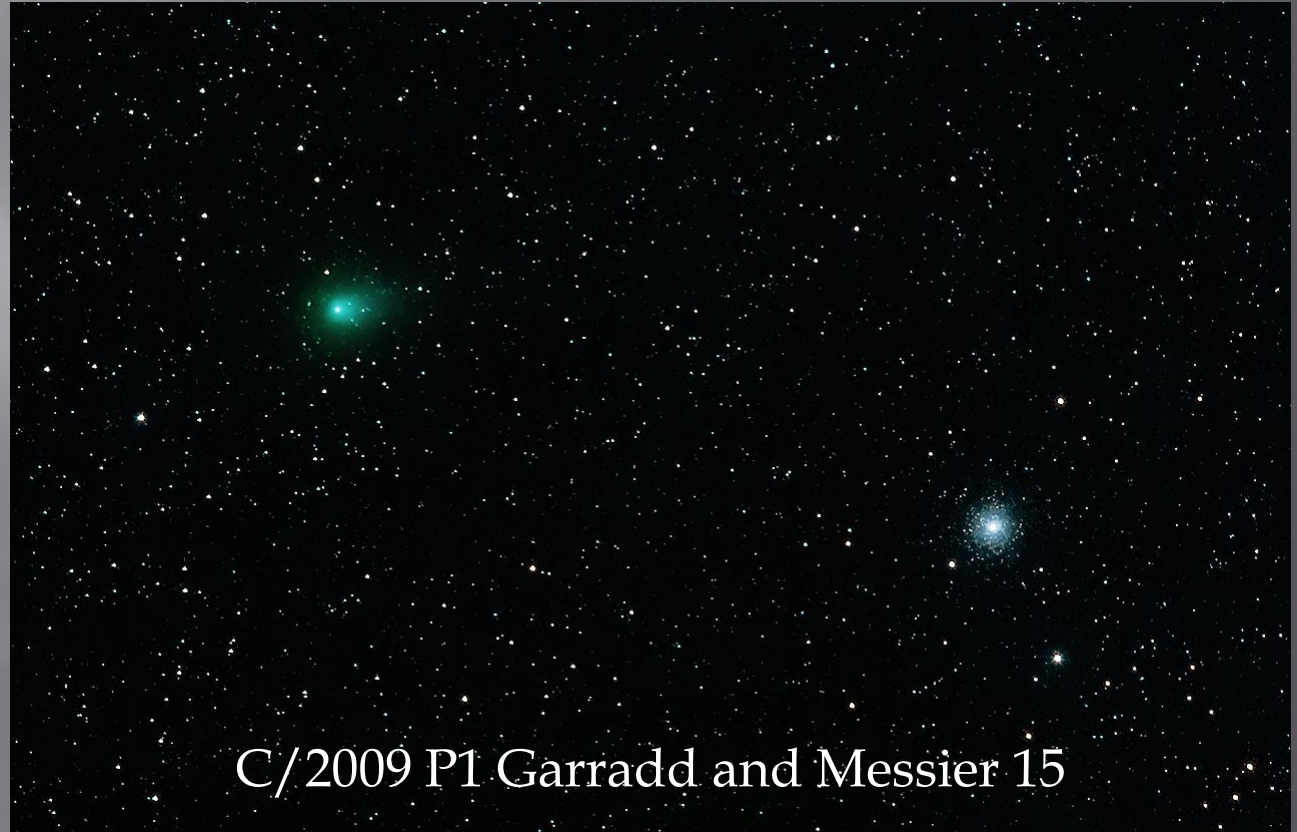


The Professor Comet's Report ¹



C/2009 P1 Garradd and Messier 15

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

Mid Summer Season – August 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	7.3 - 7.8	Getting Brighter	55°N - 65°S	Northern Region of Equuleus thru Delphinus, then thru the Summer Triangle (Aquila then Sagitta)	All Night
Elenin	2010 X1	C	9.5	Getting Brighter	30°N - 70°S	Currently undergoing retrograde motion in the S region of Leo	Early Evening (Just after Dusk)
Crommelin	27P	P	9.5	Steady	N/A	Poor Elongation <i>(lost in the daytime glare!)</i>	N/A
Hill	2010 G2	C	10.6	Brightening	55°N - 30°N	Between Ursa Major and Lynx (Moving SSW of Muscida)	All Night
*Honda - Mrkos - Pajdusakova	*45P	P	10.6	Brightening	50°N - 90°S	<i>Undergoing a wide retrograde motion that stretches across both celestial skies due to its proximity from Earth!</i>	Morning
LINEAR	2011 M1	C	10.8	Brightening	55°N - 35°N	Across Camelopardalis thru Ursa Major for the rest of August!	All Night
Van Ness	213P/2009 B3	P	12.4	Steady	55°N - 55°S	Eastern Aquarius thru NW region of Pisces <i>(Retrograde motion in the same region starts in late Aug!)</i>	Late Evening
McNaught	2011 C1	C	12.4	Fading	55°N - 45°S	East Aries and into Taurus <i>(slowly fading into the Sun!)</i>	Morning (Before Sunrise)

*45P/Honda - Mrkos - Pajdusakova is a short period comet discovered by Minoru Honda on Dec 3, 1948 who discovered 12 comets between 1948 - 1960. The co - discoverers were Antonin Mrkos a Czech astronomer and L'udmila Pajdušáková a Slovakian astronomer. Both were employed at the Skalnaté Pleso Observatory in present day Slovakia.

An elliptical orbit with a period of 5.26 yrs and a nucleus diameter: (0.5 - 1.6) km est. !

Mid Summer Season - August 2011

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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 or a comet's head there two characteristic features that are important for study: Degree of condensation (DC) and coma size measured in arcminutes. The classification system for determining the DC is based on a positive integer system from 0 to 9 as shown below.

DC value	Definition to numerical DC designation
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!

The summer season for 2011 so far has shown a few surprises for observing comets especially from the latest data obtained from field reports of the visual observations of comet C/2009 P1 Garradd. Already the comet is fast approaching a visual magnitude of 7.0 and may reach 6th magnitude before the beginning of the Autumn season. A fan like tail has formed from the 5 – 7 arcminute diameter coma that has been reported with a DC between 4 and 6 with the tail already reaching a reported length of 0.4° with a PA between 180° - 190° which can now be observed using 10x50 binoculars. Comet Garradd is continuing on its path across the Summer evening sky heading in a general WNW direction towards the constellation of Hercules where it is predicted to go under a partial retrograde motion during the month of November and then make a swing northwards while being east of the Keystone! Originally predicted to reach a maximum brightness of 7.0 in visual magnitude during the period of 11 – 24 February 2012 while possibly passing through the head of Draco according to the Minor Planter Center. However, the comet has already broken such predictions in brightness and is surpassing expectations since its coma and tail can be observed in moderately small binoculars for most of the summer evenings. Right now with an angular size of 7 arcminutes for the coma, Garradd P1 is now only ~18.4x smaller than an average full Moon and could get bigger and brighter as it approaches the Sun and Earth!

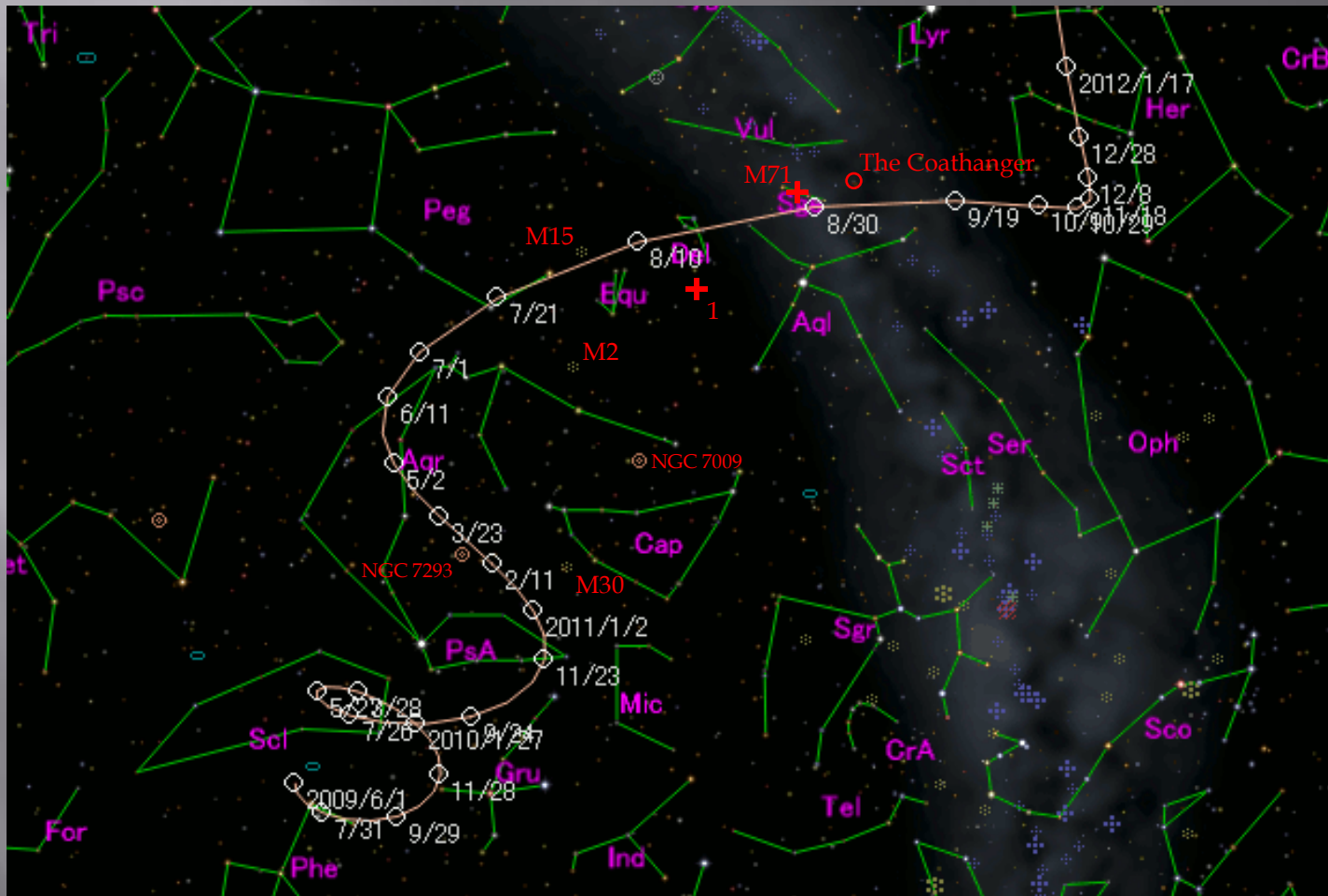
Generally when a comet gets brighter it usually gets bigger in terms of its angular size which can be theorized based on its orbital elements, proximity to the Earth and Sun, and predictions based on photometry analysis (rate at which it increases in brightness). Garradd will reach perigee during the period of 23 – 24 Dec 2011 at a minimum delta of 1.5505 AU or 144 million miles (231.8 million km) from the Earth. It is expected to 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. The comet has already flown WNW past the globular cluster M15 east of the star Enif the head of Pegasus and about halfway between the distance of Enif and the constellation Equuleus (the little horse) during evening of August 2 having approached to within 0.53° or 31.8 arcminutes of M15 about a single full Moon width. The comet will pass by a variety of some common stars and a series of non-stellar DSOs; a combination of nebulae (planetary, diffuse, and reflection) and star clusters (globular or open) during the month of August as it moves perpendicular to the path of the Milky way across the sky. Garradd is destined to fly across the southern region of the Brocchi's cluster a stellar asterism located in the southwestern region of the constellation Vulpecula 'the fox' during the evenings of September 2 – 3, 2011 with both constellations lying in the southern region of the great asterism 'The Summer Triangle'! In fact the star will get to within 0.87° or 52.2 arcminutes south of 4 Vulpeculae (the southern most star of Brocchi's cluster or the coathanger) or the top of the curl in the hook of the hanger during the night of 2 September 2011 at 23:27 CDT. 4 Vulpeculae is K0 III class star making it a bright, orange giant at 5.14 visual magnitude. During that same time the comet will appear to be in occultation with the star HD 182718 which is a A0 class (Whitish-Blue) star at 8.3 mag.

A Synopsis of the Predominant Comets for Summer 2011 (cont.)!

*Other comets that are showing great potential are C/2010 Elenin X1, C/2010 Hill G2, and the recent appearance of old comet 45P/Honda-Mrkos-Pajdusakova which are all now brighter than 11th magnitude as are getting brighter as we progress thru the summer season and the rest of 2011! Comet Elenin has already reach a visual magnitude of 9.3 and it is currently located in the SE region of Leo and it currently undergoing retrograde motion as it moves eastwards to the SW region of Virgo between the stars of Porrima and Spica which will take place during mid September of this year. Elenin will then swing around and head WNW back towards Leo finishing its retrograde motion before the end of September. However, the constellations of Virgo and Leo will be lost in the daytime glare just after sunset and before dusk by the coming of late summer, so see it now while it is low in the western skies while we are still in the month of August! The comet has a coma with a DC of 3 and an angular diameter of 3 arcminutes. Hill G2 is average, mid-10th magnitude comet with a DC of 3 for the coma and an angular diameter averaging between 3 – 6 arcminutes. This comet will be difficult to see since it will be low in the northern skies of the southern US, the comet got very close to Polaris during the later half of mid-May and is now moving SSW towards the spring constellation lynx. It will pass about several degrees to the west of Muscida (the nose of Ursa Major home to the famous asterism: The Big Dipper) with its closest approach on the nights of 8 – 9 August 2011. Finally comet 45P/Honda-Mrkos-Pajdusakova based on current field reports appears to have a visual magnitude of 10.6 and a maximum coma diameter of 3 arcminutes. Recent visual observations in the field have indicated that the coma has a DC between 1 – 3 which would mean an almost uniform coma with a little dispersion around the outer edges. **Expect 45P to be another great surprise for comets in 2011 with data on the orbital elements for this object predicting that 45P/Honda-Mrkos-Pajdusakova will get to within 0.06 AU or a mere 5 574 000 miles away from the Earth the night of August 15 and could surpass the MPC predicted brightness of 7.5 visual magnitude! Unfortunately this will happen as the comet moves thru the constellation of Mensa near the Magellanic clouds making it visible only to observers in the southern hemisphere.***

C/2009 P1 Garradd

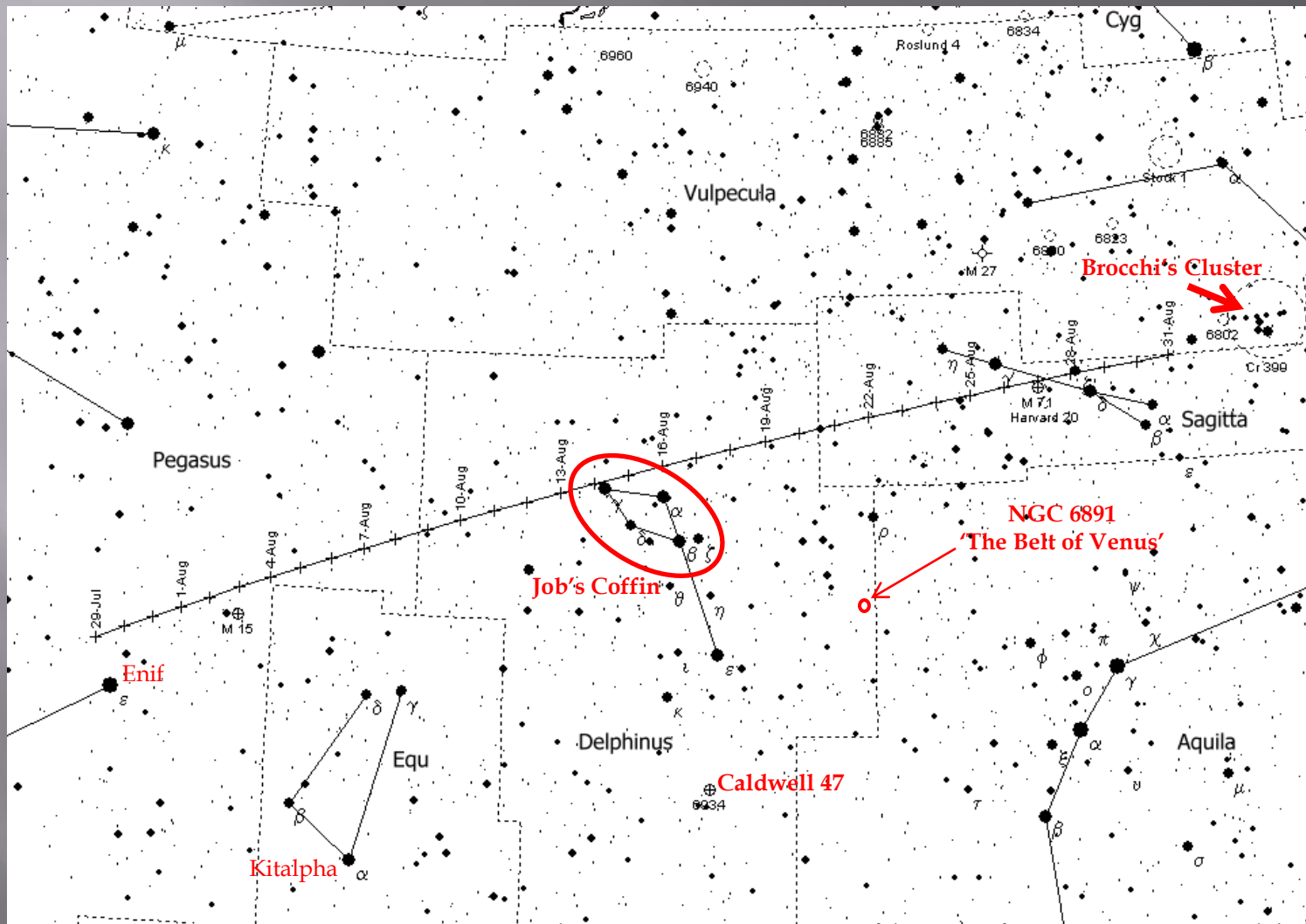
Figure 1: Garradd P1 projected path through the summer sky!



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

C/2009 P1 Garradd

Figure 2: Close up of Garradd P1 projected path from 29 Jul - 31 Aug 2011!



Courtesy of Winnie's Comet Pages 2011

Alpha (α) Delphini – Rotanev
Alpha (α) Sagittae – Sham

Beta (β) Delphini – Scalvin
Alpha (α) Vulpulae – Anser

Database of DSOs along the path of Comet Garradd

DSO	Common Name	R.A. (J2000.0)	Dec. (J2000.0)	Closest Approach	Time Period
NGC 7078	Messier 15	21h 29m 58.0s	+12° 10' 00"	The early morning the comet got to within 0.53° north of the globular cluster moving in a WNW direction!	2 August 2011
NGC 7006	None (10.6 mag. Globular Cluster)	20h 59m 15.9s	+15° 28' 31"	The comet will move thru the E region of Delphinus and will be 0.91° to the NE of this cluster at 11 PM CDT.	10 August 2011
Gamma (γ) Delphini	12 Delphini, HD 197963, TYC 01634-3057 1	20h 46m 38.9s	+16° 07' 25"	Garradd will be to the north of Gamma Delphini by a mere 0.24° just after midnight of the 14 th of August!	14 August 2011
IC 4997	He 2 - 464, PK 058 - 10.1	20h 20m 08.7s	+16° 43' 54"	The stellar looking planetary nebula at 11.3 mag will be located about 1.21° SSW of the comet about 90 min after midnight.	20 August 2011
NGC 6879	He 2 - 455, PK 057 - 8.1	20h 10m 26.7s	+16° 55' 21"	This 11 th mag planetary nebula will be 1.58° to the SW the evening of the 22 nd & 1.38° to the SE the following night!	22 - 23 August 2011
Gamma (γ) Sagittae	12 Sagittae, HD 189319, TYC 01624-3414 1	19h 58m 45.5s	+19° 29' 32"	The comet Garradd will be moving in a WNW direction while being about 0.73° to the SE and SW of the star for both consecutive evening respectfully.	25 - 26 August 2011
NGC 6839	None (Open Star Cluster)	19h 54m 33.0s	+17° 56' 18"	The comet will also be about 1.19° NNE of this open cluster during the very early morning hours heading WNW.	26 August 2011
NGC 6838	Messier 71	19h 53m 46.0s	+18° 46' 42"	Comet Garradd be north of this globular cluster and will fly to within 0.16° of M71 while still to the north heading WNW.	27 August 2011
Havard 20	Collinder 408, OCL 116	19h 53m 6.0s	+18° 20' 00"	Around the same evening Havard 20 will be 0.63° to the SW of the comet (9.6 Mag open star cluster about 7' across).	27 August 2011
Sh 2 - 84	None (Diffuse Nebula)	19h 49m 0.0s	+18° 24' 00"	For photographers this nebula will about 0.69° to the SSE of the comet and Sh2 - 84 is 0.425° to the E of Delta Sagittae.	28 August 2011
Delta (δ) Sagittae	Multiple Star System HD 187076, TYC 01619-3542 1	19h 47m 23.3s	+18° 32' 04"	Delta Sagittae will be 0.78° SSW of the comet! Here also is the location of the reflection nebula van der Bergh 127.	28 August 2011
Minkowski 1 - 71	He 2 - 439, PK 055-0.1	19h 39m 26.9s	+19° 42' 24"	A faint, stellar like planetary nebula located 0.54° to the NNE of the comet in the early morning hours before sunrise.	31 August 2011
NGC 6802	Collinder 400, OCL 114	19h 30m 35.0s	+20° 15' 42"	0.31° east of 7 Vulpeculae (the eastern edge of the coathanger) the comet will be 1.1° to the NNW of this star cluster.	1 September 2011
Brocchi's Cluster	Collinder 399, OCL 113 (The Coathanger)	19h 25m 24.0s	+20° 11' 00"	C/2009 P1 will be moving thru the southern region of the coathanger to within 0.87° south of 4 Vul (9/2 at 23:27 CDT).	2 - 3 September 2011

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

Date	UTC	R.A. (J2000)	Decl.	Delta	r	El.	Ph.	M1	*M2	Sky Motion	
	h m s									"/min	P.A.
2011 08 01	000000	21 36 39.0	+12 15 43	1.542	2.455	146.8	13.1	8.8	-	2.19	292.3
2011 08 02	000000	21 33 17.8	+12 35 37	1.528	2.445	147.4	12.9	8.8	-	2.23	291.8
2011 08 03	000000	21 29 52.2	+12 55 22	1.516	2.436	147.9	12.8	8.8	-	2.26	291.2
2011 08 04	000000	21 26 22.2	+13 14 59	1.504	2.426	148.3	12.7	8.7	-	2.30	290.7
2011 08 05	000000	21 22 47.9	+13 34 24	1.492	2.417	148.7	12.6	8.7	-	2.33	290.2
2011 08 06	000000	21 19 09.6	+13 53 36	1.481	2.408	148.9	12.6	8.7	-	2.37	289.6
2011 08 07	000000	21 15 27.4	+14 12 33	1.471	2.398	149.1	12.6	8.6	-	2.40	289.1
2011 08 08	000000	21 11 41.4	+14 31 14	1.461	2.389	149.1	12.6	8.6	-	2.42	288.6
2011 08 09	000000	21 07 51.9	+14 49 36	1.452	2.380	149.1	12.6	8.6	-	2.45	288.0
2011 08 10	000000	21 03 58.9	+15 07 38	1.444	2.370	148.9	12.8	8.5	-	2.47	287.5
2011 08 11	000000	21 00 02.8	+15 25 17	1.436	2.361	148.7	12.9	8.5	-	2.49	287.0
2011 08 12	000000	20 56 03.8	+15 42 33	1.428	2.352	148.3	13.1	8.5	-	2.51	286.4
2011 08 13	000000	20 52 02.1	+15 59 22	1.422	2.343	147.8	13.3	8.5	-	2.53	285.9
2011 08 14	000000	20 47 58.1	+16 15 43	1.416	2.333	147.3	13.6	8.4	-	2.54	285.3
2011 08 15	000000	20 43 51.8	+16 31 36	1.411	2.324	146.6	13.9	8.4	-	2.55	284.8
2011 08 16	000000	20 39 43.8	+16 46 57	1.406	2.315	145.8	14.2	8.4	-	2.56	284.2
2011 08 17	000000	20 35 34.2	+17 01 45	1.402	2.306	145.0	14.6	8.4	-	2.57	283.7
2011 08 18	000000	20 31 23.4	+17 16 00	1.398	2.297	144.1	15.0	8.3	-	2.57	283.1
2011 08 19	000000	20 27 11.7	+17 29 40	1.396	2.287	143.1	15.4	8.3	-	2.57	282.5
2011 08 20	000000	20 22 59.4	+17 42 44	1.393	2.278	142.1	15.8	8.3	-	2.56	282.0
2011 08 21	000000	20 18 46.8	+17 55 11	1.392	2.269	141.0	16.3	8.3	-	2.55	281.4
2011 08 22	000000	20 14 34.3	+18 07 00	1.391	2.260	139.8	16.8	8.3	-	2.54	280.9
2011 08 23	000000	20 10 22.3	+18 18 11	1.391	2.251	138.6	17.3	8.2	-	2.53	280.3
2011 08 24	000000	20 06 11.0	+18 28 43	1.391	2.242	137.4	17.8	8.2	-	2.51	279.7
2011 08 25	000000	20 02 00.7	+18 38 37	1.392	2.233	136.1	18.3	8.2	-	2.50	279.2
2011 08 26	000000	19 57 51.8	+18 47 51	1.393	2.224	134.8	18.8	8.2	-	2.47	278.6
2011 08 27	000000	19 53 44.7	+18 56 27	1.395	2.215	133.4	19.3	8.2	-	2.45	278.1
2011 08 28	000000	19 49 39.5	+19 04 23	1.398	2.206	132.1	19.9	8.2	-	2.42	277.5
2011 08 29	000000	19 45 36.6	+19 11 42	1.401	2.197	130.7	20.4	8.2	-	2.39	277.0
2011 08 30	000000	19 41 36.3	+19 18 24	1.404	2.188	129.3	20.9	8.1	-	2.36	276.5
2011 08 31	000000	19 37 38.8	+19 24 29	1.408	2.179	127.9	21.4	8.1	-	2.33	275.9
2011 09 01	000000	19 33 44.4	+19 29 58	1.413	2.170	126.5	22.0	8.1	-	2.30	275.4

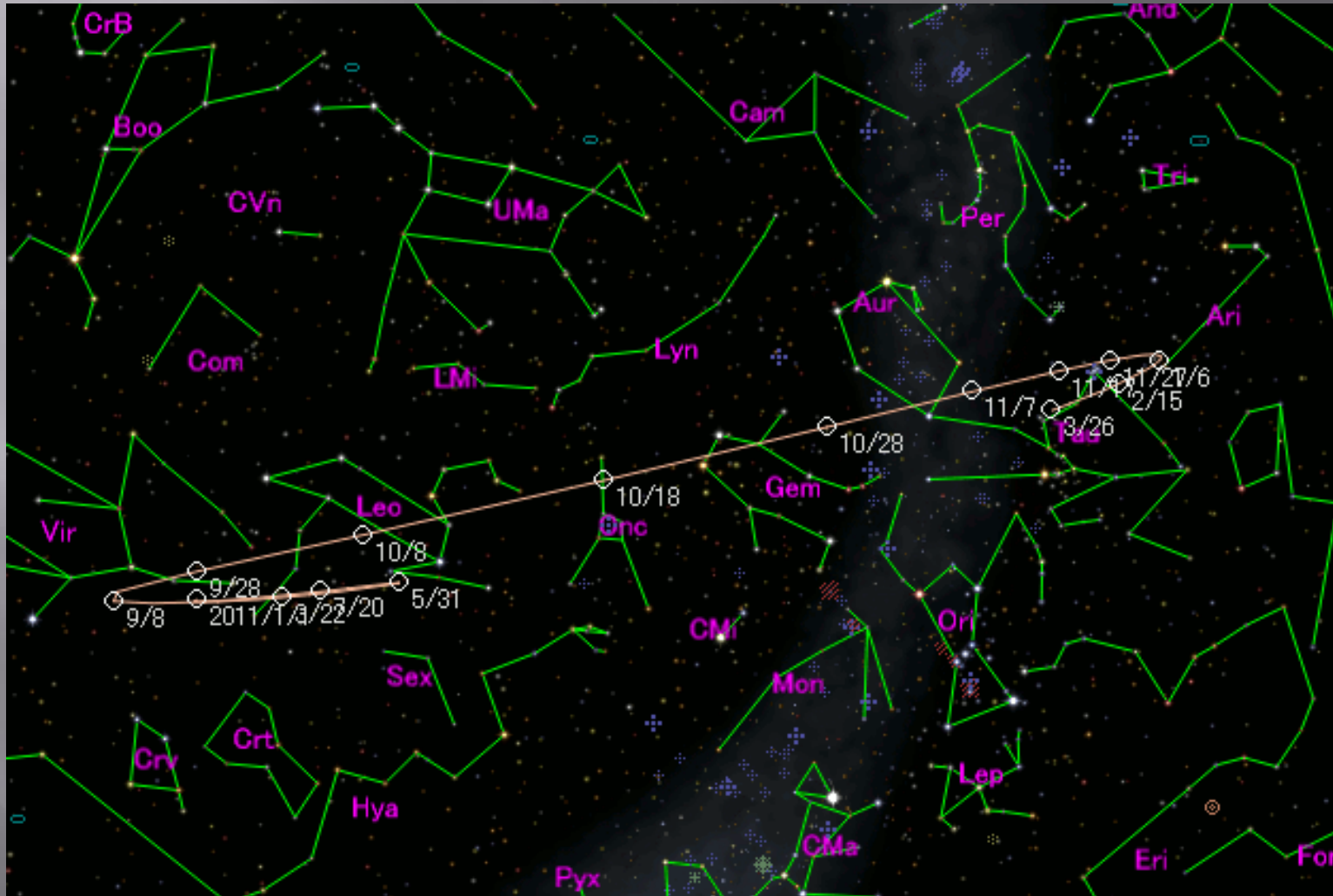
All ephemeris data above is calculated for 00 hrs UTC which would be -5 hrs for adjustment to CDT!

*M2 values are not shown if values are fainter than 19th magnitude!

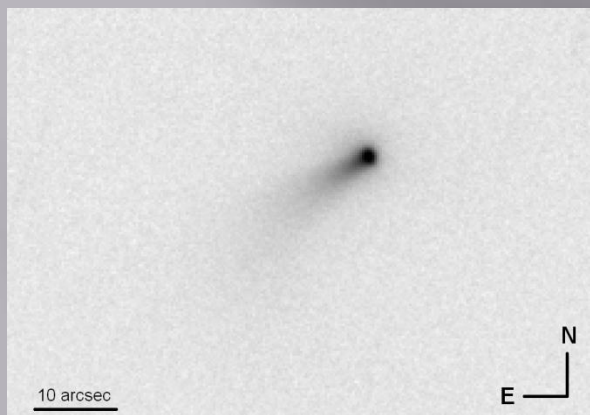
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C/2010 X1 Elenin

Figure 3: The projected path and retrograde motions of C/2010 X1 Elenin for 2011!



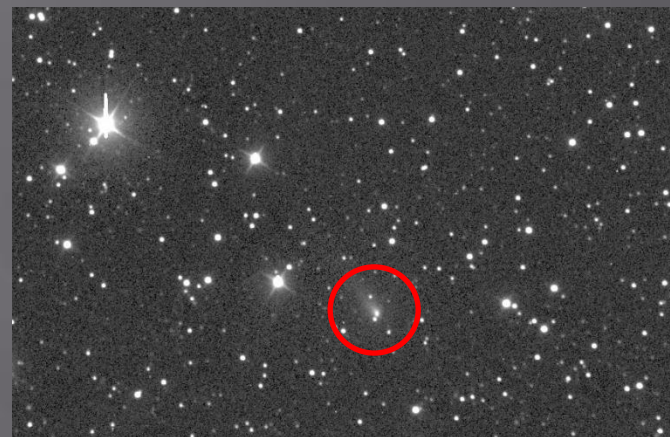
Courtesy of www.aerith.net: Seiichi Yoshida's Comet Page!



45P/Honda-Mrkos-Pajdusakova



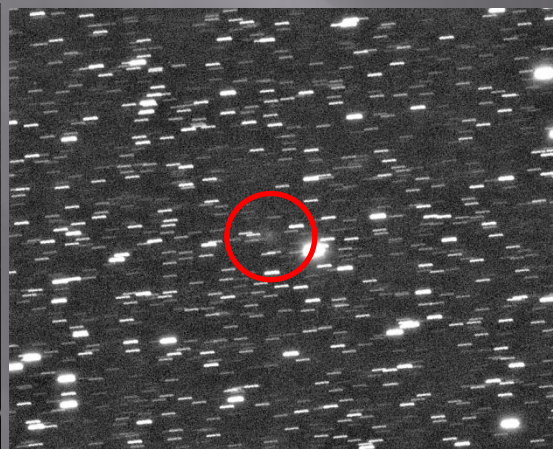
27P/Crommelin



C/2010 G2 Hill



C/2010 X1 Elenin



C/2011 M1 LINEAR



213P/Van Ness

@SOULIER
 213P VAN NESS 23H14.52 -02°02.34 le 20110705 à 00H06 TU m1 : 14.7 MPC UA : 1.50
 Newton T 254/900 Axis Instruments, 2" rfd.apl, Keller 0,73, P.o Optec
 ST7XMed 6X120s, autoguidage 2 axes, CCD -20°C avec H2O, 2.04"/pix, champ +/- 12' X 8', sans filtre, mode auto
 10dark, 2offset, 15plu PRISMV8/APE, recalage sur le noyau, DDP, FC
 Seeing 2/5, Lune : 160°, M.d'air : 3.33, Seine et Marne, FRANCE

0213P	C2011 07 05.00519 23 14 51.16 -02 02 44.1	15.3 N	C10
0213P	C2011 07 05.01303 23 14 51.42 -02 02 39.2	15.3 N	C10