Nova Notes

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

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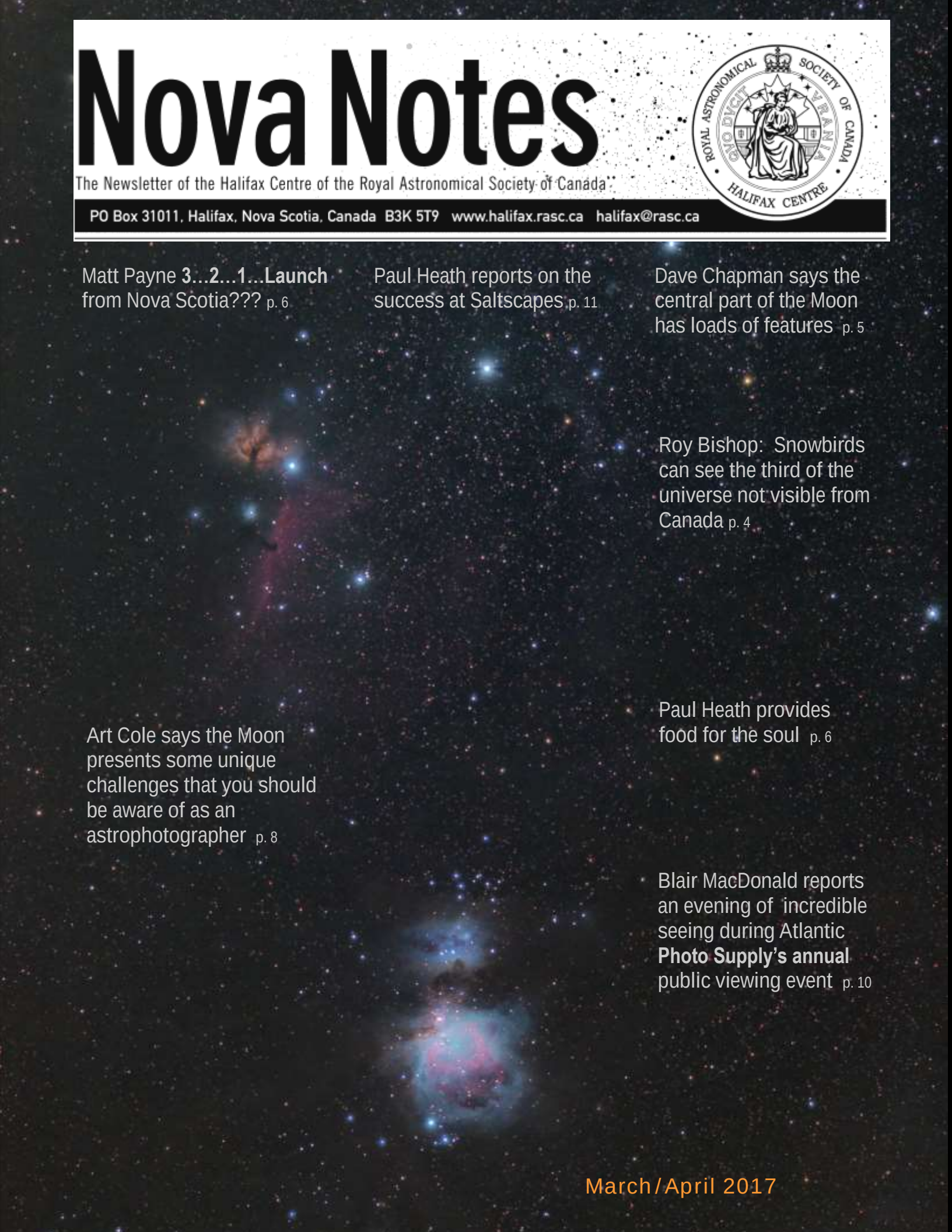


March/April 2017

St. Croix Observatory

Part of your membership in the Halifax RASC includes access to our observatory, located in the community of St. Croix, NS. 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:

May 26 (alt 27)
June 23 (alt 24)
July 21 (alt 22)

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.

What's on May 12, 2017 (a week earlier than usual)

Randall Rosenfeld
Archivist of the Royal Astronomical Society of Canada
Presents
Music of the Spheres: Astronomers as Musicians & Musicians as Astronomers

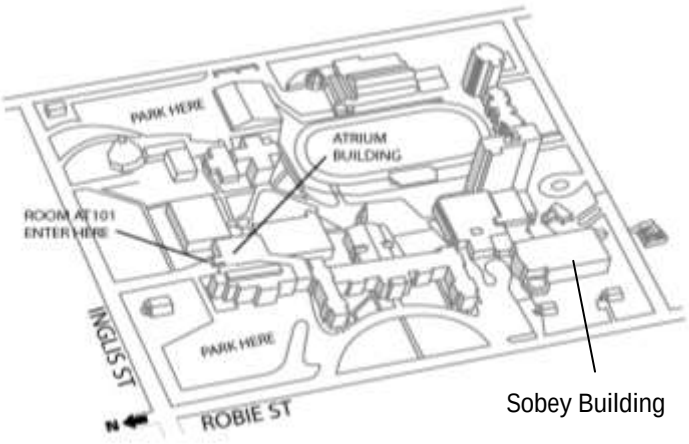
Meeting Dates for 2017

May 12, June 16 (Annual BBQ), Sept. 15, Oct. 20, Nov. 17, Dec. 8 (Annual General Meeting)

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.

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

Halifax RASC Executive, 2017:

Honorary President	**Dr. Roy Bishop**	**rlb@eastlink.ca**
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Vice-President	**Paul Gray**	**snpgray@gmail.com**
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Outreach Chair	**Paul Heath**	**pheath@eastlink.ca**
Councillor	**Art Cole**	**art.cole@gmail.com**
Councillor	**Andrew Frank**	**a.frank.tt@gmx.com**
Councillor	**Melody Hamilton**	**melynnham@gmail.com**
Councillor	**John Read**	**johnaaronread@gmail.com**

In this issue:

Cover Photo

Art Cole

Orion's Belt and Sword. Image taken December 31, 2016.

Imaged with a Canon 7D Mark II DSLR and a Rokinon 135-mm lens piggybacked on an Advanced VX mount. The main image is 40x20 sec, with the core of M42 being made from 15 5-sec subs, and a single 1-sec sub for the Trapezium. Processed in Images Plus.

From the editor ***Tony Schellinck***

"Boys and their toys." It's a familiar refrain and there is nowhere that it applies more to than amateur astronomy. As it is a tech heavy pastime, innovative products are always being introduced into the market. This is true for binoculars. The quality of low priced binoculars has improved dramatically over the last few years such that price should not be a barrier for anyone who wishes to start observing DSOs with standard binoculars. At last year's Nova East and again at the Winter Star Party in Florida this February I was introduced to the advantages of viewing the night sky through image stabilized (IS) binoculars. I had considered purchasing a set several years ago but the hefty price tag and my belief that they really didn't offer that much of an advantage in observing stopped me. However, a couple of nights under a dark sky with Dave Chapman's IS binoculars changed my mind about the improvement in views using one of these toys. Discussion with Judy and Jerry Black and Chris Young at the April RASC meeting convinced me to take the plunge. Chris even found that they were on sale on several Canadian websites. The following Monday I ordered a Canon 10x42 L series Water Proof binocular. It arrived on the Thursday.

Canon 10x42 IS L WP

The first thing I realized is that they are considerably heftier than regular binoculars, coming in at almost two and a half pounds. Time would tell if this would be a problem. Reviews had claimed the lens and eyepiece covers were next to useless and that was about right. The true test would be a viewing session. First light occurred the night of May 3rd and the target was Jupiter. They proved their worth with one glance. I could see Jupiter as a disk and see the four Galilean moons clearly. Not only that, I could study them at my leisure. Though the binoculars were heavier, I didn't have to clutch them tightly and try to hold them rock steady in order to examine the view, so it was actually easier to hold them on target for an extended period. When I raised my standard 10x50 binoculars to view Jupiter it was difficult to see it as a disk and I only had glimpses of the moons using averted vision. I would say the view is roughly equivalent to the view I have through my 80 ED refractor. I spent the rest of the evening hunting down double stars to see what I could split. For example Zeta Lyra (magnitudes 4.3 and 5.9 separation 43.7") was easily split. This means I will be able to split many of the stars listed in the Cambridge Double Star Atlas.

I feel this toy is my ticket to viewing double stars; it would also be more effective for observing variable stars and DSOs unreachable using my standard 10x50 binoculars. Given their wide field of view (6.5°) and sharp steady image they can be used to search the sky for DSOs and then check the star maps to see what I have found. Moreover, I don't have to necessarily wait for cloudless nights as I can quickly turn to and observe in areas of the sky where there are large breaks in the clouds, much easier than I can using a telescope.

Nova Notes: The Newsletter of the Halifax Centre of the RASC

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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 June 19, 2017

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.

Snowbirds

by Roy Bishop

The word "snowbirds" usually refers to those of our species who, in the colder months, often spend time further south where the air is warmer and sunny days more frequent, in places such as Florida, Arizona, Mexico, and the Caribbean.

Snowbirds with knowledge of natural history get more enjoyment from such trips than does the average tourist. In addition to the sun and sand, the flora and fauna of the tropics are of particular interest to them.

Yet there is another aspect of southern travel that few snowbirds appreciate – the night sky! Only those who are intimately familiar with the portion of the universe visible from Canada (i.e., amateur astronomers) can appreciate the part of the sky that can be seen from more southerly latitudes. My priority on trips south is not the sun, warm breezes and sunny beaches. My priority is the chance to see the third of the universe not visible from Canada. When night descends early on a warm tropical evening, the last place I want to be is stuck in a hotel dining room waiting for dinner to be served.

Much of the richest portion of our Milky Way Galaxy comes into view from the Caribbean, and ascends higher into the sky the further south one travels. Among the sights not visible from Canada are: the Great Star of the South and brightest star near the south ecliptic pole, Canopus; the nearest star system to our Sun, Alpha Centauri, with its Sun-like "A" component, Rigel Kentaurus; the most impressive globular star cluster, Omega Centauri; the Eta Carinae Nebula, the most spectacular star forming complex; NGC 3532, the richest open star cluster; Achernar, the southern terminus of the rambling celestial river, Eridanus; and the most famous constellation in the southern sky, Crux, the Southern Cross. Further south, nearer the equator, more sights come into view such as 47 Tucanae, the most beautiful globular star cluster, and the Clouds of Magellan, satellite galaxies of our Milky Way Galaxy.

Late winter/early spring in the Northern Hemisphere is the preferred time of year to see the highlights of the southern sky because then the richest part of the Milky Way Galaxy is accessible (see The Southern Sky map on p. 346 of your Observer's Handbook and note the months around its periphery giving the "late evening" orientation). Also, pick your dates to encompass several days centered on new Moon, so that the nights are dark and the splendor of the southern sky is not washed out by bright moonlight.

Unfortunately, most tourist accommodations suffer from excessive and poorly designed nighttime lighting that obscures a spectacular view of the sky. For tourists who enjoy bird watching, the equivalent situation would be one in which every hotel used explosive noise makers and cats to keep birds away. In recent years one or two hotels have recognized the natural wonder overhead, and have begun to cater to tourists who want to see the southern sky.

Perhaps my most memorable view under the southern sky occurred nine years ago, one moonless night in southeastern Australia. I was flat on my back on the ground near midnight in an inky-dark forest far from the light pollution of towns and cities, viewing with 10x42 image-stabilized binoculars. The kookaburras, rosellas and parrots were silent and asleep. Nearby, my rented motorhome was barely visible. Through an opening in the treetops, at the zenith I gazed, awestruck, at the silhouetted interstellar dust cloud known as the Coal Sack, the best dark nebula in the entire sky, framed by sparkling clumps and tendrils composed of thousands of stars.

Notes from March 17, 2017 Meeting

Judy Black

Paul Gray, Vice President of Halifax Centre, opened the meeting and welcomed the thirty-three members and guests attending the meeting. He reminded members of the *Explore the Universe* book that accompanies the *Explore the Universe Certificate Programs*. Dave Chapman had copies available for sale; one copy was also being donated to the library.

Sean Dzafovic gave a presentation of *What's Up?* in the night sky for the next month. Mercury will be at its peak on April 1st. Venus, Mars, Jupiter and Saturn will be visible. Comet 41P will also be visible. The Lyrid Showers will begin on April 16 and peak on April 22 at a rate of 10 per hour.

Catherine Gray gave a brief presentation on the upcoming *Starmus, Life and the Universe* being held in Trondheim, Norway. Special presenters will include notables such as Buzz Aldrin, Sara Seager and Stephen Hawkins. To help defray travel costs, she was selling homemade fudge.

Dave Chapman presented *Orienting your Skywatcher AZ Telescope to the Sky*. He was using his Skywatcher Heritage -

▲ Catherine Gray presents on the upcoming *Starmus, Life and the Universe* being held in Trondheim, Norway (*Photo: Dave Chapman*)

Notes from March 17, 2017 Meeting

continued

Judy Black

114P Virtuoso telescope for the purposes of this demonstration; the same principles could also be used on the 16" SCO telescope. He recommended beginners use an alt-azimuth mount and not an equatorial mount due to the latter requiring alignment with the North Pole.

Dave, through lessons learned over the years of observing, recommended seven steps to follow before you begin to observe:

1. Ensure the battery is charged
2. Plan your observing session.
3. Situate and level your mount - take the time to do this!
4. Check collimation.
5. Align your finder scope to the optical axis of your telescope (an optical finder may be more beneficial than a laser finder in the city).
6. Set latitude and longitude.
7. Where's North?

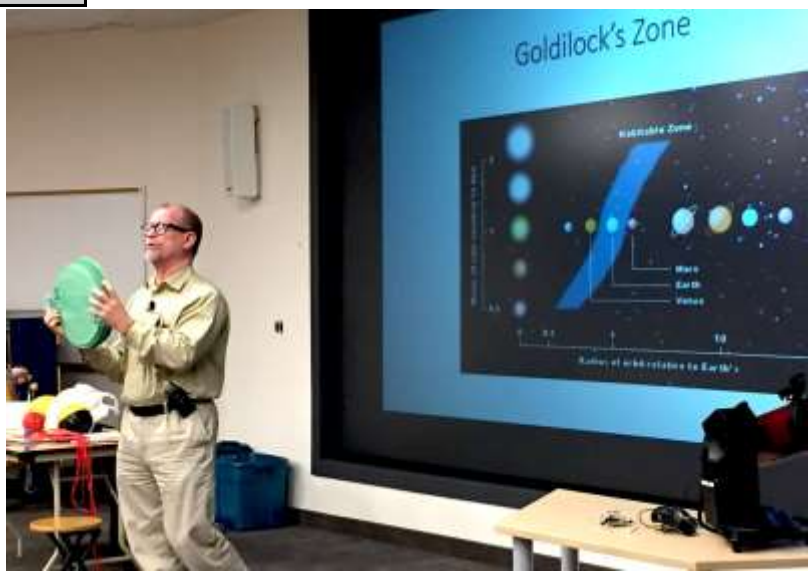
He recommended not skipping alignment. He then demonstrated how to align the telescope using no-star, 1-star and 2-star alignments.

Paul Gray introduced Paul Heath as the education guru in our Centre and our Outreach Chair who is being awarded the RASC Qilak Award at the General Assembly in Ottawa in July.

▲ Paul Gray introduces the evening line up of presenters. (*Photo: Dave Chapman*)

Paul Heath, as Outreach Chair, reported that Halifax Centre will be working with the Discovery Centre to develop programs for the planetarium. We will be asking for volunteers for the Saltscapes Expo on April 21-23. He then presented his *Food for the Soul* contribution - Volunteer.

Paul then entertained us with ways of doing outreach education: *Presenting Concepts - Inquiring Minds Want to Know!* He provided various models with which to explain astronomical concepts. Get children and adults alike to understand the size, shape, weight, and distances through models. Make it fun!



▲ Paul Heath, recipient of the RASC Qilak Award for outreach educates RASC members on outreach techniques. (*Photo: Dave Chapman*)

Here are some examples:

1. Distribution of planets in our Solar System - using a 4-foot dowel with planets suspended at appropriate intervals and with Neptune being at the centre.
2. Why we see full, quarter and new moons - Using a ball half covered in black duct tape.
3. How far can you jump on the moon?
4. Goldilocks' Zone (Habitable Zone)
5. Expanding Universe - using rubber tubing going through three balls/planets; when the universe expands, distances between objects remain proportional

Questions were welcomed from the audience. Paul was asked what was the toughest question he ever had; it was "How do you know what intelligence is?"

The meeting ended as usual with refreshments and social time. The library was open for members.

The Universe's Symphony of Sound: 3…2…1… Launch from Nova Scotia???

Matt Payne

First, I am looking forward to speaking at Nova East 2017 this year after Dave Chapman invited me to do a presentation on radio astronomy. Thanks Dave! Second, forgive me for going a bit off topic here and not writing up one of my typical radio astronomy articles.

Recently, I became aware through my friends and family in Nova Scotia, of a rocket launch facility to be built in Canso, Nova Scotia. I have read several articles about this in the *Chronicle-Herald* and on CBC starting back in November of 2016. The facility to be built will launch small to medium sized rockets designed for satellites. The rockets, built by a Ukrainian company, will be launched from a control facility three kilometres away from the launch area near Hazel Hill, Canso. Not only will this facility bring jobs to the area and economic revenue, but also it will be Canada's only space launch facility after the closing of the Churchill Rocket Range in Manitoba in 1998. The Ukrainian-built Cyclone rockets launched from Hazel Hill will take a southern flight trajectory over open water. This trajectory will allow the rockets to place their payloads in the optimal geosynchronous orbit. Additionally, the southern launch trajectory will minimize any potential impact on the population of the Eastern Shore, should there be an accident or malfunction during a launch. Maritime Launch Services, the company building the facility is based in Halifax and hopes to have an operational facility by 2020, after which the company hopes to launch about a half dozen rockets per year for a variety of clients and agencies. The Municipality of Guysborough has supported this launch facility and sees it as a great boon for the economy of the Eastern Shore area, which has suffered with the decline of the fishing industry.

So why did I take an interest in the rocket facility in Canso you might ask? A small town on the rural and quiet Eastern Shore of Nova Scotia? It happens that my family is from the small village of Larry's River not more than a 30-minute drive from Canso. I can only imagine standing in the front driveway area of Saint Peter's Church along Provincial Route 316 and the ocean, watching a rocket being launched into the heavens above.

On the radio astronomy front, keep an eye out for a possible report from Michael later this week. The Lyrid Meteor Shower peaks Saturday evening (it's in the *Handbook*!) and I bet he will be out listening and counting the meteors that streak across the skies of the Maritimes.

FOOD for the SOUL: COSMOS

Paul Heath

(April meeting 2017)

We looked toward the Skies
In fear and wonder, sought to understand
With Tales of Beings both wondrous and strong.
To explain the Awe, set so bright before our eyes.

Then, with meticulous counts we sought to understand
To measure up the Vista set before our eyes.
But not enough were all our toes and fingers
To tally up those firelights,
Yet, just enough to begin a picture, true.

Then to instruments we rushed, widened was our view
As we searched the farthest, faintest firelights
For Times beginnings, Clue.
And now we map the Eons past and gather
Time within our grasp.

But our need has grown past the Awe
And wonder has raised high the bar.
For we seek now to touch the Stars.

And so we turn the instruments within,
To see if WE, the stars can win.
And perhaps, in some age yet not come,
Our Tales will be told upon their skies,
To explain the awe and wonder
Set before those new and distant Eyes.

Lunatic Ramblings 8: Almost Halfway (Q-day –1)

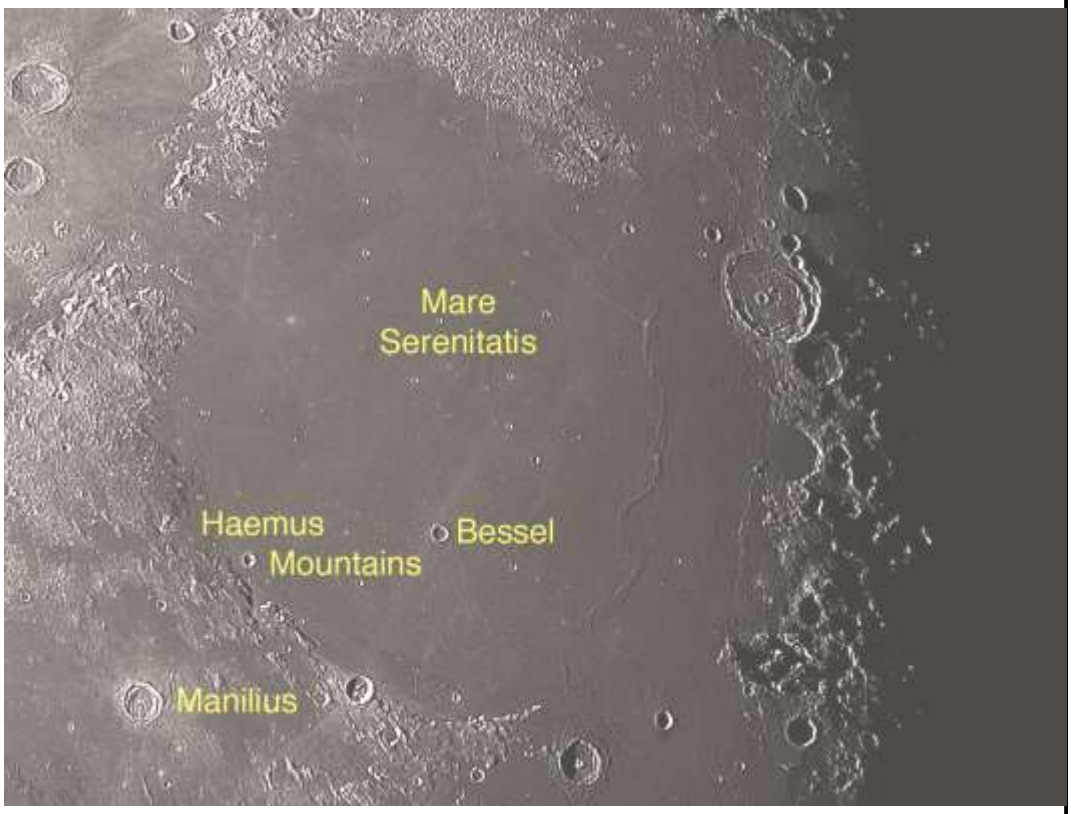
Dave Chapman

I'll take this opportunity to plug *Explore the Moon*, the RASC beginner's observing program with certificate. For details, see www.rasc.ca/observing/explore-the-moon-observing-certificate. These Nova Notes columns (starting in April 2015) take you through EtM (with occasional detours), night by night. This issue, we review features visible at Q-day –1, that is, about 1 night *before* First Quarter. The central part of the Moon has loads of features: if you observed on the night of the First Quarter and on one night either side, you would see about 40% of the entire *Explore the Moon* list! Since it well be a long time until the following issue of Nova Notes, here are the dates relevant to this issue's column: May 2, May 31, June 30, July 29, and August 28 (all in 2017). Alert readers will object that the first and third dates in that sequence are actually ON the night of the First Quarter—that happens from time to time, when the time of First Quarter occurs late in the 24-hour period AND when the eastern limb of the Moon has extreme libration towards the west. Remember that the Q-day method is approximate, and uncertainty is part of the fun!

Starting in the north, we see the prominent pair of craters Aristotle (90 km wide) and Eudoxus (80 km wide), both showing central peaks and terraced walls. To the south is Mare Serenitatis, a broad, round basin with few features, other than several wrinkle ridges that should display nicely at this phase, and the isolated crater Bessel (16 km wide), which must be very young. Forming the southwest shore of the basin are the little-known Haemus Mountains. South of this point is the crater Manilius (38 km wide), not to be confused with Menelaus to the east (which is not in the EtM observing list).

Moving southeast from this, we come across the eroded and lava-filled crater Julius Caesar (85 km wide), which I have seen described as "ruined"—don't overlook it! South of here, almost on the equator, lies Delambre (50 km wide), with terraced walls punctuated with a small secondary crater.

That should keep you busy for now. In my next column, we'll move to Q-day 0 and look around—there's lots to see! Email if you have questions or comments! dave.chapman@ns.sympatico.ca



▲ Robert Reeves (San Antonio, Texas) volunteered this lovely astrophoto to illustrate Q-day –1.

Starlight and Semiconductors: Photographing the Moon

Art Cole

Taking a picture of the Moon – sounds easy, right? It is big, bright, and you can use just about any camera and telescope combo to get something decent. But beware… the Moon presents some unique challenges that you should be aware of as an astrophotographer.

First of all, the Moon is evil when it comes to brightness. Except for when it's full, the Moon presents both intensely bright areas and extremely dark areas. This means that you need to capture the dark areas (typically along the terminator) while not overexposing the bright areas (usually close to the lunar limb). This applies both when you are taking the photo with your camera, and when you are processing the photo on your computer. When taking the photo, ensure that the histogram is not all the way over to the right. If it is, then your photo will be overexposed and the bright part of the Moon will be whitewashed – there will be no information in that part of your photo, and subsequent digital processing will emphasize that fact. You can move the histogram to the left by shortening the exposure time and/or lowering the camera gain (i.e., your ISO setting). Don't know what a histogram is? Just decrease the exposure and gain until you can see details in the brightest area of the Moon. But once you have taken that perfectly-adjusted photo, don't get cocky – overexposure is still just a mouse click away! Later, while you're doing your processing on the computer, make sure the histogram for your photo is always up on the screen. Some operations, like stretching and sharpening, will further increase the brightness of your already-bright areas, pushing the histogram to the right and potentially washing out parts of your image. Having the histogram up on the screen will help you to properly manage the brightness as you are working your magic.

▲ Figure 1: Can you see what is wrong with this photo? Never do this. Ever. (*Photo: Art Cole*)

▲ Figure 2: The Moon needs to be contrast-enhanced… give the Moon what it needs. (*Photo: Art Cole*)

The bright/dark nature of the Moon also presents a problem when you want to increase the contrast of your Moon photo – and believe me, you *do* want to increase contrast on Moon shots! The Moon has

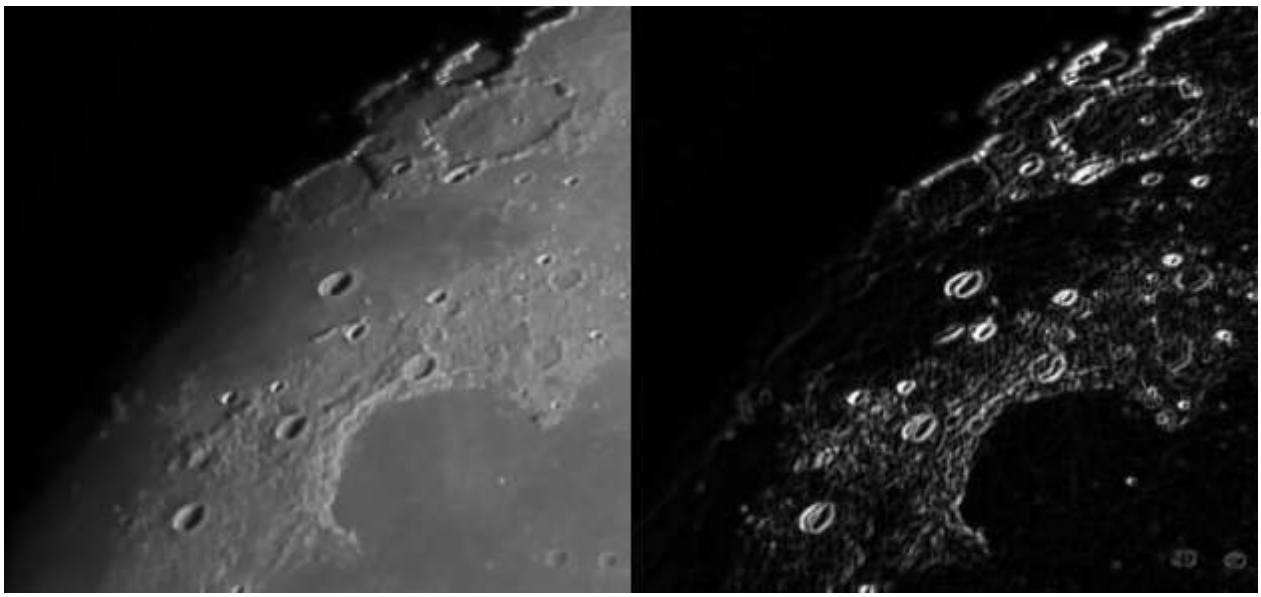
Starlight and Semiconductors: Photographing the Moon continued

Art Cole

numerous features that beg for high-contrast processing, including maria and crater rays. Increasing the contrast turns the Moon from a grey disk to a gleaming jewel–BUT – increasing the contrast means that you are making the brights brighter and the darks darker. This is fine for most of the Moon, but not so good for the crater details running along the lunar terminator. In this area, high contrast doesn't look so great, and it makes darker details (which you want) disappear. To keep this from happening, take a black-and-white copy of your lunar image, paint along the terminator with a wide white brush, then thres-hold the image so all that is left is your white stripe. Next, heavily blur the stripe, then brightness-invert the image. Now, the black part of the image corresponds to the area of the Moon where you don't want to apply the contrast function. Next, increase the contrast of the original lunar image using a contrast or curves function, then use the doctored image as a mask for that function. Everywhere will get contrast-enhanced except along the terminator. Nice!

By this point, however, you will have done something bad. You will have reduced the brightness of the darker parts of your image (generally maria), making them grainy and ugly. Ugh. You need to blur those areas without blurring everything else. Once again, masking saves the day. Take a black-and-white copy of your lunar image, and stretch the heck out of it so that the bright areas are super-bright and the dark areas are super-dark. Then invert its brightness and blur it a bit to get rid of noise. Now you have an inverse mask of the Moon! Blur your original image until the dark areas look good, and apply the mask. Presto, dark areas are fixed and bright areas are untouched!

The last thing you'll want to do is to apply sharpening, but only to things that need sharpening. If you sharpen the whole image, then areas with no features will become noisy. And you don't want to over-sharpen the lunar limb, because that makes your image look artificial - I usually don't sharpen the limb at all. So, another mask. Take a B&W copy of your image, blur it ever so slightly, then run an edge detector on it. The result will only show the areas of the original image where there are edges – these are the only areas worth sharpening. If this edge image looks grainy, blur it a bit to get rid of noise, then stretch it with a nice S-curve so that the brights are close to being white. Next, use a black brush with a wide blur radius to paint out the lunar limb. You will be left with a nice edge mask for your original image that is only bright in the areas where you want to perform sharpening. Take the original image, sharpen it (without going overboard, of course), then apply your edge mask. Craters, rays, and rilles will pop right out, and everything else (including the limb) will retain its natural look.



▲ Figure 3: A lunar image (left) and a corresponding edge mask for sharpening it (right). Edge masks will keep you from making a big deal out of nothing. (*Photo: Art Cole*)

There are plenty of other tricks to use while processing the Moon, so be sure to play around and invent your own. The Moon is a great object for experimenting with masks and for learning how to control noise, to perform stretching, and to properly sharpen details. Plus, it's one of the greatest views we have as astronomers, and is an incredibly rewarding and pleasing object to image.

Atlantic Photo Supply Public Viewing

Blair MacDonald

Once again, the Halifax Centre held a public observing event at Atlantic Photo Supply (APS) in Burnside. Originally, the event was scheduled for early March, but the weather simply would not cooperate. The folks at APS asked if we could try again in April and centre members stepped up and volunteered.

▲ Sixty to eighty people ranging in age from 4 to 78, years looked through a variety of scopes, including a 25-inch giant scope. (*Photo: Blair MacDonald*)

The weather cooperated this time and we were treated to some very clear skies and steady seeing. For those that have never attended the event at the Burnside location, it has some of the best seeing I've ever had for observing. I can't explain the steady seeing as the site breaks all the rules. We set up on asphalt, we are looking at the Moon over buildings and we observe in the early evening while the parking lot is still cooling as the Sun sets!

▲ As the sky grew darker we had a very obvious "X" show up in the parking lot as well. (*Photo: Blair MacDonald*)

▲ A few diehards look at the centre of the Orion Nebula later in the evening. (*Photo: Blair MacDonald*)

During the evening, we had 60 to 80 people have a look through scopes that ranged in size from a 100-mm refractor to Mark's 25-inch behemoth. Everyone had a great time and we had observers ranging from a four-year-old toddler to a 78-year-old grandmother. Quite a few folks brought cameras and were able to get some pictures of the Moon, either through the eyepiece, or if they had a Canon, at prime focus of Art's SCT or my refractor. When the evening kicked off the sky gods cooperated and we had a great view of the Werner X as it developed.

I'd like to take the opportunity to thank all those that came out, both with and without scopes. Allen at APS said that they had very positive comments about the event and are already planning for next year.

Nova East 2017 Schedule

Friday, July 28th

1:00 p.m.-7:00 p.m. **Registration,** ***Hosts: Melody Hamilton & Liz Greenough***
7:45 p.m. **Welcome and Announcements,** ***Hosts: Melody Hamilton & Judy Black***
8:00 p.m. ***Nova East 2017 Guest Speaker: Pat Kelly,*** **Topic: The Natural Satellites of Jupiter**
9:00 p.m. -12 midnight **Starry Night – public viewing**
10:00 p.m. **Sky Tour** ***Host: Paul Heath,*** Observing Field
10:30 p.m. **Binocular Table,** ***Host: Tony Schellinck,*** Observing Field
12 midnight. **Nova East Registrant Observing and Astrophotography**, Observing Field
No laser pointers after 12 midnight please.

Saturday, July 29th

9:00 a.m. **Astronomers' Breakfast,** ***Hosts: Chris Young, Bruce & Melody Hamilton***
9:00 a.m. - 2:00 p.m. **Registration,** ***Hosts: Melody Hamilton & Liz Greenough***
10:00 a.m. **Youth Activity** ***Host: Paul Heath,*** Observing Field
All day **Telescope Tours & Solar Observing,** ***Hosts: Nova East Astronomers***, Observing Field
11:00 a.m. **Beginner Talk: Observing the Night Sky with a Telescope,** ***Presenter: Kathy Walker***
12:00 p.m. -1:00 p.m. **Lunch Break**
1:00 p.m. **Beginner Talk: Wide-field Night Sky Photography,** ***Presenter: Dave Chapman***
2:00 p.m. **From Trekkie to Teacher-My Celestial Journey,** ***Presenter: Andrea Misner***
3:00 p.m. **Amateur Radio Astronomy,** ***Presenter: Matt Paine***
4:30 p.m.- 6:30 p.m. **Nova East Potluck BBQ/Social**
6:30 p.m. **2017 Group Photo,** Observing Field
7:00 p.m. **Astrophotography Contest Award and Door Prizes,** ***Host: Melody Hamilton***
8:00 p.m. **Observing the Night Sky with Binoculars,** ***Presenter: Tony Schellinck***
9:00 p.m.-12 midnight **Canada 150 National Star Party** ***Hosts: Nova East Astronomers***
The Nova East Astronomers invite Smileys Park campers and the public to view the Universe through telescopes of all sizes.
10:00 p.m. **Sky Tour,** ***Host: Paul Heath*** Event Building and Observing Field
10:30 p.m. **Binocular Table,** ***Host: Tony Schellinck,*** Observing Field
12 midnight **Nova East Registrant Observing and Astrophotography**
No laser pointers after 12 midnight please.

Sunday, July 30th

9:00 a.m. **Astronomers' Breakfast,** ***Hosts: Bruce & Melody Hamilton*** Event Building
Coffee and muffins will be available.

Saltscapes Outreach Report

Paul Heath

The Saltscapes Expo was a great success again this year. First off, I would like to thank all those that helped out at the booth: Jerry Black, Peter Hurley, Melody Hamilton, John McFee, Pat Kelly, Wayne Harasimovitch, Paul Gray, Sean Dzafovic, Dave Chapman and Blair MacDonald. I would also like to express our gratitude to Atlantic Photo Supply for once again hosting us at Saltscapes.

This year the crowd seemed to come in spurts, which at times made it hard to count the number of people we spoke to. Friday's count was about 190 people, Saturday's 280 people and Sunday's 110 people. We gave away 630 Star finders, 340 moon guides and about 350 Centre brochures. Three-quarters of a case of the new SkyNews and half a case of the previous edition SkyNews was also handed out.

We again had a number of requests for youth group and class room visits. This year we will be looking at doing a presentation for the Provincial Park hosts at their orientation meeting in early June. This could lead to a number of campground requests for this summer (i.e., volunteers needed!!).

Once again *thank you* to all who helped at SaltScapes.

▲ Melody Hamilton and Dave Chapman promote amateur astronomy at Saltscapes 2017.

Notes from the RASC Halifax Centre Meeting April 2017

Chris Young

Paul Gray opened the Centre Meeting by welcoming the 39 members and guests. Registration is now open for the 2017 Nova East (July 28th to 30th) and a new NE T-shirt has been designed by John Read. Sean provided a What's Up, Paul Heath read a poem for his Food for the Soul and gave a report on Outreach activities.

Centre member Ruining Zhang provided the first presentation: "Computational Cosmology, The Bridge Between Theoretical Models and Observational Data".

Ruining is a grade 11 student who recently attended a workshop at the Bejing Department of Galaxy & Computational Cosmology. She provided a description of her research in Bejing and described the value of comparing numerical simulations with observational data. Numerical simulations provide a method where cosmological models can be created to reflect our current understanding of galaxy formation and other developments in the cosmos. Advantages of computer simulations include the ability to "Overcome the limitations of light speed, Observational technology…We can travel through space and time with only a few lines of codes!".

It is possible to make new discoveries in the simulation and theories can be tested to see if they match observations. "There is a Universe in the Simulation!" she declared.

Ruining admitted that there were many challenges in doing research but she likes to solve problems for herself as she believes this will be a useful skill in her future research. Ruining assured us that anyone can be a researcher (although there was some doubt in the room).

Feeling somewhat dwarfed by this researcher, many of us took comfort when Ruining shared her travel photos of China and her inspirational reading which includes a science fiction trilogy by Cixin Liu – which I had just started!

It was an impressive report from a young person with wonderful abilities and a promising future.

Karen McLarnon was gave the second presentation titled "Space Medicine – A History & A Look Ahead". Karen's hobby is space medicine. She presented a brief history of flight on through to current mission planning. The audience knew we were in for an animated discussion when it started with "A sheep, a duck and a rooster walk into a bar…". These were the passengers on a balloon flight in 1783. The practice of sending up animals first to study the effects of flight then continued through the Sputnik and Mercury flights. Karen described the slow realization about the effects of microgravity, radiation and G forces on astronauts. Side effects include motion sickness, pooling of fluids, arrhythmias, blood cell changes, loss of bone density, heart and eye abnormalities – to name a few. Efforts to control these issues include treadmills, pressure suits, drugs and diet. Other concerns for extended space flight are confinement, inactivity and tight crew quarters. The models for studying these issues are Antarctic isolation and nuclear submarines. The "Right Stuff" is no longer sufficient and interpersonal skills, conflict resolution and acceptance of the chain of command now lead the necessary abilities for space travel.

▲ Ruining Zhang explains the value of comparing numerical simulations with observational data. (*Photo: Tony Schellinck*)

Karen expressed her respect for Werhner Von Braun's foresight in planning extended space flights which he wrote in his 1953 book "The Mars Project". Von Braun anticipated most of the current technical ideas for a trip to Mars. Karen's descriptions of space travel issues were sobering and not many of us now have any illusions about making the trip! The evening ended with refreshments and conversation with our presenters. It was an excellent meeting.

▲Karen McLarnon giving her talk titled "Space Medicine – A History & A Look Ahead". (*Photo: Tony Schellinck*)