

Event Horizon



Volume 27, Number 7
May 2020



From The Editor

Spring is finally beginning to set in, as the outside temperatures moderate. But this is a Spring like no other in my lifetime memory, and I'm getting pretty old by now.

I hope lots of you are practicing some of your social distancing under the night sky.

Once again, thanks to those who contributed!

*Bob Christmas, Editor
editor 'AT'
amateurastronomy.org*



Chair's Report by John Gauvreau

I broke a promise. I promised myself that during this time, when many are unemployed, underemployed or simply stuck at home (including myself), that I would refrain from bringing any new astronomy gear into the house. It seemed like a safe bet; with stores closed and social distancing in place there would be little opportunity to even peruse new gear. But alas, as I said, that promise, however well intentioned, went out with the dishwater.

I am the proud new owner of a second hand PST (it came from a great fellow amateur astronomer), which stands for personal solar telescope, the name given to Coronado's bottom of the line and most affordable solar scope. It was an irresistible offer and it came home with me just a couple of days ago. It has been out in my back yard once already and I had a great view of the sun.

I have a white light filter for my 90mm refractor, which shows sunspots very well and in good seeing conditions even some granulation on the surface. But during solar minimum, that time during the sun's 11 year cycle when it is very quiet and sunspots are few and far between, the white light filter
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Chair's Report (continued)

doesn't show much. And we are in the middle of a very long and deep solar minimum. Enter the PST!

The PST is a hydrogen alpha scope that shows the sun's coronasphere where there is much more action than the sun's photosphere, which provides the traditional white light that we see. On a good day I might eke out a prominence or solar flare, and on any given day I should be able to see at least some surface mottling.

This isn't the first PST in the club. Other members have enjoyed theirs and used them effectively for public outreach, and I look forward to doing the same when the time comes that we can resume those activities. So if you haven't had a look through one before, when we can get back together I will gladly share the views through mine.

And for now, with the nice weather coming and being stuck at home, I will be happy to pop out back and have a look at the sun.

Club Activities

Well...this is going to be short. As you all know, all meetings, public events and club observing sessions are on hold indefinitely. As soon as we know how and when we can resume activities we will let you know.

The club newsletter is going strong, as is the club's website and other social media. Check out the club's Twitter account and follow us on Facebook if you haven't already. Both Bob with the newsletter and Chris with our electronic platforms are doing great jobs and keeping the HAA active and visible. Well done to you both!

And of course the contributors to both the newsletter and the social media are so valuable and appreciated. From the regular contributors like Matthew Mannering's 'The Sky This Month', to those who have offered suggestions for the websites new STEM and youth activities, we thank you.

Finally

Again, stay safe and take care; I look forward to seeing each and every one of you when this has passed and we can once again gather to enjoy the company of friends and activities of the club.



HAA Helps Hamilton

To support our community, we collect non-perishable food items and cash for local food banks at our general meetings. Please bring a non-perishable food item to the meeting or a donation of cash and help us help others.

Our donations go to [Hamilton Food Share](#), which delivers them to various food banks around the Hamilton area.

If you would like to help or have any questions about this initiative, please contact the H.A.A.



Masthead Photo: *Venus, the Pleiades, the Hyades, and the International Space Station, on the evening of April 2, 2020, from Hamilton, ON, by Sue MacLachlan and Doug Turner.*

See more images of the April 2 Venus and Pleiades conjunction in the Eye Candy gallery on page 13.



The Sky This Month for May 2020 by Matthew Mannering

Before I get into this month's newsletter, I would like to thank Bob Christmas for filling in for me writing 'The Sky this Month'. Bob is the editor of the newsletter and has always done a great job. For the last few months he has done double duty while I dealt with multiple family emergencies. Having people like Bob in the club help to make it the success that it is.

So here we are in the age of Covid-19. This has meant the cessation of club meetings, public nights, nights at Binbrook Conservation Area and getting together socially over coffee to discuss many things. Sometimes we would even talk about astronomy!

Personally, I really miss the social aspect of the club. I have always enjoyed the meetings and sharing a view of the heavens with members of the public. But for many of us it is the camaraderie we share that makes the club special.

Generally, we amateur astronomers are independent sorts and quite happy to observe alone. However, I have found that sharing the observing experience with others can add to the enjoyment. So how do we go about observing alone or as a group in the age of Covid? Here are some ideas.

- Create an observing list with a friend and then compare your views over the phone or in real time via video conferencing.
- Start a new observing project such as the Messier list, learn the geography of the Moon, sketch the view through the eyepiece or try some basic astrophotography. Contact Bernie Venasse (eclipse 'AT' amateurastronomy.org) for some ideas on observing plans.
- Create a short list of difficult objects and then challenge your friends to find them. Make sure to take into account light pollution because a lot of us don't have access to a dark sky site at the moment.
- Share your successes and failures with others in the club via a short article in the Event Horizon. I'm thinking reflections on equipment gremlins, software issues or even astro-camping events.

Remember. . . we'll meet again, don't know where, don't know when - but I'm sure we'll meet again some hopefully very dark and clear night! The last thing we need is a review of our first outdoor get-together that starts with the line 'It was a dark and stormy night...'.

So what is there to see in the sky this month? Spring time is the best time to look into the 'Realm of the Galaxies' and by mid-month the grouping will be due south at 10pm. This huge grouping of galaxies is hemmed in by *Leo* to the west, *Coma Berenices* to the north and *Virgo* to the east. There are quite a few bright Messier and NGC galaxies to look at. You will need a fairly dark sight to see even the brightest of them but it is an amazing sight once you start finding them. Look for *Markarian's Chain* anchored by *M86* and *M84* midway between Denebola in *Leo* and Vindemiatrix in *Virgo*. Concentrate on the Messier galaxies as those are the largest/brightest in the realm.

Below this grouping is the constellation of *Corvus*. This is perhaps the best time of year to see *Corvus* at its highest point in the sky due south at 10pm. Look for the globular cluster *M68* about 3° below *Corvus* and *M104* the Sombrero galaxy about 5.5° above to the northeast. The Sombrero is a small galaxy but very bright. You should be able to see the dust lane that bisects it.

This is also the start of globular star cluster season. These targets are among my favourites. Globulars are generally very bright and can be seen with binoculars. These tiny balls of stars start to resolve with telescopes as small as 150mm (6 inches). Normally, I don't like to recommend high magnification for visual astronomy but you can use as much magnification as the conditions allow when viewing globulars.

(Continued on [page 4](#))

The Sky This Month for May 2020 (continued)

Here are four easy-to-find globular clusters that are big and beautiful. They are listed from west to east at 10pm. Just for comparison - a full Moon is 30 arc minutes.

- M53 in Coma Berenices: magnitude 7.6, size 13 arc minutes.
- M3 in Canes Venatici: magnitude 6.2, size 18 arc minutes.
- M5 in Serpens: magnitude 5.6, size 23 arc minutes.
- M13 in Hercules: magnitude 5.8, size 20 arc minutes.

Below is an overview of the sky facing south-east at 10pm.

I encourage you to look find these targets in your own star charts and planetarium software. There are a lot of bright stars in that area of the sky and this is a perfect chance to practice star hopping to find the constellations and targets.

Lastly, let's look at the planets for the month of May. Venus and Mercury are visible in the evening. Jupiter and Saturn separated by 5° should be visible by 3am followed by Mars at 4am.

This will be a great year for viewing Mars. On or about May 9th Mars will reach 8 arc seconds in diameter. At this point hints of surface detail on Mars should be visible in large scopes. Prime viewing of Mars won't occur until mid August when it should be visible by midnight with a diameter of 16 arc seconds.

(Continued on [page 5](#))



Chart of May sky facing south-east, generated using Stellarium

The Sky This Month for May 2020 (continued)

Venus is starting to sink towards the western horizon in the evening and will disappear by month's end. On the evenings of the 21st and 22nd, Mercury will be about 1° from Venus. This is a great chance to see Mercury using Venus as your guide.

If you haven't seen a double shadow transit of Jupiter's Moons across the face of Jupiter, this is your chance. It's always fascinating to watch the slow drift of the shadows across Jupiter. You should begin observing at 5am on the 28th.

Events this Month

Events this month are:

- *12th* – The Moon, Jupiter and Saturn make a fine grouping at 3:30am.
- *15th* – The Moon will be 4° from Mars at 4:30am.
- *21st and 22nd* – Venus and Mercury about 1° apart at 9:30pm.
- *28th* – Double shadow transit of Jupiter's moons at 5am.

The Moon

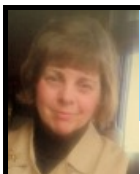
Libration this month is as follows: The Northern limb will be most exposed on the 18th and the Southern limb on the 4th. The Western limb will be most exposed on the 27th and the Eastern limb on the 12th.

The *phases* of the Moon for May occur as follows:

- May 7 – Full Moon
- May 14 – Last Quarter
- May 22 – New Moon
- May 29 – 1st Quarter

The Planets

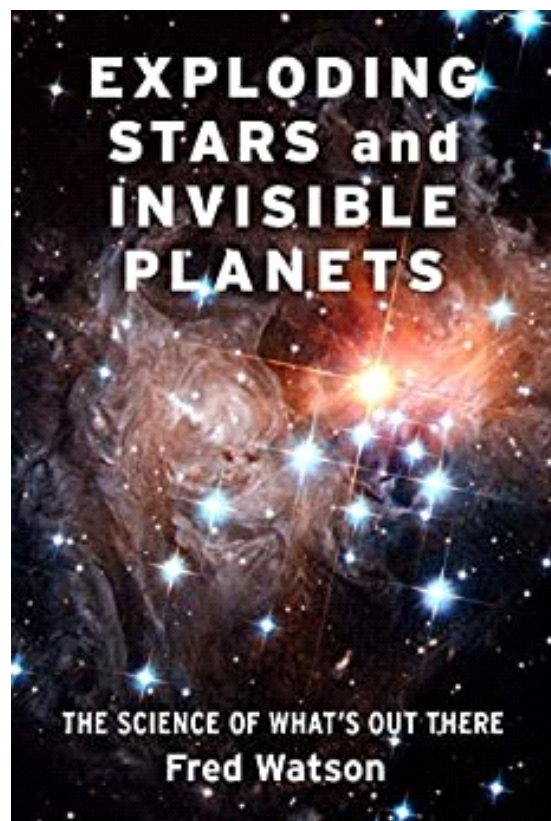
- *Mercury* appears low in the western evening sky from the 20th through month end.
- *Venus* appears in the western evening sky but disappears in front of the Sun by month end.
- *Mars* is visible by 4am low in the south east.
- *Jupiter* and *Saturn* are visible by 3am in the south east.
- *Uranus* and *Neptune* aren't visible at this time.



HAA's Library Corner by Denise White

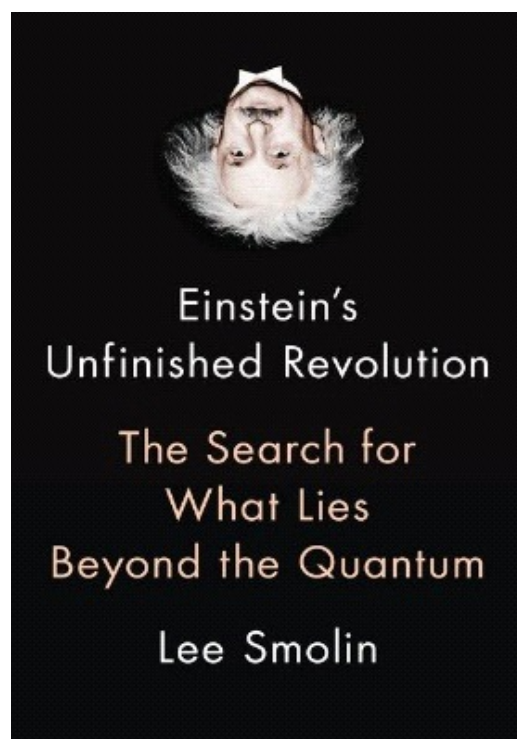
If astronomer Carl Sagan were alive today in this period of social isolation, he'd more than likely be in the company of books. Books, Sagan says in *Cosmos* 1980, "... break the shackles of time" and are "...proof that humans are capable of working magic". There is no better way for us to relax than to be completely immersed in a good book. So, rally through this lockdown by checking out these five stellar astronomy books. These books are not in our library but they are available for purchase online.

Exploding Stars and Invisible Planets: The Science of What's Out There by Fred Watson (2020)



Fred Watson is an awarding winning astronomer whose non-fiction book discusses current astronomy and space research. It touches on such topics as: stars; meteors; meteorites; radio signals; microbes in space; seas and lakes of Titan, and much more.

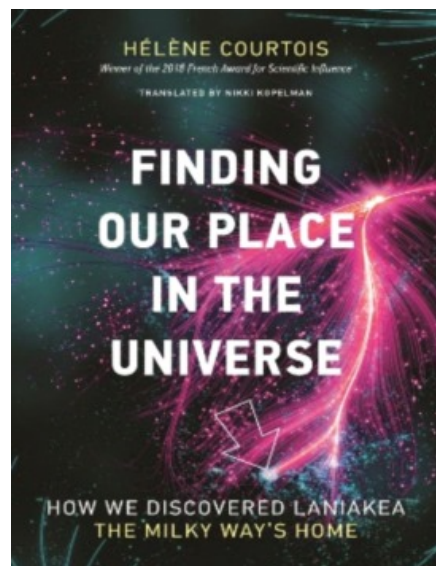
Einstein's Unfinished Revolution: The Search for What Lies Beyond the Quantum by Lee Smolin (2019)



Author Lee Smolin is an American theoretical physicist who works at the Perimeter Institute for Theoretical Physics in Waterloo, Ontario. His book talks about the gaps in the standard quantum mechanics theory and the need for a deeper explanation.

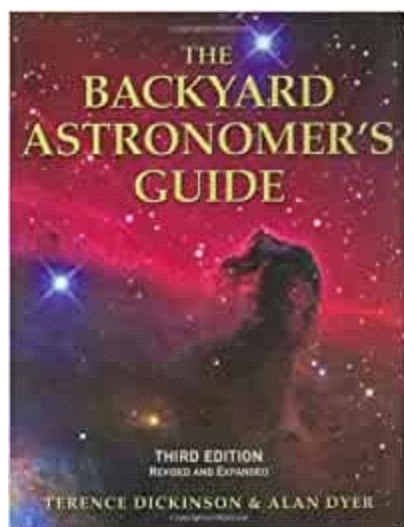
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Finding Our Place in the Universe by Hélène Courtois (2019)



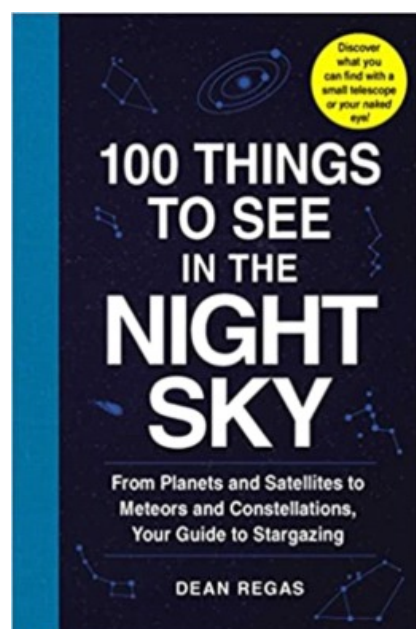
A true story about an astrophysicist's involvement in the discovery of our Milky Way's home, the galactic supercluster, Laniakea. This adventurous tale includes information on the Great Attractor, a gravitational anomaly in the centre of this supercluster.

The Backyard Astronomer's Guide by Terence Dickinson and Alan Dyer (2008)



Although this book is dated, it's still a classic instructional astronomy guide book for beginners or for anyone who wants to hone or refresh their observational skills.

100 Things to See in the Night Sky by Dean Regas (2017)



A handbook book full of suggestions of what to search for in the sky. It lists basic sky objects such as: stars; planets, and satellites for naked eye and telescope observing.

Launch yourself into another world. Grab a book, get a coffee, and watch the time fly!

— D. E. White, HAA Librarian



Doing Spectra Under Difficult Suburban Conditions and What Needs to be Done by Mike Jefferson

Taking the spectra of stars and planets is the art and science of investigating the permitted orbitals of electrons in the atoms and nearby ions of the gases of those stars, nebulae and planets; thereby exposing the frequencies of the absorbed or emitted photons that betray this process.

Unlike the almost carefree spacing of planetary, comet, asteroid and moon orbits (due mostly to masses, velocities and gravitational attractions) electrons are permitted specific orbital frequencies or 'jumps' governed by their absorption or ejection of photon energy (Quanta) from the parent atom or ion or the gases and plasmas in the given environment.

This is as far as I would like to venture with explaining this technical process because that is not the purpose of this article. Instead, I would like to dwell on the acquisition of the line profiles and synthesized spectra that were attained under conditions of streetlights and garage lights in a typical suburban environment within the Hamilton area.

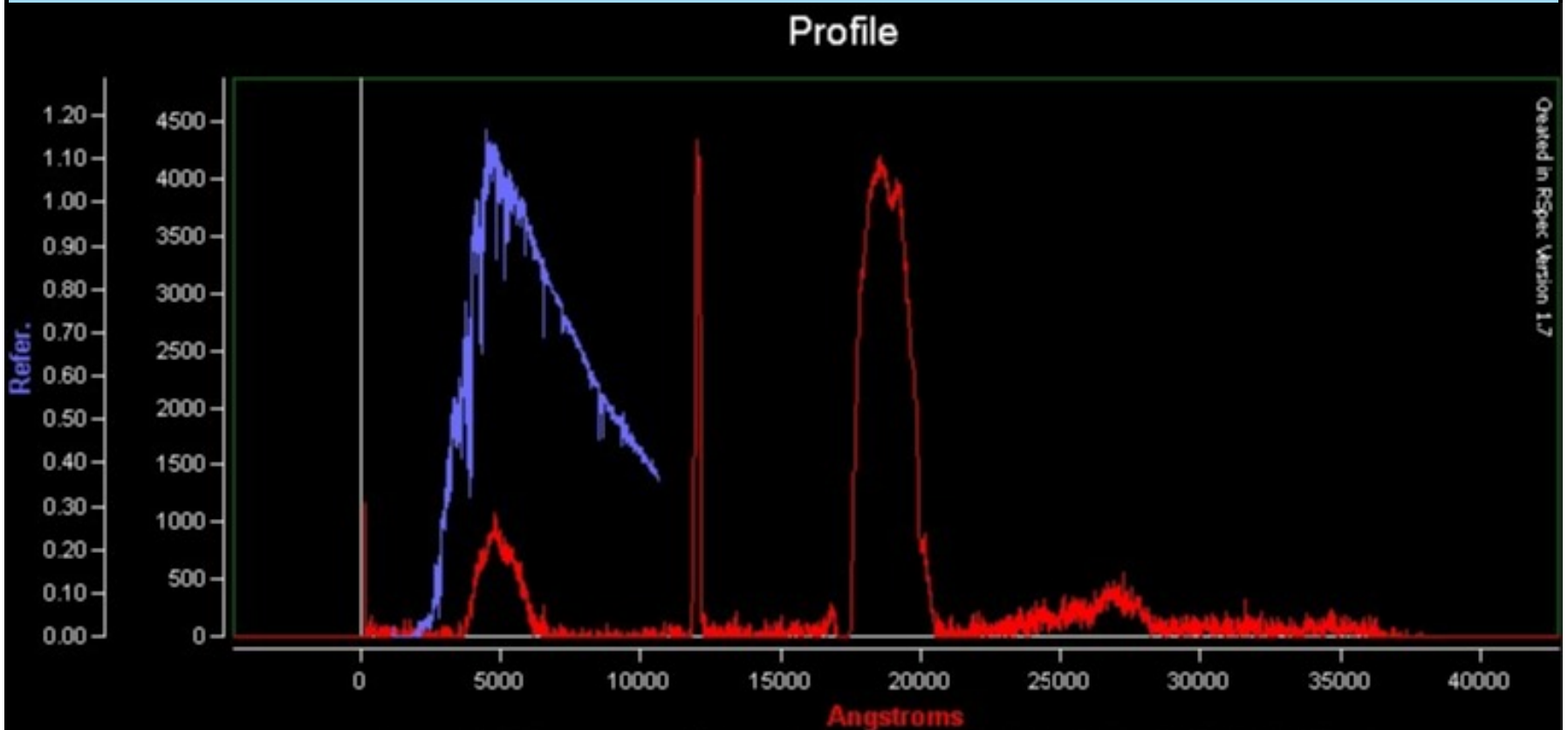
My main goal in this was to see how well my equipment could distinguish between line profiles and synthesized spectra of different types of stars. Using a Paton Hawksley diffraction grating, a 55 mm lens and digital camera, I shot a series of 2-second exposures of both Rigel and Venus - both well-placed in the night sky right now, for this purpose. I got a series of raw spectra like the first image below, with beautiful colour and capable of being processed into line profiles, like the next 2 images - Venus and Rigel - in that order. Venus has also been further processed into a synthetic spectrum, which is in black and white, but could also be done in colour.

Because of unsteady and scuzzy sky conditions, I did not know whether I had captured Rigel or Betelgeuse. It is nearly impossible to look through a camera lens without any filter and see the night sky, and so much worse with a diffraction grating clouding (no pun intended) the issue even further. However, what the camera sees is far better than anything your eyes will sense. See the first picture - a screen shot of raw spectroscopic data - showing the universe's most beautiful colours. To the left of the 'rainbow' is the target star, planet, etc., called the 0-Order spectrum.



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Doing Spectra Under Difficult Suburban Conditions and What Needs to be Done (continued)



Spectrum Profile with Venus

We use the raw data to create a line profile of the target. In this case, it is Venus, now a glorious apparition in the night sky.....if you can get a clear one! See the 2nd screen shot above. The line profile is the jagged little pyramid at the left side of the picture. The 0-Order spectrum is hidden in the left margin. The blue 'pyramid' is the reference solar spectrum and the bar below is the synthesized spectrum with its absorption and emission lines. What I have just described is the USEFUL data in this image. The rest of the big stuff in the centre and on the right is GARBAGE. It is garage lights, streetlights and Hwy 403 lights attempting to trash the image. Any spectroscope or diffraction-line grating will 'find' intrusive lighting. Somehow, I got what I really wanted; a G2V line profile, which is a reflection of the Sun off Venus.

Raising the camera-tripod configuration higher into the night sky and away from nuisance lighting, I captured the 3rd picture (top of next page) without really knowing what I had. If it was Betelgeuse, I would get (hopefully) an M-star profile. If Rigel, it would be an A-star line. I got a classic A-star profile and therefore it was Rigel and not Betelgeuse! The 0-Order spectrum (or Rigel) for Rigel is to the left side of the picture. It is very easy to see the differences between the line-profile of Venus (#2) and Rigel (#3)!

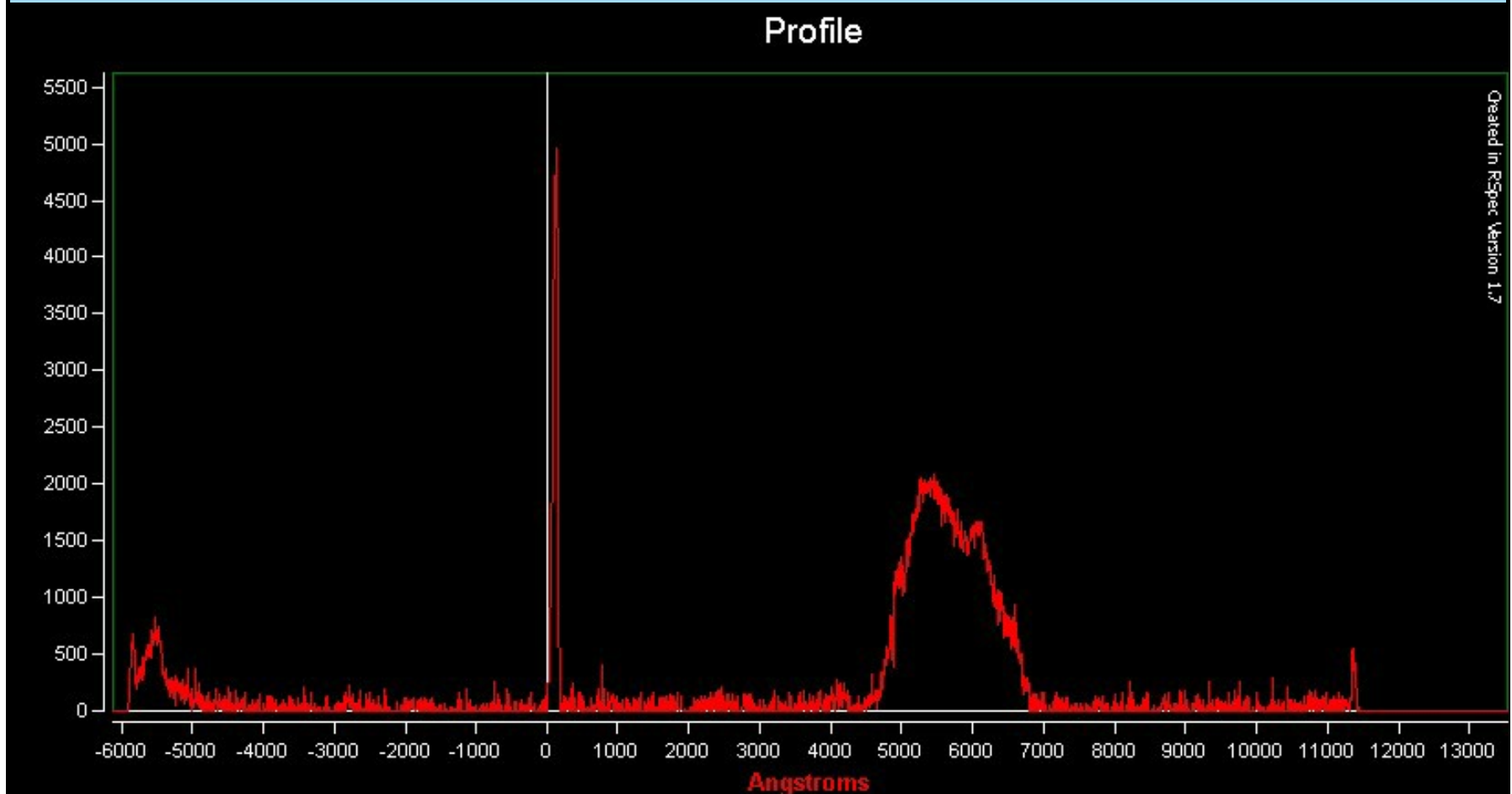
I would have preferred to capture Betelgeuse because it has been very 'big' in astronomical literature recently, with its dimming and brightening. Spectral differences in its two states would have been a joy to record. Do I have the resolution for that? Probably not, but it does not prevent one from trying. A spectrum of any object in the night sky is 'bullet proof' in its ability to classify that object.

As David Suzuki says, "It's science!"

To conclude this article, I refer back to my original premise which says that we simply have too much night time lighting, most of it absolutely useless or used as advertising in venues such as used car lots and digitized billboards. We have far too much nuisance illumination in our neighbourhoods and adjacent roadways. It becomes very clear when you factor in the COVID-19 crisis because that makes it very difficult to access dark sky locations for any kind of astronomical observations and recordings.

(Continued on [page 10](#))

Doing Spectra Under Difficult Suburban Conditions and What Needs to be Done (continued)



Spectrum Profile with Rigel

Binbrook is out of the question because, as a public space, it is ruled off-limits. Any kind of roadside ditch simply arouses the suspicions of local residents. This condition leaves you with your own backyard, driveway, and all of its attendant lighting, etc. And even that piques the curiosity of neighbours who feel you must be up to some kind of 'peeping tom' tactics - such is the ignorance of modern 'suburban-ites', most of whom have no knowledge of Nature in any form whatsoever. The short answer? There probably isn't one. The long-term solution? Probably more public nights, planetarium programmes and publicity?



H.A.A.'s Loaner Scope Program

We at the HAA are proud of our Loaner Scope Program.

If you don't have a telescope of your own and want to make use of one for a month or so, you can borrow one of our fine loaner scopes.

Please contact Jim Wamsley, at:
905-627-4323

or e-mail Jim at:
secondchair 'AT' amateurastronomy.org

and we'll gladly get one signed out for you.



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 nightsky.jpl.nasa.gov to find local clubs, events, and more!

Become a Citizen Scientist with NASA!

By David Prosper

Ever want to mix in some science with your stargazing, but not sure where to start? NASA hosts a galaxy of citizen science programs that you can join! You'll find programs perfect for dedicated astronomers and novices alike, from reporting aurora, creating amazing images from real NASA data, searching for asteroids, and scouring data from NASA missions from the comfort of your home. If you can't get to your favorite stargazing spot, then NASA's suite of citizen science programs may be just the thing for you.

Jupiter shines brightly in the morning sky this spring. If you'd rather catch up on sleep, or if your local weather isn't cooperating, all you need is a space telescope - preferably one in orbit around Jupiter! Download raw images straight from the Juno mission, and even process and submit your favorites, on the JunoCam website! You may have seen some incredible images from Juno in the news, but did you know that these images were created by enthusiasts like yourself? Go to their website and download some sample images to start your image processing journey. Who knows where it will take you? Get started at bit.ly/nasajunocam.

Interested in hunting for asteroids? Want to collaborate with a team to find them?? The International Astronomical Search Collaboration program matches potential asteroid hunters together into teams throughout the year to help each other dig into astronomical data in order to spot dim objects moving in between photos. If your team discovers a potential asteroid that is later confirmed, you may even get a chance to name it! Join or build a team and search for asteroids at iasc.cosmosearch.org.

Want to help discover planets around other star systems? NASA's TESS mission is orbiting the Earth right now and scanning the sky for planets around other stars. It's accumulating a giant horde of data, and NASA scientists need your help to sift through it all to find other worlds! You can join Planet Hunters TESS at: planethunters.org.

Intrigued by these opportunities? These are just a few of the many ways to participate in NASA citizen science, including observing your local environment with the GLOBE program, reporting aurora with Aurorasaurus, measuring snowpack levels, training software for Mars missions – even counting penguins!

(Continued on [page 12](#))

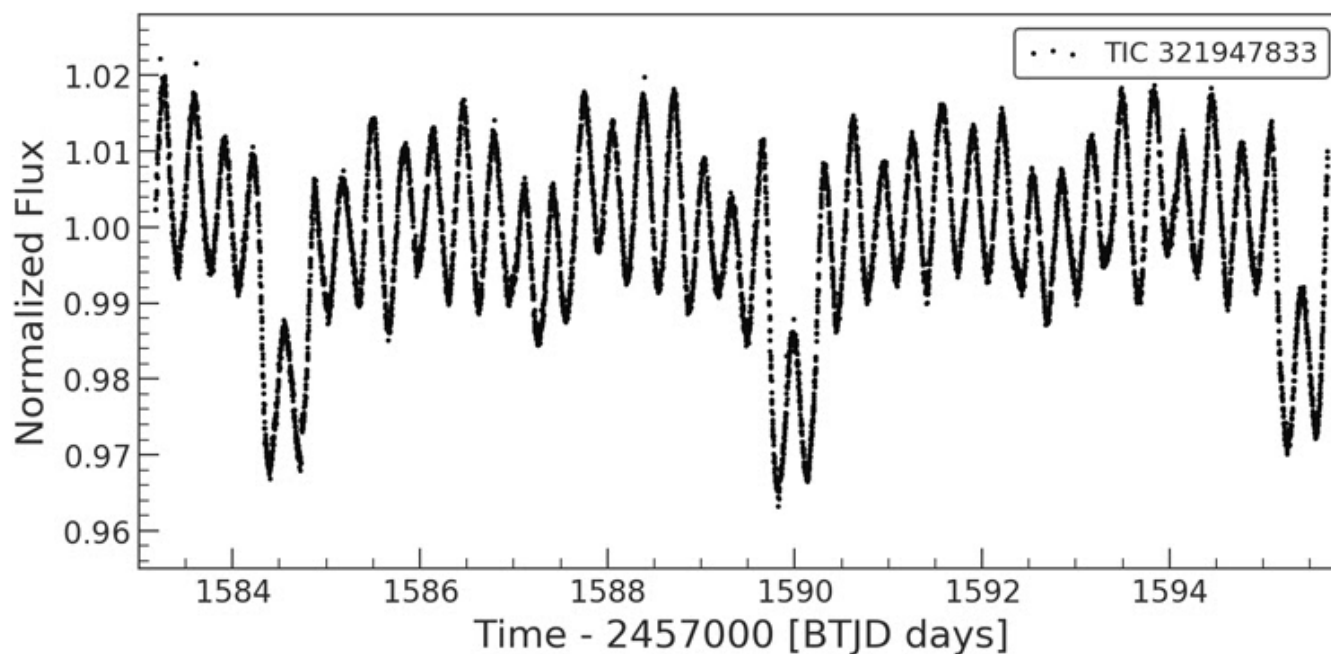
NASA Night Sky Notes (continued)

Discover more opportunities at science.nasa.gov/citizenscience and join the NASA citizen science Facebook group at facebook.com/groups/Sciencing/. And of course, visit nasa.gov to find the latest discoveries from all the research teams at NASA!



GREAT SOUTHERN JUPITER: Incredible image of Jupiter, submitted to the JunoCam site by Kevin M. Gill.

*Full Credits:
NASA/JPL-
Caltech/SwRI/MSSS/
Kevin M. Gill*



*Light curve of a binary star system containing a pulsating (variable) star, as spotted on Planet Hunters TESS by user mhuten and featured by project scientist Nora Eisner as a “Light Curve of the Week.”
Credit: Planet Hunters TESS/NASA/mhuten/Nora Eisner*

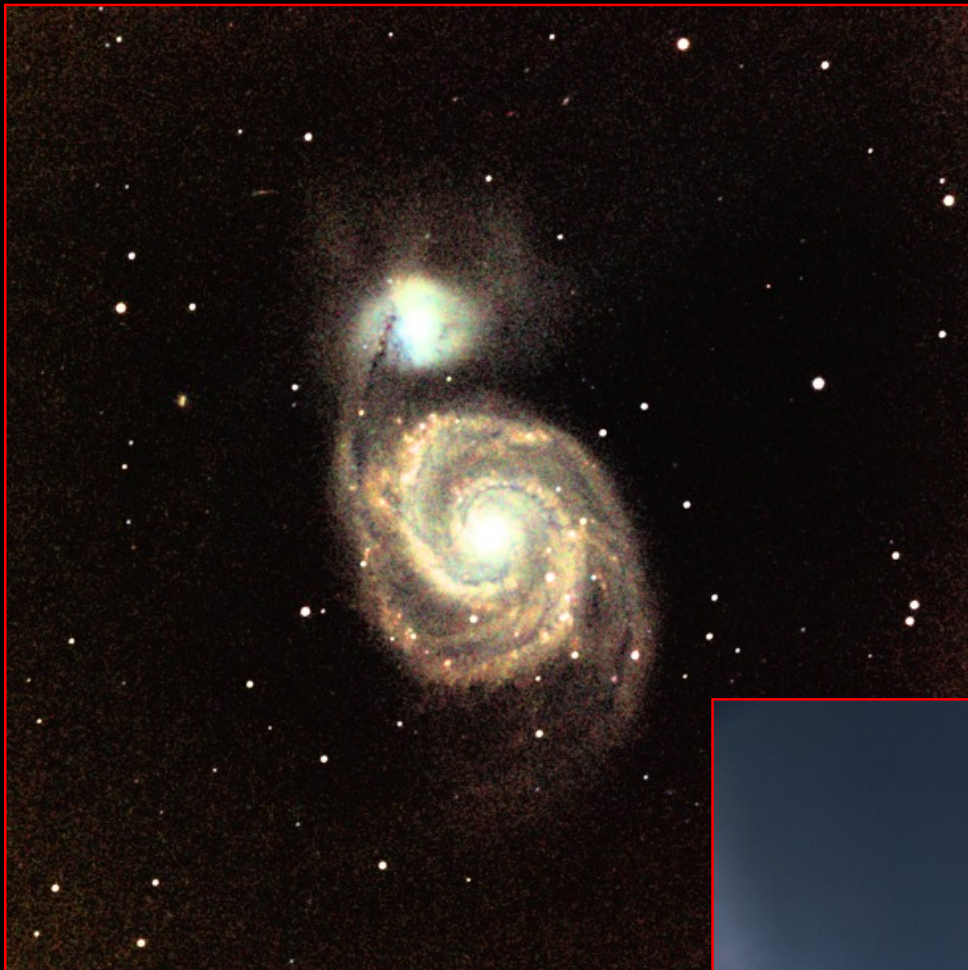
Venus and the Pleiades on the evening of April 2, 2020



Canon 40D @ ISO 400 & Tamron 300mm telephoto lens @ f/4.8; 10 minutes of total exposure time,
by **Bob Christmas**



Canon EOS Rebel T6i @ ISO 100 & EF-S55-250mm f/4-5.6 zoom lens @ 250mm; & f/13; 1/25 second
exposure, by **Sylvie Gionet**



**M51, the Whirlpool Galaxy, April 25, 2020,
from Hamilton, ON,
by Bill Tekatch**

M51 is accompanied by its companion
galaxy, NGC 5195.

2500 second exposure, through 180 mm f/9
scope with ZWO ASI533MC Pro camera.

**Circumzenithal Arc,
April 25, 2020, from Hamilton, ON,
by John Gauvreau**





Comet C/2019 Y4 ATLAS,
April 5, 2020, from
Hamilton, ON
by Ann Tekatch

2 minute
exposure at ISO 1000,
about 1600 mm focal
length, f/9.



left: Gibbous Moon,
April 2, 2020,
by John Gauvreau

*bottom: Venus in its
Crescent Phase,*
April 19, 2020,
by Matthew Mannering



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

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)



William J. McCallion Planetarium

McMASTER UNIVERSITY, HAMILTON, ONTARIO

- Public shows every Wednesday (7:00pm)
- Public transit available directly to McMaster campus
- Tickets \$7 per person; private group bookings \$150
- Different shows every week
- Upcoming shows include:

Shows are suspended until at least the end of April, and perhaps longer.

- For more details, visit
www.physics.mcmaster.ca/planetarium

UPCOMING EVENTS

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

Stay safe everyone, practice social distancing, and wash those hands!

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
Councillors at Large	Barry Sherman Bernie Venasse Dee Rowan Gary Sutton Melissa Whitman Mike Jefferson Steve Germann Sue MacLachlan

Check out the H.A.A. Website

www.amateurastronomy.org

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Education:

education@amateurastronomy.org

Newsletter:

editor@amateurastronomy.org

Digital Platforms Director:

webmaster@amateurastronomy.org

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

The Harvey Garden HAA Portable Library



Contact Information

E-mail: library@amateurastronomy.org