

Vol. 23 Issue 1  
Winter 2022

# H O R I Z O N

LA SOCIÉTÉ ROYALE D'ASTRONOMIE DU CANADA  
New Brunswick Centre du Nouveau-Brunswick  
THE ROYAL ASTRONOMICAL SOCIETY OF CANADA

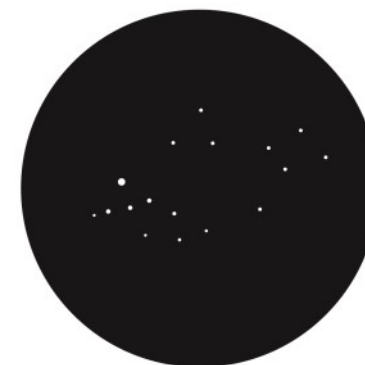


## *The Heart Nebula*

*This stellar Valentine was brought to you by Paul Owen. Why isn't it red? See Page 3 for details.*

**GUESS THAT ASTERISM** is a new feature by Ted Dunphy. Guess where you can find the answer?

## ***GUESS THAT ASTERISM?***



Located in Andromeda  
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SRAC/RASC Centre du NB Centre Inc.  
<https://rascnb.ca>  
<https://www.facebook.com/RASC.NB>  
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## Centre Meetings & Star Parties

## Library News from the Librarian Ted Dunphy

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François Thériault Chris Weadick*

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*LP Abatement: Chris Weadick  
Star Party-Events: Paul Owen  
Outreach: Curt Nason  
Website: Emile Cormier/Trevor Johnson  
Social Media: Gerry Allain  
Equipment: Chris Weadick  
Library: Ted Dunphy  
Newsletter Editor: Curt Nason*

**February 19 at 13:00:**  
Vote on By-Law change at the request  
of the Canada Revenue Agency; fol-  
lowed by presentations

**March 19**  
Business (am), Presentations (13:00)  
**April 23**  
Presentations 13:00

**May 28**  
Business (am), Presentations 13:00

**June 25**  
Presentations 13:00  
**September 17**

Business (am), Presentations 13:00  
**October 15**  
Annual Meeting & Presentations

**November 19**  
Presentations 13:00

**Kouchibouguac Spring Fest**  
June 3 & 4 (confirmed)  
**Mount Carleton**  
July 29 & 30 (confirmed)  
**Fundy Star Gaze**  
September 2 & 3 (confirmed)  
**Kouchibouguac Fall Festival**  
September 23 & 24 (tentative)

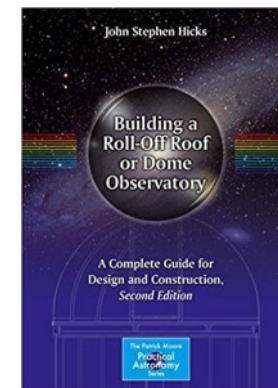
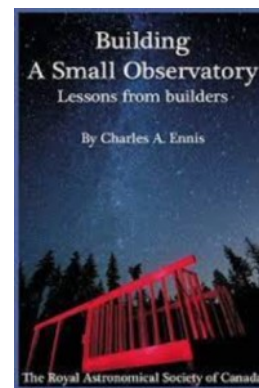
Have you ever entertained the thought of building your own observatory? Before you go any further you must read:

***Building a Small Observatory:  
Lessons from Builders***

by Charles A. Ennis. RASC publication.

Learn from those who have gone before, how to build and why to build and operate your very own small observatory. Domes! Roll-off roofs! Roll-off sheds! And Flip tops! Which one suits you? It is all discussed in this entertaining book.

We also have ***Building a Roll-off Roof or Dome Observatory*** by John Stephen Hicks. Complete guide for design and construction, part of the Patrick Moore Practical Astronomy Series. This is a rather extensive and wordy manual that covers many designs; some practical, others less so. But its charm is in the details.





## Mono or Colour Imaging System?

Paul Owen

In the fall of 2021 I began working with Sky-News magazine on processing data from the RASC Robotic Telescope in California. I had no experience processing mono/filtered data sets before as my astroimaging has always been with a DSLR, and then I moved to a One Shot Colour (OSC) dedicated astronomy camera.

The switch from the DSLR to the astronomy camera was very easy as the main difference was the ability to cool the sensor while the images were being taken. This cooling leads to much better signal to noise levels over that of a DSLR, which gives you a better starting master picture to work with, which means easier processing.

I had been using colour cameras for a few years and thought that I would never need to venture into the mono camera world as the results I had been achieving were improving and becoming easier to process after developing a good workflow. Well, when I saw the data sets coming from the Robotic Telescope it opened my eyes to what the possibilities could be with a mono camera and several filters.

The first target I received was the Lagoon Nebula and it was images taken in Hydrogen Alpha ( $H\alpha$ ), Red, Green and Blue. With this data I had to learn how to combine three images (RGB) into one image, then blend in

the  $H\alpha$  data to come up with a single image and hopefully something that was at least as good as I could do with an OSC camera. After going through that learning curve I began feeling more comfortable using their data.

The next target that became available was M20, the Trifid Nebula. This one was a little different as it was using Red, Green, Blue and Luminance as the combined filtered subs to create the image. Again, a learning curve as the Luminance was something new and it is supposed to create all the dynamic and detail once applied to the RGB images.

Finally, the turning point for me was the fourth target, the Bubble Nebula. This was my first real kick at narrow band filters. The details and structure you can see when using very narrow bands of the colour spectrum were jaw dropping to me. Also, your ability to mix them in various ways through the process of colour mapping allows for some interesting ways to look at nebulae. This is what's known as "false colour," defined as colour assigned to invisible wavelengths that are picked up by the camera sensor. These false colours, when arranged in various ways, create painting with colours, if you will, to accent various textures and elements in your image. The Red, Green and Blue imaging is known as "true colour," as everything we see in these images is the way our eyes would see them if we had the ability to see colour when observing.

For the longest time, when using OSCs, I could only get the broad band of colours (true colours) and all at the same time when

taking them. Then the duo, triple and even quad narrowband filters were introduced, giving the OSC imagers something to be able to get into the narrowband world with...to a degree. I had used two main filters: narrowband (STC DuoNarrowband,  $H\alpha$  and OIII) and broadband (Optolong L-Pro) on my OSC camera for some time and they worked effectively.



*Piering into Space: Paul's Set-up for Mono/Filter Imaging*

After processing the Bubble Nebula in narrowband I was drawn into the world of mono/filtered imaging and decided to purchase my very first mono camera, filter wheel and filters. I decided to go with the seven position filter wheel as I wanted the ability to capture targets in as many ways as possible. So I ordered the  $H\alpha$ , SII (ionized sulphur), OIII (doubly-ionized oxygen), Luminance, Red,

Blue and Green. The camera's sensor was an APS-C size which offers plenty of room for larger targets when coupled with a fairly wide-field telescope (588 mm focal length).

The images that are included in this article were all taken with the rig which is also pictured here.



*The Pleiades star cluster (aka M45 and the Seven Sisters) in Taurus*

*Paul Owen photo*

There are pros and cons when choosing any imaging system when entering into astrophotography and I'll list the pros here based on my experience.

OSC Pros: 1. You can take full colour images in shorter time frames. 2. You only need to take one set of calibration frames unless incorporating OSC narrowband filters. 3. Usually you can take a complete target or more in one night given good sky conditions.

Mono Pros: 1. You get more sensitivity with mono camera and filters. 2. You use 100% of the pixels with true exposure as opposed to the OSC colour filter array which interpolates (fills in) much of the colour. The Bayer matrix is a topic for another day. 3. You have the ability to do narrowband imaging (in much narrower bandwidths) which opens up many colour combinations. 4. You can shoot on bright moonlit nights which gives more imaging nights. 5. You can shoot in very light polluted skies.

So, to sum up my experience with both systems offering great results, I must say it takes a little longer to get a final image with a mono camera and filters, but I truly see that quality over quantity is what rings true for me. Now if we can just get through February.



*M31, the Andromeda Galaxy, with its satellite galaxies M32 and M110*

*Paul Owen photo*

## RASC NOVA Course Curt Nason

No, this course is not about cataclysmic variable stars. NOVA is an acronym for New Observers to Visual Astronomy. Some of our members have been giving introductory astronomy courses for the past two decades, resulting in new members for the local clubs and the Centre. NOVA is similar but more structured and with extra material.

NOVA was developed years ago by the Edmonton Centre and adapted by others, and for several years it was on the Outreach Committee's wish list to update and standardize the course for all Centres. Last year Jenna Hinds and Samantha Jewett, with the assistance of a few RASC members, developed an outline for the course topics and created templates for the presentations, instructor's manuals, and handouts for the students. NOVA is designed for both in-person and virtual instruction. Each 30-minute topic consists of introductory questions, a 15-minute presentation, and a 10-minute hands-on, where practical, demonstration.

Over the latter half of 2021 teams of volunteers were busy creating the course material, and Samantha has been busy since putting everything into a consistent format. Material will be put on the Members' section of the website so that all Centres can use it and adapt some parts specific to their needs. A trial virtual run is scheduled for the spring to shake out any problems. Stay tuned for NOVA announcements from Samantha.

## Double Stars - Then and Now: Iota Cassiopeiae

Len Larkin

I've been observing double stars for the last few months and, just recently, I found old logs from the 1980s of my doubles observations using different telescopes back then. There are a few stars in common so I thought it would be interesting to compare.

On a balmy August eve in 1985 my eye was poised to soak up photons from the telescope eyepiece, excited to see this triple star system (hmmm, I wonder if it was possibly my first of those types?). The mosquitoes hovering around were also excited but, alas, for a different reason. They did not know that the light I intercepted for a brief moment that night originated 130 years earlier in the Iota Cassiopeiae multiple star system.

A 200 mm Newtonian equipped with an 80 mm aperture stop (i.e., a mid-sized scope turned into a small scope) gathered up the stellar light for me that night. And what light! A 7th magnitude secondary was suspended by orbital mechanics just outside the 5th mag primary's diffraction ring, with a more distant and fainter 9th mag third companion. I logged in those and a few additional details but missed the one which is the most obvious (more about that shortly).

After the initial view I also tried a 60 mm stop but found that the secondary was almost obscured by the primary star's diffraction ring, so I stayed with the 80 mm for quite a long

time as I recall. There's just something special about a mix of suns in such a close grouping.

Now, fast forward to last September on my back deck, again poised at the eyepiece, a low-power ocular proudly perched in the focuser of my 100 mm refractor. "Ah, there it is," but at 36x magnification the view was surprisingly boring – one luminary, no companions. Could I have the wrong star? Well, 75x revealed it's true nature of multiplicity and higher powers of 130x and 180x showed the tight triple system splendidly. I did find the right one!

This time I finally noted the colours: orange and blue respectively for the primary and secondary stars (the third star was too faint to show colour). Unfortunately, I had not recorded any star colour info in the 1985 log and my recent estimates don't quite conjure up spectral types of A3 and F5, so is it chromatic error with my eyes or telescope or just one of those illusions that the eye can succumb to?

Pursuing that question, I consulted a digital file of Smyth's Bedford Catalogue and found listed for the year 1834 several lines for Iota Cas! There he noted colours of pale yellow/lilac and fine blue, probably with his 5.9-inch (147 mm) Tully-made achromatic refractor. John Nanson also wrote about observing the star in an article (on the Star Splitter website\*), where he included a sketch and noted colours of rich yellow and white for primary/secondary, so my estimates seem to be in the ballpark.

Here's some info from the Washington Double Star catalog:

<u>System</u>	<u>SAO</u>	<u>R.A.</u>	<u>Dec</u>
Iota Cas	12298	02 29 04	+67 24 09

<u>Name</u>	<u>PA</u>	<u>Sep</u>	<u>Mag1</u>	<u>Mag2</u>	<u>Mag Diff</u>
STF 262 AB	228°	3.0"	4.6	6.9	2.3
STF 262 AC	117°	6.7"	4.6	9.1	4.5

Defining star colour can be challenging but it is interesting to compare one's own estimates with other observers' (even your younger self) and, as with drawing, helps you hone your observing skills. Of all the star characteristics colour is perhaps the one that most truly originates in the eyes and the mind. Why don't you set aside some time next observing session and record what you see in this system?

\*If you haven't visited it before, the Star Splitters website has lots of laid-back stories by John Nanson and Greg Stone sharing their enjoyment of observing doubles. It's a great way to while away a winter evening, in a cozy chair with a hot drink nearby.



*Iota Cassiopeiae (Stellarium)*



## Book Review

Yolanda Kippers

### **OUR UNIVERSE: An Astronomer's Guide**

by Jo Dunkley

a Pelican Book

Penguin Random House, UK, 2019

ISBN 978-0-241-23587-4

In February 2019, Jo Dunkley was interviewed by CBC Radio host Anna Maria Tremonti on the program *The Current*. The discussion revolved around Dunkley's release of this book. I added the title to my reading list.

Dr. Dunkley is a professional astronomer with a particular interest in cosmology, working on the Atacama Telescope in Chili. She studied at Cambridge and Oxford in the UK and is now Professor of Physics and Astrophysical Sciences at Princeton University. She has received many awards for physics, astronomy, and research. She vocally supports women in astronomy.

OUR UNIVERSE is about, in Dunkley's own words, "the journey to our present-day understanding of the Universe, and the many wonderful and strange things we now know about its workings." It is a small book (11 x 18 cm with 177 pages), yet it covers a lot of ground (or space, so-to-speak) in five information-packed chapters.

In the first chapter she begins with "Our Place in Space." Initially discussing Earth's relationship to the Sun and the planets,

Dunkley goes on to position the Solar System within the solar neighbourhood, our galaxy, the Local Group of galaxies, the Virgo or Laniakea supercluster, and finally the observable Universe. Using the familiar basketball court as an analogy, the basketball-Sun has the peppercorn-sized Earth 26 large paces away and the raisin-sized Neptune about half a mile away. Within the solar neighbourhood the Solar System becomes a grain of salt in this basketball court; the solar neighbourhood becomes a peppercorn within the Milky Way Galaxy which in turn becomes a CD within the Local Group. The Local Group becomes a watermelon in the Laniakea basketball court which finally becomes a cookie. How apropos!

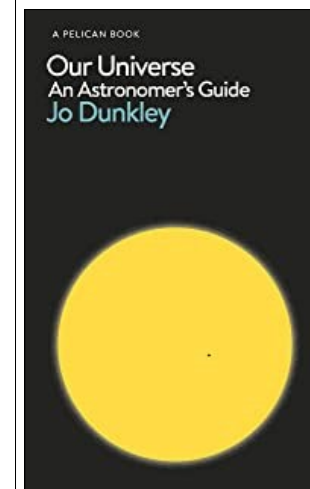
All the while, within this basketball-court analogy, Dunkley discusses our quest for understanding the Universe, from ancient times to present day space exploration. She includes the major players and the advancement in technology in the building up of our understanding of the different objects in space, their workings, and the vast distances involved. Space may be "empty" but the chapter is packed.

The second chapter is about stars: their life cycles, how they work, their properties, size and colour, the manufacture of the elements, their phenomenal number, and the variety of their planets. Dunkley explains the different forms of light. Throughout, she continues to discuss the steps taken in acquiring this knowledge.

In Chapter 3, Dunkley talks about the things we cannot see directly; the clouds of gas and

cosmic dust, black holes, and dark matter; and how we know that they are there. And, in Chapter 4 she goes on to write about the Nature of Space: how it behaves. Again, she includes the discoveries, the debates, the progress in technology, and the key players. The final chapter goes out with the Big Bang and concludes with the question about dark energy.

OUR UNIVERSE was written for the amateur astronomy enthusiast interested in the mechanisms of the Universe. It may not be an introductory-level book, and it may not be the book of choice for those who want to delve deeper, but Jo Dunkley does give a good thumbnail sketch of what is currently known. Dunkley has a unique way of weaving everything together; what we know, who determined it, the debates, and when and how it was determined. In addition to all the scientific information that Dr. Dunkley has presented, she also mentioned well over 150 astronomers and/or physicists, and included about 60 named observatories, satellites, studies and experiments.



So much information has been crammed into the 177 pages that it often left my head spinning; other times it left me scratching my head. Yet, by re-reading that particular section, things are quite clear. I would not dissuade anyone from reading OUR UNIVERSE.

## The APM Herschel Prism, and other Solar Ramblings

Alan Hindle

I'm Alan. And I'm in New Brunswick. I did something the other day that I had never done before. I was pretty pleased and a bit amazed that I could pull it off.

When I was a child most televisions were black and white and had vacuum tubes in them. Phones were attached to the wall and sunshine was good for you. Fresh air and sunshine are good for a growing boy, my mother would say. I still hold to that, but that was then.

Recently, I took video of the Sun, showing sunspots, with my phone, and within minutes my children were seeing it across the country. I thought that was pretty cool, so I'll share how I did it with you.



The rig: Televue TV-85 OTA, Televue Panoramic mount on a wooden tripod with an alt-az head, Televue Sol Searcher finder, APM Herschel Prism (wedge) solar filter, Televue Nagler type 5 31 mm eyepiece, Televue Phone-Mate, and an iPhone 12 Pro.



Yes sir, that's a nice bit of kit. Did you guess from the set-up that I'm not an astrophotographer? That is correct. So, the why is because I still like to share the sky with my kids and sometimes it's nice for a visual observer to be able to share what it looks like through the eyepiece.

The equipment I used is common for the most part in one form or another, other than the wedge. This is key to the whole operation of course, being the light filter. It's a 2" unit and comes with a 2" to 1-1/4" adapter, and it comes in a nice padded aluminum case. The first thing you notice when you hold it is that it has mass. No simple mirror in there.

The prism part, the light trap, does most of the work, reflecting, deflecting and eliminat-

ing most of the sunlight, sending it out the rear of the unit. About 95% of the light goes out the back door they say. It's visible in the second photo, shining through the opaque target. There is an airspace there and it vents in the housing above and below the target to assist cooling. Light makes heat. I touched the housing there but it wasn't hot. It is something to bear in mind, though, as I've only used the device in sub-freezing temperatures so far. It is still fairly new to me. In the photo you can also see the target of the Sol-Searcher illuminated by the sunlight.

The remaining 5% of light is diminished in brightness by a neutral density filter (ND3), bringing it to a safe range for viewing. The user can further regulate brightness with the integrated variable polarizing filter by twisting the eyepiece barrel. There is a set screw to hold the filter in place after adjustment. The literature states the polarizing filter is removable/replaceable. I haven't attempted taking it apart yet! I think I'll enjoy it a bit more first.

The user has the option of adding additional filters to the eyepiece for further control of the light. But be warned, unlike a diagonal with a mirror, there is a glass element across the top of the housing below the eyepiece tube. It would be possible, under certain circumstances, for such an eyepiece filter to contact that top element. That would not be considered good. Extension barrels can be added to the eyepiece, if needed under these conditions, to ensure the filter is raised above the point where the eyepiece is seated. The manufacturer states that optical filters should NOT be placed at the inlet of the wedge before the prism.

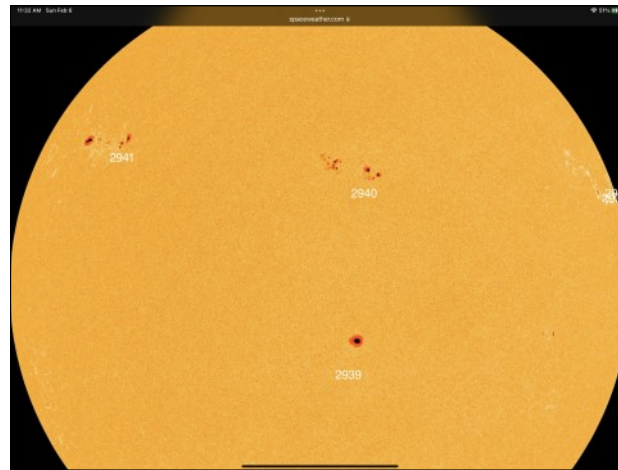
The eyepiece tube on the top of the unit incorporates a Fast-Lock mechanism to secure the eyepiece or adapter in the 2" tube. There are two slender rollers protruding into the eyepiece tube, housed between the inner and outer walls of the upper assembly. To operate the clamp there is a beefy knurled ring (the locknut) on top that you turn with one hand while grasping the tube below with the other. Without taking it apart I can envision shallow ramps pushing the rollers inward clamping the barrel against the opposite wall. It's pretty smooth and provides a solid grip. But in the whole design of the product herein lies my only concern. Thankfully, it's not really that big a deal to me.

On the morning that I shot the video it was a comfortable -12 C. In my limited experience with this unit I've seen that superior optical performance is had after the unit has cooled to match the air temperature. No surprise there really. The mass of the unit absorbs a fair bit of heat in the house so it cools in the garage before use.

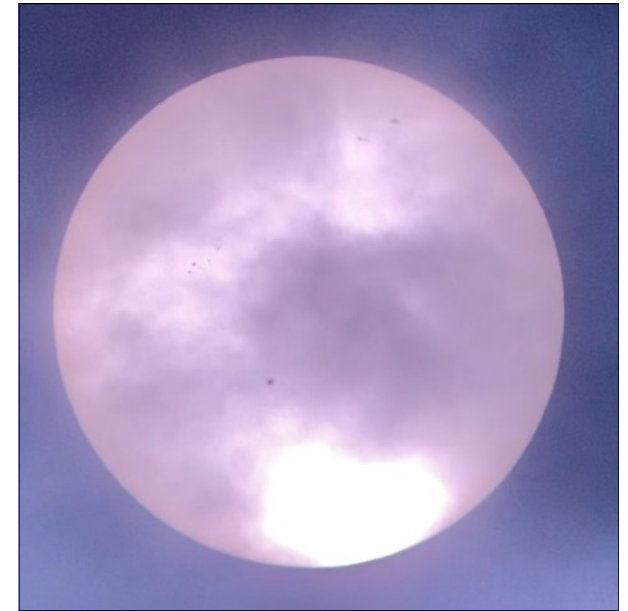
There is a lubricant used in the Fast-Lock mechanism. It's not detailed in any literature that I could find, but I believe it is a light synthetic type of grease used on the threads of the locknut. It's all fine where it's warm, but at -12 C, which is not uncommon here, the Fast-Lock is not so fast. Not immovable, but close; very sticky and sluggish. There is a possible side effect from this to be wary of. If attempting to operate the mechanism against the extra resistance take care not to twist the tube below at the same time. That's the tube that operates the polarizing filter. If you inad-

vertently turn it in your effort, and it's still locked down by the set screw, you may score the tube slightly. Do not use the set screws for added leverage. The operation of the variable polarizing filter seems unaffected by the cold temperature.

Here's how I work around that. I choose to use 1-1/4" eyepieces only and lock in the adapter before the unit gets cold. Or, leave the locknut open enough to insert and remove a 2" barrel and rely on gravity to hold things together. The latter is not my preference. The fit and finish of the product is very good and it exhibits quality workmanship. Optically, it does not disappoint. It's quite good.



Let's compare images. The labelled one above is from spaceweather.com and is used for information purposes only (an excellent site I visit daily). The other image, from the video with very light editing, is showing the Sun in white light. Note the images are reversed left to right. I see sunspots. Watching the short videos it is possible to briefly dis-



cern the penumbra around 2939, and to see other fleeting details if you have an eye for it.

Photographically I would call the videos and the still image screen grab poor, but not a failure. For it's intended purpose it is a success. If you can get a "Wow, that's cool!" once in a while from your kids you're doing okay.

When the phone is out of the way and you are eye to eyepiece, the views through this set-up are pretty sweet. Surface detail, including sunspot umbrae, penumbrae and light bridges, are all easy targets so far. Far superior to the solar filter that I was using in front of the objective lens. Edge details, such as prominences, have not been visible. I didn't expect them to be.

On a note of personal preference, my sweet



spot with this set-up for visual use is with the 1-1/4" Televue 17.3 mm and 10 mm Delos eyepieces. Coming in at 35x and 60x magnification and 2.5 mm and 1.4 mm exit pupil, respectively, they're right in the wheelhouse for this activity. And both boast 20 mm of eye relief. The eye lens on the 17.3 looks like an acre of glass. It's very forgiving for old(er) eyes. You feel like you can look around a corner with that thing. The long eye relief is very helpful with my safety glasses on!



It's February in New Brunswick. The ground is covered with snow and you want to stare at a magnified image of the Sun. Well, there's no shortage of light to get in your eye! In the same way we need to step down the intensity of the light that you want in your eyes, it helps to restrict all that stray light that you don't want in your eyes. And don't forget that it's cold here some days. Function over fashion: Protect yourself. Sunburn and frostbite are things to keep in mind while trying to avoid blistering the inside of your eyeball.

These safety glasses are prescription lenses, have photo-grey tinting, are close fitting and, as a carryover from my welding days, they don't let any light in from the side and no light reflects off the back of the lenses. This lets my eyes relax in the bright conditions and my pupil can open a bit wider. Without any shading in bright conditions like this your pupil

would be at its smallest possible diameter and you may also be squinting due to the reflected light from the snow. Don't laugh, these specs help me a lot with the viewing in these conditions.

The APM Herschel Prism is manufactured in Germany and I purchased it from [luntso-larsystems.com](http://luntso-larsystems.com) in Arizona, USA. They are friendly and easy to deal with at Lunt. Listed at \$395 USD, it's not cheap. Convert that to Canadian funds, and when it hits the border add Canadian taxes, import duty and a fee for the customs broker. What's the Sun worth to an amateur astronomer? On April 8th, 2024, with a bit of luck and clear skies, the shadow of the Moon will once again pass over me. Peggy and I will be marvelling at just under three minutes of totality for our own backyard. I'll hang onto the wedge, thank you very much. I'm gearing up.

So back to the video part. This is where I feel like an apprentice and I'm clumsy trying to get things done. The phone positioner is a fairly static item and does what it's intended to do. It's a Televue item and is designed to clamp onto the eyepiece utilizing the ring and groove that retains the soft rubber eye cup. I purchased most of the Televue gear from All-Star Telescope in Alberta. The company has relocated to Edmonton and is still my first choice for astro gear in Canada. Cheers to Nicholas at [all-startelescope.com](http://all-startelescope.com).

The wide-field lens was used on the iPhone 12 for the video. I have practised and experimented with afocal photography (page 92, *Observer's Handbook*) with a similar set-up on easier daytime targets previously with var-

ying results. My nighttime attempts were also inconsistent. I don't have much of a photography background to fall back on so I'm learning slowly. Frustration was the largest part of the night when I first tried this in the dark. A smartphone works best held in two hands with two thumbs working as fast as they can go. When you nail one to an instrument you're trying to keep still, and aimed at a target; it's lesson after lesson of what can go wrong. The phone shut off. Facial recognition doesn't recognize you in the dark, with your winter gear on, sideways. Or your sister calls.

There is a piece of the puzzle I haven't mentioned yet. It made this doable and fun again; the photography I mean. I finally found the app I was hoping for. I bought it from the App Store in the FiLMiC Creator Bundle for about \$35. This was a game changer: four apps, complete manual control of all four cameras on the iPhone, and remotely viewed and controlled from the big screen of your iPad. Heavens above! Filmic Pro-Video Camera is for video. Filmic Firstlight is for still photography. Doubletake by Filmic captures video from the front and rear cameras simultaneously. And the jewel, Filmic Remote allows control to be transferred to another device that has the app.

I'm not going to tell you how to set it up or edit stuff. I'm not a photographer. I gave you a recipe, it's up to you what you do with it. If you're unfamiliar with the Sun and are wondering what you could do with a solar filter and the gear you've got, ponder this.

The Sun is a star but it has something for us that the other stars don't have. It has size. When you magnify it, it gets bigger. When we view a solar eclipse the interaction between the Sun and Moon is striking (and very curiously coincidental) because the Sun and Moon have the same apparent size. So it stands to reason that the view you produce of the Moon with your telescope, regarding detail with magnification and field of view, would produce a similar view of the Sun. Give or take. Same but different. If you have the glass you can fill the view with nothing but Sun! You can't do that with any other star. And, you can look at the Sun every day and you'll never see the same view twice. A blank Sun is a relative term. It only means you can't see much with your eye.

One last bit to close this out. I've chased the bright light. The Sun gives us light and heat and with it life. The Sun doesn't care; it is not friendly, it is fierce. The sun is Thanos. I did my little video on February 6, 2022. On February 9, 2022 the CBC reported that Space X lost around 40 satellites due to a geomagnetic storm originating on the Sun. Starlink services rural New Brunswick, I believe, like it or not. Space X issued a statement on February 8, 2022. You can read it at spacex.com in the updates section. The explanation of the cause and effect that lead up to the loss is not what I expected. I learned something new, again.

I'm Alan. And I'm in New Brunswick.

**Note: We have a 2" Herschel wedge in our equipment library. Check out our website under Resources. The 8" Dob is retired.**

## Some Things Olds are New Again

Mary King

When I first started out in astronomy, I wanted to purchase a telescope, something affordable and easy to use for a newbie. Everyone recommended a Dobsonian, but no one I spoke with would really come out and say, "Get it from this place," and name the company. What people would say to me were things like, "Whatever you do, do NOT buy from So and So." This became very difficult to follow, especially when the various names started to lead me in circles.

So I decided to check in with my brother Greg in Calgary, and he recommended All-Star Telescope. It was situated in Olds, Alberta, a half hour drive from Calgary. All-Star Telescope was a place my brother could easily access, and he developed a very good relationship with Ken, the owner, especially in his support for my brother's role in the RASC Calgary "Telescope for Rent" program.

I appreciated the advice, then and immediately after getting the telescope. The man who took my order on the phone was from Campobello Island (Go figure!). What I particularly appreciated was the company's short, clear, practical videos on how to assemble the parts. They were easy to follow, even for an English Lit major like me. And when I called to ask some questions, nothing was too basic. Well, at least over the phone, they did not let on anything was too basic.

The owner has now retired, and the company has been sold and moved to Edmonton, three hours away from Calgary. The showroom had been closed due to Covid and all sales are shipped now anyway. My brother will not be out driving by and just dropping in. But I am appreciative to have had a positive experience in buying a telescope for the first time, and to find there was actual service beyond the point of sale.

All-Star Telescope has moved to Edmonton under the new ownership of Nicholas Kennett. The company continues with the same website, email address and telephone number (866-310-88440).



The answer is one astronomical word formed by rearranging the letters of the other word.

Clue: **Philae's Thruster**



**Answer to previous Astro Anagram  
created by Ted Dunphy:**

**MAIDEN MOXIE = VIRGO VIGOR**



## What's Up for Spring

Curt Nason

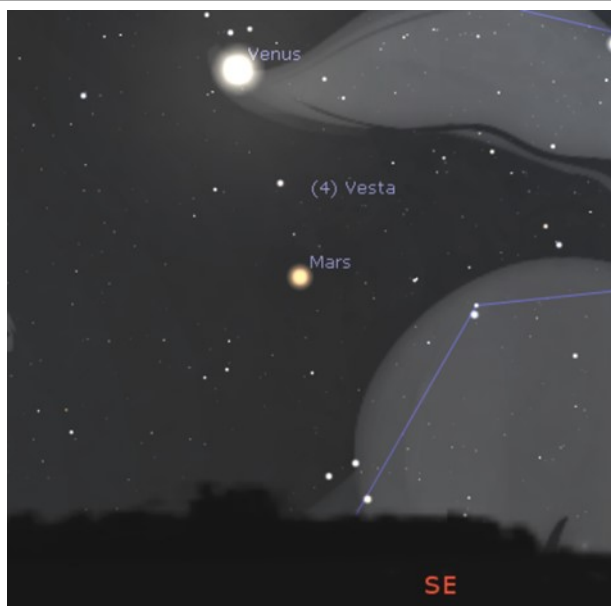
The observing highlight for the months of March to May will be a total lunar eclipse on the night of May 16/17. Watch for spectacular planetary conjunctions in the morning sky.

**Sun:** Solar Cycle 25 has been more active than expected but Cycle 24, the least active in a century, started in a similar fashion. At 11:33 on March 20 the Sun stands over Earth's equator. Welcome to spring.

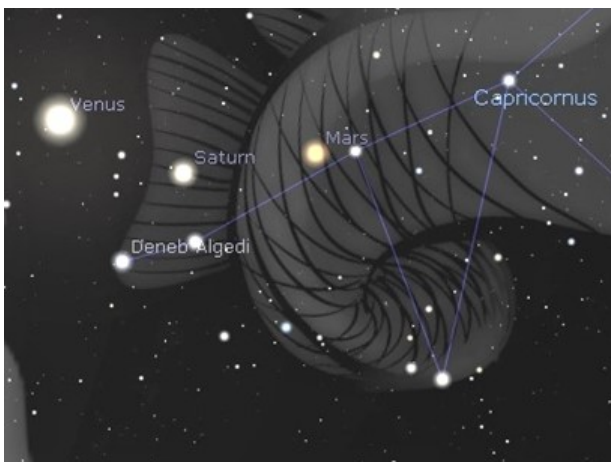
**Moon:** New Moon dates are March 2, April 1 and 30, and May 30. The partial phase of the lunar eclipse begins at 23:28 on May 16, 85 minutes of totality starts at 00:29, and the closing partial phase ends at 02:55.

**Mercury** is  $<1^\circ$  lower right of Saturn on the morning of March 2 and in superior conjunction on April 2. It reaches greatest elongation for its best evening apparition of the year on April 29, at which time it will be  $1.4^\circ$  south of the Pleiades. Mercury will be hidden much of May, at inferior conjunction May 21.

**Venus** begins March sitting  $5^\circ$  above Mars with Vesta, the brightest asteroid, between them. The two planets are one degree closer at conjunction on March 12 and remain within a wide binocular field of view throughout the month. Saturn joins the party later in the month, in conjunction with Venus March 29, and the Moon adds to the splendour March 28. Venus passes closely to Neptune on April 27/28 and has a spectacular close conjunction with Jupiter on April 30. The Moon passes a binocular field below them April 27.



**Mars** is in conjunction with Saturn on April 4, with the two planets at magnitude 1.0 and 0.9, respectively. Mars passes less than a degree below Saturn on April 4/5. The speedy red planet passes just below Neptune on May 18 and has a close conjunction with Jupiter on May 29.

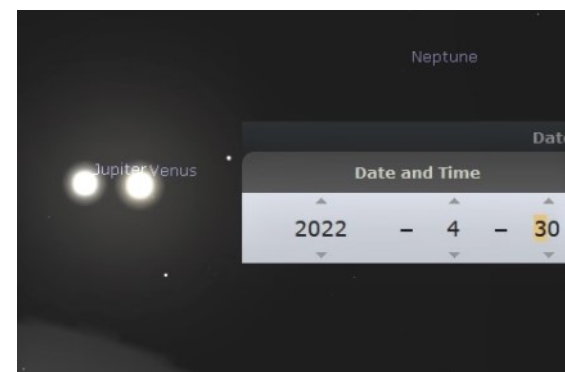


**Jupiter** is in solar conjunction March 5, and unfortunately bright twilight will hide its close conjunction with Neptune a week later.

**Saturn's** slow prograde motion through Capricornus leaves it figuratively biting the interplanetary dust of speedier Venus and Mars. But they don't have rings.

**Uranus** is  $4^\circ$  above the Moon on March 6 and it will have a series of close lunar visits over the year. It fades into twilight over April, reaching conjunction on May 5.

**Neptune** is in solar conjunction on March 13 and moves into Pisces in early May.



**4 Vesta** passes between Saturn and the eastern tip of Capricornus on May 6, about  $1^\circ$  from each.

**Comets** C/2019 L3 ATLAS and 19P/Borrelly should still be within range of backyard telescopes in early March. Perhaps C/2017 K2 PANSTARRS will brighten to magnitude 10 by late spring.

**Zodiacal light** from March 20 to April 2.

## RASC NB Outreach Events and Handouts

Year	# of Events	People At Events	Live Feed	Youth	Star Finders English	Star Finders French	Moon Guides English	Moon Guides French	Volunteer Hours
2012	75	4658			2188	229	1852	137	
2013	102	4119			1602	8	1513	120	
2014	104	4843			1716	241	1378	199	
2015	114	7262			2106	244	2568	156	
2016	219	9498			1984	115	2290	87	988
2017	248	9951	8441		2276	162	2262	131	1937
2018	187	7289	37,922	>1300	1788	170	1635	79	1355
2019	240	7036	46,675	2997	1320	216	1520	213	1950
2020	171	1859	161,688	954	817	22	636	125	1079
2021	131	731	60,240	565	108	0	46	0	1160

## Types of Outreach Events

Year	Presentation	Night Observing	Day Observing	Youth Group	School Talks	Exhibition	Observ./Planet'm
2012	12	24	2	12	17	8	0
2013	24	24	3	12	32	7	0
2014	23	21	20	17	12	8	3
2015	22	33	23	7	15	13	1
2016	31	55	39	19	54	11	10
2017	61	89	22	19	50	6	1
2018	50	80	13	18	20	5	1
2019	73	94	10	22	36	5	0
2020	86	43	5	8	29	0	0
2021	65	48	6	1	11	0	0

## Outreach Corner Coordinator

In March 2020 we were on our way toward a recording-breaking number of outreach events for a year. Then the world changed and opportunities for in-person outreach diminished greatly. Star parties were cancelled, usually our biggest source of public attendance. But, thrown a mutant lemon, the astronomy community has made online lemonade and RASC NB members already had a few years of experience with this medium.

Leading the way have been Chris Curwin, Paul Owen and Mike Powell with their weekly Sunday Night Astronomy Show over Facebook and YouTube, which actually started several months before the pandemic landed here. They are supplemented by occasional guests and the ever-popular Fun Facts contributions of Rosanna Armstrong. Chris also does live feeds from home and from his second home, Saints Rest Beach. Also coordinating and performing outreach in 2021 were Gerry Allain, Ted Dunphy and Don Kelly, and Curt Nason.

Note: The drop in reported Live Feed numbers in 2021 was due to a reassessment of who to include based on a longer time in attendance. Live Feed is for online events with an undefined audience. Online school talks, for example, are reported as in-person.



**The RASC NB  
AstroVerse**

**Don Kelly**

Our Moon is a marvellous place.  
Some say that our Moon has a face.  
They claim they see Elvis -  
His face - not his pelvis,  
But, for me, I've seen nary a trace.

***Lunar Elvis***

*aka "The  
Woman in  
the Moon"*

*Paul Owen  
photo*



Eugene and Carolyn were awesome!  
Searching for comets, they saw some.  
To enhance the versicular,  
One crashed into Jupiter  
Thrilling our Earth's population.

An eclipse of the Sun can be fun.  
In twenty-twenty four there'll be one.  
If we have a clear day,  
If the rain stays away,  
Astronomers will come on the run!

**Alan Hindle**

**Ode to Delos Eyepieces**

To crave a sip from this chalice of light  
So sweet and strong on a cool clear night  
I wish I may  
I wish I might  
Drink every star I see tonight



**Yolanda Kippers**

For indiscretions Zeus was not blamed:  
But Hera became truly inflamed  
Cast Callisto and Arcus,  
Out into the darkness:  
Ursa Major and Minor now named.



From now 'till April has passed,  
Western twilight is subtly cast.  
Zodiacal Light  
Will surely delight  
Trudy's image known to the RASC'd.



As winter slides into spring,  
And you're watching Leo the King,  
Wake up at dawn;  
Stifle that yawn  
Conjunctions are truly the thing.

***G.T.A. ANSWER***



The Small Fish  
Magnitude 6th-13th  
Size 13' x 7'