SKYNEWS

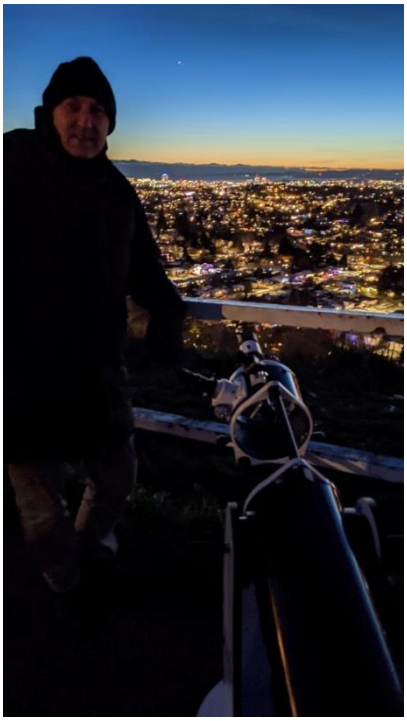
Conjunction of Jupiter and Saturn, by Nathan Hellner-Mestelman; Dec 22nd, 2020

The Next Evening

On Dec 22-23rd, 2020, during a welcome break from the cloudy wet weather, RASC Victoria Members David Robinson, Jim Cliffe, and Brian Barber (and likely a few others) observed the conjunction between Jupiter and Saturn from Mt. Tolmie. The members' telescopes attracted the interest of others, who were offered glimpses of the large planets and their moons, while donning masks and respecting social distancing.

This elicited many “ooohs” and “aaahs” as many saw the planets and their moons through a telescope for the first time. Some also excitedly talked about what the conjunction meant, astrologically and biblically. Watch RASC’s video lecture: *Star of Bethlehem: the New Discoveries and Solution* by Bradley E. Schaefer, Dec. 18, 2020, for an interesting and credible explanation of the latter than involves the former: https://www.youtube.com/watch?v=RUaSQk3hdDc

Dave (*seen next top of following page*) used his 10” aperture, 1270 mm focal length (f5) reflector purchased from Roman Unyk, who constructed the tube, mirror cell, secondary arrangement, and most of the equatorial mount back in 1994. The mirror set was made by the late Barry Arnold of Arnold Optics, in Edmonton. The mount axes are made with 1 1/2” ground steel shafts mounted in bronze bushings. The pier is made of 4” steel pipe and rectangular tubing. Legs are made of 4” square aluminium tubing and 1/4” aluminium plate with adjustable feet. The declination clutch is a simple threaded knob with a leather bearing surface. Commercial training weights are used for counterweights. The mount also has a basic clock drive that uses a 120 volt, 1 rpm motor, and a not quite sidereal rate worm gear and clutch arrangement. If the pier is roughly polar aligned, an object will stay within a 1/2 degree field for about an hour, which it did while observing the conjunction.



Jim used his Celestron C80ED refractor telescope (600mm focal length) on an equatorial mount, with a 12.5mm eyepiece. He also had some marginal success using a 2.5x Barlow. Brian (*seen right*), new to astronomy and RASC, used his first telescope, an 8” Collapsible Dobinson, purchased this summer from Quarky Science.

Mt. Tolmie is a convenient location to observe the night sky in Victoria. Setting up a telescope here will attract attention and it’s therefore a good venue to educate others about the heavens. The constant traffic and car lights are its main drawbacks. However, on the eastern side of the summit, away from the lights and crowds, is a dark flat space atop a water reservoir. It’s a short walk from the east parking lot, located under the summit’s only street light; ideal for those seeking a starry escape within city limits.

Brian Barber

Editorial Remarks

It's a brand new year and while the numbers on the calendar have changed, a lot has stayed the same. Pandemic protocols still prevent us from in-person meetings, public outreach events are the thing of memories, and the VCO is only available for limited use. Despite the lack of face to face activity, organizations like RASC National and the RASC Victoria Centre have been making good use of YouTube and Zoom to raise our online presence far beyond our regular membership. While a lot of us have been using our downtime from group activities to focus on individual observing and astrophotography sessions, some RASCals have been working on special interest groups to promote more specialized activity for: beginners, astrophotographers, telescope makers, and members interested in electronically assisted astronomy. While we wait our turn for the vaccine and the eventual lifting of restrictions, it's nice to know that there will be a lot of ways to get involved in the Centre once things open up again.

In this issue of *SkyNews*, we'll have more recaps from our Centre's activities, information about the new RASC Victoria Special Interest Groups, an article by David Lee, a short post by Jaime Smith, as well as all of the astrophotography and articles you've come to expect from the *Victoria Centre SkyNews*.

Bruce Lane: SkyNews Editor

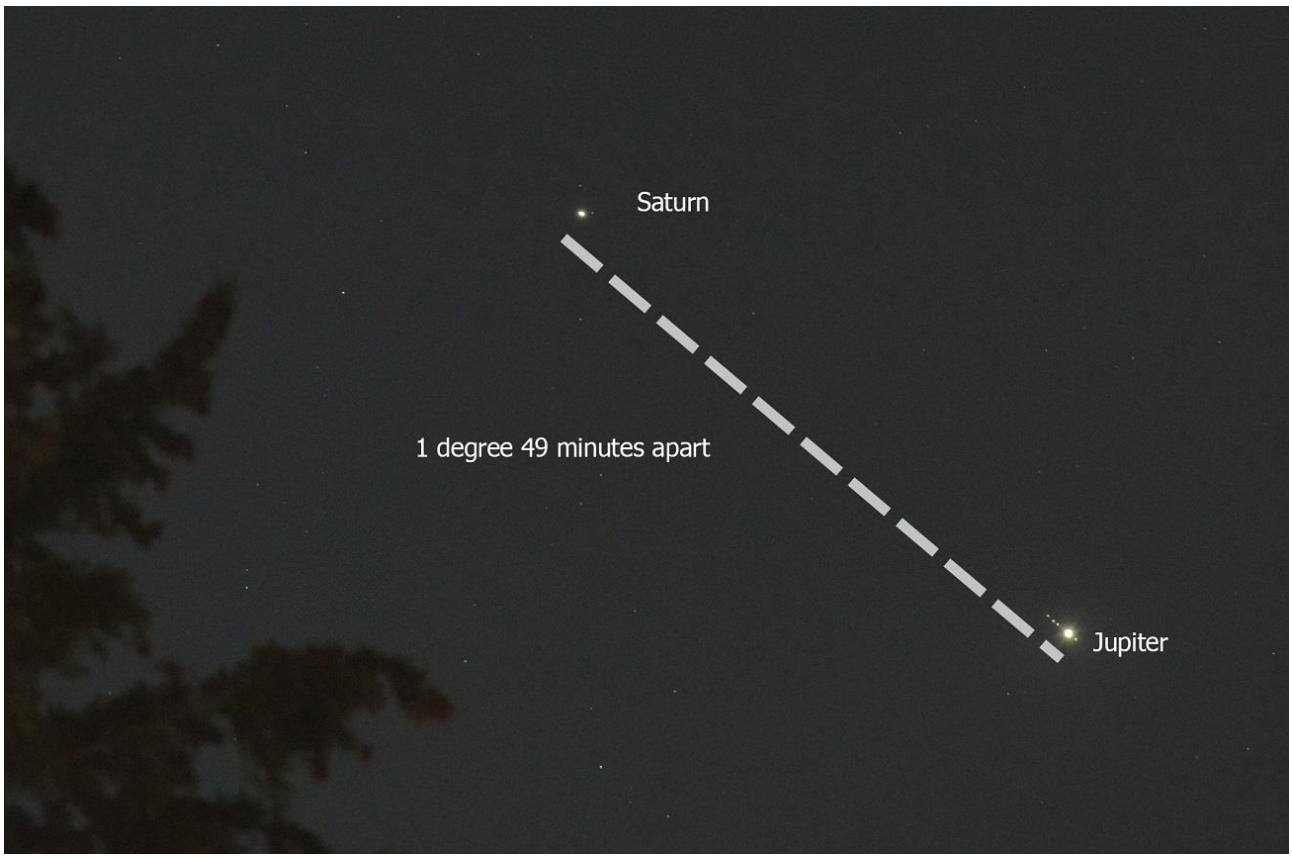
Apollo 14, Pre-Launch Breakfast, Jan 31, 1971

President's Message for January

The catastrophic collapse of the Arecibo Radio Telescope seemed to me to be an apt metaphor for 2020. There is probably little appetite for most to review the events of the past year. Before we say good bye to 2020, however, it would be ungrateful not to mention a few astronomical highlights. The surprise visit of Comet Neowise provided a much needed boost during the first phase of Covid. Wildfire smoke dissipated enough for RASCals to savour the opposition of Mars in the fall. The miracle of Zoom enabled RASCals to remain connected, both locally and nationally, and the proficiency gained will be a legacy that will change the way we conduct business going forward. But as vaccines arrive on the scene we look forward to a day when we can reduce our distance and party on.

So let's look toward the future. There are plenty of space missions on the 2021 calendar, but two in particular are guaranteed to generate high drama. The NASA Martian Rover *Perseverance* is scheduled to land on Mars on February 18th, 2021. I am not keen on that rover name, as it sounds to me like a brand name for a deodorant. Mind you, the JPL team may require a good antiperspirant during the "7 minutes of terror" when the spacecraft executes a stunning array of complicated maneuvers. Even if it successfully sticks the landing like its superstar sibling, *Curiosity*, it is scheduled to perform another high wire act. Stowed on board is a helicopter, named *Ingenuity* that will attempt to automatically explore the nearby surroundings in an atmosphere that is only one percent of that on Earth ... equivalent to the density of air at 85 000 feet. I will be on the edge of my seat with fingers crossed when they try to pull this off. Around the same time the United Arab Emirates will place an advanced weather satellite, called *Hope*, in a Martian orbit and the Chinese mission Tianwen-1 will deliver an orbiter, lander, and rover to the red planet. It will be an exciting time!

There will also be plenty of suspense surrounding the launch and deployment of the James Webb Space Telescope. After more than a decade of delays, it is scheduled to launch on Halloween 2021. The elaborate multifaceted mirror has 6.5 times the collection area of its predecessor, the Hubble. It is designed to operate in the near infrared which will enable it to study distant red-shifted galaxies and the formation of exoplanets in debris disks. It is imperative that it operates in a very cold, stable thermal environment and a delicate multilayered sunshield is required. It was complications with the deployment of this sunshield that caused the latest delays. So even if the launch is successful, the unfolding of the mirror and sunshield will generate high drama. The Canadian Space Agency has made a significant contribution and so we also have a stake in this important mission.



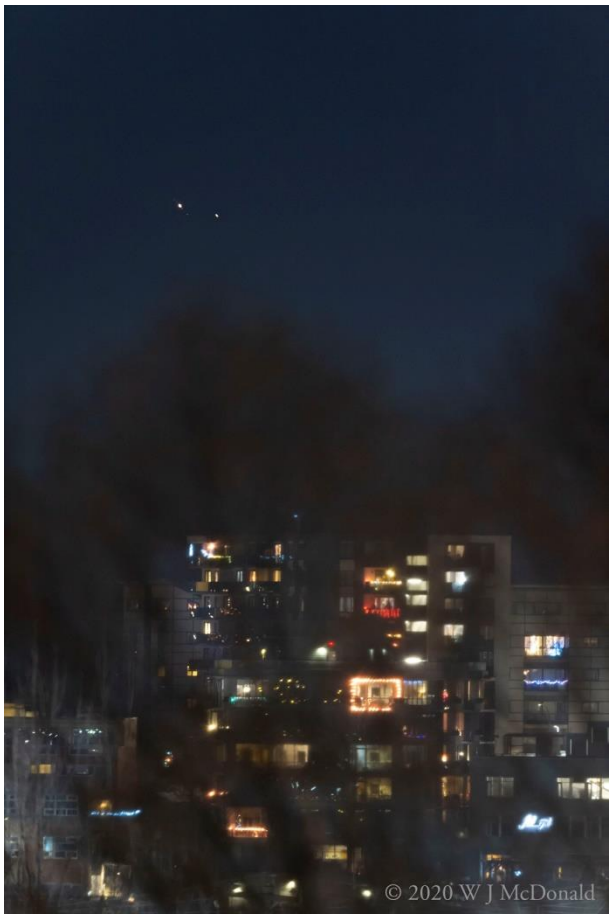
Saturn and Jupiter, under 2 degrees apart, by David Lee, Dec 4, 2020

There will be a great opportunity to review the progress of the *Perseverance* mission at our AGM that will take place via Zoom on Monday February 22nd. In addition to our annual report and elections we will also have a virtual award ceremony ... and even more high drama. So there will be plenty of interesting things in the year ahead.

Wishing you a happy and healthy New Year ... and oh yes ...

Usable Skies,

Reg Dunkley



Special Interest Groups

RASC Victoria Centre is contemplating the creation of Special Interest Groups to initiate interest and engagement in specific astronomy topics. This is formative and fluid as to how this will be implemented, so stay tuned for more information. So far, we have four Special Interest Groups that have leads and descriptions.

1. Getting Started in Astronomy Group – David Lee
2. Astrophotography Group - John McDonald
3. Electronically Assisted Astronomy Group - David Lee
4. Astronomy Related Makers Group - Jim Cliffe and David Lee
5. Radio Astronomy Group (Potential) - Jim Cliffe

Getting Started in Astronomy Group – David Lee

Look skyward on a clear, dark Victoria evening. Do you yearn to know more about the massive drift of the Universe? The night sky is well worth discovering. Armed with a map and a bit of patience, get ready to embark upon a journey across the stars!

Of course, your journey will require a passport and a guide to the cosmos! As a participant in *RASC Victoria's Getting Started in Astronomy* group, you will have the opportunity to learn about observation tools and how to choose them, what you need to know to get outdoors, sky guides and charts, terminology, dozens of informational resources, indoor astronomy, how to record your observations, and the fascinating field of astrophotography.◑

We'll meet by Zoom/outdoors as allowed. We'll decide together on session topics/meeting times and will avail ourselves of both each other's and RASC Victoria members' expertise.😎

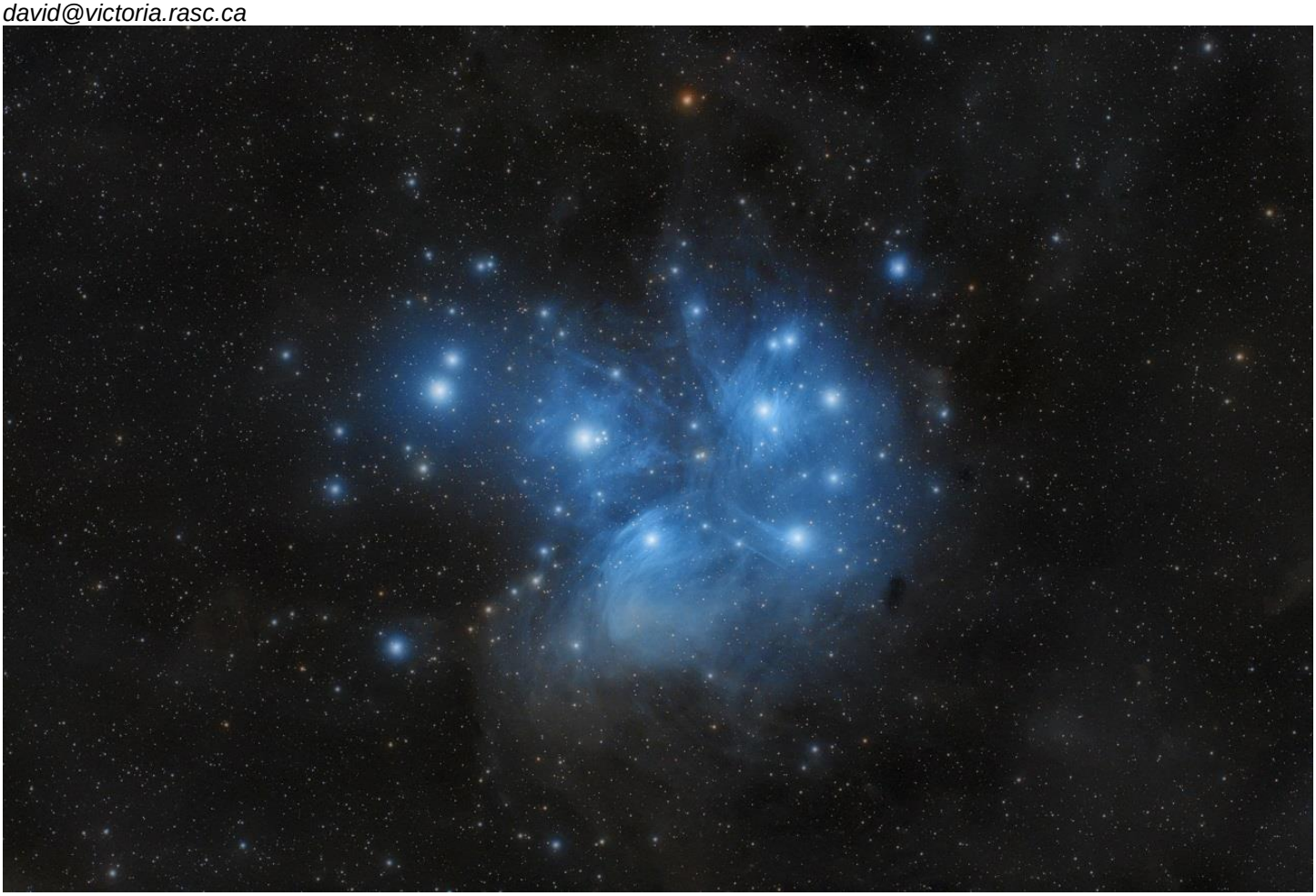
Some possible sessions:

- **Observation Tools** - unaided eye, binoculars, telescope/what do I need?/what can be seen?
- What You Need to Know to Get Outdoors - location, clothing, seating, dark adaptation, red light, orientation, weather charts, moon phases, getting your sky bearings, watching the sky move, and hand measurements for measuring sky degrees
- **Sky Guides and Charts** - using a planisphere, monthly maps of the night sky, observation guide books, sky atlases, how to observe the Moon/the Sun, and how to observe planets/satellites
- Astronomy Terminology-astronomy lingo/sphere of the night sky/abbreviations and correctly pronounce what you see
- **Astronomy Resources** - public library, podcasts, phone apps, "Explore the Universe" guide, magazines such as "Sky and Telescope", books, RASC "Observers Handbook", internet sites such as Stellarium/Time and Date, NASA's "Astronomy Picture of the Day", family-friendly astronomy activities, and clubs such as RASC Victoria
- **Astronomy Advocacy**-eg. light pollution

- **How to Record Your Observations** - sketching, observing certificates, photography, and astrophotography
- **Indoor Astronomy Resources** - sites for images/photos already taken and ready for processing
- **Astrophotography** - deep sky observing

Members of this group will decide together on session topics/meeting times. Each other's and RASC Victoria members' expertise will be utilized. Although sessions listed above are sequential, the GSA group may wish to explore topics in varying orders.

Contact: David Lee
david@victoria.rasc.ca



M45, by Dan Posey, Dec 13, 2020

Astrophotography Group – John McDonald

This SIG is intended to help those wishing to get into astrophotography and those who have already started, but who want to learn more. It is hoped that experienced astro-imagers will also join to help by sharing their expertise. The topics and focus will be determined by the attendee's questions and interests.

- Format – Zoom
- Frequency – once per month
- Duration – 1-2 hours.

To join please contact John McDonald – john@victoria.rasc.ca and please provide the following information -

Name -

Experience level -

- Beginner __
- Novice __
- Experienced __

Optional - Feel free to add any topics you would like addressed and/or questions you have at this time.

Electronically Assisted Astronomy Group – David Lee

Electronically Assisted Astronomy is an alternative means of astronomical observation aided by current technologies. Placing itself somewhere between traditional eyepiece observing and astrophotography, it is another tool in exploring the night sky.

Significant changes in the last few years in hardware and software has enabled this practice. This group will explore what is available and how to create a system that will enhance are our ability to "observe".

- Format – Zoom
- Frequency – once per month
- Duration – 1-2 hours.

For more information please contact David Lee: david@victoria.rasc.ca

Astronomy Related Makers Group – Jim Cliffe and David Lee

The Maker movement in Astronomy has its roots in the Amateur Telescope Makers (ATM) movement in the 1960's. Although the number of people engaging in ATM has been decreasing due to lower equipment prices there may still be a reason why you may want to get your tools out. This group will focus on member's current projects and a forum for getting help in Maker skills you may not have yet.

- Format – Zoom
- Frequency – once per month
- Duration – 1-2 hours.

For more information please contact Jim Cliffe (jim@victoria.rasc.ca) or David Lee (david@victoria.rasc.ca)

Astro Café: Continues Online

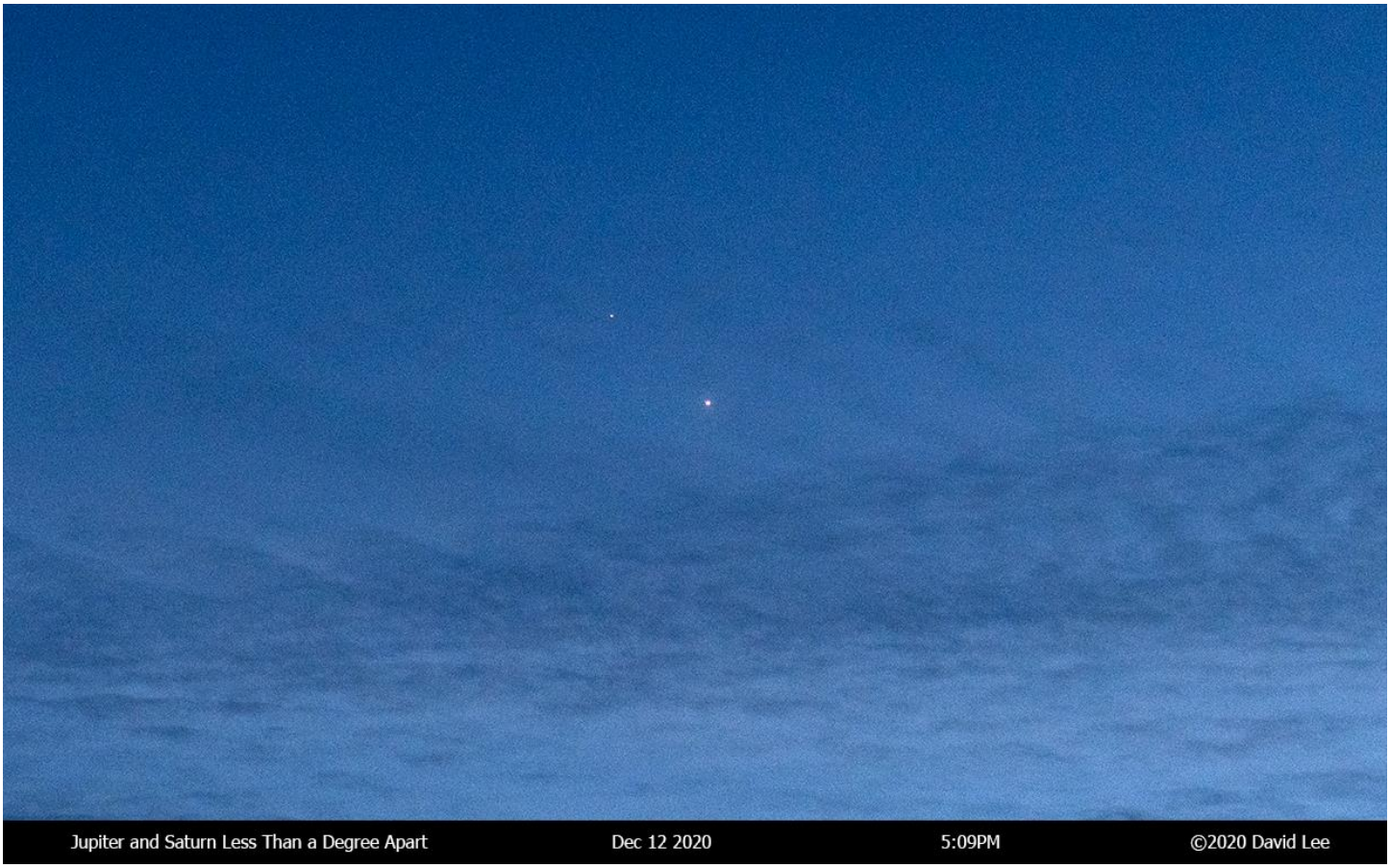
The weekly social gathering of amateur astronomers on Monday nights, known as Astro Café, is now online. As with many groups, we're trying to find ways to still function as a Centre, without meeting in person. Members are posting their astrophotography, short articles, as well as links to astronomy stories from the Web. Sadly you'll have to make your own coffee and the only cookies are those your browser picks up when you visit our website. You can access the *Virtual Astro Café* at: https://www.victoria.rasc.ca/astronomy-cafe/

The first Astro Café of October was again doing double duty as the RASC Victoria monthly meeting, with Dr. Abedin Abedin, a Herzberg Institute Fellow, giving his presentation: "The Age and Parent Body of the Quadrantid meteoroid stream".

For the 2nd Astro Café, Chris Purse started things out with another reminder about the RASC calendars for sale and the upcoming annual general meeting in February; there was a lot of talk about the upcoming conjunction of Jupiter and Saturn; Dorothy Paul gave a presentation on *Our Venusian Neighbours - Is there life on Venus?*; Randy Enkin and Joe Carr showed images

from the South American solar eclipse that day; and Reg Dunkley concluded the evening with a review of the Astro Café webpage. The last meeting of the month was on December 21st. Having it on the same night as the Great Conjunction would normally be a problem, but the weather that evening assured a decent turnout. Jenna Hinds, Outreach Coordinator for RASC National, joined the Zoom session, to talk about the RASC National email list, getting students involved in astronomy, and the RASC Robotic Telescope. David Lee led a talk on special interest groups for RASC Victoria, and Jim Cliffe led a discussion on how to make the best use of local observing spots.

Bruce Lane



EAA: Electronically Assisted Astronomy

- What is EAA?
- Historical Timeline
- What equipment do you need?
- Benefits to Individuals and Public Outreach

What is EAA?

Positioned somewhere between visual observing and astrophotography, EAA (Electronically Assisted Astronomy) is a natural transition of using available technologies to enhance our ability to “see” the universe.

Historical Timeline

In 1609 Galileo started using telescope optics to enhance his views of the night sky. Ever since then we have looked for more ways to enhance our vision. The human eye is limited in its ability to view distant objects in detail and its capacity to view objects of low illumination. Initially, the telescope addressed the first limitation of viewing distant objects. Over time telescopes grew in size, enabling the ability to see dimmer objects. When photography was introduced the observational sciences like astronomy had a way of easily recording what was observed. The first astronomical images of the Moon were produced in 1839-40 by Daguerre and Draper. It wouldn't be long before astronomical objects as distant as galaxies and nebulas would be recorded through this analog method.

Jumping ahead to the 20th century with electric circuits, semiconductors, and computers the CCD (charged coupled device) was born in 1970. This led the way to the eventual use of digital imaging over the analog, chemical-based photography. It's interesting to note that a past member and President of RASC Victoria Centre, Jack Newton in 1991 was one of the pioneers of amateur astrophotography, using a Santa Barbara Instrument Groups ST-4 CCD camera.

In the last decade CMOS detectors have been added to the digital sensor mix, addressing issues like speed of capture, and blurring the lines of video and still image acquisition.

EAA comes out of digital imaging technology. In the early days of digital sensors amateurs experimented with the low light capabilities of video surveillance cameras. They exploited their capabilities for capturing occultations of objects, like asteroids, to get timings that could estimate their size. Lunar occultations could be performed with the same equipment. Niche manufacturers developed video camera systems that could accumulate light in near real time. These are the roots of EAA.

An even more attractive solution exists today with the use of fast CMOS sensor cameras and specific image capture software. These programs are designed to capture images quickly and "stack" the results to achieve "digital sketches" of astronomical objects, to enhance the views offered by a telescope. For me that has been a welcome addition to the amateur astronomer's toolkit. Being an urban astronomer, I live under an umbrella of light pollution. Although I have access to darker sites, they all take time to get to. With the appropriate equipment and software, I can now "observe" from suburbia.

Above: Single vs Stacked Image of M42

What equipment do you need?

The optical portion of your rig can be almost any telescope; the operative part of EAA is enhancing the view you already have. Obviously, if you already have good light gathering capability in your telescope you will be ahead in terms of your near real time results after stacking. I personally have opted for lighter optics to help with my desire for a lighter imaging rig that could act as my "grab and go" imaging rig for those iffy nights when you're not sure if the efforts of setup are worth the effort. For this I chose a fast, wide field refractor. The light weight of the optics also allows me to capture longer (> 30 seconds) with a light-weight tracker, as opposed to using a full-blown German Equatorial mount. This increases my ability to "observe" dimmer objects. Note that this is a personal preference, as many that dabble in EAA use Dobsonian reflector or Schmidt-Cassegrain telescopes.

The sensor part of the rig is primarily fulfilled by CMOS cameras, although again any imager will do, but the near real time nature of EAA demands fast data acquisition. There are many considerations in your choice of camera but many EAA advocates choose OSC (one shot colour) cameras; again trying to get to near real time viewing especially with respect to colour. This addresses our inability to see colour to any great extent with our unaided eyes in dim situations. Cameras should be matched with your optics for optimal results. With my wide field refractor, I chose a camera with smaller pixels to take advantage of the shorter focal length. For guidance in choosing an imaging camera check out the Astronomy

Tools CCD Suitability Calculator at http://astronomy.tools . It allows you to choose common optics and cameras to determine optimal combinations.

As EAA becomes more popular the software offerings are growing to meet demand. The common feature of all these programs is that they take individual images and “stack” them to give you more image signal. The image builds up over time while you wait. Fast download times, typically 2 to 10 seconds depending on your USB bandwidth, can be expected. Optimally, use USB 3 if your camera has the interface. Exposure times can vary from 10 to 30 seconds or if you are willing to wait, up to 90 seconds. However, the longer the exposure, the more it becomes resembles astrophotography imaging. With EAA, the goal is not to do any post processing though you could do so if you wished. This is where the lines between the two activities get blurry.

The most popular software for EAA is *Sharpcap Pro*. It has features specifically designed for EAA. This is mostly what I use but I also use ASI Studio, which is supplied by ZWO for their line of imagers specifically for EAA. I also use *Sequence Generator Pro* which is what I normally use for astrophotography imaging. Compared to most astrophotography imaging capture software these offerings are modestly priced.

For portable computing resources, a laptop does not have to be of the same performance level you would need for astrophotography image processing. As it is primarily used for image capture, it’s more important to have adequate USB ports for data transfers and long battery life. There are also other alternatives, such as Raspberry Pi based computers that can be used with a tablet or smartphone. For ZWO ASI camera owners, the ASI Air Pro is a good match. If you use other non-ZWO cameras or want a system that is more customizable you can use Stellarmate software installed on a bare Raspberry Pi. Note that the ASI Air Pro incorporates a custom metal case and a 12V power distribution system, which justifies its higher price.

Benefits to Individuals and Public Outreach

With most of us staying home during the pandemic, EAA is something you can add to your observing toolkit. Even after the pandemic, the challenge of light pollution is still something we'll have to deal with. With "stacking" and a judicious use of light pollution filters, it's possible to enhance your view. During our transition back to normal, we will still need to keep at appropriate social distances when doing outreach, so I can see EAA helping with this transition. Many astronomy groups are taking advantage of this technology to either record or live stream views through their telescopes.

I readily acknowledge that this does not replace more traditional forms of astronomical observing, but I believe it has a place in our personal exploration of the Universe. I like traditional observing as well, along with sketching and note taking, which enhances our ability to focus and train our brains to observe. Either activity engages us, which is the important thing.

I'm looking forward to starting up a special interest group this year around EAA and astronomy related Maker topics. Let me know if you are interested!

(david@victoria.rasc.ca)

David Lee

Gaia Revisited

Gaia is a mythological personification of our planet in ancient Greece, alluded to in the poem *Theogony* by the VIII-VII BCE century by Hesiod, describing the genealogy of the gods. Chemist James Lovelock and microbiologist Lynn Margulis famously proposed in the 1970s what came to be known as the Gaia Principle, that: "*living organisms interact with their inorganic surroundings on Earth to form a synergistic and self-regulating, complex system that helps to maintain and perpetuate the conditions for life on the planet*."

The Gaia hypothesis was initially criticized for being teleological and against the principles of natural selection, and continues to attract criticism, but has not been universally assigned to the dustbin of pseudoscience. In a recent essay in Aeon magazine, Canadian evolutionary biologist W. Ford Doolittle, of Dalhousie University, described a path conceivingly consistent with Darwinian natural selection. "Multilevel selection theory" entails life being represented as "*a hierarchy of entities nested together like Russian dolls, connected by parent-offspring lineages*."

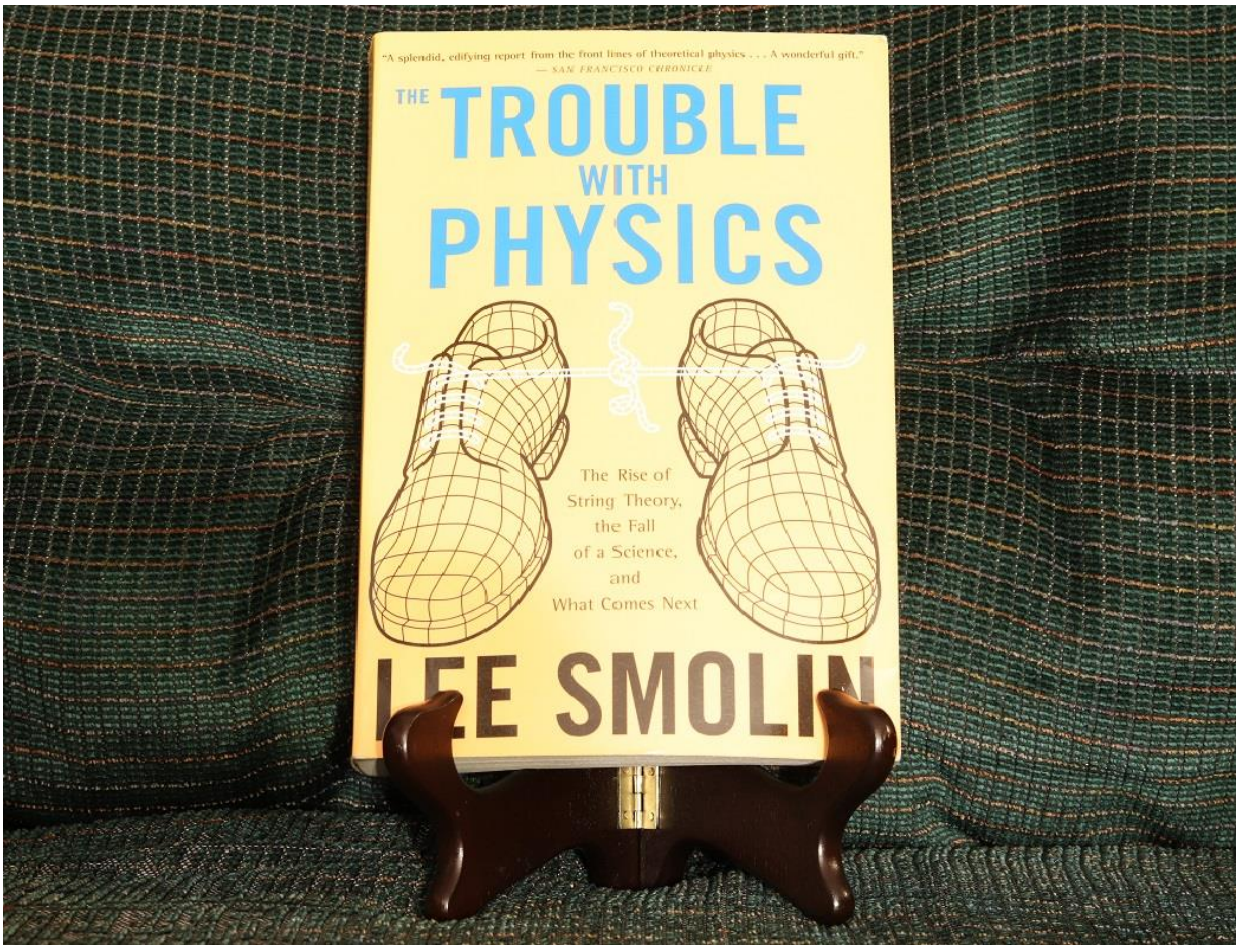
This concept is lucidly described and illustrated with thought experiments in the article. In a less "down-to-earth" usage of the name of this deity, *Gaia* is a space observatory of the European Space Agency, launched in 2013 and designed for determining positions, distances, and motions of billions of stars with great precision.

This is particularly interesting to me, having worked in the mid XX century for several years, photographing stars with a 1.54 meter (60 inch) reflecting telescope at Bosque Alegre near Córdoba, Argentina, leading to my 1966 thesis: *A Search for Quasars Among Faint Blue Stars*. What in my day had been the laborious work of collecting astrometric data about individual stellar sources had now become a routine extraterrestrial measurement.

Jaime Smith

From the Library

The RASC Victoria Centre Library is housed in the Astronomy Department's faculty lounge, located on the 4th floor of the Elliott Building, at the University of Victoria. It contains over 500 titles, curated by our new RASC Victoria Librarian: Alex Schmid. Our library covers many aspects of astronomy: observing, astrophotography, telescope construction, space exploration, astrophysics, and much more. Normally, the library is opened up during the social gatherings in the faculty lounge, after our monthly meetings, with coffee, juice, and cookies provided by our Centre. I've been doing book reviews of the contents of our Centre's library, but until the resumption of our monthly meetings at the University of Victoria, I'll be doing reviews of the astronomy books from my personal library, ones that can be purchased online or better yet at your local bookstore.



This month we're taking a closer look at *The Trouble with Physics*, by Lee Smolin. This book takes a long look at the status of dark matter and its part in figuring out the Theory of Everything. It discusses the problems, both in searching for dark matter and figuring out what it is in the first place. Lee Smolin pulls back the curtain to look at academia and how it has embraced dark matter as proven, despite repeated failures to detect any. *The Trouble with Physics* doesn't say that M Theory is the answer either, but does go into great detail about what challenges there are in trying to find a possible deeper theory than what is currently being proposed. He points out that one of the biggest obstacles in academia is that dark matter has become so entrenched that it's very difficult for researchers for find support to search for other options. *The Trouble with Physics* is a challenging, but rewarding read, and it's available by order from your local bookstore.

Bruce Lane

Heart Nebula (IC 1805), by Dan Posey, Dec 6, 2020

Hill and Dale (Observing on the Island)

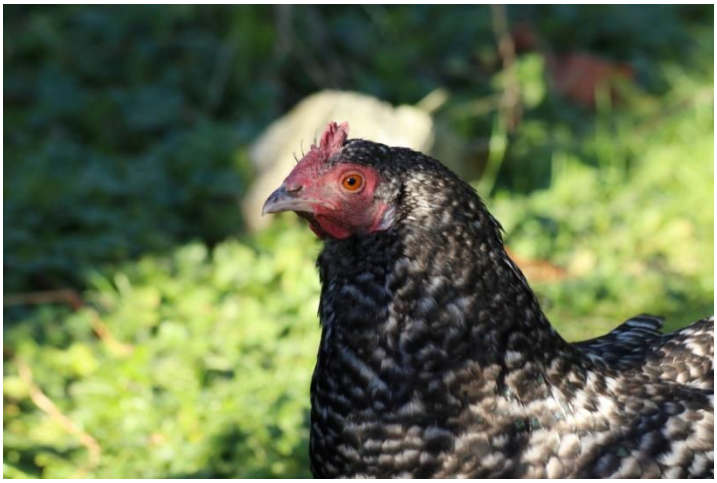
Semiregular observing sessions at the Victoria Centre Observatory have tentatively returned, with restrictions put in place by the National Research Council to ensure we limit the numbers of RASCals on the Hill and stay safe. The new rules allow for only 4 members (including the MiCs) at the VCO and 2 more amateur astronomers up at the Plaskett parking lot. Dan Posey started December off with a six hour imaging session of the Bubble Nebula up at the VCO. He was joined up at the Hill a few nights later by Matt Watson and the two of them returned to the VCO a few days after that.

December had a lot of the weather we've become accustomed to during winters in Victoria, including some snow to remind us all that the Canadian winter experience isn't just something that happens to other Canadians. Up here on the North Saanich plateau, the snow stayed around for days and it was heavy enough to bring down many large branches from the trees than fell during previous storms. The weather also decided that no one in the Greater Victoria region would have the opportunity to view the conjunction of Jupiter and Saturn at its closest. Some determined RASCals managed to still get some views of the conjunctions in the days before and after the two planets were nearest, despite being robbed of their views on December 21st.

A reminder that although the VCO belongs to and is for the use of the members of the RASC Victoria Centre, with both weekly scheduled and unscheduled sessions run by our MiCs (Members in Charge). The VCO is located on National Research Council property. This means that all visitors to our observatory must be on our observer list and registered with the NRC. To get on the list, just contact Chris Purse (Membership Coordinator) *membership@rasc.victoria.ca* and we'll see you up there on the Hill some night soon.

Bruce Lane

In Closing



Politicians are going on vacations to sunny locations and telling us all to stay home; the outgoing US president staged a failed coup, sending his followers to storm the Capitol; the opioid crisis shows no signs of ending; and the pandemic just keeps getting worse. You could be forgiven if it seems that the light at the end of the tunnel, at the beginning of 2021, seems a little dimmer. But there is at least light at the end of the tunnel. It's very likely that sometime this year; the vaccination of the general public will allow us to put the brakes on the runaway train that is this pandemic. In the meantime, it's up to us to be personally vigilant, so we'll all be there for the day when we can gather together again safely. Just because the Canadian Constitution allows us the right of free travel, doesn't mean that it's a good idea to fly to another country during a pandemic.

While we're waiting for better weather for stargazing, it's the perfect opportunity to improve your astronomical knowledge. Between the online offerings of RASC Victoria and National, as well as the general astronomy community, we're afforded a cornucopia of online interactive sessions and instructional videos to help us through the multiple learning curves of being an amateur astronomer.

Our yearly annual general meeting for the RASC Victoria Centre is coming up soon, on February 22nd. As with all the other meetings during the pandemic, this too will be online. Normally these meetings also include a semi-formal dinner, but this time you'll be on your own to figure out what you're having for dinner that night. Just make sure to mute your Zoom volume when you're chewing.

Bruce Lane: SkyNews Editor

Photography Credits

Cover: Conjunction of Jupiter and Saturn, by Nathan Hellner-Mestelman, using an iPhone, Dec 22, 2020

Page 2: Crowd on Mt. Tolmie, watching Conjunction, by Brian Barber; Dec 22, 2020

Page 2: Brian Barber on Mt. Tolmie, Dec 22, 2020

Page 3: Dave Robinson on Mt. Tolmie, by Brian Barber; Dec 22, 2020

Page 3: Crop of Bruce Lane (SkyNews Editor) at 2013 RASCal Star Party in Metchosin, by Chris Gainor

Page 4: Pre-launch breakfast. Clockwise from the left: Ed Mitchell, Tom Stafford, Stu Roosa, Al Shepard, Deke Slayton, Joe Engle, and Ron Evans. January 31, 1971. Scan by Ed Hengeveld. Courtesy of NASA

Page 5: Crop of Reg Dunkley (RASC Victoria President) at 2018 AGM, by Joe Carr

Page 5: Saturn and Jupiter, less than 2 degrees apart, by David Lee, Dec 4, 2020

Page 6: Jupiter-Saturn Conjunction, John McDonald, Dec 22, 2020. The planets were about 10 arc min apart. Shot through an Orion 80mm telescope with a Canon Ra camera, on a tripod mount.

Page 7: M45 - Askar 600, by Dan Posey, Dec 13, 2020: This is my first proper RGB image with the Askar 600, comprised from 2h6m (42x3m) frames, with the 108mm Askar 600, using a Canon Ra at ISO 640. The files were calibrated with bias, dark, and flat frames; and stacked/processed in Pixinsight

Page 8: Photograph and Design of Astro Cafe Mug, by Joe Carr

Page 9: Jupiter and Saturn less than a degree apart, by David Lee, Dec 12, 2020

Page 10: Single vs Stacked Image of M42, by David Lee

Page 11: EAA Components and Configuration Diagram, by David Lee

Page 12: Borg 55FL and ASI183MC on Astrotrac, by David Lee

Page 13: Posed Book, “The Problem with Physics”, taken in Editor’s home on July 15, 2020, by Bruce Lane

Page 14: Heart Nebula (IC 1805 - 5 hours), by Dan Posey, Dec 6, 2020: This is 4.85 hours (97x3minutes) of data on the Heart Nebula (IC 1805) with a Canon Ra at iso 1600 and a Hutch NB1 filter through a 108mm Askar 600 guided on a club-owned HEQ5Pro. Calibrated with bias and flats and stacked/processed in Pixinsight.

Page 15: Cuckoo Maran, by Bruce Lane, Jan 15, 2021

Page 15: Apollo 14, Al Shepard during suit-up for the Countdown Demonstration Test. 19 January 1971. Scan by Ed Hengeveld. Courtesy of NASA.

Page 17: Apollo 14 Saturn V on pad at night during Countdown Demonstration Test. 19 January 1971. Research by J. L. Pickering. Courtesy of NASA.

Call for Article and Photo Submissions for the February Issue

SkyNews is looking for submissions of astronomy photos and articles for the February issue of our Victoria Centre’s magazine. Send your submissions to editor@victoria.rasc.ca

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