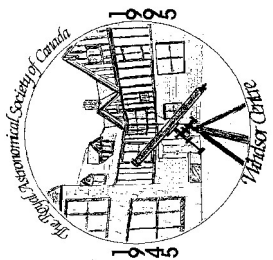




AUTORA



October 2017

The Royal Astronomical Society of Canada - Windsor Centre

Volume 43, No. 2

Barnard's Star - 2017 Installment by Steve Mastellotto



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 8 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 - 2017 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 late June Steve captured the 2017 image (top position) which now represents 72.1 arc seconds of movement over the intervening years or a rate of 10.3 arc seconds per year. 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.

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Calendar of Events

Our next meeting...

Tuesday November 21, 2017
7:30 p.m.

at
Ojibway Park Nature Centre
5200 Matchette Road

Main Speaker...

Bill Baylis and Others

Topic...

*Science City Update &
Annual General Meeting*

Activities...

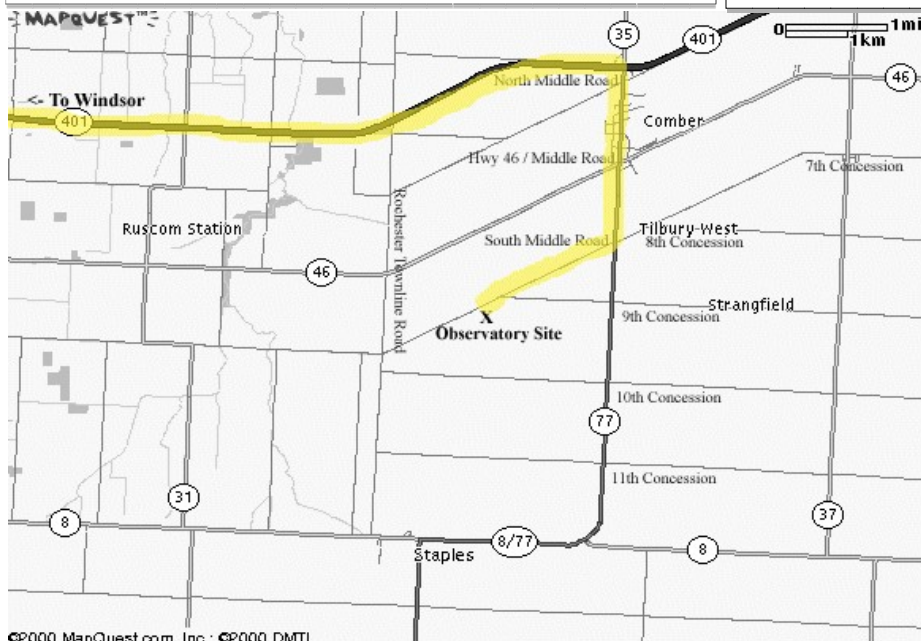
Orionid Meteor Shower: Peak on the night of Saturday October 21st with a thin crescent moon setting shortly after the Sun. Check for them on both Friday and Saturday.

Daylight Savings Time: Ends at 2:00 a.m. on Sunday November 5th. Set your clock back 1 hour.

Lunar Occultation: On Sunday November 5th Aldebaran will disappear behind the bright limb of the moon at about 8:03 p.m. and reappear on the dark limb 54 minutes later at 8:57 p.m..

Venus and Jupiter: On the morning of Monday November 13th look for the pair low in the morning sky when they will be about 1/4 degree apart. The moon joins the pair and will be 6 degrees above them on Thursday November 16th.

Leonid Meteor Shower: Peak on the night of Friday November 17th in a moonless sky.



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.

September 2017 Meeting Minutes by Dan Perissinotti

The monthly meeting of the Royal Astronomical Society of Canada - Windsor Centre was held at the Ojibway Park Nature Centre on Tuesday September 19, 2017.

Windsor Centre **1st Vice President, Mike Mastronardi** chaired the meeting and called the meeting to order at 7:35 p.m. and welcomed members and guests to the Ojibway Nature Centre.

Mike invited the members to review the minutes of the June 20, 2017 meeting which were printed in the September newsletter. A motion to accept the minutes was made and the **MOTION CARRIED**.

Mike provided an overview of the meeting and introduced Brian Thomas to the floor from the Director of Observing report.

Director of Observing

Brian started with a question period on some local observing and members' photographs, outings, and stories from the last few months.

Sun, Moon and Planets over the next month:

- The **Sun** is in Leo/Virgo. Fall officially begins Friday September 22, 2017
- New **Moon** September 20th and October 19th
- **Mercury, Venus, and Mars** are lined up in Leo in the eastern morning sky
- **Jupiter** is in Virgo, very low in the west sky following sunset
- **Saturn** will be about 25° high in the hour after sunset in the southwest sky
- **Uranus** will be in Pisces, and viewable throughout the Fall
- **Neptune** will be in Aquarius

Other notable events for the upcoming 30 days:

- for the next two weeks the **Zodiacal Light** are visible in the east morning twilight for the next two weeks as the moon is vacant in the sky
- **Venus passes Mars** in the morning of Oct 5th
- a waning crescent moon **occults Regulus** on Sunday morning of October 15th, 2017

A photo report of the **solar eclipse from August 21, 2017** was shown. Many photos highlighted our own RASC membership experiences. Views from all over North America were shown, as members visited many cities during the event.

Prior to the coffee social break, Mike welcomed **Steve Mastel-lotto** to the floor to give a brief overview of the **2018 RASC Windsor Centre Calendar** which highlights the astrophotography of our members. Calendars will be \$20 (same as last year) and will be available from our Treasurer - Greg Mockler at the October meeting.

After the coffee break, a **50/50 draw** was held, **Dan Perissinotti** won, and donated it back to the club.

Main Presentation

Mike introduced **Steve Pellarin** to the floor to conduct a presen-

tation titled **Our Home: The Milky Way**.

Steve kicked things off by asking **What is a galaxy?** A gargantuan collection of stellar and interstellar matter (stars, planets, comets, asteroids, gas, dust, etc.) all bound by gravity. Stars range in sizes from dwarf which are by far the most abundant with perhaps 100+ billion members to giants, each orbiting a galactic central mass.

The basic structure of our galaxy is a large barred spiral galaxy with some features, which include: a **barred galactic disk**, a yellowish **spherical galactic bulge**, and embedded faint spherical cloud called a **galactic halo**.

In the early studies of our Milky Way, there were two main factors that altered the understanding of the structure. Firstly: **E.E. Barnard** completed a **photographic study** of select regions showing detail of **dark dust/gas clouds**. This triggered a re-thinking of stellar density estimated; mass near the centre of the galaxy was underestimated. Secondly: the observations of **variable stars**. As the catalogue and characterization of enormous number of stars grew in the later 1800s, interest arose in their formations and life cycles. Two main types of variable stars were categorized based on their light curves, **Cepheids** (a standard, gentle curve in the change of brightness) and **RR Lyrae** (erratic, less organized looking change in brightness).

We can use this brightness of stars as "standard candle", a known brightness based on its distance. Essentially we know how far away a star is based on its brightness, but only for the variable star categories. With this we can easily measure the size of our galaxy. Not only our galaxy, but in other galaxies, like the **Andromeda Galaxy**.

Steve touched briefly on the formation of our galaxy, the central black hole and the rotation of stars around it, as well as the mass of our galaxy.

Unfortunately Steve's presentation was cut short due to time.

REMINDER: Astro Luncheon at **SKIPPY'S RESTAURANT** every second Wednesday of the month, at noon. Located at 954 University Ave West, Windsor.

Mike thanked everyone for coming out to the meeting and reminded everyone that the **next regular membership meeting** would take place on **October 17th, 2017 at 7:30 p.m.**

Meeting **adjourned at 10:08 p.m.** September 17, 2017.

Hallam Observatory Fee

A reminder that the Hallam Observatory annual access/key fee of \$60 is now due (October 1st). Please see our Treasurer Greg Mockler at the October meeting to pay for your key. If you no longer wish to have your own access to the observatory please turn in your key to Steve Mastellotto.

Key access to Hallam Observatory is available to all RASC Windsor Centre members in good standing who have been members for at least 1 year and complete a training session on the observatory equipment. Note that an additional \$10 key cutting fee applies.

At The Eyepiece: Scutum by Mike Ethier

This month we conclude our brief glimpse at some of the deep sky highlights of Scutum, one of the smaller constellations for northern viewers. The Alpha star of Scutum is located 1 degree north and 10 minutes of R.A. preceding (west of) Messier 26. It is a 4th magnitude star, so it is not that easy to pick out at first. However, immediately following Alpha is [NGC 6664](#), a large, loose open cluster in the same low power field as bright yellow Alpha. In Deb's 6" reflector there are about 30 stars in the cluster at 125x. This magnification range keeps the offending star out of the viewing field. I saw a spiral shape with my 8" scope at 56x, while Deb mentions a crescent in her notes. In the 12" scope I first viewed the cluster at 60x. It seems large and pretty rich at this range. My best view was at 136x, with Alpha out of view. The north half of the cluster has most of the brighter stars, and is richer overall. The south end is more widely scattered. There is a central group, too, but it appears at the following end, furthest from Alpha (turn off your clock drive and let things drift past—it is then easy to see what I mean by 'preceding' and 'following'). The extreme south end appears to be part of the rich Milky Way background found in this area. [Specs: oc 6664](#): Vis. mag. 7.8; Size 16'; Brightest star mag. 13.2; officially 477 stars. I saw about 50 in the main group.

More challenging is [Trumpler 34](#), a small, dense open cluster just south and following [NGC 6664](#). At 60x it appears as a small, hazy patch immediately following a magnitude 9 star. 136x and 12" of aperture resolves the central group of brighter stars, with a hazy clump north. 272x gives good resolution of about 40 stars. Though a bit difficult, it is worth a stop with a 12" scope if in the area. [Specs: Tr 34](#): Vis. mag. 8.6; Size 5'; Brightest star mag. 11.2; 87 stars officially.

[NGC 6682](#) is defined as a star cloud. A very few objects of this type are catalogued in the NGC, and this one is worth a visit with a 6" scope or higher. I viewed it at 60x, finding it quite noticeable and impressive. Just preceding it is a mag. 6.5 star, and a close double star is south of that. About 20 bright stars are seen overtop a nearly uncountable number of fainter ones. Behind that is the milky haze of thousands of unresolved stars. At 100x the cloud is noticeably elongated east-west. A vast amount of stars can be seen at 136x. I centered on the 6.5 mag. star at the preceding end and allowed the cloud to drift past (several times!). Fun! [Specs: sc 6682](#): Size 47'.

[NGC 6704](#) is the final object in this quick review of Scutum highlights, before we move on to the Messier Object of the Month. Though very faint at 60x, it does resolve into stars. It is fun at this range to sweep 1 degree south to Messier 11 for a nice comparison of the two clusters in a 12' mirror. In fact, at 100x [NGC 6704](#) can appear as a smaller, much fainter and more distant version of M 11. At 136x the open cluster resolves into about 10 brighter stars, with many fainter ones in the background. At 187x and 8" these brighter stars show well. At full aperture and 250x the cluster has a moderately rich central area with some scattered outliers. Though not a showpiece, it is quite acceptable

in a 12" scope. Being so close to M 11 is a good enough reason to seek it out. [Specs: oc 6704](#): Size 6'; Vis. mag. 9.2; Brightest star mag. 12; 71 stars officially.

Messier Object of the Month: M 11 in Scutum

M 11 is one of the most beloved of the Messier objects, and certainly one of the finest open clusters available to northern viewers. My first contact with this remarkable collection of stars was in early August of 1975. I was using my Tasco Lunagrosso 4.5" reflector. Even stopped down to 3" of aperture I enjoyed decent views of this object. At full aperture stars were resolving at 45x, and I observed with up to 150x with good results. In 2016 I observed M 11 with Space Eye, my 2" refractor. Though decidedly comet-like, the view was less than thrilling.



M 11 by Scott Stuckless

Deb summarizes her view in a 6" inch reflector: "Interestingly wedge-shaped at low power with one brighter star, the object becoming more impressively detailed and almost rosette-like with magnification; smallish but incredibly dense and pleasing. A most wonderful object in a 6" scope."

In August of 1981 I got to view it in my Edmund 8" Reflector from northern Ontario! Wow! What a rush that was. At the time I called it one of the ten best objects in the northern sky. Observing from lowest (36x) to highest (508x) magnification kept me busy that night for over an hour. I noted interesting spiral-like arms at 56x, along with distinct geometric patterns at higher power. The inner core was filled with dark spaces between tight little groups of stars. To date this is still my favourite observation of this cluster.

In August of 2017 came views with my 12" Dob. Though much brighter and more easily resolved, I still think there is more magic in seeing this group with an 8" scope. Don't get me wrong—I love the view of this group in a 12" scope, especially with my much older eyes. It just seems to me that some objects have an optimum aperture in which to observe. Anything larger does not seem to improve the aesthetics. This brings up an interesting point, and might make for a fun review of some showpiece objects: just what size of scope gives the most pleasing view of an object? Obviously most are better suited to a bigger aperture, especially galaxies, planetary nebulae, and globular clusters. But there are certainly some objects where a small to medium scope gives the optimum view. I nominate Messier 11 as a good candidate for one of these.

If you have not seen Messier 11 in awhile, or perhaps ever, I suggest making it a priority next time the summer Milky Way is visible. Take your time when observing, and use many different eyepieces. I prefer starting low, then gradually increasing magnification, before returning to low again at the very end. Whichever method or scope you use, one is always impressed by this deep sky gem.

Calendars



RASC Windsor Centre - We have once again created a calendar featuring the astrophotography of Windsor Centre members. Calendars list all major holidays, phases of the moon, our meeting dates and major meteor showers. Our supply has arrived so please see our Treasurer, Greg Mockler at the October meeting to get your copy.

Price is \$20.00 (same as last year) and includes all postage, handling and taxes.



RASC National - Our Treasurer, Greg Mockler is still taking orders for the 2018 RASC Calendar. **Price will be \$20.00** which includes all shipping, handling and taxes if he gets over 10 orders - this is a price increase from last year due to National Office pricing but is substantially less than the \$26.00 by ordering directly from the National Office. Please see Greg at the October meeting.

Important Note: National Office has indicated that there has been a delay in the production of the calendar and they will ship in early November. They may not be available at our November membership meeting.

Proposed 2018 Council of the RASC - Windsor Centre

Executive

President	Mike Mastronardi
1st Vice-President	Rick Marion
2nd Vice-President	<i>Open Position</i>
Secretary	Dan Perissinotti
Treasurer	<i>Open Position</i>
National Council Rep.	Tom Sobocan

Councilors

Randy Groundwater	Elizabeth Ismail
Steve Mastellotto	Nancy Ng
Steve Pellarin	Paul Pratt
Paul Preney	Dr. Susan Sawyer-Beaulieu
Tom Sobocan	C. Joady Ulrich
Mahayarrahh Starr-Livingstone	

Appointed Officers

Honorary President	Dr. William Baylis
Past-President	Randy Groundwater
Alternative National Council Rep	<i>Open Position</i>
Librarian	<i>Open Position</i>
Recording Secretary	Dan Perissinotti
Public Education Director	Nancy Ng
Public Relations Director	<i>Open Position/2nd-VP</i>
Directors of Observing	Steve Mastellotto
	Nancy Ng
	<i>Open Position</i>
Light Pollution Abatement Dir.	<i>Open Position</i>
Hallam Observatory Director	John Marn
Aurora Editor	Steve Mastellotto
Webmaster	Steve Mastellotto

IMPORTANT: Charitable Donations

We need your help - To break even in a typical year we need to raise about \$1,000 over our normal income sources. In the past we have had garage sales, winery events and other fund raisers. These events are a lot of work for a few people as it is difficult to get enough people involved in planning and staging an event. Alternately we are asking our members to look at making a charitable donation. If most members contributed a few dollars (even \$25 or \$50) we would raise more than what a special event generates. Any donations made before the end of the year will be eligible for a charitable donation receipt which can be used on your 2017 tax return.

If you have any questions, please contact Greg Mockler, your earnest treasurer.

**RASC
Windsor Centre**

**Financial Statement
for year ending September 30, 2017**

	Current	Last Year	Difference
Balance Sheet			
Assets			
Cash	7,340.83	4,536.29	2,804.54
Building & equipment	80,000.00	80,000.00	-
	<u>87,340.83</u>	<u>84,536.29</u>	2,804.54
Liabilities	-	-	
Accumulated surplus, open	84,536.43	85,384.22	- 847.79
Earnings (loss)	2,804.54	(847.79)	3,652.33
Accumulated surplus, close	<u>87,340.97</u>	<u>84,536.43</u>	2,804.54
Statement of Revenue & Expenses			
Revenue			
Revenue - Donations - receipted	858.25	934.79	- 76.54
Revenue - Donations - not receipted	1,745.50	707.81	1,037.69
Revenue - Sale of property or goods and services - scopes	-	-	-
Revenue - Membership fees - National	2,879.54	2,691.45	188.09
Revenue - Membership fees - Obs fee	1,130.00	700.00	430.00
Revenue - Fundraising - meetings	200.00	218.95	- 18.95
Revenue - Fundraising - 50/50 draws	107.20	145.00	- 37.80
Revenue - Fundraising - special events	170.00	185.00	- 15.00
Revenue - Fundraising - pubs	1,755.50	739.00	1,016.50
Total revenue	<u>8,845.99</u>	<u>6,322.00</u>	2,523.99
Expenses			
Expenses - Office supplies and expenses	-	2.15	- 2.15
Expenses - Occupancy costs - mtg rental	765.00	753.00	12.00
Expenses - Occupancy costs - obs rent	500.00	500.00	-
Expenses - Occupancy costs - obs utilities	480.00	480.00	-
Expenses - Occupancy costs - obs other	2,640.59	4,631.59	- 1,991.00
Expenses - Adv & promo	226.00	-	226.00
Expenses - Fundraising expenses - meetings	232.33	188.55	43.78
Expenses - Fundraising expenses - pubs	1,145.53	500.35	645.18
Expenses - Social	-	62.15	- 62.15
Expenses - Honoraria	52.00	52.00	-
Expenses - programs	-	-	-
Total expenses	<u>6,041.45</u>	<u>7,169.79</u>	- 1,128.34
Net Earnings	<u>2,804.54</u>	<u>(847.79)</u>	3,652.33

Highlights from our Treasurer - Greg Mockler

Net Earnings for the year of approximately \$2,800 compared to a loss of about \$850 last year. Revenue was up about \$2,500 compared to the previous year mainly due to:

- calendar sales increased by about \$1,000
- donations increased by \$900 mainly from the Hallam cash box with two thirds being received after we stopped the public open houses. Our new private tour method seems to be working well.
- observatory fees up about \$400
- memberships up about \$200

Major changes to expense items include:

- fiscal year 2016 included an unexpected expense of about \$2,300 to repair the scope mount
- new or additional expenses this year included \$226 under advertising and promotion for SkyNews magazine bulk order for giveaways/promotion
- additional printing costs for calendars of about \$645 which generated more than \$1,000 in new revenue

We are in much better financial shape this year as compared to last year. However, we need to continue pushing for additional sources of revenue as there is not really any room to cover unexpected expenses.