Nova Notes

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

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Highlights

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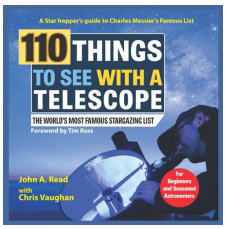

In this issue:

Cover Photos:

Main Photo:
Milky Way, Bayswater NS
by Jason Dain

Thumbnails (l-r):
St. Croix Observatory
drawing by
Mary Lou Whitehorne

"110 Things To See With
A Telescope"
by John A Read,
Stellar Publishing

Halifax Centre Logo

From the Editor

Remember to look up. The skies are open.

Yes that's a blatant steal of our centre president's sign-off line. Judy Black ends her reports with that exhortation and I've always admired it.

But I haven't lived up to it very well over the last year or so. Between the limitations of the pandemic and health issues, it's been a struggle to get myself out under "good" skies lately.

My favourite spots are the centre's observatory in St. Croix and Kejimkujik National Park. I didn't get to Keji once this year - the first that's happened in a long time - and I can count on one hand my trips to St. Croix over the past 18 months.

We live in the light pollution dome known as downtown Halifax so forget the Milky Way or any of the fainter objects like the Andromeda Galaxy (at least naked eye. I can find the faint smear of its two-million-year-old light with binoculars).

But the brighter stars like the Summer Triangle are easily visible from our balcony - even dimmer targets like Albireo shine through when they're positioned above the horizon sky glow and the transparency is good.

The vantage from our balcony is northwest so both of the Dippers have been well placed in the summer - although the big one is dipping lower as autumn progresses.

Lately we've enjoyed Venus hanging low in the southwest when we take a stroll around the Commons, particularly when it's paired with a crescent moon.

Jupiter has also been unmistakable in the southeast these evenings and it's pretty easy to track down nearby Saturn, even though it's much less prominent.

As I write this, it's a cool, clear evening on the aforementioned balcony. Vega is starting to edge into view above our building. Deneb and Altair are soon to follow, riding the eternal turn of our planet. I'll be well into dreamland by the time they move into the northwest.

But the open sky is patient. It will be there for us when we return for another look, on another night.

John

Meeting Dates for 2021

- **November 6 Guest Speaker TBD; Chris Young (Astronomy Lore)**
- **December 4 (+ AGM) - Speaker at Members' Meeting: Dr. Phil Groff, RASC Exec. Director)**

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

More to come regarding the 2022 schedule!

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

YouTube

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, 2021

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Vice-President: Patrick Kelly	(Elected)
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Co-Editor, Nova Notes: Lisa Ann Fanning	(Appointed)

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

As our Observing Chair, Dave Chapman, noted at the October members' meeting, it's that time of year when nights begin to be longer than the day, when we revel in the change of leaf colour and changes to the night sky.

Arthur Conan Doyle in one of Sherlock Holmes novels wrote, "Never trust to general impressions…. but concentrate on the details." Both youth and longtime members did just that over the summer months. They looked for details in their visual observing and astroimaging. Consequently, Halifax Centre proudly announced several RASC certificates for Explore the Universe, Explore the Moon (Liz Greenough completing both binocular and telescope), Double Stars (Melody Hamilton the first to complete this program), and astroimaging. Congratulations one and all!

Despite the COVID times in which we live, we continue to view our Universe from the many corners in which we reside and beyond. As I sat on the beach of our backcountry site in Kejimkujik National Park recently, I marvelled at the night sky - at what I recognized and what was yet to be discovered. I am sure that others besides me enjoy the tranquility of the night and the glimpses of our galaxy and beyond.

I encourage all to get out when the skies allow, perhaps even travel to the St. Croix Observatory (SCO) or your favourite site to observe and perhaps do some astroimaging. Share your sketches, your photos and observing notes that continue to inspire us all.

Remember to look up. The skies are open.

Regards,
Judy

Photo by **President Judy Black** taken during her most recent trip to Kejimkujik National Park and National Historic Site.

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

PO Box 31011, Halifax, Nova Scotia B3K 5T9

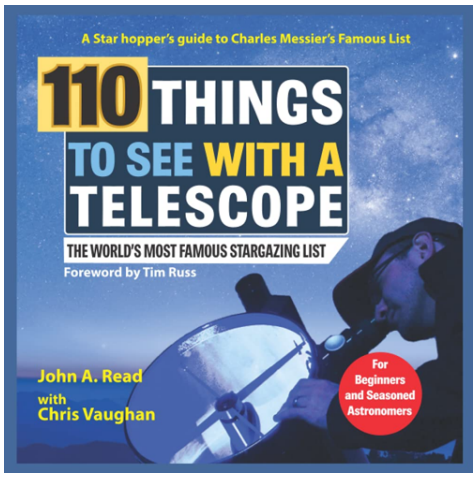
Nova Notes is published five times a year, in February, April, June/July, September/October and December.

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.

RASC Halifax Member John A Read Releases Guide To Observing Messier Catalog

By Lisa Ann Fanning



Three years in the making, and 110 Messier objects later, 2020 RASC Simon Newcomb Award for excellence in science communication recipient and RASC Halifax Centre member John A. Read has published his 12th non-fiction title, and it is a must have for any astronomy buff. 110 Things To See With a Telescope is a guide through Charles Messier's famous catalog of deep sky objects.

Read began penning the book in April 2018, beginning with M13 and ending with M24, the last object he photographed for the book.

Reviews have been consistent, five out of five stars on amazon.com and amazon.ca, and it has earned accolades as #1 Best Seller in telescopes (amazon.ca) and #1 New Release in telescopes (amazon.com). Many of the reviews point out the book's features and design.

The design team has thought of so many little format touches that make this book incredibly user friendly. Objects are organized by season to help the reader plan their observing sessions easily and the page edges are even colour coded accordingly.

Each object has a brief description in simple terms, common and alternative names, object brightness, distance and a subjective rating for difficulty to see. Additionally, each object is depicted to a scale of about 100x, similar to the size of the full moon. They are also depicted in relation to the objects (stars, constellations, etc.) that surround it, making it much easier to locate than other books, which do not typically show this information. Diagrams even include a depicted Telrad ring to aid the reader.

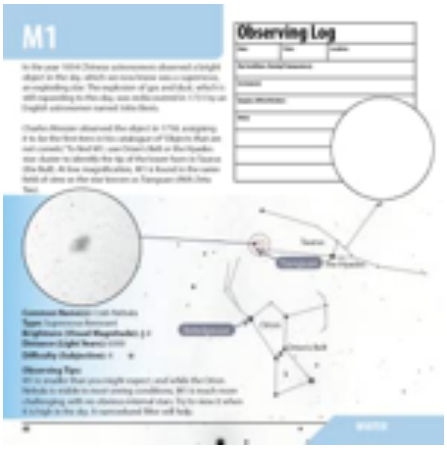
Space to record your observations is also presented on each page, with prompts for information and space to sketch that is helpful whether submitting observing certificate applications or just maintaining a record of your sightings that you can look back on in years to come.

Designed for the field

The book is geared toward observers of all skill levels, and contains comprehensive background information for beginners as well, with 20 pages of introductory information that is helpful in understanding concepts like types of telescopes, how to plan viewing sessions, how to record observations, and of course, history and background of the catalog itself.

Want to take the book out in the field? The book is designed and printed to be used under red light as well, so no need to lose your night vision while observing.

When asked what motivated Read to write this book, he replied, “This is the book I want to use when I go observing, and it simply didn't exist. Sure, there are other books on the Messier list (most are out of print), but there are none that you can simply pick up, use to find your specific target, and record your observation, all without turning a page. I believe my method for creating a book containing customized star maps with only one target per page is unique.”



In Autumn 2020, fellow RASCal and Toronto Centre member Chris Vaughan teamed up with Outreach Coordinator Jenna Hinds on the Mars opposition live-stream for the RASC.

Chris Vaughan adds “In early March, my Insider’s Guide to the Galaxy broadcast for RASC covered the Messier Marathon. John Read watched it and later reached out to say he had started a book about the Messier List and wondered if I would be interested in acting as a consultant on it. After talking more, we decided to co-author the book. I’d always wanted to write one, and he had already done a lot of the work.”

Vaughan continues, “My initial role was to review what John had prepared, and help with his overall plan. That evolved into me writing some new material for the opening chapters, suggesting alternate viewing orders for each season, refining John’s written material, adding my own notes about some targets, perfecting the telrad ring placements, and checking the accuracy of all the target data.”

Author’s anecdotes

Read had some interesting anecdotes to share about some of the experiences he had:

“After I first reached out to Tim Russ (Star Trek Voyager actor) to write the forward for the book, he responded quickly, and we began exchanging lots of emails. Several of my friends are Trekkies, and if it came up, I'd let them know I was talking with "Tuvok," Tim's character on the show. One of my friends asked me to ask Tim if he thought Captain Janeway was a murderer for killing Tuvix (a character created when Tuvok and Neelix became one person in a transporter accident). I was too shy to ask.”

On his favourite moment, Read shared this: “Taking the photos for the "Eyepiece view" images was a lot of work, but probably the most fun, and most challenging. I had an Excel file going to track which photos I had, and which photos I was missing. For consistency, I used robotic telescopes for about 80 percent of the images, but several were too far south, so I had to learn to use other robotic telescopes located down in the states. For wide field shots I ordered a wide field telescope (Sharpstar 61), but due to the pandemic, my order was delayed for months. Then Ray Khan from Khan Telescopes went to his store, found the display model, and shipped that to me.”

In the book’s acknowledgements, Read writes “I am always surprised how many people it takes to produce a book” and cites the many folks from the RASC who rose to the occasion. In addition to Vaughan, Read would like to acknowledge Blake Nancarrow from the RASC’s Observing Committee, who offered advice on how to design the book to be used in the RASC’s observing programs, and Dr. David Hoskin and David M.F. Chapman, who were proofreaders and executive consultants. Also, the viewers of Explore the Universe Online and Moon at Noon who were very encouraging!

Over the next year, Read plans to re-observe the Messier objects, using the book to document his progress and apply for the certificate.

Q&A John Read and Chris Vaughan

Q: Which object(s) would you say are the easiest to see (for beginners?)

John Read (JR): M13 (Great Globular Cluster in Hercules), M22 (Globular Cluster), M45 (The Pleiades), M31 (Andromeda Galaxy), M57 (The Ring Nebula) and M42 (Orion Nebula)

Chris Vaughan (CV): Almost everyone has already seen The Pleiades (Messier 45). From reasonably dark sky sites, we could add the Andromeda Galaxy and the Orion Nebula as naked-eye objects. Add binoculars, and anyone can see all of the above, plus the Wild Duck Cluster, even from the city. In a small telescope, even from the suburbs, beginners can easily see the Hercules Globular Cluster and other bright globulars like M2, M3, M4, M5, and M15, as well as the galaxies M81, M82 in Ursa Major, which are impressive.

John Read
@LearnToStargaze
Photo by Jennifer Read

Q: Which object(s) presented you with the biggest challenge and why?

Chris Vaughan
@AstroGeoGuy
Photo by Betty Reid

JR: I didn't see Leo Triplet until recently. This is a springtime target, but is a challenge to see from the city. Most of my dark-sky observing is done in the late summer, when Leo is below the horizon.

CV: At first I was intimidated to tackle the Virgo Cluster of galaxies – but after some planning with Stellarium, it was actually fairly easy to work through them on a dark night. The biggest challenges are finding opportunities to see fainter objects while they are high in the sky. Too many cloudy nights! Before the pandemic, in the summer I had access to a dark rural site with a low southern horizon, terrific for the Messiers in Scorpius and Sagittarius. But the low winter Messiers in Lepus and Canis Major were a challenge from my very tree-filled neighbourhood. Lucky for me, I was using a big f/5 12.5" Dobsonian telescope with a Telrad unit finder. That made finding everything quite easy.

Q: What/ when was your best night of viewing? (Most objects in a single session) + describe the evening

JR: It's hard to say what my best night of viewing was, probably one of the evenings at a past Nova East Star Party. I LOVE doing mini-marathons, challenging myself to see how many objects I can see in a single session. I usually use my 12 inch Dobsonian for this, hopping around from target to target. On a good night, I typically hit up about 30 different objects.

CV: My most memorable night was during the peak of the Perseid meteor shower in 2018. I would view an object and then, while writing in my logbook, the whole table would be lit up as a Perseid streaked by overhead. At that time, I'd already completed the Messier List and was working on the RASC Finest NGC targets. On the night of June 10-11, 2018, I logged 19 of the spring Messier galaxies between 10:30 pm and 1 am!

Q: Were there any objects that made your family members or friends go “wow!” when you showed them?

JR: Only the brightest objects like M42 typically get the wows. The dimmer more obscure objects take time and effort to appreciate, so a wow is generally not the goal for most Messier objects.

CV: My wife, who isn’t very into astronomy, really appreciated Saturn and the Hercules Globular Cluster M13. Who wouldn’t? It’s spectacular, and easy for beginners to see clearly.

Q: Are your children passionate about astronomy? What do they love most?

JR: My boys love looking at the Moon, and different coloured stars. I think they're a little young to be passionate about astronomy, but I'm hoping that will come with time.

CV: Years ago, my young daughter used my GoTo 8” SCT to find the Wild Duck Cluster herself. Now it’s kind of “her” Messier.

Q: How has the pandemic changed your viewing? Do you view more /less? Do you miss anything in particular? Have you gained anything from the pandemic?

JR: I still stargaze whenever I can. So I don't think the pandemic changed the frequency of my observations. What I really miss is the hands-on work I did at the Burke-Gaffney Observatory; getting the five Dobsonians on our school's observation deck and helping dozens of students (per session) with their observing projects for SMU's introductory astronomy course for non-science students.

CV: Goodness, yes! Not owning a cottage, and with the RASC dark sky observatory closed, I’ve largely been stuck on my driveway in suburbia, with loads of trees blocking my sightlines. Making lemonade of it, I’ve nearly completed RASC’s Isabel Williams Lunar Observing Program and their new Double Stars program. And I've spent more time at the eyepiece.

Q: Any new and exciting projects coming up?

JR: I have some projects with Formac publishing for the 6th grade science curriculum. For the next few months, I'd like to focus on creating helpful content on my LearnToStargaze YouTube channel to supplement the books.

CV: I’ve recently been able to escape the city lights for some dark sky observing with “Annie Jump Cannon”, my big Dobsonian. I’m now working on the Herschel 400 objects and the David Levy Deep Sky Gems list – as well as wrapping up the two programs mentioned above. We’ve also been able to return to using the big 74” telescope at the David Dunlap Observatory, where deep sky objects show up in colour, visually!

Q: Any advice you’d like to add for us newbies?

JR: Get the book and get to work observing! You'll be surprised how much you can see, and how fun it can be to record your progress toward seeing all 110 targets.

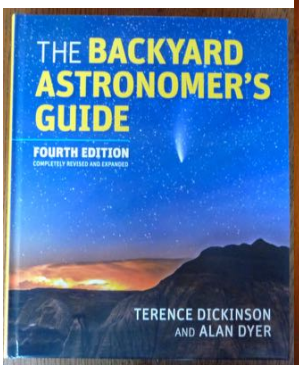
CV: Yes, a few tips! Try to get away from the city with your telescope. It doesn’t need to be a large telescope to see galaxies and nebulas - if the sky is dark. Add a Telrad unit finder on your telescope - it makes finding targets so much easier. Buy a low power, long focal length eyepiece for your telescope - most galaxies are bigger than you think! And get an Ultra High Contrast filter to make nebulas pop! Finally, tackle the winter targets by staying up all night (or getting up before dawn) in autumn, when it’s not so cold!

Once you get used to viewing them, galaxies get easier to see. Keep at it, and keep looking up!

RASC Halifax Member Mentions

Congratulations to member **Fiona Morris** on winning runner up in the youth category of *SkyNews* Magazine's annual photo contest for her stunning photo of the Andromeda Galaxy. According to *SkyNews*, "The annual photo contest gallery showcases the best images, chosen each year from the images submitted to the Photo of the Week contest. Category winners are also announced every year in the September/October issue."

Congratulations to member **Kathy Walker** on having her photo of globular cluster M-13, chosen for a two-page chapter title page spread in Terence Dickinson and Alan Dyer's new edition of their classic *Backyard Astronomer's Guide*.



Congrats **David Hoskin** who had his photo of M81 shared on EarthSky's Community Photos with this caption: "Messier 81, also known as Bode's Galaxy, is a grand spiral galaxy with a supermassive black hole at its centre. Bode's Galaxy is located in Ursa Major and is about 12 million light-years from Earth." Thank you, David! M81 is not just a September deep sky target but can be enjoyed from northern latitudes all year.

EarthSky

View at EarthSky Community Photos.

Comets: Frozen Visitors from the Outer Solar System

By David Hoskin

Throughout history humankind has viewed the unpredictable and unannounced “long-haired stars” that occasionally appeared overhead with a mixture of dread and awe. Among ancient cultures these celestial visitors, which we now know to have been comets, were often regarded as omens of disaster. One of the best-known comets, Halley’s Comet, was blamed for bringing the Black Death to England while an earlier apparition, which was recorded in the Bayeux Tapestry, coincided with the death of Harald II at the Battle of Hastings and the Norman Conquest of England. Comets are named after their discoverer, which can be a spacecraft as well as a human being.

Comets are aggregates of dust, rock, ice, and various frozen gases, and, as a result, these small solar system bodies are sometimes referred to as “dirty snowballs” or “icy mudballs”. The nucleus, which is the solid core of a comet, can have a diameter ranging from a few hundred metres to tens of kilometres. Comets typically have elliptical orbits that are highly eccentric. For a comet to brighten to naked eye visibility, it requires a large and active nucleus, a close approach to the Sun, and a close approach to the Earth. However, comets are fragile and those that come too close to the Sun may disintegrate, as did Comet C/2019 Y4 ATLAS.

As the orbit of a comet brings it close to the Sun, the frozen parts of the comet are warmed and turn into a gas cloud, known as a coma, which surrounds the nucleus. This process is known as outgassing. The coma may be as large as 15 Earth diameters. It consists largely of hydrogen derived from the destruction of water molecules but also contains carbon dioxide and other gases that sublimate from the comet’s nucleus. Organic compounds have also been detected in the nucleus, leading some scientists to speculate that comets may have brought the building blocks of life to the Earth early in the history of the Solar System. As a comet approaches the Sun it develops a dust tail and an ion tail, both of which point away from the Sun. Comet C/2020 F3 NEOWISE (shown here), which brightened to naked eye visibility during July of 2020, exhibited two such distinct tails. Dust particles released by outgassing are charged by solar radiation and spread out over millions of kilometres, forming a dust tail that curves as it follows magnetic field lines. The dust tail may be up to 10 million kilometres in length. Comet-associated plasma that interacts with the solar wind generates the ion tail, which is straight rather than curved and may be several hundred kilometers long.

Like asteroids, comets are leftovers from the dawn of the Solar System about 4.6 billion years ago. Comets originate from one of two places, either the disc-like Kuiper Belt located between the orbits of Neptune and Pluto or the Oort Cloud, which lies far beyond Pluto’s orbit.

According to NASA, there are 3,743 known comets; however, the Kuiper Belt may contain billions of comets while comets in the Oort cloud may number in the trillions. The Kuiper Belt is the source of short period comets that take less than 200 years to complete an orbit of the Sun. The apparitions of short period comets are predictable because their orbit frequently and repeatedly brings them into the inner Solar System.

Comet 4P/Faye (shown here), which is now about 1.2 astronomical units from the Earth and passing through the constellation Taurus, is an example of a short period comet. The orbital period of Comet 4P/Faye is only seven and a half years. The early morning hours are currently a good time to hunt for and view several short period comets. In contrast, comets that arrive from the Oort Cloud take more than 200 years to orbit the Sun and are therefore known as long period comets. The large number of years between apparitions causes Oort Cloud comets to be far less predictable. In fact, a long period comet may take as much as 30 million years to complete one orbit around the Sun. Comet C/2020 F3 NEOWISE is an example of a long period comet, having a relatively short orbital period of 6,766 years.

Comets that pass through the inner Solar System leave behind debris from the dust tail that is known as a meteoroid stream. Particularly dense meteoroid streams result from the occasional disintegration of a comet. Meteor showers occur when the Earth passes through the dust and debris left behind by a comet. The impressive Perseid meteor shower, which reaches its peak around August 12 each year, is associated with the stream of debris left behind by Comet Swift-Tuttle as it orbits the Sun every 133 years. It is awe-inspiring to know that you are seeing a remnant of the early Solar System the next time that you admire a comet or a comet-derived meteor.

Resources:

All About Comets – NASA SpacePlace
https://spaceplace.nasa.gov

Comets - NASA Science Solar System Exploration
https://solarsystem.nasa.gov/asteroids-comets-and-meteors/comets

Comet – Wikipedia
https://en.wikipedia.org/wiki/Comet

Comets – The Sky Live
https://theskylive.com

Comet Facts – The Nine Planets
https://nineplanets.org

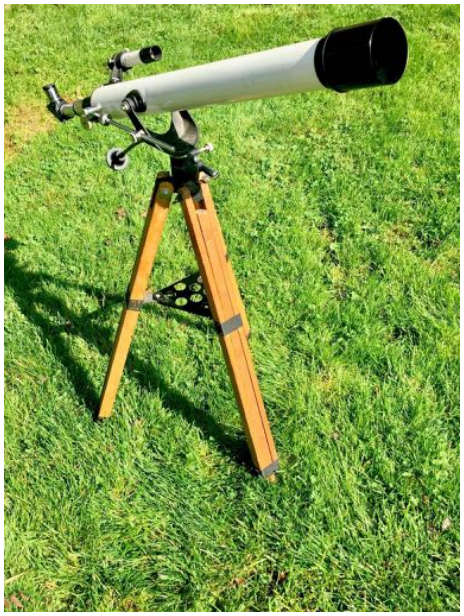
Making Time for Morning Comets by Bob King – Sky & Telescope
https://skyandtelescope.org/astronomy-news/making-time-for-morning-comets

A Vintage Telescope Story

by David Chapman

A couple of years ago, I bought a used 1963 Tasco 12TE-2 60 mm f/13.3 refractor telescope from a lady here in Halifax who was downsizing. It had only a single owner, her late husband. It was in pretty good shape, but obviously used, and a bit dusty. According to a brochure I found online, all the original parts were included, and it came in a wooden case.

My motivation in buying it was to answer a question that had been bugging me for years: "were Tasco telescopes always 'trash' telescopes?" The answer, emphatically, is NO!



I owned a Tasco 60 mm when I was just 10 years old, and my observing logbook from back then demonstrates that I saw a lot of detail on the Sun, Moon, and planets with that 'scope. I refurbished the telescope a little, and had a great view of the Moon and some double stars. Mission accomplished!

But I do not need another telescope, so I donated it to the RASC Dorner Telescope Museum.
https://www.rasc.ca/dorner-telescope-museum

Obviously, the Tasco is not a "Canadian" telescope, but it is typical of the telescopes used by a lot of Canadian amateur astronomers like me who grew up in the Space Age. That — and the fact that it is a 100% complete specimen — makes it museum-worthy, in my opinion. The director of the museum, Randall Rosenfeld, agrees with me, and he dropped by yesterday to pick it up. The Tasco is going to a great home.

So, since I divested myself of a telescope, does that mean we get two weeks of clear skies?

Congratulations New Observers!

The following observing certificates (and pins) have been awarded to Halifax Centre members over the summer:

Liz Greenough (Explore the Moon - Telescope) 7 Jun 2021
Melody Hamilton (Explore the Moon - Binocular) 2 Aug 2021
Liz Greenough (Explore the Moon - Binocular) 2 Aug 2021
Melody Hamilton (Double Stars) 14 Sep 2021

Special notes from Blake Nancarrow, RASC National Observing Committee: "Melody is the very first RASC member in the country to complete the new Double Stars program! And, of course, she sketched every target!"

Members' Universe

A Night in Kejimkujik Dark Sky Preserve, NS

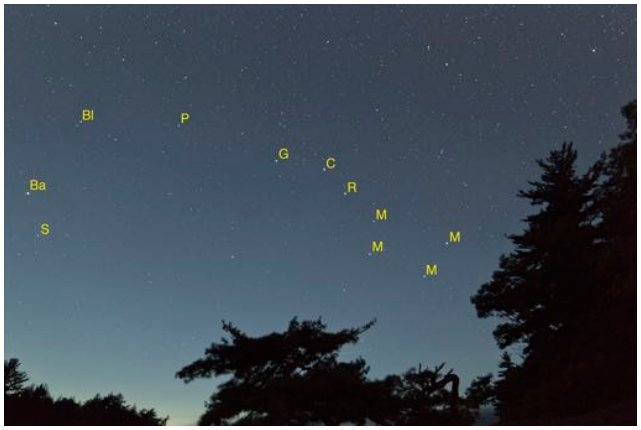
by Dave Chapman

My wife and I paddled to backcountry Site 15 in Kejimkujik on 2021 September 8. The evening was clear and the sky became dark, occasionally interrupted by passing clouds. The Sun set at 7:45 p.m. ADT and I picked out Venus and the two-day crescent Moon by 8 p.m. Mercury was below the tree line —not a great elongation coming up.

The 2-day-old "Mate Calling" Moon low in the west.

In the twilight, I watched the stars of the Mi'kmaw sky story "Muin and the Seven Bird Hunters" appear.

Ursa Major, with Boötes to the left and Ursa Minor to the right, in the twilight.



The characters in the Muin story. M=Muin, R=Robin, C=Chickadee, G=Gray Jay, P=Passenger Pigeon (extinct), Bl=Blue Jay, Ba=Barred Owl, S=Saw Whet Owl

Ursa Minor was a bonus.

The sky was fully dark by 9:30 and I struggled to get some Milky Way photos. I also observed many star fields and deep-sky objects in my 15x70 binoculars, all the typical ones, too many to recount. The SQM reading was 21.7 magnitudes per square arcsecond, nearly the best I've seen.

I use an iOptron StarTracker Pro mount on a tripod with my Canon camera to take wide-field shots. Once it is set up and aligned, I pretty much forget about it. I will share two single frames from the evening.

A classic Milky Way shot through Aquila, Scutum, and Sagittarius. This is the Spirit Road of the Mi'kmaq that carries departed spirits into the sky. Jupiter and Saturn are at the left.

The Milky Way through the Summer Triangle, aka the DAVE asterism: Deneb-Altair-VEga (Vega gets two letters because of the famous Double Double in Lyra).

It is difficult to observe and photograph in the same session, as messing with electronics tends to ruin one's dark adaptation. Sometimes I put the camera aside and just enjoy the starry sky. Kejimkujik's backcountry is a great place for that if you choose the right site.

I was fighting clouds and tiredness by midnight so I called it a night and turned in, BUT I set my alarm for 4 a.m., an hour before dawn.

I rose at 4 a.m. with dark-adapted eyes to view a star-studded sky over a calm lake. The SQM reading was a solid 21.8, the darkest I have experienced. For a good half hour, I just viewed the sky without ruining my vision with electronics. Jupiter was now setting, Pegasus was high in the sky. I counted a dozen faint stars inside the square. There are a lot of faint constellations in that sector of the sky, and I enjoyed figuring them out: Pisces, Triangulum, Cetus (very big), Aries (very bright), and Eridanus (very meandering). I traced Eri down to a medium-bright star a few degrees above the southern horizon: Acamar. I do not recall seeing that star from Nova Scotia before.

From SkySafari:
“Acamar, or θ1 Eri, is a star in the constellation Eridanus, the ancient Greeks' "River Ocean", which unlike real rivers has two ends. Eridanus begins at β Eri (Cursa), and now terminates at α Eri (Achernar), whose name comes from an Arabic phrase that means "the end of the river." But Achernar is too far south to be visible from ancient Greece. The original end of the river was the star we now call Acamar; European southern hemisphere explorers in more modern times extended the River down to Achernar. Acamar's name derives from the same Arabic phrase as Achernar's ("Akhir an-nahr", meaning "the last of the river"), but with Achernar's "rn" mis-transposed to Acamar's "m" in Roman-alphabet handwriting.”

Orion and Taurus, including The Pleiades. It’s amazing how many stars there are in that field, without it being IN the Milky Way.

The weather was rainy for our second night there, but I am thankful for this single night.

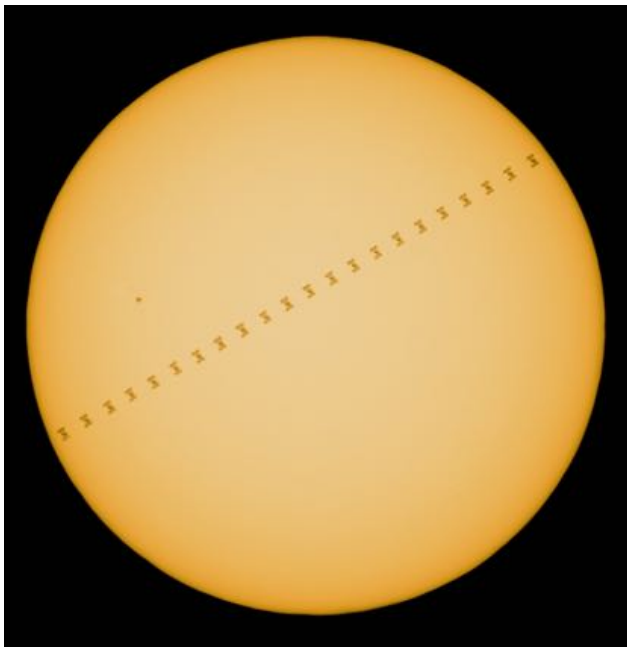
Do you have something you would like to share in an upcoming edition of *Nova Notes*?

Send your photos, poems, articles and other works to

novanoteseditor@halifax.rasc.ca

ISS Transits by Jason Dain

Jason Dain writes: “While doing astrophotography, I often see the International Space Station (ISS) flying over. I did some research on how to photograph it using various methods and found that it is easiest during a lunar or solar transit. Using a website called Transit Finder (http://transit-finder.com) you can get very precise details of where and when you can catch the ISS transiting the sun or the moon.



Just after noon on August 24 was one of those times when it would be visible relatively close to home so I grabbed my solar filter, camera and tripod and off I went. I set up at a spot right on the centre line of the transit and using a calibrated timer (http://time.gov) prepared for the transit. I gauged how quickly the sun would move across my field of view and then decided when I needed to move into position. I set my camera to record video at 4K, 30 FPS where each frame was at 1/3200th of a second, f/9 and ISO400. I used my Nikon D500, tc14iiie teleconverter and 500mm f/4 lens for the job. I started my video and let it run and watched in amazement as the ISS flew by in about 3/4 of a second.

Using PIPP processing software, I extracted and aligned the 22 frames that had the ISS in them and exported them. I then loaded them into Photoshop, selected all of the images and used Darken mode to create the stack. I then applied some coloration, noise reduction and contrast adjustments to get the result you see here. Next target is the ISS passing the full moon!

On September 20, 2021, Jason did capture the International Space Station (ISS) passing the full Mate-Calling Time / Harvest moon just outside of Milford, NS in early morning.

Jason writes:
“Using http://transit-finder.com, I planned the location where I would be able to see the transit at 2:15 this morning. I arrived at the location and setup my Nikon D850, 1.4x teleconverter and 500mm pf f/5.6 lens on my tripod and gimbal head. I used 4k video mode with a shutter speed of 1/2000th of a second, f/11 and ISO 1000 to capture a minute or so of video before and after the transit.

At home, using PIPP, I extracted the 30 frames of the ISS passing the moon. I loaded those frames into Photoshop, aligned and then converted into a smart object. I cloned the smart object into two layers, one for the moon to reduce noise and another for the ISS. I used a stack mode of Median for the moon and minimum for the ISS. I rasterized the two layers, masked the ISS and the applied various adjustments to get to the final image.”

RS Ophiuchi in first outburst in more than 15 years

Photo and caption by John A. Read

John Read writes: “This image is a single 180 second exposure of RS Oph, a recurring nova, taken on August 12th, 2021 from Paeonian Springs, Virginia (in the light polluted skies just outside of Washington DC). The telescope was a Sharpstar 61, with an L-eNhance filter, and a ZWOASI294mc pro camera.

The star, RS Oph, appears redder in this image than it should. This is most likely a function of the filter, and camera combination. I made no attempt at colour correction in post processing.

The area surrounding RS Oph is interesting to observe. There is a "V" asterism to the East of the Nova, which bears a resemblance to the popular "Lunar V" feature visible on the surface of the Moon. The neighbourhood is also home to several cascades of stars, one that arcs around RS Oph, and another further east which resembles Kemble's Cascade in Camelopardalis in that it appears to terminate in a tiny cluster.

I was motivated to grab this exposure after finding out that RS Oph was closely studied by the prolific science communicator, Dr. Tanya Harrison. RS Oph was the source of one of her very first scientific discoveries. In summary: Novae stars are the result of interactions between neighbouring red giant and white dwarf stars. Dr. Harrison discovered that the Lithium abundance in pairs of stars with Novae was far higher than in pairs of similar stars that do not produce the nova phenomenon.

Note that this may be a vast oversimplification of the discovery, the paper can be found here: https://www.jstor.org/stable/10.1086/587965?seq=1#metadata_info_tab_contents"

Kathy Walker has been busy this summer making beautiful images….

"Here are a couple of images I worked on this summer. Both were taken with my Orion 200mm f/4 Newtonian, Atik 383L+ camera, and Astrodon filters. My observatory is located in Hall's Harbour, NS, and is fully automated. The fast telescope and the automation allow me to collect all the data for a typical target in one summer night."

M8 Stats:
7x 600s Ha, 1x1 (1h10m)
8x 900s Oiii, 1x1 (2h0m)
8x 300s L, 1x1 (0h40m)
8ea 120s RGB, 2x2 (0h48m)
Total: 4h38m

Sh2-101 Stats:
10x 600s Ha, 1x1 (1h40m)
10x 600s Oiii, 2x2 (1h40m)
10ea 120s RGB, 2x2 (1h0m)
Total: 4h20m

Major Solar Prominence captured by **Lisa Ann Fanning** on 9/11/21

Per spaceweather.com, "This was one of the biggest in years. At its apex (yesterday) it curled around almost 20% of the sun's circumference. Such large structures made of plasma and magnetism rarely last long and, as expected, the prominence collapsed on Sept. 12th, hurling part of itself into space."

Taken with an iPhone 11 through a Lunt Solar Systems LS50T Ha (Hydrogen Alpha) scope equipped w/7.2mm - 21.5mm zoom eyepiece)

"Fly me to the Moon" - **Lisa Ann Fanning** writes: "This photo combines two of my favourite things - Birds (in this case, European Starlings) and the Moon! I also have an intense fascination about the correlation between migration and the moon cycles." Taken with a Canon PowerShot SX70 HS

Through David Hoskin's Lens

Our solar system, as seen and imaged through **David Hoskin**'s telescopes over the past few years.

Harvest Moon Over York Redoubt
Sept 9, 2021 by **David Hoskin**

M8 & M20
August 16, 2021 by **David Hoskin**

Lobster Claw and Bubble Nebula
July 31, 2021 by **David Hoskin**

Morning Zodiacal Light
Sept 9, 2021 by **David Hoskin**

Through Jaime Whynot's Eyepiece…

Jaime writes: "I've been naked eye observing with the help of the SkyView app for many years now. After discovering the RASC Youtube Channel in December 2020, I was amazed that I could get a closer view of the stars, moon and even some deep sky objects with binoculars so I purchased a set and they arrived just after Christmas 2020. I joined RASC Halifax Centre mid-January 2021 at the advice of a local astronomer who helped me tune up my old 60mm refractor that's been collecting dust for 15+ years in the attic. I was able to use it to see the moon, some larger craters, and random stars, but being a department store (Sears) telescope, it was not very stable and a bit frustrating to use. In late April, I decided to purchase my first "good" telescope after many discussions with local astronomer, Wayne Mansfield, and Chris Curwin from Astronomy by the Bay in NB. I'm very happy with my Skywatcher Classic 200P 8 inch dobsonian and enjoy capturing images of the moon and planets with my iPhone."

First Quarter Moon with Lunar X and V visible - September 13, 2021
Skywatcher Classic 200p 8 inch dob telescope
Skywatcher 25mm Super MA 1.25" eyepiece
Celestron NexYZ smartphone adapter
iPhone 8

58% Waxing Gibbous Moon with Rupes Recta (straight wall) visible - September 14, 2021
Skywatcher Classic 200p 8 inch dob telescope
Orion Sirius Plossl 17mm 1.25" eyepiece
Celestron NexYZ smartphone adapter
iPhone 8

Jupiter and Saturn - September 21, 2021

Skywatcher Classic 200p 8 inch Dob telescope
Orion Sirius Plossl 17mm 1.25" eyepiece with
Celestron X-Cel 2x Barlow
Celestron NexYZ smartphone adapter
iPhone 8

September Members Meeting

September 11, 2021 (14 attendees)

To watch a replay of the meeting, please visit https://www.youtube.com/watch?v=wlxcTv7Rggk on the RASC Halifax YouTube Channel.

Opening Remarks

RASC Halifax Vice President Pat Kelly welcomed everyone to the monthly meeting. President Judy Black was out of town. He welcomed people of all diversity and acknowledged that Halifax Centre is in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq people, reviewed the agenda and the benefits of membership of the RASC.

Special Presentations

- David Hoskin (RASC Halifax Centre) "*NEOWISE (C/2020 F3) The Almost Great Comet of 2020*." The discovery and observations of the brightest comet seen in Northern Hemisphere skies in nearly a quarter of a century.

- Chris Young (RASC Halifax Centre) - "*Sky Lore 2021*." Chris is well known in Halifax circles for his knowledge of astronomy lore from numerous cultures. This is his second in the series.

What's Up in the Sky? with Dave Chapman

Dave Chapman provided his monthly rundown of what's up in the night sky. For September 2021, he highlighted objects included in the *Explore the Universe* observing program. His presentation can be viewed in the meeting video or accessed directly on the RASC Halifax Centre website.

Notes from the Board/ Questions

The Centre Survey was administered to understand what members would like to see at meetings. The survey will be sent out again for those who did not have a chance to participate the first time.

International Observe the Moon Day (October 16) - given the current state of the pandemic, no organized events are planned at this time. Should that change, notice will be sent out to the membership.

St. Croix Observatory

- Updated Policy - The policy was relaxed. Masks not required, but recommended, 4 people allowed in the warm room at a time, and it is requested that attendees be fully vaccinated. Please notify via the list if you plan to attend, so that people have an idea of the number of attendees that will be present.

- Ground Fault Interrupter (GFI) is not working - John Ledard to replace and validate that there isn't an ongoing moisture issue.

- The green layer of felt will also be removed to facilitate the cleaning process.

Astrophotography contest - Normally held at Nova East, the contest will be pushed back to take place in the fall. More information will be released soon.

Review of upcoming meetings (see page 3) - For the foreseeable future, meetings will be online until St Mary's University updates their policy on allowing outside visitors to gather.

October Members Meeting

October 2, 2021 (17 attendees)

To watch a replay of the meeting, please visit https://www.youtube.com/watch?v=pT_Fe5OsF44&t=5634s on the RASC Halifax YouTube Channel.

President's Remarks

RASC Halifax President Judy Black welcomed everyone to the monthly meeting, she explained the benefits of membership and reviewed the agenda.

Indigenous Land Acknowledgement - "RASC, Halifax Centre would like to begin by acknowledging that we are in the Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq People. This territory is covered by the "Treaties of Peace and Friendship" which Mi'kmaq and Wolastoqiyik (Maliseet) Peoples first signed with the British Crown in 1725. The treaties did not deal with surrender of lands and resources but in fact recognized Mi'kmaq and Wolastoqiyik (Maliseet) title and established the rules for what was to be an ongoing relationship between nations.

"RASC as well as RASC Halifax Centre believes in and practises inclusivity and diversity. All are welcomed regardless of age, disability, gender, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, ethnic origin, colour, nationality, national origin, religion or beliefs or sex and sexual orientation. And we are opposed to all forms of unlawful, unfair discrimination."

Special Presentations

- David Hoskin (RASC Halifax Centre) "*Hydrogen Alpha Solar Imaging*"
  David reviewed the benefits of hydrogen-alpha solar imaging versus white light imaging of the Sun. He will also discuss the equipment, software, and techniques used to generate a hydrogen-alpha image of the Sun.

- Patrick Kelly (RASC Halifax Centre) - "*The Instability Gap and Cosmic Distances*."
  Pat described stars that become unstable, and how their pulsations lead to determining the size of the Milky Way and the existence of other galaxies.

What's Up in the Sky? with Dave Chapman

Dave Chapman provided his monthly rundown of what's up in the night sky. For October 2021, he highlighted objects included in the *Explore the Universe* observing program. His presentation, including hyperlinks, can be viewed in the meeting video or accessed directly on the RASC Halifax Centre website.

https://halifax.rasc.ca/index.php/2-uncategorised/63-whats-up

News from the Board/ Questions

Call for Nominations to Board of Directors - required by October 1, 2021

- Board Positions:
  President
  Vice-President
  Treasurer
  Secretary
  6 Directors

- Appointed Positions:
  Editor /Co-Editor, Nova Notes
  Observing Chair
  Outreach Chair
  Librarian
  SCO Manager
  Chair, Nominating Committee
  Chair, Governance Committee
  Chair, Dark Sky Preserve Committee

- Nominations must be received by Nominating Committee before November 3, 2021
- Halifax Centre Members notified of slate of nominations on November 13, 2021
- Election of Officers at AGM - December 4, 2021
- Appointments in January by newly elected Board of Directors

SCO Revised - SCO is open

A revision of usage guidelines will be sent via email and posted on website in the next few days.

Key Fee

Effective Oct 1, a $10 Fee for new and replacement keys requested by members who have been a Halifax Centre member for at least 1 year.

Halifax Centre Stars

- Observing Certificates
  - Liz Greenough - Explore the Moon telescope June 7, 2021
  - Liz Greenough and Melody Hamilton - Explore the Moon - binocular August 2, 2021
  - Melody Hamilton - First person to complete the Double Stars program - September 14, 2021

- David Hoskin - September 21, 2021 CTV News weather segment with Kalen Mitchell - David Hoskin's photo used in segment to explain change of colour of the moon

RASC Awards (nomination deadline December 31, 2021)

Visit https://www.rasc.ca/rasc-awards for details.
Please send nominations to Chris Gainor cgainor@shaw.ca

Nova Notes - deadline for content October 3, 2021 - If you have a submission for the next edition of *Nova Notes,* please send it to novanoteseditor@halifax.rasc.ca.

Halifax Centre Member Survey posted in June - 15 responses received. It will be reposted for those who have not responded. We need to hear from you!

InOMN (International Observe the Moon Night) - October 16, 2021 - given the current state of the pandemic, no organized events are planned at this time. Should that change, notice will be sent out to the membership.

SCO Fundraising Committee - Astrophoto Sale - Contact Blair MacDonald for details.
Photos may be donated for fundraiser for ongoing maintenance of SCO
Jerry Black, Blair MacDonald and Jason Dain are current contributors
See link on homepage for more details.
Photos for sale ($30) will be posted Dec 1, 2021

Halifax Centre 2022 Calendars - available for $25 each. Payment can be made through eTransfer or Cheque.

The Insider's Guide to the Galaxy is back!

Special Tuesday Sessions
3:30 PM Eastern
www.rasc.ca

October 12
Astronomy at other Wavelengths

October 26
Binoculars Observing

November 9
Lunar Geology

Host: Chris Vaughan
Every other Tuesday until winter holidays!

Register
Livestreamed to *The RASC YouTube Channel*

Upcoming Meetings:
November 6, 2021: Chris Young (Astronomy Lore); second speaker TBD
December 4, 2021 (+ AGM): Dr. Phil Groff, RASC Executive Director
January 8, 2022 (tentative date, as first Saturday is New Year's Day) Blair MacDonald - Pandemic Astroimaging