# ent Horizon





#### From The Editor

This edition of the E.H. has lots of "eye candy", as well as a certain SpaceX theme, both pro (the launch of the Crew Dragon to the International Space Station) and con (The Starlink Internet satellite system).

Once again, many thanks to all who contributed!

Bob Christmas, Editor editor 'AT' amateurastronomy.org

#### Chair's Report by John Gauvreau

I dragged myself away from my solar scope long enough to watch SpaceX launch their first manned mission (see image on next page). Watching the rocket take off from the Kennedy Space Center in Florida took my mind back to a launch that I saw there, back in the '80s. It is a remarkable thing, watching people leave the planet, and the visceral experience of the launch, the ground shaking, the deafening noise, the shock wave from the engine ignition washing over you, is something not soon forgotten. If any of you have the opportunity to attend a launch I heartily recommend it; it is a unique experience.

And I enjoyed watching Venus sink into the west, all the while growing in apparent size. I could easily see the crescent shape even in my 10x50 binoculars. Mercury was an easy sight low in the west, and it is so nice to see the summer constellations appearing in the east. They mark a welcome passage of time.

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Volume 27, Number 8

**June 2020** 

### Chair's Report (continued)

#### June Meeting

Those of you who read the email I sent out last week know that we have our first ever Zoom meeting coming up on June 12. We will be going online at 7:30, our regular meeting date and time. Keep an eye out for an upcoming email with a link that will allow you to join in the meeting.

There will be presentations from Chris Strejch about our website, a video from the winner of the HAA's award to the best astronomy project at BASEF (Bay Area Science and Engineering Fair) and of course The Sky This Month, by Matthew Mannering. Zoom is available for tablets, pads, desktops, laptops, Windows and Apple. Just <a href="download">download</a> for free whichever one you need for your device and follow the link on Friday June 12th.

Chris and Matt are working hard to learn the ropes here and ready themselves for the meeting, but the real unseen mastermind here is Sue MacLachlan, who is managing the behind-the-scenes action and really making this happen for us. Thanks Sue!

Hope to 'see you there' on the 12th!

#### **Club Activities**

As you would have also read in my last email, we are awaiting word from the Niagara Peninsula Conservation Authority on when we can get back to observing at Binbrook. Once we get the all clear and a set of guidelines has been set out, I will look forward to seeing you there.

Doug Turner is spearheading our calendar efforts this year, and we are very appreciative of his efforts.

The 2021 HAA wall calendar is well under way and will be ready for distribution by November, as usual. Get your images ready!

Thank you to those of you who sent in stories to share with the members. I enjoyed them and I'm sure others did as well. I sent out all the ones I got; if anyone else, any member at all, has a story to share (what's your favourite thing to observe?) please feel free to send it to me and I will send out another email to the club.

Please take care of yourselves, stay safe, and enjoy the summer now that it's here. I plan to get my solar scope out again, as soon as the weather clears!



SpaceX's Falcon 9 rocket launched from the John F. Kennedy Space Center May 30, 2020. Image Credit: Thom Baur/Reuters

**Masthead Image:** The Sun with Prominences, by John Gauvreau.

This is a *pencil sketch* that John drew at the eyepiece of his 60mm PST on May 24, 2020. He then digitized the drawing, inverted the image, and added colour to simulate a hydrogen-alpha look.

# The Sky This Summer 2020 by Matthew Mannering

I'll start this issue of 'The Sky this Summer' with a cautionary tale. One evening in May, I was photographing the Venus/Mercury conjunction. I had my camera and 70-300mm lens mounted on a camera tripod. I was in a hurry after taking the images and began dismantling the setup. That was my mistake. Never rush handling your astro or camera gear. You would think that after all these years of using equipment like this that the mantra of 'do not rush' would be ingrained, but I still messed up. I was removing the camera from the tripod and flipped the release lever and watched the camera drop five feet to the concrete. For some reason, I didn't think to have one hand on the camera. After a few moments of stunned disbelief I picked up the camera and inspected the lens. It was intact! I then pointed the camera at a garden lantern and took a picture. The camera functioned and the lens focused. I was amazed that the camera worked and furious at myself for rushing.

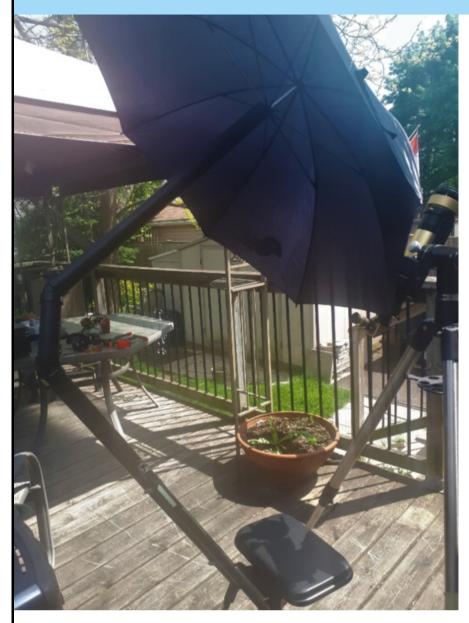
It looks like most star parties have been canceled this summer. So far at least, the Black Forest Star Party in September at Cherry Springs PA is still on. Assuming the border is open, we will all have to decide if crossing the border is a good idea. My wife and I always look forward to these parties, but I suspect we won't be going this year. There may be a few star parties closer to home after Labour Day, but we will have to wait and see.

I have been considering solar observing for some time due to the abundance of clear days and cloudy nights. A few weeks ago, I purchased a used 60mm double stack solar telescope. This scope allows me to see the prominences along the edge of the Sun and also a lot of surface detail. I have had to learn to 'see' detail on the surface much in the same way it takes time to learn to 'see' detail in the faint fuzzies of the night sky. The views so far have been very good and it's interesting to watch a prominence change its shape over a few hours.

(Continued on page 4)



# The Sky This Summer 2020 (continued)

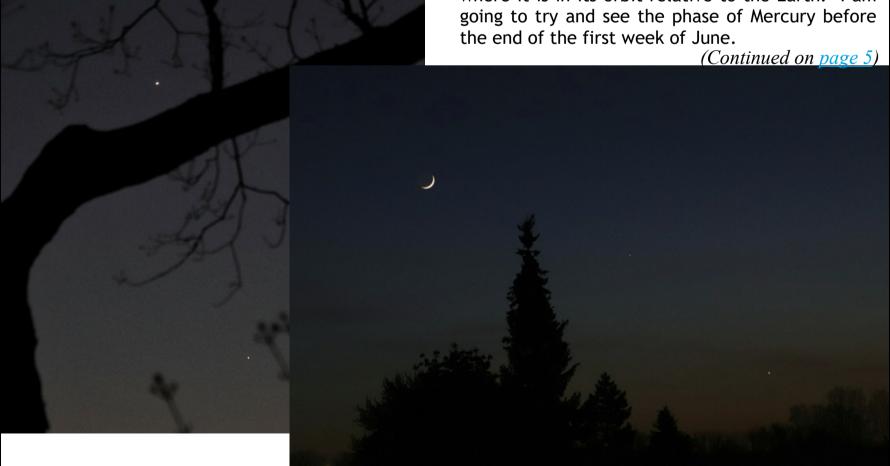


Another thing I have found is that sitting out for an hour, in direct sunlight, in 33°c heat with a ball cap and towel over your head is very hot! So I decided to do something about it. I grabbed some 1.5" pvc pipe and fittings and a couple of hose clamps. I clamped one section of pipe to my observing chair and then used some angled couplings and more pipe to create an arch over the chair. Then I stuck an umbrella into the end of the pipe. As you can see in the picture, it's a kludge but it works. I may add a reflective film to the umbrella to reflect more light and heat. I didn't glue the joints which makes it more adjustable and portable.

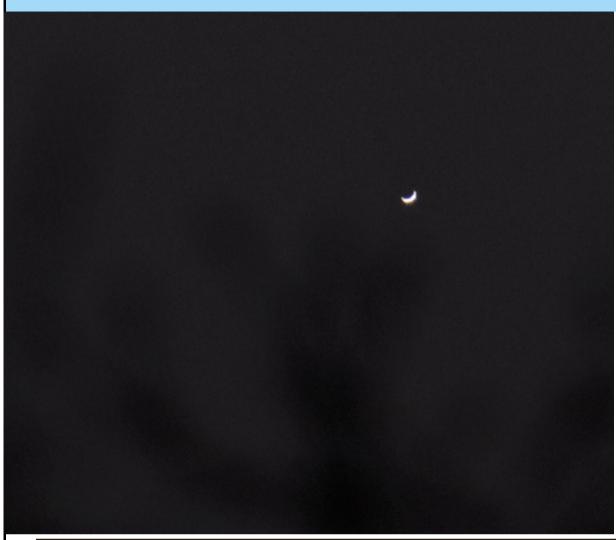
As I mentioned earlier, I spent several evenings watching Mercury climb in the evening sky to join Venus. A few days later, Mercury passed Venus (lower left) and I was able to get a nice image of them along with the Moon (lower right).

As Venus approaches *inferior conjunction* (directly between the Earth and the Sun), the phase of Venus becomes just a sliver of light. You can see the phase of Venus now with 10x50 binoculars. The top of the next page is an image from May 20 at about 9:15pm.

By the time you read this, Venus will have disappeared below the evening horizon leaving Mercury low in the western sky. Just like Venus, Mercury shows us different phases depending on where it is in its orbit relative to the Earth. I am going to try and see the phase of Mercury before the end of the first week of June.



# The Sky This Summer 2020 (continued)



This below is what the phase of Mercury will look like on June 7 at 9:30pm.

This year could have been a great one for comets, but it looks like the best candidates have fizzled out. Unless something comes along that hasn't been discovered yet, the best bet is comet *C/2017 T2 PanSTARRS*. At magnitude 8.5 you will need binoculars and a dark sky to find it. Check online for an up to date path across the sky.

On June 21st, there will be an annular solar eclipse. Unfortunately this event won't be visible from the Americas. The eclipse starts in Africa and moves across Asia and ends in the Pacific.

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| Type: planet | Page |

# The Sky This Summer 2020 (continued)



An annular eclipse occurs when the position of the Moon in its orbit is farther than average from the Earth. When the Moon moves in front of the Sun during the eclipse the apparent diameter of the Moon isn't large enough to fully cover the Sun. If you are on the center line of the eclipse path you should see a brilliant ring of fire around the Moon. Note that you can not view this event without proper eye protection.

#### **Events this Summer**

- June 19th Venus comes to 0.5° of the Moon at 05:10am.
- July 6th Saturn comes to 3.0° from the Moon at 04:45am.
- July 14th Jupiter reaches opposition at 4.14 AU from Earth (1 AU = 150 million km).
- July 20th Saturn reaches opposition at 9 AU from Earth.
- August 1st Jupiter comes to 1.5° from the Moon at 10:00pm.
  - Saturn is a just a few degrees to the east of Jupiter.
- August 9th Mars comes to 1.0° from the Moon at 4:00am.
- August 12th The Perseid meteor shower peaks.
- August 15th A double shadow transit of Io and Ganymede on Jupiter at 00:08am.
- August 28th Jupiter comes to 2.0° from the Moon at 09:33pm.

#### The Planets

- *Mercury* will be visible low in the west in the evening sky until June 10 and completely disappears by June 15.
- Venus appears in the eastern morning sky before dawn from July onward through the summer.
- Mars begins the summer about 8° west of Neptune and should be in a position to view from about 4:00am. In the morning of June 13, Mars and Neptune will be in conjunction about 1.5° apart. After that date Mars moves further east from Neptune. By summer's end, the Mars/Neptune separation approaches 40°. Look for Mars at about 2:30am on July 1st, 1:00am August 1st and 11:30pm September 1st.
- Jupiter and Saturn remain close together all summer. Look for them at about 2:00am on June 1st, midnight on July 1st, 10:00pm on August 1st and 8:30pm on September 1st.
- Uranus will be visible from 4:00am on July 1st, 2:00am on August 1st and midnight on September 1st.
- Neptune is visible from 2:00am on July 1st, midnight on August 1st and 10:00pm by September 1st.

### What Have I Been Doing During The Lockdown? by Mike Jefferson

Last month I reported on identifying stars via their spectral line profiles in light-polluted suburban neighbourhoods and how we might use this evidence as a means of getting more of society on side with our relativistic plight, through outreach. Interestingly, a retired physicist involved in laser research, from the National Science Foundation in Ottawa, 'found' Matthew Mannering on our website because of his (the scientist's) interest in spectroscopy; and Matthew turned him over to me. To keep this discourse short, he was really more interested in the equipment and techniques used to gather spectroscopic data than he was in the results and their 'stories' themselves. Much of what he had was self-made and put together with bits and pieces that he was able to derive. He came up with line profiles, calibration points and Planck curves without the software and manuals that I have and came up with some very creditable results! He thanked me for suggestions and information that he found useful. Will he contact us again? I hope so.

I have also been monitoring the night skies with the "Sky Quality Meter" - a kind of portable "radio telescope" developed by Doug Welch and Anthony Tekatch for testing the clarity of the night sky. This helps you to decide whether or not you wish to set up or prepare for a night under the stars based on the readings you get. Most of what I'm deriving, so far, is fair to middling - readings from about 13.6 to about 17.4, out of a possible 23 and higher - not very encouraging. Right now, we are plagued with sky fog which does not seem to be around during the day. It does not seem to hurt the Sun or even the Moon at night. However, with only about a dozen or so stars in the sky, after astronomical twilight, setting up observing equipment seems hardly worth the effort. What is likely happening is that the fog is present during the day as a high-altitude vapor. This does not seem to affect the Sun or the very bright Moon in the evening. However, as the skies get darker late in the evening the vapor cools and clings to dust particles (from forest fires and pollution, and blankets the more subtle features of the night sky. Nevertheless, I have been able to benefit from the appearance of some reasonable conditions for a few nights, and this makes it all worthwhile! The planet Venus has been very prominent in our evening skies over the last while; Ursa Major, Arcturus, Spica and Polaris have made appearances, too, over the last few weeks, whenever sky fog moves aside and permits them to be seen.

One recent item that makes great difficulty for me is the specter of Elon Musk's Internet satellite trains. I find it unconscionable that this man would ruin the natural beauty of the sky with these projectiles for



A train of SpaceX Starlink satellites.

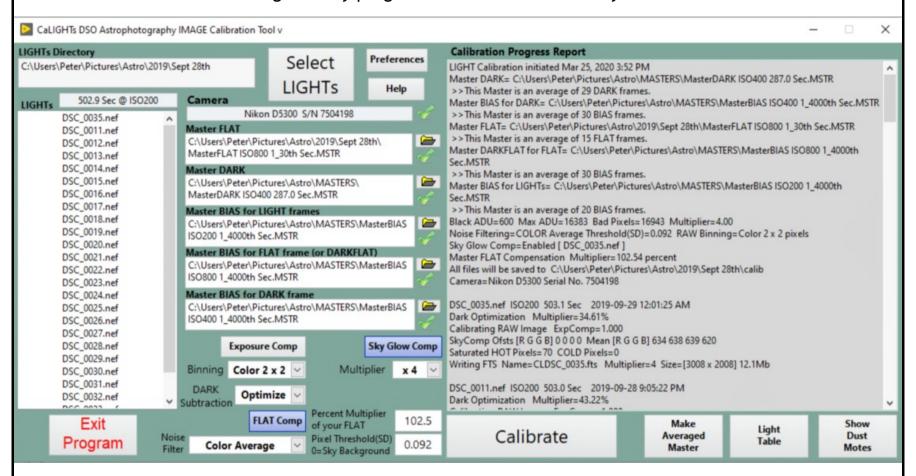
Image Credit: Marco Langbroek via SatTrackBlog

the sake of commerce - as if the environment does not now have enough troubles to contend with. In 1947 (I believe) in "Electronics and Wireless World", Arthur C. Clarke outlined a scheme by which the entire planet could be covered in communications by 3 geosynchronous satellites - not thousands of pieces of debris, many of which will fall out of the sky, due to unstable orbits. Further, it amazes me that the FCC allowed him the green light in this ridiculous adventure. It will result in many academic papers, and night sky imagery being destroyed by his questing after the almighty buck. These craft will also come down on populous areas of the world and add to the litany of space junk that is already up there. This has nothing to do with research science, but projects like this and his 'bacteria-laden million people on Mars' and other environmental degradation will result in crossing Nature's rules - at our peril. We can only hope that saner heads will prevail!



# CallGHTs DSO Astrophotography IMAGE Calibration Tool June 2020 Update! by Peter Wolsley

In April's Event Horizon I asked for beta testers for an astrophotography program I have written. The response has been pretty quiet which means either no-one has any problems calibrating their astrophotos or no-one is looking for another program to buy to add to their already too expensive hobby. As a result I have made a few changes to my program which I want to make you all aware of.



In the April Event Horizon I let everyone know that my program will soon be able to read the latest *CR3* file formats. These are the RAW picture files being created by the latest Canon mirrorless cameras. I have been able to make this a reality. CaLIGHTs has been written so that it can run on either a 32 bit or 64 bit windows operating system (typically this would be Windows 10). The CR3 support files are provided in a subfolder so that those who use these Canon cameras can configure CaLIGHTs as required. You must be using a 64 bit windows operating system to use the CR3 support files. The CR3 support files are based upon the latest version of LibRAW.

I have also decided to offer my program for FREE!!! There is no license and there is no expiry date. All I ask is if you find my program useful, that you take advantage of a Paypal donation link I have provided in the help file.

I have been using CaLIGHTs for a few years now. I trust it to give me quality calibrated images that stack without issue in deep sky stacker. CaLIGHTs allows you to create master BIAS, DARK, FLAT and DARKFLATs with confidence. CaLIGHTs is designed to calibrate the largest frame cameras available to-day and into the future... both DSLR and dedicated astrocams. CaLIGHTs uses DARK frame optimization to ensure every image is calibrated with the lowest DARK signal possible. Powerful binning algorithms give your colour images the noise reduction advantages typically only available to mono astrocams. The help file contains a detailed write-up on this topic. Sky Background compensation allows CaLIGHTs to provide you with calibrated LIGHT frames that when stacked using Kappa Sigma rejection will yield lower noise results. CaLIGHTs even has a thresholded noise filtering algorithm that will target the noise in the darkest areas of your astrophotos allowing you to pull out more detail.

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# CallGHTs DSO Astrophotography IMAGE Calibration Tool June 2020 Update! (continued)

If you would like to read a PDF listing all the features of CaLIGHTs click here.

If you want to download the installer files <u>click here</u>. You will need to open the zip file and unzip them onto your hard drive. Then you can run the "CaLIGHTs setup.exe" file which will install CaLIGHTs. The installation is performed automatically in two stages. The first is to install a LabVIEW run-time engine (~200Mb) onto your computer. I program exclusively in LabVIEW. LabVIEW is a graphical language optimized for data acquisition and control using custom hardware. Once the run-time engine is installed, the CaLIGHT program will be installed (~15Mb). Your computer may need to be re-booted before you

can run CaLIGHTs. Clear Skies... above: Nebulae of NGC 6914 below: Galaxy NGC 6946

Image Credits: Peter Wolsley (both)

## **NASA Night Sky Notes**



# This article is distributed by NASA Night Sky Network.

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.

Visit <u>nightsky.jpl.nasa.gov</u> to find local clubs, events, and more!

#### **Summer Triangle Corner: Vega**

David Prosper and Vivian White

If you live in the Northern Hemisphere and look up during June evenings, you'll see the brilliant star **Vega** shining overhead. Did you know that Vega is one of the most studied stars in our skies? As one of the brightest summer stars, Vega has fascinated astronomers for thousands of years.

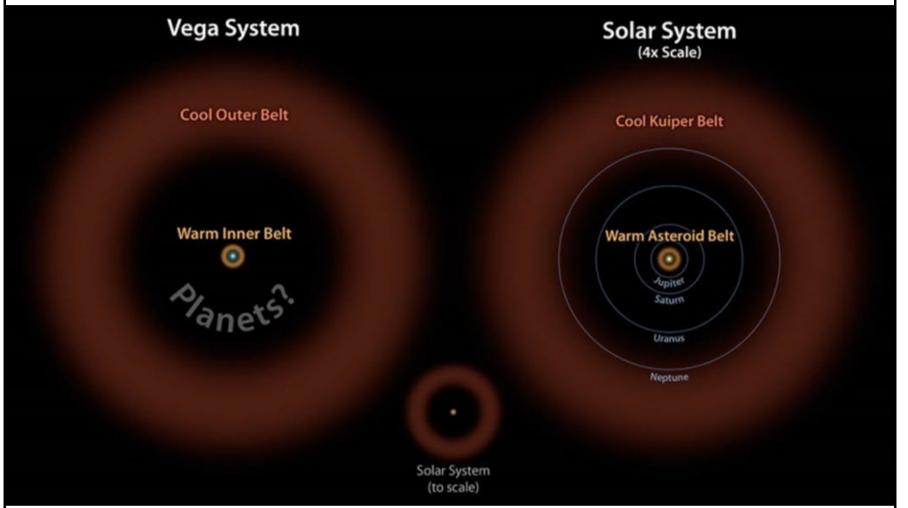
Vega is the brightest star in the small Greek constellation of Lyra, the harp. It's also one of the three points of the large "Summer Triangle" asterism, making Vega one of the easiest stars to find for novice stargazers. Ancient humans from 14,000 years ago likely knew Vega for another reason: it was the Earth's northern pole star! Compare Vega's current position with that of the current north star, Polaris, and you can see how much the Earth's tilt changes over thousands of years. This slow movement is called **precession**, and in 12,000 years Vega will return to the northern pole star position. Bright Vega has been observed closely since the beginning of modern astronomy and even helped to set the standard for the current magnitude scale used to categorize the brightness of stars. Polaris and Vega have something else in common, besides being once and future pole stars: their brightness varies over time, making them **variable stars**. Variable stars' light can change for many different reasons. Dust, smaller stars, or even planets may block the light we see from the star. Or the star itself might be unstable with active sunspots, expansions, or eruptions changing its brightness. Most stars are so far away that we only record the change in light, and can't see their surface.

NASA's TESS satellite has ultra-sensitive light sensors primed to look for the tiny dimming of starlight caused by transits of extrasolar planets. Their sensitivity also allowed TESS to observe much smaller pulsations in a certain type of variable star's light than previously observed. These observations of **Delta Scuti** variable stars will help astronomers model their complex interiors and make sense of their distinct, seemingly chaotic, pulsations. This is a major contribution towards the field of astroseismology: the study of stellar interiors via observations of how sound waves "sing" as they travel through stars. The findings may help settle the debate over what kind of variable star Vega is. Find more details on this research, including a sonification demo that lets you "hear" the heartbeat of one of these stars, at: bit.ly/DeltaScutiTESS.

(Continued on page 11)

# NASA Night Sky Notes (continued)

Interested in learning more about variable stars? Want to observe their changing brightness? Check out the website for the American Association of Variable Star Observers (AAVSO) at <u>aavso.org</u>. You can also find the latest news about Vega and other fascinating stars at <u>nasa.gov</u>.



Vega possesses two debris fields, similar to our own solar system's asteroid and Kuiper belts. Astronomers continue to hunt for planets orbiting Vega, but as of May 2020 none have been confirmed. More info: bit.ly/VegaSystem Credit: NASA/JPL-Caltech



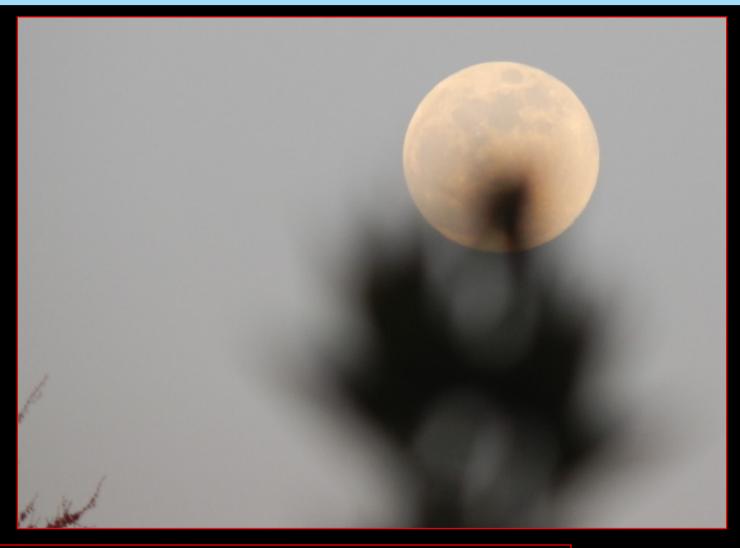
Can you spot Vega? You may need to look straight up to find it, especially if observing after midnight.



M81 (left) and M82 (right), Bode's Galaxies, by Mike Hamilton Canon T3i, through an Explore Scientific ED102 on an AVX mount; 6 hours of total exposure time



Globular Cluster M3, May 1, 2020, by Andrew Brenyo Canon Ra @ ISO 3200; 30 second exposure, through a 250mm f/10 scope





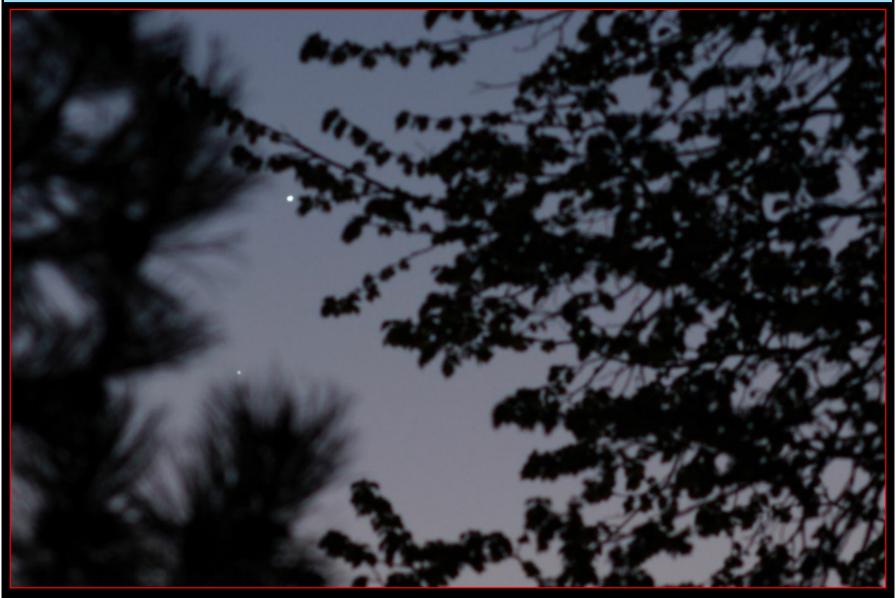
# The Full Moon Through the Trees

above:

by Brian Whitman

left:

by Chris White



above: Venus and Mercury Through The Trees, May 21, 2020, by Bob Christmas Canon 40D @ ISO 200; 1/8 second exposure, through a 100mm lens at f/4. Crop of original image.



#### left:

Venus in its Crescent Phase, May 6, 2020, by John Gauvreau

Taken through his 130mm refractor with a 4x barlow. Crop of original image.

### **Dan Copeland's Astro-Toy Collection**











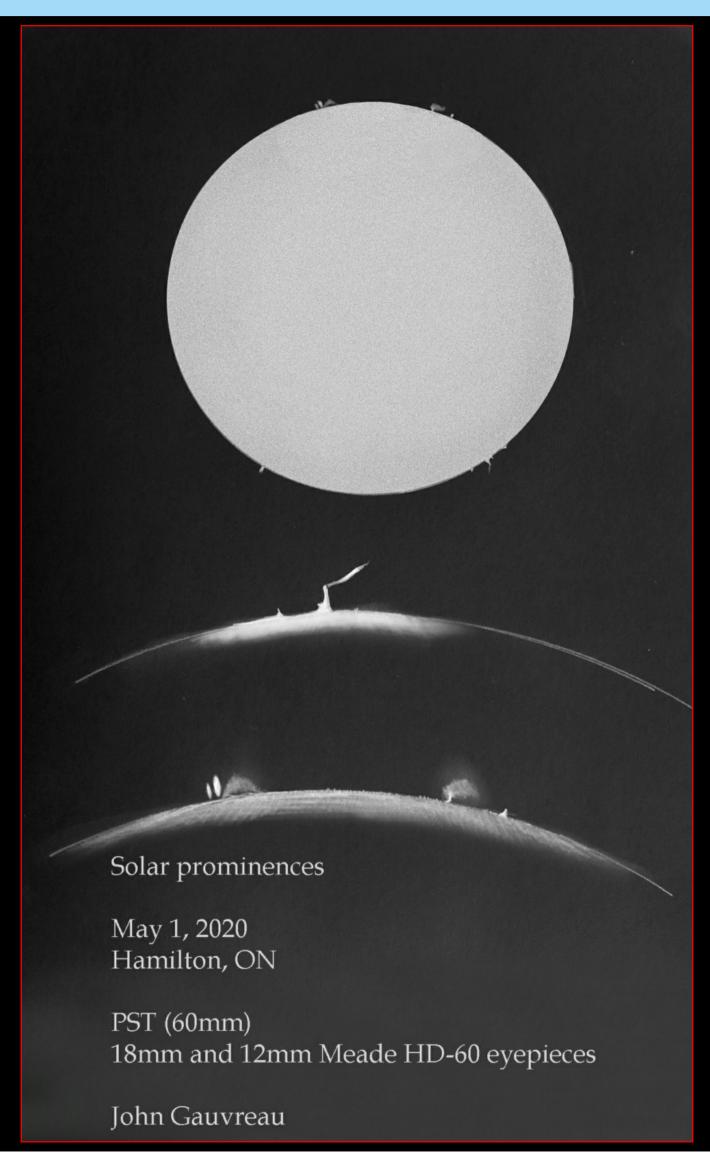


#### Clockwise from top left:

Battery box & controller for goto mount, focus aids & 3D printed lens dew hood for 5 inch Celestron scope (one was also printed for his 8 inch

guide scope using 135mm f/2.8 camera lens,

guide scope & eyepieces, 3D printed sun filter & red dot finder attachment, the Sun as shot through 3D printed shield on 5 inch Celestron



#### For Sale

#### Telescope & Power Tank

Brand new Meade ETX125 Observer Telescope including Meade Autostar Hand Controller, and Celestron Power Tank - 7aH - 12V Power Supply with spot light.

I joined the HAA about 3 years ago. Just before that I had given my 45+ year-old 4" Tasco to my half-brother who lives in a dark sky area NW of Huntsville, but I missed the old scope, so almost exactly a year ago on March 19, 2019, I purchased the above-noted Meade ETX 125 & the power tank from KW Telescope in Kitchener for \$1151.47.

I soon realized that the new instruments exceeded my capabilities at my venerable current age, so I've decided to sell them for \$950.00 total.

Shannon Cameron (who operates KW Telescope) has informed me that the Meade ETX125 is the most popular telescope in her store. I only used this telescope once (without any of the electronics) for less than an hour to show my grandkids the Moon and Jupiter with its 4 Galilean moons. A fantastic experience for me and them!

Once you've got it up and running, I wouldn't mind a peek thru it to see what I'm missing!

Thanks!

Jim Rose - Guelph - (519) 821-4333

jmrose43 'at' gmail.com

Price \$950.00 total.



### **Product Specifications**

• Optical Tube Design: Maksutov-Cassagrain

• Aperture: 127mm (5 inches) • Focal Length: 1900mm f/15

• Mount Type: Computerized Go-To

• Focuser: Internal

• Optical Cowling: Multi-coated

• Eyepieces: Two (2) 1.25" Super Plossl 9.7mm &

25mm

• Tripod: Adjustable height stainless steel with accessory tray; built-in tilt plate for EQ alignment.

• Software: AutoStar Suite DVD

Batteries: Requires 8 AA batteries (user supplied)

### **UPCOMING EVENTS**

June 12, 2020 - 7:30 pm — Virtual Online H.A.A. Meeting for members. The meeting will be conducted on the platform Zoom. Be on the lookout for an invitation e-mail with a meeting link. You may download the Zoom app for various platforms from Zoom's <u>Download Center</u>

Due to the COVID-19 Coronavirus pandemic, all in-person Hamilton Amateur Astronomers meetings and events are suspended until further notice.

### 2019-2020 Council

Chair John Gauvreau

Second Chair Jim Wamsley

Treasurer Ann Tekatch

Digital Platforms Director Christopher Strejch

Membership Director Leslie Webb

Observing Director Matthew Mannering

Education Director Jo Ann Salci

Event Horizon Editor Bob Christmas

Recorder Brenda Frederick

Secretary Denise White

Publicity Director Mario Carr

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Bernie Venasse Dee Rowan Gary Sutton Melissa Whitman Mike Jefferson Steve Germann

Sue MacLachlan

Observing site for the HAA provided with the generous support of the

#### **Binbrook Conservation Area**

Come observing with the HAA and see what a great location this is for stargazing, a family day or an outdoor function.

Please consider purchasing a season's pass for \$79 to help support the park.

http://www.npca.ca/conservation-areas/binbrook/

905-692-3228

Check out the H.A.A. Website www.amateurastronomy.org



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#### The Harvey Garden HAA Portable Library



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