

Nova Notes

The Newsletter of the Halifax Centre of the Royal Astronomical Society of Canada



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Jan/Feb 2016

THIS ISSUE: A YEAR IN THE LIFE OF THE RASC HALIFAX CENTRE

January Meeting - How to Observe the
Great August 2017 American Eclipse

February Meeting - Use a 0.6-m
Planewave CDK (or Celestron 14)
Telescope for Imaging

Michael Boschat Reports on the Mystery
of the Intensifying Cosmic Rays

Larry Bogan's Lifetime Passion for Astronomy

Dave Chapman on Young Moon Hunting

Art Cole Illustrates the Benefits of Masks

Matt Paine on the 500-Metre Dish—F.A.S.T. Radio Telescope

St. Croix Observatory

Part of your membership in the Halifax RASC includes access to our observatory, located in the community of St. Croix, N.S.. The site has expanded over the last few years and includes a roll-off roof observatory with electrical outlets, use of the Centre's new Go-To 400-mm Dobsonian telescope and 100-mm binoculars, a warm-room, and washroom facilities.

Enjoy dark pristine skies far away from city lights and the company of like minded observers searching out those faint "fuzzies" in the night. Observing nights (Fridays close to the New Moon or Saturday backup) are open to both members and their guests. If you are not a key holder and would like to become one, or need more information, please contact the SCO Manager, Tony McGrath .

Upcoming Observing Nights:

March 4 (alt 5)
April 1 (alt 2)
May 6 (alt 7)

Meetings usually begin at 7:30 p.m. at Saint Mary's

University in Room 101 of the Atrium Building (AT).

All meeting locations and presentations
subject to change

Friday, March 18th, 2016 7:30 p.m. to 9:30 p.m.

Member's Night: Short Presentations by Members
on Topics of Interest to All

Other Meeting Dates

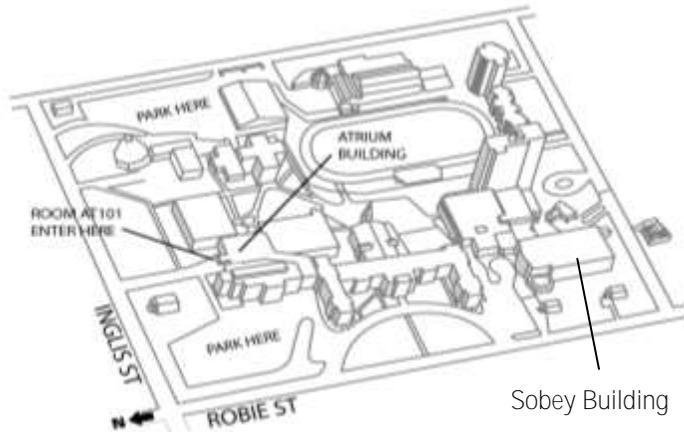
Friday, April 15, 2016
Friday, May 13, 2016
Friday, June 17, 2016

Meeting Location:

Saint Mary's University

Atrium Building (AT)
Room AT 101

The Atrium is located in front of the Patrick Power Library, between the Burke Building and Science Building.



Meetings are usually held on the third Friday of the month, except for the months of July and August, when there are no meetings.

Executive meetings begin at 6:30 p.m., usually in room AT306, and all members are welcome.

Halifax RASC Executive, 2016:

Honorary President

President

1st Vice-President

2nd Vice-President

Secretary

Treasurer

Nova Notes Editor

Librarians

SCO Manager

Observing Chair

National Representative

Councillor & Nat. Co-Chair

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Councillor

Councillor

Dr. Roy Bishop

Paul Gray

Dave Chapman

Ian Anderson

Judy Black

Jim Millar

Tony Schellinck

Andy and Elli Hasler

Tony McGrath

Sean Dzafovic

Dave Chapman

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Cover Photo Dave Chapman

It is a young Moon (just less than 24 h after new) photographed at the Winter Star Party (Florida Keys) on 2015 February 19 at 6:54 p.m. EST with a CANON EOS REBEL SL1 with an EF 70–300 mm lens @300 mm, ISO 800, f/5.6, 1/20 s.

From the editor *Tony Schellinck*

This issue covers a year in the life of the Halifax Centre. It is a big issue at 20 pages, with the front half (plus back page) containing the usual columns and tidbits of information. The back ten pages are filled with thirteen reports documenting the activities of the Centre over 2015. Anyone reading these reports can see that the executive members are busy most of the year looking after Centre affairs, but they also personally participate in many of the activities organized by the Centre.

As Nova Notes editor I now sit on the executive of the Centre and attend its meetings held prior to the monthly meeting. What impresses me is that most of the executive have been members of the Centre and more significantly, members of the executive on and off for many years (decades in some cases), and they are still keen at every monthly meeting to discuss and shape the Centre's activities and policies. And they take on new responsibilities and show initiative in creating new experiences for members, even after all these years. I have been a member of many executive councils and committees over the last 40 years and see that most members burn out after a couple of years. There must be something sustaining in this activity, and it attracts the right kind of person who is passionate about what they do and willing to sacrifice their time to make all things astronomy happen here in Nova Scotia.

Thanks to Dave Chapman for supplying an excellent photograph for the front cover that accompanies his story on Young Moon Hunting. As well, Michael Boschat contributed an interesting tidbit on cosmic rays. I won't mention the names of all the others who contribute regularly except to say that they come through on time, every second month, with interesting stuff and I am so happy that I can rely on them to do so.

There are several people who's names do not appear in this issue that made major contributions. Foremost is Judy Black, our new secretary, who collected, edited, formatted, arranged and then sent to me in a nice package all of the annual reports. As well, Patrick Kelly and Michele Arenburg manage to find a long list of corrections in what I thought was a perfect version of the issue I sent them to edit.

Despite the fact that we have regular contributors to Nova Notes, I would encourage others out there to submit material. It can be about a topic of interest to you, it can be a story covering your astronomy related experiences, or it could be information you found that you feel would be of interest to the membership.

Clear skies,

Tony Schellinck

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Nova Notes is published five times a year, in February, April, June/July, September/October and December.

The deadline for the next edition is April 15, 2016

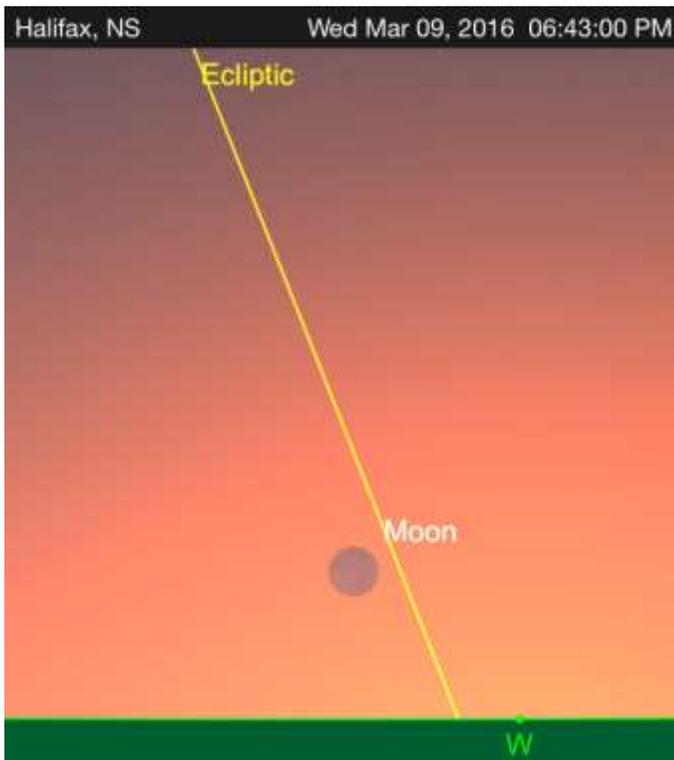
The opinions expressed herein are not necessarily those of the Halifax Centre.

Articles on any aspect of Astronomy and related activities will be considered for publication.

Lunatic Ramblings 4: Young Moon Hunting

Dave Chapman

This issue, we interrupt our tour of the selenographic landscape to consider the sport of hunting young Moons, by which I mean finding the first observable Moon following a new Moon. This can be challenging, as several factors must be stacked in the observer's favour for success. By the time you read this, one opportunity will have already passed in 2016, that of February 9, but you heard about that opportunity if you subscribe to the RASC Halifax email discussion list, so I will not dwell on it. The next two opportunities for Halifax this year occur on March 9 (21 hours after new Moon) and April 8 (36 hours after new Moon).

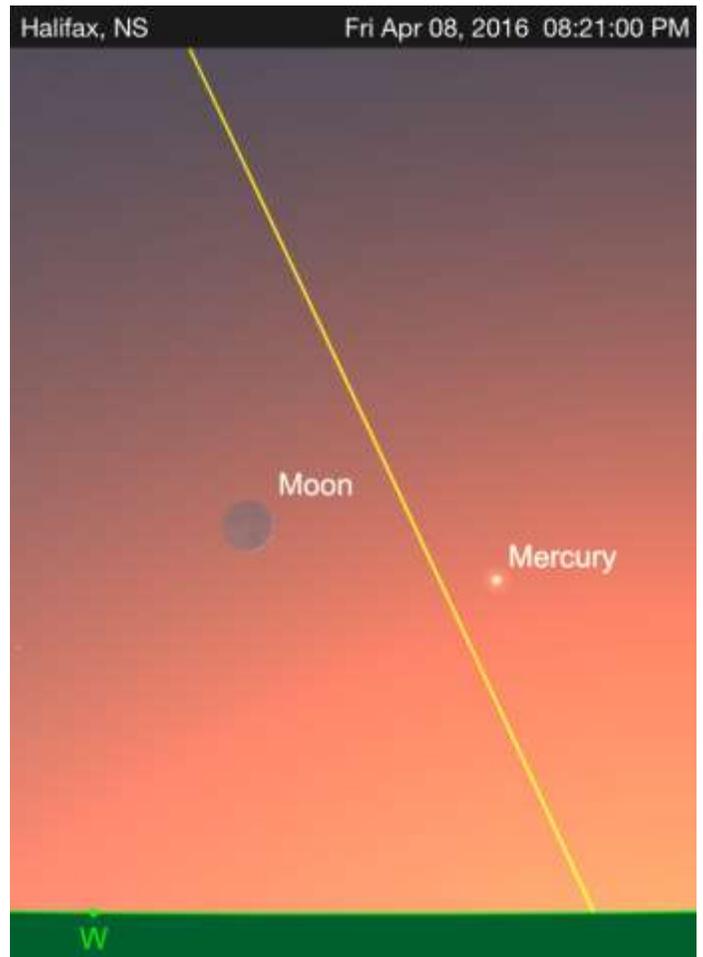


▲ In Halifax, the young Moon of 2016 March 9 will be 21 hours old, with elongation 11° and altitude 4° at 6:43 p.m. AST—tough!

With the crescent Moon being not far from the Sun the day after new Moon, there is only a narrow window of time after sunset to snag the crescent Moon before it sets itself. The crescent is impossibly thin—in the range 0.5%–2.5% illuminated—and is hard to discern against the bright sky. The sky typically does not darken sufficiently until about 30 minutes after sunset (about the time of civil dusk, when city lights turn on), but you should start looking earlier! On the other hand, you shouldn't wait too long after sunset, as the

Moon will soon set, if not below the horizon itself, then into the trees or buildings or hazy sky just above the horizon. Young moons are rarely more than 12° above the astronomical horizon, so you need to find a good vantage point with an unobstructed western view.

The springtime months February, March, and April are favourable months to view young Moons, as the ecliptic is steeply inclined to the horizon—about 65° . Since the Moon won't be far from the ecliptic, that means there is a better chance that the Moon has sufficient altitude. Another factor (over which we have no control) is having the Moon near perigee around the time of new Moon—this means that the Moon will be moving more rapidly along its eccentric orbit, and will have a favourable elongation from the Sun, which means more illumination and more altitude at civil dusk.



▲ In Halifax, the young Moon of 2016 April 8 will be 36 hours old, with elongation 21° and altitude 11° at 8:21 p.m. ADT—easy! Mercury accompanies, at magnitude -0.9 , altitude 9° , and elongation 15°

Some observing programs define a “young Moon” as one whose age is less than 24 hours after new Moon. In that case, timing is even more important. If the new Moon occurs a little after local sunset on a given day, there is a decent

Lunatic Ramblings 4: Young Moon Hunting, continued

Dave Chapman

chance of observing a 24-hour Moon the following evening. If the new Moon occurs earlier in the day, the next evening you might see a young Moon older than 24 hours, and so on. Note that the observer's geographical longitude comes into play here, as the Moon moves along the ecliptic path about 1° every 2 hours: a 21-hour Moon in Halifax would be a 24-hour Moon in Winnipeg, and a 26-hour Moon in Vancouver, as an observer at each location must wait for local civil dusk.

Finally—and this is the kicker—you need to have a clear sky, at least in the west. No clear sky, no Moon! You could have everything else arranged in your favour, and lousy weather will just crumb it up! You see now why I say that this is a challenge observation—I have only seen three Moons less than 24 hours old in the 7 years I have been seriously trying—and I'm a certified lunatic!

Next issue, I will continue with my Q-day trek across the lunar topography. Previous columns can be found in the archived Nova Notes issues at halifax.rasc.ca/archive.html : look for 2015 April, June, and October. Email if you have questions or comments!
dave.chapman@ns.sympatico.ca

The Universe's Symphony of Sound: 500-Metre Dish—F.A.S.T. Radio Telescope

Matt Paine

Due to suffering from a nasty cold most of February I have been delayed in completing my work-in-progress, the iPhone to Antenna article. Plus, I am still waiting for some parts to arrive for a complete set-up and test run. So, here is another interesting topic for now.

Growing up with an aunt from Bayamon, Puerto Rico, I had always heard about the great Arecibo Radio Telescope constructed in the north-west corner of the island in the mid-1960s. The 305 metre dish (approximately 1000 feet in diameter) has been making scientific discoveries for decades. With those discoveries, deepening our knowledge and understanding of the universe.

Fast forward to 2011 and China announces the construction of the F.A.S.T. (Five Hundred Metre Aperture Spherical Radio Telescope). It is located in Guizhou Province southwestern China. Like Arecibo, the F.A.S.T telescope is being built in a natural depression within the Earth, that conforms to a spherical shape to support the dish of the radio telescope. The 500 metre dish will be three to five times more sensitive than Arecibo and have one big modern advantage.

Arecibo is a spherical dish with a fixed permanent curvature that cannot be changed or altered. Besides being a larger dish, the designers of F.A.S.T. realized if there was a method

to “cancel-out” spherical aberration, which occurs in fixed spherical design radio telescopes, F.A.S.T would be much more accurate and precise. F.A.S.T. designers came up with a unique but rather simple solution. The panels that make up the F.A.S.T. radio telescope dish, can be manipulated. The

cable support system used to hold the panels in the F.A.S.T Radio telescope can be adjusted and manipulated, effectively canceling out spherical aberration. The panels that comprise the 305 metre Arecibo radio dish are fixed and permanent. As a result, for most research, only about 200 metres of the Arecibo radio dish surface are being used effectively in experiments. Compare that to F.A.S.T., which can use nearly 90 percent of its dish surface because of its adaptive panels that comprise the radio dish.

F.A.S.T. is set for completion in late 2016 and to be fully operational in early 2017. What cannot be understated is the toll the construction has had on the surrounding population in Guizhou Province. Is any telescope, such as the F.A.S.T. Radio Observatory, worth the human cost and relocation of 9,000 to 10,000 people?

Can such a telescope make a discovery or advance our scientific knowledge that is worth all the human cost and toil for one 500 metre dish? Only time will tell.....



▲ F.A.S.T. (Five Hundred Meter Aperture Spherical Radio Telescope) in Guizhou Province southwestern China.

Matt Paine

W1AXB@comcast.net
Nova Notes Columnist, RASC Halifax Centre

Starlight and Semiconductors: The Benefits of Masks

Art Cole

Have you ever worked on an astrophoto using your favorite software, diligently applying numerous functions for stretching, colour adjustment, sharpening, and blurring, but eventually getting frustrated for the following reasons?

“My background is too grainy/too light/too dark”

“The stars are too big and have no colour”

“The brighter parts of my image have turned white”

“The colour looks terrible”

“The entire image looks blurry”



▲ Figure 1: TL: A stacked, unstretched image of the Eagle Nebula. TR: The same image, with stretching applied. Note the bloated stars. BL: An inverted mask, made from the stars in the stretched image. BR: The stretched image, with the mask applied to the stretching function. Note the smaller, less-intrusive stars. See the full sized image at <http://tinyurl.com/gnv3v2b> (Photo: Art Cole).

If you have ever thought any of these thoughts, you may be missing out on one of the most important image processing tools available to you. It's a must-have for astroimage processing, and it may not be prominent in any of your software menus – it's masking. Masking allows us to select which areas of an image to apply a processing function to, and the degree to which that function is applied in those areas. Essentially, a mask is a greyscale image that we can apply to a function we have run on an image. The mask and the image are the same size, and in places where the mask is brighter, the function applies more to the image. And of course, in places where the mask is darker, the function is applied less

to the image. In fact, if there are places where the mask is black, the function doesn't get applied to the image at all. Even if you don't use a mask, you still are (sort of) - your mask is a pure white image!

We can make masks by creating greyscale copies of our images during processing. But it doesn't stop there – we can invert them (making light areas dark and dark areas light), stretch them, blur them, sharpen them, and even draw on them. They can be thresholded, cloned, clipped, and edge-extracted. You can be totally creative with masks to get whatever results you need.

To show what can be accomplished with masks I put together a couple of examples. A common problem when stretching an image to lighten it is that the stars become bigger (as they don't actually have sharp edges) and the centre of the stars becomes brighter. If too much stretching is applied, the stars become pure white, losing all of their colour. So we need to stretch the image without stretching the stars. Referring to Figure 1, the top-left panel shows an initial stacked image of the Eagle Nebula ready for processing. The top-right panel is a stretched version, showing details of the nebula, but also having bloated stars. To get rid of the bloat I made a mask from the stretched image (bottom-left) by creating a greyscale copy of it, running a star extraction tool on it so that only the stars were left, inverting it so that the background became white and the star areas became black, and then run-



▲ Figure 2: TL: An image of the Orion Nebula. TR: The same image, after sharpening has been applied. Note the noise in the darker areas of the nebula along the bottom and right sides of the image. BL: A mask made from the original nebula image. BR: The sharpened image, with the mask applied to the sharpening function. The darker areas appear smooth. See the full sized image at <http://tinyurl.com/zll5d7x> (Photo: Art Cole).

Starlight and Semiconductors: The Benefits of Masks, continued

ning a light blur on it to smooth it out. I then applied the mask to the stretching function (bottom-right). The nebula kept its nice stretch, as the mask background is white where the nebula is, while the stars stretched very little and stayed small, as the mask is black where the stars are in the image.

The second example shows how a mask can be used to apply a sharpening function to the brighter parts of an image. When sharpening an object like a nebula, which has both bright and dark regions, we generally only want to sharpen the bright areas. The darker areas tend to be noisier, and if we sharpen these areas we will be mostly sharpening noise, not nebula. Referring to Figure 2 (top-left) we can see a portion of the Orion Nebula that has both light and dark areas and could use some sharpening to bring out some detail. Running a sharpen function on the image produces nice results in the bright areas, but the dark areas are noisy and grainy because the noise is sharpened (top-right). Yuck. To prevent this, I created a mask from the original image (bottom-left),

stretched it to make the lights lighter and the darks darker, blurred it a bit, then applied it to the sharpen function. The result is much better (bottom-right). The bright areas retain their sharpness, and the dark areas, while receiving some sharpening, are no longer grainy-looking.

Other common astrophoto processing steps that benefit hugely from masking are:

- Blurring a dark, noisy background but not the object (use an inverted mask on a blur function)
- Brightening the object but not the background (use a normal mask on a lightening stretch)
- Darkening the background but not the object (use an inverted mask on a darkening stretch)
- Boosting colour in bright areas (use a normal mask on a saturation increase).

If you can use masks for the six processing steps described here, you will be well on your way to improving the quality of your images. Learn how to do masking in your favorite processing software and take it from there. Remember, knowledge, experimentation and creativity are your friends!

Have fun.

Intensifying Cosmic Rays

Michael Boschat reports on RASCals

For the past 11 months, neutron monitors around the Arctic Circle have sensed an increasing intensity of cosmic rays. Polar latitudes are a good place to make such measurements because Earth's magnetic field funnels and concentrates cosmic radiation there. It turns out, however, that Earth's poles aren't the only place cosmic rays are intensifying. Space-weather.com and the students of Earth to Sky Calculus have been launching helium balloons to the stratosphere to measure radiation, and they find the same trend over California.

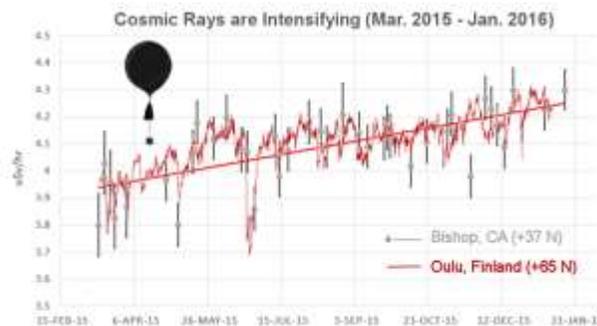
In the plot, ground-based neutron monitor measurements from the University of Oulu Cosmic Ray Station are traced in red; balloon-based gamma-ray/X-ray measurements over California are denoted in gray. The agreement between the two curves is remarkable. It means that the intensification of cosmic rays is making itself felt not only over the poles, but also over lower latitudes where Earth's magnetic field provides a greater degree of protection against deep space radiation.

Cosmic rays, which are accelerated toward Earth by distant supernova explosions and other violent events, are an important form of space weather. They can seed clouds, trigger lightning, and penetrate commercial airplanes. Indeed, our measurements show that someone flying back and forth across the continental USA, just once, can absorb as much ionizing cosmic radiation as 2 to 5 dental X-rays. Likewise, cosmic rays can affect mountain climbers, high-altitude drones, and astronauts onboard the International Space Station.

This type of radiation is modulated by solar activity. Solar storms and coronal mass ejections (CMEs) tend to sweep aside cosmic rays, making it more difficult for cosmic rays to reach Earth. On the other hand, low solar activity allows an extra dose of cosmic rays to reach our planet. Indeed, the ongoing increase in cosmic ray intensity is probably due to a decline in the solar cycle. Solar Maximum has passed and we are heading

toward a new Solar Minimum. Forecasters expect solar activity to drop sharply in the years ahead, and cosmic rays are poised to increase accordingly.

As reported at spaceweather.com



▲ Photo: http://www.spaceweather.com/images2016/27jan16/cosmicrays_mar15_jan16.png?PHPSESSID=acan0lh710989mj584eiqo2g91

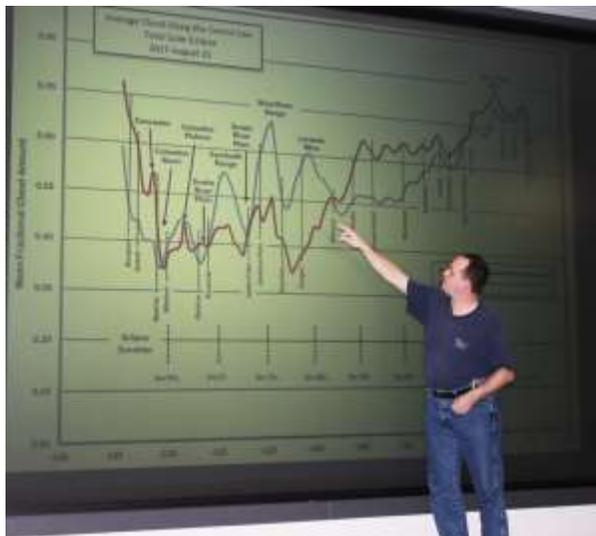
January 15, 2016 Halifax
Centre Meeting Report
Jim Millar

President Paul Gray welcomed the five new people to the meeting. He outlined the agenda for the evening.

The first topic was Paul Gray talking about ‘The Great American Eclipse.’ He described what an



▲ The Hal-Con audience were keenly engaged in the Astronomy 101 lecture and the accompanying drama. (Photo: Trevor Schellinck)



▲ Paul Gray shows the audience the best place in United States from which to view the upcoming solar eclipse. (Photo: Tony Schellinck)

eclipse was, annular vs total eclipse and what to expect by showing diagrams and pictures.

He then described what was available to plan for the upcoming eclipse of 21 August 2017 visible across the middle of North America. The website, GreatAmerican-Eclipse.com was a good site that was full of information to aid in planning where and when to see the eclipse.

He also showed a video of the Libyan eclipse and Dave Lane showed his video of the 1991 Mexican eclipse.

A great planning aid would be the book *Eclipse Bulletin: Total Solar Eclipse of 2017*.

Tony Schellinck then showed his video, *The Milky Way Galaxy: Where Empires Exist*, a play that he produced and put on at the recent Hal-Con. The premise was that it took place at a Starfleet Academy Astronomy 101 course.

The characters were Professor Strangelove II and guests. The guests included a Romulan warbird commander, a Klingon warrior and the Dominion Leader. It was quite entertaining and Tony will be putting the play on again at other locations.

Dave Chapman completed the evening with a discussion of *What's Up* from the Handbook.



▲ From the right: Heather Schellinck (Dominion Changeling), Travers Milo (Klingon), Tony Schellinck (Starfleet Academy Lecturer) and Valerie McKenzie (Romulan) perform at Hal-Con, aided by audience members taking the proverbial quiz about what is in the night sky that follows the lecture. (Photo: Trevor Schellinck)

Member Profile: Larry Bogan

Tony Schellinck

Larry Bogan has been interested in astronomy since grade 11, when the comet Arend-Roland was visible in the sky with a 15-degree tail (1956-57). This was the era of amateur telescope makers and he built his first telescope based on a design in Popular Mechanics magazine. He used 7" aluminum irrigation tubing in which he installed a purchased 6" F/10 spherical mirror. With his father's help he had a local foundry cast a right ascension axis on which to mount the scope. He did not learn the sky at the time but that came later.

He obtained his BS in physics at Case Institute of Technology (Cleveland, Ohio), where he took astronomy courses and belonged to a student astronomy club. In 1968, he obtained his PhD in physics from Cornell University. His first appointment was at the University of Connecticut where he established a spectroscopy research laboratory plus taught physics and astronomy. It was here that he learned the sky and had the use of an A-1 Spitz planetarium to teach it to his 300-student astronomy classes. He was enjoying the subject so much he started an astrophysics course for science students.

In 1973 he accompanied his wife to Nova Scotia where she was to teach nutrition at Acadia University. He taught in the Acadia physics department up until 1999. In 1995 he took over the astronomy course from Roy Bishop. After Larry retired in 1999, he continued teaching for a few more years by offering an internet astronomy course through continuing education. He had started calculating planetary orbits and in 1982 began his annual contributions to the Observer's Handbook

with "Configuration of the Saturn's Brightest Satellites". Later, he contributed the orbits of Jupiter's Galilean Satellites to the Handbook. In 1992 he did photometry on asteroids at the University of Victoria to determine their shape from their rotation and changing brightness.

He still has his first Newtonian scope from all those years ago. In the early 80s he constructed a 13" Dobsonian using a Coulter mirror. He has completed the Messier marathon a couple of times and snagged all but four or five objects, the first time with his 6" scope and the second time with the 13" scope. In 2006 he built a roll off observatory at his home at Brooklyn Corners. At

the time the area had dark skies, but, sadly, nearby shopping areas have expanded to the point where his skies are no longer as dark.

He still does casual observing these days. He obtained a used equatorial mount from Chris Young that he is modifying for use in astrophotography. He has a Maksutov-Cassegrain scope (100mm F/13) with a solar filter and built a table top mount of his own design for it (see red portion in photo). He added a collapsible tripod component for travel and he takes it with him when he goes to New Mexico for two months each year.

He joined the Halifax Centre in about 1977 and has been a member ever since. Larry

was a VP of the Halifax Centre for 2 years and started the Minas Astronomy Group (MAG) with Roy Bishop in 1994. He has been attending Nova East since when it was held at Kejimikujik National Park. He is no longer what he would call active in observing but he meets up with friends there each year. He has been interested in astronomy for almost 60 years. He says the stars have become his friends as he learned their patterns and he always enjoys observing sessions.



▲ Larry Bogan at Nova East 2015. His 100mm Maksutov-Cassegrain sits on a mount of his own design. (Photo: Tony Schellinck)

President's Report

Paul Gray

Well, 2015 is now behind us along with the successful RASC General Assembly that we hosted and another Nova East. It has been a very busy year for our centre; I must say that we have pulled off a great year.

Looking back, we all know how much time and energy the General Assembly took from many of our volunteers. A GA is not a small undertaking with a budget in the \$30,000 to \$40,000 range and about 140 people involved counting guests and our volunteers. Many members from across the RASC came to Nova Scotia and had a taste of our life style and food and went away with many great memories. The talk I hear now six months later is still one of a job very well done! Congrats and thank you to all of you in the Halifax Centre who helped in anyway making it a great GA! Special thanks to Quinn and Pat for pulling it together and being our fearless leaders!

Nova East was a huge success once again. We must thank Roy Bishop first and foremost for stepping up to pretty much chair the event to make sure that it would all come together while so many of us were preoccupied with the GA. Just for note, we are seeking a chair for the 2016 Nova East so if you are interested please contact me. Nova East this year was a hit on many fronts; first of all, we had clear skies and no rain! Observing was done and enjoyed by many. Our keynote speaker was Alan Dyer who awed many of us with his images and his techniques. A new twist this year was a club/NE BBQ. For those who were not able to make it, you missed an awesome pot-luck where members pot-

lucked everything but the meat which was paid for by the club (steaks and sausage). With over 60 people being fed and some food left over, I think all were full and looking forward to doing this again next year.

Nova Notes, as you're reading now, also saw a new look this year thanks to Tony and his great work. It's refreshed and has new content each month thanks to a few columns now and is always a good read. There is also discussion happening at the club executive level to maybe return to printing NN for all as we are in a very good cash position at this time and being a not for profit we need to spend some of our funds. More to come on this in the New Year.

Speaking of the New Year, we need to look ahead now that 2015 is behind us. It is time to refocus our club and direct our energies into new goals. One of these is the long overdue update of our clubs website. A new template based on a national RASC template will soon be available to centres and we plan to use it. If you have any web based skills and would like to help out by setting up the site or simply helping add the content contact us.

I will wrap this report up for now but plan to have a brief update in each issue of Nova Notes this year. Please feel free to contact me at any time if you have questions or ideas for our club from meetings to events. The centre is what you/we make it. Clear skies.

Respectfully Submitted,

Paul Gray, President

Halifax Centre

2nd VP Report

Ian Anderson

a) Calendar Sales for Fiscal 2015

Fiscal 2015 started with delivery of 40 2015 Calendars which because of exorbitant delivery costs the previous year (2014), the retail price to members was adjusted to \$18 and to non-members at \$20 to give some margin. At these prices, the calendars did not move and into February we were forced to sell the remainder at a discount, even to give away the last in March. We had a poor profit margin for the lot.

This difficulty in F2015 led to the current strategy in 2016: With a much reduced unit cost, to sell all cal-

endars at a simple \$15 and to limit quantities available. I can just now report that even before this December meeting, we were completely sold out of the calendars sent to us this October.

b) Other Items for Sale

Aside from some solar filter material sold in October 2014 and again at Nova East, sales were pretty much dormant.

It is my hope that we widen the store of available products for sale, both from National Office Sources, (Official RASC items) and other types of astronomy related merchandise for sale to members. I do not foresee loading up with many of any one type of merchandise. For example, we were overwhelmed with

2nd VP Report, continued
Ian Anderson

unsold T-shirts in the 1990's when we got out of merchandizing.

c) Comptroller Role

I took on the role of Comptroller to assist the new Treasurer so that accounting is jointly overseen by the two of us. I no longer handle the money but I still have close tabs on the Centre's internal affairs.

d) Tracking of Membership

I also track membership stats monthly as well as Nova Notes printed subscribers and report to the Nova Notes editor on a regular basis. There is a fair draw on printed subscriptions, (currently 15) but some are from new members who may be unaware the publication is available on line.

Respectfully Submitted,

Ian Anderson, 2nd Vice President
Halifax Centre

There are a number of outreach events coming up in January. I remain on the Board as the RASC representative for the Young Naturalist Club/Halifax. I am planning to re-vamp the Library Talks in the new year.

Respectfully Submitted,

Paul Heath, 1st Vice President, Halifax Centre

1st VP Report 2015
Paul Heath

January	Library talks	Anyone out there? (Lower Sackville)
		Constellations (Alderney Landing)
	Youth Groups	Young Naturalist Club re: General Astronomy Presentation / Night sky tour (York Redoubt)
	BGO Tour Guide	
February	Library Talks	Seti Alpha V (Pat Kelly @ Alderney Gate)
		Astronomy with Binoculars (Woodlawn)
		Two-Eyed Seeing (Dave Chapman & Cathy LeBlanc at Halifax Central)
	Youth Groups	Herring Cove Brownies Madeline Simmonds Sparks
	Event	Night Sky Astronomy Adventure (Shubenacadie Wildlife Park)
	BGO Tour Guide	
March – June	Preparations for RASC GA	
	BGO Tour Guide	
July	RASC GA Volunteer	
August	Keji Dark Sky Week-end Nova East	
September	BGO Tour Guide	
October	Display	Hal-Con Week-End
November	BGO Tour Guide	
December	TBD	

Secretary Report Chris Young

The principal duty of the secretary is to provide minutes, agendas and meeting announcements for the Centre. An additional duty is to book meeting rooms through SMU for meetings – there was a delay this year as we were unaware the new president of Saint Mary’s requested a reapplication for SMU sponsorships. It took a little while for our fall request to get processed, but we have been welcomed back and are grateful to Saint Mary’s for their very significant support.

There are typically 10 Executive Meetings a year which usually occur during the hour before the Centre Meeting. The business and topics discussed are varied and members are welcome to sit in if they wish.

Motions are made with a quorum of the executive members which provide direction on policy, activities, support of observatory at St Croix, our budget, and definition of any spending not covered in the budget.

Motions made this past year included:

Donations to the International Dark Sky Association and the Clear Sky Clock”. (\$50 each)

Purchase of new bookkeeping software (Quicken)” (\$110)

Offering a rebate on RASC membership fees to those taking the NOVA Program (\$20)

To purchase a table at this year’s HalCon and 2 day tickets and a meal for volunteers manning the table.(\$230)

Decision to auction off the 17.5” Dobsonian. (with a reserve bid of \$1,200.00.)This will occur this winter with the membership being advised and invited to bid.

To cover gas travel expenses for travel to the December Meeting, for the invited Handbook contributors. (Max of \$200)

Depreciate the value of the library 25% due to age and lack of new books” (new book purchases are planned)

Our by-laws require that I advise you of the make-up of the membership of the Centre which as of the 30th of September we had a total of 150 members:

121 Regular

8 Youth (both associate and outright)

21 Lifers

The Secretary’s position is for a maximum of 5 years which I have reached. There will be a new Secretary this year who will work with the President and members of the Executive and whom I will be pleased to assist.

It has been my pleasure to work with all the members who have served on the Executive and thank you all for being patient with my late announcements and Minutes!

Respectfully Submitted,

Chris Young, Secretary
Halifax Centre

National Council Representative Report Patrick Kelly

The Society is finally starting to get a handle on its new governance structure. With the Board having all of the decision making power, determining the best role for the National Advisory Council has been a priority. In the past, almost all of the business discussed at National Council meetings had come, not from the Council, but from the national executive and various national committees. One of the recent moves has been for the Board to change the national policy document to remove the “Advisory” from the Council’s name, so it is back to National Council. The Council is still seen as valuable “recruitment tool” for potential future Board and national committee members.

Since the Board meets more frequently than the Council, it was felt that the best way to increase communication between the two bodies was to have the chair of the National Council act as co-chair of Council meetings along with the National President and it seems to be making a

difference. I was volunteered for the position at the recent GA.

I was unable to attend the usual fall joint Board/Council meeting due to a technical issue (the WebEx platform we used dropped my computer’s operating system between the GA meetings and the fall one) and several of us only discovered this a few minutes before the meeting was due to start! I was invited to participate as an observer at the December 7th Board meeting and there are some issues that I will be taking to the National Council for discussion including a review of family memberships and the effect, if any, of national fundraising efforts on Centre fundraising.

One thing worth reporting is that Society membership is now above 5000 for the first time and up about 800 in the last seven years!

Respectfully Submitted,
Patrick Kelly, National Council Representative

Treasurer's Report for 2015

Jim Millar

Royal Astronomical Society of Canada, Halifax Centre			
Comparative Balance Sheet			
Years Ending September 30, 2015 and September 30, 2014			
September 30, 2015 Activity to: September 30, 2015	Years Ended September 30, 2016		Amount of Increase or (Decrease) during 2015
	2015	2014	
Assets			
Cash	\$6,218.10	\$4,862.03	\$1,356.07
Cash Box (Not in account)	-	-	-
Accounts Receivable	1062.73	-	1062.73
Prepaid Other Expenses	303.86	-	303.86
Merchandise Inventory	201	93.37	107.63
GA 2015 Account	2773.64	-	2773.64
Investments	12000	13000	-1000
Accrued Interest on Investment Certificates	65.07	131.31	-66.24
Prepaid GA 2015 Expenses	-	343.21	-343.21
Library Estimated	1557.96	2077.28	-519.32
Observatory Equipment	12342.52	11902.07	440.45
Miscellaneous Estimated	320.05	320.05	-
Total Assets	\$36,844.93	\$32,729.32	\$4,115.61
Liabilities			
Accounts Payable	\$2,707.47	\$-	\$2,707.47
Prepaid Nova Notes Subscriptions	160.41	96.71	63.7
Total Liabilities	\$2,867.88	\$96.71	\$2,771.17
Capital			
Nova East Working Equity	\$5,000.00	\$5,000.00	\$-
GA 2015 Working Equity	-	-	-
Common Equity	28977.05	27632.61	1344.44
Total Capital	\$33,977.05	\$32,632.61	\$1,344.44
Total Liabilities and Capital	\$36,844.93	\$32,729.32	

Treasurer's Report, continued

Jim Millar

Introduction to Unaudited Report (for December 11, 2015)

The year 2015 was another financial success for the Halifax Centre. We had operational income of over \$2,100 before depreciation and write offs. To help to keep our surplus from being too large we continued to write-off our equipment at approximately 3%. Our library has not been renewed or kept up over the last number of years and many of the books are outdated. The executive decided to write down the library by 25% of its estimated value. Nova East had only a small profit this year as it was expensive but well worth it to bring in Alan Dyer as our keynote speaker. A very successful auction brought us a small profit. Hosting the RASC GA provided a fair profit that kept us in the black overall.

Surplus of \$1,344.44 for Fiscal 2015

The Centre continues to be successful and solvent. We are holding our own with membership and Nova East continues to be successful. We continue to follow good accounting procedures by depreciating our assets over time. We will need to invest significantly in our library so that it maintains its value to the membership. I am recommending to the Executive and membership that we review our holdings and remove badly outdated books and look at getting more books that meet the current and future interests of our membership. Astrophotography and lunar observing come to mind.

Details of the 2015 Income Statement

REVENUE:

- a) Membership Fees \$2,874.30:** By year-end, 120 regular, 5 youth, and 7 family status members had signed for the year - comparable to 2014 when we had 119, 3, and 14 respectively.
- b) Donations \$400.00:** This is half the \$800 value of the telescope and eyepieces given to us from the Vanderberg Estate. We paid Richard's son Ian an additional \$400.00.
- c) Educational / Outreach \$660.00:** The Nova Course was offered this year. Eleven paid participants at \$60 enrolled in the course.
- d) Interest \$176.00:** Investment certificates earned 1.45% on an average \$12,016 invested, plus a miniscule \$1.29 was received in the bank account. In 2015, money

earned less interest during the year. The story is a continued interest rates collapse paid on fixed investments. Our most recent GIC earns at a rate of 0.40%. The interest revenue plan started only three years ago is already obsolete.

e) Sales of Merchandise (Gross) \$804.50: These were RASC calendar and solar filter sales at Nova East.

f) Nova East (net) \$424.79: Nova East's record of continually outdoing itself was broken with the additional expense of flying in special guest speaker Alan Dyer from Alberta. This net amount presumes camping fees estimated at \$300 owing to the province of Nova Scotia which were unpaid as of year end.

g) Printed Nova Notes Subscriptions Earned \$120.13: This is what printed newsletters earned this year from members subscribing to hardcopy. 48 printed copies were credited here. This price increased 42% in fiscal 2015. The increase has been reflected here as printed copies are renewed at the higher price.

h) Miscellaneous \$13.07: This is strictly US\$ premiums received from membership and Nova East fees.

EXPENSES:

- a) Meetings \$197.96:** Pat Kelly did well to keep treat spending under \$200.00. Meeting treats cost us \$175.25 (excluding the June gathering at SCO) but our March speaker cost us \$22.71 to feed.
- b) Newsletter \$472.86:** NN's expenses were enhanced by the special GA edition printed in July.
- c) Cost of Goods Sold \$557.85:** The cost to us of the RASC Calendars sold and the portion of Solar Filter material sold at Nova East.
- d) Equipment and Supplies \$210.94:** These were expenses mostly associated with trade shows we attended in the late winter.
- e) Office Administration \$342.29:** New accounting software was also purchased at a cost of \$103.49. The rental of the PO Box was \$197.00 this year, with postage going up otherwise.
- f) Educational Activities (Outreach) \$1,285.01:** This is up considerably in 2014, nearly half was gas reimbursements to participants who went to Keji in August and other assignments (\$579.96). \$448.50 were costs related to the Atlantic Outdoor Sport RV show last winter.
- g) Legal Expenses \$30.25:** Our cost to register with Joint Stocks of Nova Scotia, unchanged from 2014.

h) Insurance \$1,208.00: Insurance for SCO was up a bit in 2015.

i) Awards and Donations \$0.00: No activity.

j) Observatory - Operating \$260.80: This includes the usual gift to Mr. Carmichael, a couple of work crews during the year. A BBQ, some propane, and the odd item. It also includes taxes to Hants County.

k) Asset Depreciation \$878.87: The outgoing treasurer took a 3% slice out of observatory assets before he passed the books on to me. I in turn slashed the library holdings 25% before closing the books for 2015.

l) Miscellaneous Expenses \$56.62: This was strictly our annual membership fee to the IDA in October.

Details of the 2015 Balance Sheet

ASSETS:

a) Cash \$6,218.10: On September 30th 2015, our TD Bank cash balance was \$6,218.10. Revenue from National Office for September \$442.73 and \$602.00 in income for the GA are what make up the accounts receivable of \$1,062.73. There was 2,773.64 in the GA account on 30 Sep 2015. Cash held by members was nil. This figure includes profits from Nova East.

b) Merchandise Inventory \$201.00: A bit less than ½ of a sheet of solar filter material remains. In addition are two toques and a book on astronomy purchased as Gazer prizes which were never awarded.

c) Prepaid Expenses \$303.86: \$230 of this was the fee for participating in HalCon which took place at the end of October 2015, well into the next fiscal year. Also, the annual donation to the International Dark-Sky Association (IDA) for 2016 was paid in August to take advantage of a matching donation campaign in place at the time. Both these pre-paid expenses appropriately show as temporary assets

d) Investments and Accrued Interest \$12,065.07: The Centre held 3 GICs on September 30th, 2015:

- a 15-month GIC with the TD Bank which yields 1.55% on a principal of \$4,000. This certificate matures on April 22, 2016 paying \$75.02 at maturity. It has accrued \$41.37 in fiscal 2015.

- a 15-month GIC with the TD Bank which yields 1.26% on a principal of \$4,000. This cer-

tificate matures on August 2, 2016 paying \$62.98 at maturity. It has accrued \$20.65 in 2015.

- a 12-month GIC with the TD Bank yielding 0.40% on a principal of \$4,000. It matures on July 22, 2016 and will earn \$16.00 for the year. It has accrued \$3.05 since that date.

e) GA2015 Account \$2, 773.64: The GA2015 account was nearly ready to close as of year end and contained \$2,773.64. There were some accounts receivable and payable still outstanding at that time. In early December 2015 the GA's books were closed and balance of \$1,386.17 was transferred to the main bank account. This represents the income for the GA which was considered excellent for our efforts at hosting the 2015 GA in Halifax.

f) Estimated Library \$1,557.96: This new value reflects the second major depreciation of estimated library value since 2010. Again, no purchases or adjustments were made in this asset in 2015. We have not spent money for the Library in a number of years.

g) Observatory Equipment \$12,342.52: After depreciation of observatory equipment of \$359.55 the addition of the Vanderberg telescope and eyepieces valued at \$800 was added to the category.

h) Estimated Miscellaneous \$320.05: There were no adjustments to this asset category in 2015.

LIABILITIES:

a) Accounts Payable \$2,707.47: At year-end, we had not paid the Nova Scotia Department of Parks and Recreation for the Nova East camping nights. By the time this report is published it is hoped this issue will have been resolved one way or another. There were also about \$2,400 in accounts payable for the GA outstanding.

b) Prepaid Nova Notes Printed Subscriptions \$160.41: Forty-eight printed copies remain to be prepared before this obligation is discharged. Subscriptions to printed issues increased in late 2015 from 2014's 41 printed copies at year end. A printed copy has a value of about \$3.34.

EQUITY:

a) Nova East Reserve Equity \$5,000.00: This reserve is capped at \$5,000.00.

Treasurer's Report, continued

Jim Millar

b) Common Equity \$28,977.05: Common equity rose by \$1,344.44 from 2014, or the difference of revenues over expenses. It is equivalent to about \$10.19 per member for a \$23 "investment".

Summary and Recommendations:

I am pleased to take over as Treasurer this year. Ian Anderson left a very large void that I am attempting to fill. He has been a great help in the transition. I hope that he will continue to be my advisor.

I will be presenting a budget to the new executive in January that will help to fulfil Ian's recommendation in

last year's report for a predictive budget. Once it is approved, it will be possible to provide quarterly reports to the executive.

Our auditor has resigned and we have been unable to have the records audited at this time. I ask the membership to appoint a new auditor who can audit the current year's books and the upcoming 2016 financial statements.

I have enjoyed this year and look forward to serving you for another year as your Treasurer. Thanks to Ian Anderson, we have a stable financial position that I will endeavour to maintain with the rest of the executive.

Respectfully submitted,

Jim Millar, Treasurer
Halifax Centre

Observing Chair Report 2015

Sean Dzafovic

I have received notice of one Centre member completing an RASC observing certificate this year (Melody Hamilton; Finest NGC). If I have missed any please notify me at sdzafovic@gmail.com and I will include the names in the written report in Nova Notes.

The NOVA program is currently on hold pending a rewrite of the Explore the Universe Certificate, which will replace the now out-of-print Beginners Observer's Guide. Once that is complete, the Nova program will be upgraded as well.

Respectfully submitted,

Sean Dzafovic
Halifax Centre Observing Chair

Saint Croix Observatory Report 2015

Alex LeCreux

SCO hosted 80 visitors this year as recorded in the log book. I know there are others that didn't make it into the log. The breakdown by month is as follows:

January: 2 visitors

February and March: No visitors, too much snow!

April: 3 visitors

May: 8 visitors

June: 28 visitors

We held a Summer Solstice meeting at SCO on June 20th. By my count there were 23 in attendance though folks were coming and going and could have missed a few. We had a lovely day weather wise and enjoyed a BBQ together. There was a review of how to use the 16" scope and as it got darker the group took part in some lunar and planetary observing. The SQM recorded at 11:30 pm was 21.2.

July: 2 visitors

August: 6 visitors

September: 6 visitors

A briefing on the use and care of SCO and the 16" scope was provided to a member who was eligible for key possession. I also spent the day doing some exterior maintenance clearing brush and trees and mowing where needed.

October 12 visitors

On October 12th Dave Chapman hosted a training session on the 16" scope for 3-4 members. A total of 9 were in attendance either taking part in the training or observing.

November: 1 visitor

December: 2 visitors

Due to an unexpectedly busy year with personal and work travel requirements, I was unable to provide the level of service SCO required and still have some outstanding small jobs to complete in the coming months. Although I am stepping down at this time, I will remain available to assist the incoming SCO manager as required and continue to check in on the Observatory as I am nearby.

Respectfully Submitted,

Alex LeCreux, SCO Manager

Nova Notes Report

Tony Schellinck

ISSUE	CONTENT	COVER PHOTO
January / February	16 pages – 10 pages of reports, 3 pages of <i>A Brief History of the RASC Halifax Centre</i> by Roy Bishop, member profile Karen Hamblin, meeting reports	NGC 6946: The 'Fireworks Galaxy' (Keith Walker, July 2014)
March/April	12 pages - new cover format – Theme: Comet Lovejoy - three new columnists (see below), meeting reports, RASC GA update, two pages of Comet Lovejoy photographs, National Advisory Council Report and the Invitation to Keji Dark Sky Weekend.	Comet Lovejoy (Paul Evans)
June / July	20 pages – Special issue for GA Assembly - <i>Ode to Hubble: HUBBLE'S UNIVERSE</i> by Martin Hellmich, three columns, reprint of <i>A brief history of RASC Halifax</i> by Roy Bishop, <i>Time Lapse Astrophotography</i> by Jerry Black – member profile of David Griffith - <i>Kejimikujik National Park and Historic Site as Nova Scotia's First Dark Sky Preserve</i> by Quinn Smith, <i>Happy Birthday SCO: Member Thoughts</i> by Roy Bishop, The Astronomy Nova Scotia webpage by Dave Chapman - 150 copies printed for GA and another 50 or so saved for general distribution.	M42 - Orion Nebula (Dave Lane and Greg Palman)
September / October	12 pages – theme: Viewing the Universe in a Different Way - Mike Boschat's <i>Experience as a Radio Astronomer</i> , Member Profile: Tim Doucette, three columns, meeting reports	Jupiter, Venus and Mars (Michael Boschat)
November / December	12 pages – theme: All about Outreach, how to create outreach in a small community by Wayne Mansfield, <i>Beneath a Dome, Darkly</i> — Reaching audiences on cloudy nights by Patrick Kelly, two columns, Member Profiles: Andy and Elli Hasler, meeting reports	NGC 896 (Tony Schellinck)

Columnists/Regular Contributors

Lunatic Ramblings by Dave Chapman

Starlight and Semiconductors by Art Cole

The Universe's Symphony of Sound by Matt Paine

Member Profile by Tony Schellinck

Meeting Reports by Jim Millar and Chris Young

Between 6 and 15 copies printed each issue – the number of members paying for a hard copy is increasing.

Respectfully Submitted,

Tony Schellinck, Nova Notes Editor

Halifax Centre

Library Report

Andy and Elli Hasler

The Library has not been as active this year as years past due my having had to be away in Australia on family matters and the book cart suffering from re-occurring flat tires. Now the library is back in service as I am back and the cart is fixed (thanks Paul Heath).

The executive has also committed to refreshing the library and has given the library a budget to add new books. The library is interested in having Members propose titles for consideration and some preliminary suggestions are as follows:

Barnard - "A Photographic Atlas of Selected Regions of the Milky Way".

Nasim – "Observing by Hand: Sketching the Nebulae in the Nineteenth Century".

Barentine – "The Lost Constellations: A History of Obsolete, Extinct, or Forgotten Star Lore".

Harrison – "Imaging the Sun Using a Digital Spectroheliograph" (available March 2016).

I will be posting a invitation for book suggestions on the List and look forward to receiving suggestions. The Library is back with new life and I look forward to sharing our Centre resources with you this year.

Respectively submitted

Andy Hasler, Librarian
Halifax Centre

Generally Assembly Report

Quinn Smith

The Halifax Centre was pleased to have hosted the 2015 the RASC General Assembly this summer. The event was held at Saint Mary's University between July 1st and 5th, and was the culmination of several years of planning by a very dedicated group of Centre members. Putting on such an event is a major undertaking by any Centre, and to be done by a relatively small Centre as ours (we have approximately 160 members), speaks to the excellent participation of the membership.

We had several goals at the outset of the GA planning. One was to have a "down home" event where (when possible) we would use local speakers and arrange the events around the Nova Scotia and east coast way of life. We also wanted to include the First Nations heritage from these shores, and I must say the participation of the "Women of the Shore" (a First Nations drumming group) was one of the highlights of the GA. We also hoped to have a low-cost event (or at least as low as possible) and break even, or even make a little money for the Centre. I think that as we look back on the event, we succeeded in all those goals.

It was always appreciated that a GA is both a social event as well as a working conference. We tried to mix the two so that delegates would both enjoy the social aspect of the GA

as well as feel that future planning for the RASC was well taken care of. From the reports we heard, both during the event and afterwards, I think we also achieved that goal as well.

In the end we had a total of about 110 delegates attend the GA, and all social events were well attended. The only negative comments we were aware of, were regrets by some of the delegates for not participating in the "Wine and Tides" tour.

The final event of the GA, the Banquet, was attended by 130 delegates and guests all of whom were enthralled by the smudging and drumming ceremony that preceded the banquet and occurred outside on a beautiful sunny afternoon. In fact, the weather throughout the event was just wonderful. On the day of the "Wine and Tides" tour, the bus left the University in cloud and drizzle, and drove into bright sunshine before even leaving the city limits. We couldn't have asked for more!

My thanks go out to my Co-Chair, Pat Kelly, and to all the members of the GA planning committee and the many, many volunteers who made the 2015 (and the Halifax Centre's third GA) such a successful event. Thank you all!

Respectfully Submitted

Quinn Smith (GA Co-Chair)
Halifax Centre

Halifax Planetarium Report

Tony Schellinck

Public shows in 2015 (by RASC)

26 shows to 98 Children, 591 Adults (double shows counted as "2")
Community and other shows: 5 shows to 6 Children , 66 Adults
Total: 31 shows to 761 people

Contributors:

Pat Kelly 10 shows

Tony Schellinck 12 shows

Quinn Smith 4 shows

Chris Young 5 shows

Thanks to Stephen Payne of the Dalhousie Department of Physics and Atmospheric Science for supplying these numbers and working with the RASC volunteers to mount an impressive array of shows.

Nova East 2015 Report

Roy Bishop

Nova East, Atlantic Canada's largest annual star party, was hosted by the RASC Halifax Centre and Minas Astronomy Group on the weekend of August 14 - 16, 2015. For the 16th year, it was held at Smiley's Provincial Park in central Nova Scotia, although this was the 29th "Nova East", the first several having been held in New Brunswick's Fundy National Park beginning in 1987. The theme for Nova East 2015, *Astrophotography*, was chosen in view of the keynote speaker and special guest, Alan Dyer, from Calgary, Alberta. Highlights of Nova East 2015 included the following presentations:

The Amazing Sky, by Alan Dyer
Planetary Astrophotography, by Art Cole
Top Tips for Terrific Pix, by Alan Dyer
The Evolution of Digital Photography, by Brian Giffin

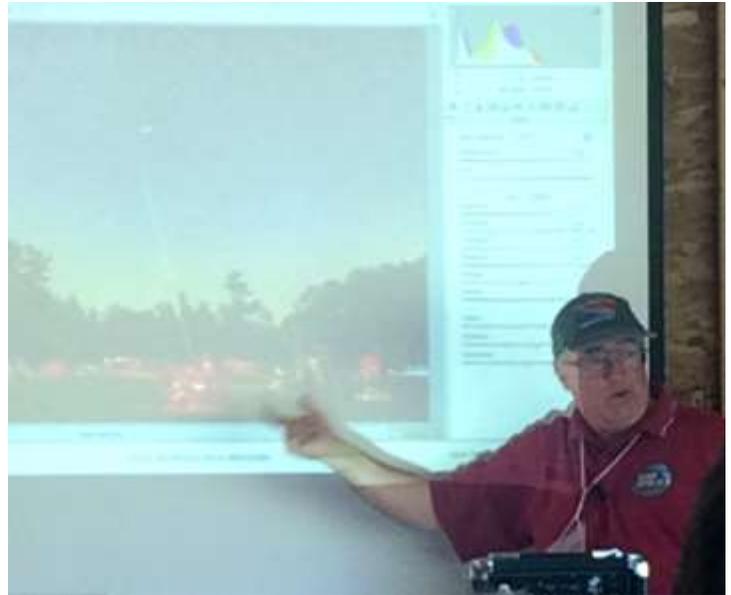
And the following special events:

Planet Walk, by Paul Heath
Nova East Auction, hosted by Quinn Smith and Pat Kelly
BBQ/Social on Saturday afternoon
The annual *Door Prize Draw*, hosted by Dave Chapman
Introduction to the August Night Sky, by Paul Heath

And the sky? Friday night was clear and dark, although dew was a problem for some telescopes. Saturday night started off cloudy, cleared for an hour after midnight, but then became cloudy again.

Respectfully Submitted

Dr. Roy Bishop, Chair, Nova East



▲ Alan Dyer gives tips for terrific pix at Nova East 2015. (Photo: Tony Schellinck)



▲ The group shot, Nova East 2015 (Photo: John Nagreaves)

President Paul Gray opened the meeting to a packed house of members and guests. He reminded people of upcoming events, the Nova East Star Party at Smiley's Provincial Park August 26-28, 2016 and the Keji Dark Sky Weekend August 5-7, 2016. The campground at Keji is pretty well booked already for that weekend.

Dave Lane was the guest speaker for the evening. His topic was *You, too, Can Use a 0.6-m Planewave CDK (or Celestron 14) Telescope for Imaging*. He was talking about the new social media functionality at the Burke Gaffney Observatory (BGO) at Saint Mary's and at his own Abbey Ridge Observatory (ARO) in Tantallon. The culmination of several years of planning and work.

The website, www.ap.smu.ca/bgo has the information on how to use this functionality. Dave reviewed the project from the beginning of the upgrade to the new telescope at the BGO and the writing of the software to allow complete robotic control of both the telescope at BGO and the one at ARO without direct human intervention. One can now send a tweet or an email to the computer and it will do the rest.

Once a person is approved to use the telescope, he can send a message to the telescope. The computer will determine the priority and the feasibility of the observation. The request will then be queued and the computer will wait for darkness, start up, take the observation and photos with a series of 1 minute exposures until the total exposure time is completed.



▲ Paul Gray sports the centre's new hands free microphone system used for the first time at this meeting. (Photo: Tony Schellinck).

After the observation run the computer will stack and process the exposures with the appropriate processes and when finished will send an email telling the observer

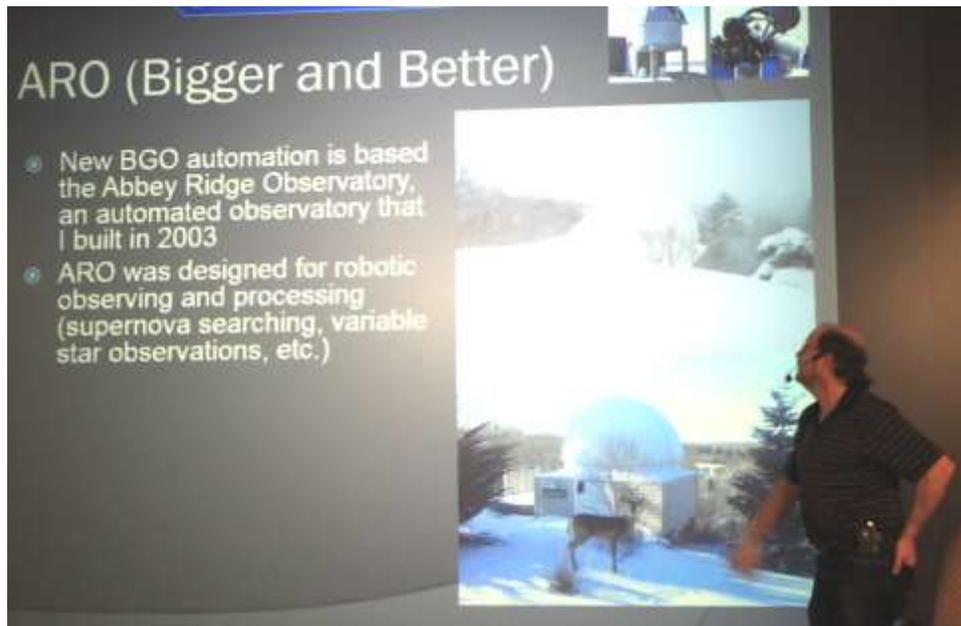
where to pick up there image. Images are available in .jpeg for casual use and raw images for scientific measurements.

Dave then ran a live demonstration with the BGO system and showed us how to set up a run. He finished off with various images that had been completed robotically.

For those who want to try their hand at this method of observing go to the website and look for the robotic interface page. It will explain how to get your own images.

Paul Gray completed the evening with a run down of What's Up for the next month. He also mentioned that the *Eclipse Bulletin: Total Solar Eclipse 2017* is now available for purchase.

The March meeting will be a night for member presentations.



▲ Dave Lane educates and inspires members to use the new system he designed that allows people to take photographs of objects in the night sky using the Burke Gaffney Observatory (BGO) and Abbey Ridge Observatory (ARO) telescopes; using email or twitter to make the requests. (Photo: Tony Schellinck).