

# The Professor Comet's Report <sup>1</sup>



**Recent Update: 7 July 2011**



comet C/2009 P1 (Garradd)  
2011 Apr. 06.82 UT ml=11.9 Dia.=1.5'  
Takahashi TOA-150 f/7.3 refractor + CCD (STL-6303) 1.7"/px  
(c) A. Novichonok & D. Chestnov Exposure = 4x120 sec  
Tzec Maun observatory - D96 (remotely Moorook, S. Australia)



C/2011 C1 McNaught

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*Welcome to the comet report which a monthly article on the observations of comet by the amateur astronomy community and comet hunters from around the world! The article is dedicated to the latest reports of available comets for observations, current state of those comets, future possibilities & projections for observations in comet astronomy!*

Mid Summer Season – July 2011

## *The Current Status of the Predominant Comets for July 2011!*

Comets	Designation (IAU - MPC)	Orbital Status	Magnitude Visual	Trend	Observation (Range in Lat.)	Constellations (Night Sky Location)	Visibility Period
Garradd	2009 P1	C	8.7 - 9.4	Varying Brightness	50°N - 75°S	Eastern Aquarius thru SW region of Pegasus	Early Morning
Crommelin <sup>^</sup>	27P <sup>^</sup>	P	10.5	Bright	30°N - Equator	Southern Auriga <i>(lost in the daytime glare!)</i>	Morning (Before Sunrise)
Elenin	2010 X1	C	10 - 12	Varying Brightness	35°N - 60°S	Across the southern region of Leo as it is currently undergoing retrograde motion	Evening
McNaught	2011 C1	C	12	Fading	45°N - 50°S	Eastern Pisces into Aries <i>(slowly fading into the Sun!)</i>	Morning (Before Sunrise)
Hill	2010 G2	C	12 - 13	Slight Brightening	50°N - 30°N	Between Camelopardalis and the head of Ursa Major	All Night
Van Ness	213P/2009 B3	P	12.5	Bright	45°N - 60°S	Eastern Aquarius thru NW region of Pisces <i>(Retrograde motion in the same region starts in late Aug!)</i>	Morning
LINEAR	2011 M1	C	13	Bright	50°N - 10°S	<i>Andromeda to Perseus to Camelopardalis before the end of July!</i>	Best Morning
Schwassman Wachmann 1*	29P*	P	13 - 14	Fading Steadily	25°N - 55°S	SE of Leo and heading into an empty region N of Crater	Evening
McNaught*	2009 F4*	C	13.5	Faint	20°S - 90°S*	Undergoing retrograde motion in Chamaeleon	All Night

\*Constellations to far south to be seen anywhere in the United States and accompanying territories!

<sup>^</sup>27P/Crommelin returns after being unobserved since 1984! It was originally known as Comet Pons - Coggia - Winnecke - Forbes and was discovered in Feb 1818!

P: Periodic Comets

C: Non - Periodic Comets

## Mid Summer Season - July 2011

## Ephemeris Data Terminology

<i>Ephemeris Term</i>	<i>Definition (plus additional comments)</i>
Date	Month and Year using the standard Gregorian calendar.
TT	Terrestrial Time (Day of the Month) as a substitute for the astronomical Julian date.
RA (2000)	Right Ascension based on the Epoch J2000 (longitudinal coordinate for the celestial sky) measured in hours, minutes, and seconds.
Dec (2000)	Declination based on the Epoch J2000 (latitudinal coordinate for the night sky) measured in degrees, arcminutes, and arcseconds.
Delta	The distance from Earth measured in AUs (1 AU = 1 Astronomical Unit = 92 955 807 mi = 149 597 871 km as the mean distance between the Earth and Sun).
R	The solar distance measured in AUs (the distance between the comet or comet - like body and the Sun)!
Elongation	Solar elongation which is the angle of separation between the observed object and the Sun as measured across the night sky as measured in degrees.
Phase	Phase angle between the Sun, the celestial object, and the observer on the surface of the Earth. Also known as the Sun - Object - Observer angle.
M1	M1: The visual magnitude of the celestial object as observed on the surface of the Earth at sea level. <i>(Note M1 values predicted by the Minor Planet Center can differ from actual visual reports obtain in the field!)</i>
M2	The nuclear magnitude of the Comet which is also the visual magnitude of the false nucleus.
"/min	The progression or motion across the sky as measured in arcseconds per minute.
P.A.	Position angle while undergoing motion in the celestial sky. <i>(P.A. is the same method applied to binary stars with starts at N goes counterclockwise in an easterly direction!)</i>

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## Degree of Condensation (DC)

*All observations of comets are broken down into three factors: estimating magnitudes for light curves to predict future brightness, coma observations, and observations that concern with a comet's tail(s). For the coma there two characteristic features that are important when studying the coma: Degree of condensation and coma size in arcminutes. The classification system for determining the DC is based on a positive integer system from 0 to 9 as shown below.*

<i>DC value</i>	<i>Definition to numerical DC designation</i>
0	<i>Diffuse coma of uniform brightness</i>
1	<i>Diffuse coma with slight brightening towards center</i>
2	<i>Diffuse coma with definite brightening towards center</i>
3	<i>Centre of coma much brighter than edges, though still diffuse</i>
4	<i>Diffuse condensation at centre of coma</i>
5	<i>Condensation appears as a diffuse spot at centre of coma – described as moderately condensed</i>
6	<i>Condensation appears as a bright diffuse spot at centre of coma</i>
7	<i>Condensation appears like a star that cannot be focused – described as strongly condensed</i>
8	<i>Coma virtually invisible</i>
9	<i>Stellar or disk like in appearance</i>

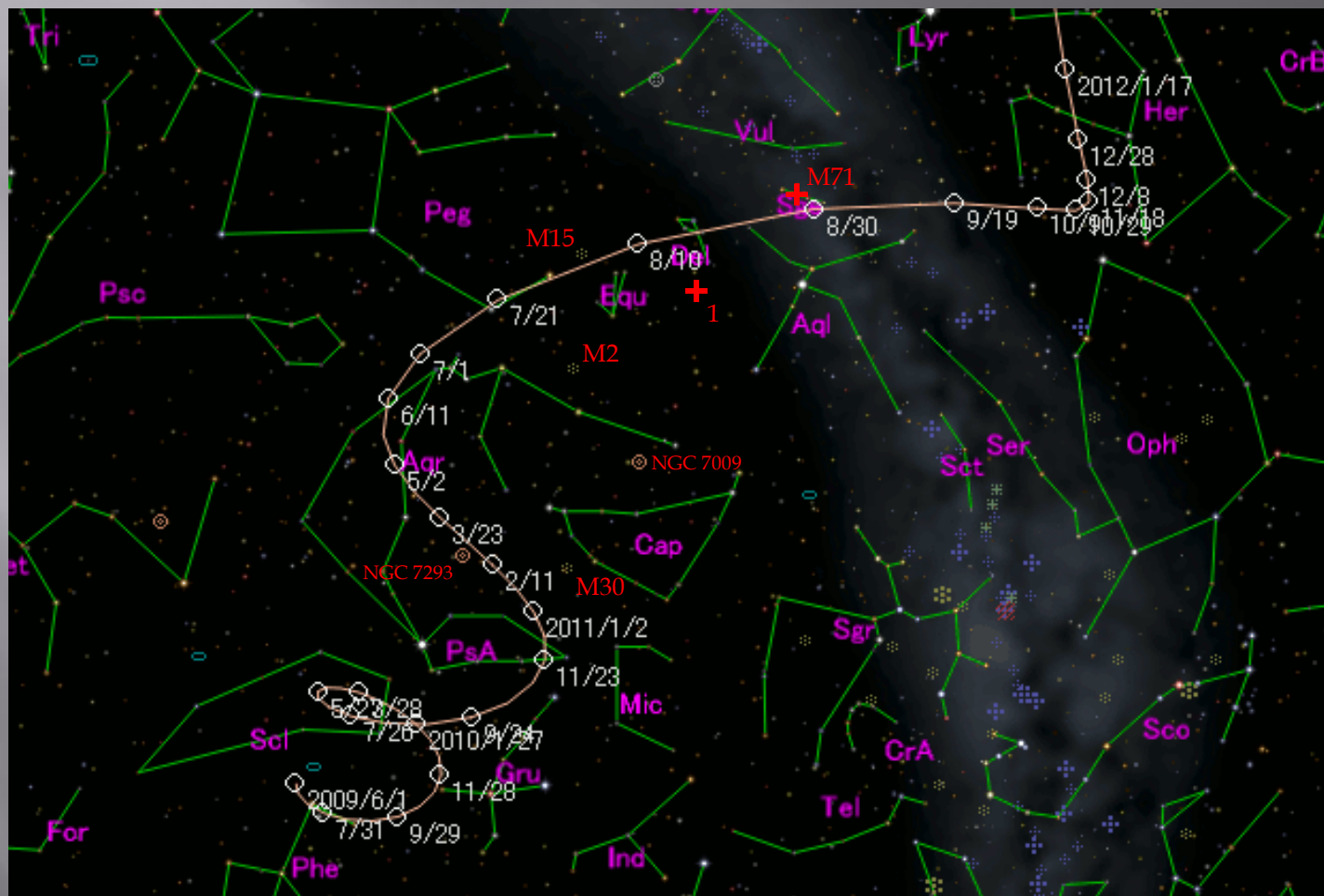
## A Synopsis of the Predominant Comets for Summer 2011!

*As we begin our progression thru the Summer season 2011, the time for comet observations although plenty in faintness is currently suffering a drought of bright and impressive comets for visual observations! Already it is approaching July 2011 put us more than halfway through this final year of the first decade of the 21<sup>st</sup> century, none of the predominant comets are currently above a maximum recorded visual magnitude of 9.4. That visual value obtained from the latest field reports globally goes to C/2009 P1 Garradd which is moving further west into the night sky. It is already moving in a NW to NNW direction leaving the recognized northern boundary of Aquarius and it is heading towards the head of the constellation of Pegasus in its' SW region! Expect the comet to approach the star Baham ( $\theta$  Pegasi) which is arabic for 'the livestockes' located about  $7.5^\circ$  to ESE of Enif the nights of 19 – 21 July 2011. For the long term future the comet will remain visible in the skies of the northern hemisphere as it moves thru the western region of the summer triangle (Aquila) and heads westward towards Hercules. It will stay in Hercules and undergo a partial retrograde motion in the SE region of Hercules to the far SE of the Keystone.*

*The comet will stay in Hercules from early October 2011 – mid February 2012 in which time the comet is expected to brighten to a visual magnitude of 6.5 possibly brighter than 6.0 during the period of 11 – 24 February 2012! Right now Garradd P1 is reported to have a DC of 6 giving it a very dispersed coma and the latest field reports indicate an angular size of only 1.5' where as the full Moon can average about 30' in size. To put that in perspective the comet as of right now is about 100x smaller than an average full Moon. Generally when a comet gets brighter it usually gets bigger in terms of its angular size which can be theorized based on the distance indicators. Garradd will reach perigee during the period of 23 – 24 Dec 2011 at a minimum delta of 1.5505 AU or 144 million miles (231.8 million km) from Earth and then reach perihelion on 5 March 2011 at 1.2569 AU or 116.2 million miles (187 million km) from the Sun. During the time between perigee and perihelion the comet will be increasing in brightness as it moves away from the Earth during the mid-Winter and progress towards the Sun through Mid – March. Along the way the comet will pay close to globular cluster M15 at a minimum of  $0.40^\circ$  to the ENE the night of 3 August 2011! After that Garradd will pass by Delphinus to the west thru mid August, skim across the northern tip of Aquila, and then leaving behind Sagitta as it crosses the milky way during 20 August – 19 September. During most of the chronological period the C/2009 P1 is predicted to stay at and above 8<sup>th</sup> visual magnitude from 10 Sept 2011 – April Fool's Day 2012! A recent set of images has forced a reevaluation of the orbital elements for comet 2010 X1 Elenin reducing its perhelion to only 0.48 AU. The comet is predicted to reach at least 6<sup>th</sup> magnitude by September but not visible in the northern hemisphere night skies until October and in favorable conditions for observing around midnight! Thru mid – late October, the comet will obtain a minimum perigee of less then 0.24 AU, so this could become the Great Comet of 2011, so stay tuned for more info throughout the year!*

## C/2009 P1 Garradd

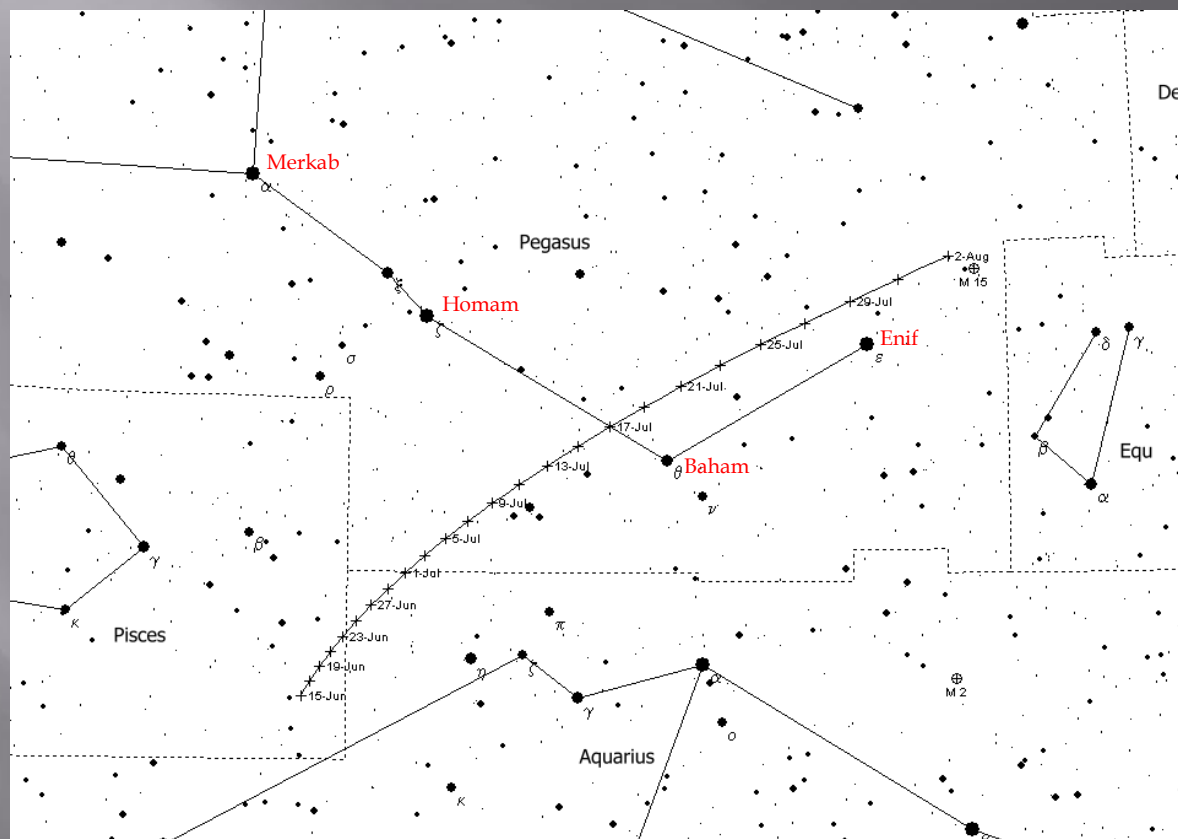
*Figure 1: Garradd P1 projected path through the summer sky!*



Courtesy of [www.aerith.net](http://www.aerith.net): Seiichi Yoshida's Comet Page!

## C/2009 P1 Garradd

*Figure 2: Close up of Garradd P1 projected path from 15 Jun - 2 Aug 2011!*



Courtesy of Winnie's Comet Page 2011!

Note: Garradd can be seen moving from a NW to WNW direction travelling through the SE region of Pegasus from 1 July - 8 August 2011! The estimated projection shows the comet to within  $\sim 0.40^\circ$  to the ENE of M15 for evenings of 2 - 3 Aug! The comet will be following a parallel path under the head of Pegasus during the period of 17 - 29 July spanning from Baham to Enif; both stars are separated by angular distance of  $7.46^\circ$  which gives the comet a progression rate of  $0.62^\circ/\text{day}$  or  $\sim 1.6'/\text{hour}$ !

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IAU MPC Ephemeris data for C/2009 P1 Garradd (June/July 2011):

<b>Date</b>	<b>CDT</b>	<b>R.A. (J2000)</b>	<b>Decl.</b>	<b>Delta</b>	<b>r</b>	<b>El.</b>	<b>Ph.</b>	<b>M1</b>	<b>*M2</b>	<b>Sky Motion</b>	
	h m s									"/min	P.A.
2011 06 24	000000	22 50 57.7	+00 47 57	2.343	2.820	107.5	20.1	10.4	-	0.82	319.3
2011 06 25	000000	22 50 05.3	+01 02 54	2.317	2.810	108.5	20.1	10.3	-	0.84	318.3
2011 06 26	000000	22 49 10.4	+01 18 01	2.291	2.800	109.5	20.0	10.3	-	0.86	317.2
2011 06 27	000000	22 48 12.7	+01 33 18	2.266	2.791	110.6	19.9	10.2	-	0.89	316.2
2011 06 28	000000	22 47 12.3	+01 48 46	2.240	2.781	111.6	19.9	10.2	-	0.91	315.2
2011 06 29	000000	22 46 09.1	+02 04 25	2.215	2.771	112.7	19.8	10.2	-	0.94	314.2
2011 06 30	000000	22 45 03.0	+02 20 14	2.190	2.761	113.8	19.7	10.1	-	0.97	313.3
2011 07 01	000000	22 43 53.9	+02 36 14	2.165	2.752	114.8	19.6	10.1	-	0.99	312.4
2011 07 02	000000	22 42 41.8	+02 52 26	2.141	2.742	115.9	19.5	10.0	-	1.02	311.5
2011 07 03	000000	22 41 26.5	+03 08 49	2.116	2.732	117.0	19.4	10.0	-	1.05	310.7
2011 07 04	000000	22 40 08.1	+03 25 23	2.092	2.723	118.1	19.2	10.0	-	1.08	309.8
2011 07 05	000000	22 38 46.3	+03 42 08	2.068	2.713	119.2	19.1	9.9	-	1.12	309.0
2011 07 06	000000	22 37 21.2	+03 59 05	2.044	2.703	120.3	18.9	9.9	-	1.15	308.2
2011 07 07	000000	22 35 52.6	+04 16 14	2.020	2.694	121.4	18.8	9.8	-	1.18	307.4
2011 07 08	000000	22 34 20.5	+04 33 34	1.997	2.684	122.5	18.6	9.8	-	1.22	306.7
2011 07 09	000000	22 32 44.8	+04 51 06	1.974	2.674	123.6	18.5	9.7	-	1.25	306.0
2011 07 10	000000	22 31 05.4	+05 08 49	1.951	2.665	124.7	18.3	9.7	-	1.29	305.2
2011 07 11	000000	22 29 22.2	+05 26 44	1.928	2.655	125.9	18.1	9.7	-	1.32	304.5
2011 07 12	000000	22 27 35.1	+05 44 51	1.906	2.645	127.0	17.9	9.6	-	1.36	303.9
2011 07 13	000000	22 25 44.1	+06 03 08	1.884	2.636	128.1	17.7	9.6	-	1.40	303.2
2011 07 14	000000	22 23 49.1	+06 21 37	1.863	2.626	129.2	17.5	9.5	-	1.44	302.6
2011 07 15	000000	22 21 50.0	+06 40 17	1.841	2.617	130.3	17.2	9.5	-	1.48	301.9
2011 07 16	000000	22 19 46.7	+06 59 07	1.820	2.607	131.4	17.0	9.5	-	1.52	301.3
2011 07 17	000000	22 17 39.2	+07 18 07	1.800	2.597	132.5	16.8	9.4	-	1.56	300.7
2011 07 18	000000	22 15 27.3	+07 37 17	1.780	2.588	133.6	16.5	9.4	-	1.60	300.1
2011 07 19	000000	22 13 11.0	+07 56 36	1.760	2.578	134.7	16.3	9.3	-	1.64	299.5
2011 07 20	000000	22 10 50.3	+08 16 04	1.740	2.569	135.8	16.0	9.3	-	1.68	298.9
2011 07 21	000000	22 08 25.0	+08 35 40	1.721	2.559	136.9	15.7	9.3	-	1.73	298.3
2011 07 22	000000	22 05 55.2	+08 55 24	1.703	2.550	137.9	15.5	9.2	-	1.77	297.8
2011 07 23	000000	22 03 20.7	+09 15 14	1.684	2.540	139.0	15.2	9.2	-	1.81	297.2
2011 07 24	000000	22 00 41.6	+09 35 09	1.667	2.530	140.0	15.0	9.1	-	1.86	296.6
2011 07 25	000000	21 57 57.8	+09 55 10	1.649	2.521	141.0	14.7	9.1	-	1.90	296.1

*All ephemeris data above is calculated for 00 hrs UTC which would be -5 hrs for adjustment to CDT!*

\*M2 values are not shown if values are fainter than 19<sup>th</sup> magnitude!

## Mid Summer Season – July 2011

