THE COMET HANDBOOK FOR 2013

彗 星 年 表

2013

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INDEX TO EPHEMERIDES

Comet 95P/(2060) Chiron
Epoch 1996 Feb. 7.0 TT = JDT 2450120.5
T 1996 Feb. 14.74560 TT Sato
q 8.4539295 (2000.0) P Q
n 0.01942786 Peri. 339.55369 -0.98660431 +0.15201012
a 13.7041714 Node 209.38450 -0.12782266 -0.94583863
e 0.3831127 Incl. 6.92995 -0.10135733 -0.28684875
P 50.73
From 1096 observations 1895 Apr. 24-2012 Oct. 20, mean residual 0″.48.

Comet C/2005 L3 (McNaught)
Epoch 2008 Jan. 15.0 TT = JDT 2454480.5
T 2008 Jan. 16.00583 TT Sato
q 5.5932713 (2000.0) P Q
z +0.0000156 Peri. 47.09693 -0.30837256 -0.72516364
+/-0.0000002 Node 288.73910 -0.94495805 +0.30792598
e 0.9999128 Incl. 139.44875 +0.10936478 +0.61588902
rom 5085 observations 2004 July 16-2012 May 17, mean residual 0″.59.

Comet P/2010 TO20 (LINEAR-Grauer)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2009 Jan. 2.60289 TT Sato
q 5.2866710 (2000.0) P Q
n 0.07247003 Peri. 264.19393 +0.61909852 +0.78470980
a 5.6976674 Node 44.10586 -0.70187615 +0.57047841
e 0.0721341 Incl. 2.53494 -0.35225969 +0.24245601
P 13.60
From 54 observations 2010 Oct. 1-2012 Nov. 15, mean residual 0″.62.

Comet C/2006 W3 (Christensen)
Epoch 2009 June 18.0 TT = JDT 2455000.5
T 2009 July 6.65788 TT Sato
q 3.1262026 (2000.0) P Q
z -0.0000143 Peri. 133.51876 +0.67604871 -0.09047618
+/-0.0000001 Node 113.57274 -0.64879618 -0.54356435
e 1.0000447 Incl. 127.07375 +0.34931600 -0.83447700
From 5558 observations 2006 Oct. 29-2011 Sept. 24, mean residual 0″.53.

Comet 74P/Smirnova-Chernykh
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2009 July 27.10378 TT Sato
q 3.5473624 (2000.0) P Q
n 0.11598988 Peri. 86.53968 -0.95287082 -0.28159063
a 4.1641143 Node 77.08152 +0.21135296 -0.88311316
e 0.1481112 Incl. 6.65095 +0.21763991 -0.37525707
P 8.50
From 2332 observations 1995 May 8-2012 Sept. 6, mean residual 0″.68.

Comet 65P/Gunn
Epoch 2010 Mar. 5.0 TT = JDT 2455260.5
T 2010 Mar. 2.15248 TT Sato
q 2.4403913 (2000.0) P Q
n 0.14517040 Peri. 196.64151 -0.09158906 +0.98159494
a 3.5855078 Node 68.35439 -0.89185848 -0.00600309
e 0.3193736 Incl. 10.38683 -0.44294457 -0.19088042
P 6.79
From 2657 observations 2004 June 23-2013 Jan. 13, mean residual 0″.68.
Nongravitational parameters A1 = +0.05, A2 = -0.4462.

Comet 215P/NEAT
Epoch 2010 June 13.0 TT = JDT 2455360.5
T 2010 June 8.03897 TT Sato
q 3.2133753 (2000.0) P Q
n 0.12217693 Peri. 222.45299 +0.45162338 +0.86609769
a 4.0223196 Node 75.44074 -0.74758492 +0.49842351
e 0.2011139 Incl. 12.78996 -0.48698369 +0.03806303
P 8.07
From 254 observations 1994 Sept. 11-2013 Jan. 8, mean residual 0″.63.
Nongravitational parameters A1 = -2.22, A2 = +1.5389.

Comet P/2011 P1 (McNaught)
Epoch 2011 Aug. 27.0 TT = JDT 2455800.5
T 2010 July 23.58817 TT Sato
q 4.9520284 (2000.0) P Q
n 0.04518499 Peri. 342.17398 +0.99032900 +0.13743568
a 7.8068035 Node 9.98386 -0.11019969 +0.86229901
e 0.3656778 Incl. 6.28216 -0.08428817 +0.48739291
P 21.81
From 121 observations 2011 Aug. 1-2012 Jan. 25, mean residual 0″.68.

Comet C/2008 FK75 (Lemmon-Siding Spring)
Epoch 2010 Oct. 11.0 TT = JDT 2455480.5
T 2010 Sept. 29.25393 TT Sato
q 4.5108789 (2000.0) P Q
z -0.0005706 Peri. 80.42007 +0.16377408 +0.82386195
+/-0.0000002 Node 218.26851 -0.78064593 +0.44452177
e 1.0025738 Incl. 61.17603 +0.60313347 +0.35164170
From 3495 observations 2008 Mar. 31-2013 Jan. 14, mean residual 0″.63.

Comet 240P/NEAT
Epoch 2010 Oct. 11.0 TT = JDT 2455480.5
T 2010 Oct. 4.27511 TT Sato
q 2.1237533 (2000.0) P Q
n 0.12987880 Peri. 351.92703 +0.38104148 -0.84037283
a 3.8616882 Node 74.97454 +0.86899994 +0.18318788
e 0.4500454 Incl. 23.52237 +0.31566833 +0.51011342
P 7.59
From 1617 observations 2002 Oct. 5-2011 July 10, mean residual 0″.67.

Comet 254P/McNaught
Epoch 2010 Oct. 11.0 TT = JDT 2455480.5
T 2010 Oct. 26.63467 TT Sato
q 3.2151095 (2000.0) P Q
n 0.09721207 Peri. 220.77397 +0.90889164 +0.06803510
a 4.6844209 Node 130.08057 -0.06665958 +0.99761859
e 0.3136591 Incl. 32.52983 -0.41167036 -0.01133018
P 10.14
From 116 observations 1980 Oct. 5-2012 Jan. 27, mean residual 0″.60.

C/2010 FB87 (WISE-Garradd)
Epoch 2010 Nov. 20.0 TT = JDT 2455520.5
T 2010 Nov. 7.38549 TT Sato
q 2.8427122 (2000.0) P Q
z +0.0032982 Peri. 265.02211 -0.30182781 -0.02451438
+/-0.0000008 Node 89.89870 +0.29854955 +0.94695783
e 0.9906241 Incl. 107.62688 -0.90541048 +0.32042147
From 589 observations 2010 Mar. 28-2012 Apr. 21, mean residual 0″.54.

C/2010 L3 (Catalina)
Epoch 2010 Nov. 20.0 TT = JDT 2455520.5
T 2010 Nov. 10.44591 TT Sato
q 9.8829144 (2000.0) P Q
z +0.0000853 Peri. 121.77327 -0.29821508 -0.73871403
+/-0.0000028 Node 38.27589 -0.76313641 -0.19584647
e 0.9991574 Incl. 102.63071 +0.57331543 -0.64493856
From 118 observations 2010 June 15-2012 May 26, mean residual 0″.56.

Comet C/2009 Y1 (Catalina)
Epoch 2011 Feb. 8.0 TT = JDT 2455600.5
T 2011 Jan. 28.90256 TT Sato
q 2.5204961 (2000.0) P Q
z +0.0026530 Peri. 127.39164 +0.65144159 +0.68689738
+/-0.0000005 Node 160.27724 -0.28549174 -0.17149616
e 0.9933132 Incl. 107.31641 +0.70293550 -0.70623017
From 1688 observations 2009 Dec. 17-2011 Dec. 23, mean residual 0″.64

Comet C/2008 S3 (Boattini)
Epoch 2011 June 8.0 TT = JDT 2455720.5
T 2011 June 7.40139 TT Sato
q 8.0178675 (2000.0) P Q
z -0.0001255 Peri. 39.96444 +0.94225520 +0.23006121
+/-0.0000006 Node 54.94140 +0.17645077 -0.95869152
e 1.0010059 Incl. 162.70401 +0.28464057 -0.16727944
From 1641 observations 2006 Dec. 27-2012 Dec. 14, mean residual 0″.66.

Comet 176P/LINEAR
Epoch 2011 July 18.0 TT = JDT 2455760.5
T 2011 June 30.96417 TT Sato

q	2.5764443	(2000.0)	P	Q
n	0.17232876	Peri.	35.60893	+0.92677561	-0.37561423
a	3.1981405	Node	346.45325	+0.34366112	+0.84896516
e	0.1943930	Incl.	0.23559	+0.15160479	+0.37171510
P	5.72				

From 104 observations 2007 Feb. 21-2012 Feb. 19, mean residual 0″.36.

Comet C/2012 E1 (Hill)
Epoch 2011 July 18.0 TT = JDT 2455760.5
T 2011 July 4.37499 TT Sato

q	7.5032716	(2000.0)	P	Q
z	+0.0002473	Peri.	48.90114	-0.20442802	-0.55087369
	+/-0.0000081	Node	286.30453	-0.93596523	+0.35207764
e	0.9981448	Incl.	122.53423	+0.28666753	+0.75668984

From 89 observations 2011 June 10-2012 July 25, mean residual 0″.58.

Comet C/2010 G2 (Hill)
Epoch 2011 Aug. 27.0 TT = JDT 2455800.5
T 2011 Sept. 2.05230 TT Sato

q	1.9807710	(2000.0)	P	Q
z	+0.0103899	Peri.	137.42622	+0.14259690	+0.42752804
	+/-0.0000002	Node	246.78087	+0.41765701	+0.79168231
e	0.9794199	Incl.	103.74537	+0.89734539	-0.43641596

From 4014 observations 2010 Apr. 10-2013 Jan. 6, mean residual 0″.59.

Comet 48P/Johnson
Epoch 2011 Oct. 6.0 TT = JDT 2455840.5
T 2011 Sept. 29.30380 TT Sato

q	2.3011175	(2000.0)	P	Q
n	0.14197639	Peri.	207.95711	+0.80964615	+0.54808513
a	3.6390831	Node	117.27175	-0.48476990	+0.82613570
e	0.3676656	Incl.	13.66221	-0.33086442	+0.13077651
P	6.94				

From 1195 observations 1949 Sept. 24-2012 Dec. 9, mean residual 0″.66.
Nongravitational parameters A1 = +0.43, A2 = -0.1502.

Comet C/2012 B3 (La Sagra)
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 6.85537 TT Sato

q	3.5365569	(2000.0)	P	Q
z	-0.0003967	Peri.	50.73650	-0.40069339	+0.05012272
	+/-0.0000072	Node	252.99824	-0.78941810	+0.48792292
e	1.0014030	Incl.	106.93225	+0.46504179	+0.87144647

From 283 observations 2012 Jan. 29-July 23, mean residual 0″.58.

Comet C/2009 S3 (Lemmon)
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 11.31008 TT Sato

q	6.4745494	(2000.0)	P	Q
z	-0.0002230	Peri.	129.76589	+0.72047334	+0.31823600
	+/-0.0000020	Node	225.13255	-0.09573854	+0.92562656
e	1.0014436	Incl.	60.38464	+0.68684226	-0.20479582

From 207 observations 2009 Sept. 24-2012 Dec. 11, mean residual 0″.69.

Comet 71P/Clark
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 15.90629 TT Sato

q	1.5675044	(2000.0)	P	Q
n	0.17834238	Peri.	208.82160	-0.03301649	+0.98930595
a	3.1258371	Node	59.61186	-0.88250157	+0.03786737
e	0.4985329	Incl.	9.47953	-0.46914911	-0.14085379
P	5.53				

From 772 observations 2005 Dec. 28-2012 Nov. 12, mean residual 0″.78.
Nongravitational parameters A1 = +1.27, A2 = -0.4705.

Comet C/2011 A3 (Gibbs)
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 16.08795 TT Sato
q 2.3449123 (2000.0) P Q
z +0.0009421 Peri. 141.16270 -0.01647444 +0.93259826
+/-0.0000012 Node 124.89052 -0.99145439 +0.03143304
e 0.9977910 Incl. 26.07522 -0.12940936 -0.35954477
From 1658 observations 2011 Jan. 15-2012 Dec. 8, mean residual 0″.56.

Comet C/2009 P1 (McNaught)
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 23.67659 TT Sato
q 1.5505379 (2000.0) P Q
z -0.0006476 Peri. 90.74639 -0.16659280 -0.82691431
+/-0.0000004 Node 325.99761 -0.58720568 +0.52077461
e 1.0010041 Incl. 106.17731 +0.79210879 +0.21214743
From 8463 observations 2009 Aug. 13-2013 Jan. 12, mean residual 0″.48.
Nongravitational parameters A1 = +1.94, A2 = +0.0576.

Comet 36P/Whipple
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 29.58749 TT Sato
q 3.0878920 (2000.0) P Q
n 0.11541112 Peri. 201.59731 +0.91385789 -0.40597042
a 4.1780242 Node 182.39108 +0.39319893 +0.88925105
e 0.2609205 Incl. 9.93096 +0.10128352 +0.21076191
P 8.54
From 462 observations 1948 July 18-2012 Dec. 10, mean residual 0″.68.
Nongravitational parameters A1 = +0.55, A2 = -0.0727.

Comet C/2009 F4 (McNaught)
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2011 Dec. 31.90012 TT Sato
q 5.4548100 (2000.0) P Q
z -0.0002862 Peri. 260.38436 +0.04750595 +0.61014597
+/-0.0000006 Node 53.58437 +0.16283572 +0.77643538
e 1.0015610 Incl. 79.34752 -0.98550886 +0.15770226
From 788 observations 2009 Mar. 19-2012 Dec. 15, mean residual 0″.57.

Comet 78P/Gehrels
Epoch 2011 Dec. 25.0 TT = JDT 2455920.5
T 2012 Jan. 12.91408 TT Sato
q 2.0085887 (2000.0) P Q
n 0.13630751 Peri. 192.79726 +0.72777415 -0.68357590
a 3.7392933 Node 210.55861 +0.63843507 +0.70478220
e 0.4628427 Incl. 6.25526 +0.25049040 +0.18975258
P 7.23
From 5246 observations 1989 June 14-2013 Jan. 12, mean residual 0″.56.
Nongravitational parameters A1 = +0.03, A2 = -0.5674.

Comet C/2011 Q2 (McNaught)
Epoch 2012 Feb. 3.0 TT = JDT 2455960.5
T 2012 Jan. 19.79270 TT Sato
q 1.3495364 (2000.0) P Q
z -0.0000117 Peri. 34.63254 +0.67955776 +0.45860156
+/-0.0000104 Node 287.36879 -0.73159860 +0.48156422
e 1.0000158 Incl. 36.86775 +0.05444951 +0.74684705
From 105 observations 2011 Aug. 26-2012 Apr. 26, mean residual 0″.46.

Comet 244P/Scotti
Epoch 2012 Feb. 3.0 TT = JDT 2455960.5
T 2012 Jan. 20.31300 TT Sato
q 3.9181889 (2000.0) P Q
n 0.09094259 Peri. 92.59082 +0.05661687 -0.99838792
a 4.8973126 Node 354.15900 +0.89963428 +0.05275827
e 0.1999308 Incl. 2.25905 +0.43295807 +0.02093147
P 10.84
From 906 observations 2000 Nov. 29-2012 Dec. 11, mean residual 0″.66.

Comet P/2011 JB15 (Spacewatch-Boattini)
Epoch 2012 Feb. 3.0 TT = JDT 2455960.5
T 2012 Jan. 21.52226 TT Sato
q 5.0187412 (2000.0) P Q
n 0.04935530 Peri. 110.92126 -0.06993311 +0.98695682
a 7.3606051 Node 153.75570 -0.99286169 -0.05478640
e 0.3181619 Incl. 19.14203 -0.09661797 -0.15137598
P 19.97
From 115 observations 2011 Apr. 30-2012 Aug. 15, mean residual 0″.64.

Comet P/2011 W1 (PANSTARRS)
Epoch 2012 Feb. 3.0 TT = JDT 2455960.5
T 2012 Jan. 22.36636 TT Sato
q 3.3120947 (2000.0) P Q
n 0.09813248 Peri. 282.43310 +0.09825720 -0.99495686
a 4.6550840 Node 161.89128 +0.93638443 +0.08557650
e 0.2884995 Incl. 3.71855 +0.33694172 +0.05232113
P 10.04
From 163 observations 2011 Nov. 23-2012 Mar. 22, mean residual 0″.51.

Comet C/2012 Q1 (Kowalski)
Epoch 2012 Feb. 3.0 TT = JDT 2455960.5
T 2012 Feb. 10.20305 TT Sato
q 9.4826421 (2000.0) P Q
n 0.00734335 Peri. 139.26590 +0.79115912 +0.60912992
a 26.2144032 Node 184.45019 -0.55096612 +0.74888127
e 0.6382660 Incl. 45.16839 +0.26552509 -0.26103177
P 134.22
From 128 observations 2012 Aug. 28-Dec. 12, mean residual 0″.60.

Comet 21P/Giacobini-Zinner
Epoch 2012 Feb. 3.0 TT = JDT 2455960.5
T 2012 Feb. 11.73505 TT Sato
q 1.0304929 (2000.0) P Q
n 0.14942946 Peri. 172.60304 +0.98510066 -0.09939096
a 3.5170502 Node 195.39755 +0.11783848 +0.98449898
e 0.7070008 Incl. 31.91062 +0.12526285 -0.14451017
P 6.60
From 769 observations 2005 Mar. 5-2012 Dec. 11, mean residual 0″.69.
Nongravitational parameters A1 = +0.88, A2 = +0.3807.

Comet P/2011 R3 (Novichonok-Gerke)
Epoch 2012 Apr. 3.0 TT = JDT 2456020.5
T 2012 Apr. 2.90606 TT Sato
q 3.5577660 (2000.0) P Q
n 0.09218663 Peri. 225.16988 +0.56967352 -0.81962864
a 4.8531542 Node 190.60954 +0.81588548 +0.57287471
e 0.2669168 Incl. 19.24009 +0.09900988 -0.00484219
P 10.69
From 361 observations 2011 Sept. 7-2012 Dec. 21, mean residual 0″.59.

Comet 242P/Spahr
Epoch 2012 Apr. 23.0 TT = JDT 2456040.5
T 2012 Apr. 3.58335 TT Sato
q 3.9799223 (2000.0) P Q
n 0.07601920 Peri. 247.68534 +0.36912744 -0.92935053
a 5.5189167 Node 180.77320 +0.91824853 +0.36349246
e 0.2788581 Incl. 32.48280 -0.14340351 -0.06465923
P 12.97
From 435 observations 1997 Oct. 29-2012 Dec. 17, mean residual 0″.68.

Comet C/2006 S3 (LONEOS)
Epoch 2012 Apr. 23.0 TT = JDT 2456040.5
T 2012 Apr. 16.33715 TT Sato
q 5.1311157 (2000.0) P Q
z -0.0006799 Peri. 140.13048 -0.21557911 -0.96492350
+/-0.0000002 Node 38.37040 -0.94613719 +0.24436147
e 1.0034889 Incl. 166.03270 -0.24155759 -0.09596936
From 4341 observations 2006 Aug. 29-2012 Sept. 25, mean residual 0″.59.

Comet P/2011 U2 (Bressi)
Epoch 2012 Apr. 23.0 TT = JDT 2456040.5
T 2012 May 6.48158 TT Sato

q	4.8376458	(2000.0)	P	Q
n	0.07766819	Peri. 157.63137	+0.42791621	-0.88825490
a	5.4405221	Node 266.69337	+0.80185408	+0.45836271
e	0.1108122	Incl. 9.62996	+0.41703447	+0.03011422
P	12.69			

From 105 observations 2011 Oct. 24-2012 Mar. 16, mean residual 0″.50.

Comet C/2010 R1 (LINEAR)
Epoch 2012 June 2.0 TT = JDT 2456080.5
T 2012 May 18.89798 TT Sato

q	5.6214158	(2000.0)	P	Q
z	-0.0006517	Peri. 114.49648	-0.63355944	-0.76579181
	+/-0.0000010	Node 343.64955	-0.77180863	+0.63550662
e	1.0036636	Incl. 156.93339	+0.05398027	+0.09845935

From 1066 observations 2010 Sept. 4-2012 Aug. 26, mean residual 0″.63.

Comet P/2011 N1 (ASH)
Epoch 2012 June 2.0 TT = JDT 2456080.5
T 2012 May 31.09635 TT Sato

q	2.8578980	(2000.0)	P	Q
n	0.06227880	Peri. 331.02311	+0.57118016	-0.59085285
a	6.3034148	Node 77.67631	+0.81945936	+0.37044669
e	0.5466111	Incl. 35.67706	+0.04732428	+0.71670228
P	15.83			

From 261 observations 2011 July 1-2013 Jan. 2, mean residual 0″.46.

Comet C/2012 L3 (LINEAR)
Epoch 2012 June 2.0 TT = JDT 2456080.5
T 2012 June 12.21158 TT Sato

q	3.0450320	(2000.0)	P	Q
z	+0.0030356	Peri. 107.09108	+0.36071136	-0.73336514
	+/-0.0000189	Node 53.48959	-0.85305138	-0.50920773
e	0.9907564	Incl. 134.19663	+0.37708177	-0.45042542

From 240 observations 2012 June 10-Oct. 5, mean residual 0″.60.

Comet P/2012 NJ (La Sagra)
Epoch 2012 June 2.0 TT = JDT 2456080.5
T 2012 June 13.08845 TT Sato

q	1.2918799	(2000.0)	P	Q
n	0.03974291	Peri. 338.41183	+0.64104429	+0.32719340
a	8.5041239	Node 315.76312	-0.47321726	-0.54367972
e	0.8480878	Incl. 84.37490	-0.60425793	+0.77288863
P	24.80			

From 2408 observations 2012 July 13-Dec. 8, mean residual 0″.36.

Comet 152P/Helin-Lawrence
Epoch 2012 July 12.0 TT = JDT 2456120.5
T 2012 July 9.22141 TT Sato

q	3.1164629	(2000.0)	P	Q
n	0.10327113	Peri. 163.79793	-0.24273563	+0.95485344
a	4.4993533	Node 91.91024	-0.90798074	-0.16146600
e	0.3073532	Incl. 9.86736	-0.34154120	-0.24936648
P	9.54			

From 385 observations 1995 Aug. 16-2012 Sept. 16, mean residual 0″.73.

Comet 189P/NEAT
Epoch 2012 July 12.0 TT = JDT 2456120.5
T 2012 July 20.42804 TT Sato

q	1.1772262	(2000.0)	P	Q
n	0.19755613	Peri. 15.35497	+0.44567898	+0.82796151
a	2.9197278	Node 282.15324	-0.85362907	+0.27855808
e	0.5968028	Incl. 20.37546	-0.26960650	+0.48670846
P	4.99			

From 1308 observations 2002 July 30-2012 Oct. 15, mean residual 0″.68.
Nongravitational parameters A1 = -0.11, A2 = -0.0105.

Comet C/2011 UF305 (LINEAR)
Epoch 2012 July 12.0 TT = JDT 2456120.5
T 2012 July 22.15971 TT Sato
q 2.1382036 (2000.0) P Q
z -0.0003106 Peri. 121.99193 -0.29610078 -0.35830011
+/-0.0000005 Node 297.43594 +0.07008825 +0.91632607
e 1.0006641 Incl. 93.96064 +0.95258174 -0.17879477
From 1623 observations 2011 July 25-2013 Jan. 14, mean residual 0″.50.

Comet 185P/Petriew
Epoch 2012 Aug. 21.0 TT = JDT 2456160.5
T 2012 Aug. 13.57869 TT Sato
q 0.9318540 (2000.0) P Q
n 0.18052125 Peri. 181.94357 +0.80923371 -0.57160694
a 3.1006340 Node 214.09039 +0.54222147 +0.81558457
e 0.6994634 Incl. 14.00765 +0.22613421 +0.08992949
P 5.46
From 876 observations 2001 June 12-2012 Dec. 11, mean residual 0″.68.
Nongravitational parameters A1 = +0.23, A2 = +0.0546.

Comet C/2011 O1 (LINEAR)
Epoch 2012 Aug. 21.0 TT = JDT 2456160.5
T 2012 Aug. 18.47053 TT Sato
q 3.8906548 (2000.0) P Q
z +0.0008211 Peri. 232.38257 +0.18297480 +0.14503790
+/-0.0000014 Node 89.81666 -0.25418467 +0.96240713
e 0.9968055 Incl. 76.49882 -0.94968962 -0.22964435
From 187 observations 2011 July 31-2012 Dec. 21, mean residual 0″.43.

Comet P/2012 S2 (La Sagra)
Epoch 2012 Aug. 21.0 TT = JDT 2456160.5
T 2012 Aug. 18.87523 TT Sato
q 1.3711921 (2000.0) P Q
n 0.10568062 Peri. 312.07309 +0.99006961 -0.07555371
a 4.4307015 Node 52.60250 +0.12347914 +0.87047420
e 0.6905248 Incl. 8.58189 -0.06719422 +0.48638081
P 9.33
From 349 observations 2012 Sept. 23-Dec. 18, mean residual 0″.45.

Comet C/2012 Y3 (McNaught)
Epoch 2012 Aug. 21.0 TT = JDT 2456160.5
T 2012 Aug. 25.95083 TT Sato
q 1.7669371 (2000.0) P Q
n 0.00589607 Peri. 235.79344 +0.50396378 -0.31003713
a 30.3454888 Node 122.66479 -0.00122424 +0.93309806
e 0.9417727 Incl. 73.25894 -0.86372392 -0.18222236
P 167.16
From 73 observations 2012 Dec. 30-2013 Jan. 10, mean residual 0″.36.

Comet C/2012 T6 (Kowalski)
Epoch 2012 Aug. 21.0 TT = JDT 2456160.5
T 2012 Aug. 26.38575 TT Sato
q 1.7751046 (2000.0) P Q
n 0.01814517 Peri. 198.09795 +0.91677702 -0.39494671
a 14.3426266 Node 186.22255 +0.39919738 +0.90136206
e 0.8762357 Incl. 33.27702 -0.01270222 -0.17766128
P 54.32
From 127 observations 2012 Oct. 15-Dec. 9, mean residual 0″.54.

Comet P/2012 T1 (PANSTARRS)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 10.88431 TT Sato
q 2.4107293 (2000.0) P Q
n 0.17600216 Peri. 300.57713 +0.88013484 -0.43447844
a 3.1534847 Node 85.77574 +0.47403676 +0.78268418
e 0.2355348 Incl. 11.05839 +0.02553051 +0.44568371
P 5.60
From 157 observations 2012 Oct. 6-Dec. 17, mean residual 0″.44.

Comet 260P/McNaught
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 12.52203 TT Sato

q	1.4971342	(2000.0)	P	Q
n	0.13944699	Peri. 15.69466	+0.98966685	-0.13828037
a	3.6829568	Node 351.96193	+0.08384945	+0.77267084
e	0.5934967	Incl. 15.73558	+0.11631339	+0.61956300
P	7.07			

From 3197 observations 2005 May 20-2013 Jan. 11, mean residual 0″.46.

Comet 160P/LINEAR
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 18.52892 TT Sato

q	2.0665355	(2000.0)	P	Q
n	0.12472948	Peri. 18.20099	+0.99099123	+0.06688590
a	3.9672537	Node 337.00174	-0.12552841	+0.76585346
e	0.4791018	Incl. 17.27595	+0.04667986	+0.63952698
P	7.90			

From 650 observations 1996 Sept. 8-2012 Dec. 12, mean residual 0″.66.

Comet C/2012 BJ98 (Lemmon)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 20.43325 TT Sato

q	2.1566784	(2000.0)	P	Q
n	0.01397943	Peri. 72.96591	-0.95548345	+0.29257081
a	17.0664419	Node 124.03062	-0.28517034	-0.88261037
e	0.8736305	Incl. 2.63692	-0.07569185	-0.36796909
P	70.50			

From 150 observations 2011 Dec. 29-2012 June 15, mean residual 0″.54.

Comet 158P/Kowal-LINEAR
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 27.48318 TT Sato

q	4.5764220	(2000.0)	P	Q
n	0.09607370	Peri. 232.84952	+0.97919806	-0.18019057
a	4.7213518	Node 137.30462	+0.20025579	+0.93228725
e	0.0306967	Incl. 7.90734	-0.03269217	+0.31364286
P	10.26			

From 446 observations 1979 July 25-2012 Dec. 8, mean residual 0″.74.

Comet 261P/Larson
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 29.13251 TT Sato

q	2.1868708	(2000.0)	P	Q
n	0.14534205	Peri. 58.82111	+0.99431313	+0.04430648
a	3.5826842	Node 298.48059	-0.08296582	+0.89239704
e	0.3895999	Incl. 6.32543	+0.06676887	+0.44907065
P	6.78			

From 479 observations 2005 July 3-2012 Dec. 24, mean residual 0″.66.

Comet P/2012 K3 (Gibbs)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 30.33730 TT Sato

q	2.0768597	(2000.0)	P	Q
n	0.14326574	Peri. 172.30293	+0.47516364	+0.86022035
a	3.6172164	Node 125.88049	-0.81896939	+0.50926520
e	0.4258404	Incl. 13.20163	-0.32172761	-0.02588269
P	6.88			

From 136 observations 2012 May 21-Sept. 9, mean residual 0″.56.

Comet 168P/Hergenrother
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Oct. 1.96458 TT Sato

q	1.4149774	(2000.0)	P	Q
n	0.14295839	Peri. 13.94932	+0.98244007	-0.18515507
a	3.6223990	Node 356.46879	+0.11412545	+0.69388146
e	0.6093811	Incl. 21.92910	+0.14760380	+0.69587795
P	6.89			

From 2846 observations 1998 Dec. 23-2013 Jan. 14, mean residual 0″.80.
Nongravitational parameters A1 = +2.78, A2 = +0.3673.

Comet P/2005 T2 (Christensen)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Oct. 7.19540 TT Sato
q 2.2091453 (2000.0) P Q
n 0.13192463 Peri. 58.65146 +0.74700816 +0.64925400
a 3.8216607 Node 260.45343 -0.64853979 +0.66436250
e 0.4219410 Incl. 8.33756 -0.14620177 +0.37025897
P 7.47
From 69 observations 2005 Oct. 7-Nov. 25, mean residual 0″.62.

Comet C/2012 T4 (McNaught)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Oct. 10.84815 TT Sato
q 1.9539724 (2000.0) P Q
z +0.0077701 Peri. 219.84735 +0.70282568 +0.58643094
+/-0.0013167 Node 99.43015 -0.50291767 +0.80994246
e 0.9848175 Incl. 24.09029 -0.50310027 +0.00958924
From 38 observations 2012 Oct. 13-Dec. 10, mean residual 0″.58.

Comet C/2011 R1 (McNaught)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Oct. 19.62372 TT Sato
q 2.0795754 (2000.0) P Q
z -0.0003296 Peri. 308.86185 -0.24323230 -0.76721590
+/-0.0000010 Node 221.40824 -0.33938253 -0.50586440
e 1.0006853 Incl. 116.19705 -0.90865700 +0.39431076
From 474 observations 2010 Oct. 11-2012 Dec. 23, mean residual 0″.52.

Comet P/2012 SB6 (Lemmon)
Epoch 2012 Nov. 9.0 TT = JDT 2456240.5
T 2012 Oct. 31.99816 TT Sato
q 2.4064433 (2000.0) P Q
n 0.12744663 Peri. 12.79508 +0.92553931 -0.37732652
a 3.9106638 Node 9.55690 +0.32844689 +0.75842384
e 0.3846458 Incl. 10.98941 +0.18841345 +0.53143012
P 7.73
From 169 observations 2012 Sept. 14-Dec. 11, mean residual 0″.57..

Comet C/2012 A2 (LINEAR)
Epoch 2012 Nov. 9.0 TT = JDT 2456240.5
T 2012 Nov. 5.09185 TT Sato
q 3.5374741 (2000.0) P Q
z +0.0010277 Peri. 101.66981 +0.08481800 +0.98342860
+/-0.0000004 Node 191.40413 +0.23708699 +0.13627289
e 0.9963644 Incl. 125.86865 +0.96777873 -0.11957379
From 1476 observations 2011 Apr. 2-2013 Jan. 14, mean residual 0″.50.

Comet C/2012 K5 (LINEAR)
Epoch 2012 Nov. 9.0 TT = JDT 2456240.5
T 2012 Nov. 28.68818 TT Sato
q 1.1417970 (2000.0) P Q
z +0.0013200 Peri. 139.29054 -0.15109471 -0.06527484
+/-0.0000012 Node 279.03905 +0.42304889 +0.89755417
e 0.9984929 Incl. 92.84788 +0.89342041 -0.43604553
From 3448 observations 2012 May 6-2013 Jan. 14, mean residual 0″.61.
Nongravitational parameters A1 = +1.10, A2 = -0.1978.

Comet P/2012 U2 (PANSTARRS)
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 3.74004 TT Sato
q 3.6287199 (2000.0) P Q
n 0.04937329 Peri. 229.44655 +0.55631630 -0.83068384
a 7.3588169 Node 186.85739 +0.80692922 +0.54630806
e 0.5068881 Incl. 10.53472 +0.19843741 +0.10729337
P 19.96
From 27 observations 2012 Oct. 20-Dec. 4, mean residual 0″.28.

Comet 262P/McNaught-Russell
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 4.47644 TT Sato
q 1.2798989 (2000.0) P Q
n 0.05399592 Peri. 171.19247 +0.86099789 -0.41122024
a 6.9325884 Node 218.01207 +0.43201631 +0.90185827
e 0.8153794 Incl. 29.07885 +0.26841113 -0.13247485
P 18.25
From 1085 observations 1994 Dec. 12-2013 Jan. 14, mean residual 0″.58.

Comet C/2012 J1 (Catalina)
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 7.24045 TT Sato
q 3.1587165 (2000.0) P Q
z -0.0004547 Peri. 147.27421 +0.84721844 -0.26315927
+/-0.0000003 Node 235.21710 +0.27903626 +0.95964390
e 1.0014363 Incl. 34.18605 +0.45206158 -0.09915033
From 3507 observations 2012 May 13-2013 Jan. 14, mean residual 0″.35.

Comet P/2013 AL76 (Catalina)
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 13.46884 TT Sato
q 2.0469512 (2000.0) P Q
n 0.06215404 Peri. 27.26055 -0.52625599 +0.78672110
a 6.3118471 Node 145.90958 +0.63680584 +0.11315325
e 0.6756970 Incl. 144.85093 +0.56350062 +0.60684945
P 15.86
From 37 observations 2013 Jan. 14-20, mean residual 0″.45.

Comet P/2006 F4 (Spacewatch)
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 14.17399 TT Sato
q 2.3421576 (2000.0) P Q
n 0.14855023 Peri. 31.02362 -0.81910982 +0.57343527
a 3.5309141 Node 184.06540 -0.56040172 -0.80558991
e 0.3366710 Incl. 12.38183 -0.12251128 -0.14898622
P 6.63
From 46 observations 2006 Mar. 26-May 31, mean residual 0″.68.

Comet 273P/Pons-Gambart
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 19.66892 TT Sato
q 0.8101544 (2000.0) P Q
z 0.0304620 Peri. 20.18840 +0.56431362 -0.69896351
+/-0.0000000 Node 320.43134 -0.81995082 -0.53646139
e 0.9753211 Incl. 136.39645 -0.09607700 +0.47292620
P 188.09
From 188 observations 1827 July 6-2013 Jan. 20, mean residual 0″.80.

Comet 275P/Hermann
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 27.28109 TT Sato
q 1.6437671 (2000.0) P Q
n 0.07148052 Peri. 173.98443 -0.95636994 -0.28340813
a 5.7501291 Node 348.75563 +0.25058440 -0.67082070
e 0.7141339 Incl. 21.34276 +0.15021314 -0.68533161
P 13.79
From 123 observations 1999 Feb. 20-2012 Dec. 29, mean residual 0″.77.

Comet C/2012 L1 (LINEAR)
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 25.41395 TT Sato
q 2.2624135 (2000.0) P Q
z +0.0012819 Peri. 140.28951 +0.00726465 -0.05699437
+/-0.0000009 Node 271.76646 +0.45250004 +0.89049606
e 0.9970998 Incl. 87.21953 +0.89173479 -0.45140715
From 865 observations 2012 June 1-2013 Jan. 14, mean residual 0″.58.

Comet C/2011 F1 (LINEAR)
Epoch 2013 Jan. 8.0 TT = JDT 2456300.5
T 2013 Jan. 8.01552 TT Sato
q 1.8191300 (2000.0) P Q
z -0.0000579 Peri. 192.55297 +0.03604789 +0.55369714
+/-0.0000003 Node 85.11503 -0.82945521 +0.48090984
e 1.0001052 Incl. 56.61276 -0.55740882 -0.67981263
From 4372 observations 2011 Mar. 17-2012 Oct. 27, mean residual 0″.51.

Comet 276P/Vorobjov
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 16.13859 TT Sato
q 3.9238627 (2000.0) P Q
n 0.07862446 Peri. 205.78750 +0.50633860 -0.85076331
a 5.3963190 Node 214.30738 +0.82809598 +0.52526016
e 0.2728631 Incl. 14.46555 +0.24057901 -0.01742264
P 12.54
From 136 observations 2000 Dec. 19-2012 Dec. 18, mean residual 0″.44.

Comet C/2012 Y1 (LINEAR)
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 17.99651 TT Sato
q 2.0165876 (2000.0) P Q
n 0.00426890 Peri. 268.69394 -0.19235799 -0.97787455
a 37.6350328 Node 193.28575 +0.98068840 -0.18854044
e 0.9464173 Incl. 20.96317 +0.03533649 -0.09063035
P 230.88
From 72 observations 2012 Dec. 18-2013 Jan. 13, mean residual 0″.55.

Comet P/2012 WA34 (Lemmon-PANSTARRS)
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 24.74320 TT Sato
q 3.1734280 (2000.0) P Q
n 0.09354946 Peri. 353.15866 +0.03976470 -0.99354305
a 4.8059052 Node 94.52360 +0.92173302 -0.00458418
e 0.3396815 Incl. 6.11884 +0.38578103 +0.11336310
P 10.54
From 24 observations 2011 Sept. 26-2013 Jan. 9, mean residual 0″.28.

Comet 259P/Garradd
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 25.43834 TT Sato
q 1.7977019 (2000.0) P Q
n 0.21877111 Peri. 256.55921 +0.59348885 +0.77538437
a 2.7277804 Node 51.96110 -0.59080875 +0.60175597
e 0.3409653 Incl. 15.89897 -0.54654919 +0.19149107
P 4.51
From 45 observations 2008 Sept. 2-2012 Apr. 15, mean residual 0″.64.

Comet 246P/NEAT
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 28.70987 TT Sato
q 2.8797621 (2000.0) P Q
n 0.12191754 Peri. 176.18917 -0.25681534 +0.92800701
a 4.0280228 Node 78.78041 -0.89382599 -0.12184455
e 0.2850681 Incl. 15.97179 -0.36758807 -0.35207513
P 8.08
From 2398 observations 2003 Jan. 24-2012 Sept. 14, mean residual 0″.56.

Comet 111P/Helin-Roman-Crockett
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 30.65912 TT Sato
q 3.7042767 (2000.0) P Q
n 0.11614603 Peri. 3.37889 -0.05519308 -0.99574908
a 4.1603812 Node 89.79425 +0.91434608 -0.08007584
e 0.1096305 Incl. 4.22882 +0.40115455 +0.04551506
P 8.49
From 116 observations 1989 Jan. 3-2001 Sept. 20, mean residual 0″.78.

Comet P/2000 R2 (LINEAR)
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Jan. 31.38466 TT Sato
q 1.4559492 (2000.0) P Q
n 0.16094914 Peri. 172.36941 +0.91032330 +0.41017742
a 3.3471636 Node 163.08310 -0.38908654 +0.89368332
e 0.5650200 Incl. 10.96968 -0.14114941 +0.18189172
P 6.12
From 54 observations 2000 Sept. 3-Nov. 29, mean residual 0″.64.

Comet C/2012 C1 (McNaught)
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Feb. 4.55463 TT Sato
q 4.8379489 (2000.0) P Q
z +0.0007445 Peri. 279.89356 +0.18024763 +0.48587228
+/-0.0000030 Node 300.63829 +0.30424590 -0.85438392
e 0.9963982 Incl. 96.27788 -0.93538507 -0.18427221
From 118 observations 2012 Feb. 5-Dec. 15, mean residual 0″.39.

Comet P/2013 A2 (Scotti)
Epoch 2013 Feb. 17.0 TT = JDT 2456340.5
T 2013 Feb. 8.18790 TT Sato
q 2.1787501 (2000.0) P Q
n 0.12296517 Peri. 134.90431 -0.65183019 -0.75835254
a 4.0051117 Node 355.76859 +0.67816440 -0.58032531
e 0.4560077 Incl. 3.37193 +0.33942665 -0.29685680
P 8.02
From 41 observations 2013 Jan. 6-22, mean residual 0″.43.

Comet P/2012 US27 (Siding Spring)
Epoch 2013 Feb. 17.0 TT = JDT 2456340.5
T 2013 Feb. 8.55331 TT Sato
q 1.8208412 (2000.0) P Q
n 0.08354123 Peri. 1.26778 +0.64020792 -0.60023118
a 5.1824542 Node 49.20675 +0.69912068 +0.19658648
e 0.6486527 Incl. 39.29202 +0.31837729 +0.77529110
P 11.80
From 145 observations 2012 Oct. 17-2013 Jan. 14, mean residual 0″.39.

Comet 133P/(7968) Elst-Pizarro
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Feb. 8.98112 TT Sato
q 2.6499747 (2000.0) P Q
n 0.17540298 Peri. 132.16265 +0.37972493 +0.92506294
a 3.1606621 Node 160.14943 -0.85573851 +0.35461553
e 0.1615761 Incl. 1.38681 -0.35145495 +0.13603819
P 5.62
From 535 observations 1979 July 24-2012 July 7, mean residual 0″.44.

Comet 125P/Spacewatch
Epoch 2013 Jan. 28.0 TT = JDT 2456320.5
T 2013 Feb. 16.98131 TT Sato
q 1.5254642 (2000.0) P Q
n 0.17815242 Peri. 87.22728 -0.48686833 +0.86996661
a 3.1280588 Node 153.18910 -0.85438039 -0.45569136
e 0.5123288 Incl. 9.98578 -0.18164080 -0.18842366
P 5.53
From 341 observations 1991 Sept. 8-2012 Dec. 8, mean residual 0″.65.
Nongravitational parameters A1 = +0.02, A2 = +0.0082.

Comet 120P/Mueller
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Feb. 22.45493 TT Sato
q 2.7290921 (2000.0) P Q
n 0.11749060 Peri. 30.11736 +0.82390910 -0.56659769
a 4.1285794 Node 4.45087 +0.48464416 +0.69357344
e 0.3389755 Incl. 8.79691 +0.29375813 +0.44488531
P 8.39
From 97 observations 1987 Oct. 18-2012 Oct. 19, mean residual 0″.74.

Comet 274P/Tombaugh-Tenagra
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Feb. 23.37262 TT Sato
q 2.4417771 (2000.0) P Q
n 0.10822123 Peri. 38.46781 -0.47407413 -0.83812707
a 4.3610835 Node 81.36162 +0.72514153 -0.54546318
e 0.4400985 Incl. 15.83718 +0.49942316 -0.00359685
P 9.11
From 251 observations 2003 Nov. 21-2013 Jan. 14, mean residual 0″.54.

Comet C/2012 T5 (Bressi)
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Feb. 24.05511 TT Sato
q 0.3227486 (2000.0) P Q
z -0.0010025 Peri. 318.10560 -0.63137306 -0.24687793
+/-0.0000272 Node 230.59228 -0.15523764 -0.88854621
e 1.0003235 Incl. 72.07219 -0.75978242 +0.38670004
From 553 observations 2012 Oct. 14-2013 Jan. 12, mean residual 0″.76.

Comet P/2007 T2 (Kowalski)
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Feb. 25.55426 TT Sato
q 0.6946803 (2000.0) P Q
n 0.18153684 Peri. 358.64786 +0.99895423 -0.04416929
a 3.0890590 Node 3.94229 +0.04339599 +0.83461683
e 0.7751159 Incl. 9.89287 +0.01439571 +0.54905722
P 5.43
From 118 observations 2007 Oct. 9-2008 Jan. 18, mean residual 0″.80.

Comet 272P/NEAT
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Feb. 27.17778 TT Sato
q 2.4167025 (2000.0) P Q
n 0.10533762 Peri. 27.89158 -0.71420876 -0.63571134
a 4.4403143 Node 109.50302 +0.57036130 -0.77113220
e 0.4557362 Incl. 18.10166 +0.40570167 -0.03501746
P 9.36
From 74 observations 2003 Dec. 1-2012 Dec. 20, mean residual 0″.57.

Comet 91P/Russell
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 1.17155 TT Sato
q 2.6168117 (2000.0) P Q
n 0.12796359 Peri. 354.64826 -0.45885451 +0.85947531
a 3.9001242 Node 247.87112 -0.80590462 -0.50935814
e 0.3290440 Incl. 14.07564 -0.37412602 +0.04308696
P 7.70
From 244 observations 1989 Jan. 1-2012 July 7, mean residual 0″.70.
Nongravitational parameters A1 = -1.69, A2 = +0.1328.

Comet C/2011 L4 (PANSTARRS)
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 10.16909 TT Sato
q 0.3015454 (2000.0) P Q
z -0.0001112 Peri. 333.65146 +0.41006435 +0.10047615
+/-0.0000011 Node 65.66585 +0.90783180 +0.05058946
e 1.0000335 Incl. 84.20739 -0.08768499 +0.99365248
From 1326 observations 2011 May 21-2013 Jan. 4, mean residual 0″.39.

Comet P/2006 S1 (Christensen)
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 16.99737 TT Sato
q 1.3596031 (2000.0) P Q
n 0.15084716 Peri. 128.29879 +0.94056130 +0.32004651
a 3.4949795 Node 213.47841 -0.33833750 +0.91208270
e 0.6109840 Incl. 11.88895 +0.02953276 +0.25627209
P 6.53
From 306 observations 2006 Aug. 23-Dec. 16, mean residual 0″.61.

Comet 256P/LINEAR
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 17.32852 TT Sato

q	2.6898999	(2000.0)	P	Q
n	0.09899256	Peri. 124.10989	-0.80874530	+0.36813475
a	4.6280817	Node 81.44681	-0.56146593	-0.71551227
e	0.4187873	Incl. 27.63655	+0.17517722	-0.59373310
P	9.96			

From 61 observations 2003 Jan. 27-2012 Feb. 19, mean residual 0″.68.

Comet P/2012 F6 (Lemmon)
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 24.51382 TT Sato

q	0.7312620	(2000.0)	P	Q
z	+0.0019872	Peri. 304.98620	+0.46125704	+0.76195136
	+/-0.0000076	Node 332.71464	-0.00392939	-0.51061439
e	0.9985468	Incl. 82.60745	-0.88725786	+0.39837554

From 270 observations 2012 Mar. 23-2013 Jan. 11, mean residual 0″.47.

Comet 197P/LINEAR
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 24.85081 TT Sato

q	1.0614592	(2000.0)	P	Q
n	0.20304132	Peri. 188.74083	-0.27022269	+0.87800156
a	2.8669037	Node 66.38994	-0.85523768	-0.03042126
e	0.6297541	Incl. 25.54240	-0.44220834	-0.47769007
P	4.85			

From 276 observations 2003 May 23-2008 Oct. 23, mean residual 0″.76.

Comet C/2012 X2 (PANSTARRS)
Epoch 2013 Mar. 9.0 TT = JDT 2456360.5
T 2013 Mar. 31.05753 TT Sato

q	4.7479990	(2000.0)	P	Q
n	0.01046212	Peri. 215.60281	-0.49634131	-0.66267049
a	20.7040922	Node 271.01873	+0.86788845	-0.36361140
e	0.7706734	Incl. 34.11829	+0.02037002	-0.65471717
P	94.21			

From 93 observations 2012 Dec. 12-2013 Jan. 13, mean residual 0″.39.

Coemt P/2012 F2 (PANSTARRS)
Epoch 2013 Apr. 18.0 TT = JDT 2456400.5
T 2013 Apr. 9.98594 TT Sato

q	2.8971989	(2000.0)	P	Q
n	0.06191313	Peri. 33.18107	-0.18136409	+0.96560979
a	6.3282096	Node 227.13625	-0.94852550	-0.22177374
e	0.5421772	Incl. 14.72379	-0.25962751	+0.13569868
P	15.92			

From 37 observations 2012 Mar. 16-July 6, mean residual 0″.49.

Comet 63P/Wild
Epoch 2013 Apr. 18.0 TT = JDT 2456400.5
T 2013 Apr. 10.77901 TT Sato

q	1.9504872	(2000.0)	P	Q
n	0.07470043	Peri. 169.00394	-0.97481931	-0.22268661
a	5.5836815	Node 358.01099	+0.17015660	-0.70875385
e	0.6506808	Incl. 19.78173	+0.14413201	-0.66938677
P	13.19			

From 149 observations 1960 June 21-2012 Dec. 20, mean residual 0″.73.
Nongravitational parameters A1 = +1.03, A2 = -0.11340.

Comet P/2012 T2 (PANSTARRS)
Epoch 2013 Apr. 18.0 TT = JDT 2456400.5
T 2013 Apr. 15.74565 TT Sato

q	4.8198554	(2000.0)	P	Q
n	0.07168964	Peri. 309.87414	+0.89856930	-0.38598007
a	5.7389414	Node 73.74854	+0.43875303	+0.78120053
e	0.1601490	Incl. 12.56096	+0.00830667	+0.49065784
P	13.75			

From 36 observations 2012 Oct. 10-Nov. 7, mean residual 0″.46.

Comet 76P/West-Kohoutek-Ikemura
Epoch 2013 Apr. 18.0 TT = JDT 2456400.5
T 2013 May 7.75836 TT Sato

q	1.6002756	(2000.0)	P	Q
n	0.15237519	Peri. 0.05867	+0.10151081	-0.85735228
a	3.4715750	Node 84.12326	+0.91253599	-0.12176669
e	0.5390347	Incl. 30.48331	+0.39619898	+0.50011993
P	6.47			

From 612 observations 1993 July 21-2013 Jan. 10, mean residual 0″.76.
Nongravitational parameters A1 = -0.17, A2 = -0.0238.

Comet C/2012 L2 (LINEAR)
Epoch 2013 May 8.0 TT = JDT 2456420.5
T 2013 May 9.32391 TT Sato

q	1.5086694	(2000.0)	P	Q
z	+0.0017446	Peri. 205.77586	-0.14642826	-0.29114704
	+/-0.0000020	Node 270.30099	+0.98903311	-0.06172916
e	0.9973680	Incl. 70.98246	-0.01929435	-0.95468472

From 1075 observations 2012 June 1-2013 Jan. 14, mean residual 0″.47.

Comet P/2012 TK8 (Tenagra)
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 May 10.38152 TT Sato

q	3.0902722	(2000.0)	P	Q
n	0.11493893	Peri. 128.19272	+0.52676310	-0.84372229
a	4.1894590	Node 289.71910	+0.74157495	+0.51550931
e	0.2623696	Incl. 6.29484	+0.41543620	+0.14960897
P	8.58			

From 47 observations 2012 Oct. 6-Nov. 7, mean residual 0″.40.

Comet 114P/Wiseman-Skiff
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 May 13.89956 TT Sato

q	1.5748648	(2000.0)	P	Q
n	0.14775065	Peri. 172.84611	+0.09996299	-0.94425365
a	3.5436416	Node 271.05473	+0.89664128	+0.22215058
e	0.5555801	Incl. 18.28409	+0.43132565	-0.24296946
P	6.67			

From 386 observations 1986 Dec. 28-2012 Oct. 19, mean residual 0″.89.
Nongravitational parameters A1 = +0.16, A2 = +0.0068.

Comet C/2010 S1 (LINEAR)
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 May 20.31092 TT Sato

q	5.8998165	(2000.0)	P	Q
z	-0.0003260	Peri. 118.61630	+0.53546690	-0.22398070
	+/-0.0000003	Node 93.43043	-0.69561841	-0.66375767
e	1.0019234	Incl. 125.33583	+0.47894700	-0.71362343

From 4561 observations 2010 Sept. 21-2012 Dec. 23, mean residual 0″.47.

Comet C/2012 K6 (McNaught)
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 May 21.49733 TT Sato

q	3.3530514	(2000.0)	P	Q
z	+0.0001558	Peri. 338.83365	-0.71569297	-0.62147355
	+/-0.0000125	Node 206.89851	-0.49561210	+0.13043378
e	0.9994776	Incl. 135.21945	-0.49208964	+0.77250091

From 74 observations 2012 May 27-Sept. 18, mean residual 0″.30.

Comet P/2010 A2 (LINEAR)
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 May 22.85548 TT Sato

q	2.0040482	(2000.0)	P	Q
n	0.28420677	Peri. 132.88415	-0.05637183	-0.99668865
a	2.2911126	Node 320.23433	+0.88724857	-0.02309451
e	0.1252948	Incl. 5.25639	+0.45783424	-0.07796402
P	3.47			

From 103 observations 2009 Dec. 10-2010 Apr. 17, mean residual 0″.92.

Comet 175P/Hergenrother
Epoch 2013 May 8.0 TT = JDT 2456420.5
T 2013 May 23.60069 TT Sato

q	1.9462510	(2000.0)	P	Q
n	0.15534704	Peri. 55.98570	-0.99609125	-0.00477168
a	3.4271575	Node 123.59081	-0.02576478	-0.93942139
e	0.4321093	Incl. 6.07801	+0.08448900	-0.34273121
P	6.34			

From 218 observations 2000 Jan. 4-2012 Dec. 17, mean residual 0″.73.

Comet 257P/Catalina
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 June 4.43062 TT Sato

q	2.1290402	(2000.0)	P	Q
n	0.13553703	Peri. 117.81280	+0.80036390	+0.57728341
a	3.7534509	Node 207.86750	-0.59471023	+0.79859597
e	0.4327779	Incl. 20.24481	+0.07574548	+0.17025962
P	7.27			

From 341 observations 2005 Apr. 17-2012 July 17, mean residual 0″.67.

Comet 277P/LINEAR
Epoch 2013 May 28.0 TT = JDT 2456440.5
T 2013 June 5.89881 TT Sato

q	1.9131808	(2000.0)	P	Q
n	0.12987808	Peri. 152.28948	+0.34444389	-0.89405961
a	3.8617025	Node 276.36160	+0.79921979	+0.43930036
e	0.5045758	Incl. 16.74773	+0.49255063	-0.08759337
P	7.59			

From 168 observations 2005 Sept. 15-2013 Jan. 18, mean residual 0″.67.

Comet 112P/Urata-Niijima
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 June 24.31037 TT Sato

q	1.4553106	(2000.0)	P	Q
n	0.14839572	Peri. 21.45003	+0.61354636	-0.75931225
a	3.5333647	Node 31.92697	+0.65168478	+0.33183258
e	0.5881233	Incl. 24.20300	+0.44594597	+0.55976070
P	6.64			

From 357 observations 1986 Oct. 4-2007 Mar. 23, mean residual 0″.65.
Nongravitational parameters A1 = +0.02, A2 = +0.0115.

Comet C/2012 S4 (PANSTARRS)
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 June 28.07450 TT Sato

q	4.3485688	(2000.0)	P	Q
z	+0.0000008	Peri. 163.62376	+0.97264688	+0.21130846
	+/-0.0000198	Node 173.10347	-0.04289575	-0.24477498
e	0.9999965	Incl. 126.54234	+0.22829369	-0.94627371

From 377 observations 2012 Sept. 28-Dec. 17, mean residual 0″.51.

Comet P/2003 U2 (LINEAR)
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 June 30.04652 TT Sato

q	1.6907847	(2000.0)	P	Q
n	0.10350880	Peri. 177.46393	+0.99729502	-0.05707547
a	4.4924634	Node 186.38723	+0.05795746	+0.99815805
e	0.6236397	Incl. 24.60245	+0.04520590	-0.02056436
P	9.52			

From 111 observations 2003 Sept. 19-2004 Jan. 5, mean residual 0″.77.

Comet C/2013 B2 (Catalina)
T 2013 June 30.66294 TT Sato

q	3.7455522	(2000.0)	P	Q
		Peri. 156.18342	-0.66893992	-0.66883176
		Node 331.89137	+0.52192919	-0.11197423
e	1.0	Incl. 43.50090	+0.52925354	-0.73493254

From 42 observations 2013 Jan. 16-23, mean residual 0″.37.

Comet 26P/Grigg-Skjellerup
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 6.01613 TT Sato
q 1.0858593 (2000.0) P Q
n 0.18804175 Peri. 2.15373 -0.83338060 +0.51539665
a 3.0174021 Node 211.55252 -0.51262359 -0.85579899
e 0.6401344 Incl. 22.42379 -0.20662487 +0.04443407
P 5.24
From 421 observations 1972 Jan. 26-2012 Dec. 14, mean residual 0″.63.
Nongravitational parameters A1 = +0.03 A2 = -0.0048.

Comet 271P/van Houten-Lemmon
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 5.80314 TT Sato
q 4.2495501 (2000.0) P Q
n 0.05342761 Peri. 35.13200 +0.71128949 -0.70261833
a 6.9816633 Node 9.58385 +0.61449581 +0.60785896
e 0.3913270 Incl. 6.85371 +0.34126553 +0.36991211
P 18.45
From 48 observations 1960 Sept. 24-2012 Nov. 13, mean residual 0″.40.

Comet 270P/Gehrels
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 7.99787 TT Sato
q 3.6016745 (2000.0) P Q
n 0.05485916 Peri. 210.94087 +0.23856882 -0.97048039
a 6.8596707 Node 225.28380 +0.90086717 +0.23477256
e 0.4749494 Incl. 2.85499 +0.36266136 +0.05522363
P 17.97
From 167 observations 1997 Feb. 1-2012 Nov. 4, mean residual 0″.67.

Comet 46P/Wirtanen
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 9.34113 TT Sato
q 1.0520977 (2000.0) P Q
n 0.18154032 Peri. 356.34303 +0.19795253 -0.95920075
a 3.0890195 Node 82.16221 +0.90441735 +0.09932585
e 0.6594072 Incl. 11.75731 +0.37794717 +0.26470417
P 5.43
From 1474 observations 1999 May 17-2008 June 23, mean residual 0″.78.
Nongravitational parameters A1 = -1.54, A2 = -0.7798.

Comet C/2012 V1 (PANSTARRS)
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 21.52972 TT Sato
q 2.0894281 (2000.0) P Q
z +0.0001576 Peri. 123.33498 +0.72695292 -0.57464104
+/-0.0002160 Node 85.37626 -0.68511686 -0.64394959
e 0.9996707 Incl. 157.84197 +0.04641491 -0.50509068
From 75 observations 2012 Nov. 3-Dec. 11, mean residual 0″.37.

Comet 178P/Hug-Bell
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 23.05619 TT Sato
q 1.9336931 (2000.0) P Q
n 0.14022732 Peri. 296.96105 +0.74414459 -0.64187057
a 3.6692809 Node 103.57541 +0.66029139 +0.66472941
e 0.4730049 Incl. 10.97551 +0.10131197 +0.38227867
P 7.03
From 279 observations 1999 Oct. 10-2007 Apr. 9, mean residual 0″.74.

Comet P/2012 B1 (PANSTARRS)
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 23.07642 TT Sato
q 3.8253460 (2000.0) P Q
n 0.05958116 Peri. 162.16864 -0.94746276 +0.31011316
a 6.4922729 Node 36.19743 -0.30725965 -0.81425252
e 0.4107848 Incl. 7.62721 -0.08891470 -0.49073686
P 16.54
From 284 observations 1997 June 1-2012 Dec. 12, mean residual 0″.58.

Comet 84P/Giclas
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 23.22313 TT Sato
q 1.8395309 (2000.0) P Q
n 0.14204710 Peri. 276.48114 +0.86834581 -0.48189437
a 3.6378753 Node 112.38318 +0.49022721 +0.79812274
e 0.4943392 Incl. 7.28648 +0.07518541 +0.36163229
P 6.94
From 637 observations 1978 Sept. 11-2007 Mar. 17, mean residual 0".71.
Nongravitational parameters A1 = -0.01, A2 = -0.0046.

Comet 184P/Lovas
Epoch 2013 July 7.0 TT = JDT 2456480.5
T 2013 July 28.47411 TT Sato
q 1.3940225 (2000.0) P Q
n 0.14908771 Peri. 78.07595 +0.99696822 +0.07303793
a 3.5224229 Node 277.73124 -0.07766190 +0.91279195
e 0.6042433 Incl. 1.55152 -0.00479627 +0.40184117
P 6.61
From 56 observations 1986 Dec. 2-2007 Jan. 20, mean residual 0".71.

Comet 278P/McNaught
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Aug. 2.48399 TT Sato
q 2.0977400 (2000.0) P Q
n 0.13840198 Peri. 237.98852 -0.28571136 +0.95781100
a 3.7014725 Node 15.50212 -0.83532006 -0.23300539
e 0.4332688 Incl. 6.68174 -0.46969076 -0.16824561
P 7.12
From 102 observations 2006 May 22-2013 Jan. 20, mean residual 0".52.

Comet 98P/Takamizawa
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Aug. 5.36212 TT Sato
q 1.6735661 (2000.0) P Q
n 0.13256647 Peri. 157.89099 +0.05168254 +0.98473772
a 3.8093154 Node 114.74043 -0.94147017 +0.10355267
e 0.5606649 Incl. 10.54399 -0.33311085 -0.13988736
P 7.43
From 195 observations 1984 July 6-2006 Sept. 25, mean residual 0".94.
Nongravitational parameters A1 = +0.60, A2 = +0.0734.

Comet C/2012 V2 (LINEAR)
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Aug. 16.49252 TT Sato
q 1.4549094 (2000.0) P Q
z 0.0016474 Peri. 217.31236 -0.12441238 -0.38816476
+/-0.0000188 Node 262.16392 +0.97455202 -0.22075347
e 0.9976032 Incl. 67.18489 -0.18646696 -0.89476032
From 505 observations 2012 Oct. 30-2013 Jan. 14, mean residual 0".52.

Comet 79P/du Toit-Hartley
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Aug. 23.30968 TT Sato
q 1.1237848 (2000.0) P Q
n 0.19494816 Peri. 281.70657 -0.92358512 +0.37958045
a 2.9457098 Node 280.61974 -0.32690966 -0.85318413
e 0.6185012 Incl. 3.14581 -0.20030129 -0.35776461
P 5.06
From 190 observations 1982 Feb. 18-2008 July 14, mean residual 0".81.
Nongravitational parameters A1 = +0.42, A2 = +0.0132.

Comet C/2012 S3 (PANSTARRS)
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Aug. 31.09773 TT Sato
q 2.3081832 (2000.0) P Q
z -0.0004259 Peri. 183.74375 +0.49678173 -0.36610713
+/-0.0000275 Node 121.30719 -0.77042635 +0.23139087
e 1.0009831 Incl. 112.93086 -0.39956369 -0.90134557
From 142 observations 2012 Sept. 27-Dec. 17, mean residual 0".53.

Comet 266P/Christensen
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Aug. 31.62887 TT Sato

		(2000.0)	P	Q
q	2.3279918			
n	0.14841601	Peri.	98.01190	-0.22585737	-0.97414616
a	3.5330426	Node	5.05058	+0.86857033	-0.20382028
e	0.3410802	Incl.	3.42790	+0.44110546	-0.09745025
P	6.64			

From 379 observations 2006 Oct. 27-2012 Dec. 10, mean residual 0″.71.

Comet 102P/Shoemaker
Epoch 2013 Aug. 16.0 TT = JDT 2456520.5
T 2013 Sept. 1.04591 TT Sato

		(2000.0)	P	Q
q	1.9684750			
n	0.13657904	Peri.	18.78880	+0.98828445	-0.00997706
a	3.7343357	Node	339.85673	-0.10695165	+0.66660287
e	0.4728714	Incl.	26.24746	+0.10888154	+0.74534627
P	7.22			

From 51 observations 1992 Dec. 2-2006 Nov. 30, mean residual 0″.87.
Nongravitational parameters A1 = -0.13, A2 = -0.9568.

Comet 121P/Shoemaker-Holt
Epoch 2013 Sept. 5.0 TT = JDT 2456540.5
T 2013 Sept. 8.63372 TT Sato

		(2000.0)	P	Q
q	3.7549716			
n	0.09914028	Peri.	12.56908	-0.27563752	-0.89766953
a	4.6234832	Node	94.22561	+0.84940668	-0.39490532
e	0.1878479	Incl.	20.16708	+0.45003584	+0.19554846
P	9.94			

From 504 observations 1989 Mar. 4-2012 Dec. 9, mean residual 0″.63.

Comet P/2007 C1 (Christensen)
Epoch 2013 Nov. 24.0 TT = JDT 2456620.5
T 2013 Nov. 16.17706 TT Sato

		(2000.0)	P	Q
q	2.1945262			
n	0.14501831	Peri.	100.56881	-0.88710925	-0.44844386
a	3.5880142	Node	52.87569	+0.35146143	-0.80973463
e	0.3883730	Incl.	7.87536	+0.29918564	-0.37845466
P	6.80			

From 133 observations 2007 Feb. 9-Apr. 12, mean residual 0″.51.

Comet 2P/Encke
Epoch 2013 Nov. 4.0 TT = JDT 2456600.5
T 2013 Nov. 21.69417 TT Sato

		(2000.0)	P	Q
q	0.3361272			
n	0.29903222	Peri.	186.53562	-0.94510542	-0.31479130
a	2.2147467	Node	334.57307	+0.30828506	-0.77005307
e	0.8482322	Incl.	11.77897	+0.10833315	-0.55490964
P	3.30			

From 1627 observations 1993 July 22-2012 Oct. 13, mean residual 0″.61.
Nongravitational parameters A1 = +0.00, A2 = +0.0017.

Comet P/2005 L1 (McNaught)
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Nov. 24.58773 TT Sato

		(2000.0)	P	Q
q	3.1594228			
n	0.12382608	Peri.	149.76544	+0.31254953	+0.94567041
a	3.9865264	Node	138.26380	-0.89624434	+0.32481908
e	0.2074747	Incl.	7.73137	-0.31473620	+0.01414384
P	7.96			

From 249 observations 2005 May 16-Sept. 15, mean residual 0″.50.

Comet C/2012 S1 (ISON)
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Nov. 28.78084 TT Sato

		(2000.0)	P	Q
q	0.0124442			
z	-0.0001366	Peri.	345.56466	0.31512988	-0.51247837
+/-	0.0000091	Node	295.65399	-0.75894914	0.36926249
e	1.0000017	Incl.	62.39176	-0.56981519	-0.77524907

From 1452 observations 2011 Dec. 28-2013 Jan. 14, mean residual 0″.43.

Comet C/2012 A1 (PANSTARRS)
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Dec. 2.20942 TT Sato

q	7.6026057	(2000.0)	P	Q
z	-0.0002189	Peri.	191.93401	-0.03048567	+0.52640944
+/-	0.0000028	Node	277.97149	+0.97306586	+0.20996600
e	1.0016644	Incl.	120.91004	+0.22850265	-0.82389768

From 162 observations 2012 Jan. 2-Dec. 21, mean residual 0″.53.

Comet P/2004 H2 (Larsen)
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Dec. 11.59599 TT Sato

q	2.6361033	(2000.0)	P	Q
n	0.10237009	Peri.	104.60199	-0.54236551	+0.82613189
a	4.5257163	Node	131.50736	-0.82776531	-0.49436093
e	0.4175279	Incl.	11.77281	-0.14368104	-0.27039484
P	9.63				

From 67 observations 2004 Apr. 19-July 9, mean residual 0″.69.

Comet 154P/Brewington
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Dec. 12.23888 TT Sato

q	1.6078498	(2000.0)	P	Q
n	0.09142634	Peri.	49.03360	+0.83281326	-0.54667449
a	4.8800224	Node	343.49535	+0.36945831	+0.66597417
e	0.6705241	Incl.	17.83273	+0.41221673	+0.50756813
P	10.78				

From 307 observations 1992 Aug. 29-2003 Mar. 21, mean residual 0″.84.

Comet P/2003 S1 (NEAT)
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Dec. 16.14247 TT Sato

q	2.5909248	(2000.0)	P	Q
n	0.10149654	Peri.	176.07342	+0.54262219	-0.83505460
a	4.5516467	Node	241.04219	+0.76780937	+0.53693305
e	0.4307720	Incl.	5.95667	+0.34063165	+0.11994461
P	9.71				

From 332 observations 2003 July 29-2005 Feb. 17, mean residual 0″.66.

Comet 87P/Bus
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Dec. 19.53541 TT Sato

q	2.1017672	(2000.0)	P	Q
n	0.15455407	Peri.	24.70919	-0.89409301	+0.44787881
a	3.4388699	Node	181.90047	-0.41809925	-0.83583987
e	0.3888204	Incl.	2.60070	-0.16059485	-0.31745281
P	6.38				

From 260 observations 1987 Jan. 29-2007 May 20, mean residual 0″.78.
Nongravitational parameters A1 = +2.01, A2 = -0.3396.

Comet C/2011 J2 (LINEAR)
Epoch 2013 Dec. 14.0 TT = JDT 2456640.5
T 2013 Dec. 25.29416 TT Sato

q	3.4432722	(2000.0)	P	Q
z	-0.0001471	Peri.	85.29601	+0.07047632	+0.97005427
+/-	0.0000012	Node	163.94719	+0.16357673	-0.24110271
e	1.0005066	Incl.	122.79903	+0.98401003	-0.02939712

From 573 observations 2011 Mar. 10-2012 Dec. 23, mean residual 0″.54.

Comet P/2006 XG16 (Spacewatch)
Epoch 2014 Jan. 23.0 TT = JDT 2456680.5
T 2014 Jan. 10.16360 TT Sato

q	2.1117559	(2000.0)	P	Q
n	0.14198072	Peri.	41.14326	-0.48559243	-0.86045041
a	3.6390091	Node	78.43704	+0.75515706	-0.50183304
e	0.4196893	Incl.	9.06479	+0.44038371	-0.08825358
P	6.94				

From 81 observations 2006 Nov. 15-2007 Apr. 14, mean residual 0″.46.

Comet P/1998 Y2 (Li)
Epoch 2014 Jan. 23.0 TT = JDT 2456680.5
T 2014 Feb. 3.96121 TT Sato
q 2.5223454 (2000.0) P Q
n 0.06509303 Peri. 319.05413 +0.57212634 -0.70905529
a 6.1203987 Node 91.86431 +0.81796471 +0.45649783
e 0.5878789 Incl. 24.35708 +0.06004320 +0.53744797
P 15.14
From 141 observations 1998 Sept. 23-1999 Apr. 8, mean residual 0″.69.

Comet 107P/(4015) Wilson-Harrington
Epoch 2014 Jan. 23.0 TT = JDT 2456680.5
T 2014 Feb. 5.27340 TT Sato
q 0.9941034 (2000.0) P Q
n 0.22974645 Peri. 91.44377 +0.99829792 -0.03226385
a 2.6402001 Node 270.40683 +0.01030157 +0.91749065
e 0.6234742 Incl. 2.78476 +0.05740328 +0.39644666
P 4.29
From 796 observations 1949 Nov. 21-2011 Feb. 26, mean residual 0″.49.

Comet 129P/Shoemaker-Levy
Epoch 2014 Jan. 23.0 TT = JDT 2456680.5
T 2014 Feb. 11.54098 TT Sato
q 3.9136775 (2000.0) P Q
n 0.11089645 Peri. 309.49805 -0.70025703 -0.71387200
a 4.2906619 Node 184.95922 +0.67200854 -0.65670701
e 0.0878616 Incl. 3.43735 +0.24092451 -0.24315154
P 8.89
From 97 observations 2006 Jan. 1-2012 Dec. 18, mean residual 0″.68.

Comet 169P/NEAT
Epoch 2014 Mar. 4.0 TT = JDT 2456720.5
T 2014 Feb. 15.27153 TT Sato
q 0.6078936 (2000.0) P Q
n 0.23428697 Peri. 218.07222 +0.82640851 -0.56291464
a 2.6059773 Node 176.11383 +0.55261719 +0.80632042
e 0.7667310 Incl. 11.29079 +0.10799633 +0.18158881
P 4.21
From 1053 observations 1989 Mar. 7-2012 May 21, mean residual 0″.46.

Comet C/2012 X1 (LINEAR)
Epoch 2014 Feb. 12.0 TT = JDT 2456700.5
T 2014 Feb. 21.43709 TT Sato
q 1.5983271 (2000.0) P Q
z +0.0059558 Peri. 132.09010 -0.22394435 +0.73224306
+/-0.0004052 Node 113.15887 -0.96327055 -0.26663923
e 0.9904807 Incl. 44.39024 +0.14818491 -0.62667665
From 86 observations 2012 Dec. 8-2013 Jan. 11, mean residual 0″.50.

Comet P/2007 H3 (Garradd)
Epoch 2014 Mar. 4.0 TT = JDT 2456720.5
T 2014 Mar. 1.23693 TT Sato
q 1.8307267 (2000.0) P Q
n 0.15036505 Peri. 350.02808 -0.26419227 +0.86663375
a 3.5024460 Node 263.67719 -0.85296060 -0.41478530
e 0.4773005 Incl. 25.20445 -0.45017848 +0.27730687
P 6.55
From 76 observations 2007 Mar. 28-Sept. 23, mean residual 0″.52.

Comet P/2008 A2 (LINEAR)
Epoch 2014 Mar. 4.0 TT = JDT 2456720.5
T 2014 Mar. 3.40065 TT Sato
q 1.2999176 (2000.0) P Q
n 0.17180646 Peri. 235.37288 -0.95976680 +0.16122991
a 3.2046189 Node 312.69085 -0.00063898 -0.81997818
e 0.5943613 Incl. 18.22656 -0.28079759 -0.54921827
P 5.74
From 146 observations 2008 Jan. 13-Mar. 6, mean residual 0″.54.

Comet 52P/Harrington-Abell
Epoch 2014 Mar. 4.0 TT = JDT 2456720.5
T 2014 Mar. 7.54977 TT Sato
q 1.7731247 (2000.0) P Q
n 0.12996727 Peri. 139.61450 -0.44973700 -0.89042807
a 3.8599356 Node 336.85283 +0.76685335 -0.34488004
e 0.5406336 Incl. 10.23059 +0.45790018 -0.29697746
P 7.58
From 418 observations 1975 Oct. 7-2007 Mar. 14, mean residual 0″.71.
Nongravitational parameters A1 = +0.29, A2 = +0.0155.

Comet P/1998 U3 (Jager)
Epoch 2014 Mar. 4.0 TT = JDT 2456720.5
T 2014 Mar. 14.43959 TT Sato
q 2.1562468 (2000.0) P Q
n 0.06481408 Peri. 180.72769 -0.56081894 -0.78181175
a 6.1379474 Node 303.42497 +0.76125857 -0.35752029
e 0.6487023 Incl. 19.05602 +0.32552651 -0.51083229
P 15.21
From 788 observations 1998 Oct. 24-1999 May 11, mean residual 0″.64.

Comet 17P/Holmes
Epoch 2014 Apr. 13.0 TT = JDT 2456760.5
T 2014 Mar. 27.48481 TT Sato
q 2.0565454 (2000.0) P Q
n 0.14310983 Peri. 24.51392 +0.97593030 +0.12419655
a 3.6198430 Node 326.76498 -0.21060844 +0.75009287
e 0.4318689 Incl. 19.09151 +0.05660504 +0.64956594
P 6.89
From 3574 observations 1964 July 16-2012 Aug. 7, mean residual 0″.63.
Nongravitational parameters A1 = -0.15, A2 = -0.1704.

Comet 117P/Helin-Roman-Alu
Epoch 2014 Apr. 13.0 TT = JDT 2456760.5
T 2014 Mar. 27.17635 TT Sato
q 3.0563467 (2000.0) P Q
n 0.11888496 Peri. 222.68426 +0.19408655 +0.97240220
a 4.0962342 Node 58.89725 -0.85432803 +0.23241812
e 0.2538643 Incl. 8.69739 -0.48213486 -0.02039083
P 8.29
From 1935 observations 2003 Nov. 30-2012 June 29, mean residual 0″.70.

Comet 119P/Parker-Hartley
Epoch 2014 Apr. 13.0 TT = JDT 2456760.5
T 2014 Apr. 2.61689 TT Sato
q 3.0265016 (2000.0) P Q
n 0.11139431 Peri. 181.30659 +0.41624815 -0.90559437
a 4.2778680 Node 244.10078 +0.83504077 +0.41618961
e 0.2925210 Incl. 5.19577 +0.35978381 +0.08176213
P 8.85
From 652 observations 1986 Sept. 29-2012 Sept. 24, mean residual 0″.71.
Nongravitational parameters A1 = -13.01, A2 = +5.4015.

Comet 124P/Mrkos
Epoch 2014 Apr. 13.0 TT = JDT 2456760.5
T 2014 Apr. 9.61162 TT Sato
q 1.6453263 (2000.0) P Q
n 0.16319143 Peri. 183.71017 -0.99747882 +0.07086388
a 3.3164323 Node 0.41468 -0.04377013 -0.57237611
e 0.5038867 Incl. 31.52903 -0.05585865 -0.81692344
P 6.04
From 595 observations 1991 Mar. 15-2012 Sept. 13, mean residual 0″.60.

Comet 156P/Russell-LINEAR
Epoch 2014 Apr. 13.0 TT = JDT 2456760.5
T 2014 Apr. 16.56145 TT Sato
q 1.5848632 (2000.0) P Q
n 0.14466619 Peri. 357.80576 +0.79929790 -0.55796119
a 3.5938340 Node 38.98151 +0.55660905 +0.54741714
e 0.5590049 Incl. 20.77828 +0.22651543 +0.62370970
P 6.81
From 74 observations 1986 Sept. 3-2008 Apr. 2, mean residual 0″.55.

Comet 191P/McNaught
Epoch 2014 May 23.0 TT = JDT 2456800.5
T 2014 May 6.21110 TT Sato

q	2.0441689	(2000.0)	P	Q
n	0.14870434	Peri. 274.47487	+0.92314529	-0.35558991
a	3.5284742	Node 106.40830	+0.38444960	+0.85271974
e	0.4206649	Incl. 8.76317	+0.00113258	+0.38265501
P	6.63			

From 491 observations 2000 Aug. 5-2008 Apr. 7, mean residual 0″.68.

Comet 209P/LINEAR
Epoch 2014 May 23.0 TT = JDT 2456800.5
T 2014 May 6.32392 TT Sato

q	0.9694574	(2000.0)	P	Q
n	0.19344640	Peri. 152.39307	-0.78895531	+0.52311621
a	2.9609355	Node 62.82453	-0.60908001	-0.59660420
e	0.6725841	Incl. 21.24339	-0.08106206	-0.60861553
P	5.09			

From 612 observations 2003 Dec. 3-2009 Aug. 15, mean residual 0″.50.

Comet 134P/Kowal-Vavrova
Epoch 2014 May 23.0 TT = JDT 2456800.5
T 2014 May 21.47173 TT Sato

q	2.5713419	(2000.0)	P	Q
n	0.06336324	Peri. 18.58270	-0.75842302	+0.65113676
a	6.2312875	Node 202.12229	-0.60718150	-0.72179337
e	0.5873498	Incl. 4.34884	-0.23690747	-0.23459594
P	15.55			

From 67 observations 1983 May 8-2000 July 31, mean residual 0″.55.

Comet 4P/Faye
Epoch 2014 May 23.0 TT = JDT 2456800.5
T 2014 May 29.63363 TT Sato

q	1.6550353	(2000.0)	P	Q
n	0.13121121	Peri. 205.06644	+0.71693230	-0.69520649
a	3.8355010	Node 199.27467	+0.66319546	+0.70308552
e	0.5684957	Incl. 9.05001	+0.21489502	+0.14952821
P	7.51			

From 3187 observations 1984 Nov. 20-2008 Apr. 29, mean residual 0″.54.
Nongravitational parameters A1 = +0.43, A2 = +0.1050.

Comet C/2012 U1 (PANSTARRS)
Epoch 2014 July 2.0 TT = JDT 2456840.5
T 2014 July 5.01109 TT Sato

q	5.2734152	(2000.0)	P	Q
z	+0.0005478	Peri. 69.94637	+0.06947670	-0.92322868
	+/-0.0002406	Node 26.99088	+0.25689303	-0.34949890
e	0.9971111	Incl. 56.37663	+0.96393929	+0.15968507

From 35 observations 2012 Oct. 17-2013 Jan. 7, mean residual 0″.31.

Comet C/2012 K8 (Lemmon)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 19.25937 TT Sato

q	6.4644158	(2000.0)	P	Q
z	-0.0002648	Peri. 75.83254	-0.03110972	-0.70872195
	+/-0.0000277	Node 312.80861	-0.70305819	+0.51672863
e	1.0017096	Incl. 106.11482	+0.71045152	+0.48031730

From 107 observations 2012 May 30-Oct. 7, mean residual 0″.56.

Comet P/2011 S1 (Gibbs)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 26.27762 TT Sato

q	6.8951786	(2000.0)	P	Q
n	0.03879491	Peri. 193.47996	+0.61060046	-0.79139423
a	8.6421045	Node 218.89869	+0.73085677	+0.57739687
e	0.2021413	Incl. 2.68024	+0.30498435	+0.20076859
P	25.41			

From 76 observations 2011 Sept. 6-2012 Nov. 18, mean residual 0″.50.

Comet C/2012 K1 (PANSTARRS)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 27.61705 TT Sato
q 1.0544226 (2000.0) P Q
z -0.0002286 Peri. 203.10828 -0.47150619 +0.78072270
+/-0.0000164 Node 317.73866 +0.87392432 +0.47592412
e 1.0002411 Incl. 142.42848 +0.11806010 -0.40493000
From 415 observations 2012 May 14-2013 Jan. 18, mean residual 0″.54.

Comet P/2008 J2 (Beshore)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 30.30983 TT Sato
q 2.3459322 (2000.0) P Q
n 0.15419079 Peri. 132.16423 -0.63261791 +0.75382034
a 3.4442693 Node 97.70657 -0.75287113 -0.54480774
e 0.3188883 Incl. 10.32553 -0.18160301 -0.36734101
P 6.39
From 479 observations 2008 May 6-Aug. 3, mean residual 0″.56.

Comet P/2001 BB50 (LINEAR-NEAT)
Epoch 2014 Sept. 20.0 TT = JDT 2456920.5
T 2014 Sept. 3.67601 TT Sato
q 2.3625959 (2000.0) P Q
n 0.07195369 Peri. 193.47867 -0.99610472 +0.08375568
a 5.7248927 Node 351.18594 -0.05447752 -0.83043759
e 0.5873117 Incl. 10.36732 -0.06933669 -0.55077981
P 13.70
From 96 observations 2001 Jan. 21-June 18, mean residual 0″.56.

Comet P/2011 S1 (Gibbs)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 26.27757 TT Sato
q 6.8951787 (2000.0) P Q
n 0.03879492 Peri. 193.47996 +0.61060051 -0.79139420
a 8.6421045 Node 218.89869 +0.73085673 +0.57739691
e 0.2021412 Incl. 2.68024 +0.30498434 +0.20076861
P 25.41
From 76 observations 2011 Sept. 6-2012 Nov. 18, mean residual 0″.50.

Comet 32P/Comas Sola
Epoch 2014 Oct. 10.0 TT = JDT 2456940.5
T 2014 Oct. 17.58906 TT Sato
q 2.0011951 (2000.0) P Q
n 0.10291485 Peri. 53.33810 -0.35118561 -0.92476059
a 4.5097315 Node 57.85067 +0.79429800 -0.37713843
e 0.5562496 Incl. 9.96985 +0.49574121 -0.05083764
P 9.58
From 1426 observations 1988 Apr. 12-2006 May 30, mean residual 0″.69.
Nongravitational parameters A1 = -1.04, A2 = -0.9082.

Comet C/2013 A1 (Siding Spring)
Epoch 2014 Oct. 25.0 TT = JDT 2456955.5
T 2014 Oct. 24.93637 TT Sato
q 1.3952464 (2000.0) P Q
z -0.0004677 Peri. 2.46567 +0.49026352 -0.56149978
+/-0.0001522 Node 300.92835 -0.81236349 -0.57147913
e 1.0006526 Incl. 129.00436 -0.31576454 +0.59843931
From 105 observations 2012 Dec. 8-2013 Jan. 21, mean residual 0″.35.

Comet 269P/Jedicke
Epoch 2014 Oct. 30.0 TT = JDT 2456960.5
T 2014 Nov. 14.61038 TT Sato
q 4.0793197 (2000.0) P Q
n 0.04971064 Peri. 223.36959 -0.37175917 -0.92212652
a 7.3254862 Node 248.71671 +0.88004557 -0.31333464
e 0.4431333 Incl. 6.60225 +0.29549098 -0.22694511
P 19.83
From 338 observations 1993 Oct. 12-2012 Nov. 12, mean residual 0″.59.

Comet 110P/Hartley
Epoch 2014 Dec. 9.0 TT = JDT 2457000.5
T 2014 Dec. 17.78892 TT Sato

q	2.4753693	(2000.0)	P	Q
n	0.14362299	Peri. 167.74974	-0.09941901	-0.97613608
a	3.6112155	Node 287.71449	+0.89497751	-0.00292072
e	0.3145329	Incl. 11.69344	+0.43489207	-0.21714010
P	6.86			

From 1232 observations 1988 Feb. 19-2009 Apr. 29, mean residual 0".69.
Nongravitational parameters A1 = -0.63, A2 = -0.3594.

Comet 44P/Reinmuth
Epoch 2015 Mar. 19.0 TT = JDT 2457100.5
T 2015 Mar. 24.15108 TT Sato

q	2.1186296	(2000.0)	P	Q
n	0.13880667	Peri. 58.28141	+0.96046012	+0.26041073
a	3.6942745	Node 286.46585	-0.27729378	+0.86295969
e	0.4265100	Incl. 5.89549	-0.02499038	+0.43299749
P	7.10			

From 732 observations 1987 Apr. 11-2010 Feb. 7, mean residual 0".75.
Nongravitational parameters A1 = +0.17, A2 = +0.0523.

Comet C/2012 F3 (PANSTARRS)
Epoch 2015 Apr. 8.0 TT = JDT 2457120.5
T 2015 Apr. 2.36023 TT Sato

q	3.4921206	(2000.0)	P	Q
z	-0.0007561	Peri. 103.37938	-0.02959111	+0.99823426
	+/-0.0003197	Node 164.64292	-0.97576153	-0.01767076
e	1.0026403	Incl. 11.21431	-0.21682667	-0.05671079

From 21 observations 2012 Jan. 19-Apr. 10, mean residual 0".36.

Comet 174P/(60558) Echeclus
Epoch 2015 Apr. 8.0 TT = JDT 2457120.5
T 2015 Apr. 22.52998 TT Sato

q	5.8170598	(2000.0)	P	Q
n	0.02822877	Peri. 162.93327	+0.91553927	+0.40213253
a	10.6825453	Node 173.33522	-0.37731554	+0.86619963
e	0.4554613	Incl. 4.34372	-0.13935861	+0.29662708
P	34.92			

From 349 observations 1979 Sept. 23-2012 Aug. 19, mean residual 0".48.

Comet 162P/Siding Spring
Epoch 2015 June 27.0 TT = JDT 2457200.5
T 2015 July 11.99114 TT Sato

q	1.2373503	(2000.0)	P	Q
n	0.18446983	Peri. 356.40945	+0.88228036	-0.40400461
a	3.0562285	Node 31.21293	+0.44266263	+0.53753832
e	0.5951382	Incl. 27.78633	+0.16009733	+0.74015730
P	5.34			

From 1410 observations 1990 Mar. 23-2012 Apr. 21, mean residual 0".43.

Comet 10P/Tempel
Epoch 2015 Nov. 14.0 TT = JDT 2457340.5
T 2015 Nov. 14.25668 TT Sato

q	1.4176465	(2000.0)	P	Q
n	0.18374465	Peri. 195.54606	+0.68126480	+0.70844652
a	3.0642645	Node 117.80528	-0.64745510	+0.70063633
e	0.5373616	Incl. 12.02886	-0.34158478	+0.08492505
P	5.36			

From 2761 observations 1951 June 1-2012 Jan. 22, mean residual 0".69.
Nongravitational parameters A1 = +0.06, A2 = -0.0023.

Comet C/2011 KP36 (Spacewatch)
Epoch 2016 May 12.0 TT = JDT 2457520.5
T 2016 May 27.94006 TT Sato

q	4.8851364	(2000.0)	P	Q
n	0.00417909	Peri. 180.60901	+0.99448291	+0.09801973
a	38.1722687	Node 173.40603	-0.09481481	+0.99230739
e	0.8720239	Incl. 18.98719	-0.04487653	+0.07561869
P	235.84			

From 130 observations 2011 May 21-2012 Aug. 26, mean residual 0".37.

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Comet 172P/Yeung
Epoch 2017 Mar. 28.0 TT = JDT 2457840.5
T 2017 Mar. 13.09257 TT                                    Sato
q   3.3369160           (2000.0)            P               Q
n   0.11414356     Peri.  209.12670     -0.50454159     +0.85757144
a   4.2088983      Node    30.88978     -0.74961740     -0.37761333
e   0.2071759      Incl.   11.23726     -0.42838248     -0.34925550
P   8.63
From 358 observations 1993 Oct. 20-2012 Nov. 20, mean residual 0".56.

Comet C/2010 U3 (Boattini)
Epoch 2019 Feb. 26.0 TT = JDT 2458540.5
T 2019 Feb. 26.88212 TT                                    Sato
q   8.4456807           (2000.0)            P               Q
z  +0.0002108      Peri.   88.09022     -0.36209619     -0.74302679
 +/-0.0000097      Node    43.06773     +0.07250666     -0.62444458
e   0.9982200      Incl.   55.51228     +0.92931649     -0.24079071
From 152 observations 2010 Oct. 31-2012 Dec. 10, mean residual 0".68.

Comet 29P/Schwassmann-Wachmann
Epoch 2019 Feb. 26.0 TT = JDT 2458540.5
T 2019 Mar. 7.81985 TT                                     Sato
q   5.7668178           (2000.0)            P               Q
n   0.06663118     Peri.   47.77793     +0.99270083     -0.00965187
a   6.0258418      Node   312.39581     -0.05127949     +0.86841974
e   0.0429855      Incl.    9.36847     +0.10915802     +0.49573582
P  14.79
From 17759 observations 1902 Mar. 5-2012 Aug. 15, mean residual 0".68.
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References:

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Comet 213P/Van Ness
Epoch 2011 June 8.0 TT = JDT 2455720.5
T 2011 June 16.25145 TT                                    Sato
q   2.1225439           (2000.0)            P               Q
n   0.15574022     Peri.    3.32791     +0.71866533     +0.68296310
a   3.4213870      Node   312.67253     -0.64201120     +0.57950905
e   0.3796247      Incl.   10.23933     -0.26709880     +0.44466917
P   6.33
From 2972 observations 2005 Aug. 4-2012 Feb. 3, mean residual 0".52.
   Nongravitational parameters A1 = +1.37, A2 = -1.5591.

Comet 189P/NEAT
Epoch 2012 July 12.0 TT = JDT 2456120.5
T 2012 July 20.42804 TT                                    Sato
q   1.1772262           (2000.0)            P               Q
n   0.19755613     Peri.   15.35497     +0.44567898     +0.82796151
a   2.9197278      Node   282.15324     -0.85362907     +0.27855808
e   0.5968028      Incl.   20.37546     -0.26960650     +0.48670846
P   4.99
From 1308 observations 2002 July 30-2012 Oct. 15, mean residual 0".68.
   Nongravitational parameters A1 = -0.11, A2 = -0.0105.

Comet P/2012 O3 (McNaught)
Epoch 2012 Aug. 21.0 TT = JDT 2456160.5
T 2012 Aug. 16.07192 TT                                    Sato
q   1.5994442           (2000.0)            P               Q
n   0.10140605     Peri.  343.64990     +0.77777449     +0.61867033
a   4.5543543      Node   336.99639     -0.54019806     +0.56769745
e   0.6488099      Incl.   16.49660     -0.32132991     +0.54310830
P   9.72
From 299 observations 2012 July 23-Dec. 12, mean residual 0".53.

Comet C/2012 CH17 (MOSS)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 28.21541 TT                                   Sato
q   1.2961402           (2000.0)            P               Q
z  -0.0000184      Peri.  137.99184     -0.04274085     +0.92534820
 +/-0.0000062      Node   125.98109     -0.99486299     -0.00478767
e   1.0000239      Incl.   27.74368     -0.09176519     -0.37908811
From 596 observations 2012 Feb. 2-July 21, mean residual 0".66.
```

Comet P/2012 K3 (Gibbs)
Epoch 2012 Sept. 30.0 TT = JDT 2456200.5
T 2012 Sept. 30.33730 TT Sato

q	2.0768597	(2000.0)	P	Q
n	0.14326574	Peri. 172.30293	+0.47516364	+0.86022035
a	3.6172164	Node 125.88049	-0.81896939	+0.50926520
e	0.4258404	Incl. 13.20163	-0.32172761	-0.02588269
P	6.88			

From 136 observations 2012 May 21-Sept. 9, mean residual 0″.56.

Comet P/1999 RO28 (LONEOS)
Epoch 2012 Dec. 19.0 TT = JDT 2456280.5
T 2012 Dec. 21.14083 TT Sato

q	1.2194371	(2000.0)	P	Q
n	0.14959253	Peri. 220.08331	+0.98581232	-0.15025692
a	3.5144938	Node 148.32108	+0.16545810	+0.94489247
e	0.6530263	Incl. 8.19007	-0.02824353	+0.29086265
P	6.59			

From 108 observations 1999 Sept. 7-Nov. 13, mean residual 0″.72.

Comet 83D/Russell
Epoch 2013 Nov. 4.0 TT = JDT 2456600.5
T 2013 Nov. 6.81770 TT Sato

q	2.1393985	(2000.0)	P	Q
n	0.13093278	Peri. 334.15886	-0.92134262	+0.31936341
a	3.8409365	Node 226.36905	-0.28188802	-0.94148465
e	0.4430008	Incl. 17.83340	-0.26770677	-0.10776671
P	7.53			

From 15 observations 1979 June 24-1985 June 17, mean residual 0″.61.

Comet P/2005 L4 (Christensen)
Epoch 2014 Jan. 3.0 TT = JDT 2456660.5
T 2014 Jan. 6.33488 TT Sato

q	2.3760492	(2000.0)	P	Q
n	0.11772135	Peri. 24.86785	+0.60900856	+0.74053721
a	4.1231826	Node 283.95299	-0.76786308	+0.46071700
e	0.4237342	Incl. 17.02196	-0.19873317	+0.48922846
P	8.37			

From 102 observations 2005 June 3-2006 Jan. 7, mean residual 0″.47.

Comet P/2007 R2 (Gibbs)
Epoch 2014 Jan. 3.0 TT = JDT 2456660.5
T 2014 Jan. 14.74172 TT Sato

q	1.4667458	(2000.0)	P	Q
n	0.15456159	Peri. 353.21109	+0.99939634	-0.03453326
a	3.4387585	Node 8.77061	+0.03293098	+0.90681757
e	0.5734665	Incl. 1.42700	+0.01106869	+0.42010635
P	6.38			

From 161 observations 2007 Sept. 10-Dec. 1, mean residual 0″.71.

Comet P/2001 Q11 (NEAT)
Epoch 2014 May 3.0 TT = JDT 2456780.5
T 2014 Apr. 23.09182 TT Sato

q	1.9543753	(2000.0)	P	Q
n	0.15385492	Peri. 207.39501	+0.97530971	+0.10342947
a	3.4492801	Node 144.91934	-0.08108301	+0.98954854
e	0.4333962	Incl. 19.84677	-0.20541791	+0.10047903
P	6.41			

From 21 observations 2001 Aug. 18-Dec. 13, mean residual 0″.48.

Comet 75D/Kohoutek
Epoch 2014 July 2.0 TT = JDT 2456840.5
T 2014 July 3.34808 TT Sato

q	1.7848972	(2000.0)	P	Q
n	0.14790721	Peri. 175.67048	+0.08215905	-0.99129365
a	3.5411405	Node 269.59381	+0.91126265	+0.11652501
e	0.4959541	Incl. 5.90588	+0.40354712	-0.06130918
P	6.66			

From 55 observations 1980 Sept. 16-1988 May 19, mean residual 0″.88.
Nongravitational parameters A1 = +2.94, A2 = -1.0403.

72D/Denning-Fujikawa
Epoch 2014 July 2.0 TT = JDT 2456840.5
T 2014 July 11.41981 TT Sato
q 0.7841901 (2000.0) P Q
n 0.10923031 Peri. 337.84064 +0.96763863 -0.23421112
a 4.3341832 Node 36.11588 +0.24876163 +0.82292687
e 0.8190685 Incl. 9.16859 +0.04234545 +0.51762584
P 9.02
From 28 observations 1881-1978, mean residual 1″.83. Nongravitational parameters A1 = -0.03, A2 = +0.0238.
From Muraoka's orbit (CHB 2005).

Comet P/2003 O3 (LINEAR)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 July 24.69346 TT Sato
q 1.2531831 (2000.0) P Q
n 0.17970917 Peri. 0.74774 +0.95213651 +0.30216712
a 3.1099678 Node 341.46184 -0.28119797 +0.80663907
e 0.5970431 Incl. 8.34878 -0.11984896 +0.50796500
P 5.48
From 260 observations 2003 July 30-Dec. 15, mean residual 0″.64.

Comet P/2008 Q2 (Ory)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 24.55388 TT Sato
q 1.3817597 (2000.0) P Q
n 0.16882890 Peri. 329.72099 +0.86200737 -0.50516169
a 3.2421880 Node 60.67885 +0.47417289 +0.77438908
e 0.5738187 Incl. 2.75398 +0.17917410 +0.38096354
P 5.84
From 1016 observations 2008 Aug. 27-2009 Mar. 24, mean residual 0″.50.

Comet 2003 WY25 = ? D/1819 W1 (Blanpain)
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 27.69828 TT Sato
q 0.9609057 (2000.0) P Q
n 0.18531536 Peri. 9.84981 +0.19525878 -0.97604927
a 3.0469250 Node 68.93975 +0.89268287 +0.13636412
e 0.6846310 Incl. 5.89999 +0.40619121 +0.16950706
P 5.32
From 254 observations 2003 Oct. 25-2004 Mar. 20, mean residual 0″.61.

Comet ? D/1819 W1 (Blanpain) = ? 2003 WY25 [Orbit 3]
Epoch 2014 Aug. 11.0 TT = JDT 2456880.5
T 2014 Aug. 28.10421 TT Sato
q 0.9608629 (2000.0) P Q
n 0.18530009 Peri. 9.85121 +0.19525587 -0.97604990
a 3.0470924 Node 68.93853 +0.89268236 +0.13636128
e 0.6846624 Incl. 5.90001 +0.40619373 +0.16950572
P 5.32
From 282 observations 1819-2004, weighting mean residual 1″.01.
Nongravitational parameters A1 = +0.08, A2 = -0.0193.
From Muraoka's orbit (CHB 2009).

Comet P/2007 H1 (McNaught) [Orbit 1]
Epoch 2014 Sept. 20.0 TT = JDT 2456920.5
T 2014 Sept. 2.69747 TT Sato
q 2.2894874 (2000.0) P Q
n 0.13997489 Peri. 202.85985 +0.97012503 +0.21085981
a 3.6736910 Node 144.29326 -0.17841342 +0.95520338
e 0.3767882 Incl. 11.86320 -0.16439612 +0.20766475
P 7.04
From 1065 observations 2006 Apr. 25-2009 Jan. 31, mean residual 0″.59.

Comet P/2007 H1 (McNaught) [Orbit 2]
Epoch 2014 Sept. 20.0 TT = JDT 2456920.5
T 2014 Sept. 2.71529 TT Sato
q 2.2894920 (2000.0) P Q
n 0.13997405 Peri. 202.86066 +0.97012811 +0.21084563
a 3.6737058 Node 144.29328 -0.17839948 +0.95520601
e 0.3767895 Incl. 11.86321 -0.16439307 +0.20766702
P 7.04
From 1062 observations 2007 Apr. 17-2008 Feb. 8, mean residual 0″.57.

Comet P/2000 QJ46 (LINEAR)
Epoch 2014 Dec. 9.0 TT = JDT 2457000.5
T 2014 Dec. 21.27903 TT Sato

q	1.8891010	(2000.0)	P	Q
n	0.07053418	Peri. 222.15576	+0.93747388	-0.34686219
a	5.8014468	Node 158.08936	+0.33638209	+0.88167604
e	0.6743741	Incl. 4.42615	+0.08938574	+0.31989684

P 13.97
From 25 observations 2000 Aug. 24-Nov. 19, mean residual 0″.66.

Comet P/2006 R2 (Christensen)
Epoch 2015 Jan. 18.0 TT = JDT 2457040.5
T 2014 Dec. 29.20895 TT Sato

q	3.0542448	(2000.0)	P	Q
n	0.11534005	Peri. 189.09112	+0.84525826	+0.50170577
a	4.1797403	Node 139.05757	-0.47093162	+0.86206416
e	0.2692740	Incl. 16.30071	-0.25251115	+0.07167076

P 8.55
From 131 observations 2006 Aug. 30-2007 Jan. 8, mean residual 0″.68.

Comet 95P/(2060) Chiron

Epoch = 2013 July 7.0 TT
T = 1996 Jan. 31.60731 TT
Peri. = 339.31971 e = 0.3806362
Node = 209.34553 2000.0 a = 13.6503204 AU
Incl. = 6.93055 n = 0.01954294
q = 8.4545143 AU P = 50.43 years

H = 5.8 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	22 24.12	-04 25.2	18.024	17.390	+0.20	+0.9	18.5	48.7
Jan. 18	22 26.08	-04 16.4	18.152	17.400	+0.21	+1.0	18.5	39.1
Jan. 28	22 28.22	-04 06.1	18.259	17.409	+0.23	+1.2	18.5	29.6
Feb. 7	22 30.50	-03 54.4	18.341	17.419	+0.24	+1.3	18.5	20.3
Feb. 17	22 32.88	-03 41.6	18.396	17.429	+0.24	+1.4	18.4	11.4
Feb. 27	22 35.28	-03 28.0	18.424	17.438	+0.24	+1.4	18.4	5.1
Mar. 9	22 37.68	-03 13.9	18.425	17.448	+0.23	+1.4	18.4	10.0
Mar. 19	22 40.01	-02 59.6	18.398	17.457	+0.22	+1.4	18.5	18.6
Mar. 29	22 42.24	-02 45.5	18.344	17.466	+0.21	+1.4	18.5	27.7
Apr. 8	22 44.31	-02 31.8	18.267	17.476	+0.19	+1.3	18.6	36.9
Apr. 18	22 46.19	-02 18.9	18.167	17.485	+0.16	+1.2	18.6	46.1
Apr. 28	22 47.83	-02 07.0	18.048	17.495	+0.14	+1.1	18.6	55.3
May 8	22 49.21	-01 56.4	17.914	17.504	+0.11	+0.9	18.6	64.6
May 18	22 50.29	-01 47.3	17.767	17.513	+0.08	+0.7	18.6	73.9
May 28	22 51.05	-01 40.1	17.613	17.522	+0.04	+0.5	18.6	83.2
June 7	22 51.47	-01 34.7	17.456	17.531	+0.01	+0.3	18.6	92.6
June 17	22 51.56	-01 31.5	17.300	17.541	-0.03	+0.1	18.5	102.1
June 27	22 51.30	-01 30.5	17.149	17.550	-0.06	-0.1	18.5	111.6
July 7	22 50.71	-01 31.6	17.010	17.559	-0.09	-0.3	18.5	121.3
July 17	22 49.82	-01 35.0	16.885	17.568	-0.12	-0.5	18.4	131.0
July 27	22 48.65	-01 40.4	16.779	17.577	-0.14	-0.7	18.4	140.7
Aug. 6	22 47.25	-01 47.7	16.696	17.586	-0.16	-0.9	18.3	150.5
Aug. 16	22 45.67	-01 56.5	16.639	17.595	-0.17	-1.0	18.3	160.3
Aug. 26	22 43.98	-02 06.7	16.609	17.604	-0.17	-1.1	18.2	169.5
Sept. 5	22 42.24	-02 17.7	16.609	17.613	-0.17	-1.1	18.2	174.4
Sept. 15	22 40.53	-02 29.2	16.639	17.622	-0.16	-1.1	18.3	167.4
Sept. 25	22 38.91	-02 40.7	16.698	17.630	-0.15	-1.1	18.3	157.7
Oct. 5	22 37.46	-02 51.8	16.786	17.639	-0.12	-1.0	18.4	147.7
Oct. 15	22 36.23	-03 01.9	16.899	17.648	-0.10	-0.9	18.4	137.6
Oct. 25	22 35.28	-03 10.8	17.034	17.657	-0.06	-0.7	18.5	127.5
Nov. 4	22 34.64	-03 18.1	17.187	17.665	-0.03	-0.5	18.5	117.4
Nov. 14	22 34.35	-03 23.6	17.355	17.674	+0.01	-0.3	18.5	107.3
Nov. 24	22 34.42	-03 27.0	17.531	17.683	+0.04	-0.1	18.6	97.2
Dec. 4	22 34.85	-03 28.2	17.711	17.691	+0.08	+0.1	18.6	87.2
Dec. 14	22 35.64	-03 27.2	17.890	17.700	+0.11	+0.3	18.6	77.3
Dec. 24	22 36.75	-03 24.0	18.062	17.709	+0.14	+0.5	18.6	67.5
Jan. 3	22 38.17	-03 18.7	18.223	17.717	+0.17	+0.7	18.6	57.7
Jan. 13	22 39.86	-03 11.4	18.369	17.726	+0.19	+0.9	18.6	48.0
Jan. 23	22 41.77	-03 02.3	18.495	17.734	+0.21	+1.1	18.6	38.4
Feb. 2	22 43.87	-02 51.7	18.599	17.742	+0.22	+1.2	18.6	28.9
Feb. 12	22 46.10	-02 39.8	18.678	17.751	+0.23	+1.3	18.6	19.5
Feb. 22	22 48.41	-02 26.9	18.730	17.759	+0.23	+1.4	18.5	10.6
Mar. 4	22 50.76	-02 13.2	18.755	17.767	+0.23	+1.4	18.5	4.7
Mar. 14	22 53.09	-01 59.1	18.752	17.776	+0.23	+1.4	18.5	10.4
Mar. 24	22 55.36	-01 45.0	18.722	17.784	+0.22	+1.4	18.6	19.2
Apr. 3	22 57.52	-01 31.0	18.666	17.792	+0.20	+1.3	18.6	28.3

Comet C/2005 L3 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2008 Jan. 15.49544 TT
Peri. = 47.09605
Node = 288.84460 2000.0
Incl. = 139.39775
q = 5.5826844 AU
e = 0.9998041

m1 = 2.8 + 5 log(Delta) + 10.0 log(r(t-400))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	09 59.82	+36 55.9	12.291	13.080	-0.42	+2.1	18.7	142.0
Jan. 18	09 55.61	+37 17.2	12.271	13.131	-0.46	+1.9	18.7	149.9
Jan. 28	09 51.03	+37 36.0	12.279	13.182	-0.48	+1.5	18.7	155.4
Feb. 7	09 46.24	+37 51.5	12.319	13.232	-0.49	+1.1	18.7	156.9
Feb. 17	09 41.39	+38 02.8	12.391	13.283	-0.47	+0.7	18.8	153.6
Feb. 27	09 36.65	+38 09.7	12.492	13.334	-0.45	+0.2	18.8	147.0
Mar. 9	09 32.17	+38 11.9	12.622	13.385	-0.41	-0.2	18.9	138.7
Mar. 19	09 28.09	+38 09.6	12.777	13.436	-0.36	-0.7	18.9	129.7
Mar. 29	09 24.53	+38 03.0	12.953	13.486	-0.30	-1.0	18.9	120.4
Apr. 8	09 21.54	+37 52.6	13.146	13.537	-0.23	-1.4	19.0	111.0
Apr. 18	09 19.20	+37 39.0	13.350	13.588	-0.17	-1.6	19.1	101.6
Apr. 28	09 17.49	+37 22.8	13.561	13.638	-0.11	-1.8	19.1	92.3
May 8	09 16.43	+37 04.5	13.774	13.689	-0.05	-2.0	19.2	83.1
May 18	09 15.97	+36 44.9	13.984	13.739	+0.01	-2.1	19.2	74.0
May 28	09 16.07	+36 24.3	14.185	13.790	+0.06	-2.1	19.3	65.1
June 7	09 16.67	+36 03.3	14.376	13.840	+0.10	-2.1	19.3	56.4
June 17	09 17.72	+35 42.3	14.551	13.891	+0.14	-2.1	19.4	48.0
June 27	09 19.14	+35 21.7	14.707	13.941	+0.17	-2.0	19.4	39.8
July 7	09 20.86	+35 01.8	14.842	13.992	+0.20	-1.9	19.4	32.1
July 17	09 22.82	+34 42.9	14.954	14.042	+0.21	-1.8	19.5	25.3
July 27	09 24.93	+34 25.4	15.042	14.093	+0.22	-1.6	19.5	20.1
Aug. 6	09 27.15	+34 09.5	15.103	14.143	+0.22	-1.4	19.5	18.2
Aug. 16	09 29.38	+33 55.5	15.138	14.193	+0.22	-1.2	19.5	20.3
Aug. 26	09 31.57	+33 43.6	15.148	14.243	+0.21	-1.0	19.6	25.6
Sept. 5	09 33.65	+33 34.0	15.132	14.294	+0.19	-0.7	19.6	32.7
Sept.15	09 35.54	+33 27.1	15.093	14.344	+0.16	-0.4	19.6	40.6
Sept.25	09 37.19	+33 22.9	15.032	14.394	+0.13	-0.1	19.6	49.0
Oct. 5	09 38.52	+33 21.7	14.952	14.444	+0.10	+0.2	19.6	57.8
Oct. 15	09 39.48	+33 23.4	14.856	14.494	+0.05	+0.5	19.6	66.9
Oct. 25	09 40.00	+33 28.2	14.749	14.544	0.00	+0.8	19.6	76.2
Nov. 4	09 40.04	+33 35.9	14.634	14.594	-0.05	+1.0	19.6	85.7
Nov. 14	09 39.54	+33 46.3	14.518	14.644	-0.10	+1.3	19.6	95.4
Nov. 24	09 38.50	+33 59.0	14.404	14.694	-0.16	+1.5	19.6	105.2
Dec. 4	09 36.88	+34 13.7	14.299	14.744	-0.22	+1.6	19.6	115.1
Dec. 14	09 34.70	+34 29.7	14.208	14.794	-0.27	+1.7	19.6	125.0
Dec. 24	09 31.99	+34 46.4	14.135	14.844	-0.32	+1.6	19.6	134.8
Jan. 3	09 28.81	+35 02.9	14.085	14.894	-0.36	+1.6	19.6	144.2
Jan. 13	09 25.24	+35 18.4	14.063	14.944	-0.39	+1.4	19.7	152.7
Jan. 23	09 21.39	+35 32.2	14.070	14.994	-0.40	+1.1	19.7	159.1
Feb. 2	09 17.38	+35 43.5	14.109	15.043	-0.40	+0.8	19.7	160.9
Feb. 12	09 13.34	+35 51.9	14.179	15.093	-0.39	+0.5	19.7	157.1
Feb. 22	09 09.41	+35 57.0	14.280	15.143	-0.37	+0.2	19.8	149.8
Mar. 4	09 05.71	+35 58.7	14.409	15.192	-0.34	-0.2	19.8	141.0
Mar. 14	09 02.36	+35 56.9	14.564	15.242	-0.29	-0.5	19.8	131.6
Mar. 24	08 59.44	+35 52.0	14.740	15.292	-0.24	-0.8	19.9	122.0
Apr. 3	08 57.01	+35 44.2	14.933	15.341	-0.19	-1.0	19.9	112.3

Comet P/2010 TO20 (LINEAR-Grauer)

Epoch = 2013 July 7.0 TT
T = 2009 Feb. 17.10988 TT
Peri. = 269.37557 e = 0.0657156
Node = 43.82707 2000.0 a = 5.7394768 AU
Incl. = 2.50107 n = 0.07167961
q = 5.3623036 AU P = 13.75 years

m1 = 3.0 + 5 log(Delta) + 17.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	03 27.69	+19 45.7	5.197	5.840	-0.10	-0.3	20.0	126.8
Jan. 18	03 26.70	+19 42.7	5.340	5.845	+0.02	+0.1	20.1	116.4
Jan. 28	03 26.95	+19 43.9	5.496	5.849	+0.14	+0.5	20.1	106.3
Feb. 7	03 28.38	+19 49.2	5.659	5.853	+0.26	+0.9	20.2	96.5
Feb. 17	03 30.96	+19 58.5	5.826	5.858	+0.36	+1.3	20.3	87.0
Feb. 27	03 34.60	+20 11.2	5.991	5.862	+0.46	+1.6	20.3	77.8
Mar. 9	03 39.17	+20 26.8	6.150	5.867	+0.54	+1.8	20.4	68.9
Mar. 19	03 44.60	+20 44.7	6.301	5.871	+0.62	+2.0	20.4	60.2
Mar. 29	03 50.75	+21 04.3	6.440	5.875	+0.68	+2.1	20.5	51.8
Apr. 8	03 57.53	+21 24.8	6.564	5.880	+0.73	+2.1	20.5	43.6
Apr. 18	04 04.84	+21 45.9	6.672	5.884	+0.77	+2.1	20.6	35.5
Apr. 28	04 12.57	+22 06.9	6.762	5.888	+0.81	+2.1	20.6	27.6
May 8	04 20.63	+22 27.5	6.832	5.892	+0.83	+2.0	20.7	19.8
May 18	04 28.94	+22 47.2	6.882	5.896	+0.85	+1.9	20.7	12.1
May 28	04 37.40	+23 05.7	6.910	5.901	+0.85	+1.7	20.7	4.5
June 7	04 45.93	+23 22.8	6.918	5.905	+0.85	+1.6	20.7	3.3
June 17	04 54.45	+23 38.4	6.904	5.909	+0.84	+1.4	20.7	10.8
June 27	05 02.86	+23 52.3	6.869	5.913	+0.82	+1.2	20.7	18.4
July 7	05 11.09	+24 04.6	6.814	5.917	+0.79	+1.1	20.7	26.0
July 17	05 19.03	+24 15.1	6.739	5.921	+0.76	+0.9	20.7	33.8
July 27	05 26.59	+24 24.1	6.646	5.925	+0.71	+0.8	20.6	41.6
Aug. 6	05 33.68	+24 31.7	6.537	5.929	+0.65	+0.6	20.6	49.5
Aug. 16	05 40.19	+24 38.1	6.413	5.933	+0.58	+0.5	20.6	57.6
Aug. 26	05 46.00	+24 43.5	6.277	5.937	+0.50	+0.5	20.5	65.9
Sept. 5	05 51.01	+24 48.2	6.131	5.941	+0.41	+0.4	20.5	74.5
Sept.15	05 55.09	+24 52.5	5.978	5.944	+0.31	+0.4	20.4	83.3
Sept.25	05 58.14	+24 56.6	5.823	5.948	+0.19	+0.4	20.4	92.3
Oct. 5	06 00.07	+25 00.6	5.668	5.952	+0.07	+0.4	20.3	101.7
Oct. 15	06 00.78	+25 04.7	5.519	5.956	-0.05	+0.4	20.3	111.4
Oct. 25	06 00.24	+25 08.9	5.380	5.960	-0.18	+0.4	20.2	121.5
Nov. 4	05 58.45	+25 12.9	5.255	5.963	-0.30	+0.4	20.2	131.9
Nov. 14	05 55.48	+25 16.4	5.151	5.967	-0.40	+0.3	20.1	142.6
Nov. 24	05 51.49	+25 19.2	5.070	5.970	-0.48	+0.2	20.1	153.5
Dec. 4	05 46.72	+25 20.8	5.018	5.974	-0.52	0.0	20.1	164.7
Dec. 14	05 41.47	+25 21.0	4.996	5.978	-0.54	-0.1	20.1	175.7
Dec. 24	05 36.11	+25 19.7	5.005	5.981	-0.51	-0.3	20.1	172.2
Jan. 3	05 31.01	+25 17.2	5.046	5.985	-0.45	-0.3	20.1	161.0
Jan. 13	05 26.51	+25 13.7	5.117	5.988	-0.36	-0.4	20.1	149.8
Jan. 23	05 22.90	+25 10.0	5.215	5.991	-0.25	-0.4	20.2	138.9
Feb. 2	05 20.39	+25 06.4	5.336	5.995	-0.13	-0.3	20.2	128.2
Feb. 12	05 19.10	+25 03.6	5.475	5.998	0.00	-0.2	20.3	117.7
Feb. 22	05 19.08	+25 01.7	5.627	6.001	+0.12	-0.1	20.4	107.6
Mar. 4	05 20.30	+25 01.0	5.788	6.004	+0.24	0.0	20.4	97.9
Mar. 14	05 22.71	+25 01.2	5.952	6.008	+0.35	+0.1	20.5	88.4
Mar. 24	05 26.22	+25 02.4	6.116	6.011	+0.45	+0.2	20.6	79.3
Apr. 3	05 30.72	+25 04.1	6.275	6.014	+0.54	+0.2	20.6	70.4

Comet C/2006 W3 (Christensen)

Epoch = 2013 July 7.0 TT
T = 2009 July 7.08938 TT
Peri. = 133.56160
Node = 113.66541 2000.0
Incl. = 127.09214
q = 3.1237298 AU
e = 1.0003941

m1 = 4.0 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	14 48.56	-64 14.7	11.174	10.718	+0.09	-4.3	19.5	60.1
Jan. 18	14 49.42	-64 57.3	11.140	10.781	-0.05	-4.3	19.6	66.2
Jan. 28	14 48.94	-65 40.5	11.095	10.843	-0.20	-4.3	19.6	72.7
Feb. 7	14 46.94	-66 23.0	11.043	10.905	-0.37	-4.0	19.6	79.4
Feb. 17	14 43.25	-67 03.5	10.987	10.968	-0.55	-3.7	19.6	86.3
Feb. 27	14 37.79	-67 40.2	10.930	11.030	-0.72	-3.1	19.6	93.2
Mar. 9	14 30.55	-68 11.3	10.878	11.092	-0.89	-2.4	19.6	99.9
Mar. 19	14 21.65	-68 35.2	10.833	11.154	-1.03	-1.5	19.6	106.3
Mar. 29	14 11.38	-68 50.0	10.798	11.215	-1.12	-0.5	19.7	112.3
Apr. 8	14 00.16	-68 54.7	10.779	11.277	-1.16	+0.6	19.7	117.6
Apr. 18	13 48.53	-68 48.4	10.776	11.339	-1.14	+1.7	19.7	121.9
Apr. 28	13 37.08	-68 31.2	10.792	11.400	-1.07	+2.7	19.7	125.1
May 8	13 26.36	-68 04.1	10.828	11.461	-0.96	+3.6	19.8	126.8
May 18	13 16.81	-67 28.4	10.885	11.523	-0.81	+4.2	19.8	127.0
May 28	13 08.72	-66 46.1	10.964	11.584	-0.65	+4.7	19.8	125.7
June 7	13 02.22	-65 59.3	11.062	11.645	-0.49	+4.9	19.9	122.9
June 17	12 57.35	-65 10.3	11.179	11.706	-0.33	+4.9	19.9	119.0
June 27	12 54.04	-64 21.1	11.313	11.767	-0.19	+4.8	20.0	114.2
July 7	12 52.15	-63 33.3	11.461	11.828	-0.06	+4.5	20.0	108.8
July 17	12 51.56	-62 48.7	11.620	11.888	+0.05	+4.0	20.1	102.9
July 27	12 52.08	-62 08.2	11.787	11.949	+0.15	+3.5	20.1	96.7
Aug. 6	12 53.56	-61 32.8	11.958	12.009	+0.23	+3.0	20.2	90.4
Aug. 16	12 55.86	-61 03.2	12.131	12.070	+0.30	+2.4	20.2	84.1
Aug. 26	12 58.82	-60 39.6	12.302	12.130	+0.35	+1.7	20.3	77.9
Sept. 5	13 02.33	-60 22.3	12.468	12.190	+0.39	+1.1	20.3	71.8
Sept.15	13 06.25	-60 11.3	12.625	12.250	+0.42	+0.5	20.4	66.0
Sept.25	13 10.46	-60 06.6	12.771	12.310	+0.44	-0.1	20.4	60.6
Oct. 5	13 14.87	-60 07.9	12.904	12.370	+0.45	-0.7	20.5	55.8
Oct. 15	13 19.36	-60 15.0	13.021	12.430	+0.44	-1.3	20.5	51.8
Oct. 25	13 23.80	-60 27.5	13.121	12.489	+0.43	-1.8	20.6	48.8
Nov. 4	13 28.11	-60 45.1	13.203	12.549	+0.40	-2.2	20.6	47.1
Nov. 14	13 32.16	-61 07.3	13.265	12.608	+0.37	-2.6	20.6	46.8
Nov. 24	13 35.81	-61 33.4	13.309	12.668	+0.31	-3.0	20.6	47.9
Dec. 4	13 38.96	-62 03.1	13.333	12.727	+0.25	-3.2	20.7	50.4
Dec. 14	13 41.46	-62 35.6	13.339	12.786	+0.17	-3.5	20.7	54.1
Dec. 24	13 43.17	-63 10.1	13.329	12.845	+0.08	-3.6	20.7	58.7
Jan. 3	13 43.96	-63 45.9	13.304	12.905	-0.03	-3.6	20.7	64.1
Jan. 13	13 43.69	-64 21.8	13.267	12.963	-0.14	-3.5	20.7	70.0
Jan. 23	13 42.25	-64 56.9	13.221	13.022	-0.27	-3.3	20.8	76.2
Feb. 2	13 39.55	-65 29.9	13.169	13.081	-0.40	-3.0	20.8	82.7
Feb. 12	13 35.54	-65 59.5	13.115	13.140	-0.53	-2.5	20.8	89.3
Feb. 22	13 30.25	-66 24.3	13.062	13.198	-0.65	-1.9	20.8	95.8
Mar. 4	13 23.79	-66 43.1	13.013	13.257	-0.74	-1.2	20.8	102.1
Mar. 14	13 16.36	-66 54.6	12.973	13.315	-0.81	-0.3	20.8	108.1
Mar. 24	13 08.23	-66 58.1	12.945	13.374	-0.85	+0.5	20.8	113.5
Apr. 3	12 59.74	-66 52.9	12.930	13.432	-0.84	+1.4	20.8	118.2

Comet 74P/Smirnova-Chernykh

Epoch = 2013 July 7.0 TT
T = 2009 July 27.10378 TT
Peri. = 86.53968 e = 0.1481112
Node = 77.08152 2000.0 a = 4.1641144 AU
Incl. = 6.65095 n = 0.11598988
q = 3.5473624 AU P = 8.50 years

m1 = 6.8 + 5 log(Delta) + 12.5 log(r(t-180))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	21 06.75	-21 41.0	5.569	4.701	+0.99	+4.3	18.8	25.5
Jan. 18	21 16.67	-20 57.5	5.632	4.706	+1.00	+4.5	18.8	18.0
Jan. 28	21 26.70	-20 12.5	5.675	4.711	+1.01	+4.6	18.8	10.8
Feb. 7	21 36.76	-19 26.4	5.697	4.716	+1.00	+4.7	18.9	5.3
Feb. 17	21 46.77	-18 39.6	5.699	4.721	+0.99	+4.7	18.9	7.5
Feb. 27	21 56.62	-17 52.9	5.680	4.726	+0.96	+4.6	18.9	14.2
Mar. 9	22 06.26	-17 06.7	5.640	4.730	+0.93	+4.5	18.9	21.4
Mar. 19	22 15.61	-16 21.7	5.582	4.734	+0.90	+4.3	18.9	28.9
Mar. 29	22 24.57	-15 38.6	5.504	4.738	+0.85	+4.0	18.8	36.4
Apr. 8	22 33.10	-14 58.2	5.411	4.742	+0.80	+3.7	18.8	44.0
Apr. 18	22 41.09	-14 21.1	5.301	4.746	+0.74	+3.3	18.8	51.8
Apr. 28	22 48.46	-13 48.2	5.179	4.750	+0.67	+2.8	18.7	59.6
May 8	22 55.13	-13 20.2	5.046	4.753	+0.59	+2.2	18.7	67.6
May 18	23 01.00	-12 57.9	4.904	4.756	+0.50	+1.6	18.6	75.7
May 28	23 05.95	-12 42.0	4.756	4.759	+0.40	+0.9	18.6	84.1
June 7	23 09.91	-12 33.3	4.606	4.762	+0.28	+0.1	18.5	92.6
June 17	23 12.74	-12 32.3	4.457	4.764	+0.16	-0.7	18.4	101.5
June 27	23 14.36	-12 39.2	4.313	4.767	+0.03	-1.5	18.4	110.6
July 7	23 14.70	-12 54.3	4.178	4.769	-0.10	-2.3	18.3	120.1
July 17	23 13.70	-13 17.0	4.056	4.771	-0.23	-2.9	18.2	129.8
July 27	23 11.41	-13 46.4	3.952	4.773	-0.35	-3.5	18.2	139.9
Aug. 6	23 07.92	-14 20.9	3.869	4.775	-0.45	-3.8	18.2	150.1
Aug. 16	23 03.39	-14 58.4	3.811	4.776	-0.53	-3.8	18.1	160.2
Aug. 26	22 58.13	-15 36.3	3.781	4.777	-0.56	-3.5	18.1	169.1
Sept. 5	22 52.50	-16 11.7	3.781	4.778	-0.56	-3.0	18.1	170.7
Sept. 15	22 46.89	-16 42.1	3.810	4.779	-0.52	-2.3	18.1	162.6
Sept. 25	22 41.73	-17 05.4	3.868	4.780	-0.44	-1.5	18.2	152.4
Oct. 5	22 37.38	-17 20.2	3.953	4.780	-0.32	-0.6	18.2	142.0
Oct. 15	22 34.13	-17 25.9	4.060	4.781	-0.20	+0.4	18.3	131.6
Oct. 25	22 32.17	-17 22.3	4.187	4.781	-0.06	+1.2	18.4	121.4
Nov. 4	22 31.58	-17 10.1	4.328	4.781	+0.08	+2.0	18.4	111.5
Nov. 14	22 32.38	-16 49.7	4.479	4.781	+0.21	+2.8	18.5	101.8
Nov. 24	22 34.50	-16 22.0	4.635	4.780	+0.34	+3.4	18.6	92.5
Dec. 4	22 37.86	-15 47.9	4.792	4.779	+0.45	+4.0	18.7	83.4
Dec. 14	22 42.32	-15 08.1	4.946	4.779	+0.54	+4.5	18.7	74.5
Dec. 24	22 47.76	-14 23.4	5.094	4.778	+0.63	+4.9	18.8	65.9
Jan. 3	22 54.04	-13 34.6	5.232	4.776	+0.70	+5.2	18.9	57.5
Jan. 13	23 01.02	-12 42.3	5.358	4.775	+0.76	+5.5	18.9	49.3
Jan. 23	23 08.59	-11 47.2	5.469	4.773	+0.80	+5.7	19.0	41.2
Feb. 2	23 16.64	-10 49.9	5.564	4.771	+0.84	+5.9	19.0	33.4
Feb. 12	23 25.05	-09 50.9	5.640	4.769	+0.87	+6.0	19.0	25.7
Feb. 22	23 33.73	-08 51.0	5.697	4.767	+0.89	+6.0	19.1	18.2
Mar. 4	23 42.61	-07 50.7	5.734	4.765	+0.90	+6.0	19.1	11.2
Mar. 14	23 51.59	-06 50.6	5.750	4.762	+0.90	+5.9	19.1	5.9
Mar. 24	00 00.59	-05 51.3	5.746	4.760	+0.90	+5.8	19.1	7.6
Apr. 3	00 09.56	-04 53.3	5.722	4.757	+0.89	+5.6	19.1	13.8

Comet 65P/Gunn

Epoch = 2013 July 7.0 TT
T = 2010 Mar. 19.04810 TT
Peri. = 207.47800 e = 0.2885046
Node = 67.28297 2000.0 a = 3.7975520 AU
Incl. = 9.97400 n = 0.13318290
q = 2.7019408 AU P = 7.40 years

m1 = 7.0 + 5 log(Delta) + 12.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	03 51.76	+20 33.2	3.984	4.705	−0.24	+0.2	18.4	132.5
Jan. 18	03 49.39	+20 35.3	4.123	4.716	−0.08	+0.6	18.5	121.8
Jan. 28	03 48.62	+20 41.5	4.277	4.727	+0.08	+1.0	18.6	111.5
Feb. 7	03 49.42	+20 51.8	4.441	4.738	+0.23	+1.4	18.7	101.5
Feb. 17	03 51.69	+21 06.0	4.610	4.748	+0.36	+1.8	18.8	92.0
Feb. 27	03 55.32	+21 23.6	4.779	4.758	+0.48	+2.0	18.9	82.8
Mar. 9	04 00.16	+21 43.8	4.945	4.768	+0.59	+2.2	18.9	74.0
Mar. 19	04 06.07	+22 06.0	5.105	4.777	+0.68	+2.4	19.0	65.4
Mar. 29	04 12.90	+22 29.5	5.254	4.786	+0.76	+2.4	19.1	57.1
Apr. 8	04 20.53	+22 53.6	5.390	4.794	+0.83	+2.4	19.2	49.1
Apr. 18	04 28.82	+23 17.7	5.512	4.803	+0.88	+2.4	19.2	41.2
Apr. 28	04 37.67	+23 41.3	5.617	4.810	+0.93	+2.3	19.3	33.6
May 8	04 46.95	+24 03.9	5.704	4.818	+0.96	+2.1	19.3	26.0
May 18	04 56.58	+24 25.1	5.773	4.825	+0.99	+2.0	19.4	18.6
May 28	05 06.45	+24 44.6	5.821	4.832	+1.00	+1.8	19.4	11.4
June 7	05 16.48	+25 02.3	5.850	4.838	+1.01	+1.6	19.4	4.4
June 17	05 26.58	+25 18.0	5.857	4.844	+1.01	+1.4	19.4	3.9
June 27	05 36.64	+25 31.6	5.845	4.850	+1.00	+1.2	19.4	10.8
July 7	05 46.60	+25 43.3	5.812	4.855	+0.97	+1.0	19.4	18.0
July 17	05 56.34	+25 53.3	5.759	4.860	+0.94	+0.8	19.4	25.3
July 27	06 05.78	+26 01.6	5.688	4.865	+0.90	+0.7	19.4	32.7
Aug. 6	06 14.82	+26 08.7	5.599	4.869	+0.85	+0.6	19.3	40.3
Aug. 16	06 23.34	+26 15.0	5.493	4.873	+0.79	+0.6	19.3	47.9
Aug. 26	06 31.22	+26 21.0	5.373	4.877	+0.71	+0.6	19.3	55.8
Sept. 5	06 38.36	+26 27.1	5.239	4.880	+0.62	+0.7	19.2	63.9
Sept. 15	06 44.59	+26 34.0	5.096	4.883	+0.52	+0.8	19.1	72.2
Sept. 25	06 49.80	+26 42.2	4.945	4.885	+0.40	+1.0	19.1	80.8
Oct. 5	06 53.82	+26 52.4	4.789	4.888	+0.27	+1.3	19.0	89.7
Oct. 15	06 56.50	+27 05.0	4.633	4.889	+0.12	+1.5	18.9	99.0
Oct. 25	06 57.71	+27 20.2	4.481	4.891	−0.04	+1.8	18.9	108.7
Nov. 4	06 57.35	+27 38.1	4.338	4.892	−0.20	+2.0	18.8	118.7
Nov. 14	06 55.34	+27 58.2	4.207	4.893	−0.36	+2.1	18.7	129.2
Nov. 24	06 51.74	+28 19.6	4.096	4.893	−0.51	+2.2	18.7	139.9
Dec. 4	06 46.67	+28 41.3	4.008	4.893	−0.63	+2.0	18.6	151.0
Dec. 14	06 40.41	+29 01.6	3.947	4.893	−0.70	+1.7	18.6	162.1
Dec. 24	06 33.36	+29 19.0	3.916	4.892	−0.73	+1.3	18.6	172.0
Jan. 3	06 26.02	+29 32.5	3.918	4.891	−0.71	+0.9	18.6	170.9
Jan. 13	06 18.95	+29 41.4	3.951	4.890	−0.63	+0.4	18.6	160.6
Jan. 23	06 12.66	+29 45.9	4.014	4.888	−0.51	+0.1	18.6	149.5
Feb. 2	06 07.55	+29 46.6	4.105	4.886	−0.36	−0.2	18.7	138.4
Feb. 12	06 03.94	+29 44.4	4.218	4.883	−0.20	−0.4	18.7	127.6
Feb. 22	06 01.98	+29 40.5	4.349	4.880	−0.03	−0.5	18.8	117.2
Mar. 4	06 01.69	+29 35.5	4.492	4.877	+0.13	−0.5	18.9	107.1
Mar. 14	06 03.03	+29 30.0	4.643	4.874	+0.29	−0.6	18.9	97.5
Mar. 24	06 05.89	+29 24.3	4.798	4.870	+0.42	−0.6	19.0	88.2
Apr. 3	06 10.14	+29 18.5	4.951	4.866	+0.55	−0.6	19.1	79.3

Comet P/2011 P1 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2010 July 18.59903 TT
Peri. = 348.46822 e = 0.3287794
Node = 4.70883 2000.0 a = 7.4948974 AU
Incl. = 5.64685 n = 0.04803475
q = 5.0307295 AU P = 20.52 years

m1 = 4.0 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 06.36	+26 51.7	5.499	6.252	−0.19	−1.1	19.6	136.7
Jan. 18	04 04.47	+26 40.6	5.642	6.273	−0.07	−0.9	19.7	126.2
Jan. 28	04 03.76	+26 31.8	5.802	6.295	+0.05	−0.6	19.8	115.9
Feb. 7	04 04.24	+26 25.7	5.974	6.316	+0.16	−0.3	19.9	105.9
Feb. 17	04 05.89	+26 22.7	6.154	6.338	+0.27	0.0	20.0	96.2
Feb. 27	04 08.63	+26 22.6	6.337	6.359	+0.37	+0.3	20.1	86.8
Mar. 9	04 12.37	+26 25.3	6.519	6.381	+0.46	+0.5	20.1	77.6
Mar. 19	04 17.01	+26 30.3	6.696	6.403	+0.54	+0.7	20.2	68.7
Mar. 29	04 22.43	+26 37.4	6.864	6.424	+0.61	+0.9	20.3	60.1
Apr. 8	04 28.53	+26 45.9	7.019	6.446	+0.67	+1.0	20.4	51.7
Apr. 18	04 35.19	+26 55.5	7.161	6.468	+0.71	+1.0	20.4	43.4
Apr. 28	04 42.33	+27 05.8	7.285	6.490	+0.75	+1.0	20.5	35.3
May 8	04 49.82	+27 16.2	7.391	6.511	+0.78	+1.0	20.5	27.4
May 18	04 57.59	+27 26.5	7.477	6.533	+0.79	+1.0	20.6	19.7
May 28	05 05.54	+27 36.5	7.542	6.555	+0.80	+0.9	20.6	12.2
June 7	05 13.59	+27 45.9	7.586	6.577	+0.80	+0.9	20.7	5.9
June 17	05 21.64	+27 54.7	7.607	6.599	+0.80	+0.8	20.7	6.4
June 27	05 29.60	+28 02.6	7.607	6.621	+0.78	+0.7	20.7	13.0
July 7	05 37.40	+28 09.8	7.586	6.642	+0.75	+0.7	20.7	20.4
July 17	05 44.95	+28 16.3	7.543	6.664	+0.72	+0.6	20.7	28.1
July 27	05 52.16	+28 22.3	7.481	6.686	+0.68	+0.6	20.7	36.0
Aug. 6	05 58.93	+28 27.8	7.401	6.708	+0.62	+0.5	20.7	44.0
Aug. 16	06 05.16	+28 33.1	7.304	6.730	+0.56	+0.5	20.7	52.2
Aug. 26	06 10.77	+28 38.4	7.192	6.752	+0.49	+0.6	20.7	60.5
Sept. 5	06 15.66	+28 44.0	7.068	6.774	+0.41	+0.6	20.7	69.1
Sept.15	06 19.71	+28 50.0	6.936	6.796	+0.31	+0.7	20.7	77.9
Sept.25	06 22.84	+28 56.8	6.798	6.817	+0.21	+0.7	20.7	86.9
Oct. 5	06 24.96	+29 04.2	6.658	6.839	+0.10	+0.8	20.6	96.2
Oct. 15	06 25.99	+29 12.5	6.522	6.861	−0.01	+0.9	20.6	105.8
Oct. 25	06 25.91	+29 21.2	6.393	6.883	−0.12	+0.9	20.6	115.7
Nov. 4	06 24.69	+29 30.3	6.276	6.905	−0.23	+0.9	20.6	125.9
Nov. 14	06 22.39	+29 39.0	6.177	6.926	−0.33	+0.8	20.6	136.3
Nov. 24	06 19.13	+29 46.9	6.100	6.948	−0.41	+0.6	20.6	146.9
Dec. 4	06 15.07	+29 53.3	6.048	6.970	−0.46	+0.4	20.6	157.6
Dec. 14	06 10.47	+29 57.5	6.026	6.992	−0.49	+0.2	20.6	167.8
Dec. 24	06 05.61	+29 59.3	6.035	7.013	−0.48	−0.1	20.6	173.4
Jan. 3	06 00.81	+29 58.4	6.076	7.035	−0.44	−0.3	20.6	166.2
Jan. 13	05 56.37	+29 55.0	6.148	7.056	−0.38	−0.5	20.7	155.9
Jan. 23	05 52.58	+29 49.6	6.248	7.078	−0.29	−0.7	20.7	145.2
Feb. 2	05 49.63	+29 42.6	6.374	7.100	−0.19	−0.8	20.8	134.5
Feb. 12	05 47.69	+29 34.7	6.521	7.121	−0.09	−0.8	20.9	124.1
Feb. 22	05 46.83	+29 26.5	6.684	7.143	+0.02	−0.8	20.9	113.9
Mar. 4	05 47.06	+29 18.3	6.860	7.164	+0.13	−0.8	21.0	104.0
Mar. 14	05 48.36	+29 10.5	7.042	7.185	+0.23	−0.7	21.1	94.3
Mar. 24	05 50.67	+29 03.2	7.227	7.207	+0.32	−0.7	21.2	84.9
Apr. 3	05 53.91	+28 56.3	7.409	7.228	+0.41	−0.6	21.2	75.8

Comet 215P/NEAT

Epoch = 2013 July 7.0 TT
T = 2010 Sept. 8.62411 TT
Peri. = 236.43554 e = 0.2180505
Node = 74.50910 2000.0 a = 4.2048278 AU
Incl. = 12.39872 n = 0.11430935
q = 3.2879630 AU P = 8.62 years

m1 = 5.2 + 5 log(Delta) + 17.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 03.90	+20 00.8	3.756	4.507	−0.25	+0.9	19.5	135.2
Jan. 18	04 01.42	+20 10.0	3.893	4.523	−0.08	+1.3	19.6	124.5
Jan. 28	04 00.59	+20 22.8	4.046	4.539	+0.08	+1.6	19.7	114.1
Feb. 7	04 01.38	+20 39.1	4.210	4.554	+0.23	+1.9	19.8	104.2
Feb. 17	04 03.71	+20 58.6	4.381	4.570	+0.37	+2.2	20.0	94.7
Feb. 27	04 07.46	+21 20.7	4.554	4.585	+0.50	+2.4	20.1	85.6
Mar. 9	04 12.48	+21 44.9	4.725	4.600	+0.61	+2.6	20.2	76.8
Mar. 19	04 18.61	+22 10.4	4.890	4.615	+0.71	+2.6	20.3	68.3
Mar. 29	04 25.72	+22 36.6	5.047	4.630	+0.79	+2.6	20.4	60.1
Apr. 8	04 33.65	+23 02.8	5.193	4.645	+0.86	+2.6	20.4	52.1
Apr. 18	04 42.29	+23 28.4	5.325	4.659	+0.92	+2.5	20.5	44.3
Apr. 28	04 51.51	+23 53.0	5.442	4.674	+0.97	+2.3	20.6	36.7
May 8	05 01.19	+24 16.1	5.542	4.688	+1.00	+2.1	20.7	29.3
May 18	05 11.24	+24 37.3	5.624	4.701	+1.03	+1.9	20.7	21.9
May 28	05 21.55	+24 56.5	5.688	4.715	+1.05	+1.7	20.8	14.7
June 7	05 32.03	+25 13.4	5.732	4.729	+1.06	+1.5	20.8	7.7
June 17	05 42.59	+25 28.0	5.757	4.742	+1.05	+1.2	20.8	2.1
June 27	05 53.14	+25 40.4	5.762	4.755	+1.05	+1.0	20.9	7.2
July 7	06 03.59	+25 50.6	5.746	4.768	+1.03	+0.8	20.9	14.3
July 17	06 13.86	+25 58.8	5.712	4.780	+1.00	+0.7	20.9	21.4
July 27	06 23.84	+26 05.4	5.658	4.793	+0.96	+0.5	20.9	28.7
Aug. 6	06 33.45	+26 10.6	5.587	4.805	+0.91	+0.4	20.9	36.1
Aug. 16	06 42.57	+26 15.1	5.499	4.817	+0.85	+0.4	20.8	43.7
Aug. 26	06 51.11	+26 19.3	5.395	4.829	+0.78	+0.5	20.8	51.4
Sept. 5	06 58.94	+26 23.9	5.277	4.840	+0.70	+0.6	20.8	59.3
Sept.15	07 05.94	+26 29.5	5.148	4.852	+0.60	+0.7	20.8	67.4
Sept.25	07 11.97	+26 36.9	5.009	4.863	+0.49	+1.0	20.7	75.9
Oct. 5	07 16.90	+26 46.6	4.865	4.874	+0.37	+1.3	20.7	84.6
Oct. 15	07 20.57	+26 59.4	4.718	4.884	+0.23	+1.6	20.6	93.7
Oct. 25	07 22.85	+27 15.7	4.573	4.895	+0.08	+2.0	20.6	103.1
Nov. 4	07 23.63	+27 35.6	4.433	4.905	−0.08	+2.3	20.5	112.9
Nov. 14	07 22.81	+27 59.0	4.304	4.915	−0.24	+2.6	20.5	123.1
Nov. 24	07 20.39	+28 25.2	4.191	4.925	−0.40	+2.8	20.4	133.6
Dec. 4	07 16.44	+28 53.1	4.099	4.934	−0.53	+2.8	20.4	144.5
Dec. 14	07 11.15	+29 20.9	4.031	4.944	−0.63	+2.6	20.4	155.5
Dec. 24	07 04.86	+29 47.0	3.993	4.953	−0.69	+2.3	20.4	166.1
Jan. 3	06 57.99	+30 09.7	3.985	4.962	−0.69	+1.8	20.4	172.6
Jan. 13	06 51.07	+30 27.6	4.009	4.970	−0.64	+1.3	20.4	166.3
Jan. 23	06 44.62	+30 40.1	4.064	4.979	−0.55	+0.7	20.4	155.8
Feb. 2	06 39.11	+30 47.5	4.149	4.987	−0.42	+0.3	20.5	144.9
Feb. 12	06 34.89	+30 50.2	4.258	4.995	−0.27	−0.1	20.6	134.1
Feb. 22	06 32.18	+30 49.2	4.387	5.002	−0.11	−0.4	20.6	123.5
Mar. 4	06 31.09	+30 45.4	4.533	5.010	+0.05	−0.6	20.7	113.4
Mar. 14	06 31.63	+30 39.6	4.689	5.017	+0.21	−0.7	20.8	103.6
Mar. 24	06 33.69	+30 32.4	4.852	5.024	+0.35	−0.8	20.9	94.2
Apr. 3	06 37.17	+30 24.0	5.016	5.031	+0.47	−0.9	21.0	85.1

Comet C/2008 FK75 (Lemmon-Siding Spring)

Epoch = 2013 July 7.0 TT
T = 2010 Sept. 29.17604 TT
Peri. = 80.49336
Node = 218.26789 2000.0
Incl. = 61.18209
q = 4.5150977 AU
e = 1.0008954

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 52.19	+23 42.5	7.656	7.779	+0.27	-3.4	18.3	93.6
Jan. 18	00 54.89	+23 08.0	7.875	7.836	+0.34	-2.7	18.4	84.1
Jan. 28	00 58.25	+22 40.8	8.093	7.892	+0.39	-2.1	18.5	74.8
Feb. 7	01 02.20	+22 20.3	8.304	7.949	+0.44	-1.4	18.5	65.7
Feb. 17	01 06.64	+22 05.9	8.505	8.006	+0.48	-0.9	18.6	56.7
Feb. 27	01 11.48	+21 57.1	8.692	8.063	+0.51	-0.4	18.7	48.0
Mar. 9	01 16.61	+21 53.0	8.862	8.119	+0.54	0.0	18.8	39.4
Mar. 19	01 21.98	+21 53.0	9.012	8.176	+0.55	+0.3	18.8	31.1
Mar. 29	01 27.48	+21 56.4	9.141	8.233	+0.56	+0.6	18.9	23.2
Apr. 8	01 33.04	+22 02.3	9.247	8.290	+0.55	+0.8	18.9	16.2
Apr. 18	01 38.59	+22 10.2	9.329	8.347	+0.55	+0.9	19.0	11.5
Apr. 28	01 44.04	+22 19.4	9.386	8.405	+0.53	+1.0	19.0	12.1
May 8	01 49.34	+22 29.4	9.419	8.462	+0.51	+1.0	19.0	17.4
May 18	01 54.41	+22 39.5	9.428	8.519	+0.48	+1.0	19.1	24.6
May 28	01 59.18	+22 49.2	9.415	8.576	+0.44	+0.9	19.1	32.4
June 7	02 03.57	+22 58.0	9.379	8.633	+0.40	+0.8	19.1	40.5
June 17	02 07.53	+23 05.5	9.325	8.690	+0.34	+0.6	19.1	48.9
June 27	02 10.98	+23 11.2	9.253	8.748	+0.29	+0.3	19.1	57.4
July 7	02 13.85	+23 14.6	9.167	8.805	+0.22	+0.1	19.1	66.2
July 17	02 16.10	+23 15.2	9.070	8.862	+0.16	-0.3	19.1	75.1
July 27	02 17.66	+23 12.7	8.966	8.920	+0.08	-0.6	19.1	84.2
Aug. 6	02 18.50	+23 06.6	8.858	8.977	+0.01	-1.0	19.1	93.5
Aug. 16	02 18.59	+22 56.5	8.753	9.034	-0.07	-1.4	19.1	103.0
Aug. 26	02 17.93	+22 42.1	8.653	9.091	-0.14	-1.9	19.1	112.7
Sept. 5	02 16.55	+22 23.2	8.565	9.149	-0.20	-2.3	19.1	122.7
Sept.15	02 14.51	+21 59.7	8.493	9.206	-0.26	-2.8	19.1	132.8
Sept.25	02 11.90	+21 31.9	8.441	9.263	-0.31	-3.2	19.1	143.1
Oct. 5	02 08.83	+20 59.9	8.415	9.320	-0.34	-3.5	19.1	153.5
Oct. 15	02 05.47	+20 24.6	8.416	9.378	-0.35	-3.8	19.1	163.7
Oct. 25	02 01.98	+19 46.7	8.449	9.435	-0.34	-3.9	19.1	172.2
Nov. 4	01 58.54	+19 07.4	8.513	9.492	-0.32	-4.0	19.2	170.2
Nov. 14	01 55.33	+18 27.8	8.610	9.549	-0.28	-3.9	19.2	160.7
Nov. 24	01 52.50	+17 49.3	8.737	9.607	-0.23	-3.6	19.3	150.2
Dec. 4	01 50.17	+17 12.8	8.892	9.664	-0.17	-3.3	19.3	139.6
Dec. 14	01 48.45	+16 39.5	9.072	9.721	-0.11	-2.9	19.4	129.0
Dec. 24	01 47.39	+16 10.0	9.271	9.778	-0.04	-2.5	19.5	118.5
Jan. 3	01 47.02	+15 44.9	9.485	9.835	+0.03	-2.1	19.5	108.1
Jan. 13	01 47.34	+15 24.3	9.709	9.892	+0.10	-1.6	19.6	97.9
Jan. 23	01 48.32	+15 08.2	9.937	9.949	+0.16	-1.2	19.7	87.8
Feb. 2	01 49.92	+14 56.5	10.165	10.006	+0.22	-0.8	19.7	78.0
Feb. 12	01 52.07	+14 48.8	10.386	10.063	+0.26	-0.4	19.8	68.3
Feb. 22	01 54.72	+14 44.8	10.597	10.120	+0.31	-0.1	19.9	58.8
Mar. 4	01 57.79	+14 43.9	10.794	10.177	+0.34	+0.2	19.9	49.5
Mar. 14	02 01.22	+14 45.5	10.973	10.234	+0.37	+0.4	20.0	40.3
Mar. 24	02 04.92	+14 49.2	11.131	10.291	+0.39	+0.5	20.0	31.2
Apr. 3	02 08.82	+14 54.5	11.266	10.348	+0.40	+0.6	20.1	22.2

Comet 240P/NEAT

Epoch = 2013 July 7.0 TT
T = 2010 Oct. 4.69323 TT
Peri. = 352.12017 e = 0.4500083
Node = 74.95143 2000.0 a = 3.8673653 AU
Incl. = 23.52519 n = 0.12959292
q = 2.1270188 AU P = 7.61 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	15 11.32	-03 00.0	5.305	4.927	+0.54	-1.1	20.0	62.4
Jan. 18	15 16.74	-03 10.5	5.186	4.952	+0.45	-0.4	20.0	70.9
Jan. 28	15 21.22	-03 14.6	5.057	4.976	+0.34	+0.2	20.0	79.6
Feb. 7	15 24.62	-03 12.5	4.924	4.999	+0.22	+0.8	19.9	88.6
Feb. 17	15 26.81	-03 04.4	4.790	5.022	+0.09	+1.3	19.9	97.9
Feb. 27	15 27.71	-02 51.2	4.659	5.044	-0.05	+1.8	19.9	107.4
Mar. 9	15 27.23	-02 33.5	4.535	5.066	-0.19	+2.1	19.9	117.2
Mar. 19	15 25.37	-02 12.5	4.425	5.088	-0.32	+2.3	19.8	127.1
Mar. 29	15 22.17	-01 49.7	4.332	5.109	-0.44	+2.3	19.8	137.1
Apr. 8	15 17.78	-01 26.8	4.262	5.130	-0.54	+2.1	19.8	146.9
Apr. 18	15 12.41	-01 05.7	4.217	5.150	-0.60	+1.7	19.8	156.0
Apr. 28	15 06.38	-00 48.3	4.200	5.170	-0.63	+1.2	19.8	162.7
May 8	15 00.04	-00 36.2	4.213	5.189	-0.63	+0.5	19.8	163.6
May 18	14 53.79	-00 30.9	4.256	5.208	-0.58	-0.2	19.9	158.0
May 28	14 47.98	-00 33.0	4.328	5.226	-0.51	-1.0	20.0	149.5
June 7	14 42.93	-00 43.0	4.426	5.244	-0.41	-1.8	20.0	140.0
June 17	14 38.87	-01 00.6	4.546	5.262	-0.29	-2.5	20.1	130.4
June 27	14 35.94	-01 25.2	4.686	5.279	-0.17	-3.1	20.2	120.8
July 7	14 34.22	-01 56.0	4.839	5.295	-0.05	-3.6	20.3	111.4
July 17	14 33.73	-02 32.2	5.003	5.312	+0.07	-4.0	20.4	102.2
July 27	14 34.41	-03 12.6	5.172	5.327	+0.18	-4.4	20.5	93.3
Aug. 6	14 36.20	-03 56.5	5.343	5.343	+0.28	-4.6	20.6	84.5
Aug. 16	14 39.01	-04 42.9	5.512	5.358	+0.37	-4.8	20.6	76.0
Aug. 26	14 42.75	-05 31.0	5.675	5.372	+0.46	-4.9	20.7	67.6
Sept. 5	14 47.32	-06 20.2	5.829	5.386	+0.53	-4.9	20.8	59.4
Sept. 15	14 52.61	-07 09.6	5.971	5.400	+0.59	-4.9	20.9	51.3
Sept. 25	14 58.54	-07 58.8	6.098	5.413	+0.65	-4.8	20.9	43.3
Oct. 5	15 05.00	-08 47.3	6.209	5.426	+0.69	-4.7	21.0	35.5
Oct. 15	15 11.91	-09 34.4	6.301	5.438	+0.73	-4.5	21.0	27.7
Oct. 25	15 19.17	-10 19.8	6.373	5.450	+0.75	-4.3	21.1	20.1
Nov. 4	15 26.69	-11 03.0	6.423	5.461	+0.77	-4.1	21.1	12.9
Nov. 14	15 34.39	-11 43.8	6.451	5.472	+0.78	-3.8	21.1	7.7
Nov. 24	15 42.16	-12 21.8	6.456	5.483	+0.78	-3.5	21.1	9.0
Dec. 4	15 49.92	-12 56.8	6.437	5.493	+0.76	-3.2	21.1	15.3
Dec. 14	15 57.55	-13 28.6	6.396	5.502	+0.74	-2.8	21.1	22.9
Dec. 24	16 04.95	-13 57.0	6.333	5.512	+0.71	-2.5	21.1	30.9
Jan. 3	16 12.01	-14 22.0	6.249	5.521	+0.66	-2.2	21.1	39.1
Jan. 13	16 18.62	-14 43.5	6.146	5.529	+0.60	-1.8	21.1	47.5
Jan. 23	16 24.64	-15 01.8	6.026	5.537	+0.53	-1.5	21.0	56.1
Feb. 2	16 29.96	-15 16.7	5.891	5.544	+0.45	-1.2	21.0	64.9
Feb. 12	16 34.43	-15 28.7	5.745	5.552	+0.35	-0.9	21.0	73.8
Feb. 22	16 37.95	-15 37.8	5.592	5.558	+0.24	-0.7	20.9	83.0
Mar. 4	16 40.38	-15 44.4	5.435	5.565	+0.12	-0.4	20.9	92.4
Mar. 14	16 41.62	-15 48.7	5.278	5.570	0.00	-0.2	20.8	102.0
Mar. 24	16 41.60	-15 51.2	5.127	5.576	-0.13	-0.1	20.7	111.9
Apr. 3	16 40.27	-15 52.0	4.986	5.581	-0.26	0.0	20.7	122.0

Comet 254P/McNaught

Epoch = 2013 July 7.0 TT
T = 2010 Oct. 23.54078 TT
Peri. = 220.38031 e = 0.3124387
Node = 129.89341 2000.0 a = 4.6670429 AU
Incl. = 32.57059 n = 0.09775554
q = 3.2088781 AU P = 10.08 years

m1 = 8.0 + 5 log(Delta) + 15.0 log(r(t-300))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	07 11.08	+05 45.7	3.887	4.837	-0.62	+4.8	20.1	163.4
Jan. 18	07 04.90	+06 34.0	3.922	4.861	-0.56	+5.3	20.2	160.7
Jan. 28	06 59.26	+07 27.2	3.988	4.885	-0.47	+5.6	20.2	152.8
Feb. 7	06 54.51	+08 23.1	4.083	4.908	-0.36	+5.7	20.3	143.2
Feb. 17	06 50.95	+09 19.7	4.203	4.931	-0.22	+5.5	20.4	133.1
Feb. 27	06 48.75	+10 15.1	4.345	4.954	-0.08	+5.3	20.5	123.0
Mar. 9	06 47.98	+11 08.0	4.503	4.977	+0.07	+4.9	20.7	113.1
Mar. 19	06 48.63	+11 57.2	4.673	5.000	+0.20	+4.5	20.8	103.5
Mar. 29	06 50.63	+12 42.1	4.850	5.023	+0.32	+4.0	20.9	94.2
Apr. 8	06 53.86	+13 22.3	5.029	5.045	+0.43	+3.5	21.0	85.2
Apr. 18	06 58.21	+13 57.4	5.206	5.067	+0.53	+3.0	21.1	76.5
Apr. 28	07 03.52	+14 27.4	5.378	5.089	+0.61	+2.5	21.2	68.1
May 8	07 09.66	+14 52.2	5.542	5.111	+0.68	+2.0	21.3	59.9
May 18	07 16.50	+15 12.1	5.695	5.132	+0.74	+1.5	21.4	51.9
May 28	07 23.91	+15 27.2	5.833	5.154	+0.79	+1.0	21.5	44.1
June 7	07 31.77	+15 37.7	5.957	5.175	+0.82	+0.6	21.6	36.4
June 17	07 39.98	+15 43.8	6.062	5.196	+0.85	+0.2	21.7	28.8
June 27	07 48.44	+15 46.0	6.149	5.216	+0.86	-0.1	21.8	21.4
July 7	07 57.05	+15 44.6	6.217	5.237	+0.87	-0.5	21.8	14.2
July 17	08 05.73	+15 39.9	6.263	5.257	+0.87	-0.7	21.9	7.4
July 27	08 14.38	+15 32.5	6.289	5.277	+0.86	-1.0	21.9	4.5
Aug. 6	08 22.94	+15 22.9	6.293	5.297	+0.84	-1.1	22.0	9.9
Aug. 16	08 31.31	+15 11.7	6.276	5.317	+0.81	-1.2	22.0	17.1
Aug. 26	08 39.43	+14 59.4	6.238	5.336	+0.78	-1.3	22.0	24.6
Sept. 5	08 47.20	+14 46.7	6.180	5.355	+0.73	-1.2	22.0	32.3
Sept. 15	08 54.53	+14 34.4	6.103	5.374	+0.68	-1.1	22.0	40.3
Sept. 25	09 01.34	+14 23.4	6.007	5.393	+0.62	-0.9	22.0	48.4
Oct. 5	09 07.54	+14 14.4	5.896	5.412	+0.55	-0.6	22.0	56.7
Oct. 15	09 13.01	+14 08.3	5.772	5.430	+0.46	-0.2	22.0	65.2
Oct. 25	09 17.66	+14 06.2	5.636	5.448	+0.37	+0.3	22.0	74.1
Nov. 4	09 21.37	+14 09.0	5.493	5.466	+0.27	+0.9	22.0	83.2
Nov. 14	09 24.03	+14 17.6	5.347	5.484	+0.15	+1.5	21.9	92.7
Nov. 24	09 25.55	+14 32.6	5.202	5.501	+0.03	+2.2	21.9	102.5
Dec. 4	09 25.85	+14 54.8	5.063	5.518	-0.10	+2.9	21.9	112.7
Dec. 14	09 24.89	+15 24.2	4.934	5.535	-0.22	+3.6	21.9	123.2
Dec. 24	09 22.70	+16 00.6	4.823	5.552	-0.34	+4.3	21.8	134.1
Jan. 3	09 19.34	+16 43.1	4.732	5.569	-0.44	+4.7	21.8	145.3
Jan. 13	09 14.98	+17 30.3	4.668	5.585	-0.51	+5.0	21.8	156.6
Jan. 23	09 09.89	+18 20.2	4.634	5.601	-0.55	+5.0	21.8	168.1
Feb. 2	09 04.38	+19 10.6	4.632	5.617	-0.55	+4.9	21.9	177.7
Feb. 12	08 58.83	+19 59.2	4.663	5.632	-0.52	+4.5	21.9	168.1
Feb. 22	08 53.62	+20 44.0	4.725	5.648	-0.45	+4.0	22.0	156.8
Mar. 4	08 49.08	+21 23.5	4.817	5.663	-0.36	+3.3	22.0	145.6
Mar. 14	08 45.49	+21 56.9	4.935	5.678	-0.25	+2.7	22.1	134.7
Mar. 24	08 43.03	+22 23.7	5.074	5.692	-0.12	+2.0	22.2	124.1
Apr. 3	08 41.80	+22 44.0	5.229	5.707	0.00	+1.4	22.3	113.8

Comet C/2010 FB87 (WISE-Garradd)

Epoch = 2013 July 7.0 TT
T = 2010 Nov. 6.27698 TT
Peri. = 265.00622
Node = 89.90674 2000.0
Incl. = 107.67463
q = 2.8457865 AU
e = 0.9881628

m1 = 8.0 + 5 log(Delta) + 10.0 log(r(t-220))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	05 31.02	+33 47.5	6.655	7.552	-0.68	+1.2	19.9	154.1
Jan. 18	05 24.19	+33 59.9	6.810	7.621	-0.58	+0.9	20.0	143.2
Jan. 28	05 18.38	+34 08.8	6.993	7.690	-0.47	+0.6	20.1	132.2
Feb. 7	05 13.72	+34 15.3	7.199	7.759	-0.34	+0.5	20.2	121.4
Feb. 17	05 10.29	+34 20.4	7.421	7.827	-0.22	+0.5	20.3	110.8
Feb. 27	05 08.08	+34 25.2	7.655	7.896	-0.10	+0.5	20.5	100.5
Mar. 9	05 07.04	+34 30.3	7.894	7.964	0.00	+0.6	20.6	90.5
Mar. 19	05 07.07	+34 36.1	8.132	8.032	+0.10	+0.7	20.7	80.7
Mar. 29	05 08.08	+34 43.2	8.366	8.100	+0.18	+0.8	20.8	71.3
Apr. 8	05 09.92	+34 51.7	8.590	8.168	+0.26	+1.0	20.9	62.1
Apr. 18	05 12.50	+35 01.5	8.800	8.236	+0.32	+1.1	21.0	53.1
Apr. 28	05 15.68	+35 12.9	8.993	8.304	+0.37	+1.3	21.1	44.4
May 8	05 19.34	+35 25.7	9.167	8.372	+0.40	+1.4	21.2	36.0
May 18	05 23.38	+35 39.9	9.318	8.439	+0.43	+1.6	21.3	28.1
May 28	05 27.67	+35 55.5	9.446	8.506	+0.45	+1.7	21.3	20.8
June 7	05 32.13	+36 12.4	9.549	8.573	+0.45	+1.8	21.4	15.2
June 17	05 36.65	+36 30.7	9.627	8.640	+0.45	+2.0	21.5	13.2
June 27	05 41.12	+36 50.5	9.679	8.707	+0.43	+2.1	21.5	16.3
July 7	05 45.46	+37 11.8	9.705	8.774	+0.41	+2.3	21.6	22.4
July 17	05 49.56	+37 34.6	9.708	8.841	+0.38	+2.5	21.6	29.8
July 27	05 53.32	+37 59.2	9.688	8.907	+0.33	+2.6	21.6	37.8
Aug. 6	05 56.65	+38 25.5	9.646	8.974	+0.28	+2.8	21.7	46.2
Aug. 16	05 59.44	+38 53.7	9.586	9.040	+0.22	+3.0	21.7	54.8
Aug. 26	06 01.59	+39 23.7	9.511	9.106	+0.14	+3.2	21.7	63.6
Sept. 5	06 03.01	+39 55.4	9.423	9.172	+0.06	+3.3	21.7	72.6
Sept.15	06 03.58	+40 28.8	9.327	9.238	-0.04	+3.5	21.7	81.8
Sept.25	06 03.22	+41 03.4	9.228	9.303	-0.14	+3.5	21.8	91.2
Oct. 5	06 01.87	+41 38.7	9.130	9.369	-0.24	+3.5	21.8	100.8
Oct. 15	05 59.47	+42 14.0	9.039	9.434	-0.34	+3.4	21.8	110.5
Oct. 25	05 56.03	+42 48.3	8.959	9.500	-0.45	+3.2	21.8	120.3
Nov. 4	05 51.57	+43 20.5	8.897	9.565	-0.54	+2.9	21.8	130.0
Nov. 14	05 46.20	+43 49.5	8.856	9.630	-0.61	+2.5	21.9	139.5
Nov. 24	05 40.10	+44 14.0	8.841	9.695	-0.66	+1.9	21.9	148.2
Dec. 4	05 33.47	+44 33.3	8.856	9.759	-0.69	+1.3	21.9	155.2
Dec. 14	05 26.59	+44 46.6	8.902	9.824	-0.68	+0.7	22.0	158.4
Dec. 24	05 19.77	+44 54.0	8.980	9.888	-0.65	+0.2	22.0	156.3
Jan. 3	05 13.27	+44 55.7	9.090	9.953	-0.59	-0.3	22.1	149.9
Jan. 13	05 07.38	+44 52.6	9.229	10.017	-0.51	-0.7	22.2	141.5
Jan. 23	05 02.28	+44 45.7	9.394	10.081	-0.42	-0.9	22.2	132.2
Feb. 2	04 58.13	+44 36.2	9.582	10.145	-0.31	-1.1	22.3	122.5
Feb. 12	04 55.00	+44 25.4	9.786	10.209	-0.21	-1.1	22.4	112.7
Feb. 22	04 52.91	+44 14.4	10.004	10.273	-0.11	-1.0	22.5	103.1
Mar. 4	04 51.84	+44 04.1	10.228	10.336	-0.01	-0.9	22.5	93.5
Mar. 14	04 51.72	+43 55.2	10.453	10.400	+0.08	-0.7	22.6	84.2
Mar. 24	04 52.49	+43 48.2	10.676	10.463	+0.15	-0.5	22.7	75.1
Apr. 3	04 54.03	+43 43.5	10.890	10.526	+0.22	-0.2	22.8	66.2

Comet C/2010 L3 (Catalina)

Epoch = 2013 July 7.0 TT
T = 2010 Nov. 10.69572 TT
Peri. = 121.76340
Node = 38.27718 2000.0
Incl. = 102.61913
q = 9.8822560 AU
e = 1.0029874

m1 = 4.4 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	15 30.83	+04 54.1	11.209	10.774	+0.11	-0.6	20.0	61.5
Jan. 18	15 31.93	+04 47.6	11.086	10.796	+0.06	-0.3	20.0	70.4
Jan. 28	15 32.50	+04 44.6	10.953	10.817	0.00	0.0	19.9	79.5
Feb. 7	15 32.48	+04 44.7	10.814	10.839	-0.06	+0.3	19.9	88.9
Feb. 17	15 31.84	+04 47.5	10.674	10.861	-0.13	+0.5	19.9	98.3
Feb. 27	15 30.54	+04 52.2	10.539	10.884	-0.20	+0.6	19.9	107.9
Mar. 9	15 28.58	+04 58.2	10.413	10.906	-0.26	+0.7	19.9	117.4
Mar. 19	15 25.98	+05 04.8	10.302	10.929	-0.32	+0.6	19.9	126.9
Mar. 29	15 22.79	+05 11.0	10.210	10.952	-0.37	+0.5	19.8	136.1
Apr. 8	15 19.10	+05 16.0	10.142	10.975	-0.41	+0.3	19.8	144.8
Apr. 18	15 14.99	+05 19.0	10.100	10.998	-0.44	0.0	19.8	152.2
Apr. 28	15 10.62	+05 19.2	10.088	11.022	-0.45	-0.3	19.8	157.1
May 8	15 06.11	+05 16.0	10.105	11.046	-0.45	-0.7	19.9	157.7
May 18	15 01.61	+05 09.0	10.154	11.069	-0.43	-1.1	19.9	153.7
May 28	14 57.26	+04 57.9	10.231	11.093	-0.41	-1.5	19.9	146.8
June 7	14 53.21	+04 42.8	10.336	11.118	-0.37	-1.9	19.9	138.6
June 17	14 49.55	+04 23.7	10.466	11.142	-0.32	-2.3	20.0	129.7
June 27	14 46.39	+04 00.8	10.616	11.167	-0.26	-2.6	20.0	120.5
July 7	14 43.77	+03 34.7	10.783	11.192	-0.20	-2.9	20.1	111.3
July 17	14 41.73	+03 05.7	10.962	11.217	-0.14	-3.1	20.1	102.0
July 27	14 40.30	+02 34.4	11.148	11.242	-0.08	-3.3	20.1	92.7
Aug. 6	14 39.46	+02 01.2	11.336	11.267	-0.03	-3.5	20.2	83.6
Aug. 16	14 39.19	+01 26.7	11.522	11.293	+0.03	-3.5	20.2	74.5
Aug. 26	14 39.46	+00 51.3	11.701	11.318	+0.08	-3.6	20.3	65.4
Sept. 5	14 40.21	+00 15.4	11.870	11.344	+0.12	-3.6	20.3	56.5
Sept.15	14 41.41	-00 20.5	12.023	11.370	+0.16	-3.5	20.4	47.7
Sept.25	14 42.98	-00 56.0	12.159	11.397	+0.19	-3.5	20.4	39.0
Oct. 5	14 44.86	-01 30.8	12.273	11.423	+0.21	-3.4	20.4	30.5
Oct. 15	14 46.99	-02 04.5	12.364	11.450	+0.23	-3.2	20.4	22.6
Oct. 25	14 49.29	-02 36.8	12.429	11.476	+0.24	-3.1	20.5	15.9
Nov. 4	14 51.70	-03 07.5	12.469	11.503	+0.24	-2.9	20.5	12.7
Nov. 14	14 54.14	-03 36.3	12.480	11.530	+0.24	-2.7	20.5	15.6
Nov. 24	14 56.52	-04 03.0	12.465	11.557	+0.23	-2.4	20.5	22.3
Dec. 4	14 58.78	-04 27.5	12.424	11.585	+0.21	-2.2	20.5	30.5
Dec. 14	15 00.84	-04 49.4	12.357	11.612	+0.18	-1.9	20.5	39.3
Dec. 24	15 02.61	-05 08.9	12.269	11.640	+0.14	-1.7	20.5	48.5
Jan. 3	15 04.03	-05 25.7	12.160	11.668	+0.10	-1.4	20.5	57.9
Jan. 13	15 05.03	-05 39.8	12.036	11.696	+0.05	-1.2	20.5	67.5
Jan. 23	15 05.54	-05 51.3	11.901	11.724	0.00	-0.9	20.5	77.3
Feb. 2	15 05.51	-06 00.3	11.758	11.752	-0.06	-0.7	20.5	87.2
Feb. 12	15 04.90	-06 07.0	11.614	11.781	-0.12	-0.4	20.4	97.3
Feb. 22	15 03.70	-06 11.5	11.474	11.809	-0.18	-0.3	20.4	107.5
Mar. 4	15 01.89	-06 14.1	11.343	11.838	-0.24	-0.1	20.4	117.8
Mar. 14	14 59.51	-06 15.2	11.227	11.867	-0.29	0.0	20.4	128.1
Mar. 24	14 56.61	-06 15.2	11.131	11.896	-0.34	+0.1	20.4	138.5
Apr. 3	14 53.25	-06 14.6	11.059	11.925	-0.37	+0.1	20.4	148.8

Comet C/2009 Y1 (Catalina)

Epoch = 2013 July 7.0 TT
T = 2011 Jan. 28.88040 TT
Peri. = 127.41508
Node = 160.31238 2000.0
Incl. = 107.32752
q = 2.5211495 AU
e = 0.9931381

m1 = 7.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	22 33.35	-59 30.8	7.643	7.061	+0.71	+3.0	20.5	50.7
Jan. 18	22 40.45	-59 01.1	7.755	7.134	+0.78	+2.5	20.6	48.0
Jan. 28	22 48.21	-58 36.5	7.849	7.206	+0.83	+1.9	20.7	46.5
Feb. 7	22 56.48	-58 17.4	7.925	7.279	+0.86	+1.3	20.7	46.3
Feb. 17	23 05.12	-58 04.6	7.982	7.351	+0.89	+0.6	20.8	47.6
Feb. 27	23 14.02	-57 58.6	8.021	7.423	+0.90	-0.1	20.8	50.0
Mar. 9	23 23.07	-57 59.9	8.044	7.495	+0.91	-0.9	20.9	53.4
Mar. 19	23 32.16	-58 09.0	8.053	7.567	+0.90	-1.7	20.9	57.7
Mar. 29	23 41.21	-58 26.4	8.048	7.639	+0.89	-2.6	21.0	62.5
Apr. 8	23 50.13	-58 52.3	8.033	7.710	+0.87	-3.5	21.0	67.8
Apr. 18	23 58.82	-59 27.1	8.010	7.781	+0.83	-4.4	21.0	73.3
Apr. 28	00 07.16	-60 10.8	7.983	7.853	+0.79	-5.2	21.1	79.0
May 8	00 15.07	-61 03.1	7.953	7.924	+0.73	-6.1	21.1	84.7
May 18	00 22.41	-62 04.0	7.924	7.994	+0.66	-6.9	21.1	90.3
May 28	00 29.01	-63 12.8	7.899	8.065	+0.57	-7.6	21.2	95.8
June 7	00 34.71	-64 28.5	7.882	8.135	+0.46	-8.2	21.2	100.9
June 17	00 39.28	-65 50.1	7.874	8.206	+0.32	-8.6	21.2	105.6
June 27	00 42.47	-67 15.9	7.879	8.276	+0.15	-8.8	21.3	109.6
July 7	00 43.98	-68 44.0	7.898	8.346	-0.05	-8.8	21.3	112.8
July 17	00 43.44	-70 12.4	7.933	8.415	-0.29	-8.6	21.3	115.1
July 27	00 40.49	-71 38.3	7.985	8.485	-0.57	-8.1	21.4	116.4
Aug. 6	00 34.79	-72 59.0	8.054	8.554	-0.87	-7.2	21.5	116.5
Aug. 16	00 26.05	-74 11.4	8.140	8.624	-1.18	-6.1	21.5	115.4
Aug. 26	00 14.27	-75 12.8	8.243	8.693	-1.45	-4.8	21.6	113.3
Sept. 5	23 59.78	-76 00.4	8.360	8.761	-1.64	-3.2	21.6	110.3
Sept. 15	23 43.43	-76 32.5	8.491	8.830	-1.70	-1.6	21.7	106.6
Sept. 25	23 26.47	-76 48.4	8.632	8.899	-1.61	0.0	21.8	102.2
Oct. 5	23 10.33	-76 48.8	8.782	8.967	-1.41	+1.3	21.8	97.5
Oct. 15	22 56.27	-76 35.5	8.937	9.035	-1.11	+2.4	21.9	92.5
Oct. 25	22 45.12	-76 11.3	9.095	9.104	-0.79	+3.2	22.0	87.4
Nov. 4	22 37.21	-75 39.0	9.253	9.172	-0.47	+3.8	22.1	82.2
Nov. 14	22 32.51	-75 01.2	9.408	9.239	-0.18	+4.1	22.1	77.2
Nov. 24	22 30.73	-74 20.3	9.557	9.307	+0.08	+4.2	22.2	72.5
Dec. 4	22 31.50	-73 38.2	9.698	9.374	+0.29	+4.2	22.3	68.1
Dec. 14	22 34.43	-72 56.5	9.829	9.442	+0.47	+4.0	22.3	64.2
Dec. 24	22 39.12	-72 16.4	9.948	9.509	+0.61	+3.8	22.4	60.9
Jan. 3	22 45.27	-71 38.8	10.053	9.576	+0.73	+3.4	22.4	58.5
Jan. 13	22 52.60	-71 04.6	10.144	9.643	+0.83	+3.0	22.5	56.9
Jan. 23	23 00.85	-70 34.5	10.221	9.709	+0.90	+2.6	22.5	56.3
Feb. 2	23 09.85	-70 09.0	10.282	9.776	+0.96	+2.0	22.6	56.7
Feb. 12	23 19.42	-69 48.7	10.329	9.842	+1.00	+1.5	22.6	58.0
Feb. 22	23 29.43	-69 34.0	10.362	9.908	+1.03	+0.9	22.6	60.2
Mar. 4	23 39.77	-69 25.3	10.383	9.975	+1.06	+0.2	22.7	63.2
Mar. 14	23 50.33	-69 23.0	10.392	10.041	+1.07	-0.4	22.7	66.7
Mar. 24	00 01.02	-69 27.3	10.392	10.106	+1.07	-1.1	22.7	70.7
Apr. 3	00 11.77	-69 38.3	10.385	10.172	+1.07	-1.8	22.8	75.0

Comet C/2008 S3 (Boattini)

Epoch = 2013 July 7.0 TT
T = 2011 June 9.88770 TT
Peri. = 40.12115
Node = 54.95546 2000.0
Incl. = 162.70630
q = 8.0203060 AU
e = 1.0021639

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	22 12.02	+05 28.7	9.330	8.746	+0.13	−0.3	18.3	51.1
Jan. 18	22 13.36	+05 26.0	9.478	8.770	+0.17	+0.2	18.4	41.8
Jan. 28	22 15.04	+05 27.9	9.604	8.794	+0.19	+0.6	18.4	33.0
Feb. 7	22 16.94	+05 34.1	9.703	8.819	+0.20	+1.0	18.4	24.9
Feb. 17	22 18.98	+05 43.9	9.776	8.844	+0.21	+1.3	18.5	18.3
Feb. 27	22 21.05	+05 56.8	9.821	8.869	+0.20	+1.5	18.5	15.1
Mar. 9	22 23.04	+06 12.2	9.837	8.894	+0.18	+1.7	18.5	17.3
Mar. 19	22 24.88	+06 29.5	9.825	8.920	+0.16	+1.9	18.5	23.4
Mar. 29	22 26.46	+06 48.1	9.786	8.946	+0.12	+1.9	18.5	31.1
Apr. 8	22 27.70	+07 07.3	9.722	8.972	+0.08	+1.9	18.5	39.5
Apr. 18	22 28.51	+07 26.5	9.636	8.999	+0.03	+1.9	18.5	48.3
Apr. 28	22 28.81	+07 45.1	9.530	9.026	−0.03	+1.7	18.5	57.3
May 8	22 28.53	+08 02.2	9.408	9.053	−0.09	+1.5	18.4	66.5
May 18	22 27.61	+08 17.3	9.275	9.081	−0.16	+1.2	18.4	75.9
May 28	22 25.98	+08 29.5	9.134	9.108	−0.24	+0.9	18.4	85.3
June 7	22 23.61	+08 38.1	8.992	9.136	−0.31	+0.4	18.4	95.0
June 17	22 20.48	+08 42.5	8.853	9.165	−0.39	−0.1	18.4	104.8
June 27	22 16.60	+08 41.9	8.723	9.193	−0.46	−0.6	18.3	114.6
July 7	22 12.01	+08 35.8	8.608	9.222	−0.52	−1.2	18.3	124.5
July 17	22 06.79	+08 23.9	8.512	9.251	−0.57	−1.8	18.3	134.3
July 27	22 01.04	+08 06.0	8.441	9.280	−0.61	−2.4	18.3	143.8
Aug. 6	21 54.93	+07 42.3	8.399	9.310	−0.63	−2.9	18.3	152.5
Aug. 16	21 48.63	+07 13.2	8.388	9.340	−0.63	−3.4	18.3	158.9
Aug. 26	21 42.32	+06 39.7	8.411	9.370	−0.61	−3.7	18.3	160.6
Sept. 5	21 36.22	+06 02.8	8.467	9.400	−0.57	−3.9	18.3	156.4
Sept.15	21 30.49	+05 23.7	8.557	9.431	−0.52	−4.0	18.4	148.7
Sept.25	21 25.30	+04 43.8	8.677	9.462	−0.45	−3.9	18.4	139.4
Oct. 5	21 20.77	+04 04.4	8.824	9.493	−0.38	−3.8	18.5	129.6
Oct. 15	21 16.99	+03 26.7	8.994	9.524	−0.30	−3.5	18.5	119.4
Oct. 25	21 14.01	+02 51.8	9.181	9.555	−0.22	−3.1	18.6	109.3
Nov. 4	21 11.81	+02 20.4	9.379	9.587	−0.14	−2.7	18.6	99.1
Nov. 14	21 10.40	+01 53.0	9.583	9.619	−0.07	−2.3	18.7	89.1
Nov. 24	21 09.72	+01 30.1	9.787	9.651	0.00	−1.8	18.7	79.2
Dec. 4	21 09.70	+01 11.8	9.986	9.683	+0.06	−1.4	18.8	69.4
Dec. 14	21 10.26	+00 58.2	10.174	9.716	+0.11	−0.9	18.8	59.8
Dec. 24	21 11.32	+00 49.1	10.346	9.749	+0.15	−0.5	18.9	50.4
Jan. 3	21 12.79	+00 44.3	10.499	9.782	+0.18	−0.1	18.9	41.3
Jan. 13	21 14.56	+00 43.6	10.629	9.815	+0.20	+0.3	19.0	32.6
Jan. 23	21 16.53	+00 46.6	10.734	9.848	+0.21	+0.6	19.0	24.6
Feb. 2	21 18.63	+00 52.9	10.812	9.882	+0.21	+0.9	19.0	18.3
Feb. 12	21 20.75	+01 02.1	10.862	9.915	+0.20	+1.2	19.1	15.7
Feb. 22	21 22.80	+01 13.6	10.883	9.949	+0.19	+1.3	19.1	18.4
Mar. 4	21 24.69	+01 27.1	10.876	9.983	+0.16	+1.5	19.1	24.6
Mar. 14	21 26.34	+01 41.9	10.843	10.018	+0.13	+1.6	19.1	32.4
Mar. 24	21 27.66	+01 57.5	10.784	10.052	+0.09	+1.6	19.1	40.9
Apr. 3	21 28.59	+02 13.3	10.704	10.087	+0.05	+1.6	19.1	49.7

Comet 176P/LINEAR

Epoch = 2013 July 7.0 TT
T = 2011 June 28.94747 TT
Peri. = 35.62140 e = 0.1934535
Node = 345.97021 2000.0 a = 3.1927260 AU
Incl. = 0.23500 n = 0.17276732
q = 2.5750820 AU P = 5.70 years

H = 15.2 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	10 10.71	+11 24.2	2.587	3.375	-0.46	+2.5	20.6	137.1
Jan. 18	10 06.06	+11 49.7	2.514	3.392	-0.63	+3.4	20.4	148.5
Jan. 28	09 59.78	+12 23.5	2.465	3.408	-0.74	+3.9	20.3	160.3
Feb. 7	09 52.39	+13 02.3	2.444	3.425	-0.78	+4.0	20.1	172.4
Feb. 17	09 44.56	+13 42.3	2.455	3.440	-0.75	+3.7	20.0	175.5
Feb. 27	09 37.07	+14 19.4	2.495	3.456	-0.65	+3.1	20.3	163.5
Mar. 9	09 30.58	+14 50.5	2.565	3.472	-0.49	+2.3	20.5	151.8
Mar. 19	09 25.64	+15 13.5	2.660	3.487	-0.31	+1.4	20.7	140.6
Mar. 29	09 22.57	+15 27.3	2.776	3.502	-0.11	+0.4	20.9	129.9
Apr. 8	09 21.48	+15 31.7	2.910	3.516	+0.09	-0.5	21.1	119.8
Apr. 18	09 22.33	+15 27.1	3.056	3.530	+0.27	-1.3	21.2	110.2
Apr. 28	09 25.01	+15 14.0	3.210	3.544	+0.43	-2.1	21.4	101.1
May 8	09 29.28	+14 53.1	3.368	3.558	+0.57	-2.8	21.5	92.5
May 18	09 34.97	+14 25.0	3.527	3.571	+0.69	-3.5	21.6	84.3
May 28	09 41.85	+13 50.3	3.683	3.584	+0.79	-4.1	21.7	76.5
June 7	09 49.72	+13 09.6	3.835	3.597	+0.87	-4.6	21.7	68.9
June 17	09 58.42	+12 23.3	3.980	3.609	+0.94	-5.1	21.8	61.6
June 27	10 07.80	+11 32.1	4.115	3.621	+0.99	-5.6	21.8	54.5
July 7	10 17.71	+10 36.4	4.240	3.633	+1.03	-6.0	21.9	47.6
July 17	10 28.05	+09 36.6	4.353	3.644	+1.07	-6.3	21.9	40.8
July 27	10 38.72	+08 33.5	4.452	3.655	+1.09	-6.6	21.9	34.1
Aug. 6	10 49.65	+07 27.3	4.536	3.666	+1.11	-6.9	21.8	27.4
Aug. 16	11 00.77	+06 18.6	4.605	3.676	+1.12	-7.1	21.8	20.8
Aug. 26	11 12.00	+05 08.0	4.657	3.686	+1.13	-7.2	21.7	14.2
Sept. 5	11 23.29	+03 56.0	4.692	3.695	+1.13	-7.3	21.6	7.6
Sept.15	11 34.60	+02 43.2	4.710	3.705	+1.13	-7.3	21.5	1.0
Sept.25	11 45.86	+01 30.1	4.710	3.713	+1.12	-7.3	21.6	5.7
Oct. 5	11 57.02	+00 17.3	4.692	3.722	+1.10	-7.2	21.7	12.5
Oct. 15	12 08.02	-00 54.5	4.656	3.730	+1.08	-7.0	21.8	19.4
Oct. 25	12 18.81	-02 04.8	4.602	3.738	+1.05	-6.8	21.9	26.4
Nov. 4	12 29.30	-03 12.8	4.531	3.745	+1.01	-6.5	21.9	33.5
Nov. 14	12 39.41	-04 17.8	4.444	3.752	+0.96	-6.1	22.0	40.8
Nov. 24	12 49.04	-05 19.3	4.342	3.758	+0.91	-5.7	22.0	48.3
Dec. 4	12 58.09	-06 16.3	4.226	3.765	+0.83	-5.2	22.0	56.0
Dec. 14	13 06.43	-07 08.2	4.098	3.770	+0.75	-4.6	21.9	63.9
Dec. 24	13 13.90	-07 54.2	3.960	3.776	+0.64	-3.9	21.9	72.1
Jan. 3	13 20.35	-08 33.5	3.815	3.781	+0.52	-3.2	21.8	80.6
Jan. 13	13 25.59	-09 05.2	3.666	3.785	+0.39	-2.3	21.7	89.4
Jan. 23	13 29.46	-09 28.5	3.517	3.790	+0.23	-1.4	21.7	98.5
Feb. 2	13 31.78	-09 42.6	3.371	3.793	+0.06	-0.4	21.5	108.0
Feb. 12	13 32.40	-09 46.9	3.232	3.797	-0.12	+0.6	21.4	118.0
Feb. 22	13 31.25	-09 40.9	3.106	3.800	-0.29	+1.6	21.3	128.4
Mar. 4	13 28.33	-09 24.5	2.996	3.803	-0.45	+2.6	21.1	139.2
Mar. 14	13 23.79	-08 58.4	2.909	3.805	-0.59	+3.4	21.0	150.4
Mar. 24	13 17.94	-08 24.1	2.847	3.807	-0.67	+4.0	20.8	161.9
Apr. 3	13 11.21	-07 43.9	2.813	3.808	-0.70	+4.3	20.6	173.6

Comet C/2012 E1 (Hill)

Epoch = 2013 July 7.0 TT
T = 2011 July 3.32273 TT
Peri. = 48.85785
Node = 286.33834 2000.0
Incl. = 122.54494
q = 7.5017712 AU
e = 0.9968436

m1 = 6.2 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	15 44.30	+37 52.9	8.403	8.256	+0.13	+6.7	20.0	78.1
Jan. 18	15 45.64	+39 00.4	8.325	8.282	+0.05	+7.5	20.0	84.1
Jan. 28	15 46.11	+40 15.8	8.248	8.308	-0.05	+8.2	20.0	90.1
Feb. 7	15 45.58	+41 37.8	8.174	8.335	-0.17	+8.7	20.0	96.0
Feb. 17	15 43.88	+43 04.6	8.109	8.361	-0.30	+8.9	20.0	101.5
Feb. 27	15 40.91	+44 33.7	8.055	8.389	-0.44	+8.9	20.0	106.4
Mar. 9	15 36.55	+46 02.6	8.015	8.416	-0.58	+8.5	20.0	110.6
Mar. 19	15 30.78	+47 28.0	7.992	8.444	-0.71	+7.9	20.0	113.8
Mar. 29	15 23.64	+48 47.0	7.989	8.472	-0.84	+6.9	20.0	115.8
Apr. 8	15 15.24	+49 56.4	8.006	8.500	-0.94	+5.7	20.0	116.5
Apr. 18	15 05.83	+50 53.7	8.043	8.529	-1.01	+4.3	20.0	115.8
Apr. 28	14 55.73	+51 37.0	8.101	8.558	-1.04	+2.8	20.1	113.9
May 8	14 45.34	+52 05.2	8.176	8.587	-1.03	+1.3	20.1	110.8
May 18	14 35.08	+52 18.3	8.269	8.617	-0.97	-0.1	20.1	106.9
May 28	14 25.35	+52 17.0	8.375	8.647	-0.89	-1.4	20.2	102.2
June 7	14 16.49	+52 03.0	8.493	8.677	-0.77	-2.5	20.2	97.1
June 17	14 08.75	+51 38.2	8.618	8.707	-0.65	-3.3	20.3	91.7
June 27	14 02.27	+51 04.9	8.747	8.738	-0.52	-3.9	20.3	86.2
July 7	13 57.10	+50 25.4	8.877	8.769	-0.39	-4.3	20.4	80.6
July 17	13 53.24	+49 42.0	9.005	8.801	-0.26	-4.5	20.4	75.2
July 27	13 50.61	+48 56.7	9.127	8.832	-0.15	-4.5	20.5	70.0
Aug. 6	13 49.11	+48 11.2	9.242	8.864	-0.05	-4.4	20.5	65.2
Aug. 16	13 48.64	+47 27.1	9.345	8.896	+0.04	-4.1	20.5	60.8
Aug. 26	13 49.06	+46 45.8	9.436	8.928	+0.12	-3.7	20.6	57.2
Sept. 5	13 50.24	+46 08.4	9.512	8.961	+0.18	-3.2	20.6	54.3
Sept.15	13 52.07	+45 36.0	9.571	8.994	+0.23	-2.7	20.6	52.4
Sept.25	13 54.41	+45 09.5	9.614	9.027	+0.27	-2.0	20.7	51.7
Oct. 5	13 57.15	+44 49.6	9.639	9.060	+0.30	-1.2	20.7	52.2
Oct. 15	14 00.16	+44 37.2	9.647	9.094	+0.32	-0.4	20.7	53.8
Oct. 25	14 03.33	+44 32.8	9.638	9.128	+0.32	+0.4	20.7	56.6
Nov. 4	14 06.54	+44 36.9	9.613	9.162	+0.31	+1.3	20.7	60.3
Nov. 14	14 09.66	+44 50.0	9.573	9.196	+0.29	+2.2	20.7	64.8
Nov. 24	14 12.55	+45 12.3	9.522	9.231	+0.25	+3.2	20.7	70.0
Dec. 4	14 15.10	+45 43.8	9.461	9.265	+0.20	+4.1	20.7	75.6
Dec. 14	14 17.14	+46 24.5	9.394	9.300	+0.14	+4.9	20.7	81.5
Dec. 24	14 18.52	+47 13.7	9.324	9.335	+0.06	+5.7	20.7	87.6
Jan. 3	14 19.11	+48 10.8	9.255	9.371	-0.04	+6.4	20.7	93.8
Jan. 13	14 18.72	+49 14.6	9.190	9.406	-0.15	+6.9	20.8	99.7
Jan. 23	14 17.21	+50 23.4	9.133	9.442	-0.28	+7.2	20.8	105.4
Feb. 2	14 14.44	+51 35.1	9.089	9.478	-0.41	+7.2	20.8	110.4
Feb. 12	14 10.31	+52 47.4	9.059	9.514	-0.55	+7.0	20.8	114.7
Feb. 22	14 04.77	+53 57.5	9.047	9.550	-0.69	+6.5	20.8	117.9
Mar. 4	13 57.82	+55 02.5	9.055	9.587	-0.82	+5.7	20.8	119.8
Mar. 14	13 49.59	+55 59.7	9.084	9.623	-0.93	+4.7	20.8	120.3
Mar. 24	13 40.31	+56 46.7	9.133	9.660	-1.00	+3.5	20.9	119.3
Apr. 3	13 30.28	+57 21.6	9.203	9.697	-1.04	+2.2	20.9	116.9

Comet C/2010 G2 (Hill)

Epoch = 2013 July 7.0 TT
T = 2011 Sept. 1.83308 TT
Peri. = 137.39110
Node = 246.79137 2000.0
Incl. = 103.76293
q = 1.9807189 AU
e = 0.9788316

m1 = 6.4 + 5 log(Delta) + 12.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	03 14.43	-49 34.9	5.409	5.504	-0.51	+5.1	19.3	90.4
Jan. 18	03 09.30	-48 43.6	5.577	5.585	-0.30	+5.7	19.5	85.4
Jan. 28	03 06.25	-47 46.7	5.743	5.666	-0.12	+5.9	19.6	80.6
Feb. 7	03 05.10	-46 47.9	5.906	5.746	+0.05	+5.8	19.7	75.9
Feb. 17	03 05.62	-45 49.9	6.062	5.826	+0.20	+5.5	19.9	71.6
Feb. 27	03 07.58	-44 55.1	6.210	5.906	+0.32	+5.0	20.0	67.8
Mar. 9	03 10.77	-44 05.2	6.347	5.986	+0.42	+4.3	20.1	64.5
Mar. 19	03 14.99	-43 21.8	6.472	6.066	+0.51	+3.6	20.2	61.8
Mar. 29	03 20.04	-42 45.9	6.585	6.145	+0.57	+2.7	20.3	59.8
Apr. 8	03 25.78	-42 18.5	6.685	6.224	+0.63	+1.8	20.5	58.7
Apr. 18	03 32.04	-42 00.1	6.772	6.302	+0.67	+0.9	20.5	58.3
Apr. 28	03 38.70	-41 51.5	6.845	6.380	+0.69	-0.1	20.6	58.7
May 8	03 45.63	-41 53.0	6.906	6.459	+0.71	-1.2	20.7	59.9
May 18	03 52.72	-42 04.9	6.956	6.536	+0.71	-2.3	20.8	61.7
May 28	03 59.86	-42 27.5	6.994	6.614	+0.71	-3.3	20.9	64.0
June 7	04 06.93	-43 00.7	7.024	6.691	+0.69	-4.4	21.0	66.9
June 17	04 13.83	-43 44.6	7.046	6.768	+0.66	-5.4	21.0	70.1
June 27	04 20.44	-44 38.9	7.063	6.844	+0.62	-6.4	21.1	73.5
July 7	04 26.62	-45 43.2	7.075	6.921	+0.56	-7.4	21.2	77.2
July 17	04 32.26	-46 56.9	7.086	6.997	+0.49	-8.2	21.2	80.9
July 27	04 37.19	-48 19.1	7.097	7.073	+0.41	-9.0	21.3	84.5
Aug. 6	04 41.27	-49 48.8	7.111	7.148	+0.30	-9.6	21.3	88.0
Aug. 16	04 44.30	-51 24.3	7.129	7.224	+0.18	-10.0	21.4	91.3
Aug. 26	04 46.11	-53 04.0	7.153	7.299	+0.04	-10.2	21.5	94.3
Sept. 5	04 46.50	-54 45.6	7.185	7.374	-0.12	-10.1	21.5	96.9
Sept.15	04 45.26	-56 26.7	7.226	7.448	-0.30	-9.8	21.6	98.9
Sept.25	04 42.23	-58 04.5	7.277	7.522	-0.49	-9.2	21.7	100.4
Oct. 5	04 37.29	-59 36.0	7.339	7.596	-0.69	-8.2	21.7	101.2
Oct. 15	04 30.41	-60 58.1	7.413	7.670	-0.87	-7.0	21.8	101.3
Oct. 25	04 21.70	-62 08.0	7.497	7.744	-1.02	-5.5	21.9	100.7
Nov. 4	04 11.46	-63 03.0	7.592	7.817	-1.13	-3.8	22.0	99.5
Nov. 14	04 00.15	-63 41.4	7.696	7.890	-1.17	-2.1	22.0	97.7
Nov. 24	03 48.40	-64 02.4	7.808	7.963	-1.15	-0.4	22.1	95.4
Dec. 4	03 36.91	-64 06.3	7.927	8.036	-1.06	+1.2	22.2	92.8
Dec. 14	03 26.32	-63 54.5	8.050	8.108	-0.92	+2.5	22.3	89.9
Dec. 24	03 17.14	-63 29.2	8.176	8.180	-0.74	+3.6	22.4	86.8
Jan. 3	03 09.71	-62 53.1	8.303	8.252	-0.55	+4.4	22.5	83.6
Jan. 13	03 04.18	-62 09.0	8.428	8.324	-0.36	+4.9	22.5	80.6
Jan. 23	03 00.55	-61 19.8	8.550	8.395	-0.18	+5.2	22.6	77.6
Feb. 2	02 58.71	-60 28.0	8.668	8.466	-0.02	+5.2	22.7	75.0
Feb. 12	02 58.52	-59 36.0	8.779	8.537	+0.13	+5.0	22.8	72.7
Feb. 22	02 59.77	-58 45.5	8.883	8.608	+0.25	+4.7	22.8	70.8
Mar. 4	03 02.28	-57 58.4	8.978	8.679	+0.36	+4.3	22.9	69.4
Mar. 14	03 05.86	-57 15.8	9.065	8.749	+0.45	+3.7	23.0	68.5
Mar. 24	03 10.32	-56 38.9	9.142	8.819	+0.52	+3.0	23.0	68.1
Apr. 3	03 15.53	-56 08.6	9.209	8.889	+0.58	+2.3	.	68.3

Comet 48P/Johnson

Epoch = 2013 July 7.0 TT
T = 2011 Oct. 1.99674 TT
Peri. = 208.51758 e = 0.3717746
Node = 116.91639 2000.0 a = 3.6514896 AU
Incl. = 13.76269 n = 0.14125342
q = 2.2939585 AU P = 6.98 years

m1 = 6.0 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 16.91	+09 18.9	2.812	3.576	−0.26	+4.0	19.3	135.1
Jan. 18	04 14.31	+09 59.2	2.956	3.610	−0.06	+4.5	19.5	124.8
Jan. 28	04 13.70	+10 44.0	3.117	3.644	+0.13	+4.8	19.7	115.0
Feb. 7	04 15.00	+11 31.7	3.288	3.677	+0.31	+4.9	19.9	105.5
Feb. 17	04 18.07	+12 20.9	3.467	3.710	+0.47	+4.9	20.1	96.4
Feb. 27	04 22.73	+13 10.3	3.648	3.743	+0.60	+4.9	20.3	87.7
Mar. 9	04 28.76	+13 58.9	3.830	3.775	+0.72	+4.7	20.5	79.4
Mar. 19	04 35.99	+14 45.7	4.007	3.807	+0.82	+4.4	20.6	71.3
Mar. 29	04 44.23	+15 30.0	4.178	3.839	+0.91	+4.1	20.8	63.6
Apr. 8	04 53.32	+16 11.1	4.340	3.870	+0.98	+3.7	20.9	56.0
Apr. 18	05 03.11	+16 48.6	4.491	3.901	+1.04	+3.3	21.1	48.7
Apr. 28	05 13.47	+17 22.1	4.629	3.932	+1.08	+2.9	21.2	41.5
May 8	05 24.28	+17 51.3	4.753	3.962	+1.11	+2.5	21.3	34.4
May 18	05 35.42	+18 16.0	4.861	3.992	+1.14	+2.0	21.5	27.5
May 28	05 46.79	+18 36.1	4.953	4.021	+1.15	+1.6	21.6	20.7
June 7	05 58.30	+18 51.6	5.027	4.050	+1.16	+1.1	21.7	14.1
June 17	06 09.86	+19 02.6	5.083	4.079	+1.15	+0.7	21.7	7.9
June 27	06 21.38	+19 09.4	5.120	4.107	+1.14	+0.3	21.8	4.2
July 7	06 32.77	+19 12.0	5.139	4.135	+1.12	−0.1	21.9	8.2
July 17	06 43.96	+19 10.8	5.138	4.162	+1.09	−0.5	21.9	14.5
July 27	06 54.85	+19 06.3	5.119	4.189	+1.05	−0.7	22.0	21.3
Aug. 6	07 05.36	+18 58.9	5.082	4.216	+1.00	−1.0	22.0	28.3
Aug. 16	07 15.40	+18 49.2	5.027	4.242	+0.95	−1.1	22.1	35.4
Aug. 26	07 24.87	+18 37.8	4.954	4.268	+0.88	−1.2	22.1	42.8
Sept. 5	07 33.68	+18 25.4	4.867	4.293	+0.80	−1.2	22.1	50.3
Sept. 15	07 41.70	+18 12.9	4.765	4.318	+0.71	−1.2	22.1	58.1
Sept. 25	07 48.82	+18 01.2	4.650	4.343	+0.61	−1.0	22.1	66.1
Oct. 5	07 54.91	+17 51.2	4.526	4.367	+0.49	−0.7	22.1	74.5
Oct. 15	07 59.82	+17 43.9	4.395	4.390	+0.36	−0.4	22.1	83.2
Oct. 25	08 03.43	+17 40.3	4.261	4.413	+0.22	+0.1	22.0	92.3
Nov. 4	08 05.58	+17 41.4	4.127	4.436	+0.06	+0.7	22.0	101.7
Nov. 14	08 06.17	+17 47.9	3.997	4.458	−0.10	+1.2	22.0	111.7
Nov. 24	08 05.12	+18 00.3	3.878	4.480	−0.27	+1.8	22.0	122.0
Dec. 4	08 02.43	+18 18.8	3.773	4.501	−0.43	+2.4	22.0	132.8
Dec. 14	07 58.18	+18 42.7	3.688	4.522	−0.56	+2.8	21.9	144.1
Dec. 24	07 52.59	+19 11.2	3.629	4.543	−0.66	+3.1	21.9	155.6
Jan. 3	07 46.01	+19 42.6	3.598	4.563	−0.71	+3.3	22.0	167.4
Jan. 13	07 38.90	+20 15.1	3.599	4.583	−0.71	+3.2	22.0	178.6
Jan. 23	07 31.80	+20 46.9	3.633	4.602	−0.66	+3.0	22.1	168.6
Feb. 2	07 25.22	+21 16.5	3.698	4.621	−0.56	+2.6	22.1	156.9
Feb. 12	07 19.66	+21 42.7	3.792	4.639	−0.42	+2.2	22.2	145.5
Feb. 22	07 15.43	+22 05.2	3.911	4.657	−0.27	+1.8	22.3	134.3
Mar. 4	07 12.75	+22 23.7	4.051	4.674	−0.10	+1.5	22.4	123.6
Mar. 14	07 11.70	+22 38.2	4.207	4.691	+0.06	+1.1	22.5	113.4
Mar. 24	07 12.25	+22 49.1	4.373	4.708	+0.21	+0.7	22.7	103.5
Apr. 3	07 14.32	+22 56.4	4.546	4.724	+0.34	+0.4	22.8	94.1

Comet C/2012 B3 (La Sagra)

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 6.72419 TT
Peri. = 50.74016
Node = 253.00121 2000.0
Incl. = 106.93298
q = 3.5374384 AU
e = 1.0003733

m1 = 8.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	14 54.27	+84 37.3	4.567	4.989	+2.45	+18.4	18.9	110.0
Jan. 18	15 18.80	+87 41.4	4.629	5.048	+65.18	+9.1	19.0	109.8
Jan. 28	02 10.61	+89 12.7	4.714	5.108	+6.11	-17.8	19.0	108.1
Feb. 7	03 11.69	+86 15.0	4.821	5.168	+1.86	-17.1	19.1	105.2
Feb. 17	03 30.32	+83 24.1	4.947	5.228	+1.53	-16.1	19.3	101.1
Feb. 27	03 45.61	+80 43.5	5.090	5.289	+1.43	-14.9	19.4	96.2
Mar. 9	03 59.89	+78 14.8	5.246	5.350	+1.39	-13.6	19.5	90.6
Mar. 19	04 13.74	+75 58.9	5.411	5.411	+1.36	-12.3	19.6	84.7
Mar. 29	04 27.30	+73 55.9	5.581	5.473	+1.33	-11.0	19.7	78.7
Apr. 8	04 40.61	+72 05.5	5.752	5.535	+1.31	-9.8	19.8	72.6
Apr. 18	04 53.71	+70 27.1	5.920	5.597	+1.28	-8.7	19.9	66.6
Apr. 28	05 06.54	+69 00.1	6.082	5.659	+1.26	-7.7	20.0	60.8
May 8	05 19.10	+67 43.4	6.235	5.722	+1.22	-6.7	20.1	55.4
May 18	05 31.34	+66 36.4	6.376	5.785	+1.19	-5.8	20.2	50.5
May 28	05 43.21	+65 38.4	6.503	5.848	+1.15	-5.0	20.3	46.3
June 7	05 54.67	+64 48.7	6.613	5.912	+1.10	-4.2	20.4	43.0
June 17	06 05.66	+64 06.8	6.705	5.975	+1.04	-3.4	20.5	40.9
June 27	06 16.10	+63 32.5	6.779	6.039	+0.98	-2.7	20.6	40.2
July 7	06 25.92	+63 05.3	6.833	6.103	+0.91	-2.0	20.6	41.0
July 17	06 35.04	+62 45.3	6.868	6.166	+0.83	-1.3	20.7	43.2
July 27	06 43.33	+62 32.2	6.883	6.231	+0.74	-0.6	20.7	46.7
Aug. 6	06 50.70	+62 26.1	6.880	6.295	+0.63	+0.1	20.8	51.2
Aug. 16	06 56.98	+62 27.0	6.859	6.359	+0.50	+0.8	20.8	56.7
Aug. 26	07 02.01	+62 34.8	6.823	6.423	+0.36	+1.4	20.8	62.8
Sept. 5	07 05.58	+62 49.2	6.773	6.488	+0.19	+2.1	20.9	69.4
Sept. 15	07 07.45	+63 10.0	6.712	6.552	-0.01	+2.6	20.9	76.6
Sept. 25	07 07.35	+63 36.2	6.645	6.617	-0.24	+3.0	20.9	84.0
Oct. 5	07 04.99	+64 06.5	6.575	6.681	-0.49	+3.2	20.9	91.8
Oct. 15	07 00.09	+64 39.0	6.505	6.746	-0.77	+3.2	21.0	99.7
Oct. 25	06 52.41	+65 10.8	6.442	6.810	-1.05	+2.8	21.0	107.7
Nov. 4	06 41.86	+65 38.5	6.389	6.875	-1.33	+1.9	21.0	115.5
Nov. 14	06 28.59	+65 58.0	6.352	6.940	-1.55	+0.7	21.0	122.9
Nov. 24	06 13.07	+66 05.2	6.335	7.004	-1.69	-0.9	21.1	129.5
Dec. 4	05 56.15	+65 56.6	6.342	7.069	-1.72	-2.6	21.1	134.6
Dec. 14	05 38.93	+65 30.3	6.376	7.134	-1.64	-4.4	21.2	137.6
Dec. 24	05 22.56	+64 46.7	6.438	7.198	-1.46	-5.9	21.2	137.9
Jan. 3	05 08.00	+63 47.8	6.529	7.263	-1.21	-7.1	21.3	135.5
Jan. 13	04 55.88	+62 37.2	6.648	7.328	-0.94	-7.8	21.4	130.7
Jan. 23	04 46.45	+61 19.2	6.793	7.392	-0.68	-8.1	21.4	124.3
Feb. 2	04 39.68	+59 57.9	6.960	7.457	-0.43	-8.1	21.5	116.9
Feb. 12	04 35.39	+58 36.9	7.145	7.522	-0.21	-7.8	21.6	108.8
Feb. 22	04 33.26	+57 18.8	7.343	7.586	-0.03	-7.3	21.7	100.5
Mar. 4	04 32.98	+56 05.5	7.551	7.651	+0.13	-6.7	21.8	92.1
Mar. 14	04 34.26	+54 58.2	7.762	7.715	+0.26	-6.1	21.9	83.6
Mar. 24	04 36.81	+53 57.4	7.972	7.780	+0.36	-5.4	22.0	75.4
Apr. 3	04 40.40	+53 03.3	8.177	7.844	+0.44	-4.8	22.1	67.2

Comet C/2009 S3 (Lemmon)

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 12.44482 TT
Peri. = 129.87110
Node = 225.13306 2000.0
Incl. = 60.38375
q = 6.4770228 AU
e = 1.0011857

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	01 15.39	+25 60.0	6.767	6.993	+0.30	−4.9	19.2	99.3
Jan. 18	01 18.40	+25 10.6	6.952	7.019	+0.38	−4.1	19.3	89.8
Jan. 28	01 22.21	+24 29.3	7.139	7.044	+0.45	−3.4	19.3	80.5
Feb. 7	01 26.72	+23 55.6	7.323	7.071	+0.51	−2.7	19.4	71.4
Feb. 17	01 31.83	+23 28.9	7.500	7.097	+0.56	−2.0	19.5	62.4
Feb. 27	01 37.44	+23 08.6	7.667	7.125	+0.60	−1.5	19.6	53.6
Mar. 9	01 43.46	+22 53.7	7.819	7.152	+0.63	−1.0	19.6	45.0
Mar. 19	01 49.80	+22 43.5	7.955	7.181	+0.66	−0.6	19.7	36.6
Mar. 29	01 56.37	+22 37.1	8.072	7.209	+0.67	−0.4	19.7	28.4
Apr. 8	02 03.09	+22 33.6	8.167	7.238	+0.68	−0.1	19.8	20.5
Apr. 18	02 09.88	+22 32.2	8.241	7.268	+0.68	0.0	19.8	13.3
Apr. 28	02 16.66	+22 32.3	8.292	7.298	+0.67	+0.1	19.8	8.5
May 8	02 23.37	+22 33.1	8.320	7.328	+0.66	+0.1	19.9	10.2
May 18	02 29.92	+22 33.9	8.324	7.359	+0.63	0.0	19.9	16.4
May 28	02 36.24	+22 34.2	8.306	7.390	+0.60	−0.1	19.9	23.9
June 7	02 42.26	+22 33.5	8.266	7.422	+0.56	−0.2	19.9	31.8
June 17	02 47.90	+22 31.2	8.206	7.454	+0.52	−0.4	19.9	39.9
June 27	02 53.08	+22 26.8	8.127	7.487	+0.46	−0.7	19.9	48.1
July 7	02 57.72	+22 19.9	8.031	7.520	+0.40	−1.0	19.9	56.6
July 17	03 01.75	+22 10.0	7.922	7.553	+0.33	−1.3	19.9	65.2
July 27	03 05.09	+21 56.8	7.803	7.586	+0.26	−1.7	19.9	74.0
Aug. 6	03 07.68	+21 39.8	7.676	7.620	+0.18	−2.1	19.8	83.1
Aug. 16	03 09.44	+21 18.7	7.546	7.655	+0.09	−2.6	19.8	92.3
Aug. 26	03 10.35	+20 53.1	7.418	7.689	0.00	−3.0	19.8	101.9
Sept. 5	03 10.37	+20 23.0	7.295	7.724	−0.09	−3.5	19.8	111.6
Sept. 15	03 09.52	+19 48.2	7.184	7.760	−0.17	−3.9	19.8	121.7
Sept. 25	03 07.84	+19 08.9	7.088	7.795	−0.24	−4.4	19.8	132.0
Oct. 5	03 05.41	+18 25.4	7.013	7.832	−0.30	−4.7	19.8	142.6
Oct. 15	03 02.38	+17 38.3	6.963	7.868	−0.35	−5.0	19.8	153.4
Oct. 25	02 58.90	+16 48.7	6.942	7.904	−0.37	−5.1	19.8	164.4
Nov. 4	02 55.19	+15 57.6	6.952	7.941	−0.37	−5.1	19.8	175.4
Nov. 14	02 51.45	+15 06.5	6.995	7.979	−0.35	−5.0	19.8	173.2
Nov. 24	02 47.91	+14 16.9	7.071	8.016	−0.31	−4.7	19.9	162.1
Dec. 4	02 44.77	+13 30.1	7.177	8.054	−0.26	−4.3	19.9	151.0
Dec. 14	02 42.19	+12 47.3	7.313	8.092	−0.19	−3.8	20.0	140.1
Dec. 24	02 40.29	+12 09.3	7.472	8.130	−0.11	−3.3	20.1	129.3
Jan. 3	02 39.16	+11 36.6	7.652	8.169	−0.03	−2.7	20.1	118.6
Jan. 13	02 38.84	+11 09.5	7.846	8.208	+0.05	−2.2	20.2	108.3
Jan. 23	02 39.33	+10 47.8	8.051	8.247	+0.13	−1.7	20.3	98.1
Feb. 2	02 40.60	+10 31.1	8.259	8.287	+0.20	−1.2	20.4	88.2
Feb. 12	02 42.60	+10 19.0	8.466	8.326	+0.27	−0.8	20.4	78.5
Feb. 22	02 45.26	+10 10.7	8.668	8.366	+0.33	−0.5	20.5	69.1
Mar. 4	02 48.52	+10 05.5	8.861	8.406	+0.38	−0.3	20.6	59.8
Mar. 14	02 52.29	+10 02.8	9.040	8.446	+0.42	−0.1	20.6	50.8
Mar. 24	02 56.49	+10 01.8	9.202	8.487	+0.46	0.0	20.7	42.0
Apr. 3	03 01.04	+10 01.9	9.345	8.528	+0.48	0.0	20.8	33.4

Comet 71P/Clark

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 15.77390 TT
Peri. = 208.92427 e = 0.4978807
Node = 59.62536 2000.0 a = 3.1284507 AU
Incl. = 9.47518 n = 0.17811894
q = 1.5708555 AU P = 5.53 years

m1 = 9.8 + 5 log(Delta) + 15.0 log(r(t-40))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	01 12.36	+03 10.8	3.183	3.334	+0.59	+6.1	19.8	90.2
Jan. 18	01 18.21	+04 11.7	3.376	3.379	+0.70	+6.5	20.0	81.8
Jan. 28	01 25.21	+05 16.2	3.567	3.423	+0.80	+6.7	20.2	73.6
Feb. 7	01 33.17	+06 23.2	3.752	3.466	+0.88	+6.8	20.4	65.8
Feb. 17	01 41.93	+07 31.6	3.929	3.508	+0.94	+6.9	20.6	58.1
Feb. 27	01 51.33	+08 40.7	4.095	3.550	+0.99	+6.9	20.8	50.6
Mar. 9	02 01.27	+09 49.5	4.248	3.590	+1.04	+6.8	21.0	43.3
Mar. 19	02 11.63	+10 57.3	4.387	3.630	+1.07	+6.6	21.1	36.1
Mar. 29	02 22.31	+12 03.7	4.510	3.669	+1.09	+6.4	21.2	29.0
Apr. 8	02 33.24	+13 08.0	4.617	3.708	+1.11	+6.2	21.4	22.1
Apr. 18	02 44.34	+14 09.8	4.705	3.745	+1.12	+5.9	21.5	15.2
Apr. 28	02 55.53	+15 08.7	4.775	3.782	+1.12	+5.6	21.6	8.3
May 8	03 06.75	+16 04.4	4.827	3.818	+1.12	+5.2	21.7	1.9
May 18	03 17.91	+16 56.7	4.859	3.853	+1.10	+4.9	21.8	5.6
May 28	03 28.95	+17 45.3	4.871	3.888	+1.08	+4.5	21.8	12.4
June 7	03 39.78	+18 30.2	4.865	3.921	+1.06	+4.1	21.9	19.3
June 17	03 50.33	+19 11.3	4.840	3.954	+1.02	+3.7	22.0	26.2
June 27	04 00.50	+19 48.6	4.797	3.986	+0.97	+3.4	22.0	33.3
July 7	04 10.20	+20 22.2	4.736	4.018	+0.91	+3.0	22.0	40.5
July 17	04 19.31	+20 52.2	4.660	4.048	+0.84	+2.7	22.0	47.8
July 27	04 27.70	+21 18.8	4.569	4.078	+0.75	+2.3	22.1	55.4
Aug. 6	04 35.25	+21 42.2	4.464	4.107	+0.65	+2.1	22.1	63.1
Aug. 16	04 41.80	+22 02.8	4.349	4.135	+0.54	+1.8	22.1	71.2
Aug. 26	04 47.18	+22 20.8	4.226	4.163	+0.41	+1.6	22.0	79.5
Sept. 5	04 51.24	+22 36.3	4.098	4.190	+0.26	+1.3	22.0	88.2
Sept. 15	04 53.80	+22 49.8	3.967	4.216	+0.09	+1.1	22.0	97.4
Sept. 25	04 54.69	+23 01.1	3.840	4.241	−0.09	+0.9	22.0	106.9
Oct. 5	04 53.81	+23 10.2	3.719	4.266	−0.27	+0.7	21.9	116.9
Oct. 15	04 51.08	+23 16.9	3.610	4.290	−0.45	+0.4	21.9	127.4
Oct. 25	04 46.56	+23 20.6	3.519	4.313	−0.61	0.0	21.9	138.3
Nov. 4	04 40.41	+23 21.1	3.450	4.335	−0.74	−0.3	21.9	149.7
Nov. 14	04 32.99	+23 17.9	3.408	4.357	−0.82	−0.7	21.9	161.4
Nov. 24	04 24.79	+23 11.1	3.396	4.378	−0.84	−1.0	21.9	173.3
Dec. 4	04 16.39	+23 01.3	3.417	4.398	−0.80	−1.1	22.0	174.2
Dec. 14	04 08.40	+22 49.9	3.470	4.418	−0.70	−1.2	22.1	162.4
Dec. 24	04 01.38	+22 38.3	3.553	4.437	−0.56	−1.0	22.1	150.6
Jan. 3	03 55.74	+22 28.3	3.665	4.455	−0.40	−0.7	22.2	139.1
Jan. 13	03 51.75	+22 21.4	3.799	4.473	−0.22	−0.3	22.3	128.0
Jan. 23	03 49.51	+22 18.6	3.951	4.489	−0.05	+0.2	22.5	117.3
Feb. 2	03 49.03	+22 20.2	4.116	4.505	+0.12	+0.6	22.6	107.1
Feb. 12	03 50.22	+22 26.4	4.289	4.521	+0.27	+1.0	22.7	97.3
Feb. 22	03 52.93	+22 36.8	4.464	4.535	+0.41	+1.4	22.8	87.8
Mar. 4	03 57.00	+22 50.9	4.638	4.549	+0.53	+1.7	22.9	78.7
Mar. 14	04 02.29	+23 07.8	4.806	4.563	+0.63	+1.9	23.0	70.0
Mar. 24	04 08.60	+23 26.9	4.965	4.575	+0.72	+2.0	.	61.6
Apr. 3	04 15.81	+23 47.3	5.113	4.587	+0.80	+2.1	.	53.4

Comet C/2011 A3 (Gibbs)

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 15.96699 TT
Peri. = 141.12645
Node = 124.89727 2000.0
Incl. = 26.07939
q = 2.3443189 AU
e = 0.9971051

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	23 23.23	-23 35.0	5.120	4.648	+0.84	+6.0	18.2	56.3
Jan. 18	23 31.59	-22 34.6	5.314	4.727	+0.87	+6.0	18.4	49.0
Jan. 28	23 40.27	-21 34.6	5.494	4.806	+0.89	+5.9	18.5	41.9
Feb. 7	23 49.19	-20 35.9	5.658	4.886	+0.91	+5.7	18.7	35.2
Feb. 17	23 58.25	-19 39.0	5.806	4.965	+0.91	+5.4	18.8	29.0
Feb. 27	00 07.36	-18 44.7	5.936	5.044	+0.91	+5.1	18.9	23.6
Mar. 9	00 16.46	-17 53.5	6.047	5.123	+0.90	+4.7	19.0	19.7
Mar. 19	00 25.48	-17 06.2	6.138	5.202	+0.89	+4.3	19.1	18.2
Mar. 29	00 34.35	-16 23.3	6.210	5.281	+0.86	+3.8	19.2	19.7
Apr. 8	00 43.00	-15 45.3	6.262	5.359	+0.84	+3.3	19.3	23.6
Apr. 18	00 51.37	-15 12.7	6.294	5.438	+0.80	+2.7	19.3	29.0
Apr. 28	00 59.39	-14 46.2	6.308	5.516	+0.76	+2.0	19.4	35.2
May 8	01 07.01	-14 26.0	6.304	5.595	+0.71	+1.3	19.5	42.0
May 18	01 14.15	-14 12.7	6.284	5.673	+0.66	+0.6	19.5	49.1
May 28	01 20.73	-14 06.6	6.249	5.751	+0.60	-0.1	19.6	56.4
June 7	01 26.69	-14 07.9	6.203	5.828	+0.52	-0.9	19.6	63.9
June 17	01 31.94	-14 16.9	6.146	5.906	+0.45	-1.7	19.7	71.7
June 27	01 36.40	-14 33.6	6.082	5.984	+0.36	-2.4	19.7	79.7
July 7	01 39.99	-14 57.8	6.014	6.061	+0.27	-3.1	19.7	87.8
July 17	01 42.65	-15 29.1	5.945	6.138	+0.17	-3.8	19.8	96.1
July 27	01 44.30	-16 06.7	5.881	6.215	+0.06	-4.3	19.8	104.6
Aug. 6	01 44.92	-16 49.7	5.823	6.292	-0.04	-4.7	19.8	113.2
Aug. 16	01 44.47	-17 36.6	5.777	6.368	-0.15	-4.9	19.8	121.7
Aug. 26	01 43.00	-18 25.5	5.747	6.444	-0.24	-4.9	19.9	130.1
Sept. 5	01 40.57	-19 14.2	5.736	6.521	-0.33	-4.6	19.9	138.0
Sept.15	01 37.32	-20 00.5	5.748	6.596	-0.39	-4.1	20.0	144.9
Sept.25	01 33.41	-20 42.0	5.786	6.672	-0.43	-3.5	20.1	149.9
Oct. 5	01 29.09	-21 16.6	5.850	6.748	-0.45	-2.6	20.1	151.7
Oct. 15	01 24.62	-21 42.4	5.942	6.823	-0.44	-1.6	20.2	149.8
Oct. 25	01 20.25	-21 58.5	6.062	6.898	-0.40	-0.6	20.3	144.8
Nov. 4	01 16.25	-22 04.5	6.207	6.973	-0.34	+0.4	20.4	137.8
Nov. 14	01 12.83	-22 00.3	6.375	7.048	-0.27	+1.3	20.5	129.7
Nov. 24	01 10.15	-21 46.9	6.562	7.122	-0.18	+2.2	20.6	121.1
Dec. 4	01 08.32	-21 25.1	6.766	7.197	-0.09	+2.9	20.7	112.2
Dec. 14	01 07.41	-20 56.4	6.981	7.271	0.00	+3.4	20.8	103.3
Dec. 24	01 07.41	-20 22.0	7.203	7.345	+0.09	+3.9	20.9	94.4
Jan. 3	01 08.30	-19 43.2	7.428	7.419	+0.17	+4.2	21.1	85.7
Jan. 13	01 10.01	-19 01.4	7.651	7.492	+0.25	+4.4	21.2	77.1
Jan. 23	01 12.48	-18 17.8	7.868	7.565	+0.31	+4.5	21.3	68.6
Feb. 2	01 15.61	-17 33.2	8.077	7.639	+0.37	+4.4	21.4	60.4
Feb. 12	01 19.32	-16 48.8	8.273	7.712	+0.42	+4.4	21.5	52.5
Feb. 22	01 23.51	-16 05.2	8.453	7.784	+0.46	+4.2	21.5	44.9
Mar. 4	01 28.09	-15 23.3	8.616	7.857	+0.49	+4.0	21.6	37.8
Mar. 14	01 32.98	-14 43.6	8.760	7.929	+0.51	+3.7	21.7	31.5
Mar. 24	01 38.08	-14 06.7	8.882	8.001	+0.52	+3.4	21.8	26.4
Apr. 3	01 43.31	-13 33.1	8.983	8.073	+0.53	+3.0	21.8	23.2

Comet C/2009 P1 (Garradd)

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 23.55822 TT
Peri. = 90.73581
Node = 325.99776 2000.0
Incl. = 106.16960
q = 1.5507633 AU
e = 1.0006234

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	09 29.06	-10 17.6	3.983	4.720	-1.13	-2.8	13.9	134.0
Jan. 18	09 17.75	-10 45.4	3.987	4.812	-1.18	-1.3	14.0	143.3
Jan. 28	09 05.98	-10 58.0	4.024	4.903	-1.16	+0.2	14.1	150.2
Feb. 7	08 54.35	-10 56.4	4.096	4.994	-1.09	+1.4	14.2	152.8
Feb. 17	08 43.41	-10 42.4	4.204	5.084	-0.98	+2.3	14.4	150.0
Feb. 27	08 33.66	-10 19.1	4.345	5.174	-0.83	+2.9	14.5	143.4
Mar. 9	08 25.40	-09 49.7	4.516	5.263	-0.66	+3.2	14.7	134.8
Mar. 19	08 18.81	-09 17.6	4.712	5.352	-0.49	+3.2	14.9	125.5
Mar. 29	08 13.91	-08 45.7	4.927	5.440	-0.33	+3.0	15.0	116.1
Apr. 8	08 10.63	-08 16.1	5.157	5.528	-0.18	+2.5	15.2	106.7
Apr. 18	08 08.84	-07 50.6	5.395	5.616	-0.05	+2.0	15.4	97.6
Apr. 28	08 08.38	-07 30.3	5.636	5.703	+0.07	+1.4	15.5	88.7
May 8	08 09.05	-07 15.9	5.876	5.790	+0.16	+0.8	15.7	80.2
May 18	08 10.69	-07 07.7	6.111	5.876	+0.24	+0.2	15.8	71.9
May 28	08 13.12	-07 05.9	6.336	5.962	+0.31	-0.5	16.0	64.0
June 7	08 16.19	-07 10.5	6.549	6.048	+0.36	-1.1	16.1	56.5
June 17	08 19.76	-07 21.4	6.746	6.133	+0.39	-1.7	16.2	49.3
June 27	08 23.69	-07 38.5	6.926	6.218	+0.42	-2.3	16.3	42.7
July 7	08 27.86	-08 01.4	7.087	6.302	+0.43	-2.9	16.4	36.8
July 17	08 32.18	-08 30.1	7.226	6.386	+0.43	-3.4	16.5	31.9
July 27	08 36.52	-09 04.1	7.344	6.470	+0.43	-3.9	16.6	28.5
Aug. 6	08 40.79	-09 43.2	7.440	6.553	+0.41	-4.4	16.7	27.1
Aug. 16	08 44.90	-10 27.1	7.512	6.636	+0.38	-4.8	16.8	28.1
Aug. 26	08 48.75	-11 15.3	7.562	6.718	+0.35	-5.2	16.9	31.2
Sept. 5	08 52.25	-12 07.6	7.591	6.801	+0.31	-5.6	16.9	36.0
Sept.15	08 55.30	-13 03.3	7.598	6.882	+0.25	-5.9	17.0	41.9
Sept.25	08 57.80	-14 02.0	7.586	6.964	+0.19	-6.1	17.0	48.6
Oct. 5	08 59.67	-15 02.9	7.558	7.045	+0.11	-6.2	17.1	55.9
Oct. 15	09 00.80	-16 05.3	7.514	7.126	+0.03	-6.3	17.1	63.5
Oct. 25	09 01.11	-17 08.1	7.460	7.207	-0.06	-6.2	17.1	71.5
Nov. 4	09 00.52	-18 10.3	7.398	7.287	-0.16	-6.0	17.2	79.7
Nov. 14	08 58.95	-19 10.5	7.333	7.367	-0.26	-5.7	17.2	88.1
Nov. 24	08 56.38	-20 07.0	7.269	7.446	-0.36	-5.1	17.2	96.6
Dec. 4	08 52.81	-20 58.4	7.210	7.525	-0.45	-4.4	17.3	105.0
Dec. 14	08 48.29	-21 42.9	7.163	7.604	-0.54	-3.6	17.3	113.2
Dec. 24	08 42.92	-22 18.7	7.131	7.683	-0.60	-2.6	17.3	121.0
Jan. 3	08 36.87	-22 44.7	7.118	7.761	-0.65	-1.5	17.4	127.9
Jan. 13	08 30.37	-22 59.7	7.129	7.839	-0.67	-0.4	17.4	133.6
Jan. 23	08 23.66	-23 03.5	7.165	7.917	-0.66	+0.7	17.5	137.4
Feb. 2	08 17.04	-22 56.4	7.228	7.995	-0.63	+1.7	17.5	138.7
Feb. 12	08 10.76	-22 39.5	7.319	8.072	-0.57	+2.5	17.6	137.3
Feb. 22	08 05.06	-22 14.3	7.436	8.149	-0.49	+3.1	17.7	133.5
Mar. 4	08 00.13	-21 42.8	7.577	8.225	-0.40	+3.6	17.7	128.1
Mar. 14	07 56.09	-21 07.2	7.740	8.302	-0.31	+3.8	17.8	121.4
Mar. 24	07 53.01	-20 29.6	7.920	8.378	-0.21	+3.8	17.9	114.2
Apr. 3	07 50.90	-19 51.9	8.114	8.453	-0.12	+3.6	18.0	106.6

Comet 36P/Whipple

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 25.22327 TT
Peri. = 200.96179 e = 0.2615475
Node = 182.07046 2000.0 a = 4.1696997 AU
Incl. = 9.91488 n = 0.11575690
q = 3.0791252 AU P = 8.51 years

m1 = 7.8 + 5 log(Delta) + 17.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	05 50.71	+10 00.1	2.646	3.567	−0.53	+1.9	19.6	156.0
Jan. 18	05 45.41	+10 19.4	2.730	3.589	−0.37	+2.5	19.7	146.1
Jan. 28	05 41.74	+10 44.7	2.838	3.610	−0.18	+2.9	19.8	135.9
Feb. 7	05 39.92	+11 14.2	2.966	3.632	+0.01	+3.2	20.0	125.8
Feb. 17	05 40.03	+11 46.1	3.110	3.654	+0.20	+3.3	20.1	116.1
Feb. 27	05 42.03	+12 18.9	3.265	3.677	+0.37	+3.2	20.3	106.8
Mar. 9	05 45.77	+12 51.1	3.429	3.699	+0.53	+3.0	20.4	97.9
Mar. 19	05 51.10	+13 21.5	3.595	3.721	+0.67	+2.8	20.6	89.4
Mar. 29	05 57.80	+13 49.0	3.762	3.744	+0.79	+2.4	20.7	81.3
Apr. 8	06 05.68	+14 12.9	3.927	3.766	+0.89	+2.0	20.8	73.5
Apr. 18	06 14.57	+14 32.4	4.086	3.789	+0.97	+1.5	21.0	65.9
Apr. 28	06 24.30	+14 47.2	4.238	3.812	+1.04	+1.0	21.1	58.6
May 8	06 34.69	+14 56.8	4.380	3.835	+1.09	+0.4	21.2	51.6
May 18	06 45.62	+15 01.1	4.511	3.858	+1.13	−0.1	21.3	44.6
May 28	06 56.96	+14 59.9	4.630	3.880	+1.16	−0.7	21.4	37.9
June 7	07 08.60	+14 53.2	4.734	3.903	+1.18	−1.2	21.5	31.3
June 17	07 20.43	+14 41.2	4.824	3.926	+1.19	−1.7	21.6	24.9
June 27	07 32.36	+14 23.9	4.899	3.949	+1.19	−2.2	21.7	18.6
July 7	07 44.30	+14 01.7	4.957	3.972	+1.19	−2.7	21.8	12.7
July 17	07 56.17	+13 34.8	4.998	3.994	+1.17	−3.1	21.8	8.1
July 27	08 07.90	+13 03.6	5.022	4.017	+1.15	−3.5	21.9	7.5
Aug. 6	08 19.42	+12 28.5	5.028	4.040	+1.12	−3.8	21.9	11.6
Aug. 16	08 30.64	+11 50.1	5.017	4.062	+1.09	−4.1	22.0	17.5
Aug. 26	08 41.51	+11 09.0	4.988	4.085	+1.04	−4.3	22.0	23.9
Sept. 5	08 51.95	+10 25.6	4.942	4.107	+0.99	−4.5	22.0	30.6
Sept. 15	09 01.87	+09 40.9	4.880	4.129	+0.93	−4.5	22.0	37.6
Sept. 25	09 11.19	+08 55.4	4.802	4.151	+0.86	−4.5	22.0	44.8
Oct. 5	09 19.83	+08 10.1	4.710	4.173	+0.78	−4.4	22.0	52.3
Oct. 15	09 27.67	+07 26.0	4.604	4.195	+0.69	−4.2	22.0	60.0
Oct. 25	09 34.61	+06 43.9	4.488	4.217	+0.59	−3.9	22.0	68.0
Nov. 4	09 40.52	+06 05.1	4.363	4.239	+0.48	−3.4	22.0	76.3
Nov. 14	09 45.28	+05 30.7	4.232	4.261	+0.35	−2.9	21.9	85.0
Nov. 24	09 48.77	+05 02.0	4.099	4.282	+0.21	−2.2	21.9	94.0
Dec. 4	09 50.86	+04 40.3	3.967	4.303	+0.06	−1.3	21.9	103.4
Dec. 14	09 51.46	+04 26.8	3.841	4.324	−0.09	−0.4	21.9	113.2
Dec. 24	09 50.54	+04 22.6	3.725	4.345	−0.24	+0.6	21.8	123.4
Jan. 3	09 48.12	+04 28.2	3.625	4.366	−0.38	+1.6	21.8	134.0
Jan. 13	09 44.33	+04 44.0	3.545	4.387	−0.49	+2.5	21.8	144.9
Jan. 23	09 39.42	+05 09.1	3.490	4.407	−0.57	+3.3	21.8	155.9
Feb. 2	09 33.74	+05 42.3	3.464	4.427	−0.60	+3.9	21.8	166.2
Feb. 12	09 27.74	+06 21.3	3.468	4.447	−0.58	+4.2	21.8	171.8
Feb. 22	09 21.91	+07 03.4	3.504	4.467	−0.52	+4.3	21.9	165.3
Mar. 4	09 16.70	+07 45.9	3.569	4.487	−0.42	+4.0	22.0	154.9
Mar. 14	09 12.50	+08 26.2	3.663	4.506	−0.29	+3.6	22.1	144.2
Mar. 24	09 09.58	+09 02.1	3.780	4.526	−0.15	+3.0	22.2	133.6
Apr. 3	09 08.08	+09 32.3	3.918	4.545	0.00	+2.4	22.3	123.4

Comet C/2009 F4 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2011 Dec. 31.94124 TT
Peri. = 260.40348
Node = 53.58045 2000.0
Incl. = 79.34997
q = 5.4555722 AU
e = 1.0000951

m1 = 2.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	03 00.77	-48 37.8	6.032	6.096	-0.34	+13.0	14.4	89.1
Jan. 18	02 57.36	-46 28.1	6.143	6.128	-0.16	+13.2	14.4	84.6
Jan. 28	02 55.73	-44 16.1	6.259	6.161	-0.01	+13.1	14.5	79.8
Feb. 7	02 55.67	-42 04.6	6.379	6.195	+0.13	+12.9	14.5	74.9
Feb. 17	02 56.95	-39 56.0	6.499	6.229	+0.24	+12.4	14.6	69.9
Feb. 27	02 59.34	-37 52.2	6.617	6.263	+0.33	+11.8	14.7	65.0
Mar. 9	03 02.66	-35 54.5	6.730	6.299	+0.41	+11.0	14.7	60.4
Mar. 19	03 06.72	-34 04.0	6.837	6.334	+0.46	+10.2	14.8	56.0
Mar. 29	03 11.37	-32 21.6	6.934	6.371	+0.51	+9.4	14.8	52.2
Apr. 8	03 16.45	-30 47.8	7.020	6.407	+0.54	+8.5	14.9	49.0
Apr. 18	03 21.86	-29 22.8	7.094	6.445	+0.56	+7.6	14.9	46.6
Apr. 28	03 27.45	-28 07.1	7.153	6.483	+0.57	+6.6	15.0	45.1
May 8	03 33.12	-27 00.7	7.198	6.521	+0.57	+5.7	15.0	44.8
May 18	03 38.78	-26 03.6	7.228	6.560	+0.55	+4.8	15.1	45.6
May 28	03 44.32	-25 15.7	7.242	6.599	+0.53	+3.9	15.1	47.4
June 7	03 49.64	-24 37.1	7.240	6.638	+0.50	+3.0	15.1	50.3
June 17	03 54.65	-24 07.4	7.223	6.678	+0.46	+2.1	15.1	54.1
June 27	03 59.25	-23 46.4	7.191	6.719	+0.41	+1.3	15.2	58.7
July 7	04 03.35	-23 33.9	7.147	6.760	+0.35	+0.5	15.2	63.8
July 17	04 06.83	-23 29.2	7.091	6.801	+0.28	-0.3	15.2	69.5
July 27	04 09.60	-23 31.9	7.025	6.843	+0.20	-0.9	15.2	75.6
Aug. 6	04 11.57	-23 41.1	6.952	6.885	+0.11	-1.5	15.2	82.0
Aug. 16	04 12.62	-23 55.8	6.875	6.927	+0.01	-1.9	15.2	88.7
Aug. 26	04 12.68	-24 14.7	6.797	6.970	-0.10	-2.2	15.2	95.7
Sept. 5	04 11.69	-24 36.4	6.722	7.013	-0.21	-2.3	15.2	102.7
Sept. 15	04 09.58	-24 58.9	6.653	7.057	-0.32	-2.1	15.2	109.8
Sept. 25	04 06.39	-25 20.2	6.594	7.101	-0.42	-1.8	15.2	116.6
Oct. 5	04 02.14	-25 38.0	6.550	7.145	-0.52	-1.2	15.2	123.1
Oct. 15	03 56.95	-25 50.0	6.523	7.189	-0.59	-0.4	15.2	128.7
Oct. 25	03 51.00	-25 53.9	6.518	7.234	-0.65	+0.6	15.3	133.1
Nov. 4	03 44.52	-25 48.0	6.536	7.279	-0.67	+1.7	15.3	135.7
Nov. 14	03 37.80	-25 31.1	6.580	7.324	-0.67	+2.8	15.3	136.0
Nov. 24	03 31.14	-25 02.6	6.649	7.370	-0.63	+4.0	15.4	134.0
Dec. 4	03 24.82	-24 22.9	6.745	7.415	-0.57	+5.0	15.4	129.9
Dec. 14	03 19.11	-23 32.7	6.864	7.461	-0.49	+5.9	15.5	124.2
Dec. 24	03 14.20	-22 33.8	7.005	7.508	-0.40	+6.6	15.6	117.3
Jan. 3	03 10.23	-21 27.7	7.164	7.554	-0.30	+7.1	15.7	109.8
Jan. 13	03 07.28	-20 16.6	7.337	7.601	-0.19	+7.4	15.7	101.9
Jan. 23	03 05.35	-19 02.1	7.519	7.648	-0.09	+7.6	15.8	93.8
Feb. 2	03 04.41	-17 46.1	7.708	7.695	0.00	+7.6	15.9	85.6
Feb. 12	03 04.42	-16 30.0	7.897	7.743	+0.09	+7.5	16.0	77.5
Feb. 22	03 05.27	-15 15.0	8.083	7.790	+0.16	+7.3	16.1	69.4
Mar. 4	03 06.88	-14 02.2	8.262	7.838	+0.23	+7.0	16.1	61.5
Mar. 14	03 09.14	-12 52.3	8.430	7.886	+0.28	+6.6	16.2	53.9
Mar. 24	03 11.95	-11 46.0	8.584	7.934	+0.33	+6.2	16.3	46.7
Apr. 3	03 15.21	-10 43.7	8.723	7.983	+0.36	+5.8	16.3	40.0

Comet 78P/Gehrels

Epoch = 2013 July 7.0 TT
T = 2012 Jan. 12.66924 TT
Peri. = 192.74351 e = 0.4622136
Node = 210.55654 2000.0 a = 3.7354173 AU
Incl. = 6.25491 n = 0.13651972
q = 2.0088566 AU P = 7.22 years

m1 = 5.6 + 5 log(Delta) + 20.0 log(r(t-40))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	10 37.50	+01 01.4	2.601	3.285	-0.37	+1.0	17.5	126.8
Jan. 18	10 33.83	+01 11.9	2.536	3.330	-0.54	+2.5	17.6	137.7
Jan. 28	10 28.40	+01 36.5	2.493	3.375	-0.67	+3.7	17.7	149.0
Feb. 7	10 21.67	+02 13.5	2.474	3.420	-0.74	+4.6	17.8	160.4
Feb. 17	10 14.24	+03 00.0	2.485	3.464	-0.74	+5.2	17.9	170.4
Feb. 27	10 06.80	+03 51.6	2.526	3.507	-0.68	+5.2	18.1	170.6
Mar. 9	10 00.05	+04 43.9	2.598	3.550	-0.55	+4.9	18.2	160.7
Mar. 19	09 54.53	+05 32.8	2.698	3.593	-0.39	+4.2	18.4	149.8
Mar. 29	09 50.63	+06 15.1	2.823	3.636	-0.21	+3.4	18.6	139.0
Apr. 8	09 48.51	+06 48.7	2.969	3.678	-0.03	+2.4	18.9	128.6
Apr. 18	09 48.21	+07 12.7	3.131	3.719	+0.14	+1.4	19.1	118.7
Apr. 28	09 49.63	+07 26.9	3.306	3.760	+0.30	+0.5	19.3	109.3
May 8	09 52.60	+07 31.4	3.489	3.801	+0.43	-0.5	19.5	100.3
May 18	09 56.95	+07 26.9	3.675	3.841	+0.55	-1.3	19.7	91.7
May 28	10 02.46	+07 14.0	3.863	3.881	+0.65	-2.0	19.9	83.5
June 7	10 08.95	+06 53.5	4.048	3.920	+0.73	-2.7	20.1	75.6
June 17	10 16.26	+06 26.3	4.228	3.959	+0.80	-3.3	20.3	67.9
June 27	10 24.22	+05 52.9	4.400	3.997	+0.85	-3.9	20.5	60.4
July 7	10 32.72	+05 14.3	4.563	4.035	+0.89	-4.3	20.7	53.1
July 17	10 41.63	+04 30.9	4.713	4.072	+0.92	-4.7	20.8	45.9
July 27	10 50.86	+03 43.6	4.850	4.109	+0.95	-5.1	21.0	38.8
Aug. 6	11 00.33	+02 52.9	4.973	4.145	+0.96	-5.3	21.1	31.8
Aug. 16	11 09.95	+01 59.5	5.078	4.181	+0.97	-5.6	21.2	24.8
Aug. 26	11 19.65	+01 04.0	5.167	4.216	+0.97	-5.7	21.4	17.8
Sept. 5	11 29.38	+00 07.0	5.237	4.251	+0.97	-5.8	21.5	10.9
Sept.15	11 39.08	-00 51.0	5.287	4.285	+0.96	-5.8	21.6	4.4
Sept.25	11 48.66	-01 49.2	5.317	4.319	+0.94	-5.8	21.7	4.7
Oct. 5	11 58.09	-02 47.2	5.328	4.352	+0.92	-5.7	21.7	11.4
Oct. 15	12 07.29	-03 44.3	5.318	4.385	+0.89	-5.6	21.8	18.6
Oct. 25	12 16.18	-04 39.8	5.288	4.417	+0.85	-5.3	21.9	26.1
Nov. 4	12 24.69	-05 33.1	5.239	4.449	+0.80	-5.0	21.9	33.8
Nov. 14	12 32.72	-06 23.6	5.171	4.480	+0.75	-4.7	21.9	41.6
Nov. 24	12 40.17	-07 10.5	5.086	4.511	+0.68	-4.3	22.0	49.7
Dec. 4	12 46.94	-07 53.1	4.986	4.541	+0.60	-3.8	22.0	58.0
Dec. 14	12 52.89	-08 30.6	4.873	4.570	+0.50	-3.2	22.0	66.5
Dec. 24	12 57.90	-09 02.4	4.749	4.600	+0.39	-2.5	22.0	75.3
Jan. 3	13 01.84	-09 27.6	4.619	4.628	+0.27	-1.8	22.0	84.5
Jan. 13	13 04.58	-09 45.3	4.485	4.656	+0.14	-1.0	22.0	93.9
Jan. 23	13 06.00	-09 54.9	4.353	4.684	0.00	-0.1	22.0	103.7
Feb. 2	13 06.02	-09 55.8	4.226	4.711	-0.14	+0.8	22.0	113.8
Feb. 12	13 04.62	-09 47.4	4.111	4.738	-0.28	+1.8	22.0	124.3
Feb. 22	13 01.84	-09 29.8	4.012	4.764	-0.40	+2.6	22.0	135.1
Mar. 4	12 57.80	-09 03.3	3.934	4.790	-0.50	+3.4	22.0	146.2
Mar. 14	12 52.77	-08 29.2	3.881	4.815	-0.57	+4.0	22.0	157.6
Mar. 24	12 47.06	-07 49.3	3.857	4.840	-0.60	+4.3	22.0	168.9
Apr. 3	12 41.06	-07 05.9	3.865	4.864	-0.59	+4.4	22.1	177.4

Comet C/2011 Q2 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2012 Jan. 19.45723 TT
Peri. = 34.89895
Node = 287.15521 2000.0
Incl. = 37.09409
q = 1.3535785 AU
e = 1.0000161

m1 = 9.0 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	04 36.19	+44 38.3	3.739	4.540	-0.47	-7.9	18.4	140.3
Jan. 18	04 31.47	+43 19.8	3.927	4.635	-0.24	-7.5	18.6	131.3
Jan. 28	04 29.04	+42 04.9	4.136	4.730	-0.03	-6.9	18.8	121.9
Feb. 7	04 28.71	+40 56.1	4.361	4.824	+0.15	-6.1	19.0	112.4
Feb. 17	04 30.24	+39 54.6	4.599	4.918	+0.31	-5.4	19.2	103.1
Feb. 27	04 33.35	+39 00.9	4.844	5.011	+0.44	-4.6	19.4	94.0
Mar. 9	04 37.77	+38 14.5	5.091	5.104	+0.55	-4.0	19.6	85.1
Mar. 19	04 43.30	+37 34.9	5.338	5.196	+0.64	-3.4	19.8	76.5
Mar. 29	04 49.71	+37 01.2	5.579	5.287	+0.71	-2.9	20.0	68.1
Apr. 8	04 56.82	+36 32.5	5.811	5.378	+0.77	-2.5	20.1	59.8
Apr. 18	05 04.48	+36 07.9	6.032	5.469	+0.81	-2.1	20.3	51.8
Apr. 28	05 12.53	+35 46.7	6.239	5.559	+0.83	-1.9	20.4	44.0
May 8	05 20.86	+35 28.2	6.429	5.648	+0.85	-1.6	20.6	36.3
May 18	05 29.35	+35 11.8	6.602	5.737	+0.86	-1.5	20.7	28.9
May 28	05 37.91	+34 57.0	6.754	5.826	+0.85	-1.3	20.8	21.9
June 7	05 46.42	+34 43.6	6.885	5.914	+0.84	-1.2	20.9	15.7
June 17	05 54.82	+34 31.2	6.994	6.002	+0.82	-1.1	21.0	11.5
June 27	06 02.99	+34 19.8	7.080	6.089	+0.79	-1.1	21.1	11.9
July 7	06 10.88	+34 09.2	7.144	6.175	+0.75	-1.0	21.2	16.5
July 17	06 18.39	+33 59.5	7.185	6.262	+0.70	-0.9	21.2	23.0
July 27	06 25.42	+33 50.9	7.204	6.348	+0.65	-0.8	21.3	30.3
Aug. 6	06 31.91	+33 43.3	7.201	6.433	+0.58	-0.6	21.4	38.0
Aug. 16	06 37.75	+33 37.0	7.180	6.518	+0.51	-0.5	21.4	46.1
Aug. 26	06 42.86	+33 32.1	7.140	6.603	+0.43	-0.3	21.5	54.4
Sept. 5	06 47.14	+33 28.8	7.085	6.687	+0.34	-0.2	21.5	62.9
Sept. 15	06 50.50	+33 27.3	7.018	6.771	+0.23	0.0	21.5	71.8
Sept. 25	06 52.84	+33 27.5	6.941	6.854	+0.13	+0.2	21.6	80.9
Oct. 5	06 54.10	+33 29.4	6.860	6.937	+0.01	+0.3	21.6	90.3
Oct. 15	06 54.19	+33 32.7	6.778	7.020	-0.11	+0.4	21.6	100.0
Oct. 25	06 53.09	+33 36.9	6.701	7.102	-0.23	+0.5	21.6	110.0
Nov. 4	06 50.81	+33 41.6	6.634	7.184	-0.34	+0.4	21.7	120.2
Nov. 14	06 47.39	+33 45.7	6.582	7.266	-0.44	+0.3	21.7	130.7
Nov. 24	06 42.97	+33 48.5	6.550	7.347	-0.52	0.0	21.7	141.3
Dec. 4	06 37.74	+33 49.0	6.544	7.428	-0.58	-0.3	21.8	151.9
Dec. 14	06 31.95	+33 46.3	6.566	7.508	-0.60	-0.6	21.8	161.9
Dec. 24	06 25.90	+33 40.1	6.620	7.589	-0.60	-1.0	21.9	169.1
Jan. 3	06 19.91	+33 30.3	6.707	7.669	-0.56	-1.3	22.0	167.0
Jan. 13	06 14.30	+33 16.9	6.826	7.748	-0.50	-1.6	.	158.2
Jan. 23	06 09.32	+33 00.7	6.975	7.827	-0.41	-1.8	.	148.0
Feb. 2	06 05.19	+32 42.4	7.152	7.906	-0.31	-2.0	.	137.4
Feb. 12	06 02.05	+32 22.9	7.353	7.985	-0.21	-2.0	.	126.9
Feb. 22	05 59.95	+32 02.9	7.572	8.063	-0.10	-2.0	.	116.6
Mar. 4	05 58.92	+31 43.1	7.804	8.141	0.00	-1.9	.	106.5
Mar. 14	05 58.92	+31 23.9	8.045	8.219	+0.10	-1.8	.	96.6
Mar. 24	05 59.87	+31 05.7	8.290	8.296	+0.18	-1.7	.	86.9
Apr. 3	06 01.68	+30 48.5	8.533	8.373	+0.26	-1.6	.	77.5

Comet P/2011 JB15 (Spacewatch-Boattini)

Epoch = 2013 July 7.0 TT
T = 2012 Jan. 20.33556 TT
Peri. = 110.82368 e = 0.3174820
Node = 153.73590 2000.0 a = 7.3517617 AU
Incl. = 19.14914 n = 0.04944438
q = 5.0177097 AU P = 19.93 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	19 55.24	-11 33.0	6.189	5.241	+0.96	+1.4	20.5	14.1
Jan. 18	20 04.84	-11 18.6	6.221	5.253	+0.95	+1.8	20.6	9.4
Jan. 28	20 14.37	-11 00.6	6.233	5.265	+0.94	+2.1	20.6	9.8
Feb. 7	20 23.75	-10 39.4	6.224	5.278	+0.91	+2.4	20.6	15.1
Feb. 17	20 32.89	-10 15.5	6.195	5.291	+0.88	+2.6	20.6	21.9
Feb. 27	20 41.70	-09 49.6	6.146	5.304	+0.84	+2.7	20.6	29.2
Mar. 9	20 50.10	-09 22.5	6.079	5.318	+0.79	+2.8	20.6	36.8
Mar. 19	20 57.99	-08 54.8	5.995	5.332	+0.73	+2.7	20.6	44.6
Mar. 29	21 05.31	-08 27.4	5.895	5.346	+0.67	+2.6	20.6	52.5
Apr. 8	21 11.96	-08 01.1	5.782	5.360	+0.59	+2.4	20.6	60.5
Apr. 18	21 17.86	-07 36.8	5.658	5.374	+0.51	+2.1	20.6	68.7
Apr. 28	21 22.92	-07 15.4	5.526	5.389	+0.42	+1.8	20.5	77.0
May 8	21 27.08	-06 57.8	5.388	5.404	+0.32	+1.3	20.5	85.5
May 18	21 30.24	-06 44.9	5.249	5.419	+0.21	+0.7	20.5	94.3
May 28	21 32.36	-06 37.6	5.112	5.435	+0.10	+0.1	20.4	103.3
June 7	21 33.38	-06 36.5	4.980	5.450	-0.01	-0.6	20.4	112.5
June 17	21 33.30	-06 42.3	4.859	5.466	-0.12	-1.3	20.4	122.1
June 27	21 32.14	-06 55.4	4.752	5.482	-0.22	-2.0	20.4	131.8
July 7	21 29.98	-07 15.6	4.663	5.499	-0.30	-2.7	20.3	141.8
July 17	21 26.96	-07 42.6	4.597	5.515	-0.37	-3.3	20.3	152.0
July 27	21 23.29	-08 15.3	4.557	5.532	-0.41	-3.7	20.4	162.1
Aug. 6	21 19.21	-08 52.5	4.544	5.549	-0.42	-4.0	20.4	171.3
Aug. 16	21 15.04	-09 32.4	4.561	5.566	-0.40	-4.1	20.4	172.2
Aug. 26	21 11.07	-10 13.3	4.607	5.583	-0.35	-4.0	20.5	163.3
Sept. 5	21 07.59	-10 53.2	4.682	5.600	-0.27	-3.7	20.5	153.2
Sept.15	21 04.87	-11 30.4	4.784	5.618	-0.18	-3.3	20.6	142.8
Sept.25	21 03.08	-12 03.7	4.908	5.636	-0.07	-2.8	20.7	132.6
Oct. 5	21 02.36	-12 32.1	5.052	5.653	+0.04	-2.3	20.8	122.5
Oct. 15	21 02.76	-12 54.9	5.212	5.672	+0.15	-1.7	20.9	112.7
Oct. 25	21 04.29	-13 11.8	5.382	5.690	+0.26	-1.1	21.0	103.1
Nov. 4	21 06.90	-13 22.7	5.559	5.708	+0.36	-0.5	21.1	93.6
Nov. 14	21 10.53	-13 27.6	5.737	5.727	+0.45	+0.1	21.2	84.4
Nov. 24	21 15.07	-13 26.8	5.914	5.745	+0.54	+0.6	21.2	75.4
Dec. 4	21 20.43	-13 20.6	6.085	5.764	+0.61	+1.1	21.3	66.6
Dec. 14	21 26.49	-13 09.4	6.246	5.783	+0.66	+1.6	21.4	57.9
Dec. 24	21 33.13	-12 53.6	6.395	5.802	+0.71	+2.0	21.5	49.3
Jan. 3	21 40.24	-12 33.7	6.529	5.821	+0.75	+2.4	21.6	40.9
Jan. 13	21 47.73	-12 10.1	6.646	5.840	+0.78	+2.7	21.6	32.5
Jan. 23	21 55.49	-11 43.6	6.743	5.860	+0.79	+2.9	21.7	24.3
Feb. 2	22 03.41	-11 14.6	6.820	5.879	+0.80	+3.1	21.8	16.1
Feb. 12	22 11.43	-10 43.8	6.875	5.899	+0.80	+3.2	21.8	8.0
Feb. 22	22 19.44	-10 11.8	6.908	5.918	+0.79	+3.3	21.8	0.2
Mar. 4	22 27.38	-09 39.1	6.918	5.938	+0.78	+3.3	21.9	8.1
Mar. 14	22 35.15	-09 06.6	6.907	5.958	+0.75	+3.2	21.9	16.1
Mar. 24	22 42.70	-08 34.9	6.874	5.978	+0.72	+3.0	21.9	24.2
Apr. 3	22 49.94	-08 04.5	6.820	5.998	+0.69	+2.8	21.9	32.2

Comet 244P/Scotti

Epoch = 2013 July 7.0 TT
T = 2012 Jan. 20.77944 TT
Peri. = 92.70319 e = 0.1988612
Node = 354.13297 2000.0 a = 4.8920735 AU
Incl. = 2.25947 n = 0.09108872
q = 3.9192299 AU P = 10.82 years

m1 = 1.4 + 5 log(Delta) + 22.5 log(r(t-140))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	09 39.28	+15 57.4	3.290	4.140	−0.45	+2.2	17.5	145.8
Jan. 18	09 34.74	+16 19.2	3.228	4.152	−0.55	+2.5	17.5	157.1
Jan. 28	09 29.21	+16 44.3	3.194	4.164	−0.61	+2.6	17.5	168.6
Feb. 7	09 23.14	+17 10.1	3.190	4.176	−0.61	+2.4	17.5	178.2
Feb. 17	09 17.08	+17 34.1	3.217	4.189	−0.55	+2.0	17.6	167.9
Feb. 27	09 11.57	+17 54.0	3.274	4.201	−0.45	+1.4	17.6	156.5
Mar. 9	09 07.06	+18 08.2	3.359	4.214	−0.32	+0.8	17.7	145.4
Mar. 19	09 03.91	+18 16.0	3.467	4.227	−0.16	+0.1	17.8	134.7
Mar. 29	09 02.29	+18 16.9	3.595	4.240	0.00	−0.6	17.9	124.4
Apr. 8	09 02.27	+18 11.2	3.738	4.253	+0.15	−1.2	18.0	114.6
Apr. 18	09 03.82	+17 58.9	3.892	4.267	+0.30	−1.8	18.1	105.2
Apr. 28	09 06.83	+17 40.7	4.053	4.281	+0.43	−2.4	18.2	96.2
May 8	09 11.15	+17 16.7	4.216	4.294	+0.55	−2.9	18.4	87.6
May 18	09 16.62	+16 47.6	4.379	4.308	+0.65	−3.4	18.5	79.4
May 28	09 23.09	+16 13.5	4.537	4.322	+0.73	−3.9	18.6	71.4
June 7	09 30.39	+15 34.9	4.690	4.337	+0.80	−4.3	18.7	63.7
June 17	09 38.38	+14 52.1	4.834	4.351	+0.86	−4.7	18.8	56.2
June 27	09 46.93	+14 05.5	4.967	4.366	+0.90	−5.0	18.8	48.9
July 7	09 55.93	+13 15.4	5.087	4.380	+0.94	−5.3	18.9	41.7
July 17	10 05.28	+12 22.2	5.194	4.395	+0.96	−5.6	19.0	34.6
July 27	10 14.89	+11 26.4	5.285	4.410	+0.98	−5.8	19.1	27.6
Aug. 6	10 24.66	+10 28.2	5.360	4.425	+0.99	−6.0	19.1	20.6
Aug. 16	10 34.55	+09 28.1	5.418	4.440	+0.99	−6.1	19.2	13.6
Aug. 26	10 44.46	+08 26.7	5.457	4.455	+0.99	−6.2	19.2	6.7
Sept. 5	10 54.35	+07 24.3	5.478	4.470	+0.98	−6.3	19.3	0.5
Sept. 15	11 04.14	+06 21.6	5.481	4.485	+0.96	−6.3	19.3	7.5
Sept. 25	11 13.77	+05 19.0	5.464	4.501	+0.94	−6.2	19.3	14.6
Oct. 5	11 23.19	+04 17.2	5.429	4.516	+0.91	−6.0	19.3	21.9
Oct. 15	11 32.30	+03 16.8	5.375	4.532	+0.87	−5.8	19.4	29.3
Oct. 25	11 41.04	+02 18.4	5.304	4.547	+0.83	−5.6	19.4	36.8
Nov. 4	11 49.33	+01 22.7	5.217	4.563	+0.77	−5.2	19.4	44.5
Nov. 14	11 57.06	+00 30.4	5.114	4.578	+0.71	−4.8	19.3	52.5
Nov. 24	12 04.13	−00 17.7	4.998	4.594	+0.63	−4.3	19.3	60.6
Dec. 4	12 10.43	−01 00.8	4.870	4.610	+0.54	−3.7	19.3	69.0
Dec. 14	12 15.83	−01 38.2	4.735	4.626	+0.44	−3.1	19.3	77.7
Dec. 24	12 20.21	−02 09.0	4.594	4.641	+0.32	−2.3	19.2	86.6
Jan. 3	12 23.45	−02 32.5	4.451	4.657	+0.20	−1.6	19.2	95.9
Jan. 13	12 25.43	−02 48.0	4.312	4.673	+0.06	−0.7	19.2	105.6
Jan. 23	12 26.07	−02 55.0	4.179	4.689	−0.07	+0.2	19.1	115.6
Feb. 2	12 25.33	−02 53.4	4.058	4.704	−0.21	+1.0	19.1	125.9
Feb. 12	12 23.26	−02 43.2	3.954	4.720	−0.33	+1.8	19.1	136.6
Feb. 22	12 19.96	−02 25.2	3.872	4.736	−0.43	+2.5	19.1	147.5
Mar. 4	12 15.66	−02 00.7	3.814	4.752	−0.50	+2.9	19.1	158.7
Mar. 14	12 10.67	−01 31.6	3.785	4.767	−0.53	+3.1	19.1	170.1
Mar. 24	12 05.37	−01 00.3	3.787	4.783	−0.52	+3.1	19.1	178.5
Apr. 3	12 00.15	−00 29.2	3.819	4.799	−0.47	+2.8	19.2	167.3

Comet P/2011 W1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2012 Jan. 22.56569 TT
Peri. = 282.49957 e = 0.2876965
Node = 161.88304 2000.0 a = 4.6512824 AU
Incl. = 3.71871 n = 0.09825282
q = 3.3131247 AU P = 10.03 years

m1 = 6.0 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	10 28.05	+08 07.1	3.000	3.730	-0.27	+2.0	19.8	131.9
Jan. 18	10 25.33	+08 27.4	2.919	3.751	-0.42	+3.0	19.8	142.9
Jan. 28	10 21.13	+08 57.1	2.861	3.772	-0.53	+3.7	19.8	154.2
Feb. 7	10 15.80	+09 33.8	2.830	3.793	-0.60	+4.1	19.8	165.8
Feb. 17	10 09.84	+10 14.5	2.828	3.815	-0.60	+4.1	19.9	177.3
Feb. 27	10 03.84	+10 55.5	2.856	3.837	-0.55	+3.8	20.0	170.7
Mar. 9	09 58.35	+11 33.5	2.915	3.859	-0.45	+3.2	20.1	159.3
Mar. 19	09 53.88	+12 05.7	3.001	3.882	-0.31	+2.4	20.2	148.1
Mar. 29	09 50.78	+12 30.1	3.111	3.904	-0.15	+1.6	20.3	137.3
Apr. 8	09 49.26	+12 45.8	3.242	3.927	+0.01	+0.7	20.4	127.0
Apr. 18	09 49.37	+12 52.4	3.388	3.950	+0.17	-0.2	20.6	117.2
Apr. 28	09 51.08	+12 50.2	3.547	3.973	+0.32	-1.1	20.7	107.9
May 8	09 54.25	+12 39.6	3.713	3.996	+0.45	-1.8	20.9	99.0
May 18	09 58.75	+12 21.3	3.882	4.020	+0.57	-2.5	21.0	90.4
May 28	10 04.41	+11 55.9	4.052	4.043	+0.66	-3.2	21.2	82.3
June 7	10 11.04	+11 24.1	4.220	4.067	+0.75	-3.8	21.3	74.4
June 17	10 18.51	+10 46.6	4.383	4.090	+0.82	-4.3	21.4	66.8
June 27	10 26.67	+10 03.9	4.538	4.114	+0.87	-4.7	21.6	59.4
July 7	10 35.38	+09 16.8	4.683	4.138	+0.92	-5.1	21.7	52.1
July 17	10 44.55	+08 25.8	4.818	4.162	+0.95	-5.4	21.8	45.0
July 27	10 54.07	+07 31.5	4.939	4.185	+0.98	-5.7	21.9	38.0
Aug. 6	11 03.86	+06 34.5	5.046	4.209	+1.00	-5.9	22.0	31.0
Aug. 16	11 13.84	+05 35.3	5.137	4.233	+1.01	-6.1	22.1	24.1
Aug. 26	11 23.94	+04 34.6	5.212	4.257	+1.02	-6.2	22.2	17.2
Sept. 5	11 34.10	+03 32.9	5.270	4.281	+1.02	-6.2	22.2	10.3
Sept. 15	11 44.27	+02 30.8	5.309	4.305	+1.01	-6.2	22.3	3.3
Sept. 25	11 54.38	+01 29.0	5.329	4.329	+1.00	-6.1	22.4	3.9
Oct. 5	12 04.37	+00 27.9	5.331	4.353	+0.98	-6.0	22.4	10.9
Oct. 15	12 14.17	-00 31.7	5.313	4.377	+0.95	-5.8	22.5	18.2
Oct. 25	12 23.71	-01 29.3	5.277	4.401	+0.92	-5.5	22.5	25.5
Nov. 4	12 32.93	-02 24.1	5.223	4.425	+0.88	-5.1	22.5	33.0
Nov. 14	12 41.73	-03 15.4	5.151	4.448	+0.83	-4.7	22.5	40.7
Nov. 24	12 50.02	-04 02.7	5.063	4.472	+0.77	-4.2	22.5	48.6
Dec. 4	12 57.69	-04 45.2	4.961	4.496	+0.69	-3.7	22.5	56.7
Dec. 14	13 04.62	-05 22.2	4.846	4.519	+0.61	-3.1	22.5	65.0
Dec. 24	13 10.69	-05 52.9	4.721	4.543	+0.51	-2.4	22.5	73.6
Jan. 3	13 15.77	-06 16.8	4.590	4.566	+0.40	-1.6	22.5	82.5
Jan. 13	13 19.72	-06 33.2	4.455	4.589	+0.27	-0.8	22.5	91.6
Jan. 23	13 22.43	-06 41.6	4.320	4.613	+0.14	0.0	22.5	101.1
Feb. 2	13 23.79	-06 41.5	4.190	4.636	0.00	+0.9	22.4	111.0
Feb. 12	13 23.75	-06 32.9	4.070	4.659	-0.14	+1.7	22.4	121.2
Feb. 22	13 22.31	-06 16.0	3.965	4.681	-0.28	+2.5	22.4	131.7
Mar. 4	13 19.55	-05 51.5	3.879	4.704	-0.39	+3.1	22.4	142.5
Mar. 14	13 15.66	-05 20.7	3.816	4.727	-0.48	+3.5	22.4	153.5
Mar. 24	13 10.90	-04 45.4	3.780	4.749	-0.53	+3.7	22.4	164.7
Apr. 3	13 05.64	-04 08.0	3.774	4.772	-0.54	+3.7	22.5	175.4

Comet C/2012 Q1 (Kowalski)

Epoch = 2013 July 7.0 TT
T = 2012 Feb. 10.20305 TT
Peri. = 139.26590 e = 0.6382660
Node = 184.45019 2000.0 a = 26.2144064 AU
Incl. = 45.16839 n = 0.00734335
q = 9.4826421 AU P = 134.22 years

m1 = -0.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	22 20.58	+08 23.9	10.136	9.598	+0.43	-0.4	19.2	54.5
Jan. 18	22 24.90	+08 19.4	10.264	9.605	+0.46	0.0	19.2	45.9
Jan. 28	22 29.49	+08 19.5	10.374	9.612	+0.48	+0.4	19.2	37.6
Feb. 7	22 34.28	+08 23.7	10.464	9.619	+0.49	+0.8	19.2	29.7
Feb. 17	22 39.20	+08 31.5	10.532	9.627	+0.50	+1.1	19.3	22.6
Feb. 27	22 44.18	+08 42.4	10.576	9.635	+0.50	+1.3	19.3	17.2
Mar. 9	22 49.14	+08 55.9	10.597	9.643	+0.49	+1.6	19.3	15.2
Mar. 19	22 54.02	+09 11.4	10.593	9.651	+0.47	+1.7	19.3	17.9
Mar. 29	22 58.76	+09 28.3	10.566	9.659	+0.45	+1.8	19.3	23.6
Apr. 8	23 03.28	+09 46.1	10.515	9.668	+0.43	+1.8	19.3	30.7
Apr. 18	23 07.54	+10 04.0	10.443	9.676	+0.39	+1.8	19.3	38.4
Apr. 28	23 11.45	+10 21.5	10.351	9.685	+0.35	+1.7	19.3	46.5
May 8	23 14.99	+10 38.1	10.242	9.694	+0.31	+1.5	19.2	54.7
May 18	23 18.07	+10 53.0	10.117	9.704	+0.26	+1.3	19.2	63.2
May 28	23 20.67	+11 05.7	9.982	9.713	+0.21	+1.0	19.2	71.8
June 7	23 22.73	+11 15.6	9.838	9.723	+0.15	+0.6	19.2	80.5
June 17	23 24.22	+11 22.1	9.689	9.733	+0.09	+0.2	19.2	89.4
June 27	23 25.12	+11 24.6	9.541	9.743	+0.03	-0.2	19.1	98.5
July 7	23 25.41	+11 22.6	9.396	9.753	-0.03	-0.7	19.1	107.7
July 17	23 25.11	+11 15.8	9.260	9.763	-0.09	-1.2	19.1	117.0
July 27	23 24.25	+11 03.8	9.136	9.774	-0.14	-1.7	19.1	126.5
Aug. 6	23 22.87	+10 46.6	9.030	9.785	-0.18	-2.2	19.0	136.0
Aug. 16	23 21.06	+10 24.3	8.945	9.796	-0.21	-2.7	19.0	145.5
Aug. 26	23 18.92	+09 57.2	8.884	9.807	-0.24	-3.1	19.0	154.7
Sept. 5	23 16.56	+09 25.8	8.850	9.818	-0.24	-3.5	19.0	162.8
Sept.15	23 14.14	+08 51.1	8.846	9.830	-0.24	-3.7	19.0	167.3
Sept.25	23 11.78	+08 14.1	8.872	9.841	-0.21	-3.8	19.0	164.4
Oct. 5	23 09.63	+07 36.0	8.927	9.853	-0.18	-3.8	19.1	156.6
Oct. 15	23 07.83	+06 57.9	9.012	9.865	-0.14	-3.7	19.1	147.3
Oct. 25	23 06.47	+06 21.2	9.122	9.877	-0.08	-3.4	19.1	137.4
Nov. 4	23 05.64	+05 46.8	9.255	9.890	-0.02	-3.1	19.2	127.5
Nov. 14	23 05.40	+05 15.7	9.407	9.902	+0.04	-2.7	19.2	117.4
Nov. 24	23 05.78	+04 48.6	9.573	9.915	+0.10	-2.3	19.2	107.5
Dec. 4	23 06.79	+04 25.9	9.749	9.928	+0.16	-1.8	19.3	97.6
Dec. 14	23 08.41	+04 07.8	9.929	9.941	+0.22	-1.3	19.3	87.8
Dec. 24	23 10.60	+03 54.5	10.109	9.954	+0.27	-0.9	19.4	78.2
Jan. 3	23 13.31	+03 45.9	10.283	9.967	+0.32	-0.4	19.4	68.7
Jan. 13	23 16.51	+03 41.6	10.448	9.981	+0.36	0.0	19.5	59.3
Jan. 23	23 20.10	+03 41.4	10.599	9.995	+0.39	+0.3	19.5	50.0
Feb. 2	23 24.04	+03 44.8	10.733	10.009	+0.42	+0.7	19.6	40.9
Feb. 12	23 28.24	+03 51.3	10.847	10.023	+0.44	+0.9	19.6	31.9
Feb. 22	23 32.65	+04 00.5	10.939	10.037	+0.45	+1.1	19.6	23.1
Mar. 4	23 37.18	+04 11.7	11.008	10.051	+0.46	+1.3	19.6	14.6
Mar. 14	23 41.78	+04 24.5	11.051	10.066	+0.46	+1.4	19.7	7.3
Mar. 24	23 46.37	+04 38.2	11.069	10.081	+0.45	+1.4	19.7	7.1
Apr. 3	23 50.90	+04 52.4	11.062	10.095	+0.44	+1.4	19.7	14.1

Comet 21P/Giacobini-Zinner

Epoch = 2013 July 7.0 TT
T = 2012 Feb. 11.63656 TT
Peri. = 172.58504 e = 0.7068491
Node = 195.39796 2000.0 a = 3.5158296 AU
Incl. = 31.90824 n = 0.14950728
q = 1.0306686 AU P = 6.59 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	10 06.41	-20 56.7	2.919	3.517	-0.67	+0.1	20.1	120.2
Jan. 18	09 59.74	-20 55.8	2.878	3.582	-0.80	+2.4	20.2	129.2
Jan. 28	09 51.75	-20 31.4	2.856	3.645	-0.87	+4.8	20.3	137.6
Feb. 7	09 43.04	-19 43.5	2.859	3.707	-0.87	+6.9	20.4	144.5
Feb. 17	09 34.32	-18 34.2	2.888	3.767	-0.81	+8.6	20.5	148.6
Feb. 27	09 26.26	-17 08.0	2.947	3.827	-0.68	+9.7	20.7	148.6
Mar. 9	09 19.45	-15 31.0	3.034	3.886	-0.52	+10.1	20.9	144.6
Mar. 19	09 14.24	-13 49.6	3.148	3.943	-0.34	+10.0	21.0	137.9
Mar. 29	09 10.86	-12 09.8	3.286	4.000	-0.16	+9.4	21.2	129.9
Apr. 8	09 09.30	-10 36.2	3.444	4.055	+0.02	+8.4	21.4	121.3
Apr. 18	09 09.49	-09 11.9	3.618	4.109	+0.18	+7.3	21.6	112.6
Apr. 28	09 11.27	-07 58.9	3.803	4.163	+0.32	+6.1	21.8	104.0
May 8	09 14.44	-06 57.9	3.996	4.215	+0.44	+4.9	22.0	95.5
May 18	09 18.81	-06 09.2	4.192	4.266	+0.54	+3.7	22.2	87.3
May 28	09 24.17	-05 32.2	4.388	4.317	+0.62	+2.6	22.3	79.3
June 7	09 30.37	-05 06.3	4.580	4.366	+0.69	+1.6	22.5	71.5
June 17	09 37.23	-04 50.8	4.766	4.415	+0.74	+0.6	22.7	64.0
June 27	09 44.62	-04 44.7	4.942	4.463	+0.78	-0.2	22.8	56.5
July 7	09 52.41	-04 47.1	5.106	4.510	+0.81	-1.0	23.0	49.3
July 17	10 00.51	-04 57.2	5.256	4.555	+0.83	-1.7	.	42.2
July 27	10 08.81	-05 14.1	5.391	4.600	+0.84	-2.3	.	35.4
Aug. 6	10 17.23	-05 36.9	5.508	4.645	+0.85	-2.8	.	28.8
Aug. 16	10 25.69	-06 05.1	5.606	4.688	+0.84	-3.3	.	22.7
Aug. 26	10 34.11	-06 37.6	5.684	4.730	+0.83	-3.6	.	17.5
Sept. 5	10 42.43	-07 14.0	5.742	4.772	+0.81	-3.9	.	14.5
Sept.15	10 50.58	-07 53.3	5.777	4.813	+0.79	-4.2	.	14.9
Sept.25	10 58.47	-08 35.0	5.792	4.853	+0.76	-4.3	.	18.8
Oct. 5	11 06.05	-09 18.3	5.784	4.892	+0.72	-4.4	.	24.5
Oct. 15	11 13.22	-10 02.5	5.755	4.930	+0.67	-4.4	.	31.3
Oct. 25	11 19.89	-10 46.8	5.706	4.968	+0.61	-4.4	.	38.6
Nov. 4	11 25.97	-11 30.4	5.637	5.005	+0.54	-4.2	.	46.4
Nov. 14	11 31.36	-12 12.4	5.551	5.041	+0.46	-3.9	.	54.5
Nov. 24	11 35.94	-12 51.8	5.449	5.076	+0.37	-3.6	.	62.9
Dec. 4	11 39.60	-13 27.7	5.335	5.111	+0.26	-3.1	.	71.6
Dec. 14	11 42.22	-13 58.8	5.212	5.145	+0.15	-2.5	.	80.7
Dec. 24	11 43.69	-14 23.9	5.083	5.178	+0.02	-1.8	.	90.0
Jan. 3	11 43.92	-14 41.7	4.954	5.210	-0.11	-0.9	.	99.7
Jan. 13	11 42.85	-14 50.7	4.829	5.242	-0.24	+0.1	.	109.6
Jan. 23	11 40.49	-14 49.8	4.713	5.273	-0.36	+1.2	.	119.9
Feb. 2	11 36.89	-14 38.0	4.612	5.303	-0.47	+2.3	.	130.3
Feb. 12	11 32.21	-14 14.5	4.532	5.333	-0.55	+3.5	.	140.7
Feb. 22	11 26.69	-13 39.8	4.476	5.361	-0.60	+4.5	.	150.8
Mar. 4	11 20.65	-12 54.6	4.449	5.390	-0.62	+5.4	.	159.7
Mar. 14	11 14.47	-12 01.0	4.453	5.417	-0.59	+5.9	.	164.4
Mar. 24	11 08.52	-11 01.6	4.489	5.444	-0.54	+6.2	.	161.6
Apr. 3	11 03.15	-09 59.5	4.556	5.470	-0.45	+6.2	.	153.6

Comet P/2011 U2 (Bressi)

Epoch = 2013 July 7.0 TT
T = 2012 Mar. 24.18312 TT
Peri. = 153.76126 e = 0.0907994
Node = 266.52639 2000.0 a = 5.3122184 AU
Incl. = 9.77834 n = 0.08049894
q = 4.8298722 AU P = 12.24 years

m1 = 5.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	05 31.47	+22 55.6	3.964	4.877	−0.44	−1.5	18.9	155.7
Jan. 18	05 27.04	+22 41.0	4.046	4.880	−0.32	−1.3	19.0	144.5
Jan. 28	05 23.88	+22 27.8	4.152	4.884	−0.17	−1.1	19.0	133.6
Feb. 7	05 22.16	+22 16.5	4.279	4.887	−0.02	−0.9	19.1	123.1
Feb. 17	05 21.96	+22 07.3	4.421	4.891	+0.13	−0.7	19.2	112.9
Feb. 27	05 23.26	+22 00.2	4.574	4.894	+0.27	−0.5	19.2	103.1
Mar. 9	05 25.98	+21 54.9	4.732	4.898	+0.40	−0.4	19.3	93.7
Mar. 19	05 30.01	+21 51.0	4.893	4.902	+0.52	−0.3	19.4	84.7
Mar. 29	05 35.23	+21 47.8	5.051	4.906	+0.62	−0.3	19.5	76.0
Apr. 8	05 41.48	+21 44.8	5.204	4.910	+0.71	−0.4	19.5	67.6
Apr. 18	05 48.62	+21 41.3	5.348	4.914	+0.79	−0.5	19.6	59.4
Apr. 28	05 56.52	+21 36.7	5.481	4.918	+0.85	−0.6	19.7	51.5
May 8	06 05.05	+21 30.6	5.601	4.922	+0.90	−0.8	19.7	43.8
May 18	06 14.09	+21 22.6	5.705	4.927	+0.94	−1.0	19.8	36.3
May 28	06 23.52	+21 12.2	5.794	4.931	+0.97	−1.3	19.8	28.9
June 7	06 33.25	+20 59.2	5.865	4.936	+0.99	−1.6	19.8	21.6
June 17	06 43.18	+20 43.4	5.917	4.940	+1.00	−1.9	19.9	14.5
June 27	06 53.20	+20 24.8	5.951	4.945	+1.00	−2.1	19.9	7.5
July 7	07 03.25	+20 03.4	5.965	4.950	+1.00	−2.4	19.9	2.6
July 17	07 13.22	+19 39.1	5.960	4.954	+0.98	−2.7	19.9	7.7
July 27	07 23.04	+19 12.1	5.935	4.959	+0.96	−2.9	19.9	14.6
Aug. 6	07 32.62	+18 42.7	5.892	4.964	+0.93	−3.2	19.9	21.8
Aug. 16	07 41.88	+18 11.2	5.830	4.969	+0.88	−3.3	19.9	29.1
Aug. 26	07 50.73	+17 37.9	5.750	4.974	+0.84	−3.5	19.8	36.5
Sept. 5	07 59.08	+17 03.2	5.654	4.980	+0.77	−3.5	19.8	44.1
Sept. 15	08 06.83	+16 27.8	5.542	4.985	+0.70	−3.6	19.8	51.9
Sept. 25	08 13.88	+15 52.1	5.418	4.990	+0.62	−3.5	19.7	59.9
Oct. 5	08 20.12	+15 16.8	5.282	4.996	+0.53	−3.4	19.7	68.1
Oct. 15	08 25.43	+14 42.6	5.138	5.001	+0.43	−3.2	19.6	76.5
Oct. 25	08 29.70	+14 10.4	4.989	5.007	+0.31	−3.0	19.6	85.3
Nov. 4	08 32.82	+13 40.9	4.837	5.012	+0.19	−2.6	19.5	94.4
Nov. 14	08 34.68	+13 14.9	4.688	5.018	+0.05	−2.2	19.5	103.9
Nov. 24	08 35.22	+12 53.2	4.545	5.024	−0.08	−1.7	19.4	113.7
Dec. 4	08 34.38	+12 36.4	4.413	5.029	−0.22	−1.1	19.3	123.9
Dec. 14	08 32.20	+12 24.9	4.298	5.035	−0.34	−0.6	19.3	134.4
Dec. 24	08 28.79	+12 18.9	4.203	5.041	−0.45	−0.1	19.3	145.1
Jan. 3	08 24.33	+12 18.2	4.133	5.047	−0.52	+0.4	19.2	156.0
Jan. 13	08 19.14	+12 22.1	4.092	5.053	−0.56	+0.8	19.2	166.4
Jan. 23	08 13.58	+12 29.9	4.081	5.059	−0.55	+1.0	19.2	172.8
Feb. 2	08 08.07	+12 40.4	4.102	5.065	−0.50	+1.2	19.2	166.5
Feb. 12	08 03.03	+12 52.3	4.153	5.071	−0.42	+1.2	19.3	156.1
Feb. 22	07 58.81	+13 04.4	4.233	5.077	−0.31	+1.1	19.3	145.3
Mar. 4	07 55.69	+13 15.7	4.337	5.084	−0.18	+1.0	19.4	134.7
Mar. 14	07 53.84	+13 25.2	4.462	5.090	−0.05	+0.7	19.4	124.4
Mar. 24	07 53.34	+13 32.2	4.602	5.096	+0.08	+0.4	19.5	114.4
Apr. 3	07 54.18	+13 36.3	4.754	5.103	+0.21	+0.1	19.6	104.8

Comet P/2011 R3 (Novichonok-Gerke)

Epoch = 2013 July 7.0 TT
T = 2012 Mar. 30.86225 TT
Peri. = 224.86500 e = 0.2640607
Node = 190.43326 2000.0 a = 4.8315962 AU
Incl. = 19.22187 n = 0.09280431
q = 3.5557615 AU P = 10.62 years

m1 = 4.2 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	06 26.18	-02 18.6	2.886	3.786	-0.55	+2.7	18.1	152.5
Jan. 18	06 20.68	-01 51.8	2.938	3.801	-0.44	+3.9	18.1	146.9
Jan. 28	06 16.31	-01 13.2	3.016	3.817	-0.29	+4.7	18.2	139.3
Feb. 7	06 13.44	-00 25.9	3.116	3.833	-0.12	+5.3	18.3	130.7
Feb. 17	06 12.25	+00 26.8	3.234	3.849	+0.06	+5.5	18.5	121.9
Feb. 27	06 12.82	+01 21.8	3.368	3.866	+0.23	+5.5	18.6	113.1
Mar. 9	06 15.10	+02 16.3	3.512	3.883	+0.39	+5.2	18.7	104.6
Mar. 19	06 18.97	+03 08.4	3.664	3.900	+0.53	+4.8	18.8	96.3
Mar. 29	06 24.30	+03 56.4	3.819	3.918	+0.66	+4.3	19.0	88.3
Apr. 8	06 30.90	+04 39.1	3.975	3.936	+0.77	+3.7	19.1	80.5
Apr. 18	06 38.60	+05 15.6	4.128	3.954	+0.86	+3.0	19.2	73.0
Apr. 28	06 47.23	+05 45.5	4.277	3.972	+0.94	+2.3	19.3	65.8
May 8	06 56.63	+06 08.3	4.419	3.991	+1.00	+1.6	19.4	58.8
May 18	07 06.67	+06 24.0	4.552	4.010	+1.05	+0.9	19.6	52.0
May 28	07 17.20	+06 32.5	4.675	4.029	+1.09	+0.1	19.7	45.5
June 7	07 28.11	+06 34.0	4.785	4.049	+1.12	-0.5	19.7	39.1
June 17	07 39.30	+06 28.5	4.883	4.068	+1.14	-1.2	19.8	32.9
June 27	07 50.66	+06 16.4	4.967	4.088	+1.14	-1.8	19.9	27.1
July 7	08 02.11	+05 58.0	5.035	4.108	+1.15	-2.4	20.0	21.7
July 17	08 13.57	+05 33.6	5.088	4.128	+1.14	-3.0	20.0	17.1
July 27	08 24.94	+05 03.7	5.125	4.148	+1.12	-3.5	20.1	14.2
Aug. 6	08 36.18	+04 28.8	5.145	4.169	+1.10	-3.9	20.2	14.0
Aug. 16	08 47.20	+03 49.4	5.148	4.189	+1.07	-4.3	20.2	16.8
Aug. 26	08 57.93	+03 06.1	5.135	4.210	+1.04	-4.7	20.2	21.4
Sept. 5	09 08.30	+02 19.5	5.104	4.231	+0.99	-4.9	20.3	27.0
Sept. 15	09 18.25	+01 30.2	5.057	4.251	+0.94	-5.1	20.3	33.2
Sept. 25	09 27.68	+00 39.1	4.994	4.272	+0.88	-5.2	20.3	39.8
Oct. 5	09 36.51	-00 13.1	4.916	4.293	+0.81	-5.2	20.3	46.8
Oct. 15	09 44.65	-01 05.6	4.823	4.315	+0.73	-5.2	20.3	54.1
Oct. 25	09 52.00	-01 57.2	4.719	4.336	+0.64	-5.0	20.3	61.6
Nov. 4	09 58.44	-02 47.0	4.604	4.357	+0.54	-4.7	20.3	69.5
Nov. 14	10 03.86	-03 33.7	4.481	4.378	+0.43	-4.2	20.3	77.7
Nov. 24	10 08.14	-04 15.9	4.353	4.400	+0.30	-3.6	20.3	86.2
Dec. 4	10 11.16	-04 52.2	4.224	4.421	+0.17	-2.9	20.2	95.1
Dec. 14	10 12.82	-05 21.0	4.096	4.442	+0.02	-2.0	20.2	104.3
Dec. 24	10 13.07	-05 40.6	3.975	4.464	-0.12	-0.9	20.2	113.8
Jan. 3	10 11.89	-05 49.7	3.864	4.485	-0.25	+0.3	20.2	123.7
Jan. 13	10 09.35	-05 46.9	3.770	4.507	-0.37	+1.5	20.2	133.8
Jan. 23	10 05.62	-05 31.6	3.696	4.528	-0.47	+2.8	20.2	143.9
Feb. 2	10 00.97	-05 03.8	3.646	4.549	-0.52	+3.9	20.2	153.5
Feb. 12	09 55.76	-04 24.8	3.625	4.571	-0.53	+4.8	20.2	161.4
Feb. 22	09 50.43	-03 36.5	3.633	4.592	-0.50	+5.4	20.2	164.2
Mar. 4	09 45.41	-02 42.1	3.671	4.614	-0.43	+5.7	20.3	159.7
Mar. 14	09 41.11	-01 44.7	3.739	4.635	-0.33	+5.7	20.4	151.2
Mar. 24	09 37.83	-00 47.8	3.833	4.656	-0.20	+5.4	20.5	141.6
Apr. 3	09 35.78	+00 05.9	3.951	4.677	-0.07	+4.8	20.6	131.8

Comet 242P/Spahr

Epoch = 2013 July 7.0 TT
T = 2012 Apr. 3.35570 TT
Peri. = 247.72418 e = 0.2773206
Node = 180.71592 2000.0 a = 5.5077870 AU
Incl. = 32.48501 n = 0.07624974
q = 3.9803642 AU P = 12.93 years

m1 = 1.2 + 5 log(Delta) + 22.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. °,	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	07 03.07	-17 26.4	3.369	4.172	-0.56	+3.6	17.8	140.2
Jan. 18	06 57.49	-16 50.5	3.388	4.185	-0.49	+5.4	17.8	139.6
Jan. 28	06 52.59	-15 56.6	3.430	4.199	-0.38	+6.8	17.9	136.5
Feb. 7	06 48.77	-14 48.4	3.494	4.213	-0.24	+7.9	18.0	131.5
Feb. 17	06 46.32	-13 29.9	3.580	4.227	-0.09	+8.4	18.1	125.2
Feb. 27	06 45.44	-12 05.5	3.683	4.242	+0.07	+8.6	18.2	118.2
Mar. 9	06 46.15	-10 39.4	3.801	4.257	+0.23	+8.5	18.3	110.8
Mar. 19	06 48.42	-09 14.7	3.931	4.272	+0.37	+8.0	18.4	103.3
Mar. 29	06 52.15	-07 54.4	4.070	4.288	+0.50	+7.4	18.5	95.8
Apr. 8	06 57.19	-06 40.2	4.213	4.303	+0.62	+6.7	18.6	88.4
Apr. 18	07 03.41	-05 33.7	4.358	4.320	+0.72	+5.8	18.7	81.2
Apr. 28	07 10.64	-04 35.7	4.502	4.336	+0.81	+4.9	18.8	74.1
May 8	07 18.71	-03 46.5	4.643	4.353	+0.88	+4.0	18.9	67.2
May 18	07 27.50	-03 06.5	4.779	4.370	+0.94	+3.1	19.0	60.5
May 28	07 36.87	-02 35.5	4.906	4.387	+0.98	+2.2	19.1	53.9
June 7	07 46.68	-02 13.4	5.024	4.404	+1.02	+1.4	19.2	47.6
June 17	07 56.85	-01 59.9	5.131	4.422	+1.04	+0.5	19.3	41.5
June 27	08 07.24	-01 54.5	5.225	4.440	+1.05	-0.2	19.4	35.7
July 7	08 17.79	-01 56.8	5.306	4.458	+1.06	-0.9	19.4	30.4
July 17	08 28.41	-02 06.3	5.371	4.476	+1.06	-1.6	19.5	25.6
July 27	08 39.00	-02 22.4	5.421	4.495	+1.05	-2.2	19.6	21.9
Aug. 6	08 49.51	-02 44.5	5.455	4.514	+1.03	-2.8	19.6	19.8
Aug. 16	08 59.86	-03 12.0	5.471	4.533	+1.01	-3.2	19.7	19.9
Aug. 26	09 09.97	-03 44.3	5.471	4.552	+0.98	-3.6	19.7	22.3
Sept. 5	09 19.79	-04 20.6	5.453	4.571	+0.94	-4.0	19.7	26.3
Sept. 15	09 29.22	-05 00.3	5.418	4.590	+0.90	-4.2	19.8	31.5
Sept. 25	09 38.20	-05 42.5	5.366	4.610	+0.84	-4.4	19.8	37.5
Oct. 5	09 46.64	-06 26.4	5.298	4.630	+0.78	-4.5	19.8	43.9
Oct. 15	09 54.46	-07 11.2	5.214	4.650	+0.71	-4.4	19.8	50.9
Oct. 25	10 01.54	-07 55.6	5.117	4.670	+0.63	-4.3	19.8	58.2
Nov. 4	10 07.81	-08 38.8	5.008	4.690	+0.53	-4.1	19.8	65.8
Nov. 14	10 13.12	-09 19.3	4.889	4.710	+0.43	-3.7	19.8	73.8
Nov. 24	10 17.39	-09 55.8	4.764	4.730	+0.31	-3.1	19.8	82.1
Dec. 4	10 20.50	-10 26.8	4.634	4.751	+0.19	-2.4	19.8	90.8
Dec. 14	10 22.36	-10 50.6	4.505	4.771	+0.05	-1.5	19.7	99.8
Dec. 24	10 22.91	-11 05.5	4.379	4.792	-0.08	-0.4	19.7	109.1
Jan. 3	10 22.13	-11 09.9	4.263	4.812	-0.21	+0.8	19.7	118.7
Jan. 13	10 20.07	-11 02.1	4.160	4.833	-0.32	+2.1	19.7	128.4
Jan. 23	10 16.88	-10 41.2	4.075	4.854	-0.41	+3.4	19.7	138.2
Feb. 2	10 12.76	-10 07.0	4.014	4.875	-0.47	+4.7	19.7	147.7
Feb. 12	10 08.05	-09 20.0	3.978	4.896	-0.49	+5.8	19.7	155.9
Feb. 22	10 03.12	-08 22.2	3.972	4.917	-0.48	+6.6	19.8	160.8
Mar. 4	09 58.35	-07 16.1	3.996	4.938	-0.42	+7.1	19.8	159.7
Mar. 14	09 54.14	-06 05.1	4.050	4.959	-0.34	+7.2	19.9	153.4
Mar. 24	09 50.78	-04 52.8	4.133	4.980	-0.23	+7.0	20.0	144.7
Apr. 3	09 48.50	-03 42.6	4.241	5.001	-0.11	+6.5	20.1	135.3

Comet C/2006 S3 (LONEOS)

Epoch = 2013 July 7.0 TT
T = 2012 Apr. 15.95845 TT
Peri. = 140.08363
Node = 38.37128 2000.0
Incl. = 166.03084
q = 5.1300177 AU
e = 1.0035846

m1 = 3.4 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	15 35.02	-17 09.7	6.062	5.513	-0.04	-0.9	14.7	52.1
Jan. 18	15 34.65	-17 19.2	5.928	5.541	-0.15	-0.6	14.7	62.4
Jan. 28	15 33.17	-17 25.0	5.780	5.569	-0.27	-0.2	14.7	72.8
Feb. 7	15 30.43	-17 26.8	5.622	5.599	-0.42	+0.3	14.6	83.6
Feb. 17	15 26.24	-17 23.7	5.461	5.629	-0.57	+0.8	14.6	94.7
Feb. 27	15 20.49	-17 15.3	5.304	5.660	-0.74	+1.5	14.6	106.1
Mar. 9	15 13.13	-17 00.7	5.159	5.692	-0.90	+2.1	14.5	117.9
Mar. 19	15 04.17	-16 39.5	5.033	5.724	-1.04	+2.8	14.5	130.0
Mar. 29	14 53.80	-16 11.4	4.933	5.757	-1.15	+3.5	14.5	142.5
Apr. 8	14 42.28	-15 36.6	4.867	5.791	-1.22	+4.0	14.5	155.2
Apr. 18	14 30.04	-14 56.1	4.840	5.826	-1.25	+4.4	14.5	168.0
Apr. 28	14 17.56	-14 11.6	4.854	5.861	-1.22	+4.6	14.5	179.1
May 8	14 05.37	-13 25.4	4.911	5.897	-1.14	+4.5	14.6	166.4
May 18	13 53.93	-12 39.9	5.008	5.933	-1.03	+4.2	14.6	153.9
May 28	13 43.62	-11 57.6	5.142	5.970	-0.89	+3.7	14.7	141.7
June 7	13 34.67	-11 20.2	5.308	6.008	-0.75	+3.1	14.8	129.8
June 17	13 27.21	-10 49.2	5.497	6.047	-0.60	+2.4	14.9	118.4
June 27	13 21.24	-10 25.3	5.705	6.085	-0.45	+1.7	15.0	107.3
July 7	13 16.71	-10 08.4	5.923	6.125	-0.32	+1.0	15.1	96.7
July 17	13 13.51	-09 58.5	6.146	6.165	-0.20	+0.3	15.2	86.3
July 27	13 11.49	-09 55.0	6.367	6.205	-0.10	-0.2	15.3	76.3
Aug. 6	13 10.50	-09 57.3	6.580	6.246	-0.01	-0.7	15.4	66.5
Aug. 16	13 10.41	-10 04.8	6.782	6.288	+0.06	-1.2	15.5	57.0
Aug. 26	13 11.05	-10 16.6	6.967	6.330	+0.12	-1.5	15.6	47.6
Sept. 5	13 12.29	-10 32.1	7.132	6.372	+0.17	-1.8	15.7	38.3
Sept.15	13 14.00	-10 50.6	7.274	6.415	+0.21	-2.1	15.8	29.2
Sept.25	13 16.05	-11 11.4	7.391	6.458	+0.23	-2.2	15.8	20.1
Oct. 5	13 18.33	-11 33.9	7.480	6.502	+0.24	-2.4	15.9	11.1
Oct. 15	13 20.70	-11 57.4	7.541	6.546	+0.24	-2.4	15.9	3.5
Oct. 25	13 23.05	-12 21.4	7.573	6.590	+0.22	-2.4	16.0	8.4
Nov. 4	13 25.27	-12 45.3	7.575	6.635	+0.20	-2.3	16.0	17.4
Nov. 14	13 27.22	-13 08.5	7.549	6.681	+0.16	-2.2	16.0	26.8
Nov. 24	13 28.79	-13 30.3	7.496	6.726	+0.11	-2.0	16.1	36.3
Dec. 4	13 29.84	-13 50.1	7.419	6.772	+0.04	-1.7	16.1	46.1
Dec. 14	13 30.25	-14 07.3	7.320	6.818	-0.04	-1.4	16.1	56.0
Dec. 24	13 29.89	-14 21.2	7.204	6.865	-0.12	-1.0	16.1	66.1
Jan. 3	13 28.65	-14 31.0	7.075	6.912	-0.22	-0.5	16.0	76.5
Jan. 13	13 26.40	-14 36.0	6.939	6.959	-0.33	+0.1	16.0	87.1
Jan. 23	13 23.08	-14 35.4	6.801	7.007	-0.44	+0.7	16.0	98.0
Feb. 2	13 18.65	-14 28.5	6.670	7.055	-0.55	+1.4	16.0	109.2
Feb. 12	13 13.10	-14 14.9	6.550	7.103	-0.66	+2.1	16.0	120.5
Feb. 22	13 06.53	-13 54.1	6.450	7.151	-0.75	+2.8	16.0	132.1
Mar. 4	12 59.07	-13 26.4	6.375	7.200	-0.81	+3.4	16.0	143.8
Mar. 14	12 50.95	-12 52.1	6.332	7.248	-0.85	+4.0	16.0	155.5
Mar. 24	12 42.44	-12 12.4	6.324	7.298	-0.86	+4.4	16.0	166.6
Apr. 3	12 33.86	-11 28.8	6.354	7.347	-0.83	+4.6	16.1	172.8

Comet C/2010 R1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 May 18.43370 TT
Peri. = 114.47231
Node = 343.67103 2000.0
Incl. = 156.92461
q = 5.6207480 AU
e = 1.0029242

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	14 21.74	+01 25.7	6.040	5.872	−0.22	+2.3	17.6	75.5
Jan. 18	14 19.53	+01 48.7	5.879	5.893	−0.35	+3.1	17.5	86.0
Jan. 28	14 16.06	+02 19.4	5.716	5.915	−0.49	+3.8	17.5	96.8
Feb. 7	14 11.21	+02 57.6	5.559	5.937	−0.63	+4.5	17.5	108.0
Feb. 17	14 04.90	+03 42.6	5.414	5.961	−0.78	+5.1	17.4	119.4
Feb. 27	13 57.14	+04 33.1	5.290	5.985	−0.91	+5.4	17.4	130.9
Mar. 9	13 48.04	+05 27.3	5.192	6.010	−1.02	+5.5	17.4	142.5
Mar. 19	13 37.80	+06 22.8	5.128	6.036	−1.10	+5.4	17.4	153.5
Mar. 29	13 26.75	+07 16.6	5.103	6.062	−1.14	+4.9	17.4	162.4
Apr. 8	13 15.32	+08 05.9	5.118	6.089	−1.14	+4.2	17.4	164.6
Apr. 18	13 03.95	+08 48.3	5.174	6.117	−1.09	+3.4	17.4	158.1
Apr. 28	12 53.10	+09 21.9	5.269	6.145	−1.00	+2.4	17.5	147.9
May 8	12 43.11	+09 45.9	5.399	6.174	−0.88	+1.4	17.6	136.9
May 18	12 34.28	+10 00.1	5.558	6.204	−0.75	+0.5	17.7	125.8
May 28	12 26.76	+10 05.2	5.740	6.234	−0.62	−0.3	17.7	114.8
June 7	12 20.61	+10 02.0	5.939	6.265	−0.48	−1.0	17.8	104.2
June 17	12 15.81	+09 51.8	6.147	6.297	−0.35	−1.6	17.9	93.8
June 27	12 12.27	+09 35.7	6.359	6.329	−0.24	−2.1	18.0	83.7
July 7	12 09.89	+09 14.8	6.568	6.361	−0.14	−2.5	18.1	73.9
July 17	12 08.54	+08 50.1	6.769	6.395	−0.05	−2.7	18.2	64.3
July 27	12 08.06	+08 22.7	6.957	6.428	+0.03	−3.0	18.3	55.0
Aug. 6	12 08.34	+07 53.2	7.129	6.463	+0.09	−3.1	18.4	45.8
Aug. 16	12 09.23	+07 22.3	7.281	6.498	+0.14	−3.1	18.4	36.8
Aug. 26	12 10.60	+06 50.8	7.409	6.533	+0.17	−3.2	18.5	27.9
Sept. 5	12 12.34	+06 19.3	7.513	6.569	+0.20	−3.1	18.6	19.2
Sept. 15	12 14.31	+05 48.2	7.589	6.605	+0.21	−3.0	18.6	11.1
Sept. 25	12 16.42	+05 18.2	7.638	6.642	+0.21	−2.8	18.6	6.5
Oct. 5	12 18.54	+04 49.9	7.657	6.679	+0.20	−2.6	18.7	11.3
Oct. 15	12 20.56	+04 23.7	7.648	6.717	+0.18	−2.3	18.7	19.6
Oct. 25	12 22.36	+04 00.3	7.612	6.755	+0.15	−2.0	18.7	28.6
Nov. 4	12 23.83	+03 40.2	7.549	6.794	+0.10	−1.6	18.7	37.9
Nov. 14	12 24.84	+03 24.1	7.463	6.833	+0.04	−1.2	18.7	47.5
Nov. 24	12 25.27	+03 12.5	7.355	6.872	−0.03	−0.7	18.7	57.3
Dec. 4	12 24.99	+03 05.9	7.231	6.912	−0.11	−0.1	18.7	67.4
Dec. 14	12 23.89	+03 05.0	7.095	6.953	−0.20	+0.5	18.7	77.8
Dec. 24	12 21.85	+03 10.2	6.951	6.993	−0.31	+1.1	18.7	88.4
Jan. 3	12 18.79	+03 21.7	6.808	7.034	−0.42	+1.8	18.6	99.3
Jan. 13	12 14.64	+03 39.5	6.670	7.076	−0.52	+2.4	18.6	110.5
Jan. 23	12 09.39	+04 03.5	6.546	7.117	−0.63	+3.0	18.6	122.0
Feb. 2	12 03.09	+04 33.1	6.442	7.159	−0.72	+3.4	18.6	133.8
Feb. 12	11 55.85	+05 07.1	6.364	7.202	−0.80	+3.7	18.6	145.7
Feb. 22	11 47.86	+05 44.2	6.319	7.244	−0.85	+3.8	18.6	157.8
Mar. 4	11 39.39	+06 22.6	6.310	7.287	−0.87	+3.8	18.6	169.7
Mar. 14	11 30.72	+07 00.4	6.339	7.331	−0.85	+3.5	18.7	175.6
Mar. 24	11 22.18	+07 35.9	6.407	7.374	−0.81	+3.2	18.7	164.9
Apr. 3	11 14.07	+08 07.5	6.513	7.418	−0.74	+2.7	18.8	153.2

Comet P/2011 N1 (ASH))

Epoch = 2013 July 7.0 TT
T = 2012 May 30.13045 TT
Peri. = 330.79329 e = 0.5455228
Node = 77.67117 2000.0 a = 6.2830575 AU
Incl. = 35.68916 n = 0.06258172
q = 2.8555064 AU P = 15.75 years

m1 = 9.8 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	06 04.15	+41 10.8	2.370	3.291	-0.87	+5.6	19.4	155.7
Jan. 18	05 55.48	+42 06.6	2.464	3.326	-0.64	+3.9	19.6	146.1
Jan. 28	05 49.07	+42 45.1	2.582	3.362	-0.37	+2.5	19.8	136.1
Feb. 7	05 45.39	+43 10.2	2.721	3.399	-0.08	+1.5	19.9	126.3
Feb. 17	05 44.58	+43 25.7	2.876	3.437	+0.20	+0.9	20.1	116.8
Feb. 27	05 46.57	+43 34.8	3.042	3.476	+0.45	+0.5	20.3	107.8
Mar. 9	05 51.09	+43 39.8	3.215	3.515	+0.68	+0.2	20.5	99.3
Mar. 19	05 57.86	+43 41.9	3.392	3.554	+0.87	0.0	20.7	91.1
Mar. 29	06 06.54	+43 41.8	3.570	3.595	+1.03	-0.2	20.9	83.4
Apr. 8	06 16.83	+43 39.7	3.745	3.636	+1.16	-0.4	21.1	76.1
Apr. 18	06 28.47	+43 35.4	3.915	3.677	+1.27	-0.7	21.2	69.0
Apr. 28	06 41.18	+43 28.9	4.079	3.719	+1.36	-0.9	21.4	62.3
May 8	06 54.76	+43 19.8	4.234	3.761	+1.42	-1.2	21.6	55.8
May 18	07 09.00	+43 08.1	4.379	3.803	+1.47	-1.4	21.7	49.7
May 28	07 23.74	+42 53.7	4.512	3.846	+1.51	-1.7	21.8	43.8
June 7	07 38.82	+42 36.6	4.634	3.889	+1.53	-2.0	22.0	38.4
June 17	07 54.12	+42 17.0	4.742	3.933	+1.54	-2.2	22.1	33.3
June 27	08 09.51	+41 55.1	4.836	3.976	+1.54	-2.4	22.2	28.9
July 7	08 24.91	+41 31.5	4.916	4.020	+1.53	-2.5	22.3	25.3
July 17	08 40.22	+41 06.5	4.980	4.064	+1.51	-2.6	22.4	23.0
July 27	08 55.36	+40 40.9	5.029	4.109	+1.49	-2.6	22.5	22.4
Aug. 6	09 10.28	+40 15.3	5.063	4.153	+1.46	-2.5	22.6	23.5
Aug. 16	09 24.91	+39 50.7	5.081	4.197	+1.43	-2.3	22.7	26.3
Aug. 26	09 39.19	+39 27.8	5.084	4.242	+1.39	-2.0	22.7	30.3
Sept. 5	09 53.07	+39 07.7	5.072	4.286	+1.34	-1.6	22.8	35.1
Sept. 15	10 06.49	+38 51.4	5.045	4.331	+1.29	-1.1	22.9	40.6
Sept. 25	10 19.39	+38 40.0	5.005	4.376	+1.23	-0.5	22.9	46.5
Oct. 5	10 31.71	+38 34.7	4.952	4.420	+1.17	+0.2	23.0	52.8
Oct. 15	10 43.36	+38 36.7	4.888	4.465	+1.09	+1.0	23.0	59.5
Oct. 25	10 54.25	+38 47.1	4.815	4.510	+1.00	+2.0	23.0	66.4
Nov. 4	11 04.29	+39 06.8	4.735	4.554	+0.90	+3.0	.	73.5
Nov. 14	11 13.34	+39 36.8	4.650	4.599	+0.79	+4.1	.	80.9
Nov. 24	11 21.26	+40 17.6	4.564	4.643	+0.66	+5.2	.	88.5
Dec. 4	11 27.89	+41 09.2	4.478	4.688	+0.52	+6.2	.	96.2
Dec. 14	11 33.04	+42 11.3	4.398	4.732	+0.35	+7.1	.	103.9
Dec. 24	11 36.56	+43 22.4	4.326	4.776	+0.17	+7.8	.	111.6
Jan. 3	11 38.25	+44 40.3	4.267	4.821	-0.02	+8.1	.	119.0
Jan. 13	11 38.01	+46 01.6	4.223	4.865	-0.22	+8.1	.	125.8
Jan. 23	11 35.78	+47 22.3	4.199	4.909	-0.41	+7.5	.	131.7
Feb. 2	11 31.65	+48 37.6	4.196	4.953	-0.58	+6.5	.	136.0
Feb. 12	11 25.86	+49 42.4	4.216	4.996	-0.70	+5.0	.	138.3
Feb. 22	11 18.85	+50 32.5	4.261	5.040	-0.77	+3.2	.	138.0
Mar. 4	11 11.19	+51 04.9	4.329	5.083	-0.77	+1.3	.	135.5
Mar. 14	11 03.53	+51 18.1	4.419	5.126	-0.70	-0.6	.	131.0
Mar. 24	10 56.52	+51 12.3	4.530	5.170	-0.58	-2.3	.	125.2
Apr. 3	10 50.68	+50 49.2	4.659	5.213	-0.43	-3.8	.	118.7

Comet C/2012 L3 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 June 12.22162 TT
Peri. = 107.08466
Node = 53.49058 2000.0
Incl. = 134.19330
q = 3.0446587 AU
e = 0.9912621

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	17 16.54	-08 53.0	4.455	3.656	+0.25	-4.2	19.9	31.8
Jan. 18	17 19.06	-09 34.7	4.405	3.708	+0.16	-3.7	19.9	40.2
Jan. 28	17 20.69	-10 12.1	4.330	3.762	+0.05	-3.4	19.9	49.3
Feb. 7	17 21.19	-10 46.2	4.234	3.817	-0.09	-3.1	20.0	58.8
Feb. 17	17 20.31	-11 17.6	4.121	3.874	-0.26	-3.0	20.0	68.7
Feb. 27	17 17.75	-11 47.4	3.996	3.931	-0.45	-2.9	20.0	79.1
Mar. 9	17 13.27	-12 16.0	3.864	3.990	-0.67	-2.8	19.9	90.0
Mar. 19	17 06.61	-12 44.0	3.733	4.049	-0.90	-2.7	19.9	101.4
Mar. 29	16 57.57	-13 11.5	3.610	4.110	-1.15	-2.7	19.9	113.3
Apr. 8	16 46.12	-13 38.2	3.505	4.171	-1.38	-2.5	19.9	125.8
Apr. 18	16 32.36	-14 03.4	3.426	4.233	-1.56	-2.3	19.9	138.8
Apr. 28	16 16.72	-14 26.3	3.380	4.295	-1.69	-2.0	20.0	152.1
May 8	15 59.84	-14 46.0	3.375	4.359	-1.73	-1.6	20.0	165.4
May 18	15 42.58	-15 02.2	3.414	4.423	-1.67	-1.3	20.1	175.5
May 28	15 25.87	-15 15.4	3.497	4.487	-1.54	-1.1	20.2	165.9
June 7	15 10.49	-15 26.8	3.624	4.552	-1.35	-1.1	20.4	153.1
June 17	14 57.03	-15 37.8	3.788	4.618	-1.12	-1.2	20.5	140.6
June 27	14 45.78	-15 50.2	3.982	4.683	-0.90	-1.5	20.7	128.5
July 7	14 36.81	-16 05.2	4.201	4.750	-0.68	-1.8	20.9	117.0
July 17	14 30.04	-16 23.5	4.436	4.816	-0.48	-2.2	21.1	106.0
July 27	14 25.26	-16 45.5	4.680	4.883	-0.30	-2.6	21.2	95.5
Aug. 6	14 22.25	-17 11.3	4.928	4.951	-0.15	-2.9	21.4	85.4
Aug. 16	14 20.75	-17 40.7	5.173	5.018	-0.02	-3.3	21.6	75.6
Aug. 26	14 20.54	-18 13.4	5.410	5.086	+0.09	-3.6	21.7	66.2
Sept. 5	14 21.40	-18 49.2	5.634	5.154	+0.17	-3.8	21.9	56.9
Sept. 15	14 23.14	-19 27.6	5.843	5.222	+0.24	-4.1	22.0	47.9
Sept. 25	14 25.57	-20 08.2	6.032	5.291	+0.30	-4.3	22.1	39.0
Oct. 5	14 28.53	-20 50.7	6.199	5.359	+0.34	-4.4	22.3	30.3
Oct. 15	14 31.89	-21 34.7	6.342	5.428	+0.36	-4.5	22.4	21.8
Oct. 25	14 35.48	-22 20.1	6.458	5.497	+0.37	-4.6	22.5	13.7
Nov. 4	14 39.19	-23 06.4	6.547	5.566	+0.37	-4.7	22.5	7.8
Nov. 14	14 42.87	-23 53.5	6.607	5.635	+0.35	-4.8	.	9.7
Nov. 24	14 46.38	-24 41.0	6.640	5.704	+0.32	-4.8	.	17.1
Dec. 4	14 49.58	-25 28.9	6.646	5.773	+0.27	-4.8	.	25.7
Dec. 14	14 52.33	-26 16.8	6.625	5.842	+0.21	-4.8	.	34.7
Dec. 24	14 54.47	-27 04.5	6.580	5.911	+0.14	-4.7	.	43.9
Jan. 3	14 55.84	-27 51.7	6.514	5.981	+0.04	-4.6	.	53.4
Jan. 13	14 56.29	-28 37.9	6.431	6.050	-0.06	-4.5	.	63.1
Jan. 23	14 55.65	-29 22.6	6.334	6.119	-0.19	-4.2	.	73.0
Feb. 2	14 53.78	-30 05.1	6.228	6.188	-0.32	-3.9	.	83.2
Feb. 12	14 50.56	-30 44.2	6.119	6.258	-0.47	-3.5	.	93.5
Feb. 22	14 45.91	-31 18.8	6.014	6.327	-0.61	-2.9	.	104.0
Mar. 4	14 39.81	-31 47.6	5.918	6.396	-0.75	-2.1	.	114.7
Mar. 14	14 32.33	-32 08.8	5.839	6.465	-0.87	-1.2	.	125.4
Mar. 24	14 23.65	-32 21.2	5.781	6.534	-0.96	-0.2	.	136.0
Apr. 3	14 14.05	-32 23.6	5.750	6.603	-1.01	+0.8	.	146.1

Comet P/2012 NJ (La Sagra)

Epoch = 2013 July 7.0 TT
T = 2012 June 13.05992 TT
Peri. = 338.40142 e = 0.8479064
Node = 315.76937 2000.0 a = 8.4932351 AU
Incl. = 84.37647 n = 0.03981937
q = 1.2917667 AU P = 24.75 years

H = 13.0 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	19 27.73	+43 13.5	3.136	2.872	+1.36	+13.1	18.7	65.5
Jan. 18	19 41.34	+45 24.3	3.222	2.964	+1.38	+14.6	18.8	66.1
Jan. 28	19 55.12	+47 50.3	3.304	3.055	+1.39	+16.0	18.9	66.9
Feb. 7	20 09.01	+50 30.1	3.383	3.146	+1.39	+17.2	19.0	67.8
Feb. 17	20 22.95	+53 22.2	3.461	3.236	+1.39	+18.3	19.1	68.8
Feb. 27	20 36.85	+56 24.9	3.538	3.326	+1.38	+19.1	19.2	69.6
Mar. 9	20 50.68	+59 35.9	3.617	3.414	+1.37	+19.7	19.3	70.4
Mar. 19	21 04.38	+62 53.3	3.698	3.502	+1.35	+20.1	19.4	71.0
Mar. 29	21 17.87	+66 14.7	3.783	3.589	+1.32	+20.3	19.5	71.3
Apr. 8	21 31.10	+69 38.1	3.871	3.676	+1.28	+20.3	19.6	71.4
Apr. 18	21 43.93	+73 01.4	3.962	3.761	+1.22	+20.1	19.7	71.2
Apr. 28	21 56.15	+76 22.6	4.057	3.846	+1.12	+19.8	19.8	70.8
May 8	22 07.32	+79 40.1	4.155	3.930	+0.89	+19.2	19.9	70.3
May 18	22 16.21	+82 52.4	4.254	4.013	+0.18	+18.5	19.9	69.5
May 28	22 18.04	+85 57.8	4.355	4.096	-5.80	+17.4	20.0	68.7
June 7	21 19.99	+88 52.1	4.455	4.178	-55.00	-4.4	20.1	67.8
June 17	12 10.00	+88 07.7	4.554	4.259	-2.11	-15.9	20.2	66.9
June 27	11 48.89	+85 28.4	4.651	4.339	+0.47	-15.1	20.3	66.1
July 7	11 53.56	+82 57.1	4.744	4.419	+0.94	-14.1	20.3	65.4
July 17	12 02.96	+80 35.6	4.833	4.498	+1.10	-13.1	20.4	65.0
July 27	12 14.00	+78 24.7	4.915	4.576	+1.18	-12.0	20.5	64.8
Aug. 6	12 25.82	+76 24.7	4.992	4.654	+1.23	-10.9	20.5	64.9
Aug. 16	12 38.11	+74 36.1	5.061	4.731	+1.25	-9.7	20.6	65.5
Aug. 26	12 50.66	+72 59.5	5.122	4.807	+1.27	-8.4	20.6	66.4
Sept. 5	13 03.40	+71 35.1	5.176	4.883	+1.29	-7.1	20.7	67.7
Sept.15	13 16.29	+70 23.6	5.221	4.958	+1.30	-5.8	20.7	69.4
Sept.25	13 29.28	+69 25.5	5.259	5.032	+1.31	-4.4	20.8	71.5
Oct. 5	13 42.33	+68 41.1	5.289	5.106	+1.31	-3.0	20.8	74.0
Oct. 15	13 55.42	+68 11.1	5.314	5.179	+1.31	-1.5	20.9	76.9
Oct. 25	14 08.48	+67 55.7	5.333	5.252	+1.30	0.0	20.9	80.0
Nov. 4	14 21.48	+67 55.3	5.348	5.324	+1.28	+1.5	20.9	83.3
Nov. 14	14 34.32	+68 10.1	5.361	5.395	+1.26	+3.0	21.0	86.7
Nov. 24	14 46.91	+68 40.1	5.374	5.466	+1.22	+4.5	21.0	90.1
Dec. 4	14 59.12	+69 24.9	5.389	5.536	+1.16	+5.9	21.0	93.4
Dec. 14	15 10.74	+70 24.0	5.408	5.606	+1.08	+7.2	21.1	96.5
Dec. 24	15 21.53	+71 36.3	5.432	5.675	+0.96	+8.4	21.1	99.3
Jan. 3	15 31.13	+73 00.7	5.465	5.744	+0.78	+9.5	21.1	101.6
Jan. 13	15 38.97	+74 35.2	5.507	5.812	+0.53	+10.2	21.2	103.2
Jan. 23	15 44.24	+76 17.7	5.560	5.879	+0.14	+10.8	21.2	104.2
Feb. 2	15 45.63	+78 05.4	5.626	5.947	-0.47	+10.9	21.2	104.3
Feb. 12	15 40.93	+79 54.7	5.703	6.013	-1.45	+10.6	21.3	103.7
Feb. 22	15 26.43	+81 40.3	5.793	6.079	-3.04	+9.4	21.3	102.2
Mar. 4	14 55.99	+83 14.4	5.894	6.145	-5.39	+6.9	21.4	100.0
Mar. 14	14 02.11	+84 23.4	6.007	6.210	-7.57	+2.6	21.5	97.2
Mar. 24	12 46.42	+84 49.3	6.128	6.275	-7.43	-2.6	21.5	93.9
Apr. 3	11 32.08	+84 23.3	6.256	6.339	-5.17	-6.6	21.6	90.2

Comet 152P/Helin-Lawrence

Epoch = 2013 July 7.0 TT
T = 2012 July 8.88021 TT
Peri. = 163.72802 e = 0.3070981
Node = 91.91041 2000.0 a = 4.4970063 AU
Incl. = 9.86805 n = 0.10335199
q = 3.1159842 AU P = 9.54 years

m1 = 4.0 + 5 log(Delta) + 20.0 log(r(t-240))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	19 31.58	-24 23.7	4.245	3.265	+1.64	+2.4	17.1	4.0
Jan. 18	19 48.02	-23 59.5	4.261	3.281	+1.62	+2.9	17.0	4.4
Jan. 28	20 04.20	-23 30.4	4.262	3.298	+1.58	+3.3	17.0	10.2
Feb. 7	20 20.03	-22 57.0	4.248	3.315	+1.54	+3.7	17.0	16.6
Feb. 17	20 35.43	-22 20.4	4.219	3.332	+1.49	+3.9	17.0	23.0
Feb. 27	20 50.33	-21 41.6	4.177	3.351	+1.43	+4.0	17.0	29.5
Mar. 9	21 04.66	-21 01.6	4.120	3.370	+1.37	+4.0	16.9	36.1
Mar. 19	21 18.33	-20 21.5	4.051	3.389	+1.29	+3.9	16.9	42.8
Mar. 29	21 31.28	-19 42.6	3.970	3.409	+1.22	+3.7	16.9	49.6
Apr. 8	21 43.44	-19 06.1	3.878	3.430	+1.13	+3.3	16.8	56.5
Apr. 18	21 54.70	-18 33.2	3.777	3.451	+1.03	+2.8	16.8	63.6
Apr. 28	22 04.99	-18 05.4	3.669	3.472	+0.92	+2.2	16.7	70.9
May 8	22 14.20	-17 43.9	3.555	3.494	+0.80	+1.4	16.7	78.4
May 18	22 22.19	-17 30.1	3.437	3.516	+0.67	+0.5	16.6	86.1
May 28	22 28.86	-17 25.0	3.318	3.539	+0.52	-0.5	16.6	94.1
June 7	22 34.05	-17 29.7	3.202	3.562	+0.36	-1.5	16.5	102.5
June 17	22 37.64	-17 44.9	3.090	3.585	+0.19	-2.6	16.5	111.2
June 27	22 39.51	-18 10.6	2.987	3.609	+0.01	-3.6	16.4	120.3
July 7	22 39.59	-18 46.3	2.897	3.633	-0.17	-4.4	16.4	129.8
July 17	22 37.88	-19 30.6	2.823	3.657	-0.34	-5.0	16.3	139.6
July 27	22 34.51	-20 20.6	2.769	3.681	-0.48	-5.2	16.3	149.6
Aug. 6	22 29.72	-21 13.0	2.740	3.706	-0.58	-5.0	16.4	159.3
Aug. 16	22 23.92	-22 03.4	2.737	3.731	-0.63	-4.4	16.4	167.0
Aug. 26	22 17.67	-22 47.8	2.762	3.756	-0.61	-3.5	16.4	167.7
Sept. 5	22 11.54	-23 22.7	2.816	3.781	-0.54	-2.3	16.5	160.5
Sept. 15	22 06.11	-23 45.8	2.896	3.806	-0.42	-1.0	16.6	150.9
Sept. 25	22 01.87	-23 56.3	3.001	3.832	-0.27	+0.2	16.8	140.9
Oct. 5	21 59.13	-23 54.3	3.128	3.858	-0.11	+1.3	16.9	130.9
Oct. 15	21 58.08	-23 40.9	3.272	3.884	+0.07	+2.4	17.0	121.2
Oct. 25	21 58.74	-23 17.3	3.430	3.909	+0.23	+3.2	17.2	111.8
Nov. 4	22 01.05	-22 44.9	3.597	3.935	+0.38	+4.0	17.3	102.7
Nov. 14	22 04.88	-22 05.1	3.770	3.961	+0.52	+4.6	17.5	93.8
Nov. 24	22 10.05	-21 18.9	3.945	3.988	+0.63	+5.2	17.6	85.3
Dec. 4	22 16.39	-20 27.4	4.119	4.014	+0.73	+5.6	17.8	77.0
Dec. 14	22 23.72	-19 31.3	4.289	4.040	+0.81	+6.0	17.9	68.9
Dec. 24	22 31.87	-18 31.6	4.451	4.066	+0.88	+6.3	18.1	61.0
Jan. 3	22 40.68	-17 28.7	4.604	4.092	+0.93	+6.5	18.2	53.3
Jan. 13	22 50.02	-16 23.5	4.745	4.118	+0.97	+6.7	18.3	45.7
Jan. 23	22 59.76	-15 16.6	4.872	4.144	+1.00	+6.8	18.4	38.3
Feb. 2	23 09.80	-14 08.4	4.984	4.171	+1.02	+6.9	18.5	31.0
Feb. 12	23 20.04	-12 59.8	5.079	4.197	+1.04	+6.8	18.6	24.0
Feb. 22	23 30.40	-11 51.3	5.157	4.223	+1.04	+6.8	18.7	17.3
Mar. 4	23 40.80	-10 43.6	5.216	4.249	+1.04	+6.6	18.8	11.4
Mar. 14	23 51.17	-09 37.1	5.257	4.275	+1.03	+6.5	18.9	8.0
Mar. 24	00 01.44	-08 32.6	5.278	4.300	+1.01	+6.2	18.9	10.1
Apr. 3	00 11.55	-07 30.6	5.281	4.326	+0.99	+5.9	19.0	15.5

Comet C/2011 UF305 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 July 22.11828 TT
Peri. = 121.98331
Node = 297.44173 2000.0
Incl. = 93.98151
q = 2.1380114 AU
e = 1.0003658

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	08 12.91	+14 59.6	1.927	2.887	-2.48	-14.3	13.4	164.8
Jan. 18	07 48.15	+12 36.6	1.984	2.961	-2.22	-13.2	13.6	171.5
Jan. 28	07 25.93	+10 24.2	2.092	3.036	-1.84	-11.5	13.8	160.0
Feb. 7	07 07.49	+08 29.2	2.244	3.113	-1.42	-9.5	14.1	146.3
Feb. 17	06 53.26	+06 53.9	2.431	3.190	-1.02	-7.7	14.4	133.3
Feb. 27	06 43.11	+05 36.8	2.645	3.269	-0.66	-6.2	14.7	121.2
Mar. 9	06 36.54	+04 34.6	2.876	3.349	-0.35	-5.1	14.9	110.1
Mar. 19	06 33.01	+03 43.5	3.117	3.429	-0.11	-4.4	15.2	99.8
Mar. 29	06 31.94	+02 59.6	3.361	3.510	+0.09	-3.9	15.5	90.2
Apr. 8	06 32.86	+02 20.2	3.604	3.591	+0.25	-3.8	15.7	81.3
Apr. 18	06 35.35	+01 42.6	3.841	3.673	+0.37	-3.8	16.0	72.9
Apr. 28	06 39.07	+01 05.0	4.069	3.755	+0.47	-3.9	16.2	65.0
May 8	06 43.74	+00 25.8	4.284	3.838	+0.54	-4.2	16.4	57.5
May 18	06 49.13	-00 16.0	4.484	3.921	+0.59	-4.5	16.6	50.6
May 28	06 55.05	-01 01.4	4.668	4.004	+0.63	-5.0	16.8	44.2
June 7	07 01.33	-01 51.1	4.833	4.087	+0.65	-5.5	16.9	38.4
June 17	07 07.83	-02 45.7	4.979	4.170	+0.66	-6.0	17.1	33.5
June 27	07 14.42	-03 45.5	5.105	4.253	+0.66	-6.5	17.2	29.8
July 7	07 20.99	-04 50.9	5.210	4.336	+0.64	-7.1	17.4	27.7
July 17	07 27.42	-06 02.2	5.295	4.420	+0.62	-7.7	17.5	27.6
July 27	07 33.62	-07 19.5	5.359	4.503	+0.59	-8.3	17.6	29.5
Aug. 6	07 39.47	-08 42.9	5.404	4.586	+0.54	-9.0	17.7	32.9
Aug. 16	07 44.87	-10 12.6	5.429	4.669	+0.48	-9.6	17.8	37.7
Aug. 26	07 49.71	-11 48.3	5.437	4.752	+0.42	-10.2	17.8	43.2
Sept. 5	07 53.86	-13 29.9	5.429	4.834	+0.33	-10.7	17.9	49.4
Sept.15	07 57.21	-15 17.0	5.408	4.917	+0.24	-11.2	18.0	56.0
Sept.25	07 59.61	-17 08.9	5.375	4.999	+0.13	-11.6	18.0	62.9
Oct. 5	08 00.94	-19 04.6	5.334	5.082	+0.01	-11.8	18.1	70.1
Oct. 15	08 01.03	-21 02.8	5.288	5.164	-0.13	-11.9	18.1	77.4
Oct. 25	07 59.77	-23 01.7	5.241	5.245	-0.27	-11.7	18.2	84.8
Nov. 4	07 57.04	-24 58.9	5.196	5.327	-0.43	-11.3	18.2	92.2
Nov. 14	07 52.76	-26 51.5	5.159	5.409	-0.58	-10.5	18.3	99.4
Nov. 24	07 46.95	-28 36.1	5.133	5.490	-0.73	-9.3	18.3	106.2
Dec. 4	07 39.67	-30 09.2	5.121	5.571	-0.85	-7.8	18.4	112.3
Dec. 14	07 31.14	-31 27.2	5.128	5.652	-0.94	-6.0	18.5	117.6
Dec. 24	07 21.70	-32 27.3	5.157	5.732	-0.99	-4.0	18.5	121.5
Jan. 3	07 11.77	-33 07.7	5.208	5.813	-0.99	-2.0	18.6	123.8
Jan. 13	07 01.85	-33 27.8	5.282	5.893	-0.94	-0.1	18.7	124.3
Jan. 23	06 52.44	-33 28.7	5.379	5.973	-0.85	+1.6	18.8	123.0
Feb. 2	06 43.94	-33 12.7	5.498	6.052	-0.72	+3.0	18.9	120.1
Feb. 12	06 36.70	-32 43.2	5.636	6.132	-0.58	+3.9	19.0	115.9
Feb. 22	06 30.90	-32 03.8	5.791	6.211	-0.43	+4.6	19.1	110.8
Mar. 4	06 26.61	-31 18.2	5.958	6.290	-0.28	+4.8	19.3	105.1
Mar. 14	06 23.82	-30 30.0	6.135	6.369	-0.14	+4.8	19.4	99.1
Mar. 24	06 22.45	-29 41.9	6.317	6.447	-0.01	+4.6	19.5	93.0
Apr. 3	06 22.36	-28 56.4	6.502	6.525	+0.11	+4.1	19.6	87.0

Comet 185P/Petriew

Epoch = 2013 July 7.0 TT
T = 2012 Aug. 13.54983 TT
Peri. = 181.93923 e = 0.6993324
Node = 214.09063 2000.0 a = 3.0997101 AU
Incl. = 14.00710 n = 0.18060196
q = 0.9319824 AU P = 5.46 years

m1 = 14.6 + 5 log(Delta) + 10.0 log(r) (r>1.8AU)
m1 = 12.0 + 5 log(Delta) + 25.0 log(r(t-20)) (r<1.8AU)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	11 03.78	-13 57.6	1.483	2.082	-0.60	-0.9	18.6	113.6
Jan. 18	10 57.82	-14 06.2	1.460	2.171	-0.90	+2.5	18.8	124.2
Jan. 28	10 48.78	-13 41.1	1.450	2.259	-1.12	+5.9	18.9	135.3
Feb. 7	10 37.54	-12 41.9	1.459	2.344	-1.22	+8.9	19.1	146.3
Feb. 17	10 25.35	-11 12.6	1.492	2.428	-1.17	+11.0	19.3	156.0
Feb. 27	10 13.61	-09 22.4	1.553	2.510	-1.01	+11.9	19.6	161.0
Mar. 9	10 03.52	-07 23.2	1.643	2.590	-0.77	+11.7	19.8	158.0
Mar. 19	09 55.85	-05 26.3	1.761	2.669	-0.49	+10.6	20.1	149.9
Mar. 29	09 50.97	-03 40.5	1.903	2.746	-0.22	+9.0	20.4	140.2
Apr. 8	09 48.82	-02 10.6	2.067	2.821	+0.03	+7.2	20.7	130.4
Apr. 18	09 49.17	-00 58.7	2.248	2.895	+0.25	+5.4	21.0	120.9
Apr. 28	09 51.68	-00 04.9	2.441	2.967	+0.43	+3.7	21.3	111.9
May 8	09 55.98	+00 32.1	2.642	3.037	+0.58	+2.2	21.5	103.3
May 18	10 01.76	+00 53.8	2.849	3.106	+0.69	+0.8	21.8	95.1
May 28	10 08.71	+01 02.0	3.058	3.174	+0.79	-0.4	22.0	87.2
June 7	10 16.58	+00 58.5	3.266	3.240	+0.86	-1.4	22.3	79.6
June 17	10 25.19	+00 44.7	3.470	3.304	+0.92	-2.3	22.5	72.2
June 27	10 34.35	+00 22.2	3.668	3.367	+0.96	-3.0	22.7	65.0
July 7	10 43.94	-00 07.9	3.858	3.429	+0.99	-3.6	22.9	57.9
July 17	10 53.84	-00 44.3	4.038	3.489	+1.01	-4.2	.	51.0
July 27	11 03.97	-01 26.0	4.206	3.548	+1.03	-4.6	.	44.1
Aug. 6	11 14.24	-02 12.2	4.360	3.606	+1.04	-5.0	.	37.3
Aug. 16	11 24.60	-03 02.0	4.498	3.663	+1.04	-5.3	.	30.5
Aug. 26	11 34.98	-03 54.5	4.620	3.718	+1.03	-5.5	.	23.8
Sept. 5	11 45.32	-04 49.2	4.724	3.772	+1.03	-5.6	.	17.2
Sept.15	11 55.59	-05 45.2	4.808	3.825	+1.01	-5.7	.	10.8
Sept.25	12 05.71	-06 42.0	4.872	3.876	+0.99	-5.7	.	6.0
Oct. 5	12 15.65	-07 38.8	4.916	3.927	+0.97	-5.6	.	7.5
Oct. 15	12 25.33	-08 35.1	4.939	3.976	+0.94	-5.5	.	13.5
Oct. 25	12 34.69	-09 30.2	4.940	4.024	+0.90	-5.3	.	20.5
Nov. 4	12 43.65	-10 23.6	4.921	4.071	+0.85	-5.1	.	27.9
Nov. 14	12 52.12	-11 14.4	4.882	4.117	+0.79	-4.8	.	35.6
Nov. 24	13 00.01	-12 02.1	4.823	4.162	+0.72	-4.4	.	43.5
Dec. 4	13 07.19	-12 46.1	4.746	4.206	+0.64	-3.9	.	51.6
Dec. 14	13 13.55	-13 25.4	4.654	4.249	+0.54	-3.4	.	60.0
Dec. 24	13 18.94	-13 59.5	4.548	4.290	+0.43	-2.8	.	68.7
Jan. 3	13 23.21	-14 27.5	4.432	4.331	+0.30	-2.1	.	77.8
Jan. 13	13 26.22	-14 48.4	4.309	4.371	+0.16	-1.3	.	87.1
Jan. 23	13 27.83	-15 01.4	4.184	4.410	+0.01	-0.4	.	96.8
Feb. 2	13 27.93	-15 05.5	4.061	4.447	-0.15	+0.6	.	106.9
Feb. 12	13 26.44	-14 59.9	3.945	4.484	-0.31	+1.6	.	117.3
Feb. 22	13 23.38	-14 43.9	3.842	4.520	-0.45	+2.7	.	128.1
Mar. 4	13 18.85	-14 17.4	3.758	4.555	-0.58	+3.7	.	139.2
Mar. 14	13 13.07	-13 40.7	3.697	4.589	-0.67	+4.5	.	150.6
Mar. 24	13 06.40	-12 55.4	3.664	4.622	-0.72	+5.2	.	162.0
Apr. 3	12 59.24	-12 03.4	3.661	4.654	-0.71	+5.6	.	172.5

Comet C/2011 O1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 Aug. 18.41533 TT
Peri. = 232.37773
Node = 89.81842 2000.0
Incl. = 76.49974
q = 3.8906863 AU
e = 0.9961080

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	23 34.51	-73 55.7	4.456	4.082	+3.27	+12.8	16.6	61.7
Jan. 18	00 07.24	-71 47.6	4.481	4.109	+2.92	+13.8	16.6	61.8
Jan. 28	00 36.42	-69 29.7	4.504	4.137	+2.63	+14.5	16.6	62.2
Feb. 7	01 02.75	-67 04.8	4.527	4.167	+2.41	+14.9	16.7	62.7
Feb. 17	01 26.81	-64 35.9	4.551	4.199	+2.22	+15.0	16.7	63.2
Feb. 27	01 49.04	-62 05.7	4.577	4.231	+2.07	+14.9	16.8	63.7
Mar. 9	02 09.79	-59 36.4	4.605	4.266	+1.95	+14.6	16.8	64.1
Mar. 19	02 29.32	-57 10.4	4.636	4.301	+1.85	+14.0	16.9	64.4
Mar. 29	02 47.79	-54 50.0	4.670	4.338	+1.76	+13.3	16.9	64.7
Apr. 8	03 05.36	-52 36.8	4.707	4.376	+1.68	+12.4	17.0	64.8
Apr. 18	03 22.12	-50 32.6	4.746	4.415	+1.60	+11.4	17.0	64.9
Apr. 28	03 38.12	-48 38.8	4.787	4.456	+1.53	+10.2	17.1	65.0
May 8	03 53.40	-46 56.5	4.828	4.497	+1.46	+9.0	17.1	65.1
May 18	04 07.97	-45 26.5	4.869	4.540	+1.39	+7.7	17.2	65.3
May 28	04 21.83	-44 09.4	4.908	4.583	+1.31	+6.4	17.3	65.6
June 7	04 34.96	-43 05.6	4.945	4.628	+1.24	+5.0	17.3	66.1
June 17	04 47.32	-42 15.3	4.979	4.673	+1.16	+3.7	17.4	66.8
June 27	04 58.88	-41 38.4	5.008	4.720	+1.07	+2.4	17.4	67.8
July 7	05 09.57	-41 14.5	5.032	4.767	+0.97	+1.1	17.5	69.2
July 17	05 19.32	-41 03.4	5.051	4.815	+0.87	-0.1	17.5	70.9
July 27	05 28.03	-41 04.3	5.063	4.864	+0.76	-1.2	17.6	73.0
Aug. 6	05 35.62	-41 16.3	5.070	4.914	+0.63	-2.2	17.6	75.4
Aug. 16	05 41.97	-41 38.4	5.071	4.964	+0.50	-3.1	17.7	78.2
Aug. 26	05 46.94	-42 09.1	5.067	5.015	+0.35	-3.8	17.7	81.3
Sept. 5	05 50.40	-42 46.8	5.059	5.066	+0.18	-4.2	17.8	84.7
Sept.15	05 52.21	-43 29.3	5.048	5.119	0.00	-4.5	17.8	88.3
Sept.25	05 52.24	-44 13.9	5.037	5.172	-0.18	-4.4	17.8	92.1
Oct. 5	05 50.41	-44 57.6	5.026	5.225	-0.38	-3.9	17.9	96.0
Oct. 15	05 46.66	-45 36.8	5.018	5.279	-0.56	-3.1	17.9	99.7
Oct. 25	05 41.06	-46 07.5	5.016	5.333	-0.73	-1.8	18.0	103.3
Nov. 4	05 33.79	-46 26.0	5.022	5.388	-0.86	-0.2	18.0	106.5
Nov. 14	05 25.18	-46 28.4	5.038	5.443	-0.95	+1.7	18.1	109.2
Nov. 24	05 15.69	-46 11.8	5.067	5.499	-0.98	+3.7	18.1	111.0
Dec. 4	05 05.89	-45 34.7	5.111	5.555	-0.95	+5.8	18.2	112.0
Dec. 14	04 56.36	-44 36.7	5.170	5.612	-0.87	+7.7	18.3	111.9
Dec. 24	04 47.64	-43 19.3	5.247	5.669	-0.75	+9.4	18.3	110.7
Jan. 3	04 40.14	-41 45.0	5.339	5.726	-0.60	+10.8	18.4	108.4
Jan. 13	04 34.14	-39 57.4	5.448	5.784	-0.44	+11.7	18.5	105.1
Jan. 23	04 29.74	-38 00.3	5.572	5.842	-0.28	+12.3	18.6	101.1
Feb. 2	04 26.96	-35 57.7	5.708	5.900	-0.12	+12.5	18.7	96.4
Feb. 12	04 25.73	-33 52.9	5.854	5.958	+0.02	+12.4	18.8	91.2
Feb. 22	04 25.90	-31 49.2	6.008	6.017	+0.14	+12.0	18.9	85.8
Mar. 4	04 27.32	-29 48.9	6.167	6.076	+0.25	+11.5	19.0	80.1
Mar. 14	04 29.82	-27 54.0	6.327	6.135	+0.34	+10.8	19.1	74.4
Mar. 24	04 33.24	-26 05.9	6.486	6.194	+0.42	+10.0	19.2	68.7
Apr. 3	04 37.42	-24 25.6	6.641	6.254	+0.48	+9.2	19.3	63.2

Comet P/2012 S2 (La Sagra)

Epoch = 2013 July 7.0 TT
T = 2012 Aug. 18.86693 TT
Peri. = 312.03732 e = 0.6907145
Node = 52.57872 2000.0 a = 4.4293906 AU
Incl. = 8.57920 n = 0.10572753
q = 1.3699463 AU P = 9.32 years

m1 = 15.6 + 5 log(Delta) + 15.0 log(r(t-100))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 28.44	+30 01.1	1.259	2.120	+0.17	+0.2	18.6	141.7
Jan. 18	04 30.17	+30 03.5	1.413	2.197	+0.48	+0.3	19.0	132.1
Jan. 28	04 35.01	+30 06.2	1.582	2.275	+0.74	+0.4	19.5	123.1
Feb. 7	04 42.39	+30 09.8	1.764	2.353	+0.94	+0.4	20.0	114.7
Feb. 17	04 51.83	+30 14.0	1.955	2.431	+1.11	+0.4	20.4	106.7
Feb. 27	05 02.90	+30 18.0	2.153	2.509	+1.23	+0.3	20.9	99.2
Mar. 9	05 15.23	+30 20.8	2.356	2.586	+1.33	+0.1	21.4	91.9
Mar. 19	05 28.52	+30 21.6	2.561	2.663	+1.40	-0.2	21.8	84.8
Mar. 29	05 42.53	+30 19.7	2.767	2.740	+1.45	-0.5	22.2	78.0
Apr. 8	05 57.05	+30 14.4	2.971	2.815	+1.49	-0.9	22.6	71.4
Apr. 18	06 11.92	+30 05.3	3.171	2.891	+1.51	-1.3	23.0	64.8
Apr. 28	06 27.00	+29 52.2	3.365	2.965	+1.52	-1.7	23.4	58.4
May 8	06 42.15	+29 34.9	3.552	3.039	+1.51	-2.1	23.7	52.1
May 18	06 57.29	+29 13.5	3.730	3.112	+1.50	-2.5	24.0	45.9
May 28	07 12.33	+28 48.1	3.897	3.184	+1.49	-2.9	.	39.7
June 7	07 27.19	+28 19.0	4.053	3.255	+1.46	-3.3	.	33.5
June 17	07 41.81	+27 46.4	4.195	3.326	+1.43	-3.6	.	27.4
June 27	07 56.14	+27 10.8	4.322	3.395	+1.40	-3.8	.	21.3
July 7	08 10.13	+26 32.6	4.434	3.464	+1.36	-4.0	.	15.4
July 17	08 23.74	+25 52.5	4.529	3.532	+1.32	-4.2	.	10.0
July 27	08 36.93	+25 10.9	4.607	3.600	+1.27	-4.2	.	6.5
Aug. 6	08 49.65	+24 28.4	4.666	3.666	+1.22	-4.3	.	8.4
Aug. 16	09 01.88	+23 45.8	4.708	3.732	+1.17	-4.2	.	13.7
Aug. 26	09 13.55	+23 03.8	4.730	3.796	+1.11	-4.1	.	20.0
Sept. 5	09 24.63	+22 23.1	4.734	3.860	+1.04	-3.8	.	26.7
Sept. 15	09 35.07	+21 44.6	4.720	3.924	+0.97	-3.5	.	33.8
Sept. 25	09 44.78	+21 09.2	4.688	3.986	+0.89	-3.1	.	41.1
Oct. 5	09 53.71	+20 37.7	4.639	4.048	+0.80	-2.6	.	48.6
Oct. 15	10 01.75	+20 11.3	4.574	4.109	+0.71	-2.1	.	56.5
Oct. 25	10 08.81	+19 50.8	4.496	4.169	+0.60	-1.4	.	64.7
Nov. 4	10 14.78	+19 37.2	4.408	4.228	+0.47	-0.6	.	73.2
Nov. 14	10 19.52	+19 31.5	4.311	4.287	+0.34	+0.3	.	82.0
Nov. 24	10 22.92	+19 34.4	4.209	4.345	+0.19	+1.2	.	91.3
Dec. 4	10 24.84	+19 46.3	4.107	4.402	+0.03	+2.1	.	100.9
Dec. 14	10 25.16	+20 07.4	4.010	4.458	-0.13	+3.0	.	111.0
Dec. 24	10 23.84	+20 37.1	3.923	4.514	-0.30	+3.7	.	121.4
Jan. 3	10 20.87	+21 14.1	3.850	4.569	-0.45	+4.2	.	132.2
Jan. 13	10 16.34	+21 56.2	3.799	4.624	-0.58	+4.4	.	143.2
Jan. 23	10 10.50	+22 40.6	3.772	4.677	-0.68	+4.3	.	154.1
Feb. 2	10 03.68	+23 23.9	3.775	4.730	-0.73	+3.9	.	164.0
Feb. 12	09 56.34	+24 03.0	3.809	4.782	-0.73	+3.2	.	169.2
Feb. 22	09 49.01	+24 35.1	3.876	4.834	-0.68	+2.3	.	164.0
Mar. 4	09 42.17	+24 58.4	3.973	4.885	-0.59	+1.4	.	154.2
Mar. 14	09 36.27	+25 12.1	4.099	4.935	-0.47	+0.4	.	143.7
Mar. 24	09 31.62	+25 16.5	4.249	4.985	-0.32	-0.4	.	133.2
Apr. 3	09 28.38	+25 12.2	4.420	5.034	-0.18	-1.2	.	122.9

Comet C/2012 Y3 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2012 Aug. 25.96334 TT
Peri. = 235.81558 e = 0.9417479
Node = 122.65553 2000.0 a = 30.3403688 AU
Incl. = 73.27126 n = 0.00589757
q = 1.7673902 AU P = 167.12 years

m1 = 8.4 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	05 25.14	-55 38.3	2.060	2.411	-0.87	+32.7	15.7	98.6
Jan. 18	05 16.45	-50 11.3	2.115	2.491	-0.39	+34.3	16.0	100.6
Jan. 28	05 12.56	-44 28.1	2.191	2.571	-0.02	+34.4	16.3	101.2
Feb. 7	05 12.38	-38 44.1	2.292	2.654	+0.26	+33.2	16.6	100.4
Feb. 17	05 15.03	-33 12.0	2.416	2.738	+0.48	+31.1	16.9	98.2
Feb. 27	05 19.83	-28 01.4	2.563	2.822	+0.64	+28.3	17.2	94.7
Mar. 9	05 26.27	-23 18.1	2.729	2.908	+0.77	+25.4	17.5	90.2
Mar. 19	05 33.95	-19 04.4	2.911	2.994	+0.86	+22.4	17.9	85.1
Mar. 29	05 42.58	-15 20.7	3.104	3.080	+0.93	+19.5	18.2	79.4
Apr. 8	05 51.89	-12 05.8	3.305	3.167	+0.98	+16.8	18.5	73.4
Apr. 18	06 01.73	-09 17.4	3.509	3.255	+1.02	+14.4	18.8	67.2
Apr. 28	06 11.91	-06 53.3	3.713	3.342	+1.04	+12.2	19.1	60.9
May 8	06 22.32	-04 50.8	3.914	3.429	+1.05	+10.3	19.4	54.6
May 18	06 32.84	-03 07.6	4.107	3.517	+1.05	+8.6	19.7	48.3
May 28	06 43.39	-01 41.5	4.291	3.604	+1.05	+7.1	19.9	42.1
June 7	06 53.87	-00 30.4	4.462	3.691	+1.03	+5.8	20.2	36.1
June 17	07 04.22	+00 27.5	4.619	3.779	+1.01	+4.6	20.4	30.4
June 27	07 14.36	+01 13.8	4.760	3.865	+0.99	+3.6	20.6	25.3
July 7	07 24.22	+01 50.1	4.882	3.952	+0.95	+2.8	20.8	21.3
July 17	07 33.75	+02 17.6	4.985	4.039	+0.91	+2.0	21.0	19.1
July 27	07 42.88	+02 37.7	5.068	4.125	+0.87	+1.4	21.2	19.6
Aug. 6	07 51.53	+02 51.6	5.129	4.211	+0.81	+0.9	21.3	22.6
Aug. 16	07 59.64	+03 00.4	5.170	4.296	+0.75	+0.5	21.5	27.4
Aug. 26	08 07.13	+03 05.4	5.189	4.382	+0.68	+0.2	21.6	33.5
Sept. 5	08 13.92	+03 07.5	5.187	4.467	+0.60	0.0	21.7	40.3
Sept.15	08 19.93	+03 07.9	5.166	4.551	+0.51	0.0	21.8	47.7
Sept.25	08 25.04	+03 08.0	5.128	4.635	+0.41	+0.1	21.9	55.6
Oct. 5	08 29.17	+03 08.8	5.073	4.719	+0.30	+0.3	22.0	63.9
Oct. 15	08 32.20	+03 11.7	5.005	4.803	+0.18	+0.6	22.1	72.6
Oct. 25	08 34.03	+03 18.0	4.928	4.886	+0.05	+1.1	22.2	81.8
Nov. 4	08 34.58	+03 29.0	4.845	4.969	-0.08	+1.7	22.3	91.4
Nov. 14	08 33.75	+03 46.2	4.762	5.051	-0.22	+2.4	22.3	101.4
Nov. 24	08 31.52	+04 10.4	4.685	5.133	-0.36	+3.2	22.4	111.8
Dec. 4	08 27.92	+04 42.6	4.618	5.215	-0.49	+4.1	22.5	122.5
Dec. 14	08 23.05	+05 23.1	4.569	5.296	-0.60	+4.9	22.6	133.6
Dec. 24	08 17.09	+06 11.7	4.543	5.377	-0.68	+5.6	22.6	144.8
Jan. 3	08 10.34	+07 07.4	4.546	5.458	-0.72	+6.1	22.7	155.7
Jan. 13	08 03.14	+08 08.5	4.581	5.538	-0.72	+6.5	22.9	165.2
Jan. 23	07 55.92	+09 13.1	4.651	5.618	-0.69	+6.6	23.0	168.1
Feb. 2	07 49.06	+10 18.7	4.755	5.697	-0.61	+6.5	.	161.3
Feb. 12	07 42.92	+11 23.2	4.893	5.776	-0.51	+6.2	.	151.0
Feb. 22	07 37.79	+12 24.8	5.060	5.855	-0.40	+5.7	.	140.2
Mar. 4	07 33.82	+13 22.2	5.254	5.933	-0.27	+5.2	.	129.4
Mar. 14	07 31.13	+14 14.6	5.468	6.011	-0.14	+4.7	.	118.8
Mar. 24	07 29.71	+15 01.5	5.698	6.089	-0.02	+4.1	.	108.6
Apr. 3	07 29.50	+15 42.9	5.937	6.166	+0.09	+3.6	.	98.6

Comet C/2012 T6 (Kowalski)

Epoch = 2013 July 7.0 TT
T = 2012 Aug. 26.33210 TT
Peri. = 198.09482 e = 0.8760535
Node = 186.19399 2000.0 a = 14.3181542 AU
Incl. = 33.27678 n = 0.01819171
q = 1.7746851 AU P = 54.18 years

m1 = 14.4 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	04 49.41	-26 10.6	1.725	2.373	+0.12	+12.7	19.3	119.9
Jan. 18	04 50.66	-24 03.4	1.852	2.447	+0.35	+13.9	19.6	115.9
Jan. 28	04 54.14	-21 44.6	1.991	2.523	+0.55	+14.3	19.9	111.4
Feb. 7	04 59.63	-19 21.9	2.141	2.601	+0.72	+14.1	20.2	106.6
Feb. 17	05 06.88	-17 01.2	2.300	2.679	+0.87	+13.4	20.5	101.6
Feb. 27	05 15.60	-14 46.8	2.468	2.759	+0.99	+12.5	20.8	96.3
Mar. 9	05 25.53	-12 41.9	2.644	2.840	+1.09	+11.4	21.0	91.0
Mar. 19	05 36.43	-10 48.2	2.824	2.921	+1.17	+10.1	21.3	85.6
Mar. 29	05 48.10	-09 07.0	3.009	3.003	+1.22	+8.8	21.6	80.1
Apr. 8	06 00.35	-07 38.8	3.196	3.085	+1.27	+7.5	21.8	74.6
Apr. 18	06 13.02	-06 23.7	3.383	3.167	+1.30	+6.2	22.1	69.1
Apr. 28	06 25.97	-05 21.5	3.568	3.250	+1.31	+5.0	22.3	63.7
May 8	06 39.09	-04 31.9	3.750	3.332	+1.32	+3.8	22.5	58.3
May 18	06 52.27	-03 54.2	3.928	3.415	+1.32	+2.6	22.7	52.9
May 28	07 05.43	-03 27.8	4.099	3.498	+1.31	+1.6	22.9	47.7
June 7	07 18.48	-03 12.1	4.261	3.580	+1.29	+0.6	23.1	42.5
June 17	07 31.36	-03 06.2	4.414	3.662	+1.26	-0.3	23.3	37.6
June 27	07 44.00	-03 09.4	4.556	3.744	+1.23	-1.2	23.4	33.0
July 7	07 56.34	-03 21.0	4.685	3.826	+1.20	-1.9	.	28.9
July 17	08 08.35	-03 40.3	4.800	3.908	+1.16	-2.6	.	25.5
July 27	08 19.96	-04 06.3	4.900	3.989	+1.12	-3.2	.	23.4
Aug. 6	08 31.12	-04 38.6	4.985	4.070	+1.07	-3.8	.	22.9
Aug. 16	08 41.79	-05 16.2	5.053	4.150	+1.01	-4.2	.	24.2
Aug. 26	08 51.90	-05 58.5	5.104	4.231	+0.95	-4.6	.	27.2
Sept. 5	09 01.42	-06 44.8	5.138	4.311	+0.88	-4.9	.	31.5
Sept.15	09 10.26	-07 34.2	5.155	4.390	+0.81	-5.2	.	36.7
Sept.25	09 18.35	-08 25.9	5.155	4.469	+0.73	-5.3	.	42.7
Oct. 5	09 25.64	-09 19.0	5.138	4.548	+0.64	-5.4	.	49.2
Oct. 15	09 32.02	-10 12.7	5.107	4.627	+0.54	-5.3	.	56.2
Oct. 25	09 37.40	-11 05.8	5.062	4.705	+0.43	-5.1	.	63.6
Nov. 4	09 41.71	-11 57.1	5.006	4.782	+0.31	-4.8	.	71.3
Nov. 14	09 44.83	-12 45.4	4.942	4.860	+0.19	-4.4	.	79.5
Nov. 24	09 46.69	-13 28.9	4.872	4.936	+0.05	-3.7	.	88.0
Dec. 4	09 47.24	-14 06.2	4.801	5.013	-0.08	-2.9	.	96.7
Dec. 14	09 46.45	-14 35.4	4.733	5.089	-0.21	-1.9	.	105.8
Dec. 24	09 44.35	-14 54.7	4.672	5.165	-0.33	-0.8	.	115.0
Jan. 3	09 41.05	-15 02.6	4.624	5.240	-0.43	+0.5	.	124.2
Jan. 13	09 36.72	-14 57.7	4.593	5.315	-0.51	+1.8	.	133.2
Jan. 23	09 31.65	-14 39.7	4.584	5.389	-0.55	+3.1	.	141.5
Feb. 2	09 26.14	-14 08.8	4.600	5.464	-0.56	+4.3	.	148.3
Feb. 12	09 20.58	-13 26.3	4.645	5.537	-0.53	+5.2	.	152.2
Feb. 22	09 15.32	-12 34.4	4.718	5.611	-0.46	+5.9	.	152.0
Mar. 4	09 10.69	-11 35.9	4.821	5.684	-0.38	+6.2	.	147.7
Mar. 14	09 06.94	-10 33.9	4.951	5.756	-0.27	+6.3	.	140.9
Mar. 24	09 04.23	-09 31.3	5.105	5.828	-0.16	+6.0	.	132.8
Apr. 3	09 02.65	-08 30.9	5.282	5.900	-0.04	+5.6	.	124.1

Comet P/2012 T1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2012 Sept. 10.60166 TT
Peri. = 300.46666 e = 0.2363537
Node = 85.77188 2000.0 a = 3.1552004 AU
Incl. = 11.05940 n = 0.17585862
q = 2.4094571 AU P = 5.60 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	02 35.09	+08 53.0	1.958	2.492	+0.56	+8.5	19.4	111.4
Jan. 18	02 40.65	+10 18.3	2.093	2.506	+0.77	+8.8	19.6	103.1
Jan. 28	02 48.35	+11 46.6	2.232	2.520	+0.95	+8.9	19.8	95.2
Feb. 7	02 57.89	+13 15.8	2.375	2.536	+1.11	+8.9	19.9	87.7
Feb. 17	03 09.03	+14 44.5	2.519	2.552	+1.25	+8.6	20.1	80.6
Feb. 27	03 21.54	+16 10.9	2.662	2.569	+1.37	+8.3	20.3	73.8
Mar. 9	03 35.21	+17 33.9	2.801	2.586	+1.47	+7.8	20.4	67.3
Mar. 19	03 49.90	+18 52.4	2.937	2.605	+1.55	+7.3	20.6	61.1
Mar. 29	04 05.43	+20 05.2	3.066	2.624	+1.63	+6.6	20.7	55.0
Apr. 8	04 21.68	+21 11.7	3.189	2.643	+1.69	+5.9	20.9	49.0
Apr. 18	04 38.55	+22 11.0	3.304	2.664	+1.73	+5.2	21.0	43.3
Apr. 28	04 55.89	+23 02.7	3.411	2.684	+1.77	+4.4	21.1	37.6
May 8	05 13.62	+23 46.3	3.508	2.705	+1.80	+3.5	21.2	32.0
May 18	05 31.64	+24 21.6	3.594	2.727	+1.82	+2.7	21.3	26.5
May 28	05 49.83	+24 48.4	3.670	2.749	+1.83	+1.8	21.4	21.1
June 7	06 08.12	+25 06.8	3.734	2.771	+1.83	+1.0	21.5	15.7
June 17	06 26.41	+25 17.0	3.787	2.793	+1.82	+0.2	21.6	10.4
June 27	06 44.60	+25 19.2	3.827	2.816	+1.80	−0.5	21.7	5.3
July 7	07 02.62	+25 14.0	3.854	2.839	+1.78	−1.2	21.7	2.7
July 17	07 20.39	+25 01.9	3.869	2.862	+1.74	−1.8	21.8	6.9
July 27	07 37.83	+24 43.7	3.870	2.885	+1.71	−2.4	21.8	12.2
Aug. 6	07 54.88	+24 20.1	3.858	2.909	+1.66	−2.8	21.9	17.8
Aug. 16	08 11.47	+23 52.1	3.832	2.932	+1.61	−3.1	21.9	23.6
Aug. 26	08 27.53	+23 20.8	3.794	2.956	+1.55	−3.4	22.0	29.5
Sept. 5	08 43.00	+22 47.2	3.742	2.979	+1.48	−3.5	22.0	35.5
Sept. 15	08 57.81	+22 12.6	3.677	3.003	+1.41	−3.4	22.0	41.8
Sept. 25	09 11.87	+21 38.4	3.601	3.026	+1.32	−3.2	22.0	48.2
Oct. 5	09 25.12	+21 06.0	3.513	3.050	+1.23	−2.9	22.0	54.9
Oct. 15	09 37.44	+20 37.0	3.415	3.073	+1.13	−2.4	22.0	61.9
Oct. 25	09 48.72	+20 13.1	3.308	3.097	+1.01	−1.7	22.0	69.1
Nov. 4	09 58.82	+19 55.9	3.194	3.120	+0.88	−0.9	21.9	76.8
Nov. 14	10 07.57	+19 47.3	3.075	3.143	+0.72	+0.2	21.9	84.7
Nov. 24	10 14.79	+19 48.9	2.954	3.166	+0.55	+1.3	21.9	93.2
Dec. 4	10 20.28	+20 02.3	2.834	3.188	+0.35	+2.6	21.8	102.0
Dec. 14	10 23.82	+20 28.6	2.718	3.211	+0.14	+3.9	21.8	111.4
Dec. 24	10 25.23	+21 07.9	2.612	3.233	−0.09	+5.2	21.7	121.2
Jan. 3	10 24.37	+21 59.5	2.519	3.255	−0.32	+6.1	21.7	131.6
Jan. 13	10 21.21	+23 00.8	2.444	3.277	−0.53	+6.7	21.7	142.2
Jan. 23	10 15.95	+24 07.6	2.393	3.299	−0.70	+6.7	21.7	152.7
Feb. 2	10 08.96	+25 14.3	2.368	3.320	−0.81	+6.0	21.7	162.2
Feb. 12	10 00.90	+26 14.7	2.373	3.341	−0.83	+4.9	21.7	166.8
Feb. 22	09 52.59	+27 03.4	2.407	3.362	−0.77	+3.4	21.8	162.1
Mar. 4	09 44.86	+27 36.9	2.470	3.383	−0.64	+1.7	21.9	152.8
Mar. 14	09 38.46	+27 53.9	2.560	3.403	−0.46	+0.1	22.0	142.5
Mar. 24	09 33.90	+27 55.1	2.671	3.423	−0.25	−1.3	22.1	132.3
Apr. 3	09 31.44	+27 42.4	2.801	3.442	−0.03	−2.5	22.3	122.4

Comet 260P/McNaught

Epoch = 2013 July 7.0 TT
T = 2012 Sept. 12.50850 TT
Peri. = 15.69541 e = 0.5936873
Node = 351.91980 2000.0 a = 3.6827569 AU
Incl. = 15.73840 n = 0.13945834
q = 1.4963509 AU P = 7.07 years

m1 = 12.0 + 5 log(Delta) + 15.0 log(r(t-15))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	02 20.85	+39 18.6	1.285	1.930	+1.76	-2.8	16.5	116.0
Jan. 18	02 38.46	+38 50.2	1.427	1.992	+1.88	-2.2	17.0	110.0
Jan. 28	02 57.24	+38 27.8	1.579	2.055	+1.96	-1.8	17.4	104.2
Feb. 7	03 16.80	+38 09.6	1.738	2.119	+2.01	-1.6	17.8	98.3
Feb. 17	03 36.92	+37 54.1	1.904	2.184	+2.05	-1.5	18.2	92.6
Feb. 27	03 57.38	+37 39.5	2.076	2.250	+2.06	-1.5	18.6	86.8
Mar. 9	04 18.00	+37 24.4	2.250	2.316	+2.07	-1.7	18.9	81.1
Mar. 19	04 38.67	+37 07.6	2.427	2.382	+2.06	-2.0	19.3	75.5
Mar. 29	04 59.26	+36 48.0	2.605	2.448	+2.04	-2.3	19.6	69.9
Apr. 8	05 19.67	+36 24.8	2.781	2.514	+2.02	-2.7	20.0	64.3
Apr. 18	05 39.83	+35 57.6	2.954	2.580	+1.98	-3.1	20.3	58.7
Apr. 28	05 59.64	+35 26.2	3.122	2.645	+1.94	-3.6	20.6	53.2
May 8	06 19.07	+34 50.2	3.285	2.710	+1.90	-4.0	20.8	47.7
May 18	06 38.05	+34 09.9	3.440	2.774	+1.85	-4.5	21.1	42.2
May 28	06 56.54	+33 25.4	3.586	2.838	+1.80	-4.8	21.3	36.7
June 7	07 14.51	+32 36.9	3.722	2.902	+1.74	-5.2	21.6	31.2
June 17	07 31.94	+31 44.9	3.847	2.965	+1.69	-5.5	21.8	25.7
June 27	07 48.80	+30 49.9	3.958	3.027	+1.63	-5.8	22.0	20.4
July 7	08 05.08	+29 52.3	4.057	3.088	+1.57	-6.0	22.2	15.4
July 17	08 20.76	+28 52.7	4.140	3.149	+1.51	-6.1	22.4	11.1
July 27	08 35.83	+27 51.7	4.208	3.209	+1.44	-6.2	22.5	8.9
Aug. 6	08 50.28	+26 49.9	4.260	3.268	+1.38	-6.2	22.7	10.6
Aug. 16	09 04.08	+25 48.1	4.295	3.327	+1.31	-6.1	22.8	14.9
Aug. 26	09 17.22	+24 47.0	4.313	3.384	+1.24	-6.0	22.9	20.4
Sept. 5	09 29.66	+23 47.2	4.313	3.441	+1.17	-5.8	.	26.6
Sept. 15	09 41.37	+22 49.6	4.297	3.498	+1.09	-5.5	.	33.1
Sept. 25	09 52.29	+21 55.1	4.264	3.553	+1.01	-5.1	.	39.9
Oct. 5	10 02.37	+21 04.5	4.214	3.608	+0.91	-4.6	.	47.0
Oct. 15	10 11.51	+20 18.9	4.149	3.662	+0.81	-4.0	.	54.5
Oct. 25	10 19.63	+19 39.1	4.071	3.715	+0.70	-3.3	.	62.3
Nov. 4	10 26.61	+19 06.2	3.982	3.767	+0.57	-2.5	.	70.4
Nov. 14	10 32.30	+18 41.2	3.883	3.819	+0.43	-1.6	.	78.9
Nov. 24	10 36.58	+18 25.0	3.779	3.870	+0.27	-0.7	.	87.9
Dec. 4	10 39.30	+18 18.1	3.672	3.920	+0.10	+0.3	.	97.2
Dec. 14	10 40.29	+18 21.1	3.567	3.969	-0.08	+1.3	.	107.0
Dec. 24	10 39.46	+18 33.7	3.470	4.018	-0.27	+2.1	.	117.3
Jan. 3	10 36.76	+18 54.9	3.385	4.065	-0.45	+2.8	.	128.0
Jan. 13	10 32.23	+19 23.1	3.318	4.112	-0.61	+3.2	.	139.1
Jan. 23	10 26.10	+19 55.5	3.275	4.159	-0.74	+3.3	.	150.3
Feb. 2	10 18.68	+20 28.8	3.259	4.204	-0.82	+3.1	.	161.4
Feb. 12	10 10.51	+20 59.5	3.274	4.249	-0.83	+2.5	.	170.0
Feb. 22	10 02.16	+21 24.4	3.321	4.294	-0.79	+1.7	.	168.2
Mar. 4	09 54.24	+21 41.2	3.399	4.337	-0.69	+0.8	.	158.5
Mar. 14	09 47.30	+21 48.7	3.507	4.380	-0.56	-0.2	.	147.7
Mar. 24	09 41.72	+21 46.9	3.642	4.422	-0.40	-1.1	.	136.9
Apr. 3	09 37.72	+21 36.4	3.797	4.463	-0.23	-1.8	.	126.4

Comet 160P/LINEAR

Epoch = 2013 July 7.0 TT
T = 2012 Sept. 18.69260 TT
Peri. = 18.29259 e = 0.4796709
Node = 336.95545 2000.0 a = 3.9719343 AU
Incl. = 17.27564 n = 0.12450907
q = 2.0667130 AU P = 7.92 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 10.58	+18 14.3	2.165	2.257	+1.65	+8.7	19.1	82.5
Jan. 18	00 27.04	+19 41.1	2.305	2.290	+1.73	+8.9	19.4	76.8
Jan. 28	00 44.30	+21 10.3	2.446	2.324	+1.79	+9.0	19.7	71.3
Feb. 7	01 02.24	+22 40.6	2.586	2.361	+1.85	+9.0	19.9	65.9
Feb. 17	01 20.76	+24 10.6	2.724	2.399	+1.90	+8.8	20.2	60.6
Feb. 27	01 39.76	+25 38.9	2.860	2.438	+1.94	+8.5	20.4	55.4
Mar. 9	01 59.16	+27 04.3	2.992	2.479	+1.98	+8.1	20.7	50.3
Mar. 19	02 18.93	+28 25.8	3.120	2.521	+2.00	+7.6	20.9	45.3
Mar. 29	02 38.97	+29 42.2	3.242	2.563	+2.03	+7.1	21.1	40.3
Apr. 8	02 59.23	+30 52.8	3.357	2.607	+2.04	+6.4	21.4	35.4
Apr. 18	03 19.65	+31 56.7	3.465	2.651	+2.05	+5.7	21.6	30.6
Apr. 28	03 40.15	+32 53.4	3.565	2.696	+2.05	+4.9	21.8	26.0
May 8	04 00.67	+33 42.5	3.655	2.742	+2.04	+4.1	22.0	21.6
May 18	04 21.11	+34 23.8	3.735	2.788	+2.03	+3.3	22.2	17.6
May 28	04 41.38	+34 57.2	3.805	2.834	+2.00	+2.6	22.4	14.4
June 7	05 01.40	+35 22.9	3.862	2.881	+1.97	+1.8	22.5	12.7
June 17	05 21.09	+35 41.2	3.908	2.928	+1.92	+1.1	22.7	13.1
June 27	05 40.33	+35 52.6	3.941	2.975	+1.87	+0.5	22.8	15.6
July 7	05 59.04	+35 57.6	3.961	3.022	+1.81	−0.1	23.0	19.5
July 17	06 17.14	+35 57.1	3.968	3.069	+1.74	−0.5	.	24.2
July 27	06 34.53	+35 51.9	3.961	3.116	+1.66	−0.9	.	29.4
Aug. 6	06 51.12	+35 43.0	3.940	3.163	+1.57	−1.1	.	35.0
Aug. 16	07 06.82	+35 31.6	3.906	3.210	+1.47	−1.3	.	41.0
Aug. 26	07 21.53	+35 18.7	3.858	3.257	+1.36	−1.3	.	47.2
Sept. 5	07 35.16	+35 05.8	3.799	3.304	+1.24	−1.2	.	53.8
Sept. 15	07 47.58	+34 54.0	3.727	3.351	+1.11	−0.9	.	60.6
Sept. 25	07 58.67	+34 44.8	3.646	3.397	+0.96	−0.5	.	67.8
Oct. 5	08 08.28	+34 39.4	3.556	3.443	+0.80	0.0	.	75.4
Oct. 15	08 16.24	+34 39.1	3.459	3.489	+0.61	+0.6	.	83.4
Oct. 25	08 22.36	+34 44.8	3.360	3.534	+0.41	+1.2	.	91.8
Nov. 4	08 26.46	+34 57.1	3.260	3.579	+0.19	+1.9	.	100.7
Nov. 14	08 28.31	+35 16.0	3.164	3.624	−0.05	+2.4	.	110.0
Nov. 24	08 27.78	+35 40.5	3.076	3.668	−0.30	+2.8	.	119.8
Dec. 4	08 24.80	+36 08.7	3.002	3.712	−0.54	+2.9	.	129.9
Dec. 14	08 19.41	+36 37.5	2.946	3.756	−0.75	+2.6	.	140.3
Dec. 24	08 11.94	+37 03.0	2.913	3.799	−0.90	+1.8	.	150.4
Jan. 3	08 02.90	+37 21.1	2.907	3.842	−0.98	+0.7	.	159.2
Jan. 13	07 53.05	+37 28.4	2.931	3.885	−0.98	−0.5	.	163.7
Jan. 23	07 43.28	+37 23.0	2.985	3.927	−0.89	−1.8	.	160.5
Feb. 2	07 34.40	+37 05.1	3.070	3.969	−0.73	−2.9	.	152.2
Feb. 12	07 27.12	+36 36.6	3.182	4.010	−0.53	−3.7	.	142.4
Feb. 22	07 21.85	+35 60.0	3.318	4.051	−0.31	−4.2	.	132.3
Mar. 4	07 18.75	+35 18.1	3.474	4.091	−0.09	−4.5	.	122.3
Mar. 14	07 17.81	+34 33.2	3.645	4.131	+0.11	−4.6	.	112.6
Mar. 24	07 18.89	+33 46.9	3.827	4.170	+0.29	−4.7	.	103.3
Apr. 3	07 21.75	+33 00.2	4.014	4.209	+0.44	−4.7	.	94.3

Comet C/2012 BJ98 (Lemmon)

Epoch = 2013 July 7.0 TT
T = 2012 Sept. 20.43586 TT
Peri. = 72.96388 e = 0.8738594
Node = 124.02661 2000.0 a = 17.0960143 AU
Incl. = 2.63705 n = 0.01394318
q = 2.1565015 AU P = 70.69 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	16 46.69	-20 31.7	3.202	2.460	+2.00	-3.1	18.0	34.9
Jan. 18	17 06.65	-21 02.4	3.180	2.512	+1.89	-2.0	18.1	40.3
Jan. 28	17 25.59	-21 22.5	3.150	2.567	+1.78	-1.1	18.2	46.1
Feb. 7	17 43.39	-21 33.5	3.113	2.625	+1.65	-0.3	18.4	52.1
Feb. 17	17 59.86	-21 36.7	3.068	2.685	+1.50	+0.3	18.5	58.4
Feb. 27	18 14.87	-21 33.8	3.016	2.747	+1.34	+0.7	18.6	64.9
Mar. 9	18 28.26	-21 26.5	2.957	2.811	+1.16	+1.0	18.7	71.8
Mar. 19	18 39.87	-21 16.6	2.893	2.876	+0.97	+1.1	18.8	79.1
Mar. 29	18 49.56	-21 05.7	2.826	2.943	+0.76	+1.0	18.9	86.7
Apr. 8	18 57.18	-20 55.6	2.757	3.011	+0.54	+0.8	19.0	94.8
Apr. 18	19 02.61	-20 47.6	2.690	3.081	+0.31	+0.5	19.1	103.3
Apr. 28	19 05.75	-20 42.8	2.628	3.151	+0.08	+0.1	19.2	112.3
May 8	19 06.57	-20 42.2	2.574	3.222	-0.14	-0.4	19.3	121.8
May 18	19 05.13	-20 45.8	2.532	3.294	-0.35	-0.8	19.4	131.8
May 28	19 01.62	-20 53.3	2.508	3.366	-0.52	-1.1	19.5	142.2
June 7	18 56.41	-21 04.0	2.504	3.439	-0.64	-1.3	19.6	153.0
June 17	18 50.00	-21 16.5	2.525	3.513	-0.70	-1.3	19.8	164.1
June 27	18 43.03	-21 29.6	2.573	3.587	-0.69	-1.3	20.0	175.1
July 7	18 36.15	-21 42.2	2.649	3.661	-0.62	-1.2	20.2	173.4
July 17	18 29.99	-21 53.7	2.753	3.735	-0.49	-1.0	20.4	162.5
July 27	18 25.05	-22 03.9	2.884	3.810	-0.34	-0.9	20.6	151.8
Aug. 6	18 21.64	-22 12.7	3.039	3.884	-0.17	-0.7	20.9	141.5
Aug. 16	18 19.92	-22 20.1	3.215	3.959	0.00	-0.6	21.1	131.5
Aug. 26	18 19.94	-22 26.4	3.408	4.034	+0.17	-0.5	21.3	121.9
Sept. 5	18 21.60	-22 31.3	3.615	4.109	+0.32	-0.4	21.6	112.6
Sept.15	18 24.80	-22 34.8	3.831	4.183	+0.46	-0.2	21.8	103.6
Sept.25	18 29.37	-22 36.7	4.054	4.258	+0.58	0.0	22.1	94.9
Oct. 5	18 35.13	-22 36.6	4.279	4.333	+0.68	+0.2	22.3	86.4
Oct. 15	18 41.92	-22 34.2	4.504	4.407	+0.76	+0.5	22.5	78.1
Oct. 25	18 49.56	-22 29.4	4.725	4.482	+0.83	+0.8	22.7	69.9
Nov. 4	18 57.90	-22 21.9	4.939	4.556	+0.89	+1.0	22.9	61.8
Nov. 14	19 06.80	-22 11.5	5.144	4.630	+0.93	+1.3	23.1	53.8
Nov. 24	19 16.13	-21 58.2	5.337	4.704	+0.96	+1.6	23.3	45.9
Dec. 4	19 25.75	-21 42.0	5.515	4.777	+0.98	+1.9	23.5	38.1
Dec. 14	19 35.56	-21 23.1	5.676	4.851	+0.99	+2.2	.	30.2
Dec. 24	19 45.44	-21 01.5	5.820	4.924	+0.99	+2.4	.	22.4
Jan. 3	19 55.29	-20 37.5	5.943	4.997	+0.97	+2.6	.	14.5
Jan. 13	20 05.03	-20 11.6	6.046	5.070	+0.95	+2.8	.	6.6
Jan. 23	20 14.55	-19 44.1	6.127	5.143	+0.92	+2.9	.	1.3
Feb. 2	20 23.78	-19 15.4	6.186	5.215	+0.89	+2.9	.	9.2
Feb. 12	20 32.64	-18 46.1	6.222	5.287	+0.84	+2.9	.	17.2
Feb. 22	20 41.03	-18 16.8	6.237	5.359	+0.79	+2.9	.	25.2
Mar. 4	20 48.89	-17 48.0	6.232	5.431	+0.72	+2.8	.	33.4
Mar. 14	20 56.13	-17 20.4	6.206	5.502	+0.66	+2.6	.	41.6
Mar. 24	21 02.68	-16 54.7	6.163	5.573	+0.58	+2.3	.	49.9
Apr. 3	21 08.47	-16 31.4	6.104	5.644	+0.49	+2.0	.	58.3

Comet 261P/Larson

Epoch = 2013 July 7.0 TT
T = 2012 Sept. 29.38230 TT
Peri. = 58.91608 e = 0.3903145
Node = 298.45412 2000.0 a = 3.5872216 AU
Incl. = 6.32715 n = 0.14506638
q = 2.1870770 AU P = 6.79 years

m1 = 8.0 + 5 log(Delta) + 25.0 log(r) (pre -T)
m1 = 11.4 + 5 log(Delta) + 15.0 log(r) (post-T)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	00 16.58	+08 47.3	2.266	2.303	+1.58	+7.9	18.6	79.7
Jan. 18	00 32.41	+10 06.8	2.403	2.326	+1.65	+8.4	18.8	73.7
Jan. 28	00 48.93	+11 30.5	2.539	2.351	+1.71	+8.6	19.0	67.8
Feb. 7	01 06.00	+12 56.6	2.673	2.377	+1.75	+8.7	19.2	62.1
Feb. 17	01 23.54	+14 23.7	2.804	2.405	+1.79	+8.6	19.4	56.5
Feb. 27	01 41.47	+15 50.2	2.931	2.434	+1.82	+8.4	19.5	51.0
Mar. 9	01 59.72	+17 14.6	3.053	2.464	+1.85	+8.1	19.7	45.6
Mar. 19	02 18.24	+18 35.8	3.170	2.495	+1.87	+7.7	19.9	40.3
Mar. 29	02 36.97	+19 52.6	3.279	2.528	+1.89	+7.1	20.0	35.0
Apr. 8	02 55.87	+21 04.1	3.381	2.561	+1.90	+6.5	20.2	29.8
Apr. 18	03 14.88	+22 09.5	3.474	2.595	+1.91	+5.9	20.3	24.6
Apr. 28	03 33.95	+23 08.0	3.558	2.630	+1.91	+5.1	20.5	19.4
May 8	03 53.01	+23 59.1	3.632	2.666	+1.90	+4.3	20.6	14.3
May 18	04 12.01	+24 42.6	3.695	2.702	+1.89	+3.6	20.7	9.2
May 28	04 30.86	+25 18.2	3.747	2.739	+1.86	+2.8	20.8	4.7
June 7	04 49.50	+25 45.7	3.787	2.776	+1.84	+2.0	20.9	3.9
June 17	05 07.86	+26 05.4	3.815	2.813	+1.80	+1.2	21.0	8.1
June 27	05 25.84	+26 17.4	3.830	2.851	+1.75	+0.5	21.1	13.3
July 7	05 43.37	+26 22.2	3.833	2.889	+1.70	-0.2	21.2	18.8
July 17	06 00.36	+26 20.2	3.822	2.927	+1.64	-0.8	21.3	24.5
July 27	06 16.72	+26 12.0	3.798	2.966	+1.56	-1.4	21.4	30.3
Aug. 6	06 32.36	+25 58.4	3.761	3.004	+1.48	-1.8	21.4	36.3
Aug. 16	06 47.18	+25 40.3	3.710	3.043	+1.39	-2.2	21.5	42.6
Aug. 26	07 01.07	+25 18.6	3.648	3.081	+1.29	-2.4	21.5	49.0
Sept. 5	07 13.94	+24 54.4	3.574	3.120	+1.17	-2.6	21.6	55.7
Sept. 15	07 25.64	+24 28.8	3.489	3.158	+1.04	-2.6	21.6	62.7
Sept. 25	07 36.04	+24 02.9	3.396	3.196	+0.90	-2.5	21.6	70.1
Oct. 5	07 45.00	+23 38.1	3.294	3.234	+0.73	-2.3	21.6	77.8
Oct. 15	07 52.31	+23 15.6	3.188	3.272	+0.55	-1.9	21.6	86.0
Oct. 25	07 57.82	+22 56.6	3.079	3.310	+0.35	-1.4	21.6	94.6
Nov. 4	08 01.33	+22 42.1	2.970	3.348	+0.13	-0.9	21.6	103.7
Nov. 14	08 02.68	+22 32.9	2.867	3.385	-0.09	-0.4	21.6	113.4
Nov. 24	08 01.75	+22 29.3	2.774	3.422	-0.32	+0.2	21.6	123.7
Dec. 4	07 58.54	+22 30.9	2.695	3.459	-0.54	+0.6	21.6	134.6
Dec. 14	07 53.19	+22 36.8	2.636	3.495	-0.71	+0.8	21.7	146.0
Dec. 24	07 46.07	+22 45.1	2.601	3.531	-0.83	+0.9	21.7	157.8
Jan. 3	07 37.74	+22 53.9	2.595	3.567	-0.88	+0.7	21.8	169.8
Jan. 13	07 28.95	+23 01.1	2.620	3.603	-0.84	+0.4	21.8	177.6
Jan. 23	07 20.51	+23 05.4	2.676	3.638	-0.74	+0.1	21.9	165.7
Feb. 2	07 13.14	+23 06.2	2.762	3.672	-0.57	-0.3	22.1	153.9
Feb. 12	07 07.42	+23 03.6	2.875	3.707	-0.38	-0.6	22.2	142.5
Feb. 22	07 03.66	+22 58.1	3.011	3.741	-0.17	-0.8	22.4	131.5
Mar. 4	07 01.97	+22 50.1	3.165	3.774	+0.04	-1.0	22.6	121.1
Mar. 14	07 02.32	+22 40.1	3.333	3.808	+0.22	-1.2	22.7	111.2
Mar. 24	07 04.56	+22 28.2	3.510	3.840	+0.39	-1.4	22.9	101.8
Apr. 3	07 08.48	+22 14.2	3.692	3.873	+0.54	-1.6	.	92.8

Comet 168P/Hergenrother

Epoch = 2013 July 7.0 TT
T = 2012 Oct. 1.94624 TT
Peri. = 13.94261 e = 0.6095632
Node = 356.44008 2000.0 a = 3.6227033 AU
Incl. = 21.93100 n = 0.14294037
q = 1.4144367 AU P = 6.90 years

m1 = 15.8 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	01 25.53	+43 33.9	1.219	1.772	+2.58	+1.6	18.1	106.7
Jan. 18	01 51.29	+43 49.5	1.349	1.835	+2.64	+0.9	18.4	102.6
Jan. 28	02 17.74	+43 58.7	1.487	1.900	+2.67	+0.3	18.8	98.4
Feb. 7	02 44.47	+44 01.3	1.634	1.966	+2.68	−0.4	19.1	94.0
Feb. 17	03 11.23	+43 57.4	1.787	2.034	+2.65	−1.0	19.4	89.5
Feb. 27	03 37.78	+43 47.0	1.946	2.102	+2.61	−1.7	19.7	84.8
Mar. 9	04 03.92	+43 29.9	2.110	2.171	+2.56	−2.4	19.9	80.1
Mar. 19	04 29.56	+43 06.2	2.278	2.241	+2.50	−3.0	20.2	75.2
Mar. 29	04 54.57	+42 36.1	2.447	2.310	+2.43	−3.6	20.5	70.3
Apr. 8	05 18.88	+41 59.6	2.617	2.380	+2.36	−4.2	20.7	65.3
Apr. 18	05 42.44	+41 17.1	2.786	2.449	+2.28	−4.8	20.9	60.3
Apr. 28	06 05.20	+40 29.0	2.953	2.518	+2.19	−5.3	21.2	55.2
May 8	06 27.14	+39 35.7	3.115	2.586	+2.11	−5.8	21.4	50.1
May 18	06 48.28	+38 37.8	3.272	2.654	+2.03	−6.2	21.6	45.0
May 28	07 08.58	+37 35.8	3.421	2.721	+1.95	−6.6	21.7	39.8
June 7	07 28.07	+36 30.3	3.562	2.788	+1.87	−6.8	21.9	34.7
June 17	07 46.78	+35 21.8	3.693	2.854	+1.79	−7.1	22.1	29.6
June 27	08 04.70	+34 11.1	3.812	2.919	+1.72	−7.2	22.2	24.6
July 7	08 21.87	+32 58.7	3.919	2.983	+1.64	−7.3	22.3	19.9
July 17	08 38.30	+31 45.2	4.012	3.047	+1.57	−7.4	22.4	15.8
July 27	08 54.01	+30 31.4	4.091	3.110	+1.50	−7.4	22.6	13.0
Aug. 6	09 09.01	+29 17.8	4.154	3.172	+1.43	−7.3	22.7	12.6
Aug. 16	09 23.31	+28 05.2	4.201	3.233	+1.36	−7.1	22.7	14.9
Aug. 26	09 36.90	+26 54.3	4.231	3.293	+1.29	−6.9	22.8	19.1
Sept. 5	09 49.78	+25 45.6	4.245	3.353	+1.21	−6.5	22.9	24.5
Sept. 15	10 01.93	+24 40.2	4.240	3.412	+1.14	−6.1	22.9	30.4
Sept. 25	10 13.29	+23 38.8	4.219	3.469	+1.05	−5.7	23.0	36.8
Oct. 5	10 23.84	+22 42.1	4.182	3.526	+0.97	−5.1	.	43.6
Oct. 15	10 33.49	+21 51.2	4.128	3.582	+0.87	−4.4	.	50.8
Oct. 25	10 42.16	+21 06.9	4.060	3.638	+0.76	−3.7	.	58.3
Nov. 4	10 49.75	+20 30.2	3.980	3.692	+0.64	−2.8	.	66.2
Nov. 14	10 56.14	+20 02.1	3.888	3.746	+0.50	−1.9	.	74.4
Nov. 24	11 01.17	+19 43.4	3.789	3.799	+0.35	−0.9	.	83.1
Dec. 4	11 04.69	+19 34.7	3.686	3.851	+0.19	+0.2	.	92.1
Dec. 14	11 06.55	+19 36.6	3.582	3.902	0.00	+1.2	.	101.6
Dec. 24	11 06.60	+19 48.7	3.483	3.952	−0.19	+2.2	.	111.6
Jan. 3	11 04.74	+20 10.3	3.393	4.002	−0.38	+2.9	.	122.0
Jan. 13	11 00.95	+20 39.6	3.318	4.050	−0.56	+3.4	.	132.7
Jan. 23	10 55.36	+21 13.9	3.264	4.098	−0.71	+3.6	.	143.6
Feb. 2	10 48.22	+21 49.7	3.235	4.145	−0.83	+3.3	.	154.4
Feb. 12	10 39.97	+22 22.9	3.235	4.192	−0.88	+2.7	.	163.7
Feb. 22	10 31.18	+22 49.8	3.267	4.237	−0.87	+1.8	.	167.3
Mar. 4	10 22.49	+23 07.7	3.331	4.282	−0.80	+0.7	.	161.4
Mar. 14	10 14.51	+23 14.7	3.425	4.326	−0.68	−0.4	.	151.7
Mar. 24	10 07.72	+23 10.7	3.547	4.370	−0.53	−1.4	.	141.3
Apr. 3	10 02.45	+22 56.5	3.693	4.412	−0.36	−2.3	.	130.9

Comet 158P/Kowal-LINEAR

Epoch = 2013 July 7.0 TT
T = 2012 Oct. 6.00916 TT
Peri. = 233.72989 e = 0.0309153
Node = 137.29500 2000.0 a = 4.7229235 AU
Incl. = 7.90683 n = 0.09602575
q = 4.5769129 AU P = 10.26 years

m1 = 3.8 + 5 log(Delta) + 17.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 40.69	-03 12.0	4.638	4.579	+0.52	+4.4	18.7	80.5
Jan. 18	00 45.87	-02 28.3	4.790	4.579	+0.61	+4.8	18.8	71.8
Jan. 28	00 51.97	-01 40.0	4.934	4.580	+0.69	+5.2	18.8	63.5
Feb. 7	00 58.87	-00 48.1	5.069	4.580	+0.76	+5.4	18.9	55.3
Feb. 17	01 06.47	+00 06.3	5.192	4.581	+0.82	+5.6	18.9	47.4
Feb. 27	01 14.65	+01 02.5	5.300	4.581	+0.87	+5.7	19.0	39.7
Mar. 9	01 23.31	+01 59.5	5.392	4.582	+0.91	+5.7	19.0	32.2
Mar. 19	01 32.37	+02 56.7	5.467	4.583	+0.94	+5.7	19.1	24.8
Mar. 29	01 41.74	+03 53.2	5.524	4.583	+0.96	+5.5	19.1	17.8
Apr. 8	01 51.34	+04 48.6	5.562	4.584	+0.98	+5.4	19.1	11.3
Apr. 18	02 01.09	+05 42.1	5.581	4.585	+0.98	+5.1	19.1	6.6
Apr. 28	02 10.93	+06 33.3	5.581	4.586	+0.99	+4.8	19.1	7.9
May 8	02 20.79	+07 21.6	5.562	4.587	+0.98	+4.5	19.1	13.5
May 18	02 30.59	+08 06.5	5.524	4.588	+0.97	+4.1	19.1	20.1
May 28	02 40.25	+08 47.7	5.469	4.589	+0.95	+3.7	19.1	27.0
June 7	02 49.70	+09 24.7	5.396	4.590	+0.92	+3.3	19.0	33.9
June 17	02 58.86	+09 57.3	5.308	4.591	+0.88	+2.8	19.0	41.1
June 27	03 07.61	+10 25.1	5.205	4.592	+0.83	+2.3	19.0	48.3
July 7	03 15.88	+10 47.9	5.089	4.593	+0.77	+1.8	18.9	55.7
July 17	03 23.54	+11 05.5	4.961	4.594	+0.69	+1.2	18.9	63.3
July 27	03 30.46	+11 17.7	4.824	4.595	+0.61	+0.7	18.8	71.0
Aug. 6	03 36.54	+11 24.4	4.680	4.597	+0.51	+0.1	18.7	79.0
Aug. 16	03 41.61	+11 25.7	4.532	4.598	+0.39	-0.4	18.7	87.3
Aug. 26	03 45.56	+11 21.5	4.383	4.599	+0.27	-0.9	18.6	95.9
Sept. 5	03 48.24	+11 12.1	4.237	4.601	+0.13	-1.4	18.5	104.9
Sept. 15	03 49.55	+10 57.8	4.097	4.602	-0.01	-1.9	18.5	114.2
Sept. 25	03 49.41	+10 39.1	3.968	4.603	-0.16	-2.2	18.4	123.9
Oct. 5	03 47.82	+10 16.9	3.854	4.605	-0.30	-2.5	18.3	133.9
Oct. 15	03 44.84	+09 52.2	3.760	4.606	-0.42	-2.6	18.3	144.2
Oct. 25	03 40.66	+09 26.5	3.690	4.608	-0.51	-2.5	18.2	154.6
Nov. 4	03 35.56	+09 01.4	3.647	4.609	-0.56	-2.3	18.2	164.3
Nov. 14	03 29.92	+08 38.9	3.633	4.611	-0.57	-1.8	18.2	170.0
Nov. 24	03 24.20	+08 20.7	3.651	4.613	-0.54	-1.2	18.2	165.3
Dec. 4	03 18.84	+08 08.5	3.698	4.614	-0.46	-0.5	18.3	155.7
Dec. 14	03 14.26	+08 03.3	3.773	4.616	-0.35	+0.2	18.3	145.2
Dec. 24	03 10.79	+08 05.8	3.873	4.618	-0.22	+1.0	18.4	134.6
Jan. 3	03 08.63	+08 15.9	3.994	4.619	-0.07	+1.7	18.4	124.2
Jan. 13	03 07.91	+08 33.1	4.131	4.621	+0.07	+2.4	18.5	114.1
Jan. 23	03 08.64	+08 56.7	4.279	4.623	+0.21	+2.9	18.6	104.4
Feb. 2	03 10.77	+09 25.7	4.434	4.625	+0.35	+3.3	18.7	95.0
Feb. 12	03 14.23	+09 59.0	4.591	4.627	+0.47	+3.6	18.8	85.9
Feb. 22	03 18.89	+10 35.5	4.747	4.629	+0.57	+3.9	18.8	77.2
Mar. 4	03 24.63	+11 14.1	4.897	4.630	+0.67	+4.0	18.9	68.7
Mar. 14	03 31.32	+11 53.8	5.040	4.632	+0.75	+4.0	19.0	60.6
Mar. 24	03 38.84	+12 33.7	5.171	4.634	+0.82	+3.9	19.0	52.6
Apr. 3	03 47.07	+13 13.1	5.290	4.636	+0.88	+3.8	19.1	44.9

Comet P/2005 T2 (Christensen)

Epoch = 2013 July 7.0 TT
T = 2012 Oct. 7.25120 TT
Peri. = 58.67602 e = 0.4218483
Node = 260.45297 2000.0 a = 3.8215365 AU
Incl. = 8.33759 n = 0.13193106
q = 2.2094278 AU P = 7.47 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	22 11.61	-04 01.6	2.886	2.315	-0.97	-6.2	20.2	30.4/ 71	46.1
Jan. 18	22 30.75	-02 21.5	2.989	2.338	-0.93	-6.0	20.3	30.4/ 70	41.0
Jan. 28	22 49.79	-00 36.9	3.087	2.362	-0.90	-5.8	20.4	30.3/ 69	36.0
Feb. 7	23 08.70	+01 10.9	3.179	2.389	-0.87	-5.6	20.6	30.2/ 69	31.0
Feb. 17	23 27.47	+03 00.8	3.265	2.417	-0.84	-5.3	20.7	29.9/ 68	26.1
Feb. 27	23 46.06	+04 51.6	3.343	2.446	-0.81	-5.0	20.8	29.6/ 68	21.2
Mar. 9	00 04.47	+06 42.1	3.414	2.477	-0.79	-4.8	21.0	29.2/ 68	16.3
Mar. 19	00 22.69	+08 31.2	3.476	2.509	-0.77	-4.4	21.1	28.7/ 68	11.6
Mar. 29	00 40.71	+10 18.0	3.529	2.543	-0.75	-4.1	21.2	28.2/ 68	7.5
Apr. 8	00 58.53	+12 01.5	3.572	2.577	-0.73	-3.8	21.3	27.6/ 68	5.3
Apr. 18	01 16.13	+13 41.0	3.605	2.613	-0.72	-3.5	21.4	26.9/ 69	7.4
Apr. 28	01 33.48	+15 15.7	3.627	2.649	-0.70	-3.1	21.5	26.2/ 69	11.6
May 8	01 50.57	+16 45.1	3.638	2.686	-0.69	-2.8	21.6	25.4/ 70	16.5
May 18	02 07.35	+18 08.5	3.638	2.724	-0.68	-2.5	21.7	24.6/ 71	21.7
May 28	02 23.76	+19 25.7	3.626	2.762	-0.67	-2.2	21.8	23.6/ 72	27.1
June 7	02 39.77	+20 36.4	3.602	2.801	-0.66	-1.8	21.9	22.6/ 73	32.6
June 17	02 55.27	+21 40.3	3.567	2.841	-0.65	-1.5	22.0	21.5/ 74	38.3
June 27	03 10.17	+22 37.3	3.520	2.881	-0.65	-1.3	22.0	20.2/ 75	44.2
July 7	03 24.38	+23 27.5	3.463	2.921	-0.65	-1.0	22.1	18.9/ 76	50.3
July 17	03 37.76	+24 11.0	3.395	2.961	-0.64	-0.7	22.1	17.3/ 77	56.7
July 27	03 50.14	+24 47.9	3.317	3.002	-0.64	-0.5	22.2	15.6/ 78	63.3
Aug. 6	04 01.38	+25 18.6	3.232	3.042	-0.65	-0.3	22.2	13.6/ 79	70.2
Aug. 16	04 11.25	+25 43.3	3.139	3.083	-0.66	-0.1	22.2	11.4/ 80	77.5
Aug. 26	04 19.57	+26 02.2	3.041	3.124	-0.67	+0.1	22.2	8.9/ 81	85.2
Sept. 5	04 26.11	+26 15.7	2.941	3.165	-0.68	+0.2	22.2	6.1/ 82	93.4
Sept.15	04 30.63	+26 23.6	2.841	3.206	-0.71	+0.3	22.3	3.1/ 86	102.1
Sept.25	04 32.94	+26 25.9	2.745	3.247	-0.73	+0.4	22.3	0.4/189	111.3
Oct. 5	04 32.89	+26 22.3	2.658	3.288	-0.76	+0.4	22.3	3.4/253	121.1
Oct. 15	04 30.46	+26 11.9	2.583	3.328	-0.80	+0.3	22.3	6.5/255	131.5
Oct. 25	04 25.78	+25 54.3	2.525	3.369	-0.83	+0.1	22.3	9.2/254	142.5
Nov. 4	04 19.22	+25 29.0	2.490	3.409	-0.86	-0.1	22.4	11.2/253	153.9
Nov. 14	04 11.34	+24 56.4	2.482	3.449	-0.87	-0.3	22.4	12.1/252	165.6
Nov. 24	04 02.92	+24 18.0	2.504	3.489	-0.88	-0.6	22.5	11.9/250	176.0
Dec. 4	03 54.76	+23 36.4	2.556	3.529	-0.86	-0.8	22.7	10.7/247	169.2
Dec. 14	03 47.63	+22 54.9	2.638	3.568	-0.84	-1.0	22.8	8.6/244	157.6
Dec. 24	03 42.08	+22 16.8	2.749	3.607	-0.80	-1.1	23.0	6.0/238	146.2
Jan. 3	03 38.45	+21 44.6	2.883	3.646	-0.76	-1.1	.	3.3/222	135.1
Jan. 13	03 36.87	+21 19.9	3.038	3.685	-0.72	-1.1	.	1.8/160	124.4
Jan. 23	03 37.31	+21 03.3	3.208	3.723	-0.67	-1.0	.	3.4/105	114.3
Feb. 2	03 39.61	+20 54.4	3.389	3.761	-0.63	-0.9	.	5.6/ 92	104.6
Feb. 12	03 43.62	+20 52.4	3.576	3.798	-0.60	-0.8	.	7.7/ 87	95.4
Feb. 22	03 49.10	+20 56.0	3.765	3.835	-0.56	-0.7	.	9.5/ 85	86.6
Mar. 4	03 55.87	+21 04.1	3.953	3.872	-0.53	-0.6	.	11.0/ 84	78.1
Mar. 14	04 03.72	+21 15.3	4.136	3.909	-0.50	-0.4	.	12.3/ 83	69.9
Mar. 24	04 12.48	+21 28.4	4.312	3.945	-0.48	-0.3	.	13.3/ 84	62.0
Apr. 3	04 22.00	+21 42.4	4.479	3.980	-0.45	-0.2	.	14.2/ 84	54.4

Comet C/2012 T4 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2012 Oct. 10.87147 TT
Peri. = 219.86719
Node = 99.42792 2000.0
Incl. = 24.09079
q = 1.9543587 AU
e = 0.9848132

m1 = 13.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	23 11.12	-26 37.9	2.678	2.231	+2.26	+15.7	19.2	53.1
Jan. 18	23 33.67	-24 00.9	2.806	2.290	+2.15	+15.7	19.4	49.3
Jan. 28	23 55.19	-21 23.5	2.937	2.352	+2.06	+15.5	19.7	45.4
Feb. 7	00 15.74	-18 48.1	3.068	2.419	+1.97	+15.1	19.9	41.4
Feb. 17	00 35.45	-16 17.0	3.199	2.488	+1.89	+14.5	20.1	37.4
Feb. 27	00 54.38	-13 51.9	3.329	2.560	+1.82	+13.8	20.3	33.4
Mar. 9	01 12.61	-11 33.9	3.455	2.635	+1.76	+13.0	20.5	29.4
Mar. 19	01 30.20	-09 24.2	3.576	2.711	+1.70	+12.1	20.7	25.5
Mar. 29	01 47.18	-07 23.3	3.690	2.789	+1.64	+11.2	20.9	21.9
Apr. 8	02 03.59	-05 31.8	3.797	2.869	+1.59	+10.2	21.1	19.0
Apr. 18	02 19.46	-03 49.9	3.895	2.950	+1.53	+9.2	21.3	17.1
Apr. 28	02 34.77	-02 17.9	3.982	3.032	+1.48	+8.2	21.4	16.7
May 8	02 49.52	-00 55.6	4.058	3.115	+1.42	+7.3	21.6	18.1
May 18	03 03.71	+00 16.9	4.122	3.198	+1.36	+6.3	21.7	21.1
May 28	03 17.28	+01 19.8	4.172	3.283	+1.29	+5.3	21.9	25.1
June 7	03 30.20	+02 13.3	4.208	3.367	+1.22	+4.4	22.0	29.9
June 17	03 42.43	+02 57.6	4.231	3.453	+1.15	+3.6	22.1	35.3
June 27	03 53.88	+03 33.1	4.240	3.538	+1.06	+2.7	22.2	41.1
July 7	04 04.49	+04 00.2	4.235	3.624	+0.97	+1.9	22.3	47.3
July 17	04 14.18	+04 19.2	4.217	3.710	+0.87	+1.2	22.4	53.9
July 27	04 22.84	+04 30.8	4.187	3.796	+0.75	+0.5	22.5	60.8
Aug. 6	04 30.38	+04 35.3	4.146	3.882	+0.63	-0.2	22.6	68.0
Aug. 16	04 36.67	+04 33.6	4.096	3.968	+0.49	-0.7	22.6	75.6
Aug. 26	04 41.61	+04 26.4	4.040	4.054	+0.35	-1.2	22.7	83.6
Sept. 5	04 45.08	+04 14.6	3.980	4.139	+0.19	-1.5	22.8	92.0
Sept. 15	04 46.99	+03 59.3	3.920	4.225	+0.03	-1.7	22.8	100.8
Sept. 25	04 47.28	+03 41.8	3.865	4.311	-0.13	-1.8	22.9	109.9
Oct. 5	04 45.94	+03 23.6	3.818	4.396	-0.29	-1.7	22.9	119.5
Oct. 15	04 43.02	+03 06.4	3.784	4.482	-0.43	-1.4	23.0	129.2
Oct. 25	04 38.71	+02 52.0	3.769	4.567	-0.55	-1.0	.	139.1
Nov. 4	04 33.26	+02 41.9	3.776	4.652	-0.62	-0.4	.	148.6
Nov. 14	04 27.02	+02 38.0	3.811	4.736	-0.66	+0.3	.	156.8
Nov. 24	04 20.44	+02 41.1	3.875	4.821	-0.65	+1.1	.	161.4
Dec. 4	04 13.96	+02 51.9	3.969	4.905	-0.60	+1.9	.	159.6
Dec. 14	04 08.01	+03 10.5	4.094	4.989	-0.51	+2.6	.	152.7
Dec. 24	04 02.94	+03 36.1	4.247	5.073	-0.39	+3.2	.	143.6
Jan. 3	03 58.99	+04 07.9	4.425	5.156	-0.27	+3.7	.	133.9
Jan. 13	03 56.33	+04 44.7	4.625	5.239	-0.13	+4.1	.	124.0
Jan. 23	03 54.99	+05 25.3	4.842	5.322	0.00	+4.3	.	114.2
Feb. 2	03 54.95	+06 08.4	5.071	5.404	+0.12	+4.5	.	104.6
Feb. 12	03 56.14	+06 52.9	5.308	5.487	+0.23	+4.5	.	95.2
Feb. 22	03 58.45	+07 37.8	5.548	5.569	+0.33	+4.5	.	86.1
Mar. 4	04 01.75	+08 22.4	5.786	5.650	+0.42	+4.4	.	77.2
Mar. 14	04 05.91	+09 05.9	6.020	5.732	+0.49	+4.2	.	68.6
Mar. 24	04 10.80	+09 47.8	6.245	5.813	+0.55	+4.0	.	60.1
Apr. 3	04 16.31	+10 27.5	6.458	5.894	+0.60	+3.7	.	51.9

Comet C/2011 R1 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2012 Oct. 19.60615 TT
Peri. = 308.85195
Node = 221.40808 2000.0
Incl. = 116.19252
q = 2.0793951 AU
e = 1.0007207

m1 = 8.8 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	16 06.70	-32 24.2	2.905	2.287	+0.47	+11.8	13.8	43.0
Jan. 18	16 11.37	-30 25.9	2.812	2.337	+0.27	+12.9	13.8	52.0
Jan. 28	16 14.03	-28 16.4	2.699	2.392	+0.04	+14.6	13.8	61.6
Feb. 7	16 14.38	-25 50.9	2.571	2.451	-0.24	+16.7	13.8	71.9
Feb. 17	16 12.02	-23 03.8	2.434	2.513	-0.55	+19.5	13.7	83.0
Feb. 27	16 06.56	-19 48.8	2.297	2.578	-0.89	+22.8	13.7	94.9
Mar. 9	15 57.64	-16 00.4	2.170	2.646	-1.26	+26.5	13.7	107.7
Mar. 19	15 45.07	-11 35.6	2.063	2.717	-1.60	+29.7	13.6	121.3
Mar. 29	15 29.02	-06 38.3	1.989	2.789	-1.89	+31.7	13.6	135.4
Apr. 8	15 10.16	-01 21.7	1.960	2.864	-2.05	+31.3	13.7	148.8
Apr. 18	14 49.66	+03 51.1	1.985	2.940	-2.06	+28.4	13.8	158.1
Apr. 28	14 29.10	+08 34.6	2.064	3.017	-1.91	+23.6	14.0	157.3
May 8	14 09.99	+12 30.6	2.193	3.096	-1.65	+18.2	14.2	148.0
May 18	13 53.46	+15 32.4	2.366	3.176	-1.33	+13.1	14.4	136.4
May 28	13 40.11	+17 43.5	2.570	3.256	-1.01	+8.9	14.7	124.8
June 7	13 30.03	+19 12.6	2.797	3.338	-0.70	+5.7	15.0	113.7
June 17	13 23.02	+20 09.3	3.038	3.420	-0.43	+3.3	15.2	103.4
June 27	13 18.72	+20 42.1	3.286	3.503	-0.20	+1.6	15.5	93.8
July 7	13 16.73	+20 58.0	3.533	3.586	-0.01	+0.4	15.7	84.7
July 17	13 16.67	+21 02.2	3.776	3.669	+0.15	-0.3	15.9	76.2
July 27	13 18.19	+20 58.8	4.010	3.753	+0.28	-0.8	16.1	68.2
Aug. 6	13 21.02	+20 50.8	4.232	3.837	+0.39	-1.0	16.3	60.6
Aug. 16	13 24.92	+20 40.6	4.439	3.921	+0.48	-1.0	16.5	53.5
Aug. 26	13 29.67	+20 30.4	4.628	4.005	+0.54	-0.9	16.6	46.9
Sept. 5	13 35.11	+20 21.6	4.797	4.090	+0.60	-0.6	16.8	41.0
Sept.15	13 41.10	+20 15.7	4.946	4.174	+0.64	-0.2	16.9	36.0
Sept.25	13 47.50	+20 14.0	5.072	4.259	+0.67	+0.4	17.0	32.3
Oct. 5	13 54.20	+20 17.8	5.176	4.343	+0.69	+1.0	17.2	30.4
Oct. 15	14 01.09	+20 28.2	5.256	4.427	+0.70	+1.8	17.2	30.6
Oct. 25	14 08.06	+20 46.4	5.314	4.511	+0.69	+2.7	17.3	32.9
Nov. 4	14 15.00	+21 13.5	5.350	4.595	+0.68	+3.7	17.4	36.9
Nov. 14	14 21.80	+21 50.6	5.365	4.679	+0.65	+4.8	17.5	42.2
Nov. 24	14 28.34	+22 38.7	5.361	4.763	+0.62	+6.0	17.5	48.4
Dec. 4	14 34.50	+23 38.8	5.341	4.847	+0.56	+7.3	17.6	55.2
Dec. 14	14 40.13	+24 51.6	5.307	4.930	+0.49	+8.6	17.6	62.5
Dec. 24	14 45.07	+26 17.6	5.263	5.014	+0.41	+9.9	17.7	70.1
Jan. 3	14 49.17	+27 56.7	5.213	5.097	+0.31	+11.2	17.7	77.8
Jan. 13	14 52.24	+29 48.7	5.161	5.180	+0.18	+12.3	17.7	85.6
Jan. 23	14 54.08	+31 52.1	5.113	5.262	+0.04	+13.3	17.8	93.3
Feb. 2	14 54.51	+34 05.1	5.072	5.345	-0.12	+13.9	17.8	100.8
Feb. 12	14 53.33	+36 24.4	5.044	5.427	-0.29	+14.2	17.8	107.7
Feb. 22	14 50.41	+38 46.2	5.033	5.509	-0.48	+13.9	17.9	113.9
Mar. 4	14 45.64	+41 05.6	5.043	5.590	-0.66	+13.2	17.9	119.0
Mar. 14	14 39.02	+43 17.3	5.076	5.672	-0.83	+11.9	18.0	122.5
Mar. 24	14 30.72	+45 16.2	5.133	5.753	-0.97	+10.1	18.1	124.2
Apr. 3	14 21.00	+46 57.5	5.216	5.834	-1.07	+8.1	18.1	124.0

Comet P/2012 SB6 (Lemmon)

Epoch = 2013 July 7.0 TT
T = 2012 Nov. 1.06275 TT
Peri. = 12.84673 e = 0.3854738
Node = 9.50520 2000.0 a = 3.9153610 AU
Incl. = 10.98377 n = 0.12721736
q = 2.4060919 AU P = 7.75 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 59.43	+13 35.7	2.224	2.451	+1.18	+8.1	19.2	91.2
Jan. 18	01 11.27	+14 56.2	2.360	2.465	+1.32	+8.5	19.3	84.3
Jan. 28	01 24.47	+16 20.9	2.496	2.480	+1.43	+8.7	19.5	77.7
Feb. 7	01 38.81	+17 48.1	2.632	2.497	+1.53	+8.8	19.7	71.3
Feb. 17	01 54.14	+19 16.3	2.765	2.516	+1.62	+8.8	19.8	65.2
Feb. 27	02 10.34	+20 44.1	2.894	2.536	+1.69	+8.6	20.0	59.3
Mar. 9	02 27.27	+22 10.1	3.019	2.558	+1.76	+8.3	20.1	53.6
Mar. 19	02 44.86	+23 32.9	3.139	2.581	+1.82	+7.9	20.3	48.0
Mar. 29	03 03.01	+24 51.5	3.252	2.606	+1.86	+7.3	20.4	42.6
Apr. 8	03 21.64	+26 04.7	3.358	2.631	+1.90	+6.7	20.5	37.2
Apr. 18	03 40.68	+27 11.7	3.455	2.658	+1.93	+6.0	20.7	32.0
Apr. 28	04 00.02	+28 11.8	3.545	2.686	+1.96	+5.2	20.8	26.9
May 8	04 19.60	+29 04.1	3.625	2.715	+1.97	+4.4	20.9	21.9
May 18	04 39.33	+29 48.5	3.695	2.744	+1.98	+3.6	21.0	17.1
May 28	04 59.10	+30 24.7	3.754	2.775	+1.97	+2.8	21.1	12.7
June 7	05 18.83	+30 52.4	3.804	2.806	+1.96	+2.0	21.2	9.1
June 17	05 38.42	+31 12.0	3.841	2.838	+1.93	+1.2	21.3	7.9
June 27	05 57.76	+31 23.7	3.867	2.871	+1.90	+0.4	21.4	9.8
July 7	06 16.77	+31 27.9	3.881	2.904	+1.86	−0.3	21.5	13.8
July 17	06 35.34	+31 25.3	3.883	2.938	+1.80	−0.9	21.6	18.6
July 27	06 53.38	+31 16.7	3.872	2.972	+1.74	−1.4	21.6	23.9
Aug. 6	07 10.81	+31 02.9	3.849	3.007	+1.67	−1.8	21.7	29.4
Aug. 16	07 27.54	+30 45.2	3.813	3.042	+1.59	−2.1	21.8	35.2
Aug. 26	07 43.46	+30 24.5	3.765	3.077	+1.50	−2.2	21.8	41.2
Sept. 5	07 58.51	+30 02.3	3.705	3.113	+1.41	−2.2	21.8	47.4
Sept. 15	08 12.56	+29 39.9	3.634	3.149	+1.30	−2.1	21.9	53.9
Sept. 25	08 25.52	+29 18.6	3.553	3.185	+1.18	−1.9	21.9	60.7
Oct. 5	08 37.28	+29 00.1	3.462	3.221	+1.04	−1.4	21.9	67.8
Oct. 15	08 47.67	+28 45.9	3.364	3.257	+0.89	−0.8	21.9	75.3
Oct. 25	08 56.54	+28 37.4	3.260	3.293	+0.72	−0.1	21.9	83.2
Nov. 4	09 03.72	+28 36.1	3.153	3.330	+0.53	+0.7	21.9	91.5
Nov. 14	09 09.01	+28 43.0	3.046	3.366	+0.32	+1.6	21.9	100.2
Nov. 24	09 12.21	+28 58.6	2.943	3.402	+0.09	+2.4	21.9	109.5
Dec. 4	09 13.16	+29 22.8	2.848	3.438	−0.14	+3.2	21.9	119.2
Dec. 14	09 11.74	+29 54.5	2.766	3.475	−0.38	+3.6	21.9	129.3
Dec. 24	09 07.97	+30 31.0	2.701	3.511	−0.59	+3.8	21.9	139.8
Jan. 3	09 02.07	+31 08.7	2.659	3.547	−0.76	+3.4	22.0	150.3
Jan. 13	08 54.45	+31 43.2	2.642	3.582	−0.86	+2.7	22.0	160.0
Jan. 23	08 45.82	+32 10.0	2.655	3.618	−0.89	+1.6	22.1	166.1
Feb. 2	08 36.96	+32 25.8	2.698	3.653	−0.82	+0.3	22.2	163.6
Feb. 12	08 28.75	+32 29.1	2.770	3.689	−0.69	−0.9	22.3	155.1
Feb. 22	08 21.89	+32 20.1	2.870	3.724	−0.50	−2.0	22.5	145.0
Mar. 4	08 16.86	+32 00.4	2.994	3.759	−0.29	−2.8	22.6	134.8
Mar. 14	08 13.93	+31 32.1	3.138	3.793	−0.08	−3.5	22.8	124.7
Mar. 24	08 13.12	+30 57.3	3.297	3.828	+0.12	−4.0	22.9	115.1
Apr. 3	08 14.32	+30 17.7	3.468	3.862	+0.30	−4.3	.	105.8

Comet C/2012 A2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 Nov. 5.16239 TT
Peri. = 101.69215
Node = 191.41321 2000.0
Incl. = 125.86372
q = 3.5377072 AU
e = 0.9963215

m1 = 7.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 13.00	+64 11.6	3.228	3.585	+0.80	-26.9	15.7	103.3
Jan. 18	00 20.97	+59 42.7	3.361	3.601	+0.86	-23.4	15.8	96.1
Jan. 28	00 29.59	+55 49.0	3.514	3.619	+0.89	-19.9	15.9	88.2
Feb. 7	00 38.54	+52 30.1	3.680	3.639	+0.91	-16.6	16.0	79.9
Feb. 17	00 47.64	+49 43.7	3.850	3.662	+0.91	-13.7	16.2	71.7
Feb. 27	00 56.75	+47 26.5	4.019	3.686	+0.90	-11.2	16.3	63.5
Mar. 9	01 05.78	+45 34.6	4.181	3.712	+0.89	-9.0	16.4	55.7
Mar. 19	01 14.66	+44 04.3	4.330	3.741	+0.86	-7.2	16.5	48.2
Mar. 29	01 23.31	+42 52.2	4.463	3.771	+0.83	-5.7	16.6	41.3
Apr. 8	01 31.66	+41 55.1	4.577	3.803	+0.80	-4.5	16.7	35.2
Apr. 18	01 39.63	+41 10.6	4.668	3.837	+0.75	-3.4	16.8	30.4
Apr. 28	01 47.15	+40 36.2	4.736	3.872	+0.70	-2.6	16.9	27.6
May 8	01 54.12	+40 10.0	4.780	3.909	+0.63	-2.0	16.9	27.2
May 18	02 00.45	+39 50.2	4.798	3.948	+0.56	-1.5	17.0	29.3
May 28	02 06.01	+39 35.3	4.792	3.988	+0.47	-1.2	17.0	33.7
June 7	02 10.69	+39 23.8	4.761	4.029	+0.36	-1.0	17.0	39.5
June 17	02 14.32	+39 14.3	4.707	4.072	+0.24	-0.9	17.1	46.4
June 27	02 16.74	+39 05.2	4.632	4.117	+0.10	-1.0	17.1	54.0
July 7	02 17.77	+38 55.1	4.539	4.162	-0.06	-1.3	17.1	62.2
July 17	02 17.20	+38 41.9	4.431	4.209	-0.24	-1.9	17.1	70.9
July 27	02 14.84	+38 23.3	4.312	4.257	-0.43	-2.7	17.1	80.1
Aug. 6	02 10.52	+37 56.8	4.187	4.306	-0.64	-3.8	17.0	89.8
Aug. 16	02 04.13	+37 18.9	4.063	4.355	-0.85	-5.3	17.0	100.1
Aug. 26	01 55.67	+36 26.1	3.946	4.406	-1.04	-7.1	17.0	110.8
Sept. 5	01 45.29	+35 14.9	3.843	4.458	-1.19	-9.2	17.0	121.9
Sept.15	01 33.35	+33 42.7	3.762	4.511	-1.29	-11.4	17.0	133.2
Sept.25	01 20.41	+31 48.4	3.711	4.564	-1.33	-13.5	17.0	144.4
Oct. 5	01 07.15	+29 33.9	3.696	4.619	-1.28	-15.0	17.1	154.4
Oct. 15	00 54.33	+27 03.6	3.722	4.674	-1.17	-15.9	17.2	160.4
Oct. 25	00 42.61	+24 24.7	3.791	4.729	-1.01	-16.0	17.2	158.4
Nov. 4	00 32.47	+21 45.2	3.901	4.786	-0.83	-15.3	17.4	150.0
Nov. 14	00 24.21	+19 12.5	4.050	4.843	-0.63	-14.0	17.5	139.3
Nov. 24	00 17.91	+16 52.2	4.231	4.900	-0.44	-12.4	17.6	127.9
Dec. 4	00 13.53	+14 48.0	4.438	4.958	-0.26	-10.7	17.8	116.6
Dec. 14	00 10.93	+13 01.1	4.663	5.017	-0.10	-9.0	17.9	105.5
Dec. 24	00 09.90	+11 31.5	4.900	5.076	+0.03	-7.3	18.1	94.7
Jan. 3	00 10.23	+10 18.1	5.141	5.135	+0.15	-5.9	18.3	84.2
Jan. 13	00 11.72	+09 19.2	5.379	5.195	+0.24	-4.6	18.4	74.0
Jan. 23	00 14.16	+08 33.0	5.610	5.256	+0.32	-3.6	18.6	64.1
Feb. 2	00 17.37	+07 57.5	5.828	5.316	+0.38	-2.7	18.7	54.5
Feb. 12	00 21.18	+07 30.8	6.029	5.377	+0.43	-2.0	18.8	45.1
Feb. 22	00 25.45	+07 11.2	6.210	5.439	+0.46	-1.4	18.9	35.8
Mar. 4	00 30.05	+06 57.0	6.368	5.500	+0.48	-1.0	19.0	26.7
Mar. 14	00 34.85	+06 46.9	6.501	5.562	+0.49	-0.7	19.1	17.8
Mar. 24	00 39.74	+06 39.5	6.607	5.625	+0.49	-0.6	19.2	8.9
Apr. 3	00 44.62	+06 33.5	6.686	5.687	+0.48	-0.6	19.3	1.6

Comet C/2012 K5 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 Nov. 28.67464 TT
Peri. = 139.27805
Node = 279.04058 2000.0
Incl. = 92.85056
q = 1.1416615 AU
e = 0.9984067

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 57.50	+18 20.8	0.369	1.309	-3.92	-118.3	8.3	147.2
Jan. 18	04 18.29	-01 22.3	0.595	1.391	-1.20	-47.0	9.7	121.5
Jan. 28	04 06.30	-09 12.4	0.861	1.483	-0.25	-22.2	10.8	106.7
Feb. 7	04 03.77	-12 54.6	1.134	1.582	+0.21	-11.9	11.8	96.3
Feb. 17	04 05.88	-14 54.0	1.403	1.686	+0.48	-7.1	12.6	87.9
Feb. 27	04 10.72	-16 05.0	1.665	1.794	+0.66	-4.7	13.3	80.7
Mar. 9	04 17.36	-16 51.8	1.915	1.904	+0.79	-3.5	13.9	74.3
Mar. 19	04 25.30	-17 26.9	2.152	2.016	+0.89	-3.1	14.5	68.7
Mar. 29	04 34.20	-17 58.1	2.375	2.130	+0.96	-3.2	15.0	63.7
Apr. 8	04 43.82	-18 29.6	2.583	2.243	+1.02	-3.5	15.4	59.3
Apr. 18	04 54.01	-19 04.9	2.775	2.357	+1.06	-4.1	15.9	55.5
Apr. 28	05 04.61	-19 46.1	2.950	2.470	+1.09	-4.9	16.3	52.5
May 8	05 15.51	-20 34.8	3.110	2.583	+1.11	-5.8	16.6	50.2
May 18	05 26.63	-21 32.5	3.254	2.696	+1.12	-6.8	16.9	48.7
May 28	05 37.84	-22 40.1	3.382	2.808	+1.12	-7.8	17.3	48.1
June 7	05 49.09	-23 58.2	3.496	2.919	+1.12	-8.9	17.5	48.2
June 17	06 00.27	-25 27.7	3.597	3.030	+1.10	-10.1	17.8	49.0
June 27	06 11.30	-27 08.9	3.686	3.140	+1.08	-11.3	18.0	50.6
July 7	06 22.11	-29 01.8	3.764	3.249	+1.05	-12.5	18.3	52.6
July 17	06 32.58	-31 06.8	3.832	3.357	+1.00	-13.7	18.5	55.2
July 27	06 42.60	-33 23.4	3.893	3.464	+0.95	-14.8	18.7	58.1
Aug. 6	06 52.07	-35 51.3	3.947	3.571	+0.88	-15.9	18.9	61.2
Aug. 16	07 00.84	-38 29.8	3.998	3.676	+0.79	-16.8	19.1	64.4
Aug. 26	07 08.72	-41 17.7	4.046	3.781	+0.68	-17.6	19.3	67.7
Sept. 5	07 15.53	-44 13.6	4.094	3.885	+0.55	-18.2	19.4	71.0
Sept.15	07 21.00	-47 15.8	4.143	3.988	+0.38	-18.6	19.6	74.2
Sept.25	07 24.81	-50 21.5	4.195	4.090	+0.18	-18.7	19.8	77.1
Oct. 5	07 26.59	-53 28.1	4.251	4.192	-0.08	-18.4	19.9	79.8
Oct. 15	07 25.83	-56 31.9	4.313	4.293	-0.38	-17.7	20.1	82.2
Oct. 25	07 21.99	-59 28.5	4.382	4.393	-0.75	-16.5	20.2	84.1
Nov. 4	07 14.44	-62 13.2	4.457	4.492	-1.18	-14.7	20.4	85.6
Nov. 14	07 02.62	-64 40.1	4.540	4.591	-1.64	-12.3	20.6	86.7
Nov. 24	06 46.24	-66 43.0	4.629	4.688	-2.07	-9.3	20.7	87.3
Dec. 4	06 25.58	-68 16.1	4.726	4.786	-2.38	-5.9	20.9	87.5
Dec. 14	06 01.83	-69 14.8	4.828	4.882	-2.48	-2.3	21.0	87.3
Dec. 24	05 37.05	-69 37.5	4.935	4.978	-2.34	+1.1	21.2	86.8
Jan. 3	05 13.63	-69 26.6	5.047	5.073	-2.01	+3.9	21.3	86.0
Jan. 13	04 53.54	-68 47.5	5.161	5.168	-1.57	+6.0	21.5	84.9
Jan. 23	04 37.81	-67 47.6	5.276	5.262	-1.12	+7.3	21.6	83.8
Feb. 2	04 26.64	-66 34.2	5.392	5.355	-0.70	+8.1	21.8	82.6
Feb. 12	04 19.66	-65 13.7	5.507	5.448	-0.34	+8.2	21.9	81.4
Feb. 22	04 16.28	-63 51.2	5.620	5.540	-0.04	+8.1	22.0	80.3
Mar. 4	04 15.89	-62 30.6	5.731	5.631	+0.20	+7.6	22.2	79.3
Mar. 14	04 17.94	-61 14.9	5.838	5.722	+0.40	+6.9	22.3	78.5
Mar. 24	04 21.92	-60 06.1	5.940	5.813	+0.56	+6.0	22.4	77.9
Apr. 3	04 27.48	-59 05.7	6.039	5.903	+0.68	+5.1	22.5	77.5

Comet P/2012 U2 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 2.78485 TT
Peri. = 229.56004 e = 0.5088082
Node = 186.55432 2000.0 a = 7.3841469 AU
Incl. = 10.51645 n = 0.04911946
q = 3.6270324 AU P = 20.07 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	03 15.26	+07 16.8	3.040	3.635	+0.20	+2.2	19.8	120.1
Jan. 18	03 17.22	+07 38.8	3.173	3.639	+0.37	+3.0	19.9	110.7
Jan. 28	03 20.88	+08 08.4	3.315	3.645	+0.52	+3.5	20.0	101.8
Feb. 7	03 26.10	+08 43.8	3.462	3.652	+0.67	+4.0	20.1	93.2
Feb. 17	03 32.75	+09 23.3	3.612	3.660	+0.79	+4.2	20.2	84.9
Feb. 27	03 40.68	+10 05.3	3.761	3.669	+0.90	+4.3	20.3	77.1
Mar. 9	03 49.72	+10 48.2	3.908	3.679	+1.00	+4.3	20.4	69.5
Mar. 19	03 59.74	+11 30.7	4.048	3.691	+1.08	+4.1	20.5	62.2
Mar. 29	04 10.58	+12 11.6	4.181	3.703	+1.15	+3.8	20.6	55.2
Apr. 8	04 22.12	+12 50.0	4.306	3.716	+1.21	+3.5	20.7	48.3
Apr. 18	04 34.25	+13 24.8	4.420	3.731	+1.26	+3.1	20.8	41.7
Apr. 28	04 46.84	+13 55.5	4.523	3.746	+1.30	+2.6	20.9	35.3
May 8	04 59.80	+14 21.5	4.613	3.762	+1.32	+2.1	21.0	29.0
May 18	05 13.03	+14 42.3	4.690	3.780	+1.34	+1.5	21.0	22.9
May 28	05 26.43	+14 57.5	4.754	3.798	+1.35	+0.9	21.1	17.2
June 7	05 39.91	+15 06.9	4.804	3.817	+1.35	+0.4	21.1	12.1
June 17	05 53.40	+15 10.6	4.838	3.837	+1.34	-0.2	21.2	8.6
June 27	06 06.80	+15 08.3	4.858	3.858	+1.32	-0.8	21.2	9.1
July 7	06 20.03	+15 00.3	4.864	3.880	+1.30	-1.4	21.3	13.0
July 17	06 33.00	+14 46.8	4.854	3.902	+1.26	-1.9	21.3	18.3
July 27	06 45.64	+14 28.1	4.829	3.925	+1.22	-2.4	21.3	24.2
Aug. 6	06 57.85	+14 04.5	4.790	3.949	+1.17	-2.8	21.3	30.5
Aug. 16	07 09.56	+13 36.5	4.737	3.974	+1.11	-3.2	21.4	36.9
Aug. 26	07 20.65	+13 04.8	4.670	4.000	+1.04	-3.5	21.4	43.6
Sept. 5	07 31.05	+12 30.0	4.591	4.026	+0.96	-3.7	21.4	50.5
Sept. 15	07 40.63	+11 52.8	4.500	4.053	+0.87	-3.9	21.4	57.7
Sept. 25	07 49.30	+11 14.2	4.399	4.080	+0.76	-3.9	21.4	65.1
Oct. 5	07 56.94	+10 35.0	4.291	4.108	+0.65	-3.9	21.4	72.8
Oct. 15	08 03.41	+09 56.5	4.176	4.137	+0.52	-3.7	21.4	80.9
Oct. 25	08 08.61	+09 19.7	4.058	4.166	+0.38	-3.4	21.3	89.3
Nov. 4	08 12.40	+08 46.0	3.940	4.196	+0.23	-2.9	21.3	98.0
Nov. 14	08 14.69	+08 16.7	3.826	4.226	+0.07	-2.4	21.3	107.2
Nov. 24	08 15.42	+07 53.1	3.720	4.257	-0.08	-1.7	21.3	116.8
Dec. 4	08 14.57	+07 36.4	3.625	4.288	-0.23	-0.9	21.3	126.7
Dec. 14	08 12.24	+07 27.6	3.548	4.319	-0.36	0.0	21.3	136.9
Dec. 24	08 08.59	+07 27.4	3.492	4.351	-0.47	+0.8	21.3	147.2
Jan. 3	08 03.93	+07 35.7	3.461	4.384	-0.53	+1.6	21.3	157.2
Jan. 13	07 58.66	+07 52.0	3.458	4.417	-0.54	+2.3	21.4	165.4
Jan. 23	07 53.25	+08 14.9	3.486	4.450	-0.51	+2.8	21.4	167.0
Feb. 2	07 48.17	+08 42.8	3.543	4.484	-0.43	+3.1	21.5	160.4
Feb. 12	07 43.86	+09 13.7	3.629	4.517	-0.32	+3.2	21.6	150.9
Feb. 22	07 40.65	+09 45.5	3.742	4.552	-0.19	+3.1	21.7	140.8
Mar. 4	07 38.76	+10 16.6	3.878	4.586	-0.04	+2.9	21.9	130.7
Mar. 14	07 38.31	+10 45.4	4.032	4.621	+0.10	+2.5	22.0	120.8
Mar. 24	07 39.30	+11 10.8	4.200	4.656	+0.24	+2.1	22.1	111.3
Apr. 3	07 41.67	+11 32.0	4.378	4.691	+0.36	+1.6	22.3	102.1

Comet 262P/McNaught-Russell

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 4.45948 TT
Peri. = 171.18203 e = 0.8153251
Node = 218.00372 2000.0 a = 6.9293180 AU
Incl. = 29.07725 n = 0.05403415
q = 1.2796711 AU P = 18.24 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 58.79	-07 55.4	1.074	1.364	+3.71	-0.4	13.2	82.9
Jan. 18	01 35.90	-07 59.8	1.171	1.415	+3.45	+2.5	13.4	81.6
Jan. 28	02 10.42	-07 34.9	1.280	1.477	+3.21	+4.5	13.8	80.2
Feb. 7	02 42.48	-06 50.1	1.401	1.546	+2.99	+5.7	14.2	78.6
Feb. 17	03 12.40	-05 53.5	1.532	1.621	+2.81	+6.1	14.6	76.7
Feb. 27	03 40.47	-04 52.1	1.671	1.701	+2.65	+6.1	15.1	74.6
Mar. 9	04 06.96	-03 50.9	1.818	1.785	+2.52	+5.7	15.5	72.2
Mar. 19	04 32.12	-02 53.7	1.971	1.872	+2.40	+5.0	16.0	69.5
Mar. 29	04 56.11	-02 03.3	2.130	1.961	+2.30	+4.2	16.5	66.6
Apr. 8	05 19.07	-01 21.6	2.292	2.051	+2.20	+3.2	17.0	63.5
Apr. 18	05 41.11	-00 49.5	2.458	2.142	+2.12	+2.2	17.4	60.1
Apr. 28	06 02.29	-00 27.8	2.625	2.234	+2.04	+1.1	17.9	56.6
May 8	06 22.66	-00 16.5	2.792	2.326	+1.96	+0.1	18.3	52.9
May 18	06 42.28	-00 15.5	2.957	2.418	+1.89	-0.9	18.7	49.0
May 28	07 01.16	-00 24.5	3.120	2.510	+1.82	-1.8	19.1	45.1
June 7	07 19.33	-00 42.8	3.278	2.601	+1.75	-2.7	19.5	41.2
June 17	07 36.81	-01 10.0	3.430	2.692	+1.68	-3.5	19.8	37.2
June 27	07 53.61	-01 45.2	3.575	2.782	+1.61	-4.3	20.2	33.4
July 7	08 09.74	-02 27.9	3.711	2.872	+1.55	-4.9	20.5	29.7
July 17	08 25.21	-03 17.3	3.837	2.961	+1.48	-5.5	20.8	26.4
July 27	08 40.01	-04 12.7	3.952	3.050	+1.41	-6.1	21.1	23.8
Aug. 6	08 54.16	-05 13.5	4.054	3.137	+1.35	-6.6	21.3	22.1
Aug. 16	09 07.64	-06 19.1	4.142	3.224	+1.28	-7.0	21.6	21.8
Aug. 26	09 20.43	-07 28.7	4.216	3.310	+1.21	-7.3	21.8	23.1
Sept. 5	09 32.52	-08 41.7	4.275	3.395	+1.13	-7.6	22.0	25.8
Sept. 15	09 43.87	-09 57.6	4.317	3.480	+1.06	-7.8	22.2	29.7
Sept. 25	09 54.44	-11 15.5	4.344	3.564	+0.97	-7.9	22.4	34.5
Oct. 5	10 04.16	-12 35.0	4.355	3.646	+0.88	-8.0	22.6	40.0
Oct. 15	10 12.97	-13 55.1	4.350	3.728	+0.78	-8.0	22.7	46.1
Oct. 25	10 20.78	-15 15.1	4.330	3.810	+0.67	-7.9	22.9	52.6
Nov. 4	10 27.50	-16 34.0	4.296	3.890	+0.55	-7.7	23.0	59.6
Nov. 14	10 33.00	-17 50.8	4.251	3.970	+0.42	-7.3	.	67.0
Nov. 24	10 37.18	-19 04.0	4.195	4.048	+0.27	-6.8	.	74.7
Dec. 4	10 39.91	-20 12.1	4.133	4.126	+0.12	-6.1	.	82.8
Dec. 14	10 41.08	-21 13.2	4.067	4.204	-0.04	-5.2	.	91.2
Dec. 24	10 40.64	-22 05.3	4.001	4.280	-0.21	-4.1	.	99.9
Jan. 3	10 38.56	-22 45.8	3.939	4.356	-0.36	-2.7	.	108.8
Jan. 13	10 34.92	-23 12.5	3.887	4.431	-0.50	-1.1	.	117.8
Jan. 23	10 29.90	-23 23.2	3.849	4.506	-0.61	+0.7	.	126.6
Feb. 2	10 23.81	-23 16.5	3.829	4.579	-0.68	+2.5	.	135.0
Feb. 12	10 17.05	-22 51.9	3.832	4.652	-0.69	+4.1	.	142.3
Feb. 22	10 10.12	-22 10.7	3.861	4.725	-0.66	+5.6	.	147.4
Mar. 4	10 03.49	-21 15.2	3.918	4.796	-0.59	+6.6	.	149.1
Mar. 14	09 57.62	-20 09.1	4.003	4.867	-0.48	+7.2	.	147.0
Mar. 24	09 52.82	-18 56.7	4.116	4.937	-0.35	+7.4	.	141.7
Apr. 3	09 49.31	-17 42.4	4.254	5.007	-0.21	+7.2	.	134.6

Comet C/2012 J1 (Catalina)

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 7.37201 TT
Peri. = 147.29767
Node = 235.21643 2000.0
Incl. = 34.17278
q = 3.1589062 AU
e = 1.0027622

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 34.63	+19 14.1	3.052	3.174	+1.28	-4.4	14.2	88.0
Jan. 18	00 47.47	+18 30.1	3.195	3.185	+1.35	-3.1	14.4	80.6
Jan. 28	01 01.01	+17 59.5	3.339	3.198	+1.41	-1.9	14.5	73.3
Feb. 7	01 15.12	+17 40.3	3.484	3.215	+1.46	-1.0	14.6	66.2
Feb. 17	01 29.69	+17 30.2	3.626	3.234	+1.49	-0.3	14.7	59.2
Feb. 27	01 44.60	+17 27.2	3.764	3.256	+1.52	+0.2	14.8	52.4
Mar. 9	01 59.76	+17 29.2	3.895	3.281	+1.53	+0.5	14.9	45.8
Mar. 19	02 15.11	+17 34.4	4.019	3.308	+1.55	+0.7	15.0	39.2
Mar. 29	02 30.56	+17 41.1	4.133	3.337	+1.55	+0.7	15.1	32.8
Apr. 8	02 46.06	+17 48.0	4.237	3.369	+1.55	+0.6	15.2	26.4
Apr. 18	03 01.54	+17 53.7	4.329	3.404	+1.54	+0.3	15.3	20.1
Apr. 28	03 16.93	+17 57.1	4.409	3.440	+1.53	0.0	15.4	13.9
May 8	03 32.18	+17 57.2	4.476	3.479	+1.50	-0.4	15.5	7.8
May 18	03 47.23	+17 53.2	4.529	3.519	+1.48	-0.9	15.5	2.5
May 28	04 02.00	+17 44.6	4.569	3.562	+1.44	-1.4	15.6	5.5
June 7	04 16.42	+17 30.6	4.595	3.606	+1.40	-2.0	15.7	11.5
June 17	04 30.43	+17 11.0	4.606	3.652	+1.35	-2.6	15.7	17.8
June 27	04 43.95	+16 45.4	4.603	3.700	+1.29	-3.2	15.8	24.2
July 7	04 56.89	+16 13.7	4.587	3.749	+1.23	-3.8	15.8	30.7
July 17	05 09.18	+15 35.6	4.557	3.800	+1.15	-4.4	15.9	37.4
July 27	05 20.71	+14 51.2	4.514	3.852	+1.07	-5.1	15.9	44.2
Aug. 6	05 31.40	+14 00.5	4.460	3.905	+0.97	-5.7	16.0	51.2
Aug. 16	05 41.13	+13 03.7	4.395	3.959	+0.87	-6.3	16.0	58.4
Aug. 26	05 49.80	+12 01.1	4.322	4.015	+0.75	-6.8	16.0	65.8
Sept. 5	05 57.29	+10 53.0	4.241	4.072	+0.62	-7.3	16.0	73.5
Sept.15	06 03.49	+09 40.0	4.156	4.129	+0.48	-7.7	16.1	81.5
Sept.25	06 08.28	+08 22.9	4.070	4.188	+0.33	-8.0	16.1	89.8
Oct. 5	06 11.57	+07 02.6	3.985	4.247	+0.17	-8.2	16.1	98.4
Oct. 15	06 13.28	+05 40.5	3.905	4.308	+0.01	-8.2	16.1	107.3
Oct. 25	06 13.39	+04 18.4	3.835	4.369	-0.15	-8.0	16.1	116.3
Nov. 4	06 11.93	+02 58.1	3.779	4.430	-0.29	-7.6	16.2	125.6
Nov. 14	06 09.01	+01 42.3	3.742	4.493	-0.41	-6.9	16.2	134.7
Nov. 24	06 04.87	+00 33.3	3.726	4.555	-0.51	-6.0	16.2	143.2
Dec. 4	05 59.82	-00 26.4	3.737	4.619	-0.56	-4.8	16.3	150.3
Dec. 14	05 54.26	-01 14.7	3.775	4.683	-0.56	-3.6	16.4	154.5
Dec. 24	05 48.64	-01 50.4	3.842	4.747	-0.52	-2.3	16.5	154.2
Jan. 3	05 43.40	-02 13.4	3.938	4.812	-0.45	-1.1	16.6	149.6
Jan. 13	05 38.92	-02 24.3	4.061	4.878	-0.34	0.0	16.7	142.4
Jan. 23	05 35.48	-02 24.5	4.208	4.943	-0.22	+0.8	16.9	134.1
Feb. 2	05 33.26	-02 16.0	4.376	5.009	-0.09	+1.5	17.0	125.2
Feb. 12	05 32.37	-02 01.0	4.560	5.076	+0.04	+1.9	17.1	116.3
Feb. 22	05 32.79	-01 41.7	4.757	5.142	+0.17	+2.2	17.3	107.5
Mar. 4	05 34.46	-01 20.0	4.962	5.209	+0.28	+2.2	17.4	98.9
Mar. 14	05 37.30	-00 57.7	5.172	5.276	+0.39	+2.1	17.6	90.6
Mar. 24	05 41.18	-00 36.2	5.382	5.344	+0.48	+2.0	17.7	82.5
Apr. 3	05 45.97	-00 16.7	5.589	5.411	+0.56	+1.7	17.9	74.7

Comet P/2013 AL76 (Catalina)

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 13.44404 TT
Peri. = 27.26162 e = 0.6756735
Node = 145.92279 2000.0 a = 6.3110788 AU
Incl. = 144.85391 n = 0.06216539
q = 2.0468501 AU P = 15.85 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	08 55.34	+56 54.4	1.203	2.062	-10.84	+37.9	19.3	141.0
Jan. 18	07 06.92	+63 12.9	1.250	2.077	-10.98	-3.5	19.4	136.4
Jan. 28	05 17.08	+62 38.1	1.384	2.095	-6.77	-24.2	19.7	123.5
Feb. 7	04 09.34	+58 35.8	1.579	2.119	-3.49	-25.2	20.1	109.2
Feb. 17	03 34.43	+54 23.9	1.807	2.146	-1.75	-20.2	20.5	95.9
Feb. 27	03 16.91	+51 01.5	2.047	2.177	-0.84	-15.0	20.8	83.9
Mar. 9	03 08.55	+48 31.7	2.287	2.211	-0.32	-10.6	21.2	73.0
Mar. 19	03 05.38	+46 45.7	2.516	2.249	-0.01	-7.2	21.5	63.2
Mar. 29	03 05.28	+45 33.7	2.728	2.290	+0.18	-4.6	21.8	54.1
Apr. 8	03 07.06	+44 48.0	2.919	2.334	+0.30	-2.5	22.0	45.8
Apr. 18	03 10.02	+44 23.1	3.084	2.381	+0.36	-0.8	22.3	38.4
Apr. 28	03 13.64	+44 14.9	3.221	2.429	+0.39	+0.5	22.5	32.2
May 8	03 17.56	+44 20.3	3.330	2.480	+0.39	+1.7	22.7	27.6
May 18	03 21.49	+44 37.4	3.409	2.533	+0.36	+2.7	22.9	25.4
May 28	03 25.12	+45 04.7	3.458	2.587	+0.31	+3.7	.	26.1
June 7	03 28.21	+45 41.4	3.477	2.642	+0.22	+4.5	.	29.6
June 17	03 30.43	+46 26.8	3.468	2.699	+0.10	+5.4	.	35.0
June 27	03 31.41	+47 20.4	3.432	2.757	-0.07	+6.1	.	41.7
July 7	03 30.73	+48 21.8	3.372	2.816	-0.29	+6.8	.	49.3
July 17	03 27.82	+49 30.1	3.292	2.876	-0.58	+7.3	.	57.5
July 27	03 21.99	+50 43.6	3.194	2.937	-0.96	+7.6	.	66.3
Aug. 6	03 12.40	+51 59.1	3.085	2.998	-1.43	+7.2	.	75.6
Aug. 16	02 58.10	+53 10.8	2.970	3.059	-1.99	+5.8	.	85.4
Aug. 26	02 38.23	+54 08.8	2.857	3.121	-2.58	+3.0	.	95.6
Sept. 5	02 12.43	+54 39.0	2.754	3.183	-3.09	-1.5	.	106.0
Sept. 15	01 41.50	+54 23.6	2.670	3.246	-3.36	-7.6	.	116.5
Sept. 25	01 07.89	+53 07.2	2.616	3.308	-3.28	-14.3	.	126.1
Oct. 5	00 35.07	+50 44.6	2.600	3.371	-2.88	-20.0	.	133.9
Oct. 15	00 06.24	+47 24.8	2.628	3.434	-2.31	-23.6	.	138.0
Oct. 25	23 43.13	+43 29.2	2.701	3.497	-1.72	-24.7	.	137.2
Nov. 4	23 25.93	+39 22.1	2.818	3.559	-1.19	-23.8	.	132.1
Nov. 14	23 14.02	+35 24.2	2.974	3.622	-0.76	-21.5	.	124.1
Nov. 24	23 06.45	+31 48.9	3.161	3.684	-0.41	-18.6	.	114.7
Dec. 4	23 02.31	+28 42.5	3.371	3.747	-0.15	-15.6	.	104.9
Dec. 14	23 00.81	+26 06.9	3.595	3.809	+0.05	-12.6	.	95.0
Dec. 24	23 01.34	+24 00.4	3.827	3.871	+0.21	-10.0	.	85.2
Jan. 3	23 03.40	+22 20.2	4.058	3.933	+0.32	-7.7	.	75.7
Jan. 13	23 06.61	+21 03.2	4.283	3.994	+0.41	-5.7	.	66.5
Jan. 23	23 10.67	+20 05.9	4.496	4.055	+0.47	-4.0	.	57.6
Feb. 2	23 15.32	+19 25.4	4.694	4.116	+0.51	-2.6	.	49.1
Feb. 12	23 20.38	+18 59.1	4.873	4.177	+0.53	-1.5	.	40.9
Feb. 22	23 25.65	+18 44.4	5.029	4.237	+0.54	-0.5	.	33.3
Mar. 4	23 31.02	+18 39.4	5.161	4.297	+0.53	+0.3	.	26.6
Mar. 14	23 36.34	+18 42.3	5.267	4.357	+0.51	+0.9	.	21.4
Mar. 24	23 41.48	+18 51.4	5.347	4.417	+0.49	+1.4	.	19.1
Apr. 3	23 46.35	+19 05.5	5.399	4.476	+0.45	+1.8	.	20.5

Comet P/2006 F4 (Spacewatch)

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 14.14580 TT
Peri. = 31.01812 e = 0.3367846
Node = 184.05955 2000.0 a = 3.5313833 AU
Incl. = 12.38126 n = 0.14852063
q = 2.3420678 AU P = 6.64 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	15 58.34	-14 06.0	2.896	2.348	-1.00	+0.9	20.0	28.3/ 94	47.6
Jan. 18	16 17.79	-14 20.8	2.809	2.353	-1.01	+0.6	19.9	27.4/ 91	53.1
Jan. 28	16 36.64	-14 23.0	2.717	2.360	-1.03	+0.4	19.9	26.3/ 88	58.7
Feb. 7	16 54.72	-14 12.9	2.621	2.369	-1.04	+0.2	19.8	25.0/ 85	64.5
Feb. 17	17 11.80	-13 50.6	2.521	2.380	-1.06	0.0	19.8	23.4/ 82	70.4
Feb. 27	17 27.68	-13 16.9	2.419	2.392	-1.09	-0.1	19.7	21.6/ 79	76.6
Mar. 9	17 42.13	-12 32.6	2.316	2.406	-1.11	-0.2	19.7	19.5/ 74	83.0
Mar. 19	17 54.91	-11 39.2	2.213	2.421	-1.14	-0.3	19.6	17.1/ 69	89.6
Mar. 29	18 05.76	-10 38.2	2.111	2.438	-1.18	-0.3	19.6	14.5/ 63	96.7
Apr. 8	18 14.46	-09 31.6	2.013	2.456	-1.23	-0.2	19.5	11.6/ 53	104.0
Apr. 18	18 20.75	-08 21.9	1.920	2.476	-1.29	-0.1	19.5	8.9/ 38	111.8
Apr. 28	18 24.45	-07 12.0	1.836	2.497	-1.35	+0.1	19.5	6.8/ 13	120.0
May 8	18 25.45	-06 05.5	1.763	2.519	-1.42	+0.2	19.5	6.4/337	128.6
May 18	18 23.78	-05 06.3	1.703	2.542	-1.49	+0.3	19.4	7.8/308	137.4
May 28	18 19.70	-04 18.5	1.662	2.566	-1.55	+0.4	19.5	9.5/290	146.1
June 7	18 13.70	-03 45.8	1.641	2.592	-1.60	+0.4	19.5	10.8/278	154.0
June 17	18 06.53	-03 31.1	1.643	2.618	-1.61	+0.4	19.6	11.1/268	159.3
June 27	17 59.14	-03 35.3	1.669	2.645	-1.60	+0.3	19.7	10.3/258	159.4
July 7	17 52.40	-03 57.4	1.719	2.673	-1.56	+0.2	19.8	8.7/245	154.4
July 17	17 47.11	-04 34.5	1.792	2.701	-1.49	+0.1	20.0	6.9/226	146.9
July 27	17 43.80	-05 22.8	1.887	2.730	-1.41	0.0	20.2	5.8/196	138.4
Aug. 6	17 42.74	-06 18.2	1.999	2.760	-1.32	0.0	20.4	6.2/163	129.8
Aug. 16	17 43.97	-07 17.1	2.127	2.790	-1.23	-0.1	20.6	7.8/139	121.3
Aug. 26	17 47.42	-08 16.2	2.266	2.821	-1.15	-0.1	20.9	9.9/125	113.1
Sept. 5	17 52.87	-09 13.1	2.416	2.852	-1.07	-0.2	21.1	11.9/116	105.3
Sept.15	18 00.12	-10 05.7	2.572	2.884	-1.00	-0.2	21.3	13.8/110	97.7
Sept.25	18 08.93	-10 52.6	2.732	2.915	-0.93	-0.3	21.5	15.5/105	90.3
Oct. 5	18 19.07	-11 32.8	2.894	2.948	-0.87	-0.4	21.7	16.9/101	83.2
Oct. 15	18 30.34	-12 05.4	3.056	2.980	-0.82	-0.5	21.9	18.0/ 98	76.2
Oct. 25	18 42.53	-12 30.0	3.215	3.012	-0.77	-0.6	22.1	19.0/ 95	69.4
Nov. 4	18 55.47	-12 46.3	3.370	3.045	-0.73	-0.7	22.3	19.8/ 93	62.7
Nov. 14	19 09.01	-12 54.1	3.519	3.078	-0.69	-0.7	22.5	20.4/ 90	56.0
Nov. 24	19 22.98	-12 53.4	3.661	3.110	-0.66	-0.8	22.6	20.9/ 88	49.4
Dec. 4	19 37.27	-12 44.4	3.793	3.143	-0.63	-0.9	22.8	21.3/ 86	42.9
Dec. 14	19 51.75	-12 27.5	3.914	3.176	-0.60	-1.0	22.9	21.5/ 84	36.4
Dec. 24	20 06.31	-12 03.0	4.022	3.208	-0.57	-1.0	.	21.6/ 82	30.0
Jan. 3	20 20.86	-11 31.5	4.117	3.241	-0.55	-1.1	.	21.6/ 80	23.7
Jan. 13	20 35.30	-10 53.5	4.198	3.274	-0.52	-1.1	.	21.5/ 79	17.5
Jan. 23	20 49.57	-10 09.9	4.263	3.306	-0.50	-1.2	.	21.3/ 77	11.8
Feb. 2	21 03.59	-09 21.2	4.312	3.338	-0.49	-1.2	.	21.0/ 76	7.6
Feb. 12	21 17.29	-08 28.4	4.345	3.370	-0.47	-1.2	.	20.6/ 74	8.0
Feb. 22	21 30.61	-07 32.3	4.361	3.402	-0.46	-1.2	.	20.1/ 73	12.5
Mar. 4	21 43.51	-06 33.6	4.360	3.434	-0.45	-1.2	.	19.5/ 72	18.5
Mar. 14	21 55.91	-05 33.3	4.343	3.465	-0.44	-1.2	.	18.7/ 71	24.8
Mar. 24	22 07.77	-04 32.4	4.309	3.497	-0.43	-1.2	.	17.9/ 70	31.4
Apr. 3	22 19.03	-03 31.6	4.260	3.528	-0.42	-1.1	.	16.9/ 69	38.1

Comet 273P/Pons-Gambart

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 19.66446 TT
Peri. = 20.18532 e = 0.9752668
Node = 320.43415 2000.0 a = 32.7536024 AU
Incl. = 136.39545 n = 0.00525794
q = 0.8101014 AU P = 187.45 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	18 47.05	-06 37.6	1.778	0.887	-0.65	+28.1	11.7	17.2
Jan. 18	18 40.51	-01 56.8	1.746	0.976	-0.69	+29.8	12.1	26.9
Jan. 28	18 33.58	+03 01.5	1.673	1.084	-0.84	+33.7	12.5	38.1
Feb. 7	18 25.21	+08 38.7	1.572	1.205	-1.15	+39.9	12.8	50.1
Feb. 17	18 13.74	+15 17.9	1.455	1.333	-1.72	+48.0	13.1	62.7
Feb. 27	17 56.50	+23 18.2	1.341	1.464	-2.72	+56.2	13.3	76.1
Mar. 9	17 29.27	+32 40.5	1.250	1.596	-4.37	+59.3	13.5	90.0
Mar. 19	16 45.53	+42 33.4	1.207	1.729	-6.64	+49.0	13.8	103.0
Mar. 29	15 39.18	+50 43.5	1.232	1.860	-8.28	+23.4	14.1	112.7
Apr. 8	14 16.40	+54 37.5	1.330	1.991	-7.52	-4.0	14.6	116.6
Apr. 18	13 01.23	+53 58.0	1.495	2.120	-5.21	-19.0	15.1	114.7
Apr. 28	12 09.15	+50 48.3	1.709	2.248	-3.17	-23.0	15.7	109.0
May 8	11 37.40	+46 58.6	1.956	2.374	-1.83	-22.1	16.2	101.6
May 18	11 19.07	+43 17.6	2.223	2.498	-1.00	-19.8	16.7	93.5
May 28	11 09.06	+39 60.0	2.500	2.620	-0.48	-17.3	17.2	85.4
June 7	11 04.29	+37 06.6	2.779	2.741	-0.13	-15.2	17.6	77.3
June 17	11 02.96	+34 34.7	3.055	2.860	+0.10	-13.4	18.0	69.4
June 27	11 03.92	+32 20.9	3.323	2.977	+0.25	-11.9	18.3	61.6
July 7	11 06.46	+30 22.1	3.579	3.093	+0.36	-10.6	18.7	54.1
July 17	11 10.10	+28 35.9	3.819	3.208	+0.44	-9.5	19.0	46.7
July 27	11 14.50	+27 00.6	4.041	3.321	+0.49	-8.6	19.2	39.5
Aug. 6	11 19.42	+25 34.8	4.242	3.433	+0.52	-7.7	19.5	32.7
Aug. 16	11 24.66	+24 17.5	4.421	3.543	+0.54	-6.9	19.7	26.4
Aug. 26	11 30.07	+23 08.2	4.576	3.652	+0.54	-6.2	19.9	21.2
Sept. 5	11 35.52	+22 06.5	4.705	3.760	+0.54	-5.4	20.1	18.1
Sept. 15	11 40.89	+21 12.4	4.809	3.866	+0.52	-4.6	20.3	18.2
Sept. 25	11 46.06	+20 26.0	4.885	3.972	+0.49	-3.9	20.4	21.8
Oct. 5	11 50.92	+19 47.4	4.936	4.076	+0.44	-3.0	20.6	27.6
Oct. 15	11 55.35	+19 17.2	4.961	4.179	+0.39	-2.1	20.7	34.7
Oct. 25	11 59.23	+18 55.7	4.961	4.281	+0.32	-1.2	20.8	42.5
Nov. 4	12 02.41	+18 43.6	4.939	4.383	+0.23	-0.2	20.9	50.9
Nov. 14	12 04.75	+18 41.5	4.898	4.483	+0.13	+0.8	21.0	59.8
Nov. 24	12 06.09	+18 49.7	4.840	4.582	+0.02	+1.9	21.0	69.1
Dec. 4	12 06.25	+19 08.8	4.770	4.680	-0.12	+3.0	21.1	78.8
Dec. 14	12 05.07	+19 38.8	4.693	4.778	-0.27	+4.0	21.1	89.0
Dec. 24	12 02.40	+20 19.3	4.615	4.874	-0.43	+5.0	21.2	99.4
Jan. 3	11 58.12	+21 09.1	4.543	4.970	-0.60	+5.7	21.3	110.3
Jan. 13	11 52.15	+22 06.4	4.483	5.065	-0.76	+6.2	21.3	121.3
Jan. 23	11 44.55	+23 08.2	4.443	5.159	-0.91	+6.3	21.4	132.4
Feb. 2	11 35.48	+24 10.9	4.429	5.252	-1.02	+5.9	21.4	143.3
Feb. 12	11 25.23	+25 10.3	4.446	5.345	-1.10	+5.2	21.5	153.1
Feb. 22	11 14.27	+26 02.4	4.498	5.437	-1.12	+4.2	21.6	159.8
Mar. 4	11 03.11	+26 44.1	4.586	5.528	-1.08	+2.9	21.7	159.9
Mar. 14	10 52.31	+27 13.2	4.711	5.618	-0.99	+1.6	21.9	153.5
Mar. 24	10 42.36	+27 29.4	4.870	5.708	-0.87	+0.4	22.0	144.2
Apr. 3	10 33.63	+27 33.3	5.058	5.797	-0.73	-0.7	22.2	134.0

Comet C/2012 L1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 25.35639 TT
Peri. = 140.25934
Node = 271.76596 2000.0
Incl. = 87.22639
q = 2.2618727 AU
e = 0.9973741

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	03 18.76	+73 07.1	1.610	2.267	+0.43	−53.6	14.6	119.9
Jan. 18	03 23.08	+64 10.9	1.650	2.278	+0.78	−50.6	14.7	117.5
Jan. 28	03 30.91	+55 44.9	1.737	2.294	+0.93	−44.9	14.8	111.9
Feb. 7	03 40.22	+48 16.0	1.865	2.316	+1.01	−38.2	15.0	104.3
Feb. 17	03 50.37	+41 53.9	2.025	2.343	+1.07	−31.8	15.2	95.9
Feb. 27	04 01.02	+36 36.0	2.206	2.375	+1.10	−26.3	15.5	87.3
Mar. 9	04 11.99	+32 13.0	2.399	2.412	+1.12	−21.9	15.7	78.8
Mar. 19	04 23.19	+28 34.5	2.598	2.453	+1.13	−18.4	16.0	70.5
Mar. 29	04 34.53	+25 30.5	2.796	2.498	+1.14	−15.8	16.2	62.5
Apr. 8	04 45.94	+22 52.4	2.988	2.547	+1.14	−13.9	16.4	54.9
Apr. 18	04 57.37	+20 33.4	3.171	2.600	+1.14	−12.5	16.7	47.4
Apr. 28	05 08.76	+18 28.1	3.342	2.656	+1.13	−11.6	16.9	40.3
May 8	05 20.07	+16 31.9	3.498	2.714	+1.12	−11.0	17.1	33.6
May 18	05 31.25	+14 41.5	3.637	2.776	+1.10	−10.7	17.2	27.2
May 28	05 42.24	+12 54.1	3.758	2.840	+1.08	−10.7	17.4	21.6
June 7	05 52.99	+11 07.2	3.860	2.906	+1.05	−10.8	17.6	17.1
June 17	06 03.46	+09 19.2	3.944	2.974	+1.01	−11.1	17.7	15.0
June 27	06 13.57	+07 28.2	4.008	3.044	+0.97	−11.5	17.8	16.0
July 7	06 23.27	+05 33.1	4.053	3.115	+0.92	−12.1	18.0	19.8
July 17	06 32.48	+03 32.6	4.080	3.188	+0.86	−12.7	18.1	25.0
July 27	06 41.11	+01 25.6	4.089	3.262	+0.80	−13.4	18.2	31.1
Aug. 6	06 49.07	−00 48.5	4.082	3.337	+0.72	−14.2	18.3	37.6
Aug. 16	06 56.27	−03 10.7	4.061	3.412	+0.63	−15.1	18.4	44.4
Aug. 26	07 02.56	−05 41.2	4.028	3.489	+0.53	−15.9	18.5	51.5
Sept. 5	07 07.81	−08 20.3	3.985	3.567	+0.41	−16.8	18.5	58.7
Sept.15	07 11.86	−11 07.9	3.936	3.645	+0.27	−17.5	18.6	66.0
Sept.25	07 14.53	−14 03.2	3.883	3.723	+0.11	−18.2	18.7	73.4
Oct. 5	07 15.63	−17 04.7	3.830	3.802	−0.07	−18.5	18.7	80.9
Oct. 15	07 14.94	−20 10.2	3.782	3.882	−0.27	−18.6	18.8	88.3
Oct. 25	07 12.29	−23 16.0	3.742	3.962	−0.48	−18.2	18.8	95.4
Nov. 4	07 07.53	−26 17.5	3.715	4.042	−0.69	−17.2	18.9	102.1
Nov. 14	07 00.59	−29 09.1	3.704	4.122	−0.90	−15.5	19.0	108.2
Nov. 24	06 51.58	−31 44.3	3.713	4.202	−1.08	−13.3	19.1	113.3
Dec. 4	06 40.77	−33 57.0	3.744	4.283	−1.21	−10.5	19.2	117.0
Dec. 14	06 28.66	−35 42.0	3.798	4.364	−1.27	−7.4	19.3	119.2
Dec. 24	06 15.97	−36 56.5	3.875	4.444	−1.25	−4.4	19.4	119.6
Jan. 3	06 03.47	−37 40.1	3.975	4.525	−1.16	−1.5	19.6	118.3
Jan. 13	05 51.91	−37 55.1	4.095	4.606	−1.00	+0.9	19.7	115.6
Jan. 23	05 41.90	−37 46.0	4.232	4.686	−0.81	+2.8	19.8	111.7
Feb. 2	05 33.81	−37 18.1	4.384	4.767	−0.60	+4.1	20.0	107.0
Feb. 12	05 27.82	−36 37.2	4.547	4.848	−0.39	+4.9	20.1	101.9
Feb. 22	05 23.92	−35 48.6	4.716	4.928	−0.19	+5.2	20.3	96.5
Mar. 4	05 21.99	−34 56.6	4.890	5.008	−0.02	+5.2	20.4	91.1
Mar. 14	05 21.84	−34 05.0	5.064	5.089	+0.14	+4.8	20.6	85.8
Mar. 24	05 23.25	−33 16.7	5.236	5.169	+0.27	+4.3	20.7	80.7
Apr. 3	05 25.99	−32 33.7	5.403	5.249	+0.39	+3.6	20.9	75.8

Comet 275P/Hermann

Epoch = 2013 July 7.0 TT
T = 2012 Dec. 27.29612 TT
Peri. = 173.99485 e = 0.7142471
Node = 348.75199 2000.0 a = 5.7525400 AU
Incl. = 21.34177 n = 0.07143558
q = 1.6438050 AU P = 13.80 years

m1 = 14.8 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	13 35.66	-10 27.9	1.473	1.649	+1.80	-26.9	18.9	81.7
Jan. 18	13 53.71	-14 57.0	1.407	1.662	+1.65	-26.8	18.9	86.2
Jan. 28	14 10.22	-19 25.1	1.345	1.682	+1.46	-26.5	18.8	91.1
Feb. 7	14 24.80	-23 50.2	1.290	1.710	+1.21	-26.0	18.8	96.5
Feb. 17	14 36.90	-28 09.9	1.241	1.744	+0.90	-25.1	18.9	102.3
Feb. 27	14 45.89	-32 21.0	1.200	1.784	+0.52	-23.8	19.0	108.7
Mar. 9	14 51.09	-36 18.8	1.167	1.829	+0.07	-21.7	19.1	115.5
Mar. 19	14 51.81	-39 56.0	1.144	1.879	-0.41	-18.7	19.2	122.7
Mar. 29	14 47.74	-43 03.1	1.135	1.934	-0.86	-14.6	19.4	129.9
Apr. 8	14 39.16	-45 29.5	1.140	1.991	-1.19	-9.6	19.6	136.7
Apr. 18	14 27.24	-47 05.8	1.163	2.053	-1.31	-4.3	19.8	142.5
Apr. 28	14 14.13	-47 49.3	1.204	2.116	-1.20	+0.4	20.1	146.2
May 8	14 02.12	-47 45.2	1.265	2.182	-0.90	+4.0	20.4	147.1
May 18	13 53.07	-47 05.3	1.345	2.250	-0.51	+6.1	20.7	145.0
May 28	13 47.94	-46 04.5	1.445	2.319	-0.12	+6.9	21.1	140.6
June 7	13 46.78	-44 55.6	1.561	2.389	+0.25	+6.7	21.4	135.0
June 17	13 49.26	-43 48.2	1.694	2.460	+0.55	+6.0	21.8	128.7
June 27	13 54.81	-42 48.1	1.842	2.532	+0.80	+5.0	22.2	122.1
July 7	14 02.84	-41 57.8	2.001	2.605	+1.00	+4.0	22.5	115.5
July 17	14 12.88	-41 18.2	2.171	2.678	+1.16	+2.9	22.9	108.9
July 27	14 24.51	-40 48.8	2.349	2.751	+1.29	+2.1	.	102.3
Aug. 6	14 37.39	-40 28.2	2.533	2.824	+1.39	+1.3	.	95.9
Aug. 16	14 51.30	-40 15.1	2.722	2.897	+1.47	+0.7	.	89.6
Aug. 26	15 06.01	-40 07.9	2.914	2.970	+1.54	+0.3	.	83.3
Sept. 5	15 21.38	-40 05.1	3.107	3.043	+1.59	0.0	.	77.0
Sept.15	15 37.26	-40 05.3	3.298	3.116	+1.63	-0.2	.	70.8
Sept.25	15 53.55	-40 07.2	3.487	3.188	+1.66	-0.3	.	64.6
Oct. 5	16 10.15	-40 09.8	3.671	3.260	+1.68	-0.2	.	58.4
Oct. 15	16 26.96	-40 12.3	3.848	3.332	+1.69	-0.1	.	52.3
Oct. 25	16 43.90	-40 13.8	4.016	3.403	+1.70	0.0	.	46.1
Nov. 4	17 00.87	-40 13.7	4.174	3.474	+1.69	+0.2	.	40.1
Nov. 14	17 17.81	-40 11.8	4.320	3.544	+1.68	+0.4	.	34.1
Nov. 24	17 34.62	-40 07.7	4.452	3.614	+1.66	+0.6	.	28.4
Dec. 4	17 51.21	-40 01.4	4.569	3.684	+1.63	+0.8	.	23.2
Dec. 14	18 07.50	-39 53.0	4.670	3.752	+1.59	+1.0	.	19.0
Dec. 24	18 23.41	-39 42.8	4.753	3.821	+1.54	+1.2	.	16.6
Jan. 3	18 38.85	-39 31.0	4.819	3.889	+1.49	+1.3	.	16.9
Jan. 13	18 53.73	-39 18.3	4.865	3.956	+1.42	+1.3	.	20.0
Jan. 23	19 07.98	-39 05.3	4.893	4.023	+1.35	+1.3	.	24.9
Feb. 2	19 21.51	-38 52.6	4.903	4.089	+1.27	+1.1	.	30.9
Feb. 12	19 34.23	-38 41.1	4.894	4.154	+1.18	+0.9	.	37.4
Feb. 22	19 46.06	-38 31.6	4.869	4.219	+1.08	+0.7	.	44.4
Mar. 4	19 56.90	-38 25.0	4.827	4.284	+0.98	+0.3	.	51.7
Mar. 14	20 06.66	-38 22.3	4.771	4.348	+0.86	-0.2	.	59.2
Mar. 24	20 15.23	-38 24.1	4.704	4.411	+0.73	-0.7	.	67.0
Apr. 3	20 22.49	-38 31.3	4.626	4.474	+0.58	-1.3	.	75.1

Comet C/2011 F1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 8.00235 TT
Peri. = 192.54715
Node = 85.11486 2000.0
Incl. = 56.61287
q = 1.8190755 AU
e = 0.9999558

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	18 34.94	-30 02.9	2.769	1.819	+2.80	-16.0	11.8	12.2
Jan. 18	19 02.97	-32 43.1	2.737	1.824	+2.98	-14.5	11.7	17.5
Jan. 28	19 32.73	-35 08.4	2.705	1.837	+3.15	-12.8	11.7	22.8
Feb. 7	20 04.20	-37 16.9	2.672	1.859	+3.31	-11.0	11.8	27.9
Feb. 17	20 37.25	-39 06.7	2.640	1.889	+3.44	-9.0	11.8	32.9
Feb. 27	21 11.62	-40 36.3	2.612	1.927	+3.53	-6.8	11.8	37.7
Mar. 9	21 46.93	-41 44.7	2.589	1.971	+3.57	-4.7	11.9	42.3
Mar. 19	22 22.67	-42 32.1	2.572	2.023	+3.56	-2.8	11.9	46.6
Mar. 29	22 58.25	-42 60.0	2.562	2.080	+3.49	-1.1	12.0	50.7
Apr. 8	23 33.12	-43 10.9	2.560	2.142	+3.36	+0.2	12.1	54.6
Apr. 18	00 06.75	-43 08.9	2.565	2.208	+3.20	+1.1	12.2	58.3
Apr. 28	00 38.72	-42 58.3	2.577	2.279	+3.00	+1.4	12.3	61.7
May 8	01 08.76	-42 43.9	2.595	2.353	+2.79	+1.4	12.5	65.0
May 18	01 36.67	-42 30.3	2.619	2.430	+2.57	+0.9	12.6	68.1
May 28	02 02.36	-42 21.4	2.646	2.509	+2.34	+0.1	12.7	71.2
June 7	02 25.79	-42 20.5	2.677	2.591	+2.11	-1.0	12.8	74.2
June 17	02 46.94	-42 30.0	2.709	2.674	+1.88	-2.1	13.0	77.2
June 27	03 05.79	-42 51.4	2.743	2.759	+1.65	-3.4	13.1	80.3
July 7	03 22.30	-43 25.7	2.777	2.845	+1.41	-4.7	13.2	83.4
July 17	03 36.42	-44 12.8	2.811	2.932	+1.16	-5.9	13.3	86.6
July 27	03 48.02	-45 12.0	2.846	3.020	+0.90	-7.0	13.5	89.9
Aug. 6	03 56.98	-46 21.7	2.881	3.109	+0.61	-7.8	13.6	93.3
Aug. 16	04 03.10	-47 39.4	2.918	3.198	+0.31	-8.2	13.7	96.6
Aug. 26	04 06.19	-49 01.7	2.958	3.287	-0.01	-8.2	13.8	100.0
Sept. 5	04 06.08	-50 24.1	3.002	3.377	-0.35	-7.7	14.0	103.1
Sept. 15	04 02.62	-51 41.0	3.052	3.467	-0.67	-6.5	14.1	106.0
Sept. 25	03 55.91	-52 46.1	3.110	3.557	-0.97	-4.7	14.2	108.5
Oct. 5	03 46.25	-53 33.0	3.177	3.647	-1.20	-2.3	14.3	110.4
Oct. 15	03 34.29	-53 55.5	3.255	3.738	-1.33	+0.6	14.5	111.5
Oct. 25	03 21.02	-53 49.5	3.345	3.828	-1.35	+3.6	14.6	111.8
Nov. 4	03 07.55	-53 13.2	3.449	3.918	-1.25	+6.6	14.7	111.2
Nov. 14	02 55.01	-52 07.7	3.567	4.008	-1.08	+9.1	14.9	109.6
Nov. 24	02 44.24	-50 36.6	3.698	4.097	-0.85	+11.2	15.0	107.0
Dec. 4	02 35.73	-48 44.9	3.842	4.187	-0.61	+12.7	15.2	103.7
Dec. 14	02 29.67	-46 38.1	3.998	4.276	-0.37	+13.6	15.3	99.7
Dec. 24	02 25.98	-44 21.7	4.165	4.365	-0.15	+14.1	15.5	95.2
Jan. 3	02 24.47	-42 00.4	4.340	4.454	+0.04	+14.2	15.7	90.3
Jan. 13	02 24.87	-39 38.1	4.521	4.542	+0.20	+14.0	15.8	85.0
Jan. 23	02 26.89	-37 17.8	4.705	4.631	+0.34	+13.6	16.0	79.6
Feb. 2	02 30.28	-35 01.9	4.891	4.719	+0.45	+13.0	16.1	74.2
Feb. 12	02 34.79	-32 52.1	5.076	4.806	+0.54	+12.2	16.2	68.7
Feb. 22	02 40.20	-30 49.6	5.257	4.894	+0.61	+11.4	16.4	63.3
Mar. 4	02 46.35	-28 55.3	5.432	4.981	+0.67	+10.6	16.5	58.2
Mar. 14	02 53.06	-27 09.8	5.599	5.067	+0.71	+9.6	16.6	53.3
Mar. 24	03 00.20	-25 33.4	5.755	5.154	+0.75	+8.7	16.7	48.8
Apr. 3	03 07.65	-24 06.5	5.900	5.240	+0.76	+7.7	16.8	44.9

Comet 276P/Vorobjov

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 17.93922 TT
Peri. = 205.99995 e = 0.2698683
Node = 214.34005 2000.0 a = 5.3734098 AU
Incl. = 14.49359 n = 0.07912781
q = 3.9232968 AU P = 12.46 years

m1 = 7.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	02 59.65	+09 46.1	3.372	3.924	+0.17	+0.2	19.1	117.4
Jan. 18	03 01.31	+09 47.8	3.510	3.923	+0.33	+1.0	19.2	107.7
Jan. 28	03 04.57	+09 57.9	3.656	3.924	+0.47	+1.7	19.3	98.4
Feb. 7	03 09.31	+10 14.9	3.806	3.924	+0.61	+2.2	19.4	89.6
Feb. 17	03 15.40	+10 37.3	3.955	3.926	+0.73	+2.6	19.5	81.1
Feb. 27	03 22.69	+11 03.6	4.102	3.927	+0.83	+2.9	19.6	72.9
Mar. 9	03 31.02	+11 32.3	4.243	3.930	+0.93	+3.0	19.7	65.1
Mar. 19	03 40.28	+12 02.2	4.376	3.933	+1.00	+3.0	19.7	57.6
Mar. 29	03 50.31	+12 32.0	4.499	3.936	+1.07	+2.9	19.8	50.3
Apr. 8	04 01.01	+13 00.6	4.610	3.940	+1.13	+2.7	19.9	43.2
Apr. 18	04 12.26	+13 27.1	4.708	3.944	+1.17	+2.4	19.9	36.4
Apr. 28	04 23.97	+13 50.8	4.792	3.949	+1.21	+2.0	19.9	29.7
May 8	04 36.03	+14 10.8	4.861	3.954	+1.23	+1.6	20.0	23.4
May 18	04 48.36	+14 26.7	4.914	3.960	+1.25	+1.1	20.0	17.3
May 28	05 00.87	+14 37.9	4.952	3.967	+1.26	+0.6	20.1	12.0
June 7	05 13.47	+14 44.1	4.974	3.973	+1.26	+0.1	20.1	8.6
June 17	05 26.08	+14 44.9	4.980	3.981	+1.25	−0.5	20.1	9.4
June 27	05 38.61	+14 40.4	4.969	3.989	+1.24	−1.0	20.1	13.6
July 7	05 50.99	+14 30.2	4.943	3.997	+1.21	−1.6	20.1	19.2
July 17	06 03.11	+14 14.5	4.901	4.005	+1.18	−2.1	20.1	25.3
July 27	06 14.90	+13 53.3	4.844	4.015	+1.14	−2.6	20.1	31.6
Aug. 6	06 26.26	+13 26.9	4.773	4.024	+1.08	−3.1	20.1	38.1
Aug. 16	06 37.09	+12 55.5	4.688	4.034	+1.02	−3.6	20.0	44.9
Aug. 26	06 47.28	+12 19.5	4.591	4.045	+0.94	−4.0	20.0	51.8
Sept. 5	06 56.72	+11 39.4	4.483	4.055	+0.86	−4.4	20.0	58.9
Sept. 15	07 05.29	+10 55.8	4.365	4.067	+0.76	−4.6	19.9	66.3
Sept. 25	07 12.85	+10 09.4	4.240	4.078	+0.64	−4.8	19.9	73.9
Oct. 5	07 19.29	+09 21.0	4.110	4.090	+0.52	−4.9	19.8	81.9
Oct. 15	07 24.44	+08 31.7	3.978	4.103	+0.37	−4.9	19.8	90.1
Oct. 25	07 28.18	+07 42.7	3.846	4.116	+0.22	−4.7	19.7	98.7
Nov. 4	07 30.40	+06 55.3	3.718	4.129	+0.06	−4.4	19.7	107.7
Nov. 14	07 31.01	+06 11.2	3.599	4.143	−0.10	−3.9	19.6	117.0
Nov. 24	07 29.99	+05 31.9	3.492	4.156	−0.26	−3.3	19.6	126.6
Dec. 4	07 27.41	+04 59.2	3.402	4.171	−0.40	−2.5	19.6	136.3
Dec. 14	07 23.43	+04 34.6	3.334	4.185	−0.51	−1.5	19.5	145.9
Dec. 24	07 18.37	+04 19.4	3.290	4.200	−0.57	−0.5	19.5	154.7
Jan. 3	07 12.64	+04 14.3	3.274	4.215	−0.59	+0.5	19.5	160.8
Jan. 13	07 06.75	+04 19.0	3.288	4.231	−0.55	+1.4	19.6	161.2
Jan. 23	07 01.21	+04 32.8	3.331	4.247	−0.47	+2.1	19.6	155.7
Feb. 2	06 56.50	+04 53.9	3.401	4.263	−0.35	+2.7	19.7	147.2
Feb. 12	06 52.99	+05 20.5	3.497	4.279	−0.21	+3.0	19.8	137.7
Feb. 22	06 50.91	+05 50.3	3.615	4.296	−0.05	+3.1	19.9	128.1
Mar. 4	06 50.40	+06 21.4	3.749	4.313	+0.11	+3.0	20.0	118.6
Mar. 14	06 51.47	+06 51.8	3.898	4.330	+0.26	+2.8	20.1	109.4
Mar. 24	06 54.04	+07 20.1	4.055	4.347	+0.40	+2.5	20.2	100.4
Apr. 3	06 58.00	+07 45.1	4.217	4.365	+0.52	+2.1	20.3	91.9

Comet C/2012 Y1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 17.99207 TT
Peri. = 268.69708 e = 0.9462221
Node = 193.28289 2000.0 a = 37.4992869 AU
Incl. = 20.96353 n = 0.00429210
q = 2.0166329 AU P = 229.63 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	05 44.71	-13 59.4	1.184	2.020	+0.13	+5.4	17.9	137.3
Jan. 18	05 46.02	-13 05.0	1.213	2.017	+0.38	+9.0	18.0	132.9
Jan. 28	05 49.86	-11 35.5	1.258	2.020	+0.66	+11.4	18.1	128.1
Feb. 7	05 56.42	-09 41.2	1.316	2.030	+0.93	+12.9	18.2	123.1
Feb. 17	06 05.68	-07 32.7	1.387	2.047	+1.17	+13.3	18.4	118.1
Feb. 27	06 17.41	-05 19.8	1.471	2.071	+1.38	+12.9	18.6	113.1
Mar. 9	06 31.24	-03 10.4	1.568	2.100	+1.56	+12.0	18.8	108.1
Mar. 19	06 46.80	-01 10.8	1.676	2.136	+1.69	+10.6	19.1	103.2
Mar. 29	07 03.70	+00 34.8	1.796	2.177	+1.79	+8.9	19.3	98.3
Apr. 8	07 21.55	+02 03.7	1.926	2.222	+1.85	+7.1	19.6	93.4
Apr. 18	07 40.04	+03 14.6	2.066	2.273	+1.89	+5.3	19.9	88.5
Apr. 28	07 58.90	+04 07.4	2.214	2.328	+1.90	+3.5	20.2	83.6
May 8	08 17.86	+04 42.8	2.370	2.386	+1.89	+1.9	20.5	78.6
May 18	08 36.78	+05 01.7	2.531	2.448	+1.87	+0.4	20.8	73.7
May 28	08 55.48	+05 05.9	2.697	2.512	+1.84	-0.9	21.2	68.7
June 7	09 13.88	+04 57.0	2.865	2.580	+1.80	-2.0	21.5	63.6
June 17	09 31.91	+04 36.6	3.035	2.649	+1.76	-3.0	21.8	58.5
June 27	09 49.51	+04 06.5	3.204	2.721	+1.72	-3.8	22.0	53.3
July 7	10 06.66	+03 28.3	3.370	2.795	+1.67	-4.5	22.3	48.0
July 17	10 23.36	+02 43.5	3.533	2.870	+1.62	-5.0	22.6	42.7
July 27	10 39.60	+01 53.4	3.690	2.946	+1.58	-5.4	22.9	37.2
Aug. 6	10 55.38	+00 59.3	3.840	3.023	+1.53	-5.7	.	31.6
Aug. 16	11 10.72	+00 02.3	3.980	3.102	+1.49	-5.9	.	26.0
Aug. 26	11 25.61	-00 56.4	4.110	3.181	+1.45	-6.0	.	20.2
Sept. 5	11 40.06	-01 56.0	4.229	3.261	+1.40	-5.9	.	14.3
Sept.15	11 54.08	-02 55.4	4.333	3.341	+1.36	-5.9	.	8.3
Sept.25	12 07.65	-03 54.0	4.423	3.422	+1.31	-5.7	.	3.1
Oct. 5	12 20.75	-04 50.8	4.498	3.504	+1.26	-5.4	.	5.6
Oct. 15	12 33.37	-05 45.2	4.555	3.585	+1.21	-5.1	.	11.8
Oct. 25	12 45.47	-06 36.3	4.596	3.667	+1.15	-4.7	.	18.6
Nov. 4	12 56.99	-07 23.6	4.619	3.749	+1.09	-4.3	.	25.6
Nov. 14	13 07.89	-08 06.2	4.625	3.831	+1.02	-3.7	.	32.9
Nov. 24	13 18.07	-08 43.6	4.613	3.913	+0.94	-3.1	.	40.4
Dec. 4	13 27.47	-09 15.0	4.585	3.996	+0.85	-2.5	.	48.1
Dec. 14	13 35.98	-09 39.9	4.542	4.078	+0.75	-1.8	.	56.2
Dec. 24	13 43.48	-09 57.6	4.487	4.160	+0.64	-1.0	.	64.5
Jan. 3	13 49.88	-10 07.6	4.420	4.242	+0.52	-0.2	.	73.2
Jan. 13	13 55.04	-10 09.3	4.346	4.324	+0.38	+0.7	.	82.2
Jan. 23	13 58.86	-10 02.3	4.268	4.405	+0.24	+1.6	.	91.5
Feb. 2	14 01.25	-09 46.5	4.190	4.487	+0.09	+2.5	.	101.2
Feb. 12	14 02.14	-09 21.8	4.116	4.568	-0.06	+3.3	.	111.3
Feb. 22	14 01.56	-08 48.5	4.053	4.649	-0.20	+4.1	.	121.7
Mar. 4	13 59.57	-08 07.6	4.005	4.730	-0.33	+4.7	.	132.4
Mar. 14	13 56.32	-07 20.3	3.977	4.811	-0.43	+5.2	.	143.3
Mar. 24	13 52.06	-06 28.6	3.974	4.891	-0.49	+5.4	.	154.3
Apr. 3	13 47.12	-05 35.0	3.998	4.972	-0.53	+5.3	.	165.2

Comet P/2012 WA34 (Lemmon-PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 24.11910 TT
Peri. = 353.03769 e = 0.3385709
Node = 94.52450 2000.0 a = 4.7972998 AU
Incl. = 6.12013 n = 0.09380128
q = 3.1730737 AU P = 10.51 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 54.05	+21 04.4	2.305	3.174	−0.31	+1.5	20.3	146.9
Jan. 18	04 50.95	+21 19.6	2.390	3.173	−0.09	+1.8	20.4	136.1
Jan. 28	04 50.09	+21 37.5	2.496	3.173	+0.14	+2.0	20.5	125.7
Feb. 7	04 51.54	+21 57.9	2.616	3.174	+0.37	+2.2	20.6	116.0
Feb. 17	04 55.23	+22 20.3	2.747	3.176	+0.58	+2.4	20.7	106.7
Feb. 27	05 01.00	+22 43.8	2.885	3.179	+0.76	+2.4	20.8	98.0
Mar. 9	05 08.63	+23 07.5	3.027	3.183	+0.93	+2.3	20.9	89.8
Mar. 19	05 17.90	+23 30.1	3.170	3.187	+1.07	+2.1	21.1	82.0
Mar. 29	05 28.58	+23 50.8	3.311	3.193	+1.19	+1.8	21.2	74.5
Apr. 8	05 40.46	+24 08.3	3.448	3.200	+1.29	+1.4	21.3	67.4
Apr. 18	05 53.34	+24 21.9	3.580	3.208	+1.37	+0.9	21.4	60.5
Apr. 28	06 07.05	+24 30.8	3.704	3.216	+1.44	+0.4	21.5	53.9
May 8	06 21.43	+24 34.5	3.821	3.226	+1.49	−0.2	21.5	47.5
May 18	06 36.32	+24 32.5	3.928	3.236	+1.53	−0.8	21.6	41.2
May 28	06 51.60	+24 24.5	4.024	3.248	+1.55	−1.4	21.7	35.1
June 7	07 07.13	+24 10.5	4.109	3.260	+1.57	−2.0	21.8	29.1
June 17	07 22.83	+23 50.5	4.183	3.273	+1.57	−2.6	21.8	23.1
June 27	07 38.57	+23 24.6	4.243	3.287	+1.57	−3.1	21.9	17.3
July 7	07 54.28	+22 53.1	4.292	3.301	+1.56	−3.7	21.9	11.5
July 17	08 09.89	+22 16.4	4.326	3.317	+1.54	−4.1	22.0	5.8
July 27	08 25.30	+21 35.1	4.347	3.333	+1.52	−4.5	22.0	2.3
Aug. 6	08 40.46	+20 49.7	4.355	3.350	+1.49	−4.9	22.1	6.9
Aug. 16	08 55.31	+20 01.0	4.348	3.368	+1.45	−5.1	22.1	12.7
Aug. 26	09 09.79	+19 09.6	4.327	3.386	+1.41	−5.3	22.1	18.8
Sept. 5	09 23.84	+18 16.5	4.292	3.405	+1.36	−5.4	22.1	25.0
Sept. 15	09 37.41	+17 22.6	4.243	3.424	+1.30	−5.4	22.2	31.3
Sept. 25	09 50.42	+16 28.8	4.181	3.445	+1.24	−5.3	22.2	37.8
Oct. 5	10 02.81	+15 36.2	4.107	3.465	+1.17	−5.0	22.2	44.5
Oct. 15	10 14.50	+14 46.0	4.020	3.487	+1.09	−4.7	22.2	51.5
Oct. 25	10 25.40	+13 59.3	3.922	3.509	+1.00	−4.2	22.1	58.6
Nov. 4	10 35.41	+13 17.5	3.814	3.531	+0.90	−3.6	22.1	66.1
Nov. 14	10 44.40	+12 41.7	3.699	3.554	+0.78	−2.8	22.1	73.9
Nov. 24	10 52.23	+12 13.4	3.579	3.577	+0.65	−2.0	22.1	82.0
Dec. 4	10 58.77	+11 53.8	3.455	3.601	+0.51	−1.0	22.0	90.5
Dec. 14	11 03.84	+11 44.1	3.332	3.625	+0.35	+0.1	22.0	99.4
Dec. 24	11 07.31	+11 45.1	3.213	3.650	+0.17	+1.2	22.0	108.7
Jan. 3	11 09.04	+11 57.4	3.102	3.675	−0.01	+2.3	21.9	118.5
Jan. 13	11 08.95	+12 20.6	3.004	3.700	−0.19	+3.3	21.9	128.8
Jan. 23	11 07.08	+12 53.7	2.922	3.725	−0.35	+4.1	21.9	139.4
Feb. 2	11 03.55	+13 34.4	2.863	3.751	−0.49	+4.5	21.9	150.3
Feb. 12	10 58.67	+14 19.4	2.829	3.777	−0.58	+4.5	21.9	161.2
Feb. 22	10 52.90	+15 04.7	2.824	3.804	−0.61	+4.2	22.0	170.7
Mar. 4	10 46.77	+15 46.4	2.849	3.831	−0.59	+3.4	22.0	170.5
Mar. 14	10 40.89	+16 20.7	2.904	3.857	−0.51	+2.5	22.1	161.0
Mar. 24	10 35.80	+16 45.2	2.986	3.884	−0.39	+1.3	22.2	150.4
Apr. 3	10 31.91	+16 58.7	3.094	3.912	−0.24	+0.2	22.3	139.8

Comet 259P/Garradd

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 25.43683 TT
Peri. = 256.56095 e = 0.3408804
Node = 51.96015 2000.0 a = 2.7274662 AU
Incl. = 15.89904 n = 0.21880892
q = 1.7977264 AU P = 4.50 years

m1 = 14.8 + 5 log(Delta) + 15.0 log(r(t-60))

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	19 56.84	-30 30.8	2.752	1.802	+3.03	+7.4	21.1	12.2
Jan. 18	20 27.15	-29 17.2	2.756	1.799	+2.97	+9.4	21.1	10.7
Jan. 28	20 56.83	-27 43.5	2.759	1.798	+2.89	+11.2	21.0	10.1
Feb. 7	21 25.69	-25 52.0	2.761	1.800	+2.79	+12.6	20.9	10.5
Feb. 17	21 53.62	-23 45.6	2.761	1.806	+2.69	+13.8	20.9	11.9
Feb. 27	22 20.53	-21 27.5	2.760	1.814	+2.59	+14.7	20.9	13.8
Mar. 9	22 46.43	-19 00.6	2.757	1.826	+2.49	+15.3	20.8	16.3
Mar. 19	23 11.35	-16 28.0	2.752	1.840	+2.40	+15.5	20.8	19.0
Mar. 29	23 35.32	-13 52.6	2.745	1.857	+2.31	+15.6	20.8	21.9
Apr. 8	23 58.40	-11 16.7	2.735	1.876	+2.23	+15.4	20.8	25.1
Apr. 18	00 20.65	-08 42.6	2.721	1.898	+2.15	+15.0	20.8	28.4
Apr. 28	00 42.11	-06 12.3	2.702	1.922	+2.07	+14.5	20.8	31.9
May 8	01 02.83	-03 47.2	2.679	1.949	+2.00	+13.8	20.9	35.6
May 18	01 22.83	-01 28.7	2.650	1.977	+1.93	+13.1	20.9	39.4
May 28	01 42.11	+00 42.1	2.616	2.006	+1.86	+12.3	20.9	43.5
June 7	02 00.66	+02 44.6	2.575	2.038	+1.78	+11.4	21.0	47.8
June 17	02 18.43	+04 38.2	2.527	2.070	+1.69	+10.4	21.0	52.4
June 27	02 35.35	+06 22.7	2.473	2.104	+1.60	+9.5	21.0	57.2
July 7	02 51.33	+07 58.0	2.411	2.138	+1.49	+8.6	21.1	62.4
July 17	03 06.22	+09 24.3	2.343	2.174	+1.36	+7.8	21.1	67.8
July 27	03 19.87	+10 41.9	2.268	2.210	+1.22	+7.0	21.1	73.7
Aug. 6	03 32.06	+11 51.5	2.189	2.246	+1.05	+6.2	21.1	80.0
Aug. 16	03 42.53	+12 53.6	2.104	2.284	+0.85	+5.6	21.2	86.8
Aug. 26	03 50.99	+13 49.4	2.018	2.321	+0.61	+5.0	21.2	94.1
Sept. 5	03 57.12	+14 39.5	1.931	2.359	+0.34	+4.5	21.2	102.1
Sept. 15	04 00.53	+15 25.0	1.846	2.396	+0.04	+4.1	21.2	110.9
Sept. 25	04 00.94	+16 06.4	1.768	2.434	-0.28	+3.8	21.2	120.4
Oct. 5	03 58.11	+16 44.0	1.700	2.472	-0.61	+3.4	21.2	130.7
Oct. 15	03 52.04	+17 17.5	1.648	2.509	-0.89	+2.9	21.3	141.9
Oct. 25	03 43.11	+17 46.3	1.616	2.547	-1.10	+2.3	21.3	153.9
Nov. 4	03 32.07	+18 09.6	1.609	2.584	-1.19	+1.8	21.4	166.4
Nov. 14	03 20.13	+18 27.7	1.632	2.621	-1.15	+1.4	21.6	179.1
Nov. 24	03 08.63	+18 42.1	1.683	2.657	-0.99	+1.3	21.7	168.2
Dec. 4	02 58.74	+18 55.4	1.764	2.694	-0.74	+1.5	21.9	155.8
Dec. 14	02 51.33	+19 10.5	1.870	2.729	-0.45	+1.9	22.2	144.1
Dec. 24	02 46.78	+19 29.9	1.999	2.764	-0.16	+2.5	22.4	133.0
Jan. 3	02 45.14	+19 54.9	2.145	2.799	+0.11	+3.1	22.6	122.5
Jan. 13	02 46.24	+20 26.2	2.304	2.833	+0.35	+3.7	22.9	112.7
Jan. 23	02 49.78	+21 03.3	2.472	2.867	+0.57	+4.2	.	103.6
Feb. 2	02 55.43	+21 45.3	2.645	2.900	+0.75	+4.6	.	94.9
Feb. 12	03 02.90	+22 31.2	2.819	2.933	+0.90	+4.8	.	86.7
Feb. 22	03 11.90	+23 19.7	2.993	2.965	+1.03	+5.0	.	78.8
Mar. 4	03 22.20	+24 09.6	3.162	2.996	+1.14	+5.0	.	71.3
Mar. 14	03 33.59	+24 59.9	3.325	3.026	+1.23	+5.0	.	64.1
Mar. 24	03 45.90	+25 49.5	3.480	3.056	+1.31	+4.8	.	57.1
Apr. 3	03 58.98	+26 37.5	3.626	3.086	+1.37	+4.6	.	50.4

Comet 111P/Helin-Roman-Crocket

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 27.98509 TT
Peri. = 2.99724 e = 0.1078121
Node = 89.79477 2000.0 a = 4.1515170 AU
Incl. = 4.22923 n = 0.11651822
q = 3.7039332 AU P = 8.46 years

m1 = 7.0 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	05 32.48	+23 17.9	2.784	3.704	-0.52	+0.5	20.6	156.0
Jan. 18	05 27.23	+23 22.4	2.858	3.704	-0.35	+0.5	20.7	144.6
Jan. 28	05 23.75	+23 27.3	2.955	3.704	-0.15	+0.6	20.7	133.6
Feb. 7	05 22.25	+23 33.2	3.071	3.704	+0.06	+0.7	20.8	123.2
Feb. 17	05 22.82	+23 40.1	3.202	3.704	+0.26	+0.8	20.9	113.2
Feb. 27	05 25.38	+23 48.1	3.343	3.705	+0.44	+0.9	21.0	103.7
Mar. 9	05 29.78	+23 56.8	3.490	3.706	+0.61	+0.9	21.1	94.7
Mar. 19	05 35.86	+24 05.5	3.639	3.707	+0.75	+0.8	21.2	86.1
Mar. 29	05 43.41	+24 13.5	3.786	3.708	+0.88	+0.7	21.3	77.9
Apr. 8	05 52.23	+24 20.2	3.929	3.710	+0.99	+0.5	21.4	70.1
Apr. 18	06 02.13	+24 24.7	4.066	3.711	+1.08	+0.2	21.4	62.5
Apr. 28	06 12.95	+24 26.5	4.194	3.713	+1.16	-0.2	21.5	55.3
May 8	06 24.53	+24 25.0	4.311	3.715	+1.22	-0.5	21.6	48.2
May 18	06 36.72	+24 19.7	4.417	3.718	+1.27	-0.9	21.6	41.3
May 28	06 49.38	+24 10.4	4.510	3.721	+1.30	-1.4	21.7	34.6
June 7	07 02.41	+23 56.8	4.589	3.723	+1.33	-1.8	21.7	28.0
June 17	07 15.71	+23 38.9	4.653	3.726	+1.34	-2.2	21.8	21.5
June 27	07 29.15	+23 16.6	4.702	3.730	+1.35	-2.7	21.8	15.1
July 7	07 42.67	+22 50.1	4.735	3.733	+1.35	-3.1	21.8	8.8
July 17	07 56.18	+22 19.6	4.752	3.737	+1.34	-3.4	21.8	2.8
July 27	08 09.59	+21 45.4	4.753	3.741	+1.33	-3.7	21.8	4.4
Aug. 6	08 22.85	+21 08.0	4.737	3.745	+1.30	-4.0	21.8	10.7
Aug. 16	08 35.87	+20 27.9	4.705	3.749	+1.27	-4.2	21.8	17.1
Aug. 26	08 48.58	+19 45.6	4.658	3.754	+1.23	-4.4	21.8	23.6
Sept. 5	09 00.93	+19 01.8	4.595	3.759	+1.19	-4.4	21.8	30.3
Sept. 15	09 12.82	+18 17.4	4.517	3.763	+1.14	-4.4	21.8	37.1
Sept. 25	09 24.18	+17 33.2	4.424	3.769	+1.07	-4.3	21.8	44.0
Oct. 5	09 34.93	+16 50.1	4.319	3.774	+1.00	-4.1	21.7	51.2
Oct. 15	09 44.96	+16 09.2	4.202	3.779	+0.92	-3.8	21.7	58.6
Oct. 25	09 54.16	+15 31.6	4.075	3.785	+0.83	-3.3	21.6	66.2
Nov. 4	10 02.41	+14 58.6	3.940	3.791	+0.72	-2.7	21.6	74.1
Nov. 14	10 09.57	+14 31.5	3.799	3.797	+0.59	-2.0	21.5	82.4
Nov. 24	10 15.49	+14 11.4	3.655	3.803	+0.45	-1.2	21.4	91.0
Dec. 4	10 20.01	+13 59.6	3.512	3.809	+0.30	-0.2	21.3	100.0
Dec. 14	10 22.97	+13 57.1	3.373	3.816	+0.13	+0.7	21.3	109.5
Dec. 24	10 24.25	+14 04.6	3.242	3.822	-0.05	+1.8	21.2	119.4
Jan. 3	10 23.77	+14 22.1	3.125	3.829	-0.22	+2.7	21.1	129.7
Jan. 13	10 21.53	+14 48.9	3.025	3.836	-0.39	+3.4	21.1	140.5
Jan. 23	10 17.67	+15 23.3	2.948	3.843	-0.52	+3.9	21.0	151.6
Feb. 2	10 12.46	+16 02.6	2.897	3.850	-0.61	+4.1	21.0	162.9
Feb. 12	10 06.36	+16 43.4	2.875	3.857	-0.64	+3.9	21.0	173.3
Feb. 22	09 59.94	+17 21.9	2.884	3.865	-0.62	+3.3	21.0	171.5
Mar. 4	09 53.78	+17 54.9	2.923	3.873	-0.53	+2.5	21.1	160.7
Mar. 14	09 48.46	+18 19.8	2.990	3.880	-0.40	+1.6	21.2	149.6
Mar. 24	09 44.43	+18 35.3	3.082	3.888	-0.25	+0.6	21.2	138.8
Apr. 3	09 41.96	+18 41.0	3.195	3.896	-0.08	-0.4	21.3	128.4

Comet 246P/NEAT

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 28.60558 TT
Peri. = 176.16540 e = 0.2850440
Node = 78.78012 2000.0 a = 4.0277715 AU
Incl. = 15.97164 n = 0.12192895
q = 2.8796794 AU P = 8.08 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	17 16.04	-21 13.8	3.713	2.882	+1.72	-4.2	14.7	28.0
Jan. 18	17 33.24	-21 56.1	3.642	2.880	+1.70	-3.6	14.7	34.1
Jan. 28	17 50.21	-22 32.1	3.559	2.880	+1.66	-3.0	14.6	40.3
Feb. 7	18 06.81	-23 02.6	3.467	2.880	+1.61	-2.6	14.6	46.6
Feb. 17	18 22.92	-23 28.5	3.365	2.882	+1.55	-2.2	14.5	53.0
Feb. 27	18 38.40	-23 50.9	3.256	2.884	+1.47	-2.0	14.5	59.6
Mar. 9	18 53.09	-24 11.2	3.140	2.888	+1.37	-2.0	14.4	66.3
Mar. 19	19 06.83	-24 30.9	3.018	2.892	+1.26	-2.1	14.3	73.2
Mar. 29	19 19.45	-24 51.9	2.893	2.897	+1.13	-2.4	14.2	80.3
Apr. 8	19 30.77	-25 16.1	2.767	2.904	+0.98	-2.9	14.2	87.7
Apr. 18	19 40.57	-25 45.2	2.641	2.911	+0.81	-3.6	14.1	95.4
Apr. 28	19 48.64	-26 21.3	2.518	2.920	+0.61	-4.5	14.0	103.4
May 8	19 54.75	-27 05.9	2.400	2.929	+0.39	-5.4	13.9	111.8
May 18	19 58.65	-27 59.9	2.292	2.939	+0.15	-6.3	13.8	120.6
May 28	20 00.18	-29 03.2	2.196	2.950	-0.09	-7.1	13.8	129.9
June 7	19 59.24	-30 14.6	2.116	2.962	-0.34	-7.6	13.7	139.5
June 17	19 55.85	-31 30.8	2.056	2.975	-0.55	-7.6	13.7	149.3
June 27	19 50.34	-32 47.2	2.019	2.989	-0.71	-7.1	13.7	158.6
July 7	19 43.24	-33 58.2	2.007	3.003	-0.79	-6.0	13.7	165.8
July 17	19 35.37	-34 58.5	2.022	3.018	-0.77	-4.6	13.7	166.1
July 27	19 27.71	-35 44.5	2.063	3.034	-0.65	-3.0	13.8	159.2
Aug. 6	19 21.17	-36 14.8	2.129	3.051	-0.47	-1.5	13.9	150.0
Aug. 16	19 16.51	-36 30.1	2.219	3.068	-0.23	-0.2	14.0	140.4
Aug. 26	19 14.19	-36 32.6	2.327	3.086	+0.02	+0.8	14.2	131.0
Sept. 5	19 14.39	-36 24.5	2.452	3.104	+0.27	+1.6	14.3	121.8
Sept. 15	19 17.07	-36 08.2	2.589	3.123	+0.50	+2.3	14.5	113.1
Sept. 25	19 22.06	-35 45.4	2.735	3.143	+0.70	+2.8	14.6	104.7
Oct. 5	19 29.10	-35 17.2	2.888	3.163	+0.88	+3.3	14.8	96.6
Oct. 15	19 37.91	-34 44.0	3.044	3.184	+1.03	+3.8	15.0	88.9
Oct. 25	19 48.20	-34 06.3	3.200	3.205	+1.15	+4.2	15.1	81.4
Nov. 4	19 59.71	-33 24.2	3.354	3.227	+1.25	+4.7	15.3	74.1
Nov. 14	20 12.20	-32 37.6	3.505	3.249	+1.32	+5.1	15.4	67.0
Nov. 24	20 25.45	-31 46.8	3.649	3.271	+1.38	+5.5	15.5	60.1
Dec. 4	20 39.27	-30 51.9	3.786	3.294	+1.42	+5.9	15.7	53.4
Dec. 14	20 53.51	-29 52.9	3.914	3.317	+1.45	+6.3	15.8	46.7
Dec. 24	21 08.00	-28 50.4	4.031	3.341	+1.46	+6.6	15.9	40.2
Jan. 3	21 22.64	-27 44.7	4.136	3.364	+1.47	+6.8	16.0	33.9
Jan. 13	21 37.33	-26 36.3	4.227	3.388	+1.46	+7.0	16.1	27.8
Jan. 23	21 51.97	-25 25.8	4.305	3.413	+1.45	+7.2	16.2	22.0
Feb. 2	22 06.49	-24 14.0	4.368	3.437	+1.43	+7.3	16.2	16.9
Feb. 12	22 20.84	-23 01.4	4.416	3.462	+1.41	+7.2	16.3	13.1
Feb. 22	22 34.94	-21 49.0	4.448	3.487	+1.38	+7.2	16.4	12.0
Mar. 4	22 48.77	-20 37.5	4.465	3.512	+1.35	+7.0	16.4	14.2
Mar. 14	23 02.27	-19 27.7	4.465	3.537	+1.31	+6.7	16.5	18.5
Mar. 24	23 15.40	-18 20.4	4.450	3.562	+1.27	+6.4	16.5	23.9
Apr. 3	23 28.12	-17 16.5	4.420	3.587	+1.23	+6.0	16.5	29.8

Comet P/2000 R2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 Jan. 31.40679 TT
Peri. = 172.38883 e = 0.5650980
Node = 163.07850 2000.0 a = 3.3479800 AU
Incl. = 10.96911 n = 0.16089027
q = 1.4560432 AU P = 6.13 years

m1 = 17.6 + 5 log(Delta) + 12.5 log(r(t-15))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	20 34.26	-15 52.9	2.368	1.477	-1.68	-1.8	21.7	48.6/ 81	19.4
Jan. 18	21 07.32	-14 28.1	2.374	1.463	-1.71	-2.7	21.6	49.2/ 79	17.2
Jan. 28	21 40.25	-12 43.1	2.384	1.457	-1.71	-3.6	21.6	49.4/ 77	15.1
Feb. 7	22 12.83	-10 41.2	2.401	1.458	-1.69	-4.3	21.6	49.3/ 75	13.1
Feb. 17	22 44.86	-08 26.4	2.424	1.467	-1.66	-4.8	21.6	48.8/ 73	11.2
Feb. 27	23 16.20	-06 03.1	2.452	1.483	-1.62	-5.2	21.6	48.0/ 72	9.3
Mar. 9	23 46.78	-03 35.6	2.486	1.507	-1.57	-5.3	21.7	47.0/ 72	7.4
Mar. 19	00 16.56	-01 08.2	2.525	1.538	-1.51	-5.2	21.8	45.8/ 72	5.7
Mar. 29	00 45.53	+01 15.3	2.568	1.574	-1.45	-5.0	21.9	44.4/ 72	4.3
Apr. 8	01 13.70	+03 31.8	2.614	1.616	-1.38	-4.6	22.1	42.9/ 73	4.0
Apr. 18	01 41.07	+05 38.8	2.660	1.663	-1.32	-4.2	22.3	41.2/ 73	5.1
Apr. 28	02 07.65	+07 34.2	2.707	1.713	-1.25	-3.7	22.4	39.6/ 75	7.3
May 8	02 33.45	+09 16.7	2.752	1.767	-1.18	-3.2	22.6	38.0/ 76	10.0
May 18	02 58.45	+10 45.5	2.794	1.824	-1.12	-2.7	22.8	36.3/ 78	13.1
May 28	03 22.63	+12 00.1	2.832	1.883	-1.05	-2.3	23.0	34.7/ 79	16.5
June 7	03 45.96	+13 00.6	2.864	1.943	-0.99	-1.8	.	33.1/ 81	20.1
June 17	04 08.40	+13 47.2	2.890	2.005	-0.93	-1.4	.	31.4/ 83	24.0
June 27	04 29.89	+14 20.4	2.907	2.068	-0.88	-1.1	.	29.8/ 85	28.2
July 7	04 50.39	+14 41.0	2.916	2.132	-0.83	-0.8	.	28.2/ 88	32.7
July 17	05 09.81	+14 49.8	2.914	2.196	-0.78	-0.6	.	26.5/ 90	37.4
July 27	05 28.10	+14 47.9	2.903	2.260	-0.74	-0.4	.	24.8/ 92	42.4
Aug. 6	05 45.16	+14 36.3	2.881	2.324	-0.70	-0.3	.	23.0/ 95	47.8
Aug. 16	06 00.91	+14 16.3	2.849	2.389	-0.67	-0.3	.	21.0/ 97	53.4
Aug. 26	06 15.24	+13 49.0	2.807	2.453	-0.64	-0.2	.	18.9/100	59.5
Sept. 5	06 28.02	+13 15.9	2.754	2.516	-0.62	-0.2	.	16.6/103	65.9
Sept.15	06 39.11	+12 38.2	2.693	2.580	-0.61	-0.3	.	14.1/106	72.7
Sept.25	06 48.35	+11 57.6	2.624	2.642	-0.61	-0.4	.	11.4/111	80.0
Oct. 5	06 55.55	+11 15.7	2.550	2.705	-0.61	-0.5	.	8.4/119	87.9
Oct. 15	07 00.52	+10 34.2	2.474	2.766	-0.62	-0.6	.	5.4/136	96.3
Oct. 25	07 03.09	+09 55.1	2.398	2.827	-0.65	-0.7	.	3.5/180	105.2
Nov. 4	07 03.10	+09 20.5	2.327	2.887	-0.68	-0.8	.	4.8/234	114.8
Nov. 14	07 00.49	+08 52.5	2.265	2.946	-0.71	-0.9	.	7.8/256	125.0
Nov. 24	06 55.38	+08 33.1	2.219	3.005	-0.75	-1.0	.	10.9/265	135.7
Dec. 4	06 48.09	+08 23.9	2.192	3.063	-0.79	-1.0	.	13.2/271	146.5
Dec. 14	06 39.19	+08 25.9	2.191	3.120	-0.82	-1.1	.	14.4/275	156.9
Dec. 24	06 29.49	+08 39.1	2.218	3.176	-0.84	-1.0	.	14.4/279	164.5
Jan. 3	06 19.88	+09 02.3	2.275	3.231	-0.84	-1.0	.	13.2/284	164.0
Jan. 13	06 11.24	+09 33.6	2.362	3.286	-0.83	-1.0	.	11.0/290	156.1
Jan. 23	06 04.24	+10 10.8	2.478	3.340	-0.80	-0.9	.	8.4/299	146.0
Feb. 2	05 59.27	+10 51.4	2.618	3.392	-0.76	-0.8	.	5.8/316	135.5
Feb. 12	05 56.54	+11 33.2	2.779	3.444	-0.72	-0.7	.	4.2/349	125.3
Feb. 22	05 55.99	+12 14.6	2.955	3.496	-0.67	-0.6	.	4.5/ 29	115.4
Mar. 4	05 57.49	+12 54.2	3.143	3.546	-0.63	-0.5	.	6.1/ 53	106.0
Mar. 14	06 00.81	+13 30.8	3.337	3.595	-0.59	-0.4	.	7.9/ 65	97.0
Mar. 24	06 05.72	+14 03.6	3.534	3.644	-0.55	-0.4	.	9.5/ 72	88.4
Apr. 3	06 11.98	+14 32.2	3.730	3.692	-0.51	-0.3	.	11.0/ 77	80.1

Comet C/2012 C1 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 4.60328 TT
Peri. = 279.89872
Node = 300.63496 2000.0
Incl. = 96.27899
q = 4.8379759 AU
e = 0.9967346

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	02 41.81	-74 29.1	5.020	4.843	-2.52	+10.0	17.4	74.0
Jan. 18	02 16.63	-72 48.7	5.060	4.840	-1.64	+11.0	17.4	71.6
Jan. 28	02 00.19	-70 58.4	5.096	4.838	-0.99	+11.1	17.4	69.4
Feb. 7	01 50.28	-69 07.3	5.128	4.838	-0.52	+10.6	17.4	67.5
Feb. 17	01 45.07	-67 21.3	5.154	4.839	-0.19	+9.7	17.4	66.1
Feb. 27	01 43.20	-65 44.4	5.170	4.841	+0.05	+8.5	17.4	65.4
Mar. 9	01 43.71	-64 19.1	5.176	4.845	+0.22	+7.2	17.4	65.2
Mar. 19	01 45.91	-63 07.2	5.171	4.849	+0.34	+5.7	17.4	65.8
Mar. 29	01 49.27	-62 10.3	5.155	4.855	+0.41	+4.1	17.4	67.2
Apr. 8	01 53.41	-61 29.4	5.127	4.862	+0.46	+2.4	17.4	69.2
Apr. 18	01 58.01	-61 05.4	5.089	4.871	+0.48	+0.6	17.4	71.9
Apr. 28	02 02.77	-60 59.2	5.040	4.880	+0.47	-1.2	17.4	75.2
May 8	02 07.43	-61 11.4	4.984	4.891	+0.43	-3.1	17.4	78.9
May 18	02 11.71	-61 42.6	4.922	4.903	+0.36	-5.0	17.4	83.1
May 28	02 15.28	-62 33.0	4.856	4.917	+0.24	-6.9	17.3	87.5
June 7	02 17.72	-63 42.4	4.789	4.931	+0.08	-8.8	17.3	92.1
June 17	02 18.51	-65 10.2	4.725	4.947	-0.16	-10.5	17.3	96.7
June 27	02 16.90	-66 54.8	4.666	4.964	-0.51	-11.8	17.3	101.1
July 7	02 11.83	-68 53.2	4.617	4.981	-1.01	-12.8	17.3	105.2
July 17	02 01.74	-71 00.8	4.581	5.000	-1.73	-12.9	17.3	108.7
July 27	01 44.46	-73 10.0	4.561	5.021	-2.73	-11.9	17.3	111.3
Aug. 6	01 17.20	-75 09.4	4.560	5.042	-3.96	-9.3	17.3	112.9
Aug. 16	00 37.55	-76 42.9	4.580	5.064	-5.10	-4.8	17.3	113.1
Aug. 26	23 46.59	-77 31.3	4.621	5.087	-5.48	+1.0	17.4	112.0
Sept. 5	22 51.84	-77 21.3	4.685	5.112	-4.80	+6.7	17.4	109.5
Sept. 15	22 03.83	-76 14.7	4.770	5.137	-3.56	+10.8	17.5	105.9
Sept. 25	21 28.20	-74 26.4	4.875	5.163	-2.37	+13.3	17.6	101.2
Oct. 5	21 04.55	-72 13.5	4.995	5.191	-1.44	+14.4	17.6	95.7
Oct. 15	20 50.18	-69 49.3	5.129	5.219	-0.78	+14.7	17.7	89.6
Oct. 25	20 42.43	-67 22.4	5.273	5.248	-0.31	+14.5	17.8	83.2
Nov. 4	20 39.29	-64 57.8	5.421	5.278	+0.01	+13.9	17.9	76.5
Nov. 14	20 39.38	-62 38.6	5.571	5.309	+0.24	+13.2	18.0	69.7
Nov. 24	20 41.74	-60 26.5	5.718	5.341	+0.39	+12.4	18.1	62.9
Dec. 4	20 45.68	-58 22.2	5.859	5.374	+0.51	+11.6	18.1	56.2
Dec. 14	20 50.74	-56 26.1	5.989	5.407	+0.58	+10.8	18.2	49.8
Dec. 24	20 56.55	-54 38.3	6.107	5.441	+0.63	+10.0	18.3	43.9
Jan. 3	21 02.83	-52 58.6	6.208	5.476	+0.65	+9.2	18.3	38.8
Jan. 13	21 09.37	-51 27.0	6.291	5.512	+0.66	+8.4	18.4	34.8
Jan. 23	21 15.97	-50 03.4	6.354	5.549	+0.65	+7.6	18.5	32.5
Feb. 2	21 22.50	-48 47.7	6.396	5.586	+0.63	+6.8	18.5	32.1
Feb. 12	21 28.81	-47 39.9	6.416	5.624	+0.59	+6.0	18.5	33.9
Feb. 22	21 34.76	-46 40.1	6.415	5.663	+0.55	+5.2	18.6	37.5
Mar. 4	21 40.23	-45 48.3	6.392	5.702	+0.49	+4.4	18.6	42.6
Mar. 14	21 45.10	-45 04.6	6.349	5.742	+0.41	+3.5	18.6	48.7
Mar. 24	21 49.24	-44 29.2	6.287	5.782	+0.33	+2.7	18.6	55.6
Apr. 3	21 52.52	-44 02.1	6.210	5.823	+0.23	+1.9	18.6	62.9

Comet P/2013 A2 (Scotti)

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 8.21203 TT
Peri. = 134.91441 e = 0.4559583
Node = 355.76815 2000.0 a = 4.0048667 AU
Incl. = 3.37194 n = 0.12297646
q = 2.1788145 AU P = 8.01 years

m1 = 13.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	08 48.68	+22 57.3	1.247	2.193	-0.58	+1.6	19.2	158.8
Jan. 18	08 42.92	+23 13.3	1.210	2.185	-0.70	+1.2	19.1	169.7
Jan. 28	08 35.91	+23 25.8	1.198	2.181	-0.69	+0.4	19.1	174.6
Feb. 7	08 29.02	+23 30.1	1.211	2.179	-0.54	-0.7	19.1	165.0
Feb. 17	08 23.63	+23 23.5	1.248	2.180	-0.28	-1.8	19.2	154.1
Feb. 27	08 20.79	+23 05.2	1.306	2.184	+0.02	-2.9	19.3	143.6
Mar. 9	08 20.99	+22 36.2	1.383	2.191	+0.33	-3.9	19.4	133.8
Mar. 19	08 24.32	+21 57.7	1.475	2.200	+0.62	-4.7	19.6	124.7
Mar. 29	08 30.55	+21 10.6	1.579	2.212	+0.87	-5.5	19.8	116.4
Apr. 8	08 39.26	+20 15.6	1.693	2.227	+1.08	-6.3	20.0	108.8
Apr. 18	08 50.03	+19 13.0	1.814	2.244	+1.24	-7.0	20.2	101.7
Apr. 28	09 02.42	+18 03.1	1.940	2.264	+1.36	-7.7	20.4	95.1
May 8	09 16.05	+16 46.3	2.071	2.286	+1.46	-8.3	20.6	88.9
May 18	09 30.61	+15 22.8	2.204	2.310	+1.52	-9.0	20.8	83.0
May 28	09 45.84	+13 53.3	2.339	2.337	+1.57	-9.5	21.0	77.4
June 7	10 01.54	+12 18.3	2.474	2.365	+1.60	-10.0	21.2	71.9
June 17	10 17.54	+10 38.5	2.609	2.395	+1.62	-10.4	21.4	66.6
June 27	10 33.74	+08 54.6	2.743	2.427	+1.63	-10.7	21.6	61.4
July 7	10 50.03	+07 07.5	2.874	2.460	+1.63	-11.0	21.8	56.3
July 17	11 06.37	+05 17.9	3.003	2.495	+1.63	-11.1	21.9	51.2
July 27	11 22.71	+03 26.6	3.126	2.531	+1.63	-11.2	22.1	46.1
Aug. 6	11 39.01	+01 34.5	3.245	2.568	+1.63	-11.2	22.3	41.0
Aug. 16	11 55.27	-00 17.8	3.358	2.606	+1.62	-11.2	22.5	35.9
Aug. 26	12 11.47	-02 09.4	3.463	2.645	+1.61	-11.0	22.6	30.8
Sept. 5	12 27.61	-03 59.8	3.560	2.685	+1.61	-10.8	22.8	25.5
Sept. 15	12 43.67	-05 48.1	3.648	2.726	+1.60	-10.6	22.9	20.2
Sept. 25	12 59.65	-07 33.8	3.725	2.768	+1.59	-10.3	.	14.8
Oct. 5	13 15.53	-09 16.3	3.792	2.810	+1.58	-9.9	.	9.3
Oct. 15	13 31.31	-10 55.0	3.846	2.852	+1.56	-9.4	.	3.8
Oct. 25	13 46.94	-12 29.4	3.888	2.895	+1.55	-9.0	.	2.6
Nov. 4	14 02.41	-13 59.0	3.916	2.938	+1.52	-8.4	.	8.3
Nov. 14	14 17.65	-15 23.4	3.930	2.982	+1.50	-7.9	.	14.4
Nov. 24	14 32.61	-16 42.3	3.929	3.025	+1.46	-7.3	.	20.6
Dec. 4	14 47.21	-17 55.4	3.914	3.069	+1.42	-6.7	.	27.1
Dec. 14	15 01.37	-19 02.5	3.884	3.113	+1.36	-6.1	.	33.7
Dec. 24	15 14.97	-20 03.5	3.840	3.157	+1.29	-5.5	.	40.5
Jan. 3	15 27.90	-20 58.5	3.782	3.201	+1.21	-4.9	.	47.5
Jan. 13	15 40.01	-21 47.6	3.712	3.245	+1.11	-4.3	.	54.7
Jan. 23	15 51.14	-22 31.0	3.630	3.289	+1.00	-3.8	.	62.2
Feb. 2	16 01.13	-23 08.9	3.538	3.333	+0.86	-3.3	.	70.0
Feb. 12	16 09.76	-23 41.8	3.439	3.377	+0.71	-2.8	.	78.1
Feb. 22	16 16.84	-24 10.0	3.335	3.420	+0.53	-2.4	.	86.5
Mar. 4	16 22.19	-24 33.6	3.229	3.464	+0.34	-1.9	.	95.3
Mar. 14	16 25.59	-24 52.9	3.124	3.507	+0.13	-1.5	.	104.4
Mar. 24	16 26.91	-25 07.7	3.025	3.550	-0.08	-1.0	.	114.0
Apr. 3	16 26.07	-25 17.8	2.936	3.592	-0.30	-0.5	.	124.0

Comet P/2012 US27 (Siding Spring)

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 8.52398 TT
Peri. = 1.25600 e = 0.6486240
Node = 49.20225 2000.0 a = 5.1816951 AU
Incl. = 39.28855 n = 0.08355959
q = 1.8207233 AU P = 11.80 years

m1 = 11.8 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 36.70	-06 35.8	1.778	1.849	+1.17	+31.2	17.1	78.3
Jan. 18	00 48.44	-01 23.7	1.866	1.834	+1.33	+29.9	17.1	72.8
Jan. 28	01 01.76	+03 35.8	1.957	1.825	+1.47	+28.6	17.2	67.6
Feb. 7	01 16.50	+08 22.0	2.050	1.821	+1.61	+27.3	17.3	62.6
Feb. 17	01 32.58	+12 54.9	2.144	1.823	+1.74	+25.9	17.4	57.9
Feb. 27	01 49.96	+17 14.0	2.238	1.831	+1.87	+24.5	17.5	53.5
Mar. 9	02 08.64	+21 19.3	2.330	1.844	+2.00	+23.1	17.6	49.3
Mar. 19	02 28.66	+25 10.3	2.421	1.863	+2.14	+21.6	17.8	45.4
Mar. 29	02 50.07	+28 46.1	2.509	1.887	+2.28	+20.0	17.9	41.8
Apr. 8	03 12.91	+32 05.9	2.595	1.916	+2.43	+18.3	18.1	38.5
Apr. 18	03 37.25	+35 08.5	2.678	1.949	+2.58	+16.4	18.3	35.5
Apr. 28	04 03.07	+37 52.4	2.757	1.987	+2.73	+14.4	18.5	32.8
May 8	04 30.35	+40 16.1	2.834	2.029	+2.86	+12.2	18.7	30.4
May 18	04 58.98	+42 18.3	2.907	2.074	+2.98	+9.9	18.9	28.4
May 28	05 28.75	+43 57.8	2.977	2.122	+3.06	+7.6	19.1	26.8
June 7	05 59.39	+45 13.8	3.044	2.173	+3.11	+5.3	19.3	25.5
June 17	06 30.51	+46 06.3	3.107	2.226	+3.12	+3.0	19.5	24.8
June 27	07 01.71	+46 36.1	3.167	2.281	+3.09	+0.8	19.7	24.5
July 7	07 32.56	+46 44.6	3.222	2.338	+3.01	-1.1	19.9	24.8
July 17	08 02.68	+46 34.0	3.273	2.397	+2.91	-2.7	20.1	25.6
July 27	08 31.77	+46 07.1	3.319	2.457	+2.78	-4.0	20.3	26.9
Aug. 6	08 59.61	+45 27.0	3.360	2.518	+2.65	-5.0	20.4	28.7
Aug. 16	09 26.07	+44 37.1	3.395	2.580	+2.50	-5.7	20.6	31.0
Aug. 26	09 51.08	+43 40.4	3.423	2.642	+2.36	-6.0	20.8	33.7
Sept. 5	10 14.65	+42 40.2	3.444	2.706	+2.22	-6.1	21.0	36.9
Sept. 15	10 36.81	+41 39.4	3.457	2.769	+2.08	-5.9	21.1	40.4
Sept. 25	10 57.60	+40 40.6	3.463	2.833	+1.95	-5.4	21.3	44.3
Oct. 5	11 17.08	+39 46.4	3.460	2.898	+1.82	-4.7	21.4	48.6
Oct. 15	11 35.27	+38 59.1	3.448	2.962	+1.69	-3.8	21.6	53.3
Oct. 25	11 52.18	+38 20.6	3.429	3.026	+1.56	-2.8	21.7	58.3
Nov. 4	12 07.83	+37 53.0	3.402	3.091	+1.43	-1.5	21.8	63.6
Nov. 14	12 22.15	+37 37.8	3.367	3.155	+1.29	-0.1	21.9	69.2
Nov. 24	12 35.06	+37 36.5	3.327	3.219	+1.14	+1.4	22.0	75.2
Dec. 4	12 46.47	+37 50.0	3.281	3.283	+0.97	+2.9	22.1	81.5
Dec. 14	12 56.19	+38 19.0	3.234	3.347	+0.79	+4.4	22.2	88.0
Dec. 24	13 04.05	+39 03.2	3.186	3.410	+0.58	+5.9	22.3	94.7
Jan. 3	13 09.82	+40 01.8	3.140	3.473	+0.34	+7.1	22.4	101.5
Jan. 13	13 13.23	+41 12.4	3.101	3.536	+0.08	+7.9	22.5	108.4
Jan. 23	13 14.07	+42 31.5	3.070	3.599	-0.19	+8.3	22.6	115.0
Feb. 2	13 12.15	+43 54.1	3.052	3.661	-0.47	+8.0	22.7	121.2
Feb. 12	13 07.42	+45 13.7	3.049	3.722	-0.74	+6.9	22.8	126.5
Feb. 22	13 00.05	+46 23.0	3.065	3.784	-0.96	+5.2	22.9	130.6
Mar. 4	12 50.49	+47 14.9	3.102	3.844	-1.10	+2.9	23.0	132.8
Mar. 14	12 39.49	+47 43.7	3.160	3.905	-1.15	+0.2	.	132.9
Mar. 24	12 28.00	+47 46.2	3.240	3.965	-1.10	-2.4	.	130.9
Apr. 3	12 16.98	+47 21.8	3.342	4.024	-0.97	-4.9	.	127.1

Comet 133P/(7968) Elst-Pizarro

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 8.85798 TT
Peri. = 132.13464 e = 0.1614358
Node = 160.14792 2000.0 a = 3.1600773 AU
Incl. = 1.38689 n = 0.17545167
q = 2.6499277 AU P = 5.62 years

H = 15.8 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	19 06.10	-21 43.7	3.635	2.653	+1.94	+3.4	20.9	2.5
Jan. 18	19 25.48	-21 09.8	3.622	2.652	+1.91	+4.2	21.0	8.0
Jan. 28	19 44.62	-20 27.6	3.597	2.650	+1.88	+5.0	21.1	13.7
Feb. 7	20 03.44	-19 37.6	3.561	2.650	+1.84	+5.7	21.2	19.3
Feb. 17	20 21.85	-18 40.6	3.513	2.650	+1.79	+6.3	21.3	25.0
Feb. 27	20 39.78	-17 37.8	3.455	2.651	+1.74	+6.8	21.3	30.6
Mar. 9	20 57.15	-16 30.0	3.386	2.653	+1.68	+7.2	21.3	36.4
Mar. 19	21 13.92	-15 18.5	3.308	2.655	+1.61	+7.4	21.3	42.1
Mar. 29	21 30.00	-14 04.5	3.221	2.658	+1.54	+7.5	21.3	48.0
Apr. 8	21 45.36	-12 49.2	3.126	2.661	+1.45	+7.5	21.3	53.9
Apr. 18	21 59.89	-11 34.0	3.023	2.666	+1.36	+7.4	21.3	59.9
Apr. 28	22 13.54	-10 20.3	2.915	2.670	+1.27	+7.1	21.3	66.1
May 8	22 26.20	-09 09.5	2.801	2.676	+1.16	+6.6	21.2	72.5
May 18	22 37.76	-08 03.2	2.684	2.682	+1.03	+6.0	21.1	79.1
May 28	22 48.07	-07 02.9	2.564	2.689	+0.89	+5.3	21.1	85.9
June 7	22 56.99	-06 10.3	2.443	2.696	+0.73	+4.3	21.0	93.1
June 17	23 04.31	-05 27.2	2.324	2.704	+0.55	+3.2	20.8	100.7
June 27	23 09.83	-04 55.2	2.209	2.712	+0.35	+1.9	20.7	108.8
July 7	23 13.36	-04 36.1	2.100	2.721	+0.13	+0.5	20.6	117.4
July 17	23 14.70	-04 31.2	2.000	2.731	-0.09	-1.0	20.4	126.6
July 27	23 13.78	-04 41.2	1.915	2.741	-0.31	-2.5	20.2	136.4
Aug. 6	23 10.63	-05 05.7	1.846	2.752	-0.51	-3.7	20.0	146.9
Aug. 16	23 05.51	-05 43.0	1.798	2.763	-0.66	-4.6	19.8	157.9
Aug. 26	22 58.95	-06 29.2	1.775	2.774	-0.73	-5.0	19.6	169.3
Sept. 5	22 51.67	-07 19.5	1.778	2.786	-0.71	-4.9	19.4	179.0
Sept. 15	22 44.56	-08 08.1	1.808	2.798	-0.61	-4.2	19.7	167.4
Sept. 25	22 38.45	-08 49.6	1.865	2.811	-0.44	-3.1	20.0	156.0
Oct. 5	22 34.02	-09 20.3	1.946	2.824	-0.23	-1.8	20.2	144.9
Oct. 15	22 31.68	-09 37.8	2.048	2.837	-0.01	-0.4	20.4	134.4
Oct. 25	22 31.59	-09 41.4	2.168	2.851	+0.21	+1.0	20.6	124.4
Nov. 4	22 33.72	-09 31.6	2.301	2.864	+0.42	+2.3	20.8	115.0
Nov. 14	22 37.91	-09 08.9	2.444	2.879	+0.60	+3.4	21.0	106.0
Nov. 24	22 43.92	-08 34.8	2.593	2.893	+0.76	+4.4	21.2	97.5
Dec. 4	22 51.50	-07 50.4	2.745	2.908	+0.89	+5.3	21.3	89.4
Dec. 14	23 00.41	-06 57.0	2.898	2.923	+1.00	+6.1	21.4	81.6
Dec. 24	23 10.42	-05 55.6	3.049	2.938	+1.09	+6.8	21.5	74.2
Jan. 3	23 21.34	-04 47.6	3.196	2.953	+1.17	+7.4	21.6	66.9
Jan. 13	23 33.00	-03 33.9	3.337	2.968	+1.23	+7.8	21.7	59.9
Jan. 23	23 45.26	-02 15.7	3.470	2.984	+1.27	+8.2	21.7	53.0
Feb. 2	23 58.00	-00 54.0	3.594	2.999	+1.31	+8.4	21.8	46.3
Feb. 12	00 11.13	+00 30.4	3.707	3.015	+1.34	+8.6	21.8	39.8
Feb. 22	00 24.57	+01 56.4	3.808	3.031	+1.37	+8.7	21.8	33.3
Mar. 4	00 38.25	+03 23.2	3.896	3.046	+1.39	+8.7	21.8	27.0
Mar. 14	00 52.11	+04 49.9	3.971	3.062	+1.40	+8.6	21.7	20.7
Mar. 24	01 06.11	+06 15.7	4.032	3.078	+1.41	+8.4	21.7	14.6
Apr. 3	01 20.20	+07 40.0	4.079	3.094	+1.41	+8.2	21.6	8.5

Comet 125P/Spacewatch

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 16.96985 TT
Peri. = 87.22172 e = 0.5123292
Node = 153.18663 2000.0 a = 3.1279636 AU
Incl. = 9.98609 n = 0.17816055
q = 1.5254165 AU P = 5.53 years

m1 = 11.4 + 5 log(Delta) + 20.0 log(r(t-20))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	16 04.37	-14 00.8	2.087	1.576	+3.19	-5.0	17.3	46.2
Jan. 18	16 36.29	-14 50.9	2.018	1.554	+3.23	-2.9	17.0	48.6
Jan. 28	17 08.54	-15 19.7	1.955	1.538	+3.23	-0.7	16.8	51.0
Feb. 7	17 40.79	-15 26.2	1.898	1.529	+3.18	+1.5	16.6	53.3
Feb. 17	18 12.63	-15 10.8	1.847	1.525	+3.10	+3.6	16.5	55.6
Feb. 27	18 43.66	-14 35.1	1.800	1.529	+2.99	+5.3	16.4	58.1
Mar. 9	19 13.56	-13 41.8	1.757	1.538	+2.85	+6.7	16.3	60.7
Mar. 19	19 42.02	-12 34.4	1.717	1.554	+2.68	+7.7	16.3	63.5
Mar. 29	20 08.80	-11 16.9	1.678	1.576	+2.50	+8.3	16.3	66.7
Apr. 8	20 33.76	-09 53.4	1.639	1.604	+2.30	+8.5	16.3	70.1
Apr. 18	20 56.73	-08 28.2	1.599	1.636	+2.09	+8.3	16.4	73.9
Apr. 28	21 17.61	-07 05.1	1.557	1.673	+1.87	+7.7	16.5	78.2
May 8	21 36.28	-05 48.1	1.513	1.714	+1.63	+6.7	16.6	83.0
May 18	21 52.58	-04 40.9	1.467	1.758	+1.38	+5.4	16.7	88.4
May 28	22 06.34	-03 47.0	1.419	1.806	+1.10	+3.7	16.8	94.4
June 7	22 17.38	-03 10.0	1.371	1.856	+0.80	+1.7	17.0	101.1
June 17	22 25.43	-02 53.4	1.323	1.908	+0.49	-0.7	17.1	108.6
June 27	22 30.28	-03 00.3	1.278	1.962	+0.15	-3.3	17.3	117.0
July 7	22 31.79	-03 33.1	1.240	2.017	-0.19	-5.9	17.5	126.4
July 17	22 29.93	-04 32.2	1.212	2.073	-0.49	-8.3	17.7	136.7
July 27	22 25.06	-05 55.3	1.200	2.130	-0.72	-10.1	17.9	147.9
Aug. 6	22 17.83	-07 36.1	1.207	2.187	-0.85	-10.9	18.1	159.8
Aug. 16	22 09.28	-09 25.3	1.238	2.245	-0.86	-10.6	18.4	172.0
Aug. 26	22 00.70	-11 11.7	1.294	2.303	-0.75	-9.4	18.8	175.5
Sept. 5	21 53.22	-12 45.9	1.376	2.361	-0.55	-7.6	19.1	163.7
Sept.15	21 47.77	-14 01.7	1.483	2.419	-0.30	-5.5	19.5	152.3
Sept.25	21 44.80	-14 56.6	1.612	2.477	-0.04	-3.4	19.9	141.5
Oct. 5	21 44.43	-15 31.0	1.759	2.534	+0.21	-1.5	20.3	131.4
Oct. 15	21 46.53	-15 46.5	1.922	2.591	+0.43	+0.1	20.7	121.9
Oct. 25	21 50.82	-15 45.4	2.096	2.647	+0.61	+1.5	21.1	113.0
Nov. 4	21 56.96	-15 30.2	2.279	2.703	+0.77	+2.7	21.5	104.4
Nov. 14	22 04.66	-15 02.9	2.468	2.758	+0.89	+3.8	21.8	96.3
Nov. 24	22 13.59	-14 25.3	2.660	2.813	+0.99	+4.6	22.2	88.5
Dec. 4	22 23.50	-13 39.1	2.853	2.867	+1.07	+5.3	22.5	80.9
Dec. 14	22 34.20	-12 45.7	3.043	2.920	+1.13	+5.9	22.8	73.5
Dec. 24	22 45.47	-11 46.3	3.229	2.973	+1.17	+6.4	.	66.3
Jan. 3	22 57.19	-10 42.0	3.408	3.025	+1.20	+6.8	.	59.2
Jan. 13	23 09.24	-09 34.0	3.579	3.076	+1.23	+7.1	.	52.2
Jan. 23	23 21.50	-08 23.2	3.739	3.126	+1.24	+7.3	.	45.3
Feb. 2	23 33.89	-07 10.5	3.887	3.175	+1.25	+7.4	.	38.5
Feb. 12	23 46.36	-05 56.7	4.021	3.224	+1.25	+7.4	.	31.8
Feb. 22	23 58.83	-04 42.8	4.141	3.272	+1.24	+7.3	.	25.1
Mar. 4	00 11.26	-03 29.4	4.244	3.319	+1.23	+7.2	.	18.6
Mar. 14	00 23.60	-02 17.2	4.330	3.365	+1.22	+7.0	.	12.2
Mar. 24	00 35.80	-01 07.1	4.399	3.411	+1.20	+6.8	.	6.6
Apr. 3	00 47.83	+00 00.5	4.450	3.455	+1.18	+6.4	.	5.1

Comet 120P/Mueller

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 22.51668 TT
Peri. = 30.14607 e = 0.3394499
Node = 4.43387 2000.0 a = 4.1315434 AU
Incl. = 8.79483 n = 0.11736419
q = 2.7290914 AU P = 8.40 years

m1 = 4.4 + 5 log(Delta) + 30.0 log(r(t-50))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m ′	m1	Elong. °
Jan. 8	00 05.27	+03 32.1	2.829	2.743	+1.17	+9.0	20.0	74.9
Jan. 18	00 16.93	+05 02.1	2.949	2.738	+1.27	+9.5	20.1	68.0
Jan. 28	00 29.60	+06 36.9	3.064	2.733	+1.35	+9.8	20.1	61.4
Feb. 7	00 43.13	+08 15.4	3.174	2.731	+1.43	+10.1	20.1	55.0
Feb. 17	00 57.42	+09 56.5	3.276	2.729	+1.49	+10.2	20.2	48.8
Feb. 27	01 12.37	+11 39.0	3.371	2.729	+1.55	+10.3	20.2	42.9
Mar. 9	01 27.91	+13 21.7	3.457	2.731	+1.61	+10.2	20.2	37.1
Mar. 19	01 43.98	+15 03.7	3.533	2.733	+1.65	+10.0	20.2	31.4
Mar. 29	02 00.52	+16 43.9	3.600	2.737	+1.70	+9.7	20.3	25.9
Apr. 8	02 17.49	+18 21.2	3.657	2.742	+1.74	+9.4	20.3	20.5
Apr. 18	02 34.85	+19 54.9	3.704	2.749	+1.77	+8.9	20.3	15.3
Apr. 28	02 52.54	+21 23.9	3.741	2.757	+1.80	+8.4	20.4	10.4
May 8	03 10.54	+22 47.6	3.767	2.766	+1.82	+7.8	20.4	6.3
May 18	03 28.77	+24 05.3	3.782	2.776	+1.84	+7.1	20.4	5.2
May 28	03 47.18	+25 16.3	3.787	2.788	+1.85	+6.4	20.4	8.3
June 7	04 05.71	+26 20.4	3.781	2.801	+1.86	+5.7	20.5	12.9
June 17	04 24.27	+27 17.2	3.764	2.815	+1.85	+4.9	20.5	17.9
June 27	04 42.77	+28 06.5	3.737	2.830	+1.83	+4.2	20.5	23.1
July 7	05 01.11	+28 48.5	3.699	2.846	+1.81	+3.5	20.5	28.4
July 17	05 19.19	+29 23.3	3.651	2.863	+1.77	+2.8	20.6	33.9
July 27	05 36.88	+29 51.5	3.592	2.881	+1.72	+2.2	20.6	39.5
Aug. 6	05 54.05	+30 13.6	3.524	2.900	+1.65	+1.7	20.6	45.2
Aug. 16	06 10.57	+30 30.4	3.447	2.920	+1.57	+1.3	20.6	51.2
Aug. 26	06 26.28	+30 43.1	3.361	2.941	+1.48	+1.0	20.7	57.4
Sept. 5	06 41.03	+30 52.7	3.267	2.963	+1.36	+0.8	20.7	63.8
Sept.15	06 54.63	+31 00.7	3.166	2.986	+1.23	+0.8	20.7	70.5
Sept.25	07 06.90	+31 08.5	3.060	3.009	+1.07	+0.9	20.7	77.6
Oct. 5	07 17.63	+31 17.7	2.950	3.033	+0.89	+1.2	20.7	85.1
Oct. 15	07 26.56	+31 29.7	2.839	3.058	+0.69	+1.6	20.7	93.0
Oct. 25	07 33.48	+31 45.7	2.729	3.083	+0.46	+2.1	20.7	101.3
Nov. 4	07 38.13	+32 06.6	2.623	3.109	+0.21	+2.6	20.7	110.2
Nov. 14	07 40.26	+32 32.5	2.525	3.135	-0.05	+3.0	20.8	119.6
Nov. 24	07 39.76	+33 02.5	2.440	3.162	-0.32	+3.2	20.8	129.6
Dec. 4	07 36.58	+33 34.5	2.371	3.189	-0.56	+3.1	20.8	139.9
Dec. 14	07 30.95	+34 05.0	2.324	3.217	-0.76	+2.5	20.9	150.4
Dec. 24	07 23.38	+34 30.1	2.302	3.245	-0.87	+1.6	21.0	160.4
Jan. 3	07 14.64	+34 46.0	2.308	3.274	-0.89	+0.4	21.1	167.2
Jan. 13	07 05.71	+34 50.4	2.343	3.303	-0.81	-0.8	21.2	165.0
Jan. 23	06 57.61	+34 42.9	2.407	3.332	-0.65	-1.8	21.4	156.3
Feb. 2	06 51.13	+34 25.0	2.498	3.361	-0.43	-2.6	21.6	146.1
Feb. 12	06 46.84	+33 59.2	2.613	3.391	-0.19	-3.1	21.8	135.8
Feb. 22	06 44.95	+33 28.3	2.747	3.421	+0.05	-3.4	22.0	125.7
Mar. 4	06 45.47	+32 54.4	2.897	3.451	+0.28	-3.5	22.3	116.1
Mar. 14	06 48.24	+32 19.0	3.059	3.481	+0.48	-3.6	22.5	106.9
Mar. 24	06 52.99	+31 42.8	3.227	3.511	+0.65	-3.7	22.7	98.2
Apr. 3	06 59.46	+31 06.0	3.400	3.541	+0.79	-3.8	23.0	89.9

Comet 274P/Tombaugh-Tenagra

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 23.37802 TT
Peri. = 38.47103 e = 0.4399214
Node = 81.36155 2000.0 a = 4.3597675 AU
Incl. = 15.83716 n = 0.10827023
q = 2.4418125 AU P = 9.10 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	07 00.24	+33 24.4	1.494	2.465	-0.79	+7.5	17.3	168.3
Jan. 18	06 52.33	+34 39.8	1.510	2.456	-0.64	+5.7	17.3	159.5
Jan. 28	06 45.95	+35 37.0	1.552	2.449	-0.38	+3.9	17.4	149.1
Feb. 7	06 42.15	+36 15.8	1.615	2.445	-0.06	+2.2	17.5	138.7
Feb. 17	06 41.59	+36 38.2	1.697	2.442	+0.29	+0.9	17.6	128.9
Feb. 27	06 44.47	+36 47.1	1.793	2.442	+0.61	-0.2	17.7	119.8
Mar. 9	06 50.61	+36 44.8	1.901	2.444	+0.91	-1.2	17.8	111.4
Mar. 19	06 59.68	+36 32.7	2.016	2.448	+1.16	-2.1	18.0	103.5
Mar. 29	07 11.24	+36 11.6	2.136	2.454	+1.36	-3.0	18.1	96.3
Apr. 8	07 24.83	+35 41.6	2.259	2.462	+1.52	-3.9	18.2	89.5
Apr. 18	07 40.04	+35 02.8	2.384	2.473	+1.64	-4.8	18.4	83.1
Apr. 28	07 56.47	+34 15.2	2.509	2.485	+1.73	-5.6	18.5	77.1
May 8	08 13.76	+33 18.8	2.632	2.500	+1.79	-6.5	18.7	71.3
May 18	08 31.67	+32 13.6	2.754	2.516	+1.83	-7.3	18.8	65.9
May 28	08 49.92	+31 00.4	2.873	2.534	+1.84	-8.1	18.9	60.6
June 7	09 08.34	+29 39.4	2.989	2.554	+1.84	-8.8	19.1	55.5
June 17	09 26.78	+28 11.5	3.101	2.576	+1.83	-9.4	19.2	50.5
June 27	09 45.13	+26 37.6	3.207	2.599	+1.82	-9.9	19.4	45.6
July 7	10 03.30	+24 58.6	3.309	2.624	+1.79	-10.3	19.5	40.8
July 17	10 21.24	+23 15.4	3.404	2.651	+1.77	-10.6	19.6	36.0
July 27	10 38.91	+21 29.1	3.493	2.678	+1.74	-10.8	19.7	31.4
Aug. 6	10 56.29	+19 40.6	3.574	2.707	+1.71	-11.0	19.9	26.8
Aug. 16	11 13.38	+17 51.1	3.647	2.738	+1.68	-11.0	20.0	22.4
Aug. 26	11 30.16	+16 01.4	3.711	2.769	+1.65	-10.9	20.1	18.2
Sept. 5	11 46.64	+14 12.5	3.765	2.801	+1.62	-10.7	20.2	14.6
Sept. 15	12 02.82	+12 25.5	3.810	2.835	+1.59	-10.4	20.3	12.2
Sept. 25	12 18.68	+10 41.0	3.843	2.869	+1.55	-10.1	20.4	11.8
Oct. 5	12 34.23	+09 00.1	3.865	2.904	+1.52	-9.7	20.5	13.8
Oct. 15	12 49.44	+07 23.6	3.875	2.940	+1.48	-9.1	20.6	17.5
Oct. 25	13 04.29	+05 52.3	3.873	2.976	+1.45	-8.5	20.6	22.3
Nov. 4	13 18.75	+04 26.8	3.857	3.013	+1.40	-7.9	20.7	27.6
Nov. 14	13 32.76	+03 08.1	3.829	3.051	+1.35	-7.1	20.8	33.3
Nov. 24	13 46.25	+01 56.7	3.788	3.089	+1.29	-6.3	20.8	39.4
Dec. 4	13 59.15	+00 53.2	3.735	3.127	+1.22	-5.5	20.9	45.7
Dec. 14	14 11.34	-00 01.7	3.670	3.166	+1.14	-4.6	20.9	52.4
Dec. 24	14 22.72	-00 47.7	3.594	3.206	+1.04	-3.7	21.0	59.3
Jan. 3	14 33.15	-01 24.3	3.508	3.245	+0.93	-2.7	21.0	66.6
Jan. 13	14 42.46	-01 51.4	3.414	3.285	+0.80	-1.7	21.0	74.2
Jan. 23	14 50.49	-02 08.9	3.314	3.325	+0.66	-0.8	21.0	82.1
Feb. 2	14 57.05	-02 16.9	3.211	3.365	+0.49	+0.1	21.0	90.3
Feb. 12	15 01.94	-02 15.7	3.108	3.405	+0.31	+1.0	21.0	99.0
Feb. 22	15 05.02	-02 06.1	3.008	3.445	+0.11	+1.7	21.0	108.0
Mar. 4	15 06.13	-01 49.2	2.915	3.486	-0.09	+2.3	21.1	117.5
Mar. 14	15 05.23	-01 26.6	2.835	3.526	-0.29	+2.6	21.1	127.2
Mar. 24	15 02.38	-01 00.6	2.770	3.566	-0.46	+2.7	21.1	137.2
Apr. 3	14 57.74	-00 33.7	2.725	3.607	-0.61	+2.4	21.1	147.2

Comet C/2012 T5 (Bressi)

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 24.05468 TT
Peri. = 318.10357
Node = 230.59030 2000.0
Incl. = 72.07219
q = 0.3227278 AU
e = 1.0003088

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 42.02	-21 38.5	0.993	1.194	-2.02	-23.4	15.8	74.4
Jan. 18	00 21.83	-25 32.4	1.018	0.999	-2.07	-21.5	15.0	59.9
Jan. 28	00 01.09	-29 07.4	1.022	0.794	-2.85	-19.4	14.0	46.5
Feb. 7	23 32.55	-32 21.7	0.998	0.581	-5.05	-3.8	12.6	34.0
Feb. 17	22 42.00	-32 59.2	0.944	0.385	-6.37	+69.7	10.7	22.9
Feb. 27	21 38.25	-21 22.4	0.914	0.335	-1.58	+124.0	10.1	19.7
Mar. 9	21 22.41	-00 42.8	0.985	0.494	+1.06	+100.1	11.9	28.9
Mar. 19	21 33.02	+15 58.0	1.116	0.706	+1.64	+73.6	13.7	38.6
Mar. 29	21 49.43	+28 13.5	1.270	0.916	+1.69	+55.8	15.1	45.7
Apr. 8	22 06.35	+37 31.8	1.431	1.115	+1.57	+44.3	16.3	50.9
Apr. 18	22 22.09	+44 55.3	1.590	1.305	+1.38	+36.6	17.2	54.9
Apr. 28	22 35.88	+51 01.7	1.745	1.485	+1.13	+31.3	17.9	58.2
May 8	22 47.16	+56 14.7	1.891	1.658	+0.81	+27.4	18.6	61.1
May 18	22 55.24	+60 48.5	2.030	1.825	+0.39	+24.3	19.1	63.8
May 28	22 59.16	+64 51.1	2.159	1.985	-0.16	+21.5	19.6	66.5
June 7	22 57.58	+68 26.4	2.280	2.141	-0.91	+18.8	20.1	69.2
June 17	22 48.47	+71 34.3	2.393	2.292	-1.90	+15.6	20.5	72.0
June 27	22 29.44	+74 10.0	2.499	2.439	-3.09	+11.4	20.9	74.8
July 7	21 58.54	+76 04.3	2.599	2.583	-4.16	+6.1	21.2	77.8
July 17	21 16.93	+77 05.0	2.695	2.723	-4.54	-0.1	21.5	80.7
July 27	20 31.58	+77 03.8	2.788	2.860	-3.96	-5.9	21.8	83.7
Aug. 6	19 51.93	+76 04.7	2.879	2.994	-2.85	-10.3	22.1	86.5
Aug. 16	19 23.48	+74 21.3	2.972	3.126	-1.72	-13.2	22.3	89.2
Aug. 26	19 06.29	+72 09.6	3.066	3.255	-0.83	-14.7	22.6	91.6
Sept. 5	18 58.01	+69 42.2	3.165	3.382	-0.17	-15.4	22.8	93.6
Sept.15	18 56.26	+67 07.9	3.269	3.507	+0.29	-15.5	23.0	95.2
Sept.25	18 59.12	+64 33.1	3.381	3.630	+0.61	-15.1	.	96.2
Oct. 5	19 05.23	+62 02.2	3.500	3.751	+0.84	-14.3	.	96.7
Oct. 15	19 13.68	+59 38.9	3.629	3.870	+1.01	-13.3	.	96.5
Oct. 25	19 23.78	+57 25.9	3.766	3.988	+1.13	-12.1	.	95.6
Nov. 4	19 35.05	+55 25.2	3.911	4.104	+1.21	-10.7	.	94.1
Nov. 14	19 47.16	+53 38.4	4.065	4.219	+1.27	-9.2	.	92.1
Nov. 24	19 59.82	+52 06.4	4.226	4.332	+1.30	-7.7	.	89.5
Dec. 4	20 12.84	+50 49.8	4.392	4.444	+1.32	-6.1	.	86.6
Dec. 14	20 26.04	+49 48.8	4.563	4.554	+1.32	-4.6	.	83.3
Dec. 24	20 39.29	+49 03.2	4.736	4.664	+1.32	-3.1	.	79.8
Jan. 3	20 52.49	+48 32.5	4.910	4.772	+1.30	-1.6	.	76.2
Jan. 13	21 05.53	+48 16.1	5.083	4.879	+1.28	-0.3	.	72.6
Jan. 23	21 18.33	+48 13.0	5.252	4.985	+1.25	+0.9	.	69.0
Feb. 2	21 30.83	+48 22.4	5.416	5.090	+1.21	+2.1	.	65.7
Feb. 12	21 42.96	+48 43.4	5.574	5.194	+1.17	+3.1	.	62.6
Feb. 22	21 54.65	+49 14.7	5.724	5.297	+1.12	+4.1	.	59.9
Mar. 4	22 05.84	+49 55.5	5.864	5.399	+1.06	+4.9	.	57.7
Mar. 14	22 16.46	+50 44.7	5.994	5.500	+1.00	+5.6	.	56.0
Mar. 24	22 26.44	+51 41.2	6.112	5.601	+0.93	+6.3	.	55.1
Apr. 3	22 35.70	+52 44.0	6.218	5.700	+0.84	+6.8	.	54.8

Comet P/2007 T2 (Kowalski)

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 25.55561 TT
Peri. = 358.64956 e = 0.7751409
Node = 3.93522 2000.0 a = 3.0890678 AU
Incl. = 9.89313 n = 0.18153607
q = 0.6946050 AU P = 5.43 years

m1 = 19.2 + 5 log(Delta) + 7.5 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	19 09.16	-27 38.6	2.056	1.081	-2.23	-6.0	22.0	63.0/ 81	5.6
Jan. 18	19 55.19	-25 30.4	1.942	0.966	-2.52	-10.4	21.5	70.5/ 76	5.0
Jan. 28	20 44.37	-22 06.1	1.839	0.859	-2.77	-15.9	21.1	78.2/ 71	3.9
Feb. 7	21 35.84	-17 17.1	1.752	0.770	-2.96	-21.8	20.7	85.1/ 66	3.7
Feb. 17	22 28.59	-11 07.2	1.684	0.712	-3.08	-27.3	20.2	89.8/ 63	6.6
Feb. 27	23 21.70	-03 58.4	1.639	0.695	-3.12	-30.6	19.8	91.1/ 61	11.3
Mar. 9	00 14.57	+03 31.1	1.620	0.725	-3.10	-30.9	19.4	88.8/ 61	16.4
Mar. 19	01 06.87	+10 38.4	1.633	0.793	-3.06	-28.3	19.2	83.5/ 62	21.3
Mar. 29	01 58.24	+16 49.0	1.679	0.888	-2.98	-23.7	19.1	76.5/ 65	25.5
Apr. 8	02 48.14	+21 43.8	1.757	0.998	-2.85	-18.3	19.4	69.0/ 70	28.5
Apr. 18	03 35.80	+25 19.0	1.861	1.115	-2.65	-13.0	19.8	61.6/ 74	30.2
Apr. 28	04 20.49	+27 41.4	1.986	1.235	-2.41	-8.5	20.3	55.0/ 79	30.9
May 8	05 01.73	+29 03.4	2.125	1.355	-2.14	-4.9	20.8	49.4/ 84	30.4
May 18	05 39.39	+29 38.3	2.273	1.473	-1.87	-2.2	21.3	44.5/ 88	29.1
May 28	06 13.57	+29 38.2	2.424	1.589	-1.61	-0.3	21.8	40.5/ 92	27.0
June 7	06 44.54	+29 12.5	2.576	1.703	-1.39	+1.0	22.2	37.2/ 95	24.3
June 17	07 12.66	+28 28.6	2.725	1.814	-1.19	+1.8	22.6	34.4/ 98	21.0
June 27	07 38.27	+27 32.0	2.867	1.922	-1.02	+2.3	23.0	32.0/100	17.4
July 7	08 01.70	+26 26.7	3.001	2.027	-0.87	+2.6	.	29.9/103	13.5
July 17	08 23.25	+25 15.6	3.124	2.129	-0.75	+2.8	.	28.1/104	9.6
July 27	08 43.14	+24 01.0	3.235	2.228	-0.65	+2.8	.	26.5/106	6.3
Aug. 6	09 01.58	+22 44.5	3.332	2.325	-0.56	+2.8	.	25.0/107	6.0
Aug. 16	09 18.71	+21 27.6	3.413	2.419	-0.49	+2.7	.	23.6/108	9.4
Aug. 26	09 34.65	+20 11.5	3.478	2.511	-0.43	+2.7	.	22.2/109	14.4
Sept. 5	09 49.48	+18 57.1	3.525	2.601	-0.38	+2.6	.	20.9/110	20.0
Sept.15	10 03.26	+17 45.5	3.555	2.688	-0.34	+2.5	.	19.5/110	26.0
Sept.25	10 16.01	+16 37.5	3.567	2.773	-0.30	+2.4	.	18.0/110	32.4
Oct. 5	10 27.72	+15 34.1	3.560	2.855	-0.27	+2.3	.	16.5/110	39.1
Oct. 15	10 38.37	+14 36.3	3.537	2.936	-0.25	+2.3	.	14.8/110	46.2
Oct. 25	10 47.88	+13 45.1	3.496	3.015	-0.23	+2.2	.	12.9/110	53.6
Nov. 4	10 56.18	+13 01.5	3.441	3.091	-0.21	+2.2	.	10.8/109	61.4
Nov. 14	11 03.13	+12 26.8	3.372	3.166	-0.20	+2.2	.	8.4/107	69.6
Nov. 24	11 08.61	+12 02.1	3.293	3.239	-0.20	+2.3	.	5.8/104	78.2
Dec. 4	11 12.43	+11 48.4	3.206	3.311	-0.20	+2.4	.	2.9/ 93	87.4
Dec. 14	11 14.43	+11 46.8	3.116	3.380	-0.20	+2.5	.	1.1/ 1	97.0
Dec. 24	11 14.44	+11 57.7	3.027	3.448	-0.21	+2.6	.	3.9/307	107.2
Jan. 3	11 12.34	+12 21.2	2.945	3.515	-0.23	+2.7	.	7.2/299	117.9
Jan. 13	11 08.08	+12 56.3	2.876	3.580	-0.25	+2.9	.	10.2/296	129.2
Jan. 23	11 01.78	+13 40.8	2.826	3.643	-0.28	+3.1	.	12.8/294	140.9
Feb. 2	10 53.71	+14 31.6	2.800	3.705	-0.31	+3.2	.	14.5/292	152.9
Feb. 12	10 44.38	+15 24.0	2.804	3.765	-0.33	+3.3	.	15.2/289	164.7
Feb. 22	10 34.45	+16 13.6	2.840	3.824	-0.35	+3.3	.	14.7/287	173.2
Mar. 4	10 24.64	+16 56.2	2.910	3.882	-0.37	+3.2	.	13.3/285	166.9
Mar. 14	10 15.67	+17 28.8	3.011	3.938	-0.37	+3.1	.	11.0/281	155.6
Mar. 24	10 08.09	+17 50.2	3.142	3.993	-0.37	+2.9	.	8.4/277	144.2
Apr. 3	10 02.23	+18 00.3	3.297	4.047	-0.36	+2.7	.	5.7/270	133.1

Comet 272P/NEAT

Epoch = 2013 July 7.0 TT
T = 2013 Feb. 27.20668 TT
Peri. = 27.90109 e = 0.4556971
Node = 109.50311 2000.0 a = 4.4400919 AU
Incl. = 18.10171 n = 0.10534554
q = 2.4167549 AU P = 9.36 years

m1 = 9.2 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	08 55.91	+23 39.0	1.509	2.446	-0.46	+12.5	17.9	157.1
Jan. 18	08 51.32	+25 44.3	1.466	2.435	-0.60	+12.4	17.8	167.1
Jan. 28	08 45.33	+27 48.5	1.451	2.427	-0.63	+11.3	17.7	170.4
Feb. 7	08 39.02	+29 41.0	1.462	2.421	-0.54	+9.2	17.7	162.5
Feb. 17	08 33.63	+31 13.3	1.500	2.418	-0.34	+6.8	17.7	152.1
Feb. 27	08 30.24	+32 21.1	1.561	2.417	-0.07	+4.3	17.8	141.6
Mar. 9	08 29.54	+33 04.1	1.641	2.418	+0.23	+2.0	17.9	131.7
Mar. 19	08 31.84	+33 24.0	1.736	2.421	+0.53	0.0	18.1	122.5
Mar. 29	08 37.09	+33 23.6	1.843	2.427	+0.79	-1.8	18.2	114.0
Apr. 8	08 44.99	+33 05.8	1.959	2.435	+1.02	-3.3	18.4	106.1
Apr. 18	08 55.16	+32 32.6	2.081	2.445	+1.20	-4.6	18.6	98.8
Apr. 28	09 07.18	+31 46.2	2.206	2.457	+1.35	-5.8	18.7	92.1
May 8	09 20.63	+30 47.9	2.333	2.472	+1.46	-6.9	18.9	85.7
May 18	09 35.20	+29 39.0	2.461	2.488	+1.54	-7.8	19.1	79.7
May 28	09 50.57	+28 20.9	2.589	2.507	+1.59	-8.6	19.2	74.0
June 7	10 06.48	+26 54.6	2.715	2.527	+1.63	-9.3	19.4	68.5
June 17	10 22.78	+25 21.3	2.839	2.549	+1.65	-9.9	19.6	63.3
June 27	10 39.29	+23 42.2	2.960	2.573	+1.66	-10.4	19.8	58.2
July 7	10 55.91	+21 58.4	3.078	2.599	+1.67	-10.7	19.9	53.2
July 17	11 12.57	+20 11.0	3.191	2.626	+1.66	-11.0	20.1	48.3
July 27	11 29.19	+18 21.2	3.298	2.655	+1.66	-11.1	20.3	43.4
Aug. 6	11 45.76	+16 30.0	3.400	2.685	+1.65	-11.2	20.4	38.7
Aug. 16	12 02.24	+14 38.4	3.495	2.716	+1.64	-11.1	20.6	34.0
Aug. 26	12 18.61	+12 47.6	3.583	2.748	+1.63	-10.9	20.8	29.4
Sept. 5	12 34.87	+10 58.5	3.663	2.782	+1.61	-10.7	20.9	25.0
Sept. 15	12 51.01	+09 12.0	3.734	2.816	+1.60	-10.3	21.1	20.8
Sept. 25	13 07.00	+07 29.0	3.795	2.852	+1.59	-9.9	21.2	17.1
Oct. 5	13 22.85	+05 50.4	3.846	2.888	+1.57	-9.3	21.3	14.4
Oct. 15	13 38.53	+04 16.9	3.885	2.925	+1.55	-8.7	21.5	13.5
Oct. 25	13 54.01	+02 49.4	3.913	2.963	+1.53	-8.1	21.6	14.9
Nov. 4	14 09.27	+01 28.5	3.928	3.001	+1.50	-7.4	21.7	18.1
Nov. 14	14 24.23	+00 15.0	3.931	3.040	+1.46	-6.6	21.8	22.5
Nov. 24	14 38.86	-00 50.8	3.920	3.080	+1.42	-5.7	21.9	27.6
Dec. 4	14 53.08	-01 48.2	3.897	3.119	+1.37	-4.9	22.0	33.2
Dec. 14	15 06.79	-02 36.8	3.860	3.160	+1.31	-4.0	22.1	39.3
Dec. 24	15 19.90	-03 16.5	3.811	3.200	+1.24	-3.1	22.2	45.6
Jan. 3	15 32.29	-03 47.0	3.749	3.241	+1.15	-2.1	22.3	52.2
Jan. 13	15 43.83	-04 08.3	3.677	3.282	+1.05	-1.2	22.4	59.1
Jan. 23	15 54.36	-04 20.6	3.595	3.324	+0.94	-0.3	22.4	66.3
Feb. 2	16 03.75	-04 24.0	3.505	3.365	+0.80	+0.5	22.5	73.8
Feb. 12	16 11.79	-04 19.1	3.409	3.407	+0.65	+1.2	22.5	81.6
Feb. 22	16 18.34	-04 06.7	3.309	3.449	+0.49	+1.9	22.6	89.7
Mar. 4	16 23.21	-03 47.6	3.209	3.491	+0.30	+2.4	22.6	98.1
Mar. 14	16 26.26	-03 23.2	3.113	3.532	+0.11	+2.8	22.6	106.9
Mar. 24	16 27.38	-02 55.1	3.023	3.574	-0.09	+3.0	22.7	116.0
Apr. 3	16 26.53	-02 25.4	2.944	3.616	-0.28	+2.9	22.7	125.4

Comet 91P/Russell

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 1.12715 TT
Peri. = 354.63625 e = 0.3290758
Node = 247.87076 2000.0 a = 3.9002418 AU
Incl. = 14.07540 n = 0.12795780
q = 2.6167666 AU P = 7.70 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	16 05.29	-24 37.4	3.257	2.636	+1.86	-2.1	18.9	43.7
Jan. 18	16 23.87	-24 58.3	3.157	2.629	+1.81	-1.1	18.8	49.7
Jan. 28	16 41.97	-25 09.0	3.050	2.624	+1.75	-0.1	18.7	55.7
Feb. 7	16 59.43	-25 09.6	2.936	2.620	+1.66	+1.0	18.6	61.9
Feb. 17	17 16.03	-25 00.1	2.817	2.618	+1.55	+1.9	18.5	68.3
Feb. 27	17 31.56	-24 40.8	2.695	2.617	+1.42	+2.9	18.4	74.8
Mar. 9	17 45.79	-24 12.3	2.570	2.617	+1.27	+3.7	18.3	81.6
Mar. 19	17 58.48	-23 35.3	2.445	2.619	+1.09	+4.5	18.2	88.7
Mar. 29	18 09.36	-22 50.6	2.321	2.622	+0.88	+5.1	18.1	96.1
Apr. 8	18 18.20	-21 59.3	2.200	2.627	+0.65	+5.7	18.0	103.9
Apr. 18	18 24.72	-21 02.4	2.085	2.633	+0.40	+6.1	17.9	112.2
Apr. 28	18 28.73	-20 01.0	1.978	2.640	+0.14	+6.5	17.8	120.9
May 8	18 30.09	-18 56.5	1.884	2.649	-0.13	+6.6	17.7	130.1
May 18	18 28.78	-17 50.3	1.805	2.659	-0.38	+6.6	17.7	139.9
May 28	18 25.00	-16 44.3	1.745	2.671	-0.58	+6.4	17.6	150.0
June 7	18 19.21	-15 40.8	1.707	2.683	-0.71	+5.9	17.6	160.1
June 17	18 12.11	-14 42.1	1.693	2.697	-0.75	+5.1	17.6	168.7
June 27	18 04.63	-13 50.9	1.706	2.712	-0.70	+4.2	17.7	169.5
July 7	17 57.67	-13 09.2	1.745	2.728	-0.56	+3.1	17.7	161.5
July 17	17 52.08	-12 38.3	1.808	2.745	-0.36	+2.0	17.9	151.7
July 27	17 48.44	-12 18.0	1.894	2.764	-0.14	+1.1	18.0	141.8
Aug. 6	17 47.04	-12 07.4	1.998	2.783	+0.09	+0.3	18.2	132.2
Aug. 16	17 47.99	-12 04.6	2.118	2.803	+0.32	-0.3	18.3	123.1
Aug. 26	17 51.20	-12 07.3	2.251	2.824	+0.53	-0.6	18.5	114.5
Sept. 5	17 56.48	-12 13.3	2.392	2.846	+0.71	-0.7	18.7	106.4
Sept. 15	18 03.62	-12 20.5	2.541	2.869	+0.88	-0.6	18.9	98.6
Sept. 25	18 12.38	-12 26.8	2.693	2.893	+1.01	-0.4	19.1	91.2
Oct. 5	18 22.51	-12 30.7	2.847	2.917	+1.13	0.0	19.2	84.0
Oct. 15	18 33.82	-12 30.7	3.001	2.942	+1.23	+0.5	19.4	77.0
Oct. 25	18 46.08	-12 25.7	3.152	2.968	+1.30	+1.1	19.6	70.3
Nov. 4	18 59.13	-12 15.0	3.299	2.994	+1.37	+1.7	19.7	63.6
Nov. 14	19 12.79	-11 57.8	3.441	3.020	+1.41	+2.4	19.9	57.1
Nov. 24	19 26.92	-11 33.7	3.575	3.048	+1.45	+3.1	20.0	50.7
Dec. 4	19 41.38	-11 02.7	3.701	3.075	+1.47	+3.8	20.2	44.4
Dec. 14	19 56.05	-10 24.5	3.816	3.103	+1.48	+4.5	20.3	38.2
Dec. 24	20 10.81	-09 39.5	3.921	3.132	+1.48	+5.2	20.4	32.1
Jan. 3	20 25.59	-08 47.7	4.013	3.160	+1.47	+5.8	20.5	26.2
Jan. 13	20 40.28	-07 49.8	4.092	3.189	+1.45	+6.4	20.6	20.5
Jan. 23	20 54.80	-06 46.0	4.157	3.219	+1.43	+6.9	20.7	15.3
Feb. 2	21 09.09	-05 37.1	4.208	3.248	+1.40	+7.4	20.8	11.5
Feb. 12	21 23.09	-04 23.6	4.244	3.278	+1.36	+7.7	20.9	10.5
Feb. 22	21 36.73	-03 06.2	4.264	3.308	+1.32	+8.1	20.9	13.0
Mar. 4	21 49.97	-01 45.6	4.270	3.338	+1.28	+8.3	21.0	17.6
Mar. 14	22 02.74	-00 22.6	4.260	3.368	+1.23	+8.5	21.1	23.1
Mar. 24	22 15.00	+01 02.2	4.235	3.398	+1.17	+8.6	21.1	29.1
Apr. 3	22 26.69	+02 28.0	4.196	3.429	+1.11	+8.6	21.1	35.3

Comet C/2011 L4 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 10.16790 TT
Peri. = 333.65273
Node = 65.66692 2000.0
Incl. = 84.20702
q = 0.3015660 AU
e = 1.0000264

m1 = 6.2 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	17 36.65	-40 44.7	2.259	1.466	+3.46	-12.9	9.2	28.0
Jan. 18	18 11.24	-42 53.8	2.009	1.283	+4.65	-11.6	8.5	31.8
Jan. 28	18 57.73	-44 50.2	1.751	1.090	+6.49	-4.5	7.7	34.3
Feb. 7	20 02.68	-45 35.6	1.499	0.886	+8.77	+18.1	6.7	34.6
Feb. 17	21 30.38	-42 34.1	1.276	0.670	+9.73	+69.3	5.4	31.3
Feb. 27	23 07.69	-31 01.6	1.126	0.451	+7.03	137.1	3.9	23.5
Mar. 9	00 18.01	-08 11.0	1.105	0.304	+1.73	144.4	2.5	15.5
Mar. 19	00 35.29	+15 53.0	1.170	0.404	-0.27	+99.8	3.6	19.4
Mar. 29	00 32.63	+32 31.3	1.251	0.618	-0.46	+74.6	5.1	29.2
Apr. 8	00 28.06	+44 56.9	1.334	0.836	-0.51	+62.3	6.2	38.8
Apr. 18	00 22.93	+55 19.9	1.417	1.043	-0.80	+55.5	7.1	47.3
Apr. 28	00 14.98	+64 35.2	1.502	1.238	-1.72	+50.9	7.8	55.0
May 8	23 57.83	+73 03.8	1.592	1.423	-5.13	+45.6	8.4	61.6
May 18	23 06.55	+80 39.6	1.691	1.600	-21.76	+27.4	8.9	67.3
May 28	19 29.00	+85 13.8	1.801	1.770	-22.92	-22.3	9.3	71.8
June 7	15 39.81	+81 30.4	1.924	1.934	-5.25	-36.9	9.8	75.3
June 17	14 47.34	+75 21.0	2.061	2.092	-1.42	-36.4	10.2	77.5
June 27	14 33.15	+69 16.8	2.211	2.245	-0.27	-34.0	10.6	78.7
July 7	14 30.48	+63 36.8	2.374	2.394	+0.23	-31.2	10.9	78.8
July 17	14 32.81	+58 24.6	2.548	2.539	+0.50	-28.4	11.3	78.0
July 27	14 37.80	+53 41.1	2.731	2.681	+0.66	-25.6	11.6	76.4
Aug. 6	14 44.36	+49 25.2	2.921	2.819	+0.76	-23.0	11.9	74.2
Aug. 16	14 51.99	+45 35.5	3.116	2.955	+0.83	-20.5	12.2	71.5
Aug. 26	15 00.34	+42 10.5	3.312	3.088	+0.89	-18.2	12.5	68.5
Sept. 5	15 09.20	+39 08.5	3.508	3.218	+0.92	-16.0	12.7	65.2
Sept.15	15 18.45	+36 28.0	3.701	3.346	+0.95	-14.0	13.0	61.9
Sept.25	15 27.94	+34 07.7	3.888	3.472	+0.97	-12.1	13.2	58.5
Oct. 5	15 37.61	+32 06.3	4.068	3.595	+0.98	-10.3	13.4	55.4
Oct. 15	15 47.37	+30 23.0	4.239	3.717	+0.98	-8.6	13.6	52.5
Oct. 25	15 57.13	+28 56.8	4.399	3.837	+0.97	-7.0	13.8	50.1
Nov. 4	16 06.82	+27 46.9	4.545	3.956	+0.95	-5.4	14.0	48.3
Nov. 14	16 16.36	+26 53.0	4.678	4.073	+0.93	-3.9	14.1	47.3
Nov. 24	16 25.67	+26 14.3	4.795	4.188	+0.90	-2.4	14.3	47.2
Dec. 4	16 34.65	+25 50.5	4.897	4.302	+0.86	-0.9	14.4	48.1
Dec. 14	16 43.22	+25 41.0	4.983	4.414	+0.80	+0.4	14.5	49.9
Dec. 24	16 51.25	+25 45.3	5.053	4.525	+0.74	+1.8	14.6	52.7
Jan. 3	16 58.66	+26 03.0	5.108	4.635	+0.67	+3.0	14.7	56.3
Jan. 13	17 05.31	+26 33.3	5.149	4.744	+0.58	+4.2	14.8	60.6
Jan. 23	17 11.08	+27 15.3	5.177	4.851	+0.48	+5.3	14.9	65.4
Feb. 2	17 15.84	+28 08.1	5.195	4.958	+0.36	+6.2	15.0	70.7
Feb. 12	17 19.45	+29 10.2	5.204	5.063	+0.23	+7.0	15.1	76.4
Feb. 22	17 21.77	+30 19.9	5.207	5.167	+0.09	+7.5	15.1	82.3
Mar. 4	17 22.68	+31 35.2	5.208	5.271	-0.06	+7.8	15.2	88.2
Mar. 14	17 22.07	+32 53.5	5.209	5.373	-0.22	+7.8	15.3	94.1
Mar. 24	17 19.88	+34 11.8	5.215	5.475	-0.38	+7.5	15.3	99.9
Apr. 3	17 16.08	+35 26.8	5.227	5.575	-0.54	+6.8	15.4	105.3

Comet P/2006 S1 (Christensen)

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 17.00633 TT
Peri. = 128.30565 e = 0.6110234
Node = 213.47810 2000.0 a = 3.4954185 AU
Incl. = 11.88866 n = 0.15081874
q = 1.3596360 AU P = 6.54 years

m1 = 17.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	19 25.39	-14 43.7	2.530	1.562	-1.48	-3.5	22.1	46.6/ 81	7.8
Jan. 18	19 56.92	-13 23.9	2.482	1.511	-1.56	-4.4	21.9	48.4/ 79	7.2
Jan. 28	20 29.21	-11 42.0	2.438	1.466	-1.63	-5.2	21.6	50.0/ 77	7.2
Feb. 7	21 02.07	-09 39.0	2.399	1.428	-1.69	-6.0	21.4	51.3/ 75	7.6
Feb. 17	21 35.29	-07 17.5	2.369	1.397	-1.73	-6.6	21.3	52.2/ 73	8.1
Feb. 27	22 08.66	-04 41.2	2.346	1.375	-1.76	-7.0	21.1	52.7/ 72	8.6
Mar. 9	22 42.03	-01 54.7	2.334	1.363	-1.77	-7.2	21.1	52.7/ 71	9.2
Mar. 19	23 15.25	+00 56.6	2.330	1.360	-1.77	-7.0	21.0	52.2/ 71	9.8
Mar. 29	23 48.19	+03 47.3	2.336	1.367	-1.75	-6.6	21.1	51.3/ 71	10.5
Apr. 8	00 20.73	+06 32.2	2.350	1.383	-1.72	-6.0	21.2	50.1/ 72	11.5
Apr. 18	00 52.79	+09 06.8	2.371	1.408	-1.67	-5.1	21.3	48.5/ 72	12.7
Apr. 28	01 24.23	+11 27.2	2.397	1.442	-1.61	-4.2	21.5	46.7/ 74	14.2
May 8	01 54.98	+13 30.8	2.427	1.483	-1.55	-3.2	21.7	44.8/ 76	16.0
May 18	02 24.93	+15 15.8	2.459	1.530	-1.47	-2.2	21.9	42.7/ 77	18.2
May 28	02 53.95	+16 41.5	2.490	1.583	-1.39	-1.2	22.2	40.7/ 80	20.7
June 7	03 21.95	+17 47.7	2.520	1.641	-1.31	-0.4	22.4	38.6/ 82	23.5
June 17	03 48.82	+18 35.0	2.547	1.702	-1.22	+0.3	22.7	36.5/ 84	26.7
June 27	04 14.45	+19 04.3	2.568	1.766	-1.14	+1.0	23.0	34.5/ 87	30.3
July 7	04 38.77	+19 17.1	2.583	1.832	-1.05	+1.5	.	32.4/ 89	34.1
July 17	05 01.68	+19 14.6	2.590	1.900	-0.98	+1.9	.	30.4/ 92	38.3
July 27	05 23.11	+18 58.7	2.589	1.969	-0.91	+2.2	.	28.4/ 95	42.9
Aug. 6	05 42.98	+18 30.9	2.578	2.040	-0.84	+2.3	.	26.2/ 98	47.8
Aug. 16	06 01.21	+17 52.8	2.558	2.110	-0.79	+2.5	.	24.1/101	53.0
Aug. 26	06 17.70	+17 06.2	2.528	2.181	-0.74	+2.5	.	21.8/104	58.7
Sept. 5	06 32.39	+16 12.6	2.489	2.252	-0.71	+2.5	.	19.3/107	64.8
Sept.15	06 45.11	+15 13.7	2.441	2.323	-0.68	+2.4	.	16.7/112	71.3
Sept.25	06 55.75	+14 11.1	2.385	2.394	-0.66	+2.3	.	13.8/118	78.4
Oct. 5	07 04.13	+13 06.4	2.323	2.464	-0.66	+2.2	.	10.8/127	86.0
Oct. 15	07 10.05	+12 01.5	2.258	2.533	-0.67	+2.1	.	8.0/142	94.1
Oct. 25	07 13.36	+10 58.2	2.193	2.602	-0.68	+1.9	.	6.0/173	102.9
Nov. 4	07 13.89	+09 58.8	2.131	2.671	-0.72	+1.7	.	6.3/213	112.4
Nov. 14	07 11.56	+09 05.5	2.077	2.738	-0.76	+1.6	.	8.7/239	122.4
Nov. 24	07 06.49	+08 20.7	2.037	2.805	-0.81	+1.4	.	11.6/253	133.0
Dec. 4	06 59.01	+07 46.7	2.015	2.871	-0.85	+1.3	.	14.0/261	143.8
Dec. 14	06 49.71	+07 25.2	2.018	2.936	-0.89	+1.2	.	15.2/267	154.3
Dec. 24	06 39.49	+07 17.1	2.048	3.000	-0.92	+1.1	.	15.2/272	162.3
Jan. 3	06 29.30	+07 21.8	2.108	3.063	-0.93	+1.1	.	13.8/277	163.4
Jan. 13	06 20.11	+07 37.8	2.198	3.125	-0.91	+1.0	.	11.4/283	156.8
Jan. 23	06 12.64	+08 02.7	2.315	3.187	-0.88	+1.0	.	8.5/292	147.1
Feb. 2	06 07.32	+08 33.6	2.458	3.247	-0.83	+1.0	.	5.6/308	136.9
Feb. 12	06 04.34	+09 08.0	2.621	3.307	-0.78	+1.0	.	3.7/344	126.7
Feb. 22	06 03.64	+09 43.4	2.800	3.366	-0.73	+1.0	.	4.0/ 31	117.0
Mar. 4	06 05.05	+10 18.0	2.990	3.424	-0.68	+1.0	.	5.8/ 56	107.7
Mar. 14	06 08.33	+10 50.3	3.188	3.481	-0.63	+1.0	.	7.8/ 68	98.7
Mar. 24	06 13.23	+11 19.1	3.389	3.537	-0.58	+1.0	.	9.5/ 75	90.2
Apr. 3	06 19.48	+11 43.7	3.590	3.592	-0.54	+1.0	.	11.0/ 79	82.1

Comet 256P/LINEAR

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 17.32433 TT
Peri. = 124.10802 e = 0.4189415
Node = 81.44674 2000.0 a = 4.6292917 AU
Incl. = 27.63653 n = 0.09895375
q = 2.6898893 AU P = 9.96 years

m1 = 11.6 + 5 log(Delta) + 12.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	14 36.23	+12 06.3	2.781	2.729	+1.30	-2.0	19.3	76.8
Jan. 18	14 49.20	+11 45.9	2.660	2.719	+1.17	-0.9	19.2	82.9
Jan. 28	15 00.94	+11 36.6	2.539	2.710	+1.02	+0.1	19.0	89.2
Feb. 7	15 11.18	+11 38.0	2.419	2.702	+0.85	+1.1	18.9	95.7
Feb. 17	15 19.65	+11 49.1	2.303	2.697	+0.64	+1.9	18.8	102.6
Feb. 27	15 26.06	+12 08.1	2.192	2.693	+0.41	+2.4	18.7	109.7
Mar. 9	15 30.14	+12 32.3	2.089	2.690	+0.15	+2.6	18.6	117.1
Mar. 19	15 31.65	+12 57.8	1.995	2.690	-0.12	+2.2	18.5	124.7
Mar. 29	15 30.47	+13 19.5	1.915	2.691	-0.38	+1.2	18.4	132.3
Apr. 8	15 26.67	+13 31.4	1.852	2.694	-0.61	-0.4	18.3	139.6
Apr. 18	15 20.57	+13 27.2	1.808	2.698	-0.78	-2.6	18.3	145.9
Apr. 28	15 12.78	+13 01.1	1.785	2.705	-0.86	-5.1	18.3	150.1
May 8	15 04.16	+12 10.0	1.787	2.713	-0.85	-7.7	18.3	150.8
May 18	14 55.66	+10 53.1	1.812	2.722	-0.75	-10.0	18.3	147.8
May 28	14 48.20	+09 13.2	1.862	2.733	-0.58	-11.8	18.4	142.1
June 7	14 42.44	+07 15.1	1.934	2.746	-0.36	-13.1	18.5	134.9
June 17	14 38.81	+05 04.1	2.026	2.760	-0.13	-13.8	18.6	127.1
June 27	14 37.47	+02 45.6	2.134	2.776	+0.09	-14.2	18.8	119.2
July 7	14 38.37	+00 23.9	2.257	2.793	+0.30	-14.2	18.9	111.4
July 17	14 41.39	-01 57.8	2.391	2.812	+0.49	-13.9	19.1	103.8
July 27	14 46.33	-04 17.1	2.532	2.832	+0.66	-13.5	19.3	96.4
Aug. 6	14 52.96	-06 32.5	2.679	2.853	+0.81	-13.1	19.4	89.3
Aug. 16	15 01.11	-08 43.0	2.829	2.875	+0.95	-12.5	19.6	82.3
Aug. 26	15 10.57	-10 48.0	2.980	2.899	+1.06	-11.9	19.7	75.6
Sept. 5	15 21.20	-12 46.8	3.130	2.923	+1.17	-11.2	19.9	68.9
Sept.15	15 32.85	-14 39.2	3.277	2.949	+1.25	-10.6	20.0	62.4
Sept.25	15 45.39	-16 24.9	3.418	2.976	+1.33	-9.9	20.2	56.0
Oct. 5	15 58.73	-18 03.6	3.553	3.004	+1.40	-9.2	20.3	49.6
Oct. 15	16 12.75	-19 35.1	3.680	3.032	+1.46	-8.4	20.5	43.3
Oct. 25	16 27.36	-20 59.3	3.798	3.062	+1.51	-7.7	20.6	36.9
Nov. 4	16 42.48	-22 16.1	3.904	3.092	+1.55	-6.9	20.7	30.6
Nov. 14	16 58.00	-23 25.5	3.998	3.123	+1.58	-6.2	20.8	24.2
Nov. 24	17 13.83	-24 27.6	4.079	3.154	+1.61	-5.5	20.9	17.9
Dec. 4	17 29.89	-25 22.4	4.146	3.186	+1.62	-4.8	21.0	11.6
Dec. 14	17 46.07	-26 10.3	4.197	3.219	+1.62	-4.1	21.1	5.6
Dec. 24	18 02.27	-26 51.8	4.233	3.253	+1.61	-3.5	21.1	3.8
Jan. 3	18 18.38	-27 27.2	4.253	3.286	+1.59	-3.0	21.2	9.2
Jan. 13	18 34.31	-27 57.5	4.257	3.321	+1.56	-2.6	21.3	15.6
Jan. 23	18 49.95	-28 23.3	4.245	3.355	+1.52	-2.2	21.3	22.3
Feb. 2	19 05.20	-28 45.7	4.217	3.390	+1.47	-2.0	21.4	29.1
Feb. 12	19 19.94	-29 05.8	4.174	3.426	+1.41	-1.9	21.4	36.1
Feb. 22	19 34.07	-29 24.8	4.117	3.461	+1.34	-1.9	21.4	43.1
Mar. 4	19 47.49	-29 44.2	4.047	3.497	+1.26	-2.1	21.4	50.3
Mar. 14	20 00.08	-30 05.3	3.965	3.533	+1.16	-2.4	21.4	57.6
Mar. 24	20 11.71	-30 29.8	3.873	3.570	+1.06	-2.9	21.4	65.1
Apr. 3	20 22.28	-30 59.1	3.774	3.606	+0.93	-3.6	21.4	72.8

Comet C/2012 F6 (Lemmon)

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 24.51341 TT
Peri. = 304.98566
Node = 332.71499 2000.0
Incl. = 82.60815
q = 0.7312559 AU
e = 0.9985333

m1 = 6.0 + 5 log(Delta) + 12.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	12 15.66	-44 01.8	1.302	1.561	+1.25	-80.6	9.0	84.9
Jan. 18	12 28.11	-57 27.9	1.125	1.419	+2.75	-99.4	8.2	84.2
Jan. 28	12 55.58	-74 02.2	1.015	1.277	+49.68	-71.1	7.4	79.4
Feb. 7	21 12.41	-85 53.2	0.986	1.138	+15.52	100.1	6.7	70.5
Feb. 17	23 47.56	-69 12.3	1.036	1.006	+1.54	+90.7	6.1	59.6
Feb. 27	00 02.97	-54 05.4	1.141	0.888	+0.50	+75.8	5.6	48.6
Mar. 9	00 07.97	-41 27.7	1.274	0.794	+0.17	+65.4	5.3	38.6
Mar. 19	00 09.66	-30 34.1	1.406	0.740	+0.07	+59.4	5.1	30.1
Mar. 29	00 10.36	-20 40.3	1.519	0.737	+0.11	+55.8	5.2	24.5
Apr. 8	00 11.42	-11 22.0	1.603	0.786	+0.19	+53.2	5.7	23.1
Apr. 18	00 13.30	-02 29.9	1.659	0.877	+0.25	+51.1	6.4	26.1
Apr. 28	00 15.76	+06 01.3	1.694	0.993	+0.25	+49.6	7.1	31.9
May 8	00 18.31	+14 17.1	1.715	1.124	+0.20	+48.4	7.8	38.9
May 18	00 20.29	+22 21.6	1.728	1.263	+0.07	+47.5	8.5	46.3
May 28	00 20.94	+30 16.7	1.741	1.404	-0.16	+46.5	9.0	53.7
June 7	00 19.33	+38 01.7	1.756	1.546	-0.52	+45.0	9.6	61.1
June 17	00 14.11	+45 31.7	1.779	1.687	-1.08	+42.6	10.1	68.1
June 27	00 03.32	+52 37.4	1.813	1.827	-1.93	+38.7	10.6	74.6
July 7	23 44.06	+59 04.4	1.860	1.966	-3.16	+32.6	11.0	80.4
July 17	23 12.43	+64 30.4	1.922	2.102	-4.71	+23.6	11.5	85.5
July 27	22 25.32	+68 26.0	1.999	2.236	-5.97	+11.6	11.9	89.6
Aug. 6	21 25.58	+70 21.9	2.091	2.368	-5.97	-0.9	12.3	92.8
Aug. 16	20 25.87	+70 12.5	2.199	2.499	-4.68	-10.4	12.7	95.0
Aug. 26	19 39.08	+68 28.7	2.319	2.627	-3.07	-15.4	13.1	96.2
Sept. 5	19 08.33	+65 54.2	2.451	2.753	-1.77	-17.2	13.4	96.5
Sept. 15	18 50.61	+63 02.5	2.592	2.878	-0.86	-16.9	13.8	96.0
Sept. 25	18 42.01	+60 13.2	2.742	3.000	-0.24	-15.7	14.2	95.0
Oct. 5	18 39.62	+57 36.6	2.898	3.122	+0.19	-13.9	14.5	93.4
Oct. 15	18 41.50	+55 17.8	3.057	3.241	+0.49	-11.8	14.8	91.5
Oct. 25	18 46.36	+53 19.3	3.220	3.359	+0.70	-9.8	15.1	89.3
Nov. 4	18 53.35	+51 41.8	3.384	3.475	+0.85	-7.6	15.4	87.0
Nov. 14	19 01.89	+50 25.5	3.547	3.590	+0.96	-5.6	15.7	84.5
Nov. 24	19 11.54	+49 29.8	3.709	3.704	+1.05	-3.6	16.0	82.1
Dec. 4	19 21.99	+48 54.1	3.869	3.816	+1.10	-1.6	16.2	79.6
Dec. 14	19 33.00	+48 37.6	4.024	3.927	+1.14	+0.2	16.4	77.3
Dec. 24	19 44.35	+48 39.3	4.176	4.037	+1.15	+1.9	16.7	75.1
Jan. 3	19 55.90	+48 58.0	4.322	4.146	+1.16	+3.5	16.9	73.2
Jan. 13	20 07.49	+49 32.9	4.463	4.254	+1.15	+5.0	17.1	71.4
Jan. 23	20 18.98	+50 22.6	4.599	4.360	+1.13	+6.3	17.3	69.9
Feb. 2	20 30.28	+51 26.1	4.728	4.466	+1.10	+7.6	17.5	68.7
Feb. 12	20 41.24	+52 42.2	4.851	4.570	+1.05	+8.7	17.7	67.8
Feb. 22	20 51.75	+54 09.5	4.967	4.674	+0.99	+9.7	17.9	67.2
Mar. 4	21 01.69	+55 46.8	5.078	4.776	+0.92	+10.6	18.0	66.9
Mar. 14	21 10.89	+57 32.8	5.183	4.878	+0.83	+11.3	18.2	66.8
Mar. 24	21 19.20	+59 26.1	5.282	4.979	+0.72	+11.9	18.3	67.0
Apr. 3	21 26.39	+61 25.3	5.376	5.079	+0.58	+12.4	18.5	67.5

Comet 197P/LINEAR

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 24.84744 TT
Peri. = 188.73759 e = 0.6297277
Node = 66.38938 2000.0 a = 2.8666508 AU
Incl. = 25.54231 n = 0.20306818
q = 1.0614414 AU P = 4.85 years

m1 = 17.8 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	15 21.75	+02 09.9	1.592	1.429	+3.38	-19.9	20.0	62.2
Jan. 18	15 55.53	-01 09.3	1.486	1.354	+3.61	-21.0	19.6	62.6
Jan. 28	16 31.68	-04 39.3	1.394	1.282	+3.88	-21.7	19.3	62.5
Feb. 7	17 10.48	-08 16.5	1.316	1.217	+4.16	-21.7	19.0	61.9
Feb. 17	17 52.09	-11 53.9	1.255	1.160	+4.44	-20.7	18.8	60.9
Feb. 27	18 36.50	-15 20.8	1.212	1.115	+4.68	-18.3	18.6	59.8
Mar. 9	19 23.35	-18 23.5	1.187	1.082	+4.84	-14.4	18.4	58.7
Mar. 19	20 11.76	-20 47.8	1.181	1.064	+4.86	-9.6	18.4	57.8
Mar. 29	21 00.38	-22 23.8	1.190	1.063	+4.73	-4.5	18.4	57.3
Apr. 8	21 47.65	-23 09.0	1.213	1.078	+4.45	-0.1	18.5	57.3
Apr. 18	22 32.15	-23 09.6	1.245	1.108	+4.08	+3.3	18.6	57.8
Apr. 28	23 12.93	-22 37.1	1.283	1.152	+3.67	+5.2	18.8	58.9
May 8	23 49.62	-21 44.7	1.323	1.207	+3.26	+6.0	19.0	60.6
May 18	00 22.22	-20 44.6	1.361	1.271	+2.87	+5.8	19.2	62.8
May 28	00 50.93	-19 46.4	1.394	1.341	+2.51	+4.9	19.5	65.5
June 7	01 16.07	-18 56.9	1.421	1.416	+2.18	+3.6	19.7	68.8
June 17	01 37.86	-18 21.2	1.440	1.495	+1.86	+1.9	19.9	72.7
June 27	01 56.46	-18 02.2	1.451	1.575	+1.55	0.0	20.1	77.1
July 7	02 11.94	-18 01.9	1.454	1.657	+1.23	-1.9	20.3	82.2
July 17	02 24.24	-18 21.2	1.448	1.739	+0.90	-3.9	20.4	88.0
July 27	02 33.20	-18 59.9	1.437	1.822	+0.54	-5.7	20.5	94.3
Aug. 6	02 38.59	-19 56.6	1.423	1.904	+0.15	-7.2	20.7	101.4
Aug. 16	02 40.12	-21 08.1	1.408	1.985	-0.26	-8.1	20.8	109.1
Aug. 26	02 37.56	-22 28.8	1.396	2.065	-0.67	-8.1	20.9	117.3
Sept. 5	02 30.85	-23 50.2	1.393	2.144	-1.06	-7.1	21.0	125.7
Sept. 15	02 20.27	-25 01.3	1.403	2.222	-1.36	-4.9	21.1	133.8
Sept. 25	02 06.65	-25 49.9	1.432	2.298	-1.53	-1.7	21.3	140.7
Oct. 5	01 51.33	-26 06.5	1.483	2.373	-1.54	+2.0	21.5	145.1
Oct. 15	01 35.95	-25 46.1	1.558	2.447	-1.39	+5.6	21.7	145.6
Oct. 25	01 22.07	-24 50.6	1.659	2.519	-1.13	+8.4	21.9	142.1
Nov. 4	01 10.74	-23 26.2	1.783	2.590	-0.82	+10.5	22.2	136.0
Nov. 14	01 02.52	-21 41.3	1.929	2.659	-0.51	+11.8	22.4	128.4
Nov. 24	00 57.44	-19 43.6	2.093	2.727	-0.22	+12.4	22.7	120.2
Dec. 4	00 55.25	-17 39.3	2.271	2.793	+0.04	+12.7	22.9	111.9
Dec. 14	00 55.61	-15 32.6	2.461	2.858	+0.25	+12.6	.	103.6
Dec. 24	00 58.11	-13 26.4	2.658	2.921	+0.43	+12.4	.	95.5
Jan. 3	01 02.37	-11 22.3	2.858	2.983	+0.57	+12.1	.	87.6
Jan. 13	01 08.08	-09 21.4	3.059	3.044	+0.69	+11.7	.	79.8
Jan. 23	01 14.96	-07 24.2	3.258	3.103	+0.78	+11.3	.	72.3
Feb. 2	01 22.78	-05 31.1	3.451	3.161	+0.86	+10.9	.	64.9
Feb. 12	01 31.37	-03 42.4	3.637	3.218	+0.92	+10.4	.	57.6
Feb. 22	01 40.56	-01 58.3	3.812	3.273	+0.97	+10.0	.	50.5
Mar. 4	01 50.22	-00 18.8	3.976	3.327	+1.00	+9.5	.	43.5
Mar. 14	02 00.26	+01 15.9	4.125	3.380	+1.03	+9.0	.	36.6
Mar. 24	02 10.56	+02 45.7	4.260	3.431	+1.05	+8.5	.	29.8
Apr. 3	02 21.06	+04 10.5	4.377	3.481	+1.06	+8.0	.	23.3

Comet C/2012 X2 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Mar. 31.20561 TT
Peri. = 215.62137 e = 0.7702163
Node = 271.01974 2000.0 a = 20.6631571 AU
Incl. = 34.11898 n = 0.01049323
q = 4.7480567 AU P = 93.93 years

m1 = 8.8 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	07 30.12	+04 16.3	3.838	4.782	−0.56	−3.7	18.5	161.7
Jan. 18	07 24.55	+03 39.5	3.833	4.774	−0.53	−2.9	18.5	161.0
Jan. 28	07 19.27	+03 10.6	3.858	4.768	−0.46	−2.1	18.5	154.8
Feb. 7	07 14.69	+02 49.3	3.911	4.762	−0.35	−1.5	18.5	146.1
Feb. 17	07 11.15	+02 34.4	3.990	4.757	−0.23	−1.0	18.6	136.7
Feb. 27	07 08.88	+02 24.5	4.089	4.753	−0.09	−0.6	18.6	127.1
Mar. 9	07 08.01	+02 18.2	4.206	4.751	+0.06	−0.5	18.7	117.8
Mar. 19	07 08.57	+02 13.6	4.336	4.749	+0.20	−0.4	18.8	108.7
Mar. 29	07 10.53	+02 09.3	4.474	4.748	+0.33	−0.5	18.8	99.9
Apr. 8	07 13.80	+02 03.8	4.616	4.748	+0.45	−0.8	18.9	91.5
Apr. 18	07 18.28	+01 56.0	4.760	4.750	+0.55	−1.1	19.0	83.4
Apr. 28	07 23.81	+01 44.9	4.901	4.752	+0.65	−1.5	19.0	75.6
May 8	07 30.28	+01 29.7	5.037	4.755	+0.73	−2.0	19.1	68.2
May 18	07 37.54	+01 09.8	5.165	4.760	+0.79	−2.5	19.1	61.1
May 28	07 45.46	+00 44.7	5.284	4.765	+0.85	−3.1	19.2	54.3
June 7	07 53.93	+00 14.1	5.393	4.771	+0.89	−3.6	19.2	47.8
June 17	08 02.84	−00 22.2	5.489	4.778	+0.92	−4.2	19.3	41.7
June 27	08 12.09	−01 04.3	5.572	4.787	+0.95	−4.8	19.3	36.0
July 7	08 21.57	−01 52.2	5.640	4.796	+0.96	−5.4	19.4	30.8
July 17	08 31.20	−02 46.0	5.694	4.806	+0.97	−6.0	19.4	26.5
July 27	08 40.91	−03 45.5	5.733	4.817	+0.97	−6.5	19.4	23.4
Aug. 6	08 50.61	−04 50.6	5.756	4.830	+0.96	−7.0	19.4	21.9
Aug. 16	09 00.22	−06 01.1	5.764	4.843	+0.95	−7.6	19.5	22.4
Aug. 26	09 09.68	−07 16.7	5.756	4.857	+0.92	−8.0	19.5	24.7
Sept. 5	09 18.91	−08 37.2	5.733	4.872	+0.89	−8.5	19.5	28.6
Sept. 15	09 27.82	−10 02.1	5.696	4.887	+0.85	−8.9	19.5	33.4
Sept. 25	09 36.34	−11 31.0	5.644	4.904	+0.80	−9.3	19.5	38.9
Oct. 5	09 44.39	−13 03.6	5.579	4.922	+0.75	−9.6	19.5	44.9
Oct. 15	09 51.86	−14 39.1	5.503	4.940	+0.68	−9.8	19.4	51.2
Oct. 25	09 58.66	−16 16.9	5.416	4.959	+0.60	−9.9	19.4	57.9
Nov. 4	10 04.69	−17 56.1	5.321	4.980	+0.51	−10.0	19.4	64.8
Nov. 14	10 09.81	−19 35.8	5.218	5.001	+0.41	−9.9	19.4	71.9
Nov. 24	10 13.93	−21 14.6	5.112	5.022	+0.30	−9.7	19.4	79.2
Dec. 4	10 16.92	−22 51.1	5.004	5.045	+0.18	−9.2	19.3	86.7
Dec. 14	10 18.69	−24 23.5	4.897	5.068	+0.05	−8.6	19.3	94.4
Dec. 24	10 19.16	−25 49.7	4.795	5.092	−0.08	−7.8	19.3	102.0
Jan. 3	10 18.32	−27 07.5	4.701	5.117	−0.21	−6.7	19.3	109.7
Jan. 13	10 16.20	−28 14.5	4.619	5.143	−0.33	−5.4	19.2	117.1
Jan. 23	10 12.93	−29 08.3	4.551	5.169	−0.42	−3.9	19.2	124.2
Feb. 2	10 08.73	−29 47.0	4.501	5.196	−0.48	−2.2	19.2	130.5
Feb. 12	10 03.92	−30 09.4	4.472	5.224	−0.50	−0.6	19.2	135.7
Feb. 22	09 58.88	−30 15.3	4.465	5.252	−0.49	+1.0	19.3	139.1
Mar. 4	09 54.01	−30 05.6	4.481	5.281	−0.43	+2.3	19.3	140.2
Mar. 14	09 49.70	−29 42.2	4.520	5.310	−0.34	+3.4	19.3	139.0
Mar. 24	09 46.27	−29 08.1	4.582	5.341	−0.23	+4.1	19.4	135.6
Apr. 3	09 43.97	−28 26.7	4.666	5.371	−0.10	+4.5	19.4	130.7

Comet P/2012 F2 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Apr. 9.95950 TT
Peri. = 33.17587 e = 0.5421744
Node = 227.13478 2000.0 a = 6.3281206 AU
Incl. = 14.72343 n = 0.06191444
q = 2.8971756 AU P = 15.92 years

m1 = 7.8 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	16 32.20	-19 41.1	3.684	2.976	+1.70	0.0	17.7	38.4
Jan. 18	16 49.17	-19 41.1	3.579	2.960	+1.66	+0.9	17.6	44.6
Jan. 28	17 05.77	-19 31.7	3.466	2.946	+1.61	+1.9	17.5	50.9
Feb. 7	17 21.84	-19 12.6	3.346	2.934	+1.54	+2.9	17.4	57.3
Feb. 17	17 37.21	-18 43.9	3.221	2.923	+1.45	+3.8	17.3	63.8
Feb. 27	17 51.70	-18 06.0	3.092	2.914	+1.34	+4.7	17.2	70.4
Mar. 9	18 05.14	-17 19.2	2.960	2.907	+1.22	+5.5	17.1	77.2
Mar. 19	18 17.33	-16 24.4	2.828	2.902	+1.07	+6.2	17.0	84.2
Mar. 29	18 28.06	-15 22.4	2.696	2.899	+0.91	+6.8	16.9	91.4
Apr. 8	18 37.16	-14 14.3	2.568	2.897	+0.72	+7.3	16.8	98.9
Apr. 18	18 44.41	-13 01.6	2.445	2.898	+0.52	+7.6	16.7	106.7
Apr. 28	18 49.64	-11 46.1	2.330	2.900	+0.31	+7.6	16.6	114.8
May 8	18 52.73	-10 29.8	2.226	2.905	+0.09	+7.5	16.5	123.2
May 18	18 53.61	-09 15.3	2.136	2.911	-0.12	+7.0	16.4	131.9
May 28	18 52.36	-08 05.4	2.063	2.919	-0.31	+6.2	16.4	140.8
June 7	18 49.21	-07 03.2	2.009	2.929	-0.46	+5.1	16.3	149.5
June 17	18 44.58	-06 11.8	1.978	2.941	-0.55	+3.8	16.3	157.1
June 27	18 39.09	-05 33.5	1.972	2.954	-0.57	+2.4	16.3	161.8
July 7	18 33.43	-05 09.7	1.990	2.970	-0.51	+0.9	16.4	161.0
July 17	18 28.34	-05 00.4	2.033	2.987	-0.39	-0.4	16.5	155.3
July 27	18 24.45	-05 04.2	2.100	3.005	-0.23	-1.5	16.6	147.4
Aug. 6	18 22.19	-05 18.8	2.188	3.026	-0.03	-2.2	16.7	138.8
Aug. 16	18 21.85	-05 41.3	2.294	3.047	+0.17	-2.7	16.9	130.2
Aug. 26	18 23.51	-06 08.5	2.417	3.071	+0.36	-2.9	17.0	121.7
Sept. 5	18 27.12	-06 37.7	2.552	3.095	+0.54	-2.9	17.2	113.5
Sept. 15	18 32.56	-07 06.3	2.697	3.121	+0.71	-2.6	17.4	105.6
Sept. 25	18 39.65	-07 32.4	2.849	3.149	+0.85	-2.2	17.5	98.0
Oct. 5	18 48.18	-07 54.3	3.005	3.177	+0.98	-1.6	17.7	90.6
Oct. 15	18 57.97	-08 10.7	3.164	3.207	+1.08	-1.0	17.9	83.4
Oct. 25	19 08.80	-08 20.6	3.324	3.238	+1.17	-0.3	18.1	76.4
Nov. 4	19 20.49	-08 23.5	3.481	3.270	+1.24	+0.5	18.2	69.6
Nov. 14	19 32.89	-08 18.9	3.635	3.303	+1.29	+1.2	18.4	62.8
Nov. 24	19 45.81	-08 06.6	3.784	3.337	+1.33	+2.0	18.5	56.2
Dec. 4	19 59.13	-07 46.6	3.925	3.372	+1.36	+2.8	18.7	49.7
Dec. 14	20 12.72	-07 19.0	4.057	3.408	+1.37	+3.5	18.8	43.3
Dec. 24	20 26.46	-06 44.2	4.180	3.444	+1.38	+4.2	19.0	36.9
Jan. 3	20 40.24	-06 02.6	4.291	3.482	+1.37	+4.8	19.1	30.7
Jan. 13	20 53.99	-05 14.7	4.389	3.520	+1.36	+5.4	19.2	24.7
Jan. 23	21 07.60	-04 21.2	4.473	3.558	+1.34	+5.9	19.3	19.1
Feb. 2	21 21.01	-03 22.6	4.543	3.597	+1.31	+6.3	19.4	14.4
Feb. 12	21 34.15	-02 19.6	4.598	3.637	+1.28	+6.6	19.5	11.7
Feb. 22	21 46.96	-01 13.2	4.638	3.677	+1.24	+6.9	19.6	12.3
Mar. 4	21 59.38	-00 03.9	4.661	3.718	+1.20	+7.1	19.7	16.0
Mar. 14	22 11.35	+01 07.4	4.669	3.759	+1.15	+7.3	19.8	21.2
Mar. 24	22 22.82	+02 19.9	4.661	3.801	+1.09	+7.3	19.8	27.1
Apr. 3	22 33.74	+03 33.0	4.637	3.843	+1.03	+7.3	19.9	33.4

Comet 63P/Wild

Epoch = 2013 July 7.0 TT
T = 2013 Apr. 10.78626 TT
Peri. = 169.00723 e = 0.6507386
Node = 358.01072 2000.0 a = 5.5846432 AU
Incl. = 19.78129 n = 0.07468114
q = 1.9505003 AU P = 13.20 years

m1 = 6.6 + 5 log(Delta) + 25.0 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	10 30.68	+36 38.1	1.334	2.152	-0.09	+0.1	16.2	135.9
Jan. 18	10 29.80	+36 39.1	1.239	2.113	-0.48	-1.2	15.8	143.7
Jan. 28	10 24.97	+36 26.7	1.162	2.078	-0.82	-3.7	15.5	150.9
Feb. 7	10 16.74	+35 49.7	1.105	2.047	-1.03	-7.2	15.1	156.2
Feb. 17	10 06.40	+34 38.0	1.071	2.019	-1.05	-11.2	14.9	157.4
Feb. 27	09 55.90	+32 46.5	1.060	1.996	-0.88	-14.8	14.7	153.6
Mar. 9	09 47.12	+30 18.2	1.071	1.977	-0.57	-17.6	14.5	146.6
Mar. 19	09 41.47	+27 22.2	1.104	1.964	-0.19	-19.3	14.4	138.5
Mar. 29	09 39.61	+24 09.4	1.155	1.955	+0.19	-20.0	14.4	130.2
Apr. 8	09 41.47	+20 49.9	1.222	1.951	+0.52	-20.0	14.4	122.4
Apr. 18	09 46.70	+17 29.9	1.302	1.952	+0.81	-19.7	14.5	115.0
Apr. 28	09 54.76	+14 13.2	1.393	1.958	+1.03	-19.2	14.6	108.2
May 8	10 05.07	+11 01.4	1.494	1.969	+1.21	-18.7	14.7	102.0
May 18	10 17.19	+07 54.7	1.601	1.985	+1.35	-18.2	14.9	96.3
May 28	10 30.71	+04 53.0	1.715	2.006	+1.46	-17.7	15.1	90.9
June 7	10 45.31	+01 56.2	1.835	2.031	+1.55	-17.2	15.3	85.8
June 17	11 00.78	-00 56.1	1.958	2.060	+1.61	-16.8	15.5	81.0
June 27	11 16.90	-03 44.0	2.085	2.093	+1.67	-16.4	15.8	76.4
July 7	11 33.57	-06 27.6	2.215	2.130	+1.71	-15.9	16.0	71.9
July 17	11 50.69	-09 06.7	2.347	2.170	+1.75	-15.4	16.3	67.4
July 27	12 08.17	-11 41.1	2.480	2.213	+1.78	-14.9	16.6	63.1
Aug. 6	12 25.99	-14 10.5	2.614	2.259	+1.81	-14.4	16.9	58.7
Aug. 16	12 44.12	-16 34.7	2.747	2.308	+1.84	-13.9	17.2	54.3
Aug. 26	13 02.51	-18 53.2	2.879	2.358	+1.87	-13.2	17.5	49.9
Sept. 5	13 21.17	-21 05.7	3.008	2.411	+1.89	-12.6	17.8	45.5
Sept.15	13 40.08	-23 11.7	3.135	2.465	+1.91	-11.9	18.2	41.0
Sept.25	13 59.22	-25 10.9	3.256	2.521	+1.94	-11.2	18.5	36.5
Oct. 5	14 18.57	-27 02.9	3.372	2.578	+1.95	-10.4	18.8	31.9
Oct. 15	14 38.11	-28 47.4	3.481	2.636	+1.97	-9.7	19.1	27.4
Oct. 25	14 57.78	-30 24.0	3.582	2.695	+1.98	-8.9	19.4	23.1
Nov. 4	15 17.56	-31 52.7	3.674	2.755	+1.98	-8.1	19.7	19.0
Nov. 14	15 37.36	-33 13.4	3.755	2.816	+1.98	-7.3	20.0	15.8
Nov. 24	15 57.12	-34 26.0	3.825	2.877	+1.96	-6.5	20.3	13.9
Dec. 4	16 16.75	-35 30.8	3.883	2.939	+1.94	-5.7	20.6	14.3
Dec. 14	16 36.15	-36 28.0	3.928	3.000	+1.90	-5.0	20.8	16.9
Dec. 24	16 55.20	-37 18.3	3.960	3.062	+1.86	-4.4	21.1	21.1
Jan. 3	17 13.78	-38 02.2	3.977	3.125	+1.80	-3.8	21.3	26.2
Jan. 13	17 31.77	-38 40.6	3.980	3.187	+1.73	-3.4	21.5	31.8
Jan. 23	17 49.02	-39 14.5	3.969	3.249	+1.64	-3.1	21.7	37.9
Feb. 2	18 05.41	-39 45.1	3.945	3.312	+1.54	-2.9	22.0	44.3
Feb. 12	18 20.77	-40 13.6	3.907	3.374	+1.42	-2.8	22.1	51.0
Feb. 22	18 34.98	-40 41.4	3.858	3.436	+1.29	-2.8	22.3	57.9
Mar. 4	18 47.88	-41 09.7	3.799	3.498	+1.14	-3.0	22.5	65.1
Mar. 14	18 59.28	-41 40.0	3.730	3.560	+0.97	-3.3	22.7	72.5
Mar. 24	19 09.02	-42 13.3	3.656	3.622	+0.79	-3.7	22.8	80.2
Apr. 3	19 16.91	-42 50.5	3.577	3.683	+0.58	-4.2	23.0	88.2

Comet P/2012 T2 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Apr. 16.15277 TT
Peri. = 309.91509 e = 0.1601650
Node = 73.74841 2000.0 a = 5.7390904 AU
Incl. = 12.56099 n = 0.07168685
q = 4.8198890 AU P = 13.75 years

m1 = 6.2 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 27.35	-08 29.9	4.982	4.830	+0.52	+6.0	19.9	75.4
Jan. 18	00 32.51	-07 29.6	5.127	4.828	+0.60	+6.3	20.0	67.0
Jan. 28	00 38.52	-06 26.2	5.263	4.826	+0.67	+6.6	20.1	58.8
Feb. 7	00 45.27	-05 20.7	5.388	4.825	+0.74	+6.7	20.1	50.7
Feb. 17	00 52.64	-04 13.7	5.500	4.823	+0.79	+6.8	20.2	42.9
Feb. 27	01 00.53	-03 06.2	5.596	4.822	+0.83	+6.8	20.2	35.3
Mar. 9	01 08.85	-01 58.6	5.676	4.821	+0.87	+6.7	20.2	28.0
Mar. 19	01 17.51	-00 51.7	5.738	4.821	+0.89	+6.6	20.2	20.9
Mar. 29	01 26.41	+00 14.0	5.781	4.820	+0.91	+6.4	20.3	14.3
Apr. 8	01 35.50	+01 18.0	5.806	4.820	+0.92	+6.2	20.3	9.2
Apr. 18	01 44.69	+02 19.9	5.811	4.820	+0.92	+5.9	20.3	8.4
Apr. 28	01 53.91	+03 19.0	5.797	4.820	+0.92	+5.6	20.3	12.7
May 8	02 03.10	+04 15.1	5.764	4.820	+0.91	+5.3	20.3	18.9
May 18	02 12.17	+05 07.8	5.714	4.821	+0.89	+4.9	20.2	25.6
May 28	02 21.04	+05 56.7	5.645	4.822	+0.86	+4.5	20.2	32.5
June 7	02 29.64	+06 41.5	5.561	4.823	+0.82	+4.0	20.2	39.6
June 17	02 37.89	+07 21.9	5.461	4.824	+0.78	+3.6	20.1	46.9
June 27	02 45.67	+07 57.7	5.348	4.825	+0.72	+3.1	20.1	54.2
July 7	02 52.90	+08 28.7	5.223	4.827	+0.66	+2.6	20.0	61.8
July 17	02 59.45	+08 54.7	5.088	4.828	+0.58	+2.1	20.0	69.6
July 27	03 05.20	+09 15.6	4.946	4.830	+0.48	+1.6	19.9	77.6
Aug. 6	03 10.04	+09 31.4	4.799	4.833	+0.38	+1.1	19.9	85.8
Aug. 16	03 13.83	+09 42.1	4.651	4.835	+0.26	+0.6	19.8	94.4
Aug. 26	03 16.45	+09 47.9	4.505	4.838	+0.14	+0.1	19.7	103.3
Sept. 5	03 17.80	+09 48.9	4.364	4.840	0.00	-0.3	19.7	112.5
Sept. 15	03 17.81	+09 45.5	4.233	4.843	-0.14	-0.7	19.6	122.1
Sept. 25	03 16.45	+09 38.5	4.117	4.846	-0.27	-1.0	19.6	132.1
Oct. 5	03 13.79	+09 28.4	4.019	4.850	-0.38	-1.2	19.5	142.3
Oct. 15	03 09.96	+09 16.6	3.945	4.853	-0.47	-1.2	19.5	152.8
Oct. 25	03 05.22	+09 04.3	3.897	4.857	-0.53	-1.1	19.4	163.1
Nov. 4	02 59.90	+08 53.0	3.878	4.861	-0.55	-0.9	19.4	171.4
Nov. 14	02 54.40	+08 44.4	3.890	4.865	-0.53	-0.4	19.5	169.1
Nov. 24	02 49.14	+08 39.9	3.932	4.869	-0.46	+0.1	19.5	159.6
Dec. 4	02 44.51	+08 40.7	4.003	4.874	-0.37	+0.7	19.5	148.9
Dec. 14	02 40.84	+08 47.7	4.100	4.878	-0.25	+1.4	19.6	138.2
Dec. 24	02 38.36	+09 01.2	4.220	4.883	-0.12	+2.0	19.7	127.7
Jan. 3	02 37.20	+09 21.2	4.357	4.888	+0.02	+2.6	19.7	117.4
Jan. 13	02 37.40	+09 47.2	4.507	4.893	+0.15	+3.1	19.8	107.5
Jan. 23	02 38.95	+10 18.6	4.666	4.899	+0.28	+3.6	19.9	97.9
Feb. 2	02 41.77	+10 54.7	4.829	4.904	+0.40	+4.0	20.0	88.6
Feb. 12	02 45.77	+11 34.6	4.991	4.910	+0.51	+4.3	20.1	79.6
Feb. 22	02 50.83	+12 17.3	5.149	4.916	+0.60	+4.5	20.1	70.9
Mar. 4	02 56.82	+13 02.1	5.300	4.922	+0.68	+4.6	20.2	62.5
Mar. 14	03 03.64	+13 48.2	5.441	4.928	+0.75	+4.7	20.3	54.3
Mar. 24	03 11.17	+14 34.8	5.569	4.935	+0.81	+4.6	20.3	46.4
Apr. 3	03 19.30	+15 21.3	5.683	4.941	+0.86	+4.6	20.4	38.6

Comet 76P/West-Kohoutek-Ikemura

Epoch = 2013 July 7.0 TT
T = 2013 May 7.74390 TT
Peri. = 0.05022 e = 0.5389884
Node = 84.12325 2000.0 a = 3.4711918 AU
Incl. = 30.48335 n = 0.15240042
q = 1.6002597 AU P = 6.47 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. °′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	00 22.37	-25 00.4	2.095	1.971	+1.46	+23.9	19.4	69.1
Jan. 18	00 37.01	-21 01.3	2.132	1.920	+1.60	+24.5	19.3	64.2
Jan. 28	00 52.98	-16 56.3	2.166	1.871	+1.72	+24.9	19.2	59.6
Feb. 7	01 10.14	-12 46.9	2.199	1.824	+1.83	+25.2	19.0	55.1
Feb. 17	01 28.40	-08 34.7	2.232	1.781	+1.93	+25.3	18.9	50.9
Feb. 27	01 47.72	-04 22.0	2.263	1.741	+2.04	+25.1	18.8	46.8
Mar. 9	02 08.07	-00 10.6	2.294	1.706	+2.14	+24.8	18.7	42.9
Mar. 19	02 29.49	+03 56.9	2.325	1.675	+2.25	+24.1	18.6	39.1
Mar. 29	02 52.01	+07 58.0	2.355	1.648	+2.37	+23.2	18.5	35.5
Apr. 8	03 15.67	+11 50.0	2.387	1.627	+2.49	+22.0	18.5	32.1
Apr. 18	03 40.55	+15 30.1	2.418	1.612	+2.61	+20.5	18.4	28.8
Apr. 28	04 06.68	+18 55.1	2.450	1.603	+2.74	+18.7	18.4	25.7
May 8	04 34.09	+22 02.2	2.482	1.600	+2.87	+16.6	18.4	22.8
May 18	05 02.76	+24 48.4	2.515	1.604	+2.98	+14.3	18.5	20.1
May 28	05 32.59	+27 11.2	2.549	1.613	+3.08	+11.7	18.5	17.7
June 7	06 03.43	+29 08.4	2.583	1.628	+3.16	+9.0	18.6	15.6
June 17	06 35.06	+30 38.4	2.617	1.649	+3.21	+6.2	18.7	13.9
June 27	07 07.14	+31 40.5	2.652	1.676	+3.22	+3.5	18.9	12.8
July 7	07 39.34	+32 15.1	2.687	1.707	+3.19	+0.8	19.0	12.3
July 17	08 11.28	+32 23.4	2.721	1.743	+3.13	-1.6	19.2	12.6
July 27	08 42.61	+32 07.7	2.755	1.783	+3.05	-3.7	19.4	13.5
Aug. 6	09 13.06	+31 30.8	2.788	1.827	+2.94	-5.4	19.6	14.9
Aug. 16	09 42.42	+30 36.5	2.820	1.873	+2.81	-6.8	19.7	16.8
Aug. 26	10 10.54	+29 28.3	2.849	1.922	+2.68	-7.8	19.9	19.1
Sept. 5	10 37.39	+28 10.1	2.875	1.974	+2.56	-8.5	20.1	21.7
Sept. 15	11 02.95	+26 45.4	2.898	2.027	+2.43	-8.8	20.3	24.6
Sept. 25	11 27.24	+25 17.8	2.916	2.082	+2.31	-8.8	20.5	27.8
Oct. 5	11 50.31	+23 50.2	2.929	2.138	+2.19	-8.5	20.7	31.2
Oct. 15	12 12.21	+22 25.6	2.936	2.195	+2.08	-7.9	20.9	35.0
Oct. 25	12 32.97	+21 06.2	2.936	2.253	+1.97	-7.2	21.0	39.1
Nov. 4	12 52.64	+19 54.4	2.929	2.312	+1.86	-6.2	21.2	43.5
Nov. 14	13 11.21	+18 52.1	2.913	2.371	+1.74	-5.1	21.3	48.2
Nov. 24	13 28.66	+18 00.9	2.889	2.430	+1.63	-3.9	21.5	53.2
Dec. 4	13 44.95	+17 22.3	2.857	2.489	+1.50	-2.5	21.6	58.5
Dec. 14	13 59.99	+16 57.6	2.817	2.548	+1.37	-1.0	21.7	64.2
Dec. 24	14 13.68	+16 47.5	2.770	2.607	+1.22	+0.5	21.9	70.2
Jan. 3	14 25.87	+16 52.9	2.717	2.665	+1.05	+2.1	22.0	76.5
Jan. 13	14 36.38	+17 14.1	2.658	2.724	+0.86	+3.6	22.0	83.2
Jan. 23	14 45.01	+17 50.6	2.597	2.781	+0.65	+5.1	22.1	90.3
Feb. 2	14 51.53	+18 41.5	2.536	2.839	+0.42	+6.3	22.2	97.6
Feb. 12	14 55.71	+19 45.0	2.477	2.896	+0.16	+7.3	22.3	105.2
Feb. 22	14 57.34	+20 57.8	2.424	2.952	-0.11	+7.8	22.4	112.9
Mar. 4	14 56.29	+22 15.3	2.380	3.008	-0.38	+7.6	22.5	120.6
Mar. 14	14 52.53	+23 31.6	2.351	3.064	-0.62	+6.8	22.5	127.9
Mar. 24	14 46.30	+24 39.4	2.339	3.118	-0.83	+5.2	22.7	134.4
Apr. 3	14 37.99	+25 31.5	2.347	3.173	-0.97	+3.0	22.8	139.3

Comet C/2012 L2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 May 9.32241 TT
Peri. = 205.77506
Node = 270.30118 2000.0
Incl. = 70.98264
q = 1.5086688 AU
e = 0.9972944

m1 = 8.8 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 15.75	+63 39.9	1.776	2.221	+3.41	-31.8	13.5	103.4
Jan. 18	00 49.86	+58 21.5	1.746	2.130	+3.09	-33.3	13.3	98.7
Jan. 28	01 20.79	+52 48.6	1.739	2.041	+2.84	-33.5	13.1	92.9
Feb. 7	01 49.17	+47 13.9	1.755	1.956	+2.64	-32.6	12.9	86.3
Feb. 17	02 15.57	+41 48.3	1.789	1.876	+2.48	-31.0	12.8	79.2
Feb. 27	02 40.39	+36 38.7	1.839	1.800	+2.36	-29.1	12.7	72.0
Mar. 9	03 03.95	+31 48.0	1.899	1.730	+2.26	-27.2	12.6	64.9
Mar. 19	03 26.54	+27 16.0	1.964	1.668	+2.18	-25.6	12.5	58.1
Mar. 29	03 48.34	+23 00.3	2.030	1.614	+2.12	-24.3	12.4	51.7
Apr. 8	04 09.53	+18 57.5	2.094	1.571	+2.08	-23.4	12.4	45.9
Apr. 18	04 30.31	+15 03.7	2.152	1.538	+2.05	-22.9	12.3	40.7
Apr. 28	04 50.82	+11 15.0	2.202	1.517	+2.04	-22.7	12.3	36.5
May 8	05 11.21	+07 27.9	2.244	1.509	+2.05	-22.9	12.3	33.5
May 18	05 31.67	+03 39.1	2.277	1.514	+2.07	-23.3	12.4	31.7
May 28	05 52.34	-00 14.3	2.302	1.531	+2.10	-24.0	12.5	31.4
June 7	06 13.38	-04 14.2	2.321	1.561	+2.16	-24.8	12.6	32.3
June 17	06 34.96	-08 22.6	2.335	1.602	+2.22	-25.7	12.7	34.3
June 27	06 57.21	-12 39.8	2.348	1.653	+2.30	-26.6	12.8	36.9
July 7	07 20.25	-17 05.5	2.364	1.713	+2.40	-27.2	13.0	39.9
July 17	07 44.22	-21 37.8	2.386	1.781	+2.50	-27.6	13.2	42.9
July 27	08 09.18	-26 13.5	2.417	1.855	+2.61	-27.5	13.4	45.7
Aug. 6	08 35.24	-30 48.2	2.459	1.934	+2.72	-26.9	13.6	48.1
Aug. 16	09 02.44	-35 17.1	2.515	2.018	+2.84	-25.8	13.9	50.0
Aug. 26	09 30.79	-39 34.7	2.585	2.106	+2.95	-24.2	14.1	51.3
Sept. 5	10 00.30	-43 36.4	2.668	2.196	+3.06	-22.2	14.3	52.0
Sept.15	10 30.91	-47 18.5	2.764	2.289	+3.16	-20.0	14.6	52.1
Sept.25	11 02.52	-50 38.2	2.871	2.384	+3.25	-17.6	14.9	51.7
Oct. 5	11 34.97	-53 34.5	2.986	2.480	+3.31	-15.3	15.1	50.9
Oct. 15	12 08.03	-56 07.1	3.106	2.577	+3.34	-13.0	15.4	49.7
Oct. 25	12 41.40	-58 16.9	3.228	2.674	+3.34	-10.9	15.6	48.5
Nov. 4	13 14.77	-60 05.5	3.349	2.773	+3.30	-9.0	15.9	47.2
Nov. 14	13 47.75	-61 35.1	3.466	2.871	+3.22	-7.3	16.1	46.2
Nov. 24	14 19.97	-62 48.0	3.577	2.970	+3.11	-5.9	16.3	45.5
Dec. 4	14 51.07	-63 47.1	3.679	3.069	+2.96	-4.8	16.5	45.4
Dec. 14	15 20.69	-64 35.2	3.770	3.167	+2.79	-4.0	16.7	46.1
Dec. 24	15 48.56	-65 14.8	3.848	3.266	+2.59	-3.4	16.9	47.5
Jan. 3	16 14.44	-65 48.7	3.913	3.365	+2.36	-3.1	17.0	49.9
Jan. 13	16 38.08	-66 19.5	3.964	3.463	+2.12	-3.0	17.2	53.0
Jan. 23	16 59.30	-66 49.1	4.000	3.560	+1.86	-3.1	17.3	56.9
Feb. 2	17 17.89	-67 19.9	4.023	3.658	+1.57	-3.3	17.5	61.6
Feb. 12	17 33.60	-67 53.2	4.032	3.755	+1.25	-3.7	17.6	66.8
Feb. 22	17 46.13	-68 30.2	4.031	3.852	+0.90	-4.1	17.7	72.6
Mar. 4	17 55.11	-69 11.6	4.020	3.948	+0.49	-4.5	17.8	78.7
Mar. 14	17 60.00	-69 56.9	4.002	4.044	+0.02	-4.8	17.9	85.3
Mar. 24	18 00.23	-70 44.5	3.981	4.139	-0.51	-4.7	18.0	92.1
Apr. 3	17 55.15	-71 31.5	3.961	4.234	-1.09	-4.1	18.1	99.0

Comet P/2012 TK8 (Tenagra)

Epoch = 2013 July 7.0 TT
T = 2013 May 10.33105 TT
Peri. = 128.18639 e = 0.2626321
Node = 289.71427 2000.0 a = 4.1909204 AU
Incl. = 6.29538 n = 0.11487882
q = 3.0902502 AU P = 8.58 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	00 45.52	+11 47.1	3.037	3.150	+0.88	+3.3	20.1	87.4
Jan. 18	00 54.36	+12 20.4	3.168	3.141	+1.01	+4.2	20.2	79.5
Jan. 28	01 04.45	+13 02.2	3.295	3.132	+1.12	+4.9	20.2	71.9
Feb. 7	01 15.61	+13 51.0	3.418	3.125	+1.21	+5.4	20.3	64.6
Feb. 17	01 27.72	+14 45.4	3.533	3.118	+1.29	+5.8	20.3	57.6
Feb. 27	01 40.65	+15 43.8	3.641	3.111	+1.36	+6.1	20.4	50.8
Mar. 9	01 54.30	+16 44.9	3.739	3.106	+1.43	+6.3	20.4	44.3
Mar. 19	02 08.58	+17 47.5	3.826	3.101	+1.48	+6.3	20.5	37.9
Mar. 29	02 23.42	+18 50.2	3.902	3.098	+1.53	+6.2	20.5	31.7
Apr. 8	02 38.74	+19 51.9	3.967	3.095	+1.57	+6.0	20.6	25.7
Apr. 18	02 54.48	+20 51.5	4.019	3.092	+1.61	+5.7	20.6	19.8
Apr. 28	03 10.58	+21 48.2	4.058	3.091	+1.64	+5.3	20.6	14.0
May 8	03 26.98	+22 41.0	4.085	3.090	+1.66	+4.8	20.6	8.6
May 18	03 43.61	+23 29.3	4.098	3.090	+1.68	+4.3	20.6	4.1
May 28	04 00.40	+24 12.3	4.099	3.092	+1.69	+3.7	20.6	5.2
June 7	04 17.29	+24 49.6	4.088	3.093	+1.69	+3.1	20.6	10.0
June 17	04 34.19	+25 20.8	4.063	3.096	+1.68	+2.5	20.6	15.5
June 27	04 51.01	+25 45.6	4.026	3.099	+1.67	+1.8	20.6	21.1
July 7	05 07.67	+26 04.0	3.977	3.104	+1.64	+1.2	20.6	26.8
July 17	05 24.06	+26 15.9	3.916	3.109	+1.60	+0.6	20.6	32.6
July 27	05 40.06	+26 21.6	3.844	3.115	+1.55	0.0	20.5	38.5
Aug. 6	05 55.57	+26 21.4	3.761	3.121	+1.49	-0.6	20.5	44.6
Aug. 16	06 10.45	+26 15.8	3.668	3.129	+1.41	-1.0	20.5	50.8
Aug. 26	06 24.57	+26 05.6	3.566	3.137	+1.32	-1.4	20.4	57.3
Sept. 5	06 37.78	+25 51.4	3.455	3.145	+1.21	-1.7	20.4	63.9
Sept. 15	06 49.91	+25 34.3	3.337	3.155	+1.09	-1.9	20.3	70.9
Sept. 25	07 00.79	+25 15.3	3.215	3.165	+0.94	-2.0	20.2	78.2
Oct. 5	07 10.23	+24 55.5	3.088	3.176	+0.78	-1.9	20.2	85.8
Oct. 15	07 18.01	+24 36.1	2.960	3.188	+0.59	-1.8	20.1	93.9
Oct. 25	07 23.92	+24 18.3	2.834	3.200	+0.38	-1.5	20.0	102.5
Nov. 4	07 27.75	+24 03.0	2.713	3.213	+0.16	-1.2	20.0	111.6
Nov. 14	07 29.31	+23 51.0	2.601	3.226	-0.08	-0.9	19.9	121.2
Nov. 24	07 28.53	+23 42.3	2.501	3.241	-0.31	-0.6	19.9	131.5
Dec. 4	07 25.43	+23 36.7	2.419	3.255	-0.52	-0.4	19.8	142.3
Dec. 14	07 20.23	+23 33.2	2.359	3.271	-0.68	-0.3	19.8	153.6
Dec. 24	07 13.43	+23 30.4	2.325	3.286	-0.77	-0.4	19.8	165.3
Jan. 3	07 05.70	+23 26.8	2.320	3.303	-0.78	-0.5	19.8	177.2
Jan. 13	06 57.89	+23 21.4	2.345	3.319	-0.70	-0.8	19.9	170.7
Jan. 23	06 50.85	+23 13.7	2.399	3.337	-0.56	-1.0	19.9	159.0
Feb. 2	06 45.26	+23 04.1	2.481	3.354	-0.36	-1.1	20.1	147.5
Feb. 12	06 41.62	+22 53.0	2.586	3.372	-0.15	-1.2	20.2	136.6
Feb. 22	06 40.15	+22 40.9	2.712	3.391	+0.07	-1.3	20.3	126.2
Mar. 4	06 40.88	+22 28.1	2.853	3.410	+0.28	-1.4	20.5	116.3
Mar. 14	06 43.70	+22 14.5	3.005	3.429	+0.47	-1.5	20.6	107.0
Mar. 24	06 48.41	+21 59.7	3.164	3.449	+0.64	-1.6	20.8	98.1
Apr. 3	06 54.76	+21 43.3	3.326	3.469	+0.78	-1.9	20.9	89.7

Comet 114P/Wiseman-Skiff

Epoch = 2013 July 7.0 TT
T = 2013 May 13.89172 TT
Peri. = 172.84141 e = 0.5555454
Node = 271.05479 2000.0 a = 3.5433318 AU
Incl. = 18.28421 n = 0.14777003
q = 1.5748501 AU P = 6.67 years

m1 = 11.0 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	23 02.52	+10 57.4	2.215	2.000	+1.94	+5.5	18.7	64.5
Jan. 18	23 21.87	+11 52.8	2.253	1.945	+2.09	+6.7	18.5	59.3
Jan. 28	23 42.74	+12 59.8	2.286	1.892	+2.23	+7.6	18.3	54.5
Feb. 7	00 05.05	+14 16.0	2.315	1.841	+2.37	+8.3	18.1	49.9
Feb. 17	00 28.77	+15 39.0	2.339	1.794	+2.51	+8.6	17.9	45.7
Feb. 27	00 53.88	+17 05.4	2.359	1.750	+2.65	+8.7	17.7	41.8
Mar. 9	01 20.33	+18 31.9	2.377	1.709	+2.78	+8.3	17.5	38.1
Mar. 19	01 48.11	+19 54.9	2.393	1.673	+2.90	+7.6	17.4	34.7
Mar. 29	02 17.14	+21 10.4	2.408	1.642	+3.02	+6.4	17.2	31.5
Apr. 8	02 47.30	+22 14.5	2.424	1.617	+3.11	+4.9	17.1	28.5
Apr. 18	03 18.44	+23 03.5	2.441	1.597	+3.19	+3.1	17.0	25.7
Apr. 28	03 50.31	+23 34.1	2.460	1.583	+3.23	+1.0	16.9	23.1
May 8	04 22.64	+23 43.8	2.481	1.576	+3.25	-1.3	16.9	20.5
May 18	04 55.11	+23 30.9	2.505	1.575	+3.22	-3.6	16.9	18.1
May 28	05 27.36	+22 55.0	2.532	1.581	+3.17	-5.9	17.0	15.8
June 7	05 59.09	+21 56.3	2.562	1.594	+3.09	-8.0	17.1	13.6
June 17	06 30.02	+20 36.4	2.595	1.613	+2.99	-9.9	17.2	11.5
June 27	06 59.93	+18 57.4	2.631	1.637	+2.88	-11.6	17.4	9.6
July 7	07 28.70	+17 01.7	2.668	1.667	+2.75	-12.9	17.6	8.0
July 17	07 56.24	+14 52.3	2.707	1.702	+2.63	-14.0	17.8	6.9
July 27	08 22.52	+12 31.8	2.746	1.742	+2.51	-14.9	18.0	6.8
Aug. 6	08 47.57	+10 02.9	2.785	1.786	+2.39	-15.5	18.3	7.8
Aug. 16	09 11.44	+07 28.1	2.822	1.833	+2.27	-15.9	18.5	9.8
Aug. 26	09 34.18	+04 49.4	2.857	1.883	+2.17	-16.1	18.8	12.4
Sept. 5	09 55.86	+02 08.7	2.888	1.935	+2.07	-16.1	19.0	15.5
Sept. 15	10 16.55	-00 32.5	2.914	1.990	+1.97	-16.0	19.3	19.0
Sept. 25	10 36.29	-03 12.7	2.933	2.046	+1.88	-15.8	19.6	22.8
Oct. 5	10 55.13	-05 51.0	2.946	2.104	+1.80	-15.5	19.8	26.9
Oct. 15	11 13.10	-08 26.5	2.951	2.163	+1.71	-15.2	20.0	31.3
Oct. 25	11 30.19	-10 58.2	2.947	2.222	+1.62	-14.8	20.3	36.1
Nov. 4	11 46.40	-13 25.8	2.934	2.282	+1.53	-14.3	20.5	41.2
Nov. 14	12 01.66	-15 48.4	2.911	2.343	+1.43	-13.7	20.7	46.5
Nov. 24	12 15.91	-18 05.8	2.878	2.404	+1.31	-13.2	20.9	52.3
Dec. 4	12 29.05	-20 17.4	2.836	2.465	+1.19	-12.5	21.1	58.3
Dec. 14	12 40.91	-22 22.6	2.784	2.526	+1.04	-11.8	21.3	64.8
Dec. 24	12 51.33	-24 21.0	2.724	2.587	+0.87	-11.1	21.4	71.6
Jan. 3	13 00.07	-26 11.8	2.658	2.648	+0.68	-10.2	21.6	78.8
Jan. 13	13 06.89	-27 53.9	2.586	2.708	+0.46	-9.2	21.7	86.4
Jan. 23	13 11.51	-29 25.6	2.513	2.768	+0.22	-7.9	21.8	94.4
Feb. 2	13 13.69	-30 45.0	2.440	2.828	-0.05	-6.4	22.0	102.9
Feb. 12	13 13.23	-31 49.1	2.371	2.887	-0.31	-4.5	22.1	111.7
Feb. 22	13 10.09	-32 34.5	2.312	2.945	-0.57	-2.3	22.2	120.9
Mar. 4	13 04.42	-32 57.5	2.265	3.003	-0.77	+0.2	22.3	130.3
Mar. 14	12 56.70	-32 55.1	2.236	3.060	-0.90	+2.9	22.5	139.4
Mar. 24	12 47.68	-32 26.2	2.229	3.117	-0.94	+5.4	22.6	147.6
Apr. 3	12 38.28	-31 32.3	2.247	3.173	-0.88	+7.4	22.8	153.5

Comet C/2010 S1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 May 20.30211 TT
Peri. = 118.61544
Node = 93.43057 2000.0
Incl. = 125.33576
q = 5.8998141 AU
e = 1.0020425

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	20 50.50	+31 29.6	6.432	5.974	+0.40	-4.7	14.2	58.3
Jan. 18	20 54.54	+30 42.5	6.504	5.963	+0.42	-3.5	14.2	52.9
Jan. 28	20 58.73	+30 07.9	6.559	5.953	+0.42	-2.3	14.2	48.6
Feb. 7	21 02.89	+29 45.1	6.595	5.944	+0.40	-1.2	14.2	45.4
Feb. 17	21 06.91	+29 33.2	6.611	5.936	+0.37	-0.2	14.2	43.7
Feb. 27	21 10.63	+29 31.0	6.606	5.929	+0.33	+0.7	14.2	43.6
Mar. 9	21 13.92	+29 37.5	6.579	5.922	+0.27	+1.4	14.2	45.2
Mar. 19	21 16.64	+29 51.6	6.531	5.916	+0.20	+2.0	14.2	48.3
Mar. 29	21 18.65	+30 12.0	6.464	5.911	+0.12	+2.5	14.2	52.6
Apr. 8	21 19.82	+30 37.3	6.378	5.907	+0.02	+2.9	14.1	57.9
Apr. 18	21 20.00	+31 06.2	6.276	5.904	-0.10	+3.1	14.1	64.0
Apr. 28	21 19.04	+31 36.8	6.161	5.902	-0.22	+3.0	14.1	70.5
May 8	21 16.81	+32 07.2	6.036	5.900	-0.36	+2.8	14.0	77.5
May 18	21 13.20	+32 35.1	5.905	5.900	-0.51	+2.3	14.0	84.8
May 28	21 08.11	+32 57.9	5.772	5.900	-0.66	+1.5	13.9	92.3
June 7	21 01.52	+33 12.8	5.643	5.901	-0.81	+0.4	13.9	99.8
June 17	20 53.46	+33 16.4	5.522	5.903	-0.94	-1.1	13.8	107.2
June 27	20 44.10	+33 05.8	5.414	5.906	-1.04	-2.8	13.8	114.3
July 7	20 33.69	+32 38.2	5.324	5.909	-1.11	-4.7	13.7	120.8
July 17	20 22.60	+31 51.7	5.257	5.914	-1.13	-6.6	13.7	126.2
July 27	20 11.29	+30 45.6	5.217	5.919	-1.10	-8.5	13.7	129.9
Aug. 6	20 00.24	+29 21.0	5.206	5.925	-1.03	-10.1	13.7	131.4
Aug. 16	19 49.92	+27 40.0	5.225	5.932	-0.92	-11.4	13.7	130.4
Aug. 26	19 40.69	+25 46.4	5.275	5.940	-0.79	-12.2	13.7	127.1
Sept. 5	19 32.81	+23 44.5	5.354	5.949	-0.64	-12.6	13.8	121.9
Sept.15	19 26.43	+21 39.0	5.459	5.958	-0.48	-12.5	13.8	115.3
Sept.25	19 21.61	+19 33.8	5.585	5.969	-0.33	-12.1	13.9	107.8
Oct. 5	19 18.28	+17 32.6	5.728	5.980	-0.19	-11.5	14.0	99.8
Oct. 15	19 16.37	+15 37.9	5.883	5.992	-0.06	-10.6	14.0	91.4
Oct. 25	19 15.73	+13 51.6	6.045	6.004	+0.05	-9.7	14.1	83.0
Nov. 4	19 16.21	+12 14.9	6.207	6.018	+0.14	-8.7	14.2	74.5
Nov. 14	19 17.65	+10 48.3	6.364	6.032	+0.22	-7.6	14.2	66.1
Nov. 24	19 19.89	+09 32.0	6.513	6.047	+0.29	-6.6	14.3	57.9
Dec. 4	19 22.79	+08 25.8	6.649	6.063	+0.34	-5.6	14.3	50.1
Dec. 14	19 26.18	+07 29.3	6.767	6.080	+0.37	-4.7	14.4	42.6
Dec. 24	19 29.92	+06 42.1	6.866	6.097	+0.40	-3.9	14.4	36.0
Jan. 3	19 33.88	+06 03.3	6.942	6.115	+0.40	-3.1	14.5	30.6
Jan. 13	19 37.91	+05 32.4	6.993	6.134	+0.40	-2.4	14.5	27.1
Jan. 23	19 41.90	+05 08.4	7.020	6.154	+0.38	-1.8	14.5	26.4
Feb. 2	19 45.72	+04 50.7	7.020	6.174	+0.35	-1.2	14.5	28.7
Feb. 12	19 49.23	+04 38.3	6.995	6.195	+0.31	-0.8	14.5	33.4
Feb. 22	19 52.33	+04 30.3	6.946	6.217	+0.26	-0.5	14.5	39.7
Mar. 4	19 54.89	+04 25.7	6.873	6.239	+0.19	-0.2	14.5	47.0
Mar. 14	19 56.78	+04 23.6	6.780	6.262	+0.11	-0.1	14.5	54.9
Mar. 24	19 57.91	+04 22.7	6.670	6.286	+0.02	-0.1	14.5	63.3
Apr. 3	19 58.14	+04 22.1	6.545	6.310	-0.08	-0.2	14.5	72.1

Comet C/2012 K6 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2013 May 21.49227 TT
Peri. = 338.83281
Node = 206.89886 2000.0
Incl. = 135.21855
q = 3.3530486 AU
e = 0.9994314

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	16 47.56	-49 32.5	4.275	3.577	+0.33	+0.9	17.1	40.0
Jan. 18	16 50.86	-49 23.7	4.142	3.546	+0.17	+0.3	17.0	47.1
Jan. 28	16 52.56	-49 20.5	3.986	3.517	-0.03	-0.1	16.9	55.1
Feb. 7	16 52.22	-49 21.9	3.811	3.490	-0.30	-0.4	16.7	63.8
Feb. 17	16 49.27	-49 26.4	3.620	3.466	-0.62	-0.5	16.6	73.2
Feb. 27	16 43.05	-49 31.1	3.419	3.443	-1.02	0.0	16.4	83.1
Mar. 9	16 32.84	-49 31.3	3.213	3.423	-1.49	+1.2	16.3	93.7
Mar. 19	16 17.94	-49 19.5	3.011	3.406	-2.00	+3.5	16.1	104.9
Mar. 29	15 57.98	-48 44.2	2.822	3.390	-2.48	+7.3	16.0	116.7
Apr. 8	15 33.23	-47 31.0	2.657	3.378	-2.82	+12.6	15.8	129.0
Apr. 18	15 05.02	-45 25.1	2.526	3.368	-2.93	+18.7	15.7	141.2
Apr. 28	14 35.74	-42 18.5	2.440	3.360	-2.77	+24.2	15.6	151.6
May 8	14 08.08	-38 16.6	2.409	3.355	-2.39	+27.8	15.6	155.9
May 18	13 44.13	-33 38.8	2.434	3.353	-1.92	+28.7	15.6	150.8
May 28	13 24.90	-28 52.0	2.513	3.354	-1.45	+27.2	15.7	140.1
June 7	13 10.41	-24 19.7	2.639	3.357	-1.02	+24.3	15.8	127.7
June 17	13 00.17	-20 17.0	2.801	3.362	-0.67	+20.7	15.9	115.3
June 27	12 53.49	-16 49.8	2.988	3.371	-0.38	+17.2	16.1	103.3
July 7	12 49.69	-13 57.7	3.190	3.381	-0.15	+14.1	16.2	92.0
July 17	12 48.19	-11 37.1	3.397	3.395	+0.03	+11.4	16.4	81.3
July 27	12 48.51	-09 43.3	3.602	3.411	+0.17	+9.2	16.5	71.0
Aug. 6	12 50.25	-08 11.4	3.799	3.429	+0.29	+7.4	16.7	61.3
Aug. 16	12 53.11	-06 56.9	3.983	3.450	+0.37	+6.1	16.8	51.8
Aug. 26	12 56.83	-05 55.9	4.148	3.473	+0.44	+5.1	16.9	42.6
Sept. 5	13 01.23	-05 05.0	4.292	3.498	+0.49	+4.4	17.0	33.7
Sept.15	13 06.11	-04 21.5	4.412	3.526	+0.52	+3.9	17.1	24.9
Sept.25	13 11.34	-03 42.5	4.506	3.555	+0.54	+3.7	17.2	16.3
Oct. 5	13 16.78	-03 05.8	4.573	3.587	+0.55	+3.7	17.2	8.5
Oct. 15	13 22.29	-02 29.3	4.611	3.621	+0.55	+3.8	17.3	6.0
Oct. 25	13 27.76	-01 50.8	4.621	3.657	+0.53	+4.2	17.4	12.6
Nov. 4	13 33.05	-01 08.3	4.602	3.694	+0.50	+4.9	17.4	21.1
Nov. 14	13 38.02	-00 19.7	4.556	3.733	+0.45	+5.7	17.4	30.1
Nov. 24	13 42.52	+00 37.1	4.486	3.774	+0.39	+6.7	17.4	39.3
Dec. 4	13 46.38	+01 44.3	4.392	3.817	+0.30	+8.0	17.4	48.9
Dec. 14	13 49.40	+03 04.3	4.280	3.861	+0.20	+9.5	17.4	58.7
Dec. 24	13 51.38	+04 39.3	4.153	3.907	+0.07	+11.2	17.4	68.8
Jan. 3	13 52.07	+06 31.6	4.018	3.954	-0.09	+13.1	17.4	79.2
Jan. 13	13 51.21	+08 42.8	3.880	4.002	-0.27	+15.1	17.4	90.0
Jan. 23	13 48.54	+11 13.6	3.747	4.052	-0.47	+17.0	17.3	101.0
Feb. 2	13 43.80	+14 03.5	3.627	4.102	-0.70	+18.6	17.3	112.2
Feb. 12	13 36.80	+17 09.4	3.529	4.154	-0.93	+19.6	17.3	123.4
Feb. 22	13 27.45	+20 25.2	3.461	4.207	-1.16	+19.7	17.3	133.9
Mar. 4	13 15.84	+23 42.4	3.430	4.261	-1.35	+18.8	17.4	142.7
Mar. 14	13 02.33	+26 50.3	3.440	4.316	-1.48	+16.8	17.4	148.0
Mar. 24	12 47.54	+29 38.6	3.495	4.372	-1.53	+14.1	17.5	147.9
Apr. 3	12 32.28	+31 59.3	3.591	4.428	-1.48	+10.9	17.6	142.7

Comet P/2010 A2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 May 22.78382 TT
Peri. = 132.86114 e = 0.1252395
Node = 320.23112 2000.0 a = 2.2909505 AU
Incl. = 5.25677 n = 0.28423694
q = 2.0040330 AU P = 3.47 years

H = 22.0 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		V	Mot.′/PA °	Elong. °
Jan. 8	00 51.12	+11 50.7	1.858	2.082	-1.17	-8.7	26.2	21.4/ 72	88.7
Jan. 18	01 05.03	+12 55.2	1.963	2.071	-1.13	-8.0	26.3	23.7/ 72	82.1
Jan. 28	01 20.47	+14 08.0	2.067	2.062	-1.11	-7.4	26.4	25.6/ 72	75.9
Feb. 7	01 37.26	+15 26.6	2.168	2.052	-1.09	-6.8	26.5	27.2/ 72	70.0
Feb. 17	01 55.26	+16 48.6	2.265	2.044	-1.08	-6.2	26.5	28.5/ 72	64.5
Feb. 27	02 14.34	+18 11.6	2.357	2.036	-1.08	-5.7	26.6	29.6/ 73	59.2
Mar. 9	02 34.40	+19 33.4	2.445	2.029	-1.08	-5.1	26.6	30.6/ 74	54.1
Mar. 19	02 55.38	+20 51.9	2.527	2.023	-1.08	-4.5	26.6	31.3/ 76	49.3
Mar. 29	03 17.18	+22 04.9	2.603	2.018	-1.09	-3.9	26.6	31.9/ 77	44.6
Apr. 8	03 39.74	+23 10.6	2.674	2.013	-1.10	-3.2	26.6	32.4/ 79	40.0
Apr. 18	04 02.99	+24 07.2	2.738	2.010	-1.10	-2.5	26.6	32.8/ 81	35.7
Apr. 28	04 26.81	+24 53.2	2.796	2.007	-1.11	-1.8	26.6	33.2/ 83	31.4
May 8	04 51.10	+25 27.1	2.849	2.005	-1.11	-1.1	26.6	33.4/ 85	27.2
May 18	05 15.76	+25 47.9	2.894	2.004	-1.11	-0.4	26.5	33.6/ 87	23.2
May 28	05 40.63	+25 54.7	2.934	2.004	-1.10	+0.3	26.5	33.7/ 90	19.2
June 7	06 05.58	+25 47.2	2.967	2.005	-1.09	+1.1	26.4	33.8/ 92	15.2
June 17	06 30.50	+25 25.0	2.993	2.007	-1.08	+1.8	26.3	33.8/ 95	11.3
June 27	06 55.23	+24 48.5	3.013	2.010	-1.06	+2.4	26.3	33.8/ 97	7.4
July 7	07 19.67	+23 58.0	3.027	2.013	-1.04	+3.1	26.2	33.7/100	3.7
July 17	07 43.72	+22 54.3	3.034	2.018	-1.02	+3.7	26.1	33.6/102	1.7
July 27	08 07.29	+21 38.2	3.033	2.023	-0.99	+4.2	26.2	33.4/104	4.8
Aug. 6	08 30.33	+20 10.9	3.026	2.030	-0.96	+4.7	26.3	33.2/106	8.7
Aug. 16	08 52.80	+18 33.6	3.012	2.037	-0.94	+5.1	26.4	33.0/108	12.7
Aug. 26	09 14.66	+16 47.6	2.991	2.044	-0.92	+5.5	26.5	32.7/110	16.8
Sept. 5	09 35.92	+14 54.2	2.962	2.053	-0.89	+5.8	26.6	32.4/111	21.0
Sept.15	09 56.58	+12 54.8	2.926	2.062	-0.88	+6.1	26.6	31.9/112	25.3
Sept.25	10 16.62	+10 50.8	2.882	2.072	-0.86	+6.3	26.7	31.5/113	29.8
Oct. 5	10 36.08	+08 43.4	2.830	2.082	-0.85	+6.5	26.7	30.9/114	34.4
Oct. 15	10 54.93	+06 34.0	2.770	2.093	-0.84	+6.7	26.7	30.2/115	39.1
Oct. 25	11 13.17	+04 23.9	2.703	2.105	-0.84	+6.8	26.7	29.4/116	44.0
Nov. 4	11 30.79	+02 14.4	2.629	2.117	-0.84	+6.9	26.8	28.4/117	49.1
Nov. 14	11 47.74	+00 06.6	2.547	2.129	-0.85	+7.0	26.7	27.3/117	54.4
Nov. 24	12 03.95	-01 58.1	2.458	2.142	-0.87	+7.1	26.7	26.0/118	60.0
Dec. 4	12 19.35	-03 58.8	2.363	2.155	-0.89	+7.1	26.7	24.5/118	65.8
Dec. 14	12 33.79	-05 54.2	2.263	2.169	-0.92	+7.2	26.6	22.6/119	71.9
Dec. 24	12 47.12	-07 43.2	2.158	2.183	-0.96	+7.3	26.6	20.5/120	78.3
Jan. 3	12 59.10	-09 24.7	2.050	2.197	-1.01	+7.4	26.5	17.9/121	85.1
Jan. 13	13 09.47	-10 57.4	1.940	2.211	-1.07	+7.6	26.4	14.9/124	92.3
Jan. 23	13 17.91	-12 20.1	1.831	2.225	-1.14	+7.8	26.2	11.4/129	100.0
Feb. 2	13 24.04	-13 31.3	1.724	2.239	-1.23	+8.2	26.1	7.6/139	108.3
Feb. 12	13 27.47	-14 29.0	1.623	2.253	-1.34	+8.6	25.9	4.3/172	117.3
Feb. 22	13 27.90	-15 11.1	1.531	2.268	-1.45	+9.2	25.7	4.7/239	126.9
Mar. 4	13 25.11	-15 35.3	1.452	2.282	-1.57	+9.8	25.5	8.5/267	137.3
Mar. 14	13 19.22	-15 39.3	1.390	2.296	-1.67	+10.6	25.3	12.3/277	148.3
Mar. 24	13 10.78	-15 22.7	1.350	2.311	-1.75	+11.4	25.1	15.0/283	159.6
Apr. 3	13 00.75	-14 47.3	1.334	2.325	-1.78	+12.0	24.8	15.7/288	169.8

Comet 175P/Hergenrother

Epoch = 2013 July 7.0 TT
T = 2013 May 23.60860 TT
Peri. = 55.98949 e = 0.4321516
Node = 123.59038 2000.0 a = 3.4274194 AU
Incl. = 6.07799 n = 0.15532924
q = 1.9462546 AU P = 6.35 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	09 26.89	+15 27.0	1.321	2.220	-0.32	+5.6	17.9	148.5
Jan. 18	09 23.67	+16 23.5	1.236	2.185	-0.56	+7.1	17.6	159.7
Jan. 28	09 18.11	+17 34.0	1.173	2.152	-0.70	+7.7	17.4	171.3
Feb. 7	09 11.10	+18 51.3	1.135	2.120	-0.72	+7.5	17.2	175.6
Feb. 17	09 03.94	+20 06.1	1.123	2.091	-0.58	+6.3	17.1	163.9
Feb. 27	08 58.12	+21 09.3	1.135	2.064	-0.33	+4.6	17.0	152.3
Mar. 9	08 54.84	+21 55.2	1.166	2.039	0.00	+2.6	16.9	141.4
Mar. 19	08 54.88	+22 20.7	1.215	2.017	+0.36	+0.5	17.0	131.4
Mar. 29	08 58.51	+22 25.6	1.277	1.997	+0.70	-1.5	17.0	122.3
Apr. 8	09 05.55	+22 10.8	1.349	1.981	+1.01	-3.4	17.0	114.1
Apr. 18	09 15.64	+21 37.2	1.428	1.967	+1.26	-5.1	17.1	106.7
Apr. 28	09 28.29	+20 46.3	1.511	1.957	+1.47	-6.7	17.2	100.1
May 8	09 42.99	+19 39.3	1.599	1.950	+1.63	-8.2	17.3	94.1
May 18	09 59.30	+18 17.5	1.689	1.947	+1.75	-9.5	17.4	88.5
May 28	10 16.82	+16 42.4	1.782	1.947	+1.84	-10.7	17.5	83.4
June 7	10 35.23	+14 55.5	1.876	1.950	+1.91	-11.7	17.6	78.7
June 17	10 54.29	+12 58.4	1.972	1.956	+1.95	-12.5	17.8	74.2
June 27	11 13.80	+10 53.1	2.068	1.966	+1.98	-13.2	17.9	69.9
July 7	11 33.61	+08 41.4	2.166	1.979	+2.00	-13.6	18.1	65.7
July 17	11 53.64	+06 25.2	2.265	1.995	+2.02	-13.9	18.2	61.7
July 27	12 13.81	+04 06.4	2.364	2.014	+2.03	-14.0	18.4	57.7
Aug. 6	12 34.08	+01 46.7	2.464	2.036	+2.04	-13.9	18.6	53.8
Aug. 16	12 54.45	-00 32.0	2.563	2.060	+2.04	-13.6	18.7	49.8
Aug. 26	13 14.90	-02 48.2	2.662	2.087	+2.05	-13.2	18.9	45.8
Sept. 5	13 35.43	-05 00.2	2.760	2.116	+2.06	-12.7	19.1	41.7
Sept.15	13 56.03	-07 06.9	2.855	2.148	+2.07	-12.0	19.3	37.6
Sept.25	14 16.71	-09 06.8	2.948	2.181	+2.07	-11.2	19.5	33.3
Oct. 5	14 37.46	-10 58.9	3.037	2.216	+2.08	-10.3	19.7	29.0
Oct. 15	14 58.26	-12 42.2	3.121	2.252	+2.08	-9.4	19.8	24.5
Oct. 25	15 19.07	-14 16.0	3.199	2.290	+2.08	-8.4	20.0	20.0
Nov. 4	15 39.88	-15 39.5	3.271	2.329	+2.07	-7.3	20.2	15.3
Nov. 14	16 00.62	-16 52.4	3.335	2.369	+2.06	-6.2	20.4	10.6
Nov. 24	16 21.22	-17 54.3	3.390	2.410	+2.04	-5.1	20.5	6.0
Dec. 4	16 41.63	-18 45.1	3.436	2.452	+2.01	-4.0	20.7	3.5
Dec. 14	17 01.74	-19 25.0	3.470	2.495	+1.97	-2.9	20.9	6.6
Dec. 24	17 21.47	-19 54.2	3.494	2.538	+1.93	-1.9	21.0	11.6
Jan. 3	17 40.73	-20 13.3	3.505	2.582	+1.87	-1.0	21.1	17.1
Jan. 13	17 59.41	-20 23.0	3.504	2.626	+1.80	-0.1	21.3	22.8
Jan. 23	18 17.40	-20 24.1	3.490	2.670	+1.72	+0.6	21.4	28.8
Feb. 2	18 34.61	-20 17.7	3.464	2.714	+1.63	+1.3	21.5	34.8
Feb. 12	18 50.93	-20 04.8	3.425	2.759	+1.53	+1.8	21.6	41.1
Feb. 22	19 06.26	-19 46.9	3.374	2.803	+1.42	+2.2	21.7	47.6
Mar. 4	19 20.50	-19 25.3	3.311	2.848	+1.30	+2.4	21.8	54.2
Mar. 14	19 33.51	-19 01.4	3.238	2.892	+1.17	+2.5	21.8	61.1
Mar. 24	19 45.20	-18 36.7	3.156	2.936	+1.02	+2.4	21.9	68.2
Apr. 3	19 55.42	-18 13.0	3.066	2.980	+0.86	+2.1	21.9	75.7

Comet 257P/Catalina

Epoch = 2013 July 7.0 TT
T = 2013 June 4.42937 TT
Peri. = 117.81303 e = 0.4327493
Node = 207.86679 2000.0 a = 3.7532611 AU
Incl. = 20.24496 n = 0.13554731
q = 2.1290400 AU P = 7.27 years

m1 = 11.8 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	18 28.76	-10 01.8	3.328	2.403	+2.09	+4.3	18.2	16.8
Jan. 18	18 49.63	-09 19.0	3.268	2.370	+2.10	+5.5	18.1	20.3
Jan. 28	19 10.64	-08 23.7	3.202	2.339	+2.11	+6.8	18.0	24.2
Feb. 7	19 31.69	-07 16.1	3.130	2.310	+2.10	+8.0	17.9	28.3
Feb. 17	19 52.70	-05 56.6	3.054	2.282	+2.09	+9.1	17.8	32.4
Feb. 27	20 13.59	-04 25.9	2.973	2.256	+2.07	+10.1	17.7	36.6
Mar. 9	20 34.28	-02 45.0	2.889	2.233	+2.04	+11.0	17.6	40.7
Mar. 19	20 54.71	-00 55.2	2.803	2.211	+2.01	+11.7	17.5	44.8
Mar. 29	21 14.81	+01 02.2	2.715	2.192	+1.97	+12.3	17.4	48.9
Apr. 8	21 34.54	+03 05.4	2.625	2.175	+1.93	+12.7	17.3	53.0
Apr. 18	21 53.85	+05 12.7	2.534	2.160	+1.88	+12.9	17.2	57.1
Apr. 28	22 12.66	+07 22.2	2.443	2.149	+1.83	+13.0	17.1	61.3
May 8	22 30.94	+09 31.8	2.350	2.140	+1.76	+12.8	17.0	65.5
May 18	22 48.58	+11 39.6	2.258	2.133	+1.69	+12.4	16.9	69.9
May 28	23 05.50	+13 43.1	2.164	2.130	+1.61	+11.7	16.8	74.5
June 7	23 21.57	+15 40.3	2.071	2.129	+1.50	+10.8	16.7	79.2
June 17	23 36.62	+17 28.7	1.978	2.131	+1.38	+9.7	16.6	84.3
June 27	23 50.46	+19 05.8	1.885	2.136	+1.24	+8.3	16.5	89.7
July 7	00 02.84	+20 28.9	1.793	2.144	+1.06	+6.6	16.4	95.5
July 17	00 13.47	+21 34.7	1.703	2.154	+0.86	+4.5	16.3	101.8
July 27	00 22.05	+22 20.0	1.616	2.167	+0.62	+2.1	16.2	108.7
Aug. 6	00 28.28	+22 40.7	1.535	2.183	+0.36	-0.8	16.1	116.3
Aug. 16	00 31.90	+22 32.7	1.461	2.201	+0.10	-4.1	16.1	124.7
Aug. 26	00 32.85	+21 52.1	1.399	2.222	-0.16	-7.5	16.0	133.9
Sept. 5	00 31.28	+20 36.7	1.351	2.244	-0.36	-11.0	16.0	143.7
Sept. 15	00 27.70	+18 46.9	1.322	2.269	-0.48	-13.8	16.0	154.0
Sept. 25	00 22.94	+16 28.6	1.316	2.296	-0.49	-15.6	16.0	163.8
Oct. 5	00 18.00	+13 52.6	1.335	2.325	-0.41	-16.0	16.1	168.9
Oct. 15	00 13.91	+11 12.9	1.382	2.355	-0.24	-14.9	16.2	163.5
Oct. 25	00 11.46	+08 43.6	1.454	2.387	-0.04	-12.9	16.4	153.7
Nov. 4	00 11.10	+06 35.0	1.551	2.420	+0.19	-10.2	16.6	143.3
Nov. 14	00 12.99	+04 52.9	1.669	2.455	+0.41	-7.4	16.8	133.3
Nov. 24	00 17.05	+03 38.8	1.804	2.491	+0.60	-4.8	17.0	123.7
Dec. 4	00 23.08	+02 51.0	1.953	2.528	+0.77	-2.4	17.3	114.6
Dec. 14	00 30.83	+02 26.8	2.112	2.566	+0.92	-0.4	17.5	106.1
Dec. 24	00 40.01	+02 22.4	2.279	2.604	+1.04	+1.2	17.7	98.0
Jan. 3	00 50.39	+02 34.2	2.450	2.644	+1.14	+2.5	18.0	90.3
Jan. 13	01 01.75	+02 58.9	2.623	2.684	+1.22	+3.5	18.2	82.9
Jan. 23	01 13.90	+03 33.4	2.795	2.725	+1.28	+4.2	18.4	75.7
Feb. 2	01 26.70	+04 15.2	2.965	2.766	+1.33	+4.7	18.6	68.8
Feb. 12	01 40.03	+05 01.9	3.130	2.808	+1.37	+5.0	18.8	62.1
Feb. 22	01 53.78	+05 51.5	3.289	2.849	+1.41	+5.1	18.9	55.6
Mar. 4	02 07.85	+06 42.4	3.440	2.892	+1.43	+5.1	19.1	49.2
Mar. 14	02 22.19	+07 32.9	3.582	2.934	+1.45	+4.9	19.2	43.0
Mar. 24	02 36.71	+08 21.9	3.713	2.977	+1.47	+4.6	19.4	36.9
Apr. 3	02 51.37	+09 08.2	3.833	3.019	+1.47	+4.3	19.5	30.9

Comet 277P/LINEAR

Epoch = 2013 July 7.0 TT
T = 2013 June 5.88698 TT
Peri. = 152.28435 e = 0.5046278
Node = 276.36121 2000.0 a = 3.8620950 AU
Incl. = 16.74800 n = 0.12985828
q = 1.9131745 AU P = 7.59 years

m1 = 12.4 + 5 log(Delta) + 15.0 log(r(t-60))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m ′	m1	Elong. °
Jan. 8	22 47.38	+08 04.8	2.627	2.297	+1.72	+6.8	20.7	59.9
Jan. 18	23 04.55	+09 12.9	2.681	2.253	+1.83	+7.8	20.6	54.3
Jan. 28	23 22.81	+10 31.2	2.728	2.211	+1.93	+8.7	20.5	49.0
Feb. 7	23 42.09	+11 58.0	2.769	2.171	+2.03	+9.4	20.4	44.1
Feb. 17	00 02.36	+13 31.7	2.803	2.133	+2.12	+9.9	20.3	39.3
Feb. 27	00 23.55	+15 10.2	2.832	2.097	+2.21	+10.1	20.2	34.9
Mar. 9	00 45.67	+16 51.4	2.856	2.064	+2.30	+10.1	20.1	30.6
Mar. 19	01 08.69	+18 32.8	2.875	2.034	+2.39	+9.9	20.0	26.6
Mar. 29	01 32.61	+20 12.0	2.890	2.006	+2.48	+9.4	19.9	22.7
Apr. 8	01 57.41	+21 46.4	2.901	1.982	+2.56	+8.7	19.8	19.1
Apr. 18	02 23.04	+23 13.2	2.909	1.961	+2.64	+7.7	19.7	15.6
Apr. 28	02 49.45	+24 29.9	2.915	1.944	+2.71	+6.4	19.5	12.4
May 8	03 16.52	+25 34.0	2.919	1.930	+2.76	+4.9	19.4	9.4
May 18	03 44.14	+26 23.3	2.920	1.920	+2.80	+3.3	19.4	7.0
May 28	04 12.10	+26 55.9	2.920	1.915	+2.81	+1.5	19.3	5.7
June 7	04 40.22	+27 10.5	2.919	1.913	+2.80	-0.4	19.2	6.3
June 17	05 08.27	+27 06.3	2.915	1.916	+2.77	-2.3	19.1	8.4
June 27	05 36.00	+26 43.2	2.909	1.922	+2.72	-4.2	19.0	11.2
July 7	06 03.20	+26 01.5	2.901	1.933	+2.65	-5.9	19.0	14.4
July 17	06 29.66	+25 02.2	2.890	1.947	+2.56	-7.6	19.0	17.8
July 27	06 55.22	+23 46.7	2.876	1.965	+2.45	-9.0	18.9	21.4
Aug. 6	07 19.76	+22 16.5	2.858	1.987	+2.34	-10.3	18.9	25.1
Aug. 16	07 43.17	+20 33.6	2.836	2.012	+2.22	-11.4	18.9	29.1
Aug. 26	08 05.38	+18 39.8	2.809	2.040	+2.10	-12.3	18.9	33.2
Sept. 5	08 26.37	+16 37.1	2.777	2.071	+1.97	-13.0	18.9	37.6
Sept. 15	08 46.10	+14 27.2	2.738	2.105	+1.84	-13.5	18.9	42.2
Sept. 25	09 04.53	+12 12.0	2.694	2.141	+1.71	-13.9	19.0	47.1
Oct. 5	09 21.64	+09 53.1	2.644	2.180	+1.57	-14.1	19.0	52.2
Oct. 15	09 37.37	+07 32.1	2.587	2.220	+1.43	-14.2	19.0	57.7
Oct. 25	09 51.66	+05 10.5	2.524	2.263	+1.27	-14.1	19.1	63.5
Nov. 4	10 04.41	+02 49.7	2.456	2.306	+1.11	-13.8	19.1	69.6
Nov. 14	10 15.47	+00 31.2	2.382	2.352	+0.92	-13.4	19.1	76.2
Nov. 24	10 24.70	-01 43.2	2.305	2.398	+0.72	-12.9	19.2	83.2
Dec. 4	10 31.90	-03 51.9	2.226	2.445	+0.49	-12.1	19.2	90.7
Dec. 14	10 36.84	-05 52.5	2.148	2.494	+0.25	-11.0	19.3	98.6
Dec. 24	10 39.32	-07 42.5	2.073	2.543	-0.01	-9.6	19.3	107.1
Jan. 3	10 39.18	-09 18.6	2.005	2.592	-0.28	-7.8	19.4	116.1
Jan. 13	10 36.36	-10 37.1	1.947	2.643	-0.53	-5.7	19.4	125.5
Jan. 23	10 31.06	-11 34.3	1.904	2.693	-0.74	-3.3	19.5	135.1
Feb. 2	10 23.70	-12 07.2	1.881	2.744	-0.87	-0.7	19.6	144.5
Feb. 12	10 15.01	-12 14.6	1.881	2.795	-0.91	+1.7	19.7	152.6
Feb. 22	10 05.94	-11 58.0	1.907	2.846	-0.85	+3.6	19.9	157.4
Mar. 4	09 57.47	-11 21.8	1.961	2.897	-0.70	+4.9	20.1	156.6
Mar. 14	09 50.44	-10 32.5	2.040	2.948	-0.50	+5.5	20.3	150.8
Mar. 24	09 45.42	-09 37.4	2.144	2.999	-0.28	+5.5	20.5	142.8
Apr. 3	09 42.67	-08 42.7	2.270	3.050	-0.05	+4.9	20.8	134.0

Comet 112P/Urata-Niijima

Epoch = 2013 July 7.0 TT
T = 2013 June 24.31037 TT
Peri. = 21.45003 e = 0.5881233
Node = 31.92697 2000.0 a = 3.5333647 AU
Incl. = 24.20300 n = 0.14839572
q = 1.4553106 AU P = 6.64 years

m1 = 14.8 + 5 log(Delta) + 15.0 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	21 36.29	-31 12.7	2.995	2.226	+2.03	+15.1	23.0	32.3
Jan. 18	21 56.55	-28 41.4	2.983	2.160	+2.06	+16.2	22.8	27.6
Jan. 28	22 17.12	-25 59.5	2.962	2.094	+2.08	+17.3	22.6	23.3
Feb. 7	22 37.96	-23 06.9	2.933	2.029	+2.11	+18.3	22.4	19.4
Feb. 17	22 59.06	-20 03.6	2.897	1.965	+2.14	+19.4	22.1	15.9
Feb. 27	23 20.42	-16 49.7	2.855	1.902	+2.17	+20.4	21.9	12.9
Mar. 9	23 42.09	-13 25.6	2.808	1.841	+2.20	+21.4	21.7	10.7
Mar. 19	00 04.12	-09 51.8	2.757	1.783	+2.25	+22.3	21.4	9.6
Mar. 29	00 26.59	-06 09.3	2.703	1.727	+2.30	+23.0	21.1	9.5
Apr. 8	00 49.62	-02 19.1	2.649	1.674	+2.37	+23.6	20.9	10.4
Apr. 18	01 13.33	+01 37.2	2.595	1.625	+2.45	+24.0	20.6	11.8
Apr. 28	01 37.87	+05 37.5	2.542	1.582	+2.56	+24.2	20.4	13.6
May 8	02 03.43	+09 39.2	2.492	1.543	+2.68	+24.0	20.1	15.5
May 18	02 30.18	+13 39.1	2.445	1.511	+2.81	+23.4	19.9	17.5
May 28	02 58.30	+17 33.2	2.402	1.485	+2.97	+22.4	19.7	19.4
June 7	03 27.98	+21 16.9	2.365	1.468	+3.13	+20.8	19.5	21.4
June 17	03 59.32	+24 44.8	2.333	1.458	+3.30	+18.7	19.3	23.4
June 27	04 32.32	+27 51.4	2.308	1.456	+3.46	+16.0	19.2	25.4
July 7	05 06.89	+30 31.5	2.288	1.462	+3.58	+12.9	19.1	27.4
July 17	05 42.71	+32 40.4	2.274	1.476	+3.66	+9.5	19.0	29.5
July 27	06 19.30	+34 15.2	2.265	1.498	+3.67	+6.0	19.0	31.6
Aug. 6	06 56.04	+35 14.8	2.260	1.527	+3.62	+2.6	19.0	33.9
Aug. 16	07 32.24	+35 40.7	2.258	1.563	+3.50	-0.4	19.1	36.4
Aug. 26	08 07.24	+35 36.3	2.259	1.604	+3.33	-3.0	19.2	39.0
Sept. 5	08 40.54	+35 06.7	2.259	1.651	+3.12	-4.9	19.3	41.8
Sept.15	09 11.79	+34 17.8	2.258	1.702	+2.90	-6.2	19.5	44.9
Sept.25	09 40.79	+33 15.9	2.255	1.756	+2.67	-6.9	19.6	48.4
Oct. 5	10 07.51	+32 06.7	2.247	1.814	+2.44	-7.1	19.8	52.1
Oct. 15	10 31.93	+30 55.8	2.234	1.874	+2.22	-6.8	20.0	56.3
Oct. 25	10 54.10	+29 47.7	2.215	1.936	+2.00	-6.1	20.2	60.8
Nov. 4	11 14.09	+28 46.6	2.189	1.999	+1.78	-5.1	20.4	65.8
Nov. 14	11 31.87	+27 55.9	2.157	2.064	+1.56	-3.7	20.6	71.3
Nov. 24	11 47.43	+27 18.5	2.118	2.129	+1.32	-2.2	20.7	77.2
Dec. 4	12 00.66	+26 56.9	2.073	2.196	+1.07	-0.4	20.9	83.7
Dec. 14	12 11.38	+26 52.9	2.024	2.262	+0.80	+1.4	21.1	90.8
Dec. 24	12 19.39	+27 07.3	1.973	2.329	+0.50	+3.3	21.2	98.4
Jan. 3	12 24.40	+27 40.1	1.922	2.395	+0.17	+4.9	21.3	106.5
Jan. 13	12 26.12	+28 29.2	1.877	2.461	-0.18	+6.1	21.5	115.1
Jan. 23	12 24.33	+29 30.4	1.840	2.527	-0.53	+6.6	21.6	124.1
Feb. 2	12 18.98	+30 36.9	1.817	2.593	-0.87	+6.2	21.8	133.2
Feb. 12	12 10.33	+31 39.2	1.813	2.658	-1.13	+4.8	22.0	141.6
Feb. 22	11 59.07	+32 27.2	1.831	2.723	-1.28	+2.5	22.2	148.3
Mar. 4	11 46.30	+32 52.3	1.875	2.787	-1.29	-0.3	22.4	151.4
Mar. 14	11 33.41	+32 49.2	1.946	2.850	-1.17	-3.1	22.6	149.9
Mar. 24	11 21.67	+32 17.9	2.043	2.913	-0.96	-5.6	22.9	144.5
Apr. 3	11 12.04	+31 22.2	2.165	2.975	-0.70	-7.5	.	137.0

Comet C/2012 S4 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 June 28.07450 TT
Peri. = 163.62376
Node = 173.10347 2000.0
Incl. = 126.54234
q = 4.3485688 AU
e = 0.9999965

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	23 27.52	+31 38.8	4.625	4.570	+0.35	-12.1	17.9	80.7
Jan. 18	23 30.98	+29 37.3	4.762	4.546	+0.43	-10.3	18.0	71.4
Jan. 28	23 35.32	+27 54.5	4.894	4.523	+0.50	-8.6	18.0	62.4
Feb. 7	23 40.32	+26 28.7	5.016	4.501	+0.55	-7.1	18.0	53.6
Feb. 17	23 45.81	+25 17.9	5.122	4.480	+0.58	-5.8	18.1	45.1
Feb. 27	23 51.61	+24 20.1	5.211	4.461	+0.60	-4.7	18.1	37.1
Mar. 9	23 57.59	+23 33.3	5.278	4.444	+0.60	-3.8	18.1	29.8
Mar. 19	00 03.64	+22 55.6	5.321	4.428	+0.60	-3.1	18.1	23.7
Mar. 29	00 09.61	+22 25.0	5.339	4.413	+0.58	-2.5	18.1	19.8
Apr. 8	00 15.42	+21 59.8	5.332	4.400	+0.55	-2.1	18.1	19.4
Apr. 18	00 20.94	+21 38.3	5.298	4.388	+0.51	-1.9	18.0	22.6
Apr. 28	00 26.05	+21 19.0	5.238	4.378	+0.46	-1.9	18.0	28.3
May 8	00 30.66	+21 00.2	5.153	4.369	+0.40	-2.0	18.0	35.4
May 18	00 34.61	+20 40.2	5.044	4.362	+0.32	-2.3	17.9	43.2
May 28	00 37.76	+20 17.4	4.915	4.356	+0.22	-2.8	17.8	51.5
June 7	00 39.98	+19 49.8	4.766	4.352	+0.11	-3.4	17.8	60.2
June 17	00 41.08	+19 15.4	4.603	4.350	-0.02	-4.4	17.7	69.3
June 27	00 40.89	+18 31.8	4.429	4.349	-0.17	-5.5	17.6	78.9
July 7	00 39.23	+17 36.6	4.248	4.349	-0.33	-7.0	17.5	88.9
July 17	00 35.91	+16 26.8	4.068	4.351	-0.51	-8.7	17.4	99.4
July 27	00 30.81	+14 59.6	3.894	4.355	-0.69	-10.7	17.3	110.5
Aug. 6	00 23.86	+13 12.8	3.734	4.360	-0.88	-12.8	17.3	122.2
Aug. 16	00 15.10	+11 04.7	3.597	4.367	-1.04	-14.9	17.2	134.6
Aug. 26	00 04.74	+08 35.9	3.490	4.376	-1.16	-16.7	17.1	147.5
Sept. 5	23 53.15	+05 49.3	3.421	4.386	-1.23	-17.9	17.1	160.7
Sept. 15	23 40.88	+02 50.7	3.396	4.397	-1.23	-18.2	17.1	173.6
Sept. 25	23 28.58	-00 11.4	3.418	4.410	-1.17	-17.7	17.1	170.4
Oct. 5	23 16.91	-03 08.4	3.486	4.424	-1.05	-16.4	17.2	157.1
Oct. 15	23 06.44	-05 52.5	3.596	4.440	-0.88	-14.6	17.3	143.8
Oct. 25	22 57.60	-08 18.5	3.743	4.457	-0.70	-12.6	17.4	130.9
Nov. 4	22 50.60	-10 24.0	3.918	4.476	-0.51	-10.5	17.5	118.5
Nov. 14	22 45.52	-12 09.0	4.112	4.496	-0.32	-8.6	17.6	106.6
Nov. 24	22 42.29	-13 34.9	4.319	4.518	-0.15	-6.9	17.7	95.3
Dec. 4	22 40.76	-14 44.2	4.529	4.540	0.00	-5.5	17.9	84.4
Dec. 14	22 40.75	-15 39.4	4.737	4.565	+0.13	-4.4	18.0	74.0
Dec. 24	22 42.06	-16 23.0	4.936	4.590	+0.24	-3.5	18.1	63.9
Jan. 3	22 44.49	-16 57.6	5.121	4.617	+0.33	-2.8	18.2	54.3
Jan. 13	22 47.83	-17 25.1	5.288	4.645	+0.41	-2.3	18.3	44.9
Jan. 23	22 51.92	-17 47.8	5.434	4.674	+0.47	-1.9	18.4	36.0
Feb. 2	22 56.58	-18 07.2	5.556	4.704	+0.51	-1.8	18.4	27.5
Feb. 12	23 01.68	-18 25.2	5.652	4.735	+0.54	-1.8	18.5	19.8
Feb. 22	23 07.07	-18 43.2	5.721	4.768	+0.56	-2.0	18.6	14.1
Mar. 4	23 12.63	-19 02.8	5.763	4.801	+0.56	-2.3	18.6	12.9
Mar. 14	23 18.23	-19 25.3	5.777	4.836	+0.55	-2.7	18.7	17.2
Mar. 24	23 23.78	-19 52.2	5.764	4.872	+0.54	-3.3	18.7	24.1
Apr. 3	23 29.15	-20 25.0	5.727	4.908	+0.51	-4.0	18.7	32.0

Comet P/2003 U2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 June 30.04652 TT
Peri. = 177.46393 e = 0.6236397
Node = 186.38723 2000.0 a = 4.4924629 AU
Incl. = 24.60245 n = 0.10350881
q = 1.6907847 AU P = 9.52 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot.′/PA °	Elong. °
Jan. 8	19 09.27	-05 10.5	3.321	2.400	-0.83	+0.3	21.7	30.9/ 86	17.2
Jan. 18	19 29.89	-04 45.5	3.257	2.337	-0.88	+0.2	21.5	31.9/ 84	17.4
Jan. 28	19 51.12	-04 08.7	3.186	2.275	-0.94	+0.1	21.3	32.9/ 82	18.8
Feb. 7	20 12.89	-03 20.4	3.108	2.215	-1.00	0.0	21.0	33.9/ 80	20.9
Feb. 17	20 35.18	-02 20.9	3.025	2.156	-1.06	-0.1	20.8	34.8/ 79	23.6
Feb. 27	20 57.94	-01 11.1	2.939	2.099	-1.12	-0.1	20.6	35.7/ 77	26.4
Mar. 9	21 21.17	+00 07.8	2.850	2.043	-1.19	-0.2	20.3	36.6/ 76	29.4
Mar. 19	21 44.84	+01 34.6	2.759	1.991	-1.26	-0.2	20.1	37.3/ 76	32.4
Mar. 29	22 08.97	+03 07.3	2.668	1.941	-1.33	-0.1	19.9	38.1/ 75	35.3
Apr. 8	22 33.56	+04 44.0	2.577	1.894	-1.40	0.0	19.6	38.7/ 75	38.2
Apr. 18	22 58.64	+06 22.3	2.487	1.851	-1.47	+0.2	19.4	39.2/ 75	41.0
Apr. 28	23 24.19	+07 59.4	2.399	1.812	-1.54	+0.6	19.2	39.7/ 76	43.8
May 8	23 50.24	+09 32.4	2.314	1.778	-1.60	+1.0	19.0	40.1/ 77	46.6
May 18	00 16.75	+10 58.1	2.231	1.749	-1.66	+1.5	18.8	40.3/ 79	49.4
May 28	00 43.68	+12 13.4	2.151	1.726	-1.72	+2.1	18.6	40.4/ 80	52.2
June 7	01 10.95	+13 14.9	2.074	1.708	-1.76	+2.8	18.5	40.3/ 83	55.0
June 17	01 38.39	+13 59.5	2.000	1.696	-1.79	+3.5	18.3	40.0/ 86	58.0
June 27	02 05.81	+14 24.4	1.929	1.691	-1.81	+4.2	18.2	39.5/ 89	61.1
July 7	02 32.98	+14 27.2	1.862	1.692	-1.81	+4.9	18.2	38.7/ 92	64.4
July 17	02 59.56	+14 06.1	1.798	1.700	-1.80	+5.4	18.1	37.7/ 96	67.9
July 27	03 25.23	+13 20.2	1.736	1.714	-1.78	+5.7	18.1	36.4/101	71.7
Aug. 6	03 49.63	+12 09.1	1.678	1.734	-1.75	+5.8	18.1	34.8/105	75.8
Aug. 16	04 12.35	+10 33.5	1.622	1.760	-1.72	+5.5	18.1	32.8/111	80.2
Aug. 26	04 33.06	+08 34.8	1.570	1.791	-1.69	+5.0	18.2	30.6/117	85.0
Sept. 5	04 51.38	+06 15.0	1.520	1.827	-1.67	+4.2	18.2	28.1/124	90.2
Sept.15	05 06.94	+03 37.3	1.475	1.867	-1.66	+3.2	18.3	25.4/132	95.8
Sept.25	05 19.44	+00 45.7	1.434	1.912	-1.67	+1.9	18.4	22.6/143	101.9
Oct. 5	05 28.57	-02 14.7	1.399	1.960	-1.70	+0.5	18.5	20.0/156	108.4
Oct. 15	05 34.08	-05 16.9	1.373	2.011	-1.76	-0.9	18.6	17.8/171	115.2
Oct. 25	05 35.90	-08 12.4	1.357	2.065	-1.82	-2.1	18.8	16.1/189	122.1
Nov. 4	05 34.12	-10 51.2	1.353	2.121	-1.90	-3.0	19.0	15.0/209	128.8
Nov. 14	05 29.18	-13 02.3	1.365	2.179	-1.96	-3.4	19.1	14.1/228	134.8
Nov. 24	05 21.93	-14 36.5	1.395	2.238	-2.00	-3.3	19.4	13.3/247	139.3
Dec. 4	05 13.47	-15 27.7	1.444	2.299	-1.99	-2.9	19.6	12.2/266	141.5
Dec. 14	05 05.07	-15 34.9	1.514	2.361	-1.93	-2.2	19.9	10.9/287	140.9
Dec. 24	04 57.86	-15 02.7	1.604	2.424	-1.84	-1.4	20.2	9.9/310	137.8
Jan. 3	04 52.63	-13 58.8	1.713	2.488	-1.72	-0.8	20.5	9.6/335	132.7
Jan. 13	04 49.82	-12 32.3	1.840	2.552	-1.58	-0.3	20.8	10.0/358	126.6
Jan. 23	04 49.52	-10 52.1	1.982	2.616	-1.45	0.0	21.2	11.1/ 16	119.9
Feb. 2	04 51.61	-09 05.6	2.137	2.681	-1.32	+0.3	21.5	12.4/ 31	113.0
Feb. 12	04 55.85	-07 18.3	2.303	2.746	-1.20	+0.4	21.8	13.8/ 41	106.1
Feb. 22	05 01.95	-05 34.5	2.477	2.810	-1.09	+0.5	22.1	15.1/ 50	99.2
Mar. 4	05 09.62	-03 56.8	2.656	2.875	-1.00	+0.5	22.4	16.2/ 56	92.5
Mar. 14	05 18.60	-02 27.1	2.839	2.939	-0.91	+0.6	22.7	17.1/ 62	85.8
Mar. 24	05 28.63	-01 06.7	3.023	3.004	-0.84	+0.6	23.0	17.8/ 67	79.4
Apr. 3	05 39.52	+00 03.9	3.207	3.068	-0.77	+0.6	.	18.4/ 71	73.0

Comet C/2013 B2 (Catalina)

T = 2013 June 30.66294 TT
Peri. = 156.18342
Node = 331.89137 2000.0
Incl. = 43.50090
q = 3.7455522 AU
e = 1.0

m1 = 10.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	07 45.49	+66 27.5	3.286	4.047	-1.43	-5.0	19.3	135.6
Jan. 18	07 31.14	+65 37.1	3.261	4.015	-1.27	-7.8	19.2	134.7
Jan. 28	07 18.40	+64 19.4	3.260	3.984	-0.98	-10.1	19.2	131.8
Feb. 7	07 08.55	+62 38.1	3.280	3.955	-0.63	-12.0	19.2	127.2
Feb. 17	07 02.24	+60 38.6	3.321	3.928	-0.27	-13.2	19.1	121.4
Feb. 27	06 59.54	+58 26.8	3.381	3.902	+0.06	-13.9	19.2	114.9
Mar. 9	07 00.10	+56 08.2	3.457	3.879	+0.34	-14.1	19.2	107.9
Mar. 19	07 03.47	+53 46.8	3.546	3.857	+0.57	-14.1	19.2	100.7
Mar. 29	07 09.15	+51 25.7	3.645	3.837	+0.75	-13.9	19.2	93.4
Apr. 8	07 16.66	+49 06.4	3.751	3.818	+0.90	-13.7	19.3	86.2
Apr. 18	07 25.61	+46 49.8	3.862	3.802	+1.00	-13.4	19.3	79.1
Apr. 28	07 35.66	+44 36.2	3.974	3.788	+1.09	-13.1	19.4	72.1
May 8	07 46.52	+42 25.6	4.086	3.776	+1.15	-12.8	19.4	65.2
May 18	07 57.99	+40 17.4	4.194	3.766	+1.19	-12.6	19.5	58.5
May 28	08 09.86	+38 11.4	4.297	3.757	+1.21	-12.4	19.5	51.9
June 7	08 22.00	+36 07.2	4.394	3.751	+1.23	-12.3	19.6	45.4
June 17	08 34.28	+34 04.2	4.482	3.748	+1.23	-12.2	19.6	39.0
June 27	08 46.59	+32 02.2	4.560	3.746	+1.23	-12.1	19.6	32.7
July 7	08 58.86	+30 00.8	4.627	3.746	+1.22	-12.1	19.7	26.6
July 17	09 11.02	+27 60.0	4.683	3.748	+1.20	-12.0	19.7	20.6
July 27	09 23.01	+25 59.5	4.725	3.753	+1.18	-12.0	19.7	14.9
Aug. 6	09 34.77	+23 59.3	4.753	3.759	+1.15	-12.0	19.7	10.2
Aug. 16	09 46.26	+21 59.5	4.767	3.768	+1.12	-12.0	19.8	8.2
Aug. 26	09 57.42	+19 59.9	4.767	3.779	+1.08	-11.9	19.8	10.8
Sept. 5	10 08.21	+18 00.7	4.751	3.792	+1.04	-11.9	19.8	15.9
Sept. 15	10 18.57	+16 02.1	4.720	3.806	+0.99	-11.8	19.8	22.0
Sept. 25	10 28.45	+14 04.2	4.674	3.823	+0.93	-11.7	19.8	28.5
Oct. 5	10 37.77	+12 07.1	4.613	3.842	+0.87	-11.6	19.8	35.4
Oct. 15	10 46.46	+10 11.0	4.539	3.862	+0.80	-11.5	19.8	42.5
Oct. 25	10 54.42	+08 16.3	4.451	3.885	+0.71	-11.3	19.7	49.8
Nov. 4	11 01.56	+06 23.2	4.352	3.909	+0.62	-11.1	19.7	57.5
Nov. 14	11 07.75	+04 31.9	4.243	3.935	+0.51	-10.9	19.7	65.4
Nov. 24	11 12.85	+02 43.0	4.127	3.963	+0.39	-10.6	19.7	73.6
Dec. 4	11 16.73	+00 56.9	4.006	3.992	+0.25	-10.3	19.6	82.1
Dec. 14	11 19.23	-00 45.8	3.884	4.023	+0.10	-9.9	19.6	91.0
Dec. 24	11 20.21	-02 24.3	3.764	4.056	-0.06	-9.3	19.6	100.3
Jan. 3	11 19.56	-03 57.7	3.650	4.090	-0.23	-8.7	19.5	109.9
Jan. 13	11 17.22	-05 24.6	3.548	4.126	-0.40	-7.9	19.5	119.8
Jan. 23	11 13.21	-06 43.8	3.462	4.163	-0.55	-7.0	19.5	129.9
Feb. 2	11 07.68	-07 53.7	3.398	4.201	-0.68	-5.9	19.5	140.1
Feb. 12	11 00.91	-08 53.1	3.358	4.241	-0.76	-4.8	19.5	149.9
Feb. 22	10 53.32	-09 41.4	3.347	4.282	-0.79	-3.7	19.5	158.3
Mar. 4	10 45.42	-10 18.4	3.367	4.324	-0.77	-2.7	19.6	162.8
Mar. 14	10 37.77	-10 45.3	3.418	4.368	-0.69	-1.9	19.7	160.4
Mar. 24	10 30.87	-11 04.0	3.499	4.412	-0.57	-1.3	19.8	153.2
Apr. 3	10 25.13	-11 16.9	3.608	4.458	-0.43	-1.0	19.9	144.2

Comet 271P/van Houten-Lemmon

Epoch = 2013 July 7.0 TT
T = 2013 July 5.80314 TT
Peri. = 35.13200 e = 0.3913270
Node = 9.58385 2000.0 a = 6.9816636 AU
Incl. = 6.85371 n = 0.05342760
q = 4.2495501 AU P = 18.45 years

m1 = 7.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 28.59	+04 35.4	4.399	4.350	+0.61	+4.5	20.4	80.7
Jan. 18	00 34.65	+05 20.5	4.538	4.339	+0.70	+5.1	20.4	72.2
Jan. 28	00 41.68	+06 11.2	4.670	4.329	+0.79	+5.5	20.5	64.0
Feb. 7	00 49.54	+07 06.7	4.793	4.319	+0.86	+5.9	20.5	56.0
Feb. 17	00 58.13	+08 06.0	4.905	4.311	+0.92	+6.2	20.6	48.2
Feb. 27	01 07.34	+09 08.4	5.005	4.302	+0.97	+6.5	20.6	40.7
Mar. 9	01 17.08	+10 13.1	5.090	4.294	+1.02	+6.6	20.6	33.3
Mar. 19	01 27.26	+11 19.3	5.159	4.287	+1.05	+6.7	20.6	26.1
Mar. 29	01 37.80	+12 26.3	5.212	4.281	+1.08	+6.7	20.7	19.0
Apr. 8	01 48.63	+13 33.5	5.249	4.275	+1.11	+6.7	20.7	12.1
Apr. 18	01 59.69	+14 40.3	5.268	4.269	+1.12	+6.6	20.7	5.5
Apr. 28	02 10.90	+15 46.1	5.270	4.265	+1.13	+6.4	20.7	3.0
May 8	02 22.20	+16 50.4	5.255	4.261	+1.13	+6.2	20.6	9.0
May 18	02 33.53	+17 52.8	5.223	4.257	+1.13	+6.0	20.6	15.6
May 28	02 44.81	+18 53.0	5.175	4.254	+1.12	+5.8	20.6	22.3
June 7	02 55.97	+19 50.7	5.111	4.252	+1.10	+5.5	20.6	29.0
June 17	03 06.93	+20 45.5	5.032	4.251	+1.07	+5.2	20.5	35.8
June 27	03 17.59	+21 37.4	4.940	4.250	+1.03	+4.9	20.5	42.7
July 7	03 27.85	+22 26.2	4.835	4.250	+0.98	+4.6	20.4	49.7
July 17	03 37.61	+23 11.8	4.719	4.250	+0.91	+4.2	20.4	56.9
July 27	03 46.72	+23 54.3	4.593	4.251	+0.83	+3.9	20.3	64.2
Aug. 6	03 55.05	+24 33.7	4.459	4.253	+0.74	+3.6	20.3	71.8
Aug. 16	04 02.45	+25 10.0	4.320	4.255	+0.63	+3.3	20.2	79.6
Aug. 26	04 08.75	+25 43.4	4.177	4.258	+0.50	+3.0	20.1	87.7
Sept. 5	04 13.79	+26 13.9	4.034	4.262	+0.36	+2.7	20.1	96.1
Sept. 15	04 17.39	+26 41.3	3.895	4.266	+0.20	+2.4	20.0	104.9
Sept. 25	04 19.41	+27 05.4	3.761	4.271	+0.03	+2.0	19.9	114.1
Oct. 5	04 19.76	+27 25.9	3.639	4.276	-0.14	+1.6	19.9	123.7
Oct. 15	04 18.40	+27 42.1	3.532	4.282	-0.30	+1.1	19.8	133.7
Oct. 25	04 15.44	+27 53.3	3.443	4.289	-0.44	+0.6	19.8	144.1
Nov. 4	04 11.07	+27 58.8	3.379	4.296	-0.54	-0.1	19.7	154.7
Nov. 14	04 05.67	+27 58.2	3.341	4.304	-0.59	-0.6	19.7	165.1
Nov. 24	03 59.74	+27 51.9	3.332	4.313	-0.59	-1.1	19.7	172.6
Dec. 4	03 53.83	+27 40.7	3.353	4.322	-0.53	-1.4	19.8	168.0
Dec. 14	03 48.50	+27 26.3	3.404	4.331	-0.43	-1.6	19.8	157.8
Dec. 24	03 44.24	+27 10.7	3.483	4.342	-0.29	-1.5	19.9	147.1
Jan. 3	03 41.37	+26 56.0	3.586	4.352	-0.12	-1.2	20.0	136.5
Jan. 13	03 40.13	+26 44.0	3.711	4.364	+0.04	-0.8	20.0	126.1
Jan. 23	03 40.58	+26 35.9	3.852	4.376	+0.21	-0.4	20.1	116.1
Feb. 2	03 42.69	+26 32.3	4.005	4.388	+0.37	+0.1	20.2	106.5
Feb. 12	03 46.39	+26 33.3	4.166	4.401	+0.51	+0.5	20.4	97.3
Feb. 22	03 51.54	+26 38.5	4.331	4.415	+0.64	+0.9	20.5	88.4
Mar. 4	03 57.97	+26 47.5	4.495	4.429	+0.76	+1.2	20.6	79.8
Mar. 14	04 05.56	+26 59.3	4.657	4.443	+0.86	+1.4	20.7	71.6
Mar. 24	04 14.13	+27 13.2	4.811	4.458	+0.94	+1.5	20.7	63.6
Apr. 3	04 23.55	+27 28.3	4.958	4.474	+1.01	+1.6	20.8	55.9

Comet 26P/Grigg-Skjellerup

Epoch = 2013 July 7.0 TT
T = 2013 July 6.01613 TT
Peri. = 2.15373 e = 0.6401344
Node = 211.55252 2000.0 a = 3.0174023 AU
Incl. = 22.42379 n = 0.18804173
q = 1.0858593 AU P = 5.24 years

m1 = 15.6 + 5 log(Delta) + 12.5 log(r(t-20))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	06 25.84	-12 30.4	1.416	2.280	-1.30	-1.5	21.2	143.1
Jan. 18	06 12.81	-12 45.4	1.374	2.202	-1.16	+2.4	20.9	137.5
Jan. 28	06 01.21	-12 21.8	1.352	2.123	-0.89	+5.8	20.7	129.9
Feb. 7	05 52.33	-11 24.1	1.346	2.042	-0.53	+8.4	20.5	121.5
Feb. 17	05 47.07	-09 59.7	1.352	1.961	-0.12	+10.2	20.3	113.0
Feb. 27	05 45.86	-08 17.7	1.363	1.879	+0.29	+11.2	20.2	104.8
Mar. 9	05 48.74	-06 25.6	1.377	1.797	+0.69	+11.6	20.0	97.3
Mar. 19	05 55.62	-04 29.5	1.390	1.714	+1.07	+11.5	19.7	90.4
Mar. 29	06 06.29	-02 34.1	1.397	1.632	+1.43	+11.2	19.5	84.1
Apr. 8	06 20.56	-00 42.4	1.399	1.551	+1.77	+10.6	19.3	78.6
Apr. 18	06 38.31	+01 03.2	1.394	1.472	+2.11	+9.7	19.0	73.7
Apr. 28	06 59.44	+02 40.5	1.382	1.396	+2.45	+8.8	18.7	69.5
May 8	07 23.89	+04 08.3	1.362	1.324	+2.78	+7.6	18.4	65.9
May 18	07 51.68	+05 24.6	1.338	1.257	+3.11	+6.3	18.0	62.9
May 28	08 22.77	+06 28.1	1.309	1.199	+3.43	+4.9	17.7	60.6
June 7	08 57.08	+07 16.9	1.279	1.151	+3.74	+3.2	17.4	58.9
June 17	09 34.45	+07 49.1	1.251	1.114	+4.01	+1.4	17.1	57.8
June 27	10 14.51	+08 02.9	1.228	1.092	+4.22	-0.7	16.8	57.3
July 7	10 56.71	+07 56.3	1.212	1.086	+4.36	-2.8	16.6	57.5
July 17	11 40.36	+07 28.4	1.208	1.095	+4.42	-4.9	16.5	58.2
July 27	12 24.58	+06 39.6	1.218	1.120	+4.39	-6.7	16.5	59.4
Aug. 6	13 08.51	+05 32.2	1.243	1.159	+4.29	-8.2	16.6	60.8
Aug. 16	13 51.42	+04 10.7	1.285	1.210	+4.13	-9.0	16.8	62.2
Aug. 26	14 32.70	+02 41.1	1.344	1.270	+3.93	-9.1	17.0	63.4
Sept. 5	15 12.01	+01 09.7	1.419	1.337	+3.72	-8.7	17.4	64.3
Sept.15	15 49.20	-00 17.7	1.510	1.410	+3.50	-7.8	17.8	64.6
Sept.25	16 24.23	-01 36.1	1.616	1.487	+3.30	-6.6	18.2	64.3
Oct. 5	16 57.19	-02 42.4	1.735	1.567	+3.10	-5.2	18.7	63.4
Oct. 15	17 28.21	-03 34.6	1.864	1.648	+2.92	-3.7	19.1	61.9
Oct. 25	17 57.43	-04 11.6	2.003	1.730	+2.76	-2.2	19.5	59.8
Nov. 4	18 25.00	-04 33.6	2.148	1.813	+2.61	-0.7	20.0	57.1
Nov. 14	18 51.08	-04 40.9	2.299	1.895	+2.47	+0.6	20.4	54.0
Nov. 24	19 15.76	-04 34.5	2.452	1.977	+2.34	+1.9	20.8	50.5
Dec. 4	19 39.20	-04 15.6	2.606	2.058	+2.23	+3.0	21.2	46.7
Dec. 14	20 01.47	-03 45.3	2.758	2.138	+2.12	+4.0	21.5	42.5
Dec. 24	20 22.66	-03 05.0	2.907	2.217	+2.02	+4.9	21.8	38.1
Jan. 3	20 42.86	-02 15.9	3.049	2.295	+1.93	+5.7	22.1	33.6
Jan. 13	21 02.14	-01 19.4	3.185	2.372	+1.84	+6.3	22.4	28.9
Jan. 23	21 20.53	-00 16.6	3.310	2.447	+1.76	+6.8	22.7	24.3
Feb. 2	21 38.11	+00 51.4	3.425	2.521	+1.68	+7.2	23.0	20.0
Feb. 12	21 54.90	+02 03.4	3.527	2.594	+1.60	+7.5	.	16.3
Feb. 22	22 10.93	+03 18.5	3.615	2.665	+1.53	+7.7	.	13.9
Mar. 4	22 26.23	+04 35.7	3.688	2.735	+1.46	+7.8	.	13.7
Mar. 14	22 40.81	+05 54.1	3.746	2.804	+1.39	+7.9	.	16.0
Mar. 24	22 54.67	+07 13.0	3.787	2.871	+1.31	+7.9	.	20.0
Apr. 3	23 07.81	+08 31.5	3.812	2.936	+1.24	+7.7	.	25.0

Comet 270P/Gehrels

Epoch = 2013 July 7.0 TT
T = 2013 July 7.99787 TT
Peri. = 210.94087 e = 0.4749494
Node = 225.28380 2000.0 a = 6.8596712 AU
Incl. = 2.85499 n = 0.05485916
q = 3.6016745 AU P = 17.97 years

m1 = -2.4 + 5 log(Delta) + 30.0 log(r(t-120))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	01 54.68	+11 44.3	3.426	3.772	+0.46	+1.9	18.5	103.1
Jan. 18	01 59.24	+12 03.7	3.554	3.754	+0.60	+2.7	18.5	94.1
Jan. 28	02 05.28	+12 31.0	3.685	3.738	+0.74	+3.4	18.5	85.4
Feb. 7	02 12.65	+13 04.9	3.814	3.722	+0.86	+3.9	18.5	77.2
Feb. 17	02 21.23	+13 44.1	3.940	3.707	+0.96	+4.3	18.4	69.3
Feb. 27	02 30.86	+14 27.3	4.059	3.693	+1.06	+4.6	18.4	61.6
Mar. 9	02 41.43	+15 13.3	4.170	3.680	+1.14	+4.7	18.4	54.3
Mar. 19	02 52.82	+16 00.7	4.271	3.667	+1.21	+4.8	18.4	47.2
Mar. 29	03 04.93	+16 48.4	4.361	3.656	+1.27	+4.7	18.4	40.3
Apr. 8	03 17.66	+17 35.5	4.438	3.646	+1.33	+4.5	18.3	33.5
Apr. 18	03 30.93	+18 20.8	4.503	3.637	+1.37	+4.3	18.3	27.0
Apr. 28	03 44.64	+19 03.7	4.554	3.629	+1.41	+4.0	18.3	20.6
May 8	03 58.72	+19 43.3	4.591	3.622	+1.44	+3.6	18.2	14.3
May 18	04 13.10	+20 18.9	4.614	3.616	+1.46	+3.1	18.2	8.1
May 28	04 27.69	+20 50.1	4.623	3.611	+1.47	+2.6	18.1	2.1
June 7	04 42.41	+21 16.4	4.618	3.607	+1.48	+2.1	18.0	4.4
June 17	04 57.19	+21 37.4	4.599	3.604	+1.47	+1.6	18.0	10.4
June 27	05 11.92	+21 53.0	4.565	3.602	+1.46	+1.0	17.9	16.5
July 7	05 26.54	+22 03.0	4.519	3.602	+1.44	+0.5	17.8	22.6
July 17	05 40.94	+22 07.6	4.459	3.602	+1.41	-0.1	17.8	28.8
July 27	05 55.01	+22 06.8	4.386	3.604	+1.37	-0.6	17.7	35.1
Aug. 6	06 08.67	+22 01.0	4.302	3.606	+1.31	-1.0	17.6	41.5
Aug. 16	06 21.78	+21 50.6	4.207	3.610	+1.25	-1.4	17.5	48.1
Aug. 26	06 34.24	+21 36.2	4.102	3.615	+1.17	-1.8	17.5	54.8
Sept. 5	06 45.91	+21 18.4	3.987	3.620	+1.07	-2.0	17.4	61.7
Sept. 15	06 56.65	+20 58.0	3.865	3.627	+0.97	-2.2	17.3	68.9
Sept. 25	07 06.31	+20 36.0	3.738	3.635	+0.84	-2.3	17.2	76.4
Oct. 5	07 14.74	+20 13.3	3.606	3.644	+0.70	-2.2	17.1	84.2
Oct. 15	07 21.75	+19 51.2	3.474	3.654	+0.54	-2.1	17.0	92.4
Oct. 25	07 27.20	+19 30.6	3.343	3.665	+0.37	-1.8	16.9	101.0
Nov. 4	07 30.92	+19 12.7	3.216	3.677	+0.19	-1.4	16.8	110.1
Nov. 14	07 32.79	+18 58.4	3.099	3.690	0.00	-1.0	16.8	119.7
Nov. 24	07 32.75	+18 48.4	2.994	3.704	-0.19	-0.5	16.7	129.7
Dec. 4	07 30.84	+18 43.1	2.907	3.719	-0.36	-0.1	16.6	140.2
Dec. 14	07 27.25	+18 42.3	2.842	3.734	-0.49	+0.3	16.6	151.2
Dec. 24	07 22.31	+18 45.5	2.802	3.751	-0.58	+0.6	16.6	162.4
Jan. 3	07 16.53	+18 51.7	2.790	3.769	-0.60	+0.8	16.6	173.3
Jan. 13	07 10.52	+18 59.8	2.808	3.787	-0.56	+0.9	16.6	173.2
Jan. 23	07 04.91	+19 08.7	2.857	3.806	-0.46	+0.9	16.7	162.3
Feb. 2	07 00.28	+19 17.6	2.933	3.826	-0.32	+0.8	16.8	151.2
Feb. 12	06 57.07	+19 25.7	3.035	3.847	-0.15	+0.7	16.9	140.4
Feb. 22	06 55.54	+19 32.6	3.158	3.868	+0.03	+0.5	17.0	129.9
Mar. 4	06 55.81	+19 37.7	3.299	3.891	+0.20	+0.3	17.2	120.0
Mar. 14	06 57.86	+19 40.7	3.454	3.914	+0.37	0.0	17.3	110.5
Mar. 24	07 01.57	+19 41.2	3.617	3.937	+0.52	-0.2	17.5	101.4
Apr. 3	07 06.79	+19 38.7	3.786	3.962	+0.65	-0.6	17.6	92.8

Comet 46P/Wirtanen

Epoch = 2013 July 7.0 TT
T = 2013 July 9.34113 TT
Peri. = 356.34303 e = 0.6594072
Node = 82.16221 2000.0 a = 3.0890192 AU
Incl. = 11.75731 n = 0.18154035
q = 1.0520977 AU P = 5.43 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	21 17.61	-23 54.7	3.156	2.332	+1.82	+8.7	21.5	27.8
Jan. 18	21 35.80	-22 28.1	3.130	2.252	+1.90	+9.6	21.1	22.4
Jan. 28	21 54.83	-20 51.8	3.090	2.171	+1.98	+10.7	20.7	17.4
Feb. 7	22 14.66	-19 05.0	3.037	2.088	+2.06	+11.8	20.2	13.0
Feb. 17	22 35.30	-17 07.2	2.972	2.004	+2.15	+12.9	19.7	9.5
Feb. 27	22 56.78	-14 58.1	2.896	1.920	+2.24	+14.1	19.2	7.7
Mar. 9	23 19.18	-12 37.1	2.812	1.834	+2.34	+15.3	18.6	8.0
Mar. 19	23 42.59	-10 04.0	2.721	1.748	+2.46	+16.5	18.0	9.8
Mar. 29	00 07.15	-07 18.5	2.626	1.663	+2.59	+17.8	17.4	12.1
Apr. 8	00 33.04	-04 20.7	2.529	1.577	+2.74	+18.9	16.8	14.2
Apr. 18	01 00.48	-01 11.3	2.432	1.494	+2.92	+20.0	16.1	16.1
Apr. 28	01 29.70	+02 08.4	2.340	1.412	+3.13	+20.7	15.4	17.5
May 8	02 00.99	+05 35.8	2.253	1.334	+3.36	+21.1	14.7	18.4
May 18	02 34.62	+09 06.5	2.176	1.261	+3.62	+20.8	14.0	18.7
May 28	03 10.82	+12 34.3	2.111	1.195	+3.89	+19.6	13.4	18.6
June 7	03 49.73	+15 50.7	2.060	1.139	+4.16	+17.4	12.8	18.0
June 17	04 31.29	+18 45.1	2.025	1.095	+4.38	+14.1	12.3	17.0
June 27	05 15.12	+21 06.5	2.006	1.065	+4.54	+9.9	12.0	15.9
July 7	06 00.50	+22 45.1	2.003	1.053	+4.59	+5.0	11.9	14.8
July 17	06 46.37	+23 34.7	2.016	1.057	+4.52	0.0	11.9	13.8
July 27	07 31.53	+23 34.4	2.043	1.079	+4.34	-4.6	12.2	13.2
Aug. 6	08 14.89	+22 48.3	2.081	1.116	+4.08	-8.4	12.6	13.0
Aug. 16	08 55.66	+21 24.7	2.129	1.167	+3.78	-11.1	13.1	13.4
Aug. 26	09 33.43	+19 33.5	2.183	1.229	+3.47	-12.9	13.7	14.2
Sept. 5	10 08.15	+17 24.5	2.242	1.299	+3.18	-13.8	14.4	15.6
Sept. 15	10 39.97	+15 06.1	2.301	1.375	+2.92	-14.1	15.1	17.4
Sept. 25	11 09.14	+12 44.8	2.359	1.455	+2.68	-13.9	15.7	19.7
Oct. 5	11 35.97	+10 25.7	2.413	1.538	+2.48	-13.3	16.4	22.5
Oct. 15	12 00.72	+08 12.3	2.461	1.622	+2.29	-12.5	17.0	25.8
Oct. 25	12 23.63	+06 07.2	2.501	1.708	+2.13	-11.5	17.6	29.6
Nov. 4	12 44.89	+04 11.9	2.531	1.794	+1.97	-10.4	18.2	33.8
Nov. 14	13 04.62	+02 27.9	2.550	1.879	+1.83	-9.2	18.7	38.5
Nov. 24	13 22.90	+00 55.9	2.557	1.964	+1.69	-7.9	19.2	43.6
Dec. 4	13 39.76	-00 23.5	2.552	2.049	+1.54	-6.6	19.6	49.2
Dec. 14	13 55.17	-01 29.9	2.534	2.132	+1.39	-5.3	20.0	55.2
Dec. 24	14 09.05	-02 22.9	2.503	2.214	+1.22	-3.9	20.4	61.7
Jan. 3	14 21.29	-03 02.3	2.462	2.294	+1.04	-2.6	20.8	68.6
Jan. 13	14 31.72	-03 27.9	2.410	2.374	+0.84	-1.2	21.1	76.1
Jan. 23	14 40.15	-03 39.7	2.350	2.452	+0.62	+0.2	21.4	84.0
Feb. 2	14 46.35	-03 37.9	2.285	2.528	+0.37	+1.5	21.7	92.5
Feb. 12	14 50.10	-03 22.7	2.219	2.603	+0.11	+2.8	21.9	101.6
Feb. 22	14 51.18	-02 55.2	2.155	2.677	-0.17	+3.9	22.2	111.2
Mar. 4	14 49.48	-02 16.7	2.098	2.749	-0.45	+4.7	22.4	121.5
Mar. 14	14 45.00	-01 29.7	2.054	2.820	-0.70	+5.2	22.6	132.3
Mar. 24	14 37.99	-00 37.9	2.028	2.889	-0.90	+5.2	22.9	143.3
Apr. 3	14 28.96	+00 14.1	2.025	2.957	-1.03	+4.7	.	154.2

Comet C/2012 V1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 July 21.52972 TT
Peri. = 123.33498
Node = 85.37626 2000.0
Incl. = 157.84197
q = 2.0894281 AU
e = 0.9996707

m1 = 11.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 16.36	+21 59.9	2.971	3.053	-0.61	-9.0	18.8	85.3
Jan. 18	00 10.26	+20 29.5	3.097	2.975	-0.37	-6.9	18.8	73.7
Jan. 28	00 06.56	+19 20.6	3.215	2.899	-0.18	-5.0	18.8	62.7
Feb. 7	00 04.73	+18 31.0	3.316	2.824	-0.04	-3.3	18.7	52.4
Feb. 17	00 04.30	+17 58.3	3.396	2.751	+0.06	-1.8	18.7	42.6
Feb. 27	00 04.89	+17 39.9	3.450	2.681	+0.13	-0.6	18.6	33.5
Mar. 9	00 06.17	+17 33.9	3.476	2.612	+0.17	+0.4	18.5	25.2
Mar. 19	00 07.86	+17 38.2	3.470	2.546	+0.18	+1.3	18.4	18.6
Mar. 29	00 09.69	+17 51.3	3.431	2.483	+0.17	+2.1	18.2	15.4
Apr. 8	00 11.42	+18 11.8	3.360	2.423	+0.13	+2.7	18.1	17.5
Apr. 18	00 12.76	+18 38.8	3.255	2.367	+0.06	+3.2	17.9	23.4
Apr. 28	00 13.41	+19 11.1	3.119	2.315	-0.04	+3.7	17.7	31.0
May 8	00 13.00	+19 48.1	2.953	2.267	-0.20	+4.1	17.5	39.5
May 18	00 11.05	+20 28.7	2.759	2.225	-0.42	+4.3	17.3	48.7
May 28	00 06.87	+21 11.7	2.542	2.187	-0.73	+4.3	17.0	58.3
June 7	23 59.54	+21 55.2	2.305	2.155	-1.19	+4.0	16.7	68.7
June 17	23 47.61	+22 35.0	2.057	2.129	-1.86	+2.7	16.4	80.0
June 27	23 29.02	+23 02.3	1.805	2.110	-2.81	-0.4	16.1	92.5
July 7	23 00.87	+22 58.6	1.565	2.097	-4.09	-7.2	15.8	106.7
July 17	22 19.99	+21 46.8	1.357	2.090	-5.44	-19.4	15.5	122.8
July 27	21 25.58	+18 32.7	1.212	2.090	-6.19	-34.4	15.2	139.4
Aug. 6	20 23.66	+12 48.7	1.163	2.098	-5.75	-42.6	15.1	148.8
Aug. 16	19 26.19	+05 43.0	1.225	2.111	-4.46	-39.3	15.3	141.1
Aug. 26	18 41.56	-00 50.5	1.383	2.131	-3.11	-30.9	15.6	125.2
Sept. 5	18 10.51	-05 59.4	1.603	2.158	-2.03	-23.0	16.0	109.4
Sept.15	17 50.16	-09 49.7	1.856	2.190	-1.27	-17.3	16.3	95.2
Sept.25	17 37.41	-12 42.5	2.123	2.228	-0.75	-13.4	16.7	82.6
Oct. 5	17 29.93	-14 56.2	2.388	2.272	-0.38	-10.7	17.1	71.1
Oct. 15	17 26.14	-16 43.1	2.643	2.320	-0.12	-8.8	17.4	60.4
Oct. 25	17 24.92	-18 11.5	2.881	2.372	+0.06	-7.5	17.6	50.3
Nov. 4	17 25.53	-19 26.6	3.096	2.428	+0.19	-6.6	17.9	40.5
Nov. 14	17 27.43	-20 32.2	3.285	2.489	+0.28	-5.8	18.1	30.9
Nov. 24	17 30.19	-21 30.6	3.445	2.552	+0.33	-5.3	18.4	21.5
Dec. 4	17 33.49	-22 23.9	3.574	2.618	+0.35	-5.0	18.5	12.1
Dec. 14	17 37.03	-23 13.5	3.670	2.687	+0.35	-4.7	18.7	2.8
Dec. 24	17 40.56	-24 00.7	3.733	2.758	+0.33	-4.6	18.9	6.6
Jan. 3	17 43.82	-24 46.7	3.763	2.831	+0.27	-4.6	19.0	16.1
Jan. 13	17 46.54	-25 32.5	3.761	2.906	+0.19	-4.7	19.1	25.6
Jan. 23	17 48.45	-26 19.2	3.730	2.982	+0.08	-4.9	19.2	35.4
Feb. 2	17 49.26	-27 07.8	3.671	3.060	-0.07	-5.1	19.3	45.4
Feb. 12	17 48.59	-27 59.3	3.588	3.139	-0.25	-5.5	19.3	55.6
Feb. 22	17 46.06	-28 54.2	3.487	3.219	-0.48	-5.8	19.4	66.3
Mar. 4	17 41.22	-29 52.7	3.372	3.299	-0.76	-6.1	19.4	77.3
Mar. 14	17 33.57	-30 54.0	3.251	3.381	-1.09	-6.2	19.5	88.9
Mar. 24	17 22.66	-31 56.1	3.132	3.463	-1.46	-5.9	19.5	100.9
Apr. 3	17 08.10	-32 54.7	3.024	3.545	-1.83	-4.9	19.5	113.6

Comet 178P/Hug-Bell

Epoch = 2013 July 7.0 TT
T = 2013 July 23.05619 TT
Peri. = 296.96105 e = 0.4730049
Node = 103.57541 2000.0 a = 3.6692810 AU
Incl. = 10.97551 n = 0.14022731
q = 1.9336931 AU P = 7.03 years

m1 = 12.0 + 5 log(Delta) + 15.0 log(r(t-120))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m ′		m1	Elong. °
Jan. 8	21 22.72	-21 25.1	3.308	2.496	+1.87	+7.9	21.9	29.2
Jan. 18	21 41.37	-20 06.0	3.318	2.450	+1.91	+8.7	21.8	23.8
Jan. 28	22 00.48	-18 38.6	3.318	2.405	+1.95	+9.5	21.7	18.6
Feb. 7	22 19.97	-17 03.2	3.307	2.362	+1.98	+10.3	21.6	13.9
Feb. 17	22 39.79	-15 20.2	3.286	2.319	+2.01	+11.0	21.5	9.8
Feb. 27	22 59.90	-13 30.6	3.257	2.277	+2.04	+11.5	21.3	7.0
Mar. 9	23 20.29	-11 35.2	3.219	2.237	+2.07	+12.0	21.2	7.0
Mar. 19	23 40.95	-09 34.8	3.174	2.199	+2.09	+12.4	21.1	9.5
Mar. 29	00 01.87	-07 30.6	3.123	2.162	+2.12	+12.7	20.9	12.9
Apr. 8	00 23.07	-05 23.9	3.067	2.127	+2.15	+12.8	20.7	16.6
Apr. 18	00 44.56	-03 15.8	3.007	2.095	+2.18	+12.8	20.6	20.3
Apr. 28	01 06.34	-01 08.0	2.943	2.065	+2.21	+12.6	20.4	24.0
May 8	01 28.44	+00 58.3	2.877	2.037	+2.24	+12.3	20.3	27.6
May 18	01 50.85	+03 01.4	2.809	2.013	+2.27	+11.8	20.1	31.1
May 28	02 13.55	+04 59.6	2.740	1.991	+2.30	+11.2	19.9	34.6
June 7	02 36.53	+06 51.5	2.671	1.973	+2.32	+10.4	19.7	38.0
June 17	02 59.74	+08 35.6	2.600	1.958	+2.34	+9.5	19.6	41.4
June 27	03 23.09	+10 10.4	2.530	1.946	+2.34	+8.4	19.4	44.9
July 7	03 46.50	+11 34.9	2.459	1.939	+2.33	+7.3	19.2	48.4
July 17	04 09.85	+12 48.1	2.388	1.934	+2.31	+6.1	19.0	51.9
July 27	04 32.98	+13 49.6	2.316	1.934	+2.27	+5.0	18.8	55.7
Aug. 6	04 55.72	+14 39.3	2.243	1.937	+2.22	+3.8	18.7	59.5
Aug. 16	05 17.87	+15 17.5	2.170	1.944	+2.13	+2.8	18.5	63.6
Aug. 26	05 39.22	+15 45.2	2.095	1.955	+2.03	+1.8	18.3	68.0
Sept. 5	05 59.54	+16 03.6	2.018	1.969	+1.90	+1.1	18.2	72.7
Sept. 15	06 18.56	+16 14.8	1.940	1.987	+1.75	+0.6	18.0	77.7
Sept. 25	06 36.02	+16 21.0	1.861	2.008	+1.56	+0.4	17.8	83.2
Oct. 5	06 51.65	+16 25.1	1.781	2.032	+1.35	+0.5	17.7	89.3
Oct. 15	07 05.11	+16 30.2	1.701	2.059	+1.10	+1.0	17.5	95.9
Oct. 25	07 16.07	+16 39.8	1.623	2.088	+0.81	+1.8	17.4	103.2
Nov. 4	07 24.19	+16 57.3	1.548	2.120	+0.49	+2.9	17.3	111.3
Nov. 14	07 29.11	+17 26.0	1.479	2.154	+0.15	+4.2	17.1	120.2
Nov. 24	07 30.60	+18 08.1	1.421	2.190	-0.20	+5.6	17.1	130.1
Dec. 4	07 28.58	+19 04.2	1.376	2.229	-0.53	+6.8	17.0	140.8
Dec. 14	07 23.33	+20 12.2	1.350	2.268	-0.78	+7.5	17.0	152.4
Dec. 24	07 15.57	+21 27.3	1.347	2.310	-0.91	+7.6	17.0	164.6
Jan. 3	07 06.44	+22 43.3	1.370	2.352	-0.91	+7.0	17.1	177.0
Jan. 13	06 57.37	+23 53.6	1.420	2.396	-0.76	+6.0	17.2	170.5
Jan. 23	06 49.73	+24 54.0	1.498	2.441	-0.53	+4.9	17.4	158.5
Feb. 2	06 44.46	+25 42.7	1.601	2.486	-0.23	+3.7	17.6	147.1
Feb. 12	06 42.11	+26 20.1	1.725	2.532	+0.06	+2.7	17.9	136.4
Feb. 22	06 42.76	+26 47.3	1.866	2.579	+0.34	+1.8	18.2	126.4
Mar. 4	06 46.20	+27 05.7	2.022	2.626	+0.59	+1.0	18.4	117.1
Mar. 14	06 52.13	+27 16.1	2.188	2.674	+0.80	+0.3	18.7	108.4
Mar. 24	07 00.12	+27 19.3	2.361	2.722	+0.97	-0.4	19.0	100.3
Apr. 3	07 09.80	+27 15.6	2.539	2.770	+1.10	-1.0	19.2	92.5

Comet P/2012 B1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 July 23.07642 TT
Peri. = 162.16864 e = 0.4107848
Node = 36.19743 2000.0 a = 6.4922731 AU
Incl. = 7.62721 n = 0.05958115
q = 3.8253460 AU P = 16.54 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	12 19.50	+04 39.6	3.610	3.979	+0.27	-1.1	16.8	105.0
Jan. 18	12 22.16	+04 29.1	3.455	3.965	+0.11	-0.2	16.7	114.4
Jan. 28	12 23.29	+04 27.5	3.312	3.950	-0.05	+0.7	16.5	124.2
Feb. 7	12 22.83	+04 34.6	3.183	3.937	-0.20	+1.5	16.4	134.4
Feb. 17	12 20.80	+04 49.2	3.074	3.924	-0.34	+2.0	16.3	144.9
Feb. 27	12 17.37	+05 09.5	2.989	3.912	-0.46	+2.3	16.3	155.6
Mar. 9	12 12.82	+05 33.0	2.930	3.901	-0.53	+2.4	16.2	166.1
Mar. 19	12 07.55	+05 56.6	2.899	3.890	-0.55	+2.0	16.2	173.7
Mar. 29	12 02.08	+06 17.0	2.898	3.881	-0.51	+1.4	16.1	168.1
Apr. 8	11 56.94	+06 31.4	2.926	3.872	-0.43	+0.6	16.1	157.9
Apr. 18	11 52.60	+06 37.6	2.980	3.863	-0.32	-0.3	16.2	147.3
Apr. 28	11 49.45	+06 34.2	3.058	3.856	-0.17	-1.4	16.2	137.0
May 8	11 47.72	+06 20.6	3.155	3.849	-0.02	-2.4	16.3	127.1
May 18	11 47.52	+05 57.1	3.268	3.843	+0.14	-3.3	16.3	117.6
May 28	11 48.88	+05 24.2	3.393	3.838	+0.28	-4.1	16.4	108.6
June 7	11 51.72	+04 42.8	3.526	3.834	+0.42	-4.9	16.5	100.0
June 17	11 55.93	+03 53.7	3.663	3.831	+0.54	-5.6	16.6	91.7
June 27	12 01.38	+02 58.0	3.802	3.828	+0.65	-6.2	16.6	83.8
July 7	12 07.92	+01 56.5	3.940	3.826	+0.75	-6.6	16.7	76.2
July 17	12 15.44	+00 50.0	4.073	3.826	+0.84	-7.1	16.8	68.8
July 27	12 23.81	-00 20.5	4.201	3.825	+0.91	-7.4	16.9	61.7
Aug. 6	12 32.90	-01 34.4	4.322	3.826	+0.97	-7.7	16.9	54.7
Aug. 16	12 42.64	-02 50.9	4.433	3.828	+1.03	-7.8	17.0	47.8
Aug. 26	12 52.93	-04 09.4	4.534	3.830	+1.08	-8.0	17.0	41.1
Sept. 5	13 03.70	-05 29.1	4.623	3.833	+1.12	-8.0	17.1	34.4
Sept. 15	13 14.88	-06 49.5	4.699	3.837	+1.15	-8.0	17.1	27.7
Sept. 25	13 26.40	-08 09.9	4.761	3.842	+1.18	-8.0	17.2	21.1
Oct. 5	13 38.22	-09 29.7	4.808	3.848	+1.20	-7.9	17.2	14.5
Oct. 15	13 50.26	-10 48.3	4.840	3.854	+1.22	-7.7	17.2	7.9
Oct. 25	14 02.46	-12 05.3	4.856	3.862	+1.23	-7.5	17.2	1.2
Nov. 4	14 14.78	-13 20.0	4.856	3.870	+1.24	-7.2	17.2	5.6
Nov. 14	14 27.13	-14 32.0	4.839	3.879	+1.23	-6.9	17.3	12.4
Nov. 24	14 39.44	-15 40.8	4.806	3.888	+1.22	-6.5	17.3	19.3
Dec. 4	14 51.63	-16 46.1	4.757	3.899	+1.20	-6.1	17.3	26.3
Dec. 14	15 03.59	-17 47.6	4.693	3.910	+1.16	-5.7	17.2	33.5
Dec. 24	15 15.23	-18 45.1	4.614	3.922	+1.12	-5.3	17.2	40.7
Jan. 3	15 26.42	-19 38.3	4.522	3.934	+1.06	-4.9	17.2	48.1
Jan. 13	15 37.03	-20 27.4	4.417	3.947	+0.99	-4.5	17.2	55.7
Jan. 23	15 46.91	-21 12.3	4.302	3.961	+0.90	-4.1	17.1	63.5
Feb. 2	15 55.91	-21 53.1	4.178	3.976	+0.79	-3.7	17.1	71.4
Feb. 12	16 03.84	-22 30.0	4.049	3.991	+0.67	-3.3	17.1	79.7
Feb. 22	16 10.55	-23 03.3	3.916	4.007	+0.53	-3.0	17.0	88.1
Mar. 4	16 15.86	-23 33.1	3.783	4.024	+0.37	-2.6	17.0	96.9
Mar. 14	16 19.60	-23 59.6	3.654	4.041	+0.21	-2.3	16.9	105.9
Mar. 24	16 21.65	-24 22.7	3.531	4.059	+0.03	-2.0	16.9	115.3
Apr. 3	16 21.94	-24 42.3	3.420	4.078	-0.15	-1.6	16.8	125.1

Comet 84P/Giclas

Epoch = 2013 July 7.0 TT
T = 2013 July 23.22313 TT
Peri. = 276.48114 e = 0.4943392
Node = 112.38318 2000.0 a = 3.6378752 AU
Incl. = 7.28648 n = 0.14204710
q = 1.8395309 AU P = 6.94 years

m1 = 10.2 + 5 log(Delta) + 20.0 log(r(t-110))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	20 32.05	-20 42.8	3.386	2.467	+1.97	+6.1	22.5	17.6
Jan. 18	20 51.77	-19 41.3	3.370	2.417	+2.01	+7.1	22.3	12.2
Jan. 28	21 11.90	-18 30.1	3.342	2.368	+2.05	+8.1	22.1	7.1
Feb. 7	21 32.39	-17 09.2	3.305	2.320	+2.08	+9.0	22.0	3.0
Feb. 17	21 53.18	-15 39.2	3.258	2.273	+2.10	+9.9	21.8	4.2
Feb. 27	22 14.22	-14 00.7	3.202	2.227	+2.13	+10.6	21.6	8.4
Mar. 9	22 35.52	-12 14.3	3.140	2.183	+2.15	+11.3	21.4	12.9
Mar. 19	22 57.05	-10 21.0	3.071	2.140	+2.18	+11.9	21.2	17.2
Mar. 29	23 18.80	-08 21.7	2.998	2.099	+2.20	+12.4	20.9	21.3
Apr. 8	23 40.82	-06 17.7	2.920	2.060	+2.23	+12.7	20.7	25.3
Apr. 18	00 03.09	-04 10.4	2.840	2.024	+2.26	+12.9	20.5	29.2
Apr. 28	00 25.65	-02 01.2	2.759	1.990	+2.29	+13.0	20.2	32.9
May 8	00 48.51	+00 08.4	2.677	1.959	+2.32	+12.8	20.0	36.4
May 18	01 11.68	+02 16.4	2.594	1.931	+2.35	+12.5	19.8	39.9
May 28	01 35.15	+04 21.0	2.513	1.906	+2.38	+11.9	19.5	43.3
June 7	01 58.91	+06 20.3	2.432	1.885	+2.40	+11.2	19.3	46.6
June 17	02 22.90	+08 12.5	2.353	1.868	+2.41	+10.3	19.0	49.9
June 27	02 47.05	+09 55.7	2.275	1.854	+2.42	+9.3	18.8	53.2
July 7	03 11.26	+11 28.3	2.200	1.845	+2.41	+8.1	18.5	56.5
July 17	03 35.37	+12 48.9	2.125	1.840	+2.38	+6.8	18.3	60.0
July 27	03 59.21	+13 56.7	2.052	1.840	+2.34	+5.4	18.0	63.6
Aug. 6	04 22.56	+14 51.2	1.979	1.844	+2.26	+4.1	17.8	67.3
Aug. 16	04 45.17	+15 32.3	1.907	1.852	+2.16	+2.9	17.6	71.4
Aug. 26	05 06.75	+16 01.0	1.835	1.864	+2.03	+1.7	17.4	75.7
Sept. 5	05 27.02	+16 18.5	1.763	1.880	+1.86	+0.8	17.1	80.5
Sept.15	05 45.64	+16 26.6	1.691	1.900	+1.66	+0.1	16.9	85.6
Sept.25	06 02.28	+16 27.9	1.619	1.924	+1.43	-0.3	16.8	91.3
Oct. 5	06 16.56	+16 25.1	1.547	1.951	+1.15	-0.4	16.6	97.7
Oct. 15	06 28.10	+16 21.6	1.478	1.982	+0.84	-0.1	16.4	104.7
Oct. 25	06 36.52	+16 20.8	1.412	2.015	+0.50	+0.5	16.3	112.6
Nov. 4	06 41.47	+16 25.9	1.353	2.051	+0.12	+1.4	16.2	121.3
Nov. 14	06 42.70	+16 39.8	1.302	2.089	-0.25	+2.4	16.1	131.0
Nov. 24	06 40.25	+17 04.0	1.266	2.130	-0.58	+3.4	16.0	141.6
Dec. 4	06 34.47	+17 38.3	1.247	2.172	-0.82	+4.2	16.0	153.0
Dec. 14	06 26.23	+18 20.7	1.251	2.216	-0.94	+4.7	16.1	164.9
Dec. 24	06 16.88	+19 07.5	1.280	2.262	-0.90	+4.8	16.2	175.4
Jan. 3	06 07.86	+19 55.2	1.336	2.309	-0.73	+4.6	16.4	169.0
Jan. 13	06 00.54	+20 40.8	1.418	2.356	-0.47	+4.2	16.6	157.4
Jan. 23	05 55.80	+21 22.8	1.524	2.405	-0.18	+3.8	16.9	146.3
Feb. 2	05 54.04	+22 00.7	1.650	2.455	+0.12	+3.3	17.2	135.7
Feb. 12	05 55.28	+22 34.1	1.795	2.505	+0.40	+2.9	17.6	125.9
Feb. 22	05 59.27	+23 03.0	1.952	2.555	+0.64	+2.4	17.9	116.8
Mar. 4	06 05.65	+23 27.0	2.121	2.606	+0.84	+1.9	18.2	108.2
Mar. 14	06 14.06	+23 45.7	2.296	2.657	+1.00	+1.3	18.6	100.1
Mar. 24	06 24.11	+23 58.8	2.476	2.708	+1.14	+0.7	18.9	92.4
Apr. 3	06 35.47	+24 06.0	2.658	2.759	+1.24	+0.1	19.2	85.1

Comet 184P/Lovas

Epoch = 2013 July 7.0 TT
T = 2013 July 28.47411 TT
Peri. = 78.07595 e = 0.6042433
Node = 277.73124 2000.0 a = 3.5224230 AU
Incl. = 1.55152 n = 0.14908770
q = 1.3940225 AU P = 6.61 years

m1 = 13.4 + 5 log(Delta) + 15.0 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m ′	m1	Elong. °
Jan. 8	17 41.51	-23 46.3	3.344	2.459	+2.10	-0.1	22.4	21.9
Jan. 18	18 02.51	-23 47.6	3.222	2.390	+2.16	+1.0	22.2	27.3
Jan. 28	18 24.16	-23 37.9	3.090	2.321	+2.23	+2.2	21.9	32.5
Feb. 7	18 46.42	-23 16.1	2.952	2.252	+2.28	+3.5	21.6	37.5
Feb. 17	19 09.25	-22 41.2	2.808	2.182	+2.34	+4.9	21.3	42.4
Feb. 27	19 32.62	-21 52.3	2.661	2.113	+2.39	+6.4	21.0	47.0
Mar. 9	19 56.51	-20 48.5	2.512	2.044	+2.44	+7.9	20.7	51.3
Mar. 19	20 20.91	-19 29.1	2.362	1.976	+2.49	+9.6	20.3	55.4
Mar. 29	20 45.81	-17 53.4	2.215	1.908	+2.54	+11.3	20.0	59.2
Apr. 8	21 11.24	-16 00.8	2.072	1.842	+2.60	+13.0	19.6	62.7
Apr. 18	21 37.21	-13 51.0	1.934	1.778	+2.66	+14.7	19.3	65.9
Apr. 28	22 03.78	-11 24.1	1.803	1.717	+2.72	+16.4	18.9	68.7
May 8	22 31.00	-08 40.3	1.681	1.658	+2.79	+17.9	18.5	71.2
May 18	22 58.92	-05 41.2	1.569	1.604	+2.87	+19.2	18.1	73.3
May 28	23 27.58	-02 28.8	1.467	1.553	+2.94	+20.2	17.8	75.1
June 7	23 57.01	+00 53.5	1.376	1.508	+3.02	+20.7	17.4	76.6
June 17	00 27.17	+04 20.9	1.298	1.470	+3.08	+20.7	17.0	77.8
June 27	00 57.96	+07 47.7	1.230	1.439	+3.13	+19.9	16.7	79.0
July 7	01 29.23	+11 07.1	1.174	1.415	+3.14	+18.5	16.4	80.1
July 17	02 00.63	+14 12.5	1.127	1.400	+3.11	+16.5	16.2	81.4
July 27	02 31.77	+16 57.9	1.088	1.394	+3.04	+14.1	16.0	83.0
Aug. 6	03 02.12	+19 19.3	1.055	1.397	+2.89	+11.5	15.8	84.9
Aug. 16	03 31.03	+21 14.1	1.026	1.410	+2.68	+8.9	15.6	87.5
Aug. 26	03 57.84	+22 42.7	1.000	1.431	+2.40	+6.4	15.6	90.7
Sept. 5	04 21.86	+23 47.0	0.975	1.460	+2.05	+4.3	15.5	94.8
Sept.15	04 42.36	+24 30.3	0.951	1.496	+1.64	+2.6	15.5	99.7
Sept.25	04 58.74	+24 56.8	0.927	1.539	+1.16	+1.4	15.6	105.8
Oct. 5	05 10.37	+25 10.5	0.904	1.588	+0.64	+0.4	15.6	112.9
Oct. 15	05 16.76	+25 14.4	0.885	1.642	+0.10	-0.4	15.8	121.4
Oct. 25	05 17.73	+25 10.3	0.871	1.699	-0.42	-1.2	15.9	131.1
Nov. 4	05 13.51	+24 58.5	0.869	1.760	-0.85	-2.0	16.1	142.0
Nov. 14	05 05.05	+24 38.4	0.882	1.823	-1.10	-2.8	16.4	154.0
Nov. 24	04 54.08	+24 10.4	0.914	1.889	-1.14	-3.3	16.7	166.6
Dec. 4	04 42.65	+23 37.1	0.970	1.955	-0.99	-3.4	17.0	178.5
Dec. 14	04 32.76	+23 03.4	1.050	2.023	-0.70	-2.9	17.4	168.0
Dec. 24	04 25.73	+22 34.6	1.154	2.092	-0.36	-2.1	17.9	156.2
Jan. 3	04 22.10	+22 13.9	1.280	2.161	-0.02	-1.1	18.3	145.1
Jan. 13	04 21.89	+22 02.7	1.426	2.231	+0.29	-0.2	18.8	134.9
Jan. 23	04 24.77	+22 00.3	1.587	2.300	+0.55	+0.5	19.2	125.3
Feb. 2	04 30.27	+22 04.9	1.761	2.370	+0.77	+0.9	19.6	116.4
Feb. 12	04 37.96	+22 14.3	1.945	2.439	+0.94	+1.2	20.1	108.1
Feb. 22	04 47.40	+22 26.6	2.136	2.507	+1.08	+1.3	20.5	100.2
Mar. 4	04 58.24	+22 39.6	2.332	2.575	+1.20	+1.2	20.9	92.6
Mar. 14	05 10.19	+22 51.9	2.530	2.643	+1.28	+1.0	21.2	85.4
Mar. 24	05 23.00	+23 02.1	2.728	2.710	+1.35	+0.7	21.6	78.4
Apr. 3	05 36.45	+23 09.2	2.924	2.776	+1.39	+0.3	21.9	71.6

Comet 278P/McNaught

Epoch = 2013 July 7.0 TT
T = 2013 Aug. 2.48859 TT
Peri. = 237.98948 e = 0.4332518
Node = 15.50293 2000.0 a = 3.7013601 AU
Incl. = 6.68181 n = 0.13840828
q = 2.0977392 AU P = 7.12 years

m1 = 12.8 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. °,	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	13 40.80	-09 05.7	2.565	2.600	+1.18	-8.2	21.1	81.0
Jan. 18	13 52.57	-10 27.7	2.398	2.560	+1.08	-7.7	20.8	88.0
Jan. 28	14 03.38	-11 44.7	2.233	2.521	+0.96	-7.2	20.6	95.3
Feb. 7	14 12.98	-12 56.3	2.071	2.483	+0.80	-6.6	20.3	102.8
Feb. 17	14 21.03	-14 02.1	1.916	2.446	+0.62	-5.9	20.0	110.7
Feb. 27	14 27.19	-15 01.6	1.769	2.410	+0.39	-5.3	19.8	119.0
Mar. 9	14 31.11	-15 54.2	1.633	2.376	+0.13	-4.5	19.5	127.9
Mar. 19	14 32.43	-16 39.3	1.512	2.343	-0.14	-3.7	19.2	137.3
Mar. 29	14 31.01	-17 16.1	1.407	2.311	-0.41	-2.8	19.0	147.3
Apr. 8	14 26.88	-17 43.7	1.322	2.281	-0.64	-1.8	18.8	157.8
Apr. 18	14 20.49	-18 01.7	1.260	2.253	-0.77	-0.9	18.6	168.5
Apr. 28	14 12.74	-18 11.0	1.221	2.226	-0.79	-0.3	18.4	175.4
May 8	14 04.82	-18 14.0	1.207	2.202	-0.68	-0.1	18.4	166.9
May 18	13 58.04	-18 15.1	1.216	2.180	-0.45	-0.4	18.3	156.1
May 28	13 53.52	-18 19.1	1.247	2.160	-0.16	-1.1	18.3	145.7
June 7	13 51.89	-18 30.2	1.295	2.143	+0.16	-2.1	18.3	135.9
June 17	13 53.49	-18 51.2	1.357	2.129	+0.48	-3.2	18.4	126.9
June 27	13 58.29	-19 23.0	1.432	2.117	+0.78	-4.2	18.5	118.7
July 7	14 06.04	-20 05.1	1.515	2.108	+1.04	-5.1	18.6	111.2
July 17	14 16.49	-20 56.1	1.605	2.102	+1.28	-5.8	18.7	104.3
July 27	14 29.32	-21 53.6	1.700	2.098	+1.49	-6.2	18.8	98.0
Aug. 6	14 44.22	-22 55.3	1.800	2.098	+1.67	-6.3	18.9	92.1
Aug. 16	15 00.97	-23 58.5	1.902	2.100	+1.83	-6.2	19.0	86.5
Aug. 26	15 19.32	-25 00.7	2.007	2.106	+1.97	-5.9	19.2	81.3
Sept. 5	15 39.05	-25 59.3	2.114	2.114	+2.09	-5.3	19.3	76.2
Sept.15	15 59.98	-26 52.1	2.222	2.125	+2.19	-4.5	19.4	71.3
Sept.25	16 21.91	-27 37.1	2.330	2.139	+2.27	-3.5	19.6	66.5
Oct. 5	16 44.65	-28 12.3	2.439	2.155	+2.34	-2.4	19.7	61.8
Oct. 15	17 08.02	-28 36.5	2.547	2.174	+2.38	-1.2	19.9	57.1
Oct. 25	17 31.80	-28 48.5	2.655	2.195	+2.40	+0.1	20.0	52.5
Nov. 4	17 55.81	-28 47.7	2.760	2.219	+2.41	+1.4	20.2	47.8
Nov. 14	18 19.86	-28 33.8	2.863	2.244	+2.39	+2.7	20.4	43.0
Nov. 24	18 43.76	-28 07.0	2.963	2.272	+2.36	+3.9	20.5	38.3
Dec. 4	19 07.36	-27 27.8	3.059	2.302	+2.32	+5.1	20.7	33.5
Dec. 14	19 30.54	-26 36.8	3.149	2.333	+2.26	+6.2	20.8	28.6
Dec. 24	19 53.16	-25 35.3	3.233	2.366	+2.20	+7.1	21.0	23.7
Jan. 3	20 15.16	-24 24.3	3.310	2.400	+2.13	+7.9	21.1	18.7
Jan. 13	20 36.46	-23 05.2	3.379	2.435	+2.06	+8.6	21.2	13.8
Jan. 23	20 57.03	-21 39.3	3.440	2.472	+1.98	+9.1	21.4	8.9
Feb. 2	21 16.85	-20 08.1	3.490	2.510	+1.91	+9.5	21.5	4.9
Feb. 12	21 35.90	-18 32.8	3.531	2.549	+1.83	+9.8	21.6	4.9
Feb. 22	21 54.19	-16 54.9	3.560	2.588	+1.75	+9.9	21.8	9.1
Mar. 4	22 11.71	-15 15.5	3.578	2.628	+1.68	+10.0	21.9	14.2
Mar. 14	22 28.47	-13 35.9	3.584	2.669	+1.60	+9.9	22.0	19.7
Mar. 24	22 44.46	-11 57.2	3.578	2.710	+1.52	+9.7	22.1	25.3
Apr. 3	22 59.69	-10 20.3	3.560	2.752	+1.44	+9.4	22.2	31.0

Comet 98P/Takamizawa

Epoch = 2013 July 7.0 TT
T = 2013 Aug. 5.36496 TT
Peri. = 157.89247 e = 0.5606573
Node = 114.74054 2000.0 a = 3.8092462 AU
Incl. = 10.54395 n = 0.13257008
q = 1.6735645 AU P = 7.43 years

m1 = 10.0 + 5 log(Delta) + 20.0 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. °,	Delta	r	Daily motion m	',	m1	Elong. °
Jan. 8	13 57.76	-01 20.0	2.522	2.542	+1.39	-3.3	20.7	80.0
Jan. 18	14 11.66	-01 52.7	2.339	2.483	+1.34	-2.2	20.3	86.6
Jan. 28	14 25.07	-02 14.7	2.159	2.424	+1.27	-1.0	20.0	93.3
Feb. 7	14 37.79	-02 24.5	1.983	2.365	+1.18	+0.3	19.6	100.1
Feb. 17	14 49.55	-02 21.2	1.813	2.306	+1.05	+1.7	19.2	107.1
Feb. 27	15 00.08	-02 04.1	1.652	2.249	+0.90	+3.1	18.8	114.4
Mar. 9	15 09.04	-01 33.0	1.500	2.192	+0.70	+4.4	18.4	121.8
Mar. 19	15 16.02	-00 48.5	1.361	2.137	+0.46	+5.5	17.9	129.5
Mar. 29	15 20.67	+00 07.0	1.236	2.083	+0.20	+6.2	17.5	137.3
Apr. 8	15 22.67	+01 09.3	1.127	2.030	-0.08	+6.2	17.1	145.1
Apr. 18	15 21.85	+02 11.7	1.035	1.980	-0.34	+5.3	16.7	152.4
Apr. 28	15 18.44	+03 04.6	0.963	1.932	-0.54	+3.3	16.3	157.8
May 8	15 13.04	+03 37.1	0.910	1.887	-0.63	+0.2	15.9	159.1
May 18	15 06.72	+03 38.7	0.877	1.846	-0.58	-3.6	15.6	155.5
May 28	15 00.94	+03 02.5	0.862	1.807	-0.39	-7.5	15.4	148.9
June 7	14 57.01	+01 47.1	0.864	1.773	-0.10	-11.1	15.2	141.2
June 17	14 56.03	-00 04.3	0.880	1.743	+0.26	-14.0	15.0	133.5
June 27	14 58.63	-02 24.5	0.909	1.719	+0.63	-16.1	14.9	126.3
July 7	15 04.96	-05 05.2	0.948	1.699	+1.00	-17.3	14.9	119.7
July 17	15 14.97	-07 58.0	0.995	1.685	+1.34	-17.7	14.8	113.7
July 27	15 28.41	-10 55.2	1.051	1.676	+1.65	-17.4	14.8	108.4
Aug. 6	15 44.91	-13 49.7	1.115	1.674	+1.93	-16.6	14.8	103.5
Aug. 16	16 04.17	-16 35.2	1.185	1.677	+2.16	-15.1	14.9	99.1
Aug. 26	16 25.80	-19 06.5	1.264	1.686	+2.36	-13.2	15.0	95.1
Sept. 5	16 49.42	-21 19.0	1.349	1.701	+2.52	-11.0	15.1	91.2
Sept.15	17 14.66	-23 09.2	1.442	1.721	+2.64	-8.6	15.3	87.5
Sept.25	17 41.07	-24 34.9	1.543	1.747	+2.72	-6.0	15.5	83.8
Oct. 5	18 08.25	-25 34.8	1.650	1.777	+2.76	-3.4	15.7	80.1
Oct. 15	18 35.81	-26 08.9	1.764	1.812	+2.75	-0.9	16.0	76.4
Oct. 25	19 03.34	-26 18.2	1.885	1.851	+2.72	+1.4	16.2	72.7
Nov. 4	19 30.54	-26 04.4	2.010	1.893	+2.66	+3.5	16.5	68.8
Nov. 14	19 57.16	-25 29.8	2.140	1.938	+2.58	+5.3	16.8	64.8
Nov. 24	20 23.00	-24 37.2	2.274	1.986	+2.50	+6.8	17.1	60.7
Dec. 4	20 47.96	-23 29.3	2.409	2.037	+2.40	+8.0	17.5	56.4
Dec. 14	21 11.97	-22 08.8	2.546	2.089	+2.31	+9.0	17.8	52.0
Dec. 24	21 35.02	-20 38.5	2.682	2.144	+2.21	+9.8	18.1	47.5
Jan. 3	21 57.15	-19 00.6	2.816	2.199	+2.12	+10.3	18.4	42.9
Jan. 13	22 18.38	-17 17.3	2.946	2.256	+2.04	+10.7	18.7	38.1
Jan. 23	22 38.77	-15 30.6	3.072	2.314	+1.96	+10.8	19.1	33.3
Feb. 2	22 58.39	-13 42.1	3.192	2.372	+1.89	+10.9	19.4	28.4
Feb. 12	23 17.28	-11 53.4	3.305	2.431	+1.82	+10.8	19.7	23.5
Feb. 22	23 35.50	-10 05.7	3.408	2.490	+1.76	+10.6	19.9	18.6
Mar. 4	23 53.10	-08 20.1	3.502	2.550	+1.70	+10.2	20.2	13.8
Mar. 14	00 10.13	-06 37.7	3.584	2.610	+1.65	+9.8	20.5	9.6
Mar. 24	00 26.59	-04 59.3	3.655	2.669	+1.59	+9.4	20.7	7.3
Apr. 3	00 42.53	-03 25.6	3.713	2.729	+1.54	+8.8	21.0	8.6

Comet C/2012 V2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 Aug. 16.49386 TT
Peri. = 217.31364
Node = 262.16401 2000.0
Incl. = 67.18509
q = 1.4549032 AU
e = 0.9976550

m1 = 8.6 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	22 57.93	+57 11.5	3.002	3.190	+2.21	-12.4	16.0	91.9
Jan. 18	23 20.02	+55 07.7	2.984	3.090	+2.29	-11.7	15.9	86.8
Jan. 28	23 42.92	+53 10.9	2.974	2.989	+2.35	-11.0	15.7	81.4
Feb. 7	00 06.42	+51 21.2	2.970	2.888	+2.40	-10.3	15.6	75.7
Feb. 17	00 30.39	+49 38.1	2.971	2.788	+2.43	-9.7	15.4	69.8
Feb. 27	00 54.71	+48 00.7	2.974	2.687	+2.46	-9.3	15.3	63.8
Mar. 9	01 19.28	+46 27.6	2.977	2.587	+2.47	-9.1	15.1	57.7
Mar. 19	01 44.03	+44 56.9	2.979	2.488	+2.48	-9.0	14.9	51.7
Mar. 29	02 08.87	+43 26.5	2.977	2.389	+2.49	-9.2	14.8	45.7
Apr. 8	02 33.75	+41 54.1	2.970	2.291	+2.49	-9.7	14.6	39.7
Apr. 18	02 58.61	+40 17.4	2.956	2.195	+2.48	-10.4	14.4	33.9
Apr. 28	03 23.38	+38 33.8	2.935	2.101	+2.46	-11.3	14.2	28.1
May 8	03 48.02	+36 40.8	2.906	2.009	+2.45	-12.5	13.9	22.4
May 18	04 12.47	+34 35.9	2.867	1.921	+2.42	-14.0	13.7	16.8
May 28	04 36.70	+32 16.3	2.819	1.837	+2.40	-15.7	13.5	11.5
June 7	05 00.69	+29 39.5	2.761	1.758	+2.38	-17.7	13.3	6.9
June 17	05 24.45	+26 42.7	2.695	1.685	+2.35	-20.0	13.0	5.1
June 27	05 48.00	+23 22.9	2.620	1.620	+2.34	-22.6	12.8	8.1
July 7	06 11.42	+19 37.2	2.539	1.564	+2.34	-25.4	12.6	12.7
July 17	06 34.79	+15 22.8	2.454	1.518	+2.34	-28.6	12.4	17.7
July 27	06 58.24	+10 37.3	2.368	1.484	+2.37	-31.8	12.2	22.7
Aug. 6	07 21.94	+05 19.1	2.286	1.463	+2.41	-35.1	12.0	27.5
Aug. 16	07 46.09	-00 31.8	2.210	1.455	+2.48	-38.1	12.0	32.0
Aug. 26	08 10.88	-06 52.3	2.148	1.461	+2.57	-40.4	11.9	36.3
Sept. 5	08 36.57	-13 36.2	2.103	1.481	+2.68	-41.7	11.9	40.0
Sept. 15	09 03.38	-20 33.2	2.080	1.514	+2.81	-41.6	12.0	43.3
Sept. 25	09 31.52	-27 29.6	2.081	1.559	+2.97	-40.1	12.1	45.8
Oct. 5	10 01.21	-34 10.8	2.107	1.614	+3.14	-37.3	12.3	47.7
Oct. 15	10 32.58	-40 23.6	2.155	1.678	+3.31	-33.4	12.5	49.0
Oct. 25	11 05.70	-45 57.8	2.221	1.750	+3.48	-29.0	12.8	49.7
Nov. 4	11 40.53	-50 47.6	2.301	1.829	+3.63	-24.4	13.0	50.0
Nov. 14	12 16.78	-54 51.3	2.390	1.912	+3.72	-19.9	13.3	50.1
Nov. 24	12 54.00	-58 10.3	2.483	2.000	+3.75	-15.8	13.6	50.2
Dec. 4	13 31.51	-60 48.5	2.575	2.092	+3.69	-12.3	13.9	50.5
Dec. 14	14 08.45	-62 51.4	2.661	2.185	+3.55	-9.4	14.1	51.3
Dec. 24	14 43.91	-64 25.2	2.739	2.281	+3.32	-7.1	14.4	52.7
Jan. 3	15 17.07	-65 36.7	2.806	2.379	+3.01	-5.5	14.6	54.8
Jan. 13	15 47.18	-66 32.1	2.861	2.477	+2.65	-4.5	14.8	57.6
Jan. 23	16 13.70	-67 17.2	2.903	2.577	+2.25	-4.0	15.0	61.2
Feb. 2	16 36.17	-67 56.9	2.931	2.677	+1.80	-3.8	15.2	65.5
Feb. 12	16 54.17	-68 35.0	2.946	2.778	+1.31	-3.9	15.4	70.5
Feb. 22	17 07.25	-69 13.8	2.950	2.878	+0.76	-4.1	15.5	76.1
Mar. 4	17 14.85	-69 54.3	2.945	2.979	+0.14	-4.1	15.7	82.3
Mar. 14	17 16.25	-70 35.4	2.933	3.079	-0.55	-3.8	15.8	89.0
Mar. 24	17 10.77	-71 13.5	2.917	3.180	-1.29	-2.8	15.9	96.0
Apr. 3	16 57.92	-71 41.9	2.903	3.280	-1.99	-0.9	16.1	103.2

Comet 79P/du Toit-Hartley

Epoch = 2013 July 7.0 TT
T = 2013 Aug. 23.30922 TT
Peri. = 281.70581 e = 0.6184991
Node = 280.61998 2000.0 a = 2.9457003 AU
Incl. = 3.14581 n = 0.19494910
q = 1.1237873 AU P = 5.06 years

m1 = 15.4 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	04 31.80	+23 18.2	1.754	2.602	-0.79	-3.0	20.8	142.1
Jan. 18	04 23.93	+22 48.3	1.784	2.532	-0.45	-2.4	20.7	130.1
Jan. 28	04 19.40	+22 24.7	1.830	2.461	-0.11	-1.5	20.6	118.8
Feb. 7	04 18.34	+22 09.4	1.887	2.389	+0.24	-0.7	20.6	108.4
Feb. 17	04 20.70	+22 02.8	1.949	2.316	+0.56	+0.1	20.5	98.8
Feb. 27	04 26.27	+22 03.9	2.010	2.241	+0.85	+0.7	20.4	90.0
Mar. 9	04 34.75	+22 11.1	2.069	2.165	+1.12	+1.1	20.3	81.9
Mar. 19	04 45.92	+22 22.0	2.120	2.089	+1.36	+1.2	20.2	74.6
Mar. 29	04 59.54	+22 34.1	2.164	2.011	+1.59	+1.0	20.1	67.8
Apr. 8	05 15.43	+22 44.6	2.197	1.933	+1.80	+0.6	20.0	61.6
Apr. 18	05 33.45	+22 50.7	2.219	1.854	+2.00	-0.1	19.8	55.9
Apr. 28	05 53.49	+22 49.6	2.231	1.775	+2.20	-1.1	19.6	50.8
May 8	06 15.45	+22 38.2	2.231	1.697	+2.38	-2.5	19.4	46.2
May 18	06 39.25	+22 13.6	2.221	1.619	+2.56	-4.1	19.2	42.0
May 28	07 04.82	+21 32.6	2.202	1.542	+2.72	-6.0	19.0	38.4
June 7	07 32.06	+20 32.3	2.175	1.468	+2.88	-8.2	18.8	35.3
June 17	08 00.91	+19 09.8	2.141	1.397	+3.03	-10.7	18.5	32.6
June 27	08 31.24	+17 22.8	2.102	1.331	+3.17	-13.3	18.3	30.5
July 7	09 02.96	+15 09.6	2.062	1.271	+3.30	-16.0	18.0	28.9
July 17	09 35.96	+12 29.5	2.021	1.218	+3.42	-18.6	17.8	27.8
July 27	10 10.13	+09 23.6	1.983	1.176	+3.53	-20.9	17.6	27.2
Aug. 6	10 45.38	+05 54.8	1.951	1.145	+3.62	-22.7	17.4	27.1
Aug. 16	11 21.63	+02 08.2	1.928	1.128	+3.71	-23.7	17.3	27.3
Aug. 26	11 58.76	-01 48.8	1.916	1.124	+3.79	-23.8	17.3	27.7
Sept. 5	12 36.67	-05 47.2	1.917	1.135	+3.85	-23.0	17.4	28.3
Sept. 15	13 15.19	-09 37.2	1.934	1.160	+3.89	-21.2	17.5	28.9
Sept. 25	13 54.08	-13 08.9	1.967	1.197	+3.90	-18.6	17.7	29.3
Oct. 5	14 33.05	-16 14.5	2.016	1.245	+3.87	-15.4	17.9	29.4
Oct. 15	15 11.72	-18 48.3	2.081	1.302	+3.80	-11.9	18.1	29.0
Oct. 25	15 49.68	-20 47.4	2.158	1.366	+3.69	-8.4	18.4	28.2
Nov. 4	16 26.54	-22 11.5	2.247	1.435	+3.54	-5.1	18.7	26.9
Nov. 14	17 01.98	-23 02.7	2.344	1.508	+3.37	-2.1	19.0	25.1
Nov. 24	17 35.72	-23 24.0	2.447	1.583	+3.19	+0.4	19.3	22.8
Dec. 4	18 07.65	-23 19.6	2.552	1.660	+3.00	+2.6	19.6	20.0
Dec. 14	18 37.68	-22 53.4	2.658	1.739	+2.81	+4.4	19.9	16.7
Dec. 24	19 05.82	-22 09.4	2.762	1.818	+2.63	+5.8	20.2	13.1
Jan. 3	19 32.15	-21 11.2	2.861	1.896	+2.46	+6.9	20.5	9.1
Jan. 13	19 56.75	-20 01.9	2.953	1.975	+2.30	+7.8	20.7	4.8
Jan. 23	20 19.73	-18 44.2	3.037	2.053	+2.15	+8.4	20.9	0.8
Feb. 2	20 41.21	-17 20.5	3.110	2.130	+2.01	+8.8	21.1	4.8
Feb. 12	21 01.28	-15 52.6	3.172	2.206	+1.87	+9.0	21.3	9.9
Feb. 22	21 20.02	-14 22.3	3.221	2.281	+1.75	+9.1	21.5	15.2
Mar. 4	21 37.54	-12 51.0	3.256	2.355	+1.63	+9.1	21.7	20.7
Mar. 14	21 53.86	-11 20.0	3.277	2.428	+1.52	+9.0	21.8	26.5
Mar. 24	22 09.03	-09 50.5	3.284	2.499	+1.41	+8.7	22.0	32.4
Apr. 3	22 23.08	-08 23.5	3.275	2.569	+1.29	+8.4	22.1	38.5

Comet C/2012 S3 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Aug. 31.10002 TT
Peri. = 183.74464
Node = 121.30725 2000.0
Incl. = 112.93055
q = 2.3081792 AU
e = 1.0009674

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	20 37.73	+32 31.3	3.859	3.443	+0.97	-11.4	18.3	58.1
Jan. 18	20 47.43	+30 36.9	3.876	3.368	+0.97	-9.6	18.2	52.5
Jan. 28	20 57.11	+29 00.8	3.880	3.294	+0.96	-8.0	18.1	47.4
Feb. 7	21 06.66	+27 41.1	3.868	3.221	+0.93	-6.5	18.0	43.2
Feb. 17	21 15.98	+26 36.3	3.839	3.150	+0.90	-5.2	17.9	40.2
Feb. 27	21 24.95	+25 44.2	3.789	3.079	+0.85	-4.1	17.8	38.7
Mar. 9	21 33.45	+25 02.9	3.718	3.011	+0.79	-3.2	17.6	38.9
Mar. 19	21 41.38	+24 30.5	3.625	2.944	+0.72	-2.6	17.5	40.8
Mar. 29	21 48.59	+24 04.6	3.509	2.879	+0.63	-2.1	17.3	44.2
Apr. 8	21 54.93	+23 43.1	3.372	2.816	+0.53	-2.0	17.1	48.9
Apr. 18	22 00.21	+23 23.5	3.214	2.756	+0.40	-2.1	16.9	54.6
Apr. 28	22 04.18	+23 02.5	3.036	2.698	+0.24	-2.6	16.7	61.2
May 8	22 06.54	+22 36.6	2.841	2.643	+0.03	-3.6	16.5	68.5
May 18	22 06.89	+22 00.8	2.631	2.592	-0.22	-5.3	16.2	76.6
May 28	22 04.71	+21 08.2	2.412	2.543	-0.54	-7.9	16.0	85.6
June 7	21 59.34	+19 49.2	2.187	2.499	-0.94	-11.9	15.7	95.6
June 17	21 49.96	+17 50.2	1.965	2.458	-1.43	-17.8	15.4	106.7
June 27	21 35.66	+14 52.3	1.755	2.422	-2.00	-25.9	15.1	119.4
July 7	21 15.66	+10 33.0	1.571	2.391	-2.60	-35.9	14.8	133.8
July 17	20 49.68	+04 34.5	1.430	2.364	-3.09	-45.1	14.5	149.7
July 27	20 18.77	-02 56.6	1.350	2.342	-3.33	-49.5	14.3	163.6
Aug. 6	19 45.48	-11 11.6	1.346	2.326	-3.20	-46.6	14.3	160.2
Aug. 16	19 13.44	-18 57.1	1.417	2.315	-2.76	-38.6	14.4	144.1
Aug. 26	18 45.80	-25 22.9	1.549	2.309	-2.17	-29.8	14.6	127.6
Sept. 5	18 24.14	-30 20.9	1.725	2.309	-1.55	-22.7	14.8	112.6
Sept. 15	18 08.66	-34 07.7	1.925	2.314	-1.00	-17.7	15.1	99.5
Sept. 25	17 58.68	-37 04.3	2.135	2.325	-0.54	-14.4	15.3	87.9
Oct. 5	17 53.32	-39 27.8	2.346	2.342	-0.16	-12.3	15.5	77.4
Oct. 15	17 51.72	-41 30.3	2.549	2.363	+0.14	-11.0	15.8	68.0
Oct. 25	17 53.16	-43 19.9	2.739	2.390	+0.39	-10.2	16.0	59.3
Nov. 4	17 57.07	-45 01.8	2.912	2.421	+0.60	-9.8	16.2	51.4
Nov. 14	18 03.04	-46 40.1	3.065	2.458	+0.77	-9.7	16.3	44.4
Nov. 24	18 10.73	-48 17.4	3.195	2.498	+0.92	-9.8	16.5	38.4
Dec. 4	18 19.91	-49 55.8	3.301	2.542	+1.05	-10.2	16.6	33.8
Dec. 14	18 30.41	-51 37.5	3.383	2.590	+1.17	-10.7	16.8	31.1
Dec. 24	18 42.12	-53 24.0	3.441	2.642	+1.29	-11.3	16.9	30.6
Jan. 3	18 54.99	-55 17.1	3.475	2.697	+1.40	-12.2	17.0	32.4
Jan. 13	19 09.02	-57 18.6	3.487	2.755	+1.53	-13.2	17.1	36.1
Jan. 23	19 24.32	-59 30.2	3.480	2.815	+1.68	-14.3	17.2	41.2
Feb. 2	19 41.09	-61 53.6	3.456	2.878	+1.86	-15.7	17.3	47.1
Feb. 12	19 59.72	-64 30.3	3.419	2.942	+2.12	-17.1	17.4	53.6
Feb. 22	20 20.94	-67 21.2	3.373	3.009	+2.52	-18.5	17.4	60.3
Mar. 4	20 46.11	-70 26.3	3.324	3.078	+3.17	-19.7	17.5	67.2
Mar. 14	21 17.81	-73 43.3	3.275	3.148	+4.38	-20.2	17.6	73.9
Mar. 24	22 01.61	-77 05.5	3.233	3.219	+6.82	-19.0	17.6	80.3
Apr. 3	23 09.85	-80 15.4	3.203	3.292	+11.43	-13.3	17.7	86.2

Comet 266P/Christensen

Epoch = 2013 July 7.0 TT
T = 2013 Aug. 31.68204 TT
Peri. = 98.01858 e = 0.3411086
Node = 5.06120 2000.0 a = 3.5331398 AU
Incl. = 3.42794 n = 0.14840989
q = 2.3279554 AU P = 6.64 years

m1 = 11.6 + 5 log(Delta) + 12.5 log(r(t-50))

0h TT 2013/14	R.A.(2000) h m	Decl. °,	Delta	r	Daily motion m	',	m1	Elong. °
Jan. 8	00 52.23	+07 35.8	2.623	2.757	+0.89	+5.7	19.5	87.3
Jan. 18	01 01.14	+08 32.9	2.729	2.727	+1.05	+6.6	19.5	79.5
Jan. 28	01 11.61	+09 38.4	2.831	2.697	+1.18	+7.2	19.5	72.1
Feb. 7	01 23.46	+10 50.7	2.928	2.668	+1.31	+7.8	19.6	65.2
Feb. 17	01 36.54	+12 08.3	3.018	2.640	+1.42	+8.1	19.6	58.5
Feb. 27	01 50.74	+13 29.4	3.100	2.612	+1.52	+8.3	19.6	52.2
Mar. 9	02 05.96	+14 52.6	3.173	2.585	+1.62	+8.4	19.6	46.1
Mar. 19	02 22.12	+16 16.4	3.237	2.559	+1.70	+8.3	19.5	40.3
Mar. 29	02 39.16	+17 39.3	3.291	2.535	+1.79	+8.1	19.5	34.7
Apr. 8	02 57.02	+18 59.8	3.336	2.511	+1.86	+7.7	19.5	29.3
Apr. 18	03 15.65	+20 16.6	3.371	2.488	+1.94	+7.2	19.5	24.1
Apr. 28	03 35.01	+21 28.2	3.397	2.467	+2.00	+6.5	19.4	19.0
May 8	03 55.04	+22 33.4	3.413	2.446	+2.06	+5.8	19.4	14.1
May 18	04 15.69	+23 30.9	3.420	2.428	+2.12	+4.9	19.3	9.4
May 28	04 36.87	+24 19.6	3.418	2.410	+2.16	+3.9	19.3	5.0
June 7	04 58.52	+24 58.6	3.408	2.394	+2.20	+2.8	19.2	2.3
June 17	05 20.54	+25 26.9	3.390	2.380	+2.23	+1.7	19.2	5.2
June 27	05 42.81	+25 43.9	3.364	2.367	+2.24	+0.5	19.1	9.5
July 7	06 05.24	+25 49.4	3.331	2.357	+2.24	-0.6	19.0	13.9
July 17	06 27.68	+25 43.1	3.290	2.347	+2.23	-1.8	19.0	18.3
July 27	06 50.01	+25 25.1	3.243	2.340	+2.21	-2.9	18.9	22.8
Aug. 6	07 12.12	+24 55.9	3.188	2.334	+2.18	-4.0	18.8	27.3
Aug. 16	07 33.87	+24 16.2	3.128	2.330	+2.13	-4.9	18.8	31.9
Aug. 26	07 55.15	+23 26.8	3.061	2.328	+2.07	-5.8	18.7	36.6
Sept. 5	08 15.86	+22 28.8	2.987	2.328	+2.00	-6.5	18.6	41.4
Sept. 15	08 35.89	+21 23.7	2.908	2.330	+1.93	-7.1	18.5	46.3
Sept. 25	08 55.16	+20 12.8	2.824	2.333	+1.84	-7.5	18.5	51.4
Oct. 5	09 13.56	+18 57.9	2.733	2.339	+1.74	-7.7	18.4	56.7
Oct. 15	09 30.99	+17 40.9	2.638	2.346	+1.64	-7.7	18.3	62.2
Oct. 25	09 47.34	+16 23.5	2.539	2.355	+1.51	-7.6	18.2	68.1
Nov. 4	10 02.49	+15 07.7	2.435	2.366	+1.38	-7.2	18.1	74.2
Nov. 14	10 16.27	+13 55.8	2.329	2.378	+1.22	-6.6	18.0	80.7
Nov. 24	10 28.51	+12 49.9	2.221	2.392	+1.05	-5.8	17.9	87.6
Dec. 4	10 38.99	+11 52.1	2.114	2.408	+0.85	-4.7	17.9	94.9
Dec. 14	10 47.45	+11 04.9	2.008	2.425	+0.62	-3.5	17.8	102.9
Dec. 24	10 53.65	+10 30.0	1.907	2.444	+0.37	-2.1	17.7	111.4
Jan. 3	10 57.31	+10 09.3	1.813	2.464	+0.09	-0.6	17.6	120.6
Jan. 13	10 58.24	+10 03.6	1.731	2.485	-0.18	+0.9	17.5	130.5
Jan. 23	10 56.40	+10 12.6	1.664	2.508	-0.44	+2.2	17.5	141.1
Feb. 2	10 51.96	+10 34.3	1.616	2.531	-0.65	+3.0	17.5	152.4
Feb. 12	10 45.44	+11 04.7	1.592	2.556	-0.77	+3.4	17.5	164.1
Feb. 22	10 37.70	+11 38.3	1.594	2.582	-0.79	+3.1	17.5	175.5
Mar. 4	10 29.75	+12 09.2	1.624	2.608	-0.71	+2.3	17.6	171.1
Mar. 14	10 22.68	+12 32.3	1.681	2.636	-0.54	+1.2	17.7	159.6
Mar. 24	10 17.31	+12 44.2	1.763	2.664	-0.32	-0.1	17.9	148.5
Apr. 3	10 14.16	+12 43.6	1.867	2.693	-0.07	-1.3	18.0	137.9

Comet 102P/Shoemaker

Epoch = 2013 July 7.0 TT
T = 2013 Sept. 1.04200 TT
Peri. = 18.78725 e = 0.4728975
Node = 339.85671 2000.0 a = 3.7345272 AU
Incl. = 26.24728 n = 0.13656853
q = 1.9684786 AU P = 7.22 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	19 01.49	-39 46.5	3.621	2.702	+2.27	+5.9	22.1	17.8
Jan. 18	19 24.22	-38 48.0	3.560	2.655	+2.26	+6.9	22.0	19.8
Jan. 28	19 46.78	-37 39.2	3.488	2.608	+2.23	+7.9	21.9	22.8
Feb. 7	20 09.04	-36 20.2	3.406	2.562	+2.19	+8.9	21.7	26.6
Feb. 17	20 30.92	-34 51.3	3.315	2.517	+2.14	+9.9	21.6	30.7
Feb. 27	20 52.31	-33 12.7	3.215	2.472	+2.08	+10.8	21.5	35.1
Mar. 9	21 13.14	-31 25.0	3.109	2.428	+2.02	+11.6	21.3	39.6
Mar. 19	21 33.38	-29 28.8	2.996	2.385	+1.96	+12.4	21.2	44.2
Mar. 29	21 52.97	-27 24.6	2.877	2.343	+1.89	+13.2	21.0	48.8
Apr. 8	22 11.88	-25 12.9	2.753	2.302	+1.82	+13.9	20.8	53.4
Apr. 18	22 30.09	-22 54.3	2.626	2.263	+1.75	+14.5	20.6	58.1
Apr. 28	22 47.55	-20 29.3	2.496	2.225	+1.67	+15.1	20.5	62.9
May 8	23 04.25	-17 58.0	2.364	2.190	+1.59	+15.7	20.3	67.7
May 18	23 20.10	-15 20.9	2.231	2.156	+1.49	+16.3	20.1	72.6
May 28	23 35.05	-12 37.6	2.098	2.124	+1.39	+16.9	19.9	77.6
June 7	23 48.99	-09 48.1	1.965	2.095	+1.28	+17.6	19.7	82.7
June 17	00 01.75	-06 52.0	1.835	2.068	+1.14	+18.3	19.5	88.1
June 27	00 13.16	-03 48.6	1.708	2.045	+0.98	+19.2	19.3	93.8
July 7	00 22.96	-00 36.9	1.585	2.024	+0.78	+20.1	19.1	99.8
July 17	00 30.79	+02 43.6	1.468	2.006	+0.55	+21.0	18.9	106.3
July 27	00 36.25	+06 13.6	1.360	1.992	+0.26	+21.9	18.7	113.2
Aug. 6	00 38.86	+09 52.5	1.262	1.981	-0.08	+22.5	18.5	120.6
Aug. 16	00 38.08	+13 37.5	1.177	1.973	-0.45	+22.5	18.3	128.5
Aug. 26	00 33.54	+17 23.0	1.109	1.969	-0.84	+21.6	18.2	136.6
Sept. 5	00 25.12	+20 58.7	1.059	1.969	-1.18	+19.2	18.1	144.4
Sept.15	00 13.33	+24 11.1	1.032	1.972	-1.38	+15.6	18.0	150.8
Sept.25	23 59.49	+26 46.9	1.028	1.979	-1.40	+11.2	18.0	153.9
Oct. 5	23 45.51	+28 38.6	1.048	1.989	-1.20	+6.9	18.1	152.4
Oct. 15	23 33.51	+29 47.4	1.090	2.003	-0.84	+3.6	18.2	147.2
Oct. 25	23 25.08	+30 23.1	1.153	2.020	-0.41	+1.5	18.4	140.3
Nov. 4	23 20.96	+30 38.1	1.231	2.040	+0.03	+0.6	18.5	132.9
Nov. 14	23 21.27	+30 44.2	1.324	2.063	+0.43	+0.6	18.8	125.6
Nov. 24	23 25.60	+30 50.5	1.428	2.089	+0.78	+1.1	19.0	118.6
Dec. 4	23 33.42	+31 02.0	1.542	2.118	+1.07	+2.0	19.2	112.0
Dec. 14	23 44.16	+31 21.7	1.662	2.149	+1.31	+2.9	19.4	105.7
Dec. 24	23 57.30	+31 50.4	1.789	2.182	+1.51	+3.7	19.7	99.7
Jan. 3	00 12.39	+32 27.7	1.920	2.218	+1.67	+4.5	19.9	94.0
Jan. 13	00 29.12	+33 12.6	2.055	2.255	+1.80	+5.1	20.1	88.5
Jan. 23	00 47.17	+34 03.3	2.193	2.294	+1.92	+5.5	20.3	83.1
Feb. 2	01 06.33	+34 58.1	2.333	2.334	+2.01	+5.7	20.5	77.9
Feb. 12	01 26.42	+35 55.3	2.473	2.376	+2.09	+5.7	20.7	72.8
Feb. 22	01 47.29	+36 52.8	2.613	2.418	+2.15	+5.6	20.9	67.8
Mar. 4	02 08.80	+37 48.9	2.752	2.462	+2.21	+5.3	21.1	62.8
Mar. 14	02 30.86	+38 42.1	2.889	2.507	+2.25	+4.9	21.3	57.9
Mar. 24	02 53.32	+39 30.9	3.023	2.552	+2.28	+4.3	21.5	53.1
Apr. 3	03 16.11	+40 14.0	3.153	2.598	+2.30	+3.7	21.6	48.4

Comet 121P/Shoemaker-Holt

Epoch = 2013 July 7.0 TT
T = 2013 Sept. 9.81012 TT
Peri. = 12.74530 e = 0.1888086
Node = 94.22529 2000.0 a = 4.6287398 AU
Incl. = 20.16584 n = 0.09897145
q = 3.7547939 AU P = 9.96 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 08.37	+11 18.5	3.122	3.869	−0.25	+4.6	19.8	133.8
Jan. 18	04 05.91	+12 05.0	3.228	3.860	−0.06	+5.1	19.8	123.5
Jan. 28	04 05.28	+12 55.7	3.350	3.851	+0.12	+5.4	19.9	113.6
Feb. 7	04 06.49	+13 49.4	3.484	3.843	+0.30	+5.6	19.9	104.0
Feb. 17	04 09.47	+14 45.1	3.623	3.835	+0.46	+5.7	20.0	94.9
Feb. 27	04 14.09	+15 41.7	3.766	3.828	+0.61	+5.6	20.1	86.1
Mar. 9	04 20.18	+16 38.0	3.907	3.821	+0.74	+5.5	20.1	77.7
Mar. 19	04 27.60	+17 33.4	4.044	3.814	+0.86	+5.4	20.2	69.7
Mar. 29	04 36.20	+18 27.0	4.174	3.808	+0.96	+5.1	20.3	61.9
Apr. 8	04 45.81	+19 18.2	4.296	3.801	+1.05	+4.8	20.3	54.4
Apr. 18	04 56.31	+20 06.2	4.406	3.796	+1.13	+4.4	20.4	47.2
Apr. 28	05 07.57	+20 50.7	4.504	3.790	+1.19	+4.1	20.4	40.1
May 8	05 19.46	+21 31.2	4.589	3.785	+1.24	+3.6	20.4	33.2
May 18	05 31.90	+22 07.4	4.659	3.781	+1.29	+3.2	20.4	26.5
May 28	05 44.77	+22 39.2	4.714	3.776	+1.32	+2.7	20.5	19.8
June 7	05 57.97	+23 06.3	4.753	3.772	+1.35	+2.3	20.5	13.3
June 17	06 11.43	+23 28.8	4.776	3.769	+1.36	+1.8	20.5	6.8
June 27	06 25.04	+23 46.8	4.782	3.766	+1.37	+1.4	20.5	0.6
July 7	06 38.73	+24 00.4	4.773	3.763	+1.37	+1.0	20.5	6.1
July 17	06 52.42	+24 10.0	4.746	3.761	+1.36	+0.6	20.4	12.5
July 27	07 06.00	+24 16.1	4.704	3.759	+1.34	+0.3	20.4	19.0
Aug. 6	07 19.42	+24 19.0	4.647	3.757	+1.31	+0.1	20.4	25.6
Aug. 16	07 32.57	+24 19.6	4.574	3.756	+1.28	−0.1	20.4	32.2
Aug. 26	07 45.36	+24 18.6	4.487	3.755	+1.23	−0.2	20.3	39.0
Sept. 5	07 57.70	+24 17.0	4.387	3.755	+1.18	−0.1	20.3	45.9
Sept.15	08 09.49	+24 15.8	4.274	3.755	+1.11	0.0	20.2	52.9
Sept.25	08 20.61	+24 16.2	4.151	3.755	+1.03	+0.3	20.1	60.2
Oct. 5	08 30.94	+24 19.6	4.019	3.756	+0.94	+0.8	20.1	67.8
Oct. 15	08 40.34	+24 27.5	3.879	3.757	+0.83	+1.4	20.0	75.6
Oct. 25	08 48.65	+24 41.2	3.735	3.759	+0.71	+2.1	19.9	83.7
Nov. 4	08 55.70	+25 02.4	3.590	3.761	+0.56	+3.0	19.8	92.2
Nov. 14	09 01.31	+25 32.3	3.446	3.763	+0.40	+4.0	19.8	101.1
Nov. 24	09 05.29	+26 11.9	3.308	3.766	+0.22	+5.0	19.7	110.3
Dec. 4	09 07.47	+27 01.6	3.179	3.769	+0.02	+5.9	19.6	120.0
Dec. 14	09 07.71	+28 00.9	3.064	3.773	−0.17	+6.7	19.5	130.0
Dec. 24	09 05.97	+29 07.9	2.968	3.777	−0.36	+7.2	19.5	140.2
Jan. 3	09 02.33	+30 19.6	2.895	3.781	−0.53	+7.2	19.4	150.4
Jan. 13	08 57.04	+31 31.6	2.848	3.785	−0.64	+6.7	19.4	159.6
Jan. 23	08 50.59	+32 38.9	2.831	3.791	−0.70	+5.8	19.4	165.2
Feb. 2	08 43.61	+33 37.1	2.843	3.796	−0.68	+4.5	19.4	162.9
Feb. 12	08 36.83	+34 22.5	2.885	3.802	−0.59	+3.1	19.5	154.8
Feb. 22	08 30.98	+34 53.7	2.954	3.808	−0.44	+1.7	19.5	145.1
Mar. 4	08 26.60	+35 10.6	3.047	3.814	−0.25	+0.4	19.6	135.1
Mar. 14	08 24.09	+35 14.5	3.160	3.821	−0.05	−0.7	19.7	125.2
Mar. 24	08 23.61	+35 07.4	3.289	3.828	+0.15	−1.6	19.8	115.7
Apr. 3	08 25.15	+34 51.1	3.428	3.836	+0.35	−2.4	19.9	106.6

Comet P/2007 C1 (Christensen)

Epoch = 2013 July 7.0 TT
T = 2013 Nov. 16.14012 TT
Peri. = 100.55018 e = 0.3887085
Node = 52.88481 2000.0 a = 3.5899817 AU
Incl. = 7.87574 n = 0.14489911
q = 2.1945253 AU P = 6.80 years

m1 = 13.0 + 5 log(Delta) + 17.5 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	03 03.20	+19 28.4	2.382	3.011	-0.78	-5.4	.	1.5/ 20	121.2
Jan. 18	03 03.55	+19 42.6	2.473	2.973	-0.75	-5.2	.	4.6/ 60	111.1
Jan. 28	03 06.40	+20 05.3	2.572	2.935	-0.72	-5.0	.	7.9/ 67	101.7
Feb. 7	03 11.57	+20 35.7	2.675	2.897	-0.70	-4.7	.	10.9/ 70	92.9
Feb. 17	03 18.88	+21 12.5	2.778	2.859	-0.69	-4.5	.	13.6/ 72	84.6
Feb. 27	03 28.13	+21 54.3	2.878	2.821	-0.68	-4.3	.	15.9/ 73	76.8
Mar. 9	03 39.12	+22 39.3	2.973	2.784	-0.69	-4.0	.	18.0/ 74	69.4
Mar. 19	03 51.69	+23 26.0	3.061	2.747	-0.70	-3.8	.	19.8/ 76	62.5
Mar. 29	04 05.67	+24 12.7	3.142	2.710	-0.71	-3.5	.	21.3/ 77	55.9
Apr. 8	04 20.95	+24 57.7	3.213	2.674	-0.73	-3.3	.	22.7/ 78	49.6
Apr. 18	04 37.40	+25 39.6	3.274	2.639	-0.75	-2.9	.	23.9/ 80	43.6
Apr. 28	04 54.91	+26 16.9	3.324	2.604	-0.77	-2.6	.	25.0/ 82	37.9
May 8	05 13.38	+26 48.2	3.365	2.570	-0.80	-2.2	.	25.9/ 84	32.4
May 18	05 32.71	+27 12.2	3.395	2.537	-0.83	-1.8	23.0	26.8/ 85	27.1
May 28	05 52.78	+27 27.9	3.414	2.505	-0.85	-1.4	22.9	27.6/ 87	22.1
June 7	06 13.51	+27 34.2	3.424	2.473	-0.88	-0.9	22.8	28.3/ 90	17.3
June 17	06 34.77	+27 30.3	3.424	2.443	-0.90	-0.4	22.7	28.9/ 92	12.7
June 27	06 56.45	+27 15.7	3.415	2.414	-0.92	+0.2	22.6	29.5/ 94	8.5
July 7	07 18.43	+26 49.9	3.397	2.387	-0.94	+0.8	22.5	30.0/ 96	5.3
July 17	07 40.62	+26 12.9	3.371	2.361	-0.96	+1.4	22.4	30.4/ 98	5.1
July 27	08 02.88	+25 24.5	3.337	2.336	-0.97	+2.0	22.3	30.9/100	8.0
Aug. 6	08 25.14	+24 25.3	3.296	2.313	-0.98	+2.6	22.2	31.2/102	11.9
Aug. 16	08 47.30	+23 15.6	3.248	2.292	-0.99	+3.3	22.1	31.4/104	16.0
Aug. 26	09 09.27	+21 56.4	3.194	2.273	-0.99	+3.9	22.0	31.6/105	20.2
Sept. 5	09 31.01	+20 28.4	3.134	2.255	-1.00	+4.5	21.9	31.7/107	24.5
Sept.15	09 52.44	+18 52.9	3.068	2.240	-1.00	+5.1	21.7	31.7/108	28.8
Sept.25	10 13.53	+17 11.2	2.997	2.227	-1.00	+5.6	21.6	31.7/109	33.2
Oct. 5	10 34.24	+15 24.6	2.921	2.216	-1.00	+6.1	21.5	31.4/110	37.7
Oct. 15	10 54.53	+13 34.7	2.841	2.207	-1.00	+6.6	21.4	31.1/110	42.3
Oct. 25	11 14.35	+11 43.2	2.756	2.200	-1.00	+7.1	21.3	30.6/111	46.9
Nov. 4	11 33.68	+09 51.5	2.667	2.196	-1.00	+7.5	21.2	29.9/111	51.8
Nov. 14	11 52.43	+08 01.6	2.575	2.195	-1.01	+7.9	21.1	29.0/111	56.8
Nov. 24	12 10.55	+06 15.0	2.479	2.195	-1.02	+8.3	21.0	27.9/111	62.0
Dec. 4	12 27.92	+04 33.4	2.380	2.198	-1.04	+8.6	20.9	26.5/111	67.4
Dec. 14	12 44.42	+02 58.5	2.279	2.204	-1.06	+9.0	20.8	24.8/110	73.1
Dec. 24	12 59.89	+01 31.7	2.177	2.212	-1.08	+9.4	20.7	22.7/110	79.0
Jan. 3	13 14.12	+00 14.4	2.073	2.222	-1.11	+9.8	20.6	20.2/109	85.4
Jan. 13	13 26.85	-00 52.1	1.970	2.234	-1.16	+10.3	20.5	17.3/108	92.1
Jan. 23	13 37.81	-01 46.9	1.869	2.248	-1.21	+10.8	20.4	13.9/108	99.3
Feb. 2	13 46.65	-02 29.2	1.771	2.265	-1.27	+11.3	20.3	10.0/107	107.0
Feb. 12	13 53.05	-02 58.6	1.679	2.283	-1.35	+11.9	20.2	5.7/107	115.4
Feb. 22	13 56.69	-03 15.6	1.596	2.304	-1.43	+12.6	20.2	1.1/117	124.4
Mar. 4	13 57.37	-03 20.8	1.524	2.326	-1.52	+13.3	20.1	3.5/277	134.1
Mar. 14	13 55.06	-03 16.4	1.469	2.350	-1.61	+13.9	20.1	7.5/278	144.4
Mar. 24	13 50.09	-03 05.5	1.433	2.375	-1.69	+14.3	20.1	10.6/277	155.2
Apr. 3	13 43.07	-02 52.1	1.420	2.402	-1.73	+14.5	20.2	12.1/275	166.0

Comet 2P/Encke

Epoch = 2013 July 7.0 TT
T = 2013 Nov. 21.69511 TT
Peri. = 186.53598 e = 0.8482245
Node = 334.57539 2000.0 a = 2.2145201 AU
Incl. = 11.77927 n = 0.29907811
q = 0.3361099 AU P = 3.30 years

H = 14.4 , G = 0.15 (r>2.0 AU)
m1 = 13.4 + 5 log(Delta) + 12.5 log(r) (r<2.0 AU)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	22 48.03	-03 35.9	3.936	3.458	+0.74	+4.5	20.8	54.4
Jan. 18	22 55.44	-02 51.3	4.015	3.410	+0.82	+5.1	20.8	46.3
Jan. 28	23 03.68	-02 00.0	4.076	3.360	+0.89	+5.7	20.7	38.4
Feb. 7	23 12.62	-01 02.8	4.117	3.307	+0.95	+6.3	20.7	30.7
Feb. 17	23 22.15	-00 00.2	4.137	3.253	+1.00	+6.7	20.6	23.3
Feb. 27	23 32.19	+01 07.3	4.136	3.196	+1.05	+7.2	20.4	16.1
Mar. 9	23 42.65	+02 19.0	4.112	3.137	+1.08	+7.6	20.3	9.4
Mar. 19	23 53.50	+03 34.6	4.067	3.076	+1.12	+7.9	20.1	4.2
Mar. 29	00 04.66	+04 53.6	4.001	3.011	+1.15	+8.2	20.1	6.6
Apr. 8	00 16.13	+06 15.7	3.914	2.945	+1.17	+8.5	20.1	12.6
Apr. 18	00 27.88	+07 40.6	3.806	2.876	+1.20	+8.7	20.1	19.0
Apr. 28	00 39.89	+09 08.0	3.680	2.803	+1.23	+9.0	20.1	25.3
May 8	00 52.17	+10 37.8	3.537	2.728	+1.25	+9.2	20.0	31.6
May 18	01 04.72	+12 09.9	3.377	2.650	+1.28	+9.4	19.9	37.7
May 28	01 17.56	+13 44.3	3.202	2.569	+1.32	+9.7	19.8	43.8
June 7	01 30.73	+15 21.2	3.015	2.484	+1.35	+10.0	19.7	49.8
June 17	01 44.28	+17 00.9	2.817	2.396	+1.40	+10.3	19.6	55.7
June 27	01 58.29	+18 43.9	2.609	2.304	+1.46	+10.7	19.4	61.5
July 7	02 12.88	+20 31.1	2.394	2.207	+1.53	+11.3	19.2	67.1
July 17	02 28.21	+22 23.8	2.174	2.107	+1.64	+12.0	18.9	72.6
July 27	02 44.57	+24 23.6	1.950	2.002	+1.78	+13.0	18.7	77.9
Aug. 6	03 02.40	+26 33.2	1.726	1.891	+2.00	+14.3	18.0	82.9
Aug. 16	03 22.42	+28 56.3	1.503	1.775	+2.35	+16.2	17.4	87.5
Aug. 26	03 45.96	+31 37.9	1.284	1.653	+2.95	+18.6	16.7	91.4
Sept. 5	04 15.47	+34 44.1	1.073	1.524	+4.04	+21.4	15.8	94.1
Sept.15	04 55.85	+38 18.0	0.873	1.388	+6.14	+21.9	14.9	95.0
Sept.25	05 57.26	+41 57.3	0.695	1.243	+9.88	+9.1	13.8	92.3
Oct. 5	07 36.06	+43 27.9	0.553	1.088	+13.21	-39.8	12.6	83.7
Oct. 15	09 48.17	+36 49.9	0.480	0.923	+11.23	-95.4	11.4	67.1
Oct. 25	11 40.51	+20 56.0	0.513	0.747	+7.37	-96.2	10.4	47.1
Nov. 4	12 54.16	+04 54.3	0.652	0.563	+5.62	-75.6	9.4	32.4
Nov. 14	13 50.31	-07 41.5	0.883	0.395	+6.36	-61.6	8.1	23.5
Nov. 24	14 53.90	-17 57.2	1.171	0.342	+7.20	-39.9	7.9	15.4
Dec. 4	16 05.94	-24 36.6	1.418	0.466	+6.39	-17.8	10.0	8.4
Dec. 14	17 09.84	-27 34.4	1.620	0.648	+5.29	-4.7	12.1	5.6
Dec. 24	18 02.74	-28 21.9	1.804	0.829	+4.37	+2.2	13.7	5.2
Jan. 3	18 46.40	-27 59.8	1.975	1.000	+3.64	+5.8	14.9	5.4
Jan. 13	19 22.85	-27 01.3	2.133	1.161	+3.09	+7.7	15.9	6.4
Jan. 23	19 53.76	-25 44.2	2.275	1.310	+2.66	+8.6	16.7	8.6
Feb. 2	20 20.41	-24 18.4	2.400	1.451	+2.33	+8.9	17.3	12.1
Feb. 12	20 43.68	-22 49.5	2.507	1.584	+2.05	+8.9	17.9	16.3
Feb. 22	21 04.22	-21 20.7	2.594	1.710	+1.83	+8.6	18.4	21.3
Mar. 4	21 22.49	-19 54.3	2.660	1.829	+1.63	+8.2	18.8	26.7
Mar. 14	21 38.77	-18 31.8	2.706	1.942	+1.45	+7.7	19.2	32.5
Mar. 24	21 53.28	-17 14.5	2.732	2.050	+1.29	+7.1	19.1	38.7
Apr. 3	22 06.14	-16 03.2	2.737	2.154	+1.12	+6.4	19.2	45.2

Comet P/2005 L1 (McNaught)

Epoch = 2013 July 7.0 TT
T = 2013 Nov. 24.72568 TT
Peri. = 149.78910 e = 0.2075400
Node = 138.26709 2000.0 a = 3.9867939 AU
Incl. = 7.73086 n = 0.12381361
q = 3.1593747 AU P = 7.96 years

m1 = 5.0 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	16 03.92	-14 04.1	4.045	3.440	-0.56	+1.9	18.8	18.4/ 98	46.3
Jan. 18	16 16.47	-14 27.8	3.919	3.425	-0.58	+1.8	18.7	17.5/ 96	53.4
Jan. 28	16 28.46	-14 45.0	3.784	3.409	-0.61	+1.8	18.5	16.4/ 94	60.5
Feb. 7	16 39.77	-14 55.9	3.641	3.395	-0.64	+1.8	18.4	15.1/ 92	67.9
Feb. 17	16 50.21	-15 00.5	3.491	3.380	-0.66	+1.7	18.3	13.6/ 90	75.4
Feb. 27	16 59.59	-14 59.3	3.337	3.366	-0.70	+1.7	18.2	11.8/ 87	83.1
Mar. 9	17 07.73	-14 52.9	3.182	3.352	-0.73	+1.7	18.0	9.7/ 84	91.1
Mar. 19	17 14.41	-14 41.9	3.028	3.339	-0.77	+1.7	17.9	7.4/ 79	99.4
Mar. 29	17 19.43	-14 27.3	2.879	3.326	-0.82	+1.8	17.7	4.9/ 70	108.0
Apr. 8	17 22.62	-14 10.1	2.737	3.313	-0.86	+1.8	17.6	2.5/ 43	116.9
Apr. 18	17 23.80	-13 51.6	2.606	3.301	-0.91	+1.9	17.5	2.2/326	126.3
Apr. 28	17 22.94	-13 32.9	2.490	3.289	-0.96	+2.0	17.3	4.5/292	136.0
May 8	17 20.08	-13 15.7	2.392	3.277	-1.00	+2.1	17.2	6.9/282	146.0
May 18	17 15.43	-13 01.3	2.316	3.266	-1.04	+2.3	17.1	8.8/276	156.0
May 28	17 09.42	-12 51.3	2.266	3.256	-1.06	+2.4	17.0	10.0/272	165.3
June 7	17 02.62	-12 46.9	2.242	3.246	-1.07	+2.5	17.0	10.1/269	170.0
June 17	16 55.72	-12 49.2	2.245	3.236	-1.06	+2.6	17.0	9.2/264	164.8
June 27	16 49.46	-12 58.7	2.275	3.227	-1.04	+2.6	17.0	7.5/257	155.5
July 7	16 44.42	-13 15.4	2.329	3.219	-1.01	+2.6	17.0	5.4/244	145.5
July 17	16 41.08	-13 38.9	2.405	3.211	-0.97	+2.6	17.0	3.5/214	135.6
July 27	16 39.72	-14 08.3	2.499	3.203	-0.92	+2.5	17.1	3.6/163	126.0
Aug. 6	16 40.43	-14 42.4	2.608	3.197	-0.88	+2.4	17.2	5.5/133	116.9
Aug. 16	16 43.21	-15 19.9	2.727	3.190	-0.84	+2.3	17.3	7.9/120	108.1
Aug. 26	16 47.94	-15 59.4	2.853	3.184	-0.81	+2.2	17.3	10.2/113	99.8
Sept. 5	16 54.48	-16 39.4	2.983	3.179	-0.78	+2.0	17.4	12.4/109	91.8
Sept.15	17 02.67	-17 18.8	3.115	3.175	-0.75	+1.9	17.5	14.3/106	84.2
Sept.25	17 12.32	-17 56.1	3.246	3.171	-0.73	+1.7	17.6	16.0/103	76.8
Oct. 5	17 23.27	-18 30.4	3.374	3.167	-0.71	+1.5	17.7	17.4/100	69.6
Oct. 15	17 35.37	-19 00.6	3.496	3.164	-0.70	+1.3	17.7	18.7/ 98	62.6
Oct. 25	17 48.44	-19 25.8	3.612	3.162	-0.68	+1.1	17.8	19.8/ 96	55.8
Nov. 4	18 02.36	-19 45.2	3.720	3.161	-0.67	+0.9	17.8	20.7/ 94	49.1
Nov. 14	18 16.97	-19 58.2	3.817	3.160	-0.66	+0.7	17.9	21.4/ 92	42.5
Nov. 24	18 32.15	-20 04.5	3.904	3.159	-0.65	+0.5	17.9	22.0/ 90	36.0
Dec. 4	18 47.78	-20 03.6	3.979	3.160	-0.64	+0.3	18.0	22.5/ 89	29.6
Dec. 14	19 03.72	-19 55.5	4.042	3.161	-0.64	+0.1	18.0	22.8/ 87	23.2
Dec. 24	19 19.86	-19 40.1	4.091	3.162	-0.63	-0.2	18.1	23.1/ 85	16.8
Jan. 3	19 36.10	-19 17.7	4.126	3.164	-0.62	-0.4	18.1	23.2/ 83	10.5
Jan. 13	19 52.33	-18 48.6	4.146	3.167	-0.62	-0.6	18.1	23.2/ 82	4.5
Jan. 23	20 08.46	-18 13.3	4.153	3.170	-0.61	-0.7	18.1	23.1/ 80	3.0
Feb. 2	20 24.40	-17 32.4	4.144	3.174	-0.61	-0.9	18.1	22.9/ 79	8.8
Feb. 12	20 40.07	-16 46.7	4.121	3.179	-0.61	-1.1	18.1	22.6/ 78	15.1
Feb. 22	20 55.39	-15 56.9	4.085	3.184	-0.60	-1.3	18.1	22.2/ 77	21.3
Mar. 4	21 10.31	-15 03.9	4.034	3.189	-0.60	-1.4	18.1	21.7/ 76	27.7
Mar. 14	21 24.74	-14 08.9	3.970	3.196	-0.60	-1.5	18.1	21.0/ 75	34.1
Mar. 24	21 38.63	-13 12.8	3.894	3.202	-0.60	-1.7	18.1	20.2/ 74	40.5
Apr. 3	21 51.91	-12 16.8	3.807	3.210	-0.61	-1.8	18.0	19.3/ 74	47.0

Comet C/2012 S1 (ISON)

Epoch = 2013 July 7.0 TT
T = 2013 Nov. 28.77534 TT
Peri. = 345.55722
Node = 295.66354 2000.0
Incl. = 62.31743
q = 0.0124497 AU
e = 1.0000040

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	07 44.28	+31 02.9	4.217	5.187	-1.10	+2.2	16.1	169.3
Jan. 18	07 33.30	+31 25.3	4.114	5.080	-1.13	+1.5	16.0	167.6
Jan. 28	07 22.01	+31 40.2	4.047	4.971	-1.10	+0.6	15.9	157.5
Feb. 7	07 11.04	+31 46.7	4.013	4.861	-1.00	-0.2	15.8	145.9
Feb. 17	07 01.02	+31 44.7	4.010	4.751	-0.86	-0.9	15.7	134.1
Feb. 27	06 52.46	+31 35.5	4.031	4.638	-0.68	-1.5	15.6	122.5
Mar. 9	06 45.68	+31 20.7	4.070	4.525	-0.48	-1.9	15.6	111.2
Mar. 19	06 40.87	+31 02.2	4.121	4.410	-0.28	-2.1	15.5	100.4
Mar. 29	06 38.06	+30 41.3	4.176	4.293	-0.09	-2.2	15.5	90.0
Apr. 8	06 37.16	+30 19.3	4.231	4.175	+0.09	-2.2	15.4	80.0
Apr. 18	06 38.07	+29 56.9	4.279	4.056	+0.25	-2.3	15.3	70.5
Apr. 28	06 40.60	+29 34.2	4.316	3.934	+0.40	-2.3	15.2	61.4
May 8	06 44.61	+29 11.4	4.338	3.811	+0.53	-2.3	15.1	52.6
May 18	06 49.92	+28 48.1	4.341	3.685	+0.65	-2.4	15.0	44.2
May 28	06 56.40	+28 24.1	4.325	3.557	+0.75	-2.5	14.9	36.2
June 7	07 03.91	+27 59.0	4.286	3.427	+0.84	-2.7	14.8	28.4
June 17	07 12.36	+27 32.1	4.224	3.295	+0.93	-2.9	14.6	20.9
June 27	07 21.64	+27 03.1	4.138	3.160	+1.01	-3.2	14.4	13.7
July 7	07 31.69	+26 31.3	4.027	3.022	+1.08	-3.5	14.2	7.3
July 17	07 42.48	+25 56.2	3.892	2.880	+1.15	-3.9	14.0	4.7
July 27	07 53.98	+25 17.0	3.732	2.735	+1.22	-4.4	13.7	9.4
Aug. 6	08 06.20	+24 33.0	3.549	2.586	+1.30	-5.0	13.4	15.6
Aug. 16	08 19.19	+23 43.2	3.343	2.433	+1.39	-5.7	13.1	21.9
Aug. 26	08 33.05	+22 46.1	3.116	2.275	+1.49	-6.6	12.7	28.1
Sept. 5	08 47.97	+21 39.8	2.870	2.111	+1.63	-7.8	12.3	34.0
Sept. 15	09 04.25	+20 21.4	2.605	1.941	+1.82	-9.5	11.8	39.7
Sept. 25	09 22.42	+18 46.1	2.325	1.762	+2.10	-12.1	11.3	44.9
Oct. 5	09 43.39	+16 45.5	2.033	1.575	+2.54	-16.1	10.6	49.3
Oct. 15	10 08.75	+14 04.8	1.732	1.375	+3.29	-23.0	9.8	52.5
Oct. 25	10 41.66	+10 14.5	1.432	1.160	+4.69	-36.0	8.9	53.5
Nov. 4	11 28.56	+04 14.9	1.148	0.923	+7.43	-59.0	7.6	50.4
Nov. 14	12 42.82	-05 35.6	0.924	0.650	+12.29	-79.8	6.0	39.6
Nov. 24	14 45.70	-18 53.7	0.869	0.300	+8.90	+64.4	3.4	17.1
Dec. 4	16 14.71	-08 09.8	0.768	0.319	-0.42	+122.1	3.3	15.4
Dec. 14	16 10.51	+12 11.2	0.548	0.664	+0.69	+180.4	5.0	39.8
Dec. 24	16 17.37	+42 14.9	0.436	0.934	+4.18	+209.1	5.6	70.6
Jan. 3	16 59.18	+77 06.0	0.468	1.170	+62.44	+5.2	6.5	101.4
Jan. 13	03 23.54	+77 58.3	0.629	1.384	+3.65	-80.6	7.7	116.5
Jan. 23	04 00.00	+64 32.4	0.859	1.583	+1.50	-47.4	8.8	118.3
Feb. 2	04 15.04	+56 38.7	1.121	1.770	+1.24	-29.9	9.7	114.2
Feb. 12	04 27.44	+51 39.5	1.403	1.948	+1.19	-20.2	10.5	107.9
Feb. 22	04 39.30	+48 17.7	1.695	2.118	+1.18	-14.3	11.2	100.9
Mar. 4	04 51.12	+45 54.6	1.994	2.282	+1.19	-10.6	11.8	93.6
Mar. 14	05 03.04	+44 09.0	2.294	2.440	+1.20	-8.0	12.3	86.2
Mar. 24	05 15.04	+42 48.6	2.593	2.593	+1.21	-6.3	12.8	78.9
Apr. 3	05 27.11	+41 45.3	2.887	2.741	+1.21	-5.1	13.2	71.6

Comet C/2012 A1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2013 Nov. 30.68862 TT
Peri. = 191.83271
Node = 277.97154 2000.0
Incl. = 120.90839
q = 7.6031532 AU
e = 1.0020523

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	06 56.68	+32 02.5	6.902	7.871	-0.87	-2.9	18.5	169.3
Jan. 18	06 48.02	+31 33.6	6.920	7.855	-0.81	-3.3	18.5	160.5
Jan. 28	06 39.89	+31 00.4	6.974	7.840	-0.73	-3.7	18.5	149.6
Feb. 7	06 32.56	+30 23.9	7.060	7.825	-0.63	-3.9	18.5	138.4
Feb. 17	06 26.25	+29 45.1	7.174	7.810	-0.52	-4.0	18.6	127.2
Feb. 27	06 21.10	+29 05.4	7.309	7.796	-0.40	-4.0	18.6	116.1
Mar. 9	06 17.14	+28 25.5	7.461	7.783	-0.28	-3.9	18.6	105.3
Mar. 19	06 14.37	+27 46.2	7.623	7.770	-0.16	-3.8	18.7	94.8
Mar. 29	06 12.73	+27 08.0	7.788	7.757	-0.06	-3.7	18.7	84.6
Apr. 8	06 12.12	+26 31.2	7.951	7.745	+0.03	-3.5	18.8	74.6
Apr. 18	06 12.43	+25 55.7	8.106	7.734	+0.11	-3.4	18.8	64.9
Apr. 28	06 13.54	+25 21.5	8.250	7.722	+0.18	-3.3	18.8	55.4
May 8	06 15.33	+24 48.4	8.377	7.712	+0.23	-3.2	18.9	46.1
May 18	06 17.67	+24 16.0	8.485	7.702	+0.28	-3.2	18.9	37.0
May 28	06 20.44	+23 44.2	8.572	7.692	+0.31	-3.2	18.9	28.0
June 7	06 23.53	+23 12.5	8.634	7.683	+0.33	-3.2	18.9	19.2
June 17	06 26.83	+22 40.8	8.671	7.674	+0.34	-3.2	18.9	10.4
June 27	06 30.23	+22 08.8	8.682	7.666	+0.34	-3.3	18.9	2.0
July 7	06 33.64	+21 36.3	8.666	7.658	+0.33	-3.3	18.9	7.2
July 17	06 36.94	+21 03.1	8.623	7.651	+0.31	-3.4	18.9	15.9
July 27	06 40.03	+20 29.0	8.555	7.644	+0.28	-3.5	18.9	24.7
Aug. 6	06 42.81	+19 53.9	8.462	7.638	+0.24	-3.6	18.9	33.6
Aug. 16	06 45.18	+19 17.8	8.347	7.632	+0.19	-3.7	18.8	42.6
Aug. 26	06 47.04	+18 40.5	8.212	7.627	+0.12	-3.8	18.8	51.7
Sept. 5	06 48.27	+18 02.0	8.060	7.622	+0.05	-4.0	18.7	61.0
Sept.15	06 48.76	+17 22.4	7.894	7.618	-0.03	-4.1	18.7	70.5
Sept.25	06 48.43	+16 41.6	7.719	7.615	-0.13	-4.2	18.7	80.3
Oct. 5	06 47.17	+15 59.8	7.540	7.611	-0.23	-4.3	18.6	90.3
Oct. 15	06 44.91	+15 17.0	7.362	7.609	-0.33	-4.4	18.5	100.6
Oct. 25	06 41.61	+14 33.5	7.192	7.607	-0.44	-4.4	18.5	111.1
Nov. 4	06 37.25	+13 49.4	7.034	7.605	-0.54	-4.4	18.4	121.9
Nov. 14	06 31.88	+13 05.2	6.896	7.604	-0.63	-4.4	18.4	132.8
Nov. 24	06 25.60	+12 21.3	6.784	7.603	-0.70	-4.3	18.4	143.8
Dec. 4	06 18.58	+11 38.4	6.702	7.603	-0.75	-4.1	18.3	154.5
Dec. 14	06 11.05	+10 57.1	6.654	7.604	-0.78	-3.9	18.3	163.6
Dec. 24	06 03.30	+10 18.0	6.644	7.605	-0.77	-3.6	18.3	166.8
Jan. 3	05 55.62	+09 42.0	6.670	7.606	-0.73	-3.3	18.3	160.9
Jan. 13	05 48.31	+09 09.4	6.733	7.608	-0.67	-2.9	18.4	151.0
Jan. 23	05 41.63	+08 40.7	6.828	7.610	-0.58	-2.5	18.4	140.2
Feb. 2	05 35.78	+08 15.7	6.951	7.613	-0.49	-2.1	18.4	129.3
Feb. 12	05 30.91	+07 54.5	7.098	7.617	-0.38	-1.8	18.5	118.4
Feb. 22	05 27.08	+07 36.5	7.261	7.621	-0.28	-1.5	18.5	107.7
Mar. 4	05 24.31	+07 21.2	7.434	7.625	-0.17	-1.3	18.6	97.4
Mar. 14	05 22.57	+07 07.9	7.612	7.630	-0.08	-1.2	18.6	87.3
Mar. 24	05 21.79	+06 55.9	7.788	7.636	+0.01	-1.1	18.7	77.6
Apr. 3	05 21.88	+06 44.5	7.958	7.642	+0.09	-1.2	18.7	68.1

Comet P/2004 H2 (Larsen)

Epoch = 2013 July 7.0 TT
T = 2013 Dec. 11.63707 TT
Peri. = 104.60881 e = 0.4173819
Node = 131.51081 2000.0 a = 4.5245362 AU
Incl. = 11.77285 n = 0.10241014
q = 2.6360767 AU P = 9.62 years

m1 = 9.4 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 8	11 48.91	+08 12.1	2.901	3.412	−0.80	+3.2	22.4	4.8/ 55	113.3
Jan. 18	11 51.53	+08 39.7	2.738	3.376	−0.85	+3.4	22.2	4.3/ 16	123.0
Jan. 28	11 52.36	+09 21.2	2.590	3.340	−0.91	+3.6	21.9	5.7/344	133.0
Feb. 7	11 51.32	+10 15.9	2.460	3.305	−0.96	+3.8	21.7	7.8/327	143.4
Feb. 17	11 48.45	+11 21.4	2.353	3.270	−1.01	+3.9	21.5	9.7/318	153.9
Feb. 27	11 43.99	+12 33.6	2.272	3.235	−1.05	+3.9	21.4	11.0/312	163.8
Mar. 9	11 38.37	+13 47.0	2.219	3.201	−1.08	+3.8	21.2	11.3/307	169.4
Mar. 19	11 32.20	+14 55.1	2.195	3.167	−1.09	+3.6	21.1	10.4/304	164.7
Mar. 29	11 26.22	+15 52.2	2.200	3.134	−1.08	+3.3	21.0	8.4/300	155.1
Apr. 8	11 21.12	+16 33.9	2.229	3.101	−1.05	+3.0	21.0	5.7/295	144.7
Apr. 18	11 17.49	+16 57.8	2.281	3.069	−1.02	+2.8	20.9	2.6/283	134.5
Apr. 28	11 15.74	+17 03.4	2.350	3.038	−0.98	+2.6	20.9	1.2/160	124.6
May 8	11 16.03	+16 51.7	2.433	3.007	−0.94	+2.5	20.9	4.4/129	115.3
May 18	11 18.39	+16 24.2	2.526	2.977	−0.90	+2.4	20.9	7.5/123	106.6
May 28	11 22.72	+15 42.8	2.624	2.948	−0.86	+2.4	20.9	10.3/121	98.4
June 7	11 28.85	+14 49.3	2.726	2.920	−0.83	+2.5	20.9	12.9/119	90.7
June 17	11 36.58	+13 45.5	2.827	2.893	−0.80	+2.6	20.9	15.2/118	83.4
June 27	11 45.73	+12 32.7	2.927	2.867	−0.78	+2.7	20.9	17.2/118	76.6
July 7	11 56.11	+11 12.4	3.023	2.842	−0.76	+2.8	20.9	19.0/117	70.1
July 17	12 07.58	+09 45.7	3.115	2.818	−0.75	+3.0	20.9	20.5/116	63.8
July 27	12 19.98	+08 13.8	3.201	2.796	−0.74	+3.1	20.9	21.9/116	57.8
Aug. 6	12 33.22	+06 37.7	3.280	2.774	−0.73	+3.3	20.8	23.1/115	52.1
Aug. 16	12 47.20	+04 58.4	3.352	2.754	−0.73	+3.4	20.8	24.1/115	46.5
Aug. 26	13 01.84	+03 17.0	3.416	2.736	−0.73	+3.5	20.8	25.1/114	41.1
Sept. 5	13 17.10	+01 34.5	3.472	2.718	−0.73	+3.6	20.8	25.9/113	35.8
Sept.15	13 32.92	−00 08.0	3.519	2.703	−0.73	+3.6	20.8	26.5/113	30.6
Sept.25	13 49.26	−01 49.5	3.558	2.689	−0.73	+3.7	20.7	27.1/112	25.6
Oct. 5	14 06.09	−03 29.0	3.588	2.676	−0.74	+3.7	20.7	27.6/111	20.7
Oct. 15	14 23.37	−05 05.2	3.609	2.665	−0.75	+3.7	20.7	27.9/109	16.1
Oct. 25	14 41.06	−06 37.2	3.621	2.656	−0.75	+3.6	20.7	28.2/108	12.0
Nov. 4	14 59.12	−08 03.8	3.623	2.649	−0.76	+3.6	20.7	28.4/107	9.1
Nov. 14	15 17.51	−09 24.1	3.616	2.643	−0.77	+3.5	20.6	28.5/105	8.8
Nov. 24	15 36.15	−10 37.1	3.600	2.639	−0.78	+3.4	20.6	28.5/104	11.2
Dec. 4	15 54.98	−11 42.1	3.575	2.637	−0.79	+3.2	20.6	28.3/102	15.2
Dec. 14	16 13.91	−12 38.2	3.540	2.636	−0.80	+3.0	20.6	28.1/100	19.9
Dec. 24	16 32.85	−13 25.1	3.497	2.637	−0.81	+2.9	20.5	27.7/ 98	24.9
Jan. 3	16 51.70	−14 02.4	3.444	2.641	−0.82	+2.7	20.5	27.2/ 96	30.2
Jan. 13	17 10.31	−14 30.0	3.383	2.645	−0.83	+2.5	20.5	26.6/ 94	35.6
Jan. 23	17 28.57	−14 48.2	3.314	2.652	−0.84	+2.3	20.5	25.8/ 93	41.1
Feb. 2	17 46.35	−14 57.2	3.236	2.660	−0.85	+2.1	20.4	24.8/ 91	46.8
Feb. 12	18 03.48	−14 57.9	3.152	2.670	−0.86	+2.0	20.4	23.7/ 89	52.6
Feb. 22	18 19.83	−14 51.2	3.060	2.682	−0.87	+1.8	20.4	22.4/ 87	58.6
Mar. 4	18 35.24	−14 38.2	2.963	2.695	−0.89	+1.7	20.4	20.8/ 86	64.8
Mar. 14	18 49.54	−14 20.3	2.861	2.710	−0.90	+1.5	20.3	19.1/ 84	71.2
Mar. 24	19 02.58	−13 59.3	2.756	2.726	−0.92	+1.5	20.3	17.0/ 83	77.9
Apr. 3	19 14.16	−13 36.8	2.648	2.744	−0.95	+1.4	20.3	14.7/ 82	84.8

Comet 154P/Brewington

Epoch = 2013 July 7.0 TT
T = 2013 Dec. 12.22701 TT
Peri. = 49.02595 e = 0.6705473
Node = 343.49554 2000.0 a = 4.8805191 AU
Incl. = 17.83225 n = 0.09141239
q = 1.6079002 AU P = 10.78 years

m1 = 7.0 + 5 log(Delta) + 22.5 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	19 05.08	-35 01.1	4.502	3.551	+1.57	+3.4	.	13.0
Jan. 18	19 20.78	-34 27.1	4.418	3.485	+1.58	+3.8	23.0	16.3
Jan. 28	19 36.62	-33 49.3	4.317	3.418	+1.59	+4.2	22.7	21.3
Feb. 7	19 52.51	-33 07.8	4.200	3.352	+1.59	+4.5	22.5	27.0
Feb. 17	20 08.38	-32 22.5	4.068	3.284	+1.57	+4.9	22.2	33.0
Feb. 27	20 24.13	-31 33.8	3.923	3.216	+1.56	+5.2	22.0	39.1
Mar. 9	20 39.70	-30 41.7	3.766	3.148	+1.53	+5.5	21.7	45.3
Mar. 19	20 55.02	-29 46.8	3.598	3.079	+1.50	+5.7	21.4	51.5
Mar. 29	21 10.02	-28 49.5	3.421	3.009	+1.46	+5.9	21.1	57.8
Apr. 8	21 24.64	-27 50.2	3.237	2.940	+1.41	+6.1	20.8	64.0
Apr. 18	21 38.79	-26 49.7	3.049	2.870	+1.36	+6.1	20.4	70.3
Apr. 28	21 52.38	-25 48.4	2.856	2.800	+1.30	+6.1	20.0	76.6
May 8	22 05.33	-24 47.1	2.663	2.729	+1.22	+6.1	19.7	83.0
May 18	22 17.50	-23 46.5	2.469	2.659	+1.12	+5.9	19.3	89.4
May 28	22 28.75	-22 47.2	2.277	2.589	+1.01	+5.7	18.8	96.1
June 7	22 38.88	-21 49.8	2.089	2.518	+0.88	+5.5	18.4	102.9
June 17	22 47.65	-20 54.8	1.907	2.449	+0.71	+5.2	18.0	110.0
June 27	22 54.75	-20 02.4	1.733	2.379	+0.51	+5.0	17.5	117.4
July 7	22 59.84	-19 12.5	1.569	2.310	+0.26	+4.8	17.0	125.3
July 17	23 02.47	-18 24.1	1.417	2.243	-0.02	+4.9	16.5	133.7
July 27	23 02.23	-17 35.1	1.279	2.176	-0.35	+5.3	16.0	142.8
Aug. 6	22 58.77	-16 42.4	1.158	2.111	-0.68	+6.1	15.5	152.5
Aug. 16	22 51.96	-15 41.0	1.058	2.048	-0.97	+7.6	15.0	162.9
Aug. 26	22 42.24	-14 25.1	0.979	1.986	-1.16	+9.5	14.6	173.1
Sept. 5	22 30.60	-12 50.4	0.925	1.928	-1.19	+11.6	14.1	171.5
Sept.15	22 18.71	-10 54.8	0.894	1.873	-1.02	+13.4	13.8	160.4
Sept.25	22 08.50	-08 40.4	0.886	1.821	-0.70	+14.8	13.4	149.0
Oct. 5	22 01.52	-06 12.5	0.898	1.773	-0.27	+15.7	13.2	138.2
Oct. 15	21 58.80	-03 35.8	0.925	1.731	+0.18	+16.2	13.0	128.4
Oct. 25	22 00.63	-00 53.8	0.963	1.694	+0.62	+16.6	12.8	119.8
Nov. 4	22 06.82	+01 51.9	1.010	1.663	+1.02	+16.9	12.6	112.3
Nov. 14	22 17.01	+04 41.0	1.064	1.638	+1.37	+17.2	12.5	105.8
Nov. 24	22 30.70	+07 33.4	1.122	1.621	+1.67	+17.5	12.4	100.2
Dec. 4	22 47.43	+10 28.7	1.185	1.610	+1.94	+17.7	12.3	95.4
Dec. 14	23 06.84	+13 25.9	1.251	1.608	+2.17	+17.7	12.3	91.2
Dec. 24	23 28.53	+16 23.2	1.322	1.613	+2.37	+17.5	12.3	87.5
Jan. 3	23 52.24	+19 17.7	1.399	1.626	+2.55	+16.9	12.4	84.2
Jan. 13	00 17.73	+22 06.7	1.481	1.646	+2.70	+16.0	12.5	81.1
Jan. 23	00 44.71	+24 46.5	1.569	1.673	+2.83	+14.7	12.7	78.2
Feb. 2	01 12.97	+27 13.9	1.665	1.706	+2.93	+13.2	12.9	75.3
Feb. 12	01 42.24	+29 25.8	1.768	1.745	+3.00	+11.4	13.1	72.4
Feb. 22	02 12.23	+31 19.7	1.879	1.790	+3.04	+9.4	13.4	69.4
Mar. 4	02 42.67	+32 53.9	1.996	1.839	+3.06	+7.4	13.7	66.4
Mar. 14	03 13.24	+34 07.6	2.120	1.892	+3.04	+5.3	14.1	63.1
Mar. 24	03 43.62	+35 00.4	2.250	1.948	+2.99	+3.3	14.4	59.7
Apr. 3	04 13.55	+35 33.1	2.385	2.008	+2.92	+1.4	14.8	56.2

Comet P/2003 S1 (NEAT)

Epoch = 2013 July 7.0 TT
T = 2013 Dec. 16.12539 TT
Peri. = 176.06763 e = 0.4305484
Node = 241.04138 2000.0 a = 4.5499435 AU
Incl. = 5.95695 n = 0.10155354
q = 2.5909726 AU P = 9.71 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot.′/PA °	Elong. °
Jan. 8	21 52.02	-07 43.0	4.118	3.425	-0.47	-2.5	20.8	19.1/ 72	40.1
Jan. 18	22 04.24	-06 44.8	4.168	3.387	-0.47	-2.5	20.8	20.0/ 71	33.1
Jan. 28	22 16.95	-05 40.4	4.203	3.350	-0.48	-2.6	20.7	20.8/ 70	26.4
Feb. 7	22 30.06	-04 30.3	4.223	3.312	-0.49	-2.7	20.6	21.5/ 70	19.8
Feb. 17	22 43.50	-03 15.1	4.228	3.276	-0.50	-2.8	20.5	22.0/ 69	13.6
Feb. 27	22 57.21	-01 55.5	4.218	3.239	-0.51	-2.9	20.5	22.5/ 68	7.8
Mar. 9	23 11.13	-00 32.0	4.192	3.203	-0.53	-3.0	20.4	22.8/ 68	4.3
Mar. 19	23 25.22	+00 54.6	4.152	3.168	-0.55	-3.1	20.3	23.1/ 67	7.4
Mar. 29	23 39.45	+02 23.7	4.098	3.132	-0.56	-3.2	20.1	23.3/ 67	12.8
Apr. 8	23 53.77	+03 54.4	4.031	3.098	-0.59	-3.3	20.0	23.4/ 67	18.5
Apr. 18	00 08.17	+05 26.1	3.952	3.064	-0.61	-3.3	19.9	23.4/ 67	24.2
Apr. 28	00 22.60	+06 58.1	3.861	3.031	-0.64	-3.4	19.8	23.3/ 67	30.0
May 8	00 37.05	+08 29.5	3.759	2.998	-0.67	-3.5	19.6	23.2/ 67	35.7
May 18	00 51.47	+09 59.6	3.647	2.966	-0.70	-3.5	19.5	22.9/ 67	41.5
May 28	01 05.81	+11 27.6	3.528	2.936	-0.74	-3.5	19.3	22.5/ 67	47.2
June 7	01 20.04	+12 52.8	3.400	2.906	-0.78	-3.5	19.2	22.0/ 68	53.0
June 17	01 34.06	+14 14.4	3.267	2.876	-0.82	-3.5	19.0	21.4/ 68	58.9
June 27	01 47.80	+15 31.6	3.128	2.848	-0.87	-3.5	18.8	20.5/ 69	64.8
July 7	02 01.15	+16 43.6	2.985	2.822	-0.93	-3.5	18.7	19.5/ 70	70.9
July 17	02 13.96	+17 49.7	2.840	2.796	-0.99	-3.4	18.5	18.2/ 71	77.2
July 27	02 26.06	+18 49.0	2.693	2.771	-1.05	-3.4	18.3	16.7/ 71	83.7
Aug. 6	02 37.25	+19 40.9	2.546	2.748	-1.13	-3.4	18.1	14.8/ 72	90.4
Aug. 16	02 47.28	+20 24.6	2.402	2.726	-1.21	-3.3	17.9	12.5/ 74	97.5
Aug. 26	02 55.87	+20 59.1	2.261	2.706	-1.30	-3.3	17.7	9.9/ 75	105.1
Sept. 5	03 02.72	+21 23.6	2.127	2.687	-1.39	-3.4	17.6	6.8/ 78	113.1
Sept.15	03 07.52	+21 37.0	2.001	2.669	-1.49	-3.5	17.4	3.5/ 88	121.6
Sept.25	03 10.03	+21 38.5	1.887	2.654	-1.60	-3.7	17.2	1.2/176	130.8
Oct. 5	03 10.09	+21 27.0	1.789	2.640	-1.70	-4.0	17.0	4.1/233	140.6
Oct. 15	03 07.75	+21 02.0	1.710	2.627	-1.78	-4.3	16.9	7.2/238	151.1
Oct. 25	03 03.40	+20 24.2	1.652	2.617	-1.85	-4.7	16.8	9.4/239	162.1
Nov. 4	02 57.66	+19 35.9	1.620	2.608	-1.88	-5.1	16.7	10.3/238	173.4
Nov. 14	02 51.48	+18 41.2	1.615	2.601	-1.86	-5.3	16.7	9.7/236	174.0
Nov. 24	02 45.86	+17 46.0	1.636	2.596	-1.82	-5.4	16.7	7.8/230	162.7
Dec. 4	02 41.70	+16 56.1	1.684	2.592	-1.74	-5.3	16.8	4.9/217	151.4
Dec. 14	02 39.67	+16 16.6	1.754	2.591	-1.65	-5.0	16.9	2.7/167	140.6
Dec. 24	02 40.07	+15 50.4	1.843	2.592	-1.55	-4.6	17.0	4.4/106	130.4
Jan. 3	02 42.98	+15 38.4	1.949	2.594	-1.46	-4.2	17.1	7.7/ 89	120.8
Jan. 13	02 48.31	+15 39.9	2.066	2.598	-1.37	-3.8	17.2	10.9/ 83	111.9
Jan. 23	02 55.82	+15 53.1	2.193	2.605	-1.29	-3.3	17.4	13.8/ 80	103.5
Feb. 2	03 05.27	+16 15.6	2.325	2.613	-1.22	-2.9	17.5	16.3/ 79	95.6
Feb. 12	03 16.41	+16 44.9	2.461	2.622	-1.16	-2.5	17.7	18.3/ 79	88.2
Feb. 22	03 28.99	+17 18.5	2.598	2.634	-1.11	-2.1	17.8	20.1/ 79	81.1
Mar. 4	03 42.79	+17 54.2	2.735	2.647	-1.07	-1.7	18.0	21.4/ 80	74.4
Mar. 14	03 57.63	+18 29.8	2.870	2.662	-1.02	-1.4	18.1	22.5/ 81	68.0
Mar. 24	04 13.33	+19 03.6	3.002	2.679	-0.99	-1.0	18.3	23.4/ 82	61.8
Apr. 3	04 29.73	+19 33.9	3.129	2.697	-0.95	-0.6	18.4	24.1/ 83	55.8

Comet 87P/Bus

Epoch = 2013 July 7.0 TT
T = 2013 Dec. 19.51618 TT
Peri. = 24.70078 e = 0.3888011
Node = 181.90109 2000.0 a = 3.4388676 AU
Incl. = 2.60067 n = 0.15455423
q = 2.1018321 AU P = 6.38 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	07 19.02	+18 30.5	2.109	3.091	-0.91	+1.9	20.6	176.2
Jan. 18	07 09.93	+18 49.2	2.082	3.052	-0.85	+1.9	20.5	168.1
Jan. 28	07 01.41	+19 08.4	2.086	3.013	-0.71	+1.8	20.4	156.2
Feb. 7	06 54.35	+19 26.7	2.115	2.974	-0.49	+1.7	20.4	144.5
Feb. 17	06 49.44	+19 43.4	2.168	2.935	-0.23	+1.4	20.3	133.3
Feb. 27	06 47.09	+19 57.7	2.239	2.896	+0.03	+1.2	20.3	122.6
Mar. 9	06 47.44	+20 09.3	2.322	2.857	+0.30	+0.8	20.3	112.7
Mar. 19	06 50.44	+20 17.7	2.414	2.818	+0.55	+0.4	20.3	103.4
Mar. 29	06 55.91	+20 22.2	2.511	2.779	+0.77	0.0	20.3	94.8
Apr. 8	07 03.59	+20 22.0	2.608	2.740	+0.97	-0.6	20.3	86.8
Apr. 18	07 13.25	+20 16.2	2.703	2.702	+1.14	-1.2	20.3	79.2
Apr. 28	07 24.61	+20 04.1	2.794	2.663	+1.28	-1.9	20.3	72.1
May 8	07 37.42	+19 44.9	2.879	2.626	+1.41	-2.7	20.3	65.5
May 18	07 51.50	+19 17.9	2.957	2.588	+1.51	-3.5	20.2	59.2
May 28	08 06.62	+18 42.7	3.027	2.552	+1.60	-4.4	20.2	53.2
June 7	08 22.63	+17 58.7	3.088	2.516	+1.68	-5.3	20.1	47.5
June 17	08 39.38	+17 05.8	3.141	2.480	+1.74	-6.2	20.1	42.0
June 27	08 56.74	+16 03.8	3.184	2.446	+1.79	-7.1	20.0	36.7
July 7	09 14.62	+14 52.8	3.218	2.413	+1.83	-8.0	19.9	31.7
July 17	09 32.92	+13 33.1	3.243	2.380	+1.87	-8.8	19.9	26.8
July 27	09 51.58	+12 04.9	3.260	2.349	+1.90	-9.6	19.8	22.0
Aug. 6	10 10.54	+10 28.9	3.267	2.319	+1.92	-10.3	19.7	17.3
Aug. 16	10 29.78	+08 45.5	3.267	2.291	+1.95	-11.0	19.6	12.8
Aug. 26	10 49.25	+06 55.7	3.259	2.264	+1.97	-11.5	19.5	8.3
Sept. 5	11 08.96	+05 00.2	3.243	2.238	+1.99	-12.0	19.4	3.9
Sept.15	11 28.90	+03 00.2	3.220	2.215	+2.02	-12.3	19.3	0.6
Sept.25	11 49.07	+00 56.9	3.191	2.193	+2.04	-12.6	19.2	4.8
Oct. 5	12 09.48	-01 08.7	3.156	2.174	+2.07	-12.6	19.1	9.1
Oct. 15	12 30.15	-03 15.0	3.114	2.156	+2.09	-12.6	19.0	13.4
Oct. 25	12 51.06	-05 20.5	3.067	2.141	+2.12	-12.3	19.0	17.7
Nov. 4	13 12.24	-07 23.8	3.015	2.129	+2.14	-11.9	18.9	22.1
Nov. 14	13 33.67	-09 23.2	2.958	2.118	+2.17	-11.4	18.8	26.5
Nov. 24	13 55.32	-11 17.1	2.896	2.110	+2.18	-10.7	18.7	30.9
Dec. 4	14 17.17	-13 04.0	2.830	2.105	+2.20	-9.8	18.6	35.4
Dec. 14	14 39.14	-14 42.3	2.759	2.102	+2.20	-8.8	18.5	40.0
Dec. 24	15 01.14	-16 10.8	2.685	2.102	+2.19	-7.7	18.4	44.7
Jan. 3	15 23.06	-17 28.2	2.607	2.105	+2.17	-6.6	18.3	49.4
Jan. 13	15 44.74	-18 33.8	2.525	2.110	+2.13	-5.3	18.3	54.4
Jan. 23	16 06.01	-19 27.0	2.440	2.117	+2.07	-4.1	18.2	59.4
Feb. 2	16 26.67	-20 07.7	2.353	2.127	+1.98	-2.8	18.1	64.7
Feb. 12	16 46.46	-20 36.2	2.263	2.140	+1.87	-1.7	18.0	70.2
Feb. 22	17 05.14	-20 53.2	2.170	2.155	+1.73	-0.7	18.0	75.9
Mar. 4	17 22.43	-20 59.8	2.077	2.172	+1.56	+0.2	17.9	81.9
Mar. 14	17 38.03	-20 57.5	1.983	2.191	+1.36	+0.9	17.8	88.3
Mar. 24	17 51.65	-20 48.1	1.890	2.212	+1.13	+1.5	17.8	95.0
Apr. 3	18 02.97	-20 33.6	1.799	2.236	+0.87	+1.8	17.7	102.3

Comet C/2011 J2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2013 Dec. 25.24458 TT
Peri. = 85.28149
Node = 163.94144 2000.0
Incl. = 122.79665
q = 3.4433866 AU
e = 1.0005327

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	11 28.14	+28 19.7	4.059	4.674	-0.57	+16.8	14.9	123.5
Jan. 18	11 22.40	+31 07.2	3.882	4.616	-0.82	+18.0	14.8	133.6
Jan. 28	11 14.17	+34 07.5	3.738	4.559	-1.09	+18.5	14.7	142.6
Feb. 7	11 03.30	+37 12.8	3.631	4.503	-1.34	+18.0	14.5	148.8
Feb. 17	10 49.91	+40 13.2	3.565	4.448	-1.55	+16.5	14.4	149.9
Feb. 27	10 34.43	+42 58.0	3.542	4.394	-1.68	+14.0	14.4	145.4
Mar. 9	10 17.66	+45 18.3	3.558	4.340	-1.70	+11.1	14.3	137.3
Mar. 19	10 00.65	+47 09.0	3.610	4.288	-1.61	+8.0	14.3	127.4
Mar. 29	09 44.56	+48 29.4	3.689	4.236	-1.42	+5.3	14.3	116.9
Apr. 8	09 30.33	+49 22.9	3.789	4.185	-1.17	+3.2	14.3	106.5
Apr. 18	09 18.63	+49 54.7	3.901	4.136	-0.89	+1.6	14.3	96.4
Apr. 28	09 09.73	+50 10.9	4.019	4.087	-0.61	+0.6	14.3	86.8
May 8	09 03.62	+50 17.0	4.135	4.040	-0.35	0.0	14.3	77.6
May 18	09 00.13	+50 17.3	4.244	3.994	-0.11	-0.2	14.4	69.0
May 28	08 58.99	+50 15.4	4.340	3.950	+0.09	-0.2	14.4	61.0
June 7	08 59.89	+50 13.7	4.422	3.907	+0.27	+0.1	14.3	53.7
June 17	09 02.57	+50 14.4	4.484	3.865	+0.42	+0.4	14.3	47.1
June 27	09 06.76	+50 18.8	4.525	3.825	+0.55	+1.0	14.3	41.6
July 7	09 12.25	+50 28.4	4.544	3.786	+0.66	+1.6	14.3	37.3
July 17	09 18.86	+50 44.4	4.540	3.750	+0.76	+2.4	14.2	34.7
July 27	09 26.46	+51 08.2	4.512	3.715	+0.85	+3.3	14.2	34.1
Aug. 6	09 34.93	+51 41.1	4.460	3.681	+0.93	+4.4	14.1	35.5
Aug. 16	09 44.21	+52 24.9	4.386	3.650	+1.00	+5.7	14.0	38.6
Aug. 26	09 54.24	+53 21.5	4.292	3.621	+1.08	+7.2	14.0	43.1
Sept. 5	10 05.05	+54 33.2	4.178	3.594	+1.16	+8.9	13.9	48.7
Sept.15	10 16.67	+56 02.6	4.049	3.568	+1.25	+11.0	13.8	55.0
Sept.25	10 29.20	+57 52.5	3.908	3.545	+1.37	+13.4	13.7	61.8
Oct. 5	10 42.90	+60 06.1	3.759	3.525	+1.52	+16.0	13.5	68.9
Oct. 15	10 58.13	+62 46.6	3.607	3.506	+1.75	+19.0	13.4	76.2
Oct. 25	11 15.66	+65 56.1	3.460	3.490	+2.13	+22.0	13.3	83.5
Nov. 4	11 36.99	+69 35.7	3.323	3.476	+2.84	+24.7	13.2	90.5
Nov. 14	12 05.41	+73 42.9	3.203	3.465	+4.42	+26.5	13.1	96.9
Nov. 24	12 49.60	+78 07.8	3.109	3.456	+8.76	+25.1	13.0	102.2
Dec. 4	14 17.16	+82 18.8	3.046	3.449	+19.27	+12.1	13.0	105.9
Dec. 14	17 29.88	+84 19.8	3.018	3.445	+18.26	-14.4	13.0	107.5
Dec. 24	20 32.50	+81 55.6	3.028	3.443	+8.12	-26.0	13.0	106.8
Jan. 3	21 53.73	+77 35.2	3.074	3.444	+4.19	-27.1	13.0	103.9
Jan. 13	22 35.67	+73 04.1	3.152	3.448	+2.73	-25.2	13.1	99.1
Jan. 23	23 02.98	+68 52.0	3.257	3.454	+2.06	-22.3	13.1	93.1
Feb. 2	23 23.58	+65 09.1	3.381	3.462	+1.69	-19.0	13.2	86.4
Feb. 12	23 40.51	+61 58.7	3.517	3.473	+1.46	-15.9	13.3	79.4
Feb. 22	23 55.15	+59 20.1	3.657	3.486	+1.31	-12.9	13.4	72.3
Mar. 4	00 08.21	+57 11.0	3.796	3.502	+1.19	-10.2	13.5	65.4
Mar. 14	00 20.06	+55 28.6	3.928	3.520	+1.08	-7.9	13.6	58.9
Mar. 24	00 30.90	+54 09.3	4.048	3.540	+0.99	-5.9	13.7	53.1
Apr. 3	00 40.83	+53 10.2	4.152	3.562	+0.90	-4.2	13.8	48.1

Comet P/2006 XG16 (Spacewatch)

Epoch = 2013 July 7.0 TT
T = 2014 Jan. 10.32173 TT
Peri. = 41.20248 e = 0.4196348
Node = 78.43950 2000.0 a = 3.6380248 AU
Incl. = 9.06648 n = 0.14203834
q = 2.1113830 AU P = 6.94 years

m1 = 9.2 + 5 log(Delta) + 25.0 log(r(t-50))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 8	00 19.46	-06 06.1	3.377	3.254	-0.46	-3.5	.	13.8/ 56	74.5
Jan. 18	00 27.07	-04 48.5	3.474	3.213	-0.46	-3.5	.	15.6/ 58	66.6
Jan. 28	00 35.89	-03 25.5	3.564	3.172	-0.45	-3.6	.	17.2/ 60	59.1
Feb. 7	00 45.78	-01 58.2	3.643	3.131	-0.46	-3.6	.	18.6/ 61	51.8
Feb. 17	00 56.63	-00 27.4	3.710	3.089	-0.46	-3.7	.	19.9/ 62	44.9
Feb. 27	01 08.33	+01 06.0	3.764	3.048	-0.47	-3.8	.	21.0/ 63	38.2
Mar. 9	01 20.79	+02 41.1	3.805	3.006	-0.48	-3.9	.	21.9/ 64	31.7
Mar. 19	01 33.95	+04 17.1	3.832	2.964	-0.50	-3.9	.	22.8/ 65	25.5
Mar. 29	01 47.76	+05 53.3	3.845	2.923	-0.51	-4.0	.	23.5/ 66	19.4
Apr. 8	02 02.16	+07 28.8	3.844	2.881	-0.53	-4.1	.	24.2/ 67	13.7
Apr. 18	02 17.14	+09 03.1	3.829	2.840	-0.56	-4.1	.	24.7/ 68	8.4
Apr. 28	02 32.67	+10 35.1	3.801	2.798	-0.59	-4.2	.	25.2/ 69	4.5
May 8	02 48.72	+12 04.4	3.760	2.757	-0.62	-4.2	.	25.7/ 70	5.6
May 18	03 05.28	+13 30.2	3.707	2.717	-0.65	-4.2	.	26.1/ 71	10.1
May 28	03 22.33	+14 51.6	3.642	2.677	-0.69	-4.2	.	26.5/ 73	15.0
June 7	03 39.85	+16 08.2	3.567	2.637	-0.73	-4.2	.	26.8/ 74	20.0
June 17	03 57.81	+17 19.1	3.482	2.598	-0.77	-4.1	.	27.0/ 75	25.0
June 27	04 16.18	+18 23.9	3.388	2.559	-0.82	-4.0	.	27.2/ 77	30.0
July 7	04 34.93	+19 22.0	3.286	2.522	-0.87	-3.8	22.9	27.4/ 78	35.0
July 17	04 53.99	+20 12.9	3.177	2.485	-0.93	-3.6	22.6	27.5/ 80	39.9
July 27	05 13.31	+20 56.4	3.061	2.449	-0.98	-3.4	22.2	27.5/ 82	44.9
Aug. 6	05 32.81	+21 32.2	2.940	2.414	-1.05	-3.1	21.9	27.4/ 83	49.9
Aug. 16	05 52.39	+22 00.5	2.815	2.381	-1.11	-2.7	21.7	27.2/ 85	54.9
Aug. 26	06 11.95	+22 21.5	2.685	2.349	-1.18	-2.3	21.4	26.9/ 86	60.0
Sept. 5	06 31.36	+22 35.8	2.553	2.318	-1.26	-1.9	21.1	26.5/ 87	65.2
Sept.15	06 50.47	+22 44.3	2.419	2.289	-1.33	-1.4	20.8	25.8/ 88	70.5
Sept.25	07 09.13	+22 48.1	2.284	2.262	-1.42	-0.8	20.6	24.9/ 89	76.0
Oct. 5	07 27.17	+22 49.1	2.150	2.236	-1.51	-0.1	20.3	23.7/ 89	81.7
Oct. 15	07 44.34	+22 49.2	2.016	2.213	-1.61	+0.6	20.0	22.2/ 89	87.7
Oct. 25	08 00.42	+22 51.0	1.885	2.192	-1.72	+1.3	19.7	20.3/ 87	94.0
Nov. 4	08 15.14	+22 57.4	1.758	2.173	-1.85	+2.2	19.4	18.0/ 85	100.7
Nov. 14	08 28.15	+23 11.8	1.637	2.156	-1.99	+3.1	19.1	15.3/ 80	107.8
Nov. 24	08 39.10	+23 37.4	1.523	2.142	-2.15	+4.1	18.9	12.3/ 71	115.5
Dec. 4	08 47.58	+24 17.3	1.418	2.131	-2.33	+5.2	18.6	9.4/ 53	123.8
Dec. 14	08 53.16	+25 13.3	1.326	2.122	-2.54	+6.2	18.3	7.9/ 24	132.8
Dec. 24	08 55.55	+26 24.9	1.250	2.116	-2.75	+7.0	18.1	8.5/352	142.3
Jan. 3	08 54.64	+27 48.7	1.192	2.112	-2.96	+7.5	17.9	10.2/330	152.3
Jan. 13	08 50.72	+29 16.8	1.155	2.111	-3.14	+7.5	17.8	11.4/317	161.7
Jan. 23	08 44.65	+30 38.8	1.142	2.114	-3.24	+7.0	17.7	11.0/307	167.6
Feb. 2	08 37.75	+31 44.3	1.153	2.119	-3.26	+6.0	17.7	8.8/299	164.3
Feb. 12	08 31.61	+32 26.0	1.188	2.126	-3.17	+5.0	17.7	5.3/288	155.5
Feb. 22	08 27.60	+32 41.7	1.245	2.136	-3.01	+4.2	17.8	1.6/237	145.8
Mar. 4	08 26.57	+32 33.3	1.320	2.149	-2.79	+3.6	17.9	4.1/135	136.3
Mar. 14	08 28.83	+32 04.2	1.411	2.165	-2.57	+3.4	18.1	8.3/123	127.5
Mar. 24	08 34.23	+31 18.6	1.515	2.183	-2.34	+3.4	18.3	12.0/119	119.2
Apr. 3	08 42.37	+30 19.5	1.630	2.203	-2.13	+3.7	18.5	15.3/117	111.6

Comet P/1998 Y2 (Li)

Epoch = 2013 July 7.0 TT
T = 2014 Feb. 3.92234 TT
Peri. = 319.04113 e = 0.5878230
Node = 91.86402 2000.0 a = 6.1198667 AU
Incl. = 24.35718 n = 0.06510152
q = 2.5224683 AU P = 15.14 years

m1 = 4.4 + 5 log(Delta) + 25.0 log(r(t-60))

0h TT 2013/14	R.A.(2000) h m	Decl. ° '	Delta	r	Variation for T=+1 day		m1	Mot./PA ' / °	Elong. °
Jan. 8	21 26.19	-31 23.0	4.728	3.909	-0.46	-0.2	.	17.5/ 73	30.2
Jan. 18	21 39.09	-30 28.6	4.734	3.859	-0.47	-0.5	.	18.2/ 73	24.4
Jan. 28	21 52.41	-29 32.1	4.722	3.809	-0.48	-0.7	.	18.9/ 73	19.6
Feb. 7	22 06.09	-28 33.7	4.693	3.758	-0.49	-1.0	23.0	19.4/ 73	16.6
Feb. 17	22 20.02	-27 33.9	4.648	3.708	-0.50	-1.2	23.0	19.8/ 73	16.1
Feb. 27	22 34.15	-26 33.3	4.586	3.658	-0.52	-1.5	22.6	20.2/ 73	18.2
Mar. 9	22 48.42	-25 32.5	4.509	3.609	-0.53	-1.8	22.5	20.4/ 74	22.1
Mar. 19	23 02.78	-24 32.1	4.418	3.559	-0.55	-2.1	22.3	20.6/ 74	26.9
Mar. 29	23 17.17	-23 33.0	4.314	3.510	-0.57	-2.5	22.1	20.7/ 75	32.2
Apr. 8	23 31.56	-22 35.8	4.198	3.461	-0.59	-2.8	21.9	20.7/ 75	37.8
Apr. 18	23 45.91	-21 41.5	4.071	3.412	-0.61	-3.2	21.7	20.6/ 76	43.5
Apr. 28	00 00.17	-20 51.1	3.935	3.364	-0.64	-3.6	21.5	20.4/ 78	49.2
May 8	00 14.30	-20 05.4	3.791	3.317	-0.66	-4.0	21.2	20.1/ 79	55.0
May 18	00 28.24	-19 25.7	3.641	3.270	-0.69	-4.4	21.0	19.7/ 81	60.8
May 28	00 41.93	-18 52.9	3.487	3.223	-0.73	-4.8	20.7	19.1/ 83	66.7
June 7	00 55.28	-18 28.2	3.330	3.178	-0.76	-5.3	20.5	18.5/ 86	72.6
June 17	01 08.20	-18 12.7	3.171	3.133	-0.80	-5.8	20.2	17.6/ 89	78.6
June 27	01 20.56	-18 07.5	3.013	3.089	-0.84	-6.4	20.0	16.6/ 93	84.7
July 7	01 32.22	-18 13.6	2.856	3.046	-0.89	-7.0	19.7	15.4/ 97	90.8
July 17	01 42.97	-18 31.9	2.703	3.004	-0.95	-7.7	19.4	14.0/103	97.1
July 27	01 52.63	-19 02.6	2.556	2.963	-1.01	-8.3	19.1	12.5/111	103.5
Aug. 6	02 00.92	-19 45.7	2.416	2.923	-1.08	-9.0	18.9	10.8/121	110.0
Aug. 16	02 07.57	-20 40.3	2.285	2.884	-1.15	-9.7	18.6	9.2/134	116.6
Aug. 26	02 12.30	-21 44.1	2.166	2.847	-1.23	-10.4	18.3	7.8/153	123.1
Sept. 5	02 14.83	-22 53.7	2.060	2.811	-1.31	-11.0	18.1	7.0/178	129.5
Sept.15	02 14.98	-24 03.3	1.971	2.777	-1.40	-11.4	17.8	7.0/206	135.3
Sept.25	02 12.72	-25 05.7	1.899	2.745	-1.47	-11.6	17.6	7.6/232	140.1
Oct. 5	02 08.27	-25 52.7	1.847	2.714	-1.54	-11.6	17.4	8.6/254	143.2
Oct. 15	02 02.13	-26 15.7	1.815	2.685	-1.57	-11.3	17.2	9.5/274	143.8
Oct. 25	01 55.12	-26 07.9	1.805	2.659	-1.58	-10.9	17.0	10.3/294	141.9
Nov. 4	01 48.20	-25 25.9	1.815	2.634	-1.55	-10.5	16.9	11.1/313	137.6
Nov. 14	01 42.32	-24 09.6	1.846	2.612	-1.50	-10.1	16.8	12.1/332	131.8
Nov. 24	01 38.24	-22 22.7	1.894	2.592	-1.42	-9.8	16.7	13.4/349	125.2
Dec. 4	01 36.41	-20 10.9	1.958	2.574	-1.34	-9.7	16.7	15.1/ 3	118.1
Dec. 14	01 37.02	-17 40.3	2.036	2.559	-1.25	-9.6	16.7	16.9/ 15	111.0
Dec. 24	01 40.05	-14 57.0	2.125	2.546	-1.18	-9.6	16.7	18.7/ 24	103.9
Jan. 3	01 45.30	-12 05.9	2.223	2.536	-1.10	-9.6	16.7	20.5/ 32	96.9
Jan. 13	01 52.59	-09 11.2	2.327	2.529	-1.04	-9.6	16.7	22.1/ 38	90.2
Jan. 23	02 01.64	-06 16.1	2.437	2.524	-0.99	-9.6	16.7	23.5/ 43	83.6
Feb. 2	02 12.24	-03 23.0	2.549	2.523	-0.95	-9.5	16.7	24.6/ 47	77.3
Feb. 12	02 24.19	-00 33.8	2.663	2.523	-0.91	-9.4	16.7	25.6/ 50	71.2
Feb. 22	02 37.29	+02 09.9	2.777	2.527	-0.88	-9.2	16.8	26.3/ 53	65.2
Mar. 4	02 51.41	+04 47.0	2.890	2.533	-0.86	-8.9	16.8	26.9/ 56	59.4
Mar. 14	03 06.43	+07 16.3	3.000	2.542	-0.84	-8.7	16.9	27.3/ 59	53.7
Mar. 24	03 22.20	+09 37.1	3.108	2.554	-0.82	-8.3	16.9	27.6/ 61	48.2
Apr. 3	03 38.66	+11 48.8	3.211	2.568	-0.81	-8.0	17.0	27.7/ 63	42.8

Comet 107P/(4015) Wilson-Harrington

Epoch = 2013 July 7.0 TT
T = 2014 Feb. 5.26720 TT
Peri. = 91.44341 e = 0.6235492
Node = 270.40710 2000.0 a = 2.6405950 AU
Incl. = 2.78472 n = 0.22969491
q = 0.9940541 AU P = 4.29 years

H = 15.8 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	14 54.23	-18 51.9	3.856	3.488	+0.90	-4.1	22.3	61.0
Jan. 18	15 03.22	-19 32.8	3.672	3.444	+0.82	-3.6	22.2	69.0
Jan. 28	15 11.37	-20 09.3	3.480	3.400	+0.71	-3.2	22.0	77.1
Feb. 7	15 18.47	-20 41.0	3.283	3.353	+0.58	-2.6	21.9	85.5
Feb. 17	15 24.27	-21 07.4	3.083	3.306	+0.42	-2.1	21.8	94.2
Feb. 27	15 28.47	-21 27.9	2.884	3.257	+0.23	-1.4	21.6	103.2
Mar. 9	15 30.80	-21 42.0	2.690	3.207	+0.01	-0.7	21.4	112.7
Mar. 19	15 30.91	-21 48.5	2.505	3.155	-0.23	+0.2	21.1	122.6
Mar. 29	15 28.58	-21 46.3	2.333	3.102	-0.49	+1.2	20.9	133.0
Apr. 8	15 23.64	-21 33.9	2.179	3.047	-0.75	+2.4	20.6	144.0
Apr. 18	15 16.12	-21 09.9	2.048	2.991	-0.97	+3.6	20.3	155.5
Apr. 28	15 06.38	-20 33.6	1.942	2.933	-1.13	+4.8	20.0	167.4
May 8	14 55.08	-19 45.8	1.865	2.874	-1.19	+5.6	19.6	177.0
May 18	14 43.21	-18 49.4	1.819	2.813	-1.13	+6.0	19.7	166.8
May 28	14 31.91	-17 49.3	1.801	2.750	-0.97	+5.8	19.9	154.5
June 7	14 22.18	-16 51.6	1.809	2.686	-0.74	+5.0	20.0	142.5
June 17	14 14.81	-16 02.0	1.839	2.621	-0.46	+3.7	20.1	131.0
June 27	14 10.24	-15 24.9	1.886	2.553	-0.16	+2.3	20.2	120.2
July 7	14 08.61	-15 02.3	1.942	2.484	+0.13	+0.7	20.3	110.2
July 17	14 09.88	-14 55.1	2.005	2.414	+0.40	-0.7	20.4	100.9
July 27	14 13.88	-15 02.3	2.068	2.341	+0.65	-2.0	20.4	92.4
Aug. 6	14 20.42	-15 22.7	2.129	2.267	+0.89	-3.2	20.4	84.4
Aug. 16	14 29.32	-15 54.5	2.185	2.192	+1.11	-4.1	20.4	77.0
Aug. 26	14 40.43	-16 35.5	2.232	2.114	+1.32	-4.8	20.4	70.1
Sept. 5	14 53.63	-17 23.7	2.270	2.035	+1.53	-5.3	20.3	63.7
Sept.15	15 08.89	-18 16.9	2.298	1.955	+1.73	-5.6	20.2	57.7
Sept.25	15 26.16	-19 12.7	2.313	1.873	+1.93	-5.6	20.1	52.1
Oct. 5	15 45.49	-20 08.6	2.317	1.790	+2.14	-5.3	20.0	46.9
Oct. 15	16 06.93	-21 01.7	2.309	1.707	+2.36	-4.7	19.9	42.2
Oct. 25	16 30.56	-21 48.9	2.290	1.622	+2.59	-3.7	19.7	37.8
Nov. 4	16 56.49	-22 26.3	2.260	1.538	+2.83	-2.3	19.5	33.8
Nov. 14	17 24.80	-22 49.5	2.220	1.454	+3.07	-0.4	19.3	30.3
Nov. 24	17 55.54	-22 53.7	2.172	1.372	+3.32	+2.0	19.1	27.3
Dec. 4	18 28.71	-22 33.5	2.119	1.293	+3.55	+5.0	18.9	24.8
Dec. 14	19 04.23	-21 43.2	2.062	1.218	+3.76	+8.5	18.7	23.0
Dec. 24	19 41.88	-20 17.7	2.004	1.149	+3.95	+12.5	18.6	21.7
Jan. 3	20 21.36	-18 13.1	1.949	1.090	+4.09	+16.5	18.4	21.0
Jan. 13	21 02.26	-15 27.9	1.899	1.043	+4.19	+20.4	18.3	21.0
Jan. 23	21 44.13	-12 04.2	1.859	1.010	+4.24	+23.6	18.2	21.6
Feb. 2	22 26.53	-08 07.9	1.830	0.995	+4.25	+25.9	18.2	22.6
Feb. 12	23 09.07	-03 49.4	1.818	0.998	+4.23	+26.8	18.2	23.9
Feb. 22	23 51.40	+00 38.3	1.823	1.020	+4.19	+26.3	18.3	25.2
Mar. 4	00 33.26	+05 01.6	1.848	1.058	+4.11	+24.6	18.4	26.5
Mar. 14	01 14.37	+09 07.5	1.892	1.109	+4.01	+21.9	18.5	27.5
Mar. 24	01 54.51	+12 46.5	1.954	1.172	+3.89	+18.6	18.7	28.1
Apr. 3	02 33.45	+15 52.6	2.032	1.243	+3.75	+15.1	18.9	28.1

Comet 129P/Shoemaker-Levy

Epoch = 2013 July 7.0 TT
T = 2014 Feb. 10.10566 TT
Peri. = 309.13494 e = 0.0906472
Node = 185.15525 2000.0 a = 4.3036601 AU
Incl. = 3.43272 n = 0.11039442
q = 3.9135454 AU P = 8.93 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	04 56.52	+18 21.4	3.181	4.042	-0.39	0.0	19.7	147.0
Jan. 18	04 52.66	+18 21.3	3.270	4.036	-0.22	+0.4	19.7	136.0
Jan. 28	04 50.49	+18 25.1	3.379	4.030	-0.04	+0.8	19.8	125.4
Feb. 7	04 50.12	+18 32.7	3.504	4.024	+0.14	+1.1	19.9	115.2
Feb. 17	04 51.56	+18 43.6	3.641	4.019	+0.32	+1.3	20.0	105.4
Feb. 27	04 54.72	+18 57.0	3.784	4.013	+0.47	+1.5	20.0	96.2
Mar. 9	04 59.46	+19 12.2	3.930	4.008	+0.62	+1.6	20.1	87.3
Mar. 19	05 05.62	+19 28.3	4.075	4.003	+0.74	+1.6	20.2	78.8
Mar. 29	05 13.05	+19 44.3	4.215	3.998	+0.85	+1.5	20.2	70.7
Apr. 8	05 21.56	+19 59.2	4.349	3.993	+0.95	+1.3	20.3	62.9
Apr. 18	05 31.02	+20 12.5	4.473	3.988	+1.03	+1.1	20.4	55.3
Apr. 28	05 41.28	+20 23.2	4.586	3.983	+1.09	+0.8	20.4	48.0
May 8	05 52.20	+20 31.0	4.687	3.979	+1.15	+0.4	20.5	40.9
May 18	06 03.67	+20 35.1	4.773	3.974	+1.19	0.0	20.5	33.9
May 28	06 15.56	+20 35.3	4.845	3.970	+1.22	-0.4	20.5	27.1
June 7	06 27.78	+20 31.3	4.901	3.966	+1.24	-0.8	20.5	20.5
June 17	06 40.23	+20 23.0	4.940	3.962	+1.26	-1.3	20.5	13.9
June 27	06 52.81	+20 10.2	4.963	3.958	+1.26	-1.7	20.5	7.6
July 7	07 05.44	+19 53.0	4.969	3.954	+1.26	-2.1	20.5	2.7
July 17	07 18.04	+19 31.5	4.958	3.951	+1.25	-2.6	20.5	6.6
July 27	07 30.52	+19 06.0	4.931	3.947	+1.23	-2.9	20.5	12.9
Aug. 6	07 42.81	+18 36.7	4.886	3.944	+1.20	-3.3	20.5	19.4
Aug. 16	07 54.82	+18 04.2	4.826	3.941	+1.16	-3.5	20.5	26.0
Aug. 26	08 06.47	+17 28.8	4.749	3.938	+1.12	-3.8	20.4	32.8
Sept. 5	08 17.68	+16 51.1	4.658	3.935	+1.07	-3.9	20.4	39.7
Sept. 15	08 28.35	+16 12.0	4.553	3.933	+1.00	-4.0	20.3	46.8
Sept. 25	08 38.38	+15 32.1	4.435	3.930	+0.93	-4.0	20.3	54.0
Oct. 5	08 47.66	+14 52.3	4.306	3.928	+0.84	-3.9	20.2	61.5
Oct. 15	08 56.07	+14 13.8	4.167	3.926	+0.74	-3.6	20.1	69.2
Oct. 25	09 03.48	+13 37.5	4.021	3.924	+0.63	-3.3	20.0	77.3
Nov. 4	09 09.75	+13 04.7	3.871	3.922	+0.50	-2.8	20.0	85.6
Nov. 14	09 14.71	+12 36.6	3.719	3.920	+0.35	-2.2	19.9	94.4
Nov. 24	09 18.22	+12 14.5	3.569	3.919	+0.19	-1.5	19.8	103.5
Dec. 4	09 20.15	+11 59.6	3.425	3.918	+0.02	-0.7	19.7	113.1
Dec. 14	09 20.38	+11 52.9	3.291	3.916	-0.15	+0.2	19.6	123.1
Dec. 24	09 18.90	+11 54.9	3.172	3.916	-0.31	+1.1	19.5	133.6
Jan. 3	09 15.77	+12 05.8	3.072	3.915	-0.46	+1.9	19.4	144.5
Jan. 13	09 11.18	+12 24.8	2.996	3.914	-0.57	+2.6	19.4	155.8
Jan. 23	09 05.50	+12 50.3	2.948	3.914	-0.63	+3.0	19.4	167.2
Feb. 2	08 59.21	+13 20.2	2.930	3.914	-0.63	+3.2	19.3	176.4
Feb. 12	08 52.91	+13 51.8	2.942	3.914	-0.57	+3.1	19.4	168.3
Feb. 22	08 47.18	+14 22.4	2.984	3.914	-0.47	+2.7	19.4	157.0
Mar. 4	08 42.52	+14 49.8	3.054	3.914	-0.32	+2.3	19.4	145.8
Mar. 14	08 39.33	+15 12.3	3.148	3.914	-0.15	+1.7	19.5	135.0
Mar. 24	08 37.81	+15 28.9	3.261	3.915	+0.02	+1.0	19.6	124.7
Apr. 3	08 38.04	+15 38.9	3.389	3.916	+0.19	+0.3	19.7	114.8

Comet 169P/NEAT

Epoch = 2013 July 7.0 TT
T = 2014 Feb. 15.26439 TT
Peri. = 218.06210 e = 0.7667862
Node = 176.12117 2000.0 a = 2.6065289 AU
Incl. = 11.29073 n = 0.23421261
q = 0.6078785 AU P = 4.21 years

m1 = 16.4 + 5 log(Delta) + 5.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	16 13.40	-12 52.3	4.496	3.857	+0.92	-0.7	22.6	44.5
Jan. 18	16 22.59	-12 59.2	4.334	3.813	+0.86	-0.1	22.5	52.3
Jan. 28	16 31.23	-12 60.0	4.158	3.768	+0.79	+0.6	22.4	60.3
Feb. 7	16 39.18	-12 54.4	3.969	3.721	+0.71	+1.2	22.2	68.4
Feb. 17	16 46.24	-12 42.4	3.772	3.673	+0.60	+1.9	22.1	76.7
Feb. 27	16 52.20	-12 23.7	3.568	3.623	+0.47	+2.5	22.0	85.3
Mar. 9	16 56.85	-11 58.3	3.362	3.572	+0.31	+3.2	21.8	94.0
Mar. 19	16 59.93	-11 26.3	3.157	3.519	+0.13	+3.8	21.6	103.1
Mar. 29	17 01.18	-10 47.9	2.957	3.464	-0.08	+4.4	21.5	112.5
Apr. 8	17 00.36	-10 03.5	2.766	3.408	-0.31	+5.0	21.3	122.3
Apr. 18	16 57.25	-09 13.9	2.589	3.349	-0.55	+5.3	21.1	132.4
Apr. 28	16 51.74	-08 20.6	2.431	3.289	-0.79	+5.5	20.9	142.7
May 8	16 43.86	-07 25.4	2.297	3.228	-1.00	+5.4	20.7	152.8
May 18	16 33.90	-06 31.3	2.189	3.164	-1.15	+4.9	20.6	161.4
May 28	16 22.43	-05 41.9	2.111	3.098	-1.22	+4.1	20.5	164.3
June 7	16 10.24	-05 01.0	2.063	3.031	-1.19	+2.9	20.4	158.6
June 17	15 58.30	-04 32.3	2.045	2.961	-1.07	+1.4	20.3	148.8
June 27	15 47.55	-04 17.8	2.053	2.889	-0.88	-0.1	20.3	137.9
July 7	15 38.73	-04 18.6	2.083	2.815	-0.64	-1.5	20.2	127.0
July 17	15 32.35	-04 34.0	2.129	2.739	-0.37	-2.9	20.2	116.6
July 27	15 28.64	-05 02.6	2.185	2.660	-0.10	-4.0	20.2	106.6
Aug. 6	15 27.63	-05 42.2	2.245	2.579	+0.16	-4.9	20.2	97.3
Aug. 16	15 29.24	-06 30.9	2.306	2.495	+0.41	-5.6	20.2	88.5
Aug. 26	15 33.33	-07 26.7	2.363	2.408	+0.64	-6.1	20.2	80.3
Sept. 5	15 39.72	-08 27.5	2.412	2.319	+0.86	-6.4	20.1	72.6
Sept.15	15 48.31	-09 31.9	2.451	2.226	+1.07	-6.6	20.1	65.3
Sept.25	15 58.96	-10 38.2	2.477	2.131	+1.27	-6.7	20.0	58.4
Oct. 5	16 11.62	-11 45.0	2.489	2.032	+1.47	-6.6	19.9	52.0
Oct. 15	16 26.28	-12 50.7	2.485	1.930	+1.67	-6.3	19.8	46.0
Oct. 25	16 42.96	-13 53.8	2.466	1.824	+1.88	-5.9	19.7	40.3
Nov. 4	17 01.75	-14 52.6	2.430	1.715	+2.11	-5.2	19.5	35.0
Nov. 14	17 22.81	-15 45.0	2.377	1.602	+2.35	-4.4	19.3	30.2
Nov. 24	17 46.31	-16 28.8	2.309	1.485	+2.63	-3.2	19.1	25.9
Dec. 4	18 12.57	-17 00.8	2.226	1.365	+2.94	-1.7	18.8	22.1
Dec. 14	18 41.94	-17 17.4	2.130	1.241	+3.29	+0.4	18.5	19.0
Dec. 24	19 14.87	-17 13.8	2.021	1.114	+3.71	+3.0	18.2	16.6
Jan. 3	19 51.93	-16 43.8	1.904	0.987	+4.18	+6.4	17.8	15.0
Jan. 13	20 33.71	-15 40.0	1.779	0.863	+4.71	+10.6	17.3	14.6
Jan. 23	21 20.79	-13 53.8	1.649	0.749	+5.27	+15.6	16.9	15.6
Feb. 2	22 13.49	-11 17.9	1.516	0.659	+5.79	+20.8	16.4	18.4
Feb. 12	23 11.38	-07 49.6	1.385	0.611	+6.18	+25.5	16.0	22.9
Feb. 22	00 13.22	-03 34.7	1.264	0.622	+6.45	+28.6	15.9	28.9
Mar. 4	01 17.67	+01 11.7	1.172	0.686	+6.58	+29.2	15.9	35.8
Mar. 14	02 23.50	+06 03.6	1.125	0.787	+6.51	+26.1	16.1	43.0
Mar. 24	03 28.63	+10 24.8	1.131	0.905	+6.16	+19.9	16.5	49.9
Apr. 3	04 30.20	+13 44.2	1.188	1.031	+5.56	+12.7	16.8	55.4

Comet C/2012 X1 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2014 Feb. 21.44111 TT
Peri. = 132.08664
Node = 113.15916 2000.0
Incl. = 44.38999
q = 1.5984525 AU
e = 0.9903661

m1 = 10.0 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	09 29.16	+33 37.8	4.063	4.931	-0.58	+8.4	18.2	148.8
Jan. 18	09 23.39	+35 02.3	3.922	4.841	-0.71	+8.3	18.1	156.6
Jan. 28	09 16.28	+36 25.2	3.813	4.751	-0.81	+7.7	18.0	160.3
Feb. 7	09 08.22	+37 41.9	3.735	4.661	-0.85	+6.6	17.9	157.5
Feb. 17	08 59.75	+38 48.4	3.689	4.570	-0.82	+5.3	17.8	149.9
Feb. 27	08 51.54	+39 41.8	3.671	4.479	-0.73	+3.9	17.7	140.4
Mar. 9	08 44.21	+40 20.9	3.679	4.388	-0.59	+2.5	17.6	130.4
Mar. 19	08 38.32	+40 45.9	3.706	4.296	-0.40	+1.2	17.6	120.3
Mar. 29	08 34.30	+40 58.3	3.748	4.203	-0.20	+0.2	17.5	110.5
Apr. 8	08 32.34	+41 00.1	3.800	4.111	+0.02	-0.7	17.5	101.0
Apr. 18	08 32.56	+40 53.2	3.855	4.017	+0.24	-1.4	17.5	92.0
Apr. 28	08 34.91	+40 39.4	3.910	3.924	+0.44	-1.9	17.4	83.4
May 8	08 39.28	+40 20.0	3.960	3.830	+0.63	-2.4	17.4	75.3
May 18	08 45.53	+39 56.0	4.003	3.736	+0.80	-2.8	17.3	67.6
May 28	08 53.50	+39 28.1	4.034	3.641	+0.95	-3.2	17.2	60.4
June 7	09 03.03	+38 56.5	4.054	3.546	+1.09	-3.5	17.2	53.6
June 17	09 13.98	+38 21.2	4.059	3.451	+1.22	-3.9	17.1	47.3
June 27	09 26.21	+37 42.4	4.049	3.356	+1.34	-4.3	17.0	41.5
July 7	09 39.64	+36 59.9	4.024	3.260	+1.45	-4.6	16.9	36.3
July 17	09 54.17	+36 13.4	3.983	3.165	+1.56	-5.1	16.8	31.8
July 27	10 09.73	+35 22.9	3.927	3.069	+1.66	-5.5	16.6	28.1
Aug. 6	10 26.29	+34 28.0	3.857	2.974	+1.75	-5.9	16.5	25.5
Aug. 16	10 43.83	+33 28.6	3.773	2.879	+1.85	-6.4	16.3	24.2
Aug. 26	11 02.31	+32 24.5	3.676	2.784	+1.95	-6.9	16.2	24.1
Sept. 5	11 21.78	+31 15.3	3.568	2.690	+2.05	-7.4	16.0	25.1
Sept.15	11 42.23	+30 01.0	3.452	2.596	+2.15	-8.0	15.8	27.0
Sept.25	12 03.70	+28 41.2	3.328	2.504	+2.25	-8.5	15.6	29.5
Oct. 5	12 26.24	+27 15.8	3.200	2.413	+2.36	-9.1	15.4	32.2
Oct. 15	12 49.87	+25 44.6	3.069	2.323	+2.48	-9.7	15.2	34.9
Oct. 25	13 14.63	+24 07.5	2.939	2.236	+2.59	-10.3	15.0	37.6
Nov. 4	13 40.54	+22 24.6	2.812	2.151	+2.70	-10.8	14.7	40.1
Nov. 14	14 07.55	+20 36.1	2.690	2.069	+2.81	-11.4	14.5	42.3
Nov. 24	14 35.62	+18 42.5	2.577	1.990	+2.90	-11.8	14.3	44.1
Dec. 4	15 04.62	+16 44.7	2.473	1.917	+2.97	-12.1	14.1	45.5
Dec. 14	15 34.37	+14 44.1	2.381	1.848	+3.03	-12.2	13.9	46.6
Dec. 24	16 04.63	+12 42.0	2.301	1.786	+3.05	-12.2	13.7	47.3
Jan. 3	16 35.12	+10 40.5	2.233	1.731	+3.04	-11.9	13.5	47.7
Jan. 13	17 05.53	+08 41.3	2.177	1.685	+3.00	-11.5	13.4	48.0
Jan. 23	17 35.56	+06 45.9	2.130	1.647	+2.94	-11.1	13.3	48.3
Feb. 2	18 04.95	+04 55.2	2.091	1.620	+2.85	-10.6	13.2	48.7
Feb. 12	18 33.45	+03 09.7	2.057	1.604	+2.75	-10.1	13.1	49.6
Feb. 22	19 00.90	+01 28.7	2.025	1.598	+2.63	-9.8	13.1	50.9
Mar. 4	19 27.18	-00 08.9	1.994	1.605	+2.50	-9.6	13.0	52.9
Mar. 14	19 52.18	-01 45.0	1.961	1.622	+2.37	-9.7	13.0	55.6
Mar. 24	20 15.85	-03 22.0	1.926	1.651	+2.23	-10.1	13.1	59.0
Apr. 3	20 38.12	-05 03.0	1.886	1.689	+2.08	-10.8	13.1	63.1

Comet P/2007 H3 (Garradd)

Epoch = 2013 July 7.0 TT
T = 2014 Mar. 1.26480 TT
Peri. = 350.03779 e = 0.4771401
Node = 263.67726 2000.0 a = 3.5013559 AU
Incl. = 25.20472 n = 0.15043528
q = 1.8307186 AU P = 6.55 years

m1 = 11.2 + 5 log(Delta) + 17.5 log(r(t-30))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	09 04.74	-10 00.8	2.709	3.505	-0.63	+6.0	.	11.8/248	138.2
Jan. 18	08 57.33	-10 45.1	2.604	3.461	-0.65	+6.4	23.0	12.9/258	145.6
Jan. 28	08 48.72	-11 11.0	2.524	3.416	-0.65	+6.7	22.8	13.5/267	150.5
Feb. 7	08 39.55	-11 17.0	2.472	3.371	-0.65	+7.0	22.7	13.2/276	151.3
Feb. 17	08 30.60	-11 03.6	2.448	3.325	-0.63	+7.2	22.6	12.1/284	147.6
Feb. 27	08 22.67	-10 33.6	2.450	3.279	-0.61	+7.2	22.5	10.2/294	140.9
Mar. 9	08 16.38	-09 51.4	2.476	3.232	-0.58	+7.1	22.4	7.9/308	132.7
Mar. 19	08 12.19	-09 02.1	2.520	3.185	-0.55	+6.9	22.3	5.8/332	123.9
Mar. 29	08 10.32	-08 10.9	2.580	3.138	-0.52	+6.6	22.3	4.9/ 8	115.2
Apr. 8	08 10.81	-07 22.0	2.650	3.090	-0.50	+6.3	22.2	6.0/ 44	106.7
Apr. 18	08 13.57	-06 38.8	2.726	3.041	-0.49	+6.0	22.2	8.0/ 64	98.5
Apr. 28	08 18.44	-06 03.9	2.804	2.992	-0.48	+5.7	22.1	10.4/ 76	90.8
May 8	08 25.19	-05 38.6	2.882	2.943	-0.47	+5.4	22.1	12.7/ 84	83.5
May 18	08 33.65	-05 24.2	2.957	2.894	-0.48	+5.2	22.0	14.9/ 89	76.6
May 28	08 43.59	-05 21.2	3.026	2.845	-0.48	+4.9	21.9	16.8/ 93	70.0
June 7	08 54.86	-05 29.8	3.089	2.795	-0.50	+4.8	21.9	18.7/ 96	63.9
June 17	09 07.29	-05 50.1	3.144	2.745	-0.51	+4.6	21.8	20.3/ 99	58.0
June 27	09 20.76	-06 21.9	3.190	2.695	-0.54	+4.5	21.7	21.9/102	52.5
July 7	09 35.16	-07 04.9	3.227	2.645	-0.56	+4.4	21.6	23.3/104	47.3
July 17	09 50.41	-07 58.8	3.254	2.595	-0.59	+4.4	21.4	24.6/105	42.4
July 27	10 06.44	-09 02.9	3.272	2.546	-0.62	+4.3	21.3	25.9/107	37.8
Aug. 6	10 23.22	-10 16.8	3.280	2.496	-0.66	+4.3	21.2	27.1/108	33.4
Aug. 16	10 40.73	-11 39.6	3.279	2.448	-0.70	+4.2	21.0	28.2/109	29.4
Aug. 26	10 58.95	-13 10.4	3.270	2.399	-0.74	+4.1	20.9	29.3/110	25.7
Sept. 5	11 17.91	-14 48.2	3.252	2.351	-0.79	+4.0	20.7	30.3/111	22.4
Sept.15	11 37.62	-16 31.8	3.226	2.304	-0.84	+3.9	20.5	31.2/111	19.7
Sept.25	11 58.11	-18 19.7	3.193	2.258	-0.90	+3.7	20.4	32.2/111	17.7
Oct. 5	12 19.44	-20 10.3	3.154	2.214	-0.96	+3.4	20.2	33.0/111	16.6
Oct. 15	12 41.67	-22 01.5	3.108	2.170	-1.03	+3.0	20.0	33.8/110	16.4
Oct. 25	13 04.84	-23 51.3	3.057	2.128	-1.10	+2.5	19.8	34.6/109	17.2
Nov. 4	13 29.00	-25 37.2	3.002	2.088	-1.17	+1.9	19.6	35.2/108	18.8
Nov. 14	13 54.18	-27 16.5	2.942	2.050	-1.24	+1.2	19.4	35.8/106	21.0
Nov. 24	14 20.38	-28 46.2	2.879	2.014	-1.31	+0.3	19.2	36.3/104	23.7
Dec. 4	14 47.56	-30 03.4	2.812	1.980	-1.38	-0.8	19.0	36.7/101	26.6
Dec. 14	15 15.61	-31 04.9	2.743	1.950	-1.43	-2.0	18.8	37.1/ 99	29.7
Dec. 24	15 44.38	-31 47.9	2.671	1.922	-1.48	-3.4	18.7	37.3/ 95	33.0
Jan. 3	16 13.62	-32 09.8	2.597	1.898	-1.51	-4.8	18.5	37.4/ 92	36.4
Jan. 13	16 43.04	-32 08.5	2.521	1.877	-1.52	-6.3	18.3	37.3/ 88	40.0
Jan. 23	17 12.30	-31 42.6	2.443	1.860	-1.51	-7.8	18.1	37.2/ 84	43.6
Feb. 2	17 41.05	-30 51.6	2.365	1.846	-1.49	-9.3	17.9	36.9/ 80	47.4
Feb. 12	18 08.94	-29 35.7	2.285	1.837	-1.46	-10.7	17.8	36.5/ 76	51.3
Feb. 22	18 35.66	-27 55.6	2.204	1.832	-1.41	-12.0	17.6	36.0/ 72	55.3
Mar. 4	19 00.96	-25 52.9	2.123	1.831	-1.37	-13.1	17.5	35.3/ 67	59.5
Mar. 14	19 24.61	-23 29.4	2.041	1.834	-1.32	-14.1	17.4	34.4/ 63	63.8
Mar. 24	19 46.48	-20 47.2	1.960	1.842	-1.28	-14.9	17.3	33.4/ 59	68.3
Apr. 3	20 06.43	-17 48.4	1.879	1.853	-1.25	-15.4	17.2	32.2/ 54	73.0

Comet P/2008 A2 (LINEAR)

Epoch = 2013 July 7.0 TT
T = 2014 Mar. 3.36792 TT
Peri. = 235.36334 e = 0.5946214
Node = 312.70401 2000.0 a = 3.2059115 AU
Incl. = 18.22210 n = 0.17170257
q = 1.2996079 AU P = 5.74 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	01 40.73	+32 20.0	3.295	3.697	-0.38	-2.5	.	5.7/143	106.5
Jan. 18	01 43.41	+31 34.2	3.391	3.649	-0.37	-2.3	.	6.8/119	97.3
Jan. 28	01 48.03	+31 00.3	3.490	3.599	-0.37	-2.1	.	8.5/105	88.4
Feb. 7	01 54.41	+30 38.4	3.587	3.549	-0.36	-2.0	.	10.3/ 96	79.9
Feb. 17	02 02.34	+30 27.5	3.680	3.498	-0.37	-1.8	.	12.0/ 90	71.7
Feb. 27	02 11.65	+30 26.6	3.765	3.446	-0.38	-1.6	.	13.6/ 86	63.9
Mar. 9	02 22.19	+30 34.3	3.839	3.392	-0.39	-1.5	.	15.1/ 84	56.4
Mar. 19	02 33.84	+30 48.9	3.901	3.338	-0.40	-1.3	.	16.4/ 82	49.3
Mar. 29	02 46.50	+31 09.2	3.950	3.283	-0.42	-1.1	.	17.6/ 81	42.5
Apr. 8	03 00.09	+31 33.4	3.983	3.227	-0.44	-1.0	.	18.6/ 81	36.0
Apr. 18	03 14.53	+32 00.4	4.001	3.169	-0.47	-0.8	.	19.5/ 81	29.8
Apr. 28	03 29.78	+32 28.5	4.003	3.111	-0.49	-0.6	.	20.4/ 81	24.1
May 8	03 45.79	+32 56.6	3.988	3.052	-0.52	-0.4	.	21.2/ 82	19.0
May 18	04 02.52	+33 23.4	3.958	2.992	-0.56	-0.1	.	21.9/ 82	14.8
May 28	04 19.93	+33 47.6	3.912	2.930	-0.59	+0.1	.	22.6/ 84	12.4
June 7	04 38.00	+34 08.1	3.851	2.868	-0.63	+0.5	.	23.2/ 85	12.4
June 17	04 56.67	+34 23.8	3.775	2.804	-0.68	+0.9	.	23.8/ 86	14.8
June 27	05 15.91	+34 33.7	3.685	2.740	-0.72	+1.3	.	24.4/ 88	18.5
July 7	05 35.68	+34 36.5	3.583	2.675	-0.77	+1.8	.	25.0/ 90	22.8
July 17	05 55.93	+34 31.5	3.468	2.609	-0.82	+2.4	.	25.6/ 92	27.4
July 27	06 16.58	+34 17.6	3.343	2.542	-0.87	+3.1	.	26.2/ 94	32.2
Aug. 6	06 37.59	+33 53.9	3.208	2.474	-0.93	+3.9	.	26.8/ 96	37.0
Aug. 16	06 58.89	+33 19.6	3.064	2.405	-0.99	+4.8	.	27.5/ 98	41.8
Aug. 26	07 20.41	+32 33.7	2.913	2.335	-1.05	+5.8	22.8	28.2/100	46.5
Sept. 5	07 42.10	+31 35.5	2.756	2.265	-1.11	+7.0	22.5	28.9/103	51.2
Sept.15	08 03.88	+30 24.1	2.594	2.195	-1.18	+8.3	22.2	29.7/105	55.9
Sept.25	08 25.70	+28 58.5	2.429	2.124	-1.25	+9.8	21.8	30.6/108	60.6
Oct. 5	08 47.53	+27 17.6	2.262	2.053	-1.33	+11.6	21.5	31.6/111	65.1
Oct. 15	09 09.32	+25 20.2	2.095	1.982	-1.42	+13.6	21.1	32.7/113	69.6
Oct. 25	09 31.06	+23 04.6	1.929	1.911	-1.52	+15.8	20.6	34.0/116	74.0
Nov. 4	09 52.75	+20 28.6	1.766	1.841	-1.64	+18.3	20.2	35.5/119	78.3
Nov. 14	10 14.39	+17 29.9	1.607	1.772	-1.77	+21.2	19.8	37.4/123	82.4
Nov. 24	10 36.04	+14 04.7	1.455	1.705	-1.94	+24.4	19.3	39.6/126	86.3
Dec. 4	10 57.77	+10 09.3	1.310	1.640	-2.14	+27.8	18.8	42.3/129	90.0
Dec. 14	11 19.64	+05 38.6	1.176	1.578	-2.39	+31.4	18.3	45.5/133	93.4
Dec. 24	11 41.85	+00 27.4	1.053	1.520	-2.69	+34.8	17.8	49.3/136	96.5
Jan. 3	12 04.57	-05 28.8	0.943	1.466	-3.07	+37.6	17.4	53.2/140	99.1
Jan. 13	12 28.05	-12 11.6	0.849	1.418	-3.54	+39.0	16.9	57.0/142	101.1
Jan. 23	12 52.70	-19 37.4	0.772	1.377	-4.13	+38.1	16.5	59.7/144	102.5
Feb. 2	13 18.92	-27 33.7	0.713	1.343	-4.86	+34.0	16.2	60.4/145	103.4
Feb. 12	13 47.18	-35 37.8	0.671	1.319	-5.73	+26.2	15.9	58.4/145	103.7
Feb. 22	14 17.95	-43 20.9	0.645	1.304	-6.74	+15.3	15.8	53.6/143	103.9
Mar. 4	14 51.27	-50 14.3	0.632	1.300	-7.85	+2.5	15.7	46.6/141	104.2
Mar. 14	15 26.47	-55 56.7	0.628	1.305	-8.93	-10.5	15.7	38.3/137	104.9
Mar. 24	16 01.76	-60 19.5	0.630	1.321	-9.85	-22.2	15.8	29.3/133	106.5
Apr. 3	16 33.83	-63 25.3	0.634	1.347	-10.54	-31.4	16.0	20.0/129	109.0

Comet 52P/Harrington-Abell

Epoch = 2013 July 7.0 TT
T = 2014 Mar. 7.61713 TT
Peri. = 139.63427 e = 0.5404121
Node = 336.86408 2000.0 a = 3.8576486 AU
Incl. = 10.23050 n = 0.13008286
q = 1.7729286 AU P = 7.58 years

m1 = 10.4 + 5 log(Delta) + 17.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	22 56.70	-03 19.4	4.163	3.712	+0.84	+5.8	.	56.5
Jan. 18	23 05.14	-02 21.8	4.237	3.663	+0.92	+6.4	.	48.7
Jan. 28	23 14.38	-01 18.0	4.297	3.613	+0.99	+6.9	.	41.1
Feb. 7	23 24.31	-00 08.5	4.341	3.562	+1.05	+7.4	.	33.7
Feb. 17	23 34.85	+01 06.0	4.367	3.511	+1.11	+7.9	.	26.6
Feb. 27	23 45.91	+02 24.9	4.376	3.460	+1.15	+8.3	23.0	19.7
Mar. 9	23 57.43	+03 47.9	4.368	3.408	+1.19	+8.6	22.9	13.1
Mar. 19	00 09.35	+05 14.2	4.341	3.355	+1.23	+8.9	22.8	7.0
Mar. 29	00 21.62	+06 43.5	4.297	3.302	+1.26	+9.2	22.6	4.1
Apr. 8	00 34.22	+08 15.2	4.237	3.249	+1.29	+9.4	22.5	8.2
Apr. 18	00 47.11	+09 48.8	4.160	3.195	+1.32	+9.5	22.3	14.0
Apr. 28	01 00.27	+11 23.9	4.068	3.140	+1.34	+9.6	22.1	19.9
May 8	01 13.68	+13 00.1	3.962	3.085	+1.37	+9.7	22.0	25.9
May 18	01 27.33	+14 36.8	3.843	3.030	+1.39	+9.7	21.7	31.8
May 28	01 41.20	+16 13.8	3.712	2.975	+1.41	+9.7	21.5	37.7
June 7	01 55.27	+17 50.6	3.571	2.919	+1.42	+9.6	21.3	43.5
June 17	02 09.51	+19 26.9	3.421	2.863	+1.44	+9.6	21.1	49.3
June 27	02 23.90	+21 02.4	3.263	2.807	+1.45	+9.4	20.8	55.1
July 7	02 38.40	+22 36.9	3.099	2.751	+1.45	+9.3	20.5	60.9
July 17	02 52.94	+24 10.1	2.930	2.695	+1.45	+9.2	20.3	66.7
July 27	03 07.45	+25 42.0	2.758	2.638	+1.44	+9.0	20.0	72.6
Aug. 6	03 21.83	+27 12.5	2.584	2.582	+1.41	+8.9	19.7	78.6
Aug. 16	03 35.94	+28 41.7	2.411	2.527	+1.37	+8.8	19.4	84.7
Aug. 26	03 49.59	+30 09.7	2.238	2.471	+1.30	+8.7	19.0	90.9
Sept. 5	04 02.57	+31 37.0	2.069	2.416	+1.20	+8.7	18.7	97.4
Sept.15	04 14.54	+33 03.7	1.905	2.362	+1.06	+8.7	18.3	104.2
Sept.25	04 25.15	+34 30.3	1.748	2.309	+0.88	+8.6	18.0	111.2
Oct. 5	04 33.94	+35 56.8	1.600	2.256	+0.64	+8.6	17.6	118.6
Oct. 15	04 40.33	+37 22.3	1.462	2.205	+0.35	+8.3	17.2	126.4
Oct. 25	04 43.79	+38 45.1	1.338	2.155	0.00	+7.6	16.9	134.5
Nov. 4	04 43.80	+40 01.0	1.230	2.107	-0.36	+6.3	16.5	142.9
Nov. 14	04 40.16	+41 03.5	1.140	2.061	-0.69	+4.1	16.2	150.9
Nov. 24	04 33.28	+41 44.4	1.070	2.017	-0.90	+1.2	15.9	157.5
Dec. 4	04 24.32	+41 56.0	1.021	1.976	-0.90	-2.1	15.6	160.0
Dec. 14	04 15.28	+41 34.8	0.995	1.938	-0.69	-5.0	15.4	156.5
Dec. 24	04 08.36	+40 44.4	0.990	1.903	-0.31	-7.0	15.3	149.3
Jan. 3	04 05.26	+39 33.9	1.003	1.871	+0.17	-8.0	15.2	140.8
Jan. 13	04 06.98	+38 14.4	1.033	1.844	+0.66	-8.0	15.1	132.2
Jan. 23	04 13.60	+36 54.6	1.076	1.820	+1.11	-7.6	15.1	124.0
Feb. 2	04 24.74	+35 38.8	1.131	1.801	+1.51	-7.1	15.1	116.5
Feb. 12	04 39.80	+34 28.0	1.193	1.787	+1.82	-6.8	15.2	109.7
Feb. 22	04 58.04	+33 20.5	1.263	1.778	+2.07	-6.7	15.3	103.6
Mar. 4	05 18.79	+32 13.2	1.339	1.773	+2.26	-7.0	15.4	98.0
Mar. 14	05 41.41	+31 03.2	1.421	1.774	+2.39	-7.6	15.5	92.8
Mar. 24	06 05.30	+29 47.7	1.508	1.780	+2.47	-8.3	15.7	88.1
Apr. 3	06 29.97	+28 24.5	1.600	1.790	+2.50	-9.2	15.8	83.7

Comet P/1998 U3 (Jager)

Epoch = 2013 July 7.0 TT
T = 2014 Mar. 14.57977 TT
Peri. = 180.77293 e = 0.6484065
Node = 303.43468 2000.0 a = 6.1312399 AU
Incl. = 19.05312 n = 0.06492046
q = 2.1557041 AU P = 15.18 years

m1 = 3.4 + 5 log(Delta) + 22.5 log(r(t+60))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	23 53.42	+19 18.1	4.223	4.155	−0.30	−2.9	19.6	9.4/ 86	79.3
Jan. 18	00 00.05	+19 24.0	4.309	4.097	−0.30	−2.8	19.5	11.1/ 81	71.1
Jan. 28	00 07.80	+19 40.2	4.387	4.039	−0.31	−2.7	19.4	12.6/ 78	63.2
Feb. 7	00 16.54	+20 05.9	4.455	3.981	−0.32	−2.6	19.2	14.0/ 75	55.6
Feb. 17	00 26.19	+20 40.2	4.510	3.922	−0.33	−2.6	19.1	15.2/ 73	48.3
Feb. 27	00 36.63	+21 22.3	4.552	3.864	−0.35	−2.5	19.0	16.3/ 72	41.3
Mar. 9	00 47.79	+22 11.3	4.579	3.805	−0.37	−2.5	18.8	17.3/ 71	34.7
Mar. 19	00 59.62	+23 06.1	4.590	3.746	−0.39	−2.4	18.6	18.1/ 70	28.6
Mar. 29	01 12.05	+24 05.8	4.584	3.687	−0.42	−2.4	18.5	18.8/ 70	23.1
Apr. 8	01 25.05	+25 09.6	4.563	3.628	−0.45	−2.3	18.3	19.5/ 69	18.6
Apr. 18	01 38.58	+26 16.5	4.526	3.569	−0.48	−2.3	18.1	20.0/ 69	15.6
Apr. 28	01 52.63	+27 25.6	4.473	3.510	−0.51	−2.2	17.9	20.5/ 69	14.9
May 8	02 07.16	+28 36.2	4.405	3.450	−0.55	−2.1	17.7	20.9/ 69	16.7
May 18	02 22.17	+29 47.4	4.322	3.391	−0.59	−2.0	17.4	21.2/ 69	20.2
May 28	02 37.63	+30 58.3	4.227	3.332	−0.64	−1.8	17.2	21.5/ 70	24.6
June 7	02 53.53	+32 08.4	4.118	3.274	−0.69	−1.6	17.0	21.7/ 71	29.5
June 17	03 09.85	+33 16.7	3.999	3.215	−0.74	−1.4	16.7	21.8/ 71	34.6
June 27	03 26.54	+34 22.6	3.869	3.157	−0.80	−1.1	16.5	21.9/ 72	39.9
July 7	03 43.58	+35 25.4	3.729	3.099	−0.87	−0.8	16.2	21.8/ 73	45.3
July 17	04 00.89	+36 24.5	3.582	3.042	−0.93	−0.3	15.9	21.7/ 74	50.7
July 27	04 18.39	+37 19.4	3.428	2.985	−1.01	+0.2	15.6	21.5/ 75	56.2
Aug. 6	04 36.00	+38 09.7	3.268	2.929	−1.09	+0.7	15.3	21.1/ 76	61.8
Aug. 16	04 53.56	+38 55.0	3.104	2.873	−1.18	+1.4	15.1	20.6/ 77	67.5
Aug. 26	05 10.92	+39 35.1	2.937	2.818	−1.27	+2.1	14.8	19.8/ 78	73.3
Sept. 5	05 27.88	+40 10.1	2.768	2.765	−1.37	+3.0	14.5	18.9/ 80	79.3
Sept. 15	05 44.18	+40 40.1	2.599	2.712	−1.47	+4.0	14.1	17.6/ 81	85.5
Sept. 25	05 59.55	+41 05.3	2.432	2.661	−1.59	+5.0	13.8	16.0/ 81	91.9
Oct. 5	06 13.63	+41 26.1	2.267	2.611	−1.72	+6.1	13.5	14.0/ 82	98.6
Oct. 15	06 26.00	+41 42.8	2.107	2.563	−1.86	+7.3	13.2	11.5/ 83	105.6
Oct. 25	06 36.24	+41 55.4	1.954	2.516	−2.02	+8.6	12.9	8.5/ 84	113.1
Nov. 4	06 43.85	+42 03.4	1.810	2.471	−2.19	+9.7	12.6	5.0/ 88	121.0
Nov. 14	06 48.32	+42 05.0	1.678	2.429	−2.38	+10.8	12.4	1.4/126	129.4
Nov. 24	06 49.30	+41 56.9	1.560	2.389	−2.58	+11.6	12.1	3.7/233	138.2
Dec. 4	06 46.67	+41 34.4	1.460	2.351	−2.78	+12.0	11.9	7.9/238	147.4
Dec. 14	06 40.75	+40 51.2	1.381	2.316	−2.93	+12.1	11.7	11.7/234	156.2
Dec. 24	06 32.55	+39 42.2	1.325	2.284	−3.02	+11.7	11.6	14.3/228	163.0
Jan. 3	06 23.53	+38 05.5	1.295	2.255	−3.02	+11.2	11.5	15.5/219	163.5
Jan. 13	06 15.47	+36 04.6	1.291	2.230	−2.93	+10.7	11.5	15.3/207	157.0
Jan. 23	06 09.84	+33 48.0	1.311	2.208	−2.77	+10.5	11.5	14.5/192	147.8
Feb. 2	06 07.53	+31 25.7	1.354	2.189	−2.57	+10.5	11.6	14.1/173	138.1
Feb. 12	06 08.88	+29 06.2	1.416	2.175	−2.37	+10.7	11.7	14.6/154	128.7
Feb. 22	06 13.71	+26 54.8	1.494	2.164	−2.17	+10.9	11.9	16.2/138	119.9
Mar. 4	06 21.62	+24 53.1	1.584	2.158	−1.99	+11.2	12.1	18.3/127	111.8
Mar. 14	06 32.16	+23 00.5	1.683	2.156	−1.83	+11.4	12.4	20.5/120	104.3
Mar. 24	06 44.81	+21 15.1	1.790	2.158	−1.69	+11.6	12.6	22.5/116	97.4
Apr. 3	06 59.14	+19 34.5	1.902	2.163	−1.56	+11.7	12.9	24.3/113	91.0

Comet 117P/Helin-Roman-Alu

Epoch = 2013 July 7.0 TT
T = 2014 Mar. 27.42333 TT
Peri. = 222.73314 e = 0.2537843
Node = 58.90008 2000.0 a = 4.0954887 AU
Incl. = 8.69845 n = 0.11891742
q = 3.0561180 AU P = 8.29 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	14 23.35	-08 56.9	3.869	3.673	+0.81	-3.9	16.8	71.3
Jan. 18	14 31.43	-09 35.9	3.703	3.651	+0.70	-3.3	16.7	79.3
Jan. 28	14 38.48	-10 08.5	3.534	3.629	+0.58	-2.6	16.5	87.6
Feb. 7	14 44.30	-10 34.4	3.365	3.608	+0.44	-1.9	16.4	96.2
Feb. 17	14 48.68	-10 53.5	3.198	3.586	+0.28	-1.2	16.3	105.2
Feb. 27	14 51.43	-11 05.6	3.038	3.565	+0.10	-0.5	16.1	114.5
Mar. 9	14 52.39	-11 10.8	2.889	3.543	-0.09	+0.1	16.0	124.2
Mar. 19	14 51.44	-11 09.5	2.754	3.522	-0.28	+0.7	15.8	134.4
Mar. 29	14 48.61	-11 02.4	2.637	3.502	-0.46	+1.2	15.7	144.9
Apr. 8	14 44.04	-10 50.6	2.544	3.481	-0.60	+1.5	15.6	155.7
Apr. 18	14 38.07	-10 35.6	2.476	3.461	-0.68	+1.6	15.5	166.7
Apr. 28	14 31.22	-10 19.9	2.436	3.441	-0.71	+1.4	15.4	175.5
May 8	14 24.12	-10 05.8	2.425	3.421	-0.67	+1.0	15.4	168.9
May 18	14 17.44	-09 56.1	2.442	3.401	-0.56	+0.3	15.3	158.1
May 28	14 11.80	-09 53.1	2.485	3.382	-0.42	-0.5	15.3	147.3
June 7	14 07.64	-09 58.4	2.550	3.363	-0.24	-1.4	15.3	136.9
June 17	14 05.27	-10 12.9	2.635	3.345	-0.04	-2.4	15.4	126.9
June 27	14 04.82	-10 36.6	2.734	3.327	+0.15	-3.3	15.4	117.4
July 7	14 06.29	-11 09.2	2.845	3.309	+0.33	-4.1	15.5	108.4
July 17	14 09.61	-11 49.9	2.962	3.292	+0.50	-4.8	15.5	99.8
July 27	14 14.65	-12 37.5	3.083	3.275	+0.66	-5.3	15.6	91.7
Aug. 6	14 21.25	-13 30.9	3.205	3.259	+0.80	-5.8	15.6	84.0
Aug. 16	14 29.30	-14 28.9	3.326	3.243	+0.93	-6.1	15.7	76.5
Aug. 26	14 38.63	-15 30.3	3.442	3.228	+1.05	-6.4	15.7	69.4
Sept. 5	14 49.14	-16 33.9	3.553	3.213	+1.16	-6.5	15.7	62.4
Sept.15	15 00.72	-17 38.6	3.656	3.199	+1.25	-6.5	15.7	55.7
Sept.25	15 13.25	-18 43.4	3.751	3.185	+1.34	-6.4	15.8	49.1
Oct. 5	15 26.67	-19 47.1	3.835	3.172	+1.42	-6.2	15.8	42.6
Oct. 15	15 40.89	-20 48.9	3.909	3.159	+1.49	-5.9	15.8	36.2
Oct. 25	15 55.82	-21 47.8	3.971	3.148	+1.56	-5.5	15.8	29.9
Nov. 4	16 11.41	-22 42.8	4.020	3.136	+1.62	-5.1	15.8	23.6
Nov. 14	16 27.56	-23 33.4	4.056	3.126	+1.66	-4.5	15.7	17.4
Nov. 24	16 44.19	-24 18.6	4.078	3.116	+1.70	-3.9	15.7	11.3
Dec. 4	17 01.22	-24 58.1	4.087	3.107	+1.73	-3.3	15.7	5.4
Dec. 14	17 18.55	-25 31.3	4.081	3.098	+1.75	-2.7	15.6	2.7
Dec. 24	17 36.09	-25 57.9	4.062	3.091	+1.76	-2.0	15.6	8.0
Jan. 3	17 53.73	-26 17.9	4.029	3.084	+1.76	-1.3	15.6	14.0
Jan. 13	18 11.35	-26 31.3	3.982	3.078	+1.75	-0.7	15.5	20.2
Jan. 23	18 28.85	-26 38.4	3.922	3.072	+1.73	-0.1	15.4	26.4
Feb. 2	18 46.12	-26 39.6	3.850	3.068	+1.69	+0.4	15.4	32.7
Feb. 12	19 03.01	-26 35.6	3.766	3.064	+1.64	+0.8	15.3	39.1
Feb. 22	19 19.44	-26 27.3	3.672	3.061	+1.58	+1.2	15.2	45.5
Mar. 4	19 35.27	-26 15.7	3.568	3.058	+1.51	+1.4	15.1	52.0
Mar. 14	19 50.39	-26 02.0	3.455	3.057	+1.43	+1.4	15.0	58.6
Mar. 24	20 04.67	-25 47.6	3.336	3.056	+1.33	+1.4	14.9	65.3
Apr. 3	20 17.98	-25 33.9	3.211	3.056	+1.22	+1.1	14.8	72.2

Comet 17P/Holmes

Epoch = 2013 July 7.0 TT
T = 2014 Mar. 27.47080 TT
Peri. = 24.51026 e = 0.4320686
Node = 326.76781 2000.0 a = 3.6210336 AU
Incl. = 19.08988 n = 0.14303925
q = 2.0564987 AU P = 6.89 years

m1 = 9.8 + 5 log(Delta) + 12.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	16 12.52	-37 24.8	4.238	3.571	+1.45	-5.2	19.8	42.2
Jan. 18	16 27.06	-38 17.0	4.100	3.532	+1.43	-5.1	19.7	48.8
Jan. 28	16 41.35	-39 08.0	3.952	3.491	+1.39	-5.0	19.6	55.6
Feb. 7	16 55.24	-39 58.0	3.793	3.451	+1.33	-4.9	19.4	62.5
Feb. 17	17 08.56	-40 47.3	3.627	3.410	+1.25	-4.9	19.3	69.6
Feb. 27	17 21.08	-41 36.5	3.455	3.369	+1.15	-5.0	19.1	76.8
Mar. 9	17 32.60	-42 26.2	3.279	3.327	+1.02	-5.1	18.9	84.1
Mar. 19	17 42.82	-43 17.0	3.103	3.285	+0.86	-5.2	18.7	91.6
Mar. 29	17 51.43	-44 09.2	2.929	3.243	+0.67	-5.4	18.5	99.3
Apr. 8	17 58.10	-45 03.2	2.759	3.200	+0.43	-5.5	18.3	107.2
Apr. 18	18 02.41	-45 58.4	2.596	3.158	+0.16	-5.5	18.1	115.2
Apr. 28	18 04.00	-46 53.4	2.444	3.115	-0.15	-5.2	17.9	123.5
May 8	18 02.52	-47 45.5	2.306	3.072	-0.48	-4.5	17.7	131.7
May 18	17 57.76	-48 30.2	2.185	3.029	-0.79	-3.2	17.5	139.8
May 28	17 49.88	-49 01.8	2.084	2.985	-1.05	-1.2	17.3	147.0
June 7	17 39.42	-49 14.1	2.005	2.942	-1.20	+1.2	17.2	152.4
June 17	17 27.46	-49 01.8	1.950	2.899	-1.20	+3.9	17.0	154.2
June 27	17 15.47	-48 23.1	1.920	2.856	-1.05	+6.3	16.9	151.6
July 7	17 04.94	-47 20.2	1.914	2.812	-0.79	+8.1	16.8	145.6
July 17	16 57.07	-45 58.9	1.931	2.770	-0.45	+9.2	16.8	137.9
July 27	16 52.57	-44 26.8	1.966	2.727	-0.09	+9.6	16.7	129.4
Aug. 6	16 51.66	-42 50.9	2.018	2.684	+0.26	+9.4	16.7	120.9
Aug. 16	16 54.24	-41 16.4	2.082	2.642	+0.58	+9.0	16.7	112.6
Aug. 26	17 00.02	-39 46.5	2.156	2.601	+0.86	+8.4	16.7	104.6
Sept. 5	17 08.61	-38 22.2	2.235	2.560	+1.11	+7.9	16.6	96.9
Sept.15	17 19.67	-37 03.0	2.317	2.520	+1.32	+7.5	16.6	89.6
Sept.25	17 32.83	-35 47.7	2.401	2.480	+1.49	+7.3	16.6	82.6
Oct. 5	17 47.77	-34 34.3	2.483	2.442	+1.65	+7.4	16.6	76.0
Oct. 15	18 04.23	-33 20.7	2.563	2.404	+1.77	+7.6	16.6	69.6
Oct. 25	18 21.91	-32 04.9	2.638	2.368	+1.87	+8.0	16.6	63.5
Nov. 4	18 40.61	-30 44.9	2.709	2.333	+1.95	+8.6	16.6	57.6
Nov. 14	19 00.12	-29 18.9	2.774	2.299	+2.01	+9.3	16.5	51.9
Nov. 24	19 20.22	-27 45.6	2.833	2.267	+2.05	+10.2	16.5	46.3
Dec. 4	19 40.76	-26 03.9	2.886	2.237	+2.08	+11.1	16.5	41.0
Dec. 14	20 01.59	-24 13.0	2.931	2.208	+2.10	+12.0	16.4	35.7
Dec. 24	20 22.57	-22 12.6	2.969	2.182	+2.10	+13.0	16.4	30.7
Jan. 3	20 43.60	-20 02.5	3.001	2.157	+2.10	+14.0	16.4	25.7
Jan. 13	21 04.61	-17 42.9	3.025	2.135	+2.09	+14.9	16.3	20.9
Jan. 23	21 25.51	-15 14.3	3.043	2.116	+2.08	+15.7	16.3	16.2
Feb. 2	21 46.28	-12 37.2	3.054	2.099	+2.06	+16.5	16.2	11.7
Feb. 12	22 06.91	-09 52.7	3.060	2.085	+2.05	+17.1	16.2	7.4
Feb. 22	22 27.37	-07 01.6	3.059	2.073	+2.03	+17.7	16.2	3.8
Mar. 4	22 47.69	-04 05.1	3.053	2.065	+2.02	+18.1	16.2	3.6
Mar. 14	23 07.87	-01 04.3	3.043	2.059	+2.01	+18.4	16.1	6.9
Mar. 24	23 27.96	+01 59.3	3.027	2.057	+2.00	+18.5	16.1	10.9
Apr. 3	23 47.99	+05 04.7	3.007	2.057	+2.00	+18.6	16.1	14.9

Comet 119P/Parker-Hartley

Epoch = 2013 July 7.0 TT
T = 2014 Apr. 2.51840 TT
Peri. = 181.28238 e = 0.2921969
Node = 244.10006 2000.0 a = 4.2761858 AU
Incl. = 5.19614 n = 0.11146005
q = 3.0266976 AU P = 8.84 years

m1 = 6.6 + 5 log(Delta) + 17.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m ′		m1	Elong. °
Jan. 8	22 12.96	-06 20.8	4.380	3.754	+1.07	+5.4	19.9	45.4
Jan. 18	22 23.63	-05 27.2	4.455	3.729	+1.12	+5.9	19.8	38.0
Jan. 28	22 34.78	-04 28.1	4.515	3.704	+1.15	+6.4	19.8	30.8
Feb. 7	22 46.33	-03 24.2	4.560	3.679	+1.19	+6.8	19.8	23.9
Feb. 17	22 58.18	-02 16.0	4.588	3.655	+1.21	+7.2	19.8	17.0
Feb. 27	23 10.26	-01 04.3	4.599	3.630	+1.22	+7.5	19.7	10.5
Mar. 9	23 22.51	+00 10.4	4.594	3.606	+1.24	+7.7	19.7	4.9
Mar. 19	23 34.87	+01 27.3	4.572	3.581	+1.24	+7.8	19.6	5.2
Mar. 29	23 47.28	+02 45.8	4.533	3.557	+1.24	+7.9	19.5	10.8
Apr. 8	23 59.71	+04 05.2	4.479	3.534	+1.24	+8.0	19.4	17.0
Apr. 18	00 12.09	+05 24.9	4.410	3.510	+1.23	+7.9	19.4	23.3
Apr. 28	00 24.38	+06 44.1	4.326	3.487	+1.22	+7.8	19.3	29.6
May 8	00 36.53	+08 02.3	4.229	3.464	+1.19	+7.6	19.2	36.0
May 18	00 48.48	+09 18.8	4.120	3.441	+1.17	+7.4	19.1	42.4
May 28	01 00.16	+10 32.9	4.000	3.419	+1.13	+7.1	19.0	48.9
June 7	01 11.49	+11 44.1	3.869	3.397	+1.09	+6.7	18.8	55.4
June 17	01 22.37	+12 51.5	3.730	3.375	+1.03	+6.3	18.7	62.0
June 27	01 32.69	+13 54.7	3.585	3.354	+0.96	+5.8	18.6	68.8
July 7	01 42.33	+14 52.9	3.434	3.334	+0.88	+5.2	18.4	75.8
July 17	01 51.11	+15 45.3	3.279	3.313	+0.78	+4.6	18.3	83.0
July 27	01 58.87	+16 31.3	3.124	3.294	+0.65	+3.9	18.1	90.5
Aug. 6	02 05.39	+17 09.9	2.969	3.274	+0.51	+3.0	18.0	98.4
Aug. 16	02 10.46	+17 40.3	2.818	3.256	+0.34	+2.1	17.8	106.7
Aug. 26	02 13.87	+18 01.3	2.673	3.238	+0.16	+1.1	17.7	115.4
Sept. 5	02 15.43	+18 12.0	2.539	3.220	-0.04	-0.1	17.5	124.6
Sept. 15	02 15.01	+18 11.3	2.418	3.203	-0.24	-1.3	17.4	134.4
Sept. 25	02 12.63	+17 58.3	2.315	3.187	-0.42	-2.5	17.2	144.7
Oct. 5	02 08.46	+17 33.1	2.234	3.171	-0.55	-3.6	17.1	155.5
Oct. 15	02 02.91	+16 56.7	2.178	3.156	-0.63	-4.5	17.0	166.5
Oct. 25	01 56.61	+16 11.7	2.149	3.142	-0.63	-5.0	17.0	175.8
Nov. 4	01 50.28	+15 21.9	2.149	3.128	-0.56	-5.0	16.9	168.9
Nov. 14	01 44.69	+14 32.4	2.178	3.116	-0.42	-4.4	16.9	157.7
Nov. 24	01 40.50	+13 48.1	2.232	3.104	-0.24	-3.5	17.0	146.5
Dec. 4	01 38.14	+13 12.8	2.310	3.093	-0.03	-2.3	17.0	135.7
Dec. 14	01 37.88	+12 49.4	2.406	3.082	+0.19	-1.1	17.1	125.3
Dec. 24	01 39.75	+12 38.8	2.518	3.073	+0.39	+0.2	17.1	115.5
Jan. 3	01 43.67	+12 41.0	2.639	3.064	+0.58	+1.4	17.2	106.3
Jan. 13	01 49.50	+12 54.9	2.768	3.056	+0.75	+2.4	17.3	97.5
Jan. 23	01 57.04	+13 19.1	2.900	3.049	+0.91	+3.3	17.4	89.2
Feb. 2	02 06.10	+13 51.7	3.033	3.043	+1.04	+3.9	17.5	81.3
Feb. 12	02 16.50	+14 31.1	3.163	3.038	+1.16	+4.4	17.5	73.7
Feb. 22	02 28.06	+15 15.2	3.289	3.034	+1.26	+4.7	17.6	66.5
Mar. 4	02 40.63	+16 02.6	3.409	3.031	+1.35	+4.9	17.7	59.6
Mar. 14	02 54.09	+16 51.4	3.522	3.028	+1.42	+4.9	17.8	52.9
Mar. 24	03 08.31	+17 40.3	3.626	3.027	+1.49	+4.8	17.8	46.5
Apr. 3	03 23.19	+18 27.9	3.721	3.027	+1.55	+4.5	17.9	40.2

Comet 124P/Mrkos

Epoch = 2013 July 7.0 TT
T = 2014 Apr. 9.58432 TT
Peri. = 183.68284 e = 0.5040297
Node = 0.43900 2000.0 a = 3.3172057 AU
Incl. = 31.52654 n = 0.16313437
q = 1.6452355 AU P = 6.04 years

m1 = 16.2 + 5 log(Delta) + 5.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	01 14.93	+37 49.2	3.334	3.684	+0.32	-3.1	21.6	103.1
Jan. 18	01 18.16	+37 18.6	3.430	3.642	+0.53	-1.8	21.7	94.5
Jan. 28	01 23.43	+37 00.2	3.527	3.599	+0.71	-0.6	21.7	86.2
Feb. 7	01 30.50	+36 54.1	3.621	3.555	+0.87	+0.6	21.7	78.3
Feb. 17	01 39.18	+36 59.6	3.710	3.511	+1.01	+1.6	21.8	70.8
Feb. 27	01 49.30	+37 15.9	3.791	3.466	+1.14	+2.6	21.8	63.6
Mar. 9	02 00.71	+37 41.6	3.861	3.420	+1.26	+3.4	21.8	56.8
Mar. 19	02 13.32	+38 15.3	3.920	3.374	+1.37	+4.0	21.8	50.4
Mar. 29	02 27.04	+38 55.8	3.965	3.326	+1.48	+4.6	21.8	44.4
Apr. 8	02 41.81	+39 41.5	3.997	3.279	+1.58	+5.0	21.8	38.9
Apr. 18	02 57.62	+40 31.1	4.014	3.230	+1.68	+5.2	21.8	33.9
Apr. 28	03 14.41	+41 23.1	4.017	3.181	+1.78	+5.3	21.7	29.6
May 8	03 32.20	+42 16.2	4.005	3.131	+1.88	+5.3	21.7	26.2
May 18	03 50.97	+43 09.1	3.979	3.081	+1.97	+5.1	21.6	23.8
May 28	04 10.70	+44 00.3	3.940	3.030	+2.07	+4.8	21.6	22.7
June 7	04 31.41	+44 48.7	3.887	2.978	+2.17	+4.4	21.5	22.9
June 17	04 53.06	+45 32.8	3.822	2.926	+2.26	+3.9	21.4	24.3
June 27	05 15.62	+46 11.5	3.746	2.873	+2.34	+3.2	21.4	26.6
July 7	05 39.03	+46 43.4	3.658	2.820	+2.42	+2.4	21.3	29.6
July 17	06 03.22	+47 07.6	3.561	2.766	+2.49	+1.5	21.2	33.1
July 27	06 28.07	+47 23.0	3.456	2.712	+2.54	+0.6	21.1	36.8
Aug. 6	06 53.47	+47 28.8	3.342	2.658	+2.58	-0.4	20.9	40.7
Aug. 16	07 19.24	+47 24.5	3.222	2.603	+2.60	-1.5	20.8	44.8
Aug. 26	07 45.22	+47 09.7	3.096	2.548	+2.60	-2.5	20.7	48.9
Sept. 5	08 11.24	+46 44.4	2.965	2.493	+2.59	-3.5	20.5	53.0
Sept. 15	08 37.10	+46 09.1	2.830	2.438	+2.55	-4.5	20.4	57.2
Sept. 25	09 02.63	+45 24.3	2.693	2.383	+2.50	-5.3	20.2	61.5
Oct. 5	09 27.67	+44 30.9	2.553	2.328	+2.44	-6.1	20.1	65.7
Oct. 15	09 52.04	+43 30.3	2.411	2.273	+2.36	-6.7	19.9	70.0
Oct. 25	10 15.60	+42 23.7	2.270	2.219	+2.26	-7.1	19.7	74.4
Nov. 4	10 38.22	+41 12.8	2.128	2.166	+2.15	-7.3	19.5	78.8
Nov. 14	10 59.71	+39 59.5	1.986	2.114	+2.02	-7.4	19.3	83.3
Nov. 24	11 19.90	+38 45.1	1.846	2.062	+1.87	-7.4	19.1	88.0
Dec. 4	11 38.59	+37 31.5	1.708	2.013	+1.69	-7.2	18.9	92.7
Dec. 14	11 55.46	+36 19.9	1.572	1.964	+1.47	-6.9	18.6	97.8
Dec. 24	12 10.17	+35 10.9	1.439	1.918	+1.21	-6.6	18.4	103.1
Jan. 3	12 22.22	+34 04.7	1.310	1.874	+0.87	-6.5	18.2	108.8
Jan. 13	12 30.95	+32 59.7	1.186	1.833	+0.47	-6.8	17.9	115.0
Jan. 23	12 35.61	+31 51.6	1.069	1.795	-0.04	-7.8	17.6	121.9
Feb. 2	12 35.24	+30 33.4	0.960	1.761	-0.63	-10.1	17.3	129.7
Feb. 12	12 28.94	+28 51.9	0.862	1.730	-1.27	-14.3	17.1	138.5
Feb. 22	12 16.26	+26 29.1	0.781	1.703	-1.85	-20.3	16.8	148.2
Mar. 4	11 57.77	+23 05.6	0.720	1.681	-2.20	-27.5	16.6	158.1
Mar. 14	11 35.72	+18 30.8	0.686	1.665	-2.20	-33.3	16.5	164.2
Mar. 24	11 13.68	+12 58.0	0.681	1.653	-1.86	-35.6	16.5	159.9
Apr. 3	10 55.07	+07 01.6	0.705	1.646	-1.30	-34.3	16.5	149.4

Comet 156P/Russell-LINEAR

Epoch = 2013 July 7.0 TT
T = 2014 Apr. 16.53107 TT
Peri. = 357.78487 e = 0.5591318
Node = 38.98697 2000.0 a = 3.5951509 AU
Incl. = 20.77792 n = 0.14458671
q = 1.5849877 AU P = 6.82 years

H = 15.2 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	17 54.16	-35 35.8	4.790	3.899	+1.39	-2.0	22.0	22.4
Jan. 18	18 08.10	-35 55.7	4.685	3.852	+1.39	-1.9	22.0	28.8
Jan. 28	18 22.03	-36 14.8	4.562	3.805	+1.38	-1.9	22.0	35.6
Feb. 7	18 35.86	-36 33.7	4.424	3.757	+1.36	-1.9	22.0	42.6
Feb. 17	18 49.48	-36 53.0	4.271	3.708	+1.33	-2.0	21.9	49.6
Feb. 27	19 02.75	-37 13.4	4.107	3.659	+1.28	-2.3	21.8	56.8
Mar. 9	19 15.57	-37 36.0	3.932	3.609	+1.22	-2.6	21.8	64.0
Mar. 19	19 27.79	-38 01.9	3.749	3.558	+1.15	-3.1	21.7	71.3
Mar. 29	19 39.25	-38 32.4	3.562	3.506	+1.05	-3.7	21.6	78.7
Apr. 8	19 49.79	-39 09.0	3.371	3.454	+0.94	-4.4	21.4	86.3
Apr. 18	19 59.17	-39 53.2	3.181	3.401	+0.80	-5.3	21.3	94.0
Apr. 28	20 07.17	-40 46.4	2.993	3.347	+0.63	-6.3	21.1	101.8
May 8	20 13.49	-41 49.8	2.812	3.293	+0.43	-7.4	20.9	109.7
May 18	20 17.78	-43 04.0	2.639	3.237	+0.19	-8.4	20.7	117.8
May 28	20 19.65	-44 28.4	2.479	3.182	-0.09	-9.3	20.5	125.9
June 7	20 18.72	-46 01.2	2.335	3.125	-0.41	-9.7	20.3	133.9
June 17	20 14.59	-47 38.1	2.210	3.068	-0.75	-9.4	20.1	141.2
June 27	20 07.14	-49 12.3	2.106	3.011	-1.06	-8.3	19.9	147.0
July 7	19 56.54	-50 35.3	2.026	2.952	-1.30	-6.2	19.7	150.2
July 17	19 43.53	-51 37.7	1.971	2.894	-1.40	-3.5	19.6	149.6
July 27	19 29.51	-52 12.4	1.940	2.834	-1.33	-0.4	19.6	145.3
Aug. 6	19 16.18	-52 16.6	1.931	2.774	-1.09	+2.5	19.6	138.6
Aug. 16	19 05.24	-51 51.7	1.942	2.714	-0.73	+4.8	19.7	130.8
Aug. 26	18 57.91	-51 03.6	1.970	2.654	-0.32	+6.5	19.8	122.5
Sept. 5	18 54.75	-49 58.6	2.011	2.593	+0.11	+7.6	19.8	114.2
Sept. 15	18 55.85	-48 42.4	2.060	2.532	+0.51	+8.3	19.9	106.2
Sept. 25	19 00.92	-47 19.1	2.114	2.471	+0.86	+8.9	19.9	98.5
Oct. 5	19 09.50	-45 50.6	2.170	2.409	+1.16	+9.3	19.9	91.2
Oct. 15	19 21.13	-44 17.3	2.227	2.348	+1.42	+9.9	19.9	84.3
Oct. 25	19 35.32	-42 38.7	2.280	2.288	+1.63	+10.5	19.9	77.8
Nov. 4	19 51.62	-40 53.3	2.330	2.227	+1.80	+11.4	19.9	71.7
Nov. 14	20 09.67	-38 59.6	2.375	2.168	+1.94	+12.3	19.9	65.9
Nov. 24	20 29.08	-36 56.2	2.415	2.109	+2.05	+13.5	19.9	60.4
Dec. 4	20 49.57	-34 41.4	2.448	2.051	+2.13	+14.7	19.8	55.2
Dec. 14	21 10.89	-32 14.3	2.476	1.995	+2.19	+16.0	19.7	50.2
Dec. 24	21 32.80	-29 34.2	2.497	1.941	+2.24	+17.4	19.7	45.6
Jan. 3	21 55.17	-26 40.7	2.514	1.889	+2.27	+18.7	19.6	41.2
Jan. 13	22 17.85	-23 33.8	2.526	1.839	+2.29	+20.0	19.5	37.0
Jan. 23	22 40.76	-20 14.3	2.535	1.792	+2.31	+21.1	19.4	33.1
Feb. 2	23 03.87	-16 43.0	2.541	1.749	+2.33	+22.2	19.3	29.3
Feb. 12	23 27.18	-13 01.4	2.544	1.710	+2.35	+23.0	19.2	25.7
Feb. 22	23 50.68	-09 11.3	2.547	1.675	+2.38	+23.6	19.1	22.3
Mar. 4	00 14.46	-05 14.8	2.550	1.646	+2.41	+24.0	19.0	19.1
Mar. 14	00 38.57	-01 14.7	2.554	1.621	+2.45	+24.1	18.9	16.0
Mar. 24	01 03.09	+02 46.4	2.558	1.603	+2.50	+23.9	18.8	13.0
Apr. 3	01 28.12	+06 45.2	2.565	1.591	+2.56	+23.3	18.7	10.2

Comet 191P/McNaught

Epoch = 2013 July 7.0 TT
T = 2014 May 6.14942 TT
Peri. = 274.45503 e = 0.4208866
Node = 106.40850 2000.0 a = 3.5299729 AU
Incl. = 8.76299 n = 0.14860965
q = 2.0442546 AU P = 6.63 years

m1 = 11.8 + 5 log(Delta) + 12.5 log(r(t-60))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	17 45.56	-20 21.9	4.579	3.680	+1.31	-0.9	22.5	21.3
Jan. 18	17 58.61	-20 30.7	4.479	3.643	+1.29	-0.4	22.4	28.3
Jan. 28	18 11.54	-20 35.1	4.362	3.606	+1.27	0.0	22.3	35.4
Feb. 7	18 24.23	-20 35.5	4.231	3.568	+1.23	+0.3	22.2	42.6
Feb. 17	18 36.58	-20 32.2	4.086	3.529	+1.19	+0.6	22.0	49.8
Feb. 27	18 48.45	-20 25.9	3.929	3.491	+1.13	+0.9	21.9	57.1
Mar. 9	18 59.73	-20 17.2	3.762	3.451	+1.05	+1.0	21.8	64.4
Mar. 19	19 10.26	-20 07.2	3.587	3.412	+0.96	+1.0	21.6	71.9
Mar. 29	19 19.90	-19 56.8	3.407	3.372	+0.86	+1.0	21.4	79.5
Apr. 8	19 28.49	-19 47.2	3.224	3.332	+0.73	+0.7	21.2	87.4
Apr. 18	19 35.82	-19 39.9	3.040	3.291	+0.59	+0.4	21.1	95.4
Apr. 28	19 41.70	-19 36.3	2.859	3.250	+0.42	-0.2	20.9	103.8
May 8	19 45.91	-19 37.9	2.684	3.209	+0.23	-0.8	20.7	112.5
May 18	19 48.23	-19 46.1	2.517	3.167	+0.02	-1.6	20.5	121.7
May 28	19 48.48	-20 02.1	2.363	3.125	-0.20	-2.4	20.3	131.3
June 7	19 46.50	-20 26.6	2.225	3.083	-0.42	-3.3	20.1	141.4
June 17	19 42.29	-20 59.2	2.107	3.041	-0.62	-3.9	19.9	152.0
June 27	19 36.06	-21 38.7	2.012	2.999	-0.78	-4.4	19.7	163.1
July 7	19 28.22	-22 22.6	1.943	2.957	-0.87	-4.5	19.6	174.5
July 17	19 19.49	-23 07.7	1.902	2.914	-0.87	-4.3	19.5	173.7
July 27	19 10.80	-23 50.7	1.888	2.872	-0.77	-3.9	19.4	162.1
Aug. 6	19 03.09	-24 29.2	1.900	2.829	-0.59	-3.2	19.3	150.8
Aug. 16	18 57.23	-25 01.7	1.936	2.787	-0.34	-2.6	19.3	139.8
Aug. 26	18 53.83	-25 27.8	1.990	2.745	-0.06	-2.0	19.3	129.4
Sept. 5	18 53.20	-25 47.5	2.060	2.703	+0.23	-1.4	19.3	119.5
Sept. 15	18 55.46	-26 01.2	2.140	2.661	+0.50	-0.8	19.3	110.3
Sept. 25	19 00.51	-26 08.8	2.226	2.620	+0.76	-0.1	19.3	101.7
Oct. 5	19 08.14	-26 10.1	2.316	2.579	+1.00	+0.6	19.3	93.5
Oct. 15	19 18.13	-26 04.6	2.407	2.539	+1.21	+1.3	19.3	85.9
Oct. 25	19 30.18	-25 51.4	2.496	2.499	+1.39	+2.2	19.3	78.7
Nov. 4	19 44.04	-25 29.9	2.581	2.461	+1.54	+3.1	19.3	71.9
Nov. 14	19 59.45	-24 59.1	2.661	2.423	+1.67	+4.1	19.2	65.4
Nov. 24	20 16.17	-24 18.5	2.735	2.386	+1.78	+5.1	19.2	59.2
Dec. 4	20 33.99	-23 27.5	2.802	2.350	+1.87	+6.2	19.2	53.3
Dec. 14	20 52.70	-22 25.8	2.862	2.315	+1.94	+7.2	19.1	47.6
Dec. 24	21 12.12	-21 13.3	2.914	2.282	+2.00	+8.3	19.1	42.2
Jan. 3	21 32.11	-19 50.1	2.958	2.251	+2.04	+9.3	19.0	36.9
Jan. 13	21 52.54	-18 16.8	2.994	2.221	+2.08	+10.3	19.0	31.9
Jan. 23	22 13.30	-16 34.0	3.023	2.193	+2.10	+11.2	18.9	27.1
Feb. 2	22 34.31	-14 42.4	3.044	2.167	+2.12	+11.9	18.9	22.5
Feb. 12	22 55.51	-12 43.3	3.059	2.143	+2.13	+12.6	18.8	18.1
Feb. 22	23 16.85	-10 37.8	3.068	2.121	+2.15	+13.1	18.7	14.0
Mar. 4	23 38.32	-08 27.2	3.071	2.102	+2.16	+13.4	18.6	10.2
Mar. 14	23 59.89	-06 13.2	3.068	2.086	+2.17	+13.6	18.6	7.2
Mar. 24	00 21.56	-03 57.3	3.061	2.072	+2.18	+13.6	18.5	5.8
Apr. 3	00 43.35	-01 41.1	3.050	2.061	+2.19	+13.5	18.4	6.9

Comet 209P/LINEAR

Epoch = 2013 July 7.0 TT
T = 2014 May 6.22409 TT
Peri. = 152.36197 e = 0.6727895
Node = 62.84930 2000.0 a = 2.9613790 AU
Incl. = 21.25853 n = 0.19340295
q = 0.9689943 AU P = 5.10 years

m1 = 17.8 + 5 log(Delta) + 5.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	03 09.02	+16 54.1	3.501	4.105	-0.28	+0.9	.	121.8
Jan. 18	03 06.18	+17 03.5	3.607	4.065	-0.09	+1.6	.	111.0
Jan. 28	03 05.24	+17 19.4	3.722	4.023	+0.09	+2.2	.	100.7
Feb. 7	03 06.12	+17 41.6	3.842	3.981	+0.26	+2.8	.	90.9
Feb. 17	03 08.71	+18 09.5	3.961	3.937	+0.41	+3.3	.	81.5
Feb. 27	03 12.84	+18 42.3	4.074	3.893	+0.55	+3.7	.	72.5
Mar. 9	03 18.37	+19 19.1	4.179	3.847	+0.68	+4.0	.	63.9
Mar. 19	03 25.14	+19 59.2	4.272	3.800	+0.79	+4.2	.	55.6
Mar. 29	03 33.00	+20 41.6	4.350	3.752	+0.88	+4.4	.	47.7
Apr. 8	03 41.85	+21 25.5	4.413	3.702	+0.97	+4.5	.	40.0
Apr. 18	03 51.57	+22 10.2	4.457	3.652	+1.05	+4.5	.	32.6
Apr. 28	04 02.07	+22 55.0	4.483	3.600	+1.12	+4.4	.	25.4
May 8	04 13.26	+23 39.2	4.490	3.547	+1.18	+4.3	.	18.5
May 18	04 25.08	+24 22.5	4.477	3.493	+1.24	+4.2	.	11.7
May 28	04 37.45	+25 04.2	4.444	3.437	+1.29	+4.0	.	5.6
June 7	04 50.32	+25 44.1	4.392	3.380	+1.33	+3.8	.	3.8
June 17	05 03.65	+26 21.8	4.321	3.322	+1.37	+3.5	.	9.1
June 27	05 17.36	+26 57.2	4.232	3.262	+1.41	+3.3	.	15.3
July 7	05 31.43	+27 30.1	4.125	3.201	+1.44	+3.0	.	21.6
July 17	05 45.80	+28 00.5	4.001	3.139	+1.46	+2.8	.	27.9
July 27	06 00.41	+28 28.6	3.861	3.075	+1.48	+2.6	.	34.2
Aug. 6	06 15.23	+28 54.6	3.708	3.009	+1.50	+2.4	23.0	40.5
Aug. 16	06 30.21	+29 19.0	3.542	2.943	+1.51	+2.3	22.9	46.8
Aug. 26	06 45.28	+29 42.3	3.364	2.874	+1.51	+2.3	22.7	53.2
Sept. 5	07 00.39	+30 05.5	3.177	2.804	+1.51	+2.4	22.5	59.6
Sept.15	07 15.48	+30 29.7	2.982	2.732	+1.50	+2.7	22.4	66.0
Sept.25	07 30.48	+30 56.5	2.781	2.659	+1.48	+3.1	22.1	72.6
Oct. 5	07 45.31	+31 27.7	2.576	2.584	+1.46	+3.8	21.9	79.3
Oct. 15	07 59.88	+32 06.0	2.369	2.508	+1.42	+4.8	21.7	86.1
Oct. 25	08 14.08	+32 54.3	2.164	2.430	+1.37	+6.2	21.4	93.1
Nov. 4	08 27.78	+33 56.6	1.962	2.350	+1.30	+8.1	21.1	100.2
Nov. 14	08 40.78	+35 17.7	1.765	2.268	+1.21	+10.5	20.8	107.5
Nov. 24	08 52.88	+37 03.1	1.577	2.185	+1.09	+13.6	20.5	114.9
Dec. 4	09 03.73	+39 19.5	1.401	2.100	+0.91	+17.3	20.1	122.3
Dec. 14	09 12.85	+42 12.9	1.240	2.014	+0.68	+21.6	19.8	129.5
Dec. 24	09 19.61	+45 48.5	1.095	1.927	+0.33	+25.9	19.4	135.8
Jan. 3	09 22.96	+50 07.1	0.971	1.838	-0.15	+29.4	19.1	140.2
Jan. 13	09 21.42	+55 00.9	0.868	1.748	-0.84	+31.0	18.7	141.3
Jan. 23	09 13.04	+60 10.6	0.787	1.657	-1.77	+29.4	18.4	138.3
Feb. 2	08 55.39	+65 04.4	0.726	1.566	-2.80	+24.0	18.1	131.9
Feb. 12	08 27.40	+69 04.8	0.680	1.476	-3.51	+16.1	17.8	123.5
Feb. 22	07 52.25	+71 45.3	0.643	1.387	-3.35	+7.9	17.6	114.7
Mar. 4	07 18.75	+73 03.9	0.610	1.300	-2.20	+2.0	17.3	106.1
Mar. 14	06 56.72	+73 23.5	0.574	1.218	-0.67	-1.1	17.0	98.4
Mar. 24	06 50.06	+73 12.4	0.531	1.143	+0.81	-2.8	16.7	91.6
Apr. 3	06 58.13	+72 44.8	0.478	1.077	+2.04	-4.4	16.4	85.9

Comet 134P/Kowal-Vavrova

Epoch = 2013 July 7.0 TT
T = 2014 May 21.42598 TT
Peri. = 18.55959 e = 0.5871525
Node = 202.12500 2000.0 a = 6.2292018 AU
Incl. = 4.34881 n = 0.06339507
q = 2.5717104 AU P = 15.55 years

m1 = 3.8 + 5 log(Delta) + 22.5 log(r(t-120))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	08 30.21	+13 22.8	3.519	4.458	-0.59	+1.8	22.3	160.4
Jan. 18	08 24.27	+13 40.7	3.434	4.408	-0.64	+2.2	22.2	171.0
Jan. 28	08 17.87	+14 02.6	3.380	4.359	-0.64	+2.4	22.1	172.9
Feb. 7	08 11.51	+14 26.6	3.357	4.309	-0.58	+2.4	22.0	162.8
Feb. 17	08 05.71	+14 51.0	3.363	4.259	-0.48	+2.3	21.9	151.6
Feb. 27	08 00.96	+15 14.1	3.397	4.209	-0.34	+2.1	21.8	140.5
Mar. 9	07 57.60	+15 34.6	3.453	4.159	-0.17	+1.7	21.7	129.8
Mar. 19	07 55.88	+15 51.5	3.528	4.109	0.00	+1.3	21.7	119.4
Mar. 29	07 55.90	+16 04.1	3.615	4.059	+0.18	+0.8	21.6	109.5
Apr. 8	07 57.66	+16 11.8	3.711	4.009	+0.34	+0.2	21.6	100.1
Apr. 18	08 01.10	+16 14.3	3.811	3.959	+0.50	-0.3	21.5	91.1
Apr. 28	08 06.08	+16 11.3	3.910	3.909	+0.64	-0.9	21.5	82.6
May 8	08 12.46	+16 02.6	4.007	3.860	+0.76	-1.5	21.4	74.4
May 18	08 20.09	+15 48.0	4.097	3.810	+0.87	-2.1	21.4	66.6
May 28	08 28.82	+15 27.4	4.178	3.760	+0.97	-2.7	21.3	59.1
June 7	08 38.50	+15 00.7	4.250	3.711	+1.05	-3.3	21.2	51.9
June 17	08 49.00	+14 28.0	4.309	3.662	+1.12	-3.9	21.1	45.0
June 27	09 00.21	+13 49.1	4.356	3.613	+1.18	-4.5	21.0	38.3
July 7	09 12.02	+13 04.3	4.389	3.564	+1.23	-5.1	20.9	31.7
July 17	09 24.34	+12 13.7	4.408	3.516	+1.27	-5.6	20.8	25.3
July 27	09 37.09	+11 17.4	4.412	3.468	+1.31	-6.2	20.7	19.1
Aug. 6	09 50.20	+10 15.6	4.402	3.421	+1.34	-6.7	20.6	13.0
Aug. 16	10 03.62	+09 08.8	4.376	3.374	+1.37	-7.2	20.5	7.1
Aug. 26	10 17.29	+07 57.3	4.337	3.327	+1.39	-7.6	20.3	2.6
Sept. 5	10 31.16	+06 41.5	4.283	3.282	+1.40	-8.0	20.2	6.0
Sept. 15	10 45.20	+05 21.9	4.215	3.236	+1.42	-8.3	20.0	11.7
Sept. 25	10 59.37	+03 59.1	4.134	3.192	+1.43	-8.5	19.8	17.5
Oct. 5	11 13.63	+02 33.7	4.040	3.148	+1.43	-8.7	19.6	23.5
Oct. 15	11 27.95	+01 06.4	3.935	3.106	+1.43	-8.8	19.5	29.5
Oct. 25	11 42.28	-00 22.0	3.818	3.064	+1.43	-8.9	19.3	35.5
Nov. 4	11 56.58	-01 50.7	3.692	3.023	+1.42	-8.8	19.1	41.6
Nov. 14	12 10.81	-03 18.8	3.557	2.984	+1.41	-8.6	18.8	47.8
Nov. 24	12 24.89	-04 45.2	3.414	2.945	+1.39	-8.4	18.6	54.1
Dec. 4	12 38.75	-06 09.0	3.264	2.908	+1.35	-8.0	18.4	60.5
Dec. 14	12 52.28	-07 29.1	3.110	2.873	+1.31	-7.5	18.1	67.0
Dec. 24	13 05.37	-08 44.2	2.953	2.839	+1.25	-6.9	17.9	73.7
Jan. 3	13 17.88	-09 53.3	2.793	2.806	+1.17	-6.2	17.6	80.6
Jan. 13	13 29.61	-10 55.0	2.634	2.775	+1.08	-5.3	17.4	87.8
Jan. 23	13 40.37	-11 48.1	2.477	2.746	+0.95	-4.3	17.1	95.2
Feb. 2	13 49.90	-12 31.3	2.324	2.719	+0.80	-3.2	16.8	102.9
Feb. 12	13 57.94	-13 03.4	2.178	2.694	+0.63	-2.0	16.6	111.0
Feb. 22	14 04.23	-13 23.1	2.041	2.671	+0.43	-0.6	16.3	119.5
Mar. 4	14 08.52	-13 29.6	1.917	2.651	+0.21	+0.7	16.0	128.6
Mar. 14	14 10.62	-13 22.2	1.807	2.632	-0.01	+2.1	15.8	138.1
Mar. 24	14 10.56	-13 01.1	1.715	2.616	-0.21	+3.3	15.5	148.2
Apr. 3	14 08.48	-12 27.6	1.645	2.602	-0.36	+4.3	15.3	158.8

Comet 4P/Faye

Epoch = 2013 July 7.0 TT
T = 2014 May 29.59208 TT
Peri. = 205.03961 e = 0.5686491
Node = 199.28185 2000.0 a = 3.8372726 AU
Incl. = 9.04933 n = 0.13112035
q = 1.6552110 AU P = 7.52 years

m1 = 8.2 + 5 log(Delta) + 15.0 log(r(t-15))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	18 22.88	-16 16.2	5.112	4.165	+1.12	+1.3	21.1	14.0
Jan. 18	18 34.05	-16 03.4	5.024	4.119	+1.11	+1.7	21.0	20.8
Jan. 28	18 45.13	-15 46.0	4.916	4.073	+1.09	+2.2	20.9	28.0
Feb. 7	18 56.03	-15 23.9	4.791	4.026	+1.06	+2.6	20.8	35.3
Feb. 17	19 06.64	-14 57.5	4.648	3.978	+1.02	+3.0	20.6	42.6
Feb. 27	19 16.84	-14 27.0	4.491	3.930	+0.97	+3.4	20.5	50.1
Mar. 9	19 26.52	-13 52.9	4.321	3.881	+0.90	+3.7	20.3	57.6
Mar. 19	19 35.55	-13 15.7	4.141	3.831	+0.83	+4.0	20.2	65.2
Mar. 29	19 43.80	-12 36.2	3.952	3.780	+0.73	+4.1	20.0	72.9
Apr. 8	19 51.14	-11 55.0	3.757	3.729	+0.63	+4.2	19.8	80.8
Apr. 18	19 57.39	-11 13.1	3.559	3.678	+0.50	+4.2	19.6	88.8
Apr. 28	20 02.39	-10 31.6	3.361	3.626	+0.36	+4.0	19.4	97.1
May 8	20 05.97	-09 51.5	3.166	3.573	+0.20	+3.7	19.1	105.6
May 18	20 07.93	-09 14.4	2.978	3.519	+0.02	+3.3	18.9	114.4
May 28	20 08.12	-08 41.9	2.800	3.465	-0.17	+2.6	18.7	123.6
June 7	20 06.41	-08 15.4	2.635	3.410	-0.37	+1.9	18.5	133.1
June 17	20 02.74	-07 56.8	2.488	3.355	-0.55	+0.9	18.2	142.9
June 27	19 57.21	-07 47.6	2.363	3.299	-0.71	-0.1	18.0	152.6
July 7	19 50.09	-07 48.8	2.261	3.242	-0.82	-1.2	17.8	161.6
July 17	19 41.86	-08 00.8	2.187	3.185	-0.87	-2.2	17.6	166.8
July 27	19 33.20	-08 22.9	2.141	3.127	-0.83	-3.1	17.5	163.4
Aug. 6	19 24.88	-08 53.6	2.122	3.069	-0.72	-3.7	17.3	154.6
Aug. 16	19 17.70	-09 30.7	2.128	3.010	-0.54	-4.1	17.2	144.5
Aug. 26	19 12.33	-10 11.4	2.157	2.951	-0.31	-4.2	17.1	134.2
Sept. 5	19 09.21	-10 53.1	2.203	2.892	-0.06	-4.0	17.0	124.1
Sept. 15	19 08.61	-11 33.3	2.263	2.832	+0.20	-3.7	17.0	114.5
Sept. 25	19 10.59	-12 10.1	2.332	2.772	+0.45	-3.2	16.9	105.4
Oct. 5	19 15.07	-12 41.8	2.405	2.711	+0.69	-2.5	16.8	96.7
Oct. 15	19 21.94	-13 06.9	2.481	2.651	+0.90	-1.7	16.7	88.6
Oct. 25	19 30.99	-13 24.1	2.554	2.590	+1.10	-0.8	16.7	80.9
Nov. 4	19 42.02	-13 32.4	2.623	2.529	+1.28	+0.2	16.6	73.6
Nov. 14	19 54.83	-13 30.8	2.687	2.469	+1.44	+1.2	16.5	66.7
Nov. 24	20 09.23	-13 18.7	2.743	2.408	+1.58	+2.3	16.4	60.1
Dec. 4	20 25.04	-12 55.3	2.790	2.348	+1.71	+3.5	16.2	53.9
Dec. 14	20 42.12	-12 20.1	2.829	2.289	+1.82	+4.7	16.1	47.9
Dec. 24	21 00.29	-11 33.0	2.858	2.231	+1.92	+5.9	16.0	42.3
Jan. 3	21 19.46	-10 33.8	2.877	2.173	+2.01	+7.1	15.8	36.9
Jan. 13	21 39.52	-09 22.5	2.888	2.117	+2.09	+8.3	15.6	31.8
Jan. 23	22 00.39	-07 59.6	2.890	2.062	+2.16	+9.4	15.5	26.9
Feb. 2	22 22.00	-06 25.6	2.885	2.009	+2.23	+10.4	15.3	22.4
Feb. 12	22 44.32	-04 41.4	2.872	1.958	+2.30	+11.3	15.1	18.0
Feb. 22	23 07.32	-02 48.3	2.854	1.909	+2.37	+12.1	14.9	14.0
Mar. 4	23 31.01	-00 47.5	2.832	1.864	+2.44	+12.7	14.8	10.1
Mar. 14	23 55.39	+01 19.1	2.806	1.822	+2.51	+13.0	14.6	6.6
Mar. 24	00 20.47	+03 29.3	2.778	1.783	+2.58	+13.2	14.4	3.2
Apr. 3	00 46.27	+05 40.9	2.749	1.749	+2.65	+13.0	14.2	0.7

Comet C/2012 U1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2014 July 4.69482 TT
Peri. = 69.90494
Node = 26.99287 2000.0
Incl. = 56.37838
q = 5.2741342 AU
e = 0.9968643

m1 = 9.6 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	01 20.56	+23 52.1	6.367	6.603	+0.04	+1.9	19.8	99.7
Jan. 18	01 20.97	+24 10.9	6.487	6.561	+0.15	+2.4	19.8	90.0
Jan. 28	01 22.44	+24 35.1	6.607	6.519	+0.24	+3.0	19.8	80.6
Feb. 7	01 24.89	+25 04.9	6.722	6.478	+0.33	+3.5	19.8	71.6
Feb. 17	01 28.23	+25 40.2	6.828	6.437	+0.41	+4.1	19.8	62.8
Feb. 27	01 32.36	+26 20.8	6.922	6.396	+0.48	+4.6	19.8	54.4
Mar. 9	01 37.18	+27 06.6	7.002	6.356	+0.54	+5.1	19.9	46.3
Mar. 19	01 42.60	+27 57.3	7.063	6.317	+0.59	+5.5	19.8	38.7
Mar. 29	01 48.52	+28 52.4	7.106	6.278	+0.63	+5.9	19.8	31.6
Apr. 8	01 54.87	+29 51.8	7.129	6.239	+0.67	+6.3	19.8	25.4
Apr. 18	02 01.55	+30 55.0	7.131	6.201	+0.69	+6.7	19.8	20.6
Apr. 28	02 08.48	+32 02.0	7.112	6.164	+0.71	+7.0	19.8	18.2
May 8	02 15.59	+33 12.3	7.073	6.127	+0.72	+7.4	19.8	19.0
May 18	02 22.80	+34 25.9	7.013	6.091	+0.72	+7.7	19.7	22.5
May 28	02 30.01	+35 42.7	6.933	6.055	+0.71	+8.0	19.7	27.8
June 7	02 37.14	+37 02.5	6.836	6.020	+0.70	+8.3	19.6	33.9
June 17	02 44.10	+38 25.3	6.721	5.985	+0.67	+8.6	19.6	40.5
June 27	02 50.76	+39 51.1	6.592	5.951	+0.63	+8.9	19.5	47.4
July 7	02 57.03	+41 19.9	6.450	5.918	+0.57	+9.2	19.4	54.5
July 17	03 02.75	+42 51.6	6.298	5.886	+0.50	+9.5	19.4	61.8
July 27	03 07.76	+44 26.1	6.138	5.854	+0.41	+9.7	19.3	69.2
Aug. 6	03 11.88	+46 03.3	5.972	5.822	+0.30	+9.9	19.2	76.7
Aug. 16	03 14.90	+47 42.5	5.805	5.792	+0.17	+10.1	19.1	84.3
Aug. 26	03 16.58	+49 23.1	5.639	5.762	+0.01	+10.1	19.1	91.9
Sept. 5	03 16.68	+51 04.0	5.478	5.733	-0.17	+9.9	19.0	99.6
Sept.15	03 14.94	+52 43.3	5.326	5.705	-0.38	+9.5	18.9	107.2
Sept.25	03 11.15	+54 18.7	5.187	5.677	-0.60	+8.9	18.8	114.6
Oct. 5	03 05.15	+55 47.3	5.063	5.650	-0.82	+7.8	18.8	121.5
Oct. 15	02 56.97	+57 05.6	4.958	5.624	-1.01	+6.5	18.7	127.8
Oct. 25	02 46.84	+58 10.3	4.875	5.599	-1.16	+4.8	18.7	132.9
Nov. 4	02 35.28	+58 58.6	4.815	5.575	-1.22	+3.0	18.6	136.3
Nov. 14	02 23.04	+59 28.7	4.781	5.551	-1.20	+1.2	18.6	137.6
Nov. 24	02 11.07	+59 41.2	4.772	5.529	-1.08	-0.3	18.6	136.4
Dec. 4	02 00.25	+59 38.2	4.786	5.507	-0.89	-1.5	18.6	133.1
Dec. 14	01 51.34	+59 23.3	4.823	5.486	-0.65	-2.2	18.6	128.2
Dec. 24	01 44.79	+59 01.3	4.879	5.466	-0.40	-2.5	18.6	122.1
Jan. 3	01 40.81	+58 36.5	4.952	5.447	-0.14	-2.3	18.6	115.5
Jan. 13	01 39.42	+58 13.2	5.037	5.429	+0.10	-1.9	18.6	108.5
Jan. 23	01 40.47	+57 54.5	5.131	5.412	+0.33	-1.2	18.7	101.4
Feb. 2	01 43.77	+57 42.4	5.230	5.396	+0.53	-0.4	18.7	94.4
Feb. 12	01 49.12	+57 38.6	5.331	5.381	+0.72	+0.5	18.7	87.6
Feb. 22	01 56.30	+57 43.5	5.431	5.366	+0.89	+1.4	18.7	81.0
Mar. 4	02 05.16	+57 57.2	5.528	5.353	+1.04	+2.2	18.8	74.8
Mar. 14	02 15.55	+58 19.4	5.618	5.341	+1.18	+3.0	18.8	68.9
Mar. 24	02 27.36	+58 49.4	5.700	5.330	+1.32	+3.7	18.8	63.4
Apr. 3	02 40.52	+59 26.4	5.774	5.319	+1.45	+4.3	18.9	58.5

Comet C/2012 K8 (Lemmon)

Epoch = 2013 July 7.0 TT
T = 2014 Aug. 19.20564 TT
Peri. = 75.83037
Node = 312.80064 2000.0
Incl. = 106.10947
q = 6.4643107 AU
e = 1.0027766

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	19 51.55	+06 00.4	8.405	7.565	+0.35	+3.8	18.8	29.5
Jan. 18	19 55.06	+06 38.0	8.392	7.531	+0.35	+4.3	18.8	27.2
Jan. 28	19 58.59	+07 21.5	8.355	7.498	+0.34	+4.9	18.8	27.7
Feb. 7	20 02.02	+08 10.8	8.294	7.465	+0.32	+5.5	18.7	30.9
Feb. 17	20 05.25	+09 05.8	8.211	7.433	+0.29	+6.1	18.7	35.9
Feb. 27	20 08.15	+10 06.3	8.105	7.400	+0.25	+6.6	18.7	42.1
Mar. 9	20 10.63	+11 12.2	7.981	7.369	+0.19	+7.1	18.6	49.0
Mar. 19	20 12.56	+12 23.0	7.841	7.338	+0.13	+7.5	18.6	56.4
Mar. 29	20 13.83	+13 38.2	7.687	7.307	+0.05	+7.9	18.5	64.1
Apr. 8	20 14.33	+14 57.2	7.524	7.276	-0.04	+8.2	18.4	71.9
Apr. 18	20 13.96	+16 19.1	7.355	7.246	-0.13	+8.4	18.4	79.9
Apr. 28	20 12.61	+17 42.9	7.186	7.217	-0.24	+8.4	18.3	87.8
May 8	20 10.20	+19 07.2	7.019	7.188	-0.35	+8.3	18.3	95.6
May 18	20 06.67	+20 30.4	6.859	7.159	-0.47	+8.0	18.2	103.3
May 28	20 02.00	+21 50.4	6.712	7.131	-0.58	+7.5	18.1	110.6
June 7	19 56.20	+23 05.2	6.580	7.103	-0.68	+6.7	18.1	117.3
June 17	19 49.37	+24 12.5	6.468	7.076	-0.77	+5.8	18.0	123.2
June 27	19 41.65	+25 10.2	6.379	7.050	-0.84	+4.6	18.0	127.9
July 7	19 33.28	+25 56.3	6.315	7.023	-0.87	+3.3	18.0	131.0
July 17	19 24.55	+26 29.6	6.277	6.998	-0.88	+2.0	17.9	132.0
July 27	19 15.77	+26 49.7	6.265	6.973	-0.85	+0.7	17.9	130.9
Aug. 6	19 07.29	+26 56.8	6.278	6.948	-0.79	-0.5	17.9	127.9
Aug. 16	18 59.42	+26 52.2	6.315	6.924	-0.70	-1.4	17.9	123.4
Aug. 26	18 52.42	+26 37.8	6.373	6.900	-0.59	-2.2	17.9	117.7
Sept. 5	18 46.48	+26 15.8	6.447	6.877	-0.48	-2.7	17.9	111.3
Sept.15	18 41.72	+25 48.9	6.535	6.855	-0.35	-2.9	17.9	104.4
Sept.25	18 38.18	+25 19.6	6.631	6.833	-0.23	-2.9	18.0	97.4
Oct. 5	18 35.86	+24 50.2	6.732	6.811	-0.12	-2.7	18.0	90.3
Oct. 15	18 34.71	+24 22.9	6.834	6.791	-0.01	-2.3	18.0	83.3
Oct. 25	18 34.64	+23 59.5	6.931	6.770	+0.09	-1.8	18.0	76.6
Nov. 4	18 35.54	+23 41.6	7.022	6.751	+0.18	-1.1	18.1	70.2
Nov. 14	18 37.29	+23 30.3	7.102	6.732	+0.25	-0.4	18.1	64.3
Nov. 24	18 39.76	+23 26.8	7.169	6.713	+0.31	+0.5	18.1	59.0
Dec. 4	18 42.83	+23 31.8	7.220	6.696	+0.35	+1.4	18.1	54.5
Dec. 14	18 46.37	+23 46.1	7.255	6.678	+0.39	+2.4	18.1	51.0
Dec. 24	18 50.22	+24 10.2	7.271	6.662	+0.41	+3.4	18.1	48.6
Jan. 3	18 54.28	+24 44.3	7.269	6.646	+0.41	+4.4	18.1	47.6
Jan. 13	18 58.39	+25 28.7	7.249	6.631	+0.40	+5.5	18.1	48.0
Jan. 23	19 02.42	+26 23.7	7.211	6.616	+0.38	+6.5	18.0	49.6
Feb. 2	19 06.24	+27 29.0	7.156	6.602	+0.35	+7.6	18.0	52.5
Feb. 12	19 09.69	+28 44.7	7.087	6.589	+0.29	+8.6	18.0	56.2
Feb. 22	19 12.63	+30 10.2	7.005	6.576	+0.23	+9.5	18.0	60.6
Mar. 4	19 14.89	+31 45.2	6.913	6.564	+0.14	+10.3	17.9	65.5
Mar. 14	19 16.31	+33 28.6	6.814	6.552	+0.04	+11.1	17.9	70.7
Mar. 24	19 16.71	+35 19.2	6.711	6.542	-0.08	+11.6	17.9	76.0
Apr. 3	19 15.91	+37 15.6	6.608	6.532	-0.22	+12.0	17.8	81.3

Comet P/2011 S1 (Gibbs)

Epoch = 2013 July 7.0 TT
T = 2014 Aug. 23.21443 TT
Peri. = 193.29920 e = 0.2026885
Node = 218.89817 2000.0 a = 8.6490544 AU
Incl. = 2.67937 n = 0.03874816
q = 6.8959905 AU P = 25.44 years

m1 = 3.6 + 5 log(Delta) + 15.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	00 34.17	+04 44.1	7.178	7.108	+0.32	+1.7	20.7	82.0
Jan. 18	00 37.32	+05 01.3	7.332	7.101	+0.39	+2.2	20.7	72.7
Jan. 28	00 41.18	+05 23.1	7.479	7.095	+0.45	+2.6	20.7	63.5
Feb. 7	00 45.65	+05 48.8	7.614	7.088	+0.50	+2.9	20.8	54.6
Feb. 17	00 50.65	+06 17.9	7.735	7.082	+0.55	+3.2	20.8	45.8
Feb. 27	00 56.10	+06 49.8	7.839	7.075	+0.58	+3.4	20.8	37.2
Mar. 9	01 01.92	+07 23.9	7.923	7.069	+0.61	+3.6	20.8	28.7
Mar. 19	01 08.03	+07 59.5	7.987	7.063	+0.63	+3.7	20.8	20.4
Mar. 29	01 14.35	+08 36.2	8.029	7.056	+0.65	+3.7	20.9	12.1
Apr. 8	01 20.80	+09 13.3	8.049	7.050	+0.65	+3.7	20.9	4.0
Apr. 18	01 27.31	+09 50.3	8.046	7.044	+0.65	+3.7	20.8	4.2
Apr. 28	01 33.81	+10 26.8	8.020	7.039	+0.64	+3.6	20.8	12.2
May 8	01 40.22	+11 02.3	7.972	7.033	+0.63	+3.4	20.8	20.2
May 18	01 46.48	+11 36.5	7.903	7.027	+0.60	+3.2	20.8	28.2
May 28	01 52.51	+12 08.7	7.814	7.022	+0.57	+3.0	20.8	36.2
June 7	01 58.23	+12 38.8	7.707	7.016	+0.53	+2.8	20.7	44.3
June 17	02 03.56	+13 06.3	7.583	7.011	+0.49	+2.5	20.7	52.5
June 27	02 08.42	+13 30.9	7.446	7.006	+0.43	+2.1	20.6	60.8
July 7	02 12.73	+13 52.3	7.297	7.001	+0.37	+1.8	20.6	69.2
July 17	02 16.41	+14 10.1	7.140	6.996	+0.30	+1.4	20.5	77.8
July 27	02 19.37	+14 24.0	6.978	6.991	+0.22	+1.0	20.5	86.6
Aug. 6	02 21.54	+14 33.8	6.814	6.987	+0.13	+0.5	20.4	95.6
Aug. 16	02 22.86	+14 39.2	6.653	6.982	+0.04	+0.1	20.4	104.9
Aug. 26	02 23.29	+14 40.1	6.499	6.977	-0.05	-0.4	20.3	114.4
Sept. 5	02 22.82	+14 36.5	6.356	6.973	-0.14	-0.8	20.3	124.2
Sept. 15	02 21.46	+14 28.3	6.229	6.969	-0.22	-1.2	20.2	134.3
Sept. 25	02 19.30	+14 15.9	6.123	6.965	-0.29	-1.6	20.2	144.6
Oct. 5	02 16.45	+13 59.8	6.040	6.961	-0.34	-1.9	20.1	155.2
Oct. 15	02 13.08	+13 40.8	5.985	6.957	-0.37	-2.1	20.1	165.9
Oct. 25	02 09.41	+13 19.9	5.960	6.953	-0.37	-2.2	20.1	176.8
Nov. 4	02 05.68	+12 58.3	5.965	6.949	-0.35	-2.1	20.1	172.2
Nov. 14	02 02.14	+12 37.3	6.002	6.946	-0.31	-1.9	20.1	161.2
Nov. 24	01 59.03	+12 18.5	6.067	6.942	-0.25	-1.6	20.1	150.3
Dec. 4	01 56.53	+12 02.8	6.160	6.939	-0.17	-1.1	20.2	139.5
Dec. 14	01 54.81	+11 51.3	6.275	6.936	-0.08	-0.7	20.2	128.9
Dec. 24	01 53.96	+11 44.7	6.409	6.933	+0.01	-0.1	20.2	118.5
Jan. 3	01 54.05	+11 43.2	6.558	6.930	+0.10	+0.4	20.3	108.3
Jan. 13	01 55.08	+11 47.0	6.715	6.927	+0.19	+0.9	20.3	98.4
Jan. 23	01 57.02	+11 55.7	6.876	6.924	+0.28	+1.3	20.4	88.7
Feb. 2	01 59.82	+12 09.2	7.037	6.922	+0.36	+1.8	20.4	79.3
Feb. 12	02 03.42	+12 26.8	7.193	6.919	+0.43	+2.1	20.5	70.0
Feb. 22	02 07.73	+12 48.1	7.341	6.917	+0.49	+2.4	20.5	61.1
Mar. 4	02 12.67	+13 12.3	7.477	6.915	+0.55	+2.7	20.6	52.3
Mar. 14	02 18.15	+13 38.8	7.597	6.913	+0.59	+2.8	20.6	43.7
Mar. 24	02 24.10	+14 07.1	7.700	6.911	+0.63	+2.9	20.6	35.3
Apr. 3	02 30.42	+14 36.5	7.785	6.909	+0.66	+3.0	20.6	27.0

Comet C/2012 K1 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2014 Aug. 27.61214 TT
Peri. = 203.08027
Node = 317.72387 2000.0
Incl. = 142.42727
q = 1.0548184 AU
e = 1.0002838

m1 = 6.6 + 5 log(Delta) + 7.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m		m1	Elong. °
Jan. 8	17 19.58	+08 06.7	7.602	6.899	+0.37	+2.2	17.3	41.8
Jan. 18	17 23.33	+08 28.3	7.430	6.814	+0.34	+2.9	17.2	48.2
Jan. 28	17 26.70	+08 57.5	7.240	6.728	+0.29	+3.7	17.1	55.3
Feb. 7	17 29.55	+09 34.2	7.033	6.642	+0.22	+4.4	17.0	62.8
Feb. 17	17 31.74	+10 18.4	6.814	6.555	+0.14	+5.1	16.9	70.7
Feb. 27	17 33.13	+11 09.9	6.587	6.467	+0.04	+5.8	16.8	78.8
Mar. 9	17 33.56	+12 08.1	6.354	6.380	-0.07	+6.4	16.7	87.0
Mar. 19	17 32.89	+13 12.3	6.121	6.291	-0.19	+6.9	16.5	95.3
Mar. 29	17 30.98	+14 21.3	5.893	6.202	-0.33	+7.2	16.4	103.5
Apr. 8	17 27.70	+15 33.6	5.674	6.113	-0.47	+7.3	16.3	111.6
Apr. 18	17 22.96	+16 46.9	5.469	6.023	-0.62	+7.2	16.1	119.2
Apr. 28	17 16.75	+17 58.6	5.283	5.933	-0.76	+6.7	16.0	126.2
May 8	17 09.10	+19 05.5	5.120	5.842	-0.89	+5.9	15.9	131.9
May 18	17 00.16	+20 04.2	4.983	5.751	-1.00	+4.7	15.8	135.7
May 28	16 50.20	+20 51.5	4.875	5.659	-1.06	+3.3	15.7	137.1
June 7	16 39.57	+21 24.5	4.796	5.566	-1.09	+1.7	15.6	135.6
June 17	16 28.70	+21 41.5	4.746	5.473	-1.06	0.0	15.5	131.6
June 27	16 18.09	+21 41.8	4.723	5.379	-0.99	-1.6	15.5	125.6
July 7	16 08.14	+21 26.2	4.724	5.285	-0.89	-3.0	15.4	118.5
July 17	15 59.23	+20 56.3	4.745	5.190	-0.76	-4.2	15.3	110.5
July 27	15 51.63	+20 14.7	4.781	5.094	-0.61	-5.1	15.3	102.3
Aug. 6	15 45.48	+19 24.0	4.826	4.998	-0.46	-5.7	15.3	93.8
Aug. 16	15 40.85	+18 27.1	4.876	4.901	-0.31	-6.1	15.2	85.4
Aug. 26	15 37.72	+17 26.6	4.925	4.803	-0.17	-6.2	15.2	77.2
Sept. 5	15 36.00	+16 24.7	4.968	4.704	-0.04	-6.1	15.1	69.1
Sept.15	15 35.62	+15 23.3	5.002	4.605	+0.08	-5.9	15.1	61.4
Sept.25	15 36.42	+14 24.1	5.022	4.505	+0.19	-5.6	15.0	54.0
Oct. 5	15 38.30	+13 28.3	5.024	4.405	+0.28	-5.1	14.9	47.1
Oct. 15	15 41.11	+12 37.3	5.007	4.303	+0.36	-4.5	14.9	40.9
Oct. 25	15 44.72	+11 52.0	4.967	4.201	+0.43	-3.9	14.8	35.7
Nov. 4	15 49.01	+11 13.4	4.904	4.098	+0.48	-3.1	14.6	32.0
Nov. 14	15 53.85	+10 42.6	4.816	3.993	+0.53	-2.2	14.5	30.3
Nov. 24	15 59.10	+10 20.6	4.703	3.889	+0.55	-1.2	14.4	30.8
Dec. 4	16 04.64	+10 08.5	4.565	3.783	+0.57	-0.1	14.2	33.6
Dec. 14	16 10.32	+10 07.7	4.401	3.676	+0.57	+1.2	14.1	38.0
Dec. 24	16 15.99	+10 19.6	4.215	3.568	+0.55	+2.6	13.9	43.7
Jan. 3	16 21.48	+10 46.0	4.006	3.460	+0.51	+4.3	13.7	50.2
Jan. 13	16 26.57	+11 29.2	3.778	3.350	+0.45	+6.3	13.4	57.3
Jan. 23	16 31.03	+12 31.8	3.533	3.240	+0.35	+8.6	13.2	64.8
Feb. 2	16 34.53	+13 57.4	3.276	3.128	+0.21	+11.3	12.9	72.7
Feb. 12	16 36.65	+15 50.3	3.010	3.016	+0.02	+14.6	12.6	80.9
Feb. 22	16 36.81	+18 16.1	2.740	2.902	-0.26	+18.5	12.3	89.3
Mar. 4	16 34.20	+21 21.3	2.473	2.788	-0.66	+23.2	11.9	97.9
Mar. 14	16 27.55	+25 12.8	2.216	2.672	-1.25	+28.3	11.5	106.4
Mar. 24	16 15.03	+29 55.6	1.980	2.556	-2.13	+33.0	11.1	114.2
Apr. 3	15 53.76	+35 25.8	1.775	2.439	-3.39	+35.2	10.7	120.4

Comet P/2008 J2 (Beshore)

Epoch = 2013 July 7.0 TT
T = 2014 Aug. 30.05272 TT
Peri. = 132.06540 e = 0.3188001
Node = 97.70692 2000.0 a = 3.4456002 AU
Incl. = 10.32551 n = 0.15410146
q = 2.3471425 AU P = 6.40 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′ / °	Elong. °
Jan. 8	06 52.97	+24 18.4	2.833	3.813	−0.70	−0.9	.	11.5/283	174.2
Jan. 18	06 44.73	+24 44.3	2.839	3.788	−0.69	−1.1	.	10.3/283	162.2
Jan. 28	06 37.36	+25 06.5	2.874	3.762	−0.67	−1.2	.	8.2/283	150.4
Feb. 7	06 31.45	+25 24.8	2.936	3.736	−0.64	−1.3	.	5.6/285	138.9
Feb. 17	06 27.44	+25 39.3	3.020	3.709	−0.62	−1.3	.	2.8/294	127.8
Feb. 27	06 25.57	+25 50.7	3.121	3.682	−0.59	−1.3	.	1.0/ 25	117.4
Mar. 9	06 25.87	+25 59.5	3.233	3.655	−0.57	−1.3	.	3.3/ 79	107.4
Mar. 19	06 28.28	+26 05.8	3.353	3.628	−0.55	−1.2	.	5.9/ 86	98.0
Mar. 29	06 32.65	+26 09.8	3.475	3.600	−0.53	−1.1	.	8.2/ 89	89.1
Apr. 8	06 38.77	+26 11.3	3.596	3.572	−0.52	−1.0	.	10.4/ 90	80.6
Apr. 18	06 46.46	+26 09.9	3.713	3.543	−0.51	−0.9	.	12.2/ 92	72.5
Apr. 28	06 55.50	+26 05.2	3.823	3.515	−0.50	−0.8	.	13.8/ 93	64.8
May 8	07 05.71	+25 56.9	3.923	3.485	−0.50	−0.6	.	15.2/ 94	57.4
May 18	07 16.92	+25 44.6	4.013	3.456	−0.50	−0.4	.	16.4/ 95	50.3
May 28	07 28.97	+25 27.9	4.090	3.427	−0.50	−0.3	.	17.4/ 96	43.5
June 7	07 41.72	+25 06.5	4.154	3.397	−0.50	−0.1	.	18.3/ 98	36.9
June 17	07 55.05	+24 40.3	4.203	3.367	−0.51	+0.1	.	19.1/ 99	30.4
June 27	08 08.85	+24 09.2	4.238	3.336	−0.51	+0.3	.	19.8/100	24.1
July 7	08 23.02	+23 33.2	4.258	3.306	−0.52	+0.5	.	20.3/101	18.1
July 17	08 37.48	+22 52.4	4.262	3.275	−0.52	+0.7	.	20.8/102	12.2
July 27	08 52.15	+22 06.9	4.250	3.245	−0.53	+1.0	.	21.2/103	6.9
Aug. 6	09 06.96	+21 17.1	4.224	3.214	−0.54	+1.2	23.0	21.6/104	4.6
Aug. 16	09 21.87	+20 23.4	4.182	3.183	−0.55	+1.4	22.9	21.8/105	8.1
Aug. 26	09 36.81	+19 26.3	4.125	3.152	−0.56	+1.7	22.8	22.0/105	13.5
Sept. 5	09 51.73	+18 26.2	4.054	3.120	−0.58	+1.9	22.7	22.1/106	19.3
Sept.15	10 06.60	+17 23.9	3.970	3.089	−0.59	+2.2	22.6	22.1/106	25.2
Sept.25	10 21.36	+16 20.2	3.872	3.058	−0.61	+2.4	22.4	22.1/106	31.2
Oct. 5	10 35.98	+15 15.8	3.762	3.027	−0.63	+2.7	22.3	21.9/107	37.2
Oct. 15	10 50.39	+14 11.9	3.641	2.996	−0.65	+3.0	22.1	21.6/106	43.4
Oct. 25	11 04.54	+13 09.4	3.509	2.965	−0.68	+3.3	22.0	21.1/106	49.7
Nov. 4	11 18.38	+12 09.6	3.368	2.934	−0.71	+3.6	21.8	20.5/105	56.2
Nov. 14	11 31.81	+11 13.8	3.220	2.904	−0.74	+4.0	21.6	19.7/104	62.8
Nov. 24	11 44.73	+10 23.5	3.066	2.873	−0.78	+4.4	21.5	18.7/103	69.5
Dec. 4	11 57.03	+09 40.3	2.907	2.843	−0.82	+4.8	21.3	17.4/101	76.5
Dec. 14	12 08.55	+09 05.8	2.745	2.813	−0.87	+5.2	21.1	15.8/ 99	83.7
Dec. 24	12 19.12	+08 41.8	2.584	2.784	−0.93	+5.7	20.8	14.0/ 95	91.2
Jan. 3	12 28.51	+08 30.1	2.424	2.755	−0.99	+6.2	20.6	11.8/ 89	99.0
Jan. 13	12 36.47	+08 32.3	2.269	2.726	−1.07	+6.8	20.4	9.4/ 79	107.2
Jan. 23	12 42.73	+08 49.7	2.121	2.699	−1.15	+7.4	20.2	7.1/ 62	115.8
Feb. 2	12 46.98	+09 22.8	1.984	2.671	−1.25	+8.1	20.0	5.7/ 31	124.7
Feb. 12	12 48.96	+10 11.3	1.861	2.645	−1.34	+8.7	19.7	6.2/354	134.0
Feb. 22	12 48.51	+11 12.6	1.756	2.619	−1.44	+9.2	19.5	8.2/329	143.6
Mar. 4	12 45.63	+12 22.3	1.671	2.593	−1.54	+9.6	19.4	10.2/314	152.8
Mar. 14	12 40.58	+13 33.3	1.611	2.569	−1.61	+9.8	19.2	11.5/304	160.5
Mar. 24	12 33.98	+14 37.3	1.575	2.546	−1.66	+9.6	19.1	11.6/295	163.2
Apr. 3	12 26.70	+15 25.7	1.565	2.523	−1.66	+9.3	19.0	10.3/285	158.8

Comet P/2001 BB50 (LINEAR-NEAT)

Epoch = 2013 July 7.0 TT
T = 2014 Sept. 3.12625 TT
Peri. = 193.12057 e = 0.5896310
Node = 351.49770 2000.0 a = 5.7536191 AU
Incl. = 10.34800 n = 0.07141549
q = 2.3611069 AU P = 13.80 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Variation for T=+1 day		m1	Mot./PA ′/°	Elong. °
Jan. 8	03 50.17	+32 20.4	4.194	4.923	-0.37	-1.5	.	4.5/234	133.5
Jan. 18	03 47.28	+31 53.8	4.269	4.875	-0.36	-1.5	.	2.8/213	123.0
Jan. 28	03 46.09	+31 29.8	4.359	4.827	-0.34	-1.4	.	2.1/162	112.8
Feb. 7	03 46.60	+31 09.9	4.460	4.778	-0.33	-1.4	.	3.2/118	102.9
Feb. 17	03 48.78	+30 54.8	4.566	4.729	-0.33	-1.3	.	4.9/102	93.4
Feb. 27	03 52.52	+30 44.7	4.674	4.680	-0.32	-1.2	.	6.7/ 94	84.3
Mar. 9	03 57.69	+30 39.4	4.779	4.631	-0.32	-1.1	.	8.3/ 90	75.5
Mar. 19	04 04.15	+30 38.3	4.878	4.581	-0.32	-1.0	.	9.8/ 88	67.0
Mar. 29	04 11.78	+30 41.0	4.966	4.531	-0.33	-0.9	.	11.2/ 87	58.8
Apr. 8	04 20.44	+30 46.4	5.043	4.481	-0.33	-0.9	.	12.4/ 86	51.0
Apr. 18	04 30.02	+30 53.8	5.106	4.430	-0.34	-0.8	.	13.4/ 86	43.4
Apr. 28	04 40.40	+31 02.5	5.153	4.380	-0.35	-0.7	.	14.3/ 86	36.1
May 8	04 51.47	+31 11.6	5.183	4.329	-0.36	-0.5	.	15.0/ 86	29.1
May 18	05 03.16	+31 20.4	5.196	4.278	-0.38	-0.4	.	15.6/ 86	22.3
May 28	05 15.36	+31 28.3	5.191	4.226	-0.39	-0.3	.	16.2/ 87	16.1
June 7	05 27.99	+31 34.7	5.167	4.175	-0.41	-0.1	.	16.6/ 88	10.8
June 17	05 40.98	+31 39.3	5.126	4.123	-0.42	0.0	.	16.9/ 88	8.3
June 27	05 54.24	+31 41.6	5.066	4.071	-0.44	+0.2	.	17.2/ 89	10.5
July 7	06 07.69	+31 41.4	4.990	4.019	-0.46	+0.4	23.0	17.3/ 90	15.5
July 17	06 21.25	+31 38.7	4.896	3.967	-0.48	+0.6	22.8	17.4/ 91	21.4
July 27	06 34.83	+31 33.3	4.786	3.915	-0.51	+0.8	22.7	17.3/ 92	27.7
Aug. 6	06 48.36	+31 25.4	4.661	3.863	-0.53	+1.0	22.5	17.2/ 93	34.0
Aug. 16	07 01.74	+31 15.2	4.522	3.810	-0.55	+1.3	22.4	16.9/ 93	40.6
Aug. 26	07 14.87	+31 03.1	4.371	3.758	-0.58	+1.6	22.2	16.5/ 94	47.2
Sept. 5	07 27.65	+30 49.6	4.208	3.706	-0.61	+1.9	22.1	15.9/ 94	54.0
Sept.15	07 39.96	+30 35.3	4.035	3.653	-0.64	+2.2	21.9	15.2/ 95	60.9
Sept.25	07 51.67	+30 21.2	3.854	3.601	-0.68	+2.6	21.7	14.3/ 95	68.0
Oct. 5	08 02.63	+30 08.0	3.667	3.549	-0.72	+2.9	21.5	13.1/ 94	75.4
Oct. 15	08 12.66	+29 57.0	3.476	3.497	-0.76	+3.3	21.3	11.6/ 93	83.0
Oct. 25	08 21.59	+29 49.1	3.284	3.445	-0.81	+3.8	21.0	9.9/ 91	90.8
Nov. 4	08 29.19	+29 45.8	3.093	3.393	-0.87	+4.2	20.8	7.8/ 88	99.1
Nov. 14	08 35.20	+29 48.0	2.906	3.342	-0.93	+4.7	20.6	5.5/ 81	107.6
Nov. 24	08 39.38	+29 56.5	2.728	3.291	-1.00	+5.1	20.3	3.1/ 60	116.7
Dec. 4	08 41.45	+30 11.6	2.560	3.240	-1.08	+5.5	20.1	2.1/351	126.1
Dec. 14	08 41.18	+30 32.6	2.408	3.190	-1.16	+5.8	19.9	4.3/306	136.0
Dec. 24	08 38.47	+30 57.6	2.275	3.141	-1.24	+6.0	19.6	7.0/292	146.1
Jan. 3	08 33.39	+31 23.3	2.166	3.091	-1.31	+6.1	19.4	9.3/284	156.3
Jan. 13	08 26.31	+31 45.1	2.082	3.043	-1.36	+6.0	19.2	10.8/278	165.1
Jan. 23	08 17.92	+31 58.4	2.027	2.995	-1.39	+5.7	19.1	11.1/271	167.6
Feb. 2	08 09.18	+31 59.2	2.000	2.948	-1.40	+5.4	18.9	10.3/263	160.9
Feb. 12	08 01.20	+31 45.5	2.000	2.902	-1.37	+5.0	18.8	8.4/251	150.9
Feb. 22	07 54.97	+31 17.7	2.025	2.858	-1.32	+4.8	18.8	6.3/231	140.5
Mar. 4	07 51.17	+30 37.7	2.070	2.814	-1.27	+4.6	18.7	5.1/194	130.2
Mar. 14	07 50.20	+29 47.9	2.132	2.771	-1.20	+4.6	18.7	6.2/156	120.4
Mar. 24	07 52.10	+28 50.8	2.206	2.730	-1.14	+4.6	18.7	8.8/136	111.3
Apr. 3	07 56.73	+27 47.7	2.288	2.691	-1.09	+4.8	18.6	11.7/125	102.7

Comet 32P/Comas Sola

Epoch = 2013 July 7.0 TT
T = 2014 Oct. 17.63404 TT
Peri. = 53.32743 e = 0.5558717
Node = 57.85598 2000.0 a = 4.5070247 AU
Incl. = 9.97041 n = 0.10300758
q = 2.0016972 AU P = 9.57 years

m1 = 8.2 + 5 log(Delta) + 15.0 log(r(t-20))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	22 31.54	-18 30.3	5.502	4.866	+0.73	+5.5	22.3	45.6
Jan. 18	22 38.83	-17 35.4	5.566	4.824	+0.78	+5.7	22.3	37.6
Jan. 28	22 46.68	-16 38.4	5.612	4.782	+0.83	+5.9	22.3	29.8
Feb. 7	22 54.97	-15 39.6	5.638	4.740	+0.87	+6.0	22.2	22.3
Feb. 17	23 03.63	-14 39.7	5.643	4.697	+0.89	+6.1	22.2	15.2
Feb. 27	23 12.54	-13 39.1	5.628	4.654	+0.91	+6.1	22.1	9.5
Mar. 9	23 21.63	-12 38.3	5.591	4.610	+0.92	+6.0	22.0	8.1
Mar. 19	23 30.84	-11 37.9	5.533	4.566	+0.92	+6.0	21.9	12.4
Mar. 29	23 40.07	-10 38.4	5.455	4.521	+0.92	+5.8	21.8	18.7
Apr. 8	23 49.27	-09 40.3	5.358	4.476	+0.91	+5.6	21.7	25.6
Apr. 18	23 58.37	-08 44.3	5.242	4.430	+0.89	+5.3	21.6	32.7
Apr. 28	00 07.29	-07 50.9	5.110	4.384	+0.87	+5.0	21.5	39.8
May 8	00 15.95	-07 00.9	4.962	4.338	+0.83	+4.6	21.4	47.1
May 18	00 24.29	-06 14.7	4.801	4.291	+0.79	+4.1	21.2	54.4
May 28	00 32.19	-05 33.3	4.628	4.244	+0.74	+3.6	21.1	61.8
June 7	00 39.57	-04 57.1	4.445	4.196	+0.67	+3.0	20.9	69.3
June 17	00 46.30	-04 27.1	4.255	4.148	+0.59	+2.3	20.8	77.1
June 27	00 52.25	-04 03.9	4.061	4.099	+0.50	+1.6	20.6	85.0
July 7	00 57.28	-03 48.3	3.865	4.050	+0.39	+0.7	20.4	93.1
July 17	01 01.21	-03 41.0	3.670	4.000	+0.27	-0.2	20.2	101.6
July 27	01 03.88	-03 42.5	3.480	3.950	+0.12	-1.1	20.0	110.4
Aug. 6	01 05.11	-03 53.3	3.299	3.900	-0.04	-2.0	19.8	119.5
Aug. 16	01 04.76	-04 13.2	3.130	3.849	-0.20	-2.8	19.6	129.1
Aug. 26	01 02.74	-04 41.4	2.977	3.798	-0.37	-3.5	19.4	139.0
Sept. 5	00 59.03	-05 16.6	2.845	3.747	-0.53	-4.0	19.3	149.2
Sept. 15	00 53.76	-05 56.3	2.738	3.695	-0.65	-4.1	19.1	159.2
Sept. 25	00 47.23	-06 36.9	2.657	3.643	-0.73	-3.8	18.9	167.5
Oct. 5	00 39.90	-07 14.5	2.606	3.591	-0.75	-3.0	18.8	168.1
Oct. 15	00 32.39	-07 44.7	2.584	3.538	-0.70	-1.9	18.7	160.0
Oct. 25	00 25.35	-08 04.0	2.591	3.485	-0.60	-0.6	18.6	149.5
Nov. 4	00 19.39	-08 09.9	2.623	3.431	-0.44	+0.9	18.5	138.7
Nov. 14	00 15.00	-08 01.3	2.676	3.378	-0.25	+2.3	18.5	128.1
Nov. 24	00 12.49	-07 38.3	2.747	3.324	-0.05	+3.7	18.4	117.8
Dec. 4	00 11.99	-07 01.5	2.829	3.270	+0.15	+4.9	18.4	108.0
Dec. 14	00 13.52	-06 12.3	2.918	3.216	+0.35	+6.0	18.4	98.6
Dec. 24	00 16.98	-05 12.1	3.011	3.162	+0.53	+7.0	18.3	89.7
Jan. 3	00 22.24	-04 02.3	3.102	3.108	+0.69	+7.8	18.3	81.2
Jan. 13	00 29.13	-02 44.2	3.190	3.054	+0.84	+8.5	18.2	73.2
Jan. 23	00 37.48	-01 19.0	3.271	3.000	+0.97	+9.1	18.2	65.5
Feb. 2	00 47.15	+00 12.3	3.344	2.946	+1.09	+9.6	18.1	58.2
Feb. 12	00 58.02	+01 48.6	3.406	2.892	+1.19	+10.0	18.0	51.2
Feb. 22	01 09.96	+03 28.9	3.458	2.838	+1.29	+10.3	17.9	44.5
Mar. 4	01 22.90	+05 12.3	3.498	2.785	+1.39	+10.6	17.8	38.1
Mar. 14	01 36.78	+06 58.1	3.525	2.732	+1.48	+10.7	17.7	31.9
Mar. 24	01 51.53	+08 45.1	3.540	2.680	+1.56	+10.7	17.6	26.1
Apr. 3	02 07.14	+10 32.5	3.543	2.629	+1.64	+10.7	17.5	20.4

Comet C/2013 A1 (Siding Spring)

Epoch = 2013 July 7.0 TT
T = 2014 Oct. 25.03029 TT
Peri. = 2.47466
Node = 300.92425 2000.0
Incl. = 128.99994
q = 1.3956109 AU
e = 1.0004297

m1 = 5.8 + 5 log(Delta) + 10.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	05 08.96	-21 26.9	6.538	7.165	-0.68	+1.5	18.4	126.3
Jan. 18	05 02.18	-21 11.7	6.543	7.083	-0.60	+2.5	18.4	119.8
Jan. 28	04 56.21	-20 46.7	6.567	7.001	-0.50	+3.3	18.3	112.3
Feb. 7	04 51.22	-20 13.7	6.606	6.919	-0.39	+3.9	18.3	104.5
Feb. 17	04 47.32	-19 34.8	6.655	6.836	-0.28	+4.3	18.3	96.4
Feb. 27	04 44.56	-18 52.2	6.708	6.752	-0.16	+4.4	18.2	88.3
Mar. 9	04 42.92	-18 08.1	6.762	6.669	-0.06	+4.4	18.2	80.4
Mar. 19	04 42.35	-17 24.0	6.811	6.585	+0.04	+4.2	18.2	72.7
Mar. 29	04 42.79	-16 41.8	6.852	6.500	+0.13	+3.9	18.1	65.4
Apr. 8	04 44.12	-16 02.8	6.881	6.416	+0.21	+3.5	18.1	58.5
Apr. 18	04 46.26	-15 27.9	6.896	6.330	+0.28	+3.0	18.0	52.2
Apr. 28	04 49.09	-14 58.4	6.892	6.245	+0.34	+2.4	17.9	46.7
May 8	04 52.49	-14 34.8	6.870	6.159	+0.39	+1.7	17.9	42.1
May 18	04 56.38	-14 18.0	6.828	6.072	+0.42	+0.9	17.8	38.8
May 28	05 00.62	-14 08.7	6.764	5.985	+0.45	+0.1	17.7	37.0
June 7	05 05.14	-14 07.3	6.678	5.898	+0.47	-0.7	17.6	36.9
June 17	05 09.80	-14 14.5	6.572	5.810	+0.47	-1.6	17.5	38.4
June 27	05 14.51	-14 30.8	6.445	5.722	+0.46	-2.6	17.4	41.4
July 7	05 19.15	-14 56.8	6.298	5.633	+0.44	-3.6	17.3	45.6
July 17	05 23.60	-15 33.2	6.133	5.544	+0.41	-4.7	17.2	50.6
July 27	05 27.72	-16 20.4	5.952	5.454	+0.37	-5.9	17.0	56.3
Aug. 6	05 31.37	-17 19.0	5.757	5.364	+0.30	-7.1	16.9	62.5
Aug. 16	05 34.37	-18 29.5	5.551	5.274	+0.22	-8.3	16.7	69.0
Aug. 26	05 36.55	-19 52.2	5.337	5.182	+0.11	-9.5	16.6	75.8
Sept. 5	05 37.67	-21 27.3	5.119	5.091	-0.02	-10.7	16.4	82.7
Sept.15	05 37.49	-23 14.5	4.900	4.999	-0.18	-11.8	16.2	89.8
Sept.25	05 35.73	-25 12.8	4.686	4.906	-0.37	-12.8	16.1	96.7
Oct. 5	05 32.08	-27 20.6	4.480	4.813	-0.59	-13.4	15.9	103.5
Oct. 15	05 26.21	-29 34.5	4.288	4.719	-0.83	-13.5	15.7	109.7
Oct. 25	05 17.86	-31 49.9	4.115	4.625	-1.10	-13.1	15.5	115.1
Nov. 4	05 06.84	-34 00.6	3.964	4.530	-1.37	-11.8	15.4	119.1
Nov. 14	04 53.14	-35 58.6	3.840	4.434	-1.61	-9.7	15.2	121.2
Nov. 24	04 37.08	-37 35.6	3.744	4.338	-1.78	-6.9	15.0	121.2
Dec. 4	04 19.29	-38 44.1	3.677	4.242	-1.85	-3.5	14.9	118.8
Dec. 14	04 00.76	-39 19.1	3.639	4.145	-1.81	-0.1	14.8	114.5
Dec. 24	03 42.63	-39 19.7	3.626	4.047	-1.67	+3.1	14.7	108.5
Jan. 3	03 25.93	-38 48.3	3.633	3.949	-1.45	+5.7	14.6	101.5
Jan. 13	03 11.45	-37 50.8	3.656	3.850	-1.19	+7.7	14.5	93.9
Jan. 23	02 59.59	-36 34.3	3.688	3.751	-0.92	+8.9	14.4	86.0
Feb. 2	02 50.43	-35 05.5	3.723	3.651	-0.66	+9.5	14.3	78.2
Feb. 12	02 43.86	-33 30.5	3.755	3.551	-0.43	+9.6	14.2	70.5
Feb. 22	02 39.61	-31 54.4	3.779	3.450	-0.22	+9.4	14.1	63.3
Mar. 4	02 37.38	-30 20.5	3.791	3.348	-0.05	+8.9	13.9	56.5
Mar. 14	02 36.87	-28 51.8	3.787	3.247	+0.09	+8.2	13.8	50.5
Mar. 24	02 37.79	-27 30.3	3.763	3.144	+0.21	+7.3	13.7	45.4
Apr. 3	02 39.88	-26 17.5	3.717	3.042	+0.30	+6.3	13.5	41.5

Comet 269P/Jedicke

Epoch = 2013 July 7.0 TT
T = 2014 Nov. 16.23329 TT
Peri. = 223.51043 e = 0.4391374
Node = 248.76693 2000.0 a = 7.2714654 AU
Incl. = 6.61661 n = 0.05026563
q = 4.0782930 AU P = 19.61 years

m1 = 3.2 + 5 log(Delta) + 17.5 log(r(t-90))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	01 18.83	+12 36.4	5.240	5.419	+0.31	+0.6	20.0	95.2
Jan. 18	01 21.92	+12 41.9	5.370	5.388	+0.41	+1.2	20.0	85.8
Jan. 28	01 26.06	+12 54.2	5.498	5.358	+0.51	+1.8	20.0	76.7
Feb. 7	01 31.17	+13 12.6	5.621	5.327	+0.60	+2.4	20.0	67.8
Feb. 17	01 37.14	+13 36.2	5.735	5.297	+0.67	+2.8	20.0	59.2
Feb. 27	01 43.87	+14 04.4	5.836	5.267	+0.74	+3.2	20.0	50.8
Mar. 9	01 51.26	+14 36.4	5.923	5.237	+0.80	+3.5	20.0	42.7
Mar. 19	01 59.23	+15 11.2	5.994	5.207	+0.85	+3.7	20.0	34.8
Mar. 29	02 07.68	+15 48.1	6.047	5.177	+0.89	+3.8	20.0	27.0
Apr. 8	02 16.54	+16 26.5	6.081	5.148	+0.92	+3.9	20.0	19.4
Apr. 18	02 25.73	+17 05.5	6.096	5.118	+0.94	+3.9	19.9	12.0
Apr. 28	02 35.17	+17 44.7	6.091	5.089	+0.96	+3.9	19.9	5.0
May 8	02 44.80	+18 23.3	6.066	5.060	+0.97	+3.8	19.8	3.8
May 18	02 54.54	+19 00.9	6.022	5.031	+0.98	+3.6	19.8	10.5
May 28	03 04.31	+19 37.1	5.958	5.002	+0.97	+3.4	19.7	17.6
June 7	03 14.05	+20 11.3	5.877	4.973	+0.96	+3.2	19.6	24.8
June 17	03 23.67	+20 43.3	5.777	4.945	+0.94	+2.9	19.5	32.0
June 27	03 33.07	+21 12.7	5.661	4.917	+0.91	+2.7	19.5	39.3
July 7	03 42.18	+21 39.3	5.531	4.889	+0.87	+2.4	19.4	46.6
July 17	03 50.88	+22 02.8	5.387	4.862	+0.82	+2.0	19.3	54.1
July 27	03 59.05	+22 23.2	5.232	4.834	+0.75	+1.7	19.2	61.7
Aug. 6	04 06.58	+22 40.3	5.067	4.807	+0.67	+1.4	19.0	69.5
Aug. 16	04 13.32	+22 54.0	4.895	4.780	+0.58	+1.0	18.9	77.6
Aug. 26	04 19.13	+23 04.3	4.719	4.754	+0.47	+0.7	18.8	85.8
Sept. 5	04 23.87	+23 11.0	4.542	4.728	+0.35	+0.3	18.7	94.4
Sept. 15	04 27.37	+23 14.2	4.367	4.702	+0.21	-0.1	18.5	103.3
Sept. 25	04 29.51	+23 13.6	4.198	4.676	+0.07	-0.4	18.4	112.6
Oct. 5	04 30.20	+23 09.2	4.039	4.651	-0.08	-0.8	18.3	122.3
Oct. 15	04 29.37	+23 00.9	3.895	4.626	-0.23	-1.2	18.2	132.4
Oct. 25	04 27.08	+22 48.4	3.770	4.602	-0.36	-1.6	18.1	142.9
Nov. 4	04 23.47	+22 32.0	3.667	4.578	-0.47	-2.0	18.0	153.7
Nov. 14	04 18.81	+22 11.9	3.591	4.554	-0.53	-2.3	17.9	164.9
Nov. 24	04 13.48	+21 48.8	3.545	4.531	-0.55	-2.5	17.8	176.2
Dec. 4	04 07.96	+21 24.0	3.529	4.508	-0.52	-2.5	17.7	172.3
Dec. 14	04 02.75	+20 59.0	3.544	4.485	-0.44	-2.3	17.7	160.8
Dec. 24	03 58.31	+20 35.7	3.587	4.463	-0.33	-2.0	17.7	149.6
Jan. 3	03 55.03	+20 15.7	3.657	4.442	-0.19	-1.6	17.7	138.6
Jan. 13	03 53.18	+20 00.1	3.748	4.421	-0.03	-1.0	17.7	127.9
Jan. 23	03 52.89	+19 49.9	3.857	4.400	+0.13	-0.5	17.7	117.6
Feb. 2	03 54.22	+19 45.1	3.978	4.380	+0.29	0.0	17.8	107.7
Feb. 12	03 57.13	+19 45.5	4.108	4.361	+0.44	+0.5	17.8	98.3
Feb. 22	04 01.52	+19 50.6	4.241	4.342	+0.58	+0.9	17.8	89.2
Mar. 4	04 07.28	+19 59.4	4.375	4.324	+0.70	+1.2	17.8	80.5
Mar. 14	04 14.28	+20 11.0	4.505	4.306	+0.81	+1.3	17.9	72.2
Mar. 24	04 22.37	+20 24.3	4.628	4.288	+0.91	+1.4	17.9	64.1
Apr. 3	04 31.42	+20 38.4	4.743	4.272	+0.99	+1.4	17.9	56.4

Comet 110P/Hartley

Epoch = 2013 July 7.0 TT
T = 2014 Dec. 17.67335 TT
Peri. = 167.69831 e = 0.3142147
Node = 287.71337 2000.0 a = 3.6108313 AU
Incl. = 11.69370 n = 0.14364592
q = 2.4762550 AU P = 6.86 years

m1 = 3.2 + 5 log(Delta) + 20.0 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m ′		m1	Elong. °
Jan. 8	21 05.48	-10 53.0	4.978	4.139	+1.02	+5.1	19.0	28.4
Jan. 18	21 15.68	-10 02.4	5.020	4.117	+1.04	+5.5	19.0	21.1
Jan. 28	21 26.11	-09 07.2	5.042	4.094	+1.06	+5.9	19.0	14.1
Feb. 7	21 36.69	-08 08.0	5.046	4.071	+1.06	+6.3	18.9	8.0
Feb. 17	21 47.32	-07 04.9	5.029	4.048	+1.06	+6.6	18.9	6.1
Feb. 27	21 57.92	-05 58.5	4.993	4.025	+1.05	+6.9	18.8	10.7
Mar. 9	22 08.43	-04 49.2	4.939	4.001	+1.03	+7.2	18.7	17.2
Mar. 19	22 18.77	-03 37.5	4.865	3.976	+1.01	+7.4	18.6	24.0
Mar. 29	22 28.87	-02 23.8	4.775	3.952	+0.98	+7.5	18.5	30.9
Apr. 8	22 38.65	-01 08.8	4.668	3.927	+0.94	+7.6	18.4	37.9
Apr. 18	22 48.03	+00 07.1	4.547	3.901	+0.89	+7.6	18.3	44.9
Apr. 28	22 56.94	+01 23.1	4.413	3.876	+0.83	+7.6	18.2	52.1
May 8	23 05.29	+02 38.9	4.267	3.850	+0.77	+7.5	18.1	59.3
May 18	23 12.97	+03 53.5	4.111	3.824	+0.69	+7.3	17.9	66.6
May 28	23 19.86	+05 06.3	3.949	3.797	+0.60	+7.0	17.8	74.0
June 7	23 25.84	+06 16.5	3.781	3.770	+0.49	+6.7	17.6	81.7
June 17	23 30.76	+07 23.1	3.610	3.743	+0.37	+6.2	17.5	89.6
June 27	23 34.46	+08 24.8	3.440	3.716	+0.23	+5.6	17.3	97.7
July 7	23 36.78	+09 20.6	3.274	3.688	+0.08	+4.8	17.1	106.1
July 17	23 37.55	+10 08.6	3.114	3.660	-0.09	+3.9	16.9	114.9
July 27	23 36.68	+10 47.3	2.965	3.632	-0.26	+2.7	16.8	124.1
Aug. 6	23 34.10	+11 14.8	2.829	3.604	-0.42	+1.5	16.6	133.5
Aug. 16	23 29.85	+11 29.3	2.713	3.575	-0.57	0.0	16.4	143.2
Aug. 26	23 24.16	+11 29.7	2.618	3.546	-0.68	-1.4	16.3	152.7
Sept. 5	23 17.38	+11 15.6	2.548	3.517	-0.73	-2.7	16.2	161.0
Sept. 15	23 10.07	+10 48.2	2.506	3.488	-0.72	-3.8	16.0	165.1
Sept. 25	23 02.86	+10 10.1	2.493	3.459	-0.64	-4.5	16.0	161.5
Oct. 5	22 56.42	+09 25.3	2.507	3.429	-0.51	-4.7	15.9	153.1
Oct. 15	22 51.32	+08 38.6	2.548	3.400	-0.33	-4.4	15.9	143.3
Oct. 25	22 47.97	+07 54.6	2.610	3.370	-0.14	-3.7	15.8	133.2
Nov. 4	22 46.61	+07 17.1	2.692	3.340	+0.07	-2.8	15.8	123.2
Nov. 14	22 47.31	+06 49.1	2.787	3.310	+0.27	-1.7	15.8	113.6
Nov. 24	22 50.01	+06 32.2	2.893	3.280	+0.46	-0.5	15.8	104.4
Dec. 4	22 54.57	+06 27.4	3.004	3.250	+0.63	+0.7	15.8	95.5
Dec. 14	23 00.83	+06 34.8	3.117	3.220	+0.78	+1.9	15.8	87.1
Dec. 24	23 08.60	+06 53.9	3.228	3.190	+0.91	+3.0	15.8	79.0
Jan. 3	23 17.68	+07 24.2	3.336	3.160	+1.02	+4.1	15.8	71.3
Jan. 13	23 27.92	+08 04.7	3.437	3.131	+1.12	+5.0	15.8	63.8
Jan. 23	23 39.15	+08 54.4	3.530	3.101	+1.21	+5.8	15.8	56.7
Feb. 2	23 51.26	+09 52.3	3.613	3.072	+1.29	+6.5	15.7	49.8
Feb. 12	00 04.14	+10 57.3	3.685	3.042	+1.36	+7.1	15.7	43.2
Feb. 22	00 17.69	+12 08.2	3.745	3.013	+1.42	+7.6	15.6	36.9
Mar. 4	00 31.86	+13 23.9	3.793	2.984	+1.47	+7.9	15.6	30.8
Mar. 14	00 46.59	+14 43.4	3.827	2.956	+1.52	+8.2	15.5	24.9
Mar. 24	01 01.82	+16 05.5	3.849	2.928	+1.57	+8.4	15.5	19.4
Apr. 3	01 17.55	+17 29.2	3.858	2.900	+1.62	+8.4	15.4	14.4

Comet 44P/Reinmuth

Epoch = 2013 July 7.0 TT
T = 2015 Mar. 24.17877 TT
Peri. = 58.33661 e = 0.4267621
Node = 286.47413 2000.0 a = 3.6933369 AU
Incl. = 5.89537 n = 0.13885953
q = 2.1171607 AU P = 7.10 years

m1 = 12.4 + 5 log(Delta) + 7.5 log(r(t-60))

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	13 40.45	-16 37.0	4.813	4.715	+0.39	-3.4	21.0	78.4
Jan. 18	13 44.36	-17 11.3	4.631	4.692	+0.27	-2.9	20.9	87.5
Jan. 28	13 47.09	-17 40.0	4.448	4.669	+0.14	-2.2	20.8	96.8
Feb. 7	13 48.49	-18 02.0	4.268	4.645	0.00	-1.5	20.6	106.5
Feb. 17	13 48.46	-18 16.6	4.095	4.620	-0.15	-0.6	20.5	116.4
Feb. 27	13 46.92	-18 22.8	3.935	4.596	-0.30	+0.3	20.4	126.7
Mar. 9	13 43.89	-18 19.9	3.791	4.570	-0.44	+1.3	20.3	137.2
Mar. 19	13 39.49	-18 07.3	3.669	4.544	-0.55	+2.2	20.3	148.0
Mar. 29	13 33.95	-17 45.3	3.573	4.518	-0.63	+3.1	20.2	158.7
Apr. 8	13 27.63	-17 14.7	3.505	4.491	-0.67	+3.7	20.1	168.7
Apr. 18	13 20.98	-16 37.3	3.467	4.464	-0.65	+4.2	20.1	171.9
Apr. 28	13 14.48	-15 55.8	3.460	4.436	-0.59	+4.3	20.1	163.8
May 8	13 08.60	-15 13.2	3.483	4.408	-0.49	+4.1	20.1	153.3
May 18	13 03.73	-14 32.6	3.532	4.379	-0.36	+3.6	20.1	142.6
May 28	13 00.17	-13 57.0	3.604	4.350	-0.21	+2.9	20.1	132.2
June 7	12 58.05	-13 28.2	3.694	4.320	-0.06	+2.0	20.1	122.1
June 17	12 57.46	-13 07.8	3.799	4.290	+0.09	+1.1	20.2	112.4
June 27	12 58.38	-12 56.5	3.913	4.259	+0.24	+0.2	20.2	103.0
July 7	13 00.74	-12 54.3	4.032	4.228	+0.37	-0.7	20.3	94.1
July 17	13 04.43	-13 00.9	4.153	4.196	+0.49	-1.5	20.3	85.4
July 27	13 09.35	-13 15.7	4.271	4.164	+0.60	-2.2	20.3	77.1
Aug. 6	13 15.37	-13 38.0	4.383	4.131	+0.70	-2.9	20.4	69.1
Aug. 16	13 22.40	-14 06.8	4.487	4.098	+0.79	-3.5	20.4	61.3
Aug. 26	13 30.32	-14 41.4	4.580	4.065	+0.87	-3.9	20.4	53.7
Sept. 5	13 39.05	-15 20.8	4.661	4.031	+0.95	-4.3	20.4	46.3
Sept.15	13 48.51	-16 04.1	4.728	3.997	+1.01	-4.6	20.4	39.0
Sept.25	13 58.61	-16 50.6	4.778	3.962	+1.07	-4.9	20.4	31.8
Oct. 5	14 09.29	-17 39.2	4.812	3.926	+1.12	-5.0	20.4	24.8
Oct. 15	14 20.50	-18 29.4	4.828	3.891	+1.17	-5.1	20.4	17.8
Oct. 25	14 32.16	-19 20.2	4.826	3.854	+1.21	-5.1	20.4	11.1
Nov. 4	14 44.22	-20 11.0	4.804	3.818	+1.24	-5.0	20.3	5.2
Nov. 14	14 56.62	-21 01.1	4.764	3.781	+1.27	-4.9	20.3	5.5
Nov. 24	15 09.29	-21 49.8	4.706	3.743	+1.29	-4.7	20.2	11.5
Dec. 4	15 22.17	-22 36.5	4.629	3.705	+1.30	-4.4	20.2	18.2
Dec. 14	15 35.16	-23 20.8	4.534	3.667	+1.30	-4.1	20.1	25.2
Dec. 24	15 48.18	-24 02.0	4.423	3.628	+1.30	-3.8	20.0	32.2
Jan. 3	16 01.15	-24 40.0	4.295	3.589	+1.28	-3.4	19.9	39.3
Jan. 13	16 13.93	-25 14.4	4.154	3.550	+1.25	-3.1	19.8	46.5
Jan. 23	16 26.41	-25 45.0	4.000	3.510	+1.20	-2.7	19.7	53.8
Feb. 2	16 38.44	-26 11.8	3.836	3.470	+1.14	-2.3	19.6	61.2
Feb. 12	16 49.86	-26 34.9	3.662	3.430	+1.06	-2.0	19.5	68.7
Feb. 22	17 00.50	-26 54.5	3.483	3.389	+0.96	-1.6	19.3	76.4
Mar. 4	17 10.14	-27 10.8	3.299	3.348	+0.84	-1.3	19.2	84.2
Mar. 14	17 18.57	-27 24.2	3.114	3.307	+0.70	-1.1	19.0	92.3
Mar. 24	17 25.54	-27 35.1	2.930	3.265	+0.52	-0.9	18.8	100.7
Apr. 3	17 30.78	-27 43.6	2.751	3.224	+0.33	-0.6	18.6	109.4

Comet C/2012 F3 (PANSTARRS)

Epoch = 2013 July 7.0 TT
T = 2015 Apr. 2.66579 TT
Peri. = 103.41506
Node = 164.66033 2000.0
Incl. = 11.21798
q = 3.4908104 AU
e = 1.0014561

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	12 03.15	+01 33.2	7.281	7.635	+0.02	+0.7	18.7	107.6
Jan. 18	12 03.34	+01 40.6	7.062	7.570	-0.06	+1.3	18.6	117.8
Jan. 28	12 02.70	+01 53.6	6.857	7.505	-0.14	+1.8	18.5	128.1
Feb. 7	12 01.27	+02 12.0	6.670	7.440	-0.22	+2.3	18.4	138.7
Feb. 17	11 59.10	+02 35.1	6.507	7.375	-0.28	+2.7	18.3	149.5
Feb. 27	11 56.30	+03 02.1	6.370	7.310	-0.33	+3.0	18.3	160.3
Mar. 9	11 53.04	+03 31.6	6.262	7.245	-0.35	+3.1	18.2	171.0
Mar. 19	11 49.51	+04 02.4	6.186	7.180	-0.36	+3.0	18.1	176.4
Mar. 29	11 45.92	+04 32.7	6.140	7.115	-0.34	+2.8	18.1	166.4
Apr. 8	11 42.50	+05 01.0	6.125	7.049	-0.30	+2.5	18.0	155.7
Apr. 18	11 39.47	+05 25.9	6.137	6.984	-0.25	+2.0	18.0	145.1
Apr. 28	11 37.02	+05 46.3	6.174	6.919	-0.17	+1.5	18.0	134.7
May 8	11 35.28	+06 01.3	6.232	6.854	-0.09	+0.9	17.9	124.5
May 18	11 34.37	+06 10.3	6.305	6.789	0.00	+0.3	17.9	114.6
May 28	11 34.33	+06 13.3	6.390	6.724	+0.09	-0.3	17.9	105.0
June 7	11 35.19	+06 10.1	6.482	6.658	+0.18	-0.9	17.9	95.6
June 17	11 36.94	+06 01.1	6.576	6.593	+0.26	-1.5	17.9	86.5
June 27	11 39.55	+05 46.5	6.669	6.528	+0.34	-2.0	17.9	77.7
July 7	11 42.95	+05 26.8	6.756	6.463	+0.42	-2.4	17.9	69.1
July 17	11 47.10	+05 02.5	6.834	6.398	+0.48	-2.8	17.8	60.7
July 27	11 51.93	+04 34.0	6.901	6.334	+0.54	-3.2	17.8	52.5
Aug. 6	11 57.36	+04 01.9	6.954	6.269	+0.60	-3.5	17.8	44.4
Aug. 16	12 03.34	+03 26.6	6.990	6.204	+0.64	-3.8	17.7	36.4
Aug. 26	12 09.79	+02 48.9	7.008	6.140	+0.69	-4.0	17.7	28.6
Sept. 5	12 16.64	+02 09.1	7.007	6.075	+0.72	-4.1	17.7	20.9
Sept.15	12 23.85	+01 27.8	6.985	6.011	+0.75	-4.2	17.6	13.3
Sept.25	12 31.33	+00 45.6	6.942	5.946	+0.77	-4.2	17.6	6.3
Oct. 5	12 39.03	+00 03.2	6.878	5.882	+0.79	-4.2	17.5	4.8
Oct. 15	12 46.88	-00 39.0	6.793	5.818	+0.79	-4.1	17.4	11.3
Oct. 25	12 54.81	-01 20.3	6.687	5.755	+0.79	-4.0	17.3	18.9
Nov. 4	13 02.76	-02 00.1	6.560	5.691	+0.79	-3.8	17.2	26.6
Nov. 14	13 10.64	-02 37.7	6.414	5.628	+0.77	-3.5	17.1	34.6
Nov. 24	13 18.37	-03 12.4	6.251	5.565	+0.75	-3.1	17.0	42.6
Dec. 4	13 25.86	-03 43.6	6.072	5.502	+0.71	-2.7	16.9	50.7
Dec. 14	13 33.00	-04 10.6	5.880	5.439	+0.67	-2.2	16.8	59.0
Dec. 24	13 39.70	-04 32.7	5.676	5.377	+0.61	-1.7	16.7	67.5
Jan. 3	13 45.83	-04 49.2	5.464	5.315	+0.54	-1.0	16.5	76.1
Jan. 13	13 51.27	-04 59.5	5.248	5.253	+0.46	-0.4	16.4	84.9
Jan. 23	13 55.90	-05 03.1	5.030	5.192	+0.37	+0.4	16.3	93.9
Feb. 2	13 59.59	-04 59.5	4.815	5.131	+0.26	+1.1	16.1	103.2
Feb. 12	14 02.23	-04 48.5	4.607	5.070	+0.15	+1.8	16.0	112.7
Feb. 22	14 03.73	-04 30.1	4.410	5.010	+0.03	+2.6	15.8	122.4
Mar. 4	14 04.03	-04 04.5	4.228	4.950	-0.09	+3.2	15.7	132.3
Mar. 14	14 03.14	-03 32.7	4.066	4.891	-0.20	+3.7	15.5	142.4
Mar. 24	14 01.15	-02 55.9	3.926	4.832	-0.29	+4.0	15.4	152.5
Apr. 3	13 58.20	-02 16.0	3.813	4.774	-0.36	+4.1	15.3	162.2

Comet 174P/(60558) Echeclus

Epoch = 2013 July 7.0 TT
T = 2015 Apr. 23.11837 TT
Peri. = 162.96980 e = 0.4562047
Node = 173.36080 2000.0 a = 10.6951382 AU
Incl. = 4.34186 n = 0.02817893
q = 5.8159659 AU P = 34.98 years

H = 9.4 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	18 24.45	-19 33.9	7.943	6.986	+0.74	+0.6	18.3	12.5
Jan. 18	18 31.84	-19 28.1	7.874	6.962	+0.72	+0.8	18.4	20.7
Jan. 28	18 39.03	-19 20.4	7.783	6.938	+0.69	+0.9	18.4	29.0
Feb. 7	18 45.94	-19 11.2	7.671	6.915	+0.65	+1.1	18.4	37.5
Feb. 17	18 52.46	-19 00.7	7.541	6.891	+0.60	+1.1	18.4	46.0
Feb. 27	18 58.50	-18 49.2	7.394	6.868	+0.55	+1.2	18.4	54.6
Mar. 9	19 03.96	-18 37.2	7.234	6.845	+0.48	+1.2	18.4	63.3
Mar. 19	19 08.76	-18 25.1	7.062	6.822	+0.40	+1.2	18.4	72.1
Mar. 29	19 12.81	-18 13.3	6.884	6.799	+0.32	+1.1	18.3	81.0
Apr. 8	19 16.03	-18 02.2	6.701	6.777	+0.23	+1.0	18.3	90.0
Apr. 18	19 18.33	-17 52.4	6.520	6.754	+0.14	+0.8	18.2	99.3
Apr. 28	19 19.69	-17 44.3	6.342	6.732	+0.04	+0.6	18.1	108.6
May 8	19 20.07	-17 38.1	6.174	6.710	-0.06	+0.4	18.0	118.2
May 18	19 19.46	-17 34.2	6.018	6.688	-0.15	+0.2	17.9	127.9
May 28	19 17.91	-17 32.7	5.880	6.666	-0.24	-0.1	17.8	137.8
June 7	19 15.51	-17 33.6	5.763	6.644	-0.31	-0.3	17.7	147.9
June 17	19 12.40	-17 36.8	5.670	6.623	-0.36	-0.5	17.6	158.0
June 27	19 08.77	-17 41.9	5.604	6.602	-0.39	-0.7	17.5	168.0
July 7	19 04.84	-17 48.7	5.567	6.581	-0.40	-0.8	17.3	175.2
July 17	19 00.87	-17 56.8	5.559	6.560	-0.37	-0.9	17.4	169.0
July 27	18 57.13	-18 05.6	5.580	6.539	-0.33	-0.9	17.5	159.1
Aug. 6	18 53.86	-18 14.8	5.628	6.519	-0.26	-0.9	17.6	149.0
Aug. 16	18 51.27	-18 24.0	5.701	6.498	-0.17	-0.9	17.7	138.9
Aug. 26	18 49.55	-18 32.9	5.796	6.478	-0.08	-0.8	17.8	128.9
Sept. 5	18 48.79	-18 41.1	5.908	6.458	+0.03	-0.7	17.9	119.1
Sept.15	18 49.09	-18 48.4	6.034	6.439	+0.14	-0.6	17.9	109.5
Sept.25	18 50.44	-18 54.4	6.168	6.419	+0.24	-0.5	18.0	100.0
Oct. 5	18 52.84	-18 58.9	6.308	6.400	+0.34	-0.3	18.0	90.8
Oct. 15	18 56.24	-19 01.6	6.448	6.381	+0.43	-0.1	18.1	81.7
Oct. 25	19 00.56	-19 02.3	6.585	6.363	+0.52	+0.2	18.1	72.8
Nov. 4	19 05.74	-19 00.8	6.715	6.344	+0.59	+0.4	18.1	64.1
Nov. 14	19 11.66	-18 56.7	6.835	6.326	+0.66	+0.7	18.1	55.4
Nov. 24	19 18.24	-18 50.0	6.941	6.308	+0.71	+0.9	18.1	46.9
Dec. 4	19 25.37	-18 40.5	7.032	6.291	+0.76	+1.2	18.1	38.5
Dec. 14	19 32.94	-18 28.2	7.104	6.273	+0.79	+1.5	18.0	30.2
Dec. 24	19 40.86	-18 13.2	7.157	6.256	+0.82	+1.8	18.0	22.0
Jan. 3	19 49.03	-17 55.3	7.189	6.239	+0.83	+2.0	17.9	13.9
Jan. 13	19 57.34	-17 35.0	7.199	6.222	+0.84	+2.3	17.8	6.2
Jan. 23	20 05.70	-17 12.3	7.187	6.206	+0.83	+2.5	17.8	4.1
Feb. 2	20 14.03	-16 47.5	7.153	6.190	+0.82	+2.6	17.9	11.3
Feb. 12	20 22.22	-16 21.1	7.098	6.174	+0.80	+2.8	17.9	19.2
Feb. 22	20 30.19	-15 53.4	7.021	6.159	+0.77	+2.8	18.0	27.3
Mar. 4	20 37.86	-15 24.9	6.925	6.144	+0.73	+2.9	18.0	35.4
Mar. 14	20 45.13	-14 56.2	6.811	6.129	+0.68	+2.8	18.0	43.5
Mar. 24	20 51.92	-14 27.8	6.681	6.114	+0.62	+2.7	18.0	51.8
Apr. 3	20 58.15	-14 00.4	6.537	6.100	+0.56	+2.6	18.0	60.1

Comet 162P/Siding Spring

Epoch = 2013 July 7.0 TT
T = 2015 July 11.79890 TT
Peri. = 356.40933 e = 0.5954805
Node = 31.23499 2000.0 a = 3.0559026 AU
Incl. = 27.80115 n = 0.18449934
q = 1.2361722 AU P = 5.34 years

H = 13.4 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	14 37.60	-15 21.9	5.181	4.862	+0.43	-3.6	21.1	65.9
Jan. 18	14 41.85	-15 58.2	5.020	4.857	+0.32	-3.2	21.0	74.9
Jan. 28	14 45.05	-16 30.5	4.852	4.851	+0.20	-2.8	21.0	84.2
Feb. 7	14 47.03	-16 58.4	4.680	4.845	+0.06	-2.3	20.9	93.7
Feb. 17	14 47.65	-17 21.6	4.510	4.838	-0.09	-1.8	20.8	103.6
Feb. 27	14 46.78	-17 39.6	4.346	4.830	-0.24	-1.2	20.7	113.7
Mar. 9	14 44.34	-17 52.1	4.192	4.821	-0.40	-0.6	20.6	124.2
Mar. 19	14 40.35	-17 58.5	4.056	4.812	-0.54	0.0	20.4	135.1
Mar. 29	14 34.90	-17 58.7	3.940	4.802	-0.67	+0.6	20.3	146.2
Apr. 8	14 28.22	-17 52.6	3.851	4.791	-0.76	+1.2	20.1	157.5
Apr. 18	14 20.64	-17 40.9	3.791	4.779	-0.80	+1.6	20.0	168.7
Apr. 28	14 12.62	-17 24.6	3.762	4.767	-0.80	+1.9	19.8	176.1
May 8	14 04.63	-17 05.5	3.765	4.754	-0.75	+2.0	20.0	166.8
May 18	13 57.16	-16 45.7	3.800	4.740	-0.65	+1.8	20.1	155.7
May 28	13 50.62	-16 27.4	3.863	4.725	-0.53	+1.5	20.2	144.6
June 7	13 45.31	-16 12.6	3.950	4.710	-0.39	+1.0	20.4	133.8
June 17	13 41.43	-16 03.0	4.057	4.693	-0.24	+0.3	20.5	123.4
June 27	13 39.05	-15 59.7	4.180	4.676	-0.09	-0.4	20.6	113.3
July 7	13 38.16	-16 03.2	4.313	4.659	+0.06	-1.1	20.6	103.6
July 17	13 38.72	-16 13.8	4.451	4.640	+0.19	-1.7	20.7	94.3
July 27	13 40.61	-16 31.2	4.590	4.621	+0.31	-2.4	20.8	85.4
Aug. 6	13 43.73	-16 55.1	4.727	4.600	+0.42	-3.0	20.8	76.7
Aug. 16	13 47.96	-17 24.9	4.857	4.579	+0.52	-3.5	20.9	68.3
Aug. 26	13 53.17	-17 59.9	4.977	4.558	+0.61	-4.0	20.9	60.1
Sept. 5	13 59.26	-18 39.7	5.084	4.535	+0.69	-4.4	20.9	52.1
Sept.15	14 06.14	-19 23.4	5.177	4.512	+0.75	-4.7	20.8	44.2
Sept.25	14 13.68	-20 10.6	5.253	4.487	+0.81	-5.0	20.8	36.6
Oct. 5	14 21.82	-21 00.6	5.311	4.462	+0.87	-5.2	20.8	29.0
Oct. 15	14 30.47	-21 52.8	5.348	4.437	+0.91	-5.4	20.7	21.7
Oct. 25	14 39.55	-22 46.7	5.365	4.410	+0.94	-5.5	20.6	14.7
Nov. 4	14 48.98	-23 42.0	5.359	4.382	+0.97	-5.6	20.5	8.9
Nov. 14	14 58.67	-24 38.2	5.332	4.354	+0.99	-5.7	20.4	7.7
Nov. 24	15 08.54	-25 35.0	5.283	4.325	+1.00	-5.7	20.5	12.5
Dec. 4	15 18.51	-26 32.1	5.213	4.295	+1.00	-5.7	20.5	19.3
Dec. 14	15 28.47	-27 29.3	5.121	4.264	+0.98	-5.7	20.6	26.6
Dec. 24	15 38.31	-28 26.7	5.009	4.232	+0.96	-5.7	20.6	34.2
Jan. 3	15 47.92	-29 24.1	4.879	4.199	+0.92	-5.8	20.6	41.9
Jan. 13	15 57.15	-30 21.8	4.732	4.165	+0.87	-5.8	20.5	49.8
Jan. 23	16 05.86	-31 19.9	4.571	4.131	+0.80	-5.9	20.5	57.8
Feb. 2	16 13.87	-32 18.7	4.397	4.095	+0.71	-6.0	20.4	65.9
Feb. 12	16 20.97	-33 18.6	4.214	4.059	+0.60	-6.1	20.3	74.3
Feb. 22	16 26.94	-34 19.9	4.025	4.022	+0.46	-6.3	20.2	82.8
Mar. 4	16 31.52	-35 22.9	3.833	3.984	+0.29	-6.5	20.1	91.5
Mar. 14	16 34.44	-36 27.5	3.642	3.944	+0.10	-6.6	20.0	100.4
Mar. 24	16 35.40	-37 33.4	3.456	3.904	-0.13	-6.6	19.8	109.6
Apr. 3	16 34.11	-38 39.4	3.279	3.863	-0.38	-6.4	19.7	118.9

Comet 10P/Tempel

Epoch = 2013 July 7.0 TT
T = 2015 Nov. 14.94334 TT
Peri. = 195.53461 e = 0.5364712
Node = 117.80383 2000.0 a = 3.0647090 AU
Incl. = 12.02768 n = 0.18370467
q = 1.4205809 AU P = 5.37 years

H = 13.6 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	09 11.48	+19 18.1	3.798	4.695	-0.66	+4.2	20.3	153.0
Jan. 18	09 04.92	+19 59.8	3.743	4.699	-0.73	+4.2	20.1	164.7
Jan. 28	08 57.65	+20 42.0	3.720	4.703	-0.75	+4.0	20.0	175.5
Feb. 7	08 50.16	+21 22.0	3.730	4.705	-0.72	+3.5	20.1	170.3
Feb. 17	08 42.97	+21 57.5	3.773	4.707	-0.64	+2.9	20.2	158.7
Feb. 27	08 36.58	+22 26.8	3.845	4.708	-0.52	+2.2	20.4	147.2
Mar. 9	08 31.39	+22 49.3	3.944	4.709	-0.37	+1.5	20.5	136.0
Mar. 19	08 27.65	+23 04.6	4.064	4.709	-0.21	+0.9	20.7	125.2
Mar. 29	08 25.50	+23 13.1	4.201	4.708	-0.05	+0.2	20.8	114.8
Apr. 8	08 24.96	+23 15.5	4.349	4.706	+0.10	-0.3	20.9	104.8
Apr. 18	08 25.97	+23 12.2	4.504	4.703	+0.24	-0.8	21.0	95.3
Apr. 28	08 28.41	+23 03.9	4.660	4.700	+0.37	-1.3	21.0	86.1
May 8	08 32.13	+22 51.0	4.813	4.696	+0.48	-1.7	21.1	77.3
May 18	08 36.98	+22 34.0	4.961	4.692	+0.58	-2.1	21.1	68.9
May 28	08 42.79	+22 13.2	5.099	4.687	+0.66	-2.4	21.2	60.7
June 7	08 49.42	+21 49.0	5.226	4.681	+0.73	-2.7	21.2	52.7
June 17	08 56.73	+21 21.6	5.338	4.674	+0.79	-3.0	21.2	44.9
June 27	09 04.60	+20 51.4	5.434	4.666	+0.83	-3.3	21.2	37.3
July 7	09 12.91	+20 18.5	5.512	4.658	+0.87	-3.5	21.1	29.9
July 17	09 21.57	+19 43.4	5.571	4.649	+0.89	-3.7	21.1	22.6
July 27	09 30.47	+19 06.4	5.611	4.640	+0.91	-3.9	21.0	15.4
Aug. 6	09 39.54	+18 27.9	5.630	4.629	+0.92	-4.0	20.9	8.7
Aug. 16	09 48.70	+17 48.3	5.627	4.618	+0.92	-4.0	20.8	4.3
Aug. 26	09 57.86	+17 08.1	5.604	4.606	+0.91	-4.0	20.9	8.4
Sept. 5	10 06.96	+16 28.0	5.559	4.594	+0.90	-4.0	21.0	15.2
Sept.15	10 15.91	+15 48.4	5.494	4.580	+0.87	-3.8	21.0	22.4
Sept.25	10 24.65	+15 10.2	5.409	4.566	+0.84	-3.6	21.0	29.9
Oct. 5	10 33.09	+14 34.0	5.304	4.552	+0.80	-3.3	21.1	37.5
Oct. 15	10 41.14	+14 00.7	5.182	4.536	+0.76	-2.9	21.1	45.3
Oct. 25	10 48.70	+13 31.3	5.043	4.520	+0.70	-2.5	21.0	53.3
Nov. 4	10 55.66	+13 06.8	4.890	4.503	+0.62	-1.9	21.0	61.5
Nov. 14	11 01.90	+12 48.2	4.726	4.485	+0.54	-1.2	21.0	70.0
Nov. 24	11 07.27	+12 36.7	4.553	4.467	+0.44	-0.3	20.9	78.8
Dec. 4	11 11.63	+12 33.3	4.374	4.447	+0.32	+0.6	20.8	87.8
Dec. 14	11 14.82	+12 39.2	4.194	4.427	+0.19	+1.6	20.7	97.2
Dec. 24	11 16.68	+12 55.2	4.017	4.406	+0.04	+2.7	20.6	107.0
Jan. 3	11 17.06	+13 21.8	3.848	4.385	-0.12	+3.7	20.4	117.1
Jan. 13	11 15.86	+13 58.9	3.692	4.363	-0.28	+4.7	20.3	127.7
Jan. 23	11 13.02	+14 45.6	3.553	4.339	-0.44	+5.4	20.1	138.5
Feb. 2	11 08.60	+15 40.0	3.438	4.316	-0.58	+5.9	20.0	149.5
Feb. 12	11 02.78	+16 39.2	3.349	4.291	-0.69	+6.0	19.8	160.2
Feb. 22	10 55.91	+17 39.3	3.291	4.265	-0.75	+5.7	19.6	168.7
Mar. 4	10 48.44	+18 36.1	3.265	4.239	-0.75	+5.0	19.6	167.8
Mar. 14	10 40.93	+19 25.6	3.270	4.212	-0.70	+3.9	19.7	158.7
Mar. 24	10 33.95	+20 05.0	3.305	4.184	-0.60	+2.7	19.8	148.0
Apr. 3	10 28.00	+20 32.5	3.366	4.155	-0.45	+1.5	20.0	137.2

Comet C/2011 KP36 (Spacewatch)

Epoch = 2013 July 7.0 TT
T = 2016 May 28.14811 TT
Peri. = 180.63506 e = 0.8724829
Node = 173.44858 2000.0 a = 38.2860314 AU
Incl. = 18.98136 n = 0.00416048
q = 4.8821237 AU P = 236.90 years

m1 = 1.2 + 5 log(Delta) + 12.5 log(r)

0h TT 2013/14	R.A.(2000) h m	Decl. °,	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	17 36.49	-05 56.7	10.369	9.522	+0.47	+0.5	18.5	29.2
Jan. 18	17 41.22	-05 51.7	10.243	9.472	+0.45	+0.8	18.5	36.7
Jan. 28	17 45.72	-05 43.7	10.097	9.423	+0.42	+1.1	18.4	44.7
Feb. 7	17 49.88	-05 32.7	9.933	9.373	+0.38	+1.4	18.3	53.1
Feb. 17	17 53.64	-05 18.9	9.753	9.324	+0.33	+1.6	18.3	61.6
Feb. 27	17 56.91	-05 02.8	9.561	9.274	+0.27	+1.8	18.2	70.3
Mar. 9	17 59.63	-04 44.6	9.360	9.224	+0.21	+2.0	18.1	79.1
Mar. 19	18 01.73	-04 24.9	9.155	9.175	+0.14	+2.1	18.0	88.0
Mar. 29	18 03.16	-04 04.2	8.949	9.125	+0.07	+2.1	18.0	97.0
Apr. 8	18 03.89	-03 43.0	8.747	9.075	0.00	+2.1	17.9	106.1
Apr. 18	18 03.89	-03 22.1	8.553	9.026	-0.07	+2.0	17.8	115.2
Apr. 28	18 03.19	-03 02.3	8.372	8.976	-0.14	+1.8	17.7	124.2
May 8	18 01.80	-02 44.1	8.206	8.926	-0.20	+1.6	17.7	133.1
May 18	17 59.80	-02 28.5	8.062	8.877	-0.25	+1.2	17.6	141.6
May 28	17 57.28	-02 16.1	7.940	8.827	-0.29	+0.9	17.5	149.4
June 7	17 54.36	-02 07.5	7.844	8.778	-0.32	+0.4	17.5	155.6
June 17	17 51.20	-02 03.2	7.774	8.728	-0.32	0.0	17.4	158.6
June 27	17 47.97	-02 03.3	7.733	8.678	-0.31	-0.5	17.4	157.1
July 7	17 44.83	-02 08.1	7.719	8.629	-0.29	-0.9	17.3	151.8
July 17	17 41.95	-02 17.3	7.732	8.579	-0.25	-1.3	17.3	144.5
July 27	17 39.50	-02 30.7	7.768	8.530	-0.19	-1.7	17.3	136.2
Aug. 6	17 37.59	-02 47.5	7.825	8.480	-0.12	-2.0	17.3	127.5
Aug. 16	17 36.35	-03 07.4	7.900	8.431	-0.05	-2.2	17.3	118.5
Aug. 26	17 35.83	-03 29.4	7.989	8.382	+0.03	-2.4	17.3	109.6
Sept. 5	17 36.08	-03 52.9	8.087	8.332	+0.10	-2.4	17.2	100.6
Sept. 15	17 37.12	-04 17.2	8.191	8.283	+0.18	-2.4	17.2	91.7
Sept. 25	17 38.95	-04 41.4	8.296	8.234	+0.26	-2.4	17.2	83.0
Oct. 5	17 41.52	-05 05.0	8.399	8.185	+0.33	-2.2	17.2	74.3
Oct. 15	17 44.81	-05 27.4	8.494	8.135	+0.39	-2.0	17.2	65.7
Oct. 25	17 48.75	-05 47.8	8.579	8.086	+0.45	-1.8	17.2	57.3
Nov. 4	17 53.28	-06 06.0	8.651	8.037	+0.51	-1.5	17.2	49.1
Nov. 14	17 58.33	-06 21.4	8.707	7.988	+0.55	-1.2	17.2	41.1
Nov. 24	18 03.82	-06 33.8	8.744	7.939	+0.58	-0.9	17.2	33.5
Dec. 4	18 09.67	-06 42.8	8.761	7.890	+0.61	-0.5	17.1	26.4
Dec. 14	18 15.79	-06 48.2	8.756	7.842	+0.63	-0.2	17.1	20.4
Dec. 24	18 22.09	-06 50.0	8.729	7.793	+0.64	+0.2	17.1	16.9
Jan. 3	18 28.50	-06 48.0	8.678	7.744	+0.64	+0.6	17.0	17.2
Jan. 13	18 34.91	-06 42.3	8.605	7.696	+0.63	+0.9	17.0	21.2
Jan. 23	18 41.24	-06 32.9	8.509	7.647	+0.62	+1.3	16.9	27.3
Feb. 2	18 47.40	-06 20.1	8.392	7.599	+0.59	+1.6	16.8	34.4
Feb. 12	18 53.30	-06 04.1	8.255	7.551	+0.55	+1.9	16.8	42.0
Feb. 22	18 58.84	-05 45.3	8.100	7.503	+0.51	+2.1	16.7	50.0
Mar. 4	19 03.95	-05 23.9	7.931	7.455	+0.46	+2.3	16.6	58.1
Mar. 14	19 08.52	-05 00.5	7.748	7.407	+0.40	+2.5	16.5	66.4
Mar. 24	19 12.48	-04 35.7	7.556	7.359	+0.33	+2.6	16.4	74.9
Apr. 3	19 15.76	-04 10.1	7.358	7.311	+0.25	+2.6	16.3	83.4

Comet 172P/Yeung

Epoch = 2013 July 7.0 TT
T = 2017 Mar. 10.54228 TT
Peri. = 208.79495 e = 0.2234432
Node = 33.56131 2000.0 a = 4.1772722 AU
Incl. = 11.31380 n = 0.11544229
q = 3.2438891 AU P = 8.54 years

H = 14.0 , G = 0.15

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	V	Elong. °
Jan. 8	03 27.05	+25 47.8	4.446	5.109	-0.16	-0.9	21.4	127.9
Jan. 18	03 25.46	+25 38.6	4.580	5.108	-0.01	-0.5	21.5	117.4
Jan. 28	03 25.39	+25 33.6	4.727	5.107	+0.14	0.0	21.6	107.3
Feb. 7	03 26.78	+25 33.2	4.882	5.105	+0.28	+0.4	21.7	97.5
Feb. 17	03 29.55	+25 37.6	5.040	5.103	+0.40	+0.9	21.7	88.1
Feb. 27	03 33.59	+25 46.2	5.197	5.101	+0.52	+1.3	21.8	79.0
Mar. 9	03 38.74	+25 58.8	5.349	5.099	+0.62	+1.6	21.8	70.2
Mar. 19	03 44.90	+26 14.5	5.492	5.096	+0.70	+1.8	21.9	61.7
Mar. 29	03 51.93	+26 32.9	5.624	5.093	+0.78	+2.0	21.9	53.5
Apr. 8	03 59.69	+26 53.1	5.742	5.090	+0.84	+2.2	21.9	45.5
Apr. 18	04 08.09	+27 14.6	5.844	5.087	+0.89	+2.2	21.9	37.7
Apr. 28	04 17.01	+27 36.8	5.929	5.083	+0.93	+2.2	21.9	30.1
May 8	04 26.35	+27 59.2	5.995	5.080	+0.97	+2.2	21.8	22.8
May 18	04 36.02	+28 21.3	6.042	5.076	+0.99	+2.2	21.7	15.7
May 28	04 45.92	+28 42.9	6.068	5.071	+1.01	+2.1	21.7	9.5
June 7	04 55.97	+29 03.5	6.074	5.067	+1.01	+2.0	21.6	6.4
June 17	05 06.09	+29 23.2	6.059	5.062	+1.01	+1.9	21.7	10.0
June 27	05 16.17	+29 41.8	6.024	5.057	+1.00	+1.7	21.7	16.3
July 7	05 26.13	+29 59.3	5.970	5.051	+0.97	+1.7	21.8	23.2
July 17	05 35.88	+30 15.8	5.896	5.046	+0.94	+1.6	21.8	30.4
July 27	05 45.31	+30 31.5	5.805	5.040	+0.90	+1.5	21.9	37.7
Aug. 6	05 54.31	+30 46.8	5.697	5.034	+0.85	+1.5	21.9	45.2
Aug. 16	06 02.78	+31 01.9	5.573	5.028	+0.78	+1.5	21.9	52.9
Aug. 26	06 10.58	+31 17.2	5.437	5.021	+0.70	+1.6	21.8	60.8
Sept. 5	06 17.58	+31 33.3	5.289	5.014	+0.60	+1.7	21.8	68.9
Sept.15	06 23.63	+31 50.7	5.133	5.007	+0.49	+1.9	21.7	77.2
Sept.25	06 28.58	+32 09.6	4.972	5.000	+0.37	+2.1	21.7	85.8
Oct. 5	06 32.26	+32 30.6	4.809	4.992	+0.23	+2.3	21.6	94.8
Oct. 15	06 34.51	+32 53.6	4.648	4.985	+0.07	+2.5	21.5	104.1
Oct. 25	06 35.21	+33 18.6	4.493	4.977	-0.10	+2.6	21.4	113.7
Nov. 4	06 34.24	+33 44.9	4.350	4.968	-0.27	+2.7	21.3	123.7
Nov. 14	06 31.57	+34 11.4	4.222	4.960	-0.43	+2.5	21.2	133.9
Nov. 24	06 27.29	+34 36.8	4.115	4.951	-0.57	+2.2	21.0	144.3
Dec. 4	06 21.57	+34 59.0	4.033	4.942	-0.68	+1.7	20.9	154.6
Dec. 14	06 14.78	+35 16.4	3.980	4.933	-0.74	+1.1	20.8	163.8
Dec. 24	06 07.39	+35 27.3	3.957	4.923	-0.74	+0.4	20.7	168.0
Jan. 3	05 59.96	+35 31.1	3.966	4.914	-0.69	-0.3	20.8	162.8
Jan. 13	05 53.08	+35 28.0	4.005	4.904	-0.58	-0.9	20.9	153.3
Jan. 23	05 47.25	+35 18.9	4.072	4.893	-0.44	-1.3	21.0	142.9
Feb. 2	05 42.85	+35 05.6	4.164	4.883	-0.27	-1.6	21.1	132.4
Feb. 12	05 40.12	+34 49.6	4.275	4.872	-0.10	-1.7	21.2	122.1
Feb. 22	05 39.16	+34 32.5	4.402	4.862	+0.08	-1.7	21.3	112.1
Mar. 4	05 39.94	+34 15.5	4.540	4.850	+0.25	-1.6	21.4	102.4
Mar. 14	05 42.40	+33 59.2	4.682	4.839	+0.40	-1.5	21.5	93.1
Mar. 24	05 46.37	+33 44.1	4.826	4.828	+0.53	-1.4	21.6	84.1
Apr. 3	05 51.72	+33 30.0	4.968	4.816	+0.66	-1.3	21.6	75.5

Comet C/2010 U3 (Boattini)

Epoch = 2013 July 7.0 TT
T = 2019 Feb. 23.90895 TT
Peri. = 87.93080
Node = 43.03349 2000.0
Incl. = 55.44012
q = 8.4582545 AU
e = 1.0029698

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	′	m1	Elong. °
Jan. 8	02 34.89	+19 52.0	14.580	15.020	-0.07	+0.3	18.6	114.8
Jan. 18	02 34.19	+19 55.3	14.701	14.978	-0.02	+0.5	18.7	104.5
Jan. 28	02 33.97	+20 00.4	14.829	14.937	+0.03	+0.7	18.7	94.4
Feb. 7	02 34.22	+20 07.6	14.959	14.895	+0.07	+0.9	18.7	84.4
Feb. 17	02 34.94	+20 16.9	15.087	14.854	+0.11	+1.1	18.7	74.5
Feb. 27	02 36.08	+20 28.2	15.207	14.812	+0.15	+1.3	18.7	64.8
Mar. 9	02 37.62	+20 41.5	15.314	14.771	+0.19	+1.5	18.7	55.2
Mar. 19	02 39.51	+20 56.5	15.406	14.729	+0.22	+1.7	18.7	45.8
Mar. 29	02 41.70	+21 13.1	15.477	14.688	+0.24	+1.8	18.7	36.6
Apr. 8	02 44.13	+21 31.1	15.527	14.646	+0.26	+1.9	18.7	27.5
Apr. 18	02 46.75	+21 50.3	15.552	14.605	+0.28	+2.0	18.7	18.7
Apr. 28	02 49.51	+22 10.4	15.552	14.564	+0.28	+2.1	18.7	10.5
May 8	02 52.33	+22 31.3	15.526	14.522	+0.28	+2.1	18.7	5.8
May 18	02 55.18	+22 52.7	15.473	14.481	+0.28	+2.2	18.7	10.8
May 28	02 57.98	+23 14.5	15.395	14.440	+0.27	+2.2	18.6	18.9
June 7	03 00.67	+23 36.4	15.291	14.398	+0.25	+2.2	18.6	27.4
June 17	03 03.21	+23 58.2	15.165	14.357	+0.23	+2.2	18.6	36.2
June 27	03 05.52	+24 19.8	15.017	14.316	+0.20	+2.1	18.6	45.0
July 7	03 07.56	+24 41.0	14.850	14.275	+0.17	+2.1	18.5	53.9
July 17	03 09.27	+25 01.6	14.668	14.234	+0.13	+2.0	18.5	62.9
July 27	03 10.59	+25 21.3	14.474	14.192	+0.09	+1.9	18.4	72.0
Aug. 6	03 11.49	+25 40.2	14.271	14.151	+0.04	+1.8	18.4	81.2
Aug. 16	03 11.92	+25 57.8	14.065	14.110	-0.01	+1.6	18.4	90.5
Aug. 26	03 11.86	+26 14.0	13.859	14.069	-0.06	+1.5	18.3	100.0
Sept. 5	03 11.29	+26 28.5	13.658	14.028	-0.11	+1.3	18.3	109.6
Sept.15	03 10.20	+26 41.3	13.467	13.987	-0.16	+1.1	18.2	119.4
Sept.25	03 08.61	+26 52.0	13.290	13.946	-0.20	+0.9	18.2	129.2
Oct. 5	03 06.58	+27 00.6	13.133	13.905	-0.24	+0.6	18.2	139.1
Oct. 15	03 04.15	+27 06.9	12.999	13.864	-0.27	+0.4	18.1	149.1
Oct. 25	03 01.42	+27 11.0	12.892	13.823	-0.29	+0.2	18.1	158.7
Nov. 4	02 58.48	+27 13.0	12.814	13.783	-0.30	0.0	18.1	167.0
Nov. 14	02 55.45	+27 13.1	12.767	13.742	-0.30	-0.1	18.1	169.7
Nov. 24	02 52.47	+27 11.7	12.751	13.701	-0.28	-0.2	18.1	163.6
Dec. 4	02 49.65	+27 09.3	12.766	13.660	-0.25	-0.3	18.0	154.3
Dec. 14	02 47.11	+27 06.4	12.809	13.620	-0.22	-0.3	18.0	144.2
Dec. 24	02 44.94	+27 03.6	12.878	13.579	-0.17	-0.2	18.0	134.0
Jan. 3	02 43.24	+27 01.4	12.968	13.538	-0.12	-0.1	18.1	123.7
Jan. 13	02 42.06	+27 00.5	13.076	13.498	-0.06	+0.1	18.1	113.5
Jan. 23	02 41.42	+27 01.2	13.196	13.457	-0.01	+0.3	18.1	103.3
Feb. 2	02 41.35	+27 04.0	13.323	13.417	+0.05	+0.5	18.1	93.4
Feb. 12	02 41.84	+27 09.0	13.451	13.376	+0.10	+0.7	18.1	83.5
Feb. 22	02 42.86	+27 16.4	13.577	13.336	+0.15	+1.0	18.1	73.9
Mar. 4	02 44.37	+27 26.2	13.694	13.296	+0.20	+1.2	18.1	64.4
Mar. 14	02 46.33	+27 38.4	13.798	13.255	+0.24	+1.5	18.1	55.2
Mar. 24	02 48.68	+27 53.0	13.887	13.215	+0.27	+1.7	18.1	46.1
Apr. 3	02 51.37	+28 09.7	13.956	13.175	+0.30	+1.9	18.1	37.3

Comet 29P/Schwassmann-Wachmann

Epoch = 2013 July 7.0 TT
T = 2019 Apr. 15.30317 TT
Peri. = 50.70519 e = 0.0427245
Node = 312.48270 2000.0 a = 6.0045510 AU
Incl. = 9.37426 n = 0.06698588
q = 5.7480096 AU P = 14.71 years

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

0h TT 2013/14	R.A.(2000) h m	Decl. ° ′	Delta	r	Daily motion m	m1	Elong. °
Jan. 8	14 03.61	-21 50.5	6.476	6.236	+0.36	-3.4	14.0	71.6
Jan. 18	14 07.24	-22 24.5	6.318	6.235	+0.27	-3.0	14.0	80.7
Jan. 28	14 09.93	-22 54.7	6.156	6.233	+0.17	-2.6	13.9	90.0
Feb. 7	14 11.61	-23 20.5	5.993	6.232	+0.06	-2.1	13.8	99.5
Feb. 17	14 12.19	-23 41.3	5.836	6.231	-0.05	-1.5	13.8	109.2
Feb. 27	14 11.66	-23 56.5	5.688	6.229	-0.16	-0.9	13.7	119.1
Mar. 9	14 10.03	-24 05.4	5.554	6.228	-0.27	-0.2	13.7	129.1
Mar. 19	14 07.38	-24 07.5	5.438	6.226	-0.35	+0.5	13.6	139.3
Mar. 29	14 03.86	-24 02.9	5.345	6.225	-0.42	+1.1	13.6	149.4
Apr. 8	13 59.69	-23 51.5	5.278	6.223	-0.46	+1.7	13.6	159.0
Apr. 18	13 55.13	-23 34.2	5.240	6.222	-0.46	+2.2	13.6	166.9
Apr. 28	13 50.50	-23 11.9	5.231	6.220	-0.44	+2.6	13.5	168.3
May 8	13 46.07	-22 46.2	5.252	6.219	-0.39	+2.7	13.6	161.8
May 18	13 42.14	-22 18.9	5.302	6.217	-0.32	+2.7	13.6	152.6
May 28	13 38.93	-21 52.0	5.378	6.215	-0.23	+2.5	13.6	142.9
June 7	13 36.62	-21 27.0	5.477	6.214	-0.13	+2.2	13.6	133.1
June 17	13 35.30	-21 05.5	5.595	6.212	-0.03	+1.7	13.7	123.4
June 27	13 35.03	-20 48.5	5.729	6.210	+0.08	+1.2	13.7	113.9
July 7	13 35.81	-20 36.9	5.873	6.209	+0.18	+0.6	13.8	104.6
July 17	13 37.61	-20 30.9	6.025	6.207	+0.28	0.0	13.8	95.6
July 27	13 40.37	-20 30.6	6.178	6.205	+0.36	-0.5	13.9	86.8
Aug. 6	13 44.01	-20 35.9	6.331	6.203	+0.45	-1.1	14.0	78.2
Aug. 16	13 48.47	-20 46.4	6.479	6.201	+0.52	-1.5	14.0	69.7
Aug. 26	13 53.65	-21 01.8	6.618	6.200	+0.58	-2.0	14.0	61.5
Sept. 5	13 59.48	-21 21.4	6.747	6.198	+0.64	-2.3	14.1	53.3
Sept. 15	14 05.88	-21 44.8	6.862	6.196	+0.69	-2.7	14.1	45.3
Sept. 25	14 12.75	-22 11.3	6.961	6.194	+0.73	-2.9	14.2	37.4
Oct. 5	14 20.04	-22 40.5	7.042	6.192	+0.76	-3.1	14.2	29.6
Oct. 15	14 27.65	-23 11.7	7.103	6.190	+0.79	-3.3	14.2	22.0
Oct. 25	14 35.52	-23 44.4	7.144	6.188	+0.80	-3.4	14.2	14.8
Nov. 4	14 43.55	-24 18.2	7.163	6.186	+0.81	-3.4	14.2	9.2
Nov. 14	14 51.67	-24 52.5	7.159	6.184	+0.81	-3.4	14.2	8.9
Nov. 24	14 59.79	-25 27.0	7.133	6.182	+0.80	-3.4	14.2	14.3
Dec. 4	15 07.81	-26 01.3	7.085	6.179	+0.78	-3.4	14.2	21.6
Dec. 14	15 15.65	-26 35.0	7.015	6.177	+0.75	-3.3	14.2	29.4
Dec. 24	15 23.18	-27 07.8	6.926	6.175	+0.71	-3.2	14.1	37.6
Jan. 3	15 30.31	-27 39.6	6.817	6.173	+0.66	-3.0	14.1	45.9
Jan. 13	15 36.92	-28 10.0	6.691	6.171	+0.60	-2.9	14.1	54.4
Jan. 23	15 42.88	-28 38.8	6.552	6.168	+0.52	-2.7	14.0	63.0
Feb. 2	15 48.07	-29 05.9	6.401	6.166	+0.43	-2.5	14.0	71.9
Feb. 12	15 52.36	-29 31.0	6.243	6.164	+0.33	-2.3	13.9	80.9
Feb. 22	15 55.65	-29 53.8	6.081	6.162	+0.22	-2.0	13.8	90.1
Mar. 4	15 57.83	-30 14.1	5.919	6.159	+0.10	-1.7	13.8	99.4
Mar. 14	15 58.81	-30 31.2	5.761	6.157	-0.02	-1.4	13.7	109.0
Mar. 24	15 58.57	-30 44.8	5.613	6.155	-0.15	-0.9	13.7	118.8
Apr. 3	15 57.11	-30 54.2	5.478	6.152	-0.26	-0.5	13.6	128.7

彗星年表　２０１３

編集委員会

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〒780-0901 高知市上町 2-6-15
電話 (088) 875-8353
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