual 0".43.

Comet P/2002 JN16 (LINEAR)
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 25.09504 TT Muraoka

q	1.7836997	(2000.0)	P	Q
n	0.15188765	Peri. 39.69881	-0.01435948	+0.98831712
a	3.4789998	Node 230.03364	-0.96032320	-0.05590094
e	0.4872953	Incl. 11.41866	-0.27851957	+0.14178984

P 6.49 (dP = +/- 0.06 day)
From 153 observations 2002 Apr. 14-Sept. 1, mean residual 0".56.

Comet 144P/Kushida
Epoch 2009 Jan. 9.0 TT = JDT 2454840.5
T 2009 Jan. 26.85978 TT Muraoka

q	1.4390171	(2000.0)	P	Q
n	0.12965516	Peri. 216.09668	-0.20067691	-0.97748298
a	3.8661276	Node 245.56052	+0.91477607	-0.16313940
e	0.6277885	Incl. 4.10917	+0.35059024	-0.13383783

P 7.60
From 983 observations 1994-2008, mean residual 0".54. Nongravitational parameters A1 = +0.86 +/- 0.04, A2 = -0.0455 +/- 0.0012.

Comet P/2003 O3 (LINEAR)
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Jan. 29.99255 TT Muraoka

q	1.2467431	(2000.0)	P	Q
n	0.18015366	Peri. 0.69070	+0.95198329	+0.30264562
a	3.1048503	Node 341.48956	-0.28158014	+0.80634096
e	0.5984531	Incl. 8.36555	-0.12016838	+0.50815341

P 5.47 (dP = +/- 0.06 day)
From 260 observations 2003 July 30-Dec. 15, mean residual 0".65.

Comet 47P/Ashbrook-Jackson
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Jan. 31.97006 TT Muraoka

q	2.7990778	(2000.0)	P	Q
n	0.11822759	Peri. 357.68617	+0.99572918	+0.09155359
a	4.1114039	Node 356.98265	-0.08066286	+0.80009666
e	0.3191917	Incl. 13.05270	-0.04490984	+0.59284338
P	8.34			

From 1248 observations 1948-2008, mean residual 0".88. Nongravitational parameters A1 = +0.15 +/- 0.01, A2 = -0.0044 +/- 0.0001.

Comet P/2009 B1 (Boattini)
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Feb. 6.20698 TT Muraoka

q	2.4265491	(2000.0)	P	Q
n	0.05697717	Peri. 128.59566	+0.35463114	-0.87264880
a	6.6886038	Node 297.43926	+0.69622342	+0.48613424
e	0.6372114	Incl. 22.22828	+0.62410713	-0.04644973
P	17.30 (dP = +/- 5.84 days)			

From 83 observations 2008 Nov. 18-2009 Feb. 1, mean residual 0".63.

Comet 202P/Scotti
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Feb. 7.00968 TT Muraoka

q	2.5270533	(2000.0)	P	Q
n	0.13430702	Peri. 255.55547	-0.00220798	-0.99995150
a	3.7763327	Node 194.58119	+0.93154010	+0.00143342
e	0.3308181	Incl. 2.18492	+0.36363191	-0.00974379
P	7.34			

From 271 observations 1929-2008, mean residual 0".64.

Comet P/2008 Y1 (Boattini)
T 2009 Feb. 25.1721 TT Muraoka

q	1.270864	(2000.0)	P	Q
n	0.0949208	Peri. 162.4405	+0.4631111	-0.8734101
a	4.759505	Node 259.7451	+0.7936926	+0.4843148
e	0.732984	Incl. 8.8039	+0.3944364	+0.0509306
P	10.38			

From 132 observations 2008 Dec. 22-2009 Jan. 22, mean residual 0".59.

Comet 14P/Wolf
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Feb. 27.25236 TT Muraoka

q	2.7241244	(2000.0)	P	Q
n	0.11277499	Peri. 158.98857	+0.98407254	+0.02164638
a	4.2428809	Node 202.11929	-0.01356339	+0.99880804
e	0.3579541	Incl. 27.94340	+0.17724919	-0.04374854
P	8.74			

From 180 observations 1950-2008, mean residual 0".71.

Comet 67P/Churyumov-Gerasimenko
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Feb. 28.36421 TT Muraoka

q	1.2465135	(2000.0)	P	Q
n	0.15286135	Peri. 12.69847	+0.45687140	-0.88453391
a	3.4642103	Node 50.19812	+0.80503775	+0.36611641
e	0.6401738	Incl. 7.04087	+0.37839496	+0.28906493
P	6.45			

From 1677 observations 1988-2008, mean residual 0".70. Nongravitational parameters A1 = +0.12 +/- 0.00, A2 = +0.0104 +/- 0.0001.

Comet 59P/Kearns-Kwee
Epoch 2009 Feb. 18.0 TT = JDT 2454880.5
T 2009 Mar. 7.64108 TT Muraoka

q	2.3555569	(2000.0)	P	Q
n	0.10368535	Peri. 127.53143	+0.15619253	-0.98057594
a	4.4873621	Node 313.03646	+0.84729321	+0.19474615
e	0.4750687	Incl. 9.34111	+0.50763975	-0.02334028
P	9.51			

From 680 observations 1981-2008, mean residual 0".73. Nongravitational parameters A1 = +0.83 +/- 0.06, A2 = -0.2373 +/- 0.0005.

Comet P/2008 J3 (McNaught)
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Mar. 10.72946 TT Muraoka

q	2.2871140	(2000.0)	P	Q
n	0.12836692	Peri. 4.40988	+0.97043398	-0.22992836
a	3.8919505	Node 9.85622	+0.20625360	+0.63195812
e	0.4123476	Incl. 25.39957	+0.12536884	+0.74010938

P 7.68 (dP = +/- 0.06 day)
From 159 observations 2008 May 10-Dec. 28, mean residual 0".68.

Comet C/2009 B2 (LINEAR)
T 2009 Mar. 10.76090 TT Muraoka

q	2.327832	(2000.0)	P	Q
	Peri.	193.9542	-0.9900540	-0.0612969
	Node	18.9054	-0.0583440	+0.9979340
e	1.0	Incl. 156.9937	-0.1280196	+0.0192450

From 27 observations 2009 Jan. 29-31, mean residual 0".73.

Comet 18D/Perrine-Mrkos [Orbit 1]
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Mar. 12.59761 TT Muraoka

q	1.7760519	(2000.0)	P	Q
n	0.11537115	Peri. 151.93694	+0.86556616	-0.46197242
a	4.1789891	Node 236.87481	+0.40533719	+0.87298504
e	0.5750044	Incl. 13.34702	+0.29410369	+0.15645637

P 8.54
From 27 observations 1955-1969, mean residual 0".32. Nongravitational parameters A1 = +1.15 +/- 0.24, A2 = -0.4481 +/- 0.0116.

Comet P/2002 Q1 (Van Ness)
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Mar. 22.60762 TT Muraoka

q	1.5512631	(2000.0)	P	Q
n	0.14681191	Peri. 185.02572	+0.99808050	-0.00320112
a	3.5587313	Node 174.00104	-0.01046168	+0.97559577
e	0.5640966	Incl. 36.28335	-0.06103982	-0.21955100

P 6.71 (dP = +/- 1.30 days)
From 57 observations 2002 Aug. 17-Oct. 14, mean residual 1".12.

Comet 145P/Shoemaker-Levy
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Mar. 26.59962 TT Muraoka

q	1.8913363	(2000.0)	P	Q
n	0.11740803	Peri. 10.13902	+0.79973782	-0.59376715
a	4.1305149	Node 26.90301	+0.53618001	+0.63999637
e	0.5421064	Incl. 11.29930	+0.27005633	+0.48769378

P 8.39
From 158 observations 1991-2008, mean residual 0".72. Nongravitational parameters A1 = -0.07 +/- 0.16, A2 = -0.0216 +/- 0.0017.

Comet 199P/Shoemaker
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Apr. 9.86452 TT Muraoka

q	2.9353841	(2000.0)	P	Q
n	0.06762228	Peri. 191.92866	+0.23776189	+0.87663622
a	5.9668190	Node 92.94816	-0.85318720	+0.39432528
e	0.5080487	Incl. 24.76253	-0.46426382	-0.27571090

P 14.58
From 511 observations 1994-2008, mean residual 0".66.

Comet 209P/LINEAR
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Apr. 15.97435 TT Muraoka

q	0.9137062	(2000.0)	P	Q
n	0.19574072	Peri. 149.72947	-0.78160955	+0.54650991
a	2.9377529	Node 66.44968	-0.61759398	-0.61036802
e	0.6889779	Incl. 19.14793	-0.08754533	-0.57339148

P 5.04
From 371 observations 2004-2008, mean residual 0".42.

Comet 18D/Perrine-Mrkos [Orbit 2]
Epoch 2009 Mar. 30.0 TT = JDT 2454920.5
T 2009 Apr. 17.28332 TT Muraoka

q	1.6361380	(2000.0)	P	Q
n	0.12582765	Peri. 156.80479	+0.80604410	-0.53817792
a	3.9441370	Node 238.06744	+0.48732792	+0.83963858
e	0.5851721	Incl. 16.87014	+0.33586369	+0.07329108
P	7.83			

From 22 observations 1961-1968, mean residual 2″.39.

Comet P/2008 O2 (McNaught)
Epoch 2009 May 9.0 TT = JDT 2454960.5
T 2009 Apr. 21.57023 TT Muraoka

q	3.8038321	(2000.0)	P	Q
n	0.10347347	Peri. 27.45918	+0.98964701	+0.10947997
a	4.4934857	Node 325.86012	-0.14188888	+0.84360719
e	0.1534785	Incl. 9.51849	+0.02159474	+0.52568150
P	9.53 (dP = +/- 0.09 day)			

From 325 observations 2008 July 28-Dec. 20, mean residual 0″.56.

Comet 2003 WY25 = ? D/1819 W1 (Blanpain) [Orbit 1]
Epoch 2009 May 9.0 TT = JDT 2454960.5
T 2009 Apr. 30.18720 TT Muraoka

q	0.9651962	(2000.0)	P	Q
n	0.18500078	Peri. 9.80491	+0.19556842	-0.97599276
a	3.0503781	Node 68.96627	+0.89266464	+0.13668233
e	0.6835815	Incl. 5.89549	+0.40608230	+0.16957617
P	5.33			

From 262 observations 2003 Oct. 25-2004 Mar. 20, mean residual 0″.67.

Comet ? D/1819 W1 (Blanpain) = ? 2003 WY25 [Orbit 3]
Epoch 2009 May 9.0 TT = JDT 2454960.5
T 2009 Apr. 30.54855 TT Muraoka

q	0.9651312	(2000.0)	P	Q
n	0.18497573	Peri. 9.80710	+0.19556033	-0.97599447
a	3.0506535	Node 68.96457	+0.89266450	+0.13667478
e	0.6836313	Incl. 5.89551	+0.40608650	+0.16957242
P	5.33			

From 282 observations 1819-2004, weighting mean residual 1″.01.
Nongravitational parameters A1 = +0.08 +/- 0.02, A2 = -0.0193 +/- 0.0003.

Comet 211P/Hill
Epoch 2009 May 9.0 TT = JDT 2454960.5
T 2009 May 7.76582 TT Muraoka

q	2.3623362	(2000.0)	P	Q
n	0.14635413	Peri. 4.38812	-0.52156397	-0.80332860
a	3.5661483	Node 117.29491	+0.77263244	-0.58762065
e	0.3375665	Incl. 18.87341	+0.36195323	+0.09677363
P	6.73 (dP = +/- 0.04 day)			

From 120 observations 2003 Mar. 24-2008 Dec. 27, mean residual 0″.56.

Comet 137P/Shoemaker-Levy
Epoch 2009 May 9.0 TT = JDT 2454960.5
T 2009 May 13.56695 TT Muraoka

q	1.9152835	(2000.0)	P	Q
n	0.10320196	Peri. 140.81147	+0.96876743	-0.23855595
a	4.5013635	Node 233.12106	+0.20089155	+0.91504546
e	0.5745104	Incl. 4.85367	+0.14536935	+0.32524277
P	9.55			

From 86 observations 1990-2001, mean residual 0″.63.

Comet 22P/Kopff
Epoch 2009 May 9.0 TT = JDT 2454960.5
T 2009 May 25.42122 TT Muraoka

q	1.5775876	(2000.0)	P	Q
n	0.15299251	Peri. 162.81609	+0.23794267	+0.96870504
a	3.4622302	Node 120.89826	-0.90052987	+0.24728560
e	0.5443435	Incl. 4.72393	-0.36390829	+0.02145649
P	6.44			

From 792 observations 1994-2008, mean residual 0″.85. Nongravitational parameters A1 = +0.05 +/- 0.01, A2 = -0.0823 +/- 0.0004.

Comet 143P/Kowal-Mrkos
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 June 12.19748 TT Muraoka

q	2.5381997	(2000.0)	P	Q
n	0.11051270	Peri.	320.76037	-0.89588148	+0.43803246
a	4.3005887	Node	245.36838	-0.38428630	-0.84791963
e	0.4098018	Incl.	4.68992	-0.22298074	-0.29859649
P	8.92				

From 136 observations 1984-2008, mean residual 0″.63.

Comet C/2008 T2 (Cardinal)
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 June 13.24224 TT Muraoka

q	1.2022448	(2000.0)	P	Q
z	-0.0000475	Peri.	215.86942	-0.76757896	+0.02809739
	+/-0.0000075	Node	309.67815	+0.57571157	-0.40892116
e	1.0000572	Incl.	56.30410	-0.28174232	-0.91213706

From 508 observations 2008 Oct. 6-2009 Feb. 1, mean residual 0″.54.
orig. 1/a = +0.0000419, fut. 1/a = +0.0003056.

Comet 64P/Swift-Gehrels
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 June 14.29629 TT Muraoka

q	1.3770129	(2000.0)	P	Q
n	0.10551095	Peri.	96.30508	+0.78774466	-0.60130984
a	4.4354501	Node	300.74117	+0.48554939	+0.73971240
e	0.6895438	Incl.	8.95148	+0.37907801	+0.30207953
P	9.34				

From 58 observations 1973-2001, mean residual 0″.83. Nongravitational parameters A1 = +0.24 +/- 0.02, A2 = +0.0254 +/- 0.0004.

Comet P/2003 A1 (LINEAR)
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 June 16.14821 TT Muraoka

q	1.9165254	(2000.0)	P	Q
n	0.13139961	Peri.	340.26412	+0.74784450	-0.34707884
a	3.8318339	Node	54.07595	+0.66318160	+0.35165034
e	0.4998412	Incl.	44.33421	+0.03031124	+0.86941263
P	7.50 (dP = +/- 0.72 day)				

From 144 observations 2003 Jan. 5-Apr. 6, mean residual 0″.62.

Comet P/2003 H4 (LINEAR)
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 June 22.41175 TT Muraoka

q	1.7014500	(2000.0)	P	Q
n	0.16160890	Peri.	10.60385	-0.54621082	+0.80633408
a	3.3380476	Node	226.74374	-0.78952854	-0.58607089
e	0.4902859	Incl.	18.15179	-0.27981854	+0.07966341
P	6.10 (dP = +/- 0.06 day)				

From 221 observations 2003 Apr. 29-Aug. 2, mean residual 0″.58.

Comet C/2008 Q3 (Garradd)
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 June 23.09508 TT Muraoka

q	1.7984619	(2000.0)	P	Q
z	+0.0001242	Peri.	340.85186	-0.56415550	-0.71960064
	+/-0.0000229	Node	219.73759	-0.65053940	+0.08544324
e	0.9997767	Incl.	140.70614	-0.50845556	+0.68911129

From 49 observations 2008 Aug. 27-Nov. 30, mean residual 0″.58.
orig. 1/a = +0.000237, fut. 1/a = +0.000697.

Comet C/2006 W3 (Christensen)
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 July 6.65809 TT Muraoka

q	3.1261926	(2000.0)	P	Q
z	-0.0000141	Peri.	133.51909	+0.67604958	-0.09047761
	+/-0.0000005	Node	113.57291	-0.64879741	-0.54356092
e	1.0000442	Incl.	127.07376	+0.34931202	-0.83447907

From 1994 observations 2006 Oct. 29-2008 Dec. 27, mean residual 0″.50.
orig. 1/a = +0.0003753, fut. 1/a = +0.0002430.

Comet 77P/Longmore
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 July 7.85302 TT Muraka
q 2.3103257 (2000.0) P Q
n 0.14433829 Peri. 196.69525 -0.85822314 +0.50214210
a 3.5992748 Node 14.91654 -0.41095902 -0.54812145
e 0.3581136 Incl. 24.39839 -0.30751540 -0.66889177
P 6.83
From 296 observations 1975-2008, mean residual 0".85. Nongravitational parameters A1 = +0.05 +/- 0.05, A2 = -0.0468 +/- 0.0011.

Comet 116P/Wild
Epoch 2009 July 28.0 TT = JDT 2455040.5
T 2009 July 18.88242 TT Muraka
q 2.1747870 (2000.0) P Q
n 0.15199097 Peri. 173.60332 -0.96747502 +0.25195369
a 3.4774231 Node 21.03180 -0.23479548 -0.86111318
e 0.3745981 Incl. 3.61282 -0.09414443 -0.44159192
P 6.48
From 949 observations 2001-2008, mean residual 0".72. Nongravitational parameters Y1 = -0.82 +/- 0.12, Y2 = -0.3294 +/- 0.0208.

Comet C/2008 P1 (Garradd)
Epoch 2009 July 28.0 TT = JDT 2455040.5
T 2009 July 22.91625 TT Muraka
q 3.8962403 (2000.0) P Q
z -0.0004543 Peri. 11.85813 +0.98146620 -0.18812154
+/-0.0000084 Node 357.67678 -0.02839027 +0.04577977
e 1.0017700 Incl. 64.30864 +0.18952070 +0.98107823
From 153 observations 2008 Aug. 13-Dec. 16, mean residual 0".49.
orig. 1/a = +0.0001481, fut. 1/a = +0.0002386.

Comet P/1999 XB69 (LINEAR)
Epoch 2009 July 28.0 TT = JDT 2455040.5
T 2009 July 25.88109 TT Muraka
q 1.6521227 (2000.0) P Q
n 0.10412673 Peri. 220.32565 -0.43211211 -0.88152033
a 4.4746723 Node 256.05288 +0.86964010 -0.35145632
e 0.6307835 Incl. 11.30580 +0.23875768 -0.31527822
P 9.47 (dP = +/- 0.11 day)
From 56 observations 1999 Nov. 14-2000 May 1, mean residual 0".49.

Comet 74P/Smirnova-Chernykh
Epoch 2009 July 28.0 TT = JDT 2455040.5
T 2009 July 30.31999 TT Muraka
q 3.5576575 (2000.0) P Q
n 0.11559991 Peri. 87.24236 -0.95634812 -0.26956627
a 4.1734741 Node 77.10042 +0.20024321 -0.88571913
e 0.1475549 Incl. 6.64740 +0.21284014 -0.37793603
P 8.53
From 1181 observations 1967-2008, mean residual 0".82. Nongravitational parameters Y1 = +0.06 +/- 0.01, A2 = -0.0122 +/- 0.0001.

Comet 24P/Schaumasse
Epoch 2009 July 28.0 TT = JDT 2455040.5
T 2009 Aug. 9.62767 TT Muraka
q 1.2139318 (2000.0) P Q
n 0.11890431 Peri. 57.99954 -0.72241688 -0.66189523
a 4.0957897 Node 79.71827 +0.54579137 -0.72345321
e 0.7036147 Incl. 11.72917 +0.42452988 -0.19624006
P 8.29
From 620 observations 1984-2001, mean residual 0".83. Nongravitational parameters A1 = +0.11 +/- 0.01, A2 = -0.0585 +/- 0.0001.

Comet 89P/Russell
Epoch 2009 Sept. 6.0 TT = JDT 2455080.5
T 2009 Aug. 17.16382 TT Muraka
q 2.2799360 (2000.0) P Q
n 0.13322450 Peri. 249.32515 +0.35605595 +0.92383941
a 3.7967616 Node 42.38493 -0.76089909 +0.37391641
e 0.3995051 Incl. 12.03142 -0.54245436 +0.08189788
P 7.40
From 97 observations 1980-2002, mean residual 0".80. Nongravitational parameters A1 = -0.03 +/- 0.21, A2 = -0.0122 +/- 0.0035.

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Comet P/2002 T1 (LINEAR)
Epoch 2009 Sept. 6.0 TT = JDT 2455080.5
T 2009 Aug. 25.47320 TT                                        Muraoka
q   1.3147544            (2000.0)            P                 Q
n   0.14165951     Peri.    3.82717     +0.95190581     -0.29298273
a   3.6445079      Node    14.22488     +0.27053276     +0.66636802
e   0.6392505      Incl.   21.39641     +0.14383097     +0.68564917
P   6.96 (dP = +/- 0.13 day)
From 423 observations 2002 Sept. 29-2003 Jan. 5, mean residual 0".63.

Comet P/2004 X1 (LINEAR)
Epoch 2009 Sept. 6.0 TT = JDT 2455080.5
T 2009 Sept. 3.34635 TT                                        Muraoka
q   0.7802076            (2000.0)            P                 Q
n   0.20367477     Peri.  345.44517     +0.99145662     +0.12996247
a   2.8609563      Node     7.11535     -0.10890172     +0.87165675
e   0.7272913      Incl.    5.14812     -0.07179273     +0.47257197
P   4.84 (dP = +/- 0.76 day)
From 86 observations 2004 Dec. 7-2005 Feb. 6, mean residual 0".72.

Comet P/2001 MD7 (LINEAR)
Epoch 2009 Sept. 6.0 TT = JDT 2455080.5
T 2009 Sept. 8.96070 TT                                        Muraoka
q   1.2239804            (2000.0)            P                 Q
n   0.12586881     Peri.  246.74446     +0.95800280     -0.22223976
a   3.9432771      Node   125.62194     +0.26560797     +0.92589791
e   0.6896033      Incl.   12.88145     -0.10808812     +0.30548740
P   7.83 (dP = +/- 0.04 day)
From 363 observations 2001 June 21-2002 Apr. 6, mean residual 0".71.

Comet C/2008 N1 (Holmes)
Epoch 2009 Sept. 6.0 TT = JDT 2455080.5
T 2009 Sept. 25.89835 TT                                       Muraoka
q   2.7834891            (2000.0)            P                 Q
z  +0.0010319      Peri.  100.81779     -0.20616892     -0.97770645
 +/-0.0000047      Node   357.47194     -0.73286316     +0.18123812
e   0.9971278      Incl.  115.51972     +0.64838720     -0.10603223
From 458 observations 2008 July 1-Dec. 22, mean residual 0".48.
orig. 1/a = +0.0011607, fut. 1/a = +0.0012193.

Comet C/2007 Q3 (Siding Spring)
Epoch 2009 Oct. 16.0 TT = JDT 2455120.5
T 2009 Oct. 7.25932 TT                                         Muraoka
q   2.2516742            (2000.0)            P                 Q
z  -0.0001155      Peri.    2.09026     -0.86793648     -0.17826277
 +/-0.0000022      Node   149.41295     +0.44145176     -0.70461180
e   1.0002600      Incl.   65.65016     +0.22761068     +0.68683666
From 270 observations 2007 Aug. 25-2008 Dec. 27, mean residual 0".34.
orig. 1/a = +0.0000260, fut. 1/a = +0.0001293.

Comet 88P/Howell
Epoch 2009 Oct. 16.0 TT = JDT 2455120.5
T 2009 Oct. 12.47203 TT                                        Muraoka
q   1.3634833            (2000.0)            P                 Q
n   0.17944815     Peri.  235.96201     +0.38417725     +0.92104565
a   3.1129828      Node    56.75643     -0.81989696     +0.37216751
e   0.5620010      Incl.    4.38163     -0.42447241     +0.11474426
P   5.49
From 738 observations 1987-2006, mean residual 0".79.  Nongravitational
   parameters A1 = +0.40 +/- 0.00, A2 = -0.0554 +/- 0.0001, A3 = +0.13 +/- 0.00.

Comet D/1884 O1 (Barnard)
Epoch 2009 Oct. 16.0 TT = JDT 2455120.5
T 2009 Oct. 16.64208 TT                                        Muraoka
q   1.3186990            (2000.0)            P                 Q
n   0.18221249     Peri.  339.90914     +0.68147130     +0.72811969
a   3.0814180      Node   332.88826     -0.64740339     +0.55278365
e   0.5720480      Incl.    9.31268     -0.34127075     +0.40530476
P   5.41 (dP = +/- 2.5 days, orbit in 1884)
From 19 observations 1884 July 26-Oct. 23, mean residual 2".16.
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Comet 127P/Holt-Olmstead
Epoch 2009 Oct. 16.0 TT = JDT 2455120.5
T 2009 Oct. 21.37147 TT Muraoka

q	2.1957067	(2000.0)	P	Q
n	0.15422790	Peri. 6.54033	+0.93918050	-0.33840123
a	3.4437167	Node 13.68454	+0.30281563	+0.73563528
e	0.3624021	Incl. 14.32149	+0.16199592	+0.58679242
P	6.39			

From 59 observations 1990-2003, mean residual 0".76.

Comet 107P/(4015)Wilson-Harrington
Epoch 2009 Oct. 16.0 TT = JDT 2455120.5
T 2009 Oct. 22.03940 TT Muraoka

q	0.9911128	(2000.0)	P	Q
n	0.23000227	Peri. 91.24498	+0.99832666	-0.03134738
a	2.6382420	Node 270.55286	+0.00944847	+0.91745064
e	0.6243283	Incl. 2.78537	+0.05704915	+0.39661274
P	4.29			

From 270 observations 1949-2007, mean residual 0".66.

Comet 54P/de Vico-Swift-NEAT
Epoch 2009 Nov. 25.0 TT = JDT 2455160.5
T 2009 Nov. 28.43113 TT Muraoka

q	2.1720466	(2000.0)	P	Q
n	0.13366008	Peri. 1.91314	+0.99990686	-0.01348318
a	3.7885082	Node 358.85299	+0.01069229	+0.87023564
e	0.4266750	Incl. 6.06831	+0.00848228	+0.49245114
P	7.37			

From 79 observations 1894-2002, mean residual 1".02. Nongravitational parameters A1 = +0.52 +/- 0.02, A2 = -0.0370 +/- 0.0005.

Comet 169P/NEAT
Epoch 2009 Nov. 25.0 TT = JDT 2455160.5
T 2009 Nov. 30.30441 TT Muraoka

q	0.6077496	(2000.0)	P	Q
n	0.23429347	Peri. 217.95905	+0.82677823	-0.56237739
a	2.6059291	Node 176.19100	+0.55206600	+0.80674240
e	0.7667820	Incl. 11.29984	+0.10798563	+0.18137910
P	4.21			

From 608 observations 1989-2006, mean residual 0".42.

Comet 100P/Hartley
Epoch 2009 Nov. 25.0 TT = JDT 2455160.5
T 2009 Dec. 6.14716 TT Muraoka

q	1.9824082	(2000.0)	P	Q
n	0.15652686	Peri. 181.70784	-0.77284237	+0.57633443
a	3.4099143	Node 37.84480	-0.57697950	-0.46389019
e	0.4186340	Incl. 25.65421	-0.26421455	-0.67278861
P	6.30			

From 172 observations 1985-2003, mean residual 0".78. Nongravitational parameters A1 = +0.24 +/- 0.02, A2 = -0.0022 +/- 0.0009.

Comet P/2004 K2 (McNaught)
Epoch 2010 Jan. 4.0 TT = JDT 2455200.5
T 2009 Dec. 15.50131 TT Muraoka

q	1.5486292	(2000.0)	P	Q
n	0.17935868	Peri. 180.75800	+0.87350242	+0.48169077
a	3.1140180	Node 150.11803	-0.44590070	+0.84975115
e	0.5026910	Incl. 8.13271	-0.19536143	+0.21423583
P	5.50 (dP = +/- 0.05 day)			

From 142 observations 2004 May 20-2004 Dec. 11, mean residual 0".68.

Comet P/2005 JQ5 (Catalina)
Epoch 2010 Jan. 4.0 TT = JDT 2455200.5
T 2009 Dec. 28.85346 TT Muraoka

q	0.8230874	(2000.0)	P	Q
n	0.22315992	Peri. 222.74296	+0.74649348	+0.65802791
a	2.6918979	Node 95.83240	-0.58055792	+0.71660519
e	0.6942353	Incl. 5.69537	-0.32511535	+0.23124938
P	4.42 (dP = +/- 0.04 day)			

From 587 observations 2005 May 6-Dec. 29, mean residual 0".60.

Comet 118P/Shoemaker-Levy
Epoch 2010 Jan. 4.0 TT = JDT 2455200.5
T 2010 Jan. 2.32551 TT Muraoka
q 1.9839256 (2000.0) P Q
n 0.15284415 Peri. 302.14533 -0.07333268 -0.99485435
a 3.4644703 Node 151.80715 +0.95759950 -0.08982238
e 0.4273510 Incl. 8.50943 +0.27861355 +0.04686968
P 6.45
From 780 observations 1991-2008, mean residual 0".77. Nongravitational parameters A1 = -0.12 +/- 0.02, A2 = -0.1421 +/- 0.0007.

Comet 82P/Gehrels
Epoch 2010 Jan. 4.0 TT = JDT 2455200.5
T 2010 Jan. 12.08156 TT Muraoka
q 3.6333766 (2000.0) P Q
n 0.11703389 Peri. 226.26850 -0.27177904 -0.96221066
a 4.1393132 Node 239.50882 +0.88850041 -0.24412082
e 0.1222272 Incl. 1.12610 +0.36973393 -0.12064686
P 8.42
From 97 observations 1975-2002, mean residual 0".70.

Comet P/2003 XD10 (LINEAR-NEAT)
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Jan. 31.95424 TT Muraoka
q 1.9897390 (2000.0) P Q
n 0.15657581 Peri. 16.09247 +0.55510651 -0.81795967
a 3.4092036 Node 40.52841 +0.73523159 +0.39763299
e 0.4163625 Incl. 13.43598 +0.38896179 +0.41572825
P 6.29 (dP = +/- 0.20 day)
From 79 observations 2003 Nov. 20-2004 Feb. 10, mean residual 0".59.

Comet 203P/Korlevic
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Feb. 8.20690 TT Muraoka
q 3.1821319 (2000.0) P Q
n 0.09841074 Peri. 154.54521 +0.08469553 -0.99522062
a 4.6463052 Node 290.56507 +0.90508064 +0.09724274
e 0.3151264 Incl. 2.97583 +0.41672018 -0.00893114
P 10.02
From 246 observations 1999-2008, mean residual 0".72.

Comet 149P/Mueller
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Feb. 19.19960 TT Muraoka
q 2.6509233 (2000.0) P Q
n 0.10919574 Peri. 43.76497 -0.93571158 +0.21114323
a 4.3350979 Node 145.26573 -0.21180808 -0.97689366
e 0.3884975 Incl. 29.73488 +0.28210134 -0.03312571
P 9.03
From 100 observations 1992-2001, mean residual 0".79.

Comet 157P/Tritton
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Feb. 20.39311 TT Muraoka
q 1.3602501 (2000.0) P Q
n 0.15655734 Peri. 148.74350 +0.01640465 -0.99384271
a 3.4094718 Node 300.10934 +0.88923033 +0.06461080
e 0.6010379 Incl. 7.27725 +0.45716551 -0.09001170
P 6.30
From 242 observations 1978-2004, mean residual 0".93. Nongravitational parameters A1 = +0.72 +/- 0.10, A2 = -0.0513 +/- 0.0409.

Comet 81P/Wild
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Feb. 22.70474 TT Muraoka
q 1.5980591 (2000.0) P Q
n 0.15351109 Peri. 41.79365 -0.99858491 -0.03597996
a 3.4544285 Node 136.09710 +0.01949984 -0.93282204
e 0.5373883 Incl. 3.23746 +0.04947660 -0.35853657
P 6.42
From 1788 observations 1992-2008, mean residual 0".71. Nongravitational parameters A1 = +0.08 +/- 0.01, A2 = -0.0079 +/- 0.0004.

Comet 126P/IRAS
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Feb. 22.79447 TT Muraoka

q	1.7134078	(2000.0)	P	Q
n	0.07343559	Peri. 356.73046	+0.99605710	+0.08417113
a	5.6476139	Node 357.76070	-0.05595109	+0.35086522
e	0.6966139	Incl. 45.83017	-0.06884572	+0.93263541
P	13.42			

From 216 observations 1983-1997, mean residual 0".87.

Comet P/2004 R1 (McNaught)
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Feb. 24.39385 TT Muraoka

q	0.9856962	(2000.0)	P	Q
n	0.17989813	Peri. 0.68867	+0.44852614	+0.89047262
a	3.1077897	Node 295.96301	-0.82042500	+0.37615508
e	0.6828305	Incl. 4.89380	-0.35458019	+0.25605833
P	5.48 (dP = +/- 0.79 day)			

From 43 observations 2004 Sept. 2-Nov. 9, mean residual 0".70.

Comet 65P/Gunn
Epoch 2010 Feb. 13.0 TT = JDT 2455240.5
T 2010 Mar. 2.13814 TT Muraoka

q	2.4403658	(2000.0)	P	Q
n	0.14517144	Peri. 196.63733	-0.09163129	+0.98159114
a	3.5854906	Node 68.35607	-0.89186090	-0.00604301
e	0.3193775	Incl. 10.38665	-0.44293096	-0.19089869
P	6.79			

From 1448 observations 1997-2008, mean residual 0".88. Nongravitational parameters A1 = +1.57 +/- 0.06, A2 = +0.2449 +/- 0.0036.

Comet P/2002 LZ11 (LINEAR)
Epoch 2010 Mar. 25.0 TT = JDT 2455280.5
T 2010 Mar. 6.08559 TT Muraoka

q	2.3643245	(2000.0)	P	Q
n	0.14098611	Peri. 107.76386	+0.91749643	+0.36615925
a	3.6561036	Node 231.05127	-0.39615115	+0.87617150
e	0.3533212	Incl. 11.52111	+0.03556083	+0.31345001
P	6.99 (dP = +/- 0.05 day)			

From 152 observations 2002 June 5-2004 Jan. 13, mean residual 0".69.

Comet 162P/Siding Spring
Epoch 2010 Mar. 25.0 TT = JDT 2455280.5
T 2010 Mar. 8.42267 TT Muraoka

q	1.2330701	(2000.0)	P	Q
n	0.18479703	Peri. 356.30645	+0.88277480	-0.40266337
a	3.0526199	Node 31.24009	+0.44210414	+0.53777764
e	0.5960617	Incl. 27.81677	+0.15891064	+0.74071413
P	5.33			

From 1258 observations 1990-2008, mean residual 0".39.

Comet P/2001 R6 (LINEAR-Skiff)
Epoch 2010 Mar. 25.0 TT = JDT 2455280.5
T 2010 Mar. 26.11497 TT Muraoka

q	2.1786379	(2000.0)	P	Q
n	0.11570248	Peri. 308.44875	+0.92933337	-0.24560244
a	4.1710072	Node 67.32362	+0.35513120	+0.79897929
e	0.4776710	Incl. 17.38642	-0.10110049	+0.54891852
P	8.52 (dP = +/- 0.12 day)			

From 100 observations 2001 Aug. 19-2002 Feb. 1, mean residual 0".65.

Comet 94P/Russell
Epoch 2010 Mar. 25.0 TT = JDT 2455280.5
T 2010 Mar. 29.74795 TT Muraoka

q	2.2402724	(2000.0)	P	Q
n	0.14940060	Peri. 92.84366	-0.95460596	-0.27994593
a	3.5175032	Node 70.91564	+0.21206811	-0.87865841
e	0.3631072	Incl. 6.18228	+0.20917597	-0.38676825
P	6.60			

From 254 observations 1984-2008, mean residual 0".68. Nongravitational parameters A1 = -0.08 +/- 0.03, A2 = +0.0043 +/- 0.0008.

```
Comet 30P/Reinmuth
Epoch 2010 May 4.0 TT = JDT 2455320.5
T 2010 Apr. 19.54480 TT                                    Muraoka
q   1.8840778           (2000.0)            P               Q
n   0.13432215     Peri.   13.20674     -0.67951338     -0.72333708
a   3.7760490      Node   119.75447     +0.65963119     -0.67553376
e   0.5010452      Incl.    8.12222     +0.32116703     -0.14296016
P   7.34
From 1147 observations 1957-2003, mean residual 0".79.  Nongravitational
   parameters A1 = +0.20 +/- 0.01, A2 = -0.0150 +/- 0.0002.

Comet C/2007 V053 (Spacewatch)
Epoch 2010 May 4.0 TT = JDT 2455320.5
T 2010 Apr. 26.48093 TT                                    Muraoka
q   4.8427161           (2000.0)            P               Q
z  +0.0000401      Peri.   75.02791     +0.08639185     -0.49857996
 +/-0.0000039      Node    59.73678     -0.15556303     -0.86189624
e   0.9998057      Incl.   86.99038     +0.98404095     -0.09248187
From 132 observations 2007 Oct. 20-2008 Dec. 23, mean residual 0".54.
orig. 1/a = +0.0000755, fut. 1/a = +0.0001031.

Comet 104P/Kowal
Epoch 2010 May 4.0 TT = JDT 2455320.5
T 2010 May 4.63754 TT                                      Muraoka
q   1.1796527           (2000.0)            P               Q
n   0.16744418     Peri.  200.55526     +0.24535441     -0.95823341
a   3.2600381      Node   235.51576     +0.91247842     +0.27945805
e   0.6381476      Incl.   10.26833     +0.32739022     -0.06076128
P   5.89
From 428 observations 1991-2004, mean residual 0".93.  Nongravitational
   parameters A1 = +0.58 +/- 0.06, A2 = -0.5169 +/- 0.0011.

Comet 215P/NEAT
Epoch 2010 June 13.0 TT = JDT 2455360.5
T 2010 June  8.03892 TT                                    Muraoka
q   3.2133783           (2000.0)            P               Q
n   0.12217682     Peri.  222.45280     +0.45162154     +0.86609861
a   4.0223221      Node    75.44082     -0.74758606     +0.49842201
e   0.2011136      Incl.   12.78997     -0.48698364     +0.03806173
P   8.07
From 96 observations 2001 May 22-2009 Feb. 2, mean residual 0".59.

Comet 43P/Wolf-Harrington
Epoch 2010 June 13.0 TT = JDT 2455360.5
T 2010 July 1.74305 TT                                     Muraoka
q   1.3576153           (2000.0)            P               Q
n   0.16091643     Peri.  191.46887     +0.15734563     -0.95316141
a   3.3476172      Node   249.89594     +0.92641901     +0.23306349
e   0.5944532      Incl.   15.96639     +0.34203825     -0.19278158
P   6.12
From 1631 observations 1990-2005, mean residual 0".67.  Nongravitational
   parameters A1 = +0.35 +/- 0.01, A2 = -0.0238 +/- 0.0002.

Comet 10P/Tempel
Epoch 2010 July 23.0 TT = JDT 2455400.5
T 2010 July  4.90708 TT                                    Muraoka
q   1.4226986           (2000.0)            P               Q
n   0.18337602     Peri.  195.66092     +0.68293961     +0.70686652
a   3.0683697      Node   117.82496     -0.64584319     +0.70212290
e   0.5363340      Incl.   12.02234     -0.34129176     +0.08580886
P   5.37
From 1055 observations 1946-2008, mean residual 0".87.  Nongravitational
   parameters A1 = +0.03 +/- 0.00, A2 = +0.0014 +/- 0.0000.

Comet 2P/Encke
Epoch 2010 July 23.0 TT = JDT 2455400.5
T 2010 Aug. 6.49786 TT                                     Muraoka
q   0.3358689           (2000.0)            P               Q
n   0.29906705     Peri.  186.54868     -0.94514219     -0.31466703
a   2.2145747      Node   334.56705     +0.30820525     -0.77005295
e   0.8483371      Incl.   11.78310     +0.10823938     -0.55498029
P   3.30
From 1441 observations 1993-2008, mean residual 0".66.  Nongravitational
   parameters A1 = +0.02 +/- 0.00, A2 = -0.0010 +/- 0.0000.
```

Comet P/2002 S1 (Skiff)
Epoch 2010 Sept. 1.0 TT = JDT 2455440.5
T 2010 Aug. 14.66657 TT Muraoka
q 2.4200674 (2000.0) P Q
n 0.11657393 Peri. 37.84911 +0.89339256 -0.43715217
a 4.1501942 Node 346.82505 +0.21201239 +0.61365434
e 0.4168785 Incl. 27.05511 +0.39610665 +0.65751527
P 8.45 (dP = +/- 0.06 day)
From 134 observations 2001 July 27-2003 Apr. 7, mean residual 0".74.

Comet 31P/Schwassmann-Wachmann
Epoch 2010 Oct. 11.0 TT = JDT 2455480.5
T 2010 Sept. 29.49032 TT Muraoka
q 3.4243248 (2000.0) P Q
n 0.11280034 Peri. 17.93242 -0.66983243 -0.73898276
a 4.2422454 Node 114.18996 +0.67116476 -0.64424549
e 0.1928037 Incl. 4.54675 +0.31758837 -0.19710969
P 8.74
From 531 observations 1979-2008, mean residual 0".87. Nongravitational parameters A1 = +1.07 +/- 0.01, A2 = -0.2729 +/- 0.0011.

Comet C/2008 FK75 (Lemmon-Siding Spring)
Epoch 2010 Oct. 11.0 TT = JDT 2455480.5
T 2010 Sept. 29.55234 TT Muraoka
q 4.5124868 (2000.0) P Q
z -0.0004273 Peri. 80.41404 +0.16367501 +0.82388157
+/-0.000623 Node 218.26810 -0.78068654 +0.44443544
e 1.0019280 Incl. 61.17699 +0.60310780 +0.35170485
From 77 observations 2008 Mar. 31-Aug. 3, mean residual 0".45.
orig. 1/a = +0.000172, fut. 1/a = +0.000054.

Comet 9P/Tempel
Epoch 2010 Dec. 30.0 TT = JDT 2455560.5
T 2011 Jan. 12.36544 TT Muraoka
q 1.5103004 (2000.0) P Q
n 0.17850669 Peri. 178.92324 -0.37705658 +0.91038339
a 3.1239187 Node 68.90704 -0.85112216 -0.26803278
e 0.5165366 Incl. 10.52235 -0.36526621 -0.31521504
P 5.52
From 1895 observations 1967-2006, mean residual 0".65. Nongravitational parameters A1 = +0.02 +/- 0.00, A2 = +0.0017 +/- 0.0000.

Comet C/2008 S3 (Boattini)
Epoch 2011 June 8.0 TT = JDT 2455720.5
T 2011 June 4.66131 TT Muraoka
q 8.0213911 (2000.0) P Q
z -0.0009911 Peri. 39.86220 +0.94193509 +0.23163663
+/-0.0002197 Node 54.93172 +0.17805672 -0.95836139
e 1.0079498 Incl. 162.72062 +0.28470000 -0.16699678
From 162 observations 2008 Sept. 29-Dec. 23, mean residual 0".57.
orig. 1/a = -0.000845, fut. 1/a = -0.000833.

Comet 213P/Van Ness
Epoch 2011 June 8.0 TT = JDT 2455720.5
T 2011 June 16.23093 TT Muraoka
q 2.1225335 (2000.0) P Q
n 0.15575168 Peri. 3.33206 +0.71870688 +0.68291841
a 3.4212191 Node 312.67187 -0.64197685 +0.57954594
e 0.3795973 Incl. 10.23962 -0.26706956 +0.44468973
P 6.33 (dP = +/- 0.003 day)
From 845 observations 2005 Aug. 4-2009 Feb. 1, mean residual 0".57.

Comet 27P/Crommelin [Orbit 2]
Epoch 2011 July 18.0 TT = JDT 2455760.5
T 2011 Aug. 3.79926 TT Muraoka
q 0.7478702 (2000.0) P Q
n 0.03530090 Peri. 195.97902 +0.09146901 -0.88487095
a 9.2033421 Node 250.63852 +0.95843121 +0.20271805
e 0.9187393 Incl. 28.95670 +0.27026475 -0.41941481
P 27.92
From 237 observations 1873-1984, mean residual 1".52. Nongravitational parameters A1 = +0.24 +/- 0.18, A2 = -0.0004 +/- 0.0001.

Comet 27P/Crommelin [Orbit 1]
Epoch 2011 July 18.0 TT = JDT 2455760.5
T 2011 Aug. 3.80820 TT Muraoka

q	0.7478719	(2000.0)	P	Q
n	0.03529425	Peri. 195.98065	+0.09145127	-0.88487453
a	9.2044981	Node 250.63807	+0.95843618	+0.20269667
e	0.9187493	Incl. 28.95655	+0.27025313	-0.41941761
P	27.93			

From 244 observations 1873-1984, mean residual 1".57. Nongravitational parameters A1 = -0.05 +/- 0.06, A2 = -0.0570 +/- 0.0010.

Comet C/2006 S3 (LONEOS)
Epoch 2012 Apr. 23.0 TT = JDT 2456040.5
T 2012 Apr. 16.35576 TT Muraoka

q	5.1311157	(2000.0)	P	Q
z	-0.0006750	Peri. 140.12907	-0.21559257	-0.96492110
+/-	0.0000056	Node 38.36822	-0.94613641	+0.24437276
e	1.0034634	Incl. 166.03238	-0.24154862	-0.09596472

From 274 observations 2006 Aug. 29-2008 Dec. 30, mean residual 0".68.
orig. 1/a = +0.0000151, fut. 1/a = -0.0000297.

Comet 27P/Crommelin [Orbit 2]
Epoch 2011 July 18.0 TT = JDT 2455760.5
T 2011 Aug. 3.79926 TT Muraoka

q	0.7478702	(2000.0)	P	Q
n	0.03530090	Peri. 195.97902	+0.09146901	-0.88487095
a	9.2033421	Node 250.63852	+0.95843121	+0.20271805
e	0.9187393	Incl. 28.95670	+0.27026475	-0.41941481
P	27.92			

From 237 observations 1873-1984, mean residual 1".52. Nongravitational parameters A1 = +0.24 +/- 0.18, A2 = -0.0004 +/- 0.0001.

Comet 27P/Crommelin [Orbit 1]
Epoch 2011 July 18.0 TT = JDT 2455760.5
T 2011 Aug. 3.80820 TT Muraoka

q	0.7478719	(2000.0)	P	Q
n	0.03529425	Peri. 195.98065	+0.09145127	-0.88487453
a	9.2044981	Node 250.63807	+0.95843618	+0.20269667
e	0.9187493	Incl. 28.95655	+0.27025313	-0.41941761
P	27.93			

From 244 observations 1873-1984, mean residual 1".57. Nongravitational parameters A1 = -0.05 +/- 0.06, A2 = -0.0570 +/- 0.0010.

Comet 158P/Kowal-LINEAR
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 27.48211 TT Muraoka

q	4.5764182	(2000.0)	P	Q
n	0.09607373	Peri. 232.84975	+0.97919821	-0.18018944
a	4.7213510	Node 137.30432	+0.20025492	+0.93228732
e	0.0306973	Incl. 7.90735	-0.03269301	+0.31364330
P	10.26			

From 263 observations 1979-2008, mean residual 0".75.

Comet 29P/Schwassmann-Wachmann
Epoch 2019 Mar. 18.0 TT = JDT 2458560.5
T 2019 Mar. 7.75493 TT Muraoka

q	5.7668224	(2000.0)	P	Q
n	0.06662629	Peri. 47.77400	+0.99270170	-0.00956690
a	6.0261367	Node 312.39486	-0.05135319	+0.86841736
e	0.0430316	Incl. 9.36830	+0.10911546	+0.49574163
P	14.79			

From 2461 observations 1902-2002, mean residual 0".94.

Remarks.

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

Comet 29P/Schwassmann-Wachmann

Epoch = 2009 July 28.0 TT
T = 2004 July 4.42177 TT
Peri. = 48.43502 e = 0.0451329
Node = 312.63483 2000.0 a = 5.9879023 AU
Incl. = 9.39430 n = 0.06726544
q = 5.7176509 AU P = 14.65 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	08 05.30	+23 26.1	5.125	6.095	-0.52	+0.8	13.4	169.7
Jan. 19	08 00.13	+23 33.8	5.115	6.098	-0.51	+0.6	13.4	176.7
Jan. 29	07 54.99	+23 39.8	5.138	6.101	-0.48	+0.3	13.4	166.8
Feb. 8	07 50.22	+23 43.3	5.191	6.103	-0.41	+0.1	13.5	155.7
Feb. 18	07 46.14	+23 43.9	5.272	6.106	-0.32	-0.2	13.5	144.8
Feb. 28	07 42.98	+23 41.5	5.379	6.109	-0.21	-0.5	13.5	134.0
Mar. 10	07 40.92	+23 36.3	5.507	6.112	-0.09	-0.8	13.6	123.6
Mar. 20	07 40.04	+23 28.3	5.650	6.115	+0.03	-1.1	13.7	113.4
Mar. 30	07 40.35	+23 17.8	5.805	6.117	+0.15	-1.3	13.7	103.6
Apr. 9	07 41.83	+23 04.8	5.965	6.120	+0.26	-1.5	13.8	94.2
Apr. 19	07 44.39	+22 49.6	6.128	6.123	+0.35	-1.7	13.8	85.0
Apr. 29	07 47.93	+22 32.3	6.289	6.125	+0.44	-2.0	13.9	76.1
May 9	07 52.36	+22 12.8	6.443	6.128	+0.52	-2.2	14.0	67.5
May 19	07 57.54	+21 51.2	6.589	6.131	+0.58	-2.4	14.0	59.1
May 29	08 03.37	+21 27.5	6.722	6.133	+0.64	-2.6	14.0	50.9
June 8	08 09.73	+21 01.7	6.841	6.136	+0.68	-2.8	14.1	42.8
June 18	08 16.53	+20 33.9	6.944	6.139	+0.71	-3.0	14.1	34.9
June 28	08 23.66	+20 04.3	7.028	6.141	+0.74	-3.1	14.1	27.1
July 8	08 31.02	+19 32.8	7.093	6.144	+0.75	-3.3	14.2	19.4
July 18	08 38.54	+18 59.7	7.138	6.146	+0.76	-3.5	14.2	11.7
July 28	08 46.13	+18 25.2	7.161	6.149	+0.76	-3.6	14.2	4.1
Aug. 7	08 53.71	+17 49.5	7.163	6.151	+0.75	-3.7	14.2	3.6
Aug. 17	09 01.20	+17 13.0	7.143	6.154	+0.73	-3.7	14.2	11.3
Aug. 27	09 08.52	+16 35.9	7.102	6.156	+0.71	-3.7	14.2	19.1
Sept. 6	09 15.60	+15 58.8	7.040	6.158	+0.68	-3.7	14.2	27.0
Sept.16	09 22.35	+15 22.0	6.958	6.161	+0.63	-3.6	14.1	35.0
Sept.26	09 28.70	+14 46.0	6.857	6.163	+0.58	-3.5	14.1	43.1
Oct. 6	09 34.54	+14 11.5	6.739	6.165	+0.53	-3.3	14.1	51.4
Oct. 16	09 39.80	+13 39.0	6.607	6.168	+0.46	-3.0	14.0	59.9
Oct. 26	09 44.38	+13 09.1	6.462	6.170	+0.38	-2.7	14.0	68.7
Nov. 5	09 48.18	+12 42.5	6.308	6.172	+0.29	-2.3	13.9	77.6
Nov. 15	09 51.11	+12 19.7	6.149	6.175	+0.20	-1.8	13.9	86.9
Nov. 25	09 53.09	+12 01.4	5.988	6.177	+0.09	-1.3	13.8	96.4
Dec. 5	09 54.03	+11 48.1	5.830	6.179	-0.01	-0.8	13.8	106.2
Dec. 15	09 53.91	+11 40.2	5.680	6.181	-0.12	-0.3	13.7	116.4
Dec. 25	09 52.70	+11 37.6	5.543	6.183	-0.22	+0.3	13.7	126.8
Jan. 4	09 50.45	+11 40.4	5.424	6.185	-0.32	+0.7	13.6	137.5
Jan. 14	09 47.27	+11 47.8	5.327	6.187	-0.39	+1.1	13.6	148.5
Jan. 24	09 43.32	+11 59.3	5.257	6.189	-0.45	+1.4	13.5	159.6
Feb. 3	09 38.85	+12 13.5	5.217	6.192	-0.47	+1.6	13.5	170.8
Feb. 13	09 34.14	+12 29.2	5.207	6.194	-0.46	+1.6	13.5	177.1
Feb. 23	09 29.49	+12 44.8	5.230	6.196	-0.43	+1.4	13.5	166.4
Mar. 5	09 25.21	+12 59.2	5.283	6.197	-0.36	+1.2	13.6	155.3
Mar. 15	09 21.56	+13 11.1	5.363	6.199	-0.28	+0.9	13.6	144.4
Mar. 25	09 18.76	+13 19.6	5.469	6.201	-0.18	+0.5	13.6	133.8

Comet P/2005 Y2 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2004 Dec. 29.12290 TT
Peri. = 194.86039 e = 0.4669298
Node = 94.60058 2000.0 a = 6.3079832 AU
Incl. = 19.17394 n = 0.06221116
q = 3.3625978 AU P = 15.84 years

m1 = 8.0 + 5 log(Delta) + 7.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	04 14.86	+11 43.2	6.863	7.584	-0.23	+1.2	18.8	134.4
Jan. 19	04 12.59	+11 55.2	7.014	7.608	-0.14	+1.5	18.8	124.0
Jan. 29	04 11.20	+12 10.1	7.182	7.632	-0.05	+1.7	18.9	113.7
Feb. 8	04 10.73	+12 27.5	7.362	7.655	+0.04	+1.9	19.0	103.7
Feb. 18	04 11.18	+12 46.9	7.549	7.679	+0.13	+2.1	19.0	93.9
Feb. 28	04 12.50	+13 08.1	7.737	7.702	+0.21	+2.2	19.1	84.3
Mar. 10	04 14.64	+13 30.3	7.924	7.725	+0.29	+2.3	19.2	74.9
Mar. 20	04 17.52	+13 53.2	8.103	7.748	+0.35	+2.3	19.2	65.8
Mar. 30	04 21.06	+14 16.3	8.271	7.770	+0.41	+2.3	19.3	56.9
Apr. 9	04 25.17	+14 39.1	8.425	7.793	+0.46	+2.2	19.3	48.2
Apr. 19	04 29.76	+15 01.3	8.562	7.815	+0.50	+2.1	19.4	39.6
Apr. 29	04 34.74	+15 22.6	8.680	7.837	+0.53	+2.0	19.4	31.3
May 9	04 40.02	+15 42.7	8.777	7.859	+0.55	+1.9	19.4	23.1
May 19	04 45.52	+16 01.4	8.852	7.881	+0.56	+1.7	19.5	15.3
May 29	04 51.15	+16 18.4	8.903	7.902	+0.57	+1.5	19.5	8.4
June 8	04 56.84	+16 33.7	8.931	7.924	+0.57	+1.3	19.5	6.5
June 18	05 02.49	+16 47.1	8.935	7.945	+0.55	+1.2	19.5	12.2
June 28	05 08.04	+16 58.7	8.916	7.966	+0.54	+1.0	19.5	19.7
July 8	05 13.39	+17 08.4	8.874	7.987	+0.51	+0.8	19.5	27.6
July 18	05 18.47	+17 16.3	8.810	8.007	+0.47	+0.6	19.5	35.8
July 28	05 23.19	+17 22.5	8.726	8.028	+0.43	+0.5	19.5	44.1
Aug. 7	05 27.48	+17 27.1	8.625	8.048	+0.38	+0.3	19.5	52.5
Aug. 17	05 31.24	+17 30.3	8.508	8.068	+0.32	+0.2	19.4	61.2
Aug. 27	05 34.39	+17 32.3	8.378	8.088	+0.25	+0.1	19.4	70.0
Sept. 6	05 36.86	+17 33.3	8.240	8.108	+0.17	0.0	19.4	79.0
Sept.16	05 38.57	+17 33.5	8.095	8.128	+0.09	0.0	19.4	88.3
Sept.26	05 39.47	+17 33.1	7.950	8.147	0.00	-0.1	19.3	97.8
Oct. 6	05 39.50	+17 32.5	7.809	8.166	-0.08	-0.1	19.3	107.6
Oct. 16	05 38.66	+17 31.8	7.676	8.185	-0.17	-0.1	19.3	117.6
Oct. 26	05 36.95	+17 31.2	7.556	8.204	-0.25	0.0	19.2	127.9
Nov. 5	05 34.43	+17 30.9	7.456	8.223	-0.32	0.0	19.2	138.4
Nov. 15	05 31.21	+17 31.2	7.378	8.242	-0.38	+0.1	19.2	149.0
Nov. 25	05 27.42	+17 32.0	7.327	8.260	-0.42	+0.2	19.2	159.7
Dec. 5	05 23.26	+17 33.6	7.306	8.278	-0.43	+0.3	19.2	169.9
Dec. 15	05 18.94	+17 36.1	7.317	8.296	-0.42	+0.4	19.2	173.8
Dec. 25	05 14.69	+17 39.7	7.360	8.314	-0.40	+0.5	19.2	165.0
Jan. 4	05 10.74	+17 44.4	7.434	8.332	-0.35	+0.6	19.3	154.4
Jan. 14	05 07.28	+17 50.4	7.537	8.349	-0.28	+0.7	19.3	143.6
Jan. 24	05 04.48	+17 57.7	7.666	8.367	-0.20	+0.9	19.3	132.8
Feb. 3	05 02.45	+18 06.4	7.816	8.384	-0.12	+1.0	19.4	122.3
Feb. 13	05 01.27	+18 16.3	7.982	8.401	-0.03	+1.1	19.4	111.9
Feb. 23	05 00.95	+18 27.3	8.159	8.417	+0.05	+1.2	19.5	101.8
Mar. 5	05 01.50	+18 39.3	8.342	8.434	+0.14	+1.3	19.6	92.0
Mar. 15	05 02.87	+18 52.0	8.526	8.451	+0.21	+1.3	19.6	82.3
Mar. 25	05 05.01	+19 05.2	8.706	8.467	+0.28	+1.3	19.7	72.9

Comet 136P/Mueller

Epoch = 2009 July 28.0 TT
T = 2007 Oct. 22.77276 TT
Peri. = 224.97708 e = 0.2934995
Node = 137.55285 2000.0 a = 4.1915404 AU
Incl. = 9.42768 n = 0.11485333
q = 2.9613254 AU P = 8.58 years

m1 = 13.8 + 5 log(Delta) + 5.0 log(r(t-180))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	05 12.01	+13 14.1	2.828	3.700	-0.41	+2.4	18.6	148.1
Jan. 19	05 07.92	+13 38.6	2.941	3.725	-0.23	+2.8	18.7	137.5
Jan. 29	05 05.64	+14 06.9	3.074	3.751	-0.04	+3.1	18.8	127.1
Feb. 8	05 05.27	+14 38.1	3.224	3.777	+0.15	+3.3	19.0	117.1
Feb. 18	05 06.76	+15 10.8	3.386	3.803	+0.32	+3.3	19.1	107.5
Feb. 28	05 10.00	+15 44.1	3.556	3.828	+0.48	+3.3	19.2	98.4
Mar. 10	05 14.82	+16 16.9	3.730	3.854	+0.62	+3.1	19.3	89.7
Mar. 20	05 21.02	+16 48.2	3.904	3.880	+0.74	+2.9	19.4	81.3
Mar. 30	05 28.44	+17 17.4	4.075	3.906	+0.84	+2.6	19.5	73.2
Apr. 9	05 36.88	+17 43.5	4.241	3.931	+0.93	+2.3	19.6	65.4
Apr. 19	05 46.18	+18 06.3	4.398	3.957	+1.00	+1.9	19.7	57.9
Apr. 29	05 56.19	+18 25.1	4.545	3.983	+1.06	+1.5	19.8	50.6
May 9	06 06.77	+18 39.7	4.681	4.008	+1.10	+1.0	19.9	43.4
May 19	06 17.79	+18 49.9	4.803	4.034	+1.13	+0.6	20.0	36.4
May 29	06 29.14	+18 55.5	4.910	4.059	+1.16	+0.1	20.0	29.6
June 8	06 40.71	+18 56.6	5.001	4.084	+1.17	-0.3	20.1	22.8
June 18	06 52.40	+18 53.2	5.076	4.109	+1.17	-0.8	20.1	16.1
June 28	07 04.13	+18 45.4	5.133	4.134	+1.17	-1.2	20.2	9.7
July 8	07 15.81	+18 33.5	5.173	4.159	+1.15	-1.6	20.2	4.3
July 18	07 27.36	+18 17.8	5.194	4.184	+1.13	-1.9	20.2	5.9
July 28	07 38.70	+17 58.7	5.197	4.209	+1.11	-2.2	20.2	12.0
Aug. 7	07 49.75	+17 36.7	5.181	4.233	+1.07	-2.4	20.3	18.7
Aug. 17	08 00.44	+17 12.3	5.148	4.258	+1.02	-2.6	20.3	25.6
Aug. 27	08 10.68	+16 46.1	5.097	4.282	+0.97	-2.7	20.3	32.7
Sept. 6	08 20.38	+16 18.8	5.029	4.306	+0.91	-2.8	20.2	40.0
Sept. 16	08 29.46	+15 51.2	4.946	4.330	+0.84	-2.7	20.2	47.4
Sept. 26	08 37.82	+15 24.2	4.848	4.353	+0.75	-2.6	20.2	55.1
Oct. 6	08 45.33	+14 58.7	4.738	4.377	+0.66	-2.3	20.2	63.1
Oct. 16	08 51.90	+14 35.7	4.617	4.400	+0.55	-1.9	20.1	71.3
Oct. 26	08 57.40	+14 16.2	4.488	4.423	+0.43	-1.5	20.1	79.9
Nov. 5	09 01.69	+14 01.3	4.355	4.446	+0.30	-0.9	20.0	88.8
Nov. 15	09 04.66	+13 52.1	4.221	4.468	+0.15	-0.3	20.0	98.1
Nov. 25	09 06.18	+13 49.5	4.089	4.491	0.00	+0.5	19.9	107.8
Dec. 5	09 06.18	+13 54.3	3.966	4.513	-0.15	+1.2	19.8	117.9
Dec. 15	09 04.64	+14 06.6	3.856	4.535	-0.30	+2.0	19.8	128.5
Dec. 25	09 01.61	+14 26.5	3.764	4.557	-0.44	+2.7	19.8	139.5
Jan. 4	08 57.24	+14 53.0	3.695	4.578	-0.54	+3.2	19.7	150.8
Jan. 14	08 51.82	+15 24.7	3.653	4.600	-0.61	+3.5	19.7	162.3
Jan. 24	08 45.73	+15 59.7	3.641	4.621	-0.63	+3.6	19.7	173.9
Feb. 3	08 39.45	+16 35.5	3.661	4.642	-0.60	+3.5	19.8	173.8
Feb. 13	08 33.46	+17 10.1	3.712	4.662	-0.52	+3.1	19.8	162.3
Feb. 23	08 28.21	+17 41.6	3.793	4.683	-0.41	+2.7	19.9	150.9
Mar. 5	08 24.08	+18 08.5	3.901	4.703	-0.28	+2.2	19.9	139.8
Mar. 15	08 21.29	+18 30.3	4.032	4.723	-0.13	+1.6	20.0	129.1
Mar. 25	08 19.98	+18 46.3	4.181	4.742	+0.02	+1.0	20.1	118.8

Comet 139P/Vaisala-Oterma

Epoch = 2009 July 28.0 TT
T = 2008 Apr. 19.50388 TT
Peri. = 165.54796 e = 0.2470858
Node = 242.44065 2000.0 a = 4.5193505 AU
Incl. = 2.32886 n = 0.10258646
q = 3.4026831 AU P = 9.61 years

m1 = 7.2 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	05 45.54	+21 49.4	2.678	3.608	-0.51	-0.4	19.1	157.9
Jan. 19	05 40.48	+21 45.6	2.761	3.623	-0.33	-0.3	19.2	146.5
Jan. 29	05 37.17	+21 43.1	2.868	3.638	-0.13	-0.1	19.3	135.6
Feb. 8	05 35.85	+21 42.2	2.995	3.653	+0.07	+0.1	19.4	125.1
Feb. 18	05 36.54	+21 43.1	3.138	3.669	+0.26	+0.2	19.6	115.2
Feb. 28	05 39.17	+21 45.4	3.291	3.685	+0.44	+0.3	19.7	105.7
Mar. 10	05 43.60	+21 48.3	3.451	3.702	+0.60	+0.3	19.8	96.8
Mar. 20	05 49.62	+21 51.3	3.614	3.719	+0.74	+0.2	20.0	88.2
Mar. 30	05 57.04	+21 53.5	3.777	3.736	+0.86	+0.1	20.1	80.0
Apr. 9	06 05.65	+21 54.1	3.937	3.753	+0.96	-0.2	20.2	72.2
Apr. 19	06 15.25	+21 52.4	4.091	3.771	+1.04	-0.5	20.3	64.6
Apr. 29	06 25.68	+21 47.8	4.237	3.789	+1.11	-0.8	20.5	57.3
May 9	06 36.77	+21 39.8	4.373	3.807	+1.16	-1.2	20.6	50.2
May 19	06 48.39	+21 28.1	4.499	3.825	+1.20	-1.6	20.7	43.2
May 29	07 00.40	+21 12.3	4.612	3.844	+1.23	-2.0	20.8	36.4
June 8	07 12.69	+20 52.3	4.711	3.862	+1.25	-2.4	20.8	29.8
June 18	07 25.15	+20 28.1	4.795	3.881	+1.25	-2.8	20.9	23.2
June 28	07 37.70	+19 59.8	4.864	3.901	+1.25	-3.2	21.0	16.6
July 8	07 50.24	+19 27.5	4.917	3.920	+1.25	-3.6	21.0	10.1
July 18	08 02.69	+18 51.4	4.953	3.940	+1.23	-3.9	21.1	3.8
July 28	08 15.00	+18 12.0	4.972	3.959	+1.21	-4.2	21.1	3.5
Aug. 7	08 27.06	+17 29.6	4.975	3.979	+1.18	-4.5	21.2	9.8
Aug. 17	08 38.84	+16 44.6	4.960	3.999	+1.14	-4.7	21.2	16.4
Aug. 27	08 50.25	+15 57.7	4.928	4.019	+1.10	-4.8	21.2	23.2
Sept. 6	09 01.21	+15 09.4	4.879	4.039	+1.05	-4.9	21.3	30.1
Sept. 16	09 11.67	+14 20.4	4.815	4.059	+0.99	-4.9	21.3	37.2
Sept. 26	09 21.52	+13 31.6	4.735	4.080	+0.92	-4.8	21.3	44.4
Oct. 6	09 30.69	+12 43.6	4.641	4.100	+0.84	-4.6	21.3	51.9
Oct. 16	09 39.08	+11 57.5	4.535	4.121	+0.75	-4.3	21.2	59.6
Oct. 26	09 46.56	+11 14.2	4.418	4.141	+0.65	-3.9	21.2	67.5
Nov. 5	09 53.03	+10 34.8	4.292	4.162	+0.53	-3.4	21.2	75.8
Nov. 15	09 58.36	+10 00.4	4.161	4.182	+0.40	-2.8	21.2	84.4
Nov. 25	10 02.41	+09 32.0	4.027	4.203	+0.26	-2.1	21.1	93.4
Dec. 5	10 05.06	+09 10.7	3.895	4.223	+0.11	-1.3	21.1	102.8
Dec. 15	10 06.21	+08 57.4	3.768	4.244	-0.04	-0.5	21.1	112.6
Dec. 25	10 05.79	+08 52.9	3.651	4.265	-0.20	+0.4	21.0	122.8
Jan. 4	10 03.81	+08 57.3	3.549	4.285	-0.34	+1.3	21.0	133.5
Jan. 14	10 00.38	+09 10.4	3.467	4.306	-0.47	+2.1	21.0	144.5
Jan. 24	09 55.71	+09 31.1	3.410	4.327	-0.56	+2.6	21.0	155.8
Feb. 3	09 50.15	+09 57.5	3.380	4.347	-0.60	+3.0	21.0	167.2
Feb. 13	09 44.14	+10 27.5	3.381	4.368	-0.60	+3.1	21.0	176.9
Feb. 23	09 38.18	+10 58.4	3.414	4.388	-0.54	+2.9	21.1	168.7
Mar. 5	09 32.76	+11 27.6	3.476	4.409	-0.45	+2.6	21.2	157.4
Mar. 15	09 28.29	+11 53.2	3.567	4.429	-0.32	+2.0	21.3	146.3
Mar. 25	09 25.06	+12 13.4	3.682	4.449	-0.18	+1.4	21.4	135.6

Comet 205P/Giacobini

Epoch = 2009 July 28.0 TT
T = 2008 Sept. 10.06387 TT
Peri. = 154.24163 e = 0.5687434
Node = 179.62444 2000.0 a = 3.5401345 AU
Incl. = 15.30441 n = 0.14797026
q = 1.5267064 AU P = 6.66 years

m1 = 11.2 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	00 49.65	-06 00.2	1.857	1.952	+1.97	+11.0	17.6	80.5
Jan. 19	01 09.39	-04 10.5	2.013	2.011	+1.94	+11.0	18.0	75.7
Jan. 29	01 28.78	-02 21.0	2.172	2.071	+1.91	+10.7	18.4	70.9
Feb. 8	01 47.88	-00 33.7	2.332	2.132	+1.88	+10.3	18.8	66.1
Feb. 18	02 06.71	+01 09.6	2.492	2.194	+1.86	+9.8	19.2	61.2
Feb. 28	02 25.32	+02 47.7	2.651	2.257	+1.84	+9.2	19.5	56.3
Mar. 10	02 43.72	+04 19.3	2.807	2.320	+1.82	+8.4	19.8	51.3
Mar. 20	03 01.93	+05 43.7	2.959	2.383	+1.80	+7.7	20.2	46.4
Mar. 30	03 19.96	+07 00.3	3.105	2.446	+1.78	+6.8	20.5	41.4
Apr. 9	03 37.79	+08 08.5	3.244	2.509	+1.76	+6.0	20.7	36.4
Apr. 19	03 55.39	+09 08.1	3.374	2.572	+1.74	+5.1	21.0	31.5
Apr. 29	04 12.78	+09 58.7	3.496	2.635	+1.71	+4.2	21.3	26.6
May 9	04 29.89	+10 40.4	3.607	2.697	+1.68	+3.3	21.5	21.9
May 19	04 46.70	+11 13.1	3.707	2.759	+1.65	+2.4	21.8	17.5
May 29	05 03.18	+11 37.0	3.794	2.820	+1.61	+1.5	22.0	13.8
June 8	05 19.26	+11 52.3	3.868	2.880	+1.57	+0.7	22.2	11.5
June 18	05 34.92	+11 59.2	3.928	2.941	+1.52	-0.1	22.4	11.7
June 28	05 50.09	+11 58.1	3.974	3.000	+1.46	-0.9	22.5	14.4
July 8	06 04.72	+11 49.4	4.005	3.059	+1.40	-1.6	22.7	18.6
July 18	06 18.75	+11 33.7	4.021	3.117	+1.34	-2.2	22.9	23.7
July 28	06 32.12	+11 11.3	4.021	3.174	+1.26	-2.8	23.0	29.3
Aug. 7	06 44.75	+10 43.0	4.006	3.231	+1.18	-3.4	23.1	35.2
Aug. 17	06 56.57	+10 09.3	3.976	3.287	+1.09	-3.8	23.2	41.5
Aug. 27	07 07.48	+09 31.0	3.932	3.342	+0.99	-4.2	23.3	48.0
Sept. 6	07 17.38	+08 48.8	3.875	3.396	+0.88	-4.5	23.4	54.9
Sept.16	07 26.16	+08 03.7	3.805	3.450	+0.75	-4.7	23.5	62.1
Sept.26	07 33.71	+07 16.7	3.724	3.503	+0.62	-4.8	23.6	69.6
Oct. 6	07 39.88	+06 28.8	3.636	3.555	+0.46	-4.7	23.6	77.5
Oct. 16	07 44.53	+05 41.4	3.541	3.607	+0.30	-4.6	23.7	85.8
Oct. 26	07 47.50	+04 55.8	3.443	3.657	+0.12	-4.2	23.7	94.5
Nov. 5	07 48.69	+04 14.0	3.347	3.707	-0.07	-3.7	23.8	103.6
Nov. 15	07 48.00	+03 37.5	3.256	3.756	-0.26	-2.9	23.8	113.2
Nov. 25	07 45.40	+03 08.3	3.175	3.805	-0.44	-2.0	23.9	123.1
Dec. 5	07 40.98	+02 48.5	3.110	3.852	-0.60	-0.9	23.9	133.2
Dec. 15	07 34.98	+02 39.4	3.065	3.899	-0.72	+0.3	24.0	143.3
Dec. 25	07 27.77	+02 42.2	3.046	3.945	-0.79	+1.5	24.0	152.7
Jan. 4	07 19.88	+02 56.8	3.055	3.990	-0.80	+2.5	24.1	159.5
Jan. 14	07 11.91	+03 22.3	3.094	4.035	-0.74	+3.5	24.3	160.6
Jan. 24	07 04.47	+03 56.8	3.164	4.079	-0.64	+4.1	24.4	155.2
Feb. 3	06 58.09	+04 37.8	3.264	4.122	-0.49	+4.5	24.5	146.5
Feb. 13	06 53.14	+05 22.6	3.389	4.164	-0.33	+4.6	24.7	136.8
Feb. 23	06 49.87	+06 08.7	3.537	4.206	-0.15	+4.5	24.9	126.9
Mar. 5	06 48.33	+06 53.8	3.702	4.247	+0.02	+4.3	25.0	117.1
Mar. 15	06 48.48	+07 36.4	3.880	4.287	+0.17	+3.9	.	107.6
Mar. 25	06 50.23	+08 15.2	4.066	4.327	+0.32	+3.4	.	98.5

Comet C/2007 S2 (Lemmon)

Epoch = 2009 July 28.0 TT
T = 2008 Sept. 14.09524 TT
Peri. = 210.41036 e = 0.5565243
Node = 296.23706 2000.0 a = 12.5315563 AU
Incl. = 16.85833 n = 0.02221757
q = 5.5574407 AU P = 44.36 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	10 45.23	-05 28.2	4.997	5.594	-0.18	-2.4	17.7	123.0
Jan. 19	10 43.42	-05 52.3	4.884	5.600	-0.28	-1.6	17.7	132.9
Jan. 29	10 40.64	-06 08.1	4.790	5.607	-0.35	-0.8	17.6	142.8
Feb. 8	10 37.09	-06 15.7	4.721	5.614	-0.41	0.0	17.6	152.4
Feb. 18	10 33.03	-06 15.4	4.680	5.622	-0.43	+0.7	17.6	160.8
Feb. 28	10 28.75	-06 08.2	4.667	5.631	-0.42	+1.3	17.6	165.3
Mar. 10	10 24.57	-05 55.5	4.684	5.640	-0.38	+1.6	17.6	162.6
Mar. 20	10 20.80	-05 39.1	4.731	5.649	-0.31	+1.8	17.7	155.1
Mar. 30	10 17.71	-05 21.1	4.804	5.659	-0.22	+1.8	17.7	146.0
Apr. 9	10 15.50	-05 03.3	4.902	5.670	-0.12	+1.6	17.8	136.4
Apr. 19	10 14.32	-04 47.7	5.021	5.681	-0.01	+1.2	17.8	126.9
Apr. 29	10 14.21	-04 35.6	5.156	5.692	+0.10	+0.7	17.9	117.5
May 9	10 15.19	-04 28.1	5.305	5.704	+0.20	+0.2	18.0	108.4
May 19	10 17.21	-04 26.0	5.461	5.716	+0.30	-0.4	18.0	99.5
May 29	10 20.21	-04 29.7	5.623	5.729	+0.39	-1.0	18.1	90.9
June 8	10 24.11	-04 39.4	5.785	5.742	+0.47	-1.6	18.2	82.6
June 18	10 28.79	-04 55.0	5.945	5.756	+0.54	-2.1	18.3	74.5
June 28	10 34.17	-05 16.5	6.099	5.770	+0.60	-2.7	18.3	66.6
July 8	10 40.14	-05 43.5	6.245	5.785	+0.65	-3.2	18.4	58.9
July 18	10 46.62	-06 15.7	6.380	5.800	+0.69	-3.7	18.5	51.3
July 28	10 53.51	-06 52.9	6.503	5.815	+0.72	-4.2	18.5	44.0
Aug. 7	11 00.73	-07 34.5	6.611	5.831	+0.75	-4.6	18.6	36.8
Aug. 17	11 08.21	-08 20.1	6.703	5.848	+0.77	-4.9	18.6	29.9
Aug. 27	11 15.88	-09 09.4	6.778	5.864	+0.78	-5.2	18.7	23.4
Sept. 6	11 23.65	-10 01.9	6.834	5.882	+0.78	-5.5	18.7	17.7
Sept.16	11 31.46	-10 57.0	6.871	5.899	+0.78	-5.7	18.7	13.7
Sept.26	11 39.25	-11 54.4	6.888	5.917	+0.77	-5.9	18.8	13.3
Oct. 6	11 46.94	-12 53.6	6.886	5.935	+0.75	-6.0	18.8	16.7
Oct. 16	11 54.46	-13 54.1	6.863	5.954	+0.73	-6.1	18.8	22.5
Oct. 26	12 01.73	-14 55.4	6.821	5.973	+0.69	-6.2	18.8	29.2
Nov. 5	12 08.67	-15 56.9	6.761	5.993	+0.65	-6.1	18.8	36.5
Nov. 15	12 15.20	-16 58.1	6.683	6.013	+0.60	-6.0	18.8	44.1
Nov. 25	12 21.21	-17 58.5	6.589	6.033	+0.54	-5.9	18.8	52.0
Dec. 5	12 26.60	-18 57.3	6.482	6.053	+0.47	-5.7	18.8	60.2
Dec. 15	12 31.29	-19 54.0	6.363	6.074	+0.39	-5.4	18.8	68.6
Dec. 25	12 35.16	-20 47.6	6.237	6.096	+0.30	-5.0	18.7	77.3
Jan. 4	12 38.12	-21 37.4	6.105	6.117	+0.20	-4.5	18.7	86.1
Jan. 14	12 40.09	-22 22.5	5.972	6.139	+0.09	-3.9	18.7	95.2
Jan. 24	12 41.00	-23 01.8	5.842	6.161	-0.02	-3.3	18.7	104.4
Feb. 3	12 40.84	-23 34.4	5.720	6.184	-0.12	-2.5	18.7	113.8
Feb. 13	12 39.62	-23 59.2	5.610	6.207	-0.22	-1.6	18.6	123.3
Feb. 23	12 37.42	-24 15.5	5.516	6.230	-0.30	-0.7	18.6	132.7
Mar. 5	12 34.41	-24 22.7	5.442	6.253	-0.36	+0.2	18.6	141.9
Mar. 15	12 30.77	-24 20.7	5.393	6.277	-0.40	+1.1	18.6	150.5
Mar. 25	12 26.77	-24 10.0	5.369	6.301	-0.41	+1.8	18.6	157.3

Comet C/2006 OF2 (Broughton)

Epoch = 2009 July 28.0 TT
T = 2008 Sept. 15.71155 TT
Peri. = 95.61459
Node = 318.50695 2000.0
Incl. = 30.17092
q = 2.4313561 AU
e = 1.0012593

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	06 02.64	+54 47.6	1.880	2.738	-0.50	-15.4	11.7	144.2
Jan. 19	05 57.67	+52 14.0	1.964	2.789	-0.16	-16.0	11.9	139.8
Jan. 29	05 56.09	+49 34.0	2.072	2.842	+0.16	-15.8	12.1	133.6
Feb. 8	05 57.70	+46 56.1	2.202	2.899	+0.43	-15.0	12.3	126.4
Feb. 18	06 02.01	+44 25.7	2.351	2.957	+0.65	-14.0	12.6	118.8
Feb. 28	06 08.54	+42 05.8	2.517	3.018	+0.83	-12.9	12.8	111.0
Mar. 10	06 16.82	+39 56.9	2.696	3.081	+0.96	-11.8	13.0	103.3
Mar. 20	06 26.44	+37 58.6	2.884	3.145	+1.06	-10.9	13.3	95.8
Mar. 30	06 37.07	+36 09.6	3.080	3.211	+1.14	-10.1	13.5	88.4
Apr. 9	06 48.45	+34 28.4	3.279	3.279	+1.19	-9.5	13.7	81.2
Apr. 19	07 00.34	+32 53.4	3.480	3.348	+1.22	-9.0	14.0	74.1
Apr. 29	07 12.57	+31 23.2	3.680	3.418	+1.24	-8.7	14.2	67.2
May 9	07 25.00	+29 56.6	3.876	3.489	+1.25	-8.4	14.4	60.4
May 19	07 37.50	+28 32.7	4.066	3.562	+1.25	-8.2	14.6	53.7
May 29	07 49.99	+27 10.6	4.249	3.635	+1.24	-8.1	14.7	47.0
June 8	08 02.37	+25 49.8	4.422	3.709	+1.22	-8.0	14.9	40.5
June 18	08 14.59	+24 29.8	4.584	3.783	+1.20	-7.9	15.1	33.9
June 28	08 26.58	+23 10.4	4.733	3.858	+1.17	-7.9	15.2	27.3
July 8	08 38.30	+21 51.5	4.868	3.934	+1.14	-7.9	15.4	20.7
July 18	08 49.71	+20 32.9	4.988	4.010	+1.10	-7.8	15.5	14.1
July 28	09 00.76	+19 14.7	5.091	4.086	+1.06	-7.8	15.6	7.5
Aug. 7	09 11.40	+17 57.0	5.177	4.163	+1.02	-7.7	15.8	1.7
Aug. 17	09 21.61	+16 40.1	5.244	4.240	+0.97	-7.6	15.9	6.6
Aug. 27	09 31.33	+15 24.0	5.293	4.318	+0.92	-7.5	16.0	13.6
Sept. 6	09 40.51	+14 09.2	5.323	4.395	+0.86	-7.3	16.1	20.7
Sept.16	09 49.09	+12 55.9	5.335	4.473	+0.79	-7.1	16.1	28.1
Sept.26	09 57.03	+11 44.6	5.328	4.551	+0.72	-6.9	16.2	35.6
Oct. 6	10 04.24	+10 35.7	5.304	4.629	+0.64	-6.6	16.3	43.4
Oct. 16	10 10.64	+09 29.7	5.263	4.707	+0.55	-6.3	16.3	51.4
Oct. 26	10 16.16	+08 27.1	5.208	4.785	+0.45	-5.9	16.4	59.7
Nov. 5	10 20.70	+07 28.6	5.141	4.863	+0.35	-5.4	16.4	68.3
Nov. 15	10 24.16	+06 34.7	5.064	4.941	+0.23	-4.9	16.5	77.2
Nov. 25	10 26.46	+05 46.1	4.982	5.019	+0.11	-4.3	16.5	86.5
Dec. 5	10 27.51	+05 03.5	4.897	5.097	-0.02	-3.6	16.5	96.1
Dec. 15	10 27.28	+04 27.4	4.816	5.175	-0.15	-2.9	16.6	106.0
Dec. 25	10 25.73	+03 58.4	4.742	5.253	-0.28	-2.2	16.6	116.3
Jan. 4	10 22.93	+03 36.6	4.682	5.331	-0.39	-1.4	16.6	126.9
Jan. 14	10 19.00	+03 22.2	4.639	5.408	-0.49	-0.7	16.7	137.8
Jan. 24	10 14.12	+03 14.8	4.621	5.486	-0.55	-0.1	16.7	148.7
Feb. 3	10 08.58	+03 13.7	4.630	5.564	-0.59	+0.4	16.8	159.5
Feb. 13	10 02.71	+03 17.6	4.669	5.641	-0.58	+0.8	16.9	168.9
Feb. 23	09 56.86	+03 25.2	4.740	5.718	-0.55	+1.0	17.0	170.6
Mar. 5	09 51.39	+03 34.8	4.843	5.795	-0.48	+1.0	17.1	162.3
Mar. 15	09 46.59	+03 45.0	4.976	5.872	-0.39	+0.9	17.2	152.0
Mar. 25	09 42.68	+03 54.1	5.136	5.949	-0.29	+0.7	17.3	141.5

Comet 147P/Kushida-Muramatsu

Epoch = 2009 July 28.0 TT
T = 2008 Sept. 22.79036 TT
Peri. = 346.82780 e = 0.2761608
Node = 93.75914 2000.0 a = 3.8083780 AU
Incl. = 2.36797 n = 0.13261541
q = 2.7566533 AU P = 7.43 years

m1 = 13.2 + 5 log(Delta) + 10.0 log(r(t-100))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	07 06.91	+23 21.4	1.836	2.818	-0.77	+1.9	18.9	176.5
Jan. 19	06 59.23	+23 40.7	1.869	2.830	-0.64	+1.5	19.0	164.6
Jan. 29	06 52.87	+23 55.8	1.929	2.842	-0.43	+1.0	19.0	153.0
Feb. 8	06 48.60	+24 06.2	2.014	2.855	-0.18	+0.6	19.1	141.8
Feb. 18	06 46.81	+24 12.2	2.119	2.869	+0.08	+0.2	19.3	131.3
Feb. 28	06 47.63	+24 14.3	2.241	2.884	+0.33	-0.2	19.4	121.4
Mar. 10	06 50.97	+24 12.6	2.376	2.900	+0.56	-0.6	19.5	112.2
Mar. 20	06 56.56	+24 07.1	2.519	2.917	+0.76	-1.0	19.7	103.5
Mar. 30	07 04.13	+23 57.5	2.668	2.934	+0.93	-1.4	19.8	95.3
Apr. 9	07 13.39	+23 43.4	2.819	2.952	+1.06	-1.9	19.9	87.6
Apr. 19	07 24.01	+23 24.3	2.970	2.970	+1.17	-2.4	20.1	80.3
Apr. 29	07 35.75	+23 00.0	3.120	2.989	+1.26	-3.0	20.2	73.3
May 9	07 48.38	+22 30.2	3.266	3.009	+1.33	-3.5	20.3	66.5
May 19	08 01.68	+21 54.7	3.406	3.030	+1.38	-4.1	20.4	60.0
May 29	08 15.49	+21 13.6	3.539	3.050	+1.42	-4.7	20.5	53.7
June 8	08 29.66	+20 26.9	3.665	3.072	+1.44	-5.2	20.6	47.5
June 18	08 44.06	+19 35.0	3.781	3.093	+1.45	-5.7	20.7	41.4
June 28	08 58.59	+18 38.0	3.887	3.116	+1.46	-6.2	20.8	35.5
July 8	09 13.16	+17 36.4	3.982	3.138	+1.45	-6.6	20.9	29.6
July 18	09 27.70	+16 30.6	4.065	3.161	+1.45	-6.9	20.9	23.7
July 28	09 42.17	+15 21.3	4.136	3.184	+1.43	-7.2	21.0	17.8
Aug. 7	09 56.49	+14 08.9	4.193	3.208	+1.41	-7.5	21.1	11.9
Aug. 17	10 10.63	+12 54.1	4.237	3.232	+1.39	-7.7	21.1	6.1
Aug. 27	10 24.56	+11 37.5	4.266	3.256	+1.37	-7.8	21.2	1.6
Sept. 6	10 38.23	+10 19.9	4.280	3.280	+1.34	-7.8	21.2	6.4
Sept.16	10 51.61	+09 01.8	4.279	3.305	+1.30	-7.8	21.2	12.4
Sept.26	11 04.65	+07 44.2	4.264	3.330	+1.27	-7.6	21.3	18.7
Oct. 6	11 17.32	+06 27.7	4.232	3.354	+1.22	-7.5	21.3	25.1
Oct. 16	11 29.55	+05 13.2	4.186	3.379	+1.17	-7.2	21.3	31.7
Oct. 26	11 41.29	+04 01.4	4.126	3.404	+1.12	-6.8	21.3	38.5
Nov. 5	11 52.46	+02 53.3	4.051	3.430	+1.05	-6.4	21.3	45.5
Nov. 15	12 02.97	+01 49.8	3.964	3.455	+0.97	-5.8	21.3	52.7
Nov. 25	12 12.72	+00 51.8	3.864	3.480	+0.89	-5.2	21.2	60.2
Dec. 5	12 21.57	+00 00.2	3.755	3.506	+0.78	-4.4	21.2	67.9
Dec. 15	12 29.40	-00 43.9	3.638	3.531	+0.66	-3.6	21.2	76.0
Dec. 25	12 36.04	-01 19.5	3.515	3.556	+0.53	-2.6	21.1	84.4
Jan. 4	12 41.31	-01 45.8	3.390	3.581	+0.38	-1.6	21.1	93.2
Jan. 14	12 45.07	-02 01.7	3.265	3.607	+0.21	-0.5	21.0	102.4
Jan. 24	12 47.15	-02 06.7	3.146	3.632	+0.03	+0.6	21.0	112.1
Feb. 3	12 47.45	-02 00.5	3.036	3.657	-0.15	+1.7	20.9	122.2
Feb. 13	12 45.93	-01 43.1	2.940	3.682	-0.33	+2.7	20.9	132.7
Feb. 23	12 42.68	-01 15.6	2.863	3.707	-0.47	+3.6	20.9	143.7
Mar. 5	12 37.93	-00 40.0	2.809	3.732	-0.59	+4.1	20.9	155.0
Mar. 15	12 32.06	+00 01.2	2.783	3.757	-0.65	+4.3	20.9	166.4
Mar. 25	12 25.58	+00 44.1	2.785	3.781	-0.65	+4.1	20.9	176.5

Comet C/2008 A1 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2008 Sept. 29.10999 TT
Peri. = 348.46896
Node = 277.88626 2000.0
Incl. = 82.54796
q = 1.0732009 AU
e = 1.0002905

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	19 07.22	+25 41.2	2.426	1.912	+1.97	+26.5	11.9	47.9
Jan. 19	19 26.94	+30 06.2	2.494	2.029	+2.00	+26.8	12.3	51.3
Jan. 29	19 46.92	+34 33.8	2.565	2.147	+2.03	+26.9	12.6	54.4
Feb. 8	20 07.17	+39 02.3	2.641	2.264	+2.06	+26.7	12.9	57.2
Feb. 18	20 27.77	+43 29.4	2.724	2.381	+2.10	+26.3	13.1	59.6
Feb. 28	20 48.77	+47 52.4	2.815	2.498	+2.15	+25.6	13.4	61.4
Mar. 10	21 10.24	+52 08.8	2.914	2.614	+2.21	+24.7	13.7	62.8
Mar. 20	21 32.34	+56 15.9	3.021	2.729	+2.29	+23.6	14.0	63.7
Mar. 30	21 55.25	+60 12.0	3.134	2.843	+2.40	+22.3	14.2	64.1
Apr. 9	22 19.21	+63 55.4	3.253	2.957	+2.54	+20.9	14.5	64.1
Apr. 19	22 44.63	+67 24.7	3.376	3.069	+2.74	+19.5	14.7	63.8
Apr. 29	23 12.05	+70 39.2	3.502	3.181	+3.02	+17.9	14.9	63.4
May 9	23 42.25	+73 38.0	3.628	3.291	+3.42	+16.2	15.2	62.8
May 19	00 16.47	+76 20.3	3.752	3.401	+4.00	+14.4	15.4	62.2
May 29	00 56.49	+78 44.7	3.874	3.509	+4.84	+12.4	15.6	61.8
June 8	01 44.86	+80 49.1	3.990	3.617	+6.00	+10.1	15.8	61.5
June 18	02 44.89	+82 29.8	4.101	3.724	+7.41	+7.2	16.0	61.4
June 28	03 59.00	+83 41.9	4.205	3.830	+8.56	+3.9	16.2	61.7
July 8	05 24.55	+84 20.7	4.301	3.935	+8.69	+0.6	16.3	62.4
July 18	06 51.41	+84 27.0	4.388	4.039	+7.71	-1.8	16.5	63.6
July 28	08 08.55	+84 09.2	4.466	4.143	+6.37	-3.0	16.6	65.1
Aug. 7	09 12.25	+83 38.8	4.534	4.245	+5.24	-3.4	16.8	67.2
Aug. 17	10 04.64	+83 05.1	4.594	4.347	+4.45	-3.1	16.9	69.6
Aug. 27	10 49.16	+82 33.9	4.646	4.448	+3.95	-2.5	17.0	72.5
Sept. 6	11 28.67	+82 08.8	4.691	4.548	+3.67	-1.7	17.1	75.7
Sept.16	12 05.40	+81 51.6	4.729	4.647	+3.56	-0.8	17.2	79.2
Sept.26	12 41.00	+81 43.1	4.763	4.746	+3.58	+0.1	17.4	82.9
Oct. 6	13 16.82	+81 43.7	4.795	4.844	+3.73	+0.9	17.5	86.8
Oct. 16	13 54.14	+81 52.5	4.826	4.941	+4.01	+1.6	17.6	90.7
Oct. 26	14 34.27	+82 08.5	4.860	5.037	+4.42	+2.1	17.7	94.6
Nov. 5	15 18.51	+82 29.2	4.897	5.133	+4.97	+2.2	17.8	98.2
Nov. 15	16 08.21	+82 51.3	4.942	5.229	+5.60	+1.9	17.9	101.4
Nov. 25	17 04.24	+83 10.6	4.996	5.323	+6.20	+1.1	18.0	104.1
Dec. 5	18 06.19	+83 21.9	5.061	5.417	+6.56	-0.1	18.1	106.1
Dec. 15	19 11.81	+83 20.7	5.138	5.510	+6.53	-1.6	18.2	107.2
Dec. 25	20 17.15	+83 04.8	5.230	5.603	+6.11	-3.0	18.3	107.4
Jan. 4	21 18.29	+82 34.7	5.335	5.695	+5.48	-4.1	18.4	106.6
Jan. 14	22 13.08	+81 53.5	5.455	5.787	+4.82	-4.8	18.5	104.9
Jan. 24	23 01.24	+81 05.3	5.588	5.878	+4.23	-5.2	18.6	102.3
Feb. 3	23 43.51	+80 13.6	5.734	5.968	+3.75	-5.2	18.8	99.0
Feb. 13	00 21.02	+79 21.4	5.889	6.058	+3.38	-5.0	18.9	95.2
Feb. 23	00 54.82	+78 30.9	6.053	6.148	+3.09	-4.7	19.0	90.9
Mar. 5	01 25.72	+77 43.5	6.222	6.237	+2.87	-4.4	19.1	86.3
Mar. 15	01 54.40	+76 59.9	6.394	6.325	+2.69	-3.9	19.2	81.5
Mar. 25	02 21.32	+76 20.6	6.567	6.413	+2.55	-3.5	19.4	76.8

Comet 187P/LINEAR

Epoch = 2009 July 28.0 TT
T = 2008 Oct. 8.32457 TT
Peri. = 132.24297 e = 0.1716520
Node = 112.00530 2000.0 a = 4.4593714 AU
Incl. = 13.72921 n = 0.10466310
q = 3.6939114 AU P = 9.42 years

m1 = 4.0 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	17 39.42	-17 12.2	4.583	3.710	+1.31	-1.4	18.7	24.4
Jan. 19	17 52.52	-17 25.9	4.519	3.713	+1.27	-0.9	18.7	31.2
Jan. 29	18 05.24	-17 34.7	4.441	3.717	+1.22	-0.4	18.6	38.2
Feb. 8	18 17.46	-17 39.0	4.348	3.722	+1.16	-0.1	18.6	45.3
Feb. 18	18 29.05	-17 39.6	4.243	3.726	+1.08	+0.2	18.6	52.6
Feb. 28	18 39.90	-17 37.3	4.126	3.731	+1.00	+0.4	18.5	60.0
Mar. 10	18 49.86	-17 33.0	4.000	3.737	+0.89	+0.5	18.5	67.6
Mar. 20	18 58.79	-17 27.9	3.867	3.742	+0.78	+0.5	18.4	75.4
Mar. 30	19 06.55	-17 23.0	3.729	3.748	+0.64	+0.3	18.3	83.4
Apr. 9	19 12.98	-17 19.6	3.589	3.755	+0.50	+0.1	18.3	91.7
Apr. 19	19 17.94	-17 19.0	3.450	3.761	+0.33	-0.3	18.2	100.3
Apr. 29	19 21.28	-17 22.4	3.315	3.768	+0.16	-0.8	18.1	109.2
May 9	19 22.90	-17 30.7	3.188	3.775	-0.02	-1.4	18.1	118.5
May 19	19 22.73	-17 44.8	3.073	3.783	-0.20	-2.0	18.0	128.2
May 29	19 20.78	-18 04.9	2.974	3.791	-0.36	-2.6	17.9	138.3
June 8	19 17.17	-18 31.0	2.895	3.799	-0.50	-3.1	17.9	148.7
June 18	19 12.16	-19 02.1	2.839	3.807	-0.60	-3.5	17.9	159.5
June 28	19 06.13	-19 36.8	2.810	3.816	-0.65	-3.7	17.9	170.3
July 8	18 59.63	-20 13.4	2.810	3.825	-0.64	-3.7	17.9	176.9
July 18	18 53.23	-20 50.1	2.838	3.834	-0.57	-3.5	17.9	166.9
July 28	18 47.50	-21 25.5	2.894	3.844	-0.46	-3.3	18.0	156.1
Aug. 7	18 42.95	-21 58.3	2.975	3.854	-0.30	-3.0	18.1	145.4
Aug. 17	18 39.92	-22 28.1	3.080	3.864	-0.13	-2.6	18.2	135.1
Aug. 27	18 38.64	-22 54.3	3.203	3.874	+0.05	-2.3	18.3	125.2
Sept. 6	18 39.19	-23 17.0	3.341	3.884	+0.23	-1.9	18.4	115.6
Sept. 16	18 41.52	-23 35.9	3.490	3.895	+0.40	-1.5	18.5	106.4
Sept. 26	18 45.57	-23 51.1	3.647	3.906	+0.56	-1.1	18.6	97.5
Oct. 6	18 51.17	-24 02.4	3.806	3.917	+0.70	-0.7	18.8	88.9
Oct. 16	18 58.16	-24 09.7	3.966	3.928	+0.82	-0.3	18.9	80.6
Oct. 26	19 06.38	-24 12.6	4.122	3.940	+0.93	+0.1	19.0	72.5
Nov. 5	19 15.65	-24 11.2	4.273	3.952	+1.01	+0.6	19.1	64.7
Nov. 15	19 25.80	-24 05.3	4.416	3.964	+1.09	+1.0	19.2	56.9
Nov. 25	19 36.68	-23 54.9	4.548	3.976	+1.15	+1.5	19.3	49.3
Dec. 5	19 48.14	-23 39.9	4.667	3.988	+1.19	+1.9	19.4	41.9
Dec. 15	20 00.05	-23 20.5	4.773	4.000	+1.22	+2.4	19.4	34.5
Dec. 25	20 12.29	-22 56.8	4.863	4.013	+1.24	+2.7	19.5	27.2
Jan. 4	20 24.72	-22 29.3	4.936	4.026	+1.25	+3.1	19.6	20.0
Jan. 14	20 37.27	-21 58.4	4.991	4.038	+1.26	+3.4	19.6	12.9
Jan. 24	20 49.82	-21 24.4	5.028	4.051	+1.25	+3.6	19.7	6.4
Feb. 3	21 02.28	-20 48.1	5.047	4.064	+1.23	+3.8	19.7	4.2
Feb. 13	21 14.58	-20 10.1	5.047	4.078	+1.21	+3.9	19.7	9.9
Feb. 23	21 26.64	-19 31.0	5.028	4.091	+1.17	+3.9	19.7	16.8
Mar. 5	21 38.37	-18 51.8	4.992	4.104	+1.14	+3.9	19.8	23.9
Mar. 15	21 49.72	-18 13.3	4.938	4.118	+1.09	+3.7	19.8	31.0
Mar. 25	22 00.62	-17 36.3	4.868	4.131	+1.04	+3.4	19.8	38.3

Comet C/2008 X3 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2008 Oct. 10.55774 TT
Peri. = 140.78056 e = 0.9563241
Node = 337.75204 2000.0 a = 43.5411625 AU
Incl. = 66.47549 n = 0.00343047
q = 1.9016995 AU P = 287.31 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	12 12.07	-06 13.5	1.743	2.191	-1.10	-26.5	17.4	103.4
Jan. 19	12 01.04	-10 38.8	1.664	2.252	-1.56	-26.0	17.4	114.0
Jan. 29	11 45.39	-14 58.4	1.607	2.316	-2.00	-23.9	17.5	124.9
Feb. 8	11 25.37	-18 57.4	1.580	2.383	-2.32	-20.1	17.6	135.2
Feb. 18	11 02.13	-22 18.1	1.589	2.454	-2.44	-14.8	17.7	143.3
Feb. 28	10 37.70	-24 46.4	1.637	2.527	-2.31	-9.3	17.9	147.1
Mar. 10	10 14.55	-26 19.1	1.722	2.602	-1.98	-4.5	18.1	145.5
Mar. 20	09 54.70	-27 04.4	1.841	2.679	-1.55	-1.2	18.4	139.7
Mar. 30	09 39.23	-27 16.5	1.987	2.758	-1.09	+0.6	18.7	132.1
Apr. 9	09 28.34	-27 10.3	2.154	2.838	-0.67	+1.3	19.0	123.9
Apr. 19	09 21.64	-26 57.3	2.337	2.919	-0.31	+1.2	19.3	115.9
Apr. 29	09 18.51	-26 45.4	2.531	3.001	-0.02	+0.6	19.6	108.1
May 9	09 18.33	-26 39.4	2.731	3.084	+0.22	-0.3	19.9	100.8
May 19	09 20.50	-26 41.9	2.933	3.168	+0.40	-1.2	20.1	93.9
May 29	09 24.54	-26 54.3	3.135	3.252	+0.55	-2.3	20.4	87.5
June 8	09 30.05	-27 17.2	3.334	3.336	+0.67	-3.3	20.6	81.4
June 18	09 36.71	-27 50.5	3.529	3.421	+0.76	-4.3	20.9	75.6
June 28	09 44.28	-28 34.0	3.717	3.506	+0.83	-5.3	21.1	70.2
July 8	09 52.55	-29 27.4	3.897	3.591	+0.88	-6.3	21.3	65.2
July 18	10 01.35	-30 30.1	4.068	3.676	+0.92	-7.2	21.5	60.5
July 28	10 10.55	-31 41.7	4.230	3.762	+0.95	-8.0	21.7	56.2
Aug. 7	10 20.05	-33 01.8	4.380	3.847	+0.97	-8.8	21.9	52.4
Aug. 17	10 29.74	-34 29.8	4.520	3.932	+0.98	-9.6	22.0	49.1
Aug. 27	10 39.54	-36 05.4	4.647	4.017	+0.98	-10.3	22.2	46.4
Sept. 6	10 49.36	-37 48.0	4.762	4.102	+0.98	-10.9	22.3	44.4
Sept.16	10 59.14	-39 37.1	4.864	4.187	+0.96	-11.5	22.5	43.1
Sept.26	11 08.79	-41 32.3	4.954	4.272	+0.94	-12.1	22.6	42.7
Oct. 6	11 18.21	-43 33.2	5.031	4.356	+0.91	-12.6	22.7	43.2
Oct. 16	11 27.31	-45 39.2	5.096	4.440	+0.87	-13.1	22.8	44.5
Oct. 26	11 35.98	-47 49.8	5.149	4.524	+0.81	-13.5	22.9	46.6
Nov. 5	11 44.07	-50 04.4	5.190	4.608	+0.73	-13.8	23.0	49.4
Nov. 15	11 51.40	-52 22.1	5.222	4.691	+0.64	-14.0	23.1	52.8
Nov. 25	11 57.77	-54 42.1	5.244	4.774	+0.51	-14.1	23.2	56.7
Dec. 5	12 02.89	-57 03.3	5.258	4.857	+0.35	-14.1	23.3	61.0
Dec. 15	12 06.43	-59 24.4	5.266	4.940	+0.15	-13.9	23.3	65.5
Dec. 25	12 07.98	-61 43.5	5.269	5.022	-0.10	-13.5	23.4	70.2
Jan. 4	12 07.01	-63 58.2	5.269	5.104	-0.41	-12.8	23.5	75.0
Jan. 14	12 02.96	-66 05.9	5.267	5.185	-0.78	-11.7	23.6	79.9
Jan. 24	11 55.21	-68 02.8	5.267	5.267	-1.19	-10.2	23.6	84.7
Feb. 3	11 43.29	-69 44.5	5.269	5.348	-1.62	-8.2	23.7	89.3
Feb. 13	11 27.08	-71 06.2	5.276	5.429	-1.99	-5.7	23.8	93.6
Feb. 23	11 07.15	-72 03.2	5.289	5.509	-2.22	-2.9	23.8	97.6
Mar. 5	10 44.99	-72 32.4	5.311	5.589	-2.22	-0.1	23.9	101.2
Mar. 15	10 22.75	-72 33.3	5.343	5.669	-2.01	+2.5	24.0	104.2
Mar. 25	10 02.63	-72 08.3	5.385	5.748	-1.64	+4.6	24.1	106.5

Comet P/2001 CV8 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2008 Oct. 11.15068 TT
Peri. = 151.60078 e = 0.4439119
Node = 359.89413 2000.0 a = 3.8839912 AU
Incl. = 9.03603 n = 0.12876170
q = 2.1598413 AU P = 7.65 years

m1 = 10.4 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	13 47.31	-11 45.5	2.229	2.269	-1.00	+9.0	19.3	20.9/121	79.6
Jan. 19	13 59.62	-13 31.1	2.134	2.293	-1.04	+9.0	19.3	18.2/123	86.4
Jan. 29	14 10.21	-15 08.3	2.039	2.319	-1.09	+8.9	19.3	15.1/126	93.6
Feb. 8	14 18.74	-16 36.5	1.946	2.347	-1.15	+9.0	19.3	11.8/132	101.3
Feb. 18	14 24.89	-17 55.3	1.856	2.377	-1.22	+9.1	19.3	8.4/145	109.6
Feb. 28	14 28.33	-19 03.7	1.774	2.409	-1.30	+9.3	19.3	5.7/173	118.4
Mar. 10	14 28.82	-20 00.5	1.702	2.442	-1.38	+9.5	19.3	5.6/218	128.0
Mar. 20	14 26.35	-20 44.1	1.644	2.476	-1.47	+9.9	19.4	7.9/248	138.1
Mar. 30	14 21.11	-21 12.9	1.605	2.512	-1.54	+10.3	19.4	10.4/262	148.7
Apr. 9	14 13.73	-21 26.1	1.587	2.549	-1.58	+10.7	19.5	12.0/270	159.4
Apr. 19	14 05.14	-21 24.4	1.594	2.587	-1.60	+11.0	19.7	12.2/276	168.9
Apr. 29	13 56.46	-21 10.6	1.627	2.625	-1.57	+11.2	19.8	11.0/281	170.4
May 9	13 48.78	-20 49.8	1.687	2.665	-1.51	+11.1	20.0	8.5/285	162.0
May 19	13 42.91	-20 27.4	1.771	2.705	-1.43	+10.8	20.3	5.4/291	151.8
May 29	13 39.34	-20 08.3	1.878	2.746	-1.33	+10.3	20.5	2.0/308	141.8
June 8	13 38.22	-19 56.2	2.003	2.788	-1.24	+9.6	20.8	1.8/ 80	132.1
June 18	13 39.48	-19 53.0	2.144	2.829	-1.14	+8.9	21.1	4.9/ 97	123.0
June 28	13 42.91	-19 59.2	2.298	2.872	-1.06	+8.2	21.4	7.7/102	114.5
July 8	13 48.27	-20 14.6	2.460	2.914	-0.98	+7.5	21.6	10.1/104	106.3
July 18	13 55.29	-20 38.0	2.630	2.957	-0.91	+6.8	21.9	12.2/105	98.6
July 28	14 03.73	-21 08.4	2.803	3.000	-0.86	+6.2	22.2	14.0/105	91.1
Aug. 7	14 13.39	-21 44.4	2.977	3.043	-0.80	+5.6	22.4	15.4/106	84.0
Aug. 17	14 24.08	-22 24.7	3.152	3.086	-0.76	+5.1	22.7	16.6/106	77.0
Aug. 27	14 35.66	-23 07.9	3.323	3.130	-0.72	+4.5	22.9	17.6/105	70.2
Sept. 6	14 47.99	-23 53.0	3.490	3.173	-0.69	+4.1	23.1	18.3/105	63.6
Sept.16	15 00.97	-24 38.8	3.651	3.216	-0.66	+3.6	23.4	19.0/105	57.0
Sept.26	15 14.51	-25 24.4	3.804	3.259	-0.63	+3.2	23.6	19.4/104	50.5
Oct. 6	15 28.51	-26 08.9	3.948	3.302	-0.60	+2.9	23.8	19.8/103	44.0
Oct. 16	15 42.89	-26 51.5	4.080	3.345	-0.58	+2.5	23.9	20.0/102	37.5
Oct. 26	15 57.59	-27 31.6	4.200	3.387	-0.56	+2.2	24.1	20.1/101	31.1
Nov. 5	16 12.51	-28 08.6	4.306	3.430	-0.54	+1.9	24.3	20.1/100	24.7
Nov. 15	16 27.57	-28 42.1	4.397	3.472	-0.53	+1.6	24.4	20.1/ 99	18.4
Nov. 25	16 42.69	-29 11.9	4.472	3.514	-0.51	+1.3	24.6	19.9/ 98	12.4
Dec. 5	16 57.78	-29 37.6	4.530	3.556	-0.50	+1.0	24.7	19.6/ 97	7.8
Dec. 15	17 12.75	-29 59.3	4.570	3.597	-0.48	+0.8	24.8	19.2/ 96	7.7
Dec. 25	17 27.50	-30 17.1	4.593	3.638	-0.47	+0.6	24.9	18.7/ 95	12.4
Jan. 4	17 41.91	-30 31.3	4.597	3.679	-0.46	+0.4	25.0	18.1/ 94	18.7
Jan. 14	17 55.89	-30 42.1	4.584	3.720	-0.45	+0.2	.	17.3/ 94	25.4
Jan. 24	18 09.33	-30 50.2	4.553	3.760	-0.44	0.0	.	16.5/ 93	32.5
Feb. 3	18 22.10	-30 56.1	4.505	3.799	-0.43	-0.2	.	15.4/ 92	39.7
Feb. 13	18 34.10	-31 00.6	4.441	3.839	-0.42	-0.3	.	14.2/ 92	47.2
Feb. 23	18 45.18	-31 04.5	4.363	3.878	-0.42	-0.5	.	12.9/ 93	54.8
Mar. 5	18 55.22	-31 08.7	4.273	3.916	-0.42	-0.6	.	11.4/ 93	62.6
Mar. 15	19 04.08	-31 14.1	4.172	3.955	-0.42	-0.8	.	9.7/ 95	70.6
Mar. 25	19 11.61	-31 21.6	4.064	3.992	-0.42	-0.9	.	7.8/ 98	78.8

Comet 172P/Yeung

Epoch = 2009 July 28.0 TT
T = 2008 Oct. 13.11827 TT
Peri. = 179.11201 e = 0.3622976
Node = 40.06127 2000.0 a = 3.5141896 AU
Incl. = 11.51527 n = 0.14961195
q = 2.2410071 AU P = 6.59 years

H = 13.9 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	17 14.86	-27 06.0	3.131	2.321	+2.23	-4.8	18.9	29.0
Jan. 19	17 37.12	-27 54.0	3.086	2.339	+2.19	-3.8	19.0	34.3
Jan. 29	17 59.04	-28 31.6	3.033	2.359	+2.14	-2.8	19.0	39.6
Feb. 8	18 20.44	-28 59.7	2.973	2.381	+2.07	-2.0	19.1	45.0
Feb. 18	18 41.15	-29 19.5	2.906	2.404	+1.99	-1.3	19.1	50.6
Feb. 28	19 01.02	-29 32.7	2.833	2.428	+1.88	-0.9	19.1	56.3
Mar. 10	19 19.86	-29 41.3	2.753	2.454	+1.77	-0.6	19.1	62.3
Mar. 20	19 37.52	-29 47.1	2.668	2.481	+1.63	-0.5	19.1	68.4
Mar. 30	19 53.81	-29 52.6	2.579	2.509	+1.47	-0.7	19.0	74.8
Apr. 9	20 08.55	-29 60.0	2.486	2.538	+1.30	-1.2	19.0	81.4
Apr. 19	20 21.56	-30 11.6	2.392	2.568	+1.11	-1.8	18.9	88.4
Apr. 29	20 32.62	-30 29.8	2.298	2.599	+0.89	-2.6	18.9	95.7
May 9	20 41.47	-30 56.2	2.206	2.630	+0.64	-3.6	18.8	103.4
May 19	20 47.89	-31 32.3	2.119	2.663	+0.37	-4.6	18.7	111.6
May 29	20 51.62	-32 18.3	2.039	2.696	+0.08	-5.5	18.6	120.2
June 8	20 52.46	-33 13.0	1.971	2.729	-0.21	-6.1	18.4	129.2
June 18	20 50.34	-34 13.6	1.918	2.763	-0.50	-6.1	18.3	138.6
June 28	20 45.39	-35 15.1	1.884	2.797	-0.73	-5.6	18.2	147.8
July 8	20 38.04	-36 11.1	1.871	2.832	-0.90	-4.4	18.1	156.3
July 18	20 29.09	-36 55.4	1.883	2.867	-0.95	-2.8	18.0	161.9
July 28	20 19.56	-37 22.9	1.921	2.902	-0.89	-0.9	18.1	161.5
Aug. 7	20 10.61	-37 31.4	1.985	2.938	-0.74	+1.0	18.3	155.5
Aug. 17	20 03.22	-37 21.8	2.073	2.973	-0.51	+2.5	18.5	147.0
Aug. 27	19 58.08	-36 56.6	2.182	3.009	-0.26	+3.7	18.7	137.8
Sept. 6	19 55.53	-36 19.7	2.311	3.044	+0.01	+4.5	19.0	128.7
Sept.16	19 55.58	-35 34.3	2.455	3.080	+0.25	+5.1	19.2	119.7
Sept.26	19 58.09	-34 43.0	2.611	3.116	+0.47	+5.5	19.4	111.1
Oct. 6	20 02.77	-33 47.5	2.776	3.151	+0.65	+5.8	19.5	102.7
Oct. 16	20 09.32	-32 49.1	2.947	3.187	+0.81	+6.1	19.7	94.7
Oct. 26	20 17.44	-31 48.0	3.120	3.222	+0.94	+6.3	19.8	86.8
Nov. 5	20 26.82	-30 44.7	3.294	3.257	+1.04	+6.6	20.0	79.2
Nov. 15	20 37.22	-29 39.1	3.464	3.292	+1.12	+6.8	20.1	71.8
Nov. 25	20 48.42	-28 31.3	3.630	3.327	+1.18	+7.0	20.2	64.5
Dec. 5	21 00.22	-27 21.3	3.789	3.362	+1.22	+7.2	20.2	57.4
Dec. 15	21 12.46	-26 09.2	3.939	3.396	+1.25	+7.4	20.3	50.3
Dec. 25	21 24.99	-24 55.2	4.078	3.430	+1.27	+7.6	20.3	43.4
Jan. 4	21 37.71	-23 39.5	4.204	3.464	+1.28	+7.7	20.4	36.6
Jan. 14	21 50.50	-22 22.6	4.316	3.498	+1.28	+7.8	20.4	29.8
Jan. 24	22 03.29	-21 04.8	4.414	3.531	+1.27	+7.8	20.4	23.3
Feb. 3	22 16.00	-19 46.5	4.494	3.564	+1.26	+7.8	20.3	17.0
Feb. 13	22 28.56	-18 28.4	4.559	3.596	+1.24	+7.8	20.3	11.5
Feb. 23	22 40.92	-17 10.8	4.605	3.629	+1.21	+7.6	20.3	8.3
Mar. 5	22 53.02	-15 54.6	4.634	3.661	+1.18	+7.4	20.3	9.9
Mar. 15	23 04.81	-14 40.2	4.644	3.692	+1.14	+7.2	20.4	14.9
Mar. 25	23 16.25	-13 28.2	4.637	3.723	+1.10	+6.9	20.5	21.0

Comet P/2008 Q2 (Ory)

Epoch = 2009 July 28.0 TT
T = 2008 Oct. 19.02920 TT
Peri. = 329.59608 e = 0.5737593
Node = 60.70419 2000.0 a = 3.2429569 AU
Incl. = 2.75511 n = 0.16876886
q = 1.3822802 AU P = 5.84 years

m1 = 14.5 + 5 log(Delta) + 15.0 log(r)

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	03 40.55	+21 56.3	0.831	1.640	+1.55	+5.9	17.3	129.2
Jan. 19	03 56.01	+22 54.9	0.950	1.697	+1.68	+5.1	17.8	122.7
Jan. 29	04 12.77	+23 46.2	1.080	1.757	+1.78	+4.3	18.3	116.5
Feb. 8	04 30.56	+24 29.7	1.221	1.819	+1.85	+3.5	18.8	110.5
Feb. 18	04 49.06	+25 04.6	1.372	1.882	+1.90	+2.6	19.3	104.6
Feb. 28	05 08.08	+25 30.6	1.531	1.947	+1.94	+1.7	19.8	98.9
Mar. 10	05 27.44	+25 47.5	1.696	2.013	+1.95	+0.8	20.2	93.2
Mar. 20	05 46.94	+25 55.2	1.867	2.080	+1.95	-0.2	20.6	87.7
Mar. 30	06 06.46	+25 53.7	2.041	2.146	+1.94	-1.0	21.0	82.2
Apr. 9	06 25.91	+25 43.2	2.218	2.213	+1.92	-1.9	21.4	76.7
Apr. 19	06 45.15	+25 24.1	2.395	2.280	+1.90	-2.7	21.8	71.3
Apr. 29	07 04.14	+24 56.8	2.571	2.347	+1.87	-3.5	22.1	65.8
May 9	07 22.80	+24 21.9	2.745	2.413	+1.83	-4.2	22.4	60.4
May 19	07 41.08	+23 40.0	2.916	2.479	+1.79	-4.8	22.7	55.0
May 29	07 58.95	+22 51.7	3.080	2.544	+1.74	-5.4	23.0	49.6
June 8	08 16.38	+21 57.7	3.238	2.608	+1.70	-5.9	23.3	44.2
June 18	08 33.36	+20 58.6	3.388	2.672	+1.65	-6.3	23.6	38.7
June 28	08 49.88	+19 55.2	3.528	2.735	+1.60	-6.7	23.8	33.2
July 8	09 05.93	+18 48.1	3.658	2.797	+1.56	-7.0	24.0	27.6
July 18	09 21.51	+17 38.1	3.775	2.858	+1.51	-7.2	24.2	22.0
July 28	09 36.63	+16 25.7	3.879	2.918	+1.46	-7.4	24.4	16.3
Aug. 7	09 51.27	+15 11.7	3.969	2.978	+1.42	-7.5	24.6	10.5
Aug. 17	10 05.44	+13 56.8	4.044	3.037	+1.37	-7.5	24.8	4.8
Aug. 27	10 19.14	+12 41.5	4.103	3.094	+1.32	-7.5	24.9	2.7
Sept. 6	10 32.34	+11 26.6	4.145	3.151	+1.27	-7.4	.	8.2
Sept.16	10 45.04	+10 12.7	4.171	3.207	+1.22	-7.2	.	14.4
Sept.26	10 57.20	+09 00.6	4.179	3.262	+1.16	-7.0	.	20.9
Oct. 6	11 08.79	+07 51.0	4.169	3.316	+1.10	-6.6	.	27.6
Oct. 16	11 19.75	+06 44.7	4.142	3.369	+1.03	-6.2	.	34.6
Oct. 26	11 30.03	+05 42.5	4.098	3.421	+0.95	-5.7	.	41.8
Nov. 5	11 39.53	+04 45.2	4.038	3.472	+0.86	-5.1	.	49.2
Nov. 15	11 48.17	+03 53.8	3.964	3.523	+0.77	-4.5	.	56.9
Nov. 25	11 55.83	+03 09.2	3.876	3.572	+0.65	-3.7	.	64.9
Dec. 5	12 02.36	+02 32.4	3.778	3.621	+0.53	-2.8	.	73.3
Dec. 15	12 07.64	+02 04.4	3.672	3.668	+0.38	-1.8	.	82.1
Dec. 25	12 11.48	+01 46.2	3.561	3.715	+0.23	-0.8	.	91.2
Jan. 4	12 13.75	+01 38.6	3.450	3.761	+0.06	+0.4	.	100.9
Jan. 14	12 14.31	+01 42.3	3.342	3.806	-0.12	+1.5	.	110.9
Jan. 24	12 13.06	+01 57.5	3.243	3.850	-0.30	+2.6	.	121.5
Feb. 3	12 10.02	+02 23.7	3.159	3.893	-0.47	+3.6	.	132.5
Feb. 13	12 05.31	+02 59.7	3.095	3.935	-0.61	+4.4	.	143.9
Feb. 23	11 59.17	+03 43.3	3.055	3.977	-0.71	+4.8	.	155.6
Mar. 5	11 52.03	+04 31.3	3.044	4.018	-0.76	+4.9	.	167.3
Mar. 15	11 44.42	+05 19.9	3.064	4.057	-0.75	+4.5	.	176.7
Mar. 25	11 36.90	+06 05.4	3.117	4.096	-0.69	+3.9	.	167.7

Comet P/2008 QP20 (LINEAR-Hill)

Epoch = 2009 July 28.0 TT
T = 2008 Nov. 2.73001 TT
Peri. = 72.04979 e = 0.5064826
Node = 325.15066 2000.0 a = 3.4914923 AU
Incl. = 7.74986 n = 0.15107321
q = 1.7231122 AU P = 6.52 years

m1 = 13.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	02 23.10	+26 09.2	1.210	1.832	+1.79	+1.2	17.6	112.8
Jan. 19	02 40.97	+26 20.9	1.324	1.864	+1.93	+1.7	17.9	106.8
Jan. 29	03 00.23	+26 37.6	1.447	1.900	+2.03	+1.9	18.2	101.0
Feb. 8	03 20.55	+26 56.3	1.578	1.938	+2.11	+1.8	18.5	95.4
Feb. 18	03 41.61	+27 14.5	1.715	1.980	+2.16	+1.5	18.8	90.1
Feb. 28	04 03.20	+27 29.9	1.857	2.024	+2.19	+1.1	19.1	84.8
Mar. 10	04 25.10	+27 40.7	2.003	2.070	+2.20	+0.5	19.4	79.6
Mar. 20	04 47.13	+27 45.4	2.152	2.117	+2.20	-0.2	19.8	74.6
Mar. 30	05 09.17	+27 43.0	2.303	2.166	+2.19	-1.0	20.0	69.5
Apr. 9	05 31.07	+27 32.8	2.455	2.217	+2.16	-1.8	20.3	64.5
Apr. 19	05 52.71	+27 14.6	2.606	2.268	+2.13	-2.6	20.6	59.5
Apr. 29	06 14.03	+26 48.3	2.755	2.320	+2.09	-3.4	20.9	54.5
May 9	06 34.93	+26 13.9	2.901	2.373	+2.04	-4.2	21.1	49.5
May 19	06 55.34	+25 31.9	3.042	2.426	+1.99	-4.9	21.4	44.5
May 29	07 15.24	+24 42.8	3.177	2.480	+1.93	-5.6	21.6	39.5
June 8	07 34.58	+23 47.0	3.306	2.534	+1.88	-6.2	21.9	34.4
June 18	07 53.33	+22 45.2	3.427	2.588	+1.82	-6.7	22.1	29.2
June 28	08 11.49	+21 38.0	3.538	2.642	+1.76	-7.2	22.3	24.0
July 8	08 29.05	+20 26.3	3.639	2.696	+1.70	-7.6	22.5	18.8
July 18	08 46.00	+19 10.6	3.728	2.750	+1.64	-7.9	22.6	13.4
July 28	09 02.35	+17 51.7	3.806	2.804	+1.57	-8.1	22.8	8.0
Aug. 7	09 18.10	+16 30.3	3.870	2.857	+1.51	-8.3	23.0	2.4
Aug. 17	09 33.24	+15 07.1	3.920	2.910	+1.45	-8.4	23.1	3.4
Aug. 27	09 47.78	+13 42.7	3.955	2.963	+1.39	-8.5	23.3	9.2
Sept. 6	10 01.69	+12 18.0	3.976	3.015	+1.33	-8.4	23.4	15.2
Sept. 16	10 14.97	+10 53.5	3.981	3.067	+1.26	-8.3	23.5	21.4
Sept. 26	10 27.58	+09 30.1	3.970	3.118	+1.19	-8.2	23.6	27.8
Oct. 6	10 39.48	+08 08.5	3.943	3.169	+1.11	-7.9	23.7	34.4
Oct. 16	10 50.61	+06 49.4	3.901	3.219	+1.03	-7.6	23.8	41.2
Oct. 26	11 00.92	+05 33.6	3.844	3.269	+0.94	-7.1	23.8	48.3
Nov. 5	11 10.30	+04 22.1	3.774	3.318	+0.84	-6.6	23.9	55.7
Nov. 15	11 18.65	+03 15.7	3.691	3.366	+0.72	-6.0	23.9	63.4
Nov. 25	11 25.85	+02 15.5	3.597	3.414	+0.59	-5.3	24.0	71.4
Dec. 5	11 31.73	+01 22.4	3.496	3.462	+0.44	-4.5	24.0	79.9
Dec. 15	11 36.16	+00 37.6	3.389	3.508	+0.28	-3.5	24.0	88.7
Dec. 25	11 38.96	+00 02.2	3.281	3.554	+0.10	-2.5	24.0	98.0
Jan. 4	11 40.00	-00 22.8	3.175	3.600	-0.08	-1.4	24.1	107.8
Jan. 14	11 39.17	-00 36.4	3.077	3.645	-0.27	-0.2	24.1	118.1
Jan. 24	11 36.45	-00 38.2	2.991	3.689	-0.45	+1.0	24.1	128.8
Feb. 3	11 31.95	-00 28.2	2.923	3.732	-0.60	+2.1	24.1	140.0
Feb. 13	11 25.91	-00 07.3	2.877	3.775	-0.72	+3.0	24.1	151.6
Feb. 23	11 18.75	+00 22.5	2.859	3.817	-0.77	+3.6	24.2	163.3
Mar. 5	11 11.02	+00 58.2	2.871	3.859	-0.77	+3.8	24.3	174.2
Mar. 15	11 03.34	+01 36.4	2.914	3.900	-0.70	+3.7	24.4	171.2
Mar. 25	10 56.30	+02 13.5	2.989	3.940	-0.59	+3.3	24.5	159.9

Comet 207P/NEAT

Epoch = 2009 July 28.0 TT
T = 2008 Nov. 6.24106 TT
Peri. = 271.16172 e = 0.7570713
Node = 200.67536 2000.0 a = 3.8861858 AU
Incl. = 10.15073 n = 0.12865265
q = 0.9440661 AU P = 7.66 years

m1 = 16.2 + 5 log(Delta) + 12.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	14 45.55	-19 01.8	1.425	1.330	+2.15	-3.1	18.5	64.0
Jan. 19	15 07.07	-19 32.9	1.442	1.427	+1.82	-1.1	18.9	69.2
Jan. 29	15 25.25	-19 43.7	1.447	1.527	+1.47	+0.8	19.3	75.1
Feb. 8	15 39.91	-19 36.2	1.440	1.628	+1.10	+2.4	19.6	82.0
Feb. 18	15 50.89	-19 12.3	1.425	1.729	+0.71	+3.9	19.9	89.6
Feb. 28	15 57.96	-18 33.2	1.404	1.830	+0.29	+5.3	20.2	98.2
Mar. 10	16 00.90	-17 39.9	1.380	1.930	-0.12	+6.6	20.5	107.7
Mar. 20	15 59.67	-16 33.5	1.359	2.028	-0.53	+7.8	20.7	118.1
Mar. 30	15 54.38	-15 15.4	1.347	2.126	-0.88	+8.7	20.9	129.4
Apr. 9	15 45.57	-13 48.7	1.349	2.222	-1.14	+9.1	21.2	141.5
Apr. 19	15 34.21	-12 18.1	1.372	2.316	-1.26	+8.8	21.4	153.9
Apr. 29	15 21.58	-10 50.2	1.420	2.409	-1.24	+7.8	21.7	165.8
May 9	15 09.13	-09 32.1	1.497	2.501	-1.10	+6.3	22.1	172.1
May 19	14 58.09	-08 29.3	1.602	2.590	-0.88	+4.5	22.4	164.4
May 29	14 49.25	-07 44.7	1.734	2.679	-0.62	+2.6	22.7	153.4
June 8	14 43.02	-07 18.9	1.889	2.765	-0.36	+0.9	23.1	142.7
June 18	14 39.42	-07 10.1	2.064	2.850	-0.12	-0.6	23.5	132.4
June 28	14 38.27	-07 15.8	2.256	2.934	+0.10	-1.7	23.8	122.8
July 8	14 39.30	-07 33.2	2.459	3.016	+0.29	-2.6	24.1	113.7
July 18	14 42.19	-07 59.6	2.672	3.096	+0.45	-3.3	24.5	105.1
July 28	14 46.67	-08 32.6	2.890	3.176	+0.58	-3.8	24.8	96.9
Aug. 7	14 52.48	-09 10.3	3.110	3.253	+0.69	-4.1	.	88.9
Aug. 17	14 59.40	-09 50.9	3.330	3.330	+0.78	-4.2	.	81.2
Aug. 27	15 07.25	-10 33.2	3.547	3.405	+0.86	-4.3	.	73.7
Sept. 6	15 15.87	-11 15.8	3.758	3.479	+0.93	-4.2	.	66.4
Sept.16	15 25.12	-11 57.7	3.961	3.551	+0.98	-4.1	.	59.1
Sept.26	15 34.90	-12 38.3	4.155	3.622	+1.02	-3.8	.	51.9
Oct. 6	15 45.09	-13 16.7	4.335	3.692	+1.05	-3.6	.	44.7
Oct. 16	15 55.60	-13 52.4	4.502	3.761	+1.07	-3.2	.	37.5
Oct. 26	16 06.35	-14 24.8	4.653	3.829	+1.09	-2.9	.	30.4
Nov. 5	16 17.24	-14 53.4	4.786	3.895	+1.09	-2.5	.	23.3
Nov. 15	16 28.19	-15 18.1	4.899	3.960	+1.09	-2.0	.	16.4
Nov. 25	16 39.11	-15 38.4	4.993	4.025	+1.08	-1.6	.	10.0
Dec. 5	16 49.92	-15 54.2	5.065	4.088	+1.06	-1.1	.	6.5
Dec. 15	17 00.51	-16 05.5	5.116	4.150	+1.03	-0.7	.	9.9
Dec. 25	17 10.79	-16 12.1	5.145	4.211	+0.99	-0.2	.	16.5
Jan. 4	17 20.66	-16 14.2	5.152	4.271	+0.94	+0.2	.	23.8
Jan. 14	17 30.01	-16 11.9	5.138	4.330	+0.87	+0.6	.	31.5
Jan. 24	17 38.72	-16 05.5	5.104	4.388	+0.80	+1.0	.	39.5
Feb. 3	17 46.69	-15 55.3	5.051	4.446	+0.71	+1.4	.	47.6
Feb. 13	17 53.79	-15 41.6	4.981	4.502	+0.61	+1.7	.	55.9
Feb. 23	17 59.90	-15 25.0	4.896	4.557	+0.50	+1.9	.	64.4
Mar. 5	18 04.89	-15 05.8	4.800	4.611	+0.38	+2.1	.	73.2
Mar. 15	18 08.65	-14 44.8	4.696	4.665	+0.24	+2.2	.	82.1
Mar. 25	18 11.05	-14 22.5	4.587	4.718	+0.10	+2.3	.	91.4

Comet C/2007 G1 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2008 Nov. 16.34599 TT
Peri. = 223.99549
Node = 78.99684 2000.0
Incl. = 88.32998
q = 2.6472865 AU
e = 1.0016834

m1 = 8.5 + 5 log(Delta) + 7.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	18 27.69	-70 03.2	3.255	2.707	+5.06	-16.2	14.3	48.6
Jan. 19	19 18.29	-72 45.4	3.211	2.731	+6.68	-12.7	14.3	52.8
Jan. 29	20 25.13	-74 52.2	3.169	2.759	+8.32	-6.1	14.3	57.0
Feb. 8	21 48.31	-75 53.5	3.133	2.790	+8.89	+3.0	14.3	60.9
Feb. 18	23 17.20	-75 23.5	3.107	2.825	+7.87	+12.0	14.3	64.4
Feb. 28	00 35.93	-73 23.9	3.093	2.863	+6.18	+18.3	14.4	67.4
Mar. 10	01 37.73	-70 20.6	3.094	2.904	+4.71	+21.9	14.4	69.7
Mar. 20	02 24.88	-66 42.0	3.112	2.947	+3.68	+23.3	14.5	71.3
Mar. 30	03 01.69	-62 49.3	3.146	2.994	+2.98	+23.2	14.6	72.1
Apr. 9	03 31.51	-58 57.0	3.196	3.043	+2.50	+22.2	14.6	72.2
Apr. 19	03 56.53	-55 14.6	3.261	3.095	+2.17	+20.6	14.7	71.6
Apr. 29	04 18.19	-51 48.5	3.336	3.148	+1.91	+18.6	14.9	70.6
May 9	04 37.32	-48 42.6	3.420	3.204	+1.72	+16.4	15.0	69.2
May 19	04 54.51	-45 59.0	3.509	3.262	+1.56	+14.0	15.1	67.7
May 29	05 10.11	-43 38.6	3.600	3.321	+1.42	+11.7	15.2	66.1
June 8	05 24.35	-41 41.4	3.689	3.382	+1.30	+9.5	15.3	64.7
June 18	05 37.37	-40 06.5	3.775	3.444	+1.19	+7.3	15.4	63.5
June 28	05 49.27	-38 53.1	3.854	3.508	+1.08	+5.3	15.5	62.8
July 8	06 00.04	-37 59.9	3.925	3.573	+0.97	+3.4	15.6	62.6
July 18	06 09.71	-37 25.5	3.986	3.639	+0.85	+1.7	15.7	63.0
July 28	06 18.22	-37 08.6	4.036	3.706	+0.73	+0.1	15.8	64.1
Aug. 7	06 25.49	-37 07.5	4.074	3.775	+0.59	-1.3	15.9	65.8
Aug. 17	06 31.44	-37 20.8	4.101	3.843	+0.45	-2.6	16.0	68.3
Aug. 27	06 35.92	-37 46.7	4.117	3.913	+0.29	-3.6	16.0	71.4
Sept. 6	06 38.78	-38 23.2	4.123	3.983	+0.11	-4.5	16.1	75.0
Sept.16	06 39.86	-39 07.8	4.120	4.054	-0.09	-5.0	16.1	79.2
Sept.26	06 38.95	-39 57.6	4.111	4.126	-0.31	-5.1	16.2	83.8
Oct. 6	06 35.89	-40 49.1	4.098	4.198	-0.53	-4.9	16.2	88.8
Oct. 16	06 30.56	-41 37.9	4.085	4.270	-0.76	-4.1	16.3	93.9
Oct. 26	06 22.93	-42 19.0	4.075	4.343	-0.98	-2.8	16.3	99.0
Nov. 5	06 13.12	-42 46.9	4.071	4.416	-1.17	-0.9	16.4	104.0
Nov. 15	06 01.46	-42 56.3	4.079	4.490	-1.30	+1.4	16.4	108.4
Nov. 25	05 48.51	-42 42.5	4.100	4.564	-1.35	+4.0	16.5	112.1
Dec. 5	05 35.00	-42 02.6	4.140	4.638	-1.33	+6.7	16.6	114.6
Dec. 15	05 21.74	-40 56.0	4.200	4.712	-1.23	+9.1	16.7	115.8
Dec. 25	05 09.48	-39 24.6	4.281	4.786	-1.07	+11.2	16.8	115.4
Jan. 4	04 58.80	-37 32.3	4.384	4.861	-0.87	+12.8	16.9	113.5
Jan. 14	04 50.05	-35 24.6	4.509	4.935	-0.67	+13.8	17.0	110.2
Jan. 24	04 43.38	-33 06.8	4.653	5.010	-0.46	+14.2	17.1	105.7
Feb. 3	04 38.76	-30 44.6	4.814	5.085	-0.27	+14.2	17.2	100.3
Feb. 13	04 36.03	-28 22.4	4.989	5.160	-0.10	+13.9	17.3	94.4
Feb. 23	04 35.02	-26 03.8	5.174	5.234	+0.05	+13.2	17.5	88.1
Mar. 5	04 35.48	-23 51.5	5.364	5.309	+0.17	+12.4	17.6	81.5
Mar. 15	04 37.21	-21 47.3	5.557	5.384	+0.28	+11.5	17.7	74.9
Mar. 25	04 39.99	-19 52.3	5.748	5.459	+0.36	+10.5	17.8	68.3

Comet C/2008 R3 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2008 Nov. 22.51889 TT
Peri. = 84.17223 e = 0.8964355
Node = 270.55371 2000.0 a = 18.4345004 AU
Incl. = 43.23604 n = 0.01245251
q = 1.9091598 AU P = 79.15 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 19.04	+29 46.2	2.150	1.989	+3.13	+6.6	17.2	67.3
Jan. 19	22 50.35	+30 52.7	2.234	2.025	+3.15	+6.0	17.4	64.9
Jan. 29	23 21.85	+31 52.9	2.331	2.066	+3.13	+5.3	17.6	62.3
Feb. 8	23 53.11	+32 45.5	2.439	2.112	+3.07	+4.4	17.8	59.3
Feb. 18	00 23.80	+33 29.4	2.558	2.164	+2.99	+3.5	18.0	55.9
Feb. 28	00 53.68	+34 04.5	2.685	2.219	+2.89	+2.6	18.2	52.1
Mar. 10	01 22.55	+34 31.0	2.818	2.279	+2.78	+1.8	18.4	48.1
Mar. 20	01 50.31	+34 49.2	2.956	2.341	+2.66	+1.0	18.6	43.8
Mar. 30	02 16.92	+34 59.6	3.095	2.407	+2.54	+0.3	18.9	39.3
Apr. 9	02 42.34	+35 02.8	3.233	2.475	+2.42	−0.4	19.1	34.7
Apr. 19	03 06.58	+34 59.2	3.367	2.546	+2.31	−1.0	19.3	29.9
Apr. 29	03 29.67	+34 49.4	3.495	2.618	+2.20	−1.6	19.5	25.1
May 9	03 51.62	+34 33.8	3.616	2.692	+2.08	−2.1	19.7	20.3
May 19	04 12.46	+34 12.9	3.727	2.768	+1.98	−2.6	19.9	15.9
May 29	04 32.22	+33 47.0	3.826	2.844	+1.87	−3.0	20.1	12.4
June 8	04 50.89	+33 16.5	3.912	2.922	+1.76	−3.5	20.2	10.9
June 18	05 08.50	+32 41.8	3.985	3.000	+1.65	−3.8	20.4	12.4
June 28	05 25.04	+32 03.3	4.042	3.080	+1.55	−4.2	20.5	16.4
July 8	05 40.49	+31 21.5	4.083	3.159	+1.44	−4.5	20.7	21.5
July 18	05 54.84	+30 36.6	4.108	3.239	+1.32	−4.7	20.8	27.4
July 28	06 08.06	+29 49.2	4.116	3.320	+1.20	−5.0	20.9	33.7
Aug. 7	06 20.08	+28 59.6	4.108	3.401	+1.08	−5.1	21.0	40.4
Aug. 17	06 30.87	+28 08.3	4.085	3.482	+0.95	−5.3	21.1	47.5
Aug. 27	06 40.34	+27 15.7	4.047	3.563	+0.81	−5.3	21.2	54.9
Sept. 6	06 48.39	+26 22.3	3.995	3.644	+0.65	−5.4	21.2	62.6
Sept. 16	06 54.93	+25 28.3	3.933	3.725	+0.49	−5.4	21.3	70.8
Sept. 26	06 59.84	+24 34.3	3.861	3.806	+0.32	−5.4	21.3	79.3
Oct. 6	07 03.01	+23 40.6	3.785	3.886	+0.13	−5.3	21.4	88.3
Oct. 16	07 04.34	+22 47.4	3.706	3.967	−0.06	−5.2	21.4	97.8
Oct. 26	07 03.74	+21 54.9	3.631	4.048	−0.25	−5.2	21.5	107.8
Nov. 5	07 01.21	+21 03.3	3.565	4.128	−0.44	−5.1	21.5	118.3
Nov. 15	06 56.83	+20 12.7	3.512	4.208	−0.60	−4.9	21.6	129.2
Nov. 25	06 50.78	+19 23.4	3.479	4.288	−0.74	−4.8	21.6	140.6
Dec. 5	06 43.43	+18 35.6	3.472	4.368	−0.82	−4.6	21.7	152.2
Dec. 15	06 35.23	+17 49.9	3.494	4.447	−0.85	−4.3	21.8	163.7
Dec. 25	06 26.74	+17 06.9	3.549	4.526	−0.82	−3.9	21.9	173.0
Jan. 4	06 18.55	+16 27.5	3.637	4.605	−0.74	−3.5	22.0	168.8
Jan. 14	06 11.16	+15 52.4	3.758	4.684	−0.62	−3.0	22.2	157.9
Jan. 24	06 04.99	+15 22.1	3.909	4.762	−0.47	−2.6	22.3	146.6
Feb. 3	06 00.29	+14 56.5	4.087	4.840	−0.31	−2.1	22.5	135.5
Feb. 13	05 57.16	+14 35.6	4.287	4.918	−0.15	−1.7	22.7	124.8
Feb. 23	05 55.62	+14 18.7	4.503	4.995	0.00	−1.4	22.9	114.5
Mar. 5	05 55.58	+14 04.9	4.731	5.072	+0.13	−1.1	23.0	104.6
Mar. 15	05 56.91	+13 53.4	4.965	5.148	+0.26	−1.0	23.2	95.0
Mar. 25	05 59.46	+13 43.2	5.202	5.225	+0.36	−1.0	23.4	85.8

Comet 150P/LONEOS

Epoch = 2009 July 28.0 TT
T = 2008 Nov. 25.98079 TT
Peri. = 245.66851 e = 0.5456929
Node = 272.42766 2000.0 a = 3.8910774 AU
Incl. = 18.50038 n = 0.12841013
q = 1.7677441 AU P = 7.68 years

m1 = 13.8 + 5 log(Delta) + 12.5 log(r(t-100))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	13 37.80	-30 21.5	1.791	1.817	+2.06	-16.5	18.4	75.6
Jan. 19	13 58.35	-33 06.8	1.732	1.841	+1.93	-14.9	18.2	80.2
Jan. 29	14 17.62	-35 35.3	1.673	1.869	+1.75	-13.1	18.1	85.2
Feb. 8	14 35.10	-37 46.0	1.614	1.901	+1.52	-11.2	18.0	90.6
Feb. 18	14 50.27	-39 38.1	1.556	1.937	+1.22	-9.3	17.9	96.6
Feb. 28	15 02.47	-41 11.0	1.499	1.976	+0.86	-7.2	17.8	103.1
Mar. 10	15 11.11	-42 22.9	1.445	2.017	+0.46	-4.9	17.7	110.3
Mar. 20	15 15.72	-43 11.7	1.397	2.062	+0.03	-2.2	17.6	118.1
Mar. 30	15 16.02	-43 33.3	1.356	2.109	-0.37	+1.0	17.6	126.5
Apr. 9	15 12.27	-43 23.1	1.327	2.157	-0.69	+4.6	17.6	135.3
Apr. 19	15 05.33	-42 37.4	1.313	2.208	-0.88	+8.2	17.6	144.2
Apr. 29	14 56.54	-41 15.9	1.319	2.259	-0.89	+11.2	17.7	152.3
May 9	14 47.63	-39 23.6	1.347	2.312	-0.76	+13.2	17.8	157.6
May 19	14 40.07	-37 11.2	1.399	2.366	-0.52	+13.9	18.0	157.8
May 29	14 34.84	-34 51.8	1.475	2.421	-0.24	+13.4	18.2	152.8
June 8	14 32.42	-32 37.5	1.575	2.477	+0.04	+12.0	18.5	145.2
June 18	14 32.78	-30 37.2	1.696	2.533	+0.29	+10.2	18.8	136.7
June 28	14 35.68	-28 55.3	1.835	2.589	+0.51	+8.2	19.0	128.1
July 8	14 40.82	-27 33.1	1.989	2.646	+0.70	+6.4	19.3	119.8
July 18	14 47.81	-26 29.5	2.155	2.702	+0.85	+4.7	19.6	111.8
July 28	14 56.34	-25 42.5	2.331	2.759	+0.98	+3.3	19.9	104.0
Aug. 7	15 06.16	-25 09.2	2.514	2.816	+1.09	+2.2	20.2	96.5
Aug. 17	15 17.01	-24 47.0	2.701	2.873	+1.17	+1.4	20.5	89.3
Aug. 27	15 28.73	-24 33.4	2.889	2.929	+1.24	+0.7	20.8	82.2
Sept. 6	15 41.16	-24 25.9	3.077	2.985	+1.30	+0.3	21.0	75.3
Sept. 16	15 54.17	-24 22.5	3.263	3.041	+1.35	+0.1	21.3	68.5
Sept. 26	16 07.65	-24 21.6	3.444	3.097	+1.39	0.0	21.5	61.7
Oct. 6	16 21.51	-24 21.5	3.618	3.152	+1.41	0.0	21.8	55.0
Oct. 16	16 35.64	-24 21.2	3.783	3.207	+1.43	+0.2	22.0	48.3
Oct. 26	16 49.98	-24 19.4	3.938	3.261	+1.44	+0.4	22.2	41.5
Nov. 5	17 04.42	-24 15.3	4.081	3.315	+1.45	+0.7	22.4	34.8
Nov. 15	17 18.91	-24 08.4	4.210	3.369	+1.44	+1.0	22.5	28.0
Nov. 25	17 33.35	-23 58.0	4.323	3.422	+1.43	+1.4	22.7	21.2
Dec. 5	17 47.65	-23 43.9	4.421	3.474	+1.41	+1.8	22.9	14.3
Dec. 15	18 01.75	-23 25.8	4.500	3.526	+1.38	+2.2	23.0	7.4
Dec. 25	18 15.56	-23 03.6	4.561	3.578	+1.34	+2.6	23.1	0.5
Jan. 4	18 28.98	-22 37.5	4.603	3.629	+1.30	+3.0	23.3	6.7
Jan. 14	18 41.94	-22 07.6	4.626	3.679	+1.24	+3.3	23.4	13.9
Jan. 24	18 54.35	-21 34.3	4.630	3.729	+1.18	+3.6	23.5	21.2
Feb. 3	19 06.11	-20 57.9	4.615	3.778	+1.10	+3.9	23.5	28.5
Feb. 13	19 17.14	-20 18.9	4.581	3.827	+1.02	+4.1	23.6	36.0
Feb. 23	19 27.34	-19 37.9	4.530	3.875	+0.93	+4.2	23.7	43.6
Mar. 5	19 36.62	-18 55.5	4.464	3.922	+0.82	+4.3	23.7	51.4
Mar. 15	19 44.87	-18 12.4	4.383	3.969	+0.71	+4.3	23.8	59.4
Mar. 25	19 51.98	-17 29.3	4.290	4.016	+0.59	+4.2	23.8	67.5

Comet C/2007 M2 (Catalina)

Epoch = 2009 July 28.0 TT
T = 2008 Dec. 8.57032 TT
Peri. = 220.67069
Node = 357.28960 2000.0
Incl. = 80.95373
q = 3.5410237 AU
e = 0.9988047

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

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	12 10.96	-53 24.8	3.550	3.553	-0.88	-23.8	16.3	82.2
Jan. 19	12 02.20	-57 23.3	3.459	3.561	-1.48	-22.8	16.2	87.9
Jan. 29	11 47.44	-61 11.6	3.383	3.572	-2.26	-20.5	16.2	93.0
Feb. 8	11 24.87	-64 36.5	3.325	3.585	-3.17	-16.5	16.2	97.2
Feb. 18	10 53.20	-67 21.5	3.287	3.600	-4.01	-10.7	16.1	100.5
Feb. 28	10 13.13	-69 08.8	3.270	3.618	-4.41	-3.8	16.2	102.6
Mar. 10	09 29.05	-69 47.3	3.273	3.638	-4.14	+2.7	16.2	103.6
Mar. 20	08 47.69	-69 20.0	3.296	3.660	-3.35	+7.6	16.2	103.6
Mar. 30	08 14.19	-68 03.5	3.335	3.683	-2.41	+10.4	16.3	102.5
Apr. 9	07 50.04	-66 19.6	3.389	3.709	-1.59	+11.3	16.3	100.8
Apr. 19	07 34.18	-64 26.7	3.453	3.737	-0.93	+10.9	16.4	98.6
Apr. 29	07 24.86	-62 37.9	3.526	3.767	-0.44	+9.6	16.5	96.0
May 9	07 20.42	-61 01.6	3.603	3.799	-0.09	+7.9	16.6	93.4
May 19	07 19.55	-59 42.5	3.683	3.832	+0.18	+5.9	16.7	90.7
May 29	07 21.31	-58 43.5	3.762	3.867	+0.37	+3.8	16.8	88.3
June 8	07 25.00	-58 05.8	3.840	3.904	+0.51	+1.6	16.8	86.0
June 18	07 30.09	-57 49.9	3.915	3.942	+0.61	-0.6	16.9	84.1
June 28	07 36.22	-57 55.7	3.985	3.982	+0.68	-2.7	17.0	82.5
July 8	07 43.04	-58 22.9	4.051	4.023	+0.73	-4.8	17.1	81.2
July 18	07 50.31	-59 10.7	4.113	4.066	+0.75	-6.8	17.2	80.2
July 28	07 57.81	-60 18.5	4.170	4.110	+0.75	-8.7	17.2	79.6
Aug. 7	08 05.28	-61 45.4	4.223	4.155	+0.72	-10.5	17.3	79.2
Aug. 17	08 12.51	-63 30.3	4.274	4.201	+0.67	-12.2	17.4	79.1
Aug. 27	08 19.18	-65 31.9	4.323	4.249	+0.57	-13.7	17.5	79.1
Sept. 6	08 24.87	-67 48.8	4.372	4.298	+0.41	-15.0	17.5	79.1
Sept.16	08 28.99	-70 19.0	4.422	4.347	+0.15	-16.1	17.6	79.2
Sept.26	08 30.53	-73 00.4	4.473	4.398	-0.29	-16.9	17.7	79.2
Oct. 6	08 27.68	-75 49.8	4.529	4.450	-1.08	-17.3	17.8	79.1
Oct. 16	08 16.83	-78 42.7	4.589	4.502	-2.70	-16.8	17.8	78.8
Oct. 26	07 49.81	-81 30.8	4.654	4.555	-6.22	-14.4	17.9	78.2
Nov. 5	06 47.57	-83 54.5	4.724	4.610	-12.23	-7.0	18.0	77.3
Nov. 15	04 45.25	-85 04.9	4.801	4.664	-12.96	+5.4	18.1	76.2
Nov. 25	02 35.64	-84 10.9	4.883	4.720	-6.98	+13.7	18.2	74.7
Dec. 5	01 25.86	-81 53.7	4.970	4.776	-3.06	+16.7	18.3	73.0
Dec. 15	00 55.25	-79 07.2	5.062	4.833	-1.26	+17.4	18.4	71.1
Dec. 25	00 42.67	-76 13.2	5.156	4.891	-0.38	+17.3	18.5	69.0
Jan. 4	00 38.89	-73 20.4	5.252	4.949	+0.10	+16.8	18.5	66.9
Jan. 14	00 39.85	-70 32.9	5.347	5.007	+0.38	+16.0	18.6	64.8
Jan. 24	00 43.60	-67 53.1	5.440	5.066	+0.55	+15.0	18.7	62.8
Feb. 3	00 49.07	-65 22.9	5.530	5.126	+0.66	+14.0	18.8	61.0
Feb. 13	00 55.63	-63 03.2	5.614	5.186	+0.73	+12.8	18.9	59.6
Feb. 23	01 02.88	-60 54.9	5.692	5.246	+0.77	+11.6	19.0	58.7
Mar. 5	01 10.55	-58 58.7	5.761	5.307	+0.79	+10.4	19.1	58.2
Mar. 15	01 18.43	-57 15.0	5.821	5.368	+0.80	+9.1	19.1	58.4
Mar. 25	01 26.39	-55 44.3	5.872	5.429	+0.79	+7.7	19.2	59.2

Comet 204P/LINEAR-NEAT

Epoch = 2009 July 28.0 TT
T = 2008 Dec. 9.22953 TT
Peri. = 355.01956 e = 0.4705693
Node = 109.10500 2000.0 a = 3.6643685 AU
Incl. = 6.58105 n = 0.14050940
q = 1.9400292 AU P = 7.01 years

m1 = 12.0 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	08 36.93	+20 32.6	0.998	1.957	-0.51	+8.0	17.1	162.3
Jan. 19	08 31.79	+21 52.7	0.990	1.970	-0.60	+7.7	17.1	173.4
Jan. 29	08 25.84	+23 09.5	1.006	1.987	-0.52	+6.4	17.2	173.0
Feb. 8	08 20.65	+24 13.6	1.045	2.006	-0.31	+4.6	17.4	162.0
Feb. 18	08 17.55	+24 59.5	1.107	2.029	-0.02	+2.6	17.6	151.2
Feb. 28	08 17.31	+25 25.6	1.188	2.055	+0.29	+0.7	17.8	141.0
Mar. 10	08 20.25	+25 32.6	1.286	2.083	+0.59	-1.0	18.1	131.7
Mar. 20	08 26.16	+25 22.5	1.398	2.114	+0.85	-2.5	18.4	123.2
Mar. 30	08 34.66	+24 57.3	1.522	2.147	+1.06	-3.8	18.7	115.3
Apr. 9	08 45.28	+24 18.9	1.655	2.183	+1.23	-5.0	19.0	108.0
Apr. 19	08 57.54	+23 28.9	1.795	2.220	+1.35	-6.0	19.3	101.2
Apr. 29	09 11.03	+22 28.8	1.940	2.259	+1.44	-6.9	19.6	94.7
May 9	09 25.41	+21 19.7	2.090	2.299	+1.50	-7.7	19.9	88.6
May 19	09 40.39	+20 02.9	2.243	2.341	+1.54	-8.4	20.2	82.8
May 29	09 55.75	+18 39.4	2.397	2.384	+1.56	-8.9	20.5	77.1
June 8	10 11.34	+17 10.3	2.551	2.428	+1.57	-9.4	20.8	71.5
June 18	10 27.03	+15 36.7	2.704	2.473	+1.57	-9.7	21.0	66.1
June 28	10 42.74	+13 59.5	2.854	2.519	+1.57	-10.0	21.3	60.7
July 8	10 58.42	+12 19.6	3.002	2.565	+1.56	-10.2	21.5	55.4
July 18	11 14.00	+10 38.0	3.145	2.612	+1.55	-10.3	21.8	50.1
July 28	11 29.49	+08 55.3	3.282	2.659	+1.54	-10.3	22.0	44.8
Aug. 7	11 44.86	+07 12.4	3.412	2.706	+1.52	-10.2	22.2	39.4
Aug. 17	12 00.09	+05 30.1	3.534	2.754	+1.51	-10.1	22.4	34.1
Aug. 27	12 15.20	+03 49.0	3.646	2.802	+1.50	-9.9	22.6	28.6
Sept. 6	12 30.16	+02 09.7	3.749	2.850	+1.48	-9.7	22.8	23.2
Sept. 16	12 44.98	+00 33.0	3.839	2.898	+1.47	-9.4	23.0	17.7
Sept. 26	12 59.65	-01 00.7	3.918	2.945	+1.45	-9.0	23.2	12.2
Oct. 6	13 14.15	-02 30.7	3.982	2.993	+1.43	-8.6	23.3	7.3
Oct. 16	13 28.46	-03 56.4	4.033	3.041	+1.41	-8.1	23.5	5.0
Oct. 26	13 42.54	-05 17.5	4.068	3.088	+1.38	-7.6	23.6	8.5
Nov. 5	13 56.36	-06 33.2	4.088	3.135	+1.35	-7.0	23.7	14.1
Nov. 15	14 09.87	-07 43.2	4.091	3.182	+1.31	-6.4	23.9	20.3
Nov. 25	14 22.99	-08 47.1	4.079	3.229	+1.27	-5.7	24.0	26.8
Dec. 5	14 35.65	-09 44.6	4.051	3.275	+1.21	-5.1	24.1	33.6
Dec. 15	14 47.75	-10 35.2	4.007	3.321	+1.14	-4.4	24.1	40.5
Dec. 25	14 59.19	-11 18.7	3.948	3.367	+1.06	-3.6	24.2	47.8
Jan. 4	15 09.82	-11 55.0	3.876	3.412	+0.97	-2.9	24.3	55.2
Jan. 14	15 19.51	-12 24.1	3.791	3.456	+0.86	-2.2	24.3	62.9
Jan. 24	15 28.10	-12 45.7	3.696	3.501	+0.73	-1.4	24.4	71.0
Feb. 3	15 35.41	-13 00.1	3.593	3.545	+0.59	-0.7	24.4	79.3
Feb. 13	15 41.28	-13 07.3	3.485	3.588	+0.42	0.0	24.4	87.9
Feb. 23	15 45.50	-13 07.6	3.376	3.631	+0.24	+0.6	24.4	96.9
Mar. 5	15 47.95	-13 01.3	3.269	3.673	+0.05	+1.2	24.5	106.4
Mar. 15	15 48.49	-12 48.9	3.168	3.715	-0.14	+1.8	24.5	116.2
Mar. 25	15 47.09	-12 31.1	3.078	3.757	-0.33	+2.2	24.5	126.4

Comet 210P/Cristensen

Epoch = 2009 July 28.0 TT
T = 2008 Dec. 19.97112 TT
Peri. = 345.77209 e = 0.8316172
Node = 93.88332 2000.0 a = 3.1761175 AU
Incl. = 10.21573 n = 0.17412424
q = 0.5348036 AU P = 5.66 years

m1 = 14.0 + 5 log(Delta) + 10.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	16 36.87	-12 37.1	0.511	0.679	-1.82	+22.5	10.9	40.2
Jan. 19	16 18.70	-08 52.5	0.591	0.811	-0.72	+14.2	12.0	55.5
Jan. 29	16 11.53	-06 30.7	0.657	0.954	-0.50	+11.5	12.9	67.7
Feb. 8	16 06.55	-04 36.2	0.703	1.098	-0.68	+11.2	13.6	79.2
Feb. 18	15 59.74	-02 44.6	0.733	1.240	-1.07	+11.8	14.3	90.9
Feb. 28	15 49.02	-00 46.6	0.754	1.378	-1.55	+12.4	14.8	103.5
Mar. 10	15 33.52	+01 16.9	0.775	1.511	-2.00	+12.1	15.2	116.9
Mar. 20	15 13.56	+03 17.9	0.804	1.640	-2.30	+10.6	15.7	131.0
Mar. 30	14 50.59	+05 03.4	0.851	1.764	-2.35	+7.6	16.1	144.8
Apr. 9	14 27.10	+06 19.9	0.923	1.884	-2.14	+4.1	16.6	156.5
Apr. 19	14 05.66	+07 00.8	1.023	2.000	-1.76	+0.6	17.1	161.3
Apr. 29	13 48.01	+07 07.2	1.150	2.113	-1.31	-2.2	17.6	156.6
May 9	13 34.92	+06 45.5	1.303	2.221	-0.87	-4.2	18.0	147.4
May 19	13 26.21	+06 03.5	1.477	2.327	-0.48	-5.6	18.5	137.6
May 29	13 21.37	+05 07.6	1.669	2.429	-0.16	-6.5	19.0	128.0
June 8	13 19.74	+04 02.8	1.875	2.528	+0.09	-7.0	19.4	119.0
June 18	13 20.69	+02 52.4	2.092	2.624	+0.30	-7.4	19.8	110.4
June 28	13 23.70	+01 38.8	2.315	2.718	+0.47	-7.5	20.2	102.2
July 8	13 28.35	+00 23.4	2.542	2.809	+0.60	-7.6	20.5	94.4
July 18	13 34.30	-00 52.4	2.771	2.898	+0.70	-7.6	20.8	86.8
July 28	13 41.30	-02 08.0	2.999	2.984	+0.78	-7.5	21.1	79.4
Aug. 7	13 49.15	-03 22.6	3.222	3.068	+0.85	-7.3	21.4	72.2
Aug. 17	13 57.67	-04 35.8	3.440	3.150	+0.91	-7.1	21.7	65.1
Aug. 27	14 06.75	-05 47.1	3.649	3.230	+0.95	-6.9	21.9	58.0
Sept. 6	14 16.27	-06 56.0	3.848	3.308	+0.99	-6.6	22.1	51.0
Sept.16	14 26.14	-08 02.3	4.034	3.384	+1.02	-6.3	22.3	44.1
Sept.26	14 36.30	-09 05.5	4.205	3.458	+1.04	-6.0	22.5	37.1
Oct. 6	14 46.65	-10 05.4	4.360	3.531	+1.05	-5.6	22.7	30.1
Oct. 16	14 57.13	-11 01.6	4.497	3.601	+1.05	-5.2	22.8	23.1
Oct. 26	15 07.68	-11 54.0	4.615	3.670	+1.05	-4.8	23.0	16.2
Nov. 5	15 18.21	-12 42.1	4.712	3.738	+1.04	-4.4	23.1	9.6
Nov. 15	15 28.65	-13 25.9	4.788	3.804	+1.03	-3.9	23.2	5.3
Nov. 25	15 38.92	-14 05.1	4.841	3.868	+1.00	-3.4	23.3	8.7
Dec. 5	15 48.92	-14 39.5	4.872	3.931	+0.96	-3.0	23.4	15.5
Dec. 15	15 58.56	-15 09.3	4.881	3.992	+0.92	-2.5	23.5	22.9
Dec. 25	16 07.73	-15 34.1	4.867	4.052	+0.86	-2.0	23.5	30.7
Jan. 4	16 16.31	-15 54.2	4.833	4.111	+0.79	-1.5	23.6	38.7
Jan. 14	16 24.18	-16 09.6	4.779	4.168	+0.70	-1.1	23.6	46.9
Jan. 24	16 31.20	-16 20.5	4.707	4.224	+0.60	-0.6	23.6	55.3
Feb. 3	16 37.22	-16 26.9	4.620	4.279	+0.49	-0.2	23.6	63.9
Feb. 13	16 42.10	-16 29.3	4.520	4.333	+0.36	+0.2	23.6	72.9
Feb. 23	16 45.67	-16 27.7	4.411	4.385	+0.21	+0.5	23.6	82.0
Mar. 5	16 47.80	-16 22.6	4.297	4.436	+0.06	+0.8	23.6	91.5
Mar. 15	16 48.37	-16 14.2	4.183	4.486	-0.11	+1.1	23.6	101.4
Mar. 25	16 47.28	-16 02.8	4.073	4.535	-0.28	+1.4	23.6	111.5

Comet P/2008 T4 (Hill)

Epoch = 2009 July 28.0 TT
T = 2008 Dec. 24.00228 TT
Peri. = 1.27405 e = 0.4353938
Node = 44.67980 2000.0 a = 4.4487854 AU
Incl. = 6.32614 n = 0.10503690
q = 2.5118118 AU P = 9.38 years

m1 = 10.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	01 42.69	+11 27.7	2.162	2.514	+0.97	+7.4	18.3	99.2
Jan. 19	01 52.41	+12 41.9	2.290	2.519	+1.14	+7.9	18.4	91.7
Jan. 29	02 03.80	+14 01.0	2.420	2.525	+1.28	+8.2	18.6	84.6
Feb. 8	02 16.65	+15 23.0	2.551	2.533	+1.41	+8.3	18.7	77.8
Feb. 18	02 30.74	+16 46.1	2.680	2.543	+1.52	+8.3	18.8	71.4
Feb. 28	02 45.93	+18 08.6	2.808	2.556	+1.61	+8.0	19.0	65.2
Mar. 10	03 02.06	+19 29.0	2.932	2.570	+1.69	+7.7	19.1	59.2
Mar. 20	03 19.00	+20 45.7	3.052	2.585	+1.76	+7.2	19.2	53.4
Mar. 30	03 36.63	+21 57.5	3.166	2.603	+1.82	+6.6	19.3	47.8
Apr. 9	03 54.85	+23 03.3	3.274	2.622	+1.87	+5.9	19.5	42.3
Apr. 19	04 13.55	+24 02.1	3.376	2.643	+1.91	+5.1	19.6	37.0
Apr. 29	04 32.64	+24 53.1	3.469	2.665	+1.94	+4.3	19.7	31.7
May 9	04 51.99	+25 35.8	3.555	2.689	+1.95	+3.4	19.8	26.5
May 19	05 11.52	+26 09.7	3.632	2.714	+1.96	+2.5	19.9	21.3
May 29	05 31.12	+26 34.7	3.700	2.741	+1.96	+1.6	20.0	16.2
June 8	05 50.68	+26 50.7	3.757	2.769	+1.94	+0.7	20.1	11.2
June 18	06 10.10	+26 57.9	3.805	2.798	+1.92	−0.1	20.2	6.5
June 28	06 29.29	+26 56.6	3.842	2.828	+1.89	−0.9	20.3	3.7
July 8	06 48.15	+26 47.4	3.867	2.859	+1.85	−1.6	20.4	6.4
July 18	07 06.60	+26 30.9	3.881	2.891	+1.80	−2.3	20.5	11.2
July 28	07 24.56	+26 08.0	3.883	2.924	+1.74	−2.8	20.5	16.5
Aug. 7	07 41.95	+25 39.6	3.873	2.958	+1.67	−3.3	20.6	22.0
Aug. 17	07 58.69	+25 06.6	3.851	2.992	+1.60	−3.6	20.7	27.7
Aug. 27	08 14.73	+24 30.3	3.817	3.027	+1.52	−3.8	20.7	33.6
Sept. 6	08 29.98	+23 51.8	3.770	3.063	+1.44	−3.9	20.8	39.7
Sept.16	08 44.37	+23 12.5	3.712	3.099	+1.35	−3.9	20.8	46.0
Sept.26	08 57.82	+22 33.6	3.642	3.136	+1.24	−3.7	20.9	52.6
Oct. 6	09 10.23	+21 56.7	3.562	3.173	+1.13	−3.4	20.9	59.5
Oct. 16	09 21.51	+21 23.1	3.473	3.211	+1.00	−2.9	20.9	66.6
Oct. 26	09 31.52	+20 54.5	3.376	3.249	+0.86	−2.2	20.9	74.2
Nov. 5	09 40.11	+20 32.4	3.273	3.287	+0.70	−1.4	20.9	82.1
Nov. 15	09 47.15	+20 18.1	3.168	3.326	+0.53	−0.5	20.9	90.4
Nov. 25	09 52.44	+20 13.0	3.061	3.365	+0.34	+0.5	20.9	99.3
Dec. 5	09 55.83	+20 18.0	2.959	3.404	+0.13	+1.5	20.9	108.6
Dec. 15	09 57.18	+20 33.4	2.864	3.443	−0.08	+2.5	20.9	118.4
Dec. 25	09 56.39	+20 58.7	2.781	3.482	−0.29	+3.4	20.9	128.8
Jan. 4	09 53.51	+21 32.3	2.715	3.521	−0.48	+3.9	21.0	139.5
Jan. 14	09 48.72	+22 11.4	2.671	3.561	−0.63	+4.1	21.0	150.6
Jan. 24	09 42.40	+22 52.1	2.653	3.600	−0.73	+3.8	21.1	161.4
Feb. 3	09 35.11	+23 30.3	2.665	3.640	−0.76	+3.2	21.1	170.2
Feb. 13	09 27.56	+24 02.1	2.706	3.679	−0.71	+2.3	21.2	168.7
Feb. 23	09 20.47	+24 24.6	2.777	3.718	−0.60	+1.2	21.4	159.1
Mar. 5	09 14.47	+24 36.5	2.877	3.758	−0.45	+0.1	21.5	148.4
Mar. 15	09 10.01	+24 37.7	3.001	3.797	−0.27	−0.9	21.7	137.8
Mar. 25	09 07.36	+24 29.1	3.146	3.836	−0.08	−1.7	21.8	127.6

Comet C/2008 Q1 (Maticic)

Epoch = 2009 July 28.0 TT
T = 2008 Dec. 30.15649 TT
Peri. = 104.48582
Node = 9.30678 2000.0
Incl. = 118.62944
q = 2.9593533 AU
e = 0.9952090

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	17 36.61	+22 18.5	3.476	2.961	+0.11	+2.4	17.4	51.2
Jan. 19	17 37.73	+22 43.0	3.402	2.966	0.00	+4.4	17.4	56.0
Jan. 29	17 37.70	+23 27.4	3.309	2.974	-0.17	+6.4	17.3	61.9
Feb. 8	17 36.04	+24 31.6	3.198	2.986	-0.38	+8.4	17.3	68.8
Feb. 18	17 32.25	+25 55.2	3.076	3.001	-0.65	+10.2	17.2	76.4
Feb. 28	17 25.71	+27 36.9	2.946	3.019	-1.00	+11.6	17.1	84.6
Mar. 10	17 15.66	+29 33.1	2.817	3.040	-1.43	+12.5	17.1	93.2
Mar. 20	17 01.37	+31 37.7	2.696	3.064	-1.92	+12.2	17.0	102.1
Mar. 30	16 42.16	+33 39.9	2.593	3.091	-2.43	+10.4	17.0	110.8
Apr. 9	16 17.82	+35 23.6	2.516	3.121	-2.88	+6.7	16.9	118.5
Apr. 19	15 49.02	+36 30.2	2.474	3.154	-3.14	+1.3	17.0	124.5
Apr. 29	15 17.59	+36 43.2	2.475	3.189	-3.13	-4.7	17.0	127.4
May 9	14 46.29	+35 55.9	2.521	3.226	-2.85	-10.2	17.1	126.6
May 19	14 17.75	+34 14.3	2.611	3.266	-2.41	-14.1	17.2	122.3
May 29	13 53.68	+31 53.6	2.742	3.309	-1.90	-16.3	17.4	115.6
June 8	13 34.64	+29 10.9	2.905	3.353	-1.43	-17.0	17.6	107.5
June 18	13 20.33	+26 20.5	3.092	3.399	-1.02	-16.9	17.8	98.8
June 28	13 10.11	+23 31.5	3.297	3.448	-0.69	-16.2	18.0	89.9
July 8	13 03.24	+20 49.3	3.510	3.498	-0.42	-15.3	18.2	81.0
July 18	12 59.03	+18 16.2	3.726	3.550	-0.21	-14.3	18.4	72.2
July 28	12 56.92	+15 52.7	3.938	3.603	-0.05	-13.4	18.5	63.6
Aug. 7	12 56.46	+13 38.7	4.142	3.658	+0.08	-12.5	18.7	55.1
Aug. 17	12 57.26	+11 33.5	4.334	3.714	+0.18	-11.7	18.9	46.7
Aug. 27	12 59.05	+09 36.3	4.509	3.771	+0.25	-11.0	19.0	38.5
Sept. 6	13 01.56	+07 46.5	4.664	3.829	+0.30	-10.3	19.2	30.5
Sept.16	13 04.59	+06 03.3	4.798	3.889	+0.34	-9.7	19.3	22.6
Sept.26	13 07.96	+04 26.1	4.908	3.950	+0.36	-9.2	19.4	15.4
Oct. 6	13 11.52	+02 54.5	4.992	4.011	+0.36	-8.6	19.5	10.0
Oct. 16	13 15.11	+01 28.2	5.050	4.074	+0.35	-8.1	19.6	10.5
Oct. 26	13 18.59	+00 07.0	5.081	4.137	+0.32	-7.6	19.7	16.4
Nov. 5	13 21.79	-01 09.4	5.086	4.201	+0.28	-7.2	19.8	24.2
Nov. 15	13 24.58	-02 21.0	5.065	4.266	+0.22	-6.7	19.8	32.7
Nov. 25	13 26.77	-03 27.8	5.019	4.331	+0.14	-6.2	19.9	41.6
Dec. 5	13 28.21	-04 29.6	4.951	4.397	+0.05	-5.7	19.9	50.9
Dec. 15	13 28.70	-05 26.4	4.864	4.463	-0.07	-5.1	19.9	60.5
Dec. 25	13 28.04	-06 17.8	4.762	4.530	-0.20	-4.6	20.0	70.5
Jan. 4	13 26.04	-07 03.5	4.650	4.597	-0.35	-3.9	20.0	80.9
Jan. 14	13 22.54	-07 43.0	4.533	4.665	-0.52	-3.3	20.0	91.6
Jan. 24	13 17.36	-08 15.6	4.417	4.733	-0.69	-2.5	20.0	102.8
Feb. 3	13 10.43	-08 40.7	4.311	4.802	-0.87	-1.7	20.0	114.4
Feb. 13	13 01.78	-08 57.7	4.220	4.870	-1.02	-0.9	20.0	126.3
Feb. 23	12 51.55	-09 06.2	4.153	4.939	-1.15	0.0	20.0	138.6
Mar. 5	12 40.07	-09 06.4	4.117	5.008	-1.23	+0.8	20.1	151.1
Mar. 15	12 27.79	-08 58.8	4.117	5.078	-1.25	+1.4	20.1	163.3
Mar. 25	12 15.29	-08 45.1	4.157	5.147	-1.21	+1.8	20.2	172.9

Comet 214P/LINEAR

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 5.61477 TT
Peri. = 190.27202 e = 0.4885898
Node = 348.25965 2000.0 a = 3.6053638 AU
Incl. = 15.21345 n = 0.14397280
q = 1.8438198 AU P = 6.85 years

m1 = 14.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	13 51.54	-14 52.9	1.786	1.844	+1.81	-19.2	19.4	77.6
Jan. 19	14 09.65	-18 04.9	1.696	1.848	+1.71	-18.9	19.3	82.6
Jan. 29	14 26.77	-21 13.6	1.609	1.855	+1.58	-18.5	19.3	87.9
Feb. 8	14 42.56	-24 18.5	1.526	1.867	+1.41	-18.1	19.2	93.5
Feb. 18	14 56.63	-27 19.1	1.448	1.883	+1.18	-17.5	19.1	99.5
Feb. 28	15 08.43	-30 14.5	1.374	1.903	+0.89	-16.9	19.1	106.0
Mar. 10	15 17.37	-33 03.3	1.308	1.926	+0.55	-16.0	19.1	112.9
Mar. 20	15 22.87	-35 42.9	1.250	1.953	+0.15	-14.6	19.0	120.4
Mar. 30	15 24.34	-38 08.6	1.203	1.983	-0.28	-12.5	19.1	128.2
Apr. 9	15 21.54	-40 13.5	1.170	2.015	-0.68	-9.6	19.1	136.2
Apr. 19	15 14.78	-41 49.4	1.152	2.051	-0.97	-5.9	19.2	143.8
Apr. 29	15 05.06	-42 48.6	1.153	2.088	-1.09	-1.9	19.3	150.3
May 9	14 54.18	-43 07.9	1.174	2.128	-1.01	+1.7	19.5	154.1
May 19	14 44.13	-42 51.0	1.216	2.170	-0.76	+4.4	19.7	153.8
May 29	14 36.53	-42 07.0	1.279	2.213	-0.42	+5.9	19.9	149.6
June 8	14 32.37	-41 08.0	1.361	2.258	-0.05	+6.3	20.2	143.3
June 18	14 31.86	-40 04.8	1.462	2.304	+0.29	+6.0	20.5	136.1
June 28	14 34.80	-39 05.1	1.578	2.352	+0.60	+5.2	20.8	128.7
July 8	14 40.76	-38 13.5	1.708	2.400	+0.85	+4.2	21.1	121.4
July 18	14 49.23	-37 31.5	1.850	2.449	+1.06	+3.2	21.4	114.2
July 28	14 59.78	-36 59.3	2.001	2.498	+1.22	+2.4	21.7	107.3
Aug. 7	15 12.03	-36 35.7	2.159	2.548	+1.36	+1.7	22.0	100.5
Aug. 17	15 25.63	-36 19.1	2.323	2.598	+1.47	+1.1	22.3	94.0
Aug. 27	15 40.36	-36 07.7	2.491	2.649	+1.56	+0.8	22.5	87.6
Sept. 6	15 55.98	-35 59.8	2.661	2.699	+1.63	+0.6	22.8	81.3
Sept.16	16 12.30	-35 53.8	2.831	2.750	+1.69	+0.6	23.0	75.1
Sept.26	16 29.21	-35 48.0	3.000	2.801	+1.73	+0.7	23.3	68.9
Oct. 6	16 46.54	-35 41.4	3.166	2.851	+1.76	+0.9	23.5	62.8
Oct. 16	17 04.19	-35 32.9	3.327	2.902	+1.79	+1.1	23.8	56.7
Oct. 26	17 22.04	-35 21.5	3.481	2.952	+1.79	+1.5	24.0	50.6
Nov. 5	17 39.98	-35 06.7	3.628	3.002	+1.79	+1.9	24.2	44.5
Nov. 15	17 57.92	-34 48.1	3.765	3.052	+1.78	+2.3	24.3	38.4
Nov. 25	18 15.76	-34 25.3	3.890	3.102	+1.76	+2.7	24.5	32.3
Dec. 5	18 33.41	-33 58.4	4.003	3.151	+1.74	+3.1	24.7	26.3
Dec. 15	18 50.78	-33 27.3	4.103	3.199	+1.70	+3.5	24.8	20.5
Dec. 25	19 07.80	-32 52.5	4.187	3.248	+1.66	+3.8	25.0	15.2
Jan. 4	19 24.39	-32 14.3	4.255	3.296	+1.61	+4.1	.	11.1
Jan. 14	19 40.48	-31 33.2	4.307	3.343	+1.55	+4.3	.	10.2
Jan. 24	19 56.01	-30 49.8	4.341	3.390	+1.49	+4.5	.	13.2
Feb. 3	20 10.90	-30 04.9	4.358	3.436	+1.42	+4.6	.	18.3
Feb. 13	20 25.12	-29 19.3	4.358	3.482	+1.35	+4.5	.	24.4
Feb. 23	20 38.58	-28 33.9	4.340	3.528	+1.27	+4.4	.	30.9
Mar. 5	20 51.24	-27 49.5	4.306	3.573	+1.18	+4.2	.	37.7
Mar. 15	21 03.03	-27 07.2	4.256	3.617	+1.08	+3.9	.	44.7
Mar. 25	21 13.87	-26 27.9	4.191	3.661	+0.98	+3.5	.	51.9

Comet C/2007 N3 (Lulin)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 10.64472 TT
Peri. = 136.86845
Node = 338.54343 2000.0
Incl. = 178.37371
q = 1.2121777 AU
e = 1.0000420

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	15 54.41	-19 25.9	1.622	1.212	-1.11	+3.3	8.9	48.2
Jan. 19	15 43.33	-18 52.5	1.340	1.219	-2.01	+6.8	8.5	61.0
Jan. 29	15 23.24	-17 44.4	1.035	1.245	-4.12	+16.7	8.0	76.1
Feb. 8	14 42.04	-14 57.5	0.727	1.290	-9.67	+51.1	7.4	96.5
Feb. 18	13 05.34	-06 26.0	0.472	1.350	-17.84	107.0	6.7	131.8
Feb. 28	10 06.94	+11 23.7	0.436	1.423	-12.52	+51.0	6.7	170.3
Mar. 10	08 01.78	+19 53.5	0.668	1.506	-5.16	+11.1	7.9	129.0
Mar. 20	07 10.13	+21 45.0	0.992	1.597	-2.21	+2.9	9.0	106.9
Mar. 30	06 48.08	+22 13.6	1.337	1.694	-0.96	+0.9	9.9	91.8
Apr. 9	06 38.47	+22 22.2	1.680	1.796	-0.35	+0.2	10.7	79.7
Apr. 19	06 35.00	+22 24.3	2.010	1.901	0.00	-0.1	11.3	69.1
Apr. 29	06 34.98	+22 23.4	2.324	2.008	+0.21	-0.3	11.9	59.4
May 9	06 37.03	+22 20.7	2.616	2.117	+0.33	-0.4	12.3	50.2
May 19	06 40.37	+22 16.6	2.884	2.226	+0.42	-0.5	12.8	41.3
May 29	06 44.54	+22 11.2	3.125	2.337	+0.46	-0.7	13.2	32.7
June 8	06 49.18	+22 04.6	3.337	2.447	+0.49	-0.8	13.5	24.2
June 18	06 54.05	+21 57.1	3.520	2.557	+0.49	-0.8	13.8	15.8
June 28	06 58.95	+21 48.6	3.672	2.668	+0.48	-0.9	14.1	7.4
July 8	07 03.71	+21 39.6	3.794	2.777	+0.45	-0.9	14.3	1.4
July 18	07 08.16	+21 30.3	3.884	2.887	+0.40	-0.9	14.6	9.6
July 28	07 12.16	+21 20.9	3.943	2.995	+0.34	-0.9	14.7	18.2
Aug. 7	07 15.52	+21 12.1	3.973	3.104	+0.26	-0.8	14.9	27.0
Aug. 17	07 18.08	+21 04.0	3.975	3.211	+0.16	-0.7	15.1	35.9
Aug. 27	07 19.63	+20 57.3	3.951	3.318	+0.03	-0.5	15.2	45.2
Sept. 6	07 19.97	+20 52.5	3.905	3.424	-0.11	-0.2	15.3	54.8
Sept.16	07 18.85	+20 50.0	3.839	3.529	-0.28	0.0	15.4	64.8
Sept.26	07 16.01	+20 50.3	3.758	3.634	-0.48	+0.3	15.5	75.2
Oct. 6	07 11.19	+20 53.4	3.669	3.738	-0.70	+0.6	15.5	86.1
Oct. 16	07 04.17	+20 59.2	3.578	3.841	-0.94	+0.8	15.6	97.7
Oct. 26	06 54.75	+21 06.9	3.494	3.943	-1.18	+0.8	15.7	109.8
Nov. 5	06 42.92	+21 15.4	3.424	4.045	-1.41	+0.7	15.7	122.6
Nov. 15	06 28.85	+21 22.8	3.378	4.145	-1.59	+0.4	15.8	135.9
Nov. 25	06 12.99	+21 27.0	3.364	4.246	-1.69	-0.1	15.9	149.6
Dec. 5	05 56.09	+21 26.5	3.391	4.345	-1.70	-0.6	16.0	163.6
Dec. 15	05 39.07	+21 20.7	3.460	4.444	-1.62	-1.1	16.2	177.1
Dec. 25	05 22.89	+21 10.1	3.575	4.542	-1.46	-1.3	16.3	168.0
Jan. 4	05 08.33	+20 56.7	3.732	4.639	-1.24	-1.4	16.5	154.5
Jan. 14	04 55.92	+20 42.4	3.927	4.736	-1.00	-1.3	16.7	141.4
Jan. 24	04 45.89	+20 29.4	4.153	4.832	-0.76	-1.0	16.9	128.9
Feb. 3	04 38.27	+20 19.0	4.402	4.928	-0.54	-0.7	17.1	117.0
Feb. 13	04 32.88	+20 11.9	4.666	5.022	-0.34	-0.4	17.4	105.6
Feb. 23	04 29.50	+20 08.4	4.940	5.117	-0.16	0.0	17.6	94.7
Mar. 5	04 27.86	+20 08.1	5.215	5.210	-0.02	+0.3	17.8	84.3
Mar. 15	04 27.68	+20 10.7	5.486	5.303	+0.10	+0.5	17.9	74.3
Mar. 25	04 28.72	+20 15.6	5.748	5.396	+0.20	+0.7	18.1	64.6

Comet P/2008 Y3 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 11.72089 TT
Peri. = 238.25494 e = 0.4474114
Node = 262.92676 2000.0 a = 8.0243993 AU
Incl. = 38.81203 n = 0.04335960
q = 4.4341916 AU P = 22.73 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	08 47.80	-22 57.8	3.735	4.434	-0.58	-5.3	18.0	130.2
Jan. 19	08 42.00	-23 50.9	3.685	4.434	-0.63	-3.4	17.9	134.8
Jan. 29	08 35.69	-24 24.6	3.659	4.435	-0.63	-1.4	17.9	137.5
Feb. 8	08 29.38	-24 38.4	3.655	4.437	-0.58	+0.5	17.9	137.9
Feb. 18	08 23.58	-24 33.8	3.675	4.439	-0.48	+2.1	17.9	136.0
Feb. 28	08 18.74	-24 13.3	3.716	4.442	-0.35	+3.3	18.0	132.1
Mar. 10	08 15.23	-23 40.6	3.778	4.445	-0.20	+4.1	18.0	126.9
Mar. 20	08 13.26	-22 59.9	3.857	4.449	-0.03	+4.5	18.1	120.8
Mar. 30	08 12.92	-22 15.1	3.951	4.454	+0.13	+4.5	18.1	114.2
Apr. 9	08 14.22	-21 30.2	4.055	4.460	+0.28	+4.2	18.2	107.5
Apr. 19	08 17.06	-20 48.0	4.169	4.466	+0.43	+3.7	18.2	100.7
Apr. 29	08 21.34	-20 10.9	4.288	4.473	+0.56	+3.0	18.3	94.0
May 9	08 26.89	-19 40.7	4.409	4.480	+0.67	+2.2	18.4	87.5
May 19	08 33.56	-19 18.6	4.531	4.488	+0.76	+1.3	18.5	81.1
May 29	08 41.19	-19 05.2	4.651	4.497	+0.85	+0.4	18.5	75.0
June 8	08 49.65	-19 01.1	4.768	4.506	+0.91	-0.5	18.6	69.1
June 18	08 58.79	-19 06.2	4.879	4.516	+0.97	-1.4	18.7	63.4
June 28	09 08.50	-19 20.6	4.983	4.527	+1.02	-2.3	18.7	58.0
July 8	09 18.67	-19 44.0	5.080	4.538	+1.05	-3.2	18.8	52.8
July 18	09 29.19	-20 16.1	5.167	4.550	+1.08	-4.0	18.8	48.0
July 28	09 39.99	-20 56.5	5.244	4.562	+1.10	-4.8	18.9	43.6
Aug. 7	09 50.98	-21 44.8	5.310	4.575	+1.11	-5.6	18.9	39.7
Aug. 17	10 02.09	-22 40.4	5.364	4.588	+1.12	-6.2	19.0	36.4
Aug. 27	10 13.25	-23 42.8	5.406	4.602	+1.11	-6.9	19.0	33.9
Sept. 6	10 24.40	-24 51.5	5.435	4.617	+1.11	-7.4	19.0	32.5
Sept.16	10 35.47	-26 05.9	5.452	4.632	+1.09	-8.0	19.1	32.2
Sept.26	10 46.40	-27 25.4	5.455	4.648	+1.07	-8.4	19.1	33.1
Oct. 6	10 57.10	-28 49.5	5.445	4.664	+1.04	-8.8	19.1	35.2
Oct. 16	11 07.52	-30 17.5	5.422	4.681	+1.00	-9.1	19.1	38.4
Oct. 26	11 17.57	-31 48.7	5.385	4.698	+0.96	-9.4	19.1	42.3
Nov. 5	11 27.14	-33 22.4	5.337	4.716	+0.90	-9.6	19.1	46.9
Nov. 15	11 36.15	-34 57.9	5.276	4.734	+0.83	-9.6	19.1	52.1
Nov. 25	11 44.45	-36 34.4	5.205	4.752	+0.75	-9.6	19.1	57.8
Dec. 5	11 51.91	-38 10.8	5.125	4.772	+0.65	-9.5	19.1	63.7
Dec. 15	11 58.40	-39 46.1	5.037	4.791	+0.53	-9.3	19.1	70.0
Dec. 25	12 03.73	-41 18.9	4.943	4.811	+0.40	-8.9	19.1	76.6
Jan. 4	12 07.76	-42 47.6	4.845	4.832	+0.26	-8.3	19.1	83.4
Jan. 14	12 10.31	-44 10.4	4.747	4.852	+0.10	-7.5	19.1	90.3
Jan. 24	12 11.27	-45 25.0	4.649	4.874	-0.07	-6.4	19.1	97.3
Feb. 3	12 10.56	-46 29.1	4.557	4.895	-0.23	-5.1	19.0	104.4
Feb. 13	12 08.23	-47 19.9	4.472	4.917	-0.38	-3.5	19.0	111.3
Feb. 23	12 04.42	-47 54.9	4.398	4.940	-0.50	-1.7	19.0	118.0
Mar. 5	11 59.44	-48 11.9	4.338	4.963	-0.57	+0.2	19.0	124.1
Mar. 15	11 53.72	-48 09.5	4.295	4.986	-0.59	+2.2	19.0	129.4
Mar. 25	11 47.79	-47 47.6	4.271	5.009	-0.56	+4.0	19.0	133.5

Comet C/2008 G1 (Gibbs)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 12.16611 TT
Peri. = 63.73651
Node = 215.91996 2000.0
Incl. = 72.85697
q = 3.9896890 AU
e = 0.9891458

m1 = 9.5 + 5 log(Delta) + 10.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	17 29.69	+26 32.1	4.461	3.990	+1.44	+10.7	18.8	55.6
Jan. 19	17 44.09	+28 19.2	4.402	3.990	+1.43	+12.0	18.7	59.3
Jan. 29	17 58.43	+30 19.4	4.343	3.992	+1.42	+13.3	18.7	62.9
Feb. 8	18 12.60	+32 32.0	4.287	3.996	+1.39	+14.4	18.7	66.4
Feb. 18	18 26.47	+34 55.7	4.235	4.002	+1.34	+15.3	18.7	69.7
Feb. 28	18 39.91	+37 29.0	4.190	4.010	+1.29	+16.1	18.6	72.8
Mar. 10	18 52.76	+40 09.8	4.150	4.019	+1.21	+16.6	18.6	75.5
Mar. 20	19 04.88	+42 55.7	4.119	4.030	+1.12	+16.9	18.6	78.0
Mar. 30	19 16.07	+45 44.5	4.094	4.043	+1.01	+16.9	18.6	80.1
Apr. 9	19 26.14	+48 33.2	4.077	4.058	+0.87	+16.6	18.6	81.8
Apr. 19	19 34.88	+51 19.3	4.067	4.075	+0.72	+16.1	18.6	83.3
Apr. 29	19 42.05	+53 60.0	4.063	4.093	+0.53	+15.2	18.7	84.6
May 9	19 47.37	+56 32.3	4.064	4.113	+0.33	+14.1	18.7	85.6
May 19	19 50.63	+58 53.6	4.069	4.134	+0.09	+12.7	18.7	86.6
May 29	19 51.58	+61 01.0	4.077	4.157	-0.15	+11.1	18.7	87.4
June 8	19 50.09	+62 51.6	4.087	4.182	-0.39	+9.1	18.8	88.3
June 18	19 46.22	+64 22.7	4.098	4.208	-0.60	+6.9	18.8	89.2
June 28	19 40.22	+65 31.7	4.110	4.235	-0.75	+4.5	18.8	90.1
July 8	19 32.70	+66 16.5	4.122	4.264	-0.82	+2.0	18.9	91.1
July 18	19 24.52	+66 36.4	4.134	4.295	-0.78	-0.5	18.9	92.2
July 28	19 16.70	+66 31.3	4.146	4.327	-0.65	-2.9	18.9	93.4
Aug. 7	19 10.23	+66 02.8	4.160	4.360	-0.44	-5.0	19.0	94.6
Aug. 17	19 05.87	+65 13.2	4.175	4.394	-0.18	-6.8	19.0	95.8
Aug. 27	19 04.07	+64 05.6	4.193	4.430	+0.09	-8.2	19.1	96.9
Sept. 6	19 05.00	+62 43.6	4.215	4.466	+0.35	-9.3	19.1	97.9
Sept.16	19 08.54	+61 10.3	4.243	4.504	+0.59	-10.1	19.2	98.6
Sept.26	19 14.49	+59 29.0	4.277	4.543	+0.81	-10.6	19.2	99.0
Oct. 6	19 22.54	+57 42.9	4.319	4.584	+0.98	-10.8	19.3	99.0
Oct. 16	19 32.36	+55 54.8	4.371	4.625	+1.13	-10.8	19.4	98.5
Oct. 26	19 43.65	+54 07.3	4.433	4.667	+1.25	-10.4	19.4	97.4
Nov. 5	19 56.11	+52 23.0	4.506	4.710	+1.34	-9.9	19.5	95.7
Nov. 15	20 09.47	+50 43.9	4.590	4.754	+1.40	-9.2	19.6	93.5
Nov. 25	20 23.49	+49 12.0	4.685	4.799	+1.45	-8.3	19.7	90.7
Dec. 5	20 37.98	+47 49.0	4.790	4.845	+1.48	-7.3	19.8	87.3
Dec. 15	20 52.75	+46 35.7	4.903	4.891	+1.49	-6.2	19.8	83.6
Dec. 25	21 07.67	+45 33.3	5.023	4.939	+1.49	-5.1	19.9	79.5
Jan. 4	21 22.60	+44 41.9	5.148	4.987	+1.48	-4.0	20.0	75.1
Jan. 14	21 37.43	+44 01.7	5.276	5.035	+1.47	-2.9	20.1	70.6
Jan. 24	21 52.09	+43 32.5	5.405	5.085	+1.44	-1.9	20.2	66.0
Feb. 3	22 06.49	+43 13.7	5.532	5.135	+1.41	-0.9	20.3	61.5
Feb. 13	22 20.57	+43 04.6	5.654	5.186	+1.37	0.0	20.4	57.2
Feb. 23	22 34.29	+43 04.7	5.770	5.237	+1.33	+0.8	20.5	53.1
Mar. 5	22 47.57	+43 12.9	5.878	5.289	+1.28	+1.5	20.6	49.6
Mar. 15	23 00.39	+43 28.3	5.975	5.341	+1.23	+2.2	20.7	46.6
Mar. 25	23 12.70	+43 50.2	6.061	5.394	+1.17	+2.7	20.7	44.4

Comet 195P/Hill

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 20.84829 TT
Peri. = 249.59858 e = 0.3147671
Node = 243.23821 2000.0 a = 6.4773104 AU
Incl. = 36.36082 n = 0.05978772
q = 4.4384662 AU P = 16.49 years

m1 = 5.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	08 15.31	-22 42.5	3.707	4.439	-0.59	-3.0	17.6	133.3
Jan. 19	08 09.42	-23 12.3	3.674	4.438	-0.60	-1.0	17.5	136.4
Jan. 29	08 03.39	-23 22.1	3.664	4.439	-0.57	+0.9	17.5	137.4
Feb. 8	07 57.73	-23 12.7	3.677	4.439	-0.48	+2.6	17.5	136.0
Feb. 18	07 52.90	-22 46.3	3.711	4.440	-0.36	+4.0	17.6	132.6
Feb. 28	07 49.27	-22 06.4	3.767	4.442	-0.22	+4.9	17.6	127.7
Mar. 10	07 47.10	-21 17.0	3.840	4.444	-0.06	+5.5	17.6	121.8
Mar. 20	07 46.53	-20 22.2	3.929	4.446	+0.10	+5.6	17.7	115.3
Mar. 30	07 47.56	-19 25.9	4.030	4.449	+0.26	+5.5	17.8	108.5
Apr. 9	07 50.15	-18 31.3	4.141	4.453	+0.40	+5.0	17.8	101.7
Apr. 19	07 54.18	-17 41.1	4.257	4.457	+0.53	+4.4	17.9	94.9
Apr. 29	07 59.52	-16 57.1	4.378	4.461	+0.65	+3.6	17.9	88.2
May 9	08 06.00	-16 20.8	4.499	4.466	+0.75	+2.8	18.0	81.7
May 19	08 13.48	-15 53.0	4.618	4.471	+0.83	+1.9	18.1	75.4
May 29	08 21.80	-15 34.3	4.735	4.477	+0.90	+0.9	18.1	69.2
June 8	08 30.84	-15 25.0	4.846	4.483	+0.96	0.0	18.2	63.3
June 18	08 40.45	-15 24.9	4.950	4.490	+1.01	-0.9	18.3	57.7
June 28	08 50.54	-15 34.0	5.046	4.497	+1.05	-1.8	18.3	52.3
July 8	09 00.99	-15 52.1	5.133	4.504	+1.07	-2.7	18.4	47.2
July 18	09 11.72	-16 18.6	5.209	4.512	+1.09	-3.5	18.4	42.5
July 28	09 22.64	-16 53.4	5.274	4.521	+1.10	-4.2	18.4	38.2
Aug. 7	09 33.66	-17 35.7	5.327	4.529	+1.11	-4.9	18.5	34.7
Aug. 17	09 44.73	-18 25.2	5.366	4.539	+1.10	-5.6	18.5	31.9
Aug. 27	09 55.78	-19 21.4	5.393	4.548	+1.09	-6.2	18.5	30.2
Sept. 6	10 06.72	-20 23.5	5.405	4.558	+1.08	-6.8	18.5	29.8
Sept.16	10 17.51	-21 31.2	5.404	4.569	+1.06	-7.3	18.6	30.7
Sept.26	10 28.06	-22 43.7	5.388	4.579	+1.02	-7.7	18.6	33.0
Oct. 6	10 38.31	-24 00.4	5.358	4.590	+0.99	-8.0	18.6	36.3
Oct. 16	10 48.18	-25 20.6	5.315	4.602	+0.94	-8.3	18.6	40.5
Oct. 26	10 57.57	-26 43.7	5.258	4.614	+0.88	-8.5	18.6	45.4
Nov. 5	11 06.39	-28 08.8	5.188	4.626	+0.81	-8.6	18.6	50.8
Nov. 15	11 14.52	-29 35.1	5.107	4.639	+0.73	-8.6	18.5	56.7
Nov. 25	11 21.85	-31 01.6	5.016	4.652	+0.64	-8.5	18.5	63.0
Dec. 5	11 28.24	-32 27.1	4.916	4.665	+0.53	-8.3	18.5	69.6
Dec. 15	11 33.55	-33 50.3	4.810	4.679	+0.41	-7.9	18.5	76.5
Dec. 25	11 37.62	-35 09.7	4.699	4.693	+0.27	-7.4	18.4	83.7
Jan. 4	11 40.33	-36 23.2	4.586	4.707	+0.12	-6.6	18.4	91.0
Jan. 14	11 41.56	-37 28.8	4.475	4.722	-0.03	-5.5	18.4	98.5
Jan. 24	11 41.25	-38 24.0	4.369	4.737	-0.18	-4.2	18.3	106.1
Feb. 3	11 39.44	-39 06.2	4.271	4.753	-0.32	-2.7	18.3	113.6
Feb. 13	11 36.23	-39 32.9	4.184	4.768	-0.43	-0.9	18.3	121.0
Feb. 23	11 31.89	-39 41.9	4.113	4.784	-0.51	+1.0	18.3	127.9
Mar. 5	11 26.79	-39 31.7	4.059	4.800	-0.54	+2.9	18.3	133.9
Mar. 15	11 21.39	-39 02.4	4.027	4.817	-0.52	+4.7	18.3	138.4
Mar. 25	11 16.19	-38 15.2	4.018	4.833	-0.45	+6.2	18.3	141.0

Comet 68P/Klemola

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 20.95810 TT
Peri. = 153.97642 e = 0.6404463
Node = 175.32853 2000.0 a = 4.8923868 AU
Incl. = 11.14485 n = 0.09107997
q = 1.7590758 AU P = 10.82 years

m1 = 9.0 + 5 log(Delta) + 15.0 log(r)

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	20 49.49	-13 36.9	2.630	1.763	+2.83	+8.3	14.8	22.6
Jan. 19	21 17.81	-12 14.0	2.656	1.759	+2.81	+9.7	14.8	19.4
Jan. 29	21 45.90	-10 37.2	2.685	1.761	+2.77	+10.8	14.8	16.2
Feb. 8	22 13.59	-08 49.1	2.716	1.769	+2.72	+11.6	14.9	13.1
Feb. 18	22 40.79	-06 52.7	2.748	1.783	+2.66	+12.2	15.0	9.9
Feb. 28	23 07.42	-04 50.8	2.783	1.803	+2.60	+12.4	15.1	6.7
Mar. 10	23 33.44	-02 46.5	2.818	1.828	+2.54	+12.4	15.2	3.4
Mar. 20	23 58.83	-00 42.4	2.854	1.858	+2.48	+12.1	15.3	0.5
Mar. 30	00 23.59	+01 18.9	2.889	1.893	+2.41	+11.6	15.5	3.6
Apr. 9	00 47.71	+03 15.2	2.922	1.932	+2.35	+11.0	15.6	7.1
Apr. 19	01 11.19	+05 04.7	2.953	1.975	+2.29	+10.1	15.8	10.8
Apr. 29	01 34.05	+06 46.0	2.980	2.022	+2.22	+9.2	16.0	14.7
May 9	01 56.24	+08 17.8	3.002	2.072	+2.15	+8.1	16.1	18.7
May 19	02 17.75	+09 39.2	3.019	2.124	+2.08	+7.0	16.3	22.9
May 29	02 38.56	+10 49.6	3.030	2.179	+2.00	+5.9	16.5	27.3
June 8	02 58.59	+11 48.7	3.033	2.236	+1.92	+4.8	16.7	31.9
June 18	03 17.80	+12 36.4	3.027	2.295	+1.83	+3.6	16.8	36.7
June 28	03 36.11	+13 12.6	3.014	2.355	+1.73	+2.5	17.0	41.8
July 8	03 53.41	+13 37.7	2.991	2.416	+1.62	+1.4	17.1	47.1
July 18	04 09.61	+13 51.9	2.959	2.478	+1.50	+0.4	17.3	52.7
July 28	04 24.59	+13 55.8	2.919	2.542	+1.36	-0.6	17.4	58.6
Aug. 7	04 38.21	+13 50.1	2.870	2.605	+1.21	-1.5	17.5	64.8
Aug. 17	04 50.31	+13 35.4	2.813	2.669	+1.04	-2.3	17.6	71.5
Aug. 27	05 00.73	+13 12.5	2.749	2.734	+0.86	-3.0	17.7	78.5
Sept. 6	05 09.28	+12 42.4	2.681	2.799	+0.65	-3.6	17.8	86.0
Sept.16	05 15.79	+12 06.2	2.611	2.863	+0.43	-4.1	17.9	94.1
Sept.26	05 20.06	+11 25.1	2.541	2.928	+0.19	-4.4	18.0	102.6
Oct. 6	05 21.94	+10 40.8	2.475	2.993	-0.06	-4.6	18.1	111.8
Oct. 16	05 21.38	+09 54.9	2.417	3.058	-0.30	-4.5	18.2	121.4
Oct. 26	05 18.41	+09 09.7	2.372	3.122	-0.52	-4.2	18.3	131.6
Nov. 5	05 13.25	+08 27.5	2.346	3.186	-0.69	-3.6	18.4	142.0
Nov. 15	05 06.33	+07 51.1	2.342	3.250	-0.81	-2.8	18.5	152.3
Nov. 25	04 58.27	+07 22.9	2.365	3.314	-0.84	-1.8	18.7	161.1
Dec. 5	04 49.85	+07 04.8	2.417	3.377	-0.80	-0.7	18.8	164.7
Dec. 15	04 41.83	+06 57.9	2.499	3.440	-0.69	+0.4	19.0	160.1
Dec. 25	04 34.91	+07 02.1	2.609	3.503	-0.53	+1.4	19.2	151.2
Jan. 4	04 29.57	+07 16.6	2.746	3.565	-0.35	+2.3	19.5	141.1
Jan. 14	04 26.09	+07 39.7	2.905	3.627	-0.15	+3.0	19.7	130.9
Jan. 24	04 24.56	+08 09.6	3.083	3.688	+0.04	+3.5	19.9	121.0
Feb. 3	04 24.93	+08 44.2	3.275	3.749	+0.21	+3.8	20.2	111.4
Feb. 13	04 27.05	+09 21.9	3.476	3.809	+0.37	+3.9	20.4	102.2
Feb. 23	04 30.75	+10 00.8	3.683	3.869	+0.51	+3.9	20.6	93.4
Mar. 5	04 35.81	+10 39.8	3.891	3.928	+0.62	+3.8	20.9	84.9
Mar. 15	04 42.04	+11 17.6	4.098	3.987	+0.72	+3.6	21.1	76.6
Mar. 25	04 49.25	+11 53.3	4.299	4.045	+0.80	+3.3	21.3	68.7

Comet P/2008 Y2 (Gibbs)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 22.38437 TT
Peri. = 162.32866 e = 0.5435008
Node = 330.89347 2000.0 a = 3.5889322 AU
Incl. = 7.27530 n = 0.14496267
q = 1.6383447 AU P = 6.80 years

m1 = 15.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	10 09.62	+18 34.5	0.761	1.644	+0.24	-8.6	17.8	140.5
Jan. 19	10 12.06	+17 08.5	0.713	1.639	-0.15	-8.4	17.7	149.6
Jan. 29	10 10.58	+15 44.3	0.680	1.640	-0.45	-8.3	17.6	159.7
Feb. 8	10 06.12	+14 20.8	0.666	1.647	-0.58	-8.3	17.6	170.4
Feb. 18	10 00.29	+12 57.6	0.671	1.659	-0.53	-8.2	17.6	178.2
Feb. 28	09 54.94	+11 35.4	0.697	1.678	-0.32	-8.1	17.8	167.4
Mar. 10	09 51.74	+10 14.4	0.742	1.701	-0.01	-8.0	18.0	157.0
Mar. 20	09 51.62	+08 54.8	0.806	1.730	+0.32	-7.9	18.3	147.4
Mar. 30	09 54.79	+07 36.1	0.885	1.763	+0.63	-7.9	18.6	138.7
Apr. 9	10 01.04	+06 17.1	0.979	1.801	+0.88	-8.0	19.0	130.7
Apr. 19	10 09.88	+04 56.6	1.086	1.842	+1.09	-8.3	19.4	123.5
Apr. 29	10 20.77	+03 33.8	1.204	1.886	+1.25	-8.6	19.7	116.8
May 9	10 33.25	+02 07.9	1.331	1.933	+1.36	-8.9	20.1	110.6
May 19	10 46.89	+00 39.1	1.467	1.983	+1.45	-9.2	20.5	104.8
May 29	11 01.38	-00 52.6	1.610	2.035	+1.51	-9.4	20.9	99.1
June 8	11 16.49	-02 27.0	1.760	2.088	+1.55	-9.6	21.2	93.7
June 18	11 32.03	-04 03.2	1.915	2.143	+1.58	-9.8	21.6	88.4
June 28	11 47.87	-05 40.7	2.074	2.199	+1.61	-9.8	21.9	83.2
July 8	12 03.94	-07 19.0	2.235	2.256	+1.62	-9.8	22.2	78.0
July 18	12 20.15	-08 57.3	2.398	2.313	+1.63	-9.8	22.6	72.9
July 28	12 36.48	-10 35.0	2.562	2.371	+1.64	-9.6	22.9	67.7
Aug. 7	12 52.91	-12 11.4	2.724	2.430	+1.65	-9.4	23.2	62.6
Aug. 17	13 09.41	-13 45.9	2.885	2.489	+1.66	-9.2	23.4	57.3
Aug. 27	13 25.98	-15 18.0	3.041	2.547	+1.66	-8.9	23.7	52.1
Sept. 6	13 42.60	-16 47.1	3.192	2.606	+1.67	-8.6	24.0	46.7
Sept.16	13 59.27	-18 12.6	3.337	2.665	+1.67	-8.2	24.2	41.3
Sept.26	14 15.99	-19 34.2	3.473	2.723	+1.67	-7.7	24.4	35.8
Oct. 6	14 32.72	-20 51.4	3.600	2.781	+1.67	-7.2	24.6	30.2
Oct. 16	14 49.46	-22 03.7	3.716	2.839	+1.67	-6.7	24.8	24.5
Oct. 26	15 06.16	-23 11.0	3.820	2.897	+1.66	-6.2	25.0	18.8
Nov. 5	15 22.78	-24 12.8	3.910	2.953	+1.65	-5.6	.	13.1
Nov. 15	15 39.29	-25 09.0	3.986	3.010	+1.63	-5.1	.	8.0
Nov. 25	15 55.61	-25 59.5	4.047	3.066	+1.61	-4.5	.	5.5
Dec. 5	16 11.68	-26 44.3	4.091	3.121	+1.57	-3.9	.	8.9
Dec. 15	16 27.41	-27 23.5	4.119	3.176	+1.53	-3.4	.	14.6
Dec. 25	16 42.71	-27 57.4	4.129	3.230	+1.48	-2.9	.	21.0
Jan. 4	16 57.47	-28 26.2	4.122	3.284	+1.41	-2.4	.	27.7
Jan. 14	17 11.59	-28 50.4	4.099	3.337	+1.34	-2.0	.	34.6
Jan. 24	17 24.95	-29 10.8	4.059	3.389	+1.24	-1.7	.	41.8
Feb. 3	17 37.39	-29 27.8	4.004	3.441	+1.14	-1.5	.	49.1
Feb. 13	17 48.80	-29 42.4	3.935	3.492	+1.02	-1.3	.	56.7
Feb. 23	17 59.01	-29 55.3	3.853	3.542	+0.88	-1.2	.	64.5
Mar. 5	18 07.86	-30 07.5	3.762	3.592	+0.73	-1.2	.	72.6
Mar. 15	18 15.19	-30 19.6	3.663	3.641	+0.56	-1.3	.	80.9
Mar. 25	18 20.80	-30 32.5	3.559	3.689	+0.37	-1.4	.	89.6

Comet P/2008 WZ96 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 23.95893 TT
Peri. = 337.64707 e = 0.5091803
Node = 59.11440 2000.0 a = 3.3536452 AU
Incl. = 6.95714 n = 0.16048277
q = 1.6460351 AU P = 6.14 years

m1 = 13.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	23 47.79	-04 56.4	1.776	1.652	+2.33	+19.6	17.7	66.5
Jan. 19	00 11.09	-01 40.8	1.841	1.647	+2.40	+19.7	17.8	63.0
Jan. 29	00 35.08	+01 36.7	1.909	1.647	+2.46	+19.6	17.9	59.6
Feb. 8	00 59.70	+04 52.7	1.979	1.652	+2.52	+19.1	18.0	56.4
Feb. 18	01 24.88	+08 03.9	2.053	1.663	+2.57	+18.3	18.1	53.3
Feb. 28	01 50.60	+11 07.0	2.131	1.680	+2.62	+17.2	18.2	50.2
Mar. 10	02 16.82	+13 59.0	2.212	1.701	+2.66	+15.8	18.4	47.2
Mar. 20	02 43.46	+16 37.0	2.296	1.727	+2.70	+14.2	18.6	44.2
Mar. 30	03 10.47	+18 58.9	2.382	1.757	+2.73	+12.4	18.8	41.1
Apr. 9	03 37.74	+21 02.8	2.472	1.792	+2.74	+10.5	19.0	38.0
Apr. 19	04 05.15	+22 47.5	2.562	1.829	+2.74	+8.5	19.2	34.8
Apr. 29	04 32.57	+24 12.4	2.653	1.870	+2.73	+6.5	19.4	31.5
May 9	04 59.83	+25 17.3	2.744	1.914	+2.69	+4.6	19.6	28.1
May 19	05 26.77	+26 02.9	2.834	1.961	+2.65	+2.7	19.8	24.7
May 29	05 53.25	+26 29.8	2.921	2.009	+2.58	+1.0	20.1	21.1
June 8	06 19.10	+26 39.3	3.005	2.059	+2.51	-0.6	20.3	17.4
June 18	06 44.20	+26 33.1	3.084	2.110	+2.43	-2.0	20.5	13.6
June 28	07 08.49	+26 12.7	3.158	2.163	+2.34	-3.3	20.7	9.7
July 8	07 31.86	+25 40.0	3.225	2.217	+2.24	-4.3	20.9	6.1
July 18	07 54.29	+24 56.9	3.283	2.271	+2.15	-5.2	21.1	4.0
July 28	08 15.75	+24 05.2	3.333	2.326	+2.05	-5.9	21.3	5.9
Aug. 7	08 36.22	+23 06.6	3.373	2.381	+1.95	-6.4	21.5	10.0
Aug. 17	08 55.73	+22 02.8	3.403	2.436	+1.85	-6.7	21.7	14.6
Aug. 27	09 14.27	+20 55.5	3.420	2.492	+1.76	-6.9	21.8	19.6
Sept. 6	09 31.84	+19 46.3	3.426	2.548	+1.66	-7.0	22.0	24.9
Sept. 16	09 48.46	+18 36.5	3.419	2.603	+1.57	-6.9	22.1	30.5
Sept. 26	10 04.11	+17 27.7	3.399	2.658	+1.47	-6.6	22.2	36.3
Oct. 6	10 18.77	+16 21.3	3.366	2.713	+1.36	-6.3	22.3	42.4
Oct. 16	10 32.41	+15 18.7	3.321	2.768	+1.26	-5.7	22.4	48.8
Oct. 26	10 44.96	+14 21.3	3.263	2.822	+1.14	-5.1	22.5	55.5
Nov. 5	10 56.35	+13 30.6	3.194	2.876	+1.01	-4.3	22.6	62.6
Nov. 15	11 06.46	+12 47.9	3.115	2.929	+0.87	-3.3	22.7	70.0
Nov. 25	11 15.17	+12 14.9	3.028	2.982	+0.71	-2.2	22.7	77.9
Dec. 5	11 22.30	+11 52.9	2.935	3.034	+0.54	-1.0	22.8	86.2
Dec. 15	11 27.68	+11 43.2	2.840	3.086	+0.34	+0.4	22.8	95.0
Dec. 25	11 31.13	+11 46.7	2.745	3.137	+0.13	+1.7	22.8	104.3
Jan. 4	11 32.46	+12 03.9	2.655	3.187	-0.09	+3.1	22.9	114.2
Jan. 14	11 31.58	+12 34.5	2.575	3.237	-0.31	+4.2	22.9	124.6
Jan. 24	11 28.44	+13 16.7	2.511	3.286	-0.52	+5.1	22.9	135.5
Feb. 3	11 23.22	+14 07.6	2.466	3.334	-0.70	+5.5	23.0	146.7
Feb. 13	11 16.27	+15 02.8	2.447	3.382	-0.81	+5.4	23.1	157.9
Feb. 23	11 08.15	+15 57.0	2.456	3.429	-0.86	+4.8	23.2	167.7
Mar. 5	10 59.59	+16 44.9	2.496	3.476	-0.82	+3.8	23.3	169.5
Mar. 15	10 51.36	+17 22.4	2.566	3.521	-0.72	+2.4	23.4	161.0
Mar. 25	10 44.15	+17 46.9	2.665	3.566	-0.57	+1.1	23.6	150.4

Comet P/2002 JN16 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 25.05504 TT
Peri. = 39.69653 e = 0.4875053
Node = 230.00985 2000.0 a = 3.4799394 AU
Incl. = 11.41825 n = 0.15182614
q = 1.7834505 AU P = 6.49 years

m1 = 13.4 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	18 03.66	-19 29.3	2.696	1.789	-1.39	-3.2	19.3	41.0/ 84	18.3
Jan. 19	18 32.39	-18 40.8	2.661	1.784	-1.38	-4.0	19.3	40.9/ 82	21.7
Jan. 29	19 00.71	-17 32.9	2.626	1.784	-1.36	-4.7	19.3	40.6/ 79	25.1
Feb. 8	19 28.38	-16 07.0	2.592	1.788	-1.33	-5.3	19.3	40.2/ 76	28.5
Feb. 18	19 55.24	-14 25.0	2.558	1.796	-1.30	-5.8	19.3	39.5/ 74	31.9
Feb. 28	20 21.14	-12 29.5	2.524	1.809	-1.26	-6.1	19.3	38.6/ 72	35.4
Mar. 10	20 45.98	-10 23.0	2.489	1.826	-1.22	-6.3	19.3	37.6/ 70	38.9
Mar. 20	21 09.70	-08 08.4	2.453	1.847	-1.19	-6.3	19.3	36.4/ 68	42.6
Mar. 30	21 32.26	-05 48.3	2.416	1.872	-1.15	-6.2	19.4	35.0/ 66	46.4
Apr. 9	21 53.62	-03 25.3	2.376	1.901	-1.12	-6.1	19.5	33.4/ 65	50.4
Apr. 19	22 13.76	-01 01.9	2.334	1.932	-1.09	-5.8	19.5	31.7/ 63	54.5
Apr. 29	22 32.66	+01 19.9	2.288	1.967	-1.07	-5.5	19.6	29.8/ 62	58.9
May 9	22 50.25	+03 37.9	2.239	2.004	-1.05	-5.1	19.7	27.7/ 61	63.5
May 19	23 06.49	+05 50.5	2.186	2.044	-1.04	-4.7	19.8	25.3/ 60	68.4
May 29	23 21.26	+07 56.0	2.129	2.086	-1.04	-4.3	19.8	22.8/ 59	73.7
June 8	23 34.44	+09 52.6	2.069	2.129	-1.05	-3.9	19.9	19.9/ 57	79.3
June 18	23 45.88	+11 39.0	2.005	2.175	-1.06	-3.5	20.0	16.8/ 56	85.4
June 28	23 55.36	+13 13.2	1.940	2.221	-1.09	-3.2	20.0	13.3/ 53	92.0
July 8	00 02.66	+14 33.3	1.874	2.269	-1.13	-3.0	20.1	9.5/ 48	99.1
July 18	00 07.54	+15 37.1	1.809	2.318	-1.18	-2.9	20.2	5.5/ 36	106.8
July 28	00 09.80	+16 21.7	1.749	2.367	-1.24	-2.9	20.2	2.4/344	115.2
Aug. 7	00 09.34	+16 44.4	1.696	2.417	-1.31	-3.1	20.3	4.5/268	124.3
Aug. 17	00 06.24	+16 42.6	1.655	2.468	-1.37	-3.5	20.4	8.3/251	134.0
Aug. 27	00 00.81	+16 14.8	1.630	2.519	-1.43	-4.0	20.5	11.5/243	144.1
Sept. 6	23 53.71	+15 21.8	1.625	2.570	-1.46	-4.5	20.6	13.7/237	154.2
Sept. 16	23 45.81	+14 07.5	1.644	2.622	-1.46	-5.1	20.8	14.3/232	162.9
Sept. 26	23 38.12	+12 38.8	1.689	2.673	-1.44	-5.4	20.9	13.5/226	166.0
Oct. 6	23 31.56	+11 04.7	1.762	2.725	-1.38	-5.6	21.2	11.5/218	160.4
Oct. 16	23 26.78	+09 34.0	1.861	2.776	-1.30	-5.6	21.4	8.9/206	151.1
Oct. 26	23 24.18	+08 13.6	1.984	2.827	-1.21	-5.4	21.7	6.6/184	141.1
Nov. 5	23 23.84	+07 08.1	2.127	2.878	-1.12	-5.1	21.9	5.6/151	131.2
Nov. 15	23 25.65	+06 19.4	2.287	2.929	-1.02	-4.7	22.2	6.5/119	121.6
Nov. 25	23 29.42	+05 47.9	2.461	2.979	-0.94	-4.3	22.5	8.3/101	112.3
Dec. 5	23 34.89	+05 32.4	2.644	3.029	-0.86	-4.0	22.7	10.3/ 90	103.5
Dec. 15	23 41.79	+05 31.5	2.833	3.079	-0.79	-3.6	23.0	12.1/ 84	95.0
Dec. 25	23 49.89	+05 43.5	3.025	3.128	-0.73	-3.3	23.2	13.7/ 80	86.8
Jan. 4	23 58.96	+06 06.3	3.216	3.177	-0.68	-3.0	23.5	15.0/ 78	78.9
Jan. 14	00 08.82	+06 38.2	3.405	3.225	-0.63	-2.7	23.7	16.1/ 76	71.2
Jan. 24	00 19.32	+07 17.6	3.588	3.272	-0.59	-2.5	23.9	17.0/ 74	63.7
Feb. 3	00 30.32	+08 02.9	3.763	3.320	-0.55	-2.3	24.1	17.6/ 73	56.4
Feb. 13	00 41.71	+08 52.7	3.928	3.366	-0.52	-2.0	24.3	18.1/ 73	49.2
Feb. 23	00 53.40	+09 45.7	4.082	3.412	-0.49	-1.9	24.4	18.4/ 72	42.1
Mar. 5	01 05.31	+10 40.9	4.222	3.458	-0.47	-1.7	24.6	18.6/ 72	35.1
Mar. 15	01 17.37	+11 37.2	4.347	3.503	-0.45	-1.5	24.8	18.7/ 72	28.2
Mar. 25	01 29.51	+12 33.7	4.457	3.547	-0.43	-1.3	24.9	18.6/ 72	21.4

Comet 144P/Kushida

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 26.84683 TT
Peri. = 216.08998 e = 0.6277966
Node = 245.55483 2000.0 a = 3.8658544 AU
Incl. = 4.10923 n = 0.12966890
q = 1.4388841 AU P = 7.60 years

m1 = 9.4 + 5 log(Delta) + 25.0 log(r(t-60))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	03 38.94	+15 39.3	0.629	1.453	+1.69	+0.6	14.0	127.3
Jan. 19	03 55.80	+15 45.0	0.662	1.442	+2.09	+2.1	13.8	121.1
Jan. 29	04 16.74	+16 06.1	0.703	1.439	+2.43	+2.9	13.6	116.0
Feb. 8	04 41.02	+16 34.6	0.753	1.445	+2.67	+2.8	13.4	111.7
Feb. 18	05 07.72	+17 02.4	0.812	1.461	+2.83	+2.0	13.4	108.0
Feb. 28	05 36.02	+17 22.8	0.881	1.484	+2.92	+0.8	13.3	104.8
Mar. 10	06 05.18	+17 30.9	0.960	1.515	+2.93	−0.7	13.4	101.8
Mar. 20	06 34.47	+17 23.8	1.049	1.554	+2.89	−2.3	13.5	98.8
Mar. 30	07 03.40	+17 00.5	1.150	1.598	+2.82	−3.9	13.7	95.9
Apr. 9	07 31.58	+16 21.4	1.260	1.648	+2.72	−5.3	13.9	92.9
Apr. 19	07 58.75	+15 28.0	1.380	1.703	+2.60	−6.6	14.2	89.7
Apr. 29	08 24.77	+14 22.0	1.510	1.761	+2.49	−7.6	14.6	86.4
May 9	08 49.63	+13 05.5	1.648	1.822	+2.37	−8.5	15.0	82.9
May 19	09 13.30	+11 40.6	1.794	1.886	+2.26	−9.2	15.5	79.2
May 29	09 35.89	+10 09.1	1.945	1.953	+2.16	−9.7	15.9	75.3
June 8	09 57.46	+08 32.6	2.102	2.020	+2.06	−10.0	16.4	71.3
June 18	10 18.10	+06 52.6	2.262	2.089	+1.98	−10.2	17.0	67.1
June 28	10 37.92	+05 10.2	2.424	2.158	+1.91	−10.4	17.5	62.8
July 8	10 57.00	+03 26.5	2.587	2.229	+1.84	−10.4	18.0	58.4
July 18	11 15.44	+01 42.5	2.749	2.299	+1.79	−10.4	18.5	53.8
July 28	11 33.32	−00 01.3	2.908	2.370	+1.74	−10.3	19.0	49.0
Aug. 7	11 50.71	−01 44.0	3.064	2.440	+1.69	−10.1	19.5	44.1
Aug. 17	12 07.65	−03 25.1	3.214	2.510	+1.66	−9.9	19.9	39.1
Aug. 27	12 24.22	−05 04.1	3.357	2.580	+1.62	−9.6	20.4	33.9
Sept. 6	12 40.45	−06 40.5	3.491	2.650	+1.59	−9.3	20.8	28.6
Sept.16	12 56.36	−08 13.7	3.615	2.719	+1.56	−9.0	21.2	23.1
Sept.26	13 11.98	−09 43.4	3.728	2.788	+1.53	−8.6	21.6	17.5
Oct. 6	13 27.31	−11 09.2	3.827	2.855	+1.50	−8.2	22.0	11.7
Oct. 16	13 42.35	−12 30.7	3.913	2.923	+1.47	−7.7	22.4	5.9
Oct. 26	13 57.09	−13 47.6	3.983	2.989	+1.44	−7.2	22.7	1.8
Nov. 5	14 11.49	−14 59.6	4.037	3.055	+1.40	−6.7	23.0	7.0
Nov. 15	14 25.52	−16 06.4	4.074	3.120	+1.36	−6.1	23.3	13.4
Nov. 25	14 39.11	−17 07.7	4.094	3.185	+1.31	−5.6	23.6	20.1
Dec. 5	14 52.19	−18 03.5	4.096	3.248	+1.25	−5.0	23.9	26.9
Dec. 15	15 04.68	−18 53.6	4.081	3.311	+1.18	−4.4	24.1	34.0
Dec. 25	15 16.46	−19 37.9	4.049	3.373	+1.09	−3.9	24.3	41.3
Jan. 4	15 27.41	−20 16.5	4.001	3.434	+1.00	−3.3	24.5	48.8
Jan. 14	15 37.40	−20 49.4	3.939	3.495	+0.89	−2.7	24.7	56.6
Jan. 24	15 46.26	−21 16.7	3.863	3.555	+0.76	−2.2	24.9	64.7
Feb. 3	15 53.83	−21 38.5	3.776	3.613	+0.61	−1.6	.	73.0
Feb. 13	15 59.95	−21 55.0	3.682	3.671	+0.45	−1.1	.	81.7
Feb. 23	16 04.42	−22 06.1	3.583	3.729	+0.27	−0.6	.	90.7
Mar. 5	16 07.09	−22 11.9	3.483	3.785	+0.08	0.0	.	100.1
Mar. 15	16 07.85	−22 12.4	3.386	3.841	−0.12	+0.5	.	110.0
Mar. 25	16 06.61	−22 07.2	3.298	3.896	−0.32	+1.1	.	120.2

Comet P/2003 O3 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 Jan. 29.99875 TT
Peri. = 0.69858 e = 0.5984550
Node = 341.48841 2000.0 a = 3.1050531 AU
Incl. = 8.36553 n = 0.18013600
q = 1.2468186 AU P = 5.47 years

m1 = 18.0 + 5 log(Delta) + 12.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	20 45.66	-19 34.6	2.151	1.272	-1.85	-11.3	21.0	55.3/ 70	19.9
Jan. 19	21 21.82	-16 14.6	2.144	1.254	-1.84	-13.1	20.9	56.3/ 68	18.9
Jan. 29	21 57.36	-12 29.1	2.146	1.247	-1.81	-14.4	20.9	56.7/ 65	18.0
Feb. 8	22 32.09	-08 25.6	2.158	1.251	-1.77	-15.3	20.9	56.5/ 64	17.3
Feb. 18	23 05.96	-04 12.2	2.182	1.267	-1.73	-15.6	21.0	55.7/ 63	16.7
Feb. 28	23 39.00	+00 03.1	2.217	1.293	-1.68	-15.4	21.1	54.4/ 63	15.9
Mar. 10	00 11.26	+04 12.8	2.263	1.329	-1.63	-14.7	21.3	52.7/ 63	15.1
Mar. 20	00 42.79	+08 10.6	2.318	1.373	-1.58	-13.7	21.5	50.7/ 64	14.0
Mar. 30	01 13.69	+11 51.6	2.381	1.424	-1.52	-12.4	21.8	48.5/ 65	12.7
Apr. 9	01 43.98	+15 12.5	2.451	1.481	-1.47	-10.9	22.1	46.3/ 66	11.2
Apr. 19	02 13.68	+18 11.1	2.525	1.543	-1.41	-9.4	22.4	44.0/ 68	9.5
Apr. 29	02 42.80	+20 46.5	2.601	1.609	-1.35	-7.8	22.7	41.8/ 70	7.6
May 9	03 11.29	+22 58.7	2.677	1.677	-1.29	-6.4	22.9	39.7/ 73	6.0
May 19	03 39.08	+24 48.4	2.752	1.747	-1.23	-5.0	23.2	37.6/ 75	5.2
May 29	04 06.12	+26 16.7	2.823	1.818	-1.16	-3.8	23.5	35.7/ 77	6.1
June 8	04 32.31	+27 25.1	2.888	1.890	-1.09	-2.7	23.8	33.9/ 80	8.6
June 18	04 57.57	+28 15.5	2.946	1.963	-1.02	-1.8	24.0	32.2/ 82	11.9
June 28	05 21.84	+28 49.8	2.996	2.036	-0.95	-1.0	24.2	30.5/ 85	15.7
July 8	05 45.02	+29 09.9	3.036	2.109	-0.88	-0.3	24.5	28.9/ 87	20.0
July 18	06 07.06	+29 18.0	3.065	2.181	-0.82	+0.3	24.7	27.3/ 89	24.5
July 28	06 27.91	+29 16.0	3.082	2.253	-0.76	+0.8	24.9	25.7/ 91	29.4
Aug. 7	06 47.50	+29 05.9	3.087	2.324	-0.71	+1.2	25.0	24.1/ 93	34.6
Aug. 17	07 05.80	+28 49.8	3.079	2.395	-0.66	+1.5	.	22.4/ 94	40.1
Aug. 27	07 22.74	+28 29.5	3.059	2.464	-0.62	+1.8	.	20.6/ 95	45.9
Sept. 6	07 38.25	+28 07.0	3.025	2.533	-0.58	+2.1	.	18.7/ 96	52.0
Sept.16	07 52.26	+27 44.1	2.979	2.601	-0.55	+2.3	.	16.6/ 97	58.6
Sept.26	08 04.66	+27 22.8	2.922	2.667	-0.53	+2.5	.	14.3/ 97	65.5
Oct. 6	08 15.32	+27 04.8	2.854	2.733	-0.51	+2.7	.	11.8/ 96	72.9
Oct. 16	08 24.08	+26 51.9	2.778	2.797	-0.50	+2.9	.	8.9/ 94	80.8
Oct. 26	08 30.75	+26 45.8	2.697	2.861	-0.50	+3.1	.	5.8/ 88	89.2
Nov. 5	08 35.11	+26 47.6	2.613	2.923	-0.52	+3.3	.	2.7/ 66	98.1
Nov. 15	08 36.95	+26 58.3	2.531	2.984	-0.54	+3.5	.	2.3/329	107.7
Nov. 25	08 36.06	+27 17.8	2.454	3.044	-0.57	+3.7	.	5.6/299	117.9
Dec. 5	08 32.37	+27 44.8	2.389	3.103	-0.61	+3.8	.	9.1/291	128.8
Dec. 15	08 25.94	+28 16.6	2.342	3.161	-0.66	+3.9	.	12.1/286	140.2
Dec. 25	08 17.09	+28 49.4	2.317	3.218	-0.71	+3.8	.	14.2/282	151.9
Jan. 4	08 06.51	+29 18.4	2.320	3.274	-0.75	+3.7	.	15.1/279	163.3
Jan. 14	07 55.09	+29 39.5	2.353	3.328	-0.77	+3.4	.	14.6/275	171.2
Jan. 24	07 43.90	+29 50.2	2.418	3.382	-0.78	+3.1	.	13.0/271	166.1
Feb. 3	07 33.93	+29 50.0	2.515	3.435	-0.78	+2.8	.	10.5/265	155.3
Feb. 13	07 25.91	+29 40.3	2.639	3.486	-0.75	+2.4	.	7.6/257	144.0
Feb. 23	07 20.26	+29 23.3	2.787	3.536	-0.71	+2.1	.	4.7/242	133.0
Mar. 5	07 17.10	+29 01.2	2.954	3.586	-0.67	+1.9	.	2.7/202	122.5
Mar. 15	07 16.33	+28 35.8	3.136	3.634	-0.63	+1.8	.	3.3/146	112.5
Mar. 25	07 17.73	+28 08.3	3.327	3.681	-0.58	+1.7	.	5.2/123	103.0

Comet 47P/Ashbrook-Jackson

Epoch = 2009 July 28.0 TT
T = 2009 Feb. 1.01558 TT
Peri. = 357.69839 e = 0.3190519
Node = 356.98279 2000.0 a = 4.1106837 AU
Incl. = 13.05302 n = 0.11825867
q = 2.7991622 AU P = 8.33 years

m1 = 3.8 + 5 log(Delta) + 22.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 28.39	-11 08.9	3.395	2.802	+1.43	+11.5	16.5	46.0
Jan. 19	22 42.69	-09 13.9	3.485	2.800	+1.46	+11.8	16.6	39.8
Jan. 29	22 57.30	-07 15.8	3.565	2.799	+1.48	+12.1	16.6	33.7
Feb. 8	23 12.14	-05 15.2	3.635	2.799	+1.50	+12.3	16.7	27.7
Feb. 18	23 27.13	-03 12.7	3.694	2.801	+1.51	+12.4	16.7	21.9
Feb. 28	23 42.24	-01 08.8	3.742	2.804	+1.52	+12.5	16.7	16.1
Mar. 10	23 57.43	+00 55.8	3.778	2.807	+1.52	+12.5	16.8	10.4
Mar. 20	00 12.67	+03 00.3	3.803	2.812	+1.53	+12.4	16.8	4.9
Mar. 30	00 27.92	+05 04.4	3.816	2.819	+1.52	+12.3	16.8	2.1
Apr. 9	00 43.16	+07 07.2	3.818	2.826	+1.52	+12.1	16.9	6.8
Apr. 19	00 58.37	+09 08.2	3.808	2.834	+1.52	+11.9	16.9	12.3
Apr. 29	01 13.52	+11 07.0	3.786	2.844	+1.51	+11.6	16.9	17.8
May 9	01 28.58	+13 02.9	3.754	2.855	+1.49	+11.3	16.9	23.3
May 19	01 43.50	+14 55.5	3.710	2.866	+1.47	+10.9	16.9	28.9
May 29	01 58.24	+16 44.6	3.656	2.879	+1.45	+10.5	16.9	34.5
June 8	02 12.72	+18 29.7	3.592	2.893	+1.42	+10.1	17.0	40.3
June 18	02 26.89	+20 10.6	3.519	2.908	+1.37	+9.7	17.0	46.1
June 28	02 40.63	+21 47.3	3.436	2.923	+1.32	+9.2	17.0	52.1
July 8	02 53.83	+23 19.8	3.346	2.940	+1.25	+8.8	17.0	58.2
July 18	03 06.36	+24 48.0	3.249	2.958	+1.17	+8.4	17.0	64.5
July 28	03 18.03	+26 12.1	3.145	2.976	+1.06	+8.0	16.9	71.1
Aug. 7	03 28.64	+27 32.4	3.037	2.995	+0.93	+7.7	16.9	78.0
Aug. 17	03 37.97	+28 49.1	2.926	3.015	+0.78	+7.3	16.9	85.2
Aug. 27	03 45.75	+30 02.2	2.814	3.036	+0.59	+7.0	16.9	92.8
Sept. 6	03 51.68	+31 11.8	2.704	3.057	+0.38	+6.5	16.9	100.8
Sept.16	03 55.49	+32 17.2	2.598	3.079	+0.14	+6.0	16.9	109.2
Sept.26	03 56.89	+33 17.5	2.500	3.102	-0.12	+5.3	16.9	118.1
Oct. 6	03 55.73	+34 10.7	2.414	3.125	-0.38	+4.4	16.8	127.5
Oct. 16	03 51.97	+34 54.5	2.343	3.149	-0.61	+3.1	16.9	137.2
Oct. 26	03 45.85	+35 25.7	2.292	3.173	-0.79	+1.6	16.9	147.0
Nov. 5	03 37.91	+35 41.7	2.265	3.198	-0.89	0.0	16.9	156.2
Nov. 15	03 28.98	+35 41.3	2.265	3.223	-0.89	-1.6	17.0	162.6
Nov. 25	03 20.07	+35 25.3	2.293	3.248	-0.79	-2.8	17.1	162.6
Dec. 5	03 12.17	+34 57.3	2.349	3.274	-0.61	-3.5	17.2	156.0
Dec. 15	03 06.04	+34 22.1	2.432	3.301	-0.39	-3.7	17.4	146.9
Dec. 25	03 02.19	+33 45.0	2.539	3.327	-0.14	-3.5	17.6	137.1
Jan. 4	03 00.81	+33 10.5	2.666	3.354	+0.10	-2.9	17.8	127.3
Jan. 14	03 01.86	+32 41.7	2.810	3.382	+0.33	-2.1	17.9	117.7
Jan. 24	03 05.18	+32 20.2	2.965	3.409	+0.53	-1.4	18.1	108.6
Feb. 3	03 10.52	+32 06.6	3.129	3.437	+0.71	-0.6	18.3	99.8
Feb. 13	03 17.64	+32 00.3	3.297	3.465	+0.87	0.0	18.5	91.4
Feb. 23	03 26.29	+32 00.5	3.466	3.493	+0.99	+0.5	18.7	83.3
Mar. 5	03 36.24	+32 06.0	3.634	3.521	+1.10	+0.9	18.9	75.6
Mar. 15	03 47.28	+32 15.4	3.798	3.549	+1.20	+1.2	19.1	68.1
Mar. 25	03 59.24	+32 27.5	3.955	3.577	+1.27	+1.4	19.2	60.9

Comet P/2009 B1 (Boattini)

Epoch = 2009 July 28.0 TT
T = 2009 Feb. 6.21068 TT
Peri. = 128.59459 e = 0.6373794
Node = 297.43936 2000.0 a = 6.6916082 AU
Incl. = 22.22786 n = 0.05693880
q = 2.4265150 AU P = 17.31 years

m1 = 11.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	01 29.96	+35 01.3	2.004	2.439	+1.51	-5.2	18.3	104.2
Jan. 19	01 45.02	+34 09.5	2.099	2.432	+1.68	-4.0	18.4	97.5
Jan. 29	02 01.81	+33 29.6	2.201	2.428	+1.82	-3.0	18.5	91.0
Feb. 8	02 20.02	+32 59.7	2.308	2.427	+1.94	-2.3	18.6	84.8
Feb. 18	02 39.37	+32 37.2	2.419	2.429	+2.03	-1.8	18.7	78.8
Feb. 28	02 59.64	+32 19.5	2.532	2.434	+2.10	-1.5	18.8	73.0
Mar. 10	03 20.60	+32 04.1	2.647	2.443	+2.15	-1.5	18.9	67.3
Mar. 20	03 42.06	+31 48.6	2.762	2.454	+2.18	-1.8	19.1	61.8
Mar. 30	04 03.86	+31 31.0	2.876	2.469	+2.20	-2.1	19.2	56.5
Apr. 9	04 25.83	+31 09.8	2.988	2.486	+2.20	-2.6	19.3	51.2
Apr. 19	04 47.82	+30 43.4	3.098	2.507	+2.19	-3.2	19.4	46.0
Apr. 29	05 09.71	+30 11.0	3.204	2.530	+2.17	-3.9	19.6	40.9
May 9	05 31.37	+29 31.9	3.305	2.556	+2.13	-4.6	19.7	35.8
May 19	05 52.67	+28 45.7	3.401	2.584	+2.09	-5.3	19.8	30.8
May 29	06 13.55	+27 52.4	3.491	2.615	+2.04	-6.0	20.0	25.7
June 8	06 33.91	+26 51.9	3.574	2.648	+1.98	-6.7	20.1	20.7
June 18	06 53.69	+25 44.7	3.648	2.683	+1.92	-7.4	20.2	15.6
June 28	07 12.85	+24 31.1	3.714	2.720	+1.85	-7.9	20.4	10.4
July 8	07 31.33	+23 11.6	3.770	2.759	+1.78	-8.5	20.5	5.2
July 18	07 49.11	+21 46.8	3.816	2.800	+1.71	-8.9	20.6	0.7
July 28	08 06.18	+20 17.4	3.851	2.842	+1.63	-9.3	20.7	5.6
Aug. 7	08 22.48	+18 43.9	3.875	2.886	+1.55	-9.7	20.8	11.0
Aug. 17	08 38.03	+17 07.0	3.886	2.931	+1.48	-10.0	21.0	16.7
Aug. 27	08 52.78	+15 27.4	3.885	2.977	+1.39	-10.2	21.1	22.5
Sept. 6	09 06.70	+13 45.8	3.872	3.024	+1.31	-10.3	21.1	28.5
Sept. 16	09 19.78	+12 02.8	3.846	3.073	+1.22	-10.4	21.2	34.7
Sept. 26	09 31.94	+10 19.1	3.807	3.122	+1.12	-10.4	21.3	41.1
Oct. 6	09 43.14	+08 35.6	3.756	3.172	+1.02	-10.3	21.4	47.8
Oct. 16	09 53.29	+06 52.7	3.694	3.223	+0.90	-10.1	21.5	54.7
Oct. 26	10 02.31	+05 11.5	3.622	3.275	+0.78	-9.9	21.5	62.0
Nov. 5	10 10.08	+03 32.7	3.541	3.327	+0.64	-9.5	21.6	69.5
Nov. 15	10 16.47	+01 57.4	3.453	3.379	+0.49	-9.1	21.6	77.5
Nov. 25	10 21.34	+00 26.6	3.361	3.433	+0.32	-8.5	21.7	85.8
Dec. 5	10 24.55	-00 58.4	3.268	3.486	+0.14	-7.8	21.7	94.5
Dec. 15	10 25.98	-02 16.0	3.176	3.540	-0.04	-6.9	21.7	103.6
Dec. 25	10 25.53	-03 24.6	3.091	3.594	-0.23	-5.8	21.8	113.2
Jan. 4	10 23.21	-04 22.5	3.018	3.648	-0.41	-4.5	21.8	123.1
Jan. 14	10 19.10	-05 08.0	2.959	3.703	-0.57	-3.2	21.9	133.2
Jan. 24	10 13.44	-05 39.8	2.922	3.758	-0.68	-1.8	22.0	143.3
Feb. 3	10 06.67	-05 57.3	2.909	3.812	-0.74	-0.4	22.0	152.8
Feb. 13	09 59.29	-06 01.1	2.924	3.867	-0.74	+0.8	22.1	160.2
Feb. 23	09 51.92	-05 52.8	2.969	3.922	-0.68	+1.7	22.3	162.2
Mar. 5	09 45.17	-05 35.5	3.043	3.977	-0.57	+2.3	22.4	157.6
Mar. 15	09 39.49	-05 12.5	3.145	4.032	-0.42	+2.5	22.6	149.3
Mar. 25	09 35.25	-04 47.2	3.273	4.087	-0.26	+2.4	22.7	140.0

Comet 202P/Scotti

Epoch = 2009 July 28.0 TT
T = 2009 Feb. 6.97458 TT
Peri. = 255.55149 e = 0.3309189
Node = 194.57346 2000.0 a = 3.7767832 AU
Incl. = 2.18499 n = 0.13428299
q = 2.5269742 AU P = 7.34 years

m1 = 11.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	04 22.42	+18 31.6	1.715	2.533	-0.02	+0.5	18.2	138.1
Jan. 19	04 22.19	+18 36.8	1.803	2.530	+0.26	+1.3	18.3	127.9
Jan. 29	04 24.79	+18 49.8	1.906	2.528	+0.53	+1.9	18.4	118.4
Feb. 8	04 30.10	+19 09.0	2.020	2.527	+0.78	+2.4	18.6	109.6
Feb. 18	04 37.86	+19 32.5	2.141	2.528	+0.99	+2.6	18.7	101.3
Feb. 28	04 47.77	+19 58.2	2.266	2.530	+1.18	+2.6	18.8	93.6
Mar. 10	04 59.54	+20 23.9	2.394	2.534	+1.33	+2.4	19.0	86.4
Mar. 20	05 12.89	+20 47.6	2.523	2.540	+1.47	+2.0	19.1	79.6
Mar. 30	05 27.55	+21 07.6	2.650	2.547	+1.57	+1.5	19.2	73.1
Apr. 9	05 43.30	+21 22.4	2.775	2.555	+1.66	+0.8	19.3	67.0
Apr. 19	05 59.91	+21 30.8	2.896	2.565	+1.73	+0.1	19.4	61.1
Apr. 29	06 17.21	+21 31.8	3.012	2.576	+1.78	-0.7	19.6	55.3
May 9	06 35.01	+21 24.8	3.123	2.589	+1.81	-1.5	19.7	49.8
May 19	06 53.15	+21 09.4	3.228	2.603	+1.84	-2.4	19.8	44.4
May 29	07 11.52	+20 45.5	3.326	2.618	+1.84	-3.2	19.9	39.1
June 8	07 29.97	+20 13.0	3.416	2.635	+1.84	-4.1	20.0	33.9
June 18	07 48.39	+19 32.2	3.498	2.652	+1.83	-4.9	20.1	28.7
June 28	08 06.72	+18 43.5	3.572	2.671	+1.81	-5.6	20.2	23.6
July 8	08 24.86	+17 47.5	3.636	2.691	+1.79	-6.3	20.3	18.4
July 18	08 42.74	+16 44.7	3.690	2.712	+1.76	-6.9	20.3	13.3
July 28	09 00.33	+15 35.9	3.735	2.733	+1.72	-7.4	20.4	8.2
Aug. 7	09 17.57	+14 21.9	3.768	2.756	+1.69	-7.8	20.5	3.1
Aug. 17	09 34.44	+13 03.6	3.791	2.780	+1.65	-8.2	20.6	2.8
Aug. 27	09 50.90	+11 41.7	3.801	2.804	+1.60	-8.4	20.6	7.9
Sept. 6	10 06.92	+10 17.3	3.800	2.829	+1.56	-8.6	20.7	13.4
Sept.16	10 22.48	+08 51.3	3.787	2.855	+1.51	-8.7	20.7	19.0
Sept.26	10 37.55	+07 24.5	3.761	2.882	+1.45	-8.6	20.8	24.8
Oct. 6	10 52.08	+05 58.0	3.723	2.909	+1.40	-8.5	20.8	30.7
Oct. 16	11 06.03	+04 32.7	3.673	2.936	+1.33	-8.3	20.8	36.8
Oct. 26	11 19.35	+03 09.7	3.610	2.964	+1.26	-8.0	20.9	43.2
Nov. 5	11 31.96	+01 50.1	3.537	2.993	+1.18	-7.5	20.9	49.7
Nov. 15	11 43.78	+00 34.7	3.452	3.022	+1.09	-7.0	20.9	56.6
Nov. 25	11 54.69	-00 35.1	3.358	3.051	+0.99	-6.3	20.9	63.7
Dec. 5	12 04.56	-01 38.3	3.255	3.081	+0.87	-5.5	20.9	71.1
Dec. 15	12 13.24	-02 33.7	3.146	3.111	+0.73	-4.6	20.9	78.9
Dec. 25	12 20.54	-03 19.9	3.033	3.141	+0.58	-3.6	20.9	87.1
Jan. 4	12 26.30	-03 55.9	2.918	3.172	+0.40	-2.4	20.8	95.8
Jan. 14	12 30.31	-04 20.4	2.805	3.202	+0.21	-1.2	20.8	104.9
Jan. 24	12 32.41	-04 32.3	2.698	3.233	+0.01	+0.1	20.8	114.5
Feb. 3	12 32.50	-04 30.8	2.601	3.264	-0.19	+1.5	20.8	124.6
Feb. 13	12 30.58	-04 15.8	2.519	3.295	-0.38	+2.8	20.8	135.3
Feb. 23	12 26.76	-03 48.0	2.456	3.326	-0.54	+3.9	20.8	146.5
Mar. 5	12 21.39	-03 09.4	2.417	3.357	-0.64	+4.6	20.8	158.0
Mar. 15	12 14.97	-02 23.1	2.405	3.388	-0.68	+5.0	20.9	169.7
Mar. 25	12 08.12	-01 33.5	2.422	3.419	-0.66	+4.8	20.9	178.3

Comet P/2008 Y1 (Boattini)

T = 2009 Feb. 25.1721 TT
Peri. = 162.4405 e = 0.732984
Node = 259.7451 2000.0 a = 4.759505 AU
Incl. = 8.8039 n = 0.0949208
q = 1.270864 AU P = 10.38 years

m1 = 14.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 59.68	+00 21.7	1.662	1.409	+2.87	+13.2	17.5	57.7
Jan. 19	23 28.40	+02 34.1	1.658	1.359	+3.09	+14.5	17.3	55.0
Jan. 29	23 59.31	+04 59.4	1.654	1.319	+3.30	+15.3	17.1	52.9
Feb. 8	00 32.34	+07 32.7	1.653	1.290	+3.50	+15.5	17.0	51.3
Feb. 18	01 07.33	+10 07.7	1.658	1.274	+3.68	+15.0	16.9	50.1
Feb. 28	01 44.10	+12 37.2	1.672	1.271	+3.82	+13.6	16.9	49.3
Mar. 10	02 22.27	+14 53.3	1.697	1.282	+3.91	+11.5	17.0	48.8
Mar. 20	03 01.35	+16 48.6	1.735	1.305	+3.94	+8.9	17.1	48.3
Mar. 30	03 40.76	+18 17.5	1.787	1.340	+3.91	+5.9	17.4	47.9
Apr. 9	04 19.81	+19 16.7	1.854	1.386	+3.81	+2.9	17.7	47.3
Apr. 19	04 57.88	+19 45.4	1.934	1.441	+3.66	0.0	18.0	46.5
Apr. 29	05 34.46	+19 45.4	2.029	1.503	+3.47	−2.6	18.4	45.4
May 9	06 09.17	+19 19.8	2.134	1.572	+3.26	−4.7	18.8	43.9
May 19	06 41.80	+18 32.7	2.250	1.645	+3.05	−6.4	19.2	42.1
May 29	07 12.34	+17 28.3	2.373	1.722	+2.85	−7.8	19.6	39.9
June 8	07 40.80	+16 10.3	2.501	1.802	+2.65	−8.8	20.0	37.3
June 18	08 07.32	+14 42.2	2.632	1.884	+2.47	−9.6	20.4	34.4
June 28	08 32.07	+13 06.7	2.765	1.967	+2.31	−10.1	20.8	31.2
July 8	08 55.20	+11 25.9	2.897	2.052	+2.17	−10.4	21.2	27.7
July 18	09 16.88	+09 41.7	3.025	2.136	+2.04	−10.6	21.5	23.9
July 28	09 37.28	+07 55.4	3.149	2.221	+1.92	−10.7	21.9	19.9
Aug. 7	09 56.51	+06 08.2	3.266	2.306	+1.82	−10.7	22.2	15.8
Aug. 17	10 14.70	+04 20.9	3.374	2.391	+1.72	−10.7	22.5	11.6
Aug. 27	10 31.94	+02 34.3	3.472	2.475	+1.64	−10.5	22.8	7.9
Sept. 6	10 48.31	+00 49.0	3.558	2.559	+1.56	−10.3	23.1	6.3
Sept. 16	11 03.87	−00 54.5	3.632	2.642	+1.48	−10.1	23.3	8.5
Sept. 26	11 18.65	−02 35.7	3.691	2.724	+1.40	−9.8	23.6	13.1
Oct. 6	11 32.66	−04 14.0	3.736	2.806	+1.33	−9.5	23.8	18.5
Oct. 16	11 45.91	−05 49.1	3.765	2.887	+1.25	−9.1	24.0	24.4
Oct. 26	11 58.38	−07 20.5	3.777	2.967	+1.16	−8.7	24.2	30.7
Nov. 5	12 10.00	−08 47.6	3.774	3.046	+1.07	−8.3	24.3	37.3
Nov. 15	12 20.74	−10 10.1	3.755	3.124	+0.97	−7.7	24.5	44.3
Nov. 25	12 30.49	−11 27.4	3.720	3.201	+0.86	−7.1	24.6	51.6
Dec. 5	12 39.13	−12 38.9	3.671	3.278	+0.74	−6.5	24.8	59.2
Dec. 15	12 46.55	−13 43.9	3.610	3.353	+0.60	−5.8	24.9	67.2
Dec. 25	12 52.59	−14 41.6	3.539	3.428	+0.45	−5.0	25.0	75.5
Jan. 4	12 57.09	−15 31.2	3.460	3.502	+0.28	−4.0	.	84.3
Jan. 14	12 59.90	−16 11.5	3.377	3.574	+0.10	−3.0	.	93.5
Jan. 24	13 00.87	−16 41.4	3.295	3.646	−0.09	−1.8	.	103.1
Feb. 3	12 59.94	−16 59.6	3.218	3.717	−0.28	−0.5	.	113.2
Feb. 13	12 57.11	−17 04.9	3.150	3.788	−0.46	+0.9	.	123.6
Feb. 23	12 52.50	−16 56.4	3.099	3.857	−0.61	+2.2	.	134.5
Mar. 5	12 46.42	−16 34.0	3.068	3.925	−0.71	+3.5	.	145.5
Mar. 15	12 39.28	−15 58.7	3.062	3.993	−0.76	+4.6	.	156.3
Mar. 25	12 31.64	−15 12.7	3.086	4.060	−0.76	+5.3	.	165.8

Comet 14P/Wolf

Epoch = 2009 July 28.0 TT
T = 2009 Feb. 27.30192 TT
Peri. = 159.00253 e = 0.3578588
Node = 202.11861 2000.0 a = 4.2423542 AU
Incl. = 27.94434 n = 0.11279600
q = 2.7241904 AU P = 8.74 years

m1 = 10.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 12.70	+02 15.7	3.293	2.741	+1.66	+2.3	19.4	48.5
Jan. 19	22 29.34	+02 38.3	3.380	2.735	+1.69	+3.2	19.4	42.4
Jan. 29	22 46.26	+03 10.1	3.460	2.730	+1.71	+3.9	19.4	36.4
Feb. 8	23 03.38	+03 49.6	3.530	2.727	+1.73	+4.5	19.5	30.5
Feb. 18	23 20.63	+04 35.0	3.591	2.725	+1.73	+5.0	19.5	24.7
Feb. 28	23 37.98	+05 25.1	3.641	2.724	+1.74	+5.3	19.5	19.1
Mar. 10	23 55.36	+06 18.3	3.681	2.725	+1.74	+5.5	19.6	13.5
Mar. 20	00 12.75	+07 13.2	3.709	2.727	+1.74	+5.5	19.6	8.3
Mar. 30	00 30.12	+08 08.4	3.725	2.731	+1.73	+5.4	19.6	4.6
Apr. 9	00 47.44	+09 02.5	3.730	2.736	+1.72	+5.2	19.6	6.0
Apr. 19	01 04.67	+09 54.2	3.723	2.742	+1.71	+4.8	19.6	10.6
Apr. 29	01 21.79	+10 42.5	3.705	2.750	+1.70	+4.4	19.6	15.9
May 9	01 38.76	+11 26.0	3.675	2.759	+1.68	+3.8	19.6	21.4
May 19	01 55.52	+12 03.7	3.634	2.770	+1.65	+3.1	19.6	26.9
May 29	02 12.03	+12 34.6	3.582	2.782	+1.62	+2.3	19.6	32.6
June 8	02 28.21	+12 57.7	3.519	2.795	+1.58	+1.4	19.6	38.3
June 18	02 43.99	+13 12.1	3.447	2.809	+1.53	+0.5	19.6	44.2
June 28	02 59.26	+13 16.8	3.365	2.824	+1.46	-0.6	19.6	50.2
July 8	03 13.90	+13 11.1	3.276	2.841	+1.39	-1.7	19.6	56.3
July 18	03 27.79	+12 54.3	3.179	2.859	+1.30	-2.9	19.6	62.7
July 28	03 40.76	+12 25.7	3.076	2.878	+1.19	-4.1	19.5	69.3
Aug. 7	03 52.65	+11 44.7	2.968	2.897	+1.06	-5.4	19.5	76.1
Aug. 17	04 03.26	+10 51.0	2.858	2.918	+0.91	-6.7	19.5	83.3
Aug. 27	04 12.38	+09 44.3	2.747	2.940	+0.74	-8.0	19.4	90.8
Sept. 6	04 19.80	+08 24.7	2.639	2.962	+0.55	-9.2	19.4	98.6
Sept. 16	04 25.29	+06 52.8	2.535	2.986	+0.34	-10.3	19.3	106.9
Sept. 26	04 28.65	+05 09.9	2.439	3.010	+0.11	-11.1	19.3	115.5
Oct. 6	04 29.77	+03 18.5	2.356	3.035	-0.12	-11.6	19.3	124.4
Oct. 16	04 28.62	+01 22.0	2.289	3.061	-0.33	-11.6	19.3	133.4
Oct. 26	04 25.31	-00 34.3	2.242	3.087	-0.51	-11.0	19.3	142.1
Nov. 5	04 20.19	-02 24.4	2.219	3.114	-0.64	-9.7	19.3	149.5
Nov. 15	04 13.79	-04 01.6	2.222	3.142	-0.70	-7.9	19.4	154.0
Nov. 25	04 06.81	-05 20.2	2.253	3.170	-0.68	-5.6	19.5	153.9
Dec. 5	04 00.04	-06 16.2	2.311	3.198	-0.59	-3.2	19.6	149.3
Dec. 15	03 54.16	-06 48.6	2.394	3.227	-0.44	-1.0	19.7	142.0
Dec. 25	03 49.73	-06 58.2	2.500	3.257	-0.26	+1.0	19.9	133.5
Jan. 4	03 47.11	-06 48.1	2.625	3.286	-0.07	+2.6	20.0	124.7
Jan. 14	03 46.43	-06 22.1	2.765	3.316	+0.13	+3.8	20.2	116.0
Jan. 24	03 47.68	-05 44.0	2.916	3.347	+0.31	+4.6	20.4	107.5
Feb. 3	03 50.77	-04 57.8	3.074	3.378	+0.47	+5.1	20.6	99.4
Feb. 13	03 55.52	-04 06.5	3.237	3.409	+0.62	+5.4	20.7	91.5
Feb. 23	04 01.74	-03 12.9	3.400	3.440	+0.75	+5.4	20.9	84.0
Mar. 5	04 09.24	-02 19.3	3.562	3.471	+0.86	+5.2	21.1	76.7
Mar. 15	04 17.84	-01 27.4	3.720	3.503	+0.95	+4.9	21.2	69.8
Mar. 25	04 27.37	-00 38.8	3.872	3.534	+1.03	+4.4	21.4	63.1

Comet 67P/Churyumov-Gerasimenko

Epoch = 2009 July 28.0 TT
T = 2009 Feb. 28.36573 TT
Peri. = 12.69936 e = 0.6402365
Node = 50.19512 2000.0 a = 3.4646913 AU
Incl. = 7.04080 n = 0.15282952
q = 1.2464695 AU P = 6.45 years

m1 = 10.4 + 5 log(Delta) + 12.5 log(r(t-40))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	23 07.96	-08 42.6	1.675	1.388	+2.65	+21.8	14.2	56.0
Jan. 19	23 34.45	-05 04.4	1.673	1.340	+2.82	+23.4	14.0	53.2
Jan. 29	00 02.61	-01 10.0	1.670	1.301	+2.99	+24.6	13.7	51.1
Feb. 8	00 32.46	+02 56.5	1.670	1.271	+3.16	+25.3	13.5	49.4
Feb. 18	01 04.06	+07 09.1	1.673	1.253	+3.34	+25.1	13.3	48.2
Feb. 28	01 37.48	+11 20.3	1.683	1.246	+3.52	+24.1	13.1	47.3
Mar. 10	02 12.72	+15 20.8	1.702	1.252	+3.69	+22.0	13.0	46.7
Mar. 20	02 49.65	+19 00.9	1.733	1.270	+3.84	+19.0	12.9	46.3
Mar. 30	03 28.03	+22 11.3	1.776	1.298	+3.93	+15.3	12.9	46.0
Apr. 9	04 07.38	+24 44.2	1.832	1.337	+3.97	+11.1	12.9	45.5
Apr. 19	04 47.03	+26 35.2	1.901	1.385	+3.92	+6.8	13.0	44.9
Apr. 29	05 26.27	+27 42.8	1.982	1.439	+3.81	+2.6	13.2	44.0
May 9	06 04.37	+28 09.3	2.075	1.500	+3.64	-1.0	13.4	42.8
May 19	06 40.75	+27 59.1	2.178	1.566	+3.43	-4.1	13.7	41.2
May 29	07 15.04	+27 18.2	2.289	1.635	+3.20	-6.5	14.0	39.3
June 8	07 47.07	+26 12.8	2.405	1.708	+2.98	-8.4	14.3	37.0
June 18	08 16.83	+24 48.9	2.526	1.782	+2.76	-9.8	14.6	34.4
June 28	08 44.44	+23 11.3	2.648	1.857	+2.56	-10.7	14.9	31.4
July 8	09 10.07	+21 24.6	2.770	1.934	+2.39	-11.3	15.3	28.1
July 18	09 33.93	+19 31.8	2.890	2.011	+2.23	-11.6	15.6	24.5
July 28	09 56.22	+17 35.7	3.006	2.088	+2.09	-11.7	15.9	20.7
Aug. 7	10 17.13	+15 38.4	3.116	2.164	+1.97	-11.7	16.2	16.7
Aug. 17	10 36.82	+13 41.3	3.219	2.241	+1.86	-11.6	16.5	12.4
Aug. 27	10 55.44	+11 45.7	3.312	2.317	+1.77	-11.3	16.8	8.2
Sept. 6	11 13.10	+09 52.6	3.395	2.392	+1.68	-11.0	17.0	4.9
Sept.16	11 29.90	+08 02.9	3.466	2.467	+1.60	-10.6	17.3	5.5
Sept.26	11 45.91	+06 17.3	3.524	2.541	+1.53	-10.1	17.5	9.7
Oct. 6	12 01.16	+04 36.4	3.567	2.614	+1.45	-9.6	17.7	14.9
Oct. 16	12 15.69	+03 00.7	3.595	2.686	+1.38	-9.0	17.9	20.7
Oct. 26	12 29.50	+01 30.9	3.608	2.757	+1.31	-8.3	18.1	26.7
Nov. 5	12 42.55	+00 07.5	3.605	2.827	+1.23	-7.7	18.2	33.1
Nov. 15	12 54.81	-01 09.0	3.586	2.895	+1.14	-6.9	18.4	39.8
Nov. 25	13 06.21	-02 18.0	3.552	2.963	+1.04	-6.1	18.5	46.7
Dec. 5	13 16.65	-03 19.0	3.502	3.030	+0.94	-5.2	18.6	54.0
Dec. 15	13 26.02	-04 11.5	3.440	3.096	+0.81	-4.3	18.7	61.6
Dec. 25	13 34.17	-04 54.8	3.366	3.161	+0.68	-3.4	18.8	69.6
Jan. 4	13 40.94	-05 28.5	3.282	3.225	+0.52	-2.4	18.9	78.0
Jan. 14	13 46.15	-05 52.0	3.192	3.287	+0.35	-1.3	18.9	86.8
Jan. 24	13 49.62	-06 04.8	3.098	3.349	+0.16	-0.2	19.0	96.1
Feb. 3	13 51.18	-06 06.8	3.006	3.410	-0.05	+0.9	19.0	105.8
Feb. 13	13 50.71	-05 57.7	2.920	3.469	-0.25	+2.0	19.1	116.1
Feb. 23	13 48.17	-05 38.1	2.845	3.528	-0.45	+2.9	19.1	126.8
Mar. 5	13 43.65	-05 09.0	2.786	3.585	-0.63	+3.7	19.2	138.0
Mar. 15	13 37.39	-04 32.2	2.750	3.642	-0.76	+4.2	19.3	149.5
Mar. 25	13 29.82	-03 50.5	2.740	3.698	-0.83	+4.3	19.3	161.2

Comet 59P/Kearns-Kwee

Epoch = 2009 July 28.0 TT
T = 2009 Mar. 7.62934 TT
Peri. = 127.52635 e = 0.4752033
Node = 313.03616 2000.0 a = 4.4884350 AU
Incl. = 9.34110 n = 0.10364818
q = 2.3555159 AU P = 9.51 years

m1 = 9.5 + 5 log(Delta) + 15.0 log(r(t-80))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	02 10.60	+25 11.6	1.877	2.397	+0.98	-0.7	17.0	109.9
Jan. 19	02 20.39	+25 04.4	1.977	2.384	+1.20	+0.4	17.1	102.0
Jan. 29	02 32.43	+25 08.3	2.082	2.373	+1.40	+1.3	17.1	94.6
Feb. 8	02 46.45	+25 21.3	2.190	2.365	+1.57	+1.9	17.2	87.7
Feb. 18	03 02.14	+25 40.5	2.300	2.359	+1.71	+2.3	17.2	81.1
Feb. 28	03 19.28	+26 03.3	2.411	2.356	+1.84	+2.4	17.2	75.0
Mar. 10	03 37.65	+26 27.1	2.520	2.356	+1.94	+2.2	17.3	69.1
Mar. 20	03 57.05	+26 49.3	2.627	2.357	+2.02	+1.9	17.3	63.5
Mar. 30	04 17.29	+27 07.8	2.733	2.362	+2.09	+1.3	17.4	58.1
Apr. 9	04 38.20	+27 20.8	2.835	2.369	+2.14	+0.6	17.4	52.9
Apr. 19	04 59.61	+27 26.5	2.933	2.378	+2.17	-0.3	17.5	47.8
Apr. 29	05 21.35	+27 23.9	3.027	2.390	+2.19	-1.2	17.5	42.9
May 9	05 43.27	+27 12.0	3.117	2.404	+2.19	-2.2	17.6	38.1
May 19	06 05.20	+26 50.3	3.201	2.420	+2.18	-3.2	17.6	33.3
May 29	06 27.03	+26 18.7	3.280	2.439	+2.16	-4.2	17.7	28.6
June 8	06 48.62	+25 37.1	3.353	2.460	+2.12	-5.1	17.7	23.9
June 18	07 09.86	+24 46.1	3.419	2.482	+2.08	-6.0	17.8	19.2
June 28	07 30.67	+23 46.0	3.478	2.507	+2.03	-6.8	17.8	14.5
July 8	07 50.96	+22 37.6	3.530	2.533	+1.97	-7.6	17.9	9.7
July 18	08 10.69	+21 21.7	3.573	2.562	+1.91	-8.2	17.9	5.0
July 28	08 29.81	+19 59.3	3.607	2.591	+1.85	-8.8	18.0	1.0
Aug. 7	08 48.29	+18 31.3	3.631	2.623	+1.78	-9.3	18.1	5.1
Aug. 17	09 06.10	+16 58.6	3.646	2.655	+1.71	-9.6	18.1	10.2
Aug. 27	09 23.23	+15 22.3	3.650	2.689	+1.64	-9.9	18.2	15.4
Sept. 6	09 39.66	+13 43.4	3.643	2.724	+1.57	-10.1	18.2	20.8
Sept. 16	09 55.36	+12 02.8	3.626	2.761	+1.50	-10.1	18.3	26.3
Sept. 26	10 10.32	+10 21.5	3.596	2.798	+1.42	-10.1	18.3	32.1
Oct. 6	10 24.48	+08 40.6	3.556	2.836	+1.33	-10.0	18.4	38.1
Oct. 16	10 37.81	+07 00.8	3.504	2.875	+1.24	-9.8	18.4	44.3
Oct. 26	10 50.24	+05 23.3	3.441	2.915	+1.14	-9.4	18.5	50.7
Nov. 5	11 01.69	+03 49.0	3.368	2.955	+1.04	-9.0	18.5	57.5
Nov. 15	11 12.05	+02 18.9	3.285	2.996	+0.91	-8.5	18.5	64.6
Nov. 25	11 21.20	+00 54.1	3.194	3.038	+0.78	-7.8	18.6	72.0
Dec. 5	11 28.99	-00 24.2	3.098	3.080	+0.63	-7.1	18.6	79.8
Dec. 15	11 35.25	-01 35.0	2.997	3.122	+0.46	-6.2	18.6	88.1
Dec. 25	11 39.80	-02 36.8	2.895	3.165	+0.27	-5.2	18.6	96.8
Jan. 4	11 42.49	-03 28.3	2.796	3.208	+0.07	-4.0	18.6	105.9
Jan. 14	11 43.17	-04 08.3	2.703	3.252	-0.14	-2.7	18.6	115.6
Jan. 24	11 41.79	-04 35.4	2.620	3.295	-0.34	-1.4	18.7	125.9
Feb. 3	11 38.42	-04 49.1	2.554	3.339	-0.51	0.0	18.7	136.5
Feb. 13	11 33.29	-04 49.0	2.508	3.382	-0.65	+1.3	18.7	147.5
Feb. 23	11 26.80	-04 36.3	2.486	3.426	-0.72	+2.3	18.8	158.6
Mar. 5	11 19.57	-04 13.2	2.492	3.470	-0.73	+3.0	18.9	168.6
Mar. 15	11 12.25	-03 42.9	2.528	3.514	-0.67	+3.3	19.0	171.1
Mar. 25	11 05.52	-03 09.6	2.594	3.558	-0.56	+3.2	19.2	162.6

Comet P/2008 J3 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2009 Mar. 10.75737 TT
Peri. = 4.41991 e = 0.4123729
Node = 9.85550 2000.0 a = 3.8922048 AU
Incl. = 25.39917 n = 0.12835434
q = 2.2871650 AU P = 7.68 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 43.04	-14 03.4	2.863	2.330	+1.57	+17.6	17.2	48.4
Jan. 19	22 58.70	-11 07.6	2.939	2.317	+1.60	+17.7	17.2	42.9
Jan. 29	23 14.70	-08 10.6	3.010	2.306	+1.63	+17.8	17.2	37.4
Feb. 8	23 30.99	-05 12.8	3.073	2.298	+1.65	+17.8	17.3	32.1
Feb. 18	23 47.52	-02 14.6	3.129	2.292	+1.68	+17.8	17.3	26.9
Feb. 28	00 04.30	+00 43.6	3.178	2.289	+1.70	+17.7	17.3	21.9
Mar. 10	00 21.30	+03 41.0	3.219	2.287	+1.72	+17.6	17.3	17.0
Mar. 20	00 38.53	+06 37.1	3.251	2.288	+1.75	+17.4	17.4	12.3
Mar. 30	00 56.01	+09 31.3	3.276	2.291	+1.77	+17.2	17.4	8.0
Apr. 9	01 13.74	+12 22.8	3.293	2.297	+1.80	+16.8	17.4	4.9
Apr. 19	01 31.74	+15 11.0	3.302	2.305	+1.83	+16.4	17.4	5.6
Apr. 29	01 50.03	+17 55.2	3.304	2.315	+1.86	+16.0	17.5	9.2
May 9	02 08.62	+20 34.7	3.297	2.327	+1.89	+15.4	17.5	13.4
May 19	02 27.51	+23 09.0	3.284	2.342	+1.92	+14.8	17.5	17.9
May 29	02 46.72	+25 37.4	3.263	2.358	+1.95	+14.2	17.6	22.5
June 8	03 06.20	+27 59.4	3.235	2.377	+1.97	+13.5	17.6	27.1
June 18	03 25.95	+30 14.7	3.200	2.397	+2.00	+12.8	17.6	31.8
June 28	03 45.90	+32 23.0	3.158	2.419	+2.01	+12.1	17.7	36.6
July 8	04 05.99	+34 24.1	3.109	2.443	+2.01	+11.4	17.7	41.5
July 18	04 26.12	+36 18.2	3.055	2.468	+2.00	+10.7	17.7	46.5
July 28	04 46.16	+38 05.7	2.994	2.495	+1.98	+10.1	17.7	51.7
Aug. 7	05 05.95	+39 47.1	2.928	2.524	+1.94	+9.6	17.8	57.0
Aug. 17	05 25.31	+41 23.5	2.857	2.553	+1.87	+9.3	17.8	62.5
Aug. 27	05 44.02	+42 56.1	2.782	2.584	+1.78	+9.0	17.8	68.2
Sept. 6	06 01.80	+44 26.3	2.704	2.616	+1.66	+9.0	17.8	74.2
Sept.16	06 18.37	+45 55.8	2.623	2.649	+1.50	+9.1	17.8	80.5
Sept.26	06 33.36	+47 26.5	2.541	2.683	+1.30	+9.3	17.9	87.0
Oct. 6	06 46.37	+48 59.8	2.460	2.718	+1.06	+9.7	17.9	93.9
Oct. 16	06 56.92	+50 36.8	2.382	2.753	+0.75	+10.1	17.9	101.0
Oct. 26	07 04.45	+52 17.6	2.310	2.789	+0.39	+10.3	17.9	108.5
Nov. 5	07 08.40	+54 00.6	2.246	2.826	-0.02	+10.2	17.9	116.0
Nov. 15	07 08.21	+55 42.3	2.194	2.863	-0.48	+9.4	18.0	123.6
Nov. 25	07 03.45	+57 16.2	2.158	2.901	-0.92	+7.8	18.0	130.8
Dec. 5	06 54.23	+58 34.0	2.139	2.939	-1.29	+5.3	18.1	137.1
Dec. 15	06 41.32	+59 26.6	2.142	2.977	-1.50	+2.1	18.2	141.7
Dec. 25	06 26.35	+59 47.3	2.168	3.016	-1.48	-1.3	18.3	143.5
Jan. 4	06 11.56	+59 33.9	2.217	3.055	-1.26	-4.4	18.4	142.3
Jan. 14	05 58.99	+58 50.3	2.290	3.094	-0.89	-6.6	18.6	138.3
Jan. 24	05 50.05	+57 43.8	2.385	3.134	-0.48	-8.0	18.7	132.4
Feb. 3	05 45.28	+56 23.4	2.499	3.173	-0.08	-8.7	18.9	125.4
Feb. 13	05 44.53	+54 56.5	2.629	3.212	+0.28	-8.8	19.1	118.0
Feb. 23	05 47.35	+53 28.5	2.773	3.252	+0.58	-8.6	19.3	110.4
Mar. 5	05 53.15	+52 02.7	2.926	3.291	+0.82	-8.2	19.5	102.8
Mar. 15	06 01.35	+50 40.5	3.087	3.331	+1.01	-7.8	19.7	95.4
Mar. 25	06 11.46	+49 22.3	3.251	3.370	+1.16	-7.4	19.9	88.2

Comet C/2009 B2 (LINEAR)

T = 2009 Mar. 10.7609 TT
Peri. = 193.9542
Node = 18.9054 2000.0
Incl. = 156.9937
q = 2.327832 AU
e = 1.0

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

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	15 06.38	-14 11.0	2.752	2.426	-0.57	-4.5	18.8	60.6
Jan. 19	15 00.70	-14 55.5	2.513	2.397	-0.97	-4.1	18.6	71.9
Jan. 29	14 51.04	-15 36.7	2.262	2.373	-1.54	-3.4	18.3	84.1
Feb. 8	14 35.69	-16 10.9	2.011	2.353	-2.33	-2.0	18.0	97.6
Feb. 18	14 12.41	-16 30.6	1.771	2.340	-3.37	+1.1	17.7	112.8
Feb. 28	13 38.71	-16 19.3	1.564	2.331	-4.53	+6.7	17.4	130.4
Mar. 10	12 53.43	-15 12.0	1.414	2.328	-5.37	+14.3	17.2	150.0
Mar. 20	11 59.76	-12 48.5	1.349	2.330	-5.37	+20.3	17.1	166.9
Mar. 30	11 06.07	-09 25.4	1.384	2.338	-4.53	+21.1	17.2	157.4
Apr. 9	10 20.77	-05 54.3	1.511	2.351	-3.38	+17.8	17.4	137.8
Apr. 19	09 46.97	-02 56.4	1.704	2.369	-2.35	+13.3	17.7	119.8
Apr. 29	09 23.51	-00 43.2	1.936	2.393	-1.56	+9.4	18.0	104.3
May 9	09 07.93	+00 50.4	2.187	2.421	-1.00	+6.3	18.3	90.8
May 19	08 57.98	+01 53.2	2.442	2.454	-0.60	+4.0	18.6	78.7
May 29	08 52.00	+02 32.8	2.690	2.491	-0.32	+2.2	18.9	67.8
June 8	08 48.80	+02 54.7	2.924	2.533	-0.12	+0.8	19.2	57.8
June 18	08 47.56	+03 02.9	3.139	2.578	+0.01	-0.3	19.4	48.4
June 28	08 47.68	+03 00.0	3.331	2.627	+0.10	-1.2	19.6	39.5
July 8	08 48.72	+02 48.0	3.497	2.680	+0.16	-2.0	19.8	31.2
July 18	08 50.33	+02 28.4	3.634	2.735	+0.19	-2.6	20.0	23.8
July 28	08 52.26	+02 01.9	3.742	2.793	+0.20	-3.2	20.1	17.9
Aug. 7	08 54.23	+01 29.6	3.819	2.854	+0.18	-3.8	20.3	15.4
Aug. 17	08 56.05	+00 52.1	3.865	2.917	+0.15	-4.2	20.4	17.6
Aug. 27	08 57.50	+00 09.7	3.882	2.982	+0.09	-4.7	20.5	23.4
Sept. 6	08 58.36	-00 36.8	3.869	3.048	0.00	-5.0	20.6	30.9
Sept.16	08 58.40	-01 27.1	3.829	3.117	-0.10	-5.3	20.7	39.3
Sept.26	08 57.35	-02 20.5	3.764	3.187	-0.24	-5.6	20.7	48.3
Oct. 6	08 54.93	-03 16.3	3.679	3.258	-0.41	-5.7	20.8	57.8
Oct. 16	08 50.83	-04 13.4	3.576	3.331	-0.61	-5.7	20.8	67.9
Oct. 26	08 44.69	-05 10.3	3.463	3.405	-0.85	-5.5	20.8	78.4
Nov. 5	08 36.18	-06 04.8	3.345	3.479	-1.12	-4.9	20.8	89.4
Nov. 15	08 25.03	-06 54.2	3.232	3.555	-1.40	-4.0	20.9	100.9
Nov. 25	08 11.06	-07 34.6	3.133	3.631	-1.67	-2.7	20.9	112.8
Dec. 5	07 54.40	-08 01.6	3.057	3.708	-1.89	-0.9	20.9	124.7
Dec. 15	07 35.50	-08 11.1	3.015	3.785	-2.03	+1.1	21.0	136.0
Dec. 25	07 15.22	-07 59.8	3.014	3.863	-2.05	+3.2	21.1	145.2
Jan. 4	06 54.73	-07 27.7	3.060	3.941	-1.95	+5.0	21.2	149.8
Jan. 14	06 35.24	-06 37.2	3.154	4.020	-1.75	+6.4	21.3	147.6
Jan. 24	06 17.76	-05 33.2	3.294	4.098	-1.48	+7.2	21.5	140.2
Feb. 3	06 02.94	-04 21.5	3.472	4.178	-1.19	+7.4	21.7	130.3
Feb. 13	05 51.00	-03 07.0	3.682	4.257	-0.91	+7.3	21.9	119.6
Feb. 23	05 41.89	-01 53.7	3.915	4.336	-0.65	+6.9	22.1	108.8
Mar. 5	05 35.38	-00 44.2	4.162	4.416	-0.43	+6.4	22.3	98.3
Mar. 15	05 31.11	+00 20.0	4.416	4.495	-0.23	+5.8	22.6	88.2
Mar. 25	05 28.76	+01 18.1	4.670	4.575	-0.08	+5.2	22.8	78.4

Comet 18D/Perrine-Mrkos [Orbit 1]

Epoch = 2009 July 28.0 TT
T = 2009 Mar. 12.60668 TT
Peri. = 151.94121 e = 0.5750862
Node = 236.87405 2000.0 a = 4.1798330 AU
Incl. = 13.34650 n = 0.11533621
q = 1.7760687 AU P = 8.55 years

m1 = 11.5 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	22 14.99	-01 16.3	2.403	1.877	-1.19	-5.3	18.9	36.8/ 75	47.1
Jan. 19	22 38.68	+00 17.7	2.441	1.848	-1.23	-5.3	18.8	38.0/ 74	43.1
Jan. 29	23 03.08	+02 01.3	2.478	1.824	-1.26	-5.3	18.7	39.1/ 73	39.2
Feb. 8	23 28.09	+03 52.3	2.514	1.804	-1.29	-5.2	18.6	39.9/ 73	35.5
Feb. 18	23 53.62	+05 48.2	2.549	1.790	-1.32	-5.0	18.6	40.5/ 73	32.0
Feb. 28	00 19.62	+07 46.3	2.586	1.780	-1.35	-4.7	18.6	40.9/ 73	28.6
Mar. 10	00 46.02	+09 43.7	2.622	1.776	-1.36	-4.3	18.6	41.0/ 73	25.3
Mar. 20	01 12.76	+11 37.4	2.660	1.778	-1.38	-3.8	18.6	41.0/ 74	22.1
Mar. 30	01 39.78	+13 24.9	2.699	1.784	-1.38	-3.2	18.7	40.8/ 75	18.9
Apr. 9	02 06.99	+15 03.5	2.739	1.796	-1.38	-2.6	18.8	40.4/ 77	15.7
Apr. 19	02 34.30	+16 30.9	2.780	1.813	-1.37	-1.8	18.9	39.8/ 78	12.6
Apr. 29	03 01.60	+17 45.3	2.821	1.835	-1.35	-1.1	19.0	39.2/ 80	9.4
May 9	03 28.77	+18 45.3	2.862	1.862	-1.32	-0.3	19.2	38.4/ 82	6.1
May 19	03 55.66	+19 29.9	2.902	1.892	-1.28	+0.5	19.4	37.5/ 84	3.0
May 29	04 22.15	+19 58.8	2.940	1.927	-1.24	+1.2	19.5	36.6/ 87	1.6
June 8	04 48.09	+20 11.9	2.975	1.965	-1.19	+1.8	19.7	35.5/ 89	4.6
June 18	05 13.33	+20 09.7	3.007	2.007	-1.13	+2.4	19.9	34.5/ 92	8.2
June 28	05 37.78	+19 52.9	3.035	2.052	-1.07	+2.9	20.2	33.4/ 94	12.1
July 8	06 01.31	+19 22.5	3.057	2.099	-1.01	+3.3	20.4	32.2/ 97	16.1
July 18	06 23.84	+18 39.8	3.072	2.148	-0.95	+3.6	20.6	31.1/ 99	20.2
July 28	06 45.31	+17 46.1	3.081	2.199	-0.90	+3.8	20.8	29.8/102	24.6
Aug. 7	07 05.64	+16 42.7	3.082	2.252	-0.84	+4.0	21.0	28.5/104	29.3
Aug. 17	07 24.80	+15 31.2	3.074	2.306	-0.79	+4.1	21.2	27.2/106	34.1
Aug. 27	07 42.74	+14 12.9	3.056	2.362	-0.75	+4.1	21.4	25.7/109	39.2
Sept. 6	07 59.40	+12 49.3	3.030	2.418	-0.71	+4.1	21.6	24.2/111	44.6
Sept.16	08 14.75	+11 21.5	2.994	2.476	-0.68	+4.0	21.8	22.5/113	50.3
Sept.26	08 28.71	+09 51.2	2.948	2.534	-0.65	+3.9	21.9	20.6/116	56.3
Oct. 6	08 41.21	+08 19.6	2.894	2.592	-0.63	+3.8	22.1	18.6/119	62.7
Oct. 16	08 52.13	+06 48.1	2.831	2.651	-0.62	+3.7	22.2	16.4/123	69.4
Oct. 26	09 01.36	+05 18.3	2.761	2.710	-0.61	+3.6	22.4	14.0/128	76.6
Nov. 5	09 08.75	+03 51.8	2.686	2.769	-0.61	+3.5	22.5	11.5/135	84.3
Nov. 15	09 14.14	+02 30.4	2.608	2.828	-0.62	+3.3	22.6	8.8/147	92.4
Nov. 25	09 17.36	+01 16.4	2.531	2.887	-0.64	+3.2	22.7	6.6/168	101.0
Dec. 5	09 18.29	+00 12.1	2.457	2.946	-0.66	+3.2	22.8	5.6/202	110.2
Dec. 15	09 16.88	-00 40.2	2.391	3.005	-0.69	+3.1	22.9	6.7/236	119.9
Dec. 25	09 13.17	-01 17.7	2.338	3.063	-0.73	+3.1	23.1	8.9/256	129.9
Jan. 4	09 07.42	-01 38.6	2.303	3.122	-0.77	+3.2	23.2	11.0/268	140.1
Jan. 14	09 00.08	-01 41.6	2.290	3.180	-0.80	+3.3	23.3	12.5/277	150.0
Jan. 24	08 51.83	-01 27.3	2.303	3.237	-0.82	+3.3	23.5	12.9/283	158.2
Feb. 3	08 43.45	-00 57.8	2.345	3.295	-0.82	+3.4	23.7	12.3/289	161.6
Feb. 13	08 35.71	-00 16.9	2.416	3.352	-0.82	+3.4	23.9	10.8/296	157.9
Feb. 23	08 29.28	+00 30.9	2.515	3.408	-0.79	+3.4	24.2	8.6/306	149.9
Mar. 5	08 24.61	+01 20.9	2.640	3.464	-0.76	+3.3	24.4	6.3/320	140.5
Mar. 15	08 21.90	+02 09.3	2.787	3.519	-0.72	+3.2	24.7	4.5/346	130.9
Mar. 25	08 21.20	+02 53.2	2.952	3.574	-0.68	+3.1	24.9	4.1/ 25	121.4

Comet P/2002 Q1 (Van Ness)

Epoch = 2009 July 28.0 TT
T = 2009 Mar. 22.61258 TT
Peri. = 185.02984 e = 0.5640772
Node = 174.00060 2000.0 a = 3.5586547 AU
Incl. = 36.28330 n = 0.14681665
q = 1.5512987 AU P = 6.71 years

m1 = 12.8 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	20 31.73	-04 13.3	2.562	1.719	-1.29	+5.4	19.0	41.6/ 92	24.8
Jan. 19	20 59.53	-04 25.1	2.561	1.679	-1.34	+5.5	18.8	42.4/ 90	20.9
Jan. 29	21 27.87	-04 23.8	2.559	1.643	-1.39	+5.5	18.6	43.0/ 89	17.0
Feb. 8	21 56.61	-04 10.8	2.557	1.612	-1.43	+5.5	18.5	43.5/ 87	13.1
Feb. 18	22 25.64	-03 47.9	2.555	1.588	-1.46	+5.5	18.3	43.9/ 86	9.3
Feb. 28	22 54.88	-03 17.0	2.552	1.569	-1.49	+5.4	18.3	44.1/ 85	5.5
Mar. 10	23 24.25	-02 40.3	2.549	1.557	-1.51	+5.3	18.2	44.3/ 85	1.7
Mar. 20	23 53.68	-02 00.1	2.546	1.552	-1.52	+5.2	18.2	44.3/ 85	2.0
Mar. 30	00 23.12	-01 18.8	2.544	1.553	-1.52	+5.0	18.2	44.2/ 85	5.7
Apr. 9	00 52.50	-00 38.6	2.542	1.562	-1.51	+4.9	18.2	44.0/ 85	9.3
Apr. 19	01 21.76	-00 01.9	2.540	1.577	-1.49	+4.7	18.3	43.7/ 86	12.9
Apr. 29	01 50.83	+00 29.2	2.540	1.599	-1.47	+4.6	18.4	43.2/ 87	16.3
May 9	02 19.60	+00 52.7	2.541	1.626	-1.43	+4.4	18.5	42.6/ 88	19.7
May 19	02 47.97	+01 07.0	2.543	1.659	-1.39	+4.2	18.7	41.8/ 89	23.0
May 29	03 15.84	+01 10.6	2.547	1.697	-1.34	+3.9	18.9	40.8/ 91	26.2
June 8	03 43.06	+01 02.5	2.551	1.740	-1.28	+3.7	19.0	39.7/ 93	29.4
June 18	04 09.51	+00 42.1	2.556	1.786	-1.22	+3.4	19.2	38.5/ 95	32.6
June 28	04 35.06	+00 09.2	2.562	1.836	-1.16	+3.0	19.5	37.1/ 97	35.8
July 8	04 59.59	-00 36.3	2.566	1.888	-1.10	+2.6	19.7	35.5/ 99	39.0
July 18	05 22.98	-01 33.8	2.570	1.943	-1.03	+2.1	19.9	33.9/102	42.3
July 28	05 45.14	-02 42.7	2.571	2.000	-0.97	+1.6	20.1	32.2/104	45.8
Aug. 7	06 05.95	-04 02.2	2.569	2.059	-0.92	+1.1	20.3	30.3/107	49.4
Aug. 17	06 25.36	-05 31.2	2.563	2.118	-0.87	+0.5	20.5	28.4/110	53.2
Aug. 27	06 43.26	-07 08.8	2.553	2.179	-0.82	-0.1	20.8	26.4/114	57.3
Sept. 6	06 59.55	-08 53.5	2.537	2.240	-0.79	-0.7	21.0	24.2/117	61.6
Sept.16	07 14.15	-10 44.3	2.516	2.302	-0.76	-1.4	21.1	22.0/122	66.2
Sept.26	07 26.91	-12 39.5	2.489	2.364	-0.74	-2.0	21.3	19.7/127	71.2
Oct. 6	07 37.71	-14 37.4	2.457	2.426	-0.72	-2.7	21.5	17.2/134	76.5
Oct. 16	07 46.38	-16 35.9	2.421	2.489	-0.72	-3.3	21.6	14.8/142	82.1
Oct. 26	07 52.72	-18 32.4	2.382	2.551	-0.73	-3.9	21.8	12.4/154	88.1
Nov. 5	07 56.57	-20 23.4	2.341	2.613	-0.76	-4.4	21.9	10.3/171	94.5
Nov. 15	07 57.77	-22 04.7	2.301	2.674	-0.79	-4.8	22.1	8.9/194	101.1
Nov. 25	07 56.23	-23 31.1	2.265	2.736	-0.83	-5.0	22.2	8.7/221	108.0
Dec. 5	07 52.02	-24 36.7	2.236	2.796	-0.88	-5.1	22.4	9.8/246	114.8
Dec. 15	07 45.43	-25 15.5	2.218	2.857	-0.92	-5.0	22.5	11.4/266	121.4
Dec. 25	07 37.01	-25 22.3	2.214	2.917	-0.96	-4.7	22.7	13.1/282	127.2
Jan. 4	07 27.59	-24 54.1	2.229	2.976	-0.99	-4.2	22.8	14.4/295	131.8
Jan. 14	07 18.08	-23 51.5	2.264	3.034	-0.99	-3.7	23.0	15.1/308	134.4
Jan. 24	07 09.44	-22 18.4	2.321	3.092	-0.97	-3.1	23.2	15.2/319	134.5
Feb. 3	07 02.40	-20 22.1	2.401	3.149	-0.94	-2.5	23.4	14.9/332	132.2
Feb. 13	06 57.43	-18 11.1	2.504	3.206	-0.89	-2.1	23.6	14.3/344	127.9
Feb. 23	06 54.74	-15 53.8	2.627	3.262	-0.84	-1.7	23.9	13.6/357	122.1
Mar. 5	06 54.31	-13 37.4	2.767	3.317	-0.78	-1.4	24.1	13.2/ 11	115.5
Mar. 15	06 55.97	-11 27.3	2.922	3.371	-0.73	-1.2	24.4	13.1/ 24	108.5
Mar. 25	06 59.51	-09 27.3	3.088	3.425	-0.68	-1.1	24.6	13.2/ 35	101.2

Comet 145P/Shoemaker-Levy

Epoch = 2009 July 28.0 TT
T = 2009 Mar. 26.61262 TT
Peri. = 10.14565 e = 0.5421997
Node = 26.90148 2000.0 a = 4.1314050 AU
Incl. = 11.29898 n = 0.11737008
q = 1.8913585 AU P = 8.40 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 53.36	-11 10.7	2.471	2.016	+1.92	+16.7	17.1	51.7
Jan. 19	23 12.60	-08 24.0	2.523	1.987	+1.99	+17.3	17.0	47.0
Jan. 29	23 32.49	-05 31.2	2.571	1.961	+2.05	+17.7	17.0	42.5
Feb. 8	23 52.95	-02 33.7	2.616	1.939	+2.10	+18.1	16.9	38.2
Feb. 18	00 13.96	+00 26.9	2.658	1.921	+2.16	+18.2	16.9	34.1
Feb. 28	00 35.51	+03 28.7	2.698	1.907	+2.21	+18.1	16.9	30.1
Mar. 10	00 57.60	+06 29.9	2.736	1.898	+2.26	+17.8	16.9	26.3
Mar. 20	01 20.23	+09 28.1	2.772	1.892	+2.32	+17.3	16.9	22.7
Mar. 30	01 43.44	+12 21.4	2.806	1.892	+2.38	+16.6	16.9	19.2
Apr. 9	02 07.21	+15 07.3	2.839	1.895	+2.43	+15.6	16.9	15.8
Apr. 19	02 31.54	+17 43.8	2.871	1.904	+2.49	+14.5	17.0	12.5
Apr. 29	02 56.42	+20 08.8	2.903	1.916	+2.54	+13.2	17.1	9.4
May 9	03 21.78	+22 20.4	2.932	1.933	+2.58	+11.7	17.1	6.6
May 19	03 47.55	+24 17.1	2.960	1.954	+2.61	+10.1	17.2	4.7
May 29	04 13.64	+25 57.6	2.986	1.978	+2.62	+8.4	17.4	4.9
June 8	04 39.88	+27 21.1	3.009	2.006	+2.62	+6.6	17.5	7.2
June 18	05 06.12	+28 27.4	3.029	2.038	+2.61	+4.9	17.6	10.3
June 28	05 32.18	+29 16.5	3.046	2.072	+2.57	+3.3	17.8	13.8
July 8	05 57.86	+29 49.1	3.057	2.110	+2.51	+1.7	17.9	17.5
July 18	06 22.99	+30 06.4	3.063	2.150	+2.44	+0.3	18.0	21.4
July 28	06 47.40	+30 09.8	3.063	2.192	+2.35	-0.9	18.2	25.6
Aug. 7	07 10.91	+30 01.1	3.057	2.236	+2.25	-1.9	18.3	30.0
Aug. 17	07 33.43	+29 42.4	3.043	2.282	+2.14	-2.7	18.5	34.6
Aug. 27	07 54.83	+29 15.8	3.020	2.330	+2.02	-3.2	18.6	39.4
Sept. 6	08 15.01	+28 43.6	2.990	2.379	+1.89	-3.6	18.8	44.6
Sept. 16	08 33.92	+28 08.1	2.950	2.429	+1.75	-3.6	18.9	50.0
Sept. 26	08 51.45	+27 31.7	2.902	2.480	+1.61	-3.5	19.0	55.7
Oct. 6	09 07.54	+26 56.6	2.846	2.532	+1.45	-3.1	19.1	61.9
Oct. 16	09 22.09	+26 25.3	2.781	2.585	+1.29	-2.5	19.2	68.3
Oct. 26	09 34.97	+25 59.9	2.710	2.638	+1.11	-1.7	19.3	75.3
Nov. 5	09 46.04	+25 42.7	2.633	2.692	+0.91	-0.7	19.4	82.6
Nov. 15	09 55.13	+25 35.4	2.553	2.746	+0.69	+0.4	19.5	90.5
Nov. 25	10 02.03	+25 39.9	2.472	2.801	+0.45	+1.7	19.6	98.9
Dec. 5	10 06.52	+25 56.9	2.394	2.855	+0.19	+3.0	19.7	107.9
Dec. 15	10 08.42	+26 26.4	2.322	2.910	-0.09	+4.1	19.7	117.4
Dec. 25	10 07.57	+27 07.1	2.261	2.964	-0.36	+4.9	19.8	127.5
Jan. 4	10 03.98	+27 55.6	2.216	3.019	-0.61	+5.1	19.9	137.9
Jan. 14	09 57.87	+28 47.1	2.192	3.073	-0.81	+4.8	20.0	148.4
Jan. 24	09 49.73	+29 35.3	2.193	3.128	-0.93	+3.9	20.2	158.0
Feb. 3	09 40.39	+30 13.9	2.222	3.182	-0.96	+2.5	20.3	164.2
Feb. 13	09 30.80	+30 38.5	2.280	3.236	-0.88	+0.8	20.5	162.5
Feb. 23	09 21.96	+30 46.6	2.367	3.289	-0.73	-0.8	20.7	154.7
Mar. 5	09 14.66	+30 38.6	2.481	3.342	-0.52	-2.2	20.9	145.0
Mar. 15	09 09.42	+30 16.6	2.619	3.395	-0.30	-3.3	21.2	135.0
Mar. 25	09 06.46	+29 43.1	2.775	3.448	-0.07	-4.2	21.4	125.2

Comet 199P/Shoemaker

Epoch = 2009 July 28.0 TT
T = 2009 Apr. 9.80508 TT
Peri. = 191.92218 e = 0.5086565
Node = 92.93676 2000.0 a = 5.9740242 AU
Incl. = 24.75250 n = 0.06749997
q = 2.9352979 AU P = 14.60 years

m1 = 6.0 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	18 00.82	-20 22.3	3.920	3.006	+1.72	-3.8	17.3	18.8
Jan. 19	18 18.07	-21 00.7	3.856	2.991	+1.72	-3.3	17.3	24.8
Jan. 29	18 35.30	-21 33.2	3.780	2.979	+1.71	-2.7	17.2	30.9
Feb. 8	18 52.40	-22 00.6	3.694	2.967	+1.69	-2.3	17.1	37.1
Feb. 18	19 09.26	-22 23.9	3.597	2.958	+1.65	-2.0	17.0	43.4
Feb. 28	19 25.79	-22 44.1	3.492	2.950	+1.61	-1.9	16.9	49.7
Mar. 10	19 41.84	-23 02.9	3.379	2.944	+1.55	-1.9	16.8	56.1
Mar. 20	19 57.33	-23 21.6	3.260	2.939	+1.48	-2.1	16.8	62.7
Mar. 30	20 12.12	-23 42.2	3.136	2.936	+1.40	-2.4	16.7	69.3
Apr. 9	20 26.07	-24 06.7	3.009	2.935	+1.30	-3.0	16.6	76.2
Apr. 19	20 39.05	-24 37.0	2.880	2.936	+1.18	-3.9	16.5	83.2
Apr. 29	20 50.90	-25 15.6	2.752	2.939	+1.05	-4.9	16.4	90.5
May 9	21 01.43	-26 04.4	2.627	2.943	+0.90	-6.1	16.3	98.0
May 19	21 10.45	-27 05.3	2.508	2.949	+0.73	-7.5	16.2	105.8
May 29	21 17.73	-28 19.9	2.396	2.956	+0.53	-8.8	16.1	114.0
June 8	21 23.06	-29 48.3	2.296	2.966	+0.32	-10.1	16.1	122.4
June 18	21 26.25	-31 29.5	2.210	2.977	+0.09	-11.1	16.0	131.0
June 28	21 27.14	-33 20.7	2.142	2.989	-0.14	-11.6	16.0	139.5
July 8	21 25.74	-35 16.7	2.095	3.003	-0.35	-11.4	16.0	147.6
July 18	21 22.25	-37 10.6	2.072	3.019	-0.52	-10.4	16.0	154.2
July 28	21 17.09	-38 54.6	2.073	3.037	-0.61	-8.7	16.0	157.6
Aug. 7	21 11.01	-40 21.3	2.100	3.055	-0.61	-6.4	16.1	156.1
Aug. 17	21 04.88	-41 25.8	2.152	3.075	-0.53	-4.0	16.2	150.7
Aug. 27	20 59.60	-42 05.8	2.228	3.097	-0.36	-1.6	16.3	143.2
Sept. 6	20 55.95	-42 22.2	2.324	3.120	-0.15	+0.5	16.5	135.0
Sept. 16	20 54.41	-42 17.5	2.438	3.144	+0.08	+2.2	16.6	126.7
Sept. 26	20 55.20	-41 55.1	2.567	3.169	+0.31	+3.7	16.8	118.4
Oct. 6	20 58.33	-41 18.3	2.707	3.196	+0.53	+4.8	17.0	110.4
Oct. 16	21 03.60	-40 30.1	2.856	3.224	+0.72	+5.7	17.2	102.6
Oct. 26	21 10.77	-39 32.7	3.011	3.252	+0.88	+6.5	17.4	95.0
Nov. 5	21 19.55	-38 28.0	3.168	3.282	+1.01	+7.1	17.5	87.7
Nov. 15	21 29.64	-37 17.3	3.326	3.313	+1.12	+7.6	17.7	80.6
Nov. 25	21 40.80	-36 01.6	3.483	3.344	+1.20	+8.0	17.9	73.8
Dec. 5	21 52.79	-34 41.8	3.637	3.377	+1.26	+8.3	18.1	67.0
Dec. 15	22 05.39	-33 18.8	3.785	3.410	+1.31	+8.6	18.2	60.5
Dec. 25	22 18.45	-31 53.2	3.927	3.444	+1.34	+8.7	18.4	54.1
Jan. 4	22 31.82	-30 25.9	4.060	3.479	+1.36	+8.8	18.5	48.0
Jan. 14	22 45.39	-28 57.6	4.183	3.514	+1.37	+8.9	18.7	42.0
Jan. 24	22 59.05	-27 28.9	4.296	3.550	+1.37	+8.8	18.8	36.3
Feb. 3	23 12.73	-26 00.7	4.396	3.587	+1.36	+8.7	18.9	31.0
Feb. 13	23 26.36	-24 33.8	4.483	3.624	+1.35	+8.5	19.0	26.2
Feb. 23	23 39.88	-23 08.9	4.557	3.662	+1.34	+8.2	19.2	22.4
Mar. 5	23 53.25	-21 46.8	4.617	3.700	+1.32	+7.9	19.3	19.9
Mar. 15	00 06.42	-20 28.2	4.662	3.738	+1.29	+7.4	19.4	19.4
Mar. 25	00 19.34	-19 13.9	4.692	3.777	+1.26	+6.9	19.5	20.9

Comet 209P/LINEAR

Epoch = 2009 July 28.0 TT
T = 2009 Apr. 15.97844 TT
Peri. = 149.73965 e = 0.6889508
Node = 66.44518 2000.0 a = 2.9375527 AU
Incl. = 19.14818 n = 0.19576073
q = 0.9137234 AU P = 5.03 years

H = 15.2 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	10 43.98	+46 35.8	0.760	1.599	+2.34	+32.6	16.8	132.6
Jan. 19	11 07.43	+52 01.9	0.652	1.504	+2.99	+37.6	16.4	132.6
Jan. 29	11 37.36	+58 17.7	0.563	1.409	+4.34	+39.6	16.1	129.0
Feb. 8	12 20.81	+64 53.4	0.491	1.315	+7.20	+35.3	15.8	122.2
Feb. 18	13 32.85	+70 46.4	0.433	1.225	+11.88	+18.1	15.6	113.0
Feb. 28	15 31.65	+73 47.4	0.385	1.139	+13.38	-15.4	15.5	102.7
Mar. 10	17 45.49	+71 13.5	0.343	1.062	+9.16	-49.3	15.4	92.0
Mar. 20	19 17.12	+63 00.9	0.306	0.997	+5.63	-76.8	15.5	81.4
Mar. 30	20 13.37	+50 12.5	0.276	0.948	+4.02	-99.7	15.6	71.5
Apr. 9	20 53.62	+33 35.2	0.262	0.920	+3.40	107.5	15.8	64.5
Apr. 19	21 27.59	+15 40.3	0.270	0.915	+3.08	-93.8	15.9	63.2
Apr. 29	21 58.39	+00 02.3	0.301	0.934	+2.79	-71.1	15.8	67.5
May 9	22 26.26	-11 48.7	0.346	0.975	+2.43	-52.1	15.8	74.4
May 19	22 50.58	-20 29.2	0.397	1.035	+1.98	-40.0	15.9	82.1
May 29	23 10.33	-27 09.4	0.447	1.107	+1.43	-33.3	16.0	90.0
June 8	23 24.62	-32 42.8	0.494	1.190	+0.80	-29.8	16.1	98.1
June 18	23 32.65	-37 40.4	0.539	1.279	+0.08	-27.4	16.2	106.5
June 28	23 33.46	-42 14.6	0.585	1.371	-0.71	-24.5	16.4	115.1
July 8	23 26.36	-46 19.9	0.634	1.466	-1.49	-20.1	16.5	123.5
July 18	23 11.44	-49 40.5	0.692	1.561	-2.13	-13.7	16.6	131.1
July 28	22 50.18	-51 57.2	0.761	1.656	-2.41	-6.0	16.8	137.1
Aug. 7	22 26.12	-52 57.0	0.846	1.751	-2.27	+1.3	17.1	140.4
Aug. 17	22 03.46	-52 43.6	0.946	1.844	-1.81	+7.1	17.4	140.6
Aug. 27	21 45.37	-51 32.2	1.064	1.936	-1.22	+10.9	17.8	137.9
Sept. 6	21 33.21	-49 42.9	1.198	2.026	-0.65	+13.0	18.2	133.2
Sept.16	21 26.68	-47 33.3	1.348	2.115	-0.18	+13.9	18.5	127.3
Sept.26	21 24.90	-45 14.7	1.512	2.202	+0.20	+14.0	18.9	120.9
Oct. 6	21 26.86	-42 54.3	1.688	2.287	+0.48	+13.8	19.2	114.2
Oct. 16	21 31.65	-40 35.9	1.874	2.370	+0.69	+13.5	19.6	107.3
Oct. 26	21 38.56	-38 20.7	2.067	2.451	+0.85	+13.1	19.8	100.5
Nov. 5	21 47.05	-36 09.6	2.266	2.531	+0.96	+12.7	20.1	93.7
Nov. 15	21 56.69	-34 02.5	2.468	2.609	+1.05	+12.3	20.3	86.9
Nov. 25	22 07.18	-31 59.1	2.671	2.685	+1.11	+12.0	20.5	80.1
Dec. 5	22 18.29	-29 59.3	2.873	2.759	+1.15	+11.7	20.7	73.4
Dec. 15	22 29.82	-28 02.7	3.071	2.831	+1.18	+11.3	20.9	66.8
Dec. 25	22 41.65	-26 09.3	3.263	2.902	+1.20	+11.0	21.0	60.2
Jan. 4	22 53.66	-24 19.0	3.447	2.971	+1.21	+10.7	21.1	53.6
Jan. 14	23 05.77	-22 31.8	3.622	3.039	+1.21	+10.4	21.2	47.1
Jan. 24	23 17.91	-20 47.9	3.784	3.105	+1.21	+10.0	21.3	40.7
Feb. 3	23 30.01	-19 07.5	3.933	3.169	+1.20	+9.7	21.3	34.4
Feb. 13	23 42.04	-17 30.8	4.067	3.232	+1.19	+9.3	21.4	28.4
Feb. 23	23 53.95	-15 58.0	4.184	3.294	+1.17	+8.8	21.4	22.7
Mar. 5	00 05.69	-14 29.6	4.284	3.354	+1.15	+8.4	21.4	17.8
Mar. 15	00 17.23	-13 05.9	4.366	3.412	+1.13	+7.9	21.4	14.4
Mar. 25	00 28.52	-11 47.1	4.429	3.469	+1.10	+7.3	21.5	13.8

Comet 18D/Perrine-Mrkos [Orbit 2]

Epoch = 2009 July 28.0 TT
T = 2009 Apr. 17.29125 TT
Peri. = 156.80930 e = 0.5852371
Node = 238.06697 2000.0 a = 3.9447932 AU
Incl. = 16.86969 n = 0.12579626
q = 1.6361538 AU P = 7.83 years

m1 = 11.5 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	21 32.33	-01 58.4	2.591	1.911	-1.04	-4.6	19.2	36.1/ 76	37.7
Jan. 19	21 55.70	-00 32.1	2.599	1.863	-1.10	-4.7	19.0	37.7/ 75	33.7
Jan. 29	22 19.97	+01 05.8	2.604	1.818	-1.16	-4.8	18.8	39.1/ 74	30.0
Feb. 8	22 45.07	+02 53.8	2.605	1.777	-1.22	-4.8	18.6	40.4/ 73	26.4
Feb. 18	23 10.96	+04 49.6	2.606	1.741	-1.28	-4.8	18.4	41.6/ 73	23.1
Feb. 28	23 37.60	+06 50.8	2.606	1.709	-1.34	-4.6	18.2	42.5/ 73	20.0
Mar. 10	00 04.96	+08 54.5	2.607	1.683	-1.39	-4.4	18.1	43.2/ 73	17.1
Mar. 20	00 33.00	+10 57.3	2.609	1.662	-1.44	-3.9	18.0	43.7/ 74	14.2
Mar. 30	01 01.67	+12 55.9	2.614	1.647	-1.48	-3.4	17.9	44.0/ 75	11.5
Apr. 9	01 30.91	+14 46.8	2.621	1.638	-1.51	-2.7	17.9	44.0/ 76	8.8
Apr. 19	02 00.60	+16 26.8	2.631	1.636	-1.53	-1.8	17.9	43.9/ 78	6.2
Apr. 29	02 30.62	+17 52.9	2.644	1.641	-1.54	-0.9	17.9	43.5/ 80	3.7
May 9	03 00.80	+19 02.5	2.660	1.651	-1.53	+0.1	18.0	42.9/ 82	1.9
May 19	03 30.93	+19 53.9	2.678	1.668	-1.50	+1.1	18.1	42.2/ 84	2.9
May 29	04 00.81	+20 26.0	2.697	1.691	-1.47	+2.0	18.2	41.3/ 87	5.4
June 8	04 30.20	+20 38.3	2.718	1.719	-1.41	+2.9	18.4	40.3/ 90	8.2
June 18	04 58.89	+20 31.2	2.738	1.753	-1.35	+3.7	18.6	39.2/ 93	11.3
June 28	05 26.69	+20 05.6	2.757	1.791	-1.28	+4.3	18.8	38.0/ 95	14.5
July 8	05 53.43	+19 22.7	2.774	1.833	-1.21	+4.9	19.0	36.7/ 98	17.9
July 18	06 18.98	+18 24.3	2.788	1.879	-1.13	+5.3	19.2	35.4/101	21.4
July 28	06 43.27	+17 12.3	2.797	1.928	-1.06	+5.5	19.4	34.0/103	25.2
Aug. 7	07 06.20	+15 48.5	2.802	1.979	-0.98	+5.7	19.7	32.6/106	29.2
Aug. 17	07 27.77	+14 14.8	2.800	2.033	-0.92	+5.7	19.9	31.1/108	33.4
Aug. 27	07 47.93	+12 33.1	2.792	2.090	-0.86	+5.7	20.1	29.6/111	38.0
Sept. 6	08 06.65	+10 45.0	2.776	2.147	-0.81	+5.5	20.4	27.9/113	42.7
Sept.16	08 23.94	+08 52.3	2.752	2.206	-0.76	+5.4	20.6	26.2/116	47.8
Sept.26	08 39.74	+06 56.3	2.719	2.266	-0.72	+5.1	20.8	24.3/119	53.2
Oct. 6	08 53.99	+04 58.6	2.679	2.327	-0.70	+4.9	21.0	22.3/122	59.0
Oct. 16	09 06.63	+03 00.6	2.630	2.389	-0.67	+4.6	21.2	20.1/125	65.1
Oct. 26	09 17.55	+01 03.7	2.574	2.451	-0.66	+4.3	21.3	17.7/130	71.7
Nov. 5	09 26.62	-00 50.3	2.512	2.513	-0.66	+4.0	21.5	15.2/136	78.7
Nov. 15	09 33.68	-02 39.8	2.446	2.576	-0.66	+3.8	21.7	12.6/145	86.1
Nov. 25	09 38.55	-04 22.4	2.378	2.638	-0.68	+3.5	21.8	10.0/158	94.1
Dec. 5	09 41.07	-05 55.6	2.310	2.701	-0.70	+3.3	21.9	8.1/180	102.5
Dec. 15	09 41.11	-07 16.3	2.247	2.763	-0.74	+3.1	22.1	7.4/210	111.4
Dec. 25	09 38.63	-08 21.0	2.193	2.825	-0.78	+3.1	22.2	8.5/238	120.8
Jan. 4	09 33.79	-09 06.2	2.151	2.887	-0.82	+3.1	22.4	10.4/257	130.3
Jan. 14	09 26.92	-09 29.0	2.128	2.948	-0.86	+3.2	22.5	12.3/270	139.7
Jan. 24	09 18.64	-09 27.8	2.127	3.009	-0.90	+3.4	22.7	13.4/280	148.3
Feb. 3	09 09.77	-09 03.4	2.152	3.070	-0.91	+3.6	22.9	13.5/289	154.3
Feb. 13	09 01.17	-08 19.3	2.204	3.130	-0.91	+3.7	23.1	12.6/298	155.6
Feb. 23	08 53.65	-07 20.8	2.284	3.189	-0.89	+3.8	23.4	10.9/307	151.6
Mar. 5	08 47.83	-06 14.4	2.390	3.248	-0.86	+3.9	23.6	8.9/320	144.4
Mar. 15	08 44.02	-05 06.1	2.520	3.307	-0.81	+3.8	23.9	7.0/339	135.8
Mar. 25	08 42.36	-04 01.1	2.670	3.364	-0.76	+3.7	24.2	5.9/ 6	126.9

Comet P/2008 O2 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2009 Apr. 21.72011 TT
Peri. = 27.48132 e = 0.1532133
Node = 325.86036 2000.0 a = 4.4921213 AU
Incl. = 9.51854 n = 0.10352062
q = 3.8038686 AU P = 9.52 years

m1 = 6.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 01.91	-10 09.4	4.517	3.820	+1.08	+7.0	18.0	40.3
Jan. 19	22 12.73	-08 59.6	4.604	3.817	+1.11	+7.3	18.0	33.0
Jan. 29	22 23.86	-07 46.2	4.676	3.815	+1.13	+7.7	18.1	25.9
Feb. 8	22 35.19	-06 29.5	4.732	3.812	+1.15	+7.9	18.1	18.9
Feb. 18	22 46.65	-05 10.1	4.771	3.810	+1.15	+8.2	18.1	12.0
Feb. 28	22 58.17	-03 48.4	4.793	3.808	+1.15	+8.3	18.1	5.5
Mar. 10	23 09.68	-02 25.1	4.798	3.807	+1.14	+8.4	18.1	3.4
Mar. 20	23 21.10	-01 00.7	4.785	3.806	+1.13	+8.5	18.1	9.2
Mar. 30	23 32.40	+00 24.4	4.756	3.805	+1.11	+8.5	18.1	15.8
Apr. 9	23 43.50	+01 49.6	4.710	3.804	+1.08	+8.5	18.1	22.4
Apr. 19	23 54.35	+03 14.3	4.649	3.804	+1.05	+8.4	18.0	29.1
Apr. 29	00 04.89	+04 38.0	4.574	3.804	+1.01	+8.2	18.0	35.9
May 9	00 15.03	+06 00.2	4.484	3.804	+0.97	+8.0	18.0	42.7
May 19	00 24.71	+07 20.3	4.382	3.805	+0.91	+7.8	17.9	49.6
May 29	00 33.84	+08 37.9	4.269	3.806	+0.85	+7.4	17.9	56.6
June 8	00 42.31	+09 52.4	4.146	3.807	+0.77	+7.1	17.8	63.7
June 18	00 50.01	+11 03.2	4.016	3.809	+0.68	+6.7	17.7	71.1
June 28	00 56.81	+12 09.8	3.879	3.811	+0.57	+6.2	17.7	78.6
July 8	01 02.55	+13 11.3	3.740	3.813	+0.46	+5.6	17.6	86.4
July 18	01 07.10	+14 07.1	3.599	3.816	+0.32	+4.9	17.5	94.5
July 28	01 10.29	+14 56.3	3.461	3.819	+0.17	+4.2	17.4	102.9
Aug. 7	01 11.97	+15 37.9	3.328	3.822	+0.01	+3.3	17.3	111.8
Aug. 17	01 12.05	+16 10.7	3.204	3.825	-0.16	+2.3	17.3	121.0
Aug. 27	01 10.46	+16 33.7	3.093	3.829	-0.32	+1.2	17.2	130.6
Sept. 6	01 07.26	+16 45.8	3.000	3.833	-0.46	+0.1	17.1	140.6
Sept. 16	01 02.66	+16 46.6	2.928	3.837	-0.57	-1.0	17.1	150.8
Sept. 26	00 56.97	+16 36.1	2.881	3.842	-0.63	-2.0	17.1	160.8
Oct. 6	00 50.69	+16 15.8	2.861	3.847	-0.63	-2.8	17.1	168.7
Oct. 16	00 44.37	+15 48.0	2.871	3.852	-0.58	-3.2	17.1	168.1
Oct. 26	00 38.59	+15 15.9	2.910	3.858	-0.47	-3.3	17.1	159.7
Nov. 5	00 33.86	+14 43.4	2.976	3.863	-0.33	-2.9	17.2	149.5
Nov. 15	00 30.53	+14 14.0	3.068	3.869	-0.17	-2.3	17.2	139.0
Nov. 25	00 28.85	+13 50.6	3.181	3.876	0.00	-1.5	17.3	128.7
Dec. 5	00 28.89	+13 35.5	3.311	3.882	+0.17	-0.6	17.4	118.7
Dec. 15	00 30.62	+13 29.7	3.454	3.889	+0.33	+0.4	17.5	109.1
Dec. 25	00 33.95	+13 33.7	3.605	3.896	+0.48	+1.3	17.6	99.9
Jan. 4	00 38.73	+13 47.2	3.761	3.903	+0.61	+2.2	17.7	91.0
Jan. 14	00 44.80	+14 09.5	3.918	3.911	+0.72	+3.0	17.8	82.4
Jan. 24	00 52.02	+14 39.8	4.072	3.919	+0.82	+3.7	17.9	74.1
Feb. 3	01 00.21	+15 17.2	4.221	3.927	+0.90	+4.3	18.0	66.1
Feb. 13	01 09.25	+16 00.4	4.361	3.935	+0.98	+4.8	18.1	58.4
Feb. 23	01 19.01	+16 48.6	4.492	3.943	+1.04	+5.2	18.2	50.9
Mar. 5	01 29.38	+17 40.5	4.610	3.952	+1.09	+5.5	18.3	43.6
Mar. 15	01 40.26	+18 35.4	4.715	3.961	+1.13	+5.7	18.3	36.5
Mar. 25	01 51.57	+19 32.2	4.806	3.970	+1.17	+5.8	18.4	29.6

Comet 2003 WY25 = ? D/1819 W1 (Blanpain) [Orbit 1]

Epoch = 2009 July 28.0 TT
T = 2009 Apr. 30.18698 TT
Peri. = 9.80452 e = 0.6836069
Node = 68.96512 2000.0 a = 3.0505725 AU
Incl. = 5.89545 n = 0.18498309
q = 0.9651801 AU P = 5.33 years

H = 21.1 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	21 51.42	-17 25.9	2.442	1.739	+2.19	+12.9	.	35.6
Jan. 19	22 13.27	-15 16.5	2.409	1.647	+2.33	+14.7	25.0	31.1
Jan. 29	22 36.55	-12 49.8	2.365	1.554	+2.48	+16.5	24.8	27.1
Feb. 8	23 01.32	-10 04.8	2.312	1.463	+2.64	+18.4	24.6	23.6
Feb. 18	23 27.72	-07 00.7	2.252	1.373	+2.82	+20.3	24.4	20.7
Feb. 28	23 55.95	-03 37.2	2.186	1.286	+3.03	+22.2	24.1	18.4
Mar. 10	00 26.26	+00 04.6	2.119	1.203	+3.27	+23.8	23.9	16.8
Mar. 20	00 58.98	+04 02.4	2.052	1.128	+3.55	+24.9	23.7	15.9
Mar. 30	01 34.49	+08 11.3	1.990	1.063	+3.86	+25.1	23.6	15.7
Apr. 9	02 13.11	+12 22.7	1.935	1.012	+4.20	+24.2	23.4	16.1
Apr. 19	02 55.09	+16 24.6	1.892	0.979	+4.53	+21.7	23.4	17.2
Apr. 29	03 40.39	+20 01.2	1.863	0.965	+4.81	+17.5	23.4	18.8
May 9	04 28.51	+22 55.7	1.851	0.974	+4.98	+11.8	23.4	20.7
May 19	05 18.35	+24 53.9	1.858	1.002	+5.00	+5.4	23.5	22.6
May 29	06 08.37	+25 48.1	1.886	1.050	+4.85	-0.9	23.7	24.3
June 8	06 56.85	+25 39.3	1.935	1.111	+4.56	-6.3	23.9	25.7
June 18	07 42.41	+24 36.3	2.002	1.184	+4.19	-10.5	24.1	26.6
June 28	08 24.29	+22 51.8	2.087	1.265	+3.80	-13.3	24.2	26.8
July 8	09 02.25	+20 39.2	2.184	1.351	+3.42	-14.9	24.4	26.4
July 18	09 36.50	+18 09.9	2.292	1.441	+3.10	-15.7	24.6	25.4
July 28	10 07.46	+15 32.7	2.407	1.532	+2.81	-15.9	24.8	23.7
Aug. 7	10 35.57	+12 53.7	2.525	1.624	+2.57	-15.7	24.9	21.5
Aug. 17	11 01.30	+10 16.9	2.644	1.717	+2.38	-15.2	.	18.8
Aug. 27	11 25.06	+07 44.9	2.761	1.808	+2.21	-14.6	.	15.6
Sept. 6	11 47.17	+05 19.4	2.873	1.899	+2.07	-13.8	.	12.1
Sept.16	12 07.89	+03 01.1	2.978	1.988	+1.96	-13.0	.	8.3
Sept.26	12 27.46	+00 50.7	3.074	2.077	+1.85	-12.2	.	4.6
Oct. 6	12 46.00	-01 11.6	3.160	2.163	+1.77	-11.4	.	3.8
Oct. 16	13 03.65	-03 05.5	3.233	2.248	+1.68	-10.6	.	7.6
Oct. 26	13 20.49	-04 51.1	3.292	2.332	+1.61	-9.7	.	12.6
Nov. 5	13 36.55	-06 28.1	3.336	2.414	+1.53	-8.9	.	18.1
Nov. 15	13 51.85	-07 56.6	3.365	2.494	+1.45	-8.0	.	24.0
Nov. 25	14 06.37	-09 16.5	3.377	2.573	+1.37	-7.1	.	30.2
Dec. 5	14 20.05	-10 27.9	3.373	2.649	+1.28	-6.3	.	36.7
Dec. 15	14 32.84	-11 30.6	3.352	2.725	+1.18	-5.4	.	43.6
Dec. 25	14 44.62	-12 24.8	3.316	2.798	+1.06	-4.6	.	50.7
Jan. 4	14 55.25	-13 10.5	3.265	2.870	+0.93	-3.7	.	58.2
Jan. 14	15 04.60	-13 47.8	3.201	2.941	+0.79	-2.9	.	66.0
Jan. 24	15 12.47	-14 16.6	3.125	3.010	+0.62	-2.0	.	74.2
Feb. 3	15 18.67	-14 37.1	3.042	3.077	+0.43	-1.2	.	82.8
Feb. 13	15 23.00	-14 49.3	2.953	3.143	+0.22	-0.4	.	91.8
Feb. 23	15 25.25	-14 53.3	2.863	3.208	0.00	+0.4	.	101.3
Mar. 5	15 25.26	-14 49.0	2.777	3.271	-0.23	+1.2	.	111.4
Mar. 15	15 22.95	-14 36.7	2.698	3.333	-0.46	+2.0	.	121.9
Mar. 25	15 18.34	-14 16.7	2.634	3.393	-0.67	+2.7	.	133.0

Comet ? D/1819 W1 (Blanpain) = ? 2003 WY25 [Orbit 3]

Epoch = 2009 July 28.0 TT
T = 2009 Apr. 30.54820 TT
Peri. = 9.80646 e = 0.6836580
Node = 68.96343 2000.0 a = 3.0508551 AU
Incl. = 5.89547 n = 0.18495740
q = 0.9651136 AU P = 5.33 years

H = 21.1 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	21 51.42	-17 25.9	2.442	1.739	+2.19	+12.9	.	35.6
Jan. 19	22 13.27	-15 16.5	2.409	1.647	+2.33	+14.7	25.0	31.1
Jan. 29	22 36.55	-12 49.8	2.365	1.554	+2.48	+16.5	24.8	27.1
Feb. 8	23 01.32	-10 04.8	2.312	1.463	+2.64	+18.4	24.6	23.6
Feb. 18	23 27.72	-07 00.7	2.252	1.373	+2.82	+20.3	24.4	20.7
Feb. 28	23 55.95	-03 37.2	2.186	1.286	+3.03	+22.2	24.2	18.4
Mar. 10	00 26.26	+00 04.6	2.119	1.203	+3.27	+23.8	23.9	16.8
Mar. 20	00 58.98	+04 02.4	2.052	1.128	+3.55	+24.9	23.7	15.9
Mar. 30	01 34.49	+08 11.3	1.990	1.063	+3.86	+25.1	23.6	15.7
Apr. 9	02 13.11	+12 22.7	1.935	1.012	+4.20	+24.2	23.4	16.1
Apr. 19	02 55.09	+16 24.6	1.892	0.979	+4.53	+21.7	23.4	17.2
Apr. 29	03 40.39	+20 01.2	1.863	0.965	+4.81	+17.5	23.4	18.8
May 9	04 28.51	+22 55.7	1.851	0.974	+4.98	+11.8	23.4	20.7
May 19	05 18.35	+24 53.9	1.858	1.002	+5.00	+5.4	23.5	22.6
May 29	06 08.37	+25 48.1	1.886	1.050	+4.85	-0.9	23.7	24.3
June 8	06 56.85	+25 39.3	1.935	1.111	+4.56	-6.3	23.9	25.7
June 18	07 42.41	+24 36.3	2.002	1.184	+4.19	-10.5	24.0	26.6
June 28	08 24.29	+22 51.8	2.087	1.265	+3.80	-13.3	24.2	26.8
July 8	09 02.25	+20 39.2	2.184	1.351	+3.42	-14.9	24.4	26.4
July 18	09 36.50	+18 09.9	2.292	1.441	+3.10	-15.7	24.6	25.4
July 28	10 07.46	+15 32.7	2.407	1.532	+2.81	-15.9	24.8	23.7
Aug. 7	10 35.57	+12 53.7	2.525	1.624	+2.57	-15.7	24.9	21.5
Aug. 17	11 01.30	+10 16.9	2.644	1.717	+2.38	-15.2	.	18.8
Aug. 27	11 25.06	+07 44.9	2.761	1.808	+2.21	-14.6	.	15.6
Sept. 6	11 47.17	+05 19.4	2.873	1.899	+2.07	-13.8	.	12.1
Sept.16	12 07.89	+03 01.1	2.978	1.988	+1.96	-13.0	.	8.3
Sept.26	12 27.46	+00 50.7	3.074	2.077	+1.85	-12.2	.	4.6
Oct. 6	12 46.00	-01 11.6	3.160	2.163	+1.77	-11.4	.	3.8
Oct. 16	13 03.65	-03 05.5	3.233	2.248	+1.68	-10.6	.	7.6
Oct. 26	13 20.49	-04 51.1	3.292	2.332	+1.61	-9.7	.	12.6
Nov. 5	13 36.55	-06 28.1	3.336	2.414	+1.53	-8.9	.	18.1
Nov. 15	13 51.85	-07 56.6	3.365	2.494	+1.45	-8.0	.	24.0
Nov. 25	14 06.37	-09 16.5	3.377	2.573	+1.37	-7.1	.	30.2
Dec. 5	14 20.05	-10 27.9	3.373	2.649	+1.28	-6.3	.	36.7
Dec. 15	14 32.84	-11 30.6	3.352	2.725	+1.18	-5.4	.	43.6
Dec. 25	14 44.62	-12 24.8	3.316	2.798	+1.06	-4.6	.	50.7
Jan. 4	14 55.25	-13 10.5	3.265	2.870	+0.93	-3.7	.	58.2
Jan. 14	15 04.60	-13 47.8	3.201	2.941	+0.79	-2.9	.	66.0
Jan. 24	15 12.47	-14 16.6	3.125	3.010	+0.62	-2.0	.	74.2
Feb. 3	15 18.67	-14 37.1	3.042	3.077	+0.43	-1.2	.	82.8
Feb. 13	15 23.00	-14 49.3	2.953	3.143	+0.22	-0.4	.	91.8
Feb. 23	15 25.25	-14 53.3	2.863	3.208	0.00	+0.4	.	101.3
Mar. 5	15 25.26	-14 49.0	2.777	3.271	-0.23	+1.2	.	111.4
Mar. 15	15 22.95	-14 36.7	2.698	3.333	-0.46	+2.0	.	121.9
Mar. 25	15 18.34	-14 16.7	2.634	3.393	-0.67	+2.7	.	133.0

Comet 211P/Hill

Epoch = 2009 July 28.0 TT
T = 2009 May 7.73391 TT
Peri. = 4.37822 e = 0.3375841
Node = 117.29457 2000.0 a = 3.5662061 AU
Incl. = 18.87312 n = 0.14635057
q = 2.3623116 AU P = 6.73 years

m1 = 10.4 + 5 log(Delta) + 15.0 log(r)

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	04 56.40	+07 33.6	1.631	2.482	-0.39	+10.5	17.4	142.3
Jan. 19	04 52.50	+09 18.3	1.689	2.464	-0.10	+11.0	17.4	132.5
Jan. 29	04 51.48	+11 08.3	1.766	2.447	+0.20	+11.1	17.5	123.0
Feb. 8	04 53.48	+12 59.4	1.857	2.431	+0.49	+10.9	17.5	114.0
Feb. 18	04 58.38	+14 48.0	1.957	2.417	+0.76	+10.4	17.6	105.5
Feb. 28	05 05.97	+16 31.5	2.064	2.404	+1.00	+9.7	17.7	97.5
Mar. 10	05 15.98	+18 08.0	2.176	2.393	+1.21	+8.8	17.8	90.1
Mar. 20	05 28.10	+19 36.0	2.288	2.383	+1.40	+7.8	17.9	83.1
Mar. 30	05 42.08	+20 54.2	2.401	2.376	+1.56	+6.7	17.9	76.5
Apr. 9	05 57.66	+22 01.6	2.511	2.370	+1.69	+5.6	18.0	70.3
Apr. 19	06 14.58	+22 57.5	2.619	2.365	+1.80	+4.4	18.1	64.4
Apr. 29	06 32.62	+23 41.2	2.723	2.363	+1.90	+3.1	18.2	58.8
May 9	06 51.58	+24 12.3	2.821	2.362	+1.97	+1.8	18.3	53.4
May 19	07 11.25	+24 30.8	2.915	2.363	+2.02	+0.6	18.3	48.2
May 29	07 31.47	+24 36.5	3.002	2.366	+2.06	-0.7	18.4	43.1
June 8	07 52.04	+24 29.8	3.083	2.371	+2.08	-1.9	18.5	38.3
June 18	08 12.84	+24 11.2	3.157	2.377	+2.09	-3.0	18.5	33.5
June 28	08 33.72	+23 41.3	3.225	2.386	+2.09	-4.0	18.6	28.9
July 8	08 54.58	+23 01.0	3.285	2.395	+2.07	-5.0	18.7	24.4
July 18	09 15.31	+22 11.2	3.337	2.407	+2.06	-5.8	18.7	20.0
July 28	09 35.87	+21 13.1	3.381	2.420	+2.03	-6.5	18.8	15.8
Aug. 7	09 56.17	+20 07.9	3.417	2.435	+2.00	-7.1	18.9	12.0
Aug. 17	10 16.18	+18 56.9	3.445	2.451	+1.97	-7.5	18.9	9.1
Aug. 27	10 35.88	+17 41.4	3.464	2.468	+1.94	-7.9	19.0	8.2
Sept. 6	10 55.24	+16 22.9	3.474	2.487	+1.90	-8.0	19.0	9.9
Sept. 16	11 14.25	+15 02.7	3.475	2.507	+1.86	-8.0	19.1	13.3
Sept. 26	11 32.90	+13 42.2	3.466	2.529	+1.83	-7.9	19.1	17.6
Oct. 6	11 51.16	+12 23.0	3.448	2.551	+1.79	-7.7	19.2	22.3
Oct. 16	12 09.04	+11 06.4	3.421	2.575	+1.75	-7.3	19.2	27.2
Oct. 26	12 26.49	+09 53.8	3.383	2.600	+1.70	-6.7	19.3	32.4
Nov. 5	12 43.48	+08 46.6	3.336	2.625	+1.65	-6.0	19.3	37.9
Nov. 15	12 59.96	+07 46.2	3.280	2.652	+1.59	-5.2	19.3	43.5
Nov. 25	13 15.87	+06 54.1	3.215	2.679	+1.52	-4.3	19.4	49.4
Dec. 5	13 31.10	+06 11.3	3.141	2.707	+1.45	-3.2	19.4	55.5
Dec. 15	13 45.56	+05 39.2	3.060	2.736	+1.35	-2.0	19.4	61.8
Dec. 25	13 59.10	+05 18.9	2.972	2.765	+1.25	-0.8	19.4	68.4
Jan. 4	14 11.57	+05 11.3	2.878	2.795	+1.12	+0.6	19.4	75.3
Jan. 14	14 22.78	+05 17.1	2.781	2.825	+0.97	+2.0	19.4	82.4
Jan. 24	14 32.50	+05 37.0	2.683	2.856	+0.80	+3.4	19.4	89.9
Feb. 3	14 40.53	+06 10.6	2.585	2.887	+0.61	+4.7	19.4	97.7
Feb. 13	14 46.63	+06 57.5	2.490	2.919	+0.39	+5.9	19.4	105.8
Feb. 23	14 50.57	+07 56.2	2.403	2.951	+0.16	+6.8	19.4	114.3
Mar. 5	14 52.19	+09 04.0	2.326	2.983	-0.08	+7.3	19.4	122.9
Mar. 15	14 51.44	+10 17.0	2.263	3.015	-0.31	+7.3	19.4	131.5
Mar. 25	14 48.36	+11 30.1	2.218	3.047	-0.51	+6.7	19.4	139.7

Comet 137P/Shoemaker-Levy

Epoch = 2009 July 28.0 TT
T = 2009 May 13.57486 TT
Peri. = 140.81541 e = 0.5745004
Node = 233.12090 2000.0 a = 4.5012946 AU
Incl. = 4.85367 n = 0.10320433
q = 1.9152991 AU P = 9.55 years

H = 14.5 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	20 52.66	-13 55.3	3.101	2.232	+2.12	+8.8	19.3	23.2
Jan. 19	21 13.85	-12 27.2	3.098	2.188	+2.16	+9.9	19.2	18.5
Jan. 29	21 35.47	-10 47.9	3.089	2.146	+2.20	+11.0	19.1	13.9
Feb. 8	21 57.44	-08 58.1	3.073	2.107	+2.23	+11.9	19.0	9.7
Feb. 18	22 19.71	-06 58.7	3.052	2.071	+2.25	+12.8	18.8	5.8
Feb. 28	22 42.25	-04 50.9	3.026	2.038	+2.28	+13.5	18.7	3.2
Mar. 10	23 05.04	-02 36.2	2.997	2.008	+2.30	+14.0	18.6	4.3
Mar. 20	23 28.07	-00 16.4	2.966	1.982	+2.33	+14.3	18.7	7.4
Mar. 30	23 51.35	+02 06.7	2.933	1.961	+2.35	+14.4	18.7	10.8
Apr. 9	00 14.86	+04 31.0	2.898	1.943	+2.37	+14.3	18.8	14.2
Apr. 19	00 38.61	+06 54.1	2.863	1.929	+2.40	+14.0	18.8	17.5
Apr. 29	01 02.60	+09 14.0	2.827	1.920	+2.42	+13.4	18.9	20.9
May 9	01 26.80	+11 28.3	2.792	1.916	+2.44	+12.6	18.9	24.2
May 19	01 51.19	+13 34.8	2.756	1.916	+2.45	+11.7	18.9	27.5
May 29	02 15.70	+15 31.5	2.720	1.921	+2.45	+10.5	18.9	30.8
June 8	02 40.25	+17 16.5	2.683	1.930	+2.45	+9.2	19.0	34.2
June 18	03 04.72	+18 48.5	2.645	1.944	+2.43	+7.8	19.0	37.8
June 28	03 28.99	+20 06.3	2.605	1.962	+2.39	+6.3	19.0	41.4
July 8	03 52.87	+21 09.3	2.564	1.984	+2.33	+4.8	19.1	45.3
July 18	04 16.19	+21 57.4	2.519	2.011	+2.25	+3.3	19.1	49.3
July 28	04 38.74	+22 30.7	2.471	2.040	+2.15	+1.9	19.1	53.6
Aug. 7	05 00.29	+22 50.0	2.420	2.074	+2.03	+0.7	19.1	58.2
Aug. 17	05 20.63	+22 56.6	2.364	2.110	+1.89	-0.5	19.2	63.2
Aug. 27	05 39.53	+22 51.7	2.304	2.149	+1.72	-1.4	19.2	68.5
Sept. 6	05 56.75	+22 37.3	2.240	2.191	+1.53	-2.2	19.1	74.2
Sept. 16	06 12.06	+22 15.3	2.172	2.235	+1.31	-2.8	19.1	80.3
Sept. 26	06 25.21	+21 47.7	2.101	2.281	+1.07	-3.1	19.1	87.1
Oct. 6	06 35.93	+21 16.7	2.029	2.329	+0.80	-3.2	19.0	94.4
Oct. 16	06 43.97	+20 44.4	1.958	2.379	+0.51	-3.2	19.0	102.3
Oct. 26	06 49.08	+20 12.9	1.889	2.430	+0.20	-2.9	18.9	111.0
Nov. 5	06 51.08	+19 43.7	1.828	2.482	-0.12	-2.5	18.8	120.5
Nov. 15	06 49.92	+19 18.3	1.777	2.536	-0.42	-2.1	18.7	130.7
Nov. 25	06 45.73	+18 57.5	1.742	2.590	-0.67	-1.6	18.6	141.7
Dec. 5	06 38.99	+18 41.3	1.727	2.645	-0.85	-1.2	18.4	153.2
Dec. 15	06 30.50	+18 29.6	1.737	2.700	-0.92	-0.8	18.3	165.0
Dec. 25	06 21.29	+18 21.9	1.775	2.756	-0.88	-0.4	18.2	174.7
Jan. 4	06 12.52	+18 17.9	1.842	2.812	-0.74	-0.1	18.4	168.4
Jan. 14	06 05.13	+18 17.3	1.937	2.869	-0.53	+0.3	18.8	157.1
Jan. 24	05 59.83	+18 19.9	2.058	2.926	-0.29	+0.5	19.1	145.9
Feb. 3	05 56.96	+18 25.3	2.202	2.982	-0.04	+0.7	19.4	135.2
Feb. 13	05 56.54	+18 32.7	2.363	3.039	+0.19	+0.9	19.6	125.0
Feb. 23	05 58.47	+18 41.3	2.540	3.096	+0.40	+0.9	19.9	115.4
Mar. 5	06 02.48	+18 49.9	2.726	3.153	+0.58	+0.8	20.1	106.4
Mar. 15	06 08.28	+18 57.5	2.920	3.210	+0.73	+0.6	20.3	97.8
Mar. 25	06 15.60	+19 03.3	3.117	3.266	+0.86	+0.3	20.5	89.6

Comet 22P/Kopff

Epoch = 2009 July 28.0 TT
T = 2009 May 25.41700 TT
Peri. = 162.81306 e = 0.5444282
Node = 120.89826 2000.0 a = 3.4628408 AU
Incl. = 4.72388 n = 0.15295204
q = 1.5775726 AU P = 6.44 years

m1 = 6.0 + 5 log(Delta) + 20.0 log(r(t-15))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	15 39.51	-15 32.4	2.495	2.052	+2.37	-6.8	14.6	52.6
Jan. 19	16 03.18	-16 40.5	2.355	1.997	+2.46	-5.7	14.2	56.9
Jan. 29	16 27.75	-17 37.7	2.216	1.943	+2.54	-4.5	13.9	61.1
Feb. 8	16 53.19	-18 22.4	2.079	1.891	+2.63	-3.1	13.5	65.2
Feb. 18	17 19.46	-18 53.2	1.947	1.841	+2.70	-1.6	13.1	69.0
Feb. 28	17 46.44	-19 08.7	1.820	1.794	+2.75	+0.1	12.7	72.7
Mar. 10	18 13.99	-19 08.1	1.699	1.751	+2.79	+1.7	12.3	76.2
Mar. 20	18 41.93	-18 51.0	1.585	1.711	+2.81	+3.3	12.0	79.5
Mar. 30	19 10.04	-18 17.6	1.479	1.676	+2.80	+4.8	11.6	82.7
Apr. 9	19 38.04	-17 29.3	1.381	1.645	+2.76	+6.1	11.3	85.8
Apr. 19	20 05.67	-16 28.0	1.290	1.620	+2.69	+7.1	11.0	88.9
Apr. 29	20 32.57	-15 16.8	1.208	1.600	+2.58	+7.7	10.7	92.0
May 9	20 58.42	-13 59.9	1.133	1.586	+2.45	+7.8	10.4	95.4
May 19	21 22.88	-12 41.8	1.065	1.579	+2.27	+7.4	10.2	98.9
May 29	21 45.53	-11 28.1	1.004	1.578	+2.04	+6.4	10.0	102.9
June 8	22 05.97	-10 24.3	0.949	1.584	+1.78	+4.8	9.8	107.4
June 18	22 23.77	-09 35.9	0.900	1.595	+1.47	+2.8	9.7	112.6
June 28	22 38.44	-09 08.1	0.858	1.613	+1.11	+0.3	9.7	118.6
July 8	22 49.55	-09 04.8	0.822	1.637	+0.72	-2.3	9.7	125.5
July 18	22 56.76	-09 27.7	0.795	1.666	+0.31	-4.9	9.7	133.5
July 28	22 59.86	-10 16.3	0.778	1.700	-0.07	-6.8	9.8	142.6
Aug. 7	22 59.16	-11 24.5	0.775	1.739	-0.38	-7.8	10.0	152.6
Aug. 17	22 55.40	-12 42.8	0.788	1.781	-0.56	-7.6	10.2	163.0
Aug. 27	22 49.83	-13 58.8	0.821	1.827	-0.58	-6.2	10.5	172.3
Sept. 6	22 44.02	-15 00.5	0.874	1.876	-0.47	-4.0	10.8	170.8
Sept. 16	22 39.34	-15 40.5	0.948	1.928	-0.26	-1.5	11.2	161.2
Sept. 26	22 36.76	-15 56.0	1.043	1.981	0.00	+0.8	11.7	151.2
Oct. 6	22 36.76	-15 47.9	1.155	2.036	+0.26	+2.8	12.1	141.7
Oct. 16	22 39.33	-15 19.6	1.284	2.093	+0.49	+4.5	12.6	132.7
Oct. 26	22 44.26	-14 34.4	1.428	2.150	+0.69	+5.9	13.1	124.2
Nov. 5	22 51.19	-13 35.7	1.584	2.209	+0.86	+6.9	13.5	116.2
Nov. 15	22 59.77	-12 26.5	1.749	2.268	+0.99	+7.8	14.0	108.6
Nov. 25	23 09.66	-11 08.8	1.923	2.328	+1.09	+8.4	14.4	101.3
Dec. 5	23 20.60	-09 44.7	2.103	2.388	+1.17	+8.9	14.8	94.3
Dec. 15	23 32.32	-08 15.8	2.286	2.448	+1.24	+9.3	15.2	87.4
Dec. 25	23 44.67	-06 43.3	2.472	2.508	+1.28	+9.5	15.6	80.7
Jan. 4	23 57.49	-05 08.5	2.657	2.568	+1.32	+9.6	16.0	74.1
Jan. 14	00 10.66	-03 32.4	2.841	2.627	+1.34	+9.7	16.4	67.5
Jan. 24	00 24.10	-01 55.9	3.020	2.686	+1.36	+9.6	16.7	61.1
Feb. 3	00 37.73	-00 19.9	3.194	2.745	+1.38	+9.5	17.0	54.7
Feb. 13	00 51.49	+01 14.9	3.360	2.804	+1.38	+9.3	17.3	48.4
Feb. 23	01 05.33	+02 47.7	3.517	2.862	+1.39	+9.0	17.6	42.2
Mar. 5	01 19.21	+04 17.9	3.664	2.919	+1.39	+8.7	17.9	35.9
Mar. 15	01 33.10	+05 45.0	3.798	2.976	+1.39	+8.3	18.1	29.7
Mar. 25	01 46.96	+07 08.4	3.920	3.032	+1.38	+7.9	18.4	23.6

Comet 143P/Kowal-Mrkos

Epoch = 2009 July 28.0 TT
T = 2009 June 12.19563 TT
Peri. = 320.76088 e = 0.4097407
Node = 245.36748 2000.0 a = 4.3001435 AU
Incl. = 4.69003 n = 0.11052987
q = 2.5381997 AU P = 8.92 years

H = 13.8 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	12 06.75	-06 41.6	2.330	2.746	+0.56	-5.4	18.8	104.4
Jan. 19	12 12.36	-07 35.9	2.183	2.721	+0.37	-4.2	18.7	112.9
Jan. 29	12 16.05	-08 18.0	2.045	2.698	+0.16	-2.8	18.4	121.9
Feb. 8	12 17.61	-08 45.5	1.920	2.676	-0.06	-1.1	18.2	131.4
Feb. 18	12 16.97	-08 56.7	1.811	2.656	-0.28	+0.6	18.0	141.4
Feb. 28	12 14.19	-08 50.2	1.722	2.637	-0.45	+2.4	17.7	151.9
Mar. 10	12 09.65	-08 26.6	1.655	2.619	-0.57	+3.8	17.5	162.5
Mar. 20	12 03.97	-07 48.1	1.614	2.603	-0.60	+4.9	17.2	171.8
Mar. 30	11 57.99	-06 59.5	1.599	2.589	-0.53	+5.2	17.2	170.4
Apr. 9	11 52.65	-06 07.2	1.610	2.576	-0.39	+4.9	17.4	160.6
Apr. 19	11 48.76	-05 18.0	1.646	2.566	-0.19	+4.0	17.6	150.0
Apr. 29	11 46.89	-04 37.6	1.703	2.556	+0.05	+2.7	17.8	139.8
May 9	11 47.35	-04 10.2	1.778	2.549	+0.28	+1.2	18.0	130.2
May 19	11 50.17	-03 57.7	1.868	2.544	+0.51	-0.3	18.2	121.2
May 29	11 55.24	-04 00.6	1.969	2.540	+0.71	-1.8	18.3	112.8
June 8	12 02.36	-04 18.3	2.079	2.538	+0.89	-3.1	18.5	105.0
June 18	12 11.25	-04 49.4	2.194	2.539	+1.04	-4.3	18.6	97.7
June 28	12 21.70	-05 32.2	2.313	2.541	+1.18	-5.3	18.8	90.9
July 8	12 33.47	-06 25.0	2.434	2.544	+1.29	-6.1	18.9	84.4
July 18	12 46.36	-07 26.0	2.556	2.550	+1.39	-6.7	19.0	78.2
July 28	13 00.23	-08 33.3	2.678	2.558	+1.47	-7.2	19.0	72.2
Aug. 7	13 14.93	-09 45.4	2.798	2.567	+1.54	-7.5	19.1	66.5
Aug. 17	13 30.36	-11 00.5	2.915	2.578	+1.61	-7.7	19.2	60.9
Aug. 27	13 46.43	-12 17.2	3.028	2.591	+1.66	-7.7	19.2	55.4
Sept. 6	14 03.08	-13 34.0	3.138	2.606	+1.71	-7.5	19.3	49.9
Sept.16	14 20.22	-14 49.5	3.242	2.622	+1.76	-7.3	19.3	44.6
Sept.26	14 37.82	-16 02.4	3.340	2.640	+1.80	-6.9	19.3	39.2
Oct. 6	14 55.81	-17 11.6	3.431	2.659	+1.83	-6.4	19.3	33.8
Oct. 16	15 14.12	-18 15.9	3.514	2.680	+1.86	-5.8	19.3	28.4
Oct. 26	15 32.72	-19 14.4	3.589	2.702	+1.88	-5.2	19.3	23.0
Nov. 5	15 51.52	-20 06.2	3.655	2.725	+1.89	-4.4	19.3	17.5
Nov. 15	16 10.45	-20 50.5	3.710	2.750	+1.90	-3.6	19.2	11.9
Nov. 25	16 29.42	-21 26.9	3.755	2.776	+1.89	-2.8	19.1	6.3
Dec. 5	16 48.34	-21 54.9	3.788	2.803	+1.88	-1.9	19.0	0.8
Dec. 15	17 07.12	-22 14.3	3.809	2.831	+1.85	-1.1	19.2	5.3
Dec. 25	17 25.65	-22 25.0	3.818	2.860	+1.82	-0.2	19.3	11.1
Jan. 4	17 43.81	-22 27.4	3.815	2.890	+1.77	+0.6	19.5	17.1
Jan. 14	18 01.50	-22 21.7	3.798	2.920	+1.71	+1.3	19.6	23.2
Jan. 24	18 18.60	-22 08.4	3.769	2.952	+1.64	+2.0	19.7	29.5
Feb. 3	18 35.00	-21 48.4	3.727	2.984	+1.56	+2.6	19.7	35.8
Feb. 13	18 50.59	-21 22.4	3.673	3.017	+1.47	+3.1	19.8	42.3
Feb. 23	19 05.26	-20 51.5	3.608	3.050	+1.36	+3.5	19.8	48.9
Mar. 5	19 18.88	-20 16.7	3.532	3.084	+1.25	+3.7	19.8	55.7
Mar. 15	19 31.35	-19 39.2	3.447	3.119	+1.12	+3.9	19.8	62.7
Mar. 25	19 42.54	-19 00.3	3.354	3.154	+0.98	+3.9	19.8	69.9

Comet C/2008 T2 (Cardinal)

Epoch = 2009 July 28.0 TT
T = 2009 June 13.24137 TT
Peri. = 215.86875
Node = 309.67800 2000.0
Incl. = 56.30403
q = 1.2022424 AU
e = 1.0000287

m1 = 8.2 + 5 log(Delta) + 10.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	01 11.05	+79 47.7	1.994	2.524	+2.82	−21.5	13.7	111.3
Jan. 19	01 39.29	+76 12.9	1.916	2.413	+2.85	−23.5	13.4	108.3
Jan. 29	02 07.82	+72 18.3	1.852	2.302	+2.84	−25.2	13.2	104.2
Feb. 8	02 36.20	+68 06.4	1.803	2.191	+2.80	−26.7	12.9	99.3
Feb. 18	03 04.15	+63 39.7	1.767	2.081	+2.75	−27.9	12.6	93.8
Feb. 28	03 31.61	+59 00.9	1.744	1.972	+2.69	−28.9	12.4	87.8
Mar. 10	03 58.49	+54 12.3	1.731	1.865	+2.62	−29.7	12.1	81.6
Mar. 20	04 24.70	+49 15.6	1.727	1.760	+2.55	−30.4	11.8	75.3
Mar. 30	04 50.25	+44 11.7	1.730	1.659	+2.49	−31.1	11.6	69.0
Apr. 9	05 15.10	+39 01.0	1.738	1.563	+2.41	−31.8	11.3	63.0
Apr. 19	05 39.24	+33 43.3	1.749	1.473	+2.35	−32.5	11.1	57.3
Apr. 29	06 02.71	+28 18.0	1.762	1.391	+2.29	−33.4	10.9	52.1
May 9	06 25.58	+22 44.5	1.774	1.321	+2.24	−34.2	10.7	47.5
May 19	06 47.95	+17 02.3	1.784	1.265	+2.21	−35.1	10.5	43.8
May 29	07 10.03	+11 10.9	1.792	1.226	+2.20	−36.0	10.4	41.2
June 8	07 32.07	+05 10.5	1.796	1.205	+2.24	−36.9	10.3	39.7
June 18	07 54.44	−00 58.5	1.798	1.205	+2.31	−37.7	10.3	39.6
June 28	08 17.57	−07 15.2	1.800	1.224	+2.44	−38.3	10.4	40.7
July 8	08 41.97	−13 37.7	1.805	1.263	+2.62	−38.5	10.5	42.7
July 18	09 08.19	−20 02.3	1.816	1.318	+2.86	−38.1	10.7	45.4
July 28	09 36.82	−26 22.9	1.838	1.388	+3.16	−36.8	10.9	48.3
Aug. 7	10 08.41	−32 30.7	1.875	1.468	+3.50	−34.3	11.2	51.1
Aug. 17	10 43.45	−38 13.8	1.931	1.558	+3.88	−30.6	11.6	53.5
Aug. 27	11 22.23	−43 20.0	2.008	1.654	+4.24	−25.8	11.9	55.2
Sept. 6	12 04.65	−47 37.8	2.106	1.755	+4.54	−20.1	12.3	56.1
Sept.16	12 50.03	−50 59.0	2.223	1.860	+4.71	−14.2	12.6	56.1
Sept.26	13 37.11	−53 21.2	2.359	1.967	+4.70	−8.6	13.0	55.2
Oct. 6	14 24.14	−54 47.1	2.509	2.076	+4.53	−3.7	13.4	53.5
Oct. 16	15 09.43	−55 24.1	2.670	2.186	+4.23	+0.2	13.7	51.1
Oct. 26	15 51.72	−55 22.3	2.838	2.296	+3.86	+3.0	14.1	48.1
Nov. 5	16 30.33	−54 52.1	3.010	2.407	+3.48	+5.0	14.4	44.6
Nov. 15	17 05.17	−54 02.2	3.182	2.518	+3.13	+6.2	14.7	40.9
Nov. 25	17 36.43	−52 60.0	3.349	2.629	+2.80	+6.9	15.0	37.0
Dec. 5	18 04.48	−51 50.5	3.510	2.739	+2.52	+7.3	15.3	33.2
Dec. 15	18 29.70	−50 37.7	3.661	2.849	+2.28	+7.3	15.6	29.8
Dec. 25	18 52.47	−49 24.3	3.800	2.958	+2.06	+7.2	15.8	27.1
Jan. 4	19 13.07	−48 12.1	3.924	3.067	+1.87	+6.9	16.0	25.6
Jan. 14	19 31.76	−47 02.7	4.032	3.175	+1.70	+6.5	16.2	25.7
Jan. 24	19 48.72	−45 57.3	4.122	3.282	+1.54	+6.1	16.4	27.6
Feb. 3	20 04.07	−44 56.7	4.194	3.389	+1.38	+5.5	16.6	31.1
Feb. 13	20 17.92	−44 01.8	4.247	3.494	+1.24	+4.8	16.8	35.8
Feb. 23	20 30.31	−43 13.4	4.281	3.599	+1.09	+4.1	16.9	41.4
Mar. 5	20 41.25	−42 32.2	4.297	3.704	+0.95	+3.3	17.1	47.7
Mar. 15	20 50.74	−41 58.7	4.296	3.807	+0.80	+2.5	17.2	54.6
Mar. 25	20 58.71	−41 33.7	4.279	3.910	+0.64	+1.6	17.3	61.9

Comet 64P/Swift-Gehrels

Epoch = 2009 July 28.0 TT
T = 2009 June 14.29781 TT
Peri. = 96.30602 e = 0.6895641
Node = 300.74133 2000.0 a = 4.4357498 AU
Incl. = 8.95147 n = 0.10550026
q = 1.3770160 AU P = 9.34 years

m1 = 9.4 + 5 log(Delta) + 20.0 log(r(t-60))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	20 23.73	-18 14.1	3.165	2.231	+2.05	+9.4	20.5	15.2
Jan. 19	20 44.20	-16 40.1	3.115	2.153	+2.12	+10.8	20.2	10.2
Jan. 29	21 05.41	-14 52.6	3.055	2.076	+2.19	+12.2	19.9	5.6
Feb. 8	21 27.31	-12 51.0	2.986	2.000	+2.26	+13.6	19.6	2.2
Feb. 18	21 49.93	-10 35.0	2.910	1.925	+2.34	+15.1	19.3	4.1
Feb. 28	22 13.29	-08 04.3	2.830	1.852	+2.42	+16.5	18.9	7.6
Mar. 10	22 37.44	-05 19.5	2.746	1.781	+2.50	+17.8	18.6	10.9
Mar. 20	23 02.48	-02 21.1	2.662	1.713	+2.60	+19.1	18.2	14.0
Mar. 30	23 28.51	+00 49.5	2.580	1.649	+2.72	+20.0	17.8	16.6
Apr. 9	23 55.66	+04 10.0	2.502	1.589	+2.84	+20.7	17.4	19.0
Apr. 19	00 24.09	+07 37.2	2.430	1.534	+2.98	+21.0	17.0	20.9
Apr. 29	00 53.93	+11 06.8	2.366	1.486	+3.14	+20.6	16.6	22.5
May 9	01 25.29	+14 33.1	2.310	1.445	+3.30	+19.7	16.2	23.8
May 19	01 58.25	+17 49.8	2.266	1.414	+3.45	+18.0	15.9	24.9
May 29	02 32.75	+20 49.5	2.232	1.391	+3.58	+15.6	15.5	25.8
June 8	03 08.58	+23 25.2	2.210	1.379	+3.68	+12.5	15.1	26.6
June 18	03 45.41	+25 30.6	2.197	1.378	+3.73	+9.1	14.8	27.5
June 28	04 22.70	+27 01.5	2.194	1.387	+3.71	+5.4	14.5	28.4
July 8	04 59.78	+27 55.8	2.198	1.407	+3.62	+1.8	14.3	29.6
July 18	05 36.00	+28 14.3	2.208	1.436	+3.48	-1.4	14.1	31.0
July 28	06 10.76	+27 59.8	2.221	1.475	+3.28	-4.3	14.0	32.8
Aug. 7	06 43.57	+27 17.0	2.235	1.521	+3.06	-6.6	13.9	35.0
Aug. 17	07 14.15	+26 11.3	2.249	1.574	+2.82	-8.3	13.9	37.7
Aug. 27	07 42.36	+24 48.1	2.259	1.632	+2.58	-9.5	14.0	40.7
Sept. 6	08 08.15	+23 12.7	2.265	1.696	+2.34	-10.3	14.1	44.3
Sept.16	08 31.56	+21 29.5	2.264	1.763	+2.11	-10.7	14.3	48.3
Sept.26	08 52.66	+19 42.4	2.256	1.833	+1.88	-10.8	14.5	52.8
Oct. 6	09 11.49	+17 54.9	2.240	1.906	+1.66	-10.5	14.8	57.8
Oct. 16	09 28.11	+16 09.5	2.215	1.981	+1.44	-10.1	15.1	63.4
Oct. 26	09 42.50	+14 28.9	2.181	2.056	+1.21	-9.4	15.3	69.5
Nov. 5	09 54.59	+12 55.1	2.139	2.133	+0.97	-8.5	15.6	76.2
Nov. 15	10 04.31	+11 30.2	2.091	2.210	+0.72	-7.4	15.9	83.6
Nov. 25	10 11.48	+10 16.1	2.037	2.288	+0.45	-6.2	16.2	91.6
Dec. 5	10 15.95	+09 14.5	1.982	2.366	+0.16	-4.7	16.5	100.3
Dec. 15	10 17.54	+08 27.3	1.928	2.444	-0.14	-3.2	16.8	109.8
Dec. 25	10 16.14	+07 55.6	1.880	2.521	-0.43	-1.6	17.0	120.1
Jan. 4	10 11.81	+07 40.1	1.843	2.598	-0.70	0.0	17.3	131.1
Jan. 14	10 04.83	+07 40.2	1.824	2.675	-0.91	+1.4	17.6	142.9
Jan. 24	09 55.77	+07 54.0	1.827	2.751	-1.02	+2.4	17.9	155.0
Feb. 3	09 45.54	+08 17.9	1.857	2.826	-1.04	+3.0	18.2	167.1
Feb. 13	09 35.18	+08 47.4	1.917	2.901	-0.95	+3.1	18.6	174.7
Feb. 23	09 25.70	+09 17.9	2.007	2.975	-0.78	+2.8	18.9	165.6
Mar. 5	09 17.93	+09 45.4	2.126	3.049	-0.56	+2.2	19.3	154.1
Mar. 15	09 12.32	+10 07.4	2.270	3.121	-0.33	+1.5	19.7	142.9
Mar. 25	09 09.07	+10 22.2	2.437	3.193	-0.10	+0.7	20.1	132.2

Comet P/2003 A1 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 June 16.15338 TT
Peri. = 340.26639 e = 0.4998555
Node = 54.07602 2000.0 a = 3.8319522 AU
Incl. = 44.33391 n = 0.13139352
q = 1.9165298 AU P = 7.50 years

m1 = 9.2 + 5 log(Delta) + 22.5 log(r(t-30))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	22 18.76	-46 26.8	2.954	2.337	-1.12	-6.1	20.4	32.0/ 55	43.2
Jan. 19	22 42.75	-43 13.6	2.955	2.292	-1.05	-7.5	20.2	33.1/ 54	40.1
Jan. 29	23 05.99	-39 50.0	2.953	2.249	-0.98	-8.8	20.0	34.0/ 53	37.2
Feb. 8	23 28.50	-36 17.7	2.950	2.208	-0.92	-9.9	19.8	34.8/ 53	34.5
Feb. 18	23 50.33	-32 38.7	2.945	2.169	-0.86	-11.0	19.7	35.4/ 52	31.8
Feb. 28	00 11.56	-28 54.7	2.939	2.131	-0.80	-12.0	19.5	35.8/ 52	29.3
Mar. 10	00 32.26	-25 07.8	2.932	2.096	-0.76	-12.8	19.3	36.0/ 52	27.0
Mar. 20	00 52.50	-21 19.7	2.923	2.063	-0.71	-13.5	19.1	36.2/ 52	25.0
Mar. 30	01 12.36	-17 32.0	2.913	2.033	-0.68	-14.2	18.9	36.1/ 52	23.2
Apr. 9	01 31.90	-13 46.5	2.901	2.007	-0.65	-14.7	18.7	36.0/ 52	21.9
Apr. 19	01 51.19	-10 04.2	2.886	1.983	-0.63	-15.1	18.6	35.8/ 53	21.2
Apr. 29	02 10.30	-06 26.2	2.868	1.962	-0.61	-15.4	18.4	35.5/ 53	21.2
May 9	02 29.28	-02 53.3	2.845	1.945	-0.60	-15.7	18.3	35.1/ 54	21.9
May 19	02 48.17	+00 34.1	2.819	1.932	-0.60	-15.9	18.1	34.7/ 54	23.4
May 29	03 07.04	+03 55.5	2.787	1.923	-0.60	-16.1	18.0	34.3/ 55	25.6
June 8	03 25.89	+07 11.0	2.749	1.918	-0.62	-16.2	17.9	33.8/ 56	28.4
June 18	03 44.79	+10 20.8	2.705	1.917	-0.64	-16.2	17.8	33.4/ 56	31.7
June 28	04 03.74	+13 25.2	2.655	1.919	-0.67	-16.2	17.7	32.9/ 56	35.4
July 8	04 22.76	+16 24.9	2.599	1.926	-0.70	-16.2	17.6	32.4/ 56	39.5
July 18	04 41.87	+19 20.7	2.537	1.937	-0.75	-16.1	17.6	32.0/ 56	43.9
July 28	05 01.04	+22 13.8	2.469	1.951	-0.81	-15.8	17.5	31.5/ 56	48.6
Aug. 7	05 20.24	+25 05.6	2.395	1.969	-0.87	-15.6	17.5	31.0/ 55	53.5
Aug. 17	05 39.45	+27 57.7	2.318	1.991	-0.95	-15.1	17.5	30.5/ 54	58.8
Aug. 27	05 58.59	+30 52.0	2.237	2.016	-1.04	-14.6	17.5	30.0/ 52	64.3
Sept. 6	06 17.57	+33 50.9	2.155	2.044	-1.15	-13.9	17.5	29.5/ 50	70.1
Sept.16	06 36.27	+36 56.7	2.073	2.075	-1.27	-13.0	17.5	28.9/ 46	76.1
Sept.26	06 54.50	+40 11.9	1.992	2.109	-1.40	-11.8	17.5	28.5/ 42	82.4
Oct. 6	07 12.02	+43 38.9	1.916	2.145	-1.56	-10.4	17.6	28.0/ 37	88.9
Oct. 16	07 28.53	+47 19.2	1.846	2.183	-1.75	-8.8	17.7	27.6/ 31	95.6
Oct. 26	07 43.52	+51 13.3	1.786	2.223	-1.98	-6.9	17.7	27.1/ 24	102.4
Nov. 5	07 56.34	+55 19.2	1.739	2.265	-2.26	-5.0	17.9	26.5/ 16	109.0
Nov. 15	08 06.06	+59 32.7	1.706	2.308	-2.61	-3.0	18.0	25.6/ 8	115.3
Nov. 25	08 11.24	+63 45.6	1.691	2.353	-3.06	-1.4	18.1	24.1/358	120.7
Dec. 5	08 09.95	+67 46.1	1.696	2.399	-3.64	-0.5	18.3	22.0/347	124.9
Dec. 15	07 59.74	+71 19.3	1.720	2.446	-4.33	-0.6	18.6	19.3/333	127.4
Dec. 25	07 38.53	+74 07.8	1.765	2.494	-5.05	-2.0	18.8	16.2/316	128.0
Jan. 4	07 07.34	+75 56.0	1.829	2.543	-5.49	-4.5	19.1	13.0/293	126.8
Jan. 14	06 32.62	+76 38.2	1.910	2.592	-5.37	-7.2	19.3	10.2/265	124.1
Jan. 24	06 03.85	+76 23.2	2.006	2.642	-4.78	-9.2	19.6	8.2/232	120.2
Feb. 3	05 46.72	+75 30.3	2.115	2.692	-4.07	-10.1	19.9	7.6/197	115.6
Feb. 13	05 41.32	+74 17.2	2.234	2.742	-3.47	-10.1	20.3	8.4/168	110.6
Feb. 23	05 45.33	+72 54.8	2.361	2.793	-3.02	-9.5	20.6	9.9/149	105.5
Mar. 5	05 56.09	+71 28.9	2.495	2.844	-2.69	-8.5	20.9	11.6/137	100.2
Mar. 15	06 11.45	+70 01.4	2.633	2.894	-2.42	-7.4	21.2	13.2/130	95.0
Mar. 25	06 29.87	+68 32.4	2.774	2.945	-2.20	-6.2	21.5	14.6/126	89.8

Comet P/2003 H4 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 June 22.41555 TT
Peri. = 10.60593 e = 0.4902820
Node = 226.74371 2000.0 a = 3.3380278 AU
Incl. = 18.15179 n = 0.16161034
q = 1.7014528 AU P = 6.10 years

m1 = 13.8 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 9	12 13.50	-22 15.1	1.894	2.226	-1.71	+4.0	22.1	19.3/127	96.1
Jan. 19	12 24.73	-24 09.6	1.738	2.175	-1.93	+4.1	21.8	17.2/128	102.5
Jan. 29	12 34.74	-25 54.5	1.588	2.126	-2.18	+4.2	21.4	14.5/129	109.2
Feb. 8	12 43.18	-27 25.2	1.445	2.078	-2.48	+4.4	21.0	11.2/130	116.2
Feb. 18	12 49.74	-28 36.5	1.311	2.031	-2.81	+4.8	20.5	7.2/128	123.5
Feb. 28	12 54.04	-29 20.9	1.189	1.987	-3.17	+5.5	20.1	2.6/111	131.2
Mar. 10	12 55.89	-29 29.9	1.080	1.944	-3.54	+6.5	19.7	3.6/349	139.4
Mar. 20	12 55.36	-28 54.5	0.986	1.904	-3.88	+7.9	19.4	9.4/340	147.8
Mar. 30	12 52.91	-27 26.6	0.910	1.866	-4.16	+9.4	19.0	14.9/342	155.8
Apr. 9	12 49.59	-25 04.4	0.854	1.832	-4.32	+10.5	18.7	19.3/348	161.7
Apr. 19	12 46.73	-21 55.2	0.819	1.800	-4.35	+10.7	18.5	21.9/356	161.9
Apr. 29	12 45.69	-18 16.4	0.806	1.773	-4.25	+9.7	18.3	22.6/ 7	155.8
May 9	12 47.52	-14 32.3	0.814	1.750	-4.07	+7.7	18.2	22.0/ 20	147.2
May 19	12 52.68	-11 05.7	0.840	1.731	-3.84	+5.0	18.2	21.4/ 36	138.1
May 29	13 01.19	-08 12.3	0.882	1.716	-3.60	+2.3	18.2	21.7/ 53	129.6
June 8	13 12.76	-05 59.5	0.938	1.707	-3.36	+0.1	18.3	23.0/ 67	121.8
June 18	13 26.90	-04 27.6	1.003	1.702	-3.14	-1.7	18.4	24.9/ 77	114.9
June 28	13 43.16	-03 32.7	1.077	1.702	-2.94	-2.9	18.6	27.0/ 85	108.8
July 8	14 01.11	-03 09.2	1.158	1.708	-2.75	-3.7	18.8	28.8/ 90	103.3
July 18	14 20.36	-03 10.7	1.245	1.718	-2.58	-4.3	19.0	30.5/ 94	98.4
July 28	14 40.66	-03 31.2	1.337	1.733	-2.42	-4.5	19.2	31.8/ 96	93.9
Aug. 7	15 01.76	-04 05.1	1.434	1.752	-2.27	-4.7	19.5	32.7/ 98	89.7
Aug. 17	15 23.47	-04 47.2	1.536	1.776	-2.13	-4.8	19.7	33.5/ 98	85.7
Aug. 27	15 45.67	-05 33.5	1.643	1.804	-2.00	-4.8	20.0	34.0/ 98	81.9
Sept. 6	16 08.23	-06 19.8	1.753	1.835	-1.88	-4.8	20.3	34.2/ 98	78.2
Sept.16	16 31.03	-07 03.3	1.868	1.870	-1.76	-4.8	20.6	34.4/ 97	74.5
Sept.26	16 53.99	-07 41.2	1.986	1.908	-1.65	-4.8	20.9	34.3/ 95	70.8
Oct. 6	17 17.01	-08 11.4	2.107	1.949	-1.55	-4.8	21.2	34.2/ 94	67.1
Oct. 16	17 39.98	-08 32.4	2.230	1.992	-1.45	-4.8	21.5	33.9/ 92	63.2
Oct. 26	18 02.83	-08 43.2	2.356	2.037	-1.35	-4.8	21.8	33.6/ 90	59.3
Nov. 5	18 25.47	-08 42.9	2.482	2.083	-1.26	-4.8	22.1	33.1/ 88	55.3
Nov. 15	18 47.81	-08 31.4	2.609	2.132	-1.18	-4.7	22.5	32.7/ 86	51.1
Nov. 25	19 09.78	-08 08.8	2.734	2.181	-1.10	-4.6	22.8	32.2/ 84	46.8
Dec. 5	19 31.30	-07 35.5	2.857	2.231	-1.03	-4.5	23.1	31.6/ 82	42.5
Dec. 15	19 52.34	-06 52.0	2.976	2.283	-0.96	-4.4	23.3	31.0/ 80	38.0
Dec. 25	20 12.85	-05 59.1	3.091	2.335	-0.90	-4.3	23.6	30.4/ 79	33.5
Jan. 4	20 32.77	-04 57.8	3.199	2.387	-0.84	-4.1	23.9	29.7/ 77	29.0
Jan. 14	20 52.11	-03 49.1	3.300	2.440	-0.79	-3.9	24.1	29.0/ 75	24.5
Jan. 24	21 10.84	-02 33.9	3.392	2.492	-0.74	-3.7	24.4	28.3/ 74	20.3
Feb. 3	21 28.95	-01 13.4	3.475	2.545	-0.69	-3.5	24.6	27.6/ 72	16.5
Feb. 13	21 46.43	+00 11.5	3.547	2.598	-0.66	-3.3	24.8	26.8/ 71	13.7
Feb. 23	22 03.29	+01 39.6	3.607	2.651	-0.62	-3.1	.	25.9/ 70	12.7
Mar. 5	22 19.50	+03 10.0	3.655	2.704	-0.59	-2.8	.	25.1/ 68	14.1
Mar. 15	22 35.09	+04 41.9	3.689	2.756	-0.57	-2.6	.	24.1/ 67	17.3
Mar. 25	22 50.02	+06 14.3	3.710	2.808	-0.54	-2.4	.	23.1/ 66	21.7

Comet C/2008 Q3 (Garradd)

Epoch = 2009 July 28.0 TT
T = 2009 June 23.09693 TT
Peri. = 340.85283
Node = 219.73753 2000.0
Incl. = 140.70640
q = 1.7984637 AU
e = 0.9998001

m1 = 10.4 + 5 log(Delta) + 10.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	21 00.67	-47 51.8	3.488	2.711	+0.30	+4.9	17.4	32.5
Jan. 19	21 03.67	-47 03.0	3.439	2.626	+0.37	+3.9	17.3	29.3
Jan. 29	21 07.39	-46 24.5	3.361	2.542	+0.41	+2.7	17.1	28.8
Feb. 8	21 11.50	-45 57.6	3.252	2.461	+0.42	+1.4	16.9	31.1
Feb. 18	21 15.69	-45 44.1	3.114	2.382	+0.40	-0.2	16.6	35.7
Feb. 28	21 19.65	-45 46.3	2.946	2.305	+0.33	-2.2	16.4	41.9
Mar. 10	21 22.97	-46 07.9	2.751	2.231	+0.22	-4.6	16.1	49.2
Mar. 20	21 25.14	-46 54.0	2.531	2.162	+0.02	-7.8	15.8	57.3
Mar. 30	21 25.36	-48 12.3	2.290	2.096	-0.31	-12.2	15.4	66.2
Apr. 9	21 22.25	-50 14.3	2.033	2.035	-0.92	-18.2	15.0	75.9
Apr. 19	21 13.08	-53 15.8	1.767	1.980	-2.14	-26.1	14.6	86.6
Apr. 29	20 51.64	-57 36.6	1.503	1.931	-5.02	-34.0	14.1	98.6
May 9	20 01.43	-63 17.0	1.257	1.888	-11.81	-26.8	13.7	112.4
May 19	18 03.28	-67 45.4	1.058	1.854	-16.73	+31.7	13.2	127.2
May 29	15 15.94	-62 28.0	0.946	1.827	-9.45	+91.2	12.9	137.5
June 8	13 41.42	-47 16.2	0.958	1.809	-3.95	+92.5	12.9	132.9
June 18	13 01.88	-31 51.7	1.088	1.800	-1.73	+68.8	13.1	117.6
June 28	12 44.62	-20 23.4	1.294	1.800	-0.73	+47.0	13.5	101.6
July 8	12 37.29	-12 33.9	1.537	1.809	-0.22	+32.1	13.9	87.7
July 18	12 35.05	-07 13.4	1.793	1.827	+0.07	+22.5	14.3	75.5
July 28	12 35.76	-03 28.2	2.045	1.853	+0.25	+16.4	14.6	64.6
Aug. 7	12 38.31	-00 44.2	2.284	1.888	+0.38	+12.4	15.0	54.6
Aug. 17	12 42.08	+01 20.1	2.503	1.930	+0.46	+9.8	15.2	45.3
Aug. 27	12 46.69	+02 58.4	2.698	1.979	+0.52	+8.2	15.5	36.5
Sept. 6	12 51.90	+04 20.3	2.866	2.034	+0.56	+7.2	15.8	28.2
Sept.16	12 57.50	+05 32.3	3.004	2.095	+0.59	+6.7	16.0	20.8
Sept.26	13 03.37	+06 39.6	3.111	2.160	+0.60	+6.7	16.2	15.3
Oct. 6	13 09.36	+07 46.6	3.187	2.230	+0.60	+7.1	16.4	14.0
Oct. 16	13 15.34	+08 57.2	3.232	2.303	+0.58	+7.8	16.6	17.9
Oct. 26	13 21.19	+10 14.9	3.246	2.380	+0.55	+8.9	16.7	24.7
Nov. 5	13 26.74	+11 43.5	3.232	2.459	+0.51	+10.3	16.9	32.9
Nov. 15	13 31.82	+13 26.8	3.192	2.540	+0.44	+12.2	17.0	41.7
Nov. 25	13 36.21	+15 28.8	3.130	2.624	+0.34	+14.5	17.1	51.0
Dec. 5	13 39.64	+17 53.7	3.051	2.709	+0.21	+17.2	17.1	60.7
Dec. 15	13 41.78	+20 45.5	2.960	2.795	+0.04	+20.2	17.2	70.8
Dec. 25	13 42.19	+24 07.8	2.864	2.882	-0.19	+23.4	17.3	81.2
Jan. 4	13 40.31	+28 02.0	2.771	2.971	-0.48	+26.5	17.3	91.9
Jan. 14	13 35.47	+32 26.7	2.692	3.060	-0.87	+28.8	17.4	102.5
Jan. 24	13 26.81	+37 15.1	2.635	3.149	-1.34	+29.8	17.5	112.7
Feb. 3	13 13.44	+42 13.2	2.611	3.239	-1.89	+28.7	17.6	121.7
Feb. 13	12 54.57	+47 00.5	2.626	3.329	-2.46	+25.2	17.7	128.4
Feb. 23	12 29.97	+51 12.4	2.684	3.420	-2.93	+19.5	17.9	131.4
Mar. 5	12 00.62	+54 27.2	2.786	3.511	-3.16	+12.6	18.1	130.3
Mar. 15	11 28.98	+56 33.1	2.929	3.601	-3.06	+5.9	18.3	125.7
Mar. 25	10 58.40	+57 31.8	3.106	3.692	-2.66	+0.4	18.5	118.9

Comet C/2006 W3 (Christensen)

Epoch = 2009 July 28.0 TT
T = 2009 July 6.66091 TT
Peri. = 133.52081
Node = 113.57463 2000.0
Incl. = 127.07241
q = 3.1261921 AU
e = 1.0002315

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 02.42	+43 12.8	3.691	3.567	+0.49	-14.5	11.4	75.1
Jan. 19	22 07.32	+40 47.5	3.780	3.523	+0.55	-11.9	11.4	67.5
Jan. 29	22 12.81	+38 48.7	3.861	3.480	+0.58	-9.4	11.3	60.3
Feb. 8	22 18.58	+37 14.3	3.930	3.440	+0.58	-7.3	11.3	53.7
Feb. 18	22 24.43	+36 01.4	3.983	3.401	+0.57	-5.4	11.3	47.9
Feb. 28	22 30.18	+35 07.7	4.016	3.365	+0.55	-3.7	11.3	43.3
Mar. 10	22 35.63	+34 30.8	4.027	3.330	+0.50	-2.3	11.3	40.2
Mar. 20	22 40.62	+34 08.3	4.015	3.299	+0.44	-1.0	11.2	38.8
Mar. 30	22 44.98	+33 58.2	3.977	3.269	+0.35	0.0	11.1	39.5
Apr. 9	22 48.52	+33 58.6	3.915	3.242	+0.25	+0.9	11.1	42.1
Apr. 19	22 51.00	+34 07.4	3.829	3.218	+0.12	+1.5	11.0	46.3
Apr. 29	22 52.19	+34 22.8	3.720	3.197	-0.04	+2.0	10.9	51.8
May 9	22 51.76	+34 42.4	3.590	3.178	-0.24	+2.1	10.8	58.3
May 19	22 49.35	+35 03.6	3.443	3.162	-0.48	+1.9	10.7	65.6
May 29	22 44.54	+35 22.9	3.281	3.149	-0.77	+1.2	10.6	73.6
June 8	22 36.85	+35 35.1	3.111	3.139	-1.10	-0.2	10.4	82.2
June 18	22 25.81	+35 33.6	2.937	3.131	-1.48	-2.5	10.3	91.4
June 28	22 11.04	+35 09.0	2.767	3.127	-1.86	-5.9	10.2	101.2
July 8	21 52.47	+34 09.7	2.610	3.126	-2.19	-10.7	10.0	111.3
July 18	21 30.54	+32 23.0	2.477	3.128	-2.42	-16.4	9.9	121.3
July 28	21 06.38	+29 39.2	2.377	3.133	-2.47	-22.3	9.8	130.5
Aug. 7	20 41.71	+25 56.3	2.321	3.141	-2.33	-27.1	9.8	137.1
Aug. 17	20 18.40	+21 25.0	2.317	3.152	-2.04	-29.9	9.8	139.1
Aug. 27	19 57.98	+16 25.9	2.365	3.166	-1.67	-30.2	9.9	135.4
Sept. 6	19 41.31	+11 23.6	2.464	3.182	-1.27	-28.6	10.0	127.7
Sept.16	19 28.58	+06 37.8	2.606	3.202	-0.90	-25.8	10.1	117.8
Sept.26	19 19.57	+02 20.1	2.781	3.224	-0.57	-22.5	10.3	107.3
Oct. 6	19 13.83	-01 25.1	2.979	3.249	-0.30	-19.4	10.5	96.6
Oct. 16	19 10.86	-04 38.6	3.190	3.277	-0.07	-16.5	10.7	86.1
Oct. 26	19 10.17	-07 23.6	3.404	3.307	+0.12	-14.0	10.9	76.0
Nov. 5	19 11.34	-09 44.0	3.616	3.339	+0.26	-12.0	11.0	66.1
Nov. 15	19 13.99	-11 43.8	3.818	3.374	+0.38	-10.3	11.2	56.5
Nov. 25	19 17.81	-13 26.5	4.006	3.411	+0.47	-8.9	11.3	47.0
Dec. 5	19 22.53	-14 55.3	4.176	3.450	+0.54	-7.8	11.5	37.8
Dec. 15	19 27.91	-16 12.8	4.323	3.491	+0.59	-6.9	11.6	28.7
Dec. 25	19 33.77	-17 21.6	4.445	3.534	+0.61	-6.2	11.7	19.7
Jan. 4	19 39.91	-18 23.6	4.541	3.579	+0.63	-5.7	11.8	10.7
Jan. 14	19 46.16	-19 20.9	4.608	3.626	+0.62	-5.4	11.9	2.3
Jan. 24	19 52.37	-20 15.3	4.648	3.674	+0.60	-5.3	12.0	7.6
Feb. 3	19 58.37	-21 08.6	4.658	3.724	+0.56	-5.4	12.1	16.5
Feb. 13	20 04.02	-22 02.6	4.642	3.775	+0.51	-5.7	12.1	25.5
Feb. 23	20 09.15	-22 59.2	4.599	3.828	+0.44	-6.1	12.1	34.7
Mar. 5	20 13.58	-24 00.2	4.533	3.881	+0.35	-6.7	12.2	44.0
Mar. 15	20 17.12	-25 07.5	4.446	3.937	+0.24	-7.5	12.2	53.5
Mar. 25	20 19.56	-26 23.0	4.341	3.993	+0.11	-8.5	12.2	63.2

Comet 77P/Longmore

Epoch = 2009 July 28.0 TT
T = 2009 July 7.85371 TT
Peri. = 196.69524 e = 0.3580615
Node = 14.91679 2000.0 a = 3.5989828 AU
Incl. = 24.39875 n = 0.14435586
q = 2.3103256 AU P = 6.83 years

m1 = 6.8 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	12 35.86	+15 29.2	2.146	2.595	+0.48	-3.5	16.7	106.0
Jan. 19	12 40.65	+14 54.6	2.000	2.567	+0.23	-2.7	16.5	114.4
Jan. 29	12 42.94	+14 27.8	1.863	2.541	-0.06	-2.1	16.2	123.3
Feb. 8	12 42.37	+14 06.9	1.739	2.515	-0.36	-1.8	16.0	132.7
Feb. 18	12 38.73	+13 48.8	1.631	2.490	-0.67	-2.0	15.8	142.7
Feb. 28	12 32.01	+13 28.9	1.543	2.467	-0.94	-2.8	15.6	152.9
Mar. 10	12 22.61	+13 01.3	1.480	2.445	-1.12	-4.1	15.4	162.4
Mar. 20	12 11.41	+12 20.6	1.443	2.425	-1.18	-5.8	15.3	167.4
Mar. 30	11 59.63	+11 22.9	1.434	2.405	-1.09	-7.6	15.2	162.7
Apr. 9	11 48.69	+10 07.0	1.452	2.388	-0.89	-9.2	15.2	153.0
Apr. 19	11 39.75	+08 34.9	1.494	2.372	-0.62	-10.5	15.2	142.6
Apr. 29	11 33.56	+06 49.8	1.558	2.358	-0.31	-11.5	15.2	132.4
May 9	11 30.46	+04 55.1	1.639	2.345	-0.01	-12.1	15.3	122.9
May 19	11 30.38	+02 53.7	1.732	2.335	+0.27	-12.6	15.4	114.0
May 29	11 33.09	+00 47.4	1.835	2.326	+0.52	-13.0	15.5	105.9
June 8	11 38.27	-01 22.5	1.944	2.319	+0.73	-13.3	15.5	98.3
June 18	11 45.57	-03 35.3	2.056	2.314	+0.91	-13.5	15.7	91.3
June 28	11 54.69	-05 50.4	2.170	2.311	+1.07	-13.7	15.8	84.8
July 8	12 05.39	-08 07.4	2.283	2.310	+1.21	-13.8	15.9	78.7
July 18	12 17.44	-10 25.9	2.395	2.311	+1.33	-14.0	16.0	72.9
July 28	12 30.71	-12 45.4	2.505	2.314	+1.44	-14.0	16.1	67.4
Aug. 7	12 45.06	-15 05.3	2.612	2.319	+1.53	-14.0	16.2	62.2
Aug. 17	13 00.40	-17 24.9	2.715	2.326	+1.63	-13.9	16.3	57.1
Aug. 27	13 16.70	-19 43.4	2.813	2.335	+1.72	-13.7	16.4	52.2
Sept. 6	13 33.90	-21 59.9	2.906	2.346	+1.81	-13.4	16.5	47.5
Sept.16	13 51.97	-24 13.4	2.994	2.358	+1.89	-13.0	16.6	42.9
Sept.26	14 10.92	-26 23.0	3.076	2.372	+1.98	-12.4	16.7	38.4
Oct. 6	14 30.72	-28 27.3	3.151	2.388	+2.06	-11.8	16.9	34.0
Oct. 16	14 51.35	-30 25.4	3.220	2.406	+2.14	-11.1	17.0	29.8
Oct. 26	15 12.79	-32 16.0	3.282	2.425	+2.22	-10.2	17.1	25.8
Nov. 5	15 35.00	-33 57.9	3.336	2.446	+2.29	-9.2	17.2	22.1
Nov. 15	15 57.91	-35 30.2	3.382	2.468	+2.35	-8.2	17.3	18.9
Nov. 25	16 21.45	-36 51.8	3.420	2.491	+2.40	-7.0	17.4	16.7
Dec. 5	16 45.47	-38 02.0	3.450	2.516	+2.44	-5.8	17.5	15.7
Dec. 15	17 09.85	-39 00.4	3.471	2.541	+2.46	-4.6	17.6	16.3
Dec. 25	17 34.41	-39 46.8	3.483	2.568	+2.45	-3.5	17.7	18.4
Jan. 4	17 58.96	-40 21.4	3.485	2.596	+2.43	-2.3	17.8	21.6
Jan. 14	18 23.31	-40 44.7	3.478	2.625	+2.39	-1.3	17.9	25.5
Jan. 24	18 47.26	-40 57.8	3.461	2.654	+2.33	-0.4	18.0	29.9
Feb. 3	19 10.61	-41 01.9	3.435	2.684	+2.26	+0.3	18.1	34.7
Feb. 13	19 33.20	-40 58.6	3.400	2.715	+2.17	+0.9	18.1	39.8
Feb. 23	19 54.88	-40 49.8	3.355	2.747	+2.06	+1.2	18.2	45.1
Mar. 5	20 15.50	-40 37.3	3.302	2.779	+1.95	+1.4	18.3	50.5
Mar. 15	20 34.96	-40 23.3	3.240	2.812	+1.82	+1.3	18.3	56.2
Mar. 25	20 53.14	-40 10.2	3.171	2.845	+1.68	+1.0	18.4	62.1

Comet 116P/Wild

Epoch = 2009 July 28.0 TT
T = 2009 July 18.88242 TT
Peri. = 173.60332 e = 0.3745981
Node = 21.03180 2000.0 a = 3.4774231 AU
Incl. = 3.61282 n = 0.15199097
q = 2.1747870 AU P = 6.48 years

m1 = 7.0 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	10 03.31	+17 17.9	1.693	2.539	-0.32	+2.6	15.2	141.6
Jan. 19	10 00.11	+17 44.2	1.592	2.506	-0.57	+3.4	15.0	152.5
Jan. 29	09 54.42	+18 18.7	1.514	2.475	-0.76	+3.7	14.8	163.8
Feb. 8	09 46.87	+18 55.8	1.461	2.444	-0.84	+3.3	14.6	173.8
Feb. 18	09 38.45	+19 29.1	1.436	2.415	-0.81	+2.4	14.5	169.8
Feb. 28	09 30.37	+19 52.6	1.437	2.387	-0.65	+1.0	14.4	158.6
Mar. 10	09 23.88	+20 02.2	1.462	2.360	-0.40	-0.6	14.4	147.4
Mar. 20	09 19.88	+19 56.4	1.508	2.335	-0.10	-2.1	14.3	136.6
Mar. 30	09 18.85	+19 35.2	1.571	2.311	+0.21	-3.5	14.3	126.7
Apr. 9	09 20.94	+18 59.7	1.646	2.288	+0.50	-4.8	14.4	117.5
Apr. 19	09 25.95	+18 11.4	1.731	2.268	+0.76	-6.0	14.4	109.1
Apr. 29	09 33.58	+17 11.2	1.821	2.249	+0.99	-7.1	14.5	101.4
May 9	09 43.45	+16 00.2	1.915	2.232	+1.17	-8.1	14.5	94.4
May 19	09 55.18	+14 39.0	2.011	2.217	+1.33	-9.1	14.6	87.9
May 29	10 08.44	+13 08.4	2.108	2.205	+1.45	-9.9	14.6	81.8
June 8	10 22.96	+11 29.1	2.204	2.194	+1.55	-10.7	14.7	76.1
June 18	10 38.47	+09 41.9	2.299	2.186	+1.63	-11.4	14.8	70.8
June 28	10 54.80	+07 47.6	2.392	2.180	+1.70	-12.0	14.8	65.7
July 8	11 11.79	+05 47.3	2.483	2.176	+1.75	-12.5	14.9	60.8
July 18	11 29.33	+03 41.9	2.571	2.175	+1.80	-12.9	15.0	56.1
July 28	11 47.35	+01 32.7	2.657	2.176	+1.84	-13.2	15.0	51.5
Aug. 7	12 05.77	-00 39.1	2.739	2.179	+1.88	-13.3	15.1	47.1
Aug. 17	12 24.56	-02 52.3	2.819	2.185	+1.91	-13.3	15.2	42.7
Aug. 27	12 43.71	-05 05.5	2.894	2.193	+1.95	-13.2	15.3	38.3
Sept. 6	13 03.18	-07 17.5	2.966	2.203	+1.98	-12.9	15.4	33.9
Sept.16	13 22.97	-09 26.9	3.033	2.215	+2.01	-12.6	15.5	29.6
Sept.26	13 43.09	-11 32.4	3.096	2.229	+2.04	-12.0	15.5	25.2
Oct. 6	14 03.50	-13 32.7	3.153	2.246	+2.07	-11.4	15.6	20.7
Oct. 16	14 24.20	-15 26.7	3.205	2.264	+2.10	-10.6	15.7	16.2
Oct. 26	14 45.16	-17 13.2	3.250	2.284	+2.12	-9.8	15.8	11.6
Nov. 5	15 06.34	-18 51.1	3.288	2.306	+2.14	-8.9	15.9	7.0
Nov. 15	15 27.70	-20 19.6	3.318	2.330	+2.15	-7.8	16.0	2.5
Nov. 25	15 49.16	-21 38.0	3.340	2.355	+2.15	-6.8	16.1	3.3
Dec. 5	16 10.62	-22 45.7	3.354	2.382	+2.14	-5.7	16.2	8.1
Dec. 15	16 32.02	-23 42.5	3.358	2.410	+2.12	-4.6	16.3	13.2
Dec. 25	16 53.21	-24 28.3	3.352	2.439	+2.09	-3.5	16.4	18.4
Jan. 4	17 14.08	-25 03.3	3.336	2.469	+2.04	-2.5	16.5	23.8
Jan. 14	17 34.49	-25 27.9	3.311	2.501	+1.98	-1.5	16.6	29.4
Jan. 24	17 54.32	-25 43.0	3.274	2.533	+1.91	-0.6	16.6	35.1
Feb. 3	18 13.40	-25 49.4	3.228	2.566	+1.82	+0.1	16.7	40.9
Feb. 13	18 31.63	-25 48.5	3.171	2.600	+1.72	+0.7	16.8	47.0
Feb. 23	18 48.83	-25 41.5	3.105	2.634	+1.61	+1.1	16.8	53.2
Mar. 5	19 04.89	-25 30.1	3.031	2.669	+1.48	+1.4	16.9	59.6
Mar. 15	19 19.65	-25 15.8	2.948	2.705	+1.33	+1.5	16.9	66.2
Mar. 25	19 32.97	-25 00.5	2.859	2.741	+1.17	+1.5	16.9	73.1

Comet C/2008 P1 (Garradd)

Epoch = 2009 July 28.0 TT
T = 2009 July 22.91625 TT
Peri. = 11.85813
Node = 357.67678 2000.0
Incl. = 64.30864
q = 3.8962403 AU
e = 1.0017700

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	23 03.71	-24 28.5	4.798	4.246	+0.55	+13.7	16.3	50.8
Jan. 19	23 09.19	-22 11.1	4.879	4.213	+0.62	+13.6	16.3	43.0
Jan. 29	23 15.34	-19 55.5	4.946	4.181	+0.67	+13.4	16.3	35.3
Feb. 8	23 22.02	-17 41.5	4.998	4.151	+0.71	+13.2	16.3	27.8
Feb. 18	23 29.07	-15 29.1	5.033	4.122	+0.73	+13.1	16.3	20.6
Feb. 28	23 36.40	-13 18.2	5.049	4.095	+0.75	+13.0	16.2	13.9
Mar. 10	23 43.88	-11 08.6	5.047	4.069	+0.75	+12.8	16.2	9.0
Mar. 20	23 51.42	-09 00.2	5.026	4.045	+0.75	+12.8	16.2	8.9
Mar. 30	23 58.93	-06 52.6	4.986	4.022	+0.74	+12.7	16.1	13.7
Apr. 9	00 06.31	-04 45.7	4.927	4.002	+0.72	+12.6	16.1	20.2
Apr. 19	00 13.47	-02 39.3	4.850	3.983	+0.69	+12.6	16.0	27.2
Apr. 29	00 20.33	-00 33.1	4.757	3.966	+0.64	+12.6	16.0	34.3
May 9	00 26.76	+01 33.2	4.648	3.951	+0.59	+12.7	15.9	41.6
May 19	00 32.67	+03 39.9	4.525	3.937	+0.53	+12.7	15.8	49.1
May 29	00 37.92	+05 47.3	4.390	3.926	+0.44	+12.8	15.8	56.7
June 8	00 42.36	+07 55.8	4.246	3.916	+0.35	+13.0	15.7	64.4
June 18	00 45.83	+10 05.5	4.094	3.908	+0.23	+13.1	15.6	72.4
June 28	00 48.14	+12 16.7	3.939	3.902	+0.09	+13.3	15.5	80.5
July 8	00 49.08	+14 29.3	3.783	3.898	-0.07	+13.3	15.4	88.9
July 18	00 48.41	+16 42.7	3.630	3.896	-0.25	+13.3	15.3	97.6
July 28	00 45.91	+18 56.0	3.485	3.896	-0.45	+13.1	15.2	106.5
Aug. 7	00 41.38	+21 07.3	3.352	3.898	-0.67	+12.7	15.1	115.6
Aug. 17	00 34.69	+23 13.8	3.236	3.902	-0.89	+11.8	15.1	124.7
Aug. 27	00 25.82	+25 11.9	3.142	3.908	-1.08	+10.5	15.0	133.6
Sept. 6	00 15.01	+26 57.2	3.074	3.916	-1.23	+8.8	15.0	141.8
Sept.16	00 02.70	+28 25.6	3.036	3.926	-1.31	+6.8	15.0	148.1
Sept.26	23 49.59	+29 34.0	3.029	3.937	-1.30	+4.8	15.0	151.2
Oct. 6	23 36.55	+30 21.8	3.055	3.951	-1.21	+2.9	15.0	149.7
Oct. 16	23 24.44	+30 51.0	3.112	3.966	-1.05	+1.4	15.0	144.5
Oct. 26	23 13.98	+31 05.5	3.196	3.983	-0.83	+0.5	15.1	137.2
Nov. 5	23 05.66	+31 10.8	3.305	4.002	-0.60	+0.2	15.2	128.8
Nov. 15	22 59.68	+31 12.4	3.433	4.023	-0.36	+0.3	15.3	120.2
Nov. 25	22 56.08	+31 15.0	3.576	4.045	-0.14	+0.8	15.4	111.6
Dec. 5	22 54.72	+31 22.5	3.729	4.069	+0.07	+1.5	15.6	103.3
Dec. 15	22 55.37	+31 37.4	3.886	4.095	+0.24	+2.4	15.7	95.2
Dec. 25	22 57.81	+32 01.5	4.046	4.122	+0.40	+3.4	15.8	87.5
Jan. 4	23 01.77	+32 35.7	4.203	4.151	+0.53	+4.5	15.9	80.3
Jan. 14	23 07.04	+33 20.2	4.355	4.181	+0.64	+5.5	16.0	73.4
Jan. 24	23 13.40	+34 15.2	4.499	4.213	+0.73	+6.5	16.1	67.0
Feb. 3	23 20.68	+35 20.4	4.634	4.246	+0.80	+7.5	16.2	61.1
Feb. 13	23 28.73	+36 35.3	4.759	4.281	+0.87	+8.4	16.3	55.7
Feb. 23	23 37.41	+37 59.4	4.871	4.317	+0.92	+9.3	16.4	51.0
Mar. 5	23 46.62	+39 32.1	4.971	4.354	+0.96	+10.1	16.5	46.9
Mar. 15	23 56.25	+41 12.8	5.057	4.393	+1.00	+10.8	16.5	43.7
Mar. 25	00 06.24	+43 00.9	5.130	4.432	+1.03	+11.5	16.6	41.4

Comet P/1999 XB69 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 July 25.88109 TT
Peri. = 220.32565 e = 0.6307835
Node = 256.05288 2000.0 a = 4.4746718 AU
Incl. = 11.30580 n = 0.10412675
q = 1.6521226 AU P = 9.47 years

m1 = 14.5 + 5 log(Delta) + 15.0 log(r(t-50))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	00 21.83	+11 06.2	2.518	2.552	-0.69	-2.9	23.4	16.5/ 82	80.8
Jan. 19	00 32.93	+11 27.3	2.583	2.486	-0.70	-2.7	23.3	19.1/ 80	73.3
Jan. 29	00 45.72	+12 01.1	2.643	2.421	-0.73	-2.6	23.2	21.5/ 78	66.3
Feb. 8	01 00.09	+12 45.5	2.695	2.356	-0.76	-2.4	23.1	23.7/ 77	59.7
Feb. 18	01 15.93	+13 38.6	2.738	2.292	-0.80	-2.3	23.0	25.8/ 76	53.5
Feb. 28	01 33.16	+14 38.4	2.772	2.229	-0.84	-2.2	22.8	27.7/ 76	47.7
Mar. 10	01 51.76	+15 42.7	2.798	2.168	-0.89	-2.0	22.7	29.4/ 76	42.2
Mar. 20	02 11.67	+16 49.0	2.814	2.108	-0.95	-1.8	22.5	31.1/ 77	37.1
Mar. 30	02 32.92	+17 55.2	2.822	2.049	-1.01	-1.6	22.3	32.7/ 78	32.4
Apr. 9	02 55.47	+18 58.5	2.822	1.993	-1.07	-1.2	22.2	34.2/ 79	27.9
Apr. 19	03 19.31	+19 56.3	2.816	1.940	-1.14	-0.8	22.0	35.7/ 81	23.8
Apr. 29	03 44.44	+20 45.8	2.805	1.889	-1.21	-0.2	21.8	37.0/ 83	19.9
May 9	04 10.77	+21 24.0	2.789	1.842	-1.27	+0.4	21.6	38.3/ 85	16.3
May 19	04 38.21	+21 48.3	2.770	1.799	-1.34	+1.2	21.4	39.6/ 88	13.0
May 29	05 06.63	+21 56.0	2.750	1.761	-1.39	+2.1	21.2	40.7/ 90	10.0
June 8	05 35.84	+21 44.9	2.730	1.728	-1.43	+3.1	21.0	41.6/ 93	7.3
June 18	06 05.59	+21 13.2	2.710	1.700	-1.46	+4.1	20.8	42.5/ 96	5.0
June 28	06 35.65	+20 20.1	2.692	1.678	-1.48	+5.1	20.6	43.1/ 99	3.5
July 8	07 05.72	+19 05.4	2.677	1.663	-1.48	+6.0	20.5	43.6/101	3.5
July 18	07 35.57	+17 30.1	2.665	1.654	-1.46	+6.9	20.3	43.8/104	4.8
July 28	08 04.97	+15 35.7	2.656	1.652	-1.44	+7.6	20.2	43.8/106	6.7
Aug. 7	08 33.72	+13 24.7	2.652	1.657	-1.40	+8.2	20.1	43.5/109	8.8
Aug. 17	09 01.71	+10 59.9	2.651	1.669	-1.35	+8.5	20.0	43.0/111	11.0
Aug. 27	09 28.86	+08 24.6	2.654	1.687	-1.31	+8.7	19.9	42.3/112	13.4
Sept. 6	09 55.10	+05 41.9	2.658	1.711	-1.26	+8.6	19.9	41.4/113	15.9
Sept.16	10 20.44	+02 55.1	2.665	1.741	-1.21	+8.4	19.9	40.3/115	18.6
Sept.26	10 44.90	+00 07.0	2.671	1.777	-1.16	+8.0	19.9	39.1/115	21.5
Oct. 6	11 08.46	-02 39.6	2.677	1.817	-1.11	+7.6	20.0	37.7/116	24.7
Oct. 16	11 31.18	-05 22.7	2.681	1.862	-1.07	+7.0	20.0	36.2/116	28.1
Oct. 26	11 53.05	-08 00.2	2.681	1.910	-1.03	+6.4	20.1	34.6/116	31.9
Nov. 5	12 14.06	-10 30.6	2.676	1.962	-0.99	+5.7	20.2	32.8/116	36.0
Nov. 15	12 34.21	-12 52.8	2.665	2.016	-0.96	+5.0	20.4	31.0/116	40.4
Nov. 25	12 53.44	-15 05.7	2.647	2.074	-0.93	+4.4	20.5	29.0/116	45.2
Dec. 5	13 11.67	-17 08.8	2.622	2.133	-0.90	+3.7	20.6	26.9/115	50.4
Dec. 15	13 28.82	-19 01.5	2.588	2.194	-0.88	+3.1	20.8	24.6/115	55.9
Dec. 25	13 44.72	-20 43.6	2.547	2.256	-0.86	+2.5	20.9	22.2/115	61.8
Jan. 4	13 59.19	-22 14.7	2.497	2.319	-0.85	+2.0	21.1	19.5/115	68.2
Jan. 14	14 12.05	-23 34.9	2.440	2.384	-0.85	+1.5	21.2	16.5/115	75.0
Jan. 24	14 23.02	-24 43.9	2.378	2.449	-0.85	+1.1	21.3	13.3/116	82.3
Feb. 3	14 31.84	-25 41.4	2.311	2.514	-0.87	+0.7	21.4	9.8/118	90.1
Feb. 13	14 38.25	-26 26.8	2.243	2.580	-0.89	+0.5	21.6	6.0/123	98.5
Feb. 23	14 41.98	-26 59.2	2.176	2.646	-0.92	+0.4	21.7	2.2/147	107.4
Mar. 5	14 42.87	-27 17.2	2.115	2.712	-0.96	+0.4	21.8	2.6/265	116.9
Mar. 15	14 40.90	-27 19.2	2.063	2.778	-1.01	+0.5	21.9	6.4/284	127.1
Mar. 25	14 36.26	-27 03.7	2.026	2.844	-1.05	+0.8	22.0	9.7/290	137.7

Comet 74P/Smirnova-Chernykh

Epoch = 2009 July 28.0 TT
T = 2009 July 30.31999 TT
Peri. = 87.24236 e = 0.1475549
Node = 77.10042 2000.0 a = 4.1734741 AU
Incl. = 6.64740 n = 0.11559991
q = 3.5576575 AU P = 8.53 years

m1 = 5.2 + 5 log(Delta) + 15.0 log(r(t-120))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	09 43.94	+21 17.1	2.762	3.626	-0.47	+4.3	16.0	146.9
Jan. 19	09 39.28	+21 59.8	2.690	3.620	-0.60	+4.4	15.9	157.8
Jan. 29	09 33.28	+22 43.9	2.644	3.614	-0.67	+4.1	15.8	168.0
Feb. 8	09 26.54	+23 25.1	2.629	3.608	-0.68	+3.5	15.8	171.6
Feb. 18	09 19.73	+23 59.6	2.643	3.602	-0.62	+2.5	15.8	163.5
Feb. 28	09 13.55	+24 24.7	2.687	3.597	-0.49	+1.4	15.8	152.9
Mar. 10	09 08.63	+24 38.7	2.756	3.592	-0.32	+0.3	15.9	142.2
Mar. 20	09 05.38	+24 41.6	2.847	3.587	-0.13	-0.8	15.9	131.7
Mar. 30	09 04.05	+24 33.9	2.956	3.583	+0.07	-1.7	16.0	121.7
Apr. 9	09 04.70	+24 16.7	3.079	3.579	+0.25	-2.6	16.1	112.2
Apr. 19	09 07.25	+23 51.2	3.210	3.576	+0.43	-3.3	16.1	103.2
Apr. 29	09 11.54	+23 18.2	3.348	3.572	+0.58	-4.0	16.2	94.6
May 9	09 17.39	+22 38.7	3.487	3.569	+0.72	-4.5	16.3	86.5
May 19	09 24.57	+21 53.3	3.625	3.567	+0.83	-5.1	16.4	78.7
May 29	09 32.89	+21 02.5	3.759	3.564	+0.93	-5.6	16.4	71.2
June 8	09 42.15	+20 06.7	3.888	3.562	+1.00	-6.0	16.5	64.1
June 18	09 52.19	+19 06.5	4.009	3.561	+1.07	-6.4	16.6	57.1
June 28	10 02.86	+18 02.1	4.121	3.559	+1.12	-6.8	16.6	50.4
July 8	10 14.05	+16 54.1	4.222	3.559	+1.16	-7.1	16.7	43.8
July 18	10 25.63	+15 42.7	4.312	3.558	+1.19	-7.4	16.7	37.4
July 28	10 37.53	+14 28.4	4.389	3.558	+1.21	-7.7	16.7	31.0
Aug. 7	10 49.67	+13 11.7	4.453	3.558	+1.23	-7.9	16.7	24.8
Aug. 17	11 01.98	+11 53.2	4.503	3.558	+1.24	-8.0	16.8	18.7
Aug. 27	11 14.40	+10 33.3	4.537	3.559	+1.25	-8.1	16.8	12.8
Sept. 6	11 26.88	+09 12.6	4.557	3.560	+1.25	-8.1	16.8	7.4
Sept.16	11 39.38	+07 51.6	4.562	3.562	+1.25	-8.1	16.8	5.3
Sept.26	11 51.85	+06 31.1	4.550	3.563	+1.24	-7.9	16.8	9.0
Oct. 6	12 04.23	+05 11.7	4.523	3.566	+1.23	-7.8	16.8	14.8
Oct. 16	12 16.48	+03 54.1	4.481	3.568	+1.21	-7.5	16.7	21.0
Oct. 26	12 28.54	+02 38.9	4.423	3.571	+1.18	-7.2	16.7	27.5
Nov. 5	12 40.34	+01 27.0	4.350	3.574	+1.15	-6.8	16.7	34.2
Nov. 15	12 51.81	+00 18.9	4.263	3.577	+1.10	-6.3	16.6	41.1
Nov. 25	13 02.86	-00 44.4	4.163	3.581	+1.05	-5.8	16.6	48.2
Dec. 5	13 13.37	-01 42.2	4.051	3.585	+0.99	-5.2	16.5	55.5
Dec. 15	13 23.25	-02 33.8	3.929	3.590	+0.91	-4.5	16.4	63.0
Dec. 25	13 32.33	-03 18.5	3.798	3.595	+0.81	-3.7	16.4	70.7
Jan. 4	13 40.47	-03 55.5	3.661	3.600	+0.70	-2.9	16.3	78.7
Jan. 14	13 47.50	-04 24.2	3.519	3.605	+0.57	-2.0	16.2	87.0
Jan. 24	13 53.23	-04 44.1	3.377	3.611	+0.42	-1.1	16.1	95.7
Feb. 3	13 57.48	-04 54.9	3.238	3.617	+0.26	-0.1	16.0	104.7
Feb. 13	14 00.09	-04 56.3	3.105	3.623	+0.08	+0.8	15.9	114.2
Feb. 23	14 00.91	-04 48.5	2.983	3.630	-0.10	+1.6	15.9	124.0
Mar. 5	13 59.93	-04 32.4	2.875	3.636	-0.27	+2.3	15.8	134.2
Mar. 15	13 57.18	-04 09.1	2.786	3.644	-0.43	+2.8	15.7	144.8
Mar. 25	13 52.86	-03 40.7	2.720	3.651	-0.55	+3.1	15.7	155.5

Comet 24P/Schaumasse

Epoch = 2009 July 28.0 TT
T = 2009 Aug. 9.62767 TT
Peri. = 57.99954 e = 0.7036147
Node = 79.71827 2000.0 a = 4.0957895 AU
Incl. = 11.72917 n = 0.11890432
q = 1.2139318 AU P = 8.29 years

m1 = 9.6 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	00 44.23	-05 05.3	2.665	2.668	+0.69	+9.1	19.2	79.6
Jan. 19	00 51.08	-03 34.1	2.724	2.588	+0.87	+10.0	19.0	71.6
Jan. 29	00 59.77	-01 54.5	2.774	2.507	+1.04	+10.7	18.8	64.2
Feb. 8	01 10.14	-00 07.5	2.814	2.425	+1.19	+11.3	18.6	57.2
Feb. 18	01 22.08	+01 45.7	2.842	2.342	+1.35	+11.9	18.3	50.6
Feb. 28	01 35.54	+03 44.3	2.858	2.259	+1.49	+12.3	18.1	44.4
Mar. 10	01 50.46	+05 47.4	2.861	2.175	+1.64	+12.7	17.8	38.6
Mar. 20	02 06.85	+07 54.2	2.852	2.091	+1.79	+12.9	17.5	33.2
Mar. 30	02 24.76	+10 03.6	2.831	2.007	+1.95	+13.1	17.2	28.2
Apr. 9	02 44.26	+12 14.3	2.799	1.923	+2.12	+13.1	16.8	23.5
Apr. 19	03 05.47	+14 24.8	2.758	1.840	+2.31	+12.9	16.4	19.3
Apr. 29	03 28.55	+16 33.3	2.708	1.758	+2.51	+12.4	16.0	15.4
May 9	03 53.65	+18 37.2	2.652	1.677	+2.73	+11.6	15.6	11.9
May 19	04 20.96	+20 33.3	2.591	1.599	+2.97	+10.4	15.2	8.9
May 29	04 50.65	+22 17.5	2.528	1.524	+3.22	+8.7	14.8	6.4
June 8	05 22.80	+23 44.8	2.464	1.454	+3.46	+6.5	14.4	4.3
June 18	05 57.44	+24 49.4	2.404	1.390	+3.69	+3.6	14.0	3.0
June 28	06 34.38	+25 25.1	2.348	1.333	+3.89	+0.1	13.6	2.6
July 8	07 13.24	+25 26.1	2.300	1.286	+4.02	-3.8	13.3	3.1
July 18	07 53.43	+24 47.8	2.262	1.249	+4.08	-8.0	13.1	3.8
July 28	08 34.18	+23 28.3	2.235	1.225	+4.05	-11.9	12.9	4.6
Aug. 7	09 14.68	+21 29.0	2.221	1.214	+3.95	-15.4	12.8	5.3
Aug. 17	09 54.23	+18 54.8	2.221	1.218	+3.81	-18.2	12.8	5.8
Aug. 27	10 32.29	+15 53.1	2.235	1.235	+3.63	-20.0	12.9	6.2
Sept. 6	11 08.55	+12 33.3	2.262	1.265	+3.44	-20.9	13.2	6.5
Sept. 16	11 42.90	+09 04.4	2.301	1.307	+3.25	-21.0	13.4	6.7
Sept. 26	12 15.39	+05 34.7	2.349	1.359	+3.07	-20.4	13.8	6.8
Oct. 6	12 46.10	+02 11.1	2.406	1.420	+2.91	-19.3	14.2	7.2
Oct. 16	13 15.21	-01 01.8	2.467	1.487	+2.76	-17.9	14.6	8.1
Oct. 26	13 42.86	-04 00.3	2.531	1.559	+2.63	-16.2	15.0	9.5
Nov. 5	14 09.17	-06 42.7	2.594	1.635	+2.51	-14.5	15.4	11.7
Nov. 15	14 34.25	-09 08.0	2.654	1.715	+2.39	-12.8	15.8	14.6
Nov. 25	14 58.17	-11 16.0	2.708	1.796	+2.28	-11.1	16.2	18.1
Dec. 5	15 20.96	-13 07.2	2.755	1.879	+2.17	-9.5	16.6	22.1
Dec. 15	15 42.64	-14 42.4	2.792	1.963	+2.05	-8.0	17.0	26.6
Dec. 25	16 03.18	-16 02.8	2.819	2.047	+1.93	-6.7	17.3	31.5
Jan. 4	16 22.51	-17 09.6	2.834	2.131	+1.81	-5.5	17.6	36.9
Jan. 14	16 40.59	-18 04.2	2.836	2.215	+1.67	-4.4	17.9	42.6
Jan. 24	16 57.30	-18 48.4	2.826	2.298	+1.52	-3.5	18.2	48.7
Feb. 3	17 12.54	-19 23.6	2.802	2.381	+1.36	-2.8	18.4	55.2
Feb. 13	17 26.19	-19 51.6	2.767	2.464	+1.19	-2.3	18.7	62.0
Feb. 23	17 38.08	-20 14.1	2.721	2.545	+1.00	-1.9	18.9	69.3
Mar. 5	17 48.03	-20 33.0	2.665	2.626	+0.79	-1.7	19.1	77.0
Mar. 15	17 55.89	-20 49.6	2.602	2.706	+0.55	-1.6	19.2	85.1
Mar. 25	18 01.42	-21 05.7	2.535	2.784	+0.30	-1.7	19.4	93.8

Comet 89P/Russell

Epoch = 2009 July 28.0 TT
T = 2009 Aug. 17.17246 TT
Peri. = 249.32425 e = 0.3994025
Node = 42.38885 2000.0 a = 3.7961137 AU
Incl. = 12.03173 n = 0.13325860
q = 2.2799366 AU P = 7.40 years

m1 = 8.0 + 5 log(Delta) + 20.0 log(r(t-30))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	15 56.57	-21 04.9	3.307	2.738	+1.67	-7.2	19.7	47.3
Jan. 19	16 13.23	-22 17.1	3.170	2.703	+1.66	-6.8	19.5	53.5
Jan. 29	16 29.84	-23 25.1	3.027	2.669	+1.64	-6.4	19.3	59.7
Feb. 8	16 46.26	-24 28.9	2.879	2.636	+1.61	-6.0	19.0	66.0
Feb. 18	17 02.37	-25 29.3	2.727	2.604	+1.56	-5.8	18.8	72.4
Feb. 28	17 17.98	-26 27.0	2.574	2.572	+1.49	-5.6	18.6	78.8
Mar. 10	17 32.89	-27 23.1	2.420	2.542	+1.40	-5.6	18.3	85.5
Mar. 20	17 46.89	-28 19.0	2.268	2.513	+1.28	-5.7	18.1	92.3
Mar. 30	17 59.69	-29 16.3	2.120	2.486	+1.13	-6.1	17.8	99.3
Apr. 9	18 10.98	-30 16.8	1.977	2.459	+0.95	-6.5	17.6	106.6
Apr. 19	18 20.44	-31 22.3	1.842	2.434	+0.72	-7.2	17.3	114.3
Apr. 29	18 27.66	-32 34.0	1.717	2.411	+0.46	-7.8	17.1	122.3
May 9	18 32.27	-33 52.4	1.605	2.389	+0.17	-8.4	16.8	130.7
May 19	18 33.94	-35 16.5	1.507	2.369	-0.15	-8.7	16.6	139.4
May 29	18 32.46	-36 43.1	1.428	2.351	-0.45	-8.3	16.4	148.2
June 8	18 27.99	-38 06.3	1.369	2.335	-0.69	-7.3	16.2	156.5
June 18	18 21.11	-39 19.2	1.331	2.320	-0.82	-5.6	16.1	162.4
June 28	18 12.88	-40 14.8	1.318	2.308	-0.81	-3.4	16.0	162.8
July 8	18 04.80	-40 48.6	1.327	2.298	-0.64	-1.2	16.0	157.3
July 18	17 58.35	-41 00.7	1.357	2.290	-0.37	+0.7	16.0	149.2
July 28	17 54.70	-40 53.8	1.408	2.285	-0.02	+2.1	16.0	140.5
Aug. 7	17 54.53	-40 32.9	1.475	2.281	+0.34	+3.1	16.1	132.0
Aug. 17	17 57.97	-40 02.4	1.556	2.280	+0.69	+3.7	16.2	123.8
Aug. 27	18 04.86	-39 25.1	1.648	2.281	+1.00	+4.2	16.3	116.1
Sept. 6	18 14.82	-38 42.8	1.750	2.284	+1.25	+4.7	16.4	108.9
Sept. 16	18 27.35	-37 55.8	1.859	2.290	+1.47	+5.2	16.5	102.0
Sept. 26	18 42.02	-37 03.6	1.973	2.298	+1.63	+5.8	16.6	95.5
Oct. 6	18 58.37	-36 05.8	2.091	2.308	+1.76	+6.4	16.8	89.3
Oct. 16	19 15.98	-35 01.4	2.213	2.320	+1.85	+7.2	16.9	83.4
Oct. 26	19 34.53	-33 49.8	2.336	2.334	+1.92	+7.9	17.1	77.6
Nov. 5	19 53.69	-32 30.9	2.460	2.350	+1.95	+8.6	17.2	72.0
Nov. 15	20 13.20	-31 04.4	2.583	2.368	+1.97	+9.4	17.4	66.5
Nov. 25	20 32.87	-29 30.6	2.705	2.388	+1.96	+10.1	17.5	61.0
Dec. 5	20 52.51	-27 49.9	2.825	2.410	+1.95	+10.7	17.7	55.6
Dec. 15	21 12.02	-26 03.1	2.942	2.433	+1.93	+11.2	17.8	50.3
Dec. 25	21 31.28	-24 10.8	3.054	2.458	+1.90	+11.7	18.0	44.9
Jan. 4	21 50.24	-22 14.1	3.162	2.485	+1.86	+12.0	18.1	39.6
Jan. 14	22 08.84	-20 13.9	3.262	2.512	+1.82	+12.3	18.3	34.3
Jan. 24	22 27.07	-18 11.2	3.356	2.541	+1.78	+12.4	18.4	29.1
Feb. 3	22 44.90	-16 07.1	3.442	2.571	+1.74	+12.5	18.6	23.8
Feb. 13	23 02.34	-14 02.3	3.518	2.603	+1.70	+12.4	18.7	18.7
Feb. 23	23 19.37	-11 58.0	3.585	2.635	+1.66	+12.3	18.9	13.7
Mar. 5	23 36.01	-09 55.0	3.642	2.668	+1.62	+12.1	19.0	9.3
Mar. 15	23 52.25	-07 54.1	3.687	2.702	+1.59	+11.8	19.1	6.5
Mar. 25	00 08.11	-05 56.0	3.721	2.736	+1.54	+11.5	19.3	7.8

Comet P/2002 T1 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 Aug. 25.47172 TT
Peri. = 3.82594 e = 0.6392839
Node = 14.22494 2000.0 a = 3.6448479 AU
Incl. = 21.39616 n = 0.14163969
q = 1.3147553 AU P = 6.96 years

m1 = 18.5 + 5 log(Delta) + 12.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	18 22.22	-38 43.9	3.584	2.688	-0.82	-0.4	.	26.3/ 91	20.8
Jan. 19	18 44.67	-38 40.1	3.475	2.617	-0.88	-1.1	.	27.1/ 89	25.1
Jan. 29	19 07.78	-38 27.1	3.354	2.544	-0.95	-1.8	.	28.0/ 87	29.6
Feb. 8	19 31.45	-38 04.1	3.223	2.471	-1.01	-2.8	.	28.8/ 85	34.3
Feb. 18	19 55.61	-37 30.2	3.085	2.398	-1.08	-3.8	.	29.8/ 83	38.9
Feb. 28	20 20.20	-36 44.6	2.941	2.323	-1.14	-5.1	.	30.7/ 81	43.4
Mar. 10	20 45.13	-35 46.5	2.792	2.249	-1.21	-6.5	.	31.7/ 79	47.8
Mar. 20	21 10.34	-34 35.2	2.640	2.174	-1.27	-8.1	24.8	32.8/ 77	52.0
Mar. 30	21 35.79	-33 10.0	2.488	2.099	-1.33	-9.8	24.5	34.0/ 75	56.0
Apr. 9	22 01.42	-31 30.2	2.336	2.024	-1.38	-11.8	24.2	35.3/ 73	59.7
Apr. 19	22 27.23	-29 34.7	2.187	1.950	-1.43	-14.1	23.8	36.7/ 70	63.1
Apr. 29	22 53.18	-27 22.7	2.041	1.877	-1.49	-16.5	23.5	38.2/ 68	66.2
May 9	23 19.27	-24 53.2	1.900	1.804	-1.54	-19.2	23.1	39.8/ 66	69.0
May 19	23 45.53	-22 04.9	1.765	1.734	-1.59	-22.0	22.7	41.6/ 64	71.5
May 29	00 11.95	-18 56.7	1.638	1.666	-1.64	-25.1	22.3	43.5/ 62	73.6
June 8	00 38.57	-15 27.3	1.520	1.601	-1.70	-28.1	22.0	45.5/ 60	75.4
June 18	01 05.44	-11 35.4	1.410	1.540	-1.76	-31.2	21.6	47.6/ 58	76.9
June 28	01 32.63	-07 20.6	1.310	1.485	-1.85	-34.0	21.2	49.7/ 56	78.2
July 8	02 00.19	-02 42.9	1.220	1.435	-1.94	-36.4	20.9	51.7/ 55	79.2
July 18	02 28.25	+02 16.7	1.142	1.392	-2.07	-38.0	20.6	53.3/ 53	80.1
July 28	02 56.91	+07 35.0	1.074	1.358	-2.21	-38.5	20.3	54.5/ 52	81.0
Aug. 7	03 26.25	+13 07.0	1.018	1.333	-2.39	-37.4	20.1	55.1/ 51	82.0
Aug. 17	03 56.37	+18 45.6	0.973	1.319	-2.59	-34.7	19.9	54.5/ 51	83.2
Aug. 27	04 27.18	+24 21.8	0.938	1.315	-2.81	-30.2	19.8	52.9/ 50	84.8
Sept. 6	04 58.48	+29 46.8	0.913	1.322	-3.03	-24.0	19.8	50.2/ 50	86.8
Sept. 16	05 29.90	+34 52.6	0.895	1.340	-3.24	-16.7	19.8	46.3/ 50	89.4
Sept. 26	06 00.70	+39 34.6	0.884	1.368	-3.43	-8.8	19.9	41.6/ 49	92.7
Oct. 6	06 29.94	+43 51.5	0.879	1.404	-3.59	-0.8	20.1	36.3/ 47	96.5
Oct. 16	06 56.46	+47 45.5	0.878	1.449	-3.75	+6.6	20.2	30.6/ 43	101.1
Oct. 26	07 18.78	+51 20.7	0.880	1.501	-3.93	+13.1	20.4	25.0/ 35	106.3
Nov. 5	07 35.39	+54 40.5	0.886	1.558	-4.18	+18.2	20.6	20.0/ 22	112.1
Nov. 15	07 44.61	+57 45.0	0.898	1.621	-4.57	+21.6	20.9	16.3/ 0	118.3
Nov. 25	07 44.80	+60 28.2	0.917	1.686	-5.12	+22.8	21.1	14.5/333	124.6
Dec. 5	07 35.22	+62 36.5	0.946	1.755	-5.77	+21.3	21.4	14.5/304	130.7
Dec. 15	07 17.04	+63 52.8	0.988	1.826	-6.29	+17.4	21.7	15.0/277	135.7
Dec. 25	06 54.33	+64 03.6	1.045	1.899	-6.41	+11.9	22.1	15.3/252	138.8
Jan. 4	06 32.92	+63 09.6	1.119	1.973	-6.03	+6.7	22.4	15.1/229	139.4
Jan. 14	06 17.09	+61 25.9	1.212	2.047	-5.32	+2.7	22.8	14.8/207	137.4
Jan. 24	06 08.37	+59 12.6	1.323	2.122	-4.54	+0.5	23.2	14.6/187	133.2
Feb. 3	06 06.20	+56 47.8	1.450	2.197	-3.82	-0.5	23.6	14.7/170	127.7
Feb. 13	06 09.19	+54 22.8	1.594	2.271	-3.21	-0.7	24.0	15.2/155	121.5
Feb. 23	06 16.08	+52 03.8	1.751	2.346	-2.72	-0.3	24.3	15.9/144	114.9
Mar. 5	06 25.74	+49 53.4	1.919	2.420	-2.31	+0.2	24.7	16.7/136	108.2
Mar. 15	06 37.36	+47 51.7	2.096	2.493	-1.99	+0.7	.	17.5/129	101.6
Mar. 25	06 50.34	+45 57.9	2.280	2.566	-1.72	+1.2	.	18.2/125	94.9

Comet P/2004 X1 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 Sept. 3.34891 TT
Peri. = 345.44484 e = 0.7272920
Node = 7.12062 2000.0 a = 2.8609026 AU
Incl. = 5.14776 n = 0.20368050
q = 0.7801910 AU P = 4.84 years

m1 = 18.5 + 5 log(Delta) + 12.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 9	15 17.71	-20 27.5	3.287	2.862	-0.62	+2.8	.	19.3/108	56.3
Jan. 19	15 30.81	-21 26.1	3.086	2.787	-0.70	+2.9	.	18.9/108	63.3
Jan. 29	15 43.77	-22 22.2	2.878	2.710	-0.79	+3.0	.	18.4/108	70.3
Feb. 8	15 56.49	-23 15.7	2.663	2.631	-0.90	+3.1	.	17.7/107	77.4
Feb. 18	16 08.83	-24 07.0	2.446	2.550	-1.04	+3.3	.	16.8/108	84.6
Feb. 28	16 20.62	-24 56.5	2.227	2.467	-1.20	+3.4	.	15.7/109	91.8
Mar. 10	16 31.63	-25 44.9	2.011	2.381	-1.39	+3.6	24.7	14.3/110	99.3
Mar. 20	16 41.62	-26 33.3	1.798	2.294	-1.62	+3.8	24.3	12.5/114	106.8
Mar. 30	16 50.23	-27 23.0	1.591	2.204	-1.92	+4.0	23.8	10.4/121	114.7
Apr. 9	16 57.00	-28 15.6	1.393	2.111	-2.28	+4.5	23.3	8.1/135	122.9
Apr. 19	17 01.37	-29 13.3	1.206	2.017	-2.73	+5.3	22.7	6.6/167	131.5
Apr. 29	17 02.52	-30 17.9	1.032	1.920	-3.30	+6.6	22.1	8.3/208	140.6
May 9	16 59.45	-31 31.0	0.874	1.820	-3.98	+9.0	21.5	13.6/233	150.2
May 19	16 50.88	-32 52.1	0.732	1.718	-4.77	+13.3	20.8	21.2/246	160.0
May 29	16 35.31	-34 16.3	0.610	1.614	-5.55	+20.6	20.0	30.1/254	167.0
June 8	16 11.58	-35 31.9	0.509	1.508	-6.05	+31.9	19.3	39.3/261	162.9
June 18	15 39.47	-36 18.6	0.426	1.401	-5.75	+46.7	18.5	47.2/268	149.9
June 28	15 00.45	-36 13.3	0.362	1.294	-4.07	+61.5	17.7	53.2/275	133.8
July 8	14 17.19	-35 01.0	0.310	1.187	-0.64	+69.2	16.9	60.5/281	116.2
July 18	13 30.22	-32 29.7	0.266	1.083	+4.79	+60.6	16.1	75.6/288	97.3
July 28	12 35.73	-27 57.2	0.226	0.985	+12.54	+20.1	15.2	107.5/295	75.9
Aug. 7	11 26.82	-19 23.4	0.197	0.899	+21.76	-75.2	14.4	142.5/303	49.5
Aug. 17	10 07.78	-05 26.9	0.196	0.831	+26.07	177.7	14.0	125.8/311	19.7
Aug. 27	09 04.24	+08 17.4	0.238	0.790	+20.55	153.6	14.1	69.6/317	19.4
Sept. 6	08 31.50	+16 42.3	0.315	0.781	+12.46	-82.1	14.7	28.4/335	37.4
Sept.16	08 22.89	+20 58.8	0.405	0.808	+6.93	-39.1	15.4	14.0/ 24	50.1
Sept.26	08 27.06	+23 06.7	0.491	0.864	+3.80	-17.7	16.2	14.1/ 61	59.5
Oct. 6	08 36.10	+24 13.8	0.565	0.943	+2.06	-6.4	16.9	13.4/ 71	67.6
Oct. 16	08 45.45	+24 56.3	0.622	1.036	+1.03	+0.4	17.7	10.2/ 67	75.6
Oct. 26	08 52.41	+25 35.6	0.662	1.137	+0.33	+5.2	18.3	6.2/ 39	84.2
Nov. 5	08 55.30	+26 24.2	0.689	1.243	-0.24	+9.0	18.9	7.2/334	93.7
Nov. 15	08 52.95	+27 28.6	0.706	1.351	-0.80	+12.1	19.4	13.9/306	104.4
Nov. 25	08 44.38	+28 49.0	0.721	1.458	-1.39	+14.6	19.8	21.4/295	116.4
Dec. 5	08 29.40	+30 17.0	0.739	1.565	-2.00	+15.9	20.3	27.6/288	129.7
Dec. 15	08 08.89	+31 37.1	0.770	1.670	-2.57	+15.4	20.7	30.5/282	143.9
Dec. 25	07 45.25	+32 32.1	0.822	1.772	-2.96	+13.2	21.2	29.4/276	157.9
Jan. 4	07 22.01	+32 52.4	0.899	1.873	-3.08	+10.0	21.7	24.9/269	168.6
Jan. 14	07 02.25	+32 41.2	1.003	1.971	-2.96	+6.9	22.2	18.7/261	165.7
Jan. 24	06 47.72	+32 09.2	1.133	2.067	-2.70	+4.5	22.7	12.2/251	154.9
Feb. 3	06 38.76	+31 27.8	1.286	2.161	-2.38	+3.0	23.2	6.7/230	143.6
Feb. 13	06 34.75	+30 44.3	1.459	2.252	-2.06	+2.1	23.7	4.2/178	133.0
Feb. 23	06 34.88	+30 02.4	1.647	2.340	-1.78	+1.7	24.2	5.9/131	123.2
Mar. 5	06 38.28	+29 23.1	1.847	2.427	-1.54	+1.5	24.6	8.6/115	114.1
Mar. 15	06 44.17	+28 46.1	2.055	2.511	-1.34	+1.5	.	10.9/109	105.5
Mar. 25	06 52.01	+28 10.5	2.269	2.593	-1.17	+1.5	.	12.8/105	97.4

Comet P/2001 MD7 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2009 Sept. 8.95945 TT
Peri. = 246.74333 e = 0.6896525
Node = 125.62221 2000.0 a = 3.9439058 AU
Incl. = 12.88150 n = 0.12583872
q = 1.2239813 AU P = 7.83 years

m1 = 11.0 + 5 log(Delta) + 14.0 log(r(t-30))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 9	17 45.66	-16 10.6	3.755	2.878	-0.59	+1.8	20.8	23.7/ 93	23.3
Jan. 19	18 02.10	-16 21.4	3.620	2.802	-0.65	+1.7	20.5	24.3/ 91	29.2
Jan. 29	18 18.96	-16 24.9	3.472	2.725	-0.71	+1.6	20.3	24.8/ 90	35.1
Feb. 8	18 36.19	-16 20.9	3.312	2.648	-0.78	+1.5	20.0	25.3/ 88	41.0
Feb. 18	18 53.76	-16 09.3	3.144	2.569	-0.86	+1.3	19.8	25.9/ 86	46.7
Feb. 28	19 11.67	-15 50.1	2.968	2.489	-0.95	+1.0	19.5	26.5/ 85	52.4
Mar. 10	19 29.88	-15 23.5	2.785	2.409	-1.06	+0.7	19.1	27.1/ 83	57.9
Mar. 20	19 48.44	-14 49.7	2.600	2.328	-1.17	+0.4	18.8	27.8/ 82	63.3
Mar. 30	20 07.38	-14 08.9	2.412	2.246	-1.31	-0.1	18.5	28.6/ 81	68.5
Apr. 9	20 26.73	-13 21.8	2.224	2.164	-1.47	-0.7	18.1	29.6/ 80	73.5
Apr. 19	20 46.63	-12 28.8	2.038	2.082	-1.65	-1.4	17.7	30.7/ 80	78.3
Apr. 29	21 07.20	-11 30.8	1.856	1.999	-1.86	-2.2	17.3	32.1/ 79	82.9
May 9	21 28.62	-10 28.7	1.679	1.917	-2.11	-3.3	16.8	34.0/ 79	87.3
May 19	21 51.18	-09 23.5	1.509	1.835	-2.40	-4.5	16.4	36.2/ 80	91.3
May 29	22 15.20	-08 16.7	1.348	1.755	-2.74	-6.2	15.9	39.1/ 81	94.9
June 8	22 41.12	-07 10.0	1.198	1.676	-3.13	-8.2	15.3	42.7/ 82	98.1
June 18	23 09.48	-06 05.3	1.061	1.600	-3.58	-10.6	14.8	47.2/ 83	100.8
June 28	23 40.84	-05 05.4	0.938	1.527	-4.07	-13.7	14.3	52.5/ 85	102.7
July 8	00 15.75	-04 13.3	0.831	1.459	-4.57	-17.4	13.7	58.2/ 86	103.9
July 18	00 54.56	-03 32.0	0.742	1.396	-5.02	-21.7	13.2	63.6/ 88	104.1
July 28	01 36.98	-03 04.9	0.673	1.341	-5.31	-26.5	12.7	67.3/ 89	103.3
Aug. 7	02 21.91	-02 53.4	0.624	1.295	-5.38	-31.6	12.3	68.2/ 91	101.8
Aug. 17	03 07.41	-02 56.7	0.593	1.259	-5.19	-36.4	11.9	65.4/ 92	100.0
Aug. 27	03 51.04	-03 12.2	0.579	1.235	-4.81	-40.4	11.6	59.4/ 92	98.3
Sept. 6	04 30.71	-03 34.5	0.578	1.225	-4.38	-43.2	11.4	51.5/ 93	97.4
Sept.16	05 05.11	-03 59.2	0.584	1.227	-4.01	-44.9	11.2	42.6/ 93	97.6
Sept.26	05 33.52	-04 21.9	0.593	1.244	-3.76	-45.4	11.1	33.3/ 93	99.2
Oct. 6	05 55.76	-04 37.8	0.603	1.272	-3.65	-44.9	11.1	24.0/ 91	102.3
Oct. 16	06 11.80	-04 42.3	0.611	1.313	-3.67	-43.5	11.2	14.6/ 85	106.9
Oct. 26	06 21.56	-04 29.3	0.619	1.363	-3.81	-41.3	11.3	6.6/ 55	113.2
Nov. 5	06 25.16	-03 51.4	0.627	1.421	-4.01	-38.2	11.5	7.6/335	121.1
Nov. 15	06 22.99	-02 42.4	0.639	1.486	-4.23	-34.3	11.7	14.9/314	130.5
Nov. 25	06 15.91	-00 58.3	0.661	1.556	-4.38	-29.6	12.0	20.6/312	140.9
Dec. 5	06 05.64	+01 18.4	0.696	1.631	-4.40	-24.7	12.3	23.3/313	151.3
Dec. 15	05 54.27	+03 57.6	0.750	1.708	-4.25	-20.1	12.8	22.8/317	159.8
Dec. 25	05 43.95	+06 45.1	0.826	1.788	-3.96	-16.3	13.3	19.8/325	161.9
Jan. 4	05 36.28	+09 27.4	0.926	1.869	-3.57	-13.2	13.8	16.1/337	156.3
Jan. 14	05 32.00	+11 55.7	1.047	1.950	-3.15	-10.8	14.4	13.1/355	147.6
Jan. 24	05 31.25	+14 06.0	1.189	2.033	-2.76	-8.9	14.9	11.7/ 18	138.4
Feb. 3	05 33.76	+15 57.6	1.348	2.115	-2.41	-7.3	15.4	12.1/ 39	129.4
Feb. 13	05 39.03	+17 31.8	1.522	2.198	-2.10	-6.0	16.0	13.3/ 54	120.8
Feb. 23	05 46.60	+18 50.0	1.708	2.280	-1.84	-4.9	16.5	14.8/ 64	112.6
Mar. 5	05 56.02	+19 53.9	1.903	2.361	-1.63	-3.9	17.0	16.1/ 71	104.9
Mar. 15	06 06.86	+20 44.7	2.105	2.442	-1.44	-3.1	17.4	17.2/ 76	97.4
Mar. 25	06 18.84	+21 23.7	2.311	2.522	-1.28	-2.5	17.8	18.1/ 80	90.3

Comet C/2008 N1 (Holmes)

Epoch = 2009 July 28.0 TT
T = 2009 Sept. 25.89271 TT
Peri. = 100.81599
Node = 357.47190 2000.0
Incl. = 115.51972
q = 2.7834987 AU
e = 0.9971029

m1 = 8.5 + 5 log(Delta) + 10.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	21 18.89	+14 49.5	4.408	3.805	+0.29	+4.2	17.5	46.9
Jan. 19	21 21.83	+15 31.4	4.432	3.741	+0.35	+5.5	17.5	40.6
Jan. 29	21 25.30	+16 26.2	4.432	3.678	+0.38	+6.8	17.4	35.7
Feb. 8	21 29.08	+17 34.1	4.407	3.616	+0.39	+8.1	17.3	32.6
Feb. 18	21 32.99	+18 55.5	4.358	3.555	+0.39	+9.5	17.2	31.7
Feb. 28	21 36.86	+20 31.0	4.285	3.496	+0.36	+11.0	17.1	33.0
Mar. 10	21 40.47	+22 21.1	4.189	3.438	+0.31	+12.6	17.0	36.2
Mar. 20	21 43.62	+24 26.9	4.072	3.381	+0.24	+14.3	16.8	40.8
Mar. 30	21 46.05	+26 49.4	3.937	3.327	+0.14	+16.0	16.7	46.3
Apr. 9	21 47.44	+29 29.8	3.787	3.274	0.00	+17.9	16.5	52.4
Apr. 19	21 47.39	+32 29.3	3.625	3.223	-0.20	+19.9	16.4	58.9
Apr. 29	21 45.37	+35 48.8	3.456	3.174	-0.48	+21.9	16.2	65.5
May 9	21 40.60	+39 28.2	3.286	3.127	-0.86	+23.7	16.0	72.1
May 19	21 32.05	+43 25.6	3.121	3.083	-1.39	+25.0	15.9	78.5
May 29	21 18.19	+47 35.5	2.966	3.041	-2.12	+25.0	15.7	84.5
June 8	20 57.00	+51 45.9	2.829	3.002	-3.09	+22.9	15.5	89.8
June 18	20 26.13	+55 35.2	2.716	2.966	-4.21	+17.5	15.4	94.0
June 28	19 44.02	+58 30.4	2.635	2.932	-5.14	+8.3	15.3	96.7
July 8	18 52.62	+59 53.8	2.588	2.902	-5.36	-3.2	15.2	97.5
July 18	17 59.03	+59 22.0	2.577	2.875	-4.71	-13.8	15.1	96.4
July 28	17 11.89	+57 03.9	2.602	2.851	-3.62	-21.0	15.1	93.5
Aug. 7	16 35.66	+53 34.0	2.658	2.830	-2.56	-24.4	15.1	89.1
Aug. 17	16 10.03	+49 29.8	2.739	2.814	-1.72	-25.1	15.2	83.7
Aug. 27	15 52.85	+45 19.1	2.838	2.800	-1.10	-24.0	15.2	77.6
Sept. 6	15 41.83	+41 18.7	2.946	2.791	-0.66	-22.1	15.3	71.3
Sept.16	15 35.20	+37 37.3	3.058	2.785	-0.35	-19.9	15.4	65.0
Sept.26	15 31.71	+34 18.5	3.166	2.783	-0.13	-17.5	15.4	58.9
Oct. 6	15 30.44	+31 23.3	3.265	2.785	+0.03	-15.2	15.5	53.3
Oct. 16	15 30.75	+28 51.1	3.349	2.791	+0.14	-13.0	15.6	48.5
Oct. 26	15 32.13	+26 41.1	3.417	2.801	+0.21	-10.9	15.6	44.8
Nov. 5	15 34.21	+24 52.2	3.463	2.814	+0.24	-8.9	15.7	42.5
Nov. 15	15 36.65	+23 23.4	3.488	2.831	+0.25	-6.9	15.7	42.0
Nov. 25	15 39.15	+22 14.1	3.488	2.851	+0.23	-5.0	15.8	43.3
Dec. 5	15 41.44	+21 23.7	3.464	2.875	+0.18	-3.2	15.8	46.4
Dec. 15	15 43.22	+20 52.1	3.417	2.902	+0.10	-1.3	15.8	51.2
Dec. 25	15 44.18	+20 39.2	3.347	2.933	-0.02	+0.6	15.8	57.2
Jan. 4	15 43.94	+20 45.2	3.257	2.966	-0.18	+2.5	15.8	64.3
Jan. 14	15 42.11	+21 10.0	3.152	3.003	-0.39	+4.3	15.8	72.3
Jan. 24	15 38.20	+21 53.5	3.034	3.042	-0.65	+6.1	15.7	81.1
Feb. 3	15 31.66	+22 54.3	2.911	3.084	-0.97	+7.6	15.7	90.6
Feb. 13	15 21.91	+24 10.0	2.790	3.128	-1.35	+8.5	15.7	100.7
Feb. 23	15 08.39	+25 35.2	2.679	3.175	-1.76	+8.6	15.7	111.3
Mar. 5	14 50.75	+27 01.3	2.588	3.224	-2.17	+7.5	15.6	121.9
Mar. 15	14 29.07	+28 16.3	2.527	3.275	-2.49	+5.0	15.7	131.8
Mar. 25	14 04.15	+29 06.2	2.504	3.328	-2.66	+1.3	15.7	139.7

Comet C/2007 Q3 (Siding Spring)

Epoch = 2009 July 28.0 TT
T = 2009 Oct. 7.26843 TT
Peri. = 2.09398
Node = 149.41293 2000.0
Incl. = 65.65037
q = 2.2516568 AU
e = 1.0002324

m1 = 6.8 + 5 log(Delta) + 7.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	05 30.12	-52 19.4	3.379	3.706	-0.76	+10.5	13.7	101.7
Jan. 19	05 22.57	-50 34.7	3.315	3.627	-0.53	+13.4	13.6	100.6
Jan. 29	05 17.28	-48 20.3	3.258	3.549	-0.27	+16.0	13.5	99.0
Feb. 8	05 14.62	-45 40.5	3.211	3.471	0.00	+18.0	13.4	96.9
Feb. 18	05 14.64	-42 40.5	3.173	3.394	+0.26	+19.5	13.3	94.3
Feb. 28	05 17.26	-39 25.3	3.145	3.318	+0.50	+20.5	13.2	91.3
Mar. 10	05 22.29	-36 00.2	3.126	3.243	+0.72	+21.0	13.1	87.8
Mar. 20	05 29.46	-32 30.0	3.116	3.169	+0.91	+21.1	13.0	83.9
Mar. 30	05 38.52	-28 58.9	3.114	3.096	+1.07	+20.8	12.9	79.7
Apr. 9	05 49.24	-25 30.9	3.120	3.024	+1.21	+20.2	12.9	75.2
Apr. 19	06 01.38	-22 09.2	3.134	2.954	+1.34	+19.3	12.8	70.5
Apr. 29	06 14.74	-18 56.3	3.153	2.886	+1.44	+18.2	12.7	65.6
May 9	06 29.15	-15 54.5	3.176	2.820	+1.53	+17.0	12.7	60.5
May 19	06 44.44	-13 05.0	3.202	2.756	+1.60	+15.6	12.6	55.4
May 29	07 00.47	-10 28.7	3.230	2.695	+1.67	+14.3	12.6	50.1
June 8	07 17.13	-08 06.2	3.257	2.636	+1.72	+12.9	12.5	44.8
June 18	07 34.28	-05 57.3	3.282	2.580	+1.76	+11.6	12.5	39.5
June 28	07 51.85	-04 01.6	3.304	2.528	+1.79	+10.3	12.4	34.2
July 8	08 09.75	-02 18.4	3.320	2.479	+1.82	+9.2	12.4	28.9
July 18	08 27.91	-00 46.6	3.330	2.435	+1.84	+8.2	12.3	23.8
July 28	08 46.29	+00 34.9	3.332	2.394	+1.85	+7.3	12.3	18.9
Aug. 7	09 04.82	+01 47.7	3.325	2.358	+1.87	+6.6	12.2	14.7
Aug. 17	09 23.48	+02 53.4	3.308	2.327	+1.88	+6.0	12.1	11.9
Aug. 27	09 42.26	+03 53.7	3.281	2.301	+1.89	+5.7	12.1	11.8
Sept. 6	10 01.14	+04 50.5	3.242	2.280	+1.90	+5.5	12.0	14.5
Sept.16	10 20.12	+05 46.0	3.193	2.265	+1.91	+5.6	12.0	18.9
Sept.26	10 39.20	+06 42.4	3.133	2.255	+1.92	+6.0	11.9	24.1
Oct. 6	10 58.37	+07 42.3	3.062	2.252	+1.93	+6.6	11.9	29.9
Oct. 16	11 17.66	+08 48.2	2.983	2.254	+1.94	+7.5	11.8	36.0
Oct. 26	11 37.07	+10 03.1	2.896	2.262	+1.95	+8.7	11.8	42.3
Nov. 5	11 56.58	+11 30.2	2.803	2.276	+1.96	+10.2	11.7	48.8
Nov. 15	12 16.18	+13 12.5	2.707	2.295	+1.96	+12.1	11.7	55.4
Nov. 25	12 35.82	+15 13.5	2.610	2.320	+1.96	+14.2	11.6	62.2
Dec. 5	12 55.45	+17 35.8	2.515	2.349	+1.95	+16.6	11.6	69.0
Dec. 15	13 14.98	+20 21.9	2.426	2.384	+1.93	+19.1	11.6	75.8
Dec. 25	13 34.24	+23 32.8	2.347	2.424	+1.88	+21.5	11.5	82.5
Jan. 4	13 53.04	+27 08.0	2.281	2.467	+1.81	+23.7	11.5	88.9
Jan. 14	14 11.14	+31 04.6	2.232	2.515	+1.71	+25.3	11.5	94.9
Jan. 24	14 28.20	+35 17.4	2.202	2.567	+1.56	+26.1	11.6	100.2
Feb. 3	14 43.82	+39 38.9	2.193	2.621	+1.37	+26.1	11.6	104.6
Feb. 13	14 57.56	+44 00.3	2.206	2.679	+1.13	+25.2	11.7	107.9
Feb. 23	15 08.88	+48 12.3	2.240	2.740	+0.84	+23.4	11.8	109.9
Mar. 5	15 17.27	+52 06.0	2.294	2.803	+0.50	+20.8	12.0	110.7
Mar. 15	15 22.25	+55 34.3	2.366	2.869	+0.12	+17.7	12.1	110.5
Mar. 25	15 23.48	+58 31.2	2.452	2.937	-0.25	+14.1	12.3	109.3

Comet 88P/Howell

Epoch = 2009 July 28.0 TT
T = 2009 Oct. 12.47430 TT
Peri. = 235.96199 e = 0.5619606
Node = 56.75794 2000.0 a = 3.1126965 AU
Incl. = 4.38180 n = 0.17947291
q = 1.3634837 AU P = 5.49 years

m1 = 7.0 + 5 log(Delta) + 23.0 log(r(t-40))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	13 05.93	-02 31.7	2.635	2.853	+0.73	-3.4	20.3	92.6
Jan. 19	13 13.21	-03 05.9	2.436	2.793	+0.58	-2.4	20.0	100.8
Jan. 29	13 19.04	-03 29.9	2.242	2.733	+0.40	-1.2	19.6	109.5
Feb. 8	13 23.09	-03 42.2	2.056	2.672	+0.19	+0.1	19.2	118.5
Feb. 18	13 25.02	-03 41.5	1.881	2.609	-0.06	+1.5	18.8	128.1
Feb. 28	13 24.46	-03 26.7	1.720	2.546	-0.33	+2.9	18.4	138.4
Mar. 10	13 21.16	-02 57.7	1.577	2.483	-0.61	+4.2	18.0	149.2
Mar. 20	13 15.07	-02 15.6	1.457	2.418	-0.86	+5.2	17.6	160.5
Mar. 30	13 06.47	-01 23.6	1.361	2.353	-1.04	+5.6	17.2	171.6
Apr. 9	12 56.10	-00 27.9	1.292	2.288	-1.10	+5.2	16.9	172.1
Apr. 19	12 45.12	+00 23.8	1.249	2.222	-1.02	+4.0	16.6	160.7
Apr. 29	12 34.89	+01 03.4	1.231	2.156	-0.82	+2.1	16.3	148.6
May 9	12 26.72	+01 24.0	1.234	2.089	-0.52	-0.2	16.0	137.0
May 19	12 21.53	+01 22.0	1.253	2.023	-0.17	-2.6	15.8	126.3
May 29	12 19.80	+00 56.3	1.283	1.958	+0.19	-4.9	15.5	116.5
June 8	12 21.66	+00 07.5	1.319	1.893	+0.53	-7.0	15.3	107.7
June 18	12 26.97	-01 02.2	1.357	1.829	+0.85	-8.9	15.0	99.8
June 28	12 35.52	-02 31.2	1.395	1.766	+1.15	-10.6	14.8	92.8
July 8	12 47.06	-04 17.2	1.430	1.706	+1.43	-12.1	14.5	86.6
July 18	13 01.38	-06 18.0	1.462	1.647	+1.70	-13.3	14.2	81.2
July 28	13 18.37	-08 31.3	1.490	1.593	+1.96	-14.3	13.9	76.4
Aug. 7	13 37.94	-10 54.6	1.513	1.542	+2.21	-15.0	13.6	72.2
Aug. 17	14 00.07	-13 24.6	1.533	1.496	+2.47	-15.3	13.3	68.5
Aug. 27	14 24.82	-15 57.5	1.550	1.455	+2.74	-15.1	12.9	65.4
Sept. 6	14 52.23	-18 28.3	1.565	1.421	+3.01	-14.3	12.6	62.7
Sept.16	15 22.31	-20 50.9	1.582	1.394	+3.27	-12.8	12.3	60.5
Sept.26	15 55.06	-22 58.7	1.600	1.376	+3.52	-10.5	12.0	58.6
Oct. 6	16 30.24	-24 44.0	1.622	1.365	+3.72	-7.6	11.8	57.0
Oct. 16	17 07.47	-25 59.6	1.651	1.364	+3.87	-4.0	11.6	55.6
Oct. 26	17 46.14	-26 39.9	1.687	1.372	+3.93	-0.1	11.5	54.4
Nov. 5	18 25.45	-26 41.1	1.732	1.388	+3.91	+3.8	11.4	53.2
Nov. 15	19 04.52	-26 03.1	1.788	1.412	+3.81	+7.5	11.4	51.9
Nov. 25	19 42.59	-24 48.5	1.854	1.444	+3.65	+10.6	11.4	50.6
Dec. 5	20 19.04	-23 02.7	1.930	1.483	+3.45	+13.1	11.6	49.0
Dec. 15	20 53.52	-20 52.2	2.017	1.528	+3.24	+14.9	11.8	47.1
Dec. 25	21 25.90	-18 23.7	2.112	1.577	+3.03	+16.0	12.1	44.9
Jan. 4	21 56.21	-15 43.6	2.215	1.631	+2.84	+16.6	12.4	42.5
Jan. 14	22 24.59	-12 57.2	2.324	1.688	+2.67	+16.8	12.8	39.7
Jan. 24	22 51.24	-10 08.8	2.436	1.748	+2.51	+16.7	13.2	36.6
Feb. 3	23 16.36	-07 21.8	2.551	1.810	+2.38	+16.3	13.6	33.3
Feb. 13	23 40.17	-04 38.4	2.667	1.873	+2.27	+15.8	14.0	29.7
Feb. 23	00 02.85	-02 00.6	2.780	1.938	+2.17	+15.1	14.4	25.8
Mar. 5	00 24.54	+00 30.5	2.891	2.004	+2.09	+14.4	14.9	21.8
Mar. 15	00 45.40	+02 54.0	2.996	2.070	+2.01	+13.5	15.3	17.5
Mar. 25	01 05.53	+05 09.3	3.095	2.136	+1.95	+12.7	15.7	13.1

Comet D/1884 O1 (Barnard)

Epoch = 2009 July 28.0 TT
T = 2009 Oct. 16.64725 TT
Peri. = 339.91250 e = 0.5719918
Node = 332.88857 2000.0 a = 3.0809961 AU
Incl. = 9.31264 n = 0.18224992
q = 1.3186916 AU P = 5.41 years

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

0h TT	R.A.(2000) Decl.	Delta	r	Variation		m1	Mot./PA	Elong.
2009/10	h m ° ′			for T=+1 day			′ °	°
Jan. 9	13 51.93 -17 46.6	2.955	2.888	-0.74	+4.9	22.0	16.2/122	76.5
Jan. 19	14 01.63 -19 10.7	2.757	2.829	-0.83	+5.2	21.7	14.9/124	84.0
Jan. 29	14 10.40 -20 33.1	2.557	2.768	-0.92	+5.6	21.5	13.3/127	91.7
Feb. 8	14 17.97 -21 53.2	2.360	2.706	-1.04	+6.1	21.2	11.4/133	99.6
Feb. 18	14 24.02 -23 10.7	2.166	2.643	-1.17	+6.6	20.9	9.3/143	107.9
Feb. 28	14 28.14 -24 24.9	1.980	2.579	-1.32	+7.3	20.6	7.3/161	116.5
Mar. 10	14 29.89 -25 34.3	1.805	2.514	-1.48	+8.2	20.3	6.4/193	125.4
Mar. 20	14 28.85 -26 37.0	1.643	2.449	-1.66	+9.3	20.0	7.7/227	134.8
Mar. 30	14 24.62 -27 29.3	1.498	2.383	-1.83	+10.8	19.6	10.7/249	144.5
Apr. 9	14 17.10 -28 06.8	1.373	2.316	-1.99	+12.4	19.3	14.0/262	154.1
Apr. 19	14 06.59 -28 24.3	1.271	2.248	-2.10	+14.3	19.0	16.6/272	162.1
Apr. 29	13 54.00 -28 17.7	1.194	2.181	-2.13	+16.2	18.8	17.7/279	164.3
May 9	13 40.84 -27 47.0	1.141	2.112	-2.08	+17.6	18.5	16.7/287	158.2
May 19	13 28.90 -26 57.4	1.112	2.044	-1.96	+18.4	18.3	13.6/295	148.5
May 29	13 19.78 -25 58.5	1.103	1.976	-1.80	+18.5	18.2	9.0/309	138.0
June 8	13 14.58 -25 01.8	1.109	1.908	-1.65	+18.0	18.0	4.7/346	127.8
June 18	13 13.77 -24 16.4	1.126	1.841	-1.52	+17.0	17.9	5.7/ 61	118.4
June 28	13 17.40 -23 48.0	1.149	1.775	-1.44	+15.8	17.8	10.9/ 86	109.9
July 8	13 25.31 -23 39.2	1.175	1.710	-1.40	+14.6	17.7	16.4/ 94	102.4
July 18	13 37.21 -23 49.0	1.200	1.648	-1.41	+13.4	17.6	21.6/ 98	95.7
July 28	13 52.88 -24 15.4	1.224	1.589	-1.45	+12.2	17.4	26.6/ 99	89.9
Aug. 7	14 12.15 -24 54.3	1.244	1.533	-1.54	+11.0	17.3	31.2/100	84.8
Aug. 17	14 34.88 -25 40.7	1.261	1.481	-1.67	+9.7	17.2	35.5/ 99	80.5
Aug. 27	15 01.01 -26 28.7	1.276	1.435	-1.82	+8.1	17.1	39.6/ 98	76.8
Sept. 6	15 30.41 -27 11.3	1.289	1.396	-1.99	+6.3	17.0	43.3/ 96	73.7
Sept.16	16 02.88 -27 40.7	1.301	1.363	-2.17	+4.0	16.9	46.7/ 93	71.1
Sept.26	16 38.09 -27 49.2	1.315	1.339	-2.33	+1.4	16.9	49.7/ 90	69.1
Oct. 6	17 15.46 -27 29.6	1.333	1.324	-2.46	-1.7	16.8	52.1/ 86	67.4
Oct. 16	17 54.24 -26 36.5	1.356	1.319	-2.54	-4.9	16.9	53.8/ 83	66.1
Oct. 26	18 33.57 -25 07.6	1.388	1.323	-2.55	-8.2	16.9	54.8/ 79	65.0
Nov. 5	19 12.58 -23 04.1	1.429	1.337	-2.51	-11.1	17.0	55.0/ 76	64.1
Nov. 15	19 50.51 -20 30.2	1.481	1.360	-2.41	-13.4	17.2	54.6/ 73	63.1
Nov. 25	20 26.90 -17 32.4	1.546	1.391	-2.27	-15.1	17.4	53.5/ 70	62.1
Dec. 5	21 01.44 -14 18.2	1.622	1.430	-2.12	-16.1	17.6	51.9/ 68	60.8
Dec. 15	21 34.07 -10 55.0	1.710	1.475	-1.97	-16.4	17.9	50.0/ 66	59.3
Dec. 25	22 04.87 -07 28.8	1.809	1.526	-1.81	-16.1	18.1	48.0/ 65	57.5
Jan. 4	22 33.98 -04 04.6	1.917	1.581	-1.67	-15.5	18.4	45.9/ 65	55.4
Jan. 14	23 01.58 -00 45.9	2.034	1.640	-1.54	-14.5	18.7	43.8/ 64	52.9
Jan. 24	23 27.90 +02 24.9	2.157	1.702	-1.43	-13.4	19.0	41.8/ 64	50.1
Feb. 3	23 53.10 +05 26.3	2.285	1.766	-1.33	-12.3	19.3	40.0/ 64	47.0
Feb. 13	00 17.36 +08 17.2	2.416	1.832	-1.23	-11.1	19.5	38.2/ 65	43.6
Feb. 23	00 40.82 +10 57.3	2.548	1.899	-1.15	-9.9	19.8	36.6/ 65	39.9
Mar. 5	01 03.61 +13 26.3	2.679	1.967	-1.08	-8.8	20.1	35.1/ 66	36.1
Mar. 15	01 25.82 +15 44.2	2.808	2.035	-1.02	-7.7	20.3	33.7/ 67	32.1
Mar. 25	01 47.54 +17 50.9	2.932	2.103	-0.96	-6.8	20.6	32.3/ 68	27.9

Comet 127P/Holt-Olmstead

Epoch = 2009 July 28.0 TT
T = 2009 Oct. 21.34531 TT
Peri. = 6.53133 e = 0.3625927
Node = 13.68547 2000.0 a = 3.4447675 AU
Incl. = 14.32034 n = 0.15415734
q = 2.1957199 AU P = 6.39 years

m1 = 13.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	19 57.73	-31 17.5	3.819	2.866	+1.89	+6.3	22.8	12.3
Jan. 19	20 16.59	-30 14.8	3.793	2.830	+1.89	+6.9	22.7	10.3
Jan. 29	20 35.47	-29 05.3	3.754	2.795	+1.88	+7.6	22.6	11.4
Feb. 8	20 54.28	-27 49.3	3.702	2.760	+1.87	+8.2	22.5	14.8
Feb. 18	21 12.94	-26 27.2	3.638	2.725	+1.85	+8.8	22.3	19.3
Feb. 28	21 31.40	-24 59.5	3.563	2.690	+1.82	+9.3	22.2	24.2
Mar. 10	21 49.61	-23 26.8	3.477	2.656	+1.79	+9.7	22.1	29.3
Mar. 20	22 07.54	-21 49.7	3.383	2.623	+1.76	+10.1	21.9	34.5
Mar. 30	22 25.15	-20 08.9	3.279	2.590	+1.73	+10.3	21.8	39.6
Apr. 9	22 42.41	-18 25.4	3.169	2.558	+1.69	+10.6	21.6	44.8
Apr. 19	22 59.29	-16 39.9	3.051	2.526	+1.65	+10.7	21.5	50.0
Apr. 29	23 15.76	-14 53.1	2.928	2.495	+1.60	+10.7	21.3	55.2
May 9	23 31.77	-13 06.1	2.801	2.466	+1.55	+10.7	21.1	60.5
May 19	23 47.27	-11 19.4	2.670	2.437	+1.49	+10.5	20.9	65.8
May 29	00 02.21	-09 34.0	2.537	2.410	+1.43	+10.3	20.8	71.2
June 8	00 16.47	-07 50.8	2.402	2.383	+1.35	+10.0	20.6	76.7
June 18	00 29.95	-06 10.3	2.266	2.359	+1.25	+9.7	20.4	82.4
June 28	00 42.49	-04 33.4	2.131	2.335	+1.14	+9.3	20.2	88.4
July 8	00 53.87	-03 00.7	1.998	2.313	+1.00	+8.8	20.0	94.6
July 18	01 03.89	-01 32.7	1.868	2.293	+0.83	+8.3	19.8	101.2
July 28	01 12.20	-00 09.9	1.742	2.274	+0.63	+7.7	19.6	108.2
Aug. 7	01 18.47	+01 07.5	1.623	2.257	+0.39	+7.2	19.4	115.8
Aug. 17	01 22.34	+02 19.2	1.513	2.242	+0.11	+6.6	19.2	124.0
Aug. 27	01 23.43	+03 25.1	1.414	2.229	-0.19	+6.0	19.0	133.0
Sept. 6	01 21.51	+04 25.4	1.330	2.218	-0.49	+5.5	18.8	142.8
Sept. 16	01 16.60	+05 20.3	1.265	2.210	-0.75	+5.0	18.7	153.3
Sept. 26	01 09.05	+06 10.0	1.220	2.203	-0.92	+4.6	18.6	164.6
Oct. 6	00 59.81	+06 55.6	1.200	2.198	-0.97	+4.3	18.5	176.3
Oct. 16	00 50.13	+07 38.5	1.205	2.196	-0.87	+4.3	18.5	171.6
Oct. 26	00 41.42	+08 21.1	1.236	2.196	-0.65	+4.5	18.6	159.9
Nov. 5	00 34.90	+09 06.1	1.290	2.198	-0.36	+5.0	18.7	148.7
Nov. 15	00 31.28	+09 55.8	1.364	2.202	-0.04	+5.6	18.8	138.1
Nov. 25	00 30.88	+10 52.1	1.456	2.209	+0.27	+6.4	19.0	128.3
Dec. 5	00 33.63	+11 55.9	1.562	2.218	+0.56	+7.1	19.2	119.3
Dec. 15	00 39.22	+13 07.1	1.678	2.228	+0.81	+7.8	19.3	111.0
Dec. 25	00 47.33	+14 25.4	1.802	2.241	+1.03	+8.4	19.5	103.2
Jan. 4	00 57.59	+15 49.5	1.931	2.256	+1.21	+8.9	19.7	95.9
Jan. 14	01 09.68	+17 18.3	2.064	2.273	+1.37	+9.2	19.9	89.1
Jan. 24	01 23.33	+18 50.4	2.199	2.291	+1.50	+9.4	20.1	82.7
Feb. 3	01 38.30	+20 24.2	2.333	2.312	+1.61	+9.4	20.3	76.5
Feb. 13	01 54.41	+21 58.1	2.468	2.333	+1.71	+9.3	20.5	70.6
Feb. 23	02 11.52	+23 30.8	2.599	2.357	+1.80	+9.0	20.7	64.9
Mar. 5	02 29.49	+25 00.8	2.728	2.382	+1.87	+8.6	20.8	59.4
Mar. 15	02 48.22	+26 26.6	2.853	2.408	+1.94	+8.1	21.0	54.0
Mar. 25	03 07.61	+27 47.2	2.973	2.435	+1.99	+7.4	21.2	48.8

Comet 107P/(4015)Wilson-Harrington

Epoch = 2009 July 28.0 TT
T = 2009 Oct. 22.04254 TT
Peri. = 91.24692 e = 0.6243223
Node = 270.55531 2000.0 a = 2.6381300 AU
Incl. = 2.78550 n = 0.23001692
q = 0.9910866 AU P = 4.28 years

H = 16.0 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	15 48.58	-21 43.5	3.500	2.950	+1.38	-4.1	21.9	49.0
Jan. 19	16 02.36	-22 24.3	3.325	2.891	+1.36	-3.6	21.8	55.9
Jan. 29	16 15.98	-23 00.6	3.140	2.831	+1.33	-3.2	21.7	62.9
Feb. 8	16 29.29	-23 32.1	2.947	2.769	+1.29	-2.7	21.5	69.9
Feb. 18	16 42.15	-23 58.8	2.749	2.705	+1.22	-2.2	21.4	77.1
Feb. 28	16 54.38	-24 20.9	2.547	2.640	+1.14	-1.8	21.2	84.3
Mar. 10	17 05.76	-24 38.5	2.344	2.573	+1.03	-1.3	21.0	91.7
Mar. 20	17 16.05	-24 51.9	2.142	2.505	+0.89	-1.0	20.7	99.3
Mar. 30	17 24.92	-25 01.5	1.944	2.434	+0.71	-0.6	20.5	107.2
Apr. 9	17 31.98	-25 07.9	1.752	2.362	+0.48	-0.3	20.2	115.5
Apr. 19	17 36.81	-25 11.2	1.568	2.289	+0.20	0.0	19.8	124.2
Apr. 29	17 38.84	-25 11.6	1.397	2.213	-0.13	+0.3	19.4	133.5
May 9	17 37.51	-25 08.4	1.239	2.136	-0.52	+0.8	19.0	143.4
May 19	17 32.29	-25 00.0	1.099	2.058	-0.94	+1.6	18.5	154.3
May 29	17 22.85	-24 43.7	0.979	1.978	-1.34	+2.8	18.0	166.0
June 8	17 09.48	-24 15.6	0.882	1.896	-1.62	+4.3	17.3	178.2
June 18	16 53.25	-23 33.1	0.808	1.814	-1.71	+5.6	17.3	167.9
June 28	16 36.15	-22 37.1	0.756	1.730	-1.54	+6.3	17.4	154.4
July 8	16 20.74	-21 33.9	0.725	1.645	-1.16	+6.1	17.5	141.2
July 18	16 09.14	-20 33.0	0.708	1.561	-0.64	+5.0	17.5	128.8
July 28	16 02.77	-19 43.1	0.700	1.477	-0.06	+3.4	17.6	117.6
Aug. 7	16 02.20	-19 09.0	0.695	1.394	+0.52	+1.8	17.6	107.8
Aug. 17	16 07.36	-18 51.0	0.688	1.313	+1.07	+0.5	17.6	99.3
Aug. 27	16 18.06	-18 46.3	0.675	1.236	+1.60	-0.3	17.6	92.2
Sept. 6	16 34.09	-18 49.5	0.654	1.166	+2.12	-0.4	17.6	86.3
Sept.16	16 55.31	-18 53.6	0.625	1.103	+2.66	+0.3	17.5	81.6
Sept.26	17 21.92	-18 50.4	0.587	1.052	+3.24	+2.1	17.4	78.1
Oct. 6	17 54.30	-18 29.2	0.541	1.015	+3.90	+5.2	17.2	76.0
Oct. 16	18 33.27	-17 36.7	0.492	0.995	+4.69	+10.2	17.1	75.4
Oct. 26	19 20.15	-15 54.8	0.445	0.993	+5.59	+17.4	16.9	76.9
Nov. 5	20 16.08	-13 00.6	0.405	1.009	+6.45	+26.2	16.7	80.8
Nov. 15	21 20.60	-08 38.3	0.382	1.043	+6.92	+33.4	16.5	87.2
Nov. 25	22 29.80	-03 04.2	0.384	1.091	+6.69	+34.5	16.4	95.3
Dec. 5	23 36.66	+02 41.3	0.416	1.152	+5.88	+29.6	16.5	102.8
Dec. 15	00 35.50	+07 37.6	0.479	1.221	+4.93	+22.8	16.7	108.1
Dec. 25	01 24.77	+11 25.6	0.567	1.297	+4.09	+16.9	17.1	110.6
Jan. 4	02 05.68	+14 14.9	0.676	1.377	+3.46	+12.7	17.5	110.8
Jan. 14	02 40.25	+16 21.5	0.802	1.459	+3.01	+9.7	17.9	109.2
Jan. 24	03 10.36	+17 58.6	0.943	1.543	+2.70	+7.6	18.3	106.4
Feb. 3	03 37.36	+19 14.3	1.097	1.628	+2.48	+5.9	18.7	102.7
Feb. 13	04 02.16	+20 13.7	1.261	1.712	+2.33	+4.6	19.1	98.5
Feb. 23	15 25.25	-14 53.3	2.863	3.208	0.00	+0.4	19.4	101.3
Mar. 5	15 25.26	-14 49.0	2.777	3.271	-0.23	+1.2	19.8	111.4
Mar. 15	15 22.95	-14 36.7	2.698	3.333	-0.46	+2.0	20.0	121.9
Mar. 25	15 18.34	-14 16.7	2.634	3.393	-0.67	+2.7	20.3	133.0

Comet 54P/de Vico-Swift-NEAT

Epoch = 2009 July 28.0 TT
T = 2009 Nov. 28.47926 TT
Peri. = 1.93022 e = 0.4269945
Node = 358.85716 2000.0 a = 3.7903811 AU
Incl. = 6.06738 n = 0.13356103
q = 2.1719092 AU P = 7.38 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	18 20.15	-28 01.2	4.058	3.118	+1.73	+1.0	23.7	15.0
Jan. 19	18 37.45	-27 51.4	3.974	3.077	+1.74	+1.6	23.6	21.1
Jan. 29	18 54.82	-27 35.6	3.876	3.035	+1.73	+2.2	23.4	27.3
Feb. 8	19 12.15	-27 13.6	3.766	2.993	+1.72	+2.8	23.2	33.5
Feb. 18	19 29.33	-26 45.8	3.644	2.952	+1.70	+3.3	23.0	39.7
Feb. 28	19 46.30	-26 12.7	3.512	2.910	+1.66	+3.8	22.8	45.9
Mar. 10	20 02.93	-25 34.8	3.371	2.869	+1.62	+4.2	22.6	52.0
Mar. 20	20 19.15	-24 52.8	3.223	2.828	+1.57	+4.5	22.4	58.2
Mar. 30	20 34.86	-24 07.6	3.069	2.788	+1.51	+4.7	22.1	64.4
Apr. 9	20 49.95	-23 20.3	2.911	2.748	+1.44	+4.8	21.9	70.7
Apr. 19	21 04.32	-22 31.9	2.750	2.708	+1.35	+4.8	21.7	77.1
Apr. 29	21 17.84	-21 43.9	2.588	2.669	+1.25	+4.6	21.4	83.5
May 9	21 30.35	-20 57.6	2.427	2.631	+1.14	+4.3	21.1	90.2
May 19	21 41.71	-20 14.4	2.268	2.594	+1.00	+3.8	20.9	97.0
May 29	21 51.69	-19 36.2	2.113	2.557	+0.84	+3.2	20.6	104.1
June 8	22 00.07	-19 04.4	1.964	2.521	+0.65	+2.4	20.3	111.6
June 18	22 06.57	-18 40.6	1.824	2.487	+0.43	+1.5	20.0	119.5
June 28	22 10.92	-18 26.1	1.694	2.453	+0.19	+0.5	19.7	127.9
July 8	22 12.84	-18 21.3	1.577	2.421	-0.07	-0.4	19.5	136.8
July 18	22 12.18	-18 25.6	1.477	2.390	-0.33	-1.1	19.2	146.4
July 28	22 08.93	-18 37.1	1.395	2.361	-0.55	-1.5	19.0	156.4
Aug. 7	22 03.43	-18 51.7	1.335	2.333	-0.71	-1.3	18.8	166.6
Aug. 17	21 56.37	-19 04.3	1.298	2.308	-0.76	-0.5	18.6	173.9
Aug. 27	21 48.79	-19 09.5	1.286	2.284	-0.69	+0.7	18.5	167.8
Sept. 6	21 41.93	-19 02.8	1.298	2.262	-0.50	+2.1	18.5	157.5
Sept. 16	21 36.90	-18 42.1	1.331	2.242	-0.24	+3.5	18.4	147.0
Sept. 26	21 34.47	-18 07.0	1.384	2.225	+0.06	+4.9	18.5	137.0
Oct. 6	21 35.06	-17 18.2	1.452	2.210	+0.36	+6.1	18.5	127.6
Oct. 16	21 38.65	-16 17.2	1.534	2.197	+0.64	+7.2	18.6	118.9
Oct. 26	21 45.06	-15 05.1	1.626	2.187	+0.89	+8.2	18.7	110.9
Nov. 5	21 53.95	-13 42.9	1.725	2.179	+1.10	+9.1	18.8	103.4
Nov. 15	22 04.93	-12 11.4	1.830	2.174	+1.27	+10.0	18.9	96.3
Nov. 25	22 17.65	-10 31.4	1.939	2.172	+1.41	+10.8	19.0	89.8
Dec. 5	22 31.78	-08 43.6	2.050	2.172	+1.52	+11.5	19.1	83.5
Dec. 15	22 47.02	-06 48.9	2.163	2.176	+1.62	+12.1	19.2	77.6
Dec. 25	23 03.17	-04 48.2	2.277	2.181	+1.69	+12.6	19.4	71.9
Jan. 4	23 20.04	-02 42.6	2.389	2.190	+1.74	+12.9	19.5	66.4
Jan. 14	23 37.47	-00 33.5	2.501	2.201	+1.79	+13.2	19.6	61.1
Jan. 24	23 55.36	+01 38.1	2.611	2.214	+1.83	+13.3	19.8	55.9
Feb. 3	00 13.63	+03 50.8	2.718	2.230	+1.86	+13.2	19.9	50.8
Feb. 13	00 32.21	+06 03.3	2.822	2.248	+1.89	+13.1	20.1	45.8
Feb. 23	00 51.06	+08 14.3	2.922	2.268	+1.91	+12.8	20.2	40.9
Mar. 5	01 10.14	+10 22.6	3.017	2.291	+1.93	+12.4	20.4	36.0
Mar. 15	01 29.43	+12 27.0	3.107	2.315	+1.95	+11.9	20.6	31.2
Mar. 25	01 48.91	+14 26.4	3.191	2.341	+1.96	+11.3	20.7	26.5

Comet 169P/NEAT

Epoch = 2009 July 28.0 TT
T = 2009 Nov. 30.30463 TT
Peri. = 217.96130 e = 0.7667907
Node = 176.19371 2000.0 a = 2.6058130 AU
Incl. = 11.29962 n = 0.23430913
q = 0.6076997 AU P = 4.21 years

H = 16.2 , G = 0.15 (r>1.1AU)
m1 = 19.0 + 5 log(Delta) + 25.0 log(r) (pre -T & r<1.1AU)
m1 = 16.0 + 5 log(Delta) + 10.0 log(r) (post-T & r<1.1AU)

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		Mag.	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	16 37.68	-13 36.2	4.175	3.475	+1.10	-0.6	22.7	39.7
Jan. 19	16 48.69	-13 41.7	4.013	3.419	+1.07	+0.1	22.6	47.0
Jan. 29	16 59.38	-13 40.7	3.836	3.361	+1.02	+0.8	22.5	54.5
Feb. 8	17 09.61	-13 33.0	3.647	3.302	+0.96	+1.5	22.4	62.0
Feb. 18	17 19.23	-13 18.3	3.448	3.240	+0.88	+2.2	22.3	69.7
Feb. 28	17 28.04	-12 56.4	3.240	3.177	+0.78	+2.9	22.2	77.5
Mar. 10	17 35.84	-12 27.4	3.028	3.112	+0.66	+3.6	22.0	85.5
Mar. 20	17 42.39	-11 51.1	2.813	3.045	+0.50	+4.3	21.8	93.7
Mar. 30	17 47.40	-11 07.7	2.600	2.975	+0.32	+5.0	21.6	102.2
Apr. 9	17 50.55	-10 17.4	2.391	2.904	+0.09	+5.7	21.4	110.9
Apr. 19	17 51.50	-09 20.5	2.190	2.830	-0.17	+6.3	21.1	120.1
Apr. 29	17 49.83	-08 18.0	2.001	2.754	-0.46	+6.7	20.8	129.6
May 9	17 45.21	-07 11.2	1.828	2.676	-0.78	+6.9	20.5	139.4
May 19	17 37.39	-06 02.6	1.675	2.595	-1.10	+6.7	20.1	149.1
May 29	17 26.34	-04 55.7	1.546	2.512	-1.38	+6.0	19.7	157.4
June 8	17 12.49	-03 55.7	1.444	2.426	-1.57	+4.7	19.5	161.0
June 18	16 56.75	-03 08.5	1.370	2.337	-1.63	+2.9	19.4	156.5
June 28	16 40.49	-02 39.8	1.324	2.245	-1.52	+0.7	19.4	146.9
July 8	16 25.30	-02 33.3	1.303	2.150	-1.27	-1.6	19.4	135.6
July 18	16 12.55	-02 49.6	1.301	2.052	-0.93	-3.8	19.5	124.2
July 28	16 03.21	-03 27.4	1.312	1.951	-0.55	-5.6	19.5	113.3
Aug. 7	15 57.75	-04 23.4	1.329	1.846	-0.15	-7.1	19.5	103.2
Aug. 17	15 56.23	-05 34.2	1.346	1.738	+0.23	-8.3	19.5	93.9
Aug. 27	15 58.55	-06 56.9	1.358	1.625	+0.60	-9.2	19.5	85.4
Sept. 6	16 04.53	-08 28.8	1.360	1.509	+0.94	-10.0	19.4	77.6
Sept.16	16 13.97	-10 08.4	1.348	1.390	+1.28	-10.6	19.2	70.7
Sept.26	16 26.82	-11 54.6	1.320	1.266	+1.62	-11.2	19.1	64.4
Oct. 6	16 43.04	-13 46.9	1.273	1.140	+1.97	-11.9	18.8	58.8
Oct. 16	17 02.69	-15 45.8	1.205	1.013	+2.32	-12.8	19.5	53.8
Oct. 26	17 25.86	-17 53.7	1.112	0.888	+2.64	-14.2	17.9	49.5
Nov. 5	17 52.28	-20 16.1	0.994	0.771	+2.85	-17.1	16.2	45.7
Nov. 15	18 20.79	-23 07.4	0.851	0.674	+2.72	-23.2	14.4	42.2
Nov. 25	18 48.00	-26 59.3	0.689	0.616	+1.91	-35.1	12.9	38.2
Dec. 5	19 07.06	-32 50.6	0.525	0.614	+0.14	-55.0	12.5	32.9
Dec. 15	19 08.41	-42 00.8	0.384	0.669	-3.46	-82.3	12.2	27.8
Dec. 25	18 33.80	-55 43.6	0.277	0.764	-16.85	-90.4	12.0	32.5
Jan. 4	15 45.27	-70 47.6	0.212	0.880	-29.40	+71.1	12.1	55.4
Jan. 14	10 51.30	-58 56.1	0.195	1.005	-8.26	150.8	12.5	90.7
Jan. 24	09 28.69	-33 48.0	0.232	1.132	-2.92	108.0	15.0	124.7
Feb. 3	08 59.46	-15 47.7	0.310	1.259	-1.32	+66.6	15.3	147.5
Feb. 13	08 46.24	-04 41.8	0.419	1.382	-0.52	+41.1	15.9	156.6
Feb. 23	08 41.07	+02 09.5	0.551	1.502	0.00	+26.0	16.7	153.3
Mar. 5	08 41.03	+06 29.2	0.702	1.618	+0.35	+16.6	17.5	145.1
Mar. 15	08 44.51	+09 15.0	0.870	1.731	+0.61	+10.4	18.2	136.2
Mar. 25	08 50.56	+10 59.3	1.053	1.839	+0.79	+6.2	18.8	127.6

Comet 100P/Hartley

Epoch = 2009 July 28.0 TT
T = 2009 Dec. 6.14363 TT
Peri. = 181.70624 e = 0.4187208
Node = 37.84623 2000.0 a = 3.4103978 AU
Incl. = 25.65314 n = 0.15649357
q = 1.9823933 AU P = 6.30 years

m1 = 7.1 + 5 log(Delta) + 32.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	09 17.35	+53 55.7	2.210	3.041	-1.09	+8.3	24.5	141.4
Jan. 19	09 06.43	+55 18.5	2.152	2.998	-1.35	+5.6	24.3	143.2
Jan. 29	08 52.91	+56 14.2	2.119	2.956	-1.44	+2.1	24.0	141.7
Feb. 8	08 38.49	+56 35.5	2.109	2.913	-1.33	-1.5	23.8	137.5
Feb. 18	08 25.18	+56 20.5	2.120	2.870	-1.04	-4.8	23.6	131.3
Feb. 28	08 14.75	+55 32.5	2.150	2.827	-0.65	-7.4	23.4	124.1
Mar. 10	08 08.28	+54 18.1	2.195	2.784	-0.22	-9.3	23.3	116.6
Mar. 20	08 06.06	+52 44.8	2.251	2.741	+0.18	-10.6	23.1	109.0
Mar. 30	08 07.89	+50 58.5	2.315	2.699	+0.54	-11.5	22.9	101.5
Apr. 9	08 13.27	+49 03.4	2.384	2.656	+0.83	-12.1	22.8	94.4
Apr. 19	08 21.59	+47 02.2	2.456	2.614	+1.07	-12.6	22.6	87.6
Apr. 29	08 32.29	+44 55.8	2.527	2.572	+1.26	-13.1	22.4	81.1
May 9	08 44.87	+42 44.8	2.596	2.530	+1.40	-13.6	22.3	75.0
May 19	08 58.90	+40 29.0	2.663	2.489	+1.51	-14.1	22.1	69.1
May 29	09 14.05	+38 08.1	2.725	2.448	+1.60	-14.6	21.9	63.6
June 8	09 30.03	+35 41.8	2.783	2.409	+1.66	-15.2	21.7	58.3
June 18	09 46.63	+33 09.9	2.835	2.370	+1.71	-15.8	21.5	53.2
June 28	10 03.69	+30 32.2	2.881	2.332	+1.74	-16.3	21.3	48.3
July 8	10 21.08	+27 48.8	2.922	2.295	+1.76	-16.9	21.2	43.6
July 18	10 38.72	+24 59.9	2.957	2.259	+1.78	-17.4	21.0	39.0
July 28	10 56.55	+22 05.7	2.986	2.225	+1.80	-17.9	20.8	34.6
Aug. 7	11 14.54	+19 06.8	3.009	2.193	+1.81	-18.3	20.6	30.2
Aug. 17	11 32.69	+16 03.6	3.026	2.162	+1.83	-18.7	20.4	26.0
Aug. 27	11 50.99	+12 57.0	3.038	2.133	+1.85	-18.9	20.2	21.8
Sept. 6	12 09.47	+09 47.5	3.044	2.106	+1.87	-19.1	20.0	17.8
Sept.16	12 28.15	+06 36.2	3.044	2.082	+1.89	-19.2	19.9	13.8
Sept.26	12 47.07	+03 23.7	3.039	2.059	+1.92	-19.2	19.7	10.2
Oct. 6	13 06.27	+00 11.2	3.028	2.040	+1.95	-19.2	19.6	7.1
Oct. 16	13 25.81	-03 00.4	3.012	2.023	+1.99	-19.0	19.4	5.8
Oct. 26	13 45.72	-06 10.0	2.991	2.009	+2.03	-18.6	19.3	7.3
Nov. 5	14 06.06	-09 16.5	2.964	1.998	+2.08	-18.2	19.2	10.5
Nov. 15	14 26.86	-12 18.8	2.933	1.989	+2.13	-17.7	19.1	14.4
Nov. 25	14 48.17	-15 15.8	2.896	1.984	+2.18	-17.1	19.1	18.5
Dec. 5	15 10.00	-18 06.4	2.854	1.982	+2.24	-16.3	19.0	22.8
Dec. 15	15 32.38	-20 49.5	2.807	1.984	+2.29	-15.5	19.0	27.2
Dec. 25	15 55.28	-23 24.4	2.756	1.988	+2.34	-14.6	19.0	31.7
Jan. 4	16 18.68	-25 50.0	2.701	1.995	+2.38	-13.6	19.0	36.3
Jan. 14	16 42.53	-28 06.0	2.642	2.006	+2.42	-12.6	19.0	41.0
Jan. 24	17 06.72	-30 12.0	2.579	2.019	+2.44	-11.6	19.1	45.8
Feb. 3	17 31.12	-32 08.1	2.513	2.036	+2.45	-10.7	19.1	50.6
Feb. 13	17 55.61	-33 54.7	2.444	2.055	+2.44	-9.8	19.2	55.6
Feb. 23	18 19.97	-35 32.9	2.373	2.076	+2.40	-9.1	19.3	60.7
Mar. 5	18 43.98	-37 04.0	2.300	2.100	+2.35	-8.6	19.4	65.9
Mar. 15	19 07.43	-38 29.9	2.226	2.127	+2.26	-8.3	19.5	71.3
Mar. 25	19 30.03	-39 52.9	2.152	2.155	+2.15	-8.3	19.6	76.8

Comet P/2004 K2 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2009 Dec. 15.53140 TT
Peri. = 180.77448 e = 0.5025727
Node = 150.11901 2000.0 a = 3.1131703 AU
Incl. = 8.13255 n = 0.17943194
q = 1.5485759 AU P = 5.49 years

m1 = 14.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 9	15 05.01	-10 44.6	3.448	3.110	-0.62	+2.4	24.1	17.4/ 99	62.0
Jan. 19	15 16.69	-11 11.0	3.267	3.061	-0.67	+2.5	23.9	16.4/ 97	69.3
Jan. 29	15 27.79	-11 29.5	3.081	3.011	-0.73	+2.6	23.6	15.2/ 94	76.7
Feb. 8	15 38.13	-11 39.5	2.891	2.960	-0.79	+2.7	23.4	13.8/ 91	84.3
Feb. 18	15 47.49	-11 40.4	2.700	2.908	-0.87	+2.8	23.1	12.0/ 86	92.0
Feb. 28	15 55.63	-11 31.8	2.511	2.856	-0.95	+2.9	22.8	9.9/ 80	100.1
Mar. 10	16 02.25	-11 13.5	2.326	2.803	-1.04	+3.1	22.5	7.6/ 68	108.4
Mar. 20	16 07.06	-10 45.4	2.149	2.749	-1.15	+3.3	22.2	5.5/ 46	117.1
Mar. 30	16 09.73	-10 07.7	1.982	2.695	-1.26	+3.5	21.9	4.7/ 4	126.2
Apr. 9	16 09.98	-09 21.2	1.829	2.640	-1.37	+3.7	21.6	6.4/327	135.7
Apr. 19	16 07.61	-08 27.7	1.694	2.585	-1.49	+3.9	21.3	9.4/308	145.4
Apr. 29	16 02.61	-07 29.8	1.580	2.529	-1.59	+4.1	21.0	12.4/298	155.1
May 9	15 55.25	-06 31.9	1.489	2.473	-1.67	+4.2	20.8	14.5/291	163.4
May 19	15 46.18	-05 39.4	1.423	2.417	-1.71	+4.2	20.5	15.2/286	165.9
May 29	15 36.37	-04 58.3	1.382	2.360	-1.71	+4.1	20.3	14.2/280	159.9
June 8	15 27.03	-04 34.3	1.367	2.303	-1.67	+3.9	20.1	11.6/272	150.2
June 18	15 19.29	-04 30.7	1.372	2.247	-1.60	+3.7	20.0	8.0/257	139.9
June 28	15 14.05	-04 48.5	1.395	2.190	-1.51	+3.6	19.8	5.0/220	129.9
July 8	15 11.86	-05 26.7	1.431	2.134	-1.42	+3.5	19.7	5.8/164	120.5
July 18	15 12.94	-06 22.7	1.476	2.079	-1.35	+3.6	19.6	9.6/138	111.7
July 28	15 17.29	-07 33.4	1.526	2.024	-1.29	+3.7	19.5	13.8/126	103.8
Aug. 7	15 24.79	-08 55.3	1.578	1.971	-1.25	+3.8	19.4	17.9/120	96.5
Aug. 17	15 35.23	-10 25.2	1.631	1.919	-1.24	+4.0	19.3	21.7/116	89.9
Aug. 27	15 48.46	-11 59.9	1.682	1.868	-1.24	+4.1	19.2	25.1/113	83.9
Sept. 6	16 04.31	-13 36.1	1.731	1.820	-1.26	+4.2	19.1	28.2/110	78.4
Sept.16	16 22.62	-15 10.6	1.777	1.774	-1.30	+4.2	19.0	31.1/107	73.4
Sept.26	16 43.29	-16 40.0	1.820	1.731	-1.35	+4.1	18.9	33.7/105	68.8
Oct. 6	17 06.17	-18 00.9	1.861	1.692	-1.41	+3.8	18.8	36.1/102	64.5
Oct. 16	17 31.12	-19 09.6	1.899	1.656	-1.48	+3.4	18.7	38.3/ 99	60.6
Oct. 26	17 57.97	-20 02.7	1.936	1.625	-1.55	+2.8	18.6	40.2/ 96	57.0
Nov. 5	18 26.47	-20 36.7	1.972	1.598	-1.61	+2.1	18.5	41.9/ 93	53.7
Nov. 15	18 56.32	-20 48.9	2.008	1.577	-1.67	+1.2	18.5	43.3/ 90	50.6
Nov. 25	19 27.20	-20 37.3	2.046	1.562	-1.71	+0.1	18.5	44.5/ 87	47.6
Dec. 5	19 58.71	-20 00.9	2.086	1.552	-1.73	-1.0	18.5	45.3/ 84	44.9
Dec. 15	20 30.46	-18 60.0	2.129	1.549	-1.74	-2.1	18.5	45.9/ 81	42.2
Dec. 25	21 02.12	-17 35.8	2.175	1.551	-1.72	-3.2	18.5	46.1/ 78	39.7
Jan. 4	21 33.35	-15 51.1	2.226	1.560	-1.69	-4.2	18.6	46.0/ 76	37.2
Jan. 14	22 03.96	-13 49.2	2.282	1.575	-1.64	-4.9	18.8	45.7/ 74	34.7
Jan. 24	22 33.79	-11 33.8	2.341	1.596	-1.59	-5.5	18.9	45.1/ 72	32.1
Feb. 3	23 02.76	-09 09.2	2.405	1.622	-1.52	-5.9	19.1	44.4/ 71	29.5
Feb. 13	23 30.85	-06 39.1	2.472	1.652	-1.46	-6.1	19.2	43.4/ 70	26.8
Feb. 23	23 58.09	-04 07.3	2.542	1.687	-1.39	-6.1	19.4	42.3/ 69	24.1
Mar. 5	00 24.51	-01 37.1	2.614	1.727	-1.32	-5.9	19.6	41.2/ 69	21.2
Mar. 15	00 50.18	+00 48.9	2.686	1.769	-1.26	-5.7	19.9	40.0/ 69	18.2
Mar. 25	01 15.16	+03 08.3	2.759	1.815	-1.20	-5.3	20.1	38.7/ 70	15.1

Comet P/2005 JQ5 (Catalina)

Epoch = 2009 July 28.0 TT
T = 2009 Dec. 28.85285 TT
Peri. = 222.73796 e = 0.6942180
Node = 95.83394 2000.0 a = 2.6918961 AU
Incl. = 5.69534 n = 0.22316014
q = 0.8231334 AU P = 4.42 years

m1 = 17.3 + 5 log(Delta) + 12.5 log(r(t-15))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	12 27.12	+03 42.4	3.113	3.482	-0.47	+3.0	.	2.7/ 61	103.9
Jan. 19	12 28.69	+03 55.3	2.914	3.430	-0.51	+3.3	.	2.7/349	113.7
Jan. 29	12 28.32	+04 22.1	2.726	3.377	-0.55	+3.5	.	5.6/318	124.0
Feb. 8	12 25.81	+05 03.4	2.552	3.322	-0.59	+3.7	.	9.0/308	134.9
Feb. 18	12 21.01	+05 58.5	2.399	3.266	-0.63	+3.8	.	12.5/303	146.1
Feb. 28	12 13.97	+07 05.5	2.270	3.208	-0.66	+3.8	.	15.3/299	157.7
Mar. 10	12 04.96	+08 20.2	2.170	3.149	-0.67	+3.8	.	17.2/297	168.3
Mar. 20	11 54.56	+09 36.7	2.101	3.088	-0.67	+3.6	.	17.7/294	170.6
Mar. 30	11 43.58	+10 48.1	2.064	3.025	-0.65	+3.3	25.0	16.7/291	160.8
Apr. 9	11 32.99	+11 47.9	2.056	2.960	-0.61	+3.0	24.9	14.3/288	149.0
Apr. 19	11 23.71	+12 31.4	2.075	2.894	-0.57	+2.6	24.8	10.9/283	137.2
Apr. 29	11 16.44	+12 56.4	2.115	2.825	-0.52	+2.4	24.8	7.1/275	125.9
May 9	11 11.63	+13 02.6	2.170	2.755	-0.48	+2.1	24.7	3.4/251	115.2
May 19	11 09.41	+12 51.2	2.234	2.683	-0.44	+2.0	24.6	2.8/169	105.2
May 29	11 09.76	+12 23.8	2.302	2.609	-0.41	+2.0	24.5	5.8/136	95.9
June 8	11 12.53	+11 42.2	2.369	2.533	-0.40	+2.0	24.5	9.1/126	87.3
June 18	11 17.50	+10 48.1	2.432	2.455	-0.39	+2.1	24.4	12.2/122	79.3
June 28	11 24.47	+09 42.5	2.487	2.375	-0.39	+2.3	24.2	15.1/120	71.8
July 8	11 33.24	+08 26.4	2.533	2.292	-0.40	+2.5	24.1	17.7/119	64.8
July 18	11 43.66	+07 00.6	2.567	2.208	-0.42	+2.8	23.9	20.2/118	58.2
July 28	11 55.62	+05 25.4	2.589	2.121	-0.45	+3.1	23.8	22.6/117	52.0
Aug. 7	12 09.05	+03 41.3	2.596	2.032	-0.48	+3.5	23.6	25.0/117	46.3
Aug. 17	12 23.94	+01 48.4	2.590	1.941	-0.53	+3.9	23.3	27.4/116	40.8
Aug. 27	12 40.33	-00 13.2	2.570	1.847	-0.59	+4.4	23.1	29.9/116	35.8
Sept. 6	12 58.29	-02 23.2	2.535	1.751	-0.66	+5.0	22.8	32.6/115	31.1
Sept.16	13 17.98	-04 41.3	2.488	1.654	-0.75	+5.6	22.5	35.4/115	26.8
Sept.26	13 39.64	-07 07.1	2.428	1.554	-0.87	+6.3	22.1	38.6/114	23.0
Oct. 6	14 03.54	-09 39.6	2.357	1.454	-1.01	+7.0	21.7	42.2/113	19.6
Oct. 16	14 30.10	-12 17.2	2.277	1.353	-1.18	+7.7	21.3	46.2/111	16.7
Oct. 26	14 59.82	-14 57.1	2.191	1.252	-1.40	+8.3	20.8	50.7/109	14.4
Nov. 5	15 33.27	-17 34.4	2.100	1.154	-1.66	+8.6	20.3	55.7/107	12.8
Nov. 15	16 11.12	-20 01.5	2.008	1.060	-1.98	+8.4	19.8	61.2/104	12.0
Nov. 25	16 53.92	-22 06.9	1.919	0.975	-2.34	+7.5	19.3	66.9/100	12.0
Dec. 5	17 41.91	-23 34.9	1.836	0.904	-2.72	+5.4	18.7	72.4/ 95	13.0
Dec. 15	18 34.64	-24 07.0	1.764	0.852	-3.06	+2.0	18.2	77.0/ 90	14.9
Dec. 25	19 30.71	-23 26.5	1.707	0.825	-3.29	-2.4	17.7	80.1/ 84	17.6
Jan. 4	20 27.83	-21 26.1	1.671	0.829	-3.35	-7.3	17.4	81.0/ 79	20.8
Jan. 14	21 23.57	-18 12.3	1.659	0.861	-3.25	-11.5	17.3	79.6/ 74	24.1
Jan. 24	22 16.06	-14 04.7	1.675	0.918	-3.03	-14.3	17.5	76.1/ 70	27.3
Feb. 3	23 04.37	-09 29.0	1.720	0.994	-2.77	-15.5	17.8	71.2/ 68	29.8
Feb. 13	23 48.37	-04 49.0	1.791	1.081	-2.49	-15.4	18.3	65.6/ 66	31.5
Feb. 23	00 28.38	-00 22.2	1.885	1.176	-2.22	-14.3	18.9	59.9/ 66	32.4
Mar. 5	01 04.88	+03 41.1	1.997	1.275	-1.98	-12.7	19.5	54.5/ 66	32.3
Mar. 15	01 38.43	+07 16.7	2.123	1.376	-1.76	-10.9	20.0	49.7/ 67	31.4
Mar. 25	02 09.51	+10 23.6	2.257	1.477	-1.57	-9.2	20.6	45.5/ 69	29.8

Comet 118P/Shoemaker-Levy

Epoch = 2009 July 28.0 TT
T = 2010 Jan. 2.31915 TT
Peri. = 302.14064 e = 0.4272470
Node = 151.80732 2000.0 a = 3.4639302 AU
Incl. = 8.50941 n = 0.15287990
q = 1.9839764 AU P = 6.45 years

m1 = 9.0 + 5 log(Delta) + 14.0 log(r(t-50))

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	22 34.01	-11 20.1	3.761	3.176	+1.19	+6.2	19.3	47.2
Jan. 19	22 45.94	-10 17.7	3.821	3.134	+1.26	+6.8	19.2	40.2
Jan. 29	22 58.54	-09 09.6	3.867	3.091	+1.32	+7.3	19.2	33.3
Feb. 8	23 11.73	-07 56.5	3.897	3.048	+1.37	+7.7	19.1	26.7
Feb. 18	23 25.42	-06 39.2	3.913	3.005	+1.41	+8.1	19.1	20.3
Feb. 28	23 39.56	-05 18.2	3.913	2.962	+1.45	+8.4	19.0	14.1
Mar. 10	23 54.09	-03 54.4	3.898	2.918	+1.49	+8.6	18.9	8.2
Mar. 20	00 08.99	-02 28.5	3.868	2.875	+1.52	+8.7	18.8	3.6
Mar. 30	00 24.23	-01 01.3	3.824	2.831	+1.56	+8.8	18.7	5.3
Apr. 9	00 39.80	+00 26.4	3.766	2.787	+1.59	+8.7	18.6	10.4
Apr. 19	00 55.67	+01 53.8	3.696	2.744	+1.62	+8.6	18.4	15.8
Apr. 29	01 11.85	+03 20.1	3.614	2.700	+1.65	+8.4	18.3	21.2
May 9	01 28.33	+04 44.3	3.522	2.657	+1.68	+8.1	18.2	26.5
May 19	01 45.11	+06 05.7	3.420	2.614	+1.71	+7.8	18.0	31.7
May 29	02 02.18	+07 23.2	3.309	2.571	+1.73	+7.3	17.8	36.9
June 8	02 19.51	+08 36.0	3.191	2.529	+1.76	+6.7	17.7	42.0
June 18	02 37.11	+09 43.1	3.066	2.487	+1.78	+6.0	17.5	47.0
June 28	02 54.92	+10 43.4	2.936	2.447	+1.80	+5.3	17.3	52.1
July 8	03 12.89	+11 36.1	2.802	2.406	+1.81	+4.4	17.1	57.1
July 18	03 30.98	+12 20.4	2.665	2.367	+1.81	+3.5	16.9	62.1
July 28	03 49.07	+12 55.2	2.526	2.329	+1.80	+2.5	16.7	67.2
Aug. 7	04 07.04	+13 19.8	2.386	2.292	+1.77	+1.4	16.4	72.3
Aug. 17	04 24.78	+13 33.8	2.246	2.256	+1.73	+0.3	16.2	77.6
Aug. 27	04 42.06	+13 36.7	2.106	2.222	+1.66	-0.8	16.0	83.0
Sept. 6	04 58.69	+13 28.5	1.969	2.189	+1.57	-1.9	15.7	88.5
Sept.16	05 14.40	+13 09.5	1.835	2.158	+1.45	-2.9	15.5	94.3
Sept.26	05 28.87	+12 40.3	1.705	2.129	+1.29	-3.8	15.2	100.5
Oct. 6	05 41.76	+12 02.6	1.581	2.103	+1.09	-4.4	14.9	106.9
Oct. 16	05 52.68	+11 18.2	1.464	2.078	+0.85	-4.8	14.7	113.9
Oct. 26	06 01.19	+10 30.1	1.356	2.057	+0.57	-4.8	14.4	121.4
Nov. 5	06 06.92	+09 42.3	1.258	2.037	+0.26	-4.3	14.2	129.4
Nov. 15	06 09.55	+08 59.5	1.174	2.021	-0.06	-3.2	13.9	138.1
Nov. 25	06 08.96	+08 27.6	1.105	2.007	-0.35	-1.5	13.7	147.2
Dec. 5	06 05.45	+08 12.3	1.055	1.997	-0.57	+0.6	13.6	156.2
Dec. 15	05 59.77	+08 18.0	1.026	1.989	-0.66	+2.9	13.4	163.4
Dec. 25	05 53.13	+08 47.1	1.020	1.985	-0.61	+5.1	13.4	164.6
Jan. 4	05 47.05	+09 37.9	1.036	1.984	-0.42	+6.8	13.4	158.5
Jan. 14	05 42.86	+10 46.0	1.074	1.986	-0.13	+7.9	13.4	149.6
Jan. 24	05 41.56	+12 05.0	1.132	1.991	+0.21	+8.3	13.5	140.3
Feb. 3	05 43.61	+13 28.5	1.207	2.000	+0.54	+8.2	13.6	131.3
Feb. 13	05 49.02	+14 50.9	1.297	2.012	+0.85	+7.7	13.7	122.9
Feb. 23	05 57.56	+16 07.7	1.398	2.026	+1.13	+6.8	13.9	115.1
Mar. 5	06 08.83	+17 15.5	1.508	2.043	+1.35	+5.7	14.1	107.9
Mar. 15	06 22.37	+18 12.2	1.626	2.064	+1.54	+4.4	14.2	101.1
Mar. 25	06 37.77	+18 56.2	1.750	2.086	+1.68	+3.0	14.4	94.8

Comet 82P/Gehrels

Epoch = 2009 July 28.0 TT
T = 2010 Jan. 12.34509 TT
Peri. = 226.29981 e = 0.1219867
Node = 239.51582 2000.0 a = 4.1381305 AU
Incl. = 1.12631 n = 0.11708407
q = 3.6333336 AU P = 8.42 years

m1 = 9.5 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	02 21.78	+14 17.4	3.365	3.803	+0.28	+1.2	20.8	109.1
Jan. 19	02 24.60	+14 29.0	3.503	3.794	+0.44	+1.9	20.9	99.7
Jan. 29	02 29.02	+14 48.5	3.645	3.786	+0.59	+2.6	21.0	90.6
Feb. 8	02 34.91	+15 14.7	3.788	3.778	+0.72	+3.2	21.1	81.9
Feb. 18	02 42.10	+15 46.3	3.927	3.770	+0.83	+3.6	21.1	73.7
Feb. 28	02 50.44	+16 22.1	4.061	3.763	+0.94	+3.9	21.2	65.7
Mar. 10	02 59.79	+17 00.8	4.186	3.755	+1.02	+4.0	21.2	58.0
Mar. 20	03 10.02	+17 41.2	4.301	3.748	+1.10	+4.1	21.3	50.6
Mar. 30	03 21.01	+18 22.3	4.404	3.741	+1.16	+4.1	21.3	43.3
Apr. 9	03 32.65	+19 03.0	4.493	3.734	+1.22	+3.9	21.3	36.3
Apr. 19	03 44.85	+19 42.5	4.568	3.727	+1.27	+3.7	21.4	29.5
Apr. 29	03 57.52	+20 19.9	4.629	3.721	+1.31	+3.5	21.4	22.8
May 9	04 10.57	+20 54.7	4.673	3.714	+1.34	+3.1	21.4	16.2
May 19	04 23.93	+21 26.1	4.701	3.708	+1.36	+2.8	21.4	9.7
May 29	04 37.50	+21 53.7	4.714	3.702	+1.37	+2.3	21.4	3.3
June 8	04 51.22	+22 17.2	4.709	3.696	+1.38	+1.9	21.4	3.1
June 18	05 05.00	+22 36.2	4.689	3.691	+1.38	+1.4	21.4	9.5
June 28	05 18.76	+22 50.6	4.653	3.686	+1.36	+1.0	21.3	15.8
July 8	05 32.41	+23 00.4	4.602	3.681	+1.35	+0.5	21.3	22.2
July 18	05 45.86	+23 05.6	4.535	3.676	+1.32	+0.1	21.3	28.6
July 28	05 59.02	+23 06.3	4.455	3.671	+1.28	-0.3	21.2	35.2
Aug. 7	06 11.77	+23 02.9	4.360	3.667	+1.22	-0.7	21.2	41.8
Aug. 17	06 24.02	+22 55.7	4.253	3.663	+1.16	-1.0	21.1	48.6
Aug. 27	06 35.63	+22 45.4	4.135	3.659	+1.08	-1.3	21.0	55.5
Sept. 6	06 46.48	+22 32.5	4.007	3.656	+0.99	-1.5	21.0	62.7
Sept. 16	06 56.42	+22 17.8	3.870	3.652	+0.89	-1.6	20.9	70.1
Sept. 26	07 05.29	+22 02.2	3.727	3.649	+0.76	-1.6	20.8	77.8
Oct. 6	07 12.92	+21 46.6	3.580	3.646	+0.62	-1.4	20.7	85.9
Oct. 16	07 19.12	+21 32.2	3.431	3.644	+0.46	-1.2	20.6	94.3
Oct. 26	07 23.70	+21 19.9	3.285	3.642	+0.28	-0.9	20.5	103.1
Nov. 5	07 26.49	+21 10.6	3.144	3.640	+0.08	-0.6	20.4	112.5
Nov. 15	07 27.34	+21 05.1	3.012	3.638	-0.12	-0.1	20.3	122.3
Nov. 25	07 26.15	+21 03.8	2.894	3.637	-0.32	+0.3	20.2	132.7
Dec. 5	07 22.99	+21 06.5	2.795	3.635	-0.49	+0.6	20.1	143.5
Dec. 15	07 18.05	+21 12.7	2.719	3.634	-0.63	+0.9	20.1	154.8
Dec. 25	07 11.70	+21 21.2	2.670	3.634	-0.72	+0.9	20.0	166.5
Jan. 4	07 04.55	+21 30.7	2.651	3.633	-0.73	+0.9	20.0	178.0
Jan. 14	06 57.28	+21 39.9	2.661	3.633	-0.67	+0.8	20.0	169.7
Jan. 24	06 50.62	+21 47.9	2.702	3.634	-0.54	+0.6	20.1	158.0
Feb. 3	06 45.22	+21 54.3	2.771	3.634	-0.37	+0.5	20.1	146.6
Feb. 13	06 41.52	+21 58.9	2.863	3.635	-0.17	+0.3	20.2	135.6
Feb. 23	06 39.80	+22 01.7	2.976	3.636	+0.03	+0.1	20.3	125.1
Mar. 5	06 40.14	+22 02.8	3.103	3.637	+0.23	-0.1	20.4	115.1
Mar. 15	06 42.47	+22 02.1	3.242	3.639	+0.42	-0.3	20.5	105.7
Mar. 25	06 46.66	+21 59.2	3.386	3.640	+0.59	-0.5	20.6	96.7

Comet P/2003 XD10 (LINEAR-NEAT)

Epoch = 2009 July 28.0 TT
T = 2010 Jan. 31.86914 TT
Peri. = 16.05441 e = 0.4165787
Node = 40.53392 2000.0 a = 3.4107582 AU
Incl. = 13.43421 n = 0.15646877
q = 1.9899090 AU P = 6.30 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	20 30.97	-29 40.1	4.198	3.273	-0.52	-1.7	.	21.2/ 75	17.4
Jan. 19	20 46.47	-28 40.6	4.186	3.233	-0.53	-2.0	.	21.7/ 74	12.7
Jan. 29	21 02.14	-27 37.0	4.156	3.192	-0.53	-2.3	.	22.1/ 73	10.3
Feb. 8	21 17.91	-26 29.8	4.111	3.151	-0.54	-2.6	.	22.4/ 73	11.6
Feb. 18	21 33.70	-25 19.1	4.050	3.110	-0.55	-3.0	.	22.7/ 72	15.6
Feb. 28	21 49.47	-24 05.5	3.975	3.068	-0.57	-3.4	.	22.9/ 71	20.7
Mar. 10	22 05.14	-22 49.4	3.885	3.026	-0.58	-3.7	25.0	23.0/ 71	26.2
Mar. 20	22 20.70	-21 31.4	3.783	2.984	-0.60	-4.1	24.8	23.0/ 71	31.8
Mar. 30	22 36.09	-20 12.2	3.669	2.941	-0.62	-4.6	24.6	22.9/ 70	37.6
Apr. 9	22 51.28	-18 52.5	3.545	2.899	-0.64	-5.0	24.4	22.7/ 70	43.3
Apr. 19	23 06.24	-17 33.0	3.411	2.856	-0.66	-5.5	24.2	22.5/ 70	49.1
Apr. 29	23 20.93	-16 14.6	3.270	2.813	-0.69	-6.0	24.0	22.1/ 70	54.9
May 9	23 35.29	-14 58.1	3.122	2.771	-0.72	-6.5	23.8	21.6/ 70	60.7
May 19	23 49.28	-13 44.4	2.968	2.728	-0.76	-7.1	23.6	21.0/ 71	66.5
May 29	00 02.82	-12 34.3	2.811	2.686	-0.81	-7.8	23.4	20.1/ 71	72.5
June 8	00 15.81	-11 29.0	2.652	2.643	-0.86	-8.5	23.1	19.1/ 72	78.5
June 18	00 28.15	-10 29.4	2.491	2.601	-0.91	-9.3	22.8	17.8/ 73	84.7
June 28	00 39.67	-09 36.5	2.331	2.560	-0.98	-10.1	22.6	16.2/ 74	91.0
July 8	00 50.19	-08 51.3	2.173	2.519	-1.06	-11.1	22.3	14.3/ 75	97.6
July 18	00 59.48	-08 14.7	2.019	2.478	-1.15	-12.1	22.0	11.8/ 77	104.5
July 28	01 07.23	-07 47.5	1.871	2.438	-1.26	-13.3	21.7	8.9/ 79	111.8
Aug. 7	01 13.12	-07 29.9	1.730	2.399	-1.38	-14.5	21.4	5.5/ 81	119.6
Aug. 17	01 16.78	-07 21.7	1.600	2.361	-1.51	-15.8	21.1	1.6/ 90	127.8
Aug. 27	01 17.84	-07 21.7	1.483	2.323	-1.66	-17.2	20.9	2.7/259	136.6
Sept. 6	01 16.05	-07 27.1	1.381	2.287	-1.80	-18.4	20.6	7.0/265	146.0
Sept.16	01 11.36	-07 33.6	1.299	2.253	-1.94	-19.5	20.3	10.8/269	155.5
Sept.26	01 04.08	-07 35.3	1.238	2.219	-2.04	-20.2	20.1	13.5/274	164.1
Oct. 6	00 55.04	-07 25.0	1.201	2.188	-2.09	-20.5	19.9	14.5/281	167.4
Oct. 16	00 45.45	-06 57.1	1.189	2.158	-2.08	-20.4	19.8	13.9/291	161.6
Oct. 26	00 36.72	-06 07.7	1.200	2.130	-2.01	-20.1	19.7	12.2/306	152.0
Nov. 5	00 30.12	-04 56.5	1.234	2.104	-1.90	-19.5	19.7	10.6/329	141.7
Nov. 15	00 26.46	-03 25.7	1.286	2.081	-1.77	-18.9	19.7	10.7/357	131.8
Nov. 25	00 26.12	-01 38.4	1.353	2.059	-1.64	-18.2	19.7	12.8/ 20	122.5
Dec. 5	00 29.10	+00 21.9	1.431	2.041	-1.52	-17.5	19.8	15.8/ 35	114.0
Dec. 15	00 35.13	+02 32.1	1.518	2.025	-1.42	-16.9	19.9	19.0/ 44	106.1
Dec. 25	00 43.91	+04 49.7	1.611	2.012	-1.34	-16.2	19.9	21.9/ 49	98.8
Jan. 4	00 55.08	+07 12.3	1.708	2.002	-1.28	-15.6	20.0	24.5/ 53	92.1
Jan. 14	01 08.32	+09 37.9	1.808	1.995	-1.24	-14.9	20.1	26.6/ 56	85.9
Jan. 24	01 23.40	+12 04.7	1.909	1.991	-1.21	-14.2	20.2	28.4/ 59	80.0
Feb. 3	01 40.08	+14 30.6	2.010	1.990	-1.20	-13.5	20.3	29.8/ 61	74.6
Feb. 13	01 58.19	+16 53.8	2.112	1.992	-1.19	-12.7	20.5	31.0/ 63	69.4
Feb. 23	02 17.61	+19 12.3	2.212	1.997	-1.19	-11.9	20.6	31.8/ 65	64.5
Mar. 5	02 38.20	+21 24.1	2.312	2.006	-1.20	-11.0	20.7	32.5/ 67	59.8
Mar. 15	02 59.87	+23 27.4	2.410	2.017	-1.21	-10.0	20.8	32.9/ 69	55.3
Mar. 25	03 22.52	+25 20.4	2.506	2.031	-1.22	-9.1	21.0	33.2/ 71	51.0

Comet 203P/Korlevic

Epoch = 2009 July 28.0 TT
T = 2010 Feb. 8.20201 TT
Peri. = 154.54539 e = 0.3148655
Node = 290.56176 2000.0 a = 4.6446026 AU
Incl. = 2.97602 n = 0.09846485
q = 3.1821775 AU P = 10.01 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	23 59.08	+02 58.9	3.954	3.773	+0.80	+4.6	19.6	72.3
Jan. 19	00 07.05	+03 44.7	4.070	3.748	+0.89	+5.2	19.7	64.2
Jan. 29	00 15.96	+04 37.0	4.176	3.723	+0.97	+5.8	19.7	56.4
Feb. 8	00 25.69	+05 34.9	4.272	3.699	+1.04	+6.3	19.7	48.9
Feb. 18	00 36.12	+06 37.4	4.355	3.675	+1.10	+6.6	19.7	41.6
Feb. 28	00 47.17	+07 43.7	4.424	3.652	+1.16	+6.9	19.7	34.5
Mar. 10	00 58.74	+08 52.7	4.479	3.628	+1.20	+7.1	19.7	27.6
Mar. 20	01 10.77	+10 03.7	4.518	3.605	+1.24	+7.2	19.6	20.9
Mar. 30	01 23.19	+11 15.7	4.542	3.583	+1.28	+7.2	19.6	14.3
Apr. 9	01 35.94	+12 28.1	4.550	3.561	+1.30	+7.2	19.6	8.0
Apr. 19	01 48.97	+13 40.0	4.542	3.539	+1.33	+7.1	19.5	2.6
Apr. 29	02 02.25	+14 50.8	4.518	3.517	+1.35	+6.9	19.5	5.6
May 9	02 15.70	+15 59.8	4.480	3.497	+1.36	+6.7	19.4	11.6
May 19	02 29.28	+17 06.5	4.426	3.476	+1.37	+6.4	19.3	17.7
May 29	02 42.94	+18 10.2	4.359	3.456	+1.37	+6.0	19.3	23.8
June 8	02 56.62	+19 10.4	4.278	3.437	+1.36	+5.6	19.2	30.0
June 18	03 10.24	+20 06.8	4.185	3.418	+1.35	+5.2	19.1	36.2
June 28	03 23.72	+20 59.0	4.080	3.400	+1.32	+4.8	19.0	42.5
July 8	03 36.96	+21 46.6	3.964	3.382	+1.29	+4.3	18.9	48.8
July 18	03 49.86	+22 29.6	3.839	3.365	+1.24	+3.8	18.8	55.2
July 28	04 02.29	+23 07.8	3.705	3.348	+1.18	+3.3	18.7	61.9
Aug. 7	04 14.08	+23 41.2	3.565	3.332	+1.10	+2.9	18.6	68.6
Aug. 17	04 25.09	+24 09.9	3.419	3.317	+1.00	+2.4	18.5	75.7
Aug. 27	04 35.10	+24 34.1	3.270	3.303	+0.88	+2.0	18.4	83.0
Sept. 6	04 43.90	+24 54.0	3.120	3.289	+0.74	+1.6	18.2	90.6
Sept.16	04 51.25	+25 10.0	2.971	3.276	+0.56	+1.2	18.1	98.7
Sept.26	04 56.90	+25 22.2	2.825	3.264	+0.37	+0.9	18.0	107.1
Oct. 6	05 00.60	+25 30.8	2.687	3.253	+0.16	+0.5	17.8	116.1
Oct. 16	05 02.17	+25 35.7	2.559	3.242	-0.07	+0.1	17.7	125.6
Oct. 26	05 01.47	+25 36.6	2.445	3.232	-0.29	-0.4	17.6	135.7
Nov. 5	04 58.56	+25 33.1	2.351	3.223	-0.49	-0.9	17.5	146.3
Nov. 15	04 53.66	+25 24.5	2.279	3.215	-0.64	-1.4	17.4	157.4
Nov. 25	04 47.28	+25 10.6	2.234	3.208	-0.71	-1.9	17.3	168.8
Dec. 5	04 40.15	+24 51.9	2.217	3.202	-0.70	-2.2	17.3	177.2
Dec. 15	04 33.11	+24 29.9	2.229	3.196	-0.61	-2.3	17.3	167.1
Dec. 25	04 27.01	+24 07.0	2.270	3.192	-0.45	-2.1	17.3	155.6
Jan. 4	04 22.54	+23 45.6	2.337	3.188	-0.24	-1.8	17.4	144.4
Jan. 14	04 20.13	+23 28.0	2.426	3.185	-0.01	-1.2	17.5	133.6
Jan. 24	04 20.02	+23 15.7	2.534	3.183	+0.22	-0.7	17.6	123.4
Feb. 3	04 22.21	+23 09.1	2.655	3.182	+0.44	-0.1	17.7	113.7
Feb. 13	04 26.57	+23 07.8	2.787	3.182	+0.64	+0.3	17.8	104.6
Feb. 23	04 32.94	+23 11.1	2.925	3.183	+0.81	+0.7	17.9	95.9
Mar. 5	04 41.08	+23 17.6	3.065	3.185	+0.97	+0.8	18.0	87.8
Mar. 15	04 50.76	+23 25.9	3.206	3.188	+1.10	+0.9	18.1	80.0
Mar. 25	05 01.77	+23 34.6	3.345	3.191	+1.21	+0.8	18.2	72.6

Comet 149P/Mueller

Epoch = 2009 July 28.0 TT
T = 2010 Feb. 19.25971 TT
Peri. = 43.78275 e = 0.3886134
Node = 145.26611 2000.0 a = 4.3356963 AU
Incl. = 29.73547 n = 0.10917314
q = 2.6507865 AU P = 9.03 years

m1 = 9.4 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	06 53.12	-04 12.2	2.706	3.609	-0.72	+6.5	21.3	152.8
Jan. 19	06 45.97	-03 07.5	2.690	3.574	-0.64	+8.0	21.2	149.7
Jan. 29	06 39.61	-01 47.4	2.702	3.539	-0.50	+9.1	21.2	143.1
Feb. 8	06 34.61	-00 16.2	2.739	3.505	-0.32	+9.8	21.1	134.8
Feb. 18	06 31.39	+01 21.5	2.798	3.470	-0.12	+10.0	21.1	125.8
Feb. 28	06 30.17	+03 01.2	2.875	3.436	+0.09	+9.8	21.1	116.7
Mar. 10	06 31.04	+04 39.2	2.965	3.402	+0.29	+9.4	21.1	107.7
Mar. 20	06 33.94	+06 12.7	3.065	3.368	+0.48	+8.7	21.1	99.0
Mar. 30	06 38.76	+07 39.7	3.170	3.334	+0.66	+7.9	21.1	90.6
Apr. 9	06 45.34	+08 58.8	3.276	3.301	+0.81	+7.0	21.1	82.6
Apr. 19	06 53.48	+10 09.1	3.381	3.268	+0.95	+6.1	21.0	74.9
Apr. 29	07 03.01	+11 10.3	3.482	3.235	+1.08	+5.2	21.0	67.6
May 9	07 13.77	+12 01.9	3.577	3.202	+1.18	+4.2	21.0	60.5
May 19	07 25.57	+12 44.2	3.664	3.170	+1.27	+3.3	21.0	53.6
May 29	07 38.28	+13 17.0	3.741	3.139	+1.35	+2.4	21.0	47.0
June 8	07 51.76	+13 40.8	3.807	3.108	+1.41	+1.5	20.9	40.6
June 18	08 05.89	+13 55.6	3.862	3.078	+1.47	+0.6	20.9	34.4
June 28	08 20.57	+14 02.0	3.905	3.048	+1.51	-0.2	20.8	28.3
July 8	08 35.70	+14 00.4	3.935	3.019	+1.55	-0.9	20.8	22.3
July 18	08 51.21	+13 51.4	3.952	2.990	+1.58	-1.6	20.7	16.4
July 28	09 07.02	+13 35.4	3.955	2.963	+1.60	-2.2	20.6	10.6
Aug. 7	09 23.06	+13 13.3	3.945	2.936	+1.62	-2.7	20.6	4.9
Aug. 17	09 39.30	+12 45.8	3.922	2.910	+1.64	-3.2	20.5	1.7
Aug. 27	09 55.67	+12 13.8	3.885	2.885	+1.65	-3.6	20.4	6.9
Sept. 6	10 12.14	+11 38.3	3.836	2.861	+1.65	-3.8	20.3	12.6
Sept.16	10 28.68	+11 00.3	3.774	2.838	+1.66	-3.9	20.2	18.4
Sept.26	10 45.25	+10 21.0	3.701	2.816	+1.66	-3.9	20.1	24.2
Oct. 6	11 01.81	+09 41.8	3.616	2.795	+1.65	-3.8	20.0	30.0
Oct. 16	11 18.34	+09 04.0	3.520	2.776	+1.65	-3.5	19.9	36.0
Oct. 26	11 34.80	+08 29.2	3.415	2.757	+1.63	-3.0	19.8	42.0
Nov. 5	11 51.12	+07 59.2	3.301	2.740	+1.62	-2.3	19.7	48.1
Nov. 15	12 07.27	+07 35.8	3.180	2.725	+1.59	-1.5	19.5	54.4
Nov. 25	12 23.17	+07 21.0	3.052	2.710	+1.55	-0.4	19.4	60.7
Dec. 5	12 38.70	+07 17.0	2.921	2.698	+1.51	+0.9	19.3	67.3
Dec. 15	12 53.78	+07 26.0	2.786	2.686	+1.45	+2.4	19.1	74.0
Dec. 25	13 08.24	+07 50.4	2.651	2.676	+1.37	+4.2	19.0	80.8
Jan. 4	13 21.91	+08 32.2	2.517	2.668	+1.27	+6.1	18.9	87.9
Jan. 14	13 34.57	+09 33.4	2.387	2.662	+1.14	+8.2	18.7	95.1
Jan. 24	13 45.97	+10 55.5	2.263	2.656	+0.99	+10.3	18.6	102.5
Feb. 3	13 55.82	+12 38.8	2.149	2.653	+0.80	+12.4	18.5	110.0
Feb. 13	14 03.84	+14 42.5	2.046	2.651	+0.59	+14.1	18.4	117.5
Feb. 23	14 09.71	+17 03.5	1.958	2.651	+0.35	+15.3	18.3	124.9
Mar. 5	14 13.24	+19 36.0	1.888	2.652	+0.11	+15.6	18.2	131.6
Mar. 15	14 14.30	+22 12.1	1.838	2.655	-0.13	+14.9	18.1	137.3
Mar. 25	14 12.95	+24 41.1	1.809	2.660	-0.34	+13.1	18.1	141.2

Comet 157P/Tritton

Epoch = 2009 July 28.0 TT
T = 2010 Feb. 20.36248 TT
Peri. = 148.71330 e = 0.6011429
Node = 300.11506 2000.0 a = 3.4109984 AU
Incl. = 7.27763 n = 0.15645224
q = 1.3605010 AU P = 6.30 years

m1 = 14.0 + 5 log(Delta) + 17.5 log(r)

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	20 48.57	-16 10.7	4.589	3.691	+1.14	+5.2	.	21.5
Jan. 19	20 59.97	-15 18.5	4.585	3.640	+1.17	+5.7	.	14.2
Jan. 29	21 11.70	-14 21.6	4.562	3.587	+1.20	+6.1	.	7.1
Feb. 8	21 23.67	-13 20.2	4.519	3.533	+1.21	+6.6	.	1.9
Feb. 18	21 35.78	-12 14.6	4.457	3.479	+1.22	+7.0	.	7.4
Feb. 28	21 47.99	-11 04.8	4.376	3.424	+1.22	+7.3	.	14.1
Mar. 10	22 00.23	-09 51.4	4.277	3.368	+1.22	+7.7	.	20.8
Mar. 20	22 12.44	-08 34.7	4.161	3.310	+1.21	+8.0	.	27.5
Mar. 30	22 24.57	-07 14.9	4.030	3.252	+1.20	+8.2	.	34.1
Apr. 9	22 36.58	-05 52.6	3.885	3.193	+1.18	+8.4	.	40.7
Apr. 19	22 48.41	-04 28.1	3.727	3.133	+1.16	+8.6	.	47.2
Apr. 29	23 00.01	-03 01.8	3.559	3.072	+1.13	+8.8	.	53.7
May 9	23 11.33	-01 34.3	3.381	3.011	+1.10	+8.8	25.0	60.2
May 19	23 22.29	-00 05.9	3.196	2.948	+1.05	+8.9	24.7	66.8
May 29	23 32.82	+01 22.8	3.006	2.884	+1.00	+8.9	24.4	73.4
June 8	23 42.80	+02 51.4	2.812	2.820	+0.93	+8.8	24.1	80.1
June 18	23 52.12	+04 19.2	2.617	2.755	+0.85	+8.6	23.8	86.9
June 28	00 00.61	+05 45.4	2.421	2.689	+0.75	+8.4	23.4	93.9
July 8	00 08.07	+07 09.4	2.229	2.622	+0.62	+8.1	23.1	101.1
July 18	00 14.26	+08 30.1	2.041	2.554	+0.46	+7.6	22.7	108.6
July 28	00 18.86	+09 46.0	1.861	2.486	+0.27	+6.9	22.3	116.5
Aug. 7	00 21.51	+10 55.5	1.690	2.417	+0.03	+6.1	21.8	124.8
Aug. 17	00 21.86	+11 56.0	1.531	2.348	-0.23	+4.8	21.4	133.7
Aug. 27	00 19.52	+12 44.4	1.388	2.278	-0.52	+3.3	21.0	143.0
Sept. 6	00 14.31	+13 16.9	1.263	2.208	-0.80	+1.3	20.5	152.7
Sept. 16	00 06.34	+13 29.7	1.159	2.138	-1.01	-1.0	20.1	162.0
Sept. 26	23 56.20	+13 20.1	1.078	2.068	-1.11	-3.1	19.7	167.3
Oct. 6	23 45.12	+12 49.2	1.021	1.998	-1.04	-4.7	19.3	162.9
Oct. 16	23 34.69	+12 02.3	0.987	1.930	-0.81	-5.4	19.0	153.0
Oct. 26	23 26.61	+11 08.7	0.974	1.862	-0.44	-4.9	18.7	142.1
Nov. 5	23 22.20	+10 19.8	0.977	1.795	-0.01	-3.5	18.4	131.5
Nov. 15	23 22.14	+09 44.8	0.993	1.731	+0.46	-1.5	18.2	121.7
Nov. 25	23 26.70	+09 30.1	1.015	1.669	+0.90	+0.9	17.9	112.9
Dec. 5	23 35.72	+09 38.8	1.042	1.610	+1.32	+3.2	17.7	105.2
Dec. 15	23 48.89	+10 11.3	1.069	1.556	+1.70	+5.5	17.5	98.4
Dec. 25	00 05.91	+11 06.3	1.097	1.506	+2.05	+7.5	17.3	92.6
Jan. 4	00 26.45	+12 21.0	1.124	1.462	+2.38	+9.0	17.1	87.6
Jan. 14	00 50.24	+13 51.2	1.149	1.425	+2.69	+10.1	17.0	83.5
Jan. 24	01 17.10	+15 32.2	1.175	1.396	+2.97	+10.5	16.9	80.0
Feb. 3	01 46.77	+17 17.5	1.203	1.375	+3.22	+10.3	16.8	77.1
Feb. 13	02 19.00	+19 00.2	1.234	1.363	+3.45	+9.3	16.8	74.8
Feb. 23	02 53.45	+20 32.9	1.269	1.361	+3.62	+7.5	16.9	72.9
Mar. 5	03 29.63	+21 48.4	1.312	1.368	+3.73	+5.2	17.0	71.3
Mar. 15	04 06.93	+22 40.7	1.364	1.385	+3.77	+2.5	17.1	69.9
Mar. 25	04 44.66	+23 06.0	1.425	1.410	+3.74	-0.3	17.4	68.6

Comet 81P/Wild

Epoch = 2009 July 28.0 TT
T = 2010 Feb. 22.72605 TT
Peri. = 41.80817 e = 0.5373707
Node = 136.09699 2000.0 a = 3.4540018 AU
Incl. = 3.23746 n = 0.15353954
q = 1.5979224 AU P = 6.42 years

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	02 24.41	+10 27.6	3.136	3.572	+0.11	+1.6	18.6	108.5
Jan. 19	02 25.48	+10 43.9	3.239	3.523	+0.29	+2.5	18.5	98.6
Jan. 29	02 28.42	+11 09.1	3.344	3.474	+0.47	+3.3	18.5	89.3
Feb. 8	02 33.12	+11 42.1	3.447	3.425	+0.63	+3.9	18.4	80.4
Feb. 18	02 39.40	+12 21.3	3.546	3.374	+0.77	+4.4	18.4	72.0
Feb. 28	02 47.13	+13 05.5	3.636	3.323	+0.90	+4.8	18.3	64.0
Mar. 10	02 56.16	+13 53.4	3.716	3.271	+1.02	+5.0	18.3	56.3
Mar. 20	03 06.36	+14 43.6	3.783	3.218	+1.13	+5.1	18.2	49.0
Mar. 30	03 17.64	+15 35.0	3.837	3.165	+1.23	+5.1	18.1	41.9
Apr. 9	03 29.89	+16 26.4	3.876	3.111	+1.31	+5.0	18.0	35.1
Apr. 19	03 43.04	+17 16.7	3.900	3.056	+1.40	+4.8	17.8	28.6
Apr. 29	03 57.03	+18 05.1	3.908	3.001	+1.48	+4.5	17.7	22.3
May 9	04 11.80	+18 50.4	3.901	2.945	+1.55	+4.1	17.6	16.3
May 19	04 27.30	+19 31.8	3.878	2.889	+1.62	+3.7	17.4	10.4
May 29	04 43.49	+20 08.4	3.841	2.832	+1.68	+3.1	17.2	4.9
June 8	05 00.32	+20 39.4	3.789	2.775	+1.74	+2.5	17.0	2.4
June 18	05 17.77	+21 03.9	3.723	2.717	+1.80	+1.7	16.9	6.9
June 28	05 35.79	+21 21.3	3.644	2.659	+1.85	+1.0	16.6	12.1
July 8	05 54.34	+21 30.9	3.553	2.600	+1.90	+0.1	16.4	17.3
July 18	06 13.38	+21 31.9	3.452	2.541	+1.95	-0.8	16.2	22.3
July 28	06 32.88	+21 23.8	3.340	2.483	+1.99	-1.8	15.9	27.3
Aug. 7	06 52.78	+21 06.2	3.220	2.424	+2.03	-2.8	15.7	32.2
Aug. 17	07 13.05	+20 38.6	3.092	2.365	+2.06	-3.8	15.4	37.1
Aug. 27	07 33.64	+20 00.8	2.958	2.306	+2.09	-4.8	15.1	41.8
Sept. 6	07 54.51	+19 12.5	2.819	2.248	+2.11	-5.9	14.8	46.5
Sept. 16	08 15.63	+18 13.7	2.676	2.190	+2.13	-6.9	14.5	51.1
Sept. 26	08 36.96	+17 04.6	2.530	2.133	+2.15	-7.9	14.2	55.7
Oct. 6	08 58.47	+15 45.5	2.384	2.077	+2.17	-8.9	13.8	60.2
Oct. 16	09 20.16	+14 16.8	2.237	2.022	+2.18	-9.7	13.5	64.6
Oct. 26	09 42.00	+12 39.4	2.092	1.969	+2.20	-10.5	13.2	69.0
Nov. 5	10 03.97	+10 54.1	1.949	1.917	+2.21	-11.2	12.8	73.4
Nov. 15	10 26.08	+09 02.1	1.810	1.868	+2.22	-11.7	12.4	77.7
Nov. 25	10 48.29	+07 05.3	1.676	1.822	+2.23	-12.0	12.1	81.9
Dec. 5	11 10.56	+05 05.5	1.548	1.779	+2.23	-12.0	11.7	86.2
Dec. 15	11 32.85	+03 05.0	1.426	1.739	+2.22	-11.8	11.4	90.4
Dec. 25	11 55.03	+01 06.8	1.311	1.703	+2.19	-11.3	11.0	94.8
Jan. 4	12 16.96	-00 45.9	1.205	1.672	+2.14	-10.4	10.7	99.2
Jan. 14	12 38.40	-02 29.8	1.106	1.646	+2.06	-9.1	10.4	103.8
Jan. 24	12 58.98	-04 00.9	1.017	1.625	+1.93	-7.5	10.1	108.6
Feb. 3	13 18.28	-05 15.9	0.936	1.610	+1.74	-5.6	9.9	113.8
Feb. 13	13 35.71	-06 11.6	0.864	1.601	+1.49	-3.4	9.7	119.5
Feb. 23	13 50.59	-06 45.9	0.802	1.598	+1.17	-1.2	9.5	125.9
Mar. 5	14 02.30	-06 58.2	0.751	1.601	+0.80	+0.8	9.4	133.0
Mar. 15	14 10.28	-06 49.8	0.711	1.611	+0.40	+2.5	9.3	141.0
Mar. 25	14 14.27	-06 24.9	0.685	1.626	+0.04	+3.4	9.3	149.9

Comet 126P/IRAS

Epoch = 2009 July 28.0 TT
T = 2010 Feb. 22.83336 TT
Peri. = 356.74647 e = 0.6964346
Node = 357.76507 2000.0 a = 5.6438583 AU
Incl. = 45.82779 n = 0.07350890
q = 1.7132801 AU P = 13.41 years

m1 = 9.0 + 5 log(Delta) + 15.0 log(r)

0h TT	R.A.(2000)	Decl.	Delta	r	Daily motion		m1	Elong.
2009/10	h m	° ′			m	′		°
Jan. 9	15 22.35	-54 20.1	4.585	4.096	+1.42	-11.1	21.5	54.6
Jan. 19	15 36.53	-56 10.7	4.426	4.032	+1.42	-11.6	21.3	60.4
Jan. 29	15 50.74	-58 06.2	4.259	3.967	+1.41	-12.0	21.1	66.3
Feb. 8	16 04.84	-60 06.7	4.088	3.902	+1.38	-12.6	20.9	72.2
Feb. 18	16 18.66	-62 12.2	3.915	3.836	+1.33	-13.1	20.7	78.2
Feb. 28	16 31.94	-64 22.9	3.742	3.770	+1.24	-13.6	20.5	84.0
Mar. 10	16 44.32	-66 38.7	3.572	3.704	+1.10	-14.0	20.3	89.8
Mar. 20	16 55.31	-68 59.1	3.407	3.636	+0.88	-14.4	20.1	95.3
Mar. 30	17 04.10	-71 23.4	3.249	3.569	+0.53	-14.6	19.8	100.5
Apr. 9	17 09.44	-73 49.8	3.100	3.501	-0.01	-14.5	19.6	105.3
Apr. 19	17 09.32	-76 15.1	2.963	3.433	-0.90	-13.9	19.4	109.6
Apr. 29	17 00.32	-78 34.1	2.838	3.364	-2.31	-12.3	19.2	113.2
May 9	16 37.17	-80 36.8	2.727	3.295	-4.31	-9.1	18.9	115.9
May 19	15 54.12	-82 07.3	2.630	3.225	-6.10	-3.8	18.7	117.6
May 29	14 53.17	-82 45.3	2.547	3.156	-5.96	+2.3	18.5	118.2
June 8	13 53.54	-82 21.8	2.479	3.086	-3.97	+7.0	18.3	117.8
June 18	13 13.86	-81 12.1	2.423	3.016	-1.79	+9.3	18.1	116.4
June 28	12 55.96	-79 39.5	2.379	2.945	-0.18	+9.9	17.9	114.2
July 8	12 54.13	-78 00.6	2.346	2.875	+0.91	+9.6	17.7	111.2
July 18	13 03.23	-76 24.1	2.322	2.805	+1.69	+9.0	17.5	107.8
July 28	13 20.14	-74 53.8	2.306	2.735	+2.28	+8.4	17.4	104.0
Aug. 7	13 42.96	-73 30.1	2.295	2.665	+2.75	+7.9	17.2	100.0
Aug. 17	14 10.48	-72 11.1	2.289	2.596	+3.14	+7.8	17.0	95.9
Aug. 27	14 41.88	-70 53.1	2.287	2.527	+3.44	+8.2	16.8	91.7
Sept. 6	15 16.31	-69 31.4	2.287	2.458	+3.66	+9.1	16.7	87.5
Sept.16	15 52.87	-68 00.6	2.290	2.391	+3.78	+10.5	16.5	83.3
Sept.26	16 30.62	-66 15.5	2.295	2.325	+3.79	+12.4	16.3	79.1
Oct. 6	17 08.53	-64 11.7	2.303	2.260	+3.71	+14.6	16.1	75.0
Oct. 16	17 45.67	-61 46.2	2.313	2.197	+3.57	+16.9	15.9	70.8
Oct. 26	18 21.38	-58 57.5	2.325	2.136	+3.38	+19.2	15.8	66.6
Nov. 5	18 55.17	-55 45.8	2.340	2.077	+3.17	+21.3	15.6	62.4
Nov. 15	19 26.85	-52 12.3	2.359	2.021	+2.96	+23.3	15.4	58.2
Nov. 25	19 56.42	-48 19.4	2.381	1.968	+2.76	+25.0	15.3	53.9
Dec. 5	20 23.98	-44 09.8	2.406	1.918	+2.57	+26.3	15.2	49.5
Dec. 15	20 49.73	-39 46.5	2.434	1.873	+2.42	+27.4	15.0	45.1
Dec. 25	21 13.89	-35 12.3	2.464	1.833	+2.28	+28.2	14.9	40.6
Jan. 4	21 36.67	-30 30.2	2.496	1.797	+2.16	+28.8	14.8	36.1
Jan. 14	21 58.31	-25 42.4	2.530	1.768	+2.07	+29.1	14.7	31.5
Jan. 24	22 19.00	-20 51.0	2.563	1.744	+1.99	+29.3	14.7	27.0
Feb. 3	22 38.92	-15 58.0	2.597	1.727	+1.93	+29.4	14.6	22.4
Feb. 13	22 58.26	-11 04.4	2.629	1.717	+1.89	+29.3	14.6	18.0
Feb. 23	23 17.18	-06 11.6	2.658	1.713	+1.86	+29.1	14.6	13.7
Mar. 5	23 35.82	-01 20.5	2.686	1.717	+1.85	+28.9	14.7	9.8
Mar. 15	23 54.34	+03 28.3	2.710	1.727	+1.85	+28.6	14.7	7.0
Mar. 25	00 12.88	+08 13.9	2.731	1.745	+1.87	+28.2	14.8	6.6

Comet P/2004 R1 (McNaught)

Epoch = 2009 July 28.0 TT
T = 2010 Feb. 24.38591 TT
Peri. = 0.67547 e = 0.6828515
Node = 295.96726 2000.0 a = 3.1082543 AU
Incl. = 4.89392 n = 0.17985779
q = 0.9857782 AU P = 5.48 years

m1 = 18.5 + 5 log(Delta) + 12.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	10 47.68	+04 04.5	3.184	3.856	-0.43	+3.1	.	5.8/279	126.9
Jan. 19	10 43.83	+04 14.0	3.016	3.805	-0.45	+3.3	.	8.8/284	138.0
Jan. 29	10 38.11	+04 35.0	2.870	3.753	-0.47	+3.4	.	11.5/286	149.5
Feb. 8	10 30.72	+05 06.8	2.751	3.699	-0.48	+3.5	.	13.6/288	161.4
Feb. 18	10 22.04	+05 47.4	2.662	3.645	-0.48	+3.5	.	14.7/289	172.9
Feb. 28	10 12.67	+06 33.8	2.606	3.590	-0.48	+3.5	.	14.7/289	172.1
Mar. 10	10 03.34	+07 22.1	2.581	3.533	-0.46	+3.3	.	13.5/290	160.4
Mar. 20	09 54.77	+08 08.1	2.587	3.475	-0.44	+3.2	.	11.4/291	148.4
Mar. 30	09 47.61	+08 48.5	2.620	3.415	-0.41	+3.0	.	8.5/292	136.6
Apr. 9	09 42.33	+09 20.5	2.673	3.355	-0.38	+2.8	.	5.2/296	125.4
Apr. 19	09 39.17	+09 42.8	2.742	3.293	-0.36	+2.6	.	1.9/309	114.8
Apr. 29	09 38.19	+09 54.6	2.821	3.229	-0.34	+2.5	.	1.7/ 86	104.8
May 9	09 39.36	+09 55.8	2.905	3.165	-0.33	+2.4	.	4.7/101	95.4
May 19	09 42.51	+09 46.6	2.990	3.098	-0.32	+2.3	.	7.6/105	86.6
May 29	09 47.48	+09 27.4	3.070	3.031	-0.32	+2.3	.	10.2/106	78.2
June 8	09 54.07	+08 58.5	3.144	2.962	-0.32	+2.3	.	12.5/108	70.4
June 18	10 02.09	+08 20.3	3.209	2.891	-0.33	+2.3	.	14.6/109	62.9
June 28	10 11.40	+07 33.1	3.262	2.819	-0.34	+2.4	.	16.5/110	55.8
July 8	10 21.86	+06 37.2	3.302	2.746	-0.36	+2.5	.	18.3/110	49.1
July 18	10 33.36	+05 33.0	3.328	2.671	-0.38	+2.7	.	20.0/111	42.6
July 28	10 45.84	+04 20.4	3.340	2.594	-0.40	+2.9	.	21.6/112	36.4
Aug. 7	10 59.22	+02 59.9	3.337	2.516	-0.44	+3.1	.	23.1/112	30.5
Aug. 17	11 13.49	+01 31.5	3.318	2.436	-0.47	+3.3	.	24.7/113	24.8
Aug. 27	11 28.65	-00 04.5	3.284	2.355	-0.52	+3.6	.	26.2/113	19.3
Sept. 6	11 44.72	-01 48.0	3.236	2.272	-0.57	+3.9	.	27.8/114	14.1
Sept.16	12 01.77	-03 38.6	3.173	2.187	-0.63	+4.2	.	29.5/114	9.3
Sept.26	12 19.88	-05 36.1	3.098	2.101	-0.70	+4.6	25.0	31.3/114	5.0
Oct. 6	12 39.18	-07 39.9	3.011	2.014	-0.78	+4.9	24.7	33.3/113	3.3
Oct. 16	12 59.85	-09 49.4	2.914	1.925	-0.88	+5.3	24.4	35.4/113	6.0
Oct. 26	13 22.10	-12 03.5	2.808	1.835	-0.99	+5.6	24.0	37.8/112	9.6
Nov. 5	13 46.19	-14 20.8	2.695	1.744	-1.13	+5.9	23.7	40.4/111	13.2
Nov. 15	14 12.47	-16 39.0	2.579	1.653	-1.30	+6.0	23.3	43.4/109	16.4
Nov. 25	14 41.30	-18 54.8	2.460	1.562	-1.49	+5.9	22.9	46.6/107	19.2
Dec. 5	15 13.10	-21 03.1	2.344	1.472	-1.71	+5.5	22.4	50.2/105	21.5
Dec. 15	15 48.28	-22 57.2	2.232	1.383	-1.95	+4.6	22.0	54.1/102	23.2
Dec. 25	16 27.12	-24 27.9	2.129	1.298	-2.21	+3.0	21.6	58.1/ 98	24.4
Jan. 4	17 09.62	-25 24.0	2.037	1.217	-2.45	+0.7	21.1	62.0/ 93	24.9
Jan. 14	17 55.41	-25 33.5	1.962	1.144	-2.65	-2.4	20.7	65.5/ 88	24.7
Jan. 24	18 43.53	-24 46.1	1.905	1.081	-2.77	-5.9	20.3	68.2/ 83	23.9
Feb. 3	19 32.62	-22 57.0	1.868	1.032	-2.78	-9.5	20.0	69.8/ 78	22.7
Feb. 13	20 21.18	-20 08.7	1.854	0.999	-2.70	-12.6	19.8	70.0/ 74	21.2
Feb. 23	21 07.94	-16 31.8	1.860	0.986	-2.54	-14.8	19.8	68.8/ 70	19.6
Mar. 5	21 52.09	-12 22.2	1.886	0.993	-2.34	-15.8	19.8	66.4/ 67	18.2
Mar. 15	22 33.30	-07 56.8	1.928	1.021	-2.13	-15.7	20.0	63.0/ 66	17.2
Mar. 25	23 11.58	-03 30.8	1.982	1.066	-1.93	-14.9	20.3	59.1/ 65	16.7

Comet 65P/Gunn

Epoch = 2009 July 28.0 TT
T = 2010 Mar. 2.04807 TT
Peri. = 196.61036 e = 0.3194955
Node = 68.35768 2000.0 a = 3.5862751 AU
Incl. = 10.38601 n = 0.14512381
q = 2.4404763 AU P = 6.79 years

m1 = 6.8 + 5 log(Delta) + 12.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	12 35.19	+08 47.1	2.983	3.357	+0.38	+0.9	15.7	103.9
Jan. 19	12 39.03	+08 56.1	2.817	3.327	+0.20	+2.1	15.6	113.0
Jan. 29	12 41.08	+09 17.2	2.661	3.296	+0.01	+3.3	15.4	122.5
Feb. 8	12 41.15	+09 49.8	2.519	3.266	-0.20	+4.2	15.2	132.3
Feb. 18	12 39.16	+10 32.3	2.395	3.235	-0.40	+4.9	15.1	142.4
Feb. 28	12 35.13	+11 21.5	2.293	3.204	-0.58	+5.1	14.9	152.4
Mar. 10	12 29.33	+12 12.6	2.217	3.174	-0.71	+4.8	14.8	161.3
Mar. 20	12 22.24	+13 00.2	2.168	3.143	-0.77	+3.8	14.7	165.9
Mar. 30	12 14.53	+13 38.4	2.148	3.113	-0.75	+2.4	14.6	162.0
Apr. 9	12 07.01	+14 02.3	2.155	3.082	-0.66	+0.7	14.6	153.3
Apr. 19	12 00.45	+14 09.2	2.187	3.052	-0.50	-1.1	14.6	143.3
Apr. 29	11 55.44	+13 57.9	2.241	3.022	-0.30	-2.9	14.6	133.3
May 9	11 52.42	+13 29.1	2.312	2.992	-0.09	-4.4	14.6	123.6
May 19	11 51.53	+12 44.7	2.397	2.962	+0.13	-5.8	14.6	114.4
May 29	11 52.79	+11 46.6	2.492	2.933	+0.33	-7.0	14.6	105.7
June 8	11 56.08	+10 37.0	2.591	2.904	+0.51	-7.9	14.7	97.5
June 18	12 01.21	+09 17.8	2.694	2.876	+0.68	-8.7	14.7	89.8
June 28	12 08.01	+07 50.5	2.797	2.847	+0.83	-9.4	14.7	82.5
July 8	12 16.28	+06 16.4	2.897	2.820	+0.96	-10.0	14.7	75.5
July 18	12 25.83	+04 36.9	2.993	2.793	+1.07	-10.4	14.8	68.9
July 28	12 36.53	+02 52.8	3.084	2.766	+1.17	-10.8	14.8	62.5
Aug. 7	12 48.25	+01 05.1	3.169	2.740	+1.26	-11.0	14.8	56.4
Aug. 17	13 00.88	-00 45.3	3.246	2.715	+1.35	-11.2	14.8	50.4
Aug. 27	13 14.36	-02 37.6	3.314	2.690	+1.43	-11.3	14.8	44.6
Sept. 6	13 28.62	-04 30.9	3.374	2.667	+1.50	-11.3	14.8	39.0
Sept.16	13 43.60	-06 24.2	3.424	2.644	+1.57	-11.3	14.8	33.4
Sept.26	13 59.29	-08 16.8	3.465	2.622	+1.64	-11.1	14.7	28.0
Oct. 6	14 15.65	-10 07.7	3.496	2.601	+1.70	-10.8	14.7	22.6
Oct. 16	14 32.65	-11 55.8	3.516	2.581	+1.76	-10.5	14.7	17.2
Oct. 26	14 50.27	-13 40.4	3.527	2.562	+1.82	-10.0	14.6	11.9
Nov. 5	15 08.49	-15 20.2	3.527	2.545	+1.88	-9.4	14.6	6.8
Nov. 15	15 27.27	-16 54.5	3.516	2.528	+1.93	-8.8	14.6	2.2
Nov. 25	15 46.57	-18 22.2	3.496	2.513	+1.98	-8.0	14.5	4.4
Dec. 5	16 06.34	-19 42.4	3.466	2.499	+2.02	-7.2	14.5	9.5
Dec. 15	16 26.53	-20 54.6	3.426	2.487	+2.05	-6.3	14.4	14.8
Dec. 25	16 47.04	-21 57.9	3.376	2.476	+2.07	-5.4	14.4	20.1
Jan. 4	17 07.77	-22 52.0	3.318	2.466	+2.09	-4.5	14.3	25.4
Jan. 14	17 28.63	-23 36.7	3.251	2.458	+2.09	-3.5	14.2	30.7
Jan. 24	17 49.49	-24 12.0	3.176	2.451	+2.07	-2.6	14.2	36.1
Feb. 3	18 10.20	-24 38.3	3.094	2.446	+2.04	-1.8	14.1	41.6
Feb. 13	18 30.65	-24 56.1	3.005	2.443	+2.00	-1.0	14.0	47.1
Feb. 23	18 50.66	-25 06.5	2.910	2.441	+1.94	-0.4	14.0	52.7
Mar. 5	19 10.11	-25 10.6	2.810	2.441	+1.87	+0.1	13.9	58.4
Mar. 15	19 28.83	-25 10.0	2.705	2.442	+1.78	+0.4	13.8	64.2
Mar. 25	19 46.66	-25 06.5	2.597	2.445	+1.68	+0.4	13.7	70.1

Comet P/2002 LZ11 (LINEAR)

Epoch = 2009 July 28.0 TT
T = 2010 Mar. 6.38690 TT
Peri. = 107.81172 e = 0.3529046
Node = 231.09539 2000.0 a = 3.6532095 AU
Incl. = 11.52213 n = 0.14115368
q = 2.3639751 AU P = 6.98 years

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

0h TT	R.A.(2000) Decl.	Delta	r	Variation for T=+1 day		m1	Mot./PA	Elong.
2009/10	h m ° ′						′ °	°
Jan. 9	16 30.00 -20 34.9	4.113	3.415	-0.56	-0.2	20.3	18.9/ 94	39.7
Jan. 19	16 43.44 -20 44.6	3.978	3.382	-0.59	-0.4	20.1	18.3/ 92	46.8
Jan. 29	16 56.51 -20 47.9	3.832	3.348	-0.62	-0.6	20.0	17.6/ 90	53.9
Feb. 8	17 09.07 -20 44.9	3.676	3.314	-0.65	-0.8	19.8	16.7/ 87	61.2
Feb. 18	17 20.97 -20 35.4	3.511	3.280	-0.69	-1.0	19.7	15.6/ 85	68.5
Feb. 28	17 32.04 -20 19.6	3.341	3.247	-0.73	-1.2	19.5	14.3/ 82	76.0
Mar. 10	17 42.07 -19 57.6	3.167	3.213	-0.77	-1.4	19.3	12.7/ 78	83.7
Mar. 20	17 50.87 -19 29.9	2.992	3.179	-0.82	-1.7	19.1	10.9/ 73	91.5
Mar. 30	17 58.22 -18 56.8	2.819	3.145	-0.88	-1.9	18.9	8.9/ 65	99.7
Apr. 9	18 03.88 -18 18.9	2.650	3.111	-0.94	-2.2	18.7	6.8/ 52	108.2
Apr. 19	18 07.63 -17 36.7	2.489	3.077	-1.00	-2.4	18.5	5.1/ 27	117.0
Apr. 29	18 09.28 -16 51.2	2.338	3.043	-1.07	-2.6	18.3	4.9/350	126.2
May 9	18 08.68 -16 03.4	2.203	3.010	-1.14	-2.8	18.1	6.4/320	135.8
May 19	18 05.83 -15 14.3	2.085	2.977	-1.21	-2.9	17.9	8.7/304	145.7
May 29	18 00.88 -14 25.8	1.990	2.944	-1.27	-3.0	17.7	10.7/295	155.8
June 8	17 54.25 -13 39.6	1.918	2.911	-1.31	-3.1	17.6	12.0/290	165.1
June 18	17 46.56 -12 58.0	1.873	2.878	-1.33	-3.1	17.5	12.1/286	169.6
June 28	17 38.63 -12 23.2	1.855	2.846	-1.32	-3.1	17.4	11.0/284	164.1
July 8	17 31.36 -11 57.3	1.863	2.815	-1.29	-3.0	17.3	8.7/281	154.5
July 18	17 25.54 -11 41.1	1.894	2.784	-1.25	-3.0	17.3	5.6/276	144.3
July 28	17 21.77 -11 35.0	1.946	2.753	-1.20	-2.9	17.2	2.0/262	134.3
Aug. 7	17 20.40 -11 37.9	2.014	2.723	-1.14	-2.8	17.2	2.0/121	124.8
Aug. 17	17 21.57 -11 48.2	2.095	2.694	-1.09	-2.7	17.3	5.6/106	115.8
Aug. 27	17 25.25 -12 04.0	2.185	2.666	-1.04	-2.7	17.3	9.1/102	107.3
Sept. 6	17 31.31 -12 22.9	2.281	2.638	-1.00	-2.6	17.3	12.2/100	99.3
Sept.16	17 39.55 -12 42.9	2.380	2.612	-0.96	-2.6	17.3	15.1/ 97	91.8
Sept.26	17 49.76 -13 01.6	2.479	2.586	-0.93	-2.5	17.4	17.6/ 95	84.6
Oct. 6	18 01.73 -13 17.2	2.577	2.561	-0.91	-2.6	17.4	19.7/ 94	77.9
Oct. 16	18 15.23 -13 28.0	2.673	2.538	-0.90	-2.6	17.4	21.7/ 92	71.4
Oct. 26	18 30.10 -13 32.3	2.764	2.516	-0.89	-2.7	17.4	23.4/ 90	65.2
Nov. 5	18 46.12 -13 28.8	2.851	2.494	-0.88	-2.8	17.4	24.8/ 88	59.3
Nov. 15	19 03.12 -13 16.5	2.932	2.475	-0.87	-2.9	17.4	26.1/ 86	53.5
Nov. 25	19 20.94 -12 54.6	3.006	2.456	-0.87	-3.1	17.4	27.2/ 84	47.9
Dec. 5	19 39.42 -12 22.4	3.074	2.440	-0.86	-3.2	17.4	28.2/ 82	42.5
Dec. 15	19 58.41 -11 39.8	3.134	2.424	-0.86	-3.4	17.4	29.0/ 80	37.2
Dec. 25	20 17.79 -10 46.7	3.187	2.411	-0.86	-3.6	17.4	29.7/ 78	32.1
Jan. 4	20 37.42 -09 43.3	3.232	2.399	-0.86	-3.7	17.4	30.2/ 76	27.1
Jan. 14	20 57.21 -08 30.2	3.269	2.388	-0.85	-3.9	17.4	30.6/ 75	22.3
Jan. 24	21 17.07 -07 08.1	3.299	2.380	-0.85	-4.0	17.4	30.9/ 73	17.7
Feb. 3	21 36.92 -05 37.8	3.321	2.373	-0.85	-4.1	17.4	31.1/ 72	13.5
Feb. 13	21 56.72 -04 00.3	3.335	2.368	-0.85	-4.2	17.4	31.2/ 71	9.9
Feb. 23	22 16.40 -02 16.9	3.341	2.365	-0.85	-4.2	17.4	31.2/ 70	7.9
Mar. 5	22 35.94 -00 28.9	3.340	2.364	-0.85	-4.2	17.4	31.1/ 69	8.6
Mar. 15	22 55.32 +01 22.6	3.331	2.365	-0.85	-4.2	17.4	30.9/ 68	11.4
Mar. 25	23 14.52 +03 16.3	3.315	2.367	-0.85	-4.1	17.4	30.6/ 68	15.2

Comet 162P/Siding Spring

Epoch = 2009 July 28.0 TT
T = 2010 Mar. 8.43684 TT
Peri. = 356.31403 e = 0.5960948
Node = 31.25084 2000.0 a = 3.0523683 AU
Incl. = 27.81617 n = 0.18481987
q = 1.2328674 AU P = 5.33 years

H = 14.1 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	16 35.56	-35 04.0	4.405	3.684	+1.27	-5.9	20.8	38.3
Jan. 19	16 48.21	-36 02.9	4.260	3.637	+1.25	-6.0	20.7	45.4
Jan. 29	17 00.66	-37 03.0	4.101	3.590	+1.21	-6.2	20.7	52.7
Feb. 8	17 12.78	-38 05.2	3.931	3.542	+1.16	-6.5	20.6	60.0
Feb. 18	17 24.40	-39 10.1	3.750	3.493	+1.09	-6.9	20.5	67.5
Feb. 28	17 35.34	-40 18.8	3.563	3.443	+1.00	-7.4	20.4	75.0
Mar. 10	17 45.35	-41 32.6	3.371	3.391	+0.88	-8.0	20.3	82.7
Mar. 20	17 54.20	-42 52.7	3.178	3.339	+0.73	-8.8	20.1	90.5
Mar. 30	18 01.54	-44 20.3	2.987	3.285	+0.54	-9.6	20.0	98.4
Apr. 9	18 06.96	-45 56.4	2.801	3.231	+0.30	-10.5	19.8	106.4
Apr. 19	18 09.99	-47 41.1	2.623	3.175	+0.01	-11.2	19.6	114.5
Apr. 29	18 10.05	-49 33.6	2.458	3.118	-0.35	-11.7	19.4	122.6
May 9	18 06.51	-51 30.8	2.308	3.060	-0.77	-11.6	19.2	130.4
May 19	17 58.80	-53 27.1	2.177	3.001	-1.23	-10.7	18.9	137.4
May 29	17 46.54	-55 14.0	2.068	2.941	-1.65	-8.6	18.7	142.9
June 8	17 30.04	-56 40.5	1.982	2.879	-1.95	-5.6	18.6	145.8
June 18	17 10.52	-57 36.4	1.922	2.817	-2.04	-1.9	18.5	145.2
June 28	16 50.15	-57 55.5	1.886	2.753	-1.86	+1.7	18.5	141.2
July 8	16 31.59	-57 38.8	1.872	2.688	-1.46	+4.5	18.5	134.9
July 18	16 17.00	-56 54.0	1.878	2.622	-0.94	+6.2	18.5	127.4
July 28	16 07.61	-55 52.1	1.899	2.556	-0.39	+6.9	18.5	119.4
Aug. 7	16 03.73	-54 43.5	1.931	2.488	+0.13	+6.7	18.6	111.4
Aug. 17	16 05.05	-53 36.0	1.970	2.419	+0.61	+6.2	18.6	103.7
Aug. 27	16 11.11	-52 33.9	2.012	2.349	+1.03	+5.5	18.6	96.3
Sept. 6	16 21.38	-51 38.7	2.054	2.278	+1.40	+4.9	18.6	89.4
Sept.16	16 35.37	-50 49.4	2.094	2.206	+1.74	+4.6	18.6	82.8
Sept.26	16 52.73	-50 03.6	2.128	2.134	+2.04	+4.6	18.6	76.7
Oct. 6	17 13.10	-49 18.1	2.157	2.062	+2.31	+5.0	18.6	71.0
Oct. 16	17 36.17	-48 28.3	2.178	1.989	+2.55	+5.9	18.5	65.7
Oct. 26	18 01.65	-47 29.8	2.192	1.915	+2.75	+7.2	18.4	60.8
Nov. 5	18 29.15	-46 17.6	2.198	1.843	+2.91	+9.1	18.3	56.3
Nov. 15	18 58.28	-44 46.9	2.198	1.770	+3.03	+11.4	18.2	52.0
Nov. 25	19 28.62	-42 53.2	2.190	1.699	+3.11	+14.0	18.1	48.1
Dec. 5	19 59.68	-40 32.8	2.178	1.630	+3.14	+17.0	18.0	44.6
Dec. 15	20 31.04	-37 42.8	2.161	1.562	+3.13	+20.1	17.9	41.2
Dec. 25	21 02.32	-34 21.7	2.143	1.498	+3.09	+23.2	17.8	38.2
Jan. 4	21 33.24	-30 29.3	2.123	1.438	+3.04	+26.3	17.6	35.3
Jan. 14	22 03.62	-26 06.6	2.105	1.384	+2.98	+29.0	17.5	32.7
Jan. 24	22 33.41	-21 16.3	2.090	1.336	+2.92	+31.4	17.4	30.3
Feb. 3	23 02.64	-16 02.5	2.079	1.295	+2.88	+33.2	17.3	28.1
Feb. 13	23 31.46	-10 30.3	2.074	1.264	+2.86	+34.4	17.2	26.1
Feb. 23	00 00.05	-04 46.0	2.076	1.243	+2.86	+34.9	17.1	24.4
Mar. 5	00 28.68	+01 03.1	2.085	1.234	+2.89	+34.7	17.1	22.9
Mar. 15	00 57.62	+06 49.7	2.103	1.235	+2.96	+33.7	17.1	21.8
Mar. 25	01 27.20	+12 26.3	2.128	1.249	+3.05	+31.9	17.1	20.9

Comet P/2001 R6 (LINEAR-Skiff)

Epoch = 2009 July 28.0 TT
T = 2010 Mar. 26.20304 TT
Peri. = 308.44900 e = 0.4780468
Node = 67.37030 2000.0 a = 4.1728787 AU
Incl. = 17.38875 n = 0.11562465
q = 2.1780474 AU P = 8.52 years

m1 = 11.2 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ °	Elong. °
Jan. 9	18 09.20	-28 23.7	4.678	3.751	-0.46	+1.5	24.6	18.5/ 95	17.4
Jan. 19	18 23.17	-28 38.4	4.581	3.707	-0.49	+1.3	24.5	18.5/ 95	24.4
Jan. 29	18 37.18	-28 50.7	4.468	3.663	-0.51	+1.2	24.3	18.3/ 94	31.4
Feb. 8	18 51.10	-29 00.9	4.339	3.618	-0.55	+1.0	24.2	18.0/ 94	38.4
Feb. 18	19 04.83	-29 09.6	4.196	3.574	-0.58	+0.8	24.0	17.6/ 93	45.5
Feb. 28	19 18.29	-29 17.6	4.041	3.529	-0.62	+0.6	23.8	17.1/ 94	52.6
Mar. 10	19 31.34	-29 25.8	3.876	3.483	-0.66	+0.4	23.6	16.4/ 94	59.8
Mar. 20	19 43.88	-29 35.4	3.703	3.438	-0.70	+0.2	23.4	15.6/ 95	67.0
Mar. 30	19 55.78	-29 47.7	3.523	3.393	-0.75	-0.1	23.2	14.5/ 97	74.3
Apr. 9	20 06.89	-30 04.2	3.340	3.347	-0.80	-0.3	23.0	13.4/100	81.8
Apr. 19	20 17.06	-30 26.5	3.156	3.301	-0.86	-0.6	22.8	12.0/105	89.4
Apr. 29	20 26.10	-30 56.2	2.973	3.255	-0.93	-0.9	22.5	10.6/112	97.2
May 9	20 33.79	-31 35.1	2.794	3.210	-1.01	-1.2	22.3	9.2/123	105.2
May 19	20 39.90	-32 24.6	2.623	3.164	-1.10	-1.4	22.0	8.1/139	113.4
May 29	20 44.15	-33 25.6	2.461	3.118	-1.19	-1.6	21.8	7.7/160	121.9
June 8	20 46.28	-34 38.2	2.314	3.072	-1.30	-1.8	21.6	8.3/182	130.6
June 18	20 46.04	-36 00.9	2.183	3.027	-1.41	-1.8	21.3	9.6/200	139.3
June 28	20 43.26	-37 30.4	2.072	2.981	-1.52	-1.6	21.1	11.0/214	147.7
July 8	20 37.99	-39 01.1	1.984	2.936	-1.62	-1.2	20.9	12.0/225	154.8
July 18	20 30.56	-40 25.9	1.921	2.892	-1.70	-0.7	20.7	12.3/234	158.7
July 28	20 21.67	-41 36.9	1.883	2.847	-1.75	+0.1	20.5	11.5/243	157.4
Aug. 7	20 12.41	-42 27.8	1.871	2.804	-1.76	+0.8	20.4	9.7/253	151.4
Aug. 17	20 03.98	-42 55.2	1.881	2.760	-1.72	+1.5	20.3	7.1/266	143.3
Aug. 27	19 57.54	-42 59.2	1.912	2.718	-1.66	+1.9	20.2	4.3/293	134.5
Sept. 6	19 53.93	-42 42.3	1.960	2.676	-1.58	+2.1	20.1	3.4/353	125.6
Sept.16	19 53.56	-42 08.3	2.022	2.635	-1.50	+2.1	20.1	5.8/ 35	117.0
Sept.26	19 56.54	-41 20.6	2.093	2.595	-1.42	+1.8	20.0	9.1/ 50	108.7
Oct. 6	20 02.68	-40 21.8	2.170	2.556	-1.36	+1.3	20.0	12.4/ 57	100.9
Oct. 16	20 11.63	-39 13.6	2.251	2.518	-1.30	+0.7	20.0	15.4/ 61	93.6
Oct. 26	20 23.05	-37 56.6	2.333	2.481	-1.25	0.0	19.9	18.2/ 63	86.6
Nov. 5	20 36.51	-36 31.1	2.415	2.446	-1.20	-0.7	19.9	20.7/ 64	80.0
Nov. 15	20 51.65	-34 56.9	2.494	2.412	-1.17	-1.5	19.9	22.9/ 64	73.7
Nov. 25	21 08.14	-33 13.7	2.571	2.381	-1.13	-2.3	19.8	24.9/ 64	67.8
Dec. 5	21 25.67	-31 21.6	2.644	2.351	-1.10	-3.1	19.8	26.6/ 64	62.1
Dec. 15	21 43.98	-29 20.5	2.713	2.322	-1.07	-3.8	19.8	28.1/ 64	56.7
Dec. 25	22 02.88	-27 10.6	2.777	2.297	-1.04	-4.6	19.7	29.4/ 63	51.5
Jan. 4	22 22.18	-24 52.6	2.836	2.273	-1.02	-5.3	19.7	30.6/ 63	46.5
Jan. 14	22 41.76	-22 27.2	2.890	2.252	-0.99	-5.9	19.7	31.5/ 62	41.6
Jan. 24	23 01.52	-19 55.2	2.939	2.233	-0.97	-6.5	19.6	32.3/ 62	37.0
Feb. 3	23 21.37	-17 18.1	2.984	2.217	-0.95	-7.0	19.6	32.9/ 61	32.5
Feb. 13	23 41.29	-14 36.9	3.024	2.203	-0.93	-7.5	19.6	33.4/ 61	28.1
Feb. 23	00 01.25	-11 53.0	3.060	2.192	-0.91	-7.8	19.6	33.7/ 61	23.9
Mar. 5	00 21.21	-09 08.0	3.091	2.185	-0.89	-8.1	19.6	34.0/ 61	19.9
Mar. 15	00 41.19	-06 23.1	3.118	2.180	-0.88	-8.3	19.6	34.0/ 62	16.1
Mar. 25	01 01.18	-03 40.0	3.140	2.178	-0.87	-8.5	19.6	34.0/ 62	12.7

Comet 94P/Russell

Epoch = 2009 July 28.0 TT
T = 2010 Mar. 29.83768 TT
Peri. = 92.86926 e = 0.3630229
Node = 70.92108 2000.0 a = 3.5167237 AU
Incl. = 6.18274 n = 0.14945027
q = 2.2400724 AU P = 6.59 years

m1 = 12.4 + 5 log(Delta) + 10.0 log(r(t-30))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	02 31.95	+12 53.0	2.979	3.456	+0.15	+2.4	20.3	111.0
Jan. 19	02 33.48	+13 16.5	3.090	3.422	+0.35	+3.2	20.3	101.3
Jan. 29	02 36.94	+13 48.3	3.205	3.387	+0.53	+3.9	20.4	92.1
Feb. 8	02 42.19	+14 27.0	3.320	3.353	+0.69	+4.4	20.4	83.4
Feb. 18	02 49.06	+15 11.4	3.432	3.318	+0.83	+4.9	20.4	75.1
Feb. 28	02 57.38	+16 00.1	3.538	3.283	+0.96	+5.2	20.4	67.2
Mar. 10	03 07.02	+16 51.9	3.635	3.248	+1.08	+5.3	20.5	59.6
Mar. 20	03 17.83	+17 45.3	3.722	3.213	+1.19	+5.4	20.5	52.4
Mar. 30	03 29.69	+18 39.4	3.798	3.177	+1.28	+5.3	20.5	45.4
Apr. 9	03 42.50	+19 32.8	3.860	3.142	+1.37	+5.2	20.4	38.7
Apr. 19	03 56.17	+20 24.7	3.909	3.106	+1.45	+4.9	20.4	32.2
Apr. 29	04 10.62	+21 13.9	3.944	3.070	+1.52	+4.6	20.4	26.0
May 9	04 25.78	+21 59.7	3.964	3.035	+1.58	+4.1	20.4	19.9
May 19	04 41.57	+22 41.1	3.971	2.999	+1.64	+3.6	20.3	13.9
May 29	04 57.94	+23 17.5	3.963	2.963	+1.69	+3.1	20.3	8.2
June 8	05 14.81	+23 48.2	3.941	2.928	+1.73	+2.4	20.2	2.6
June 18	05 32.13	+24 12.7	3.906	2.892	+1.77	+1.8	20.1	3.3
June 28	05 49.82	+24 30.4	3.858	2.857	+1.80	+1.1	20.0	8.7
July 8	06 07.81	+24 41.1	3.797	2.822	+1.82	+0.3	20.0	14.1
July 18	06 26.04	+24 44.4	3.724	2.787	+1.84	-0.4	19.9	19.5
July 28	06 44.42	+24 40.4	3.641	2.753	+1.85	-1.1	19.8	24.9
Aug. 7	07 02.87	+24 29.1	3.547	2.719	+1.85	-1.8	19.7	30.3
Aug. 17	07 21.33	+24 10.7	3.443	2.686	+1.84	-2.5	19.5	35.7
Aug. 27	07 39.69	+23 45.6	3.330	2.653	+1.82	-3.1	19.4	41.1
Sept. 6	07 57.88	+23 14.5	3.210	2.621	+1.79	-3.6	19.3	46.6
Sept. 16	08 15.81	+22 38.0	3.082	2.589	+1.76	-4.1	19.1	52.1
Sept. 26	08 33.39	+21 57.2	2.949	2.559	+1.71	-4.4	19.0	57.8
Oct. 6	08 50.51	+21 13.3	2.810	2.529	+1.66	-4.6	18.8	63.6
Oct. 16	09 07.07	+20 27.6	2.668	2.500	+1.59	-4.6	18.7	69.5
Oct. 26	09 22.94	+19 42.0	2.523	2.472	+1.50	-4.4	18.5	75.7
Nov. 5	09 37.98	+18 58.2	2.377	2.446	+1.40	-4.0	18.3	82.0
Nov. 15	09 52.02	+18 18.5	2.232	2.420	+1.28	-3.3	18.1	88.7
Nov. 25	10 04.83	+17 45.4	2.088	2.396	+1.14	-2.4	17.9	95.7
Dec. 5	10 16.19	+17 21.2	1.948	2.373	+0.96	-1.3	17.7	103.1
Dec. 15	10 25.80	+17 08.5	1.813	2.352	+0.75	+0.1	17.5	110.9
Dec. 25	10 33.32	+17 10.0	1.688	2.333	+0.51	+1.7	17.3	119.3
Jan. 4	10 38.44	+17 27.0	1.573	2.315	+0.24	+3.3	17.1	128.3
Jan. 14	10 40.84	+18 00.1	1.473	2.299	-0.05	+4.7	17.0	137.8
Jan. 24	10 40.36	+18 47.4	1.390	2.284	-0.32	+5.7	16.8	147.9
Feb. 3	10 37.11	+19 44.2	1.328	2.272	-0.55	+5.9	16.7	158.0
Feb. 13	10 31.59	+20 43.0	1.289	2.261	-0.69	+5.1	16.6	166.8
Feb. 23	10 24.71	+21 34.4	1.275	2.253	-0.70	+3.6	16.5	168.4
Mar. 5	10 17.75	+22 10.1	1.286	2.247	-0.58	+1.5	16.5	160.9
Mar. 15	10 11.94	+22 24.6	1.321	2.242	-0.36	-0.9	16.5	150.9
Mar. 25	10 08.33	+22 16.0	1.376	2.240	-0.09	-3.0	16.6	140.9

Comet 30P/Reinmuth

Epoch = 2009 July 28.0 TT
T = 2010 Apr. 19.58506 TT
Peri. = 13.22084 e = 0.5008209
Node = 119.75335 2000.0 a = 3.7743000 AU
Incl. = 8.12251 n = 0.13441553
q = 1.8840517 AU P = 7.33 years

m1 = 9.4 + 5 log(Delta) + 16.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	00 02.88	-07 36.7	4.055	3.816	+0.68	+5.8	21.7	69.1
Jan. 19	00 09.64	-06 39.2	4.152	3.772	+0.78	+6.3	21.7	60.9
Jan. 29	00 17.42	-05 36.5	4.237	3.728	+0.87	+6.7	21.7	53.0
Feb. 8	00 26.11	-04 29.7	4.308	3.682	+0.95	+7.0	21.6	45.4
Feb. 18	00 35.58	-03 19.7	4.364	3.637	+1.02	+7.3	21.6	38.0
Feb. 28	00 45.74	-02 07.1	4.404	3.591	+1.08	+7.4	21.5	30.9
Mar. 10	00 56.50	-00 52.9	4.428	3.544	+1.13	+7.5	21.4	24.0
Mar. 20	01 07.79	+00 22.3	4.434	3.497	+1.18	+7.6	21.3	17.5
Mar. 30	01 19.56	+01 37.9	4.422	3.449	+1.22	+7.5	21.2	11.5
Apr. 9	01 31.75	+02 52.9	4.393	3.401	+1.26	+7.4	21.1	7.0
Apr. 19	01 44.31	+04 07.0	4.347	3.353	+1.29	+7.2	21.0	7.0
Apr. 29	01 57.22	+05 19.4	4.285	3.304	+1.32	+7.0	20.9	11.4
May 9	02 10.41	+06 29.4	4.207	3.255	+1.35	+6.7	20.7	16.9
May 19	02 23.87	+07 36.6	4.115	3.205	+1.37	+6.4	20.6	22.7
May 29	02 37.56	+08 40.3	4.008	3.155	+1.39	+6.0	20.4	28.6
June 8	02 51.43	+09 40.0	3.889	3.105	+1.40	+5.5	20.2	34.4
June 18	03 05.44	+10 35.0	3.758	3.054	+1.41	+5.0	20.0	40.3
June 28	03 19.54	+11 24.9	3.616	3.004	+1.41	+4.4	19.8	46.2
July 8	03 33.66	+12 09.2	3.466	2.953	+1.41	+3.8	19.6	52.1
July 18	03 47.73	+12 47.5	3.308	2.901	+1.39	+3.2	19.4	58.1
July 28	04 01.65	+13 19.3	3.143	2.850	+1.37	+2.5	19.2	64.1
Aug. 7	04 15.31	+13 44.5	2.973	2.799	+1.33	+1.8	18.9	70.3
Aug. 17	04 28.57	+14 02.8	2.800	2.748	+1.27	+1.1	18.7	76.6
Aug. 27	04 41.26	+14 14.2	2.625	2.697	+1.19	+0.5	18.4	83.1
Sept. 6	04 53.18	+14 18.9	2.451	2.646	+1.09	-0.2	18.1	89.8
Sept. 16	05 04.10	+14 17.3	2.277	2.595	+0.96	-0.7	17.8	96.7
Sept. 26	05 13.73	+14 10.0	2.108	2.545	+0.80	-1.2	17.5	104.1
Oct. 6	05 21.74	+13 58.3	1.944	2.495	+0.60	-1.5	17.2	111.8
Oct. 16	05 27.79	+13 43.4	1.789	2.446	+0.37	-1.6	16.9	120.1
Oct. 26	05 31.48	+13 27.4	1.645	2.398	+0.10	-1.5	16.6	128.9
Nov. 5	05 32.50	+13 12.9	1.516	2.351	-0.19	-1.0	16.2	138.3
Nov. 15	05 30.64	+13 02.6	1.403	2.304	-0.47	-0.3	15.9	148.4
Nov. 25	05 25.95	+12 59.8	1.311	2.259	-0.70	+0.8	15.7	158.6
Dec. 5	05 18.91	+13 07.5	1.243	2.216	-0.85	+2.0	15.4	167.9
Dec. 15	05 10.46	+13 27.8	1.199	2.174	-0.85	+3.4	15.2	169.2
Dec. 25	05 01.95	+14 01.9	1.181	2.134	-0.71	+4.7	15.0	160.6
Jan. 4	04 54.87	+14 49.2	1.187	2.096	-0.44	+5.9	14.9	149.8
Jan. 14	04 50.44	+15 48.0	1.213	2.061	-0.09	+6.8	14.8	139.2
Jan. 24	04 49.51	+16 55.6	1.257	2.028	+0.29	+7.3	14.8	129.1
Feb. 3	04 52.40	+18 08.8	1.314	1.998	+0.67	+7.5	14.8	119.9
Feb. 13	04 59.08	+19 24.1	1.381	1.971	+1.03	+7.4	14.8	111.6
Feb. 23	05 09.33	+20 38.1	1.454	1.947	+1.35	+6.9	14.8	104.0
Mar. 5	05 22.79	+21 47.3	1.532	1.927	+1.63	+6.1	14.9	97.2
Mar. 15	05 39.06	+22 48.5	1.613	1.910	+1.87	+5.0	14.9	91.0
Mar. 25	05 57.74	+23 38.9	1.697	1.898	+2.07	+3.7	15.0	85.4

Comet C/2007 V053 (Spacewatch)

Epoch = 2009 July 28.0 TT
T = 2010 Apr. 26.40894 TT
Peri. = 75.01726
Node = 59.74535 2000.0
Incl. = 86.99593
q = 4.8428368 AU
e = 0.9996678

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

0h TT 2009/10	R.A.(2000) h m	Decl. ° '	Delta	r	Daily motion m	'	m1	Elong. °
Jan. 9	02 48.20	+41 50.0	5.485	6.044	-0.52	-0.3	18.8	120.5
Jan. 19	02 43.01	+41 47.2	5.584	6.000	-0.35	0.0	18.8	110.5
Jan. 29	02 39.53	+41 46.7	5.695	5.957	-0.18	+0.4	18.8	100.7
Feb. 8	02 37.71	+41 50.5	5.810	5.914	-0.03	+0.9	18.8	91.2
Feb. 18	02 37.43	+41 59.8	5.926	5.871	+0.11	+1.6	18.8	82.1
Feb. 28	02 38.56	+42 15.6	6.036	5.830	+0.24	+2.3	18.8	73.3
Mar. 10	02 40.95	+42 38.2	6.138	5.789	+0.35	+3.0	18.9	65.0
Mar. 20	02 44.45	+43 07.9	6.227	5.748	+0.45	+3.7	18.9	57.2
Mar. 30	02 48.91	+43 44.6	6.300	5.708	+0.53	+4.4	18.9	49.9
Apr. 9	02 54.20	+44 28.2	6.356	5.669	+0.60	+5.0	18.9	43.3
Apr. 19	03 00.21	+45 18.5	6.393	5.630	+0.66	+5.7	18.9	37.6
Apr. 29	03 06.82	+46 15.3	6.409	5.592	+0.71	+6.3	18.8	33.0
May 9	03 13.92	+47 18.5	6.405	5.555	+0.75	+6.9	18.8	30.1
May 19	03 21.43	+48 28.0	6.380	5.518	+0.78	+7.6	18.8	29.1
May 29	03 29.25	+49 43.8	6.335	5.482	+0.80	+8.2	18.8	30.1
June 8	03 37.29	+51 05.9	6.271	5.447	+0.82	+8.9	18.7	32.9
June 18	03 45.46	+52 34.5	6.189	5.413	+0.82	+9.5	18.7	37.1
June 28	03 53.64	+54 09.9	6.090	5.379	+0.81	+10.2	18.6	42.1
July 8	04 01.69	+55 52.4	5.976	5.347	+0.78	+11.0	18.5	47.8
July 18	04 09.49	+57 42.2	5.851	5.315	+0.73	+11.8	18.5	53.8
July 28	04 16.82	+59 39.8	5.715	5.284	+0.66	+12.6	18.4	60.2
Aug. 7	04 23.42	+61 45.3	5.573	5.254	+0.55	+13.4	18.3	66.6
Aug. 17	04 28.95	+63 59.0	5.427	5.224	+0.39	+14.2	18.3	73.2
Aug. 27	04 32.86	+66 20.7	5.281	5.196	+0.15	+14.9	18.2	79.7
Sept. 6	04 34.40	+68 49.4	5.138	5.169	-0.20	+15.4	18.1	86.1
Sept.16	04 32.35	+71 23.7	5.002	5.142	-0.76	+15.6	18.0	92.3
Sept.26	04 24.76	+74 00.1	4.877	5.117	-1.63	+15.3	18.0	98.2
Oct. 6	04 08.44	+76 32.8	4.766	5.093	-3.01	+13.9	17.9	103.5
Oct. 16	03 38.38	+78 51.3	4.672	5.069	-4.98	+10.7	17.8	108.0
Oct. 26	02 48.59	+80 37.9	4.597	5.047	-6.92	+5.1	17.8	111.5
Nov. 5	01 39.35	+81 28.5	4.543	5.026	-7.22	-2.0	17.7	113.8
Nov. 15	00 27.13	+81 08.8	4.510	5.006	-5.53	-7.7	17.7	114.7
Nov. 25	23 31.82	+79 52.0	4.499	4.987	-3.46	-10.6	17.7	114.2
Dec. 5	22 57.22	+78 05.7	4.508	4.969	-1.93	-11.4	17.7	112.4
Dec. 15	22 37.88	+76 11.3	4.535	4.952	-0.95	-10.9	17.7	109.5
Dec. 25	22 28.35	+74 22.2	4.577	4.936	-0.34	-9.6	17.7	105.8
Jan. 4	22 24.98	+72 45.7	4.630	4.922	+0.06	-8.0	17.7	101.6
Jan. 14	22 25.56	+71 26.1	4.691	4.908	+0.32	-6.0	17.7	97.0
Jan. 24	22 28.72	+70 25.7	4.756	4.896	+0.48	-4.0	17.8	92.4
Feb. 3	22 33.57	+69 45.4	4.823	4.885	+0.59	-2.0	17.8	87.8
Feb. 13	22 39.51	+69 25.2	4.888	4.876	+0.66	0.0	17.8	83.5
Feb. 23	22 46.12	+69 25.0	4.949	4.867	+0.69	+1.9	17.8	79.5
Mar. 5	22 53.03	+69 43.8	5.004	4.860	+0.69	+3.7	17.8	76.0
Mar. 15	22 59.97	+70 20.9	5.052	4.854	+0.67	+5.4	17.9	73.0
Mar. 25	23 06.64	+71 15.3	5.090	4.849	+0.60	+7.1	17.9	70.5

Comet 104P/Kowal

Epoch = 2009 July 28.0 TT
T = 2010 May 4.55106 TT
Peri. = 200.46640 e = 0.6386157
Node = 235.59122 2000.0 a = 3.2634042 AU
Incl. = 10.26834 n = 0.16718518
q = 1.1793431 AU P = 5.90 years

m1 = 12.0 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	19 20.31	-15 21.5	5.080	4.105	+1.08	+2.7	.	6.8
Jan. 19	19 31.11	-14 54.4	5.027	4.060	+1.08	+3.2	.	9.6
Jan. 29	19 41.95	-14 22.6	4.953	4.015	+1.08	+3.6	.	15.8
Feb. 8	19 52.71	-13 46.4	4.859	3.968	+1.06	+4.0	.	22.8
Feb. 18	20 03.32	-13 05.9	4.746	3.921	+1.04	+4.4	.	29.9
Feb. 28	20 13.68	-12 21.5	4.615	3.872	+1.00	+4.8	.	37.2
Mar. 10	20 23.68	-11 33.6	4.467	3.823	+0.95	+5.1	.	44.5
Mar. 20	20 33.23	-10 42.6	4.305	3.772	+0.90	+5.4	.	51.9
Mar. 30	20 42.22	-09 49.1	4.130	3.720	+0.83	+5.5	.	59.3
Apr. 9	20 50.53	-08 53.8	3.944	3.668	+0.75	+5.6	24.9	66.8
Apr. 19	20 58.03	-07 57.3	3.751	3.614	+0.66	+5.7	24.6	74.5
Apr. 29	21 04.59	-07 00.5	3.552	3.560	+0.54	+5.6	24.4	82.3
May 9	21 10.02	-06 04.4	3.350	3.504	+0.41	+5.4	24.2	90.3
May 19	21 14.17	-05 10.1	3.149	3.447	+0.26	+5.1	23.9	98.5
May 29	21 16.81	-04 19.1	2.950	3.389	+0.09	+4.6	23.6	107.1
June 8	21 17.75	-03 33.0	2.759	3.330	-0.10	+3.9	23.3	115.9
June 18	21 16.78	-02 53.6	2.578	3.270	-0.30	+3.0	23.1	125.1
June 28	21 13.74	-02 23.1	2.411	3.209	-0.52	+1.9	22.8	134.7
July 8	21 08.57	-02 03.7	2.263	3.146	-0.72	+0.6	22.5	144.5
July 18	21 01.38	-01 57.4	2.137	3.083	-0.89	-0.8	22.2	154.1
July 28	20 52.48	-02 05.6	2.036	3.018	-1.00	-2.3	21.9	162.1
Aug. 7	20 42.48	-02 28.3	1.962	2.952	-1.03	-3.6	21.7	164.7
Aug. 17	20 32.21	-03 04.1	1.917	2.885	-0.96	-4.6	21.5	159.1
Aug. 27	20 22.59	-03 49.9	1.899	2.817	-0.80	-5.2	21.3	149.6
Sept. 6	20 14.54	-04 41.5	1.905	2.748	-0.58	-5.3	21.1	139.1
Sept.16	20 08.76	-05 34.5	1.932	2.677	-0.31	-5.0	20.9	128.6
Sept.26	20 05.69	-06 25.0	1.975	2.605	-0.02	-4.5	20.8	118.4
Oct. 6	20 05.53	-07 09.5	2.027	2.532	+0.27	-3.6	20.6	108.8
Oct. 16	20 08.24	-07 45.7	2.086	2.459	+0.55	-2.6	20.4	99.7
Oct. 26	20 13.72	-08 12.0	2.146	2.384	+0.80	-1.5	20.3	91.2
Nov. 5	20 21.76	-08 26.8	2.203	2.308	+1.04	-0.3	20.1	83.3
Nov. 15	20 32.13	-08 29.5	2.256	2.231	+1.25	+1.0	19.9	75.8
Nov. 25	20 44.64	-08 19.2	2.302	2.153	+1.44	+2.4	19.6	68.9
Dec. 5	20 59.07	-07 55.3	2.338	2.075	+1.62	+3.8	19.4	62.4
Dec. 15	21 15.27	-07 17.4	2.365	1.996	+1.79	+5.2	19.1	56.4
Dec. 25	21 33.12	-06 25.1	2.382	1.917	+1.94	+6.7	18.8	50.7
Jan. 4	21 52.51	-05 18.3	2.388	1.838	+2.09	+8.1	18.5	45.5
Jan. 14	22 13.40	-03 57.2	2.384	1.760	+2.24	+9.5	18.2	40.7
Jan. 24	22 35.78	-02 21.8	2.371	1.682	+2.39	+10.9	17.8	36.3
Feb. 3	22 59.64	-00 33.1	2.349	1.606	+2.54	+12.1	17.5	32.4
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Feb. 13	23 25.08	+01 28.0	2.321	1.533	+2.71	+13.2	17.1	28.9
Feb. 23	23 52.17	+03 39.8	2.287	1.462	+2.89	+14.0	16.7	25.9
Mar. 5	00 21.03	+05 59.7	2.251	1.396	+3.08	+14.4	16.3	23.3
Mar. 15	00 51.80	+08 24.1	2.215	1.336	+3.28	+14.5	15.9	21.2
Mar. 25	01 24.58	+10 48.6	2.179	1.284	+3.48	+13.9	15.6	19.6

Comet 215P/NEAT

Epoch = 2009 July 28.0 TT
T = 2010 June 7.73027 TT
Peri. = 222.38715 e = 0.2007914
Node = 75.44419 2000.0 a = 4.0211250 AU
Incl. = 12.79093 n = 0.12223138
q = 3.2137177 AU P = 8.06 years

m1 = 3.0 + 5 log(Delta) + 25.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	15 05.37	-09 08.8	4.151	3.798	+0.89	-3.3	20.6	62.5
Jan. 19	15 14.22	-09 42.1	3.997	3.781	+0.80	-2.7	20.4	70.3
Jan. 29	15 22.21	-10 09.3	3.836	3.763	+0.69	-2.1	20.3	78.4
Feb. 8	15 29.13	-10 30.5	3.671	3.746	+0.57	-1.5	20.2	86.7
Feb. 18	15 34.82	-10 45.9	3.506	3.729	+0.42	-1.0	20.0	95.3
Feb. 28	15 39.06	-10 55.5	3.342	3.711	+0.26	-0.4	19.9	104.2
Mar. 10	15 41.67	-10 60.0	3.185	3.694	+0.08	0.0	19.7	113.4
Mar. 20	15 42.51	-10 59.8	3.038	3.677	-0.10	+0.4	19.6	123.1
Mar. 30	15 41.47	-10 55.8	2.905	3.660	-0.29	+0.7	19.4	133.0
Apr. 9	15 38.58	-10 49.0	2.790	3.643	-0.46	+0.8	19.3	143.4
Apr. 19	15 33.99	-10 40.7	2.697	3.626	-0.60	+0.8	19.1	153.9
Apr. 29	15 28.00	-10 32.5	2.630	3.610	-0.69	+0.6	19.0	164.2
May 9	15 21.10	-10 26.4	2.591	3.593	-0.72	+0.2	19.0	171.9
May 19	15 13.89	-10 24.0	2.580	3.577	-0.69	-0.3	18.9	168.3
May 29	15 06.99	-10 27.1	2.598	3.561	-0.60	-1.0	18.9	158.6
June 8	15 01.02	-10 37.2	2.643	3.545	-0.46	-1.8	18.9	148.1
June 18	14 56.41	-10 54.7	2.710	3.529	-0.29	-2.5	18.9	137.8
June 28	14 53.49	-11 20.2	2.798	3.514	-0.11	-3.3	18.9	127.8
July 8	14 52.42	-11 53.1	2.901	3.499	+0.08	-4.0	18.9	118.3
July 18	14 53.23	-12 33.0	3.015	3.484	+0.26	-4.6	18.9	109.2
July 28	14 55.85	-13 18.7	3.138	3.469	+0.43	-5.1	19.0	100.5
Aug. 7	15 00.19	-14 09.4	3.264	3.455	+0.59	-5.4	19.0	92.2
Aug. 17	15 06.11	-15 03.9	3.392	3.441	+0.74	-5.7	19.1	84.2
Aug. 27	15 13.48	-16 01.2	3.518	3.427	+0.87	-5.9	19.1	76.6
Sept. 6	15 22.16	-17 00.1	3.639	3.413	+0.99	-6.0	19.1	69.2
Sept.16	15 32.02	-17 59.6	3.755	3.400	+1.09	-5.9	19.2	62.0
Sept.26	15 42.95	-18 58.8	3.863	3.387	+1.19	-5.8	19.2	54.9
Oct. 6	15 54.84	-19 56.7	3.960	3.375	+1.28	-5.6	19.2	48.0
Oct. 16	16 07.60	-20 52.6	4.047	3.363	+1.35	-5.3	19.2	41.3
Oct. 26	16 21.14	-21 45.5	4.122	3.351	+1.42	-4.9	19.2	34.6
Nov. 5	16 35.35	-22 34.7	4.183	3.340	+1.48	-4.5	19.2	28.0
Nov. 15	16 50.16	-23 19.7	4.230	3.329	+1.53	-4.0	19.2	21.4
Nov. 25	17 05.47	-23 59.9	4.262	3.318	+1.57	-3.5	19.2	14.9
Dec. 5	17 21.19	-24 34.7	4.280	3.308	+1.60	-2.9	19.1	8.5
Dec. 15	17 37.23	-25 04.0	4.282	3.299	+1.63	-2.4	19.1	2.5
Dec. 25	17 53.48	-25 27.6	4.268	3.289	+1.64	-1.8	19.1	5.1
Jan. 4	18 09.84	-25 45.5	4.239	3.281	+1.64	-1.2	19.0	11.4
Jan. 14	18 26.22	-25 57.8	4.195	3.273	+1.63	-0.7	19.0	17.9
Jan. 24	18 42.49	-26 04.9	4.136	3.265	+1.61	-0.2	18.9	24.4
Feb. 3	18 58.55	-26 07.3	4.064	3.258	+1.58	+0.2	18.9	30.9
Feb. 13	19 14.31	-26 05.7	3.978	3.251	+1.53	+0.5	18.8	37.5
Feb. 23	19 29.64	-26 01.0	3.880	3.245	+1.48	+0.7	18.7	44.2
Mar. 5	19 44.43	-25 54.2	3.772	3.239	+1.42	+0.8	18.6	50.9
Mar. 15	19 58.58	-25 46.5	3.654	3.234	+1.34	+0.7	18.6	57.7
Mar. 25	20 11.96	-25 39.3	3.528	3.230	+1.25	+0.5	18.5	64.7

Comet 43P/Wolf-Harrington

Epoch = 2009 July 28.0 TT
T = 2010 July 1.60375 TT
Peri. = 191.33530 e = 0.5949762
Node = 249.99835 2000.0 a = 3.3515878 AU
Incl. = 15.97121 n = 0.16063056
q = 1.3574727 AU P = 6.14 years

m1 = 9.0 + 5 log(Delta) + 14.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	19 34.87	-12 17.2	5.218	4.254	+1.03	+3.3	21.4	10.4
Jan. 19	19 45.15	-11 44.7	5.181	4.215	+1.03	+3.8	21.3	9.8
Jan. 29	19 55.47	-11 07.1	5.123	4.174	+1.03	+4.2	21.2	14.0
Feb. 8	20 05.73	-10 24.7	5.044	4.133	+1.01	+4.7	21.1	20.3
Feb. 18	20 15.83	-09 37.6	4.946	4.091	+0.99	+5.1	21.0	27.1
Feb. 28	20 25.70	-08 46.1	4.829	4.048	+0.95	+5.5	20.9	34.2
Mar. 10	20 35.21	-07 50.6	4.695	4.004	+0.91	+5.9	20.8	41.4
Mar. 20	20 44.29	-06 51.5	4.545	3.959	+0.85	+6.2	20.7	48.7
Mar. 30	20 52.82	-05 49.3	4.382	3.914	+0.79	+6.5	20.5	56.1
Apr. 9	21 00.69	-04 44.6	4.208	3.867	+0.71	+6.7	20.3	63.5
Apr. 19	21 07.79	-03 37.9	4.025	3.820	+0.62	+6.8	20.2	71.1
Apr. 29	21 13.97	-02 30.1	3.835	3.772	+0.51	+6.8	20.0	78.9
May 9	21 19.09	-01 21.9	3.642	3.723	+0.39	+6.7	19.8	86.7
May 19	21 22.98	-00 14.5	3.447	3.673	+0.25	+6.5	19.6	94.8
May 29	21 25.47	+00 50.9	3.255	3.622	+0.09	+6.2	19.4	103.1
June 8	21 26.37	+01 52.6	3.069	3.571	-0.08	+5.6	19.2	111.7
June 18	21 25.53	+02 48.7	2.892	3.518	-0.27	+4.8	19.0	120.5
June 28	21 22.81	+03 37.0	2.728	3.465	-0.46	+3.8	18.7	129.5
July 8	21 18.19	+04 14.9	2.581	3.410	-0.64	+2.5	18.5	138.6
July 18	21 11.75	+04 39.7	2.454	3.355	-0.80	+0.9	18.3	147.3
July 28	21 03.79	+04 49.2	2.352	3.298	-0.90	-0.7	18.1	154.7
Aug. 7	20 54.80	+04 42.1	2.276	3.241	-0.93	-2.3	17.9	158.6
Aug. 17	20 45.48	+04 18.7	2.227	3.183	-0.89	-3.8	17.8	156.8
Aug. 27	20 36.60	+03 40.9	2.206	3.124	-0.76	-4.8	17.6	150.2
Sept. 6	20 28.96	+02 52.4	2.210	3.064	-0.58	-5.5	17.5	141.4
Sept. 16	20 23.16	+01 57.9	2.237	3.003	-0.35	-5.6	17.4	131.9
Sept. 26	20 19.64	+01 02.0	2.281	2.941	-0.10	-5.3	17.3	122.2
Oct. 6	20 18.61	+00 09.1	2.338	2.878	+0.15	-4.7	17.3	112.9
Oct. 16	20 20.11	-00 37.7	2.404	2.814	+0.39	-3.8	17.2	103.8
Oct. 26	20 24.05	-01 15.8	2.475	2.750	+0.62	-2.8	17.1	95.2
Nov. 5	20 30.26	-01 43.4	2.546	2.684	+0.83	-1.6	17.0	87.1
Nov. 15	20 38.54	-01 59.4	2.614	2.618	+1.02	-0.4	16.9	79.3
Nov. 25	20 48.71	-02 03.0	2.677	2.551	+1.18	+0.9	16.8	72.0
Dec. 5	21 00.56	-01 53.9	2.733	2.484	+1.34	+2.2	16.7	65.1
Dec. 15	21 13.91	-01 32.0	2.780	2.416	+1.47	+3.5	16.6	58.5
Dec. 25	21 28.64	-00 57.1	2.817	2.347	+1.60	+4.8	16.4	52.2
Jan. 4	21 44.60	-00 09.5	2.842	2.278	+1.71	+6.0	16.3	46.3
Jan. 14	22 01.71	+00 50.4	2.858	2.208	+1.82	+7.2	16.1	40.8
Jan. 24	22 19.92	+02 02.3	2.862	2.139	+1.93	+8.3	15.9	35.5
Feb. 3	22 39.18	+03 25.2	2.855	2.069	+2.03	+9.3	15.7	30.6
Feb. 13	22 59.49	+04 58.4	2.839	2.000	+2.14	+10.2	15.5	26.1
Feb. 23	23 20.89	+06 40.6	2.814	1.932	+2.25	+11.0	15.2	21.9
Mar. 5	23 43.42	+08 30.4	2.781	1.864	+2.37	+11.6	15.0	18.0
Mar. 15	00 07.16	+10 26.0	2.742	1.798	+2.51	+11.9	14.8	14.6
Mar. 25	00 32.21	+12 25.0	2.699	1.734	+2.65	+12.0	14.5	11.6

Comet 10P/Tempel

Epoch = 2009 July 28.0 TT
T = 2010 July 4.87950 TT
Peri. = 195.63068 e = 0.5362668
Node = 117.83021 2000.0 a = 3.0686567 AU
Incl. = 12.02266 n = 0.18335030
q = 1.4230380 AU P = 5.38 years

H = 13.9 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	12 10.44	+09 46.1	3.560	4.004	+0.06	+3.4	20.4	109.9
Jan. 19	12 11.08	+10 20.0	3.386	3.970	-0.11	+4.6	20.3	120.0
Jan. 29	12 10.00	+11 05.9	3.226	3.936	-0.29	+5.7	20.1	130.3
Feb. 8	12 07.12	+12 02.4	3.085	3.901	-0.46	+6.5	19.9	140.9
Feb. 18	12 02.50	+13 07.2	2.967	3.864	-0.62	+6.9	19.7	151.5
Feb. 28	11 56.32	+14 16.4	2.876	3.827	-0.73	+6.9	19.5	161.2
Mar. 10	11 48.98	+15 25.0	2.816	3.789	-0.80	+6.3	19.4	166.8
Mar. 20	11 41.02	+16 27.9	2.786	3.751	-0.79	+5.2	19.4	163.3
Mar. 30	11 33.08	+17 20.3	2.787	3.711	-0.73	+3.8	19.5	154.1
Apr. 9	11 25.81	+17 58.7	2.815	3.671	-0.60	+2.3	19.6	143.7
Apr. 19	11 19.76	+18 21.4	2.868	3.629	-0.44	+0.7	19.7	133.1
Apr. 29	11 15.34	+18 28.2	2.940	3.587	-0.26	-0.8	19.8	122.8
May 9	11 12.78	+18 20.1	3.025	3.544	-0.06	-2.1	19.9	113.0
May 19	11 12.14	+17 58.6	3.121	3.499	+0.12	-3.3	20.0	103.6
May 29	11 13.36	+17 25.4	3.221	3.454	+0.30	-4.3	20.0	94.7
June 8	11 16.34	+16 42.2	3.321	3.409	+0.46	-5.2	20.1	86.2
June 18	11 20.91	+15 50.5	3.419	3.362	+0.60	-5.9	20.1	78.2
June 28	11 26.91	+14 51.4	3.511	3.314	+0.73	-6.5	20.1	70.5
July 8	11 34.18	+13 46.0	3.595	3.265	+0.84	-7.1	20.1	63.2
July 18	11 42.56	+12 35.1	3.669	3.216	+0.94	-7.6	20.1	56.1
July 28	11 51.94	+11 19.5	3.731	3.165	+1.03	-8.0	20.1	49.4
Aug. 7	12 02.22	+09 59.9	3.780	3.114	+1.11	-8.3	20.0	42.8
Aug. 17	12 13.29	+08 36.7	3.815	3.061	+1.18	-8.6	19.9	36.5
Aug. 27	12 25.10	+07 10.7	3.836	3.008	+1.25	-8.8	19.8	30.4
Sept. 6	12 37.60	+05 42.3	3.841	2.954	+1.31	-9.0	19.7	24.6
Sept. 16	12 50.74	+04 12.2	3.831	2.899	+1.38	-9.1	19.6	19.0
Sept. 26	13 04.50	+02 40.9	3.806	2.843	+1.44	-9.2	19.5	14.0
Oct. 6	13 18.87	+01 09.2	3.765	2.786	+1.50	-9.2	19.3	10.1
Oct. 16	13 33.83	-00 22.5	3.710	2.729	+1.56	-9.1	19.2	8.8
Oct. 26	13 49.39	-01 53.2	3.640	2.671	+1.62	-8.9	19.2	10.9
Nov. 5	14 05.55	-03 22.3	3.557	2.611	+1.68	-8.7	19.2	15.0
Nov. 15	14 22.33	-04 49.0	3.461	2.552	+1.74	-8.3	19.2	19.7
Nov. 25	14 39.73	-06 12.4	3.353	2.491	+1.80	-7.9	19.1	24.8
Dec. 5	14 57.77	-07 31.6	3.235	2.430	+1.87	-7.4	19.1	29.9
Dec. 15	15 16.47	-08 45.6	3.107	2.369	+1.94	-6.8	19.0	35.0
Dec. 25	15 35.84	-09 53.6	2.971	2.307	+2.00	-6.1	18.9	40.0
Jan. 4	15 55.88	-10 54.4	2.830	2.244	+2.07	-5.3	18.9	45.0
Jan. 14	16 16.63	-11 47.3	2.683	2.182	+2.14	-4.4	18.7	49.8
Jan. 24	16 38.07	-12 31.3	2.533	2.120	+2.21	-3.4	18.6	54.6
Feb. 3	17 00.22	-13 05.5	2.381	2.058	+2.29	-2.4	18.5	59.1
Feb. 13	17 23.08	-13 29.3	2.229	1.996	+2.36	-1.3	18.3	63.5
Feb. 23	17 46.65	-13 42.1	2.079	1.935	+2.43	-0.2	18.2	67.7
Mar. 5	18 10.93	-13 43.7	1.932	1.875	+2.50	+1.0	18.0	71.7
Mar. 15	18 35.94	-13 33.8	1.789	1.816	+2.57	+2.1	17.8	75.5
Mar. 25	19 01.67	-13 12.8	1.652	1.760	+2.65	+3.1	17.6	79.0

Comet 2P/Encke

Epoch = 2009 July 28.0 TT
T = 2010 Aug. 6.57714 TT
Peri. = 186.49808 e = 0.8479350
Node = 334.56975 2000.0 a = 2.2161643 AU
Incl. = 11.78286 n = 0.29874535
q = 0.3370010 AU P = 3.30 years

H = 14.4 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	22 16.28	-09 16.1	4.741	4.089	+0.74	+4.5	21.5	43.9
Jan. 19	22 23.67	-08 30.6	4.843	4.085	+0.78	+4.9	21.4	35.7
Jan. 29	22 31.51	-07 41.5	4.925	4.078	+0.82	+5.2	21.4	27.6
Feb. 8	22 39.69	-06 49.2	4.985	4.070	+0.84	+5.5	21.3	19.7
Feb. 18	22 48.09	-05 54.3	5.023	4.061	+0.85	+5.7	21.2	11.9
Feb. 28	22 56.62	-04 57.5	5.037	4.050	+0.86	+5.8	21.1	4.4
Mar. 10	23 05.20	-03 59.2	5.027	4.037	+0.85	+5.9	21.1	4.0
Mar. 20	23 13.73	-02 60.0	4.995	4.023	+0.84	+6.0	21.2	11.3
Mar. 30	23 22.14	-02 00.4	4.940	4.008	+0.82	+5.9	21.3	18.9
Apr. 9	23 30.34	-01 01.1	4.862	3.991	+0.79	+5.9	21.3	26.4
Apr. 19	23 38.26	-00 02.6	4.764	3.972	+0.75	+5.7	21.4	34.0
Apr. 29	23 45.79	+00 54.6	4.647	3.952	+0.71	+5.5	21.4	41.6
May 9	23 52.85	+01 49.6	4.512	3.930	+0.65	+5.2	21.3	49.3
May 19	23 59.32	+02 42.0	4.361	3.906	+0.58	+4.9	21.3	57.1
May 29	00 05.07	+03 31.0	4.197	3.881	+0.49	+4.5	21.2	65.1
June 8	00 09.97	+04 15.7	4.022	3.854	+0.39	+4.0	21.2	73.3
June 18	00 13.84	+04 55.2	3.839	3.826	+0.27	+3.3	21.1	81.7
June 28	00 16.50	+05 28.5	3.651	3.796	+0.12	+2.6	21.0	90.4
July 8	00 17.74	+05 54.3	3.461	3.764	-0.04	+1.7	20.8	99.4
July 18	00 17.35	+06 11.2	3.275	3.730	-0.22	+0.7	20.7	108.9
July 28	00 15.13	+06 17.8	3.096	3.695	-0.42	-0.5	20.5	118.9
Aug. 7	00 10.90	+06 12.5	2.929	3.658	-0.63	-1.8	20.3	129.4
Aug. 17	00 04.59	+05 54.2	2.780	3.619	-0.83	-3.2	20.1	140.4
Aug. 27	23 56.29	+05 22.0	2.654	3.578	-1.00	-4.5	19.8	152.0
Sept. 6	23 46.28	+04 36.7	2.556	3.535	-1.12	-5.6	19.6	163.8
Sept. 16	23 35.10	+03 40.3	2.489	3.490	-1.16	-6.4	19.3	173.6
Sept. 26	23 23.48	+02 36.5	2.456	3.443	-1.12	-6.6	19.4	168.1
Oct. 6	23 12.29	+01 30.5	2.456	3.395	-1.00	-6.3	19.5	156.1
Oct. 16	23 02.29	+00 27.7	2.487	3.344	-0.82	-5.5	19.7	143.8
Oct. 26	22 54.14	-00 27.3	2.544	3.291	-0.59	-4.4	19.8	131.8
Nov. 5	22 48.22	-01 11.0	2.621	3.235	-0.36	-3.1	19.9	120.2
Nov. 15	22 44.66	-01 41.7	2.711	3.178	-0.12	-1.7	20.0	109.3
Nov. 25	22 43.47	-01 58.7	2.810	3.118	+0.10	-0.3	20.1	98.8
Dec. 5	22 44.49	-02 02.0	2.910	3.056	+0.30	+1.0	20.1	89.0
Dec. 15	22 47.50	-01 52.4	3.007	2.991	+0.48	+2.2	20.1	79.6
Dec. 25	22 52.31	-01 30.6	3.097	2.923	+0.64	+3.3	20.1	70.7
Jan. 4	22 58.68	-00 57.6	3.175	2.853	+0.77	+4.3	20.1	62.3
Jan. 14	23 06.42	-00 14.2	3.239	2.780	+0.90	+5.3	20.1	54.2
Jan. 24	23 15.38	+00 38.8	3.286	2.704	+1.00	+6.2	20.0	46.5
Feb. 3	23 25.41	+01 40.7	3.315	2.625	+1.10	+7.0	19.9	39.1
Feb. 13	23 36.44	+02 50.8	3.325	2.543	+1.20	+7.8	19.8	32.0
Feb. 23	23 48.39	+04 08.7	3.314	2.457	+1.28	+8.5	19.6	25.3
Mar. 5	00 01.24	+05 34.0	3.283	2.367	+1.38	+9.2	19.4	19.0
Mar. 15	00 14.99	+07 06.2	3.231	2.274	+1.47	+9.9	19.2	13.1
Mar. 25	00 29.71	+08 45.3	3.159	2.176	+1.58	+10.6	18.9	8.0

Comet P/2002 S1 (Skiff)

Epoch = 2009 July 28.0 TT
T = 2010 Aug. 15.24180 TT
Peri. = 38.05258 e = 0.4175320
Node = 346.84202 2000.0 a = 4.1498849 AU
Incl. = 27.04676 n = 0.11658697
q = 2.4171751 AU P = 8.45 years

m1 = 7.3 + 5 log(Delta) + 20.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 9	18 19.72	-45 04.6	5.068	4.208	-0.49	-1.0	23.3	16.6/ 90	26.2
Jan. 19	18 35.42	-45 00.9	4.988	4.173	-0.50	-1.3	23.2	16.5/ 90	30.7
Jan. 29	18 50.94	-44 56.7	4.893	4.138	-0.51	-1.6	23.1	16.2/ 90	36.1
Feb. 8	19 06.17	-44 52.5	4.782	4.102	-0.53	-1.9	23.0	15.7/ 90	42.0
Feb. 18	19 20.97	-44 48.7	4.657	4.066	-0.54	-2.3	22.8	15.2/ 90	48.3
Feb. 28	19 35.23	-44 46.1	4.519	4.030	-0.55	-2.6	22.7	14.5/ 91	54.8
Mar. 10	19 48.82	-44 45.5	4.371	3.994	-0.57	-3.0	22.5	13.6/ 92	61.5
Mar. 20	20 01.60	-44 47.8	4.214	3.957	-0.59	-3.3	22.4	12.6/ 94	68.4
Mar. 30	20 13.42	-44 54.1	4.050	3.920	-0.61	-3.7	22.2	11.4/ 97	75.4
Apr. 9	20 24.10	-45 05.3	3.882	3.883	-0.63	-4.1	22.0	10.0/101	82.6
Apr. 19	20 33.47	-45 22.5	3.712	3.846	-0.66	-4.5	21.8	8.6/107	90.0
Apr. 29	20 41.28	-45 46.5	3.543	3.808	-0.69	-4.9	21.7	7.0/117	97.5
May 9	20 47.30	-46 17.5	3.378	3.771	-0.73	-5.3	21.5	5.6/133	105.2
May 19	20 51.26	-46 55.5	3.219	3.733	-0.78	-5.6	21.3	4.7/160	113.0
May 29	20 52.84	-47 39.5	3.071	3.694	-0.83	-5.9	21.1	4.9/193	120.9
June 8	20 51.78	-48 27.0	2.935	3.656	-0.89	-6.1	20.9	6.1/219	128.7
June 18	20 47.90	-49 14.5	2.816	3.618	-0.96	-6.2	20.7	7.8/237	136.1
June 28	20 41.16	-49 56.8	2.717	3.579	-1.02	-6.1	20.5	9.4/250	142.8
July 8	20 31.87	-50 27.5	2.639	3.541	-1.07	-5.9	20.4	10.7/262	147.7
July 18	20 20.69	-50 40.8	2.586	3.502	-1.10	-5.6	20.2	11.5/273	149.7
July 28	20 08.62	-50 31.7	2.558	3.463	-1.11	-5.2	20.1	11.7/285	148.2
Aug. 7	19 56.93	-49 58.5	2.555	3.424	-1.10	-4.8	20.0	11.4/299	143.6
Aug. 17	19 46.76	-49 02.3	2.575	3.385	-1.06	-4.4	19.9	10.8/314	136.9
Aug. 27	19 39.03	-47 47.0	2.617	3.347	-1.01	-4.2	19.9	10.2/331	129.1
Sept. 6	19 34.22	-46 17.6	2.676	3.308	-0.94	-4.1	19.8	10.0/349	120.8
Sept.16	19 32.45	-44 39.0	2.750	3.269	-0.88	-4.2	19.8	10.5/ 7	112.5
Sept.26	19 33.60	-42 55.1	2.835	3.231	-0.82	-4.3	19.7	11.4/ 22	104.2
Oct. 6	19 37.40	-41 08.8	2.928	3.193	-0.77	-4.5	19.7	12.8/ 33	96.1
Oct. 16	19 43.49	-39 21.5	3.024	3.154	-0.72	-4.7	19.7	14.3/ 42	88.2
Oct. 26	19 51.54	-37 33.7	3.122	3.117	-0.68	-4.9	19.6	15.9/ 48	80.5
Nov. 5	20 01.24	-35 45.5	3.217	3.079	-0.65	-5.2	19.6	17.4/ 52	73.1
Nov. 15	20 12.26	-33 56.5	3.309	3.042	-0.62	-5.5	19.6	18.8/ 55	65.9
Nov. 25	20 24.39	-32 06.1	3.394	3.005	-0.59	-5.7	19.5	20.1/ 57	58.9
Dec. 5	20 37.39	-30 13.6	3.472	2.969	-0.57	-6.0	19.5	21.3/ 58	52.0
Dec. 15	20 51.06	-28 18.5	3.540	2.933	-0.55	-6.3	19.4	22.3/ 59	45.3
Dec. 25	21 05.26	-26 20.2	3.598	2.898	-0.54	-6.6	19.3	23.2/ 59	38.8
Jan. 4	21 19.85	-24 18.4	3.644	2.863	-0.52	-6.8	19.2	24.0/ 59	32.4
Jan. 14	21 34.72	-22 12.7	3.678	2.829	-0.51	-7.1	19.2	24.7/ 59	26.2
Jan. 24	21 49.79	-20 03.2	3.700	2.796	-0.50	-7.4	19.1	25.3/ 59	20.1
Feb. 3	22 04.96	-17 49.6	3.709	2.764	-0.50	-7.7	19.0	25.9/ 58	14.3
Feb. 13	22 20.20	-15 32.1	3.705	2.733	-0.50	-8.0	18.9	26.3/ 58	8.7
Feb. 23	22 35.45	-13 10.7	3.688	2.703	-0.50	-8.2	18.8	26.6/ 57	4.2
Mar. 5	22 50.68	-10 45.8	3.659	2.673	-0.50	-8.5	18.7	26.9/ 57	5.3
Mar. 15	23 05.87	-08 17.3	3.619	2.645	-0.50	-8.8	18.5	27.2/ 56	10.1
Mar. 25	23 21.01	-05 45.5	3.567	2.619	-0.51	-9.1	18.4	27.3/ 56	15.4

Comet C/2008 FK75 (Lemmon-Siding Spring)

Epoch = 2009 July 28.0 TT
T = 2010 Sept. 29.32070 TT
Peri. = 80.38658
Node = 218.25735 2000.0
Incl. = 61.16881
q = 4.5130715 AU
e = 1.0024262

m1 = 5.3 + 5 log(Delta) + 10.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	15 24.21	-09 06.3	7.123	6.656	+0.49	+2.8	17.8	58.2
Jan. 19	15 29.07	-08 38.3	6.922	6.603	+0.42	+3.5	17.7	67.2
Jan. 29	15 33.31	-08 03.8	6.712	6.550	+0.35	+4.1	17.6	76.3
Feb. 8	15 36.80	-07 22.4	6.497	6.497	+0.26	+4.8	17.5	85.6
Feb. 18	15 39.44	-06 34.0	6.281	6.444	+0.17	+5.6	17.4	95.1
Feb. 28	15 41.16	-05 38.4	6.069	6.392	+0.07	+6.2	17.3	104.6
Mar. 10	15 41.86	-04 36.0	5.866	6.340	-0.03	+6.9	17.2	114.3
Mar. 20	15 41.53	-03 27.3	5.677	6.288	-0.14	+7.4	17.1	124.0
Mar. 30	15 40.15	-02 13.4	5.506	6.236	-0.24	+7.8	17.0	133.6
Apr. 9	15 37.77	-00 55.9	5.358	6.185	-0.33	+7.9	16.9	142.8
Apr. 19	15 34.52	+00 23.4	5.236	6.135	-0.40	+7.9	16.8	151.1
Apr. 29	15 30.55	+01 42.2	5.143	6.084	-0.44	+7.6	16.7	157.2
May 9	15 26.10	+02 57.8	5.081	6.034	-0.47	+7.0	16.6	159.0
May 19	15 21.43	+04 08.1	5.049	5.985	-0.46	+6.3	16.6	155.6
May 29	15 16.84	+05 10.8	5.046	5.935	-0.42	+5.4	16.5	148.7
June 8	15 12.59	+06 04.5	5.071	5.887	-0.36	+4.4	16.5	140.2
June 18	15 08.95	+06 48.3	5.119	5.838	-0.28	+3.4	16.5	131.2
June 28	15 06.12	+07 21.9	5.187	5.791	-0.19	+2.4	16.5	122.0
July 8	15 04.25	+07 45.9	5.270	5.743	-0.08	+1.5	16.5	113.0
July 18	15 03.42	+08 01.2	5.363	5.697	+0.03	+0.8	16.5	104.1
July 28	15 03.69	+08 08.7	5.463	5.650	+0.14	+0.1	16.5	95.4
Aug. 7	15 05.06	+08 10.0	5.565	5.605	+0.24	-0.4	16.5	87.0
Aug. 17	15 07.50	+08 06.3	5.665	5.559	+0.35	-0.7	16.5	78.9
Aug. 27	15 10.96	+07 59.1	5.759	5.515	+0.44	-0.9	16.5	71.1
Sept. 6	15 15.37	+07 49.8	5.845	5.471	+0.53	-1.0	16.5	63.6
Sept.16	15 20.67	+07 39.6	5.919	5.428	+0.61	-1.0	16.5	56.4
Sept.26	15 26.78	+07 29.8	5.980	5.385	+0.68	-0.8	16.5	49.7
Oct. 6	15 33.63	+07 21.6	6.025	5.343	+0.75	-0.6	16.5	43.4
Oct. 16	15 41.12	+07 16.1	6.054	5.302	+0.81	-0.2	16.5	37.8
Oct. 26	15 49.20	+07 14.4	6.066	5.262	+0.86	+0.3	16.4	33.2
Nov. 5	15 57.76	+07 17.6	6.059	5.222	+0.90	+0.9	16.4	29.8
Nov. 15	16 06.74	+07 26.6	6.034	5.183	+0.93	+1.6	16.3	28.2
Nov. 25	16 16.06	+07 42.5	5.990	5.145	+0.96	+2.4	16.3	28.6
Dec. 5	16 25.61	+08 06.2	5.929	5.108	+0.97	+3.2	16.2	30.8
Dec. 15	16 35.32	+08 38.6	5.852	5.072	+0.98	+4.2	16.2	34.5
Dec. 25	16 45.08	+09 20.4	5.759	5.036	+0.97	+5.2	16.1	39.3
Jan. 4	16 54.80	+10 12.5	5.652	5.002	+0.96	+6.3	16.1	44.7
Jan. 14	17 04.38	+11 15.4	5.534	4.968	+0.93	+7.4	16.0	50.6
Jan. 24	17 13.69	+12 29.6	5.407	4.935	+0.89	+8.6	15.9	56.7
Feb. 3	17 22.62	+13 55.4	5.273	4.904	+0.84	+9.7	15.8	62.9
Feb. 13	17 31.05	+15 32.8	5.135	4.873	+0.78	+10.9	15.7	69.3
Feb. 23	17 38.83	+17 21.5	4.995	4.844	+0.70	+11.9	15.6	75.5
Mar. 5	17 45.85	+19 20.9	4.857	4.816	+0.61	+12.9	15.6	81.7
Mar. 15	17 51.94	+21 29.8	4.723	4.788	+0.50	+13.7	15.5	87.7
Mar. 25	17 56.97	+23 46.7	4.597	4.762	+0.38	+14.2	15.4	93.5

Comet 31P/Schwassmann-Wachmann

Epoch = 2009 July 28.0 TT
T = 2010 Sept. 30.20803 TT
Peri. = 18.04934 e = 0.1922444
Node = 114.18808 2000.0 a = 4.2387975 AU
Incl. = 4.54744 n = 0.11293799
q = 3.4239124 AU P = 8.73 years

m1 = 6.4 + 5 log(Delta) + 17.5 log(r(t-60))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	01 41.17	+05 30.2	3.893	4.125	+0.36	+3.4	20.3	96.7
Jan. 19	01 44.72	+06 03.7	4.031	4.109	+0.49	+4.0	20.3	87.6
Jan. 29	01 49.61	+06 43.7	4.168	4.092	+0.61	+4.5	20.4	78.8
Feb. 8	01 55.70	+07 29.0	4.300	4.076	+0.71	+4.9	20.4	70.4
Feb. 18	02 02.84	+08 18.3	4.425	4.060	+0.81	+5.2	20.5	62.2
Feb. 28	02 10.92	+09 10.8	4.540	4.043	+0.89	+5.4	20.5	54.4
Mar. 10	02 19.82	+10 05.2	4.642	4.027	+0.96	+5.5	20.5	46.7
Mar. 20	02 29.43	+11 00.6	4.731	4.011	+1.02	+5.6	20.5	39.3
Mar. 30	02 39.65	+11 56.3	4.805	3.994	+1.07	+5.5	20.5	32.1
Apr. 9	02 50.39	+12 51.3	4.862	3.978	+1.12	+5.4	20.5	25.1
Apr. 19	03 01.58	+13 45.0	4.903	3.962	+1.16	+5.2	20.5	18.2
Apr. 29	03 13.14	+14 36.8	4.927	3.946	+1.19	+4.9	20.5	11.6
May 9	03 24.99	+15 26.0	4.933	3.930	+1.21	+4.6	20.5	5.4
May 19	03 37.06	+16 12.2	4.923	3.914	+1.22	+4.3	20.4	3.8
May 29	03 49.29	+16 55.0	4.894	3.898	+1.23	+3.9	20.4	9.3
June 8	04 01.60	+17 33.9	4.850	3.882	+1.23	+3.5	20.3	15.6
June 18	04 13.91	+18 08.7	4.789	3.866	+1.22	+3.1	20.3	22.1
June 28	04 26.15	+18 39.3	4.712	3.851	+1.21	+2.6	20.2	28.7
July 8	04 38.22	+19 05.5	4.620	3.835	+1.18	+2.2	20.1	35.3
July 18	04 50.03	+19 27.3	4.515	3.820	+1.14	+1.7	20.0	42.0
July 28	05 01.46	+19 44.7	4.396	3.805	+1.09	+1.3	20.0	48.8
Aug. 7	05 12.40	+19 57.9	4.266	3.789	+1.03	+0.9	19.9	55.8
Aug. 17	05 22.72	+20 07.3	4.127	3.775	+0.95	+0.6	19.8	62.9
Aug. 27	05 32.26	+20 13.2	3.978	3.760	+0.86	+0.3	19.6	70.3
Sept. 6	05 40.87	+20 16.2	3.824	3.745	+0.75	+0.1	19.5	77.9
Sept.16	05 48.36	+20 16.7	3.666	3.731	+0.62	-0.1	19.4	85.9
Sept.26	05 54.53	+20 15.6	3.506	3.717	+0.47	-0.2	19.3	94.2
Oct. 6	05 59.19	+20 13.6	3.349	3.703	+0.30	-0.2	19.1	102.9
Oct. 16	06 02.15	+20 11.3	3.197	3.689	+0.11	-0.2	19.0	112.1
Oct. 26	06 03.24	+20 09.5	3.054	3.676	-0.09	-0.1	18.9	121.8
Nov. 5	06 02.35	+20 08.8	2.925	3.662	-0.29	+0.1	18.8	131.9
Nov. 15	05 59.49	+20 09.4	2.813	3.649	-0.47	+0.2	18.7	142.6
Nov. 25	05 54.81	+20 11.3	2.725	3.636	-0.61	+0.3	18.6	153.7
Dec. 5	05 48.67	+20 14.6	2.663	3.624	-0.71	+0.4	18.5	165.2
Dec. 15	05 41.61	+20 18.9	2.629	3.612	-0.73	+0.5	18.4	175.9
Dec. 25	05 34.30	+20 24.1	2.627	3.600	-0.68	+0.6	18.4	170.3
Jan. 4	05 27.49	+20 30.5	2.654	3.588	-0.57	+0.8	18.4	158.8
Jan. 14	05 21.83	+20 38.3	2.709	3.577	-0.40	+1.0	18.4	147.4
Jan. 24	05 17.84	+20 47.8	2.788	3.566	-0.20	+1.2	18.4	136.4
Feb. 3	05 15.83	+20 59.4	2.888	3.556	+0.01	+1.4	18.5	125.8
Feb. 13	05 15.92	+21 12.9	3.004	3.545	+0.22	+1.5	18.5	115.7
Feb. 23	05 18.09	+21 28.0	3.130	3.535	+0.41	+1.6	18.6	106.1
Mar. 5	05 22.23	+21 44.1	3.264	3.526	+0.59	+1.6	18.7	97.1
Mar. 15	05 28.17	+22 00.3	3.400	3.517	+0.75	+1.6	18.7	88.5
Mar. 25	05 35.72	+22 15.8	3.536	3.508	+0.89	+1.4	18.8	80.3

Comet 9P/Tempel

Epoch = 2009 July 28.0 TT
T = 2011 Jan. 12.29342 TT
Peri. = 178.92929 e = 0.5168566
Node = 68.92579 2000.0 a = 3.1241444 AU
Incl. = 10.52398 n = 0.17848734
q = 1.5094097 AU P = 5.52 years

m1 = 8.4 + 5 log(Delta) + 17.5 log(r(t-20))

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	05 17.79	+27 06.8	3.589	4.479	-0.64	-0.3	22.6	151.6
Jan. 19	05 11.35	+27 03.8	3.660	4.459	-0.48	-0.4	22.6	140.1
Jan. 29	05 06.51	+27 00.1	3.754	4.439	-0.30	-0.3	22.7	128.9
Feb. 8	05 03.51	+26 56.9	3.867	4.418	-0.11	-0.2	22.7	118.1
Feb. 18	05 02.38	+26 55.1	3.993	4.396	+0.07	0.0	22.7	107.8
Feb. 28	05 03.09	+26 55.2	4.127	4.374	+0.24	+0.2	22.8	97.9
Mar. 10	05 05.53	+26 57.4	4.263	4.351	+0.40	+0.4	22.8	88.4
Mar. 20	05 09.53	+27 01.3	4.398	4.327	+0.54	+0.5	22.8	79.4
Mar. 30	05 14.95	+27 06.5	4.528	4.302	+0.67	+0.6	22.9	70.7
Apr. 9	05 21.60	+27 12.7	4.648	4.277	+0.77	+0.6	22.9	62.4
Apr. 19	05 29.33	+27 19.1	4.757	4.251	+0.87	+0.6	22.9	54.3
Apr. 29	05 38.00	+27 25.2	4.853	4.224	+0.95	+0.5	22.9	46.6
May 9	05 47.46	+27 30.5	4.932	4.196	+1.01	+0.4	22.9	39.0
May 19	05 57.58	+27 34.4	4.995	4.168	+1.07	+0.2	22.8	31.7
May 29	06 08.27	+27 36.6	5.040	4.139	+1.11	0.0	22.8	24.5
June 8	06 19.40	+27 36.8	5.065	4.109	+1.15	-0.2	22.8	17.6
June 18	06 30.88	+27 34.7	5.071	4.078	+1.18	-0.5	22.7	11.0
June 28	06 42.64	+27 30.2	5.058	4.047	+1.19	-0.7	22.7	5.4
July 8	06 54.56	+27 23.3	5.025	4.015	+1.20	-0.9	22.6	5.9
July 18	07 06.58	+27 14.0	4.972	3.982	+1.20	-1.1	22.5	11.5
July 28	07 18.61	+27 02.6	4.900	3.948	+1.20	-1.3	22.4	18.1
Aug. 7	07 30.57	+26 49.3	4.810	3.913	+1.18	-1.5	22.3	24.8
Aug. 17	07 42.37	+26 34.6	4.703	3.878	+1.16	-1.6	22.2	31.7
Aug. 27	07 53.93	+26 18.9	4.578	3.841	+1.12	-1.6	22.1	38.6
Sept. 6	08 05.14	+26 03.1	4.439	3.804	+1.08	-1.5	21.9	45.7
Sept. 16	08 15.92	+25 47.8	4.285	3.766	+1.02	-1.4	21.8	53.0
Sept. 26	08 26.13	+25 34.1	4.119	3.728	+0.95	-1.1	21.6	60.4
Oct. 6	08 35.65	+25 23.2	3.943	3.688	+0.87	-0.7	21.5	68.1
Oct. 16	08 44.34	+25 16.2	3.759	3.648	+0.77	-0.2	21.3	76.0
Oct. 26	08 52.00	+25 14.6	3.570	3.607	+0.64	+0.5	21.1	84.2
Nov. 5	08 58.43	+25 20.0	3.378	3.565	+0.50	+1.4	20.9	92.7
Nov. 15	09 03.42	+25 33.9	3.187	3.522	+0.33	+2.4	20.7	101.6
Nov. 25	09 06.69	+25 57.6	3.000	3.478	+0.13	+3.4	20.4	111.0
Dec. 5	09 07.97	+26 32.0	2.823	3.434	-0.10	+4.5	20.2	120.8
Dec. 15	09 07.01	+27 17.3	2.660	3.388	-0.34	+5.5	20.0	131.0
Dec. 25	09 03.62	+28 12.4	2.514	3.342	-0.59	+6.2	19.8	141.7
Jan. 4	08 57.76	+29 14.1	2.392	3.295	-0.81	+6.4	19.6	152.4
Jan. 14	08 49.63	+30 18.1	2.296	3.247	-0.99	+6.0	19.4	162.3
Jan. 24	08 39.75	+31 18.0	2.230	3.199	-1.08	+5.0	19.2	167.5
Feb. 3	08 28.99	+32 08.0	2.195	3.149	-1.06	+3.6	19.1	162.5
Feb. 13	08 18.40	+32 43.5	2.190	3.099	-0.93	+1.9	18.9	152.4
Feb. 23	08 09.10	+33 02.5	2.212	3.048	-0.71	+0.3	18.8	141.4
Mar. 5	08 01.96	+33 05.6	2.256	2.996	-0.44	-1.1	18.8	130.5
Mar. 15	07 57.54	+32 54.9	2.317	2.943	-0.15	-2.2	18.7	120.0
Mar. 25	07 56.08	+32 33.2	2.391	2.890	+0.15	-3.0	18.6	110.1

Comet C/2008 S3 (Boattini)

Epoch = 2009 July 28.0 TT
T = 2011 June 1.94328 TT
Peri. = 39.68818
Node = 54.92336 2000.0
Incl. = 162.72132
q = 8.0242811 AU
e = 1.0082661

m1 = 6.4 + 5 log(Delta) + 7.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	03 44.54	+17 15.2	8.936	9.585	-0.45	-0.4	18.5	129.0
Jan. 19	03 40.01	+17 11.0	9.055	9.554	-0.37	-0.2	18.5	117.8
Jan. 29	03 36.29	+17 09.1	9.191	9.522	-0.29	+0.1	18.6	106.8
Feb. 8	03 33.40	+17 09.7	9.337	9.491	-0.21	+0.3	18.6	96.0
Feb. 18	03 31.34	+17 12.8	9.488	9.460	-0.13	+0.5	18.6	85.4
Feb. 28	03 30.08	+17 18.2	9.636	9.429	-0.05	+0.8	18.6	75.1
Mar. 10	03 29.54	+17 25.9	9.776	9.398	+0.01	+1.0	18.6	65.0
Mar. 20	03 29.65	+17 35.6	9.903	9.368	+0.07	+1.1	18.7	55.1
Mar. 30	03 30.34	+17 46.9	10.013	9.338	+0.12	+1.3	18.7	45.4
Apr. 9	03 31.50	+17 59.6	10.102	9.308	+0.15	+1.4	18.7	35.8
Apr. 19	03 33.04	+18 13.3	10.167	9.278	+0.18	+1.4	18.7	26.4
Apr. 29	03 34.88	+18 27.7	10.206	9.249	+0.20	+1.5	18.7	17.2
May 9	03 36.91	+18 42.5	10.219	9.220	+0.21	+1.5	18.7	8.0
May 19	03 39.04	+18 57.5	10.203	9.191	+0.21	+1.5	18.7	1.2
May 29	03 41.18	+19 12.3	10.158	9.163	+0.21	+1.4	18.6	10.2
June 8	03 43.23	+19 26.7	10.086	9.134	+0.19	+1.4	18.6	19.2
June 18	03 45.10	+19 40.6	9.988	9.106	+0.16	+1.3	18.6	28.3
June 28	03 46.70	+19 53.6	9.865	9.078	+0.12	+1.2	18.6	37.4
July 8	03 47.91	+20 05.6	9.719	9.051	+0.07	+1.1	18.5	46.6
July 18	03 48.65	+20 16.3	9.553	9.024	+0.02	+0.9	18.5	56.0
July 28	03 48.82	+20 25.6	9.371	8.997	-0.05	+0.8	18.4	65.4
Aug. 7	03 48.32	+20 33.3	9.177	8.970	-0.13	+0.6	18.4	75.1
Aug. 17	03 47.05	+20 38.9	8.976	8.944	-0.21	+0.3	18.3	85.0
Aug. 27	03 44.94	+20 42.4	8.772	8.918	-0.30	+0.1	18.2	95.1
Sept. 6	03 41.94	+20 43.2	8.571	8.892	-0.39	-0.2	18.2	105.4
Sept.16	03 37.99	+20 41.2	8.379	8.867	-0.49	-0.5	18.1	116.0
Sept.26	03 33.11	+20 36.1	8.202	8.841	-0.58	-0.9	18.1	126.9
Oct. 6	03 27.35	+20 27.5	8.047	8.817	-0.65	-1.2	18.0	138.1
Oct. 16	03 20.82	+20 15.4	7.918	8.792	-0.72	-1.5	18.0	149.5
Oct. 26	03 13.66	+20 00.0	7.821	8.768	-0.76	-1.8	17.9	161.1
Nov. 5	03 06.11	+19 41.6	7.760	8.744	-0.77	-2.1	17.9	172.7
Nov. 15	02 58.40	+19 20.8	7.735	8.720	-0.76	-2.2	17.9	174.6
Nov. 25	02 50.79	+18 58.6	7.748	8.697	-0.72	-2.3	17.9	163.0
Dec. 5	02 43.56	+18 36.1	7.798	8.674	-0.66	-2.2	17.9	151.2
Dec. 15	02 36.91	+18 14.4	7.880	8.652	-0.59	-2.0	17.9	139.5
Dec. 25	02 31.03	+17 54.6	7.991	8.630	-0.50	-1.7	17.9	127.9
Jan. 4	02 26.03	+17 37.7	8.124	8.608	-0.41	-1.3	18.0	116.5
Jan. 14	02 21.96	+17 24.3	8.274	8.586	-0.31	-0.9	18.0	105.3
Jan. 24	02 18.85	+17 14.9	8.433	8.565	-0.22	-0.5	18.0	94.4
Feb. 3	02 16.66	+17 09.6	8.595	8.544	-0.13	-0.1	18.1	83.8
Feb. 13	02 15.33	+17 08.5	8.754	8.524	-0.06	+0.3	18.1	73.3
Feb. 23	02 14.78	+17 11.2	8.905	8.504	+0.01	+0.6	18.1	63.2
Mar. 5	02 14.91	+17 17.6	9.041	8.484	+0.07	+1.0	18.1	53.2
Mar. 15	02 15.62	+17 27.1	9.159	8.465	+0.12	+1.2	18.2	43.5
Mar. 25	02 16.81	+17 39.4	9.255	8.446	+0.16	+1.5	18.2	33.9

Comet 213P/Van Ness

Epoch = 2009 July 28.0 TT
T = 2011 June 15.88956 TT
Peri. = 3.19131 e = 0.3797373
Node = 312.69321 2000.0 a = 3.4241826 AU
Incl. = 10.24060 n = 0.15554953
q = 2.1238928 AU P = 6.34 years

m1 = 5.4 + 5 log(Delta) + 17.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	11 05.06	+00 41.2	3.950	4.542	-0.26	-0.4	19.9	121.5
Jan. 19	11 02.44	+00 36.8	3.808	4.528	-0.41	+0.5	19.8	132.2
Jan. 29	10 58.39	+00 41.7	3.686	4.513	-0.53	+1.4	19.7	143.2
Feb. 8	10 53.09	+00 55.5	3.589	4.498	-0.62	+2.2	19.6	154.4
Feb. 18	10 46.85	+01 17.1	3.520	4.483	-0.68	+2.8	19.5	165.4
Feb. 28	10 40.06	+01 44.6	3.481	4.467	-0.68	+3.1	19.5	173.6
Mar. 10	10 33.22	+02 15.7	3.475	4.451	-0.64	+3.2	19.5	167.9
Mar. 20	10 26.82	+02 47.4	3.499	4.434	-0.55	+3.0	19.4	157.1
Mar. 30	10 21.27	+03 17.3	3.552	4.416	-0.43	+2.6	19.4	146.1
Apr. 9	10 16.94	+03 42.8	3.630	4.398	-0.29	+2.0	19.5	135.2
Apr. 19	10 14.03	+04 02.3	3.729	4.380	-0.14	+1.2	19.5	124.8
Apr. 29	10 12.64	+04 14.8	3.843	4.361	+0.01	+0.5	19.5	114.7
May 9	10 12.78	+04 19.4	3.968	4.342	+0.16	-0.3	19.6	105.1
May 19	10 14.36	+04 16.2	4.099	4.322	+0.29	-1.1	19.6	95.9
May 29	10 17.29	+04 05.1	4.232	4.301	+0.41	-1.9	19.6	87.1
June 8	10 21.43	+03 46.5	4.363	4.280	+0.52	-2.6	19.6	78.6
June 18	10 26.64	+03 20.7	4.489	4.259	+0.61	-3.3	19.7	70.5
June 28	10 32.78	+02 48.2	4.607	4.236	+0.69	-3.9	19.7	62.6
July 8	10 39.73	+02 09.4	4.714	4.214	+0.76	-4.5	19.7	55.0
July 18	10 47.37	+01 24.9	4.809	4.191	+0.82	-5.0	19.7	47.6
July 28	10 55.59	+00 35.0	4.889	4.167	+0.87	-5.5	19.7	40.3
Aug. 7	11 04.31	-00 19.7	4.954	4.143	+0.91	-5.9	19.7	33.3
Aug. 17	11 13.44	-01 18.6	5.002	4.119	+0.95	-6.3	19.7	26.3
Aug. 27	11 22.90	-02 21.5	5.032	4.094	+0.97	-6.6	19.6	19.5
Sept. 6	11 32.63	-03 27.8	5.044	4.068	+0.99	-6.9	19.6	13.1
Sept.16	11 42.57	-04 37.0	5.037	4.042	+1.01	-7.2	19.5	7.6
Sept.26	11 52.65	-05 48.7	5.010	4.016	+1.02	-7.4	19.5	6.5
Oct. 6	12 02.81	-07 02.3	4.965	3.988	+1.02	-7.5	19.4	11.1
Oct. 16	12 13.00	-08 17.5	4.900	3.961	+1.01	-7.6	19.3	17.5
Oct. 26	12 23.14	-09 33.6	4.818	3.933	+1.00	-7.7	19.2	24.3
Nov. 5	12 33.16	-10 50.1	4.717	3.904	+0.98	-7.7	19.1	31.3
Nov. 15	12 42.98	-12 06.7	4.600	3.875	+0.95	-7.6	19.0	38.5
Nov. 25	12 52.51	-13 22.7	4.467	3.846	+0.91	-7.5	18.9	45.9
Dec. 5	13 01.63	-14 37.6	4.321	3.816	+0.86	-7.3	18.8	53.4
Dec. 15	13 10.22	-15 50.8	4.162	3.785	+0.79	-7.1	18.6	61.1
Dec. 25	13 18.13	-17 01.8	3.994	3.754	+0.71	-6.8	18.5	69.0
Jan. 4	13 25.19	-18 09.8	3.818	3.723	+0.60	-6.4	18.3	77.1
Jan. 14	13 31.21	-19 14.2	3.637	3.691	+0.48	-6.0	18.1	85.4
Jan. 24	13 35.98	-20 14.1	3.455	3.659	+0.33	-5.4	18.0	94.0
Feb. 3	13 39.27	-21 08.3	3.275	3.626	+0.16	-4.7	17.8	103.0
Feb. 13	13 40.87	-21 55.5	3.101	3.593	-0.03	-3.9	17.6	112.3
Feb. 23	13 40.58	-22 34.1	2.936	3.560	-0.23	-2.8	17.4	121.9
Mar. 5	13 38.30	-23 02.1	2.786	3.526	-0.43	-1.6	17.2	131.8
Mar. 15	13 34.03	-23 17.7	2.654	3.491	-0.61	-0.1	17.0	142.0
Mar. 25	13 27.95	-23 18.8	2.544	3.456	-0.75	+1.4	16.9	152.0

Comet 27P/Crommelin [Orbit 2]

Epoch = 2009 July 28.0 TT
T = 2011 Aug. 4.06445 TT
Peri. = 195.99824 e = 0.9184035
Node = 250.68842 2000.0 a = 9.1563340 AU
Incl. = 28.97176 n = 0.03557309
q = 0.7471248 AU P = 27.71 years

H = 15.0 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 9	19 09.40	-05 42.8	9.480	8.543	+0.47	+1.3	24.8	16.7
Jan. 19	19 14.13	-05 29.4	9.410	8.487	+0.47	+1.7	24.8	19.2
Jan. 29	19 18.78	-05 12.7	9.314	8.431	+0.45	+2.0	24.8	24.9
Feb. 8	19 23.27	-04 52.9	9.194	8.374	+0.42	+2.3	24.8	32.0
Feb. 18	19 27.50	-04 30.2	9.052	8.317	+0.39	+2.5	24.8	39.8
Feb. 28	19 31.39	-04 05.1	8.890	8.260	+0.35	+2.7	24.8	48.0
Mar. 10	19 34.84	-03 37.7	8.709	8.202	+0.29	+2.9	24.7	56.4
Mar. 20	19 37.77	-03 08.7	8.514	8.144	+0.23	+3.0	24.7	65.0
Mar. 30	19 40.10	-02 38.5	8.308	8.085	+0.16	+3.1	24.6	73.7
Apr. 9	19 41.74	-02 07.6	8.094	8.026	+0.09	+3.1	24.6	82.6
Apr. 19	19 42.63	-01 36.8	7.877	7.967	+0.01	+3.0	24.5	91.5
Apr. 29	19 42.72	-01 06.8	7.661	7.908	-0.08	+2.8	24.4	100.6
May 9	19 41.95	-00 38.4	7.450	7.848	-0.16	+2.6	24.4	109.7
May 19	19 40.33	-00 12.3	7.249	7.787	-0.25	+2.3	24.3	118.8
May 29	19 37.86	+00 10.5	7.063	7.726	-0.33	+1.9	24.2	127.9
June 8	19 34.60	+00 29.2	6.895	7.665	-0.40	+1.4	24.0	136.7
June 18	19 30.65	+00 42.9	6.749	7.604	-0.45	+0.8	23.9	144.9
June 28	19 26.13	+00 51.2	6.629	7.542	-0.49	+0.2	23.8	152.0
July 8	19 21.24	+00 53.7	6.536	7.479	-0.51	-0.4	23.8	156.4
July 18	19 16.18	+00 50.1	6.472	7.416	-0.50	-0.9	23.7	156.6
July 28	19 11.17	+00 40.8	6.437	7.353	-0.47	-1.5	23.7	152.5
Aug. 7	19 06.45	+00 26.3	6.430	7.289	-0.42	-1.9	23.7	145.6
Aug. 17	19 02.24	+00 07.3	6.448	7.225	-0.35	-2.2	23.8	137.3
Aug. 27	18 58.71	-00 15.0	6.489	7.161	-0.27	-2.5	23.8	128.4
Sept. 6	18 56.01	-00 39.6	6.549	7.095	-0.18	-2.6	23.9	119.2
Sept.16	18 54.22	-01 05.4	6.624	7.030	-0.08	-2.6	23.9	109.9
Sept.26	18 53.42	-01 31.1	6.709	6.964	+0.02	-2.5	23.9	100.6
Oct. 6	18 53.61	-01 55.8	6.798	6.897	+0.12	-2.3	23.9	91.5
Oct. 16	18 54.76	-02 18.5	6.889	6.830	+0.21	-2.0	23.9	82.5
Oct. 26	18 56.85	-02 38.5	6.975	6.763	+0.29	-1.7	23.9	73.6
Nov. 5	18 59.79	-02 55.1	7.054	6.695	+0.37	-1.3	23.9	65.0
Nov. 15	19 03.52	-03 07.8	7.120	6.626	+0.44	-0.8	23.9	56.5
Nov. 25	19 07.94	-03 16.0	7.172	6.557	+0.50	-0.4	23.9	48.3
Dec. 5	19 12.96	-03 19.5	7.206	6.488	+0.55	+0.1	23.8	40.4
Dec. 15	19 18.48	-03 18.1	7.220	6.418	+0.59	+0.7	23.7	33.0
Dec. 25	19 24.40	-03 11.4	7.212	6.347	+0.62	+1.2	23.7	26.4
Jan. 4	19 30.62	-02 59.6	7.182	6.276	+0.64	+1.7	23.6	21.3
Jan. 14	19 37.04	-02 42.5	7.127	6.204	+0.65	+2.2	23.5	18.7
Jan. 24	19 43.56	-02 20.2	7.049	6.131	+0.65	+2.7	23.5	19.7
Feb. 3	19 50.07	-01 52.9	6.948	6.058	+0.64	+3.2	23.5	23.7
Feb. 13	19 56.49	-01 20.6	6.824	5.984	+0.62	+3.7	23.5	29.6
Feb. 23	20 02.70	-00 43.6	6.678	5.910	+0.59	+4.1	23.4	36.3
Mar. 5	20 08.60	-00 02.3	6.513	5.835	+0.55	+4.5	23.4	43.6
Mar. 15	20 14.09	+00 43.1	6.330	5.760	+0.50	+4.9	23.4	51.2
Mar. 25	20 19.06	+01 32.1	6.133	5.683	+0.43	+5.2	23.3	59.0

Comet 27P/Crommelin [Orbit 1]

Epoch = 2009 July 28.0 TT
T = 2011 Aug. 4.07364 TT
Peri. = 195.99962 e = 0.9184029
Node = 250.68797 2000.0 a = 9.1563371 AU
Incl. = 28.97162 n = 0.03557308
q = 0.7471305 AU P = 27.71 years

15.0 , G = 0.15

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	19 09.41	-05 42.7	9.480	8.543	+0.47	+1.3	24.8	16.7
Jan. 19	19 14.13	-05 29.3	9.410	8.487	+0.47	+1.7	24.8	19.2
Jan. 29	19 18.78	-05 12.6	9.314	8.431	+0.45	+2.0	24.8	24.9
Feb. 8	19 23.27	-04 52.8	9.194	8.374	+0.42	+2.3	24.8	32.0
Feb. 18	19 27.50	-04 30.2	9.052	8.317	+0.39	+2.5	24.8	39.8
Feb. 28	19 31.39	-04 05.0	8.890	8.260	+0.35	+2.7	24.8	48.0
Mar. 10	19 34.84	-03 37.7	8.709	8.202	+0.29	+2.9	24.7	56.4
Mar. 20	19 37.77	-03 08.7	8.514	8.144	+0.23	+3.0	24.7	65.0
Mar. 30	19 40.10	-02 38.4	8.308	8.085	+0.16	+3.1	24.6	73.7
Apr. 9	19 41.74	-02 07.6	8.094	8.026	+0.09	+3.1	24.6	82.6
Apr. 19	19 42.63	-01 36.8	7.877	7.967	+0.01	+3.0	24.5	91.5
Apr. 29	19 42.72	-01 06.8	7.661	7.908	-0.08	+2.8	24.4	100.6
May 9	19 41.96	-00 38.3	7.450	7.848	-0.16	+2.6	24.4	109.7
May 19	19 40.34	-00 12.3	7.249	7.787	-0.25	+2.3	24.3	118.8
May 29	19 37.87	+00 10.5	7.063	7.726	-0.33	+1.9	24.2	127.9
June 8	19 34.61	+00 29.2	6.895	7.665	-0.40	+1.4	24.0	136.7
June 18	19 30.65	+00 43.0	6.750	7.604	-0.45	+0.8	23.9	144.9
June 28	19 26.14	+00 51.3	6.629	7.542	-0.49	+0.2	23.8	152.0
July 8	19 21.24	+00 53.7	6.537	7.479	-0.51	-0.4	23.8	156.4
July 18	19 16.18	+00 50.1	6.472	7.416	-0.50	-0.9	23.7	156.6
July 28	19 11.17	+00 40.8	6.437	7.353	-0.47	-1.5	23.7	152.5
Aug. 7	19 06.46	+00 26.3	6.430	7.289	-0.42	-1.9	23.7	145.6
Aug. 17	19 02.24	+00 07.4	6.448	7.225	-0.35	-2.2	23.8	137.3
Aug. 27	18 58.71	-00 15.0	6.490	7.161	-0.27	-2.5	23.8	128.4
Sept. 6	18 56.01	-00 39.6	6.550	7.096	-0.18	-2.6	23.9	119.2
Sept.16	18 54.23	-01 05.3	6.624	7.030	-0.08	-2.6	23.9	109.9
Sept.26	18 53.42	-01 31.1	6.709	6.964	+0.02	-2.5	23.9	100.6
Oct. 6	18 53.61	-01 55.8	6.798	6.897	+0.12	-2.3	23.9	91.5
Oct. 16	18 54.77	-02 18.5	6.889	6.830	+0.21	-2.0	23.9	82.5
Oct. 26	18 56.85	-02 38.5	6.975	6.763	+0.29	-1.7	23.9	73.6
Nov. 5	18 59.80	-02 55.1	7.054	6.695	+0.37	-1.3	23.9	65.0
Nov. 15	19 03.52	-03 07.8	7.120	6.626	+0.44	-0.8	23.9	56.5
Nov. 25	19 07.94	-03 16.0	7.172	6.557	+0.50	-0.4	23.9	48.3
Dec. 5	19 12.96	-03 19.5	7.206	6.488	+0.55	+0.1	23.8	40.4
Dec. 15	19 18.48	-03 18.0	7.220	6.418	+0.59	+0.7	23.7	33.0
Dec. 25	19 24.40	-03 11.4	7.212	6.347	+0.62	+1.2	23.7	26.4
Jan. 4	19 30.62	-02 59.6	7.182	6.276	+0.64	+1.7	23.6	21.3
Jan. 14	19 37.04	-02 42.5	7.127	6.204	+0.65	+2.2	23.5	18.7
Jan. 24	19 43.56	-02 20.2	7.049	6.131	+0.65	+2.7	23.5	19.7
Feb. 3	19 50.07	-01 52.8	6.948	6.058	+0.64	+3.2	23.5	23.7
Feb. 13	19 56.49	-01 20.5	6.824	5.985	+0.62	+3.7	23.5	29.6
Feb. 23	20 02.70	-00 43.6	6.678	5.910	+0.59	+4.1	23.4	36.3
Mar. 5	20 08.60	-00 02.3	6.513	5.835	+0.55	+4.5	23.4	43.6
Mar. 15	20 14.09	+00 43.1	6.331	5.760	+0.50	+4.9	23.4	51.2
Mar. 25	20 19.06	+01 32.1	6.133	5.683	+0.43	+5.2	23.3	59.0

Comet C/2006 S3 (LONEOS)

Epoch = 2009 July 28.0 TT
T = 2012 Apr. 16.94818 TT
Peri. = 140.03202
Node = 38.31949 2000.0
Incl. = 166.02731
q = 5.1376502 AU
e = 1.0002652

m1 = 4.5 + 5 log(Delta) + 7.5 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	22 37.20	+02 34.7	10.382	9.834	+0.13	+0.2	17.0	53.8
Jan. 19	22 38.49	+02 36.6	10.461	9.780	+0.17	+0.6	17.0	44.3
Jan. 29	22 40.15	+02 42.4	10.518	9.727	+0.19	+0.9	17.0	34.9
Feb. 8	22 42.10	+02 51.5	10.551	9.673	+0.21	+1.2	17.0	25.9
Feb. 18	22 44.24	+03 03.5	10.557	9.619	+0.23	+1.5	17.0	17.6
Feb. 28	22 46.50	+03 18.1	10.535	9.566	+0.23	+1.7	17.0	11.4
Mar. 10	22 48.79	+03 34.7	10.485	9.512	+0.22	+1.8	16.9	11.2
Mar. 20	22 51.00	+03 52.8	10.406	9.459	+0.21	+1.9	16.9	17.2
Mar. 30	22 53.08	+04 11.9	10.299	9.405	+0.18	+2.0	16.9	25.2
Apr. 9	22 54.91	+04 31.5	10.167	9.352	+0.15	+1.9	16.8	33.9
Apr. 19	22 56.43	+04 50.9	10.010	9.299	+0.11	+1.9	16.8	42.8
Apr. 29	22 57.55	+05 09.7	9.833	9.245	+0.06	+1.7	16.7	51.9
May 9	22 58.17	+05 27.2	9.637	9.192	+0.01	+1.6	16.6	61.1
May 19	22 58.24	+05 42.7	9.428	9.139	-0.06	+1.3	16.6	70.4
May 29	22 57.66	+05 55.7	9.208	9.085	-0.13	+1.0	16.5	79.9
June 8	22 56.38	+06 05.5	8.984	9.032	-0.20	+0.6	16.4	89.5
June 18	22 54.34	+06 11.4	8.759	8.979	-0.28	+0.1	16.4	99.3
June 28	22 51.51	+06 12.7	8.540	8.926	-0.36	-0.4	16.3	109.2
July 8	22 47.86	+06 09.0	8.331	8.873	-0.44	-0.9	16.2	119.3
July 18	22 43.43	+05 59.6	8.139	8.820	-0.52	-1.5	16.1	129.5
July 28	22 38.27	+05 44.5	7.968	8.767	-0.58	-2.1	16.1	139.7
Aug. 7	22 32.48	+05 23.4	7.823	8.714	-0.63	-2.7	16.0	149.7
Aug. 17	22 26.21	+04 56.7	7.709	8.661	-0.66	-3.2	16.0	159.0
Aug. 27	22 19.63	+04 25.0	7.627	8.609	-0.67	-3.6	15.9	165.4
Sept. 6	22 12.97	+03 49.2	7.580	8.556	-0.65	-3.9	15.9	164.6
Sept.16	22 06.44	+03 10.6	7.568	8.504	-0.62	-4.0	15.9	157.1
Sept.26	22 00.26	+02 30.7	7.589	8.451	-0.56	-4.0	15.9	147.4
Oct. 6	21 54.62	+01 50.8	7.641	8.399	-0.49	-3.8	15.8	136.9
Oct. 16	21 49.67	+01 12.3	7.719	8.346	-0.41	-3.6	15.8	126.2
Oct. 26	21 45.52	+00 36.5	7.818	8.294	-0.33	-3.2	15.9	115.5
Nov. 5	21 42.25	+00 04.4	7.932	8.242	-0.24	-2.8	15.9	104.9
Nov. 15	21 39.86	-00 23.3	8.055	8.190	-0.15	-2.3	15.9	94.4
Nov. 25	21 38.35	-00 46.2	8.181	8.138	-0.07	-1.8	15.9	84.1
Dec. 5	21 37.65	-01 04.0	8.304	8.087	+0.01	-1.3	15.9	73.9
Dec. 15	21 37.70	-01 16.6	8.419	8.035	+0.07	-0.8	15.9	63.9
Dec. 25	21 38.42	-01 24.2	8.519	7.984	+0.13	-0.3	15.9	54.2
Jan. 4	21 39.71	-01 27.0	8.602	7.932	+0.17	+0.2	15.9	44.6
Jan. 14	21 41.45	-01 25.2	8.663	7.881	+0.21	+0.6	15.9	35.3
Jan. 24	21 43.55	-01 19.4	8.699	7.830	+0.23	+1.0	15.9	26.5
Feb. 3	21 45.89	-01 09.8	8.708	7.779	+0.25	+1.3	15.9	18.4
Feb. 13	21 48.36	-00 57.0	8.689	7.728	+0.25	+1.6	15.9	12.6
Feb. 23	21 50.87	-00 41.5	8.641	7.678	+0.24	+1.8	15.8	12.4
Mar. 5	21 53.30	-00 23.8	8.564	7.627	+0.22	+1.9	15.8	18.0
Mar. 15	21 55.55	-00 04.4	8.460	7.577	+0.20	+2.0	15.7	25.8
Mar. 25	21 57.50	+00 15.9	8.329	7.527	+0.16	+2.1	15.7	34.4

Comet 158P/Kowal-LINEAR

Epoch = 2009 July 28.0 TT
T = 2012 Sept. 16.13105 TT
Peri. = 231.58482 e = 0.0292466
Node = 137.30956 2000.0 a = 4.7194546 AU
Incl. = 7.90841 n = 0.09613164
q = 4.5814266 AU P = 10.25 years

m1 = 5.7 + 5 log(Delta) + 15.0 log(r)

0h TT 2009/10	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 9	16 18.19	-14 25.5	5.469	4.809	+0.85	-1.3	19.6	43.9
Jan. 19	16 26.70	-14 38.4	5.351	4.808	+0.79	-0.8	19.6	52.0
Jan. 29	16 34.59	-14 46.9	5.220	4.806	+0.71	-0.4	19.5	60.1
Feb. 8	16 41.72	-14 51.0	5.078	4.804	+0.62	0.0	19.5	68.5
Feb. 18	16 47.95	-14 51.1	4.927	4.802	+0.52	+0.4	19.4	77.0
Feb. 28	16 53.15	-14 47.4	4.771	4.801	+0.40	+0.7	19.3	85.7
Mar. 10	16 57.18	-14 40.2	4.614	4.799	+0.27	+1.0	19.2	94.7
Mar. 20	16 59.93	-14 30.2	4.459	4.797	+0.14	+1.2	19.2	103.9
Mar. 30	17 01.29	-14 17.8	4.310	4.795	-0.01	+1.4	19.1	113.4
Apr. 9	17 01.23	-14 03.6	4.172	4.793	-0.15	+1.5	19.0	123.1
Apr. 19	16 59.74	-13 48.5	4.048	4.791	-0.28	+1.5	18.9	133.1
Apr. 29	16 56.89	-13 33.2	3.944	4.789	-0.40	+1.5	18.9	143.2
May 9	16 52.87	-13 18.6	3.863	4.787	-0.49	+1.3	18.8	153.4
May 19	16 47.94	-13 05.6	3.808	4.785	-0.55	+1.0	18.8	163.1
May 29	16 42.44	-12 55.1	3.781	4.783	-0.57	+0.7	18.8	170.2
June 8	16 36.78	-12 48.1	3.784	4.781	-0.54	+0.3	18.8	168.0
June 18	16 31.37	-12 45.1	3.815	4.779	-0.48	-0.2	18.8	159.4
June 28	16 26.58	-12 46.8	3.873	4.777	-0.38	-0.7	18.8	149.5
July 8	16 22.74	-12 53.3	3.956	4.775	-0.27	-1.1	18.9	139.4
July 18	16 20.08	-13 04.6	4.061	4.773	-0.13	-1.6	18.9	129.6
July 28	16 18.73	-13 20.4	4.182	4.771	0.00	-2.0	19.0	119.9
Aug. 7	16 18.77	-13 40.1	4.317	4.768	+0.14	-2.3	19.1	110.5
Aug. 17	16 20.17	-14 03.1	4.461	4.766	+0.27	-2.6	19.1	101.4
Aug. 27	16 22.90	-14 28.7	4.610	4.764	+0.40	-2.7	19.2	92.6
Sept. 6	16 26.88	-14 55.9	4.760	4.762	+0.51	-2.8	19.3	84.0
Sept.16	16 31.99	-15 24.1	4.908	4.760	+0.62	-2.8	19.3	75.6
Sept.26	16 38.15	-15 52.5	5.051	4.758	+0.71	-2.8	19.4	67.5
Oct. 6	16 45.24	-16 20.3	5.185	4.755	+0.79	-2.7	19.4	59.4
Oct. 16	16 53.15	-16 46.9	5.309	4.753	+0.86	-2.5	19.5	51.5
Oct. 26	17 01.77	-17 11.6	5.419	4.751	+0.92	-2.2	19.5	43.7
Nov. 5	17 11.00	-17 34.0	5.514	4.749	+0.97	-2.0	19.6	36.1
Nov. 15	17 20.73	-17 53.5	5.593	4.746	+1.01	-1.6	19.6	28.5
Nov. 25	17 30.86	-18 09.7	5.653	4.744	+1.04	-1.3	19.6	20.9
Dec. 5	17 41.28	-18 22.5	5.694	4.742	+1.06	-0.9	19.6	13.6
Dec. 15	17 51.90	-18 31.6	5.715	4.740	+1.07	-0.5	19.6	7.0
Dec. 25	18 02.60	-18 36.9	5.715	4.737	+1.07	-0.2	19.6	5.5
Jan. 4	18 13.29	-18 38.4	5.695	4.735	+1.06	+0.2	19.6	11.3
Jan. 14	18 23.86	-18 36.2	5.655	4.733	+1.03	+0.6	19.6	18.5
Jan. 24	18 34.21	-18 30.6	5.595	4.730	+1.00	+0.9	19.6	26.0
Feb. 3	18 44.22	-18 21.9	5.517	4.728	+0.96	+1.1	19.5	33.7
Feb. 13	18 53.80	-18 10.5	5.421	4.726	+0.90	+1.4	19.5	41.4
Feb. 23	19 02.83	-17 57.0	5.309	4.723	+0.84	+1.5	19.4	49.3
Mar. 5	19 11.19	-17 41.9	5.183	4.721	+0.76	+1.6	19.4	57.3
Mar. 15	19 18.78	-17 25.9	5.045	4.719	+0.67	+1.6	19.3	65.4
Mar. 25	19 25.48	-17 09.9	4.898	4.717	+0.57	+1.5	19.3	73.7

彗星年表　２００９

編集委員会

門　田　健　一
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（五十音順・敬称略）
○印は編集長

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