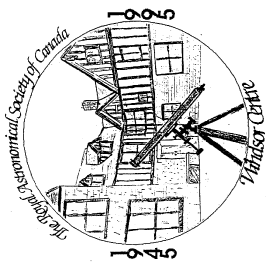




AURORA



September 2014

The Royal Astronomical Society of Canada - Windsor Centre

Volume 40, No. 1

Barnard's Star



Barnard's Star is about six light-years away from Earth in the constellation of Ophiuchus. It is the fourth-closest star to the Sun at almost 6 light years away. The three components of the Alpha Centauri system are closer which makes it the closest star visible from the Northern Hemisphere. Barnard's Star is a low-mass red dwarf star which makes it dim at about 9th magnitude despite its close proximity. It is named for American astronomer E.E. Barnard. He was not the first to observe the star but in 1916 he measured its proper motion or movement against the background sky as 10.3 arc seconds per year. This is the largest-known proper motion of any star relative to the Solar System.

The image above or more correctly the 5 images above were captured by Dave Panton. Each year, in the month of May, Dave has captured an image of the field that contains Barnard's Star. 2010 was the first year of this personal project when Barnard's Star was in the lowest position in the above composite image created by Steve Mastellotto. Last May Dave captured the 2014 image (top position) which now represents 41.2 arc seconds of movement over the intervening years.

Over the years Dave has captured his images with slightly different settings but in general he is shooting through the Celestron 14 inch scope at Hallam using his Nikon digital camera and about 2 minute exposures at ISO 800 or 1600. Dave will typically focus using the Bahtinov mask and process his images using the AIP4Win program.

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Calendar of Events

Our next meeting...

Tuesday October 21, 2014

7:30 p.m.

at

Ojibway Park Nature Centre

5200 Matchette Road

Main Speaker...

To Be Determined

Topic...

To Be Announced

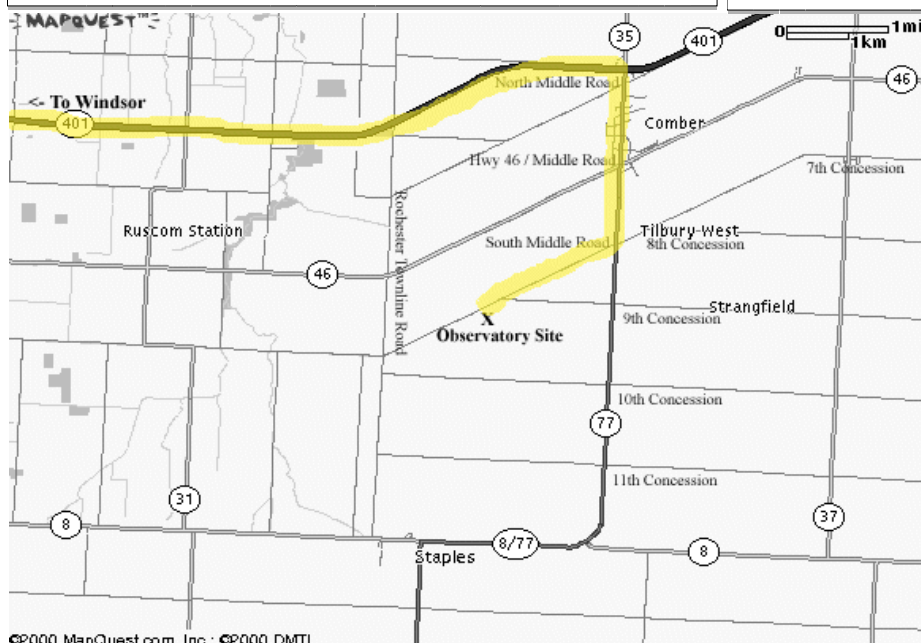
Activities...

Autumnal Equinox: The Sun will cross the Celestial Equator heading South on Monday September 22 at 10:29 p.m..

Open House Night at Hallam: The next open house night at Hallam is on Saturday September 27 at 7:45 p.m..

Total Lunar Eclipse: On Wednesday October 8th the Moon will begin entering the umbral shadow of the Earth at 5:14 a.m. marking the beginning of the partial phase of the eclipse. Totality begins at 6:25 a.m., mid-eclipse is 6:55 a.m. and totality ends at 7:24 a.m..

Council Meeting: The next meeting of Council will take place on Tuesday October 14, 2014 starting at 7:30 p.m.. The meeting will be at the home of Steve Mastellotto.



Hallam Observatory Site

Directions: The map at left shows the Comber area and it includes the major highways (401, 77, 8 and 46) that are in the area of the observatory.

The most direct route from Windsor is "highlighted" on the map which is to take Highway 401 East to Highway 77 South to South Middle Road. Turn right onto South Middle Road and go about 1 kilometer and just after the point where Concession 9 joins it (it is hard to see this intersection) you will find the observatory site on the South side (left) of the road. 3989 South Middle Road.

If you hit the Rochester Townline Road (you come to a stop sign) you have gone too far.

Submissions

Aurora is published monthly except for July, August and December. The September, October, January, March and May issues are full newsletters (usually 6 pages) with a number of member submitted articles. The November, February, April and June issues are short flyers (2 pages).

Submitted articles can be of any length from a paragraph to multiple pages. I can scan pictures and/or diagrams (both prints and film) to support your article and the originals will be returned to you.

Submission deadline is the 1st of the month.

Editor: Steve Mastellotto Email: mmastellotto@cogeco.ca

Membership

The Windsor Centre of The Royal Astronomical Society of Canada meets on the 3rd Tuesday of every month (except July and August) at the Ojibway Park Nature Centre. In addition to regular meetings the centre hosts a number of observing nights, a picnic and a December social. Members receive a copy of the Observer's Handbook, a subscription to SkyNews magazine and access to the Centre's library and telescopes. Optionally the RASC Journal is available in print form—online version free.

Annual Membership Fees: Please see the RASC website at www.rasc.ca for current rates.

Contact Greg Mockler at (519) 326-7255 or visit our website at: <http://www.rascwindsor.com> for more information.

June 2014 Meeting Minutes by Matt McCall

The monthly meeting of The Royal Astronomical Society of Canada - Windsor Centre was held at the Ojibway Park Nature Centre on June 17, 2014.

Windsor Centre **Past President Paul Pratt** chaired the Meeting. Paul called the meeting to order at 7:38 p.m. and welcomed members and guests to the Ojibway Nature Centre.

A motion to accept the minutes of the May 20, 2014 members meeting was made by Greg Mockler, seconded by Dan Taylor.
MOTION CARRIED.

Correction to May 20, 2014 Meeting Minutes: In the last *Aurora* flyer of June 2014, the name of the astrophotographer mentioned during the main speaker's talk was incorrectly captured as 'Mark John Hitchinson'. The correct name is Mark John 'Christensen'.

Main Speaker

Paul introduced the main speaker for the evening, **Dr. Bill Baylis**, and his talk: **Our Evolving Perception of the Universe**.

Dr. Baylis began his presentation by explaining what's known as the Copernican principle, as well as its basic points and origins. Famous scientists and astronomers who aided the advancement of our perception were then mentioned and described.

Bill explained how Nicolas Copernicus believed that a model of the Solar System made much more sense if the Sun was located in its center instead of the Earth. Of course it was Galileo Galilei who got himself into trouble by openly supporting the Copernican model, Bill said.

In today's world, the Copernican viewpoint has been extended even further so that not only is the Earth not in the center of the Solar System, but our Solar System is also not in the center of the Milky Way Galaxy, or the Universe itself.

Johannes Kepler and Isaac Newton were mentioned as having advanced the Copernican theory as well, and then William Herschel's 1800 discovery of infrared radiation in a thermometer was described. In his experiments, he was able to split the colours of the Sun's rays, and it was intriguing for him to learn which colours were the warmest by using thermometers for each colour.

He observed the sky from more than six-hundred different locations around the world and counted every star that he could see and based on the apparent brightness attempted to ascertain the shape of the Universe.

Bill spoke of Henrietta Swan Leavitt, who was known as a "computer" at the Harvard College Observatory. She was initially unpaid there, but then later earned thirty cents per hour. Women were not allowed to operate the telescopes at the time.

Harlow Shapley was based at Mount Wilson Observatory and studied Cepheid variables and the Leavitt relation-determined

distances to globular clusters with the sixty-inch telescope there. It was found that the Milky Way is larger than previously believed. However, he lost the great debate with Heber Curtis in 1920; that there are other galaxies outside of our own in the Universe.

In 1924, Cepheid variables in the Andromeda "Nebula" were used to estimate distance, and in 1929, using Cepheids once again, an approximate red-shift/distance relation was noted.

The presentation continued through numerous figures of science, and at one point, Dr. Baylis spoke of Fritz Zwicky's pioneering work in 1933, and also American astronomer Vera Rubin and her colleagues' analysis of how galaxies rotate. It was concluded that gravity made up of visible matter that we could see could not possibly hold the galaxies together. They must also contain invisible or Dark Matter, or perhaps their proposed theory of galactic clusters could explain this mystery.

However, at the time, Ms. Rubin preferred the theory of MOND, or "Modification of Newtonian Dynamics", as the explanation of how galaxies remained intact.

In conclusion; Bill mentioned that our perception of the Universe has changed at an accelerating pace over the past four centuries. Since there are still a few serious problems within our understanding, we can expect further developments in our perception in the coming years.

Paul thanked Dr. Baylis for his great presentation, and then announced the break period and fifty-fifty draw.

Break and Fifty-Fifty Draw: Winner was Mario Fabris.

Announcements

- The next Hallam Observatory Open House is to be held on Saturday July 5th, beginning at 9:45 p.m.
- The next Point Pelee Dark Sky Night will be hosted by space author Peter McMahon on Saturday July 26th.

Director of Observing Report, Steve Pellarin: Steve began his presentation by having the audience take a quick look at the Skymap he provided for them, claiming that we're starting to get a little bit more of the Milky Way visible in our skies above. It's not getting dark until very late now though.

The Sun has been moderately active very recently, with a number of C-class eruptions on the surface of the Sun. Photographs of the Sun taken at different wavelengths showed an active sunspot region, though by now we are well past the time of Solar Maximum.

We've pretty much lost all of our winter constellations in the sky, and if you haven't had the chance to take a look at Jupiter yet this year, it would be good to do so low in the western sky before it disappears behind the Sun.

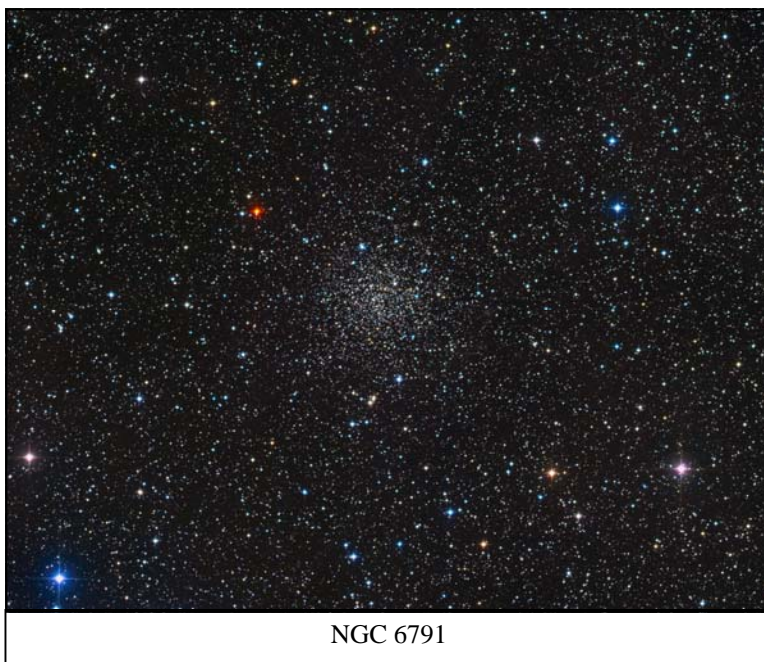
At The Eyepiece: Lyra's Hidden Treasures by Mike Ethier

September is such a wonderful month to get outside and do some observing. In July and August, observing the summer constellations means having to begin very late in the evening, something impossible for those who work next morning. In July it doesn't get truly dark until after 11:00 pm. Along comes the autumnal equinox with a nice surprise: most of those summer constellations are still available, and darkness comes early enough now to allow at least an hour or two of observing even during a work week. For a time in September, the stars actually appear not to advance at all from one night to the next, due to the earlier sunsets and darkness. So if you have had a tough time getting your observing act together during the summer, you can still see the wonders of Lyra, Cygnus, Aquila, and even Sagittarius over the next several weeks.

This month I would like to talk about a pair of objects in Lyra. They are challenging ones that require larger apertures to appreciate. Both objects, a planetary nebula and an open cluster, look splendid in our club's 14" telescope. Hopefully, I can entice you out to Hallam Observatory some night soon for a look.

Lyra has the most famous planetary nebula in the heavens. M57, the Ring Nebula, is one of the most looked at objects in the sky. It looks beautiful in a 3" scope, and anything bigger is a bonus. On a spectacularly clear night last October, I was able to glimpse the central star with a 12" scope. There is even a very faint IC galaxy very close by that also makes for a challenging search. However, I wish to talk about another planetary nebula in Lyra, NGC 6765. It cannot be found with a 3" scope; not even with a 6". It is 40 arc seconds in size and close to 13th magnitude. It's central star is beyond reach of the 14" scope, at mag. 16.

Located slightly north of globular cluster M56, and preceding it by 6' of Right Ascension this object surprises even veteran observers, who are often intrigued to learn of its existence. While it can be located in an 8" scope on a very fine night, a bigger aperture is required to fully appreciate its size and shape. While it is certainly no Ring Nebula, it offers an overhead planetary nebula much more tricky to observe in detail, though worthwhile for patient observers. It lies close enough to M56 that making a stopover here is not difficult. I observed it over several nights in the 12" scope, trying to figure out exactly what it was I was seeing. When tackling new objects at the eyepiece, I avoid looking up photos until my sketch and description is complete. Then I go to Google Images for a peek.



NGC 6791

I saw a large, faint object at 100x, nearly half the size of M57. It is in a very rich star field, and it bears magnification well, whereas at 200x it becomes oval. At first I thought I was seeing a star in it, but on further viewing it seemed like a bright clump of nebulosity. My ultra-block filter worked very well here, making the object brighter and larger. Eventually I was able to discern two parts to the nebula. At first it was merely rectangular in shape, but as I viewed it longer it began to resemble a snowman, with a small, roundish head situated atop a larger, roundish body. Is there a "snowman nebula" out there already? If not, I nominate NGC 6765!

Seven and a half degrees north of M56, and 4 minutes following is the unusual and eye-popping open cluster NGC 6791. This one

requires a big aperture to resolve the multitude of stars, the brightest of which is mag. 15. Observed back in the old days with the 8", it was seen as a milky haze, quite large and not that difficult to locate. With a diameter of 10 arc minutes and a visual magnitude of around 9.5, it is impressive even when not resolving. However, it does begin to resolve in the 12" at higher powers (187x begins to show stars; at 250x things start to become overwhelming). For those who love to view NGC 7789 in Cassiopeia (which resolves well in a 6" scope), 6791 is another step or two beyond. I have viewed it in the club's 14",

but I would really like to see this in a 16" scope or higher. Stars, stars, stars!

With all the wonderful globular clusters out there, it is not surprising that M56 gets overlooked sometimes by summer sky-watchers. When seen directly overhead, M56 is a real treasure. Once again, the larger the aperture the more you will see. Since this spectacular globular cluster is used this month as our nearest guide object, it would be a shame not to include it in our explorations. It makes a wonderful third object, beginning with the faint planetary, following up with the challenging-to-resolve open cluster, and finishing with M56. If you haven't seen M57 in a while, view it after viewing 6765 to appreciate the differences. Enjoy the night skies!

P.S. Deb and I are usually at Hallam on clear nights away from full moon. Should you stop by some night when the dome is closed, we are always set up in the parking lot with our 12" and 6" scopes, and will be more than happy to show you the objects discussed above.

June Meeting Minutes *(continued)*

(Continued from page 3)

Mars is prominent along with Saturn, despite the fact that it's disc is getting smaller in size. Not many features are remaining visible on the red planet through small telescopes these days.

Saturn continues to tilt on it's axis enough that the rings are now very wide open, and will still continue to do so. This has been making it appear brighter at night, particularly while it's in such a dim constellation like Libra.

Asteroid Vesta is visible in binoculars right now, and Comet Pan-STARRS K1 - discovered in 2012 - is in the sky at magnitude 8.

Steve showed displays indicating where to find these objects over the next month or so.

June 21	Summer Solstice
June 23-25	Venus and Moon closing within range of each other with Aldebaran nearby.
June 29-30	Around dusk - Jupiter near crescent Moon
June 30-July 2	At dusk, Moon around Leo constellation.
July 5	Moon and Mars meet up for close conjunction. Southern Delta Aquarid meteor shower occurs around this date as well.

Paul thanked Steve for his presentation and also thanked everyone for coming out to the meeting. The meeting was **adjourned at 10:06 p.m.**

Point Pelee Dark Sky Night

A call for any RASC members wanting to assist visitors in observing the night sky on Friday September 26 - please contact an RASC Windsor Centre council member.

We still wish to try carrying over the momentum from the last two Dark Sky Nights at Point Pelee, however, since this is not an officially RASC hosted event, no member is actually required to be there to volunteer.

We're still determining if members will have the ability to observe in the park past midnight. We can inform interested members as soon as we know. All campgrounds & cabins are occupied so no camping privileges will be available this time around. We need a list of members wishing to stay late in case this option becomes available.

Any volunteers should meet up at the Visitor Centre parking lot but for any other members own enjoyment, we recommend setting up your astronomical equipment at DeLaurier Homestead so you have the best chance of observing undisturbed at any time of the evening. This site is the darkest of all those that provide a very good field of view with limited interference from the trees.

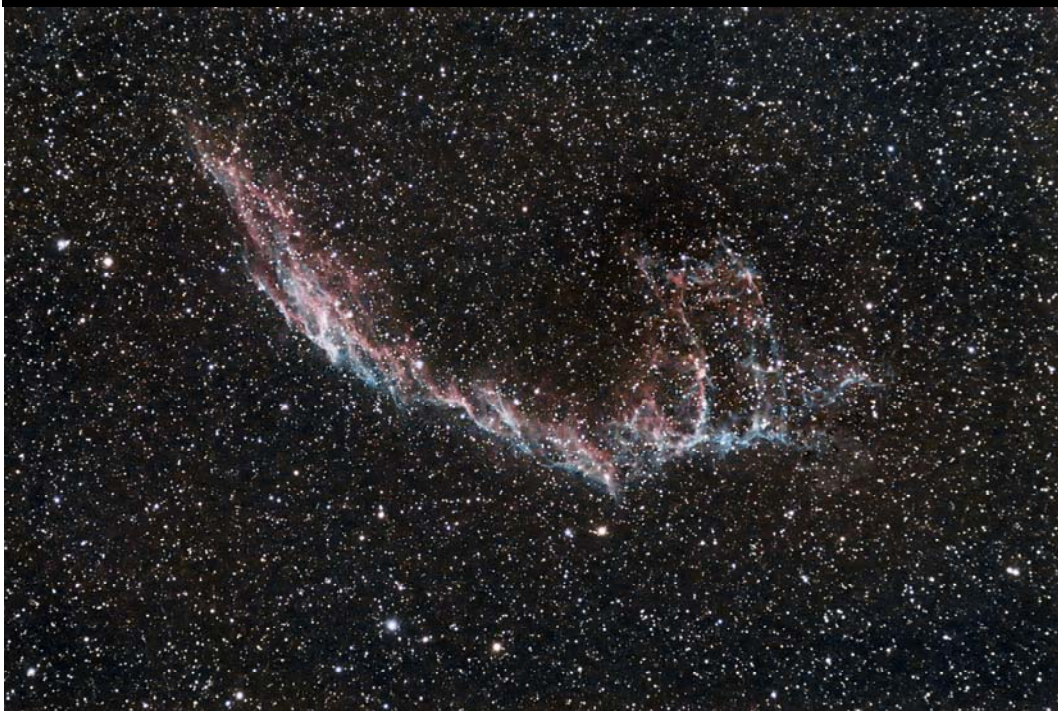
Calendars

Our Treasurer, Greg Mockler is taking orders for the 2015 RASC Calendar. Price will be \$17.50 including S&H and HST if he gets over 10 orders - this is the same price as last year and is substantially less than ordering directly from National. Please see Greg at the September meeting.



The RASC - Windsor Centre picnic was held on Saturday June 14 at Hallam Observatory. Photo by Mike Mastronardi.

Member Astrophotos



Clockwise from left: The Veil Nebula NGC 6992 by Pete Barbaro, M22 by Pete Barbaro, Conjunction of Venus and Jupiter on the morning of August 18th by Mike Mastronardi and Conjunction of the Moon and Mars on July 5 by Barb Arsenault.

