Professor Comet Report

January/February 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
Hartley 2	103P	**P**	10	Fading	60°N – 55°S	Monoceros	Early Evening
Garradd	2009 P1	C	10.5	Bright	Poor Elongation	Aquarius	N/A
Tempel 2	10P	**P**	~13	Fading	60°N – 45°S	Cetus	Evening
Tempel 1	9P	**P**	~13	Steady	Poor Elongation	Sagittarius	N/A
Schwassman Wachmann	29P	**P**	~13	Varies	60°N – 55°S	Leo	Morning
Catalina	2009 Y1	C	13.5	Fading	90°N – 30°N	Cygnus	Evening
McNaught	2009 R1	C	~13.5	Fading	30°S – 55°S	Octans	All Night
Scheila	(596)	**P**	~14	Steady	90°N – 25°S	Leo Minor	Best Morning
Ikeya Murakami	2010 V1	C	~14	Fading	35°N – 45°S	Scorpius	Early Morning
Gunn	65P	**P**	14	Fading	Poor Elongation	Aquarius	N/A
Cardinal	2010 B1	C	14	Fading	45°N - 55°S	Lepus	Best Evening
Elenin	2010 X1	C	~14	Bright	55°N - 50°S	Virgo	Morning

*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. 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.

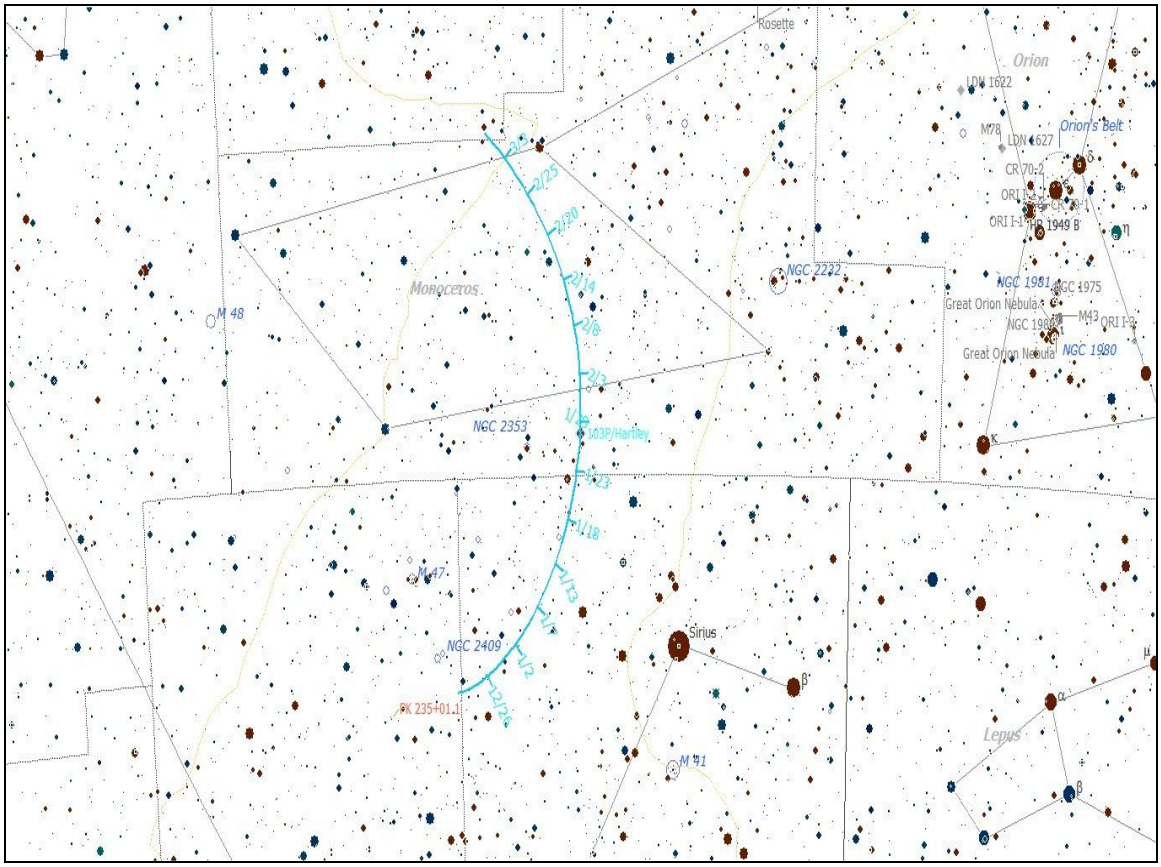
A Synopsis of the Predominant Comets for Early 2011

The prospect for comets in the early months of 2011 is looking paltry for the New Year. The best comet that is expected to become the brightest comet for 2011 will be 2009 P1 Garradd. Currently this comet is located in between Capricornus and Pisces Austrinus with a currently reported visual magnitude of 10.5 average. Garradd will being move in a general northward direction making it visible high up in the night skies of the northern hemisphere. The comet is 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 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 another comet that has possibilities; the Schwassman – Wachmann comet 73P which is currently located in the constellation of Leo, but the brightness of its largest fragments remain uncertain. Its opposition occurs on the night of Feb 6-7 which is reaches a maximum solar elongation of 164.1º with a minimum phase angle of 5.3º allowing for a brightening of the comet. The comet will be moving WNW while undergoing retrograde motion at started October 29 last year and will continue until June 20 of this year. The comet will get to within 2º of alpha lyncis an Orange giant at a visual magnitude 3.14 on the night of Feb 23 2011! Only the comet 103P/Hartley 2 remains as the brightest comet to be observed by amateur astronomers with telescopes for the night skies of early 2011. The comet is no longer visible to the unaided, naked – eye and would be impossible to observe with most binoculars due to its fading profile.

103P/Hartley 2

Figure 1: Hartley 2 path undergoing retrograde motion.



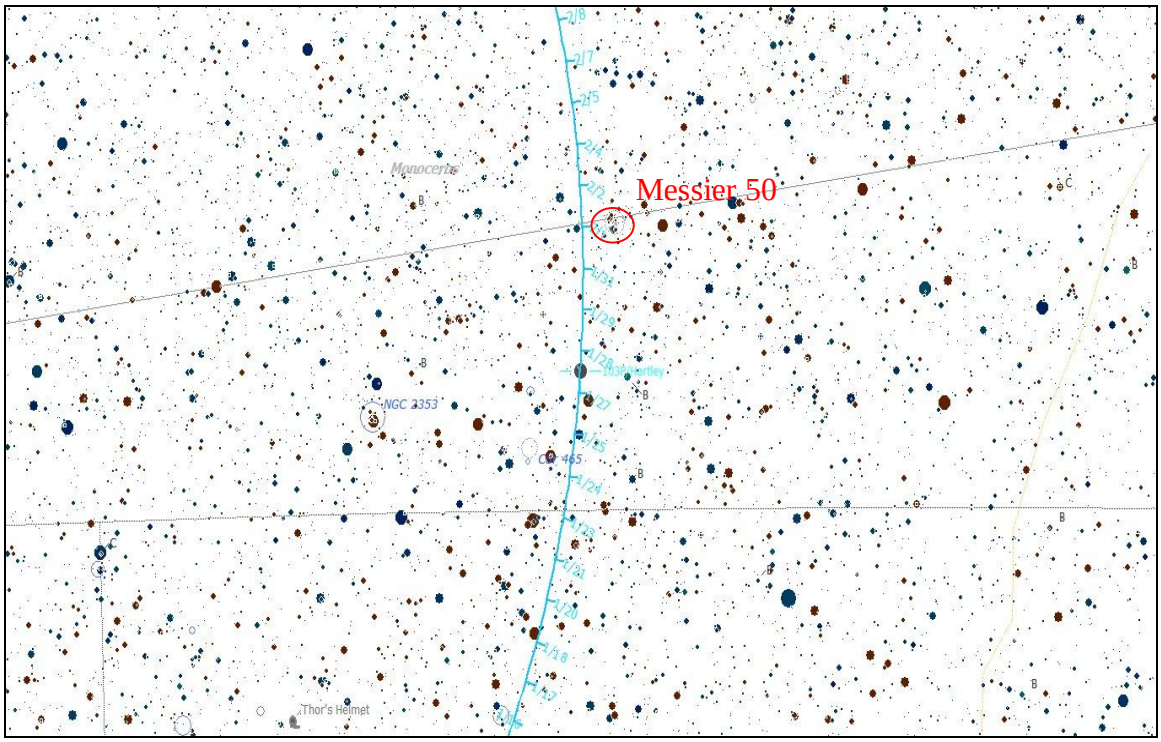
Courtesy of Skytools 3 Pro, 2011.

Hartley 2 is continuing on the final leg of its retrograde motion as it is now moving strictly northward to NNE direction thru the month of Feb 2011 as it flies across the constellation of Monoceros and heads into Canis Minor by March.

Hartley 2 is now located in the constellation of Monoceros after spending most of January and part of late – December last year in the constellation of Canis Major in its NE region. It has past by a variety of open star clusters that lie in the region of Canis Major thru Monoceros and will continue to do so as the comet lies within the plane of the Milky Way as seen across the night sky. Currently the latest report of the comet in terms of its visual magnitude was reported at 9.3 back on Jan 4, but the comet has faded since then to about 10th magnitude by Mid January. By the middle of the month the comet will have faded to about 12th magnitude although the comet is still being reported with a size of about 9.9'. This would place the comet size with a current earth distance of 0.7 AU and a solar distance of 1.6 AU as of Jan 27 2011 at about 300 000 km.

Expect the comet to move northward and then NNE by Feb 15 as the comet moves thru the heart of Monoceros in the southern region of the constellation. It will soon fly very near to open star cluster M50 during the evenings of Jan 29 thru Feb 5 when it will within 1^{o} of the object. Expect the closest approach to the 5.9 magnitude cluster to occur on the night of Feb 2 during the early evening hours when it will within 15" of the cluster. Further to the west will be the fainter open star cluster Ivanov 4 about 35" to the W of M50 and contains the faint nebula vdB 87! As the comet turns a bit more to the east during the evenings of Feb 9 – 11 expect the comet to pass by the more obscure open star cluster Haffner 3 and the stellar asterism NGC 2338. NGC 2338 could look like a small cluster of a mere 15 stars loosely centered on the star TYC 4827021721 which is non – distinguishing with a 10.6 visual magnitude. Haffner 3 has about 20 stars, but with little concentration and would be challenge to observe against the Milky Way background.

Figure 2: Hartley 2 retrograde path for Late Jan/Early Feb 2011!

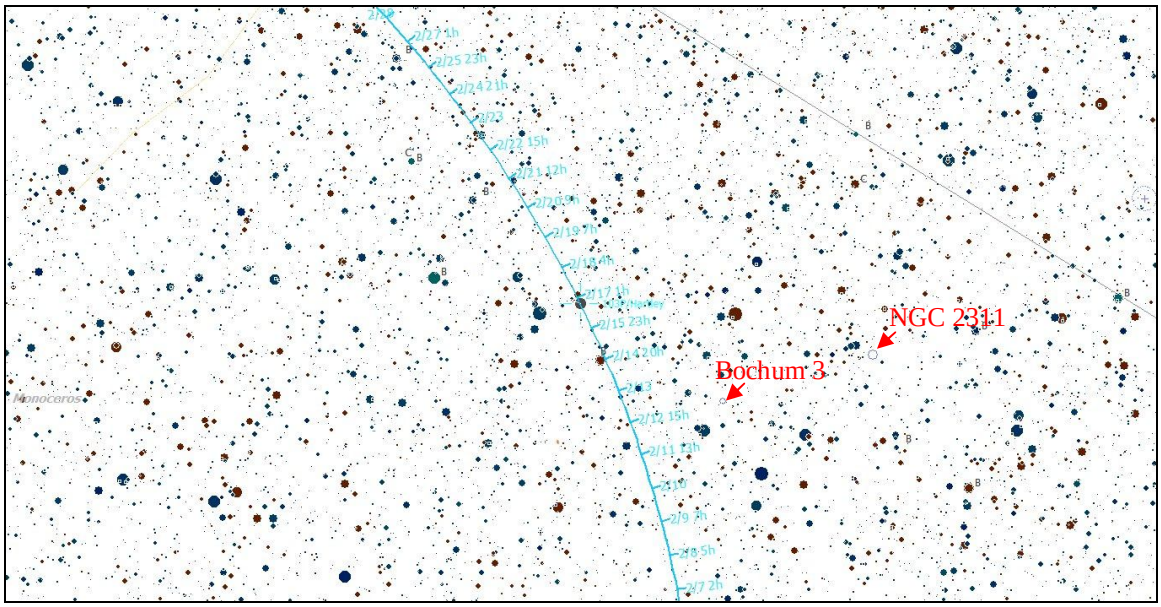


Courtesy of Skytools 3 Pro, 2011.

The retrograde motion of Hartley 2 is now in a N to NNE progression as the comet will move thru the southern Region of Monoceros for the rest of February! Note that the comet will graze closely to the east of Messier 50 during the first few days of February.

Later on in the month Hartley 2 will be about 1º from the open star cluster Bochum 3 the evenings of Feb 11 – 15 to the SSE and then due east of the cluster of loosely – packed group of 25 stars. The comet will then pass by the bright nebula IC 466 to within 2.5" to the NW of the nebula the evenings of Feb 15 - 16. To find Hartley 2 as it travels through the central region of southern part of Monceros, look for the variable star AO or 19 Monocerotis. This is also a triple star system where the main star is a Blue giant with a visual magnitude of 9.7. The comet will be located about 20' SE of the star the early evening of Feb 14. Beyond the 17th of February the comet will have faded to 13th magnitude and will be visible only in very dark skies with moderate size telescopes.

Figure 3: Hartley 2 retrograde path for mid/late Feb 2011!



Courtesy of Skytools 3 Pro, 2011.

The path of Hartley will take it thru the southern region of Monoceros for the rest of February until it approaches the constellation boundary between Monoceros and Canis Major sometime during the night of March 5/6 2011. The comet will have faded to 15th magnitude.

A suggestion in finding the comet once it has dimmed to below 13th magnitude is to look for the double star BAL 157 with visual magnitudes of 8.6 and 11.3! The comet will be located about 6' to the SE of the double star as Hartley 2 makes it way out of the inner solar system. This happens on the night of September 23 as it continues to the NE towards Canis Minor. It will graze nearby the double star BAL 453 at visual magnitudes of 8.3 and 12.1 about 5' to WNW of Hartley 2. The next predominant object that can be used to locate the comet will the open star cluster Berkeley 37 during the evenings of March 1 – 3, but by then the comet will have faded to 14th magnitude!

IAU MPC Ephemeris data for 103P/Harley 2 (January 2011):

Date	UT	R.A. (J2000)	Decl.	Delta	r	El.	Ph.	M1	M2	Sky Motion	
	h m s									"/min	P.A.
2011 01 27	000000	07 04 30.8	-10 08 55	0.687	1.590	143.5	21.6	11.7	18.7	0.76	353.8
2011 01 28	000000	07 04 23.8	-09 50 53	0.697	1.599	143.2	21.6	11.8	18.8	0.75	355.3
2011 01 29	000000	07 04 18.8	-09 32 52	0.708	1.607	143.0	21.6	11.9	18.8	0.75	356.8
2011 01 30	000000	07 04 15.8	-09 14 52	0.718	1.616	142.7	21.7	12.0	18.9	0.75	358.4
2011 01 31	000000	07 04 14.7	-08 56 54	0.729	1.625	142.4	21.7	12.0	18.9	0.75	359.9
2011 02 01	000000	07 04 15.5	-08 39 00	0.740	1.634	142.1	21.8	12.1	19.0	0.74	001.5
2011 02 02	000000	07 04 18.4	-08 21 10	0.751	1.643	141.7	21.8	12.2	19.0	0.74	003.0
2011 02 03	000000	07 04 23.1	-08 03 24	0.763	1.651	141.3	21.9	12.3	19.1	0.74	004.6
2011 02 04	000000	07 04 29.8	-07 45 45	0.774	1.660	140.9	22.0	12.3	19.1	0.74	006.1
2011 02 05	000000	07 04 38.4	-07 28 12	0.786	1.669	140.5	22.1	12.4	19.2	0.74	007.7
2011 02 06	000000	07 04 48.8	-07 10 46	0.798	1.678	140.1	22.1	12.5	19.2	0.73	009.3
2011 02 07	000000	07 05 01.2	-06 53 28	0.810	1.687	139.6	22.2	12.6	19.2	0.73	010.8
2011 02 08	000000	07 05 15.4	-06 36 18	0.822	1.696	139.2	22.4	12.7	19.3	0.73	012.4
2011 02 09	000000	07 05 31.4	-06 19 17	0.834	1.705	138.7	22.5	12.7	19.3	0.73	013.9
2011 02 10	000000	07 05 49.2	-06 02 26	0.847	1.714	138.2	22.6	12.8	19.4	0.73	015.5
2011 02 11	000000	07 06 08.8	-05 45 45	0.860	1.723	137.7	22.7	12.9	19.4	0.72	017.0
2011 02 12	000000	07 06 30.1	-05 29 14	0.872	1.731	137.2	22.8	13.0	19.5	0.72	018.6
2011 02 13	000000	07 06 53.2	-05 12 55	0.885	1.740	136.6	22.9	13.0	19.5	0.72	020.1
2011 02 14	000000	07 07 17.9	-04 56 46	0.898	1.749	136.1	23.0	13.1	19.6	0.72	021.6
2011 02 15	000000	07 07 44.2	-04 40 49	0.912	1.758	135.5	23.2	13.2	19.6	0.72	023.1
2011 02 16	000000	07 08 12.2	-04 25 04	0.925	1.767	135.0	23.3	13.3	19.7	0.72	024.6
2011 02 17	000000	07 08 41.7	-04 09 32	0.938	1.776	134.4	23.4	13.4	19.7	0.72	026.1
2011 02 18	000000	07 09 12.8	-03 54 11	0.952	1.785	133.8	23.5	13.4	19.8	0.72	027.5
2011 02 19	000000	07 09 45.4	-03 39 04	0.966	1.794	133.2	23.7	13.5	19.8	0.72	029.0
2011 02 20	000000	07 10 19.4	-03 24 09	0.980	1.803	132.6	23.8	13.6	19.9	0.72	030.4
2011 02 21	000000	07 10 54.9	-03 09 27	0.994	1.812	132.0	23.9	13.6	19.9	0.72	031.8
2011 02 22	000000	07 11 31.8	-02 54 58	1.008	1.821	131.4	24.0	13.7	19.9	0.72	033.1
2011 02 23	000000	07 12 10.1	-02 40 42	1.023	1.830	130.8	24.2	13.8	20.0	0.72	034.5
2011 02 24	000000	07 12 49.8	-02 26 39	1.037	1.838	130.2	24.3	13.9	20.0	0.72	035.9
2011 02 25	000000	07 13 30.7	-02 12 50	1.052	1.847	129.6	24.4	13.9	20.1	0.72	037.2
2011 02 26	000000	07 14 13.0	-01 59 15	1.067	1.856	128.9	24.5	14.0	20.1	0.72	038.5
2011 02 27	000000	07 14 56.6	-01 45 52	1.082	1.865	128.3	24.6	14.1	20.2	0.72	039.8
2011 02 28	**000000**	**07 15 41.4**	**-01 32 44**	**1.097**	**1.874**	**127.7**	**24.7**	**14.2**	**20.2**	**0.72**	**041.1**

All ephemeris data above is calculated for the SE Texas region at 00:00 CST which is -6 hrs behind UTC?