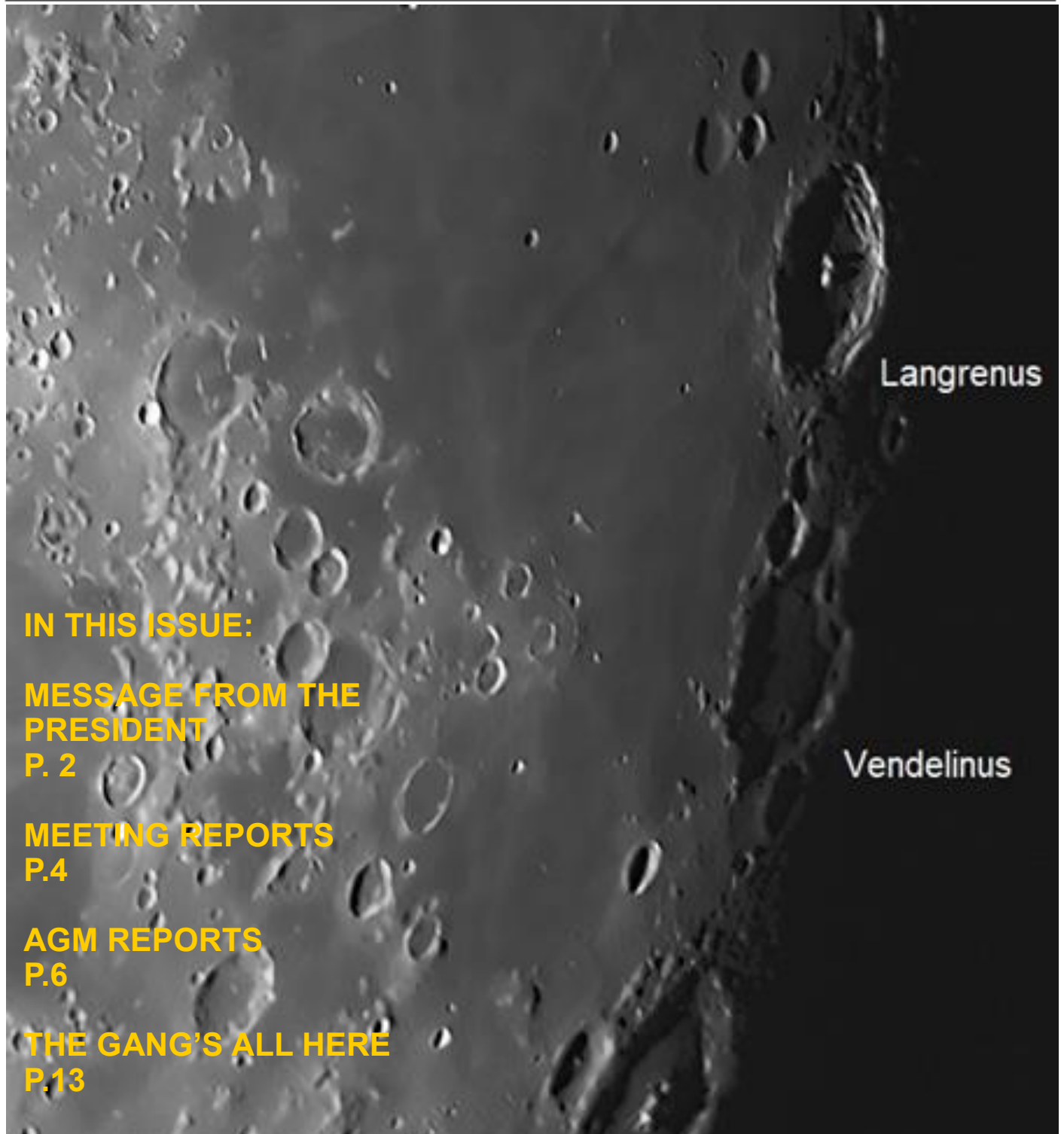


Nova Notes

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



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A Message from the President

On behalf of the RASC Halifax Centre Board of Directors, I would like to thank everyone for their support and input over the past year as well as my fellow Board members for their commitment to the Centre and dedication during the pandemic. I look forward to working with the newly elected Board in what will hopefully become post-pandemic 2021.

Voltaire once said, "Life is a shipwreck, but we must not forget to sing in the lifeboats." On those clear nights that we as RASC members are outside, our faces are turned upwards to watch the night sky float past us, knowing our fellow members are with us in this lifeboat – a sense of wonderment in the peace and calm of the night.

Members can be proud of everything the Centre has accomplished in the past year, despite COVID-19. Acquiring a Zoom account allowed us as a Board and as a Centre to stay connected and engaged, regardless of where we were in the province or further afield across Canada and the United States. Our meetings continued to keep members engaged with timely information, and the Board continued with the business of the Centre. SCO fundraising initiatives and upgrades were undertaken. The incredible photos, sketches and observing logs were shared by our astroimagers of both Comet NEOWISE and Mars as they traversed our Nova Scotia skies – as well as other cosmic delights.

COVID-19 will change how, where, and with whom we celebrate over the coming holiday season. Although we cannot be with you as in years past to celebrate the start of the season, we wish everyone the best. May the wonder and joy of the holidays surround you and yours, and may 2021 bring many happy moments of once more being together under the stars. It can only get better.

Stay safe. Stay well. Look up, the skies are open.

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.

St. Croix Observatory

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

Meeting Dates for 2021

6 February, 2021
6 March, 2021
10 April, 2021
1 May, 2021
5 June, 2021

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 panellists' presentations are being recorded and will become accessible via a link on <https://halifax.rasc.ca>

Halifax RASC Board of Directors, 2020:

Honorary President : Mary Lou Whitehorne	(Appointed)
President: Judy Black	(Elected)
Vice-President: Paul Gray	(Elected)
Secretary: Peter Hurley	(Elected)
Treasurer: Gregg Dill	(Elected)
National Council Rep: Pat Kelly	(Appointed)
Director: Pat Kelly	(Elected)
Director: Matthew Dyer	(Elected)
Director: Paul Heath	(Elected)
Director: Wayne Harasimovitch	(Elected)
Director: Tom Crosman	(Elected)
Director: David Hoskin	(Elected)
Librarian: Wayne Harasimovitch	(Appointed)
SCO Manager: John Liddard	(Appointed)
Observing Chair: Dave Chapman	(Appointed)
Outreach Chair: Paul Heath	(Appointed)
DSP Committee: Dave Chapman (interim)	(Appointed)
Nova Notes Editor : Charles White	(Appointed)

Cover photo

By David Hoskin

Two of the four craters in the "Gang of Four" taken by David Hoskin.

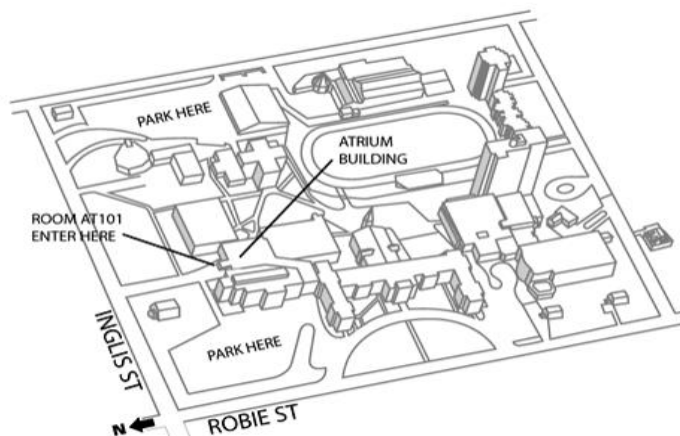
Be sure to check out the image in full and read David's article on them in "*The Gang's All Here*" on page 13!

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 first Saturday of the month, except for the months of July and August.

Board meetings begin at 10:30 a.m., usually in room AT217, and all members are welcome.

November Members Meeting

RASC Halifax President, Judy Black welcomed everyone who tuned into the Zoom meeting for the month of November. She reminded those present that the Centre has been doing meetings via Zoom for some time and that it will be continuing this way into the new year.

Following a reminder on the benefits of joining the RASC, Judy asked for Paul Heath to talk about Centre outreach. There have been three youth groups that have reached out to Paul, and he is in the works of making a Covid protocol session for each of these groups. He then gave a presentation of his monthly, *Food for the Soul* which was about the experience of three small children looking through a telescope for the first time at Saturn.

News from the Board was presented by Judy Black. Judy discussed the meeting that was had on the electrification of SCO, and that at the end of the meeting it was determined unanimously to proceed with getting electricity to the observatory. Minutes were sent out to those present after the meeting was concluded, and that there will be a fundraising campaign to make up the remaining difference to complete the upgrade. One big fundraising initiative is an astrophoto campaign and more details will be coming out on that.

Lisa Fanning of RASC Halifax was virtually awarded the Explore the Universe Certificate by Judy Black. Lisa is a newer member to our Centre and Judy pointed this out to encourage those who have been around for sometime to try out completing the certificate themselves.

A call went out for nominations for any and all the board positions for the Centre to be sent to the nominating committee, which is Peter Hurley, Chris Young, and Judy Black. The deadline for the nominations is midnight on the 24th of November.

With news from the board, and questions concluded, Judy passed the floor over to Dave Chapman to provide his "*What's Up*" for November. He outlined dates for the Moon and planets, and also provided a lot of information to help those working on their Explore the Universe certificates.

Following Dave's presentation, Judy then shared with the members a well produced piece that her and RASC Halifax Centre, Melody Hamilton produced earlier this year talking about observing the Moon, what went into completing the various lunar observing programs the RASC offers.

After the video, Paul Heath rounded off the meeting by demonstrating how to construct a homemade dew shield for your telescope. He provided detailed instructions, as well as the materials required to build it.

Judy then adjourned the official recorded meeting at 2:40, and reminded those present that if they wish to stay and chat that they are welcome to do so.

Editor's note: The video of the November 2020 members' meeting can be found at this URL: <https://www.youtube.com/watch?v=2xmZNWLxd0Q>

December Members Meeting

Welcome

President Judy Black welcomed the twenty-nine members attending the Members' Meeting being hosted December 5, 2020 on Zoom. This meeting immediately followed the Annual General Meeting (AGM). Although the meeting was recorded but the Astro-Chat was not.

Paul Gray provided the photo montage, noting numerous photos of Mars but not many of deep-sky objects. Contributors to the montage (in alphabetical order) were:

Photos: Jerry Black, Michael Boschat, Dave Chapman, Art Cole, David Hoskin

Sketches: Roy Bishop, Michael Boschat, Dave Chapman, Michael Gatto, Tony Schellinck, Charles White

Special Presentation: Paul Gray The RASC Calendar – Front to Back and Back to Front

The purpose of his presentation was to inform members of how to read the calendar and what it takes to put one together. He extended thanks to all the volunteers involved and extended a special thanks to Michael Gatto for his expertise and time spent on the production of the calendar. He noted the calendar is geared to North American observers.

Front to Back:

Before using the calendar, he invited members to look at the third last page that describes "how to use the calendar". Adjustments to locations are only critical when you consider how far west of the meridian you are located. For trip and event planning purposes, dates of the New Moon in 2021 and 2022 are highlighted in blue.

Looking at January, he explained the description of the photo of the month, which was truly meant for beginners as an education tool. In the top left is the planet location that month. The Moon phase in the top left of every day shows a black dot indicating the favourably librated limb from our view. The size of the dot varies according to the amount of libration.



Above: A sample from January in the calendar

The rise and set times for the Sun and Moon are in the right-hand side of each week for latitudes 40° N and 50° N. Special holidays are in bold font.

Interesting observing challenges (lunar, deep-sky, planetary), today in history, meteor showers, conjunctions, lunar perihelion and apogee, planets (in opposition, stationary) and Moon phase are cited when relevant in the lower half of each day. He noted that if the upper right corner of a day contained a green triangle, it meant it was a significant, interesting, or rare occurrence; for example, on January 23, Mercury is at its greatest elongation for the year. Also included are calendars for the month before and the month after. In the bottom right of every month is some information

on how to use the calendar that month and some general information. Diane Brooks and Dave Chapman are vital in providing the calendar's historical data.

There were errors found, such as Halifax Centre's Keith Egger's photo of Eta Carina, not the Tarantula Nebula as cited. Also included are Halifax Centre members' photos by Jason Dain (Rho Ophiuchus and Prancing Horse) and youth member Fiona Morris (North America Nebula). Paul noted that images were just spectacular this year! The descriptors from the photographers and the list of contributors are included inside the back cover. He explained how the front cover photo by Alan Dyer of Comet NEOWISE was chosen.

Back to Front:

Rajeev Gupta was the original developer of the RASC Calendar. Paul noted the calendar database was thereafter based on the codes developed by Dave Lane and Alister Ling, such as sunrise/set times. There were 294 events in the 2021 calendar spreadsheet, such the April 12, 2020 marking the 60th anniversary of Yuri Gagarin being the first human in space.

There is a spreadsheet for the planets by month that is created manually because there is no database containing this information. The Observer's Handbook has the information, but the challenge is in abbreviating it to fit the space provided in the calendar.

A PowerPoint presentation showed some of the 150 photos forwarded for inclusion in the 2021 calendar. Paul noted no names are attached to the photos and none were from our Centre. The number of photos received varied with the time of year. To be considered, the photos needed to be 3200 x 3080 pixels in a tiff image to get the quality of the photo required for printing the calendar. He noted the following criteria when determining what photos to include: framing, image scale and the detail consequently provided, clarity of the stars, level of processing ("WOW!" versus "doesn't look natural"), landscape versus portrait (the latter cannot be used in the calendar but can be for the Handbook covers), and whether the object had been in the calendar in the past 3 years. He conscientiously placed photos in the months related to the object; for instance, Orion Nebula images were placed in a winter month.

Paul also showed his favourite photos from the past 9 years of calendars including:

Kathy Walker – M13 (also won the People's Choice Award in the Halifax Centre Astroimaging Contest, 2019)

Barry Burgess – Southern Milky Way and Shoreline

Allen Dyer -photo of the solar eclipse
Jennifer West, Calgary Centre – Yellowstone geyser plus meteor, night sky with Milky Way and moonbow

Kevin Black - Horsehead Nebula (Jan 2021 calendar)

Paul Morefield - Hamburger Galaxy taken with the RASC telescope. Noctilucent clouds over Yellowknife Museum also reflected in the lake

Paul is about to begin year 10, his last year as editor of the calendar. He is looking for his replacement. He is willing to partner with an Assistant Editor for 2022 and then they be on their own for 2023 onwards. Judy Black thanked Paul for all his work during his tenure and for letting the membership know the complexity of how the calendar is created.

Youth Activity: Anyone Out There?

Paul Heath described what is needed to present this as an outreach activity. He has used this presentation with children and adults alike at various outreach events, including library talks.



Above: Paul giving his presentation on outreach

Scientists have already identified candidates for possible life, but the question is what kind of life. The first thing to do was to describe the type of planet being considered – rocky, water, gaseous, or frozen ice worlds. How would the body be affected by low or high gravity? What about atmospheric conditions? Thin atmosphere means sound travels slower, vision is clearer and there is less breathable air whereas a thick atmosphere means the opposite. If it's a water planet, does the alien swim, crawl along the bottom, or float, and does it have rapid motion? If it's a rocky planet with low gravity, perhaps the bodies would be thin with thin legs; with higher gravity, it could be a heavier body with thick, solid legs.

He then showed his felt board with various body parts – eyes (different sizes, on stalks), ears, beaks, wings, gills, mouth, legs (long, short, thick, tentacles), different sized heads, etc. After discussing the parameters of the planet, the audience then decides (individually or as a group) what the alien could potentially look like using the felt pieces to construct it.

It's a fun exercise that uses their imagination but is also based on perhaps basic scientific knowledge of planets and life as we know it.

Paul noted an 8" Celestron was donated to the East Preston Community Centre for use in their youth observing program. Two of the directors are working to complete the Explore the Universe observing program.

News from the Board

Judy Black noted the Observer's Handbook 2021 had been delayed due to the shipper moving location. Members can still acquire their copy of the 2021 calendar from the Centre, and she thanked Treasurer Gregg Dill and Postmaster Wayne Harasimovitch for contributing to its distribution.

SCO Fundraising Committee (Chairman Blair MacDonald, Matthew Dyer and Gregg Dill) were thanked for their work in the two components of the fundraising efforts:

Astrophotos

The income from astrophoto sales goes towards the SCO electrical upgrade and future enhancements. She thanked astroimagers Blair MacDonald, Jerry Black and Jason Dain for contributing to this cause. There are 10 deep-sky and 6 wide field images from which members can choose one or more 8"x10" colour prints for themselves or that special someone for \$30 each. The centre panel of our Centre's home page provides a link to the fundraiser.

Member Donations

Judy officially thanked Mary Lou Whitehorne for the cartoon depiction of the SCO site. She then stated that as of 11:30 AM, there was \$7,885 in the coffers which surpasses the goal of \$7,500. Donations will still be received to fund future enhancements and maintenance of the site. Thanks to everyone who has donated to date! Additional donations would always be welcomed.

Judy, Dr. Roy Bishop and John Liddard were on site with the K-line representative to establish the location of the pole. The pole has been installed on the site to ensure wires were below the treeline.



She thanked K-Line Construction and Minas Energy for their time and work on this project. The next steps include installation of the transformer, selection of the electrician and a masthead installed on the warm room.

Congratulations to Karen Hamblin and Troy Sweeney for completion of the Explore the Universe certificate, and to Tony Schellinck for completion of the Finest NGC objects. Halifax Centre stars included Art Cole for his photo of *Moon and Maple* on the RASC Weekly masthead and John McPhee for his first-place win in the "Sunset, Sunrise and Night Sky" category of the Friends of Keji Photo Contest with his photo of *Milky Way, Jupiter, Mersey River*.

At the national level, RASC now has 30 Centres with the recent addition of the Fraser Valley Astronomers Society in Abbotsford BC. Data obtained by the RASC telescope can now be purchased. On November 27, two RASC members were appointed to the order of Canada – Dr. P.J.E. Peebles (Honorary Member) and Dr. Sara Seager (Honorary Member, Toronto Centre).

What's Up in the December Skies?

Dave Chapman, Observing Chair, described what to look for in the December skies; his presentation is also accessible on the Centre's home page. He noted that he will be retiring his role as Observing Chair as of December 2021.

He noted members can now view the Winter Hexagon and Triangle. He noted that Winter Solstice occurs on December 21 which means there is not much change in the length of darkness between now and mid-January. The Moon will be close to six planets: Venus (Dec 12), Jupiter & Saturn conjunction (Dec 16/17), Neptune (Dec 20), Mars (Dec 23) and Uranus (Dec 24). Only Mercury is missing from the list.

Dave provided members who were working to acquire the Explore the Universe (ETU) certificate with the following challenges: four lunar mare and four craters; the Saturn-Jupiter conjunction that is very low in the evening sky; Uranus and Neptune. He provided a depiction of what could be seen of Saturn and Jupiter in a higher magnification telescope. He highly recommended looking the night before as well as early on the evening of December 21. The Geminids meteor shower occurs the moonless nights of [December 13/14](#) but he suggested to begin looking on December 9/10. The observed rates are approximately 25 meteors per hour with long slow tracks. There is also the minor Ursid meteor shower on December 21/22.

He showed the winter constellations and stars included in the ETU. All the stars cited are used in SynScan telescope alignments. He noted deep-sky objects that are mostly open clusters. He also noted the asterism Kemble's Cascade in Camelopardalis, named

after the priest and RASC member Dr. Lucien Kemble. He asked members to let him know their system for locating the Cascade. He also cited the double stars 16 Cygni, Theta1 Tauri and Delta Cephei. He challenged to observe Delta Cephei. Judy thanked Dave for his presentation and his contributions in the past year.

The next Members' meeting is Saturday, January 9, 2021. The next Board of Directors meeting is Thursday, January 7, 2021. Members were reminded the September/October edition of Nova Notes was now on the website, and they can provide their contribution to the November/December edition to Charles White ASAP. Members were invited to remain for Astro-Chat.

Adjournment at 4:00 PM.

Editor's note: The video of the December 2020 members' meeting can be found at this URL: <https://www.youtube.com/watch?v=2xmZNWLxd0Q>

Royal Astronomical Society of Canada - Halifax Centre Annual General Meeting (AGM) Saturday, December 5, 2020 – 1:00-1:40 PM

Welcome and Opening Remarks

Judy Black welcomed the 29 members to the meeting and thanked them for coming. She then provided opening remarks.

Approval of 2020 Agenda

201205AGM-Mot01:

It was moved by Blair MacDonald and seconded by Joanne Cook to approve the 2020 AGM agenda as circulated.
CARRIED.

Approval of 2019 AGM Minutes

The minutes of the 2019 AGM had been pre-circulated to members.

201205AGM-Mot02:

It was moved by Mary Lou Whitehorne and seconded by Paul Heath to approve the minutes of the 2019 AGM as circulated.
CARRIED.

Appointment of a New Auditor

Gregg Dill spoke with Ian Anderson, the Auditor for 2019-2020. Ian has agreed to have his name forwarded for re-appointment for 2020-2021.

201205AGM-Mot03:

It was moved by Gregg Dill and seconded by Dave Lane to appoint Ian Anderson as Auditor for 2020-2021. CARRIED.

Board Reports

(Note: Reports in their entirety will included in the Jan/Feb 2021 edition of Nova Notes)

Judy Black noted the reports from the Board and the appointed positions had been circulated as part of the AGM agenda circulated on December 1, 2020. She apologized to Paul Gray for not including his report in the collated report.

201205AGM-Mot04:

It was moved by Mary Lou Whitehorne and seconded by Bob Russell to accept the pre-circulated executive and appointed position reports as they were sent by email. CARRIED with 1 Abstention.

Dave Chapman stated how proud he is of the Centre for all the observing programs followed and certificates earned. The Centre, which is a medium-sized Centre that only represents 1/15 of the population of the RASC, accounts for 25% of all certificates earned across Canada – an amazing achievement. Members noted the Centre's success in this regard was on his shoulders, i.e., his continuing involvement in and promotion of observing and the RASC programs in his *What's Up?* and in outreach and media events he attends. Dave thanked members for the shout-out.

Judy Black noted the Treasurer's and Auditor's reports were missing from the compilation. Gregg Dill is working with Ian Anderson and that this is an unbalanced financial report but once a re-audit has been done, the numbers will probably not change much. He noted that Judy will forward both the Treasurer's and Auditor reports to members following the meeting. He proceeded to highlight the following on the income and expense statements:

Income:

Membership fee revenue had increased probably to the time of year that members renewed.

Educational Activities income due to GA video edits by Halley Davies that received a special RASC grant.

Sale of merchandise had an increase, a majority from sale of ETU Guides; kudos to Tony Schellinck who sold

more than his share of this publication.

Nova East shows a negative \$100 was due to purchase of door prizes prior to cancellation of the event.

Expenses:

Meeting treats have decreased due to no face-to-face meetings since April.

There was the added expense of a Zoom subscription that balanced the lack of treats.

Legal expenses were none last year due to their inclusion in office expenses.

Educational Activities included \$500.00 of the \$832.00 for payment to Halley Davies. In essence, there was only \$332 compared to almost \$1,200 the year before.

Balance Sheet:

The Centre had \$14,000 in GIC investments at the beginning of the year. With \$6000 of the GICs cashed in, cash was up to \$9,496.99 bringing us in essence to the same place as last year as far as the bank is concerned. There is no comparative between 2019 and 2020 offered until a re-evaluation has been conducted early in 2021.

Ian Anderson had provided a letter with an attached Auditor's report. Accounting programs and accounting procedures had been discussed. Ian has not seen the hard copy of the books, but he was forwarded records and transaction reports of all accounts, the general ledger, bank statements and RASC reports via email. Ian also noted that he and Gregg will correct errors from 2018, 2019 and 2020, and will provide a 3-year report in the Jan/Feb 2021 edition of Nova Notes. Gregg stated he appreciated Ian's commitment to trying to make the most of what was presented to him and to Dave Lane for his work two years ago.

Gregg stated the Centre is not sustainable as an organization. We have been cashing in our GICs to maintain the Centre's activities. Without new sources of revenue, we will continue mining our investments. There are numerous Life members (20 of the 173 (11.5%) of members) who do not contribute fees to the Centre. Gregg was thanked for the hard work he has done as Treasurer to get us back on track. It was noted there have been periods of spend and save, and that one of the revenue streams suggested was a key fee. The possibility of increasing membership fees was suggested. Judy Black noted the Board had discussed this earlier in the year but, given the pandemic and the possibility of some members losing jobs, it was felt the increase would be left for discussion in May 2021.

201205AGM-Mot06:

It was moved by Gregg Dill and seconded by Mary Lou Whitehorne to accept the financial and auditor reports as presented.

CARRIED.

Call for Nominations and Election of 2019 Board of Directors

The Board had approved appointments at their deliberations of November 26, 2020. Judy Black stated Mary Lou Whitehorne continues to be the Honorary President until December 2023. The list of individuals who were appointed was also noted:

National Council Rep	Judy Black
DSP Committee, Co-Chairs	Dave Chapman, Tony Schellinck
Observing Chair	Dave Chapman
Outreach Chair	Paul Heath
SCO Manager	John Liddard
Librarian	Wayne Harasimovitch
Nova Notes, Co-Editors	John McPhee,
Lisa Fanning	
Nominating Committee	Peter Hurley
Governance Committee	Judy Black
NE Planning Committee	vacant

The Nova East Planning Committee requires a Chairperson to begin the planning process for Nova East 2021 in February/March 2021. Additional members to the planning committee were also welcomed.

Judy Black explained that according to Bylaw #1 (2017) now enacted, there could be no less than five and no more than 10 on the Board. She thanked Tom Crosman and Paul Gray who are stepping down from the Board for their service and commitment to the Centre's work and Objectives.

There were 3 call for nominations from the floor for the 2020 Board of Directors. The slate of nominees for the 2020 Board of Directors was then presented as follows and included two new members (*):

Executive Committee

President – Judy Black

Vice-President – Patrick Kelly

Recording Secretary – Peter Hurley

Treasurer – Gregg Dill

Directors

Paul Heath

Matthew Dyer

Wayne Harasimovitch

David Hoskin

Tim Doucette*

Kathy Walker*

There being no further nominations, the 2020 Board of Directors positions were approved by acclamation.

Adjournment

071218AGM-Mot07

It was moved by Joanne Cook to adjourn the AGM.

Members were invited to socialize and enjoy the Christmas treats provided.

RASC Halifax Centre Auditor's Report for AGM

The attached Financial Statements have been prepared by the treasurer and myself in recent days after discussions about accounting procedures and problems which have arisen from an unbalanced report.

The Revenues and Expenses have been reviewed carefully and we believe they are an accurate representation of the Centre's fiscal performance over the past year. Note that the Balance Sheet only shows the current standing of the Centre at the end of September 2020. No comparison between 2020 and 2019 is offered. This is because we are not confident of the figures presented in the 2019 Balance sheet.

We believe a loss of \$318.88 occurred in 2020. This includes allowances made for more depreciation expensed to reduce the library holdings and the value of the observatory. Unsold 2020 calendars were also written off at year-end to the amount of about \$163.

I have not seen any supporting documentation except for bank statements to verify these numbers. The work to this point has been to establish a preliminary treasurer's report which can be used as a guideline during the AGM of December 5th 2020.

I have recommended that as the statements of 2018 and 2019 were also out of balance, the Treasurer and I will correct these errors over the coming weeks and present a three year report which will be published in the February 2021 Nova Notes (NN 5201) which is the Centre's official archival resource.

Changes to FY 2020 are possible during the reconstruction of prior years' financial reports which were never printed in Nova Notes. Therefore these reports are presented at this time on an unaudited, unverified and preliminary basis only. We do not expect the information for 2020 when it appears in Nova Notes will differ much from what has been presented here.

Respectfully Submitted,

Ian Anderson
2020 Auditor
RASC - Hfx Centre

ROYAL ASTRONOMICAL SOCIETY of CANADA,
Halifax Centre

COMPARATIVE INCOME STATEMENT

YEARS ENDING Sept 30, 2020 and Sept 30, 2019

Last Updated: December 2, 2020
Activity to: Sep 30 20
Years Ended: September 30 2020 - 2019
Amount of Increase or (Decrease) during 2020
=====

REVENUE

	R	Y	A
Membership Fees: 126 3 15	\$3,026.78	\$2,949.96	\$76.82
Donations: 175.00 67.50	\$107.50		
Education and Outreach: 500.00 50.00			\$450.00
Interest: 315.22 212.62	\$102.60		
Sales of Merchandise: 1,610.00 690.00	\$920.00		
Nova East: (100.07) 1,025.40	(\$1,125.47)		
Nova Notes Subscriber Income: 157.00 182.00			(\$25.00)
Miscellaneous: 3.00 0.00	\$3.00		

Total Revenue: \$5,686.93 \$5,177.48 \$509.45

EXPENSES

Meetings Treats: \$124.24 \$248.71	(\$124.47)
Zoom Sub: 197.29 197.29	
Newsletter : 0.00 60.35	(60.35)
National Office Processing: 100.76 68.52	32.24
Asset Depr & Loss Write-offs: 629.67 492.44	137.23
Merchandize Purchases: 1,130.70 886.25	244.45
Office Administration: 361.14 455.27	(94.13)
Legal Expenses: 31.15 31.15	
Education and Outreach: 832.20 1,186.93	(354.73)
Insurance: 1,462.00 1,385.00	77.00
Awards & Donations: 120.00 385.28	(265.28)
Operating Exp - Observatory: 1,016.66 1,641.97	(625.31)

Total Expenses: \$6,005.81 \$6,810.72 (\$804.91)

Surplus or (Deficit) on Oper (\$318.88)(\$1,633.24)
\$1,314.36

=====

ROYAL ASTRONOMICAL SOCIETY of CANADA,
Halifax Centre

BALANCE SHEET
YEAR ENDING Sept 30, 2020

December 2, 2020
Year Ended September 30, 2020

=====

ASSETS

Cash	\$9,496.99
Accounts Receivable	560.35
Merchandise Inventory	0.00*
Investments	8,000.00
Accrued Interest	0.00*
Library Est'd	1,296.31
Observatory Equipment*	10,429.19
Miscellaneous Est'd	320.05
	=====
Total Assets	\$30,102.89

LIABILITIES

Accounts Payable	\$0.00
Other	0.00
	=====
Total Liabilities	\$0.00

CAPITAL

NE Working Equity	\$5,000.00
Common Equity	\$25,102.89
	=====
Total Capital	\$30,102.89

Total Liabilities & Capital \$30,102.89

=====

Royal Astronomical Society of Canada, Halifax Centre Comparative Income Statement

Years ending September 30, 2019 - September 30, 2020

	Years Ended September 30	Amount of Increase or (Decrease) During 2020
	2020	2019
Revenue:		
Membership fees:	3026.78	2949.96
Donations:	175.00	67.50
Edu. Activities:	500.00	50
Interest	315.22	212.62
Sale of Merch.:	1610.00	690.00
Nova East (Net):	(100.07)	1025.40
Nova Notes Prints:	157.00	182.00
Miscellaneous:	3.00	0.00
Total Revenue:	5686.93	5177.48
Expenses		
Meeting Treats:	124.24	248.71
Zoom subscription:	197.29	0.00
News Letter:	0.00	60.35
Deprecation and write off:	629.67	492.44
Purchase of Merch:	1130.70	886.25
Office Administration:	361.14	455.27
Edu. Activities:	832.20	1186.93
Insurance:	1462.00	1385.00
Awards and Donations:	120.00	385.28
Nat. Office Processing:	100.76	68.52
Operating Expenses SCO:	1016.66	1641.97
Total Expenses:	6005.81	6810.72
Operational Surplus (Deficit):	(318.00)	(1633.24)
	1314.36	

Royal Astronomical Society of Canada, Halifax Centre Balance Sheet

Dec. 4 2020 Year Ended, Sept. 30, 2020

Assests:	
Cash:	9496.99
Accounts Receivable:	560.00
Investments:	8000.00

Library Estimate:	1296.31
Miscellaneous Estimate:	320.05
Total Assets:	30102.89
Liabilities:	
Accounts Payable:	0.00
Other:	0.00
Total Liabilities:	0.00
Capital:	
Nova East Working Equity:	5000.00
Common Equity:	25102.89
Total Capital:	30102.89
Total Liabilities and Capital:	30102.89

Royal Astronomical Society of Canada, Halifax Centre 2019 - 2020 Treasurer's Report

Introduction:

The year 2019 - 20 was an unusual but, successful year financially for the Halifax Centre. We had an operational surplus of approximately \$311 before depreciation and write offs. This compares to a deficit of \$1,633 last year on the same basis. Our outreach activities were curtailed due to COVID-19. Nova East that usually contributes about \$1,000 to revenue, was held as an online event. We also continued to write off our equipment at a rate of 3% and library holdings at a rate of 10%.

Deficit of \$318.88 for Fiscal 2019 - 2020

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 educational activities ezpenses, our deficit would be \$700 to \$1,000 higher based on previous years expenses.

Details of the 2020 Income Statement

REVENUE:

Membership Fees \$3,026.78: Membership fees were approximately the same as last year. At year end we had 163 members, down from 170 the previous year.

Donations \$175.00: Donations made by members when renewing their annual membership.

Educational / Outreach: Grant from National Special Projects Program for 2015 GA video editing project led by Dave Chapman The editing was done by Halley Davies.

Interest \$315.22: GIC interest was higher this year as a result of staggered maturity dates.

Sales of Merchandise \$1,610: The two items we sold were RASC calendars and Explore the Universe guides.

Nova East (net) (-\$100.07): Purchase of gifts before the decision was made to hold Nova East online. They will be held in hopes of Nova East 2021.

Printed Nova Notes Subscriptions \$157.00: Three fewer members requested printed copies this year.

EXPENSES:

Meetings \$124.24: Meeting treats were provided at the end of meetings for only 6 months.

Zoom subscription \$197.29: NN's expenses are up this year. This is caused by increased postage and printing costs. We are now subsidizing each issue by about \$6, up from \$5.

Purchase of merchandise \$1,130.70: Purchase of Explore the Universe guides accounted for the increase.

Office Administration \$361.14: Mailbox rental was the major expense (\$229)

Educational Activities (Outreach) \$832.20:

The major expense was \$500 to edit the 2015 GA videos. SkyNews and centre brochure printing are also included.

Insurance \$1,462.00: Insurance for SCO increased by \$77.

Awards and Donations \$120.00: We continue to donate to the Clear Sky Clock website and the International Dark Sky Association.

Observatory - Operating \$1,016.66: Propane and furnace servicing were the major expenses. It also includes taxes to Hants County and the usual gift to Mr Carmichael.

Asset Depreciation \$629.67: We continue to depreciate equipment at 3% per year and library books at 10% per year. Thirteen 2020 unsold calendars were written off in addition to the depreciation of observatory and library assets and holdings.

Details of the 2020 Balance Sheet

ASSETS:

Cash \$9,496.99: This is the balance in our chequing account compared to \$3,843.76 last year. The increase is a result of cashing \$6,000 of GICs in anticipation of the SCO electrification project. We also had \$560.35 in accounts receivable for September membership fees owing from National Office.

Merchandise Inventory \$877.08: This includes 2021 calendars, Explore the Universe, guides and a small quantity of mylar film.

Investments \$8,000.00: We have two-\$4,000 GICs that come due in June 2021. Interest is counted at maturity.

Estimated Library \$1,296.31: We did not purchase any new holdings this year.

Observatory Equipment \$10,429.19: After depreciation of observatory equipment of \$322.49.

LIABILITIES:

No outstanding liabilities at year end.

EQUITY:

Nova East Reserve Equity \$5,000.00: This reserve is allocated for upfront costs before Nova East receives income from its various sources.

Common Equity \$25,102.89: Common equity was reduced by an operating deficit of \$318.88.

Summary and Recommendations:

This year will be remembered for the impact COVID-19 had on our activities – some positive and some negative reflected in our small operational deficit. I was pleased to serve as Treasurer again this year. I thank our auditor, Ian Anderson, for his rigorous review of the books and look forward to working with him to resolve the anomalies he detected.

In a normal year with higher educational activities expenses, it is my opinion that our ongoing deficit is unsustainable.

Respectfully submitted,

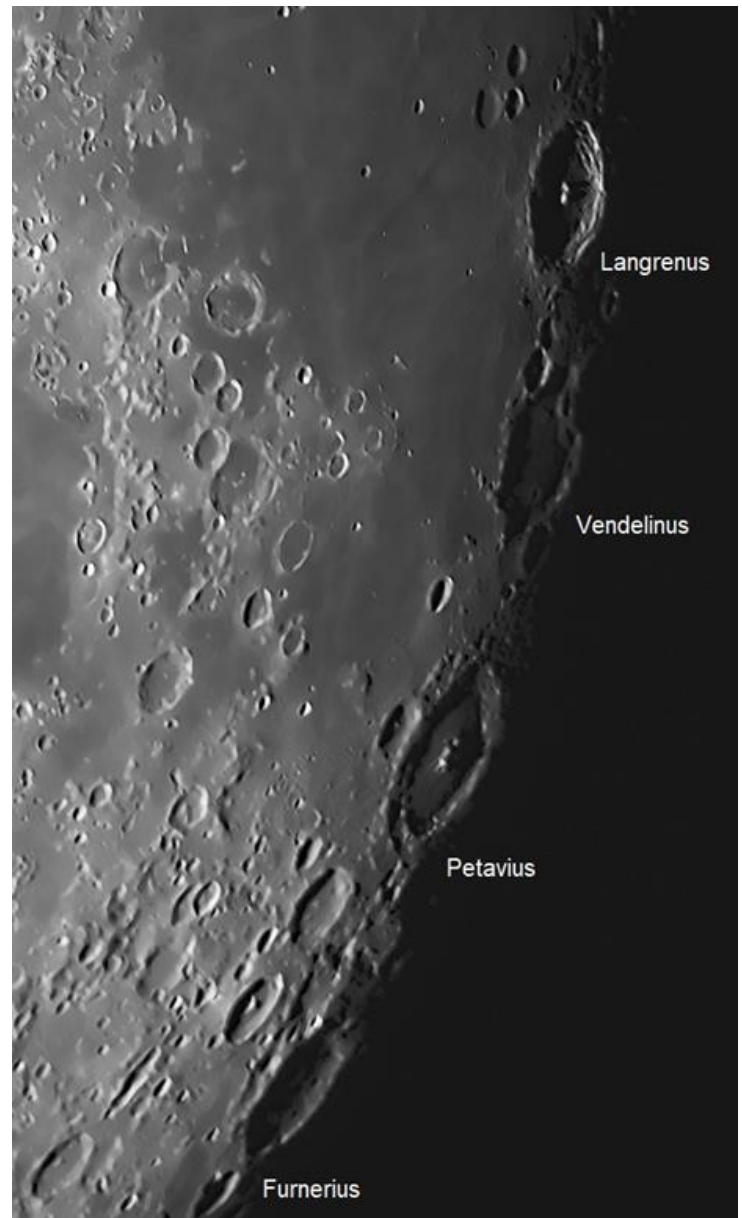
Gregg Dill
Treasurer, RASC - Halifax Centre
December 5, 2020

The Gang's All Here

By: David Hoskin

The “Gang of Four” refers to a row of 4 large impact craters (Langrenus, Vendelinus, Petavius, and Furnerius) located on the southeast side of the Moon. The craters that comprise the “Gang” are nearly circular in shape but appear oval when viewed from Earth due to foreshortening. The descriptive nickname for this lunar feature was coined by Dave North, an amateur astronomer and past president of the San Jose Astronomical Association.

The “Gang” become visible on day 2 of the lunar cycle, but the best view of these craters and their features, in my opinion, occurs on day 3 of the lunar cycle when the terminator has advanced to the west. If you are clouded out on these days don't despair, another good view of the “Gang” occurs a few days after



“Gang of Four” taken by David using an ASI290MM CMOS camera and a 200-millimeter Schmidt-Cassegrain telescope

the Full Moon during the Moon's Waning Gibbous phase. Although not visible to the naked eye, the “Gang” can be easily seen through binoculars; however, a telescope is necessary to observe the distinctive features of these craters.

From north to south, the first prominent crater south of Mare Crisium is Langrenus; next, comes Vendelinus, followed by Petavius and Fernerius. Langrenus, named (after himself!) in 1645 by the Flemish astronomer Michel Florent van Langren, has a diameter of 132 kilometers.

The crater has prominent central peaks that rise a kilometer above the crater's floor and broad terraced ramparts, as well as many external ridges and furrows. Vendelinus, named after another Flemish astronomer, Godefroy Wendelin, is an ancient impact crater with a diameter of 147 kilometers.

The age of Vendelinus is apparent from its worn and battered walls that have been extensively eroded by subsequent impacts. Vendelinus has no central peak, although the crater's relatively flat floor is scarred by several small craters. Ridges on the floor of Vendelinus were formed by the impact that created the crater Lamé on Vendelinus' east side. Petavius, at 177 kilometers in width, is the most impressive crater in the "Gang".

Named after the Jesuit theologian and astronomer Denis Pétau, Petavius has a prominent central mountain massif, extensively terraced walls, and an external network of ridges and furrows. As shadows shorten on day 3 of the lunar cycle, Petavius' amazing floor is revealed. Sinuous rilles can be seen to extend across the crater's floor. The most impressive rille is Rimae Petavius, which runs in a more or less straight line from the central mountains to the southwestern inner wall of Petavius. Rima Petavius, a fault feature formed by crustal tension, is visible with a small telescope and gives Petavius the appearance of a clock face with its hour hand at the 8 o'clock position. The western wall of Petavius joins with a smaller crater, Wrottesley, which is as deep as Petavius and also contains central mountains.

Last, but not least, is 125 kilometer-diameter Fernerius that, like Vendelinus, is a very old crater with eroded walls and no central mountains. Look closely when the lighting is right and you will see that Fernerius' floor is marked by a number of small impact craters ranging in width from 8 to 58 kilometers, as well as a 50 kilometer-long rille named Rima Fernerius.

The next time you spy the young Crescent Moon setting in the west, pick up some binoculars or your grab-and-go telescope and take some time to admire the "Gang of Four"!

Resources:

Moon Observers Guide by Peter Grego, Firefly Books, 2004.

The Hitchhiker's Guide to the Moon @ [www. https://shallowsky.com/moon/](https://shallowsky.com/moon/)

The Moon in Close-up by John Wilkinson, Springer, 2010.

Thank YOU, RASC Halifax

By: Charles White

Thank you, and I do mean YOU. You the Centre member reading this column right now. After three years of putting Nova Notes together, this is the last one. The final curtain drop for me. Putting this together has been a lot of fun over the last three years, and there has been loads of great articles and images to go into the pages of the last fifteen editions. But none of those editions would be possible without the contributions, the images, the sketches, and everything else that goes into putting one of these every couple of months. All of these contributions come from, you guessed it, YOU!

It's what makes the RASC a great place for amateur astronomers. We have a great base of resources, both material and in person to draw from and I know personally I have had to draw on that experience many, many times. So with the new co-editors coming in, I wanted to just remind everyone who reads this newsletter that the quality and content of it depends solely on contributions from us. Let's help them out in 2021 by giving them lots of great things to work with, articles, sketches, images and the like. I added my own flair and stamp on it when I started packaging, it's time for them to add their own and I would love to see the Centre provide lots for the co-editors to work with.

To all the proof readers as well, thank you for slogging through. I am not an English major, and at times it was quite evident, so again thank you for that. While I am grateful for all the help with everything submitted, I would like to give a special shout out to David Hoskin, given the difficulty of 2020, he provided the lion's share of images, and articles provided.

In closing, this small little chapter of my time here at the RASC has been an absolute blast while I was doing it. I just want to again say thank you to everyone who has helped me, helped the newsletter and I hope that you continue your contributions to this great newsletter.

I'm not going far, I'll still be around and can't wait until we can finally start doing big outreach events again.

Clear skies