

# 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](http://www.halifax.rasc.ca) [halifax@rasc.ca](mailto:halifax@rasc.ca)



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### Cover Photos:

#### Main Photo:

Perseids Meteor Shower Peak  
Composite Stillwater Lake, NS  
August 12/13, 2023  
by **Jason Dain**

#### Thumbnails (L-r):

St. Croix Observatory  
drawing by  
**Mary Lou Whitehorne**

**Note: All photos and original works in this edition are the copyrighted property of the photographers, writers and artists. Permission to use any of their photos for other purposes must be obtained from the photographer.**

## Have something to share?

Articles, reviews,  
photos and sketches  
welcome!

email:

[novanoteseditor@halifax.rasc.ca](mailto:novanoteseditor@halifax.rasc.ca)

# From the Editor

Since a picture is worth a thousand words, I decided to dedicate this page to reliving some of the wonderful memories Rob and I got to make this summer during our visit to Nova Scotia. If I could have a re-do, I would have taken so many more photos, and a group photo too, but there was the fine line between being behind the lens and living in the moment.

It has been a challenging summer for so many of us. Weather and smoke prevented many of us from observing and enjoying the hobby. Getting to meet many of you and share in some personal celebrations definitely made up for that.

Special shout out to Judy and Jerry Black for their hospitality and being the best tour guides ever. Additional thanks to all who took time to show us what makes the Maritimes so special!

Thank you, from the bottom of my heart for making our own sunshine this summer! Cheers! To new memories yet to be made!

With continued gratitude,

Lisa



The first RASCal we met was Tim Doucette at Deep Sky Eye!



Many thanks to John Read for showing us BGO (and for starting me on this journey!)



Cheers! To friendship! Cider with Jaime Whynot and Judy Black



Peggys Cove with Judy and Jerry Black



Co-editors!  
(with John McPhee)



Sharing many laughs and greetings at SCO



Thanks to everyone who braved the heavy rain for some fun at SCO!

## Upcoming Meeting Dates

- November 4
- December 2 (Members Meeting + AGM)

### 2024 Dates Coming Soon!

We are now hosting hybrid live/Zoom Members' Meetings. Halifax Centre meetings are usually held on the first Saturday of the month, except for July and August.

Come join us in-person in Room AT101 at Saint Mary's University or by pre-registering for the meeting on Zoom.

The meeting are recorded and become accessible shortly thereafter on our Halifax RASC YouTube channel. For information about the meeting and how to register for the Zoom session, please visit <https://halifax.rasc.ca/index.php/activities/rasc-events>

For past meeting replays, visit our YouTube Channel <https://www.youtube.com/c/raschalifax>



## St. Croix Observatory

Part of your membership in the Halifax RASC includes access to our observatory, located in the community of St. Croix, NS. The site has expanded over the last few years and includes a roll-off roof observatory with electrical outlets, a warm-room, and toilet 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, at [scomanager@halifax.rasc.ca](mailto:scomanager@halifax.rasc.ca).

### SCO is Open!

Go to our website (<https://halifax.rasc.ca>) for the latest SCO usage guidelines and conditions.



St. Croix Observatory  
drawing by Mary Lou Whitehorne

NOTE: As of Fall 2023, the building has lights again! (Thanks to Tony McGrath and Peter Hurley, the lights have been connected to 110v AC power.)

## Halifax RASC Board of Directors, 2023

Elected	
President	John Nangreaves
Vice-President	Patrick Kelly
Secretary	Peter Hurley
Treasurer	Gregg Dill
Director	Judy Black
Director	Gregg Dill
Director	Matthew Dyer
Director	David Hoskin
Director	Tony McGrath
Director	Kathy Walker
Appointed	
Honorary President	Mary Lou Whitehorne
Auditor (2022-2023)	TBD
Communications Committee, Chair	Patrick Kelly
Dark-Sky Preserve Committee, Co-Chair	Peter Hurley
Dark-Sky Preserve Committee, Co-Chair	Tony Schellinck
Governance Committee, Chair	Judy Black
Librarian	Jerry Black
National Council Representative	Judy Black
Nominating Committee, Chair	Peter Hurley
Nova Notes, Editor	Lisa Ann Fanning
Nova Notes, Copy Editor	John McPhee
Observing / EPO Chair	David Hoskin
St. Croix Observatory, Manager	John Liddard

## SAVE THE DATES FOR 2024!



**Dark-Sky Weekend**  
August 2-4, 2024

**New Moon August 4, 2024**

**Nova East Star Party**  
August 9-11, 2024





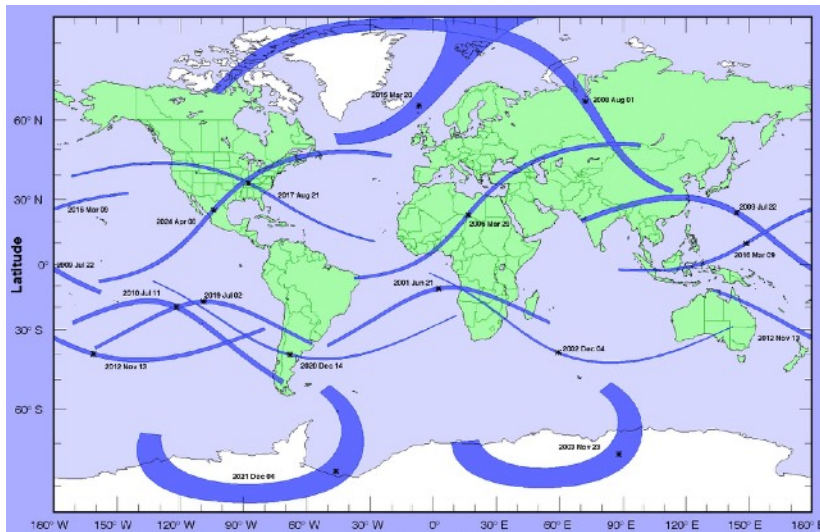
# Exiligmos: Not the Latin Word for Spreadsheet

by Patrick Kelly

Anyone who has looked at the night sky will know that a lot of things repeat in cycles. The same constellations return each season. The Sun is high in the summer, low in the winter, then high again next summer. The Moon goes through a set of phases every month. These are a few examples of ones that are easy to see.

The times it takes for these to repeat are not perfect integers, at least not using the units of time that we have adopted! In many cases, we can approximate them with a fraction, which seems to work, but can have long-term consequences. The one most people are likely familiar with is the number of days in a year: 365.25. Throw in an extra day every four years and the night sky, at a particular time, on a particular date, will be the same year after year.

Astronomy is never that simple! The actual amount of time it takes the Earth to go around the Sun is not exactly 365.25 days. There are several different ways to measure the year, but the one most usually used, from one March equinox to the next, is called the tropical year and is 365.2422 days.



Paths of Total Solar Eclipses 2001–25. From NASA web site.

The rule of adding one day every four years was introduced by Julius Caesar, and resulted in the Julian calendar. It worked well but as the centuries rolled by, people noticed that the stars at a particular time, on a particular date, had slowly drifted and were no longer as they had been in antiquity. The Catholic Church needed to be precise about dates because many important liturgical dates, especially Easter, depended on the March equinox "being on time," which it no longer was.

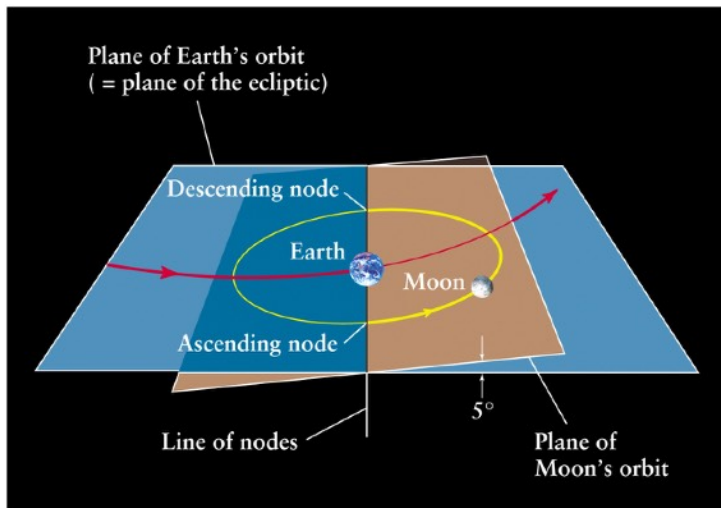
By the 16th century, the discrepancy was up to 11 days! Pope Gregory XIII had many experts look at the problem, and the net result was the Gregorian calendar.

This calendar fixed two problems: To get the dates and the sky back in sync, Thursday, Oct. 4, 1582, was followed by the first day of the Gregorian calendar, Friday, Oct. 15, 1582. To keep the sky and calendar in sync, the leap day rule was changed to only put a leap day in a century year if that year was evenly divisible by 400.

This brings us to the main topic of this column. Just as there is more than one way to measure the year, there is more than one way to measure the month, the time it takes the Moon to orbit the Earth. The one most people know (and the only one that is close to 30 days) is the synodic month, the time it takes the Moon to go from one new moon (or full moon) to the next. It is 29.530589 days long.

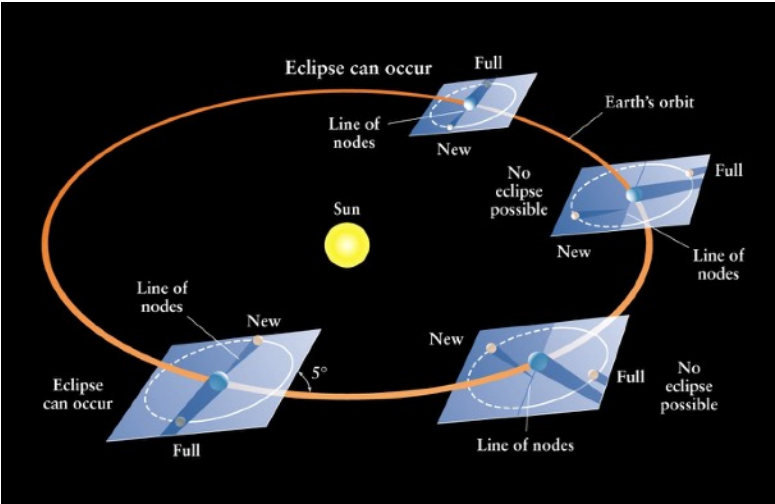
Now comes a bit of math: 223 synodic months is  $223 \times 29.530589 = 6585.3213$  days. Keep this number in mind! This is one saros and has a length of 18 years and either 10.3213 or 11.3213 days depending on how many leap days occur in a given saros. Thus whenever you have a new moon or a full moon, after one saros you will have the Moon at that phase again. The saros cycle has been known since antiquity.

Another month, the draconic month, is how long it takes the Moon to go from one of the nodes of its orbit, back to the same node. (See the accompanying diagrams.) The draconic month is 27.212221 days long. More math! Two hundred and forty-two draconic months is  $242 \times 27.212221 = 6585.3575$  days. Notice this number is almost identical to one saros! This means that if you have either a solar or lunar eclipse (which can only happen when the Moon is at one of the nodes) after one saros you will have another eclipse, almost identical to the one that occurred one saros earlier.



The Moon crosses the ecliptic twice a month as it orbits the Earth; its orbit is tilted 5° relative to the ecliptic.

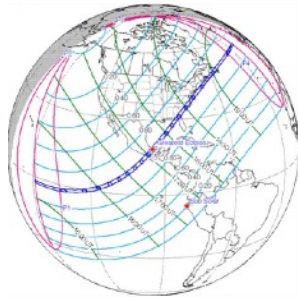
Eclipses can only occur when the line of nodes points towards the Sun as those are the only times when the Sun, Moon, and Earth all lie in the same plane. At those times, note that the Moon is either new, or full.



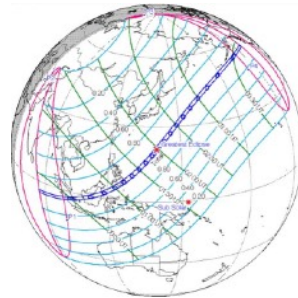
Now, we have a similar problem to that with the leap years. The saros is not an integer, it has an extra 0.3213 days. That means that if you have a total solar eclipse, one saros later the Earth, Sun, and Moon are back in almost exactly the same locations and you will have a similar total solar eclipse, but in that extra 0.3213 days (7.7 hours) the Earth will have rotated an extra  $120^\circ$ . Thus the path of the new eclipse will occur about one-third of the way westward around the Earth. After a second saros, the eclipse path will have moved a farther  $120^\circ$  west, and after a third saros it will be roughly back where it started! This time interval of three saros cycles is called an exeligmos.

Now consider diagrams showing the tracks of four total solar eclipses. Notice that the dates are just over 18 years apart (one saros), and the path of totality is almost identical in each one.

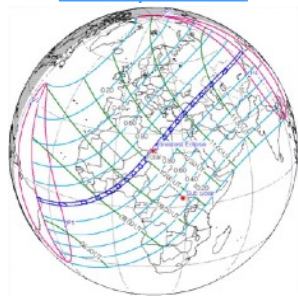
In the 2024 eclipse, the track is over New Brunswick and not Nova Scotia. I was 11 years old for the 1970 eclipse which crossed Halifax. It was totally overcast but I did see it get so dark that the streetlights came on. To date, that is the only total solar eclipse that I have “seen,” as my plans to go to Patagonia in December 2020 were thwarted by the pandemic. Hopefully, the sky will be clear on April 8 of next year!



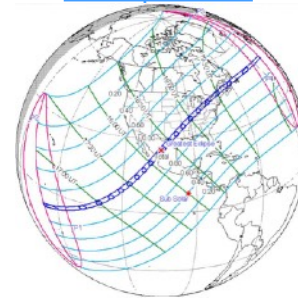
Eclipse March 7, 1970  
Credit: Fred Espenak  
[mreclipse.com](http://mreclipse.com)



Eclipse March 18, 1988  
Credit: Fred Espenak  
[mreclipse.com](http://mreclipse.com)



Eclipse March 29, 2006  
Credit: Fred Espenak  
[mreclipse.com](http://mreclipse.com)



Eclipse April 8, 2024  
Credit: Fred Espenak  
[mreclipse.com](http://mreclipse.com)

While you might expect that every exeligmos will bring an eclipse back to the Maritimes, that is not the case due, in part, to the two numbers (6585.3213 and 6585.3575) not being exactly the same. Given enough time, the slow change in the relative positions of the Earth and Moon will cause these eclipses to no longer happen. These four eclipses are all part of Saros 139, a series of eclipses that started with a partial solar eclipse on May 17, 1501 and will end with a partial solar eclipse on July 3, 2763.

The reason why maps show different tracks of solar eclipses over a period of time - such as the one with this article (for simplicity, showing just total solar eclipses) for the period 2001–2025 - is because there are many saros cycles going on simultaneously. Look and see how many pairs you can find that are just over 18 years apart. Each of those pairs is part of a different saros cycle!

# Book Review: *The Story of the Universe in 100 Stars\**

By Dave Chapman

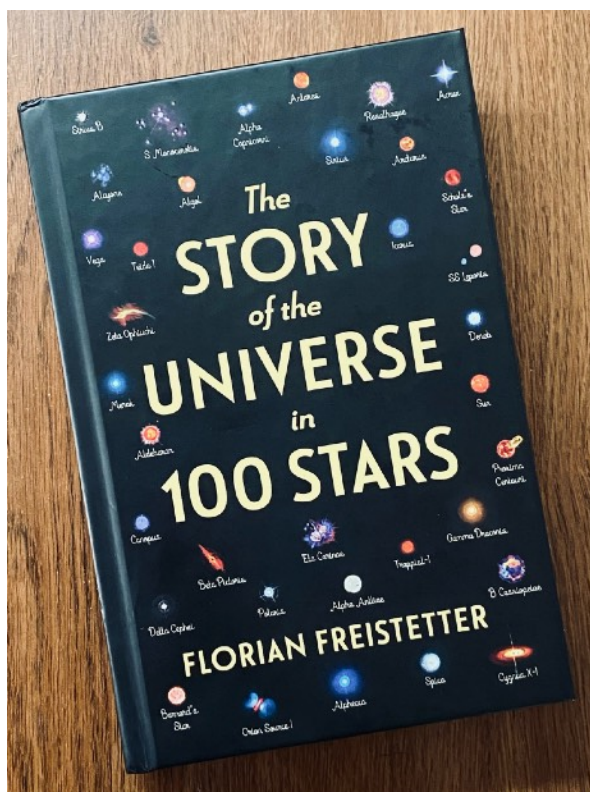
When I received this book as a 70th birthday gift this summer, at first I was worried. I'll tell you about that after, as this is supposed to be a book review.

This book teaches us much about astronomy and astrophysics by telling the story of individual stars. It is a case of communicating the general by focussing on the particular. For example, the first star described is Hikoboshi, which is the same as Altair, but the Japanese version. Right off the mark, the author teaches us that the stars are for everyone and that different cultures have different sky stories. Picking at random, the story of Z Chamaeleontis introduces black dwarf stars, which I had never heard of. The story of the Sun is all about the Astronomical Unit.

There is no obvious internal organization of the 100 stars, they are not even numbered. Each chapter is only two to three pages long, so it is a great book to read in available moments. Paraphrasing the author, the 100 stars have little in common. Some are bright and well-known; others are feeble and observable only in professional telescopes. Most don't even have sensible names, just catalogue numbers.

The book is written in a good scientific journalism style, avoiding jargon and mathematics, using plain language to convey the ideas. I believe most amateur astronomers — and even professional astronomers — would enjoy this book and would learn from it.

Now, why was I worried? I have been working on a book concept called "Stars You Should Know," and for a split second I thought someone had scooped me. Although there is a small overlap in the subject matter of these books (the author's real book and my imagined one), I really did not have anything to worry about, as I quickly discovered. The book under review is very science-oriented, where mine will be more observational and cultural in theme. Whew! Portions of my work on this have appeared in guest "appearances" on the Actual Astronomy Podcast with Canadian hosts Chris Beckett and Shane Ludtke (<https://actualastronomy.com/>).



\*by Florian Freistetter (The Experiment, New York, 2019—translated 2021)



# Food for the Soul: The Poetry of Paul Heath

## *Balance*

From farthest Sunlight's reach  
With tiny steps, does night creep  
With equal measure, day has fled.  
Our spinning sphere, in balance does appear.

The Scales, a balance holds upon the sky,  
Equality, as day and night, divides.  
The Sun, our spinning sphere in equal measure shares.  
Our spinning sphere, in balance does appear.

This day the Sun, does mark its center points,  
This night a fortune teller claims the dark,  
With season lost, at setting Sun  
Sun's rising, a season soon to come,  
While in the dark, a Hero's steed flies high,  
Our sister pinwheel, trailing, floats upon the sky.

The fortune teller's tale is heard.  
The winged stars, within the sky descend.  
Upon the spinning sphere,  
Gathering wings, the fleeing day pursue.

Soon, between shooting sky showers,  
Sunlight's harvest is gathered in,  
As Sky Hunters, their quest do win.  
And future Sunlight's yield is sown,  
While Winged Stars the sky ascend.

The Scales, a balance held upon the Sky,  
Just a fleeting turn upon the clock.  
This night, a fortune teller's tale was told  
This day, the Sun in equal measure shared.

A balance, it does appear,  
Upon our Spinning and Celestial spheres, is here.

By *Paul Heath*

## *Pot of Gold*

Upon the sky it rests  
Vibrant and strong,  
Fixed against the passing storm,  
Each vision, a storm's passion reflects.

Held upon the eye  
For each, their own piece of wonder.  
Soundless it shines  
Unless by surprise it has appeared.

Fleeting it rushes before the Sun  
Bringing joy after turmoil  
Bringing calm, Bringing wonder,  
Bringing a child's hope.

Hah! Does not your Eye  
Rush to wonders end,  
Does it not seek that glittering reflection,  
The sounds of coins falling on coins.

But a child's hope shows rarely,  
Only when storms passion is severe,  
And wonder has doubled upon the air,  
Will child's hope touch upon the Earth  
And gold's glitter be revealed.

But wait,  
Is not each coin within the pot  
But a wonder placed within your eye  
And kept safe,  
Deep, within one's mind.

By *Paul Heath*



# Member News

## Lane, Fields Co-author Remote Access Observation Paper

July, 2023 - **Dave Lane** and **Tiffany Fields** co-authored a paper with Ian Short at SMU and about a project completed in the winter of 2021 at BGO that allowed observers to secure remote access (using only a web-browser) to live spectrographic observations through the telescope.

He has since developed Python codes to easily process collected observations and compare those to simulations created by his OpenStars stellar atmosphere project (also web based).

### The Burke-Gaffney Observatory: A fully robotized remote-access observatory with a low resolution spectrograph

C. Ian Short

Department of Astronomy & Physics and Institute for Computational Astrophysics, Saint Mary's University, Halifax, NS, Canada, B3H 3C3

ian.short@smu.ca

David J. Lane

Department of Astronomy & Physics and Institute for Computational Astrophysics, Saint Mary's University, Halifax, NS, Canada, B3H 3C3

dave.lane@smu.ca

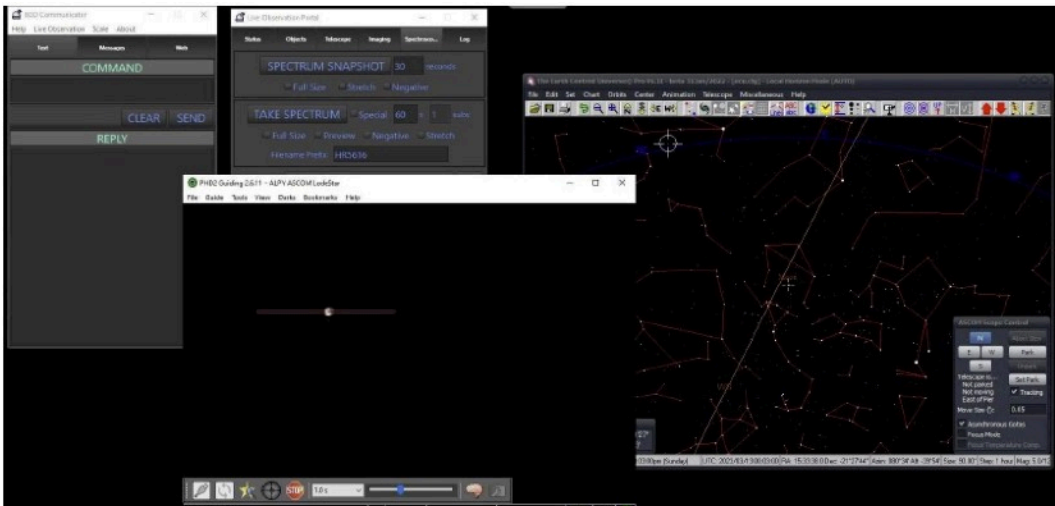
Tiffany Fields

Department of Astronomy & Physics and Institute for Computational Astrophysics, Saint Mary's University, Halifax, NS, Canada, B3H 3C3

tiffany.fields@smu.ca

The paper can be downloaded here:

[https://www.researchgate.net/publication/372404246\\_The\\_Burke-Gaffney\\_Observatory\\_A\\_fully\\_robotized\\_remote-access\\_observatory\\_with\\_a\\_low\\_resolution\\_spectrograph/link/64b4b021b9ed6874a524906b/download](https://www.researchgate.net/publication/372404246_The_Burke-Gaffney_Observatory_A_fully_robotized_remote-access_observatory_with_a_low_resolution_spectrograph/link/64b4b021b9ed6874a524906b/download)



# Member News

## Hoskin Photo appears in BBC Sky at Night Magazine

### ▽ Mars and M44

David Hoskin, Halifax, Nova Scotia, Canada, 31 May 2023



David says: "I was delighted when a clear, transparent sky allowed me to photograph Mars as it approached the Beehive Cluster, just after sunset on the last day of May."

Equipment: Canon Rebel T3i DSLR camera, William Optics RedCat51 refractor, Sky-Watcher Star Adventurer mount

Exposure: 22x 30" Software: Sequator, Photoshop, StarNet+, GraXpert

July, 2023 - **David Hoskin's** image of Mars and M44 was published in the August issue of *BBC Sky at Night Magazine*



## Dain Milky Way Photo Wins Photo Contest

July, 2023 - **Jason Dain's** Milky Way image from Polly Cove, NS has been selected as the July 2023 winner for the Viewpoint Gallery International Photo contest.

"Since 2013, ViewPoint Gallery has held a competition open to photographers located in any country around the world, with no restrictions on subject



matter. The images are reviewed by an independent jury, and the winning 12 photographs are displayed through the year at ViewPoint Gallery."

You can see the details of the image at the following link toward the bottom of the page.: [https://mailchi.mp/1f6f2c46007e/viewpoint-gallery-july-2023-newsletter-9369451?](https://mailchi.mp/1f6f2c46007e/viewpoint-gallery-july-2023-newsletter-9369451?e=8acc6430d5&fbclid=IwAR1jliTZbOUC7tI5qs57k9loOEK10IBv9ONQsCUdPIbXrdhDTt0KiGaOW0)

[e=8acc6430d5&fbclid=IwAR1jliTZbOUC7tI5qs57k9loOEK10IBv9ONQsCUdPIbXrdhDTt0KiGaOW0](https://mailchi.mp/1f6f2c46007e/viewpoint-gallery-july-2023-newsletter-9369451?e=8acc6430d5&fbclid=IwAR1jliTZbOUC7tI5qs57k9loOEK10IBv9ONQsCUdPIbXrdhDTt0KiGaOW0)

# Member News

## Mi'kmaw Moons Nominated for 2024 Yellow Cedar Award



October, 2023 - *Mi'kmaw Moons: The Seasons in Mi'kma'ki*, written by **Cathy LeBlanc and David Chapman**, illustrated by Loretta Gould and published by Formac Publishing Company Limited has been named one of ten finalists for the 2024 Yellow Cedar Book Award from Forest of Reading. The Yellow Cedar Award is the category for Grades 5-8, non-fiction. Congratulations!

See the full list of nominees here: <https://forestofreading.com/yellow-cedar-nominees/>

Graphic Credit: Formac Books

## Deep Sky Eye Wins Tourism Business Of The Year Honour

October, 2023 - Congratulations to **Tim Doucette** and **Deep Sky Eye Observatory** on their award of the Tourism Business Of The Year 2023 at the Yarmouth Chamber of Commerce business awards, sponsored by Yarmouth & Acadian Shores / Côtes acadiennes et Yarmouth.



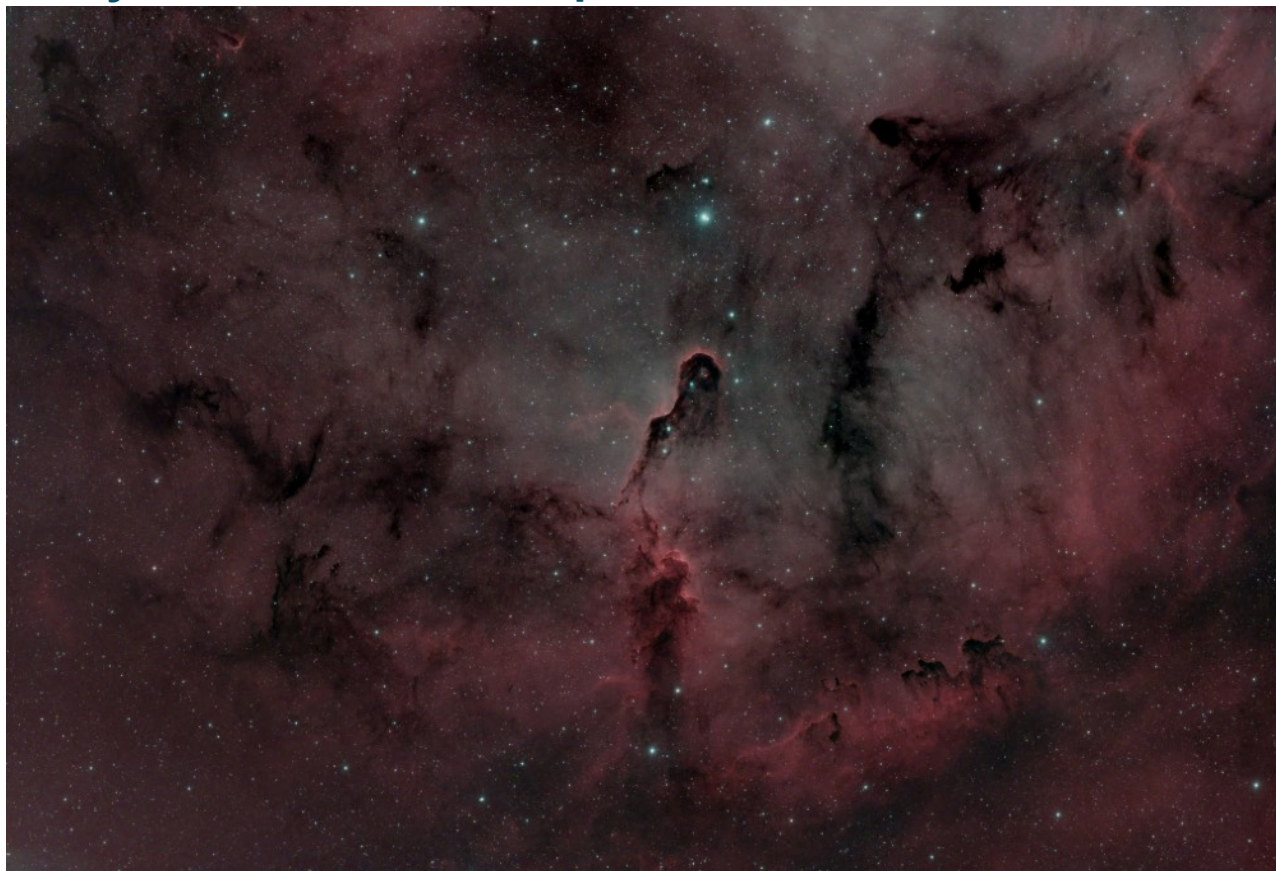
Photo credits: Deep Sky Eye Observatory Facebook





# Members' Universe

## Jerry Black Reworks Elephant Trunk Data



**Jerry Black** has reworked his image of IC 3396, the Elephant Trunk Nebula, with some recent, additional image data.

He writes: "IC 13965 (also known as the Elephant Trunk Nebula) is, according to Wikipedia, a concentration of interstellar gas and dust within the much larger ionized gas region IC 1396 located in the constellation Cepheus about 2,400 light years away from Earth. It is called the Elephant's Trunk nebula because of its appearance at visible light wavelengths, where there is a dark patch with a bright, sinuous rim."

Lower Sackville, Nova Scotia. 2022-10-18 and earlier sessions

### The Details:

Exposure 82@1200 sec (27 hours)

ISO 3200

Camera Nikon Z7 [8856 x 5504]

Optics Skywatcher Esprit 120mm Refractor,  
840 mm focal length

Radian Triad Ultra Quad-Band Narrowband Filter

Phd2 using a ZWO 224MC on an

Orion 60x240mm Guide scope

Images taken using Kstars on an

Mele Quieter 3C under Ubuntu 22.04.3

PixInsight Processing

WeightedBatchPreprocessing Script

Dynamic Crop

Dynamic Background Extraction

Image Solver Script

SpectrophotometricColorCalibration

BlurXTerminator

NoiseXTerminator

HistogramTransformation

CurvesTransformation

# Members' Universe: Blair MacDonald

**Blair MacDonald** shares “Here is a dark sky shot taken by DEO from our cottage at Marion Bridge. The target is the Cocoon Nebula, IC5146, in Cygnus.

According to Wikipedia - IC 5146 (also Caldwell 19, Sh 2-125, Barnard 168, and the Cocoon Nebula) is a reflection/emission nebula and Caldwell object in the constellation Cygnus. The NGC description refers to IC 5146 as a cluster of 9.5 mag stars involved in a bright and dark nebula. The cluster is also known as Collinder 470. It shines at magnitude +10.0/+9.3/+7.2. Its celestial coordinates are RA 21h 53.5m , dec +47° 16'. It is located near the naked-eye star Pi Cygni, the open cluster NGC 7209 in Lacerta, and the bright open cluster M39. The cluster is about 4,000 ly away, and the central star that lights it formed about 100,000 years ago; the nebula is about 12 arcmins across, which is equivalent to a span of 15 light years.

When viewing IC 5146, dark nebula Barnard 168 (B168) is an inseparable part of the experience, forming a dark lane that surrounds the cluster and projects westward forming the appearance of a trail behind the Cocoon.”



Cocoon Nebula RA 21:53:32 Dec +47:16:03  
23 August, 2023  
Marion Bridge, Nova Scotia

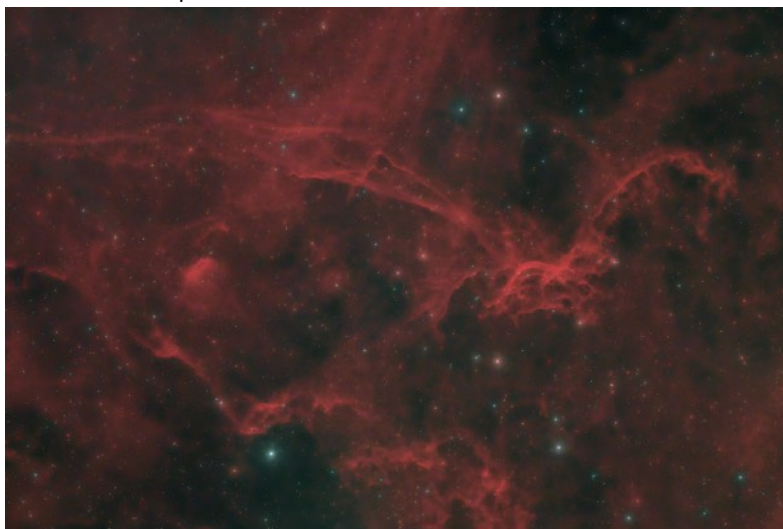
Exposure 3 hours (12 X 15 minutes)  
Conditions Bortle 4 skies.  
Gain 100  
Camera Zwo ASI2600MC-Pro  
Optics Prime focus of a SkyWatcher Esprit  
120 f/7 APO refractor with a focal length of  
840 mm  
Filter Optolong L-eNhanche  
Processing This image was captured using  
Sequence Generator Pro. Noise reduced with  
Noise Exterminator, sharpened with Blur  
Exterminator. Arcsinh stretched using Images  
Plus. This was followed by my typical split star  
processing.

**Blair MacDonald** writes: “Here is a dark sky shot taken from our cottage at Marion Bridge. The target is the Flying Dragon Nebula composed of SH2-113 and SH2-114.

Until recently, this nebular complex was rarely imaged due to its faintness. Modern equipment makes even faint targets like this relatively easy to image. SH2-114, the Flying Dragon (center right in the image) has the filamentary structure similar to a supernova remnant, but there is no evidence of a supernova in the area.”

Flying Dragon Nebula RA 21:21:14  
Dec +38:02:55  
22 August, 2023  
Marion Bridge, Nova Scotia

Exposure 4.5 hours (19 X 15 minutes)  
Conditions Bortle 4 skies.  
Gain 100  
Camera Zwo ASI2600MC-Pro  
Optics Prime focus of a SkyWatcher Esprit  
120 f/7 APO refractor with a focal length of  
840 mm  
Filter Optolong L-eNhanche  
Processing This image was captured using  
Sequence Generator Pro. Noise reduced with  
Noise Exterminator, sharpened with Blur  
Exterminator. Arcsinh stretched using Images  
Plus. This was followed by my typical split  
star processing.



Enjoy more of Blair's work here: <http://www.nightanddayastrophotography.com/>

# Members' Universe: Comet Hunting with David Hoskin



Comet Nishimura  
Sept 5 2023 at 5:20 a.m. ET  
Captured with Dwarf 2  
64 15-second exposures at  
gain 100  
Stacked with DeepSkyStacker,  
other post processing with  
Photoshop, GraXpert, MS  
Photo. Photo by **David Hoskin**

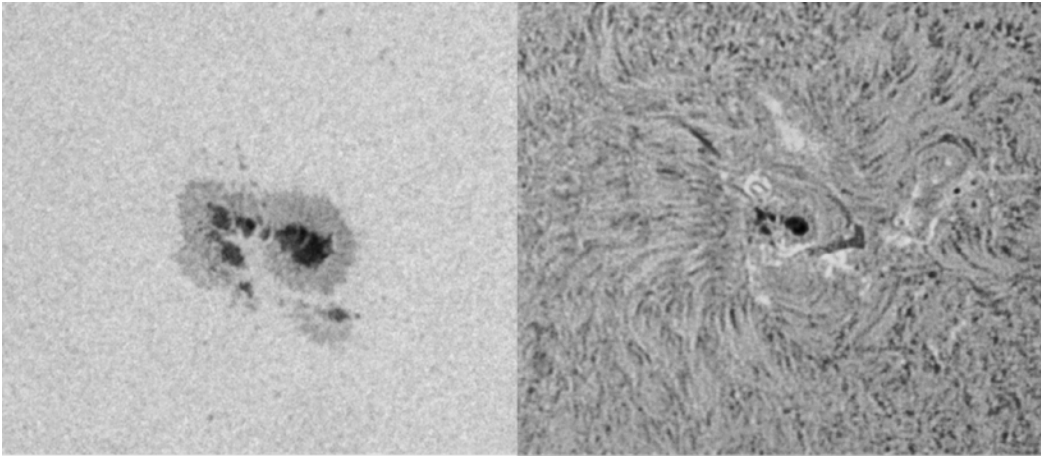
Comet Tsuchinshan-ATLAS  
June 20 2023  
Photo by **David Hoskin**





# Members' Universe:

## David Hoskin's Universe - Sun and Moon



Sunspot AR3435 in white light and hydrogen alpha September, 2023 by **David Hoskin**



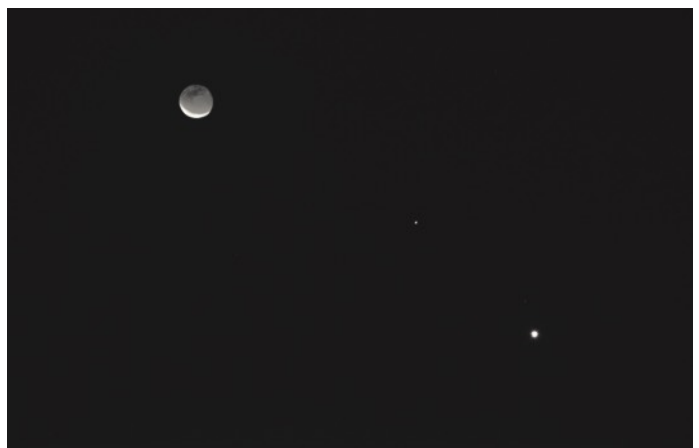
Harvest Moon (Wikewiku's/Animal Fattening Moon) over Halifax Harbour September 28, 2023 by **David Hoskin**



M45 and waning gibbous Moon October 2, 2023 by **David Hoskin**



Waning gibbous Moon October 4, 2023 by **David Hoskin**



Early morning waning crescent Moon-Regulus-Venus October 10, 2023 by **David Hoskin**

# Members' Universe: David Hoskin's Universe - The Planets



Mars M44 Venus June 12, 2023  
Image by **David Hoskin**



Mars Venus Moon June 21, 2023  
I captured these images of Mars, Venus, and the crescent Moon forming a triangle just after sunset last night. Image by **David Hoskin**



Jupiter and Ganymede, imaged at 4 a.m. on August 24, 2023.

Details: Celestron C8 SCT, 1.5x Barlow, ASI224MC camera with IR/UV cut filter, SkyWatcher EQ6R mount. Bortle 7 site, good seeing. 2000 frames of video stacked with AutoStakkert, wavelets adjusted with Registax, other post-processing with Photoshop. Image by **David Hoskin**



Saturn - August 24, 2023 Image of Saturn with the Cassini division visible in the ring system. Stack of 1500 frames using AutoStakkert, Registax for wavelets, additional post-processing with Photoshop and PhotoScape X. Image by **David Hoskin**

# PUZZLE CORNER – Terms Used in Astronomy

(See next page for clues)

## PUZZLE CORNER – Optics & Observing

### Astro Cross Words

By Judy Black

**Astro Cross Words** became a regular feature in *Nova Notes*. Five puzzles were provided to members over the course of a year's editions, the original series created by Laureen Burgoyne and Norman Scrimger. Each puzzle had a common astronomical theme. This, the first by developed by Judy Black, follows suit. The answers for this puzzle are all derived from terms used in astronomy with some perhaps more obscure than others. Good luck to everyone! Answers will be in the next edition of *Nova Notes*.

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38									39					40				
41								42										



**Across**

1. What light can become.
7. Location of cone-shaped receptors in the eye.
7. Instrument used to measure luminance of the night sky (acronym)
9. Two stars that are close together, optically or gravitationally.
11. Central group of stars found in most spiral galaxies.
14. A place where a target can be found.
16. The lens or combination of lenses to which the eye is applied.
18. Designation given to a hard, black pencil.
20. The opening in the lens through which light travels
21. Danko's accurate and most usable forecast of astronomical observing conditions (acronym)
24. The telescope lens that gathers light from the object being observed and focuses it to produce an image.
27. RASC compilation of observing information (acronym)
29. Free software used by astrophotographers to combine consecutive images.
30. Equator that is coplanar with a body's terrestrial equator
34. Celestial equivalent of terrestrial latitude
36. Any large concentration of mass at the centre of a galaxy (acronym)
38. H $\beta$  and OIII filters are sometimes referred to as this type of filter.
39. A telescope accessory used to improve details and contrast of celestial objects.
41. A determinant for observing over which astronomers have no control.
42. Brightness of the faintest star visible with the unaided eye (acronym)

**Down**

1. A type of telescope alignment.
2. Where we record personal observations.
3. A desired object to view in an observing or astroimaging session.
4. The sudden appearance of a bright and apparently new star.
5. Types of cells in the eye providing night vision.
6. Vision used to view dimmer objects.
8. Unitless measure of the brightness of a star or other celestial body.
10. Internationally coordinated time based on the average speed of the Earth's rotation.
12. The science that deals with the genesis and propagation of light and the phenomena closely associated with it.
13. An instrument used for sketching.
15. The passage of a celestial body across the line of sight between an observer and another celestial object.
17. Type of narrow-band filter used to improve details when observing or imaging.
19. The acronym for the Halifax Centre's Observatory.
20. The point at which a body orbiting the Earth is furthest from the Earth.
22. A condition in which eyes become nearsighted in low-light conditions, such as at night.
23. Preferred colour for lighting in headlamps and other equipment with light.
25. Introductory RASC observing program.
26. The line between light and dark on the Moon.
28. The width of the light beam leaving the eyepiece.
31. Type of filter used when observing the Sun.
32. A lens placed in the focusing tube to double or triple a telescope's focal length.
33. Brightness of the faintest star visible determined by the aperture and exposure duration of an observing instrument (acronym).
35. Human anatomical structure used for observing.
37. Type of vast theoretical cloud surrounding the Sun.
39. The amount of sky visible through the objective lens of an eyepiece (acronym).
40. The celestial equivalent of terrestrial longitude (acronym).

**Answers to Last Edition's Puzzle**

m	A	I	N	S	E	Q	U	E	N	C	E			P	A	R	S	E	C		
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L	U	N	A	R	A	M	A	R	E					H	E	L	I	O			
K		P		S		R		S						E				L			
Y				H	A									P	U	L	S	A	R		
W			C	H	R			N	E	B	U	L	A	I		L					
A	P	O	G	E	E			O		M	R			O	R	B	I	T			
Y			P					V		B	A			N	E						
	L	I	G	H	T	Y	E	A	R	R	B			D							
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M	A	G	N	I	T	U	D	E						L							
				D		Y			F	O	C	A	L	R	A	T	I	O			
S	A	R	O	S		N		R	A							R					
I						E			C						M	A	S	S			
D	O	P	P	L	E	R				U				M	V		N	Y			
E			L							D	E	C	L	I	N	A	T	I	O	N	Z
R	A	D	A	R						W				A		S	R	U	Y		
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L				D	A	R	K			F	L	A	R	E		S	O	L	A	R	

# September 9, 2023 RASC Halifax Centre Meeting:

(29 attendees)

To watch a replay of the meeting, please visit: <https://www.youtube.com/watch?v=kDcOSR58YdM> on the RASC Halifax YouTube Channel.

## Welcome - Pat Kelly

RASC Halifax Vice-President and program emcee Pat Kelly welcomed everyone to the monthly meeting and reviewed the agenda.

President: John Nangreaves  
[president@halifax.rasc.ca](mailto:president@halifax.rasc.ca)

[halifax.rasc.ca](http://halifax.rasc.ca)  
Contact Us

YouTube channel: [RASC Halifax](#)



Member's Meeting  
September 9, 2023



## David Hoskin - Photo Montage

David presented photographs and sketches from Centre members Jerry Black, Michael Boschat, Barry Burgess, Dave Chapman, Jason Dain, Tim Doucette, Lisa Ann Fanning, David Hoskin, Fabian Pittman, Blair MacDonald, Tom MacIntyre and Tarek El Wazzi.

## Special Presentation:

### Burning the Candle at Both Ends - My trip to Lapland 2023 - Jason Dain (Halifax Centre)

In February of 2023, I travelled to Swedish, Finnish, and Norwegian Lapland to photograph the birds, mammals and the Northern Lights. I will take you through the journey through pictures and stories. While there I was able to see and photograph some spectacular Arctic landscapes and wildlife during the day and some major solar storms during the night.

Bio: Jason Dain is an information technology professional in the natural resources sector. Jason is a passionate birder and photographer who got into birding about seven years ago when he bought a new digital camera and started taking pictures of birds and learning more about them. Jason enjoys birding around the St. Margarets Bay area of Nova Scotia where he lives, as well as other parts of the province. As part of his work, Jason gets to travel to different places around the world and has had the privilege of birding on five of the seven continents.

Jason has been involved with astronomy for just over three years. He started with photographing the Milky Way and progressed into multi-night deep space object photography. Jason has had his photographs published internationally and has been recognized with two NASA Astronomy Picture of the Day awards.



## Paul Heath - Food for the Soul - Balance

Paul presented his poem *Balance* which can be read on page 8 of this edition of Nova Notes.

## **David Hoskin (EPO/Observing Chair) - What's up for September, 2023**

David reviewed highlights of the September sky. The Autumnal Equinox is in the spotlight this month, occurring at 3:49 AM ADT on Sept. 23. He discussed the Sun, solar activity, the Moon, and targets needed to check off for Explore the Universe, and when they can be viewed. He also explained planetary positions, constellations, stars (including double and multiple) and deep sky objects. Also highlighted was the opportunity to see zodiacal light. Remember, each month, you can find David's presentations on the homepage at <http://halifax.rasc.ca>.

## **News from the Board presented by Pat Kelly**

- Governance - Updated Policies:
  - No updates over the summer but there may be changes this fall.
- *Nova Notes* content deadline is Oct. 20. Submit any content to [novanoteseditor@halifax.rasc.ca](mailto:novanoteseditor@halifax.rasc.ca)

### Upcoming Events:

#### Members' Meetings

- October 14 (Members' stuff!!)
- November 4 (Tim Doucette - Visiting the Canada-France-Hawaii Telescope)
- December 2 (Plus AGM)

### Other events:

- 2023 St. Croix BBQ will be held Friday, Sept. 15 / rain date Sept. 16

## **October 21, 2023 RASC Halifax Centre Meeting:**

**(26 attendees)**

To watch a replay of the meeting, please visit: <https://www.youtube.com/watch?v=SPh4VCLvZW0> on the RASC Halifax YouTube Channel.

### **Welcome - David Hoskin**

RASC Halifax Director, Observing / EPO Chair and program emcee David Hoskin welcomed everyone to the monthly meeting, shared the Indigenous Land Acknowledgement, statement on inclusivity and diversity and reviewed the agenda. Additionally, he introduced the concept of the new Members' Presentations segment - where members are encouraged to share their astronomy favorites, book review, challenges or anything that would be of interest to the group. The aim of this segment is to get members engaged in the centre.

### **David Hoskin - Photo Montage**

David presented photographs and sketches, including a photo of the Northern Lights from the air by Roy Bishop's grandson who is an airline co-pilot, Centre members Jerry Black, Michael Boschat, Barry Burgess, Jason Dain, David Hoskin, Blair MacDonald, Tom MacIntyre and Gaurav Singh.

### **Chris Young - SkyLore Man In the Moon Edition**

Chris Young gave a presentation of the lore of the Man in the Moon. He discussed the phenomenon of pareidolia, which causes people to see patterns such as animals and faces in objects like the Moon.



Chris Young and the  
"Man in the Moon"  
Photo by Dave Chapman



## **Members' Presentations**

### **Dave Chapman: *Mi'kmaw Moons: Through the Seasons***

Dave told the story of how the book *Mi'kmaw Moons* by Cathy Jean LeBlanc and David Chapman came to be. There have been 4,000 copies sold and distributed with another printing in the works. The book has also been nominated for an award. Dave read one of the stories from the book, which can be purchased online or by contacting Dave directly.

### **David Hoskin - "Show and Tell"**

David shared the following book recommendations: *Moon: An Illustrated History: From Ancient Myths to the Colonies of Tomorrow* by David Warmflash and *100 Things to See in the Night Sky* by Dan Regas.



David Hoskin and his Dwarf II  
Photo by Dave Chapman

And he shared his Dwarf II Mini Robotic Telescope.  
A full review can be read in the May/June edition of *Nova Notes*.

### **Jerry Black - "Show and Tell"**

Flip-Flat, a USB controlled device that fits on the end of your telescope, which enables astrophotographers to take dark exposures remotely, rather than manually at the telescope. It also has an LED to allow a user to take a "flat" frame.

### **Paul Heath - Food for the Soul - *Pot of Gold***

Paul presented his poem *Pot of Gold*, which can be read on page 8 of this edition of *Nova Notes*.

### **David Hoskin (EPO/Observing Chair) - What's up for October, 2023**

David reviewed highlights of the October sky and autumn features. Nights are getting longer. (If only we would have clear skies!). Also highlighted are the Sun, solar activity, the Moon, and targets needed to check off for Explore the Universe, and when they can be viewed. He also highlighted planetary positions, constellations, stars (including double and multiple) and deep sky objects. Remember, each month, you can find David's presentations on the homepage at <http://halifax.rasc.ca>

### **News from the Board presented by Peter Hurley**

- SCO is open! But access is limited due to this summer's flooding and construction is underway for repairs. Cars are advised not to use the road.
- Many thanks to Tony McGrath for stepping in while John Liddard was recovering from a broken arm, and to Bob Russel and Jerry Black for their work as well.
- 2024 RASC Calendars available for sale - \$25 for Canadian members or \$30 CDN for American members (both prices include tax and delivery.) Payment by check, money order or e-transfer.

### **Upcoming Members' Meetings:**

- Nov. 4 - Tim Doucette will present "Visiting the Canada-France-Hawaii Telescope"
- Dec. 2 - New member, John Badowski will present "Percival Lowell and the canals of Mars"
  - That is also the date of the AGM. Elections for the Board of Directors will take place.
- Nov. 2 - St. Mary's University Dan MacLennan Memorial Lecture in Astronomy. Dr. Kristine Spekkens, will be speaking about "Galaxies, Cosmology and the Radio Telescope Revolution: Paving the Way to the SKA."

## ***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.