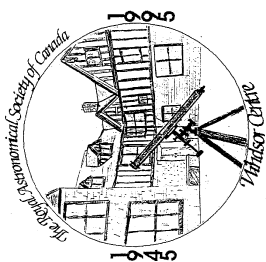




# AURORA



September 2016

The Royal Astronomical Society of Canada - Windsor Centre

Volume 42, No. 1

## Barnard's Star - 2016 Installment



Barnard's Star is about six light-years away from Earth in the constellation of Ophiuchus which makes it the fourth-closest star to the Sun. The three components of the Alpha Centauri system are closer which makes Barnard's Star 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 7 images above were captured by Dave Panton (assisted by Al DesRosiers) and Steve Mastellotto. Since 2010 Dave captured an image of the field that contains Barnard's Star and for 2015 and 2016 Steve captured the images. 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. In July Steve captured the 2016 image (top position) which now represents 61.8 arc seconds of movement over the intervening years. At this rate it will take about 175 years to span the width of the Moon.

Over the years Dave and Steve captured the images with slightly different set ups but in general the images are through the Celestron 14 inch scope at Hallam using Nikon and Canon digital cameras and about 2 minute exposures at ISO 800 or 1600. Focus is achieved using a Bahtinov mask.

### *In This Issue*

Barnard's Star	Cover
Events; Housekeeping Items	Page 2
June Meeting Minutes	Page 3
At the Eyepiece	Page 4 and 5
Hallam Fundraising / Calendars	Page 5
Member Astrophotos	Page 6

## Calendar of Events

### *Our next meeting...*

Tuesday October 18, 2016

7:30 p.m.

at

Ojibway Park Nature Centre

5200 Matchette Road

### *Main Speaker...*

John Marn

### *Topic...*

*2016 Hallam Observatory Challenges*

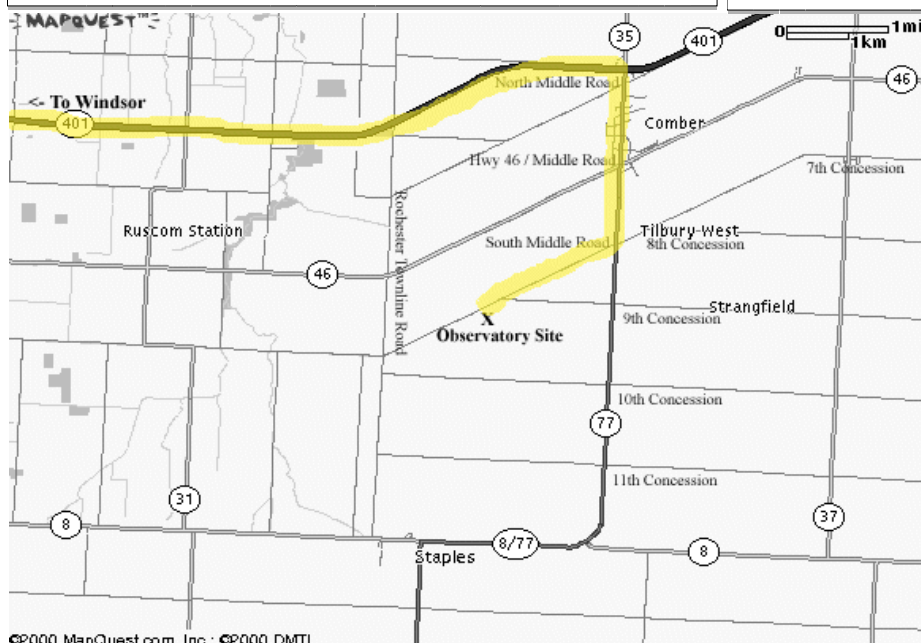
### *Activities...*

**Autumnal Equinox:** The Sun will cross the Celestial Equator heading South on Thursday September 22nd at 10:21 a.m. EDT.

**Mercury:** Is visible in the morning sky in late September and furthest from the Sun on **Wednesday September 28th**. On Tuesday October 11th Mercury is **3/4 of a degree North of Jupiter** low in the morning sky.

**Open House Night at Hallam:** The next open house night at Hallam is on Saturday October 8th at 7:30 p.m..

**Council Meeting:** The next meeting of Council will take place on Tuesday October 11, 2016 starting at 7:30 p.m.. The meeting will be hosted by Melissa Martin at Skippy's Restaurant, 954 University Ave. West.



### 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](mailto: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](http://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 2016 Meeting Minutes by Dan Perissinotti

The monthly meeting of the Royal Astronomical Society of Canada - Windsor Center was held at the Ojibway Park Nature Centre on Tuesday June 21, 2016.

Windsor Centre **1st Vice President, Mike Mastronardi**, chaired the meeting and called the meeting to order at 7:36 p.m. and welcomed members and guests. Mike invited members to review the minutes of the May 17, 2016 meeting which were printed in the June newsletter.

A motion to accept the minutes of the May 17, 2016 membership meeting was made by Dr. Susan Sawyer-Beaulieu, seconded by Brian Thomas. **MOTION CARRIED.**

Mike welcomed everyone to the meeting and explained that President, Randy Groundwater asked Mike to chair the meeting during his absence. Mike provided a brief agenda of the topics which were going to be discussed.

### Main Presentation

Mike introduced the **main speaker, Nancy Ng** who gave an extensive presentation on **"The Chinese Sky"**. Nancy's interest with the Chinese sky started with her study of Antares. Relating the western study of constellations to the Chinese view of the sky. The Chinese zodiacs are laid out based on their belief that Jupiter took 12 years to orbit around the sun. Each zodiac has an animal associated to it, as the word zodiac means the circle of animals in Latin and Greek. The sky was split into 4 regions (N, E, S, W), and each quadrant was split into 7 sections called lunar mansions. Within those 7 sections there are 28 detailed lunar mansions.

The power of the emperor comes from what people call the mandate of heaven. He had to be seen as understanding the sky. The sky is represented as a direct representation of life on earth. As such, astronomers became very important to the emperor.

Some famous Chinese astronomers include Zu Chongzhi who created the DaMing calendar, used as an agricultural/astronomical calendar. He was one of the first to calculate the number of eclipses in a 24 year period (4).

Nancy gave an in depth review of some common asterisms and how they relate to our western constellations.

Mike thanked Nancy for her very informative presentation.

### Other Business

Mike welcomed **Dave Sobocan** to the floor to give a brief photo presentation on his astronomy related vacation in California.

**Steve Mastellotto** then presented a sample of a mock-up of a

Windsor Centre calendar to be sold for 2017. This calendar will focus on member astrophotos. It will be sold alongside the National RASC calendar.

**Break and 50/50 draw:** took place at 9:30 p.m. \$6.00 went to Mahayarrahh-Starr who donated the proceeds back to the Centre.

Jody was welcomed to the floor to present the Windsor Centre Service Certificate to Matt McCall.

Nancy was kind enough to offer a door prize, a FU pendant which went to Paula O'Rourke.

### Director of Observing Report

Mike welcomed **Brian Thomas** to the floor, to present the D of O Report. He started off with by asking the audience what they have been viewing over the last month. Comments included Mars and Jupiter roving across the low southern sky. Matt had mentioned a quick view of a weather balloon.

A quick overview was given of the planetary locations and visibility, along with the phases of the moon. Upcoming events through the summer included **Pluto** near Pi Sagittarii, **Perseid meteor shower**, and the **Venus** and **Jupiter** conjunction on August 27, 2016.

Nearby star parties for the Windsor area include **Starfest** 2016 August 4-7, 2016 in River Place Park (near Mount Forest). **Manitoulin Star Party** August 5-8, 2016 in Gordon's Park Dark Sky Preserve.

Brian's spotlight for this month was on **Scorpius**. It is a Southern sky constellation just visible to Canadians in the lower latitudes. Some visible features include the doubles **Beta Scorpii**, **Mu Scorpii**, **Omega Scorpii**, globular cluster **M4**, and open clusters **M6**, **M7**, and the **Northern Jewel Box NGC 6231**.

**Point Pelee dark sky nights** this summer include Saturday July 16 when the park will be open until 2 a.m. and hosted by Peter McMahon of SkyNews. Friday August 12 is a RASC hosted Perseid meteor shower event at the West Beach and the park will remain open all night.

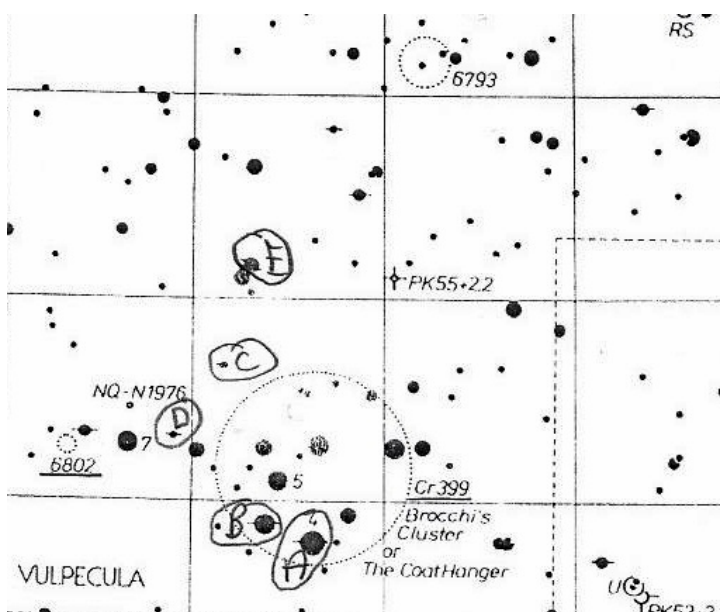
Mike thanked everyone for coming out to the meeting and reminded everyone that the **next regular membership meeting** would take place **September 20<sup>th</sup>, 2016 at 7:30 p.m.**

Mike **adjourned the meeting** at 9:35 p.m..

## At The Eyepiece: Vulpecula by Mike Ethier

This month we are going to look closely at two familiar objects in Vulpecula. The first object is open cluster **Cr 399**, “**The Coathanger**”. The second object is **Messier 27**, which will introduce a new feature to these articles. Each month I will write about one of the Messier objects, in addition to the regular, slightly more obscure objects I usually talk about.

The Coathanger is not a true cluster, but rather an asterism, or chance alignment of stars. No matter, it still is a beautiful sight to behold in binoculars, finder scopes and rich field telescopes. My best view of the entire object has been in the 4 1/4” Edmund Astroscan, at 16x! In my 2” refractor (Space Eye), it mostly fits into my 30x field and is an attractive group, with about 20 stars counted. In Deb’s 6”, a beautiful view can be had at 42x, and it almost all fits into the field of view. In my 12” Dob at 43x, I have to scan around to see the whole object. The first thing I noticed is how white the straight line of bright stars is, representing the bottom of the coat hanger. The two most southerly stars, by contrast (top of the hook), are very colourful, being very yellow (star 4) and bright gold (NE of 4). Remember that in binoculars the coathanger image is upside down, but in a telescope it is seen right side up.



There are five double stars of note in and around the cluster, labeled A through E on the accompanying map above. I encourage you to explore them all, along with many others not listed.

**A= 4 Vul:** Triple star—5.2-10/14”; and 5.2-11.7/ 52”: The main star is very yellow, and is the most southerly bright star in the cluster, at the top of the hook. It is also the brightest star in the cluster.

**B=STF 2521:** Quadruple star—5.8-10.5/14”; 5.8-10.5/52”; 5.8-10.5/152”: This deep golden star is just north following 4 Vul. (northeast), in the middle of the hook. Lovely at 100x in the 12”.

**C=STF 2527:** Classic double—8.5-9.7/4.3”: A stunning pair at 136x! Pale yellow and pale blue. In the N part of Cr. 399.

**D=STF 2530:** Double star. 9.4-10.7/5.6”: Yellow and blue at 100x, 136x. A similar pair is S of the nearby bright star in the field.

**E=STF 2523:** Close double star—8-8.1/6.3”: Split nicely at 100x. Virtually equal mag. It is the northern-most star of a bright, close asterism N of Cr 399.

**NGC 6802:** Open Cluster, 5’; Vis. Mag. 8.8; Br. Star mag. 14; 20 stars (there are many more).

Pushing just east of Cr. 399 (following it) is a lovely open cluster, framed by two pair of wide doubles to the N. **NGC 6802** could not offer more contrast to the gigantic Coathanger. It is small and very concentrated, and not very interesting in a 6” or 8” scope, appearing mostly as a fine, elongated haze. However, at high power in the 12” (200-272x) it resolves into a rich N/S cluster of very faint stars, a thrilling sight on a night with good transparency. In Randy’s 22” mirror, this little group is like a mini Messier 11!

I hope you take the time this month to seek out these treasures. Cr 399 can be seen with the naked eye as a hazy patch, about 7 degrees S of Albireo. If you are searching with a Go To, simply punch in NGC 6802 and move west just a bit. Happy hunting.



*M27 - Image by Ted Gervais using his Canon 5D Mark III and C-11 telescope. Exposure is 10 x 3 minutes at ISO 1000.*

And now, welcome to Messier Moment! I’d like to dedicate this first report to Joady Ulrich, one of the club’s most enthusiastic observers! Messier 27, the “Dumbbell Nebula,” needs little introduction to amateur astronomers. It is one of the most popular objects in the northern sky, and with good reason. At 402” in size, and having an overall mag. of 7.4, it can be seen well in the smallest of instruments. An 8” scope will show its 13.9 mag. central star on a good night, along with a lot of fine detail.

While observing certain very special deep sky objects, I often have processing problems. Call it sensory overload. M 27 is a

(Continued on page 5)



## At the Eyepiece (continued)

(Continued from page 4)

planetary nebula, the result of a star shedding its outer layers of gas. These nebulae sometimes loosely resemble a planet, and thus their nickname. Knowing this does not help much in dealing with the incredible view provided by any modest telescope. In a 12" Dob at 136x, and using an O111 filter, there are very few appropriate words that come to mind. Perhaps listening to Benjamin Britten's 1<sup>st</sup> String Quartet, Op. 25, 3<sup>rd</sup> Mov't "Andante Calmo," expresses it best (by all means listen to music when observing—just use your headphones so as not to disturb other observers). A more mundane verbal description might describe it looking like a giant interstellar greyish-green football floating past, on its way to the end zone at the end of the galaxy. The N/S ends of M 27, rounded, are very bright compared to the E/W sides (and thus the dumbbell shape). The following and preceding ends are much fainter, with the following end (east) seemingly cut off at some point. The preceding end (west) appears rounder. Without a filter, several stars are easily seen, seemingly imbedded (though not really) in the haze. The central star is embedded, though, and should appear in a decent 8" scope at higher powers. M 27 even looks like a showpiece object in my 2" refractor at 30x!

Messier 27 seems more like astronomical poetry to me, rather than an interstellar object of great force and violence. Visible at higher powers in a 12" Dob (200x and higher) are many swirls, subtle shadings, and other fascinating and unexpected details. The nebula repays frequent visits, but it will probably not help the descriptive words come to mind. Just gaze and enjoy! And while visiting M 27, don't forget to cruise around the stellar neighbourhood—M 27 lies in a very rich part of the sky. You never know what you might discover.

Happy hunting, and clear skies.

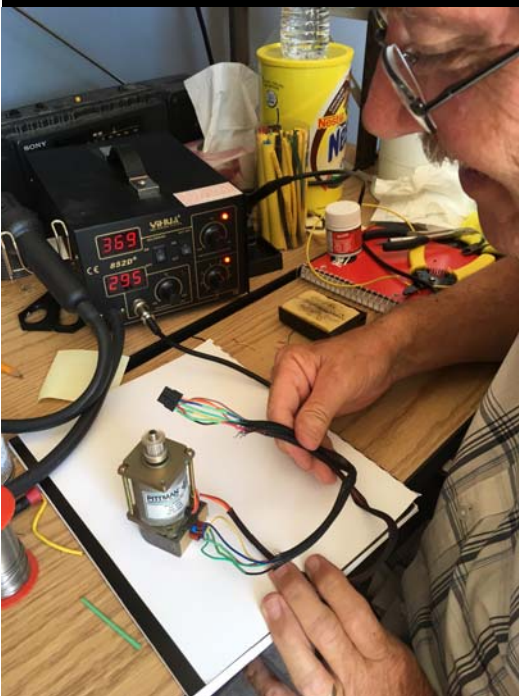
## Calendars



**RASC Windsor Centre** - We will be producing a 2017 calendar featuring the astrophotography of Windsor Centre members. We are trying to determine the interest level so please see our Treasurer, Greg Mockler at the September meeting where we will have a mock up available to view. The plan is to put the order in by the end of September so they will be available at the October meeting. Cost will be determined by the level of interest and will not be more than \$20.

**RASC National** - Our Treasurer, Greg Mockler is taking orders for the 2017 RASC Calendar. Price will be \$17.50 which includes shipping and handling as well as 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.

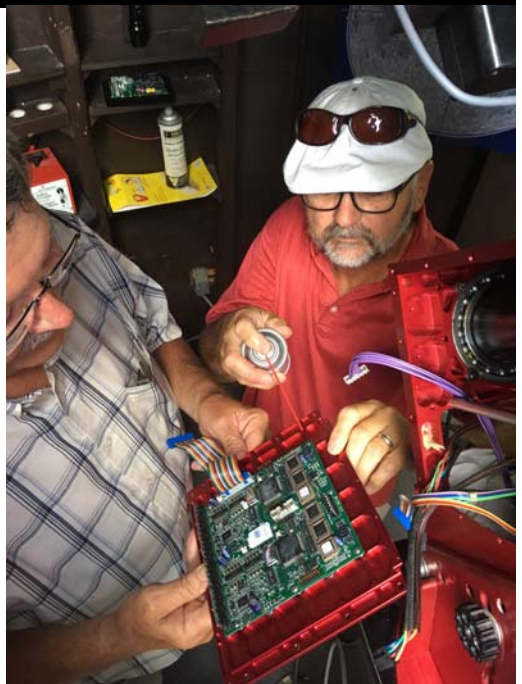
## Hallam Fund Raising Request



John Marn inspects the RA motor, encoder and wires.

John Marn will be discussing the issues we have been having at Hallam Observatory at the October meeting however the short story is an infestation of mice has caused some serious damage to the mount. After discussion with the manufacturer we have ordered and installed a 2 generation upgrade to the circuit boards and are now waiting on a new RA motor encoder and wiring.

These upgrades have set us back \$2,500 and we are hoping to offset some of these costs with donations from our members. To date we have raised \$700 and are looking for your help. Any amount will help so please see our Treasurer, Greg Mockler at the regular membership meeting and remember we are a registered charity and will issue tax receipts upon request.



John and Al DesRosiers cleaning the circuit board.



## Member Astrophotos



*Top Left:* Mars by Mike Pataky - 12.5" Dall Kirkham, Baader LRGB filters, Flea3 video camera at 100fps.

*Top Right:* M8 & 20, Lagoon and Trifid Nebulae by Brian Thomas - William Optics FLT 132mm f/7, Canon 5D, ISO 1600 total exposure of 48 minutes.

*Middle Right:* M17, Swan Nebula by Brian Thomas - Celestron 9.25 at f/10, Canon 5D, ISO 1600, total exposure of 81 minutes.

*Bottom Right:* NGC 7635, Bubble Nebula along with open cluster M52 and NGC 7538 (nebula in upper right corner) by Pete Bararo - Orion 110 ED Refractor, Nikon D5100, ISO 800, 21 x 3 minute subs = 63 minutes total exposure.

*Bottom Left:* M27, Dumbbell Nebula by Brian Thomas - Celestron 9.25 at f/10, Canon 5D, ISO 1600, total exposure 105 minutes.