

Nova Notes

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

PO Box 31011, Halifax, Nova Scotia, Canada B3K 5T9 www.halifax.rasc.ca halifax@rasc.ca



Highlights

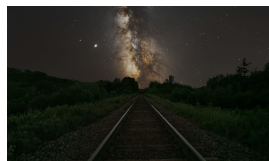
JANUARY /
FEBRUARY 2021

VOL 52 NO 1



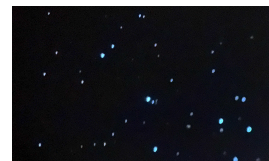
FROM THE EDITOR

2



MEMBERS' UNIVERSE

5



AGM, MEMBERS
MEETINGS AND
AUDITOR'S REPORTS

11

In this issue:

From the Editor	2
Centre Information	3
A Message From the President	4
Members' Universe	5
AGM Meeting Report	11
Jan. Meeting Report	19
Feb. Meeting Report	21
Auditor's Report	23

Cover Photos:

Main Photo:

M42 by John Read

Thumbnails:

"Earthshine" and "Pleiades"
by Lisa Ann Fanning
"Railway to the Milky Way"
by Fiona Morris

From the Editor

Welcome to the first *Nova Notes* in three years not edited by Charles White. Lisa Ann Fanning (who just became a member of the Halifax Centre last August!) and I have taken the baton from his capable hands. Kudos to Charles for his work - as we've quickly learned, it's a big challenge to edit and compile the individual submissions, meeting minutes and regular features that make up this newsletter.

A few notes about your new editors. I've been a member of the Halifax Centre for over 20 years. My interest in astronomy dates back to the 1972 total solar eclipse, when I remember being amazed, and not a little fearful, as the day turned into night on the afternoon of July 10.

Later in the 1970s, I asked for a Tasco telescope for Christmas. Like others who began their astronomical journey with a Tasco have attested, its wobbly tripod and inferior eyepieces weren't the best introduction to the hobby.

But I did get tantalizing if shaky glimpses of the craters on the moon. Over the years my interest waxed and waned but I was drawn back into astronomy in a big way in 1996 by the incredible sight of Comet Hyakutake spanning the skies over Annapolis Royal.

A few years later, after getting a job as a copy editor with the *Chronicle Herald*, I joined the centre and - with the help of Dave Lane - wrote an astronomy column called Starstruck.

I must admit I haven't been the most active member - I've helped out at SCO and written pieces about projects such as Dave Chapman's Mi'kmaw Moons and the Keji Dark-Sky Preserve program.

That's in stark contrast to Lisa Ann. As I noted, she joined the Centre less than a year ago and here she is co-editing *Nova Notes*. While I do the copy editing, Lisa Ann very capably handles the layout and organization of the newsletter. She's already earned an Explore the Universe certificate and is working on her Explore the Moon certificate. She's written a piece in the Jan/Feb edition of *SkyNews Magazine*, in which she describes her introduction to astronomy and her affiliation with the Halifax Centre even though she lives in New Jersey. (Lisa Ann is also a new member of the Amateur Astronomers Association of Princeton (AAP)).

She and husband, Rob, are avid birders so she's turned her spotting scope to the night sky, most recently on the close conjunction of Jupiter and Saturn in December. In a piece written for AAP, she notes her interest in astronomy was sparked by reading John Read's series "50 Things to See" in the night sky. Besides the spotting scope, she is learning how to use an old Orion SkyQuest XT10, which was given to her by a friend.

After we took on the *Nova Notes* job, I received kind emails of appreciation from other members including Roy Bishop. As usual, Roy's email was informative and engaging:

"The first issue of *Nova Notes* appeared under the editorship of Barry Matthews two months after the Halifax Centre was re-activated by Barry on September 18, 1970, just over half a century ago. I still have my 8-page copy of volume 1, number 1. Its 5-cent postage stamp indicates what inflation has done to the dollar during those 50 years."

Lisa Ann and I hope to do justice to this venerable history of *Nova Notes*.
Clear skies!

John McPhee

Meeting Dates for 2021

- **March 6 - Special Presentation: Dr. Luigi Gallo (Saint Mary's University) - Black Holes: the Loud, the Quiet and the Silent**
- **April 10 (Speaker - Adam Gonzalez, PhD student at SMU)**
- **May 1 (Speaker - Chris Gainor, RASC Victoria Centre: Amateur use of the HST)**
- **June 5 (Speaker: Leslie Sage, Nature magazine's astronomy editor)**
- **September 11 (Labour Day is Sept. 6)**
- **October 2**
- **November 6**
- **December 4 (+ AGM)**

In lieu of a face-to-face meeting, we will now be hosting Members' Meetings using Zoom. You do not require a Zoom account to join in but you are required to register for this webinar. The webinar is limited to 100 registrants - first come, first served. The panelists' presentations are being recorded and will become accessible via a link on <https://halifax.rasc.ca>

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, a warm-room, and washroom facilities. We welcome you to bring your own equipment or to use the Centre's 400-mm Dobsonian telescope, 100-mm binoculars, and the recently acquired SCT and gear for astro-imaging.

Enjoy dark pristine skies far away from city lights and the company of like-minded observers searching out those faint "fuzzies" in the night. Most clear Moon-free nights, you will find our keen observers out there! Announcements of members visiting SCO are made on the Centre's Discussion List. If you are not a key holder and would like to become one or need more information, please contact the SCO Manager, John Liddard.

Given the current status of COVID-19 and the provincial requirements for physical distancing, requirements have been developed for the safe use of our dark-sky observatory by all members wishing to enjoy the night skies. These precautions are in place to protect both you and those with you at the facility. They will change as the provincial restrictions change. Go to our website (halifax.rasc.ca) for the SCO usage guidelines.

Halifax RASC Board of Directors, 2021

President: Judy Black	(Elected)
Vice-President: Patrick Kelly	(Elected)
Secretary: Peter Hurley	(Elected)
Treasurer: Gregg Dill	(Elected)
Director: Tim Doucette	(Elected)
Director: Mathew Dyer	(Elected)
Director: Wayne Harasimovitch	(Elected)
Director: Paul Heath	(Elected)
Director: David Hoskin	(Elected)
Director: Kathy Walker	(Elected)
Honorary President : Mary Lou Whitehorne	(Appointed)
Auditor (2020-2021): Ian Anderson	(Appointed)
Co-Chair, DSP Committee: Dave Chapman	(Appointed)
Co-Chair, DSP Committee: Tony Schellinck	(Appointed)
Librarian: Wayne Harasimovitch	(Appointed)
Observing Chair: Dave Chapman	(Appointed)
Outreach Chair: Paul Heath	(Appointed)
National Council Rep: Judy Black	(Appointed)
SCO Manager: John Liddard	(Appointed)
Co-Editor, Nova Notes: John McPhee	(Appointed)
Co-Editor, Nova Notes: Lisa Ann Fanning	(Appointed)

Nova East Star Party

August 6-8 (New Moon: Aug 8)

NOTE: The Board of Directors will determine in April/May if this event should go forward based on the status of provincial restrictions related to the pandemic.



A Message from the President

January and the beginning of February have had very few clear nights in our part of the world. However, excitement builds as we wait for these clouds and those of the pandemic to clear, allowing us once more to stand and dream under the stars.

What was once was a dream for our Centre is fast becoming a reality. Thanks to the generosity of members and the diligence of our St. Croix Observatory (SCO) Manager, John Liddard, the upgrade is progressing quite well. Minas Energy and K-Line Construction have installed the power pole and lines on the site. DMac Electrical's installation of the masthead on the east face of the Warm Room and the electrical panel passed Nova Scotia Power electrical inspection in late January. John has worked with Minas Energy and the electrician to ensure work is progressing towards the hook-up from the pole to the masthead. Thank you from all of us, John, for your dedication to seeing this project through!

Membership in our Centre is almost at an all-time high at 183 members, up from 167 last spring. Welcome to the new members and we look forward to meeting you at a time when health restrictions allow us to once again meet face-to-face at Saint Mary's University, and perhaps at SCO some evening.

Remember that SCO is open for members' use; the link to the Guidelines for its use under pandemic restrictions can be found on our Centre's home page <https://halifax.rasc.ca>.

In conclusion, I wish everyone well. Keep looking up even after we had our first true snowstorm on Feb. 8, with more than 40 centimetres of snow.

Michael Poeltl, in his book *The Judas Syndrome*, wrote: "The storm long past, the night sky was beset with stars. Pointing upward, I asked her to pick a point of light and stay with it. Standing up, I eased Sara to her feet. Whispering into her ear, I asked, 'Have you ever stood under a star... and felt the earth move under your feet?'" Remember - the skies are open (provided no one else buys any more astronomy equipment affecting the cloud cover). May you feel the Earth move under your feet as you stand under the stars.

With Regards,
Judy Black, President
RASC, Halifax Centre

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

PO Box 31011, Halifax, Nova Scotia B3K 5T9

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

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.

Members' Universe

Congratulations Fiona Morris

Congratulations to 16-year-old Fiona Morris from River Philip, N.S., on winning Subaru's grand prize, a 2-year lease on a Subaru Impreza, with her stunning photo "Railway to the Milky Way."



<https://www.saltscapes.com/contests/staycation-contest>

Photo Title: Railway to the Milky Way

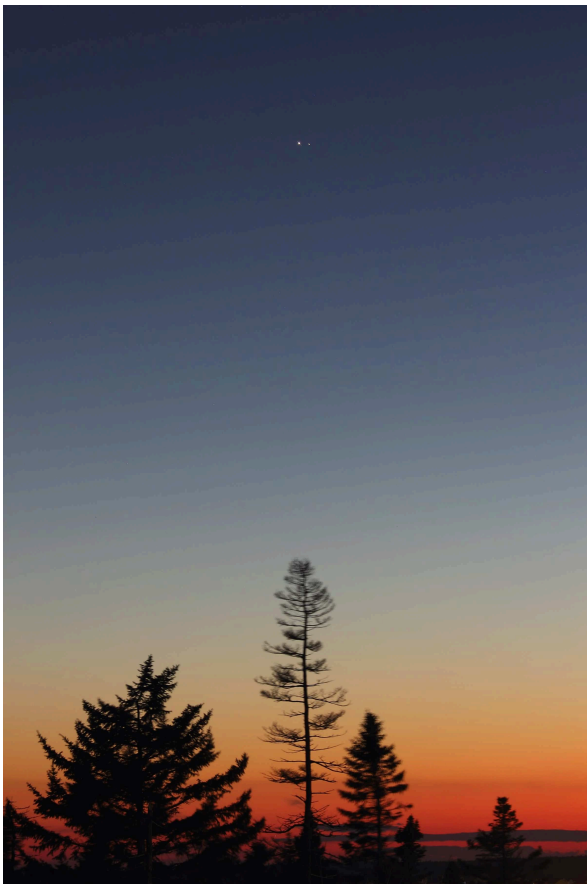


Photo Story: I'm 16 years old, live in N.S., and have a fierce love for the stars. A few years back I got into photography. I work a full-time job with back shifts over the summer to support my needs for photography equipment. I put my two favourite hobbies together into one and I dedicate a lot of time and money into it. Astrophotography is my passion. On the night of July 21st, 2020, my Mom and I drove 5 minutes from my backdoor into a field to photograph Comet NEOWISE. After I photographed the comet, we drove over some train tracks and I had an image in mind. We spent a few minutes at the tracks and made my idea come to life. In my mind it is my best image yet. You can see more of my photography on my Instagram @fionamorris_photography



Fiona and her
Subaru Canada Grand Prize

**Jupiter-Saturn conjunction
22 December 2020 by David Hoskin**



Food for the Soul

Outward We Reach

~ Paul Heath

We saw the Moon, upon the mountain high
And climbed and climbed, to try and touch it in the sky.
We watched the Eagle soar so high,
And sought to fly and fly, to reach the sky.

With wax and wood, as birds
We tried and tried,
Then heated spheres we shaped
To lift us high above the clouds.

But still upon the mountain high,
The shining sphere sat and begged us, higher climb.

With smoke and thunder, harnessed,
We drove into the air
To heights that even Eagles would not dare,
Then climbed and soared and fell, to climb again once more.

With a thousand lions' roar
We leapt and drove beyond the sky.
In pride, sustained above the air
We circled our deep blue World below.

But still upon the mountain high,
The shining sphere sat, and begged us, higher climb.

Then with the roar, a thousand dragons made,
We breached the sky, in victory
Left foot prints, pressed
Upon the grey dust of a billion years.

But still upon the mountain high,
The shining sphere sat, and begged us, higher climb.

So, as with babies, first steps may wobble and fall,
We rise and reach and strive, and push for more.
Until that day adrift in space, our deep blue World, far below us view,
And turning Outward, Reach
To hold the shining Stars, within our outstretched hands.

Do you have something you would like to share in an upcoming edition of *Nova Notes*?

Send your photos, poems, articles and other works to

novanoteseditor@halifax.rasc.ca

Double Stars, a New RASC Observing Program

By Melody Hamilton

The Double Star program, the newest in the RASC family of observing programs, was released in October 2020. In this program you will be introduced to a variety of double and multi-star systems. A direct link to the program is located here: <https://rasc.ca/double-stars>

You will find the “Guide” giving detailed instructions about equipment, observing techniques, and getting the most of your double star observing sessions. There’s also a “Quick Guide” offering rapid start-up reference with samples and suggestions. The master list is here along with the supplement. The supplement gives additional information about the double and lists other companion stars if in a multiple system. These two parts of the program go hand in hand. By using the supplement, I promise you, it will enhance the enjoyment of your observing session!

These past few months both Dave Chapman and I have had the privilege of “test-driving” the program and have arrived, quite independently, at a very similar technique for observing double stars.

Step 1 Choose a double star from the master list.

Step 2 Using your telescope (or binoculars in some cases) locate the chosen target. Make a positive identification of the double by comparing surrounding star patterns in your field of view with your star chart. There are lots of double stars out there!

Step 3 Observing the double, ask yourself questions like:

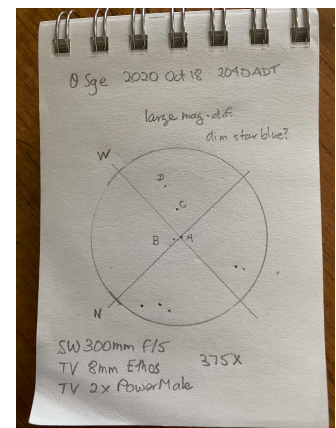
- which is the “A” star? (usually the brightest) and the “B” star, the companion? Are there other stars quite close to the double? Could this be a multiple system?
- describe the distance between the stars in the double using terminology such as: extremely wide, very wide, wide, easy, close, tight, or touching.
- What colour are the “A” and “B” stars and how bright are they compared to other stars in the field?
- if possible, observe the double using more than one magnification. Does more magnification bring out more detail?

Step 4 Make a sketch of the star field (not required but not difficult, either) by using bigger dots for brighter stars and smaller dots for the fainter stars. The double is usually obvious. Record as many of the stars in the field as you can see for comparison with the supplement later.

- After completing your sketch watch the drift of the stars. The drift will always be west, indicate the west on your sketch. Add the star names, date, time, instrument used, magnification and any other details you wish to include.

Step 5 To add to the fun, now compare your sketch with the information in the supplement. Are there other stars in the system and have you already captured them in your sketch? One you didn’t record? Back to the eyepiece for an even closer observation!

Dave and I differ when it comes to recording our observations.

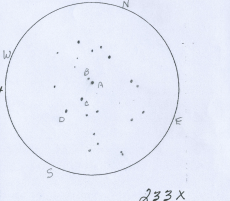


Sketch of Theta Sagitta
by Dave Chapman

I use the downloadable observing form. You decide what works for you.

NOTE: BOTH OBSERVATIONS HAVE A SKETCH! Hint! Hint! 😊

RASC Double Star Observing Program Log Book		Date: 17/09/20		Observer: (Vicky Annunzio, Alan, Maggie)		Copyright © 2019 Royal Astronomical Society	
target	17 Spc	alternate ID: Theta Spc	SAO 89 226	HIP 99352			
constellation	Sagitta	combined mag	6.2	RA (2000)	20 09.9	Dec (2000)	+20 55
date	Sept 17/20	time	22:00 hr (-3)	Atlantic	M 6.6	M 2 8.9	
location	WAO	location	Litchfield, N.S.	44/26	65/36		
telescope equipment used	6" f/11 mirror diagonal						
eyepieces, magnifications used	12mm (102x), 17mm (164x)	12mm (83x)					
first impression of system	multiple						
general appearance of entire system	misaligned in quite dense star field						
pair designations	A, B	A, B, C					
orientation	NW	SE					
distance	close	wide					
brightness	bright	faint					
colour	yellow	reddish/orange					
sky conditions, particularly seeing	seeing 1/8" trans 1/4" sky location part phase 80° N horizon SW						
Notes	<p>Notes: this pair located in quite dense star field seen at high power! the search done @ 12mm EP. View @ 17mm EP offered more detail and fainter stars near target. The 12mm EP provided the best view so was used for sketch. The "A" star is the brightest in FOV but there are other stars in FOV almost as bright. The "B" star is fainter but clearly visible at 102x temp 8°C (chilly - water eqn't hot) slight breeze, very dewy! I saw a few crystals slipping against tonight.</p>						



This is my report of the same double

In conclusion, the Double Star program can be accomplished with a small telescope. You do NOT need a dark sky! Stars are bright! (I have successfully observed double stars with a full moon in the sky!) The seeing will effect double star observing more than light pollution. Try sketching! How difficult can a few dots on a page be? There are 110 double stars on the master list and the journey through them will be enhanced by using the supplement, thus adding depth to your experience at the eyepiece.

This is a certificate program and you must be an RASC member to apply upon completion.

My thanks to Blake Nancarrow of the Toronto Centre for his time and seemingly tireless efforts which resulted in this Double Star program. Well done, Blake!

Dave and I are both happy to answer any questions you may have.

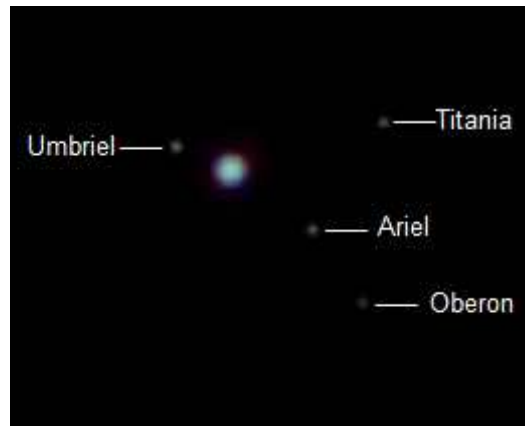
Join the fun of double star observing!

Giving the Ice Giants and Their Moons Some Love

By David Hoskin

Uranus and Neptune are the two outermost planets in the Solar System. It takes sunlight 2 hours and 40 minutes to travel to Uranus, and 4 hours to travel to Neptune! Uranus was discovered in 1781 by William Herschel using a 160-mm Newtonian telescope while Neptune was found near its calculated position in 1846 by Johann Galle working at the Berlin Observatory. Even though Uranus and Neptune are smaller than the gas giants Jupiter and Saturn, the diameter of these planets (51,118-km and 49,532-km, respectively) dwarfs that of the Earth (12,742-km). Uranus rotates at almost 90 degrees from the plane of its orbit whereas Neptune's axial tilt at 28 degrees is similar to that of the Earth and Mars. Both Uranus and Neptune have hydrogen-rich atmospheres above a mix of water, methane, and ammonia ices and a rocky core. Uranus and Neptune are referred to as ice giants because of their size and the presence of the volatile compounds such as water, ammonia, and methane with freezing points above 100 Kelvins. This constitutes "ice" in planetary science. In fact, the presence of methane-ice clouds in the atmosphere of Uranus and Neptune is the reason both are coloured blue. These of these cold, remote worlds have ring systems and are orbited by numerous moons, some of which can be observed and imaged by amateur astronomers.

Uranus, at magnitude 5.7, is visible to the naked eye under a clear, dark sky; however, Neptune, which is two magnitudes fainter, requires an optical aid to be observed. Both ice giants appear as blue-green points of light when seen with binoculars while a medium-sized telescope will resolve a small disk. Using a larger telescope (250+ mm), it is possible to observe Uranus's brightest moons (Oberon, Titania, Umbriel, and Ariel); however, the planet's glare will obscure any satellites that are not well separated from the planet's disk. In contrast, Neptune's largest moon, Triton, is relatively easy to spot because Neptune is not as bright as Uranus and so the planet's glare is greatly reduced.



Uranus and moons
by David Hoskin



Neptune and Triton
By David Hoskin

Last year I was able to photograph Uranus with its four brightest moons, as well as Neptune and Triton using an 80-mm f/6 refractor paired with an ASI183MC CMOS camera. The images of the moons were captured using SharpCap's live stacking feature and 1.3-second exposures at 120 gain and 25 brightness for Uranus's moons, and 220 gain and 25 brightness for Triton. Since Uranus and Neptune were badly overexposed at the camera settings needed to capture the faint moons, I used Photoshop to blend the images of the moons with properly exposed images of Uranus and Neptune obtained by lucky imaging. Stellarium was used to identify the moons based on their position and to verify proper scaling of the planet relative to the position of the moons.

I find it amazing that it is possible for an amateur to observe and image the largest moons of Uranus and Neptune, planets that are over 2.7 billion and 4.3 billion kilometers, respectively, from Earth! Imagine what William Herschel and Johann Galle would say!!

More Food for the Soul.....

Christmas Star

Once again, the World
Plague feared, looks hopeful to the Skies.
Foretold, a wondrous, gentle kiss will arise,
That distance has separated, in both time and space,
Yet lies hidden now, by Earth's sympathetic tears,

But Hope
A tiny kernel swells,
The Earth, in joy responds.

In nervous anticipation, we sweep the skies above.
Searching out that sparkling gleam
That within Suns waning glory,
Lies hidden to our sight.

With Hope,
Earth's tears
The skies have washed clean.

Then sudden the outcry,
A joyous sight, that long awaited sparkling gleam,
And yes, a faint companion does remain.
Perhaps that long awaited kiss has passed,
Yet still, hands clasped, they, before departing rest.

With joy
Earth's tears have cleansed,
Her darken skies go crystal clear.

The glass now is upswung,
The pair drawn close to view.
A sight not seen, in time and space
Since years, far distant gone.

Wonder shakes our Soul,
As Earth's heart
Beats within our captured eye.

Upon the darkened canvas of the sky,
A sight scarce imagined, fills up the eye.
Wonder takes away our tears,
As awe, in clarity dispels our fears.

The pair, long separated
Now, but a spinning step apart,
Their finest attire, to each display.

His wide girth, with knotted belts holds fast,
His outflung diamonds circling,
The other, his mellow hue enhanced,
With wide and glowing rings, encircling.

But we are not alone,
In seeking
This far flung joining.

Those sparkling gems that
Upon Summers warm breezes
Frolic on the glittering rivers girth,
Hold their passing,
To witness so rare a reunion's kiss.

Fall's Heroes also pause, upon the crystal skies,
As Rabbit halts his rush into the night.
Each holds the long1awaited joining
Prolonged and joyous, in their sight.

Only one, red faced in anger slips away,
Hiding from this wonder's sight,
Behind Rabbits, brightening, shining light.

Once more onto the glass we turn,
As still hand in hand, they drop toward the missing Sun,
Now only, as in a Dream, a wavering image they appear.

We cannot help but wonder now,
Will they meet and kiss once more,
Upon some far and distant year.

~ Paul Heath, January 2021

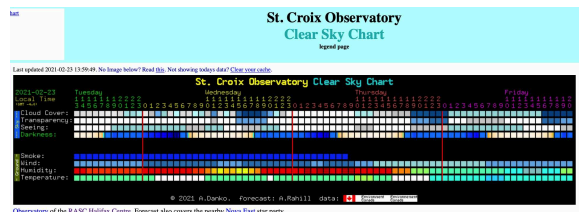
RASC Halifax Centre Contributions Benefit Halifax Centre Members

By Judy Black

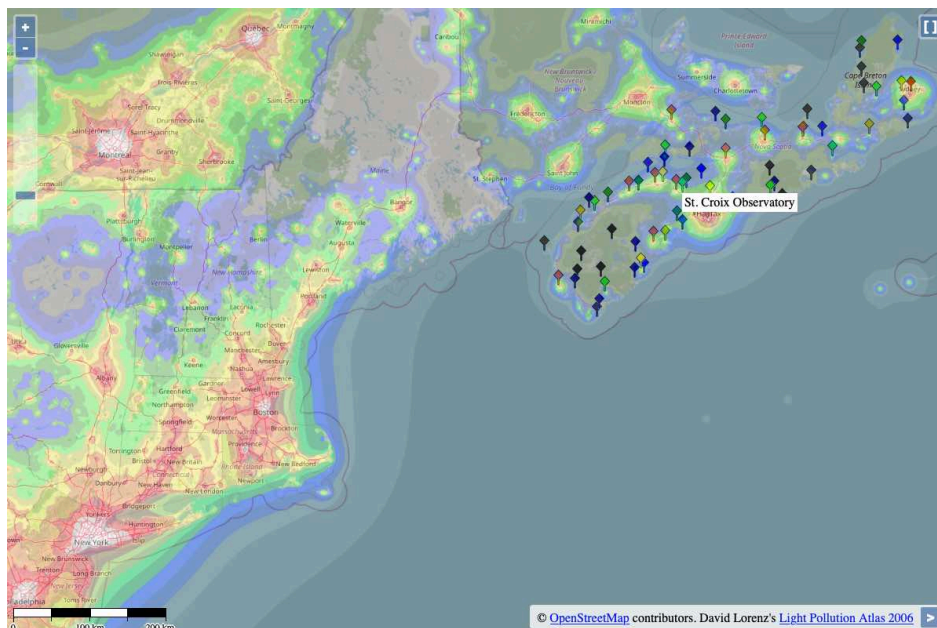
For several years the RASC Halifax Centre has made small contributions to two endeavours that benefit all of its members — the International Dark-Sky Association (IDA) and ClearDarkSky, the website of Attila Danko who provides Clear Sky Charts (CSC) for many localities in Nova Scotia and elsewhere.

The national RASC and many of our sister centres across Canada make contributions to the IDA because of our common goal of protecting dark skies. By working with the IDA, slowing and possibly reversing ever-increasing light pollution is our common goal. Learn more about light abatement on their site: www.darksky.org, and see pages 79-84 in your Observer's Handbook.

Attila Danko provides Clear Sky Charts (CSC) using forecast models developed by Allan Rahill at the Canadian Meteorological Centre. Important to Halifax Centre members are the 67 sites across Nova Scotia with Clear Sky Charts that can be accessed to determine if conditions are favourable for observing. Even St. Croix Observatory has a CSC associated with it, and the CSC mentions that it also covers the nearby Nova East Star Party! Look for a chart close to you at: www.cleardarksky.com/csk/



<http://www.cleardarksky.com/c/StCroixObNFkey.html>



There are 67 sites in Nova Scotia with Clear Sky Charts like the one for SCO. The map above depicts the location of the sites in Nova Scotia plus the level of light pollution in Nova Scotia and the Northeastern United States where we have members. Source: ClearDarkSky.com

2020 Annual General Meeting (AGM) Reports

President

2020 is soon going into history and with it my first term as President will come to an end. Had I known the challenges 2020 would bring, I may have had second thoughts. However, the incredible team on the Board of Directors and its committees was a drawing card and I would not have wanted to miss the challenges and excitement.

Nova East was presented in a whole new way due to the COVID-19 pandemic. In lieu of the on-site event, the speaker's series of talks on Zoom with March of the Planets – COVID Cancelled! as the theme.

Nova Notes once again is one of the best Centre newsletters in the RASC. A special thanks to Charles who, after three years as Editor, is stepping down from that role. Many thanks also goes to those who submitted articles over the past year.

Outreach and observing events at the Halifax Centre again were vast – or at least until March 22 when the provincial State of Emergency was called. Congratulations and thank you to volunteers who stepped up at events once the emergency measures were modified to allow for small groups.

On October 24, 2020, members approved going forward with an electrical upgrade to ensure the site is up to 2020 electrical standards. Many thanks to John Liddard, SCO Manager, and Dr. Roy Bishop for spearheading this project. Also, thanks to the SCO Fundraising Committee for implementing a fund development plan to ensure the project goes forward (Blair MacDonald, Matthew Dyer, Gregg Dill). The Centre thanks Minas Energy and K-Line Construction for their generous offers and their time to make the upgrade come to fruition.

One major change this year was how meetings were held. Our Members' Meetings continued by using the RASC's Zoom webinar feature. Halifax Centre, because the pandemic was not short-lived, approved the purchase of a 1-year Zoom meetings-only membership that has been used for Centre meetings and virtual observing and astro-imaging sessions. Using Zoom has meant members anywhere in the province could participate, Board and committee members outside Metro did not have to travel to attend, and RASC members from across Canada and the USA's Eastern seaboard could also participate. It also provided recruitment capabilities outside the Metro area. The use of Zoom will be evaluated in 2021.

This was the second year we have been meeting on the first Saturday afternoon at 1 pm of each month except July and August. Meetings were held initially at Saint Mary's University and then hosted on Zoom. Social time with fellow members is important but COVID-19 unfortunately put a stop to meeting in person and for the dinner afterwards. However, in November, the Astro-Chat was introduced at the end of the meeting where members were welcomed to stay online for an informal, non-recorded session. This will continue in 2021 to be part of the meeting agenda.

I would like to thank all the volunteers on our Board and its committees, and to our members who volunteered for our outreach and observing events. A special thank you to Paul Gray and Tom Crosman who are stepping down from the Board and to Charles White who is retiring as *Nova Notes* Editor.

Here is the list of 2020 RASC Halifax Centre team whose efforts made the past year possible.

<p>Board of Directors</p> <ul style="list-style-type: none"> ● President: Judy Black ● Vice-President: Paul Gray ● Secretary: Peter Hurley ● Treasurer: Gregg Dill ● Directors: Tom Crosman, Matthew Dyer, Wayne Harasimovitch, Paul Heath, David Hoskin, Patrick Kelly 	<p>Nova East Planning Committee</p> <ul style="list-style-type: none"> ● Chair: Judy Black ● Members: Dave Chapman, Gregg Dill, Liz Greenough, Wayne Harasimovitch, Patrick Kelly, Chris Young ● Consultants: Paul Gray, Mary Lou Whitehorne
<p>Appointed Positions</p> <ul style="list-style-type: none"> ● Honorary President: Mary Lou Whitehorne ● Co-Editor, <i>Nova Notes</i>: Charles White ● Deep-Sky Preserve Committee: Dave Chapman ● Governance Committee: Judy Black ● Librarian: Wayne Harasimovitch ● National Council Representative: Patrick Kelly ● Observing Chair: Dave Chapman ● Outreach Chair: Paul Heath ● SCO Manager: John Liddard 	<p>Dark-Sky Preserve Committee</p> <ul style="list-style-type: none"> ● Chair: Dave Chapman ● Members: Paul Gray, Melody Hamilton, Peter Hurley, Tony Schellinck, Chris Young
<p>Communications Strategy Task Team Dave Chapman, Judy Black, Patrick Kelly</p>	<p>Nominating Committee Peter Hurley (Chair), Chris Young, Judy Black (ex officio)</p>
<p>Governance Review Committee Judy Black (Chair), Paul Gray, Gregg Dill</p>	<p>SCO Fund Development Committee Blair MacDonald (Chair), Matthew Dyer, Gregg Dill, Judy Black (ex officio)</p>

We have an incredible Centre for which we should all be proud. A sincere thank you to everyone for the support and expertise you provided to me and my fellow Board members in the past year. I look forward to working with you and for you in the coming year.

Stay safe. Stay healthy. Look up, the skies are open.
Respectfully submitted,
Judy Black, President
RASC, Halifax Centre

Secretary

The principal duty of the secretary is to provide minutes, agendas, and meeting announcements to the Board of Directors and to the Members of the Centre. An additional duty is to book meeting rooms through St. Mary's University for our meetings. We were welcomed back to SMU again this year and we are grateful to SMU for this support.

But COVID-19 arrived in early 2020 and on March 22, 2020 the Government of Nova Scotia declared a provincial State of Emergency to help contain the spread of the virus, and public gatherings were prohibited.

As a consequence, we adopted using Zoom, a web-based computer video conferencing tool to host our Members', Board and committee meetings virtually and it appears to have been a great success. We even began using Zoom for virtual observing sessions.

Members' Meetings are held on the first Saturday of the month, unless that falls on a holiday. Members' meetings were held at SMU until March 2020 and in April we moved to using Zoom. The Board of Directors would meet earlier in the same day as the Members' meeting until April, but the Board thereafter moved to meeting using Zoom on the Thursday before the Members' meeting.

There were other consequences of COVID-19. The annual Nova East Star Party was cancelled but all six of the guest speakers agreed to deliver their presentations as Zoom meetings. The annual BBQ at SCO was cancelled. The Kejimkujik Dark Sky weekend was also cancelled but because the Park campgrounds were closed for renovations. The subsequent Dark-Sky event planned at Kejimkujik was also cancelled due to COVID-19 restrictions. New guidelines for the use of our St. Croix Observatory (SCO) during COVID-19 were also developed. There were a number of virtual observing sessions held using Zoom.

There were 10 regular Member's meetings, 6 in-person meetings held at SMU and 4 held using Zoom. There were also 10 regular Board of Directors meetings, 4 held using Zoom. There were also 2 special meetings of the Board held to discuss the possibility of providing electrical power to SCO.

COVID-19 provided significant challenges to us all in 2020. The membership and the Board of Directors all rose to the challenge and we did an admirable job of dealing with those challenges. The membership of the Centre as of the September 30 totaled 173 members (up slightly from 170 last year):

- 15 Family Regular
- 5 Family Youth
- 20 Life
- 127 Regular
- 2 Regular USA
- 4 Youth

Respectfully Submitted,
Peter Hurley, Secretary
RASC, Halifax Centre

National Council

These are the main activities for 2020:

- The Centre Manual should be finished in time for the first meeting of 2021
- National Finances: It is expected that the 2020 budget will break even or have a small surplus. Revenue is projected to be \$938,000, up about 20% from last year, mostly due to increases in revenue from membership fees, publication revenue, and the robotic telescope. Expenses are projected to be \$920,000, a 2% increase. SkyNews, in its new form, is expected to break even. A surplus of \$18,000 is expected.
- iMIS System Upgrade/Replacement: This is the system used to keep track of memberships, run the on-line store, etc. It has been replaced with a new system that will be easier (and cheaper) to maintain, plus come with modules for tasks that we cannot currently do on iMIS. The new system will start going into effect in early 2021.
- By-law Changes: There were some housekeeping changes made at this year's AGM. More substantive changes will be coming for the 2021 AGM.
- Policy Manual Changes: There are also plans to change Policy G23, which is related to the complaints and mediation process. There have been some cases in the past year and there have been problems with the mediator process. As written, there is no provision to prevent cases which are "frivolous or vexatious", to use the proper legal term. These changes may simply be to allow the Board to decline appointing a mediator in such cases.

- Green Laser Pointer: The RASC has had its certificate extended for another year by Transport Canada. It runs from June 30, 2020 to June 30, 2021.
- National Committee Changes: There have been changes to a number of committees, the main ones being that the Fundraising Committee no longer exists, its functions now being done by staff; the Publications Committee has become the Editorial Board, to ensure consistency between existing publications as well as to help produce new ones; the new Next Generation Committee, to look at getting more younger people involved in the RASC; and, the Nominating Committee, which is now made up of the entire Board. Fundraising had brought in \$19,000 in August, and this year, to date, we had received almost \$270,000. Last year's total had been \$275,000. The Nominations Committee is now the entire Board.

Respectfully Submitted,
Patrick Kelly, NC Representative
RASC, Halifax Centre

Dark-Sky Preserve (DSP) Committee

Things have been quiet on the DSP front in 2020 owing to the closure of the Kejimikujik front country campground (which includes the Sky Circle) for major renovations. As a result, there was no Dark Sky Weekend in 2020. Alternate activities were discussed, but the pandemic put an end to that. The DSP backcountry was accessible as usual.

Access to the front country will resume in spring 2021, and the DSW is scheduled for August 13–15, 2021. We are looking forward to seeing the new washrooms and completing a lighting audit, which would normally have been done on Fall 2020.

Boxing Rock Brewery issued a limited run of Dark as Keji beer, and Dave Chapman assisted in the creation of 6 collectible constellation cards that promoted the DSP and the RASC.

In 2021, the DSP Committee will be co-chaired by Dave Chapman and Tony Schellinck. Other members include Peter Hurley, Paul Gray, and Melody Hamilton.

Respectfully Submitted,
Dave Chapman, Chair
RASC, Halifax Centre

Governance Committee

I would like to thank my fellow members on the Governance Committee, Paul Gray and Gregg Dill, for the work accomplished in the past year.

No changes to the Bylaw #1 nor the Objectives were recommended.

As of December 7, 2019, adjustments were made to the Reporting Mechanism in several of the appointed positions. All appointed positions, except National Representative and the Honorary President, had their responsibility regarding Board meeting attendance changed to “May attend RASC Halifax Centre Board meetings”, and that all retained the reporting mechanism statement:

1. Attendance at RASC, Halifax Centre Board meetings as set by the President of the RASC, Halifax Centre Board:
 - If an elected Director: Mandatory attendance at a Board of Director meeting.
 - If not an elected Director: Attend Board of Directors meetings when invited to address the Board, when a request to address the Board has been approved, or as a guest.

With the recommendations from the Committee, the Board of Directors approved the following additions to the RASC Halifax Centre policies found in About Us on the RASC Halifax website.

- a. Policy G8: RASC Halifax Centre Astroimaging Contest – (Adopted March 7, 2020) This changed the astroimaging contest from that of Nova East to one of the Halifax Centre, thereby opening to Nova East registrants (regardless of home address) and any resident of Nova Scotia.
- b. Policy G9: RASC Halifax Centre Guidelines Regarding In-Camera Sessions – (Adopted May 21, 2020) Because confidentiality is a fiduciary responsibility of the Board of Directors, a policy was developed regarding the process of holding such sessions and the consequences of not maintaining confidentiality.
- c. Policy G10: Policies Regarding Permitted Commercial Activities at RASC Halifax Centre Meetings and Events – (Adopted June 18, 2020) This was based on a policy approved in 2020. It provides guidance when asked by an outside entity to display and to perhaps sell merchandise.

Respectfully Submitted,
 Judy Black, Chair
 RASC, Halifax Centre

Editor, Nova Notes

Four editions of *Nova Notes* have been published as of the AGM, with a range of 9 to 13 pages per issue, 43 pages in total. No June edition was published. The editions have been thin this year with article, photo, and sketch submissions down for a second straight year. The issues tended to include only meeting reports, the Centre Showcase and Food for the Soul. A few single one-off articles were published as well. There were no recurring columns.

I would like to give my thanks to the following for their contribution in 2019-2020:

- Article Contributors: Dr. Roy Bishop, Judy Black, Michael Boschat, Paul Heath, Pat Kelly, Fiona Morris, Charles White
- Photo Contributions: Jerry Black, Michael Boschat, Barry Burgess, David Chapman, Art Cole, Jason Dain, Jeff Donaldson, David Hoskin, Blair MacDonald, Charles White
- Sketchers: Dave Chapman, Michael Gatto

I look forward to what *Nova Notes* will have in it in the year ahead for the new editors taking the reins as this is my final year, after 3 years of editing *Nova Notes*.

Respectfully submitted,
 Charles White, Editor
 RASC Halifax Centre

Nova East Star Party

Due to COVID-19, the 34th consecutive Nova East camping event planned to be held at Smiley's Provincial Park during the weekend of August 21 – August 23, was cancelled; however, speakers agreed to a series of presentations.

Given the focus on Mars this year and the prominence of Jupiter and Saturn in the sky at Nova East, the theme was “March of the Planets”. When the pandemic changed plans, the theme was slightly modified to *Nova East – The COVID-19 Edition!*

Many thanks to John Read for the 2020 logo design that, due to COVID, was then overwritten with “COVID Cancelled”. It featured the planets in relative position to the Sun as they would during the August 23rd weekend. The process for on-demand printing from any printing source was described on the website; John Read provided a video on how to order a t-shirt through Vistaprint.

2020 NE Planning Committee (NEPC):

Members included Judy Black (Chair), Gregg Dill (Treasurer), Pat Kelly (Registrar), Chris Young, Dave Chapman, Wayne Harasimovitch and Liz Greenough. Consultants were Mary Lou Whitehorne and Paul Gray. There were three meetings – one face-to-face planning meeting held February 15, and four Zoom meetings held March 21, April 25, May 9 and May 23. The success of Nova East 2020 was because of

the dedication, imagination and prep work done by each of the members during the planning and implementation phases of this event.

Speaker Series:

Despite the camping event being cancelled, our six speakers participated in a series of 1-hour talks each Tuesday, beginning on August 4. Our speaker for the public talk, Andrew Fazekas, will be invited to next year's Nova East when he can also attend as a participant.

- Aug 4 – Kathy Walker: *Beginner Image Processing for Astrophotographers*
- Aug 11 – David Hoskin: *Astrophotography of the Moon and Planets*
- Aug 18 – Fiona Morris, Keegan Oickle: *RASC – the Next Generation*
- Aug 25 – Tony Schellinck: *Summer/Fall Challenge Using Binoculars*
- Sept 1 – Paul Heath: *Walk the Solar System (How-to)*

The September 8 presentation by Pat Kelly (*All About Mars: The Science of What You're Seeing*) was moved to September 12 as part of the Members' Meeting.

Astrophotography Contest:

The ***Astrophotography Contest*** continued as a RASC Halifax Centre photo contest with its winners awarded at Nova East. Thirty-four photos were judged in three categories with specific criteria for use by adjudicators Blair MacDonald and Mary Lou Whitehorne. The categories, number of submissions in each category and the winners were:

- Deep-Sky/Prime Focus (11 submissions): Jeff Donaldson – *IC 1805 / Heart Nebula*
- Solar System (5 submissions): David Hoskin – *Aristoteles and Eudoxus, the 'Bike Wheel' lunar craters*
- Wide-Field (18 submissions): Jason Dain – *Milky Way Bayswater*

The ***People's Choice Award*** winner, Jerry Black, was awarded a \$50.00 Atlantic Photo Supply gift certificate for his *Observing NEOWISE in Solitude*.

Blair, on behalf of APS and Halifax Centre, announced the winners at the October 3, 2020 Members' Meeting. APS subsequently sent each winner an email explaining how to arrange for a canvas-wrapped print of their winning image. A letter of thanks was sent to the adjudicators for their time, and to APS for their generous donations.

Other Considerations:

Due to the COVID-19 restrictions, speakers presented their talks through a Zoom speaker series. Aspects of the camping event were obviously cancelled – field observing sessions, telescope medics, registration desk, astro breakfasts, potluck BBQ, and door prizes. Look forward to their return in 2021!

Special recognition was given on September 24 to RASC Halifax Centre members that were presented with RASC certificates and awards since the previous Nova East. The list is included in Dave Chapman's Observing report.

The Task Chart acted as a guide for the 2020 Nova East Planning Committee and provided the timeline for planning the event. This document was used throughout the planning process and was revised to reflect the COVID-altered event.

Terms of Reference - Nova East Planning Committee:

No changes to the Terms of Reference are suggested.

Date of 2021 Nova East:

As approved by the Board of Directors at a prior meeting and is now included in the 2021 RASC Calendar, Nova East 2021 will be held August 6-8 provided COVID-19 does not affect the event for a second year. The New Moon is on August 8.

Chair, 2021 Nova East Planning Committee:

I am stepping down as Chair of the Nova East Planning Committee due to responsibilities as President and as the National Council representative for Halifax Centre. A chair for the 2021 Star Party is needed.

Respectfully Submitted,
Judy Black, Chair
RASC, Halifax Centre

Observing Committee

Despite (or perhaps because of) the pandemic keeping us at home, Centre members have had a banner year, earning 7 observing certificates of about 30 Canada-wide. Considering our medium size, this is remarkable. Here's the list:

Explore the Universe
Stewart Cameron
Dave Chapman
Lisa Ann Fanning (New Jersey)
Karen Hamblin
Troy Sweeney

Explore the Moon
Tony Schellinck

Finest NGC Objects
Tony Schellinck

Isabel Williamson Lunar Observing Program
Melody Hamilton

Melody and Dave are active on the national Observing Committee. Melody has also been granted permission to review EtU submissions from members of the Minas Astronomy Group, not all of whom are RASC members.

Observers are reminded that there is now a new intermediate RASC observing program on Double Stars, for which one can earn a certificate (see <https://www.rasc.ca/double-stars>).

What's Up? presentations are posted to the Centre website on the first of each month (except July and August) and are presented "live" at the monthly meetings.

Respectfully Submitted,
Dave Chapman
Chair, Observing Committee
RASC, Halifax Centre

Outreach Committee

The year began well but Covid-19 shut us down quickly. Despite having to cancel many events, we did manage to complete a number of outreach events. With the use of online formats, we presented astronomy to many.

In January, we did another successful night at York Redoubt for the Young Naturalist Club with 109 participants, all family groups.

Nova East Star Party had seven live online presentations, all recorded for our YouTube channel.

Tony Schellinck moved his SCAN presentations online:

- Astronomy on the Cheap (15)
- Is our Flat Earth at the Center of the Universe (100 +)

International Observe the Moon (InOMN) was presented online on October 23rd with Jerry Black and Blair MacDonald using their cameras and telescopes and Dave Chapman as moderator/host. This was recorded for our YouTube channel.

The team also presented other online observing and astroimaging sessions that were recorded for inclusion on the RASC Halifax YouTube channel:

- Explore the Moon Virtual Lunar Observing Session: Dave Chapman and Blair MacDonald (April 29)
- Exploring ImagesPlus: Blair MacDonald (April 11)
- PixInsight Workflow: Jeff Donaldson (May 2)
- Introduction Image Processing using ImagesPlus: Blair MacDonald (May 5)
- ImagesPlus, Session 2: Blair MacDonald (May 29)
- Informal Online Imaging of M27 and the Butterfly Nebula: Jeff Donaldson and Blair MacDonald (August 19)

Wayne Harasimovitch and Peter Hurley worked on our behalf with the Discovery Centre for an astronomy weekend on September 26-27. With the proper Covid-19 protocols, it went well with 442 registered to attend the event. Besides Wayne and Peter, other volunteers at the event were Judy and Jerry Black, Michael Boschat, Daphne Themelis and Paul Heath.

Dave Chapman offered two presentations at the Deanery Project:

- Sea Light Sky Light event (30 mixed ages)
- Explore the Moon (20 mixed ages)

I began a youth intro astronomy program at the North Preston Recreation Centre; after 2 weeks in, it was shut down by Covid-19.

Again, with initiative and innovative ideas, Halifax Centre has continued to present Astronomy to many.

I would like to thank everyone who put in the effort to make our events a success.

Respectively Submitted,
Paul Heath, Outreach Chair
RASC, Halifax Centre

[Manager, St. Croix Observatory](#)

The Covid-19 has played a significant impact on the user of the St. Croix Observatory (SCO) for 2020. As a result, the annual BBQ had to be cancelled for the 2020 season. Current social gathering restrictions still allow for limited use of SCO by members as long as they adhere to the provincial guidelines.

2020 has provided an opportunity to attend to some maintenance that has been required. In March, some much needed maintenance was performed on the propane furnace as a leak had been detected. The maintenance also included a replacement of the thermocouple sensor, starter, and thermostat that enables the furnace to be started much easier than before. The leak resulted in a noticeable loss of fuel in the propane tank and after the repairs were made the tank was refilled. In the fall we were able to get some new paint on the lower sections of the observatory fascia boards as well as the window and door frames of the warm room.

The most significant announcement regarding SCO has been the almost unanimous decision to connect the facility to the Minas Energy electrical grid. This connection will provide the observatory and warm room with a permanent connection to AC power that can be used by telescopes, new interior and exterior lighting, potential security systems, internet connectivity, sky cameras, etc. It also now provides us with the ability to migrate away from fossil fuels to heat the warm room and use a clean renewable source of energy from the hydroelectric dam and wind turbines. Minas Energy is supporting the connection to their lines through their contractor K-Line Construction.

There will be some electrical contracting work required by the Halifax Centre in the warm room and observatory to be able to receive the electrical connection and ensure it meets the proper electrical codes specified by the province of Nova Scotia. After requesting a number of quotes for this electrical work, it has recently been decided to provide this job to DMac Electric.

As of Nov 29, 2020, K-Line has installed a pole on the SCO site that brings a line from the roadway that will eventually connect to the warm room. Discussions have begun with DMac Electric as to when the electrical work in the warm room and the observatory can commence.

Respectfully Submitted,
 John Liddard, SCO Manager
 RASC, Halifax Centre

Nominating Committee Report

The following appointments were approved at the Board of Directors meeting of November 26, 2020 and come into effect as of January 1, 2021.

Honorary President	Mary Lou Whitehome
National Representative	Judy Black
Dark-Sky Preserve (DSP) Committee, Co-Chairs	Dave Chapman, Tony Schellinck
Nova East Planning Committee	VACANT
Outreach Chair	Paul Heath
Observing Chair	Dave Chapman
SCO Manager	John Liddard
Librarian	Wayne Harasimovitch
Nova Notes, Co-Editors	John McPhee, Lisa Fanning
Nominating Committee	Peter Hurley
Governance Committee	Judy Black

The following is the list of nominations put forward to the Board on November 26, 2020 and to members as of November 27, 2020. The call for further nominations will be made at the AGM on December 5, 2020.

President	Judy Black
Vice-President	Pat Kelly
Secretary	Peter Hurley
Treasurer	Gregg Dill
Director	Matthew Dyer
Director	Wayne Harasimovitch
Director	Paul Heath
Director	David Hoskin
Director	Tim Doucette
Director	Kathy Walker

Respectfully Submitted,
 Peter Hurley, Chair
 RASC Halifax Centre

January Members Meeting

Jan. 11, 2021 members meeting minutes

President's remarks

President Judy Black opened the meeting by noting the centre has been meeting via Zoom for over a year since the pandemic began.

"We seem to have great success with this format so we'll continue until such time as we actually get to meet face to face," she said. "We hope to be addressing various topics that members are very much interested in and certainly if any member has a topic they would like to see addressed at any one of our meetings please let us know. We'd love to hear from you and we'll try and find a speaker to address the topic you wish to hear about."

Judy strongly encouraged any meeting participants who aren't members to join up, noting that members get the *Observer's Handbook* - nine Halifax members contribute to this publication - and you can get a free copy of the *Explore the Universe Guide*, which is the guide to the program that introduces to the night sky.

You also get a subscription to *SkyNews*, the *Journal of RASC*, *Nova Notes* and access to publications such as the RASC's astronomy calendar. Local members also can access the centre's library and the Saint Croix Observatory.

(Short) presentation of members' photos

Paul Gray presented what he called a short version of members' astrophotos given the number of cloudy nights lately. He received about 16 contributions compared to two months ago when there were 70. The latest images were mostly of the Saturn/Jupiter conjunction in December. He encouraged members to send their images to the email chat list or directly to his email.

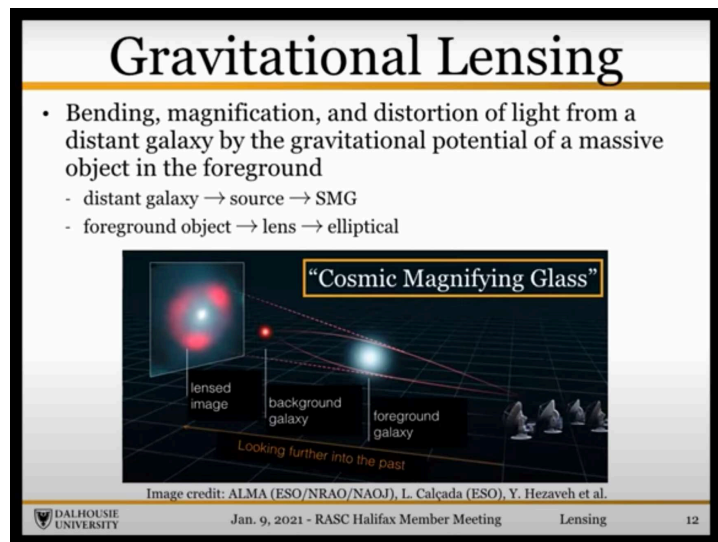
Special presentation

Kaja Rotermund, who recently earned her PhD at Dalhousie's Department of Physics and Atmospheric Science, spoke about her research into ancient and distant galaxies and galaxy clusters that can only be observed using sub-millimetre spectrums (far-infrared and microwave wavebands).

Her research, under supervisor Scott Chapman, uses data from the South Pole Telescope Survey. Her specialities include gravitational lensing, when the light from a distant object is magnified and bent as it passes around the gravitational field of a massive object in the foreground.

The 10-metre SPT is located at the geographic south pole on the Antarctic Plateau, specifically at the Amundsen South Pole station. It can observe about six per cent of the full night sky - about 2,500 square degrees, which has resulted in a significant and large-scale survey, Kaja said.

"This is one of the best sites in the world for observation of the night sky because it has very low water vapour content in the atmosphere and also extremely stable water vapour content," she said. "This location also benefits immensely from the circumpolar nature of the motion of the sky meaning that the sky appears to be motionless because the SPT is located at the celestial pole."



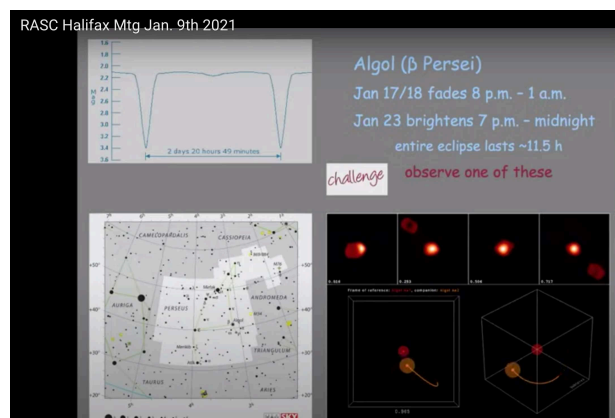
Using the SPT telescope, Kaja's team believe they were able to detect the most massive over-dense structure known in the distant universe - a protocluster (a group of galaxies still in the process of forming) of 14 galaxies in a very compact region.

"Other protoclusters have been observed but they span a significantly larger area, which makes this such an incredibly massive object."

Food for the Soul

After Kaja's presentation, Paul Heath recited the most recent poem in his monthly Food for the Soul presentation called Christmas Star. (see Members' Universe - page 9 - to read it)

What's Up in the Sky? with Dave Chapman



Dave Chapman presented his monthly What's Up in the Sky rundown of sunlight statistics, planet appearances, moon cycle and other information for December 2021.

While the Chief Moon began the month in Mi'kmaw lunar time, the Jan. 13 new moon started a period called Tom Cod. It's named for the fish that live in brackish water at the mouth of rivers. For some reason, they decide to spawn in January and they swim upstream so for the Mi'kmaw living inland, they can fish them through the ice.

Still in the lunar theme, Dave encouraged people to complete the lunar part of Explore the Universe.

There's a special map for this in the Explore the

Universe guidebook and it's a subset of the Explore the Moon program that lists 12 craters and 12 maria (you only need to observe half of them for the certificate.)

News from the Board

Judy reminded members that the RASC has astronomical calendars for sale - this year's edition has contributions from Halifax members Keith Egger, Jason Dain and youth member Fiona Morris. Email an e-transfer to treasurer@halifax.rasc.ca to nab one.

She also noted the Saint Croix Observatory is undergoing an upgrade to its electrical capacity and a fundraising campaign has exceeded its goal of \$7,500 at \$8,210, but if you wish to still donate, everything that comes in will be kept for SCO upgrades and for ongoing maintenance of the facility. An additional \$257 for SCO was raised by astroimagers Jerry Black, Jason Dain and Blair MacDonald who offered photos for sale.

Thanks very much to them and thanks to Blair for overseeing the distribution for those that are sold. A new board of directors was elected in December: Pat Kelly vice-president, Peter Hurley secretary and Gregg Dill treasurer retained their positions and Mary Lou continued as honorary president.

Tim Doucette and Kathy Walker are new members of the board, Ian Anderson is returning as our auditor, Dave Chapman now has a co-chair Tony Schellnick for the Dark-Sky Preserve Committee and Judy will chair governance review and other committees.

"We hope to continue building our relationships over the coming year, building that bridge between our centre and Keji with the Dark-Sky Preserve as well as with the Discovery Centre in providing various programs with them," Judy said.

There has been a significant uptake in RASC observing programs completed, including six members who've done the Explore the Universe program.

Judy also gave a shout-out to one of the Halifax Centre's newest members, Lisa Ann Fanning, who published an article on her experiences as a new amateur astronomer in the January/February *SkyNews*. Lisa Ann is also a co-editor of *Nova Notes*.

Also in the centre "stars" category, Mike Gatto's incredible lunar sketch production can be found in the latest *Journal of RASC*.

Judy thanked members for their work over the past year of “that little critter.” Although the pandemic has been a detriment to the way we’ve usually done things, we’ve kept things going with virtual meetings and outreach events that abided by public health guidelines.

February Members Meeting

Members meeting Feb. 6. (25 attendees)

President’s remarks

President Judy Black opened the meeting by noting the centre has been meeting via Zoom for over a year since the pandemic began.

“We seem to have great success with this format so we’ll continue until such time as we actually get to meet face to face,” she said. “We hope to be addressing various topics that members are very much interested in and certainly if any member has a topic they would like to see addressed at any one of our meetings please let us know. We’d love to hear from you and we’ll try and find a speaker to address the topic you wish to hear about.”

Judy strongly encouraged any meeting participants who aren’t members to join up, noting that members get the *Observer’s Handbook* - nine Halifax members contribute to this publication - and you can get a free copy of the *Explore the Universe Guide*, which is the guide to the program that introduces to the night sky.

You also get a subscription to *SkyNews*, the *Journal of RASC*, *Nova Notes* and access to publications such as the RASC’s astronomy calendar. Local members also can access the centre’s library and the Saint Croix Observatory.

Glenn Roberts’ presentation

Judy’s opening remarks are usually followed by Paul Gray’s photo montage but that was put off because of the limited submissions related to the cloudy weather we’ve had recently.

The meeting’s feature presentation was done by P.E.I. amateur astronomer and newspaper columnist Glenn Roberts.

Glenn was born in Glasgow, Scotland, and moved to Canada when he was five in 1952. He recounted the birth of his passion for astronomy as a teenager who lived in a foster home in the Muskokas in Ontario. He used to sneak out of the house at night to a granite hill in back of the house to “lay on my back to look at the night sky. I don’t know what drew me, it just fostered something in me. I often used to fantasize about travelling through space.”

After moving to Connecticut in the 1960s, Glenn participated in a high school astronomy club. He eventually moved to New Brunswick to avoid the Vietnam draft and then made his way to Nova Scotia where he attended NSCAD and TUNS. His interest in astronomy was rekindled after joining the Halifax Centre and enjoyed meetings and star parties with members including David Lane and Mary Lou Whitehorne. He left Halifax in 1987 for P.E.I. and worked as a land-use planner for the provincial government. He helped start the Charlottetown astronomy club along with people including UPEI professor Dr. Earl Wonnecott.

The university had a 16-inch Schmidt-Cassegrain, “which afforded a lot of opportunities to look at the night sky even though we were in a polluted environment.”

Glenn started giving talks to community groups like the Boy Scouts and Girl Scouts in the late 1980s and did a radio program on observing the night sky with the CBC’s Matt Rainnie. The appearance of Comet Hyakutake in 1996 led to an uptick in the public’s interest in astronomy and he began writing an astronomy newspaper column at the *Guardian*, which evolved from a monthly piece to the current weekly column with the SaltWire newspaper group.

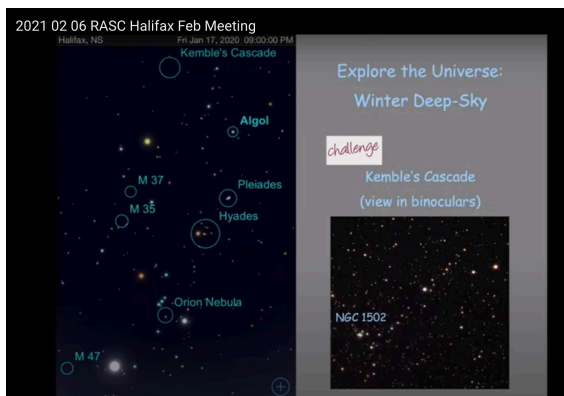


Glenn Roberts

The Charlottetown astronomy club lasted until 2007 when declining public interest and the loss of meeting space at the university following Dr. Wonnecott's death led to its dissolution. Glenn said he and others still get together to observe and talk about celestial matters. Glenn is particularly interested in galaxies and he's logged observations about more than 1,000. The pandemic has put the kibosh on many public observing sessions but Glenn is talking with the P.E.I. school board to do an in-class astronomy session for elementary kids and he's also writing a children's astronomy book *Why the Sky is Blue (and Not Pink.)* "And I'm doing my PhD in environmental science - don't ask me why at 73 but what the hell, you're never too old to follow your dreams." After Glenn's talk, he exchanged reminiscences with members he'd met back in his Halifax Centre days and was encouraged to find ways to restart the Charlottetown club by reaching out to UPEI.

Food for the Soul, What's Up in the Night Sky?

After Glenn's presentation, Paul Health recited his latest Food for the Soul poem called "Outward we Reach" (see Members' Universe - page 6 - to read it)



Dave Chapman gave his monthly talk on What's Up in the Night Sky for February. (All of his presentations can be found on the RASC Halifax's YouTube site). Dave also noted he will be helping to update the RASC's Explore the Universe guidebook for its 3rd edition and encouraged members to pass along suggestions on improvements. Dave himself wants to get more information on variable star observing into the new edition. He also noted that Jenna Hines and John Read will be starting on an Explore the Moon online course in the spring and an official guidebook will be published. Dave himself is working with Cathy Leblanc on their Mi'kmaw Moons book, whose cover will be John Read's impressive painting series of the moon cycle.

President's closing remarks

Judy said John Liddard has done an "incredible" job overseeing electrical upgrades at SCO with the help of Paul Gray, Blair MacDonald and Dave Lane. Two new red/white light fixtures will be installed to replace the pot light system that's now in place in the warm room..

There will be additional outlets inside the observatory and on the exterior side facing the concrete pads.

Judy singled out the most recent accomplishments of Halifax RASC members:

- Dave Hoskin earning his Explore the Moon certificate, which is on top of Dave's several astroimaging certificates.
- Dave Chapman's sketch of Mars appeared in the February 2021 RASC *Journal* and Blair MacDonald has a four-page article on imaging in that edition. The *Journal* also includes Michael Gatto's "incredible" Mars sketches. Judy hopes to get Michael to do a presentation on his technique at an upcoming meeting.
- Fiona Morris won the grand prize in *Saltscapes* magazine's photo competition with her amazing image of the Milky Way called Railway to the Milky Way.

Dave Chapman was interviewed on the Actual Astronomy podcast in Saskatchewan which can be found at www.actualastronomy.com

Auditor's Report for Fiscal 2020

After a review of the Centre's financial statements for 2020, I realized many pieces of the puzzle just did not fit. I knew there had been balancing issues in previous years, so I proposed the financials be recalculated from 2018 onward. This meant a reference point was needed to move forward from. I suggested we accept as "Official Truth" the balance sheet the previous treasurer prepared for 2017 and re-examine the transactions which have occurred since then.

Furthermore, I was aware that proper Treasurer's Reports had not been published in Nova Notes, the Centre's paper of record, since February 2018. That information appears in this edition of Nova Notes for the first time. This report, prepared by Gregg Dill and me, is a summary of the Centre's financial performance over the past three years, but focuses mainly on the year just past.

Financial reporting of the Centre's activities has never been standardized. Each individual handling the books has had his own way of interpreting and reporting information. Differences are in matters of detail, not in the overall representation of the Centre's position. With each change comes accounting headaches. Comparison with prior years becomes problematic.

Currently, we have adopted more streamlined reporting. For ease of preparation, some items no longer appear in the financial statements. We've dispensed with accounting for costs of merchandise inventory. Instead, we represent sales as revenue for merchandise vs. merchandise purchases on the expenses side. "Cost of Goods Sold" no longer appears as an expense.

Another change which has been in effect for some time, is the accounting of interest earned on investments. Since 2016, we have switched from an accrual basis to a cash basis - again, for the sake of ease and simplicity. Legal expenses have been merged with Office Administration costs.

Auditor's Statement for Fiscal 2020

I have extensively reviewed the financial documents and accounting for Fiscal 2020 and believe that the income statement and balance sheet faithfully represent the performance and position of the Halifax RASC for the year ending September 30 2020.

The numbers differ from those in the preliminary statement of the December 2020 AGM and were expected at the time due to corrections in the recalculation of Fiscal 2018 and 2019. We have determined there was a loss of \$129.00 for 2020. This deficit is far less than the depreciation for observatory and library items. Furthermore, with the kind of year 2020 was, and without benefit of a profitable Nova East, I think it was as good as could be expected.

I recommend that as the library has been aggressively depreciated since 2015, a more relaxed depreciation rate be used for the foreseeable future. I suggest something in the 3% range.

Respectfully Submitted,

Jan R Anderson

February 2021

RASC, Halifax Centre 2019-2020 Treasurer's Report

The fiscal year 2019-20 will be remembered as the year that COVID-19 caused the cancellation of Nova East, a significant annual source of revenue. Although unusual, it was a successful year financially for the Halifax Centre. Lost Nova East revenue was, mostly, off-set by a unique increase in merchandise sales (see highlights). Halifax Centre achieved a surplus of \$350 before allowance of \$479 for depreciation and write-offs. This is the first time we generated a surplus since 2015-16.

As can be seen from the four-year financial summary, our Centre has lost an average of \$526 per year before depreciation and write-offs.

The Centre continues to be successful and solvent. However, new sources of revenue will be required in future years to maintain our solvency. In a normal year with higher outreach and educational activities expenses, our deficit would be \$700 to \$1,000 higher based on previous years expenses. In my opinion, this is not sustainable.

I thank our auditor, Ian Anderson, for the many hours he committed to our society to ensure an accurate record of our finances is documented and reported in *Nova Notes* to maintain a continuous history.

Respectfully submitted.

Gregg Dill

Gregg Dill
Treasurer, RASC – Halifax Centre

Highlights of the 2019-20 Income statement

Revenue

Membership fees: Year-end memberships were 125 regular, 3 youth, 13 family, and 6 family youth. Total membership was 167 at year-end including life memberships.

Educational activities: \$500 was received through the RASC Special Project program and paid directly for editing the 2015 GA videos for posting on YouTube.

Interest: \$314.03 was earned on GICs that are maturing this year. \$1.19 in bank interest.

Sales of merchandise: \$1,610 from sales of calendars - \$720 and Explore the Universe - \$880 and 1 T-shirt - \$10. Calendar sales were unusually high due to timing of receiving the 2020 and 2021 calendars in the same calendar year.

Nova East: \$100.07 was expended for prizes prior to Nova East being changed to an on-line event.

Nova Notes: Seven *Nova Notes* printed subscriptions were sold for \$20 per year. One subscription was renewed at the old \$17 rate.

Expenses

Meetings: \$282.14 Meeting treats cost (\$84.85) was about half of last year due to in-person meetings being changed to Zoom meetings. A Zoom subscription (\$197.29) was purchased to facilitate members and board meetings as well as outreach events.

Depreciation and write-offs: \$479.18 Includes \$335.15 depreciation of observatory assets, \$144.03 depreciation of library

Educational activities: \$832.20 2015 GA video production, centre brochure printing, *SkyNews*.

Operating expenses SCO: \$1,017. Furnace repairs (\$543), propane (\$325) and gift card.

Assets

Cash: \$10,057. Includes \$6,000 from GICs cashed in anticipation of the SCO electrification project.

Investments: \$8,000. Two \$4,000 GICs yielding 1.95% maturing June 2021.

ROYAL ASTRONOMICAL SOCIETY of CANADA, Halifax Centre
 COMPARATIVE BALANCE SHEET
 For the Year Ending September 30th

	2020	2019	2018	2017
ASSETS				
Cash	\$10,057.34	\$3,623.25	\$3,505.25	\$3,018.58
Accounts Receivable				272.50
Merchandise Inventory				161.00
Investments	8,000.00	14,126.30	16,056.12	16,062.98
Library	1,296.31	1,440.34	1,600.38	1,778.19
Observatory Equipment	10,838.78	11,173.93	11,471.14	11,825.89
Miscellaneous	320.05	320.05	320.05	320.05
	=====			
Total Assets	\$30,512.48	\$30,683.87	\$32,952.94	\$33,439.19

LIABILITIES				
Accounts Payable	\$0.00	\$42.39	\$849.42	\$620.70
	=====			
Total Liabilities	\$0.00	\$42.39	\$849.42	\$620.70

CAPITAL				
NE Working Equity	\$4,899.93	\$5,000.00	\$5,000.00	\$4,567.65
Common Equity	\$25,612.55	\$25,641.48	\$27,103.52	\$28,250.84
	=====			
Total Equity	\$30,512.48	\$30,641.48	\$32,103.52	\$32,818.49

Total:				
Liabilities & Capital	\$30,512.48	\$30,683.87	\$32,952.94	\$33,439.19
	=====			
Change in Total Equity	(\$129.00)	(\$1,462.04)	(\$714.97)	(\$2,042.23)

Prepared by Gregg Dill and Ian Anderson

ROYAL ASTRONOMICAL SOCIETY of CANADA, Halifax Centre
COMPARATIVE INCOME STATEMENT
For the Year Ending September 30th

	2020	2019	2018	2017
REVENUE				
Membership Fees	\$3,026.78	\$2,950.16	\$2,736.12	\$2,976.45
Donations & NE Don.	175.00	111.00	25.49	73.24
Educational Activities	500.00		300.00	
Interest	315.22	282.80	107.86	132.63
Sales of Merchandise	1,610.00	690.00	1,060.00	1,140.50
Nova East	(100.07)	1,025.30	1,279.43	(432.35)
Nova Notes Print Subs.	157.00	187.00	238.00	204.00
Miscellaneous	3.00	7.52		
	=====			
Total Revenue	\$5,686.93	\$5,253.78	\$5,746.90	\$4,094.47
EXPENSES				
Meetings	\$282.14	\$141.12	\$169.57	\$785.13
Newsletter		60.35	407.22	455.45
National Off. Processing	100.76	68.52	50.99	55.08
Depreciation & Write-off	479.18	504.14	532.56	727.99
General Assembly				116.68
Equipment & Supplies			15.02	79.22
Merchandise Purch./CoGS	1,130.70	886.25	1,081.34	225.82
Office Administration	392.29	634.75	853.83	336.80
Educational & Outreach	832.20	1,046.93	1,402.30	1,455.10
Insurance	1,462.00	1,385.00	1,297.00	1,251.00
Awards & Donations	120.00	392.78	66.52	128.83
Observatory Oper Expense	1,016.66	1,595.98	424.52	507.10
Miscellaneous			161.00	12.50
	=====			
Total Expenses	\$5,815.93	\$6,715.82	\$6,461.87	\$6,136.70
Surplus or (Deficit) on Operations	(\$129.00)	(\$1,462.04)	(\$714.97)	(\$2,042.23)