

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

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Cover Photos:

Main Photo:

First quarter moon
(54.9% illuminated)
November 11th, 2021
Lunar X and V visible
by Jaime Whynot

Thumbnails (l-r):

St. Croix Observatory
drawing by
Mary Lou Whitehorne

M45 (Pleiades or
the Seven Sisters)
by David Hoskin

Halifax Centre Logo

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From the Editor

Many of you know that I'm a birder as well as an amateur astronomer. Not to mention, I know quite a few folks in the centre are also birders as well. We birders are thrilled by the idea of the "tick" - no, not the eight-legged kind, but rather, checking off a species off your life, year, day or patch lists.

Having come to astronomy only recently, I've applied that same discipline to my observing as well. Give me a list as a set of goals, and my telescope, and let me at it! (I suppose that is the appeal to me about RASC observing programs.)

I always enjoy hearing what motivates others to share in this wonderful hobby. I love seeing your logbooks, sketches, photographs and hearing what you are working on.

We are almost about to turn the calendar page on the month of February and enter what I am calling "Messier Marathon March." I always joke that "if you would have asked me five years ago who Messier was and how they relate to goals, I'd tell you about the New York Rangers winning the Stanley Cup in 1994." Now the name Messier brings a different kind of excitement to me.

I don't know if I will have the time, energy (thanks to a crazy project schedule at work) or clear skies to see all the Messier objects in one night, but I will surely be out there with my scope trying to see as many of those 110 gems that I can over the next few weeks.

I am sure that many of you will be challenging yourselves to see or photograph them as well. **So, I am issuing this challenge for you all for the next edition of Nova Notes: Send in your stories, photos, sketches and anecdotes and let's have a Messier-packed edition for the March/April edition.**

Keep inspiring, keep looking up! And send us your Messiers!

Wishing you clear skies!



Lisa

Meeting Dates for 2022

- **March 5, 2022:** David Shuman (Montreal Centre) (The New Space Race: A look at current Launch Vehicles and Human Spaceflight)
David Chapman (RASC, Halifax Centre) (What's in a name? How celestial objects are named)
- **April 2, 2022**
- **May 7, 2022:** Randy Attwood (2024 Total Eclipse)
- **June 4, 2022:** Karim Jaffer + Youth (Remote Telescopes and Youth Science)
- **September 10, 2022 (Labour Day = Sept 5)**
- **October 1, 2022 (Thanksgiving = Oct 10)**
- **November 5, 2022:** Marcin Sawicki, SMU (NIRISS – Near InfraRed Imager & Slitless Spectograph)
- **December 3, 2022**

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 YouTube. For more information, please visit <https://halifax.rasc.ca/index.php/activities/rasc-events>

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 at scomanager@halifax.rasc.ca.

SCO is Open!

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



St. Croix Observatory drawing by Mary Lou Whitehorne

Halifax RASC Board of Directors, 2022

Elected

President (Also Appointed: National Council Representative; Chair, Governance Committee)	Judy Black
Vice-President	Patrick Kelly
Secretary (Also Appointed: Chair, Nominating Committee)	Peter Hurley
Treasurer	Gregg Dill
Director	Tim Doucette
Director	Matthew Dyer
Director	Paul Heath
Director	David Hoskin
Director	Kathy Walker
Director	Jaime Whynot

Appointed

Honorary President	Mary Lou Whitehorne
Auditor (2021-2022)	Dave Lane
Dark-Sky Preserve Committee, Co-Chair	Peter Hurley
Dark-Sky Preserve Committee, Co-Chair	Tony Schellinck
Librarian	Jerry Black
Nova Notes, Editor	Lisa Ann Fanning
Nova Notes, Copy Editor	John McPhee
St. Croix Observatory, Manager	John Liddard

Nova East Star Party

SAVE THE DATE FOR 2022!

August 26-28, 2022

(New Moon August 27 @ 5:17 AM)



A Message from the President

One thing that impresses me about the RASC is the level of volunteerism of our members from coast to coast to coast, and never more so than here in Halifax Centre. Ivan Scheier once said the broadest most meaningful definition of volunteering was “doing more than you have to because you want to, in a cause you consider good.”

I’ve discovered that the vast majority of ‘volunteers’ within the RASC certainly fit that definition. Never do we have to worry about members stepping up when assistance on any project is needed, whether it be committees, task teams, outreach, or work to be done at local observatories.

Then, when you pair that with the sheer excitement of sharing knowledge and the wonder of night skies, you realize we have an utterly amazing team of amateur and professional astronomers within Halifax Centre. Their breadth of expertise is amazing as well. Our Centre is active and alive because of their additional expertise – architects, engineers, teachers, computer programmers/‘geeks’, accountants, nurses, physicians, scientists with various expertise, just to name a few. Just think about hosting an event like Nova East without medical aid (should it be required), renovating or building at SCO, conducting the annual audit, developing our website and other social media, or determining what to do with the turtle nests at SCO. Without the various expertise of our members outside of astronomy, these could never be accomplished as easily.

Helen Dyer once stated that “volunteerism is the voice of the people put into action. These actions shape and mold the present into a future of which we can all be proud.” I agree with Helen Dyer. We can all be proud of what we are building together. Throughout 2022, the Board of Directors will incorporate the many suggestions made in the member survey conducted in June and November 2021. Thanks to those who responded, a variety of topics will be addressed in the coming year, including equipment and adjunct reviews, member observing, youth programs, remote telescopes, and so much more. If you have suggestions for a topic you wish to see addressed, please contact us.

Stay safe. Stay healthy. Looking forward to another year of the opportunities for observing and being with fellow astronomers.

Cheers to one and all!

Judy

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.

Space2Inspire: The Art of Inspiration

A collaboration between Inspiration4 Astronaut Dr. Sian Proctor, and RASCal, John A. Read

by John A. Read



I've known Dr. Sian Proctor since 2020, before she was an astronaut. We met at the Explore Mars virtual happy hour. She had written a book called *Meals For Mars* based on her time at HI-SEAS, the Mars simulation facility in Hawaii. We met (via zoom) in late 2020 to discuss *Meals For Mars* and brainstorm collaboration on future books.

However, our book plans were unexpectedly interrupted. In early 2021, Dr. Proctor told me that she might be tied up with a new television program. What really happened was that she was selected to be the pilot of the Inspiration4 mission to space. Part of the mission would include a five-episode Netflix special. Our book projects were put on hold, indefinitely.

For those not familiar with the Inspiration4 mission, this was fundamentally a fundraiser for St. Jude's Children's hospital. It was also the first all civilian orbital mission to

space. The four-person crew had to train together for several months, learning to fly the Dragon Spacecraft, and learn to work together as a team. They did most of the things that all astronauts do: they completed parabolic flights to experience microgravity, trained in a centrifuge, flew fighter jets, and even climbed a mountain.

The mission was also a science mission, and a mission of inspiration. They tested cutting-edge medical devices, including a tiny AI controlled ultrasound and a miniaturized blood sample analyzer. During their space flight, the crew spent time on video calls with the patients and staff of St. Jude. One of the astronauts, Hayley Arceneaux, is a pediatric cancer survivor, with a prosthetic inside her leg. She was a patient at St. Jude before getting a job there as a physician assistant. The Inspiration4 mission ultimately raised over \$200 million for the cause.

Dr. Proctor used some of her time in space to explore her passion for poetry and art. She brought some of her art with her to space, and even created an original piece while on orbit using special paints. Her style is called Afrofuturism, with its goal to "encourage conversations about women of colour in the space industry".

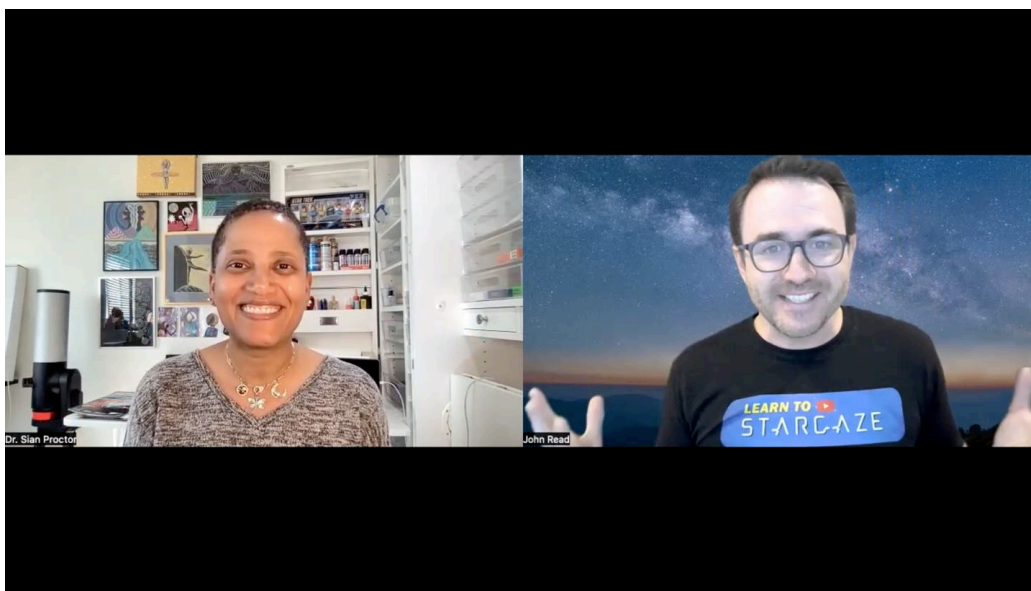


Painting called "Suspended By You" completed while on orbit.

A few weeks after her return from space, Dr. Proctor called me and asked me to collaborate on a new project. She had a collection of her art, and poetry and asked me to help her create a book that would not only showcase these pieces, but help people feel the connection between art and exploration.

The book started off small, less than 40 pages. I encouraged Dr. Proctor to include more about her background, legacy, and spaceflight experience. Over several weeks of collaboration, we more than doubled the page count. But this book isn't contained to just the pages. The entire book is an augmented reality (AR) experience. Download a special app, point your phone at the pages, and each and every spread comes alive with either a video from the Inspiration4 mission, or an animated version of the art with a recording of each poem being read.

The book is called *Space2Inspire: The Art of Inspiration*, and is available now on Amazon. We're currently in the process of gathering reviews (so please write one if you receive a copy). A hardcover edition is also in the works, which we'll plan to distribute to bookstores. We're also working on a Kindle edition with the AR content uploaded directly into the file as videos.



Recording an interview for an upcoming
LearnToStargaze YouTube Video

This won't be the last collaboration between us. I recently interviewed Dr. Proctor for an upcoming video on my YouTube channel, [LearnToStargaze](https://www.youtube.com/channel/UC...). We've also got plans for more books, and other projects. So, stay tuned! And remember, *the Future is Looking Up!*

Sherman Williams

Nature's Naturalist 1939 – 2021

by Roy Bishop

For nearly six decades Sherman was my best friend and fellow explorer of many aspects of this incredible universe. I dedicate this article to his memory.



photo credit: Jeff Dalton

Early Years

Sherman and I each spent the early part of our lives on a small farm, Sherman on his father's farm in Pugwash Junction, I on my paternal grandfather's farm in Greenwich, near Wolfville. Sherman remained on the farm until he attended Agricultural College in Truro. I moved to the industry-based town of Hantsport when I was two, although I visited my grandfather's farm nearly every Sunday for another decade. In that respect both Sherman and I had childhoods close to nature. The late American amateur astronomer Leslie Peltier described that influence in his classic book *Starlight Nights*:

“Blessed are they who are raised on a farm. Nowhere else in the whole wide world can one acquire a keener appreciation for the things in life that are really worthwhile.”

I first met Sherman in 1963. After two years of graduate studies, I arrived back in Nova Scotia that summer as an assistant professor at Acadia University. I found a house to rent in Port Williams, a ten-minute drive from Acadia. A year earlier Sherman had arrived in the same community, and was appointed principal of its elementary school in 1963. Our wives were each expecting their first child that autumn, and we attended the one church in Port Williams.

From early 1964 through mid-1966 Sherman and I discovered that we had many interests in common, most involving natural history. An event that Sherman remembered all his life occurred on the evening of March 9, 1965 when I arrived at his school with a refractor telescope borrowed from Acadia. Sherman's class of some twenty children had their first looks at lunar craters and mountains, the cloud belts of Jupiter, and Jupiter's four Galilean satellites.

Another memorable date that year was November 3. From the Starr's Point Road east of Port Williams, in the cold, dark, pre-dawn, southern sky, Sherman and I saw the great Sun-grazing comet, Ikeya-Seki. The comet was then 13 days past perihelion, and from its star-like head a long, glowing tail sprawled seventeen degrees westward above the Wolfville Ridge, from the constellation Corvus, across Crater, and into Hydra. It was Sherman's first comet. In the eastern sky before twilight began that morning we encountered another apparition, the tall, tilted, ghostly pillar of the zodiacal light. Neither of us had seen it before. Back then, now more than half a century ago, there was less light pollution to interfere with such sights.

A month later, with a 7x50 monocular and a star chart, I was following the bright asteroid Vesta as it drifted slowly from night to night against the background stars. One evening I invited Sherman over to have a look. Most people never get beyond "a look", but that evening Sherman proved to be one of those rare individuals for whom a look ignites a passion to know and experience the universe beyond our small planet. During the weeks that followed, on his own initiative and with his binoculars, Sherman followed Vesta, recording its path in sketches annotated in his elegant handwriting.

That winter we each acquired an astronomical telescope. Sherman purchased a small refractor, a 60-mm Unitron. I bought a 127-mm, f/4 achromat, an Amici prism (both "war-surplus" items), a 20-mm Erfle eyepiece and, with plywood, assembled an RFT (rich field telescope).

In the summer of 1966 Sherman and I with our families left Port Williams and headed west, he to take a teaching position in Alberta in the foothills of the Rockies near Jasper, I to pursue further graduate studies in Manitoba. By coincidence, in the summer of 1969 we both arrived back in Nova Scotia. I returned to my position at Acadia, and Sherman extended his knowledge of natural history by completing a B.Sc. in biology at Acadia in 1973.

Sherman and I shared many experiences during more than half a century. Remarkably, we discovered two that we had shared before we even met! One we were able to date: 1945 July 9. We were five years old. Sherman was at home in Pugwash Junction, I was at home in Hantsport. Sherman's father coated a pane of glass with soot from a smoky kerosene lantern (electricity had not yet arrived in Pugwash Junction). My father used a candle flame for a similar purpose, to make a dark filter to allow viewing the partial eclipse of the Sun that morning. For Sherman and me, it was our first eclipse. My first lasting memory of the mystery of the sky had occurred a few years earlier when my mother pointed out the constellation Cassiopeia. The 1945 eclipse reinforced that mystery, turning it into celestial magic. Things actually happen beyond Earth!

Becoming a Naturalist

Sherman once told me of a pivotal experience in his appreciation of the natural world. It occurred in his mid-teens on the farm. One sunny day in a field he spotted a male Ring-Necked Pheasant that was quietly preening its feathers. He raised a rifle and shot it. When Sherman got to where the bird lay, he was shaken by the contrast: what had been innocent, beautiful, and alive was now a blood-splattered corpse. A century earlier, the poet, naturalist and philosopher Henry David Thoreau wrote:

"[The young man] goes thither at first as a hunter or fisher, until at last, if he has the seeds of a better life in him, he distinguishes his proper objects, as a poet or naturalist it may be, and leaves the gun and fish-pole behind."

That day Sherman was on his way to becoming a naturalist.

Sherman became the most versatile naturalist I have known. In terms of the subjects cited in the introduction to the original 1974 Constitution of the Blomidon Naturalists Society, Sherman knew “the rocks, plants, animals, water, air, and stars”:

Rocks

Sherman could classify a rock in terms of its composition, structure and origins, be it sedimentary, igneous, or metamorphic. He could read the history that rocks carried, whether it involved slow cooling for millions of years deep underground, or glacial scoring or placement a mere twenty thousand years ago during the last ice age. His home during his last 46 years was at Horton Bluff, one of the most important fossil-rich areas in the world for its early Carboniferous record of the emergence of life from the sea onto the land. Winter frosts, pounding waves, and turbulent tides wrench slabs of shale from the bluff and scatter them along that beach. During the many field trips he led at Horton Bluff, Sherman loved to explain to children and curious adults the nature of strange patterns they found in those rocks. He could read the messages in the scattered pieces of shale as if they were pages ripped from a 350-million-year-old book.

Plants

Many a time I have watched Sherman on his hands and knees as he inspected something small and green on the forest floor, described the several species of ferns sprouting in the woods early in May, examined a flower, explained how a lichen survives on a rock, or as he identified the species of a tree. I recall a night when he took me deep into a forest to see a bioluminescent mushroom he had discovered glowing dimly in the inky darkness. Sherman knew the structure of flowers, the life cycles of many plants, what plants are closely related to others, how soil conditions determine where plant species are apt to be found, their common names and, in many cases, their Linnaean names as well.

Animals

Having grown up on a farm, educated at the Nova Scotia Agricultural College, and with an Acadia degree in biology, Sherman had a broad knowledge of animals. He particularly enjoyed birds and was skilled at identifying a bird by sound alone, from the joyous, tinkling cadence of an invisible Winter Wren, to the thin squeal of a Bald Eagle high in the blue sky. Not only did he know their calls and songs, but also he could imitate the calls of several birds. Participants in evening field trips he led were sometimes pleasantly startled by his imitation of the call of a Barred Owl, and even more impressed when, from the deep woods, an owl occasionally returned his call.

Water

For more than four decades Sherman and I have lived on the edge of Minas Basin. Many a time we discussed the Bay of Fundy and its tides. As the years passed, our understanding of the tides grew: how variations in the wind, in barometric pressure, and the several cycles of the motion of the Moon are linked to what we were seeing at the edge of the tide. By the time Sherman was 50, the capabilities of personal computers had matured to the point where he used them to generate monthly charts displaying the cyclic variations of Minas Basin tides. For several years he provided various tourist bureaus and restaurants with those charts, including the times for high tides each day, and for tidal bores in the Windsor and Truro areas. Sherman delighted in meeting tourists at tidal bore viewing sites to explain what they were about to see, a practice he pursued until last year when he no longer had the strength to continue.

Air

Having spent his youth on a farm where weather impacts daily schedules, Sherman was attuned to variations in temperature, humidity, wind and cloud cover. Both he and I had grown up listening to the CBC weekly radio program “Ask Your Weatherman”, introduced by a roll of thunder and hosted by the legendary Rube Hornstein with his sonorous voice. (Television did not exist before we were teenagers.) Ability to read the wind and clouds maintained its usefulness in later years as Sherman became increasingly familiar with the sky and the weather prospects for using his telescopes for a night of observing, or for scheduling an astronomy field trip for the Blomidon Naturalists Society.

Stars

Sherman was also a Naturalist of the Night. He knew the night sky well, with its planets, stars, constellations, bright and dark nebulae, galaxies, where they are located, and how their positions in the sky change with the hour of the night, with the seasons, and with the latitude of the observer. Not one person in a thousand knows the universe that well. It is a familiarity that comes only through years of observing with the assistance of a good star atlas and a manually operated telescope. Once that familiarity is attained, the hours offered by a dark, clear night are powerfully enticing, an opportunity to immerse oneself in celestial exploration and beauty. The stars and where they are located become as familiar as the objects in one’s own home.

A Birthday Gift

One of my fondest memories is the birthday gift I received from Sherman in the year 2000. I mention it because it demonstrated not only our close bond, but also Sherman’s computer expertise and his knowledge of observational astronomy. Three years earlier the International Astronomical Union had honoured me by naming minor planet (asteroid) number 6901 “Roybishop”. Sherman realized that the telescope I had built for my observatory in 1993 with its 444 mm aperture might have enough light grasp to enable us to see the asteroid.

The evening of 2000 September 22, my 61st birthday, was clear and moonless. A cold front had come through the night before resulting in a transparent sky. Sherman did not tell me what he was up to that day. Near the end of evening twilight he arrived at my door with a folder containing nine sheets of paper. The top sheet was a black-on-white image of hundreds of stars with “Happy Birthday Roy” printed across it and an arrow pointing to where “6901 Roybishop” was predicted to be that evening.

Sherman had gone on the Internet and discovered that the orbital positions of Earth and asteroid 6901 were such that the asteroid was well placed in the late evening sky early that autumn. On the website of NASA’s Jet Propulsion Laboratory he obtained the precise coordinates of the asteroid for 9 p.m. that evening, and on the website of the Palomar Sky Survey he found and downloaded a photo showing all stars to magnitude +20 (extremely faint) for the quarter-degree-square patch of sky in eastern Cygnus where the asteroid would be located. He then prepared a sequence of three finder star charts at progressively larger scales to enable me to find that small patch of sky (I prefer to know the sky, so have no electronic aids to aim my telescope.). Those nine sheets of paper represented several hours work on his part. Sherman then left me alone to study his birthday gift and undertake a search.

Within two hours I found the asteroid, at magnitude +16.2 a barely visible but definite speck of light that was not on the Palomar photo. It was visible only about 20% of the time, as the rod cells in my viewing eye shifted past its point-like stream of photons. Within fifteen minutes its slow drift relative to the background stars was obvious, confirming its identity as a minor planet in the inner Solar System. Roy Bishop was looking at asteroid Roybishop!

Immediately I called Sherman and invited him over. Forty minutes after my last observation, without showing him my annotated Palomar photo, on a fresh copy of the photo Sherman marked where he spotted the asteroid, right where the drift I noted earlier had carried it.

Two and a Half Societies

Sherman's versatility as a naturalist was apparent to two and a half societies. His favourite organization was the *Blomidon Naturalists Society* (BNS). A founding member of the BNS, he was among the 59 people who attended the organizational meeting held at Acadia University on March 5, 1974, and came out of that meeting as the Society's first president (1974/75). Several years later he again served as president, that time for a two- year term (1987/89).

Sherman often led field trips for the BNS, was a regular participant in annual bird counts, and was the featured speaker at some of the monthly meetings. In recognition of his many contributions, in the year 2000 the BNS awarded Sherman an Honorary Life Membership. However, at that point in time, and in terms of sheer time commitment, Sherman had completed only the first three years of his greatest, and least visible contribution to the BNS, the preparation of press-ready copy of its annual Natural History Calendar. Each autumn for 21 consecutive years (1997 through 2017), in addition to serving on the Calendar Committee, Sherman devoted a few weeks of his time and computer skills to that task, a contribution that provided great publicity for the Blomidon Naturalists Society and gave the Society a sound financial foundation.

The second society to which Sherman contributed his skills as a naturalist was the Halifax Centre of the Royal Astronomical Society of Canada. His participation spanned five decades, beginning with the meeting when the Halifax Centre was reactivated in September 1970. In recent years at many of its annual star parties in Smileys Provincial Park, Sherman gave nature walks in the surrounding forest during the day, and assisted in the sky observation sessions for the public at night.

During the past quarter century Sherman also was a valued member and participant in the informal Minas Astronomy Group (MAG). One of his memorable presentations to MAG he entitled *How I Share the Sky with Children*, a talk distilled from his experience as a summer park naturalist at Cape Breton Highlands and Kejimikujik National Parks, and 35 years as a teacher at the middle and high school levels.

To Close

I bring my comments about Sherman to a close by quoting the American writer, educator and naturalist, Chet Raymo:

“The sea. The air. The teeming creatures. Of dust and sunlight we are conjured up. A dream, each one of us, brief and fleeting and beautiful. Like flowers, like mayflies, like the Sun itself, we flourish and fade. We are the dream of the Earth. In us the Earth has become self-aware, the Universe becomes conscious.”

Kemble's Asterisms

By David Hoskin

An asterism is a grouping of stars that create a memorable pattern, which is typically smaller than constellations and often has a popular name such as the "Big Dipper." Kemble's Cascade is an asterism that will be familiar to many amateur astronomers; however, not all stargazers realize that two additional asterisms are associated with Father Lucien Kemble!

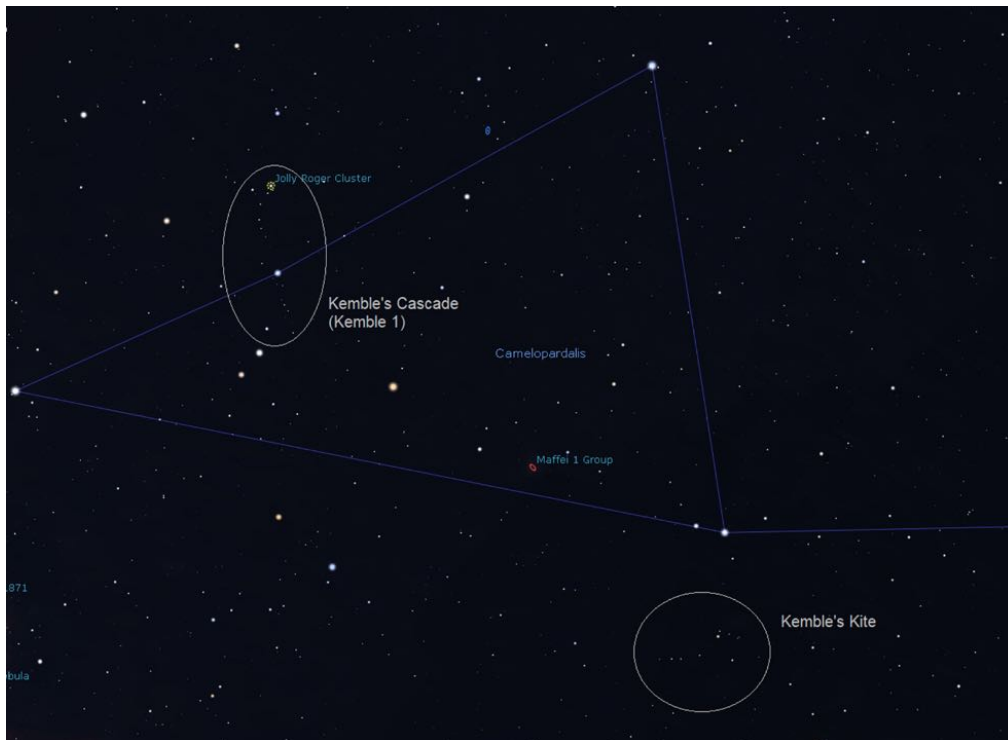
Lucien Kemble was christened Joseph Bertille Kemble after his birth on a farm near Alberta's Pincher Creek on 5 November 1922. He served as a radio operator with the Royal Canadian Air Force during the Second World War, after which he entered the Franciscan Novitiate and adopted the name Lucien. He was ordained a priest by the Franciscan Order in 1953. Father Kemble's passion for astronomy led him to become an accomplished visual observer, viewing the Moon, planets, double stars, star clusters, nebulae, and galaxies, at first with binoculars and later with a 28-centimetre telescope that he installed at his "Roger Bacon Observatory." He was an enthusiastic member of the Royal Astronomical Society of Canada, earning several observing certificates and awards, as well as having his observations and photographs published in leading astronomy magazines. At the time of his death in 1999 Father Kemble was still an avid amateur astronomer and looking forward to observing and photographing an upcoming conjunction of Jupiter and Venus.



Kemble's Cascade and NGC 1502 (photo by D. Hoskin)

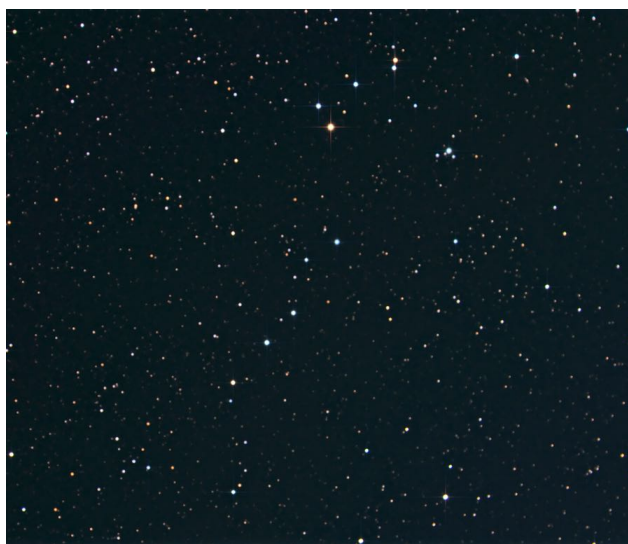
Father Kemble is best known for his discovery in 1980 of a chain of more than 20 colourful stars that ends in a compact open star cluster. His sketch of this "beautiful cascade of faint stars tumbling from the northwest down to the open cluster NGC 1502" was published in *Sky & Telescope*. Deep-Sky Wonders columnist Walter Houston named this delicate star pattern Kemble's Cascade in honour of Father Kemble. Kemble's Cascade, also known as Kemble 1, consists of 7th to 9th magnitude stars with a 5th magnitude star in the middle of the asterism. Kemble's Cascade, located in the

constellation Camelopardalis, spans 2.5 degrees and is easily seen with binoculars. In fact, Father Kemble was using 7x35 binoculars when he discovered the asterism that bears his name.



Location of Kemble's Cascade and Kemble's Kite (created with Stellarium®)

Camelopardalis is also the constellation in which one finds Kemble's Kite. This small asterism, which resembles a kite with a tail blowing in the wind, is a binocular target that was first described by Father Kemble. The variable red giant star V805 Cas, at magnitude 6.4, is the brightest member of this asterism. The rest of the "Kite" consists of 7th and 8th magnitude stars.

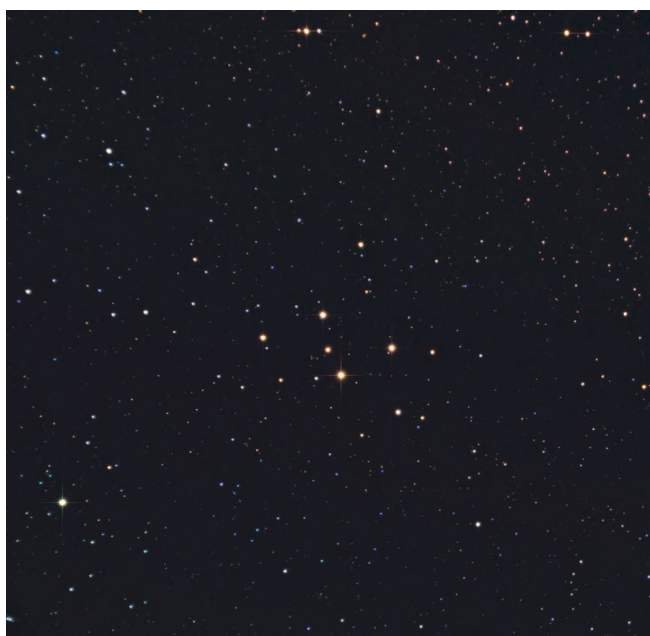


Kemble's Kite (photo by D. Hoskin)



Location of Kemble 2/Mini-Cassiopeia (created with Stellarium®)

The third asterism that was discovered by Father Kemble lies in the constellation Draco near 3.6 magnitude Chi Draconis. It was named Kemble 2 in honour of Father Kemble, who described the asterism in an unpublished article. The appearance of Kemble 2 mirrors that of the larger W formed by the five bright stars of Cassiopeia. As a result of this uncanny resemblance, Kemble 2 is also known as Mini-Cassiopeia. Kemble 2 is a collection of 7th to 9th magnitude yellow-orange stars that spans about a third of a degree.



Kemble 2/Mini-Cassiopeia (photo by D. Hoskin)

The next time that you find yourself under dark skies with a pair of binoculars, see if you can spot Father Kemble's three asterisms. You will be following in the footsteps of a notable Canadian amateur astronomer and past fellow member of the Royal Astronomical Society of Canada.

References

Binocular Asterisms by Gene Hanson, www.genehanson.com.

Deep-Sky Wonders by Sue French, Firefly Books, 2011.

Lucien Kemble Obituary by Peter Bergbusch, The Journal of the Royal Astronomical Society of Canada, volume 93, pages 151-152, 1999.

RASC Halifax Member Mentions



2022 January 13 - **Jason Dain** was featured in NASA's APOD (Astronomy Photo Of the Day)

"Each day a different image or photograph of our fascinating universe is featured, along with a brief explanation written by a professional astronomer."

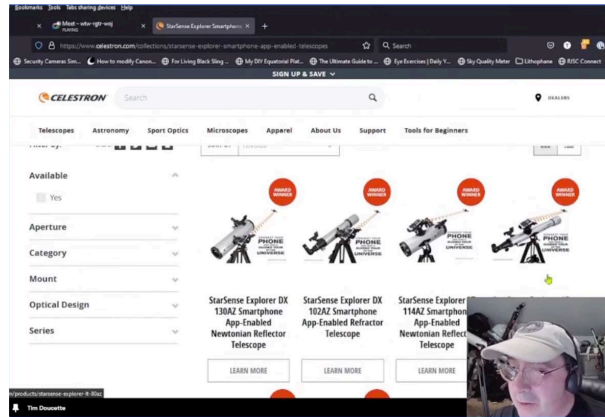
"Supernova Remnant Simeis 147

Image Credit & Copyright: Jason Dain

Explanation: It's easy to get lost following the intricate, looping, twisting filaments in this detailed image of supernova remnant Simeis 147. Also cataloged as Sharpless 2-240 it goes by the popular nickname, the Spaghetti Nebula. Seen toward the boundary of the constellations Taurus and Auriga, it covers nearly 3 degrees or 6 full moons on the sky. That's about 150 light-years at the stellar debris cloud's estimated distance of 3,000 light-years. This composite includes image data taken through narrow-band filters where reddish emission from ionized hydrogen atoms and doubly ionized oxygen atoms in faint blue-green hues trace the shocked, glowing gas. The supernova remnant has an estimated age of about 40,000 years, meaning light from the massive stellar explosion first reached Earth 40,000 years ago. But the expanding remnant is not the only aftermath. The cosmic catastrophe also left behind a spinning neutron star or pulsar, all that remains of the original star's core." <https://apod.nasa.gov/apod/ap220113.html>

On Sunday, January 16, **Tim Doucette** was a guest on *The Sunday Night Astronomy Show* which broadcasts live on the “Astronomy By The Bay” Facebook and YouTube channels Sundays at 8PM AT. He gave a brief talk on the StarSense Explorer telescopes and software.

A replay of this show is also available on those channels.



Observing Chair, David Hoskin was featured on CTV News Atlantic on Friday, February 11, 2022

[Amateur astronomer captures amazing images](#) (click for video)

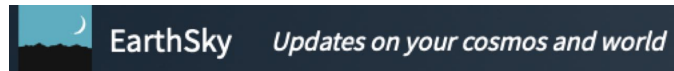
<https://atlantic.ctvnews.ca/amateur-astronomer-reveals-beauty-of-the-cosmos-from-his-backyard-1.5779053> (click for text)

The Centre was also well-represented in the past few months on *EarthSky's* media channels.

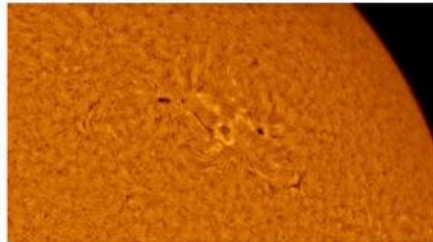
David Hoskin's Community Photo Portfolio continues to grow on [EarthSky.com](https://earthsky.org)

To visit his portfolio, and see details of each photo, visit:

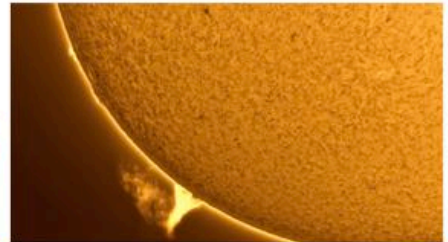
https://earthsky.org/earthsky-community-photos/?filter_1_3=David&filter_1_6=Hoskin&mode=all



David Hoskin
Halifax, Nova Scotia, Canada | [View Details](#)



David Hoskin
Halifax, Nova Scotia, Canada | [View Details](#)



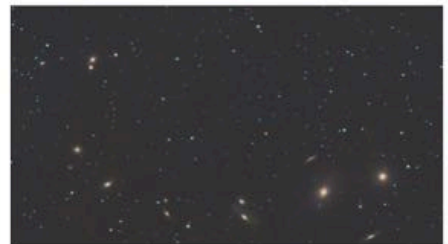
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Halifax, Nova Scotia, Canada | [View Details](#)



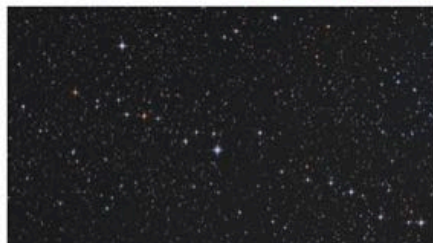
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Member's Universe

The Switch to Mono Imaging

By Jason Dain

I recently embarked on a transition to monochrome imaging with broadband and narrowband filters and I wanted to share my experience. Like most astrophotographers, I started with a stock DSLR, then I used a modified DSLR, and finally a cooled one-shot color (OSC) camera. In the following article, I will share my experiences as I made the transition to full-time monochrome (mono) imaging with filters.

My primary reason for wanting to switch to a mono camera and filters was to take advantage of the inevitably clear nights with a bright Moon and to be able to produce Hubble palette images. I had used my colour camera with a dual narrowband filter on those nights, but I was not satisfied with the results. It allowed me to shoot HII (emission nebulae) regions past the first-quarter Moon but once the Moon got closer to full, it was not as effective.

My approach was to wade into mono imaging on one of my two rigs. I purchased a mono setup including a camera, filter wheel and LRGB and SHO filters. I started with some lower-end filters but quickly found they were not that great and upgraded them. At first, I struggled with some unrelated mount issues but quickly got the hang of the process. My first target was M16 or the Eagle Nebula. My goal was to capture a SHO narrowband image of this target to highlight the Pillars of Creation made famous by the Hubble Space Telescope. I spent a good bit of time watching various videos from different sources, trying different combinations and processing methods until I found one that I liked. I did not shoot any broadband targets or RGB stars on my first few narrowband targets, as I wanted to get the hang of working with the monochrome data.

For me, the greatest benefit of the mono setup is shooting options. With the LRGHSHO filter combination in my filter wheel, I can create any number of combinations to suit my taste. I can also process the same data multiple ways such as SHO, HOO etc. I also gain the flexibility to be able to make the most of my imaging time. For example, on a night where the Moon comes up after midnight, I can spend the first part of the night shooting broadband on one target and then, once the Moon comes up, I can switch to narrowband on that or another without losing any sleep.

I found that once I was able to settle on a process, the monochrome data was not as onerous to process compared to OSC data. The workflow I had been taught by Ron Brecher and the Masters of Pixinsight guys prepared me well to deal with the new data sources and I picked it up quickly. I have created workflow icons in Pixinsight to simplify the process as much as possible and make the results repeatable from one image to the next.

One significant downside that comes to mind with monochrome imaging is the calibration frames, specifically flats and dark flats. I hate flats on the best of days and with mono imaging, you need many more sets of them. Also, with various exposure times for the different filters, you need a collection of dark flats to match. The other thing that is a bit more challenging with mono imaging is planning your projects. You need to think a few targets ahead in terms of what you need to capture with the new Moon vs. once the Moon is out. My practice now is to have multiple targets on the go and capture the data I need to complete them as their altitude and sky conditions allow.

I have really enjoyed the migration to mono imaging. I have been able to produce images that I'm very happy with and don't find it to be that much more effort and enjoy the challenge. My original plan was to keep one setup with a colour camera but I have since changed it over to a mono setup as well. I kept one colour camera for use with my wide angle DSLR lenses or in the case of a comet but I primarily image with mono now. Mono imaging is not cheap with all of the equipment needed but as Ferris Bueller said, "if you have the means, I highly recommend picking one up."

Through Jason Dain's Lens



HOO reprocess of the Flaming Star and friends in Auriga
by **Jason Dain**



The Triangulum Galaxy (M33 or NGC 598)
by **Jason Dain**



HOO rendition of the Elephant Trunk nebula
by **Jason Dain**



Jaime Whynot's Best Astro Images of 2021 - One of the fun trends on social media is the "Top Images" feature where users share their best or favourite images in a collage format.



Lisa Ann Fanning's Lunar Best of 2021:

Equipment Details:
 Images taken with a combination of:
 iPhone 11 through Swarovski Spotting Scope
 iPhone 11 through Celestron NexStar Evolution 8
 Canon Sx70 HS
 And iPhone 11

Post-processing Details: Compilation made through Collageable

Image Details: 12 months of Moon images for 2021.

A compilation of my favorite moon memories each month.

- Jan - Full Moon
- Feb- Waxing Crescent Moon
- March- Earthshine
- April- Copernicus Crater
- May- Partial Lunar Eclipse Moonset
- June- Waxing Crescent Moon
- July- Lunar X and Lunar V
- Aug- Waxing Crescent Daytime Moon
- Sept- Lunar Straight Wall, Rupes Recta
- Oct- International Observe the Moon Night
- Nov- Maximum Lunar Exlipse
- Dec - setting moon composite

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



Lisa Ann Fanning

Sandy Hook Lighthouse, NJ

February 11, 2022 4:58 pm

Equipment Details: iPhone 13

“Lighting the way” - Having some fun with the moon at the end of a fun day. The Sandy Hook Lighthouse is the oldest lighthouse in America (since the original Boston Light was burned down during the American Revolution.) I enjoyed playing the game of place the moon in a fun position and was able to capture it atop the lighthouse.



David Hoskin captured this wonderful close-up of Mare Humorum and the crater Gassendi.

February 12, 2022 at 7 PM.



Lunar Straight Wall
Rupes Recta

LAAM
@BullyMoonbeams
Lisa's Look Up!

Lisa Ann Fanning

Monmouth County, NJ

February 9, 2022 7:15 pm

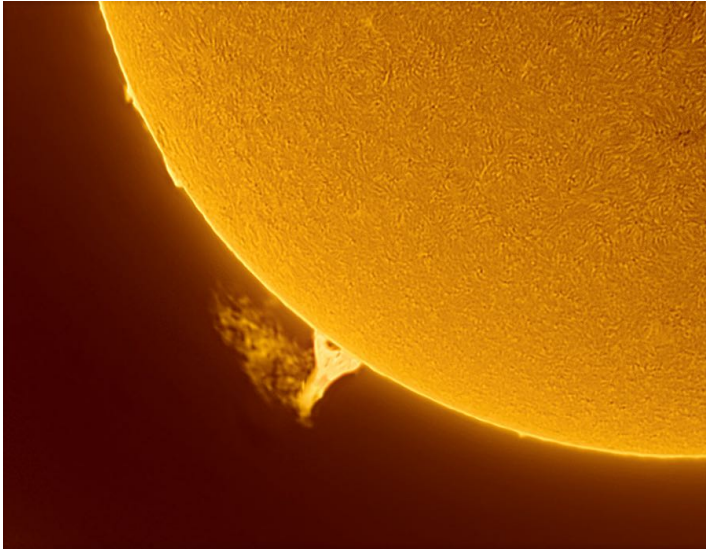
Equipment Details: iPhone 13 through Celestron NexStar

Evolution 8 + 40 mm eyepiece

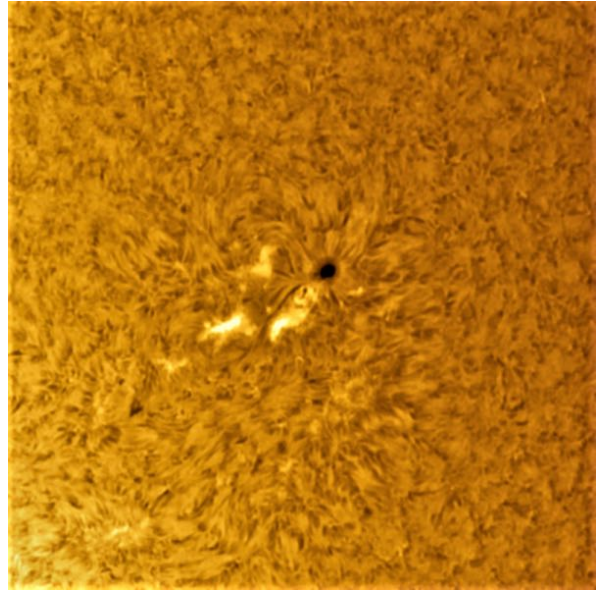
Waxing Gibbous Moon. The day after First Quarter is always a fun time to look for the Straight Wall (Rupes Recta) as highlighted here.



David Hoskin captured the Waxing Gibbous moon with his Canon T3i DSLR and Celestron C8 SCT with Meade 0.63 focal reducer. February 12, 2022.



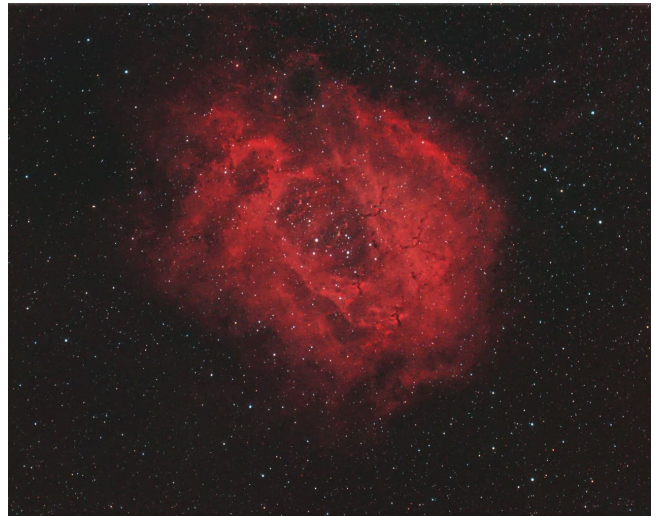
David Hoskin captured this large Solar Prominence on February 6. He notes it “is large enough to swallow 30 Earths!”



David Hoskin also captured the detail around Sunspot AR2939 on February 6. He noted that it produced a solar flare that lasted for more than 3 hours!



David Hoskin took this photo of Markarian's Chain consisting of 8 different galaxies from the Virgo Galaxy Cluster on January 27th



David Hoskin recently worked on some data collected for NGC2244 Rosette Nebula in the few clear nights before the 1st Quarter Moon to create this beautiful image.

Food for the Soul: The Poetry of Paul Heath

Ears See

“TOO DARK, TOO DARK I cannot see.
Squeak, squeak, chirp chirp, “follow me”
Tap tap, Clap, tap tap
“TOO Dark, too dark, I cannot see.
TAP TAP, Clap Clap, “follow me”
“Too dark, I cannot see,
Tap, tap, “Listen!”.

Surge and splash, “follow me”
TOO DEEP, TOO DARK, I cannot see.
A Mme-oo-y-aa, OOHH – yaaa, aauugh - yyaa
Surge and splash, “follow me”
Too Deep, too dark, I cannot see,
AAhh mmeoo-yyaa oohh - yyaaauugh, “follow me”
Too deep, too dark, I cannot see.
Surge and splash, “Listen!”.

“Dark caves you now return??”
Tap, Tap, “Listen”

“Deep Waters you now return??”
Oohh – yyaaauugh, “Listen”.

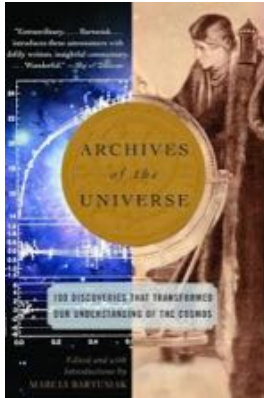
“The sky, so murky, I cannot see.
ping, ping, “listen”
“Clouds hide the stars, I cannot see,
“Stretch your ears, the sky is bright”
PING, ping, “listen”
“The sky, so murky, I cannot see.
“STRETCH YOUR EARS, the SKY IS Bright”
PING, PING, “Listen!”

“The Sky is Bright now.”
So much to SEE,
PING, PING, just LISTEN.

Book Review: *Archives of the Universe*

Marcia Bartusiak Random House 2004

By Tony McGrath



For those interested in the history of astronomy, whether that interest is casual or focused, Marcia Bartusiak has done a wonderful service with this aptly named work. Aptly named because it is indeed an archive of sorts, and it is this approach which makes the book unique. Bartusiak is an accomplished author, trained as a journalist and with a graduate degree in Physics. She is a winner of the Gemant Award from the American Institute of Physics and a Fellow of the American Association for the Advancement of Science.

The author has chosen to tell the history of astronomy, from ancient time to present day, through 100 topics presented in the words of the individuals who made the discoveries. Here you will get the story as told by Copernicus, Galileo, Kepler, Newton, Halley, Hubble and Einstein and dozens of other original thinkers. This was a brilliant idea, and you will find that close to half of the words in this book are those of the scientists who made the discoveries.

I think for the casual historian, the attraction of the book would be its complete treatment of the subject. For the more focused reader already familiar with astronomical history, the attraction of the book might be the inclusion of edited works as published by the original authors.

The book is divided into eight sections, **The Ancient Sky, Revolutions, Taking Measure, Touching the Heavens, Einsteinian Cosmos, The Milky Way and Beyond, New Eyes, New Universe, and Accelerating Outward**. Bartusiak uses these sections to subdivide the history of astronomy into a story centred on the pivotal discoveries which became turning points in our understanding of the cosmos. For example, there is a section called **Touching the Heavens**, and within this section the author explores the work of the astronomers who were first to use the spectroscope to study the heavens and begin the course correction which moved astronomy from astrometry to astrophysics. The chapters in this section include extracts from papers by Fraunhofer, Kirchhoff, Huggins, Cannon, Hertzsprung, Russell and others who pioneered spectroscopy and the stellar classification systems we use today.

Each section and chapter are introduced with a short essay by Bartusiak. These essays give an overview of why the section describes a pivotal change. The chapter introductions prepare the reader for the excerpts from the original papers which follow. The original papers are edited, with the highly technical details and calculations omitted. Papers published many years ago have had the text minimally edited so that it can be clearly understood by the modern reader.

The eight sections are not chronological, but logical. You can read each section in isolation as your particular interest determines, or if you are up for it, you can read the book from start to finish. The start to finish approach will give you a wonderful overview of the history of astronomy. The book is a tour de force at 623 pages and runs to 695 pages when you include the full index, source notes and bibliography.

For me one of the interesting things about the book is that the first 25% deals with discoveries made from 400 BC to 1800 AD. The next 25% of the book deals with discoveries made from 1800 to 1900. The final 50%, fully half of the book, deals with discoveries of the 20th century. Such has been the trajectory of our knowledge of the cosmos. What will the 21st century bring?

2021 Annual General Meeting (AGM) Reports

2021 Annual Report: President

2021 is now in the history books and with it is my second term as President. I feel the challenges of 2021 have been addressed by the incredible team on the Board of Directors and its committees. It is because of them that RASC Halifax Centre is continuing to thrive and grow.

Nova Notes once again is one of the best Centre newsletters in the RASC. A special thanks to Lisa Ann Fanning and John McPhee for their incredible work over the past year. Many thanks also go to those who submitted articles and photos in the past year.

Outreach and observing events at the Halifax Centre again were at a minimum this past year due to the pandemic restrictions but that did not appear to dampen volunteer efforts. Congratulations and thank you to members who stepped up at events once the emergency measures were modified to allow for small groups.

Nova East was cancelled this year due to the Provincial Park restrictions. I am sure we are all looking forward to the possibility of an on-site event in 2022.

In fall 2020, members approved going forward with an electrical upgrade. Many thanks to John Liddard, SCO Manager, for spearheading this project. The SCO Fundraising Committee implemented a fund development plan to ensure the project goes forward (Blair MacDonald, Matthew Dyer, Gregg Dill) and that plan continued into this year. The Centre thanks Minas Energy and K-Line Construction for their generous offers, expertise, and time to make the upgrade come to fruition.

Our Members' Meetings continued using Zoom as way to remain in contact – Centre meetings, virtual observing, and astro-imaging sessions. Using Zoom had several advantages over the past year of lockdowns and group gathering restrictions:

- RASC Halifax Centre members from anywhere in the province could participate.
- Board and committee members outside Metro could be recruited for active participation because travel to meetings was not required.
- RASC members from across Canada and the USA's Eastern seaboard could also be involved.
- Recruitment for Board and committee members outside the Metro area was easier when travel not required; consequently, we have Board members from Yarmouth to Truro to Hall's Harbour.

Use of Zoom will continue into 2022 and, when we once again meet face-to-face, we will investigate using both 'live' and Zoom capabilities.

This was the third year we have been meeting on the first Saturday afternoon at 1 pm of each month except July and August. Social time with fellow members is important and since November 2020 the Astro-Chat was included at the end of the meeting. Members were welcomed to stay online for an informal, non-recorded session. This will continue in 2022 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. Dave Chapman (Observing Chair, Co-Chair of the DSP Committee) and Wayne Harasimovitch (Director, Librarian) are stepping down for their roles. Many thanks to these dedicated members for their expertise and time spent on RASC Halifax endeavours. They aren't gone from the Centre and I'm sure we can engage them in other ways in the coming year.

Here is the list of 2021 RASC Halifax Centre team whose efforts made the past year possible.

Board of Directors

- President: Judy Black
- Vice-President: Patrick Kelly
- Secretary: Peter Hurley
- Treasurer: Gregg Dill

• Directors:

- Tim Doucette, Matthew Dyer, Wayne Harasimovitch, Paul Heath, David Hoskin, Kathy Walker

<p>Appointed Positions</p> <ul style="list-style-type: none"> • Honorary President: Mary Lou Whitehorne • Auditor: Ian Anderson • Co-Editor, Nova Notes: Lisa Ann Fanning, John McPhee • Deep-Sky Preserve Committee: Dave Chapman 		<ul style="list-style-type: none"> • Governance Committee: Judy Black • Librarian: Wayne Harasimovitch • National Council Representative: Judy Black • Observing Chair: Dave Chapman • Outreach Chair: Paul Heath • SCO Manager: John Liddard
<p>Dark-Sky Preserve Committee</p> <ul style="list-style-type: none"> • Co-Chair: Dave Chapman, Tony Schellinck • Members: Paul Gray, Melody Hamilton, Peter Hurley, Tony Schellinck, Chris Young 	<p>Nominating Committee</p> <p>Peter Hurley (Chair), Chris Young, Judy Black (ex officio)</p>	
<p>Governance Review Committee</p> <p>Judy Black (Chair), Patrick Kelly, Gregg Dill</p> <p>SCO Usage Review Task Team</p> <p>Kathy Walker, David Hoskin</p>	<p>SCO Fund Development Committee</p> <p>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 your support and the expertise you provided me and my fellow Board members in the past year. I look forward to again 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

2021 Annual Report: Vice-President

With Judy Black as the Centre's President, there is not a lot left over for a Vice-President to do. As Judy was out of town for a Board meeting and the Centre Member's Meeting that followed it, I did get two chances to fill in as "acting president".

The two main projects I worked on this year were a guide to selecting binoculars for astronomy, which is now on our web site, and wrangling with the data from the membership survey that was undertaken this year.

It was a lot of fun working with the Board this year, and hopefully next year I will be a bit busier!

Respectfully submitted,
 Patrick Kelly, Vice-President
 RASC Halifax Centre

2021 Annual Report: 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 for our meetings and, in the past, meeting space has been generously provided by St. Mary's University.

As a result of COVID-19 in 2020 and public health measures put in place to help control the spread of the virus, RASC Halifax Centre adopted Zoom, a web-based computer video conferencing tool to host our Member's, Board, and Committee meetings virtually. We used Zoom throughout 2021 for all our meetings and for virtual observing sessions and other in-reach sessions.

Member's meeting switched to the first Saturday of the month, unless that fell on a holiday. Board meetings would usually meet the Tuesday before the Member's meeting. There were 10 regular Member's meetings all using Zoom; no meetings were held in July or August. There were also 10 regular meetings of the Board again all using Zoom. The Annual General Meeting is usually held on the

same day but before the Member's meeting in December, and that will be the case again in 2021, using Zoom.

There have been other consequences of COVID-19. The annual Nova East Star Party was cancelled again in 2021, as was the annual BBQ at SCO. But the Kejimkujik Dark-Sky Weekend was able to go ahead although with some new and innovative modifications. Guidelines for use of SCO were modified as NS Provincial Health COVID-measures changed, but SCO remained open for use and observing sessions continued as measures permitted members to access SCO.

Membership increased in 2021. The membership of the Centre as of October 2021 totaled 180 members (up from 173 last year).

- 28 Family
- 124 Regular
- 2 Regular US
- 21 Life
- 5 Youth

Respectfully submitted,
Peter Hurley, Secretary
RASC, Halifax Centre

2021 Annual Report: Dark-Sky Preserve Committee

After no Dark-Sky Weekend in 2020 (because of park renovations, not COVID), we cautiously planned with Kejimkujik to have an event in 2021, although the format was a little different due to COVID restrictions.

The DSW was held over 4 nights, Thursday 12 August to Friday 14 August, starting one day earlier to include the peak of the Perseid meteor shower. Incredibly, it was clear all 4 nights (unheard of). We opted not to have people look through telescopes, and instead set up telescopes with cameras and monitors. This seemed to work OK and may be included in future events to a limited extent. The necessity to limit and control crowds during COVID introduced additional complications of participants registering and checking in for events, plus dividing the activities between the Sky Circle field and Merrymakedge Beach. Again, this is something we may consider for future. By all accounts, DSW 2021 was successful but also more complicated than previous years. Its success was made possible by the close cooperation between RASC volunteers and Kejimkujik staff.

In February, Dave and Tony were invited to Kejimkujik to inspect the lighting of the new washrooms, the installation of which cancelled the 2020 DSW and all front country camping. There had been concerns raised on social media about the apparent high levels. There are good things about the new design (no up-light) but overall we felt that the levels were higher than recommended by RASC for Dark-Sky compliance. We've had a couple of meetings on the issue and are continuing to talk with a view to "continuous improvement." The washrooms embedded in the vegetative screening of the main campsite are of little concern to us, but we are more concerned about those near beaches that could be used for dark-sky viewing. Nothing has been fully resolved to date; however, both RASC and Kejimkujik are committed to improving the lighting conditions at the park to make them more "observer-friendly" and we continue to enjoy a good working relationship.

In terms of volunteer-hours, we had 14 volunteers this year (mostly for DSW) who accounted for 322 person-hours of volunteer work (average of 23 h +/- 11h). This includes not only in-person time on-site but also travelling, planning, and virtual meetings (mostly for DSW but also regarding the new washroom lighting). Thanks to: Jerry Black, Judy Black, Jeff Donaldson, Paul Heath, David Hoskin, Peter Hurley, Wayne Mansfield, Fiona Morris, Keegan Oickle, Karl Penney, Daphne Themelis, and Chris Young.

In 2022, the DSP Committee co-chairs to be appointed are Tony Schellinck and Peter Hurley. Other members will include Dave Chapman, Paul Gray, Melody Hamilton, and Chris Young.

Respectfully Submitted,
Dave Chapman and Tony Schellinck
Co-Chair, Dark-Sky Preserve (DSP) Committee
RASC, Halifax Centre

2021 Annual Report: Governance Committee

I would like to thank my fellow members on the Governance Committee, Patrick Kelly and Gregg Dill, for the work accomplished in the past year. Kathy Walker and David Hoskin were members of the SCO Usage Review Task Team and provide insight as to what, if any, revisions should be made as provincial COVID-19 restrictions changed.

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

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

- a) **Policy G6: Procedures Regarding Nominations, Elections & Appointments** – (Adopted October 19, 2018; Revised June 1, 2021) The process for appointments was clarified as it differed from election of the Board of Directors.
- b) **Policy G11: Policy Regarding RASC Halifax Centre Membership and Conflict Resolution** – (Adopted June 1, 2021) Based on the example and recommendation of the RASC Board of Directors, a document regarding conflict resolution was developed.
- c) **Guidelines Regarding the Use of the St. Croix Observatory (SCO)** – (Adopted Nov 2, 2021) members were apprised of revisions to the policy approved by the Board. Phase 5 Guidelines were approved on November 2, 2021.

Respectfully Submitted,
Judy Black, Chair
Governance Committee
RASC, Halifax Centre

2021 Annual Report: National Council

These are the main activities for 2021:

- **RASC:** A new site for National Office was located and the office plus the Dorner Telescope Museum will be moving in December 2021. Brandon Roy, Malhar Kendurkar and Betty Robinson joined the Board of Directors in the past year.
- **The Centre Manual** continues to be drafted. Elements of the Manual are being developed such as volunteering and some sections being revised.
- **Driven!:** This is the system adopted to keep track of memberships, run the on-line store, etc. It replaced iMIS with a system that should be easier (and cheaper) to maintain, plus come with modules for tasks that we cannot currently do on iMIS. The new system came into effect in early 2021. New membership database is fully working. Identified challenges of the system are being addressed by the Society Office.
- **Total Solar Eclipse Task Force:** Randy Attwood leads the team to coordinate preparations for the 2024 total solar eclipse. Its objective is for safe observing and to promote the event through the RASC and in conjunction with other organizations such as CASCA, the FAAQ, the Canadian Space Agency and the Canadian Association of Science Centres.
- **RASC General Assembly Working Group:** Randy Attwood leads this team to develop materials for a host centre to follow from the initial offer to hold a GA through the planning process followed by running of the event is being developed. Judy Black volunteered to assist Randy in this endeavour along with others to make this a true coast-to-coast project.

• **Policy and By-law Changes:** There were some housekeeping changes made by the RASC Board of Directors.

- Policy G9: Nomination and Election of Officers – This was revised to conform with the Canada Not-For-Profit Corporation.
- The RASC Board removed the Bylaw #1 prohibition stating “9.1.4 No person who is a Director of the Society, or who is President, a Vice-President, Secretary or Treasurer of the Society, may simultaneously be the President, Vice-President, Secretary, Treasurer or a National Council Representative of a Centre”; it will be ratified at the June 2022 AGM.
- A risk mitigation statement is being developed for inclusion on the RASC member registration and renewal forms. A best practices document is being developed for Centres to reference.

• **RASC Liability Insurance:** Centres forwarded questions regarding volunteer and event liability. They have been forwarded to the insurance broker for answering and preparing a document.

• **National RASC Committees:** Virginia DiCiocco is replacing Roland Deschenes as Chair of the Inclusivity and Diversity Committee. Chris Beckett is replacing Paul Gray as editor of the RASC Calendar. The *New Observers to Visual Astronomy (NOVA)* program is being revised by the EPO Committee to include videos and printed materials for presentation in 5 to 8 sessions. The eight modules will include topics relating to astronomical objects, telescopes, and other equipment plus some science.

• **National Finances:** SkyNews profit in 2020 was approximately \$2400; the unaudited 2021 revenue is projected to be upwards of \$90,000. Investments are also bouncing back.

Respectfully Submitted,
Judy Black, NC Representative
RASC, Halifax Centre

2021 Annual Report: Nova Notes

To date four issues of Nova Notes have been published, with the fifth and final issue for 2021 to be published at the end of December (content deadline is December 18, 2021).

Nova Notes got a facelift this year as well with the inclusion of more colour photographs per edition and an increased size limit of website storage of each PDF increased to 10 MB. Many thanks to Jerry Black for getting this done!

The editorial staff consisted of John McPhee who focused on copy edit and Lisa Ann Fanning who solicited content and performed layout. Additional review was provided by Judy Black and Pat Kelly.

Jerry Black assisted with posting to the Halifax Centre website. Once posted, editions are promoted with a Member Announcement (via email), and announcements on the RASC Facebook page and Listserv.

Current editions are also displayed at each monthly meeting as well as an update on upcoming deadlines for content by the President, Judy Black.

Edition Sizes:

- Jan/Feb 2021 (Vol 52 No 1) issue was 28 pages total
- March/April 2021 (Vol 42 No 2) issue was 20 pages total
- May/June 2021 (Vol 42 No 3) issue was 27 pages total
- September/October 2021 (Vol 42 No 4) issue was 24 pages total

Regular features include:

- *From the Editor* (John McPhee and Lisa Ann Fanning alternating)
- *A Message from the President* (Judy Black)
- Halifax centre Information page

- *Food for the Soul* (poetry by Paul Heath)
- *Members' Universe* (a new feature with member news and submitted work)
- Member's Meetings reports

Main cover photos were provided by: John A. Read, Kathy Walker, David Hoskin and Jason Dain.

Contributors of articles, photos and sketches include Jerry Black, Judy Black, Dave Chapman, Jason Dain, Tim Doucette, Lisa Ann Fanning, Melody Hamilton, Paul Heath, David Hoskin, Blair MacDonald, Tony McGrath, Fiona Morris, John A. Read, Kathy Walker and Jaime Whynot.

The 2020 AGM Minutes and Auditor's reports appeared in the Jan/Feb 2021 edition.

News from the Governance Committee appeared in the May/June 2021 edition.

The May/June 2021 edition was themed "Sun, Moon and More" and featured many Solar, Lunar and June 10, 2021 Solar Eclipse photos.

Regular updates appeared in each edition regarding the St. Croix Observatory (SCO) COVID guidelines during the COVID-19 pandemic.

We would like to extend our sincerest thanks to the many folks who put effort into making Nova Notes a success!

Respectfully Submitted,
 Lisa Ann Fanning and John McPhee
 Nova Notes Co-Editors
 RASC, Halifax Centre

2021 Annual Report: Observing Committee

This year was interesting, owing to COVID restrictions. RASC Halifax Centre did not offer any public observing events other than the Kejimikujik Dark Sky Weekend (reported on elsewhere).

Activity at the Centre's Saint Croix Observatory was low, probably owing to COVID restrictions. Several "virtual" observing sessions were conducted online via Zoom, thanks to the help of Dave Lane, Jerry Black, Blair MacDonald, and Judy Black.

The following Observing Certificates were earned and awarded (congratulations to all!):

1. Explore the Universe – Jeanette Kenny
2. Explore the Moon—Binocular: Melody Hamilton and Liz Greenough
3. Explore the Moon—Telescope: Judy Black, David Hoskin, John Read, Lisa Ann Fanning, and Liz Greenough
4. Double Stars: Melody Hamilton

The Chair has been aided by Melody Hamilton and David Hoskin. Melody originally came on board to support observing certificate applications by members of the Minas Astronomy Group; however, neither MAG nor RASC Halifax had in-person meetings in 2021, so very little in-person reviewing was done. Melody and Dave happen also to be members of the Society-wide RASC Observing Committee, and have been active in that domain, reviewing applications and guiding policy. David Hoskin came on board in anticipation of following Dave Chapman as Chair and reviewed 3 Explore the Moon applications this year.

David Hoskin has been nominated to Chair the Observing Committee. Committee members will include Melody Hamilton and Dave Chapman (for continuity).

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

2021 Annual Report: Outreach

COVID-19 again shut us down for the most part for outreach events.

We had three school requests which we were unable to fulfill.

Dark-Sky Weekend (DSW) was a great success again this year, even with the COVID-19 restrictions. The audiovisual presentation at Merrymakedge Beach saw 27 registrants on night one and 20 on night two before all headed to the beach for a guided binocular tour with Tony Schellinck. More than 120 over two nights enjoyed the sky lore presentations of Dave Chapman and Chris Young. We had 14 volunteers over 4 days who averaged 21 hours +/-5 hours each, including meetings, prep, travel, and program delivery.

Dave Chapman was able to get out and do outreach, THANKS DAVE, and Cathy LeBlanc.

Halifax Planetarium: 15 people

Lunenburg Library (with Cathy LeBlanc): 26 people

The Deanery Project: Dave Chapman hosted 2 events, 12 people each

Mi'kmaq Moons on-line presentation.

Blair MacDonald conducted two astroimaging workshops on using masking to a total of 24 participants

Hopefully, the upcoming year will allow us to do public outreach once more as we have done in the past.

Respectfully Submitted,
Paul Heath
Outreach Chair
RASC, Halifax Centre

2020 - 2021 Annual Report: Manager, St. Croix Observatory

The COVID-19 continued to have an impact on the use of the St. Croix Observatory (SCO) for 2021. The annual BBQ had to be cancelled again for the 2021 season. However, loosening of government restrictions and availability of vaccinations had allowed for an increase in the use of SCO by members as long as they adhered to the provincial guidelines.

2021 continued to provide opportunity to attend to necessary maintenance. The door to the storage room/bathroom building had received temporary repairs to the deadbolt and casing strike area. It has made the door easier to lock and unlock but a more permanent repair will require the replacement of the door casing. Age and past vandalism have taken its toll on the casing, and it is not allowing the door to hang properly.

The majority of the electrical upgrades to provide SCO with AC power from the Minas Energy power grid have been completed. The lighting in the warm room and the roll-off observatory have been upgraded with red and white LED bulbs and dimmer switches. An external flood light that can be used for packing up in the dark has been added above the warm room door. A total of 3 electrical circuits now exists in the roll-off observatory and all electrical outlets for the roll-off observatory have been upgraded and replaced. There are now three quad outlets along the inside north wall, three quad outlets along the inside south wall, and three double outlets along the outside of the south facing wall.

Electrical upgrades that remain to be completed are replacing the propane furnace with an electric heater and bringing AC power and lights over to the storage room/bathroom building. Lighting in the storage room/bathroom is still provided through the 12v solar storage system. The date to complete these upgrades is still to be determined and will be visited again in the spring.

An interesting (non-astronomical) event was experienced in late September 2021. While tending to some maintenance, the hatching of 44 snapping turtles was witnessed near the warm room and efforts ensured they all made it safely to the water. We will be in discussions with appropriate wildlife experts to ensure future nests are well protected from foot traffic.

In summary, attendance/use of SCO has seen an increase in 2021 with the addition of three new keyholders. Responses regarding the upgrades has been highly favourable with everyone enjoying the new lighting and abundant supply of electricity.

Respectfully Submitted,
John Liddard
SCO Manager
RASC, Halifax Centre

Nominating Committee Report

The following is the list of nominations put forward to the Board on November 2, 2021 and to all members as of November 13, 2021 through the Announce List. The call for further nominations will be made at the AGM on December 4, 2021.

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

The following appointments were discussed at the Board of Directors meeting of November 2, 2021. The positions will be appointed by the newly elected Board at their meeting in January 2022. The call for further nominations will be made at the AGM on December 4, 2021.

Honorary President	Mary Lou Whitehorne
2022 Auditor	Vacant*
Dark-Sky Preserve (DSP) Committee, Co-Chairs	Tony Schellinck, Peter Hurley
Governance Committee	Judy Black
Librarian	Jerry Black
National Council Representative	Judy Black
Nominating Committee	Peter Hurley
Nova East Planning Committee	Vacant
Nova Notes, Co-Editors	Lisa Ann Fanning, John McPhee
Outreach, Chair	Paul Heath

Observing, Chair

David Hoskin

SCO Manager

John Liddard

* Dave Lane volunteered at AGM; appointed as Auditor at January 4, 2022 Board of Directors meeting

Policy G6: Procedures regarding Nominations, Elections and Appointments can be found on the RASC Halifax centre website (https://halifax.rasc.ca/images/documents/G6_Nominations_Elections.pdf).

Respectfully Submitted,
Peter Hurley, Chair
Nominating Committee
RASC Halifax Centre

Auditor's Statement for Fiscal 2021

I have been involved in the Centre's accounting function being Treasurer from 2010 to 2014. I also recently balanced the books for 2016, and 2018 through 2020. This is in addition to my five year stint as Treasurer in the mid 1990s. In my final report as Auditor for 2021, I was disappointed at the conditions which hamper our ability to deliver timely and accurate accounting. Aside from the whole year being under emergency protocol conditions, our support at National Office failed us in April when they switched their accounting systems without consulting the regional centres what would be needed to continue serving them properly.

Despite difficulties piecing some of the information together, I am confident the statements prepared by the Treasurer and me accurately represent the Centre on September 30th 2021. There were some points I have raised with Gregg Dill. SCO lease payments for example were made for the next four years, so this would show as a prepaid expense asset of \$4.60 on the balance sheet. Instead for simplicity, the amount was expensed in 2021. My concern is that a \$1.15 lease payment will be due in May 2026 which is a long way off. Who will remember to do that?

I have recommended "Miscellaneous Assets" be merged with Observatory Equipment since everything in the category is now housed at SCO. This asset first appeared on the balance sheet in 1984 - long before SCO was built. It consisted of items which have since been lost or are no longer of value to us - especially from a viewpoint of bookkeeping. This year, items acquired before 1995 were written off. Those purchased since 2010 were halved in value, their first depreciation.

I have not inspected the documentation for authenticity. This is a natural and essential part of the auditing process. I strongly recommend therefore that the auditor for 2022 do a quick check of 2021's papers. It is appropriate for any current auditor to review or inspect the books of prior periods if the need arises.

So for better or worse, my efforts in this supporting role are finished. In the future, I hope the Treasurer is someone who has basic bookkeeping and accounting knowledge and that the reporting standards I have tried to achieve can be maintained. Good luck to those who take up the task.

Respectfully submitted,

Ian R Anderson

Ian Anderson
Halifax Centre RASC Auditor 2021

RASC, Halifax Centre

2020-2021 Treasurer's Report

The fiscal year 2020-21 is the second year that COVID-19, with no signs of abatement yet, greatly reduced activities. Membership remained stable. A fundraising program to raise funds to bring electricity to the Saint Croix Observatory successfully attracted donations of \$9,090 towards the unusual one-time expense of the project cost of \$15,471. It was a successful year financially for the Halifax Centre. Halifax Centre achieved a surplus of \$1,334 before allowance of \$547 for depreciation and write-offs.

Accurate reporting of donations will be difficult going forward unless National office addresses inadequate reporting to Halifax Centre since the implementation of a new membership platform in May.

Details of the 2021 Income Statement

REVENUE:

Membership Fees \$3,027: Basically, the same as 2020 with 166 members including 20 life members. Regular member fees were increased by \$5 as of June 2021. The increased fees have not been transferred to Halifax Centre due to miscommunication at National office. The fees will be transferred in the next fiscal year.

Donations \$307: Donations made by members when renewing their membership plus a \$100 donation by Dave Chapman from the sale of a friend's telescope.

Interest \$237: Interest on our investments was down as a result of cashing \$8,000 in GICs.

Sales of Merchandise \$550: For the sale of calendars and four Explore the Universe books.

Nova Notes Subscriptions \$157: For members subscribing to printed copies.

EXPENSES:

Meetings \$230: Annual Zoom subscription fee to hold members and board meetings as well as technical sessions offered by members.

Depreciation and write-offs \$547: Depreciation of observatory and library plus \$45 of old miscellaneous items and 1/2 the value of the other miscellaneous items purchased since 2010.

Cost of Goods Sold \$0: The 2021 calendars invoice was paid in 2019-20 and sales occurred in this fiscal year.

Office Administration \$297: Post office box accounted for \$229.

Educational Activities (Outreach) \$414: Brochure printing and Sky News magazines.

Insurance \$1,687: Insurance for SCO was up a further \$225 in 2021.

Operating expenses - SCO \$15,638: This includes the electrification project as well as the propane tank rental and taxes to West Hants Regional Municipality.

Details of the 2021 Balance Sheet

ASSETS:

Cash \$5,410: This is the balance in our chequing account including \$244 in accounts receivable for September membership fees owing from National Office.

Investments \$8,000: This is now the value of the principle in our investments. We now have four GICs that come due throughout the year and interest is only counted at maturity.

EQUITY:

Common Equity \$20,019: Common equity was reduced by \$5,593 due to the Centre's contribution to the Saint Croix Observatory electrification project. The electrification project cost was expensed and consequently reduced common equity.

I was pleased to serve as Treasurer again this year. Thank you to our auditor, Ian Anderson, for ensuring the books were balanced at year-end.

Respectfully submitted,

Gregg Dill

Gregg Dill
Treasurer, RASC – Halifax Centre

ROYAL ASTRONOMICAL SOCIETY of CANADA, Halifax Centre
COMPARATIVE BALANCE SHEET
YEARS ENDING Sept 30, 2021 and Sept 30, 2020

Final	Years Ended September 30		Amount of Increase or (Decrease) during 2021
	2021	2020	
ASSETS			
Cash	\$5,410.24	\$10,057.34	(\$4,647.10)
Investments	8,000.00	8,000.00	0.00
Library Estimated	1,257.42	1,296.31	(38.89)
Observatory Equipment	10,513.68	10,838.78	(325.10)
Miscellaneous Estimated	137.40	320.05	(182.65)
Total Assets	\$25,318.74	\$30,512.48	(\$5,193.74)
LIABILITIES			
Accounts Payable	\$399.63	\$0.00	\$399.63
Total Liabilities	\$399.63	\$0.00	\$399.63
CAPITAL			
NE Working Equity	\$4,899.93	\$4,899.93	\$0.00
Common Equity	\$20,019.18	\$25,612.55	(\$5,593.37)
Total Capital	\$24,919.11	\$30,512.48	(\$5,593.37)
Total Liab. & Capital	\$25,318.74	\$30,512.48	(\$5,193.74)

*Misc Assets will be merged with Observatory Equipment in 2022.

ROYAL ASTRONOMICAL SOCIETY of CANADA, Halifax Centre
 COMPARATIVE INCOME STATEMENT
 YEARS ENDING Sept 30, 2021 and Sept 30, 2020

Final	Years Ended September 30		Amount of Increase or (Decrease) during 2021
	2021	2020	
REVENUE			
	R	Y	A
Membership Fees	125	5	16
	\$3,027.24	\$3,026.78	\$0.46
Donations	306.83	175.00	131.83
Observatory Donations	9,090.00	0.00	9,090.00
Education & Outreach	0.00	500.00	(500.00)
Interest	237.36	315.22	(77.86)
Sales of Merchandise	550.00	1,610.00	(1,060.00)
Nova East	0.00	(100.07)	100.07
Nova Notes Print Subs.	157.00	157.00	0.00
Miscellaneous	0.00	3.00	(3.00)
	=====		
Total Revenue	\$13,368.43	\$5,686.93	\$7,681.50
EXPENSES			
Meetings	\$230.00	\$282.14	(\$52.14)
Nova Notes Newsletter	0.00	0.00	0.00
Nat Off Processing Fee	98.28	100.76	(2.48)
Depreciation & Write-offs	546.64	479.18	67.46
Merchandise Purchases	0.00	1,130.70	(1,130.70)
Office Administration	297.41	392.29	(94.88)
Education & Outreach	414.22	832.20	(417.98)
Insurance	1,687.00	1,462.00	225.00
Awards & Donations	50.00	120.00	(70.00)
Observatory Oper. Exp.	15,638.25	1,016.66	14,621.59
Miscellaneous	0.00	0.00	0.00
	=====		
Total Expenses	\$18,961.80	\$5,815.93	\$13,145.87
	=====		
Surplus or (Deficit)	(\$5,593.37)	(\$129.00)	(\$5,464.37)
	=====		
SCO Electrification Project	\$15,470.66		

January 8th 2022 RASC Halifax Centre Meeting:

(23 attendees)

To watch a replay of the meeting, please visit:

<https://www.youtube.com/watch?v=eKzSAa6eF34> on the RASC Halifax YouTube Channel.
(click on noted [time](#) to launch specific segments)

President's Remarks

Welcome - Judy Black

0:00

RASC Halifax President Judy Black welcomed everyone to the monthly meeting, explained the benefits of membership and reviewed the agenda. She acknowledged the Indigenous lands in which the meeting was held and read the Centre's inclusivity and diversity statement.

Photo Montage Presented by Paul Gray

04:45

Paul Gray presented members' astrophotos. He highlighted a wonderful collection of images (photos and sketches) by (in order of appearance) David Chapman, Melody Hamilton, Paul Gray, Jerry Black, David Hoskin, Michael Boschat, Charles White, Michael Gatto, Judy Black, John McPhee, Dave Robertson and Art Cole. Members can send their images (including sketches) to the email chat list or directly to his email for inclusion in a future montage.

Special Presentations

• **Blair MacDonald - *An Astronomer's Skies: Pandemic Astrophotography*** 22:58

Blair presented his third of *An Astronomer's Skies* talks given to the Centre. Great images in the middle of a pandemic can be achieved with a few changes to equipment and technique. Pandemic restrictions meant limited travel to dark skies. He described his site's limitations and the gear he used under Bortles 7 skies.

He provided guidelines such as shorter subs to prevent saturation on bright sky backgrounds and to allow for longer exposure to tame the noise. He recommended the use of a light shade in addition to the dew shield to prevent gradients caused by sky glow, i.e., off-axis light seen at edges of photos. He suggested all three colour channels be watched, not just the luminance when using the filter. He described how the use of a light shade and the filter produced several photos of nebulae showing various star colours and details using his 60da and Zwo AS12600MC cameras.

Galactic imaging does differ. Because galaxies tend to be a much broader light source (not narrowband like nebulae), Blair suggested taking the galaxy shots without a filter then adding a few filtered shots to add in red later. He described how he photographed galaxies. As COVID restrictions eased, Blair did accomplish some dark sky imaging using his 120 mm APO refractor to capture nebulae and Messier objects and especially Cygnus-X1 showing the relativistic jets and bow shocks with his Zwo AS12600MC camera. He described how he overcame the challenges he faced in capturing and processing the photos.

He encouraged members to look up wherever they are during the pandemic. They will be surprised at what they see and what they can capture.

• **Chris Young - *Sky Lore: The Pleiades. Long Observed. Everywhere.*** 1:39:00

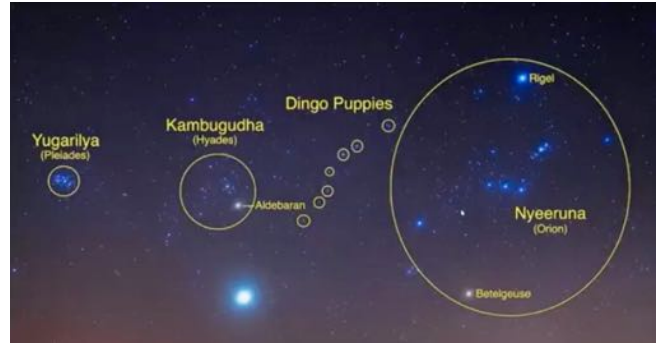
The star cluster is visible in all parts of the sky. The stories all involve seven sisters and their myths explain why they are only six and some explain where the seventh went.

The roots of the seven women come from Africa about 100,000 years ago that would have allowed time to spread around the world. Around 16,000 BCE, the pre-historic Caves of Lascaux show Taurus with six stars above it (Pleiades) and 4 stars of Orion below it.



In Germany, two items were found of astronomical interest: the Nebra Star Disk that was probably in use for about 200 years before it was buried circa 1600 BCE making it the oldest star map in the world, and an iron sword from the Iron Age circa 350 BCE. In Malta, the Tal-Qadi Sky Tablet, circa 2,600 BCE, was found at a temple site. Lines were etched into the limestone with depictions of the Hyades, Pleiades, Taurus and the ecliptic, Orion and Perseus. There was reference to the Golden Gate of the Ecliptic between the Hyades and the Pleiades.

Chris explained how various Australian Aboriginal tribes had similar stories. One in particular tells how they are protected from Orion's fire by their older sister, the Hyades who enlists the aid of Father Dingo who wrestles Orion to inactivate his fire. Father Dingo then places several dingo puppies between Orion and the Hyades (one of the horns of Taurus) to continue protecting the women.



The Kiowa and Lakota legends explain Wyoming's Devil's Tower (Bears Lodge).

Several young Indian maidens were being chased by giant bears. The women stood on a rock, prayed to the Creator to save them, and they were saved by the rock rising to the sky. The bears clawed the grooves into the mountainside while trying to reach the maidens who were made into stars.

In New Zealand, the star Alcyone and the cluster itself are referred to as Matariki signal the beginning of their new year. Chris noted that when the Pleiades show up in various cultures, it often signals the beginning of planting or harvest season, of changing seasons and that sea travel is again possible. It also serves as a clock and a compass for many cultures.

What's Up in the January Skies with David Hoskin

2:08:54

As we are now past Winter Solstice, days are lengthening to almost 10 hours by the end of the month.

Solar activity is becoming interesting. Sunspot AR2924 has quadrupled in size since it first developed and is lining up nicely with Earth. Because the magnetic field is apparently changing, we might expect some solar flares in the next few days. One of NASA's solar observing satellites is looking at a couple of bright UV patches behind the eastern limb that should come around in the next day or so, and they are likely to result in sunspots.

David provided the Moon phase dates and described the Mi'kmaq *Tom Cod Spawning Moon* (Punamujuiku's). He also explained the conjunctions of Saturn, Jupiter and Mars – each on separate occasions with the Moon. He listed the planets to be observed and noted the Quadrantid Meteor shower in Boötes peaked on January 3. He described the maxima and minima of Algol (β Persei).

David also presented 6 January observing challenges to members that would help them complete the *Explore the Universe* observing program as well as items of interest such as Kemble's Cascade.

He also asked members to attempt to find Hind's Crimson Star (*R Leporis*), a carbon star that is a long-period Mira variable star (427 days, from mag 5.5 to 11.7). If patient, also observe it over a period of time with a telescope.

News from the Board Presented by Judy Black

2:30:20

The Board of Directors were elected at the December 2021 AGM and appointments were made by the Board at its January 4, 2022 meeting. The Board is reviewing the outcome of the Member Survey conducted last year and will be implementing many suggestions made.



"Take a little bit of sunset, add a dash of Venus and sprinkle with the Milky Way"
by Jerry Black

Halifax Centre stars included Jerry Black who won 2nd prize in the Subaru and Saltscapes Staycation contest with his photo "Take a little bit of sunset, add a dash of Venus and sprinkle with the Milky Way".

Dr Roy Bishop was published in the JRASC (*A Green Laser Observation Across Minas Basin*) as was a Mars sketch made by David Chapman.

The *New Observers to Visual Astronomy (NOVA)* program has been revised for presentation virtually and in-person. Jenna Hinds was thanked for her past six years with RASC and Samantha Jewett welcomed (outreach@rasc.ca). Judy apologized to members who had not received their Observer's Handbook (OH); they should be receiving it shortly. She noted that there are 10 Nova Scotia

contributors to the OH, many being longtime contributors.

Judy outlined the meeting dates and highlighted upcoming speakers. Look forward to Dr. Jennifer West on February 5 addressing the Magnetic Tunnel Project (refer to *SkyNews*, January/February 2022 edition). Mary Lou Whitehorne thanked Chris Young for his presentation, especially the Golden Gate reference in discussing the Pleiades. After thanking members for attending, the meeting was adjourned at 3:45 PM AST.

February 5th 2022 RASC Halifax Centre Meeting:

(37 attendees)

To watch a replay of the meeting, please visit:

<https://youtu.be/i8pWRysFjbM> on the RASC Halifax YouTube Channel.

(click on noted [time](#) to launch specific segments)

President's Welcome - Judy Black

0:00

RASC Halifax President Judy Black welcomed everyone to the monthly meeting, explained the benefits of membership and reviewed the agenda. Fifty-four had registered for the meeting. She acknowledged the Indigenous lands in which the meeting was held and read the Centre's inclusivity and diversity statement.

Photo Montage Presented by Paul Gray

04:16

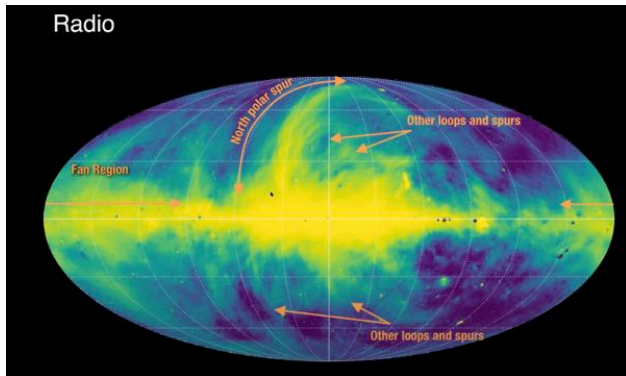
Paul Gray presented members' astrophotos, highlighting wonderful contributions by David Chapman, Michael Boschat, David Hoskin and Paul Gray despite wintery weather. Members can send their images to the email chat list or directly to his email for inclusion in a future montage.

Special Presentations

• Dr. Jennifer West - *Inside the Galactic Tunnel in the Sky*

09:44

Her recent work received much press coverage and she will provide the “inside story.” We often forget the three-dimensional aspect of space and the vast distances between objects.



Because Jennifer is a radio astronomer, she looks at the sky with radio telescopes. The sky was first observed via radio wave images in the 1960's (top left) with the galactic plain. The huge arc extending over the top of the galactic centre is the striking North Polar Spur (NPS) with other loops and spurs. On the left is the Fan Region (FR), so named from older observations of polarization maps.

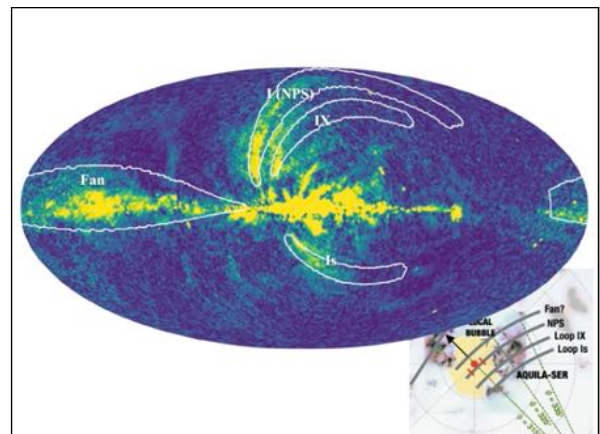
However, if you put together both X-rays and Gamma ray images, a bluish envelope around the Gamma ray emissions shows which may suggest some central outflow or jets from an active nucleus of

our galaxy.

Some believe the north polar spur is not at the galactic centre but rather is closer to us. Looking at dust gives a 3-dimension view and allows for measuring distances. The satellite Gaia measured the brightness of nearly 1.7 billion stars and calculated distances of 1.3 billion stars using parallax. This has allowed for 3-dimension maps of the dust within 1000 light years of our Sun.

Dr. West explained how examining magnetic fields also changes our view; for example, videos of solar flares show charged particles arcing out to trace the magnetic fields. She explained how radio waves and polarization measure the magnetic fields. The NPS and FR do show up quite well in the polarized radio image.

They chose a point between the North Polar Spur and the Fan Region in the conventional view with the galactic centre in the middle then rotated the view so that the point was in the middle. A 1965 article suggested the North Polar Spur and Fan Region are features of the local arm in which our Sun is located. Using this orientation, the simulated polarized intensity looked like what we see with the NPS and FR. However, she introduced a slight curve into model to explain how part of the NPS can be far away and the other end close to us. She then featured a map of the tunnel with an overlay of constellations before entertaining questions.



• **Tim Doucette (RASC, Halifax Centre) - *Equipment Review: Celestron Starsense Explorer LT 80AZ Telescopes & Software*** [1:16:44](#)

Tim provided background of the Starsense development in 2019-2020 and primary features. Its a cell phone app that you install as part of your telescope. It turned the telescope into a push-to type telescope technology without any motors or other technology besides your phone. There are several different models but Tim chose the *Celestron Starsense Explorer LT*, an 80mm Azimuth refractor telescope that weighs less than 10 pounds with all the gear mounted on it. The package includes an instruction manual, licensing keys for the various software to use with it, x2 Barlow, red dot finder, plus 10 mm and 20 mm eyepieces. An image-correcting star diagonal was included which meant that because it reduced incoming light it could be used in the daytime; however, it does lose light because of the prism in it to flip the image.

He explained the unit that attached to the phone, and how the app worked on the phone to locate various targets.



The Millennium Falcon shaped piece of plastic is what's attached to the telescope. His objective was to take this technology and attach it to his 16" Dobsonian telescope for outreach purposes. He's in the process of building a 3-D model for this purpose.

It is well suited for people new to astronomy and who are as young as 8-10 years old who want something light and portable. It is also supposed to work in light-polluted skies but it will depend on how well your cell phone works at night.

Food for the Soul - "Ears See" - The Poetry of Paul Heath

[1:32:50](#)

This poem can be read on page 24 of this edition of *Nova Notes*.

What's Up? for Feb. 2022 with David Hoskin

[1:36:20](#)

February has some interesting things to look for provided the weather cooperates. Days are lengthening to 11.25 hours by the end of the month. Altitude of the Sun is also getting higher.

Sunspot AR2936 is just rotating out of view and had been the source of small solar flares over the past few days. A few new sunspots are rotating into view with not much chance of big solar flare or ejection. Five sunspots are currently visible on the Sun. He noted the DayStar website as a source for solar images.

David outlined the phases of the Moon and described the Mi'kmaq Snow-Blinding Moon (Apuknajit). He noted three conjunctions: Uranus will be 1.2°N of Saturn (Feb. 7) and, on February 27, Venus will be 9°N with Mars 4°N of the Moon in the early morning. February and March also happen to be the best months to observe the Zodiacal Light in the western sky in the morning twilight. He explained it was a good month to observe planets, except Saturn. Venus and Mars are prominent in the dawn sky. He highlighted the star Gomeisa. He described the maxima and minima of Algol (β Persei).

David also presented 5 February observing challenges to members that would help them complete the *Explore the Universe* and *Messier Catalogue* observing programs. He also suggested members observe Algol (β Persei) at its maxima (mag 2.1) on February 14 with minima (mag 3.4) on February 15. Locating thermions of Uranus with a telescope could be challenging given their magnitudes of 14 to 15.

News from the Board Presented by Judy Black

2:00:04

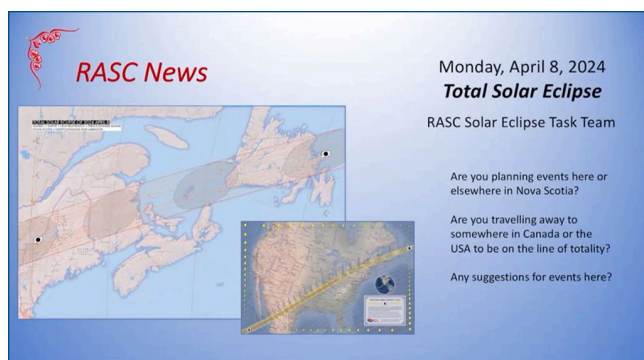
Following the AGM elections, the Governance Committee reviewed *Policy G6: Procedures Regarding Nomination, Elections and Appointments to the Board*. The revisions were approved at the February 1, 2022 Board meeting. Under review for approval in March is *Policy G11: Policies Regarding RASC Halifax Centre Membership and Conflict Resolution*.

Halifax Centre stars include Jason Dain for his photo of Supernova Remnant Simeis 147 in the NASA Astrophoto of the Day (APOD) and David Hoskin for the Pleiades posted in the January 27 EarthSky Community Photos; both of their photos are featured in this newsletter.

Judy outlined the meeting dates and highlighted upcoming speakers. Members should look forward to David Shuman's March 5th presentation on space race launch vehicles and human spaceflight.

Recognizing that not all members attend Halifax meetings for various reasons, simultaneous in-person

meeting and with online and recording capabilities would be preferable. Because members requested a return to in-person meetings, a task team has been formed to determine how best to host Centre meetings when welcomed back to Saint Mary's University (SMU). She also invited members to present their thoughts about their astronomy gear; Allan Sutherland of Atlantic Photo Supply (APS) has also been invited to present up and coming equipment as they become available to APS.



A RASC Solar Eclipse Task Team has been formed to begin plans. Paul Gray is our representative on the task team that is looking at events to be held

and resources needed, such as solar glasses. Members were asked to think about where they will be at that time, i.e., will they be here for the event or will they be travelling to the line of totality. Please advise if you are thinking of hosting an event here.

RASC's *Insider's Guide to the Galaxy* includes the *Messier Minutes* where RASC members are encouraged to complete the RASC Messier Catalogue certificate.

Paul Heath informed the audience of the on-line program developed by the RASC Inclusivity and Diversity (I&D) Committee for Black History Month on February 19, 2021. Three speakers from the Black community will share their research in astronomy, physics and education. One speaker is from Dalhousie University.

After being apprised that the links on how to become a member did not work, Judy explained the changes made. She thanked everyone for attending and invited members and guests to join in the informal Astrochat. The meeting adjourned at 3:15 PM AST.