Nova Notes

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

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IN THIS ISSUE:

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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:
7 December (alt 8)

Meetings usually begin at 8:00 p.m. at Saint Mary's University in Room 101 of the Atrium Building (AT).

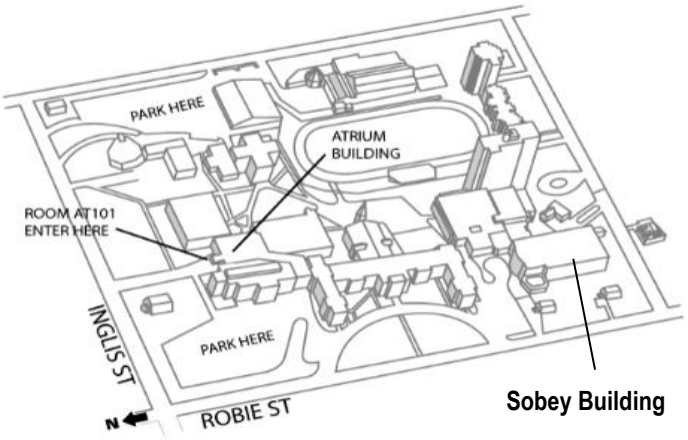
All meeting locations and presentations subject to change

Meeting Dates for 2018/19

Friday, 16th November
Friday, 7th December
(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 6:45 p.m., usually in room AT306, and all members are welcome.

Halifax RASC Board of Directors, 2018:

Honorary President : Dr. Roy Bishop	**(Appointed)**
President: Paul Gray	**(Elected)**
Vice-President: Melody Hamilton	**(Elected)**
Secretary: Judy Black	**(Elected)**
Treasurer: Gregg Dill	**(Appointed)**
National Council Rep: Patrick Kelly	**(Elected)**
Director: Sean Dzafovic	**(Elected)**
Director: Andrew Frank	**(Elected)**
Director: Paul Heath	**(Elected)**
Director: John Read	**(Elected)**
Director: Charles White	**(Elected)**
Librarians: Vacant	**(Appointed)**
SCO Manager: Tony McGrath	**(Appointed)**
Observing Chair: Sean Dzafovic	**(Appointed)**
Outreach Chair: Paul Heath	**(Appointed)**
Nova Notes Editor : Charles White	**(Appointed)**

Cover Photo By:

David Hoskin
"P21 Giacobini/Zinner "

P21 Giacobini/Zinner taken from Clayton Park with an ASI224MC with a total integration time of 17 minutes.

In this issue:

A Co-worker of mine looks at the Moon for the first time through a telescope

From the Editor — I work in broadcasting, it's a fun job and you get to meet a lot of interesting people and go to a lot of interesting places in the process. For this entry of From the Editor, I would like to focus on the latter.

We do a lot of outreach throughout the course of the year, be it the Keji Dark Sky Weekend, the public viewing at Nova East, the star party at Atlantic Photo Supply, the list just goes on. Which is phenomenal and it showcases the RASC, and the Halifax Centre in an excellent light. Unfortunately, given that in my field of work I need to go where the next event is, I miss out on a lot of the public outreach events that we do. I don't let this discourage me however, merely take my outreach on the road with me!

Whenever I go on the road, I always pack up my 70mm Celestron refractor, a couple of low power eye pieces (mostly 15mm, 20mm, and 25mm), my solar filter and my logbook. Under normal circumstances we're gone for two nights so when I arrive I normally check in and inform the hotel staff that I'll be setting up my telescope around a certain time and that they, and the public are welcome to stop by. I try and stay as close to the door as possible to maximise the amount of people that might stop to see what's going on and once I get an individual(s) who are interested, I'll show them whatever objects might be overhead at the time.

I don't have the figures of how many people have looked through my humble refractor but some of the comments and stories I've been told have been quite wonderful to listen too. Those that look tend to go get others they are staying at the hotel with to peer through the scope and see the craters on the Moon, or the rings of Saturn. I always have my logbook on hand as well to show them some objects that are not presently up that you can see, as well as some RASC handouts too.

To wrap up this piece, I guess the point I was trying to make was that we can do outreach at any point and anywhere and if we setup, they will come and to quote the lady at the front desk from my last trip "I was having a pretty rough day, but this just turned my mood around." Astronomy can, and does have a positive effect on people! Hopefully my ramblings here might encourage you to do some spontaneous outreach and turn someone's mood around.

- Charles

RASC Halifax Centre new publications:

Congratulations to Paul Heath and John Read for their new publications. Read a snippet of Food for the Soul : Poems for Star Gazers on page 9.

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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 December 30th 2018.

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.

September Meeting Report

- Judy Black

Paul Gray, President, welcomed the twenty-five members in attendance to the meeting.

Paul Heath, Outreach Chair, asked for volunteers for "Nocturne", an evening with the Young Naturalists being held at the Museum of Natural History in Halifax. He then stated that with encouragement from family and friends he now has a book published of his Food for the Soul poems. His book, Food for the Soul: Poems for Stargazers, will be in book stores soon and is also now available at Amazon.ca by searching for "food for soul Paul Heath". He then read a poem about Searching for Sirius B in honour of the feature presentation this evening.

It was also brought to members' attention that John Read had his first professionally published book, 50 Things to See with a Small Telescope. It will be out in bookstores in January 2019, but members can obtain a signed copy tonight.

Sean Dzafovic, the Observing Chair, presented What's Up? He noted the full Moon is next week and the New Moon on October 9. The moon will be close to the Pleiades on October 28 and to Aldebaran on October 29. Jupiter will be close to a crescent moon on October 11. The Draconids will peak on October 7-8. Venus will be at its brightest for the year due to its proximity to the Earth and despite being illuminated only 25%.

Paul Gray reminded members of the McLelland Lecture on October 12, 2018. At this time, the speaker is unknown. The next members meeting has Laura Mclarnon as its guest speaker. He also reminded members that the RASC award nomination deadline is December 31, 2018. To find out about the types of awards and their criteria, go to https://www.rasc.ca/nominations.

Paul then apprised members of the decision made by the Board of Directors at the meeting that had preceded the members meeting. Starting in January 2019, Centre meetings will be held on Saturday afternoons; 1–4 PM was suggested as a possible time but more details will be forthcoming as the Board makes more definitive plans for the meetings. The numbers attending on a Friday evening for the past six months are known; this will be on a trial basis for January to June to determine if numbers and age groups attending change. A brief discussion followed.

Our featured Speaker, Blair MacDonald, gave his presentation Image Challenge: The Hunt for Sirius B. His desire was to obtain a raw image to show the star for which Dave Chapman had inspired him to find at an outreach event at Atlantic Photo Supply. So why was it so hard to acquire? There were a few reasons:

-The two stars are separated by slightly less than 11 arcseconds.
- Sirius has a magnitude of -1.4 whereas Sirius B's magnitude is 8.4 (meaning A is 8,318 times brighter than B)
- Brightness difference puts this at the limit of his 14-bit camera
- Reflector secondary causes large halos around the A component with bright diffraction spikes that can hide the dim B component
- There are no star charts for the area in close to Sirius

Therefore, he had to rely on calibrating the image position cited in the RASC Observers Handbook. Blair explained the optical, telescope, and camera issues he also had to solve before he successfully captured the image:
- Got around the brightness difference by taking 122, 0.1-second exposures where the A component was just saturated. Averaging all the exposures increased resolution to 17.5 bits, enough to resolve B from A
-Got around optical issues by using an Esprit 120 refractor
- First attempt at calibration failed due to using goto system to move the scope
- Recalibrated using the north button on the hand controller to determine north and then turning off mount and letting the scope drift at sidereal rate for 10 seconds while exposing to see star motion in camera frame
- After a faint star was found near Sirius A he checked its position using the calibration to verify it was Sirius B

He then showed the results of his efforts - the photo of Sirius and Sirius B along with the background star field. Paul Gray thanked Blair and then opened the floor for questions and comments.

Paul then showed the trailer for the upcoming Movie, First Man, that will be opening in theatres on October 12, 2018. He suggested that a time for an RASC group to attend could perhaps be arranged for a week or two after opening night.

Dave Chapman provided a brief report on the Kejimkujik Dark-Sky Week-end held August 17–19, 2018. The 3-night event had one great night of observing with cloud or rain affecting the other two. There were eight or so telescope operators. It was a social event for many families at the park. RASC members were unable to use green laser pointer due to approval from Transport Canada not being received in time. As an alternate, focusable LED magnum flashlights made with PVC piping extensions were used successfully.

Kathryn Gray was the keynote speaker and was very well received by a standing-room-only audience on Saturday evening; she spoke about her experiences as a supernova hunter. Melody Hamilton won the 6" SkyWatcher telescope. All in all, about 450 people attended the event. The dates to look forward to next year are:
- August 23–25, 2019 - Keji Dark-Sky Weekend 10th Anniversary (also 50th Anniversary of the park)
- August 30–Sept 1, 2019 - Nova East Star Party

Jerry Black then presented his time-lapse videos:
- Mount Carleton Provincial Park (N.B.) Milky Way, June 11/18 (https://vimeo.com/275550720)Noctilucent Clouds at Rocky Mountain House, Alta., July 7/18 (https://vimeo.com/290332990)
- Echo Valley View Campground, Sask. overlooking the Qu-Appelle Valley, July 11/18 (https://vimeo.com/290603240)
- Nova East 2018 Star Party & Perseid Meteor Shower, August 10-13/18 (https://vimeo.com/285873072)
- Mars, Saturn & Jupiter over Kejimkujik Lake, July 31/18 (https://vimeo.com/282920662)

Before showing his last presentation about a night of observing in the Kejimkujik backcountry, Jerry thanked Dave Chapman for his creative assistance and in obtaining permission from Rachel Lafond for the use of her music. Dave explained his friendship with her and how thrilled he was that two of his friends who had never met (one here and one in New Zealand) worked in collaboration to produce the video. The video will be on her website as well as Astronomy Nova Scotia (ANS).

- The Magic of Keji at Night: Backcountry Site 15 on the night of Sept 9/18 (https://vimeo.com/290203445)

Dave Lane presented two citizen science projects in which he is involved using his Abbey Ridge Observatory (and the SMU Burke-Gaffney Observatory), now in its sixteenth year of operation. For his first project, Dave stated he is collaborating to obtain data about Tabby's Star, an F-type main sequence star located in Cygnus that was discovered to have odd behavior by the Planet Hunters citizen science project in 2015. What caught people’s attention was an unusual dimming of brightness of the star of up to 20%. The American Association of Variable Star Observers (AAVSO) had put out a call to observers (mostly to volunteer amateur astronomers) to monitor the star in the hopes that it future dimming events would be recorded again to discern what is causing them. He has observed it for the past three years and there was no change in brightness until the spring of 2017. He utilized multiple filters to determine dust and the change in brightness. The bowl-shaped dip, typical of eclipsed stars, was determined to be caused by very fine dust, not something solid. The magnitude of the star at that time was 11.5.

Dave's second project involved exoplanet HAT-P-53b. Twenty years ago, there were no exoplanets found; now there are thousands known to exist. To assist in processing and analyzing images captured, Dave downloaded AstroImageJ; the program was made for education and amateur astronomers and allows the images, taken over several hours, to be analyzed to detect, plot, and model the very small drops in brightness caused by a star's planet tansiting in front. It takes things like metallicity, limb darkening, the star's radius and computes the size of the planet (compared to Jupiter), the length and depth of the eclipse, etc. He explained that the Transmitting Exoplanet Survey Satellite (TESS) was launched aboard a SpaceX Falcon 9 rocket in April 2018. Its purpose is to to discover new small exoplanets that will later be studied by the still-to-be-launched James Webb Space Telescope. TESS will be surveying the southern hemisphere for the first year and then the northern hemisphere for the second year. Because of the large pixel size of TESS’s images, smaller Earth-based images are needed to follow up on many exoplanet candidates to weed out the non-planets and determine which stars actually contains planets. Dave is doing the preparatory work before seeking to join NASA's "Seeing Limited Subgroup", a group set up to do these follow-ups. Coincidentally, the first TESS planet discoveries were announced this week.

Paul Gray stated that because of the time he would not conduct the astronomy quiz at this meeting. He explained that New Brunswick had done this for years and that it was fun and enjoyed by members. It will be on hold until a future meeting. The photo compilation normally provided at this time will be presented at the next meeting.

The meeting adjourned at 10:05 PM. Members then gathered for the social time and treats provided.

Lunatic Ramblings 11: Copernicus and More (Q-day 2)

- Dave Chapman

This column is based on *Explore the Moon*, the RASC beginner's observing program with certificate. For details, see www.rasc.ca/observing/explore-the-moon-observing-certificate. This issue, we review features visible over 4 nights leading up to Full Moon (that, is Q-days 3, 4, 5, and 6). Because of the large lava "ocean" there are not as many prominent features to see during this late Gibbous phase: observe during the dates 2018 November 18–22 and December 18–21. This column is the last of this series.

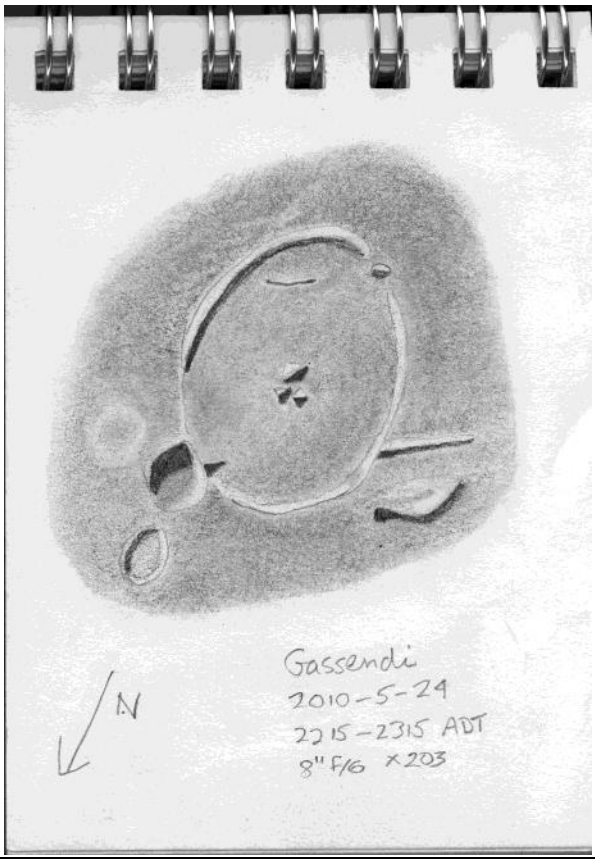
Starting in the north, the Jura Mountains next to Sinus Iridum (Bay of Rainbows, part of Mare Imbrium) both form an impressive landscape when the terminator is near. North of the Juras, find Sinus Roris (Bay of Dew), which joins Mare Frigoris (Sea of Cold) to Oceanus Procellarum (Ocean of Storms).

Oceanus Procellarum is the largest lunar mare (and its only ocean). It dominates the western limb of the Moon, and is pockmarked with only a few craters. Aristarchus (40 km) is the brightest crater on the Moon, owing to impact ejecta. Nearby is the interesting Schroter's Valley (not an EtM target). Further south, Kepler (30 km) has interesting detail within its walls and has a wide ejecta field.

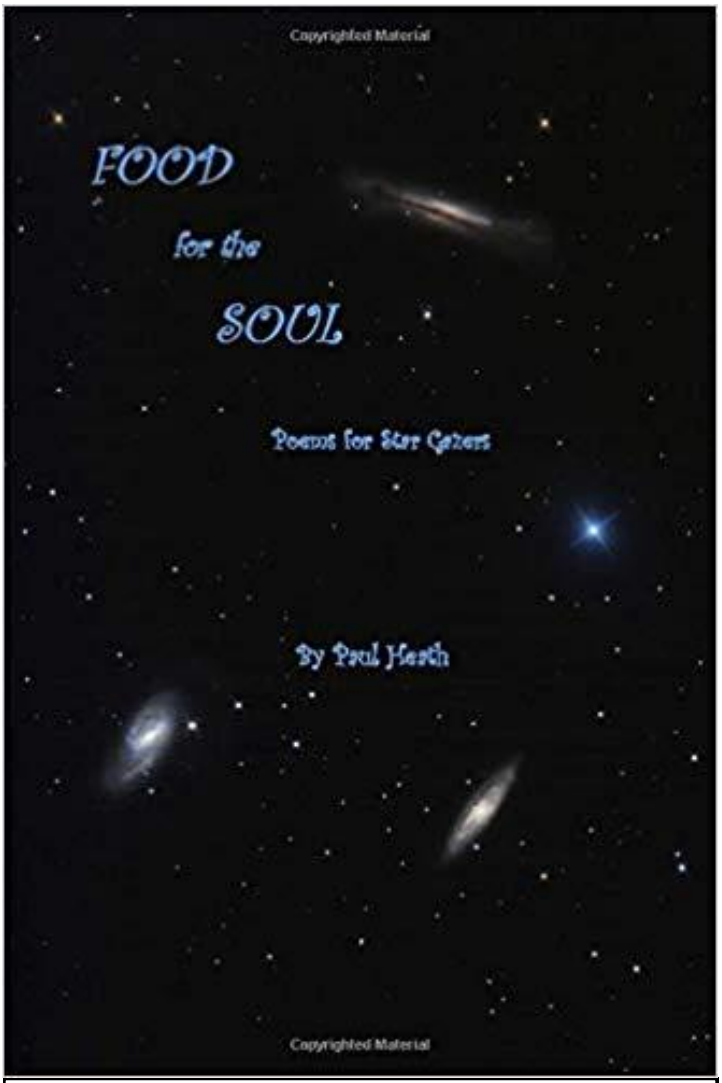
Further south again, we find Mare Humorum (Sea of Moisture) with lots of interesting topography along its shores, notably the large, eroded crater Gassendi (110 km) with its multiple central peaks, secondary craters, and rilles along its floor. To the west is the eroded and pock-marked Mersenius (85 km) with multiple floor fractures.

As we approach the western limb of the Moon, all craters are foreshortened by perspective. Schickard (210 km) is a very large crater with interesting variations in floor brightness. Nearby, Schiller is also foreshortened, but also weirdly elongated (180 x 70 km), with an odd central ridge. Near the western shore of Oceanus Procellarum, we find the dark-floored Grimaldi (175 km), which easily stands out in binoculars, and Hevelius (120 km), another eroded and fractured crater.

There's lots more to see nearby, especially when lunar libration favours the western limb. As I mentioned above, this is 12th and last article of Lunatic Ramblings. Enjoy your own lunar rambles, and I hope you get as crazy about observing the Moon as me! Email if you have questions or comments!
dave.chapman@ns.sympatico.ca



The author's 2010 sketch of Gassendi (110 km), straight from his sketchbook.



Above: The cover for Paul Heath's new book Food for the Soul: Poems for Star Gazers.

Food for the Soul: Poems for Star Gazers

- Paul Heath

I have been writing Food for the Soul poems for a number of years now. At each meeting I try to have a poem that looks at the science topic of the meeting in a different way. To help the other astronomers look at the science, 'outside of the box'.

I have gotten a good response from reading my poems and the last couple of years have been told by many to put them in a book. This past Christmas I decided to do just that.

As Each poem was 'Inspired' by a specific astronomical topic or event, I also included an inspiration page after each poem.

The book 'Food for the Soul poems for Star Gazers is available on amazon.ca. It is out in paper back and e-book format.

PUP

- Paul Heath

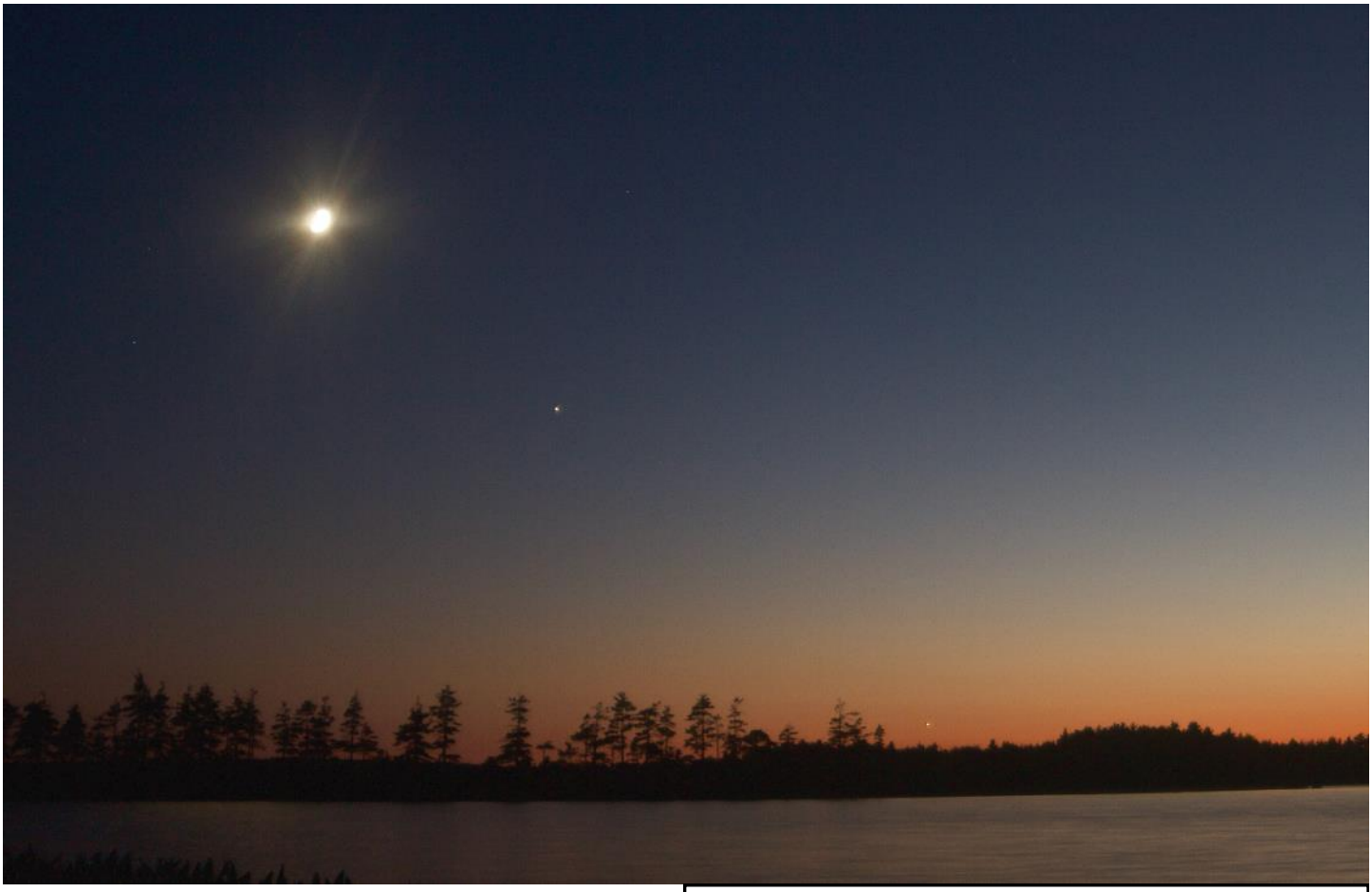
He hid behind the glare, tail wagging
Gave away.
Yet their dance betrayed, the path
On which he strayed.

He hid behind the glare, til' polished sands
Gave away.
Yet for ages past, his path laid out
Along the steps they made.

He hid behind the glare, til' polished sands
His stature betrayed.
Yet the stories, in the steps
Bespoke his stature, with the dance.

He hid behind the glare, til' larger polished sands
Claimed a second one, may be at hand.
Yet stories within the dance
Bespoke that life, was there.

He hid behind the glare, a Pup
Perhaps a pair.
They pace the dance, copied from the air
Could not the Dog on, the Pup's true self be aware.



The planet Jupiter hangs below the moon above Kejimkujik Lake. Venus is just visible in the evening twilight very low right of centre.

Trip to Kejimkujik

- John McPhee

The loons are wailing, the sun has set and I'm alone on an island in the middle of a lake. Perfect.

Well except for the jarring crack of fireworks that startled me a few minutes ago from a nearby campsite. I assume that was courtesy of the group of drunken campers that disturbed my usual Kejimkujik Lake peace earlier in the day as they loudly took selfies of themselves on the island across from Campsite 14.

It's my favourite site at Keji because it's (usually) quiet and the views of the western and overhead skies are lovely from the narrow beach. I've camped here in September for the past several years now. It's not too challenging for my basic kayaking skills - I rent a boat from Whynot Adventures, which is only a 20-minute or so paddle away from the island.

And as for that singular first-person pronoun, yes I camp alone. None of my family members or friends are particularly outdoorsy and frankly, I enjoy the solitude. Most of the time the silence is absolute except for the wind in the trees, the lap of waves on the lake and those unearthly loon calls. And being on my own means I have lots of time to fool around with my Canon 7D to capture some memories of that lovely Keji sky. I've been lucky with clear skies during my camping trips over the past several years. Like tonight, there's often a moon but I try to time my reservations so it's not a full or waxing gibbous.

On this early evening in mid-September, the crescent moon has lots of company on the ecliptic. Jupiter is just below the moon in the southwest and way down toward the horizon is Venus, whose usual brilliance has been washed out in the lingering twilight.

Back toward the south, just moving into view past the canopy of trees above the beach is Saturn, and farther to the east is Mars - I have to walk around the bend of the beach away from the campsite to see it. The Red Planet has dimmed quite a bit since its brilliant debut in the spring but it's always a thrill to catch sight of this fascinating planet.

I don't have a portable scope but my 10x50 Carton Adlerblicks are more than adequate for casual observing at Keji, particularly when the nebula-rich star-fields of the central Milky Way are above the horizon.

And really, no optical equipment is necessary to appreciate the celestial splendour of this Dark Sky Preserve. As someone who lives in the light-polluted wastelands of downtown Halifax, I don't take these moments for granted. In the company of the loons and stars of Kejimkujik, I lean back to drink in the view.

RASC Halifax Centre Highlights

Many thanks to all the members who participated in this edition of Nova Notes in the way of articles, but also to those who contributed to this now recurring part of the news letter where we get to show off the work and art that the RASC Halifax Centre members produce.

This months highlights, in order are:

John McPhee, Mars and Milky Way over Lake Kejimkujik.

Michael Boschat, A capture of a Draconid meteor during the shower this year.

Blair MacDonald, A mosaic of the Andromeda Galaxy

David Hoskin, P21 Giacobini/Zinner taken from Clayton Park with an ASI224MC with a total integration time of 17 minutes.

Blair MacDonald, A mosaic of the NGC 7000

The planet Mars and the Milky Way are seen above Kejimkujik Lake in mid-September.