

PROFESSOR COMET REPORT

MARCH/APRIL 2011

Current status of the predominant comets for 2011

Comets	Designation (IAU-MPC)	Orbital Status	Magnitude (Visual)	Trend	Observation (Lat.)	Constellations (Night Sky Location)	Visibility Period
McNaught	2011 C1	C	10.5	Bright	40°N - 60°S	Aquila/Aquarius	Morning
Garradd	2009 P1	C	10.5	Bright	Poor Elongation	Aquarius	Best Morning
Schwassman Wachmann	29P	P	~13	Varies	60°N - 60°S	Leo/Sextans	Best Evening
Catalina	2009 Y1	C	13.5	Fading	Poor Elongation	Pegasus	N/A
Scheila	(596)	P	13.5	Steady	75°N - 25°S	Lynx	All Night
Tempel 1	9P	P	~13.5	Fading	15°N - 45°S	Capricornus	Early Morning
Hartley 2	103P	P	14	Fading	60°N - 55°S	Canis Minor	Evening
Elenin	2010 X1	C	~14	Bright	60°N - 55°S	Leo	Best Midnight

The **red designation** is assigned to all comets that are of 10th visual magnitude or brighter and are classified as the **major comets**. All remaining comets that are possibility at 12th visual magnitude or fainter are given the **blue designation** and are classified as the minor comets! The **green designation** is assigned to comets to far south to be seen in the continental United States: **only for comets brighter than 11th magnitude**. The **orange designation** is for comets that are lost in the daytime glare or have poor elongation!

Ephemeris data terminology:

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 and minutes.

Decl.: Declination as measured in degrees and arcminutes.

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 as measured in AUs.

Elong: 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: The visual magnitude of the celestial object as observed on the surface of the Earth at sea level.

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.

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.

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

A Synopsis of the Predominant Comets for Early 2011

The prospect for observing bright comets for 2011 continues to be paltry in the early half of this year. The best hopes lie 2009 P1 Garradd and quite possibly C/2010 X1 Elenin as the brightest comets for all of 2011. Currently P1 Garradd can be located within the constellation of Aquarius; current reports give it an average visual magnitude of 10.5. Garradd is available for observations as the summer sky now rises earlier in the morning hours before daybreak. The comet is presently progressing in a general northward direction allowing it to become visible high up in the night skies of the northern hemisphere going into the spring season. Garradd currently has and at present still undergoing a series of retrograde motions with the latest one directed in a south - north orientation giving the comet's path a S - shape pattern. 2009 P1 latest retrograde motion started in early - March of last year when it was in the western region of Sculptor and will complete this process by late - July 2011 as it moves across the SW region of Pegasus. Expect the comet to reach a maximum possible visual magnitude of 7.0 by the time it reaches the constellation of Hercules sometime in late - December 2011 into early - Jan 2012!

There is little in the prospects of other comets that now appear in the night sky for early 2011. Most of the comets that were bright and easily visible in small telescopes, binoculars, or where naked eye objects have returned and will at magnitude fainter than 12 - 13 or have faded out completely! Among the other possible prospects is the recent discovery of another McNaught comet C/2011 C1 which now moving quickly between the constellations of Aquarius and Capricornus. The latest observation reports have placed the brightness of the comet around 10.2 visual magnitude as of 18 March 2011. Right now the comet is very diffuse with a DC of 1 and a coma size reported up to 4.5' across. This comet is expected to approach the Sun with a perihelion of 0.88 AU around mid - April and maintain a visual magnitude range 10 - 11 through May. It is likely it will fade out rapidly before then since it is a tiny comet without a distinguishing center to separate out from its' diffuse coma.

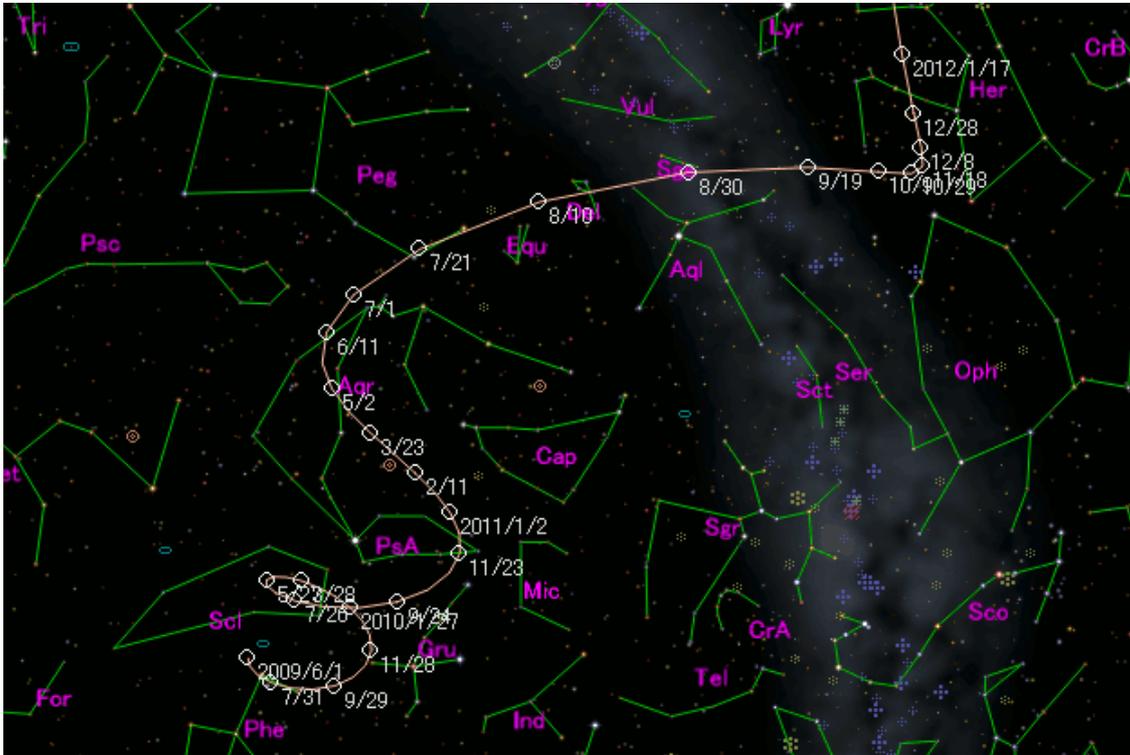
The big surprise could be Elenin C/2010 X1 which is at present moving through the constellation of Leo undergoing a tight retrograde motion that will reach its maximum western edge on May 31. The comet will then head eastwards towards Virgo where it was originally discovered and then turn around towards the SW region of Virgo. It will complete its latest retrograde

motion on 8 September to the SE of Porphyrion and then start to move in a progressive NW direction through Leo towards the Winter Sky. It will eventually move across the northern region of the 'winter hexagon'; Gemini, Auriga, and then skim across the northern edge of Taurus. Elenin will then undergo a winter 2011 retrograde period while staying in the general area between the Taurus and Aries through March 2012!

*Elenin at present has a current visual magnitude of 14, but the comet is expected to brighten to a maximum of 3.8 during the period of 16 - 27 September 2011. The comet will start to get brighter than 7th magnitude starting in late August and not dim below that value until the latter end of early November. The comet will reach perihelion on 11 Sept 2011 at a minimum solar distance of 0.4825 AU (~72.1 million km) at visual magnitude 4.1! However, it will reach its brightest as it moves away from the Sun and as it approaches Earth. It will obtain a perigee of 0.2339 AU (~34.96 million km) on 17 October 2011, but it will be past the period of maximum brightness for Elenin corresponding to a predicted visual magnitude 4.7! **Unfortunately, the entire period of optimized brightness for XI Elenin occurs when both Leo & Virgo are lost in the daytime glare during the month of August and most of September!** Look for the two constellations to rise again in the early morning sky before sunrise in October 2011 when the comet will still be bright in the 4th - 5th visual magnitude range.*

C/2009 P1 Garradd

Figure 2: Garradd P1 projected path through the summer sky!



Courtesy of www.aerith.net: Seiichi Yoshida's Comet Page!

Ephemeris data will become available when particular comets have acquired visual magnitudes brighter than 10.0 upon confirmation from reported visual observations!