

# NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC  
VOLUME 2022 ISSUE 3 MAY JUNE 2022



## Sliding (Happily) Down the Slippery Slope

Getting into Astronomy, by Marla Daskis

So, you've always liked science shows on TV, and maybe you had a book (or two) by Carl Sagan, and then one day you have an opportunity to get a telescope (without any research as to what kind to get), and you get it, and then what??

This was my scenario a few years ago. The box arrived at the house, and my first thought was, "Oh my, what have I done?!" The telescope I got was a "go-to"—the implication being that you simply point it at the sky, and it figures everything out for you. After getting it all set

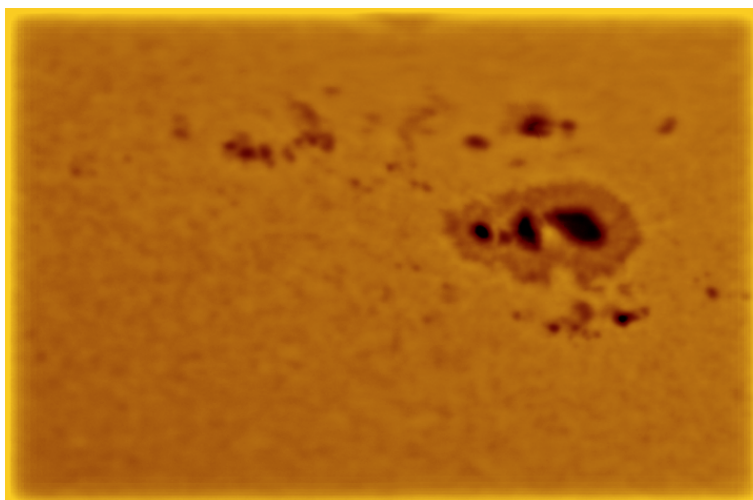
up and then looking blankly at the alignment instructions, I realized that the marketing

than knowledge to do?

I love books, so by default they were my first acquisitions. There are a lot of excellent books for beginners, and they cover lots of good information. I was still having problems trying to find things in the sky, however, and when I did look through the telescope at something, it wasn't the same as all the

fabulous pictures I was seeing in books and online. Thus, my next phase was looking online for information, and that's where I found the RASC and got

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Sunspots on a partially cloudy day

hype far exceeds reality—go-to scopes need some idea of where they are and what they're looking at.

So, what is an aspiring astronomer with more telescope

**MAY 12**

**Zoom**

Clare Higgs from UVic: Getting to know the neighbours: Dwarf galaxies in the Local Group. See Meetup for Zoom details.

**JUNE 9**

**Zoom**

Speaker TBA. Watch Meetup for updates and Zoom link.

**JULY 14**

**Zoom**

Speaker TBA Watch Meetup for updates and Zoom link.

# Moonrise

by J. Karl Miller

Many people have little interest in astronomy. Most of them have never given thought, or don't know, for instance, the cause of the Moon's various phases, and its different locations in the sky from day to day. The picture at right was taken through our living room window, the Moon phase shown a day or so after full. The Moon and Earth are, as are all the planets and their moons in our solar system, illuminated by the Sun.

I expected to see the Moon rise behind the mountains at about that position and at that time, both from past experience (we've lived in our house for over 50 years), and rough calculations of thumb.

The Moon's speed in its orbit around Earth is such that it moves the distance of its own diameter (about 3500 km) eastward in an hour. That is its real motion in the sky, as is obvious when compared with the position of background

stars. The Moon's apparently much larger motion westward is the result of Earth's daily rotation.

The full Moon is always located in the sky opposite the

Earth orbits through the four seasons, the rising and setting points for Sun and Moon change every day; nonetheless, the full Moon is always opposite the Sun. That implies that

the position of the Sun in the sky six months later will be approximately where the full Moon is today, and the full Moon six months later will be approximately where the Sun is today. Opposing positions can also be applied to other phases of the Moon. For instance, first quarter Moon and last



The Moon, about a day after full

Sun's position in the sky on an imaginary straight line from the Sun, to the Earth, and then the Moon. For the northern hemisphere in summer, the Sun rises in the northeast, and sets in the northwest. The full Moon on the same day rises in the southeast and sets in the southwest. The winter sunrise and sunset are again opposite each other: Sun southeast rise, southwest set, the full Moon northeast rise, northwest set.

Throughout the year, as the

quarter are in the same relationship as full Moon and Sun. One difference is that their respective illuminations are opposite. In the northern hemisphere on Earth, the first quarter shows the illuminated right side and the third quarter is its illuminated left side, as seen standing up, facing south. In general, all phases of the Moon before full are illuminated on the right side, all phases past full Moon are illu-

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# President's Message

by Alan Jones

Every couple of months, our Nova editor asks around council for articles and pictures for our newsletter. Members are also welcome to submit both to the editor. We are a group of passionate people that feel the quest to understand better the mysteries of the universe and to share our knowledge journey

with each other and the public.

As your president, I am continually impressed by our membership. This week, five of our council members presented talks at our virtual International Astronomy Day which we shared again with Simon Fraser University's Science Rendez-vous.

Our first presenter was Suzanna Nagy with a refreshing review of the relative distances between the Sun and each of the planets, including demoted Pluto. The model was made using a one metre strip of paper. Over the course of 40 minutes, we created a model by dividing

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## About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at SFU's Burnaby campus (see map on page 4). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$89.00 per year (\$52.00 for persons under 21 years of age; family memberships also available) and can be obtained online, at a meeting, or by writing

to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd-numbered months. Opinions expressed herein are not nec-

essarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor or mailed to the address below.

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in the Trotter Studio in the Chemistry wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

## 2022 Vancouver Centre Officers

**President** Alan Jones  
president@rasc-vancouver.com  
**Vice-President** Robert Conrad  
vp@rasc-vancouver.com  
**Secretary** Suzanna Nagy  
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**At Large** Rob Lyons, Douglas Filipenko,  
Shay Pomeroy, Michael Levy, Karimbir Singh  
**Honourary President** J. Karl Miller

## Library

The centre has a large library of books, magazines and old NOVAs for your enjoyment. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

## On the Internet

rasc-vancouver.com  
astronomy.meetup.com/131/  
www.facebook.com/RASC.Van  
www.instagram.com/rascvancouver/



@RASCVancouver

## Mailing Address

RASC Vancouver Centre  
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Burnaby, B.C.  
V5A 4Y0

## Map to Meeting Site



## IMPORTANT NOTICE:

Our lectures have moved on-line until further notice due to COVID-19 and SFU having shut down most on-campus activities.

We will resume our physical lectures at SFU once it is deemed safe to do so.

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the distance in half each time and then identifying which planet occupies that closer orbit around the Sun. Who knew that a simple folding exercise could be so much fun?

That was followed by Renuka Pampana with a passionate explanation of the life cycle of stars, complete with one of the most iconic Hubble Telescope Astro photos of the Pillars of Creation. She explained hydrogen to helium nuclear fission that runs the star heat furnace and the multiple different life paths of stars before ignition and several end-of-life paths that lead to recycling and creating new stars.

Rob Lyons next walked us through his recent journey showing us the results of his learning in only the past couple of years in astrophotography. Rob is already showing impressive results that have the attention of *Sky News*. He warns

that this is addictive and hard on your savings as you upgrade equipment for better results. It was enjoyable to see the excellent results Rob is producing.

Leigh Cummings gave us another lecture on light pollution. I find this subject the most difficult as it seems that in general society has lost its way by over-lighting up the night sky. Pollution is the correct term for it. We seem to lamely and quietly accept artificial substitutes for one of nature's best gifts: a clear, cool, dark night under the stars. Instead, we mask the sky and pretend there is nothing wrong with ignoring the impacts of lighting up residential buildings like an oil derrick. We all need to do our part, as I have done over 20 years ago by installing dark sky approved outdoor lighting.

The last presentation of the day was by Robert Conrad, an expert trainer by vocation who gave us a crash course in setting

up Stellarium. He showed us the importance of understanding how to add telescopes with eyepieces and even a pair of binoculars. Doing this gives us the ability to see exactly the field of view available at the eyepiece. In closing, he showed us how the planets are currently visible in a beautiful row at 5 AM in the morning. Robert left us with links to information from his courses in star hopping using Stellarium, a freely-available sky charting software application.

The Astronomy Day event was hosted and coordinated by SFU Science Outreach. Our councillor, Kyle Dally, introduced each speaker with Douglas Filipenko assisting with reading the questions from the chat. I extend my gratitude and thanks to everyone that helped put on this excellent series of virtual Astronomy Day sessions this year.

More member talent was apparent at our last month's member's meeting with a presenta-

tion by Rouz Bidsharhri. I met Rouz in person for the first time earlier this year at one of the Starry Nights events. As he looked through my 16-inch homemade Dobson telescope, he mentioned he only owns one eyepiece. He told me he liked the telescope view and then he showed me some of his astrophotos on his phone. I was stunned by the high quality and that led to inviting him to present in April. To get to the end of a story too long to tell, Rouz's April presentation is truly amazing. We recorded it and you can watch it on our RASC-Vancouver YouTube channel. Rouz discusses many aspects of astrophotography and shows examples of the concepts in a very well organized and information-packed presentation. It received many compliments. I highly recommend it if you only watch it to enjoy the amazing photos.

Moving further afield but still showcasing Canadian astronomy talent, this month's member meeting features Dr. Clare Higgs, a recent graduate of the Astronomy department at the University of Victoria lead by Dr. Kim Venn. Dr. Higgs will take us through a closer look at dwarf galaxies in the local group and describe her research in observing evolution of dwarfs in isolation from the influence of close larger galaxies. I am continually amazed by the work done in Canada in the advancement of space exploration and astronomy. Dr. Higgs is also program coordinator of the New Technologies for Canadian Observatories, a program led by Dr. Venn that includes twelve universities preparing students for leadership positions in creating emerging observation instrumentation technologies. We plan to invite more Canadian astronomers and researchers to

speak at our monthly meetings in the near future.

In closing, I recently discovered that our member, Preston Thompson, wrote software to log and display the meteor radar detection experiment 'hits.' The radio telescope interest group has three receivers running in the experiment, now logging data to a test web site. The principle is that several receivers are turned to a television station over the horizon. Since TV UHF signals are line of sight, nothing is normally received. However, when a meteor enters the atmosphere between the receiver and the transmitting station, a reflection path is created that momentarily allows the TV UHF transmission to be received. Although Preston is a busy guy, I hope that he will be able to find time to give members a presentation on this exciting experiment and the results at a future members meeting. ★

## Membership has its Privileges!

Are you tired of looking at the same objects again and again (planets, moon, etc.)? Is your telescope collecting dust because it's hard to locate deep sky objects? Would you like to bring your observing to a stellar level? Robert Conrad, our new observing director, revived the Vancouver RASC observing group and invites you to join by sending him an email at [observing@rasc-vancouver.com](mailto:observing@rasc-vancouver.com). Some of the benefits of belonging to this group include:

- Hands on training on how to operate the SFU Trottier observatory
- Weekly observing sessions at the observatory or at dark sky locations
- One-on-one coaching on how to locate thousands of objects in the night sky
- Attend small interactive seminars delivered by Robert on a range of topics including failsafe star-hopping, charting challenging objects and understanding the motions of the cosmos
- Learn to make your telescope dance by locating objects such as asteroids, nova, and supernovae
- Spectroscopy and imaging training from Howard Trottier and an opportunity to collaborate on observatory research projects
- Updates on observable sky events happening during the week like asteroid/comet/deep sky conjunctions
- Access to observing guides and lists that Robert created that took hundreds of hours to create and will help with planning observing sessions
- Knowledge and expertise from other observing group members
- Learn how to quickly and efficiently find and star-hop to deep sky objects using a range of binoculars and telescopes



# Upcoming Events

## August

21 - 28 – Mt. Kobau Star Party

## September

4 - 12 – Merritt Star Quest

## October

21 – Manning Park Dark Sky Weekend (Beginners)

28 – Manning Park Dark Sky Weekend (Advanced)

## December

12 – AGM

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a membership.

If you haven't already had the opportunity, check out the RASC Meetup for the excellent online webinars talking about Stellarium and other tools, from Robert Conrad, one of RASC Vancouver's Education Directors. These are extremely helpful. I progressed a lot with my own astronomy skills after attending his sessions.

With my membership, I got notifications for and began attending in-person events, such as Astronomy Day at SFU, (co-hosted by the RASC), and RASC monthly meetings. These are interesting and informative, and expanded my view of what astronomy includes. I love visual astronomy, but there are so many more aspects to the field. Much of the work done by professional astronomers doesn't involve peering through an

eyepiece, but deciphering data, and using that data to form images. This led to a brief detour for me, and I took some online courses through EDX, hosted by the Australian National University. These are high school physics level courses, where the math has been simplified (still

planet was orbiting a star so far away!

Another fun event was the Manning Park Dark Sky weekends. The first one I attended was pre-pandemic and was an eye-opener to the value of a dark sky and unobstructed horizons. My own back yard has

a fair amount of light pollution, from a brilliantly-lit industrial area to the south, to neighbours with curtainless windows. There are also very tall trees that block half the sky to the west, and the house blocks skies to the north. At the Manning Park



M13 - The Hercules Cluster

a workout for me though!) but results in a much greater appreciation of the math, physics, and overall science behind a lot of the popular television shows on astronomy. When I see a program on discovering exoplanets, as an example, I have a greater appreciation of how the astronomers figured out a

event, there was an opportunity to see objects through RASC volunteers' telescopes that truly showed how good visual astronomy can be! This was very inspiring and helped me temper my expectations for my backyard sessions.

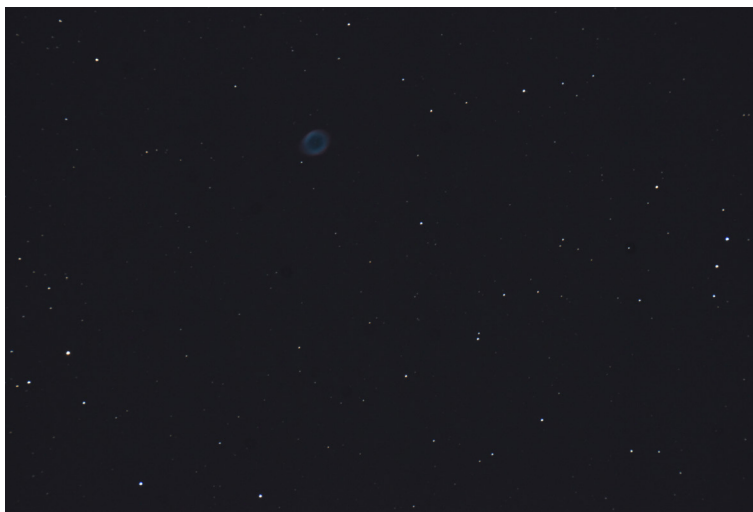
My next steps were to volunteer with the RASC Vancouver

Centre. I'm your Membership Director, and if you have questions about your membership, renewing, benefits, etc., please reach out to me at [membership@rasc-vancouver.com](mailto:membership@rasc-vancouver.com) and I'd be happy to try to find the answers for you. As a volunteer, I also help at events—such as the Manning Park Dark Sky and others that RASC hosts or participates in. I strongly encourage all members to consider volunteering; it's a wonderful learning opportunity. I've been able to pick up tips and tricks, and to pass them on to others in

the same boat as me, and this has helped my observational skills a lot.

Talking about my journey with astronomy would not be complete without mentioning equipment. I started off with one telescope but as I found out, many people don't stop at one. I love camping, and it wasn't always going to be possible to fit the telescope in (although it's reasonably portable), so my next acquisition was a pair of astronomy binoculars and a tripod. Wow, that showed me where my observational skills needed improvement, be-

cause there's no automation for binoculars! I realized I had too much reliance on what my little go-to scope was finding for me. So now I'm working on improving my sky navigation skills. This is a work in progress, and I'm thrilled every time I recognize objects or constellations



M57 - The Ring Nebula

without referring to my notes! I have another pair of “regular” or smaller binoculars that I have taken when I have flown somewhere, and coupled with all the cool apps for cellphones, I can take a moment on a trip and enjoy the sky view from a different perspective. Equipment includes accessories. An inexpensive solar filter for my telescope revealed sunspots, and it's fun to check periodically to see where the spots are, and track as they appear, disappear, and move with the rotation of the Sun.

Finally, I got to a point where

I wanted to capture what I was seeing, so I've dabbled with astrophotography and astro-sketching. There is nothing quite like looking at the Orion nebula through a telescope, and then taking a picture and seeing the difference between what your eye can discern and

what a camera picks up! Astro-sketching is also fun—I'm starting off by just sketching the sunspots, and I'll move on as I get more confident.

Being around other like-minded people and taking webinars and courses an-

swered a lot of the questions I originally had—and eliminated much of the frustration I was feeling about my experience at my telescope. There are still frustrations that remain, but it's not with the equipment or how to use it, it's with my own application of knowledge. And that is just a matter of practice. If you're new to this, don't let your frustrations with location, equipment or knowledge discourage you. Move at your own pace, take advantage of the many benefits of RASC membership, and never stop looking up! ✨

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minated on the left side. The opposite is true for the mid-southern hemisphere, where you are looking north to find the Moon. Close to the equator, the Moon moves through the sky overhead, your left/right phase perceptions depend on the direction you're facing.

An aside: in the northern hemisphere, due to the Earth's daily rotation, the Sun (and at night the Moon and astronomical objects) moves in the sky from left to right, if you are facing south. If you're looking at the North Star, the stars move around it counter-clockwise. The North Star is below the horizon for the southern hemisphere—there is no South Star. The stars move around the "South Point" clockwise and, facing north, all astronomical objects move from right to left. In the northern hemisphere, you can simulate all these effects by stretching out on the ground. If your head points south, the stars overhead appear to move like they do in the southern hemisphere (right to left); lie down in the southern hemisphere with your head pointing north, they move as they do in the northern hemisphere (left to right). The Cardinal Points—North, East, South, and West—are never changed. They are the same in both hemispheres. It all boils down to "personal positioning."

The Earth is not flat after all!

The Moon's average apparent diameter, as it appears from Earth, is about half of a degree. Also, the Moon, in reality, moves eastward about one half of a degree per hour (see above). In a day, that is a distance of about 12 degrees. In a month, Earth, along with the Moon, has moved along the Earth's orbit by about 30 degrees. The orbit of the full Moon, say, from today's position with respect to background stars to the next time in the same relative position with the same stars is 27.3 days. That is the sidereal month. At that point the Moon is not full again, because of the 30 degree change in the Earth's orbital position. The Moon has to move about 2.2 days more before full phase occurs. Therefore, the synodic month, from full Moon to full Moon, or any other phase to the same phase again, is about 29.5 days.

The numbers shown here are all general approximations and ignore several other aspects of Earth and Moon orbits. For one thing, the plane of the Moon's orbit differs by 5 degrees from the Earth's orbital plane. The Earth's rotational axis is inclined by 23.5 degrees from the vertical to the Earth's orbital plane. Both Moon and Earth orbits are not circles; that also affects orbital speed and position. The imaginary

line I mentioned connecting Sun, Earth, and full Moon is only really straight when the Moon is at the crossover points of Earth's and Moon's orbital planes. When a lunar eclipse occurs, the Earth is exactly between the Sun and the full Moon. With the new, invisible Moon exactly between the Sun and Earth, solar eclipses occur. At other times, that line is "slightly bent."

As I mentioned in the beginning, past experience and simple calculations give me an approximate idea about the area in the sky where I should find the Moon, the planets or the major constellations and stars. There are much easier ways to do all this, of course. Nowadays, many computer-based highly accurate sky map applications for smartphones, laptops, and desktops are available. I use those quite often, too. What these apps don't do for me is give me a mental perspective of the spatial distribution of the Moon, Earth, planets, and stars, and the immense timespans and distances in the universe, something like being on a trip in space, or looking at the sky through binoculars and telescopes.

You can get an accurate version of the numbers above in the RASC's *Observer's Handbook*. You can either purchase the book, or have it sent to you without cost if you are a member of RASC Vancouver or other RASC centres. ✱



## Jim Bernath – Donation of a Telescope in his Name by Suzanna Nagy

Dear Members:

You may recall that in January of 2019 our good friend and long-standing RASC member Jim Bernath passed away. Following his passing, your Council acquired a large portion of his space and astronomy collection. With our return to some in-person events again, we have been able to show pieces of this collection such as the Jim Bernath Meteorite Collection a few times already, albeit at outdoor events. The balance of his collection is still in storage, awaiting a return to larger in-person gatherings.

One of Jim's astronomy assets was a 1960s PARKS Newtonian telescope and one of his wishes at his passing was that his telescope be used for educational purposes.

Unfortunately, our attempts to salvage the mount for the telescope were unsuccessful. It

(thank you to our Honourary President, Karl Miller, for the use of his basement).



The PARKS telescope

was just too old and damaged. Then COVID-19 hit with lockdowns and other more pressing issues that required Council's attention. Jim's telescope sat in storage for over a year

fered to RASC Vancouver a brand new 8-inch Skywatcher Dobsonian telescope in exchange for their keeping the PARKS telescope as a proj-

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ect to be worked on by them in the future. The intention was to get a telescope into the hands of a school before term end—being that we were already three years since Jim’s passing. After discussions with Council and Barbara Bernath (Jim’s daughter), we accepted the offer of the Skywatcher telescope. However, as RASC Council was going to spend the money anyways on a custom-built mount, we felt it more appropriate to purchase the Skywatcher from Markarian Fine Optics in a co-sponsor arrangement with the telescope sold to us at a significant discount. A huge thank-you to Harout and Bryce at Markarian Fine Optics for their sponsorship.

A plaque was made to commemorate Jim Bernath, which was then secured onto the mount of the new telescope.

Once the new telescope was picked by Karl and myself

in April, we had discussions about which school to reach out to first with the donation. As Jim Bernath lived for de-

had gone to school there, too. A phone call to the principal of Moscrop Secondary School, Christopher Sandor, and the telescope donation was immediately accepted.

On May 4, Karl and I attended at Moscrop Secondary School with the donation of the telescope. We also donated a RASC Observers Handbook and some laminated star charts to get the students started. We arrived at the school, expecting to meet with the principal, the science teacher, and a couple of students. Instead, a small crowd awaited us. They were all overjoyed upon our entering the classroom with the telescope and were very enthusiastic as Karl and I gave a short tutorial on how to use it. We left

with many, many “thank-you”s following us out the door. Karl and I shared a wonderful experience that day, saddened only by the thought that Jim could not have shared it with us.

After three years, we are



Harout and Bryce from Markarian Fine Optics with the new 8" Dobsonian

acades in Burnaby off Willingdon Avenue, we decided to place our first call to Moscrop Secondary School as it was just down the hill from Jim’s home and we were advised by his daughter Barbara that she



thrilled that one of Jim's last wishes concerning his telescope was finally fulfilled. Although not his own personal telescope, a brand new Skywatcher certainly will be enjoyed by the students of Moscrop Secondary School and fulfilled his wish of the telescope being used for educational purposes.

You are still in our minds and hearts, Jim. I hope you are smiling down on us from the stars and heavens above. ★

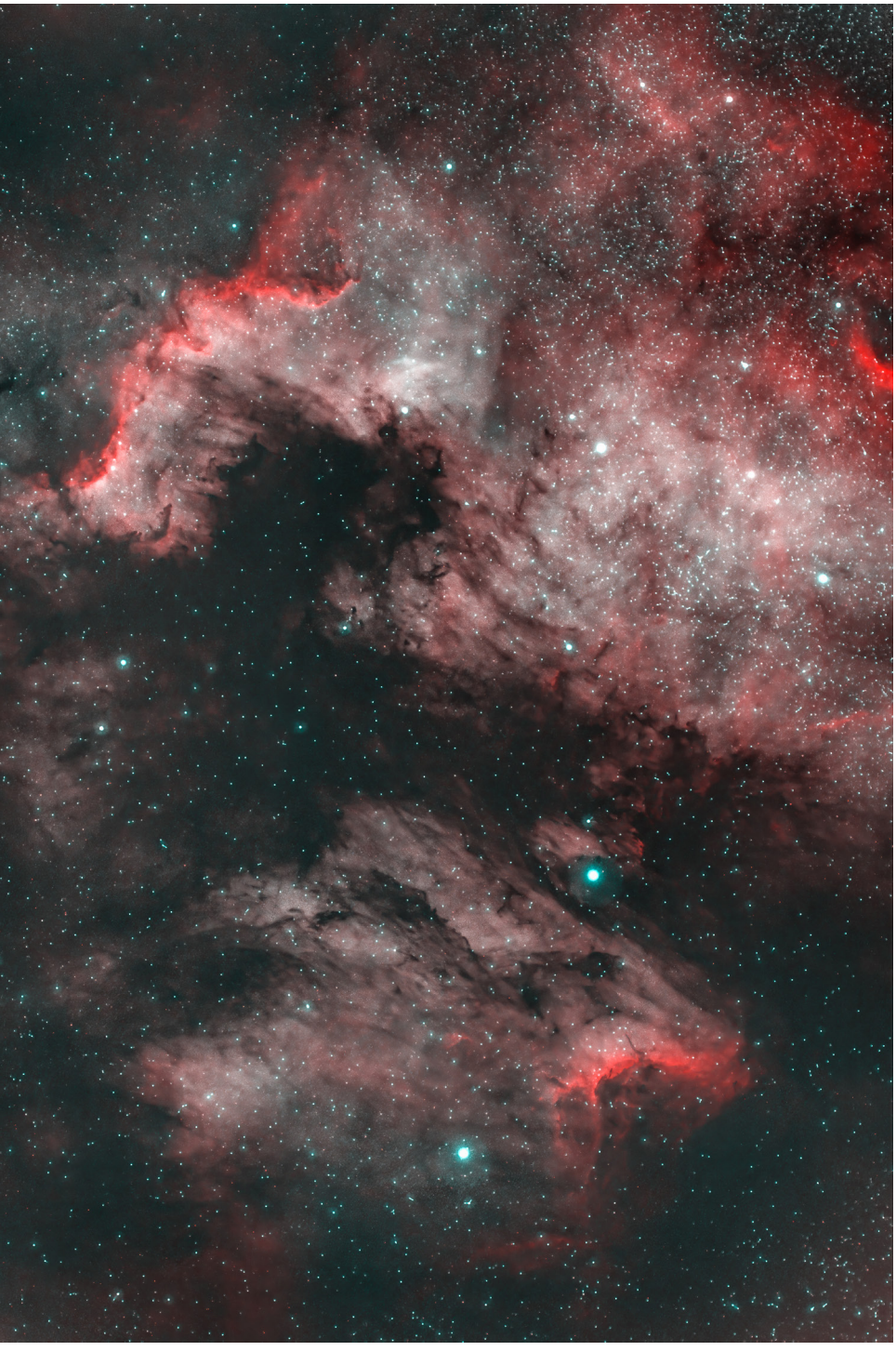


The memorial plaque adorning the donated telescope



Early this month, staff and students at Moscrop Secondary School in Burnaby received the donated telescope in Jim Bernath's honour





## **The Pelican and North America Nebulae by Rob Lyons**

These two nebulae in the constellation Cygnus are starting to rise at about 1am now, heralding the coming of summer skies. Imaged in narrowband over three evenings in May, 2021. 153 x 300 second exposures. Telescope: William Optics Redcat51. Mount: SkyWatcher AZ-GTi. Camera: ZWO ASI 183MM Pro.