Beaver Blood Moon

The lunar eclipse this November was another astronomical event where the clouds decided to be the headliner of the show. Between the weather forecast of clouds and the unusually cold weather, most RASCals turned in early, with the hopes of seeing anything looking bleak.

One RASCal, David Lee, waited patiently for any opening in the clouds and was rewarded by a momentary break in the weather after 2am in the morning. In David's own words:

Just after the total eclipse began on November 8th the sky was filled with clouds. There was crusty snow on the driveway. I carried out the tracker and my telephoto that always accompanies me on lunar eclipses. It was a long shot, but with another lunar eclipse so far in the future it was worth the effort.

The skies did part for moments at a time, often the Moon was only visible on the screen of my camera. At this stage of the eclipse the Moon was very red, even visually. Wind gusts made exposures challenging, but I did have moments of stillness that allowed me to image the eclipse, including some of the star field. By now a warm house was beckoning and the clouds had won the battle. As I was packing up, I looked up and saw an equally red Mars floating above the clouds.

The event occurred either very early on the morning of November 8th or very late on the evening of November 7th, depending on how you process time. There was also a lunar occultation of Uranus that morning (starting at 4:39am), but it likely wasn't seen by many people in this area due to the clouds. Given that it occurred in the middle of the night, during the work week, even if the skies were perfectly clear there would have been less people up to see it and many put off by the unseasonably cold temperatures. As observers and astrophotographers, we are always at the mercy of the weather, and the weather is often less than merciful. All we can do is plan our outings, dress appropriately, and hope for the best.

The last lunar eclipse, on May 15th, was similarly marred by the weather here in Greater Victoria. Some amateur astronomers managed to get some brief sights and images of part of the eclipse, but totality was hidden from view behind the clouds. On years where we get two lunar eclipses, we're often rewarded by having clear skies for at least one of them, but not this year. For those of us who missed out on seeing either of the two lunar eclipses this year, sadly you won't have another opportunity in Victoria until 2025.

Bruce Lane

Editorial Remarks

It's been a busy time of year for astronomy and space exploration, beyond the high profile Artemis 1 mission that's currently approaching the Moon as I write this. The new James Webb Space Telescope continues to provide amazing data, work goes on aboard the International Space Station, and numerous rocket missions are delivering payloads into orbit. The most recent SpaceX resupply mission to the ISS has been postponed until Saturday at the earliest. Aboard are new solar arrays, a dwarf tomato experiment, and something that originates from the University of Victoria! ORCASat is part of the CubeSat program overseen by the Canadian Space Agency. The UVic cube satellite is designed to improve star calibrations by earth bound telescope observatories by providing brightness measurements of stars and super novae unimpaired by our atmospheric effects. Another cube satellite, from Dalhousie University, is also scheduled to be deployed on this mission.

A lot of us are still not quite over the shock from the sudden change in the weather, which might have contributed to less people deciding to go outside for the remote chance and see the lunar eclipse. We went from the late summer in October to the depths of winter at the end of the month, without much a transition, beyond scrambling to find out where our winter clothes had gotten to. Our seasons on the Island tend to take their time to play out and slowly move on to the next phase of the year. This *light switch on, light switch off* sudden transition is more like what you'd expect if we were living on the Prairies. While the weather here can be a bit dreary and drizzly this time of year, we're generally not experiencing January weather at the end of October and well into November. We've gone from making it routine to break records for high temperatures in October to making it routine to break records for low temperatures in November. Beyond the long term ramifications of Climate Change, in the short term our climate appears to be taking a change for the strange.

In this issue of *SkyNews*, we'll have more recaps from our Centre's activities, a short article about Eratosthenes, as well as all the astrophotography and articles you've come to expect from the *Victoria Centre SkyNews*.

Bruce Lane: SkyNews Editor

Astro Café: Hybrid Meetings

The weekly social gathering of amateur astronomers on Monday nights, known as Astro Café, was reduced to being an online gathering via Zoom for the beginning of the Pandemic. As with many groups, we were trying to find ways to still function as an astronomical society, without being able to meet in person. While the Pandemic isn't ending anytime soon, RASC Victoria has shifted from Astro Café being online only, to being a hybrid event. It's still accessible online, but RASC Victoria members can also attend this event live at the Fairfield & Gonzales Community Association centre. Of course this dual format means double the hosting requirements, so RASC Victoria will need more of a volunteer commitment, both online and onsite. You can access updates about Astro Café at the Virtual Astro Café at: https://www.victoria.rasc.ca/astronomy-cafe/

The first Astro Café of October was hosted by Brock Johnston. Jeff Pivnick gave a presentation on the DART spacecraft impact and talked about Kelly Fast coming to give a talk about it during the October 17th Astro Café; Reg Dunkley, David Lee, and Brock Johnston showed some of their astrophotography; and Dan Posey discussed imaging with the Plaskett Telescope. David Lee gave an update on the Special Interest Groups and the Sky Brightness Survey;

Lauri Roche brought up the fact that she's taking a list of names interested in buying the upcoming 2023 RASC Calendars; Chris Gainor talked about the future of the Hubble Space Telescope; and Bill Weir discussed a recent telescope donations and sidewalk astronomy.

After skipping a week for the Thanksgiving weekend, Jeff Pivnick introduced guest speaker Kelly Fast (NASA/Planetary Defence Coordination Office) who gave a presentation on the *DART spacecraft impact - Finding Asteroids Before They Find Us*.

The October 24th session of Astro Café was hosted by Jim Cliffe. Randy showed some pictures of the Moon from his trip to Paris and gave a talk about Gamma Ray Bursts; David Lee shared some preliminary results from the Sky Brightness Survey; Nathan Hellner-Mestelman showed his video: *Seeing Beyond*; Lauri brought up the availability of RASC 2023 Calendars; and there were a series of announcements made.

Randy Enkin hosted the Halloween edition of Astro Café, which was an online only event due to the meeting space not yet cleaned up after an earlier Halloween party. Randy gave a brief talk about the upcoming lunar eclipse and a related citizen science opportunity; Joe Carr showed off the RASC Victoria Centre 2023 calendar; and Chris Gainor gave some astronomy mission updates and a RASC National report about SkyNews (*the other one*). David Lee was outside with his telescope for some sidewalk astronomy, accosting trick or treaters for most of the meeting, but came inside later on to give an update on SIGs. The meeting ended with a discussion about public outreach and a brief conversation about the possibility of a return to meetings at the University of Victoria.

Bruce Lane

SH2-200 (Bearclaw), October 2nd, 2022; by Scott Garrod

Special Interest Groups

Getting Started in Astronomy

The beginners group SIG continues. For our next meeting we will review some terms that to help us interpret the information we find in books and software. We will cover magnitude, astronomical coordinate systems, and the significance of colour. Of course we will have time for questions, descriptions of epic observing, and imaging adventures. For more information on this group, please contact David Lee at *david@victoria.rasc.ca*

Astrophotography

The astrophotography SIG continues to grow and foster all things about imaging the night sky. Unfortunately, our long stretch of summer has come to an end. Many members continue to image when they can but there are fewer opportunities and less certainty due to the weather. At one of the Astro Cafés, Brock Johnston hosted a discussion about images made by members of the SIG. We're hoping this will be a regular feature during one Astro Café per month. For more information about this group, please contact David Payne at *vp@victoria.rasc.ca*.

Electronically Assisted Astronomy

The EAA SIG continues to meet on equipment and software related to the topic. For more information on this group, please contact David Lee at *david@victoria.rasc.ca*

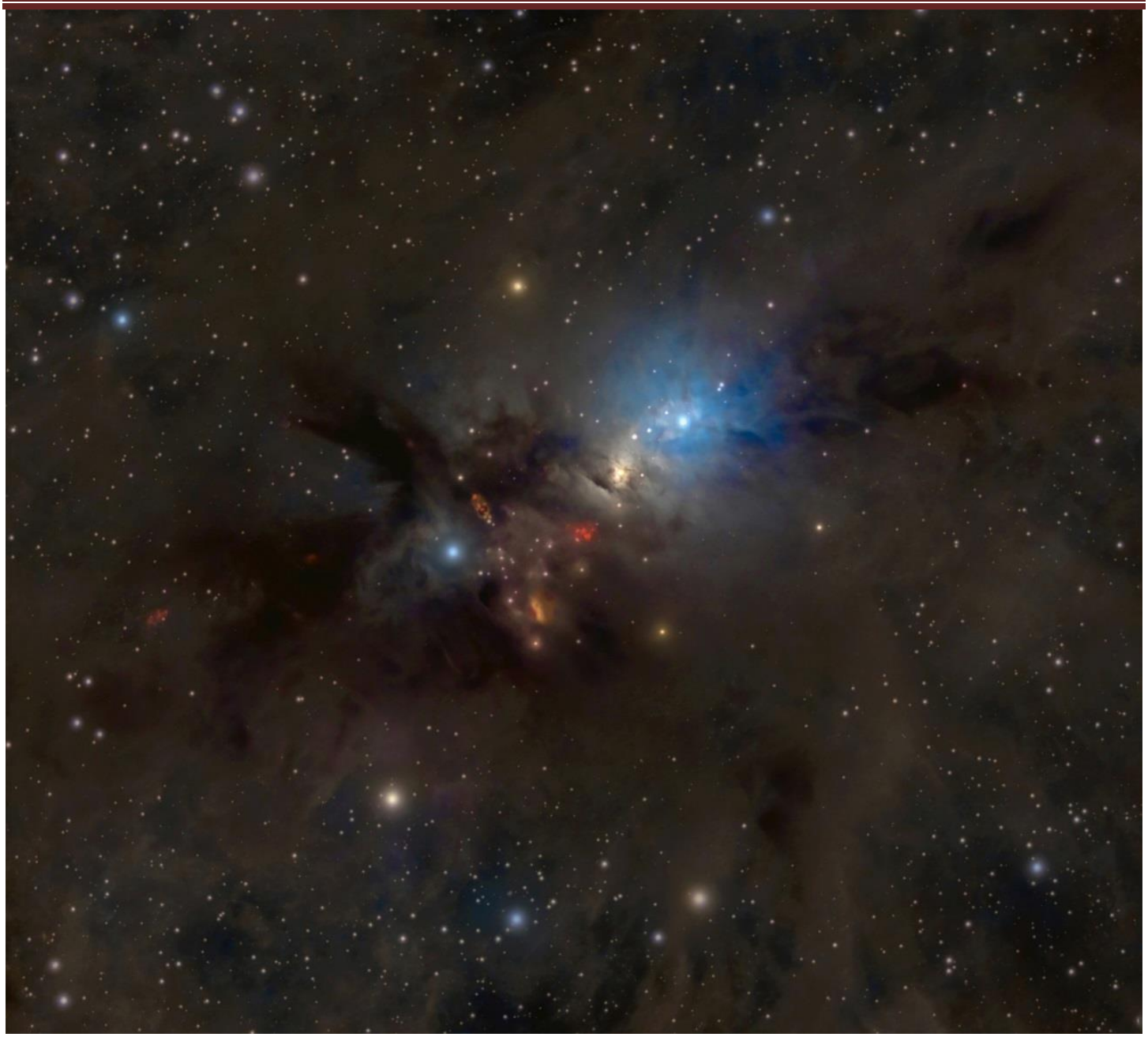
Makers

The Makers SIG is open for business to discuss member projects, and to answer questions associated with repair and development of astronomical equipment. In the next few sessions David Lee will talk about some microcontroller projects he's working on that support astronomical observing and imaging. For more information about this group, please contact Jim Cliffe at *jim@victora.rasc.ca*.

Citizen Science SIG

With the recent sky brightness survey, we hope members might want learn more about other citizen science projects where amateur astronomers can contribute to scientific research. There will be more information in coming Astro Café meetings. For more information on this group, please contact David Lee at *david@victoria.rasc.ca*

David Lee



NGC 1333 (Reflection Nebula in Perseus) imaged from Coombs, BC, October 1st, 2022; by Scott Garrod

Taking the Measure of a World

Like early episodes of *Doctor Who*, many of the greatest works of the ancient world are now lost and we only know of them because they were referenced by the authors of surviving works. This is the case of the often referenced three volumes of *Geographika* written by Eratosthenes of Kyrene (285-205 BC). A few fragments of his work exist, but his genius is mostly echoed in the writings of others. The first volume of his work was his attempt to gather everything he knew or hypothesized about the nature of the world he lived on. The second volume was all about how he used mathematics to calculate the circumference of the world. The third volume included a political map, with parallel and meridian lines forming grids that had the similar climactic zones we see on modern day maps of the world.

Eratosthenes' calculations of the circumference of the Earth were made possible by one of the first scientific missions of its kind. Eratosthenes knew that the Earth was round. He observed how when the Sun was moving overhead, stone columns cast shadows of differing lengths. He observed that the shadow cast by sticks in different places at the same time of day had different lengths, and devised a plan. To make his calculation he would need to make a measurement of the shadow at the same time of day from two different locations that he also knew the distance between. To determine the distance between the cities of Alexandria and Syene, which had a long used and well-traveled caravan route between them, he used trained walkers to pace out the distance, which came to about 5000 *stade**. He then sent a servant to Syene, where they used a stick to measure the length of the shadow at noon, at the same time that he measured the shadow from an identical stick in Alexandria. The angles that created the difference in the lengths of the shadows and distance between the two cities allowed him to calculate that the curvature of the Earth was 7.2 degrees. Using the data from this small slice of the circle of the globe he could calculate the size of the world, knowing that the globe would be 360 degrees. We're unsure whether Eratosthenes used Greek or Egyptian stades, but he did live and perform the experiment in Egypt, using pacers working there. If he used the Greek standard he would have been off in his calculations by 16%, but if he used the Egyptian stade he would have only been off by only 2% from modern measurements that have the benefit of orbital satellites. It was simple, elegant, and several thinkers who came after him made a mess out of trying to recreate his experiment or do the math.

Eratosthenes represented the academic elite of his time in the Ancient Mediterranean. He studied at Plato's Academy in Athens and became knowledgeable in many fields (he also invented the mathematical algorithm, *Sieve of Eratosthenes,* to discover prime numbers). After his studies in Athens he became the chief librarian of the Library of Alexandria and is regarded as the *Father of Geography*. Many great discoveries in science require teamwork and delegating tasks becomes even more necessary when you need to do measurements in different places at the same time. Centuries later, scientists like those aboard Captain Cook's voyage to observe the Transit of Venus, were travelers who made perilous journeys to further the bounds of human knowledge.

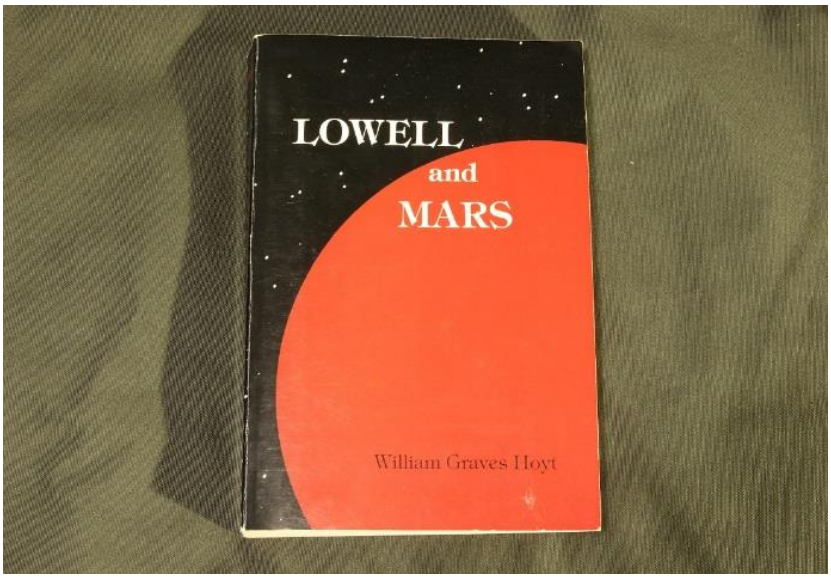
Bruce Lane

**What is a stade? It's something that came up during Astronomy Café a number of years ago and the answer here elaborates on the one I gave then. The stade is an agricultural measurement, originating in Ancient Greece. It was based on how long an ox will pull a plough in a line, to make a furrow, before stopping to rest. Given differences in the quality of soil and oxen, there were some regional variances between how long a stade was. If you were looking for a convenient and roughly standardized measurement for a race course, the stade was ideal. You could find fields anywhere there were villages and their location was generally suited for races on foot or horseback. It was such an ideal measurement that it became the basis for the name for a place or stadium where more organized races took place in urban centres. Like many other things they adopted from their neighbours, the Romans incorporated it into their own measurements of distance, with a stade equal to 1/8 of a Roman mile. The length of a stade is very similar to the length of a furlong, a measurement of the same agricultural origin, but from Northern Europe. The furlong was the length of a furrow on a farmyard of one acre. Anyone familiar with horse racing will have heard the word furlong used in the "Sport of Kings". People in rural locales have always needed some kind of standardized measurement to hold races and this was the closest thing to a universal race length available. It's similar to how rural kids, in the absence of marked out racing tracks, might race each other from one telephone pole to the next.*

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 Alex Schmid, our RASC Victoria Centre Librarian. Alex is currently running our library in the same way the Greater Victoria Public Library runs its shut-in branch, driving around to do deliveries and pickups for our membership to provide access to books from the collection. For more information or to make a book delivery request, please contact Alex Schmidt at: *librarian@victoria.rasc.ca*

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. In the past 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 mostly 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 *Lowell and Mars* by William Graves Hoyt. William Hoyt spent six years (1942-48) as a reporter for the New York World Telegram. Hoyt went on to become the editor for a number of smaller newspapers, before settling in as the editor of the Arizona Sun Times in Flagstaff, Arizona (1958-66).

William Hoyt's first book was about the goings on at a local private observatory: *Lowell and Mars*. His next non-fiction book, *Planets 'X' and Pluto*, was about the discovery of Pluto by Clyde Tombaugh, at the same Lowell Observatory. His third book, *Coon Mountain Controversies: Meteor Crater and the Development of Impact Theory,* about a nearby crater of some interest, was published after his death in 1985, at the age of 63. In addition to being a newspaper editor and author, William Graves Hoyt was also a research associate at the Lowell Observatory on Mars Hill. The great scientific institutions of their day had a habit of drawing in interested parties like a gravity well. One moment you're writing an article about an observatory and then next you're working there.

Lowell and Mars is a detailed historical view of the history of planetary science, more specifically as it relates to Mars during the lifetime of Percival Lowell and beyond. Despite the high quality of work that came out of the private observatory on Mars Hill, Lowell was often criticized for being outside the academic system. A lot of this criticism stemmed from Lowell's belief that there was life on Mars, which at the time was not exactly an uncommonly held view by many in the scientific community. There was a lot of wild speculation about what the "*canals*" on the surface of Mars might be, including the belief that they were migration routes through vegetation made by animals. Because Lowell built an observatory to study planetary science (including the hunt for Planet X) and his popular influence in the newspaper media of his time, he had attributed to him the ideas that were held by many others, despite all the serious science that was also being done at his observatory. As a private institution, his observatory also existed outside of the control of the government and academia, which caused some friction with people in the astronomical community who were used to controlling things. A lot of the hate sent his way also had to do with the vicious personal conflicts that dominated the astronomy community until well into the second half of the 20th Century. That Lowell is singled out for his beliefs about Mars is a testament to the long standing grudges and pettiness of that scientific community. The books Lowell published on the subject did have an influence on science fiction writers: from Edgar Rice Burroughs' *Barsoom* novels to Ray Bradbury's *The Martian Chronicles*. The idea that the observed lines on Mars were ancient canals from a dead or dying civilization was finally and conclusively disproved by NASA's Mariner missions in the 1960s.

Some of the outstanding work done in Flagstaff, Arizona included observations by Vesto Slipher that proved the expansion of the Universe, the discovery of Pluto, and the discovery of the sodium layer of the Earth's mesosphere. Despite some perceptions of Percival Lowell as an uneducated amateur astronomer, he graduated with distinction in mathematics from Harvard University. He spent some time as a diplomat and traveler, in Korea and Japan, writing numerous books about the cultures he encountered. After returning to the United States, he dedicated himself to the study of Astronomy and used his not inconsiderable personal wealth to build his own observatory. It's probably remarkable for many to learn that Lowell's choice to locate his observatory in the Arizona Territory in 1894 (statehood wouldn't happen until 1912) marked the first time ever that an astronomical observatory was specifically and intentionally cited in a place away from civilization where observing conditions were favourable. Lowell died in 1916 and was buried on Mars Hill, near his observatory. The mausoleum built for him is shaped like an observatory and is made from granite from the same quarry that is used in his family plot in Massachusetts. The mausoleum dome has a transparent stained glass roof to allow a view of the sky. As the only member of his family not buried in his family plot, there is a cenotaph there in his memory, carved out of petrified wood from Arizona. Seven months before he passed away, Lowell was made an Honorary Fellow of the Royal Astronomical Society of Canada during a visit to Toronto. A number of astronomical features were named in honour of his contribution to planetary astronomy, including: the Lowell Crater on the Moon, the Lowell Crater on Mars, Asteroid 1886 Lowell, and the Lowell Regio (the northern polar region of Pluto discovered by NASA's New Horizons mission in 2015). *Lowell and Mars* is excellent read and it's among the many volumes you can borrow from the RASC Victoria library.

Bruce Lane

Heart and Soul Nebulae, Oct 11, 12, 18, and 22nd, 2022, by Lucky Budd

Hill and Dale (Observing on the Island)

The October weather was a bit of a confused mess, but one that favoured amateur astronomers for the most part. There were even a couple nice clear nights around the new moon, before the weather took a turn for the worse at the end of the month. There was interest in the lunar occultation of Uranus on October 11th, but no reports were forthcoming. The next evening, Dan Posey observed a bollide streaking through the sky, just below the Summer Triangle. Bill Weir braved the cold for a few nights of observing up at Pearson College, as well as his usual stints of sidewalk astronomy. Many astrophotographers took advantage of the favourable weather, including Lucky Budd and Scott Garrod, whose images can be found throughout this and most issues of *SkyNews* this year.

Access to the Victoria Centre Observatory is currently restricted due to road construction on Observatory Hill. It's expected that we'll be able to access our observatory again by as early as December 22nd, with ongoing construction continuing on into the spring. A reminder that although the VCO belongs to and is for the use of the members of the RASC Victoria Centre. In the *Before Times*, MiCs (Members in Charge) ran both weekly scheduled and unscheduled sessions to take advantage of the weather, but for the foreseeable future observing sessions will be a lot less scheduled and less frequent. 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) at *membership@rasc.victoria.ca* and we'll see you up there on the Hill one of these nights in the not too distant future.

Bruce Lane

In Closing

It's not officially winter yet, but someone forgot to inform the weather. The first day of winter isn't until December 21st, but it's felt like January in Victoria since the last week of October. The Pandemic isn't just continuing, it's overwhelming our healthcare system. With the complete lack of health mandates from our government, schools and work places are being decimated. BC isn't even requiring people to stay home from work or school anymore if they test positive for covid-19. There's a shocking lack of children's medication, as schools are being hit by covid-19, influenza, and respiratory syncytial virus (RSV) all at the same time. Regular hospitals have quickly become children's hospitals. There's also been a massive drop in the rates of vaccination, both for the flu and for covid-19 booster shots.

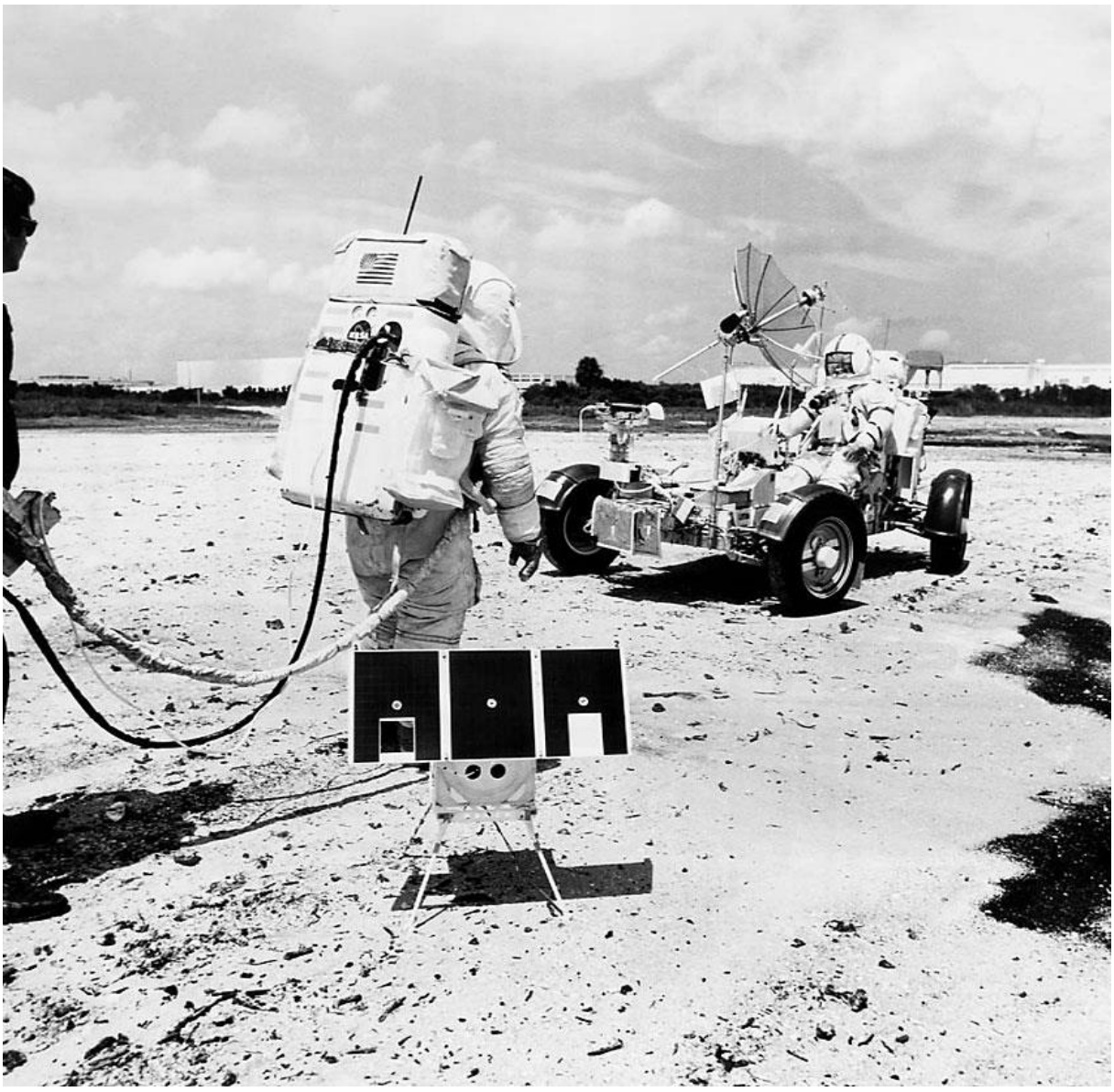
It's going to be another tough winter and the complete disregard for the stress it's having on our healthcare system is only going to result in increased burnout, illness, and more medical professionals leaving the field. This doesn't just effect those getting sick, it also means that operations are going to get delayed or cancelled. Government attempts to offset these losses by poaching healthcare workers from the developing world will not make the World a better place. It's still not a great time to do a lot of traveling, unless you're absolutely determined to bring home new virus variants as souvenirs. A lot of people don't seem to realize that the air on planes is recycled, which is ideal if you're an airborne virus, but somewhat less ideal if you're a respirating mammal. A week ago, 800 people who tested positive with covid-19 were allowed to leave their cruise ship to wander freely around in Sydney, Australia. The things we did early on in this pandemic are just as necessary now: getting vaccinated, wearing masks in public, social distancing, and practicing proper hygiene. Being a responsible citizen during a public health crisis is the very least you can do.

A lot of our thoughts in November are of Remembrance Day and the makeup of the veteran community is a lot different than it was just a few decades ago. The last Canadian to serve in World War I passed away twelve years ago. Only around twenty thousand Canadian World War II veterans still remain among us of the million or so who served during that conflict. They're in their 90s now or even older, and the veterans of the Korean War aren't much younger. The Royal Canadian Legions that were once brimming with military veterans are now service clubs where you'll often be lucky to find someone who served in Scouts Canada as a child. Between the generational divide and the transition to non-veteran memberships, Canadian veterans of the fighting that took place in Former Yugoslavia, Syria, Afghanistan, and a multitude of peace keeping missions that weren't always very peaceful rarely find the Legion to be a place they feel they can hang their hat.

Beyond veterans running into each other from time to time on the street or social media, once they leave the military they can find themselves cast adrift without the same sense of purpose. It's a bit like belonging to a church and then one day you show up and the doors are barred to you, while everyone else carries on inside. Some find the transition to civilian life easier than others. Some will continue to live in a space shaped by their experiences in the military and be unable to relate to anyone or anything alien to that experience. For homeless veterans, the support system used to be a trailer in the wilderness that had supplies occasionally dropped off for the few who knew about it, but things have since improved with the establishment of places like Cockrell House in Colwood.

The regular meetings and events hosted by other astronomical societies on Vancouver Island continue, regardless of the weather. The Centre of the Universe and Plaskett Telescope on Observatory Hill are hosting monthly events, with the next evening scheduled for November 26th. Due to the physical site being closed for road construction this will be an online only event. These public outreach events on Observatory Hill are hosted by the National Research Council and Friends of the Dominion Astrophysical Telescope, with volunteers from the RASC Victoria Centre also taking part. The University of Victoria is hosting weekly Wednesday open house events at the Bob Wright Centre Observatory, from 8-10pm. The Nanaimo Astronomy Society have their next monthly meeting for members scheduled for tonight: November 24th. These events by the Nanaimo group are hybrid events, with both in person and online attendance via ZOOM. The Comox Valley Astronomy Club's next monthly meeting is at the Courtney Public Library on December 5th. The peak of the annual Geminids Meteor shower is scheduled to happen on December 14-15th. The Geminids is the result of the Earth plowing through a debris field left by an asteroid, instead of a comet as is the case for most of the other meteor showers. It's a meteor shower that's every bit as spectacular as the Perseids meteor shower in the summer, but generally less available due the weather conditions in December.

Bruce Lane: SkyNews Editor



Photography Credits

Cover: Total Lunar Eclipse Nov 8th, 2022 (02:24 PST), by David Lee. Shot using a Nikon D7200 with a Nikkor 300/4 AFS lens and TC1.4, mounted on a Star Adventurer. Shutter speed of 1/2 second at f/5.6, ISO 3200, and processed with Adobe Photoshop 2023.

Page 2: Apollo 17 training, Gene Cernan in the White Room on the launch tower for the Countdown Demonstration Test. Pad leader Guenter Wendt is immediately to Gene's left. Research by J. L. Pickering. Courtesy of NASA.

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

Page 3: Photograph and Design of Astro Cafe Mug, by Joe Carr

Page 4: SH2-200, Bearclaw, Oct 2, 2022; by Scott Garrod. AT 130 EDT/ iOptron CEM70/ ZWO asi533MC Pro/ AWO asiAir Plus, with Antlia ALP-T filter. 80 X 300 seconds (6 hour, 40 minutes of data)

Page 5: Apollo 17-4, *Gene Cernan scratches his nose during suit-up prior to a Countdown Demonstration Test.* There is actually a nose scratcher for astronauts to make use of inside of their helmets (you wouldn't want someone taking their helmet off to scratch their nose on the Moon). Photo filed Nov 21, 1972. Research by J. L. Pickering. Courtesy of NASA.

Page 6: NGC 1333 (Reflection Nebula in Perseus) from Coombs BC, Oct 1, 2022; by Scott Garrod. AT130 EDT/ iOptron CEM70/ ZWO asi2600MC Pro/ ZWO asiAir Plus. 228 X 300 seconds (19 hours of data)

Page 7: Egyptian Desert, May 24, 2018; by Crocmak. Fair Use from Pixabay.

Page 8: Posed Book, "Lowell and Mars", taken in Editor's home on Nov 24, 2022, by Bruce Lane

Page 9: Apollo 17 training, *Gene Cernan (left) holds geology hammer. The scoop, which was usually used by Jack schmitt (right) has been stuck in the ground near the gnomon leg that holds the color/gray scale. Gene may have just put the gnomon in position, in which case Jack would wait to take a cross-Sun picture until Gene had stepped away far enough to get his shadow off the gnomon and sample.* Photo filed Nov 7, 1972. Scan by J. L. Pickering. Courtesy of NASA.

Page 10: Apollo 17 training, *Jack Schmitt during suit-up for the Countdown Demonstration Test.* Nov 21, 1972. Scan by J. L. Pickering. Courtesy of NASA.

Page 11: Heart and Soul Nebulae, Oct 11, 12, 18, and 22, 2022, by Lucky Budd from backyard. 12 hours of one minute subs using a Sharpstar 61, Idas NBZ filter, Canon RA on a star adventurer pro mount. 12 hours of integration time (1 min unguided subs).

Page 12: Buff Orpington Chicken, Nov 15, 2022; by Bruce Lane

Page 13: Apollo 17 training, *Jack Schmitt (left) returns to the one-g LRV trainer from the SEP transmitter. During the mission, he deployed the transmitter 140 meters east of the LM at the end of EVA-1.* Photo filed Nov 2, 1972. Scan by J. L. Pickering. Courtesy of NASA.

Page 15: Apollo 17 training, *Launch Control Center during Apollo 17 Countdown Demonstration Test.* Photo filed Nov 21, 1972. Scan by J. L. Pickering. Courtesy of NASA.

Call for Article and Photo Submissions for the December Issue

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

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