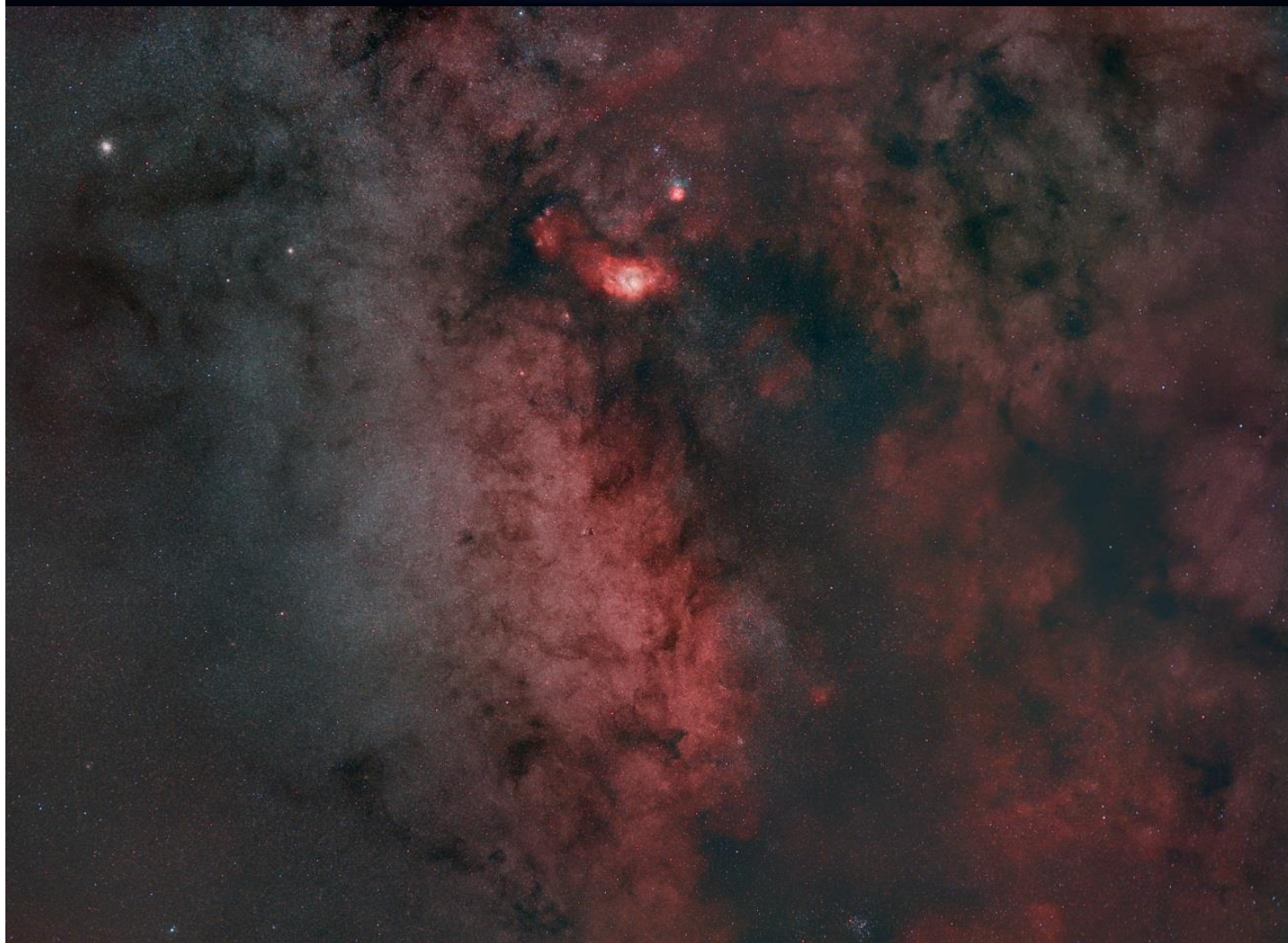


SKYNEWS



Lower Sagittarius, July 30, 2020; by Daniel Posey

Summer Days drifting away to Oh Oh the Summer Nights

As we approach the last day of summer, on September 22nd or March 206th by the *new reckoning*, we look back at a season of opportunities gained and lost in the amateur astronomy community. There were certainly plenty of planetary occultations and chances to view the best comet of this century. We gained some online activities through the summer, like Astro Café, at a time when regular meetings are normally suspended. What was missing was all the public outreach, star parties, and trips up to the Victoria Centre Observatory we've grown accustomed to. Hopefully, going forward the emphasis of online activities lays a foundation towards continuing to reach out to the amateur astronomy community online, as we ease our way back to more traditional activities of public outreach and group observing sessions.



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My own summer was filled with long work days and yardening until it was dark, before returning to do more work online, leaving a lot less time for astronomy than I would have liked. I still managed to find the time to get some great views of Comet NEOWISE from my back deck and even spent a couple evenings imaging it, when it was visible in the gaps between trees of North Saanich. Later, after days of watching the Moon and Mars, through the window beside my desk, I got a favourable break in the treeline to image their conjunction. During night checks on the chickens, when the skies were clear, I took the time to take in the breathtaking views of the night sky in North Saanich, made better by keeping a pair of binoculars handy.

John McDonald's challenges this summer came from doing astronomy while contending with the light pollution of Victoria. In his own words:

A year ago, Wendy and I moved into a nice 8th floor apartment in downtown Victoria. The views are great but it is not dark like the backyard I enjoyed while we were in Fairfield. Light pollution is a fact of life here. I recall reading something an experienced astronomer said about making use of the conditions you have and it has stuck with me. He pointed out that clear nights are for deep sky objects and hazy ones are for planets because that calms the seeing. Well, light polluted sites can be for planets too and hazy ones even more so. With that in mind, I purchased an 8" SCT this summer to give me a bit more aperture for planetary imaging. It is about as large as I can easily store and setup on the patio; and makes a nice addition to my 80 and 105 mm refractors. I have never been a fan of SCTs, but they have improved in recent years



and my new one, a Celestron Edge, works well even at $f/25$, with the addition of a Televue Powermate. That is a lot of power, but I can focus with little image shift, and have been having fun learning how to do better planetary imaging with it.

I have always liked the opportunity a nearby site gives for getting out of bed in the middle of the night to capture something when the conditions are right. There is a patio attached to our apartment (seen left), with room for storing and using my telescopes, as well as a garden for Wendy. I am able leave my mount setup and ready to go when I wake up in the night. I have captured several images of the Moon that way and this summer did two planetary projects that have kept me relatively sane during the covid restrictions.

The first was a study of the changing size and phase of Venus as it approached opposition -

<https://rascvic.zenfolio.com/p1028029664/he39bf138#he8b0fd37> and the second was capturing a double shadow event when shadows of two of Jupiter's moons crossed the planet -

<https://rascvic.zenfolio.com/p1028029664/he39bf138#hec3f7031>

Capturing did not take long but the processing involved learning how to deal with the rapid rotation rate of the planet, blurring the image, and dealing with that did take time. I turned to the program WinJUPOS, which did the de-rotation quite well once I figured out how to use it. I also got lucky and found some good seeing to capture my best image of Saturn to date (seen top of previous page)

All in all, the move to city centre has not been so bad. Wendy has a manageable sized garden now and I have a patio observatory that is working out to be a lot of fun. When I want to go back to the deep sky VCO is not far away. Hopefully the covid restrictions will not go on forever and it will be possible to go up there again. In the meantime Mars is coming close and getting higher. Also Uranus and Neptune are coming. That should keep me going for now.

Like John, Diane Bell was missing the experience of observing with her fellow RASCals, but that hasn't stopped her from escaping downtown, with her binoculars of unusual size in tow, for the darker skies of Metchosin and Central Saanich.

When the COVID-19 pandemic was declared in mid-March, I thought of our varied RASC duties over the spring and summer - all but gone. Here we were, left to rethink our "Plan B" activities during this isolation and lockdown. So I thought, "I have a sack of lemons - time to make lemonade!"

Gone were the plans to make my space-themed, sleep masks for the DAO's Centre of the Universe gift shop. It would not be open this summer! So I repurposed deep-space "gems" on quilt shop fabric, including two beautiful barred spiral galaxies, NGC 1300 (on the left) and NGC 1365, into necessary face masks for shopping and outings. My sewing machine was quite busy during the first months....

Yes, I lamented the loss of my in-person volunteer



livelihood and outreach with our astronomy community, but we met on Zoom from our homes for Astronomy Cafe and other meetings. But July brought us a gift - Comet C/2020 F3 NEOWISE, which survived its loop around the sun, and was set to put on a grand show! It made an appearance in our morning skies in the early part of the month and later on in July in the evening. As my outings on our condo property were limited due to security issues and bright lighting, I made a few trips out to the Metchosin Cricket Field and Island View Beach. I brought along the largest binoculars I could find, my sketch pad, star maps, and a comfortable chair to view our beautiful visitor and to catch up with my Messier hunting. My socially-distanced friends were there too, setting up cameras and telescopes....

As NEOWISE drew further and further away from us, in early August, Jupiter and Saturn began to swing around to the southeast. The viewing off my deck was difficult, but as the evenings were consistently clear, I set up my 8" Dob telescope in my living room! A clean mirror, good optics, and clear skies made up for the double-pane glass of my window. I was able to see the moons of Jupiter as they "danced" through the evenings of August. I was able to view Saturn and her rings, and to spy Titan and perhaps another small moon as well....

When life gives you lemons, make the best pitcher of lemonade you can. And make memories....

David Lee has become more of an observer of the morning sky, than the night sky, this summer. He's been out and about before the birds are up, to take in various conjunctions, and to get a head start on most of us observing and imaging Comet NEOWISE.

For me, vacation is somewhat academic, having retired a couple of years ago. As soon as the weather got better, I took advantage of what the night sky had to offer. Being fond of wide field nightscapes, my Zenfolio portfolio is appropriately populated. There were certainly some gems this summer, with a parade of the planets, thin crescent moons, lunar conjunctions, and our first interesting comet in a long time. Not Hale Bopp class, but still delightful. Lunar conjunctions this summer included Mars and Venus. Through the years, I have always enjoyed this particular type of event, with the constantly changing landscapes that the Moon and planets appearing above.



Crescent Moon Venus and Orion

August 16 2020

©2020 David Lee

Although the summer was filled with opportunities for astrophotography, the thing I remember most is my reintroduction to observing. I was most inspired by some early morning astronomy sessions, where the view of the last quarter Moon revealed beautiful views at the terminator. There's something special about viewing with the impending dawn. You get to see objects like the Moon against a lighter blue background, rather than the black sky. This lowering of contrast, between the Moon and the background sky, I found helpful in observing details on the Moon.

Then the Comet appeared early July, which kept me busy first with early 2:30am mornings and weeks later trying to locate it at dusk. My most memorable moment was the morning that the comet appeared with noctilucent clouds on July 10th. By chance, while waiting for the Comet, I witnessed a beautiful setting 2 day old thin crescent moon. Bracketing the New Moon, thin crescents are challenging in both observation and imaging.

The search for the Perseids reintroduced me to the use of binoculars. The northerly view at Cattle Point is the perfect spot for binocular scanning. Although my observation of significantly bright Perseids was limited, the other end of the Milky Way, with Cassiopeia and Perseus, was filled with wonderful binocular objects like the Alpha Persei Cluster, The Double Cluster, and Stock 2 (Ed. aka the Muscleman Cluster).

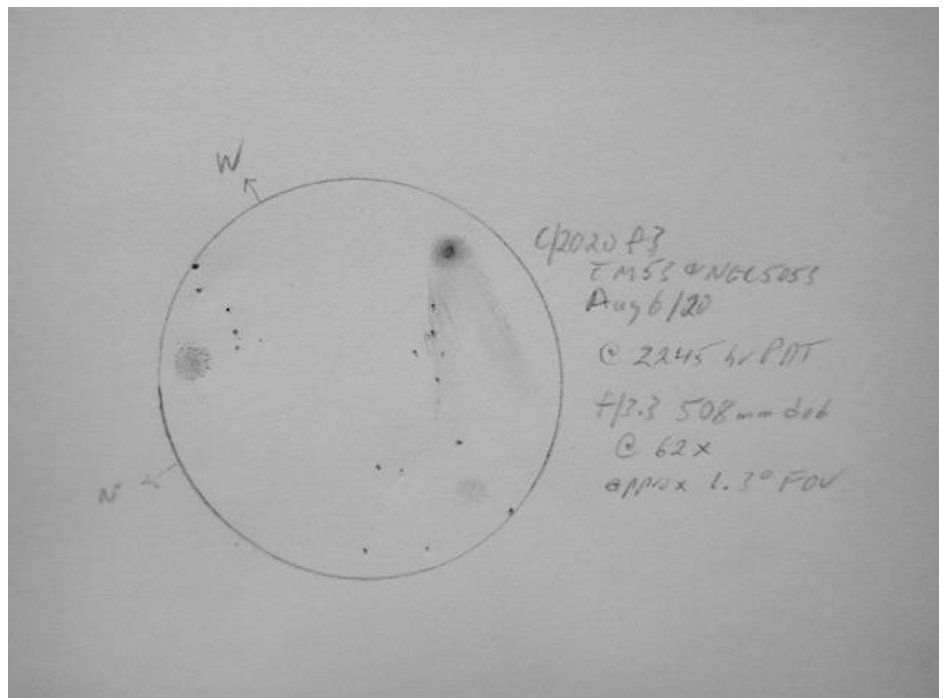
As the summer has been coming to an end, I've been taking advantage of my early morning astronomy habit observing the Moon and the rise of Venus at dawn, Mars, and Orion ahead of schedule. Soon it will get darker, earlier in the evening. I'm actually looking forward to observing in the evening and keeping more "normal" hours.

Bill Weir had the advantage of living out in Metchosin, largely free of the light pollution that plagues most of us who are located closer to the big city lights, and took full advantage of it and access to the Pearson College Observatory.

Wasn't that a great summer, with endless clear nights, traveling to various star parties, getting together with others and observing, doing solar outreach at Vancouver Island Music Fest? No. Wait, that was what was supposed to happen but didn't. Oh well, at least it wasn't last year, when I'd cancelled most of the summer's activities to save money for an expensive exotic trip, because that at least did happen. Whew!

Now Bruce has asked me to write about what observing I did do this summer. Sure I can do that. The only problem is that this summer I decided to take it easy and not really note take during all of my observing sessions. Lucky for me there was a comet. Unfortunately C/2020f3

(NEOWISE) didn't turn out to be a true "Great Comet", but on the whole it still was pretty fine. A naked eye comet hasn't happened in some time. The day it began to be visible at our latitude, the chase was on. First it was getting up in the middle of the night and driving to the beach, before twilight ruined the view. Then, when it became an evening comet, it was heading to a location where there was a good view to the west, to catch it as the sky darkened and before it set into the hills. Each time I sketched it, as viewed through either of my small scopes or with my big scope, I always used the same eyepiece so that the sketches could truly show the changes to the comet. Looking back at the sketches and the few garbage images I took as of this writing, I can see



that since July 12/20 I've been able to observe the comet a total of 16 times. Cool, and if luck holds I'm not done yet. It's been getting tough though, being around full Moon, but now it's waning!

Without these sketches I'd have no record to remind me that despite it appearing everything was cancelled, a lot still happened. On a few occasions some fellow Centre members joined me at the village green/cricket pitch. On other occasions, at this same field I ran into other people there to observe the comet, or even just because they lived in the area had a new telescope and thought the field would be a good place to go. One night I was able to help a young girl and her grandma use her new little refractor. On another evening, it was a guy with his brand new big SCT. For a while there, it seemed to be a nightly ongoing star party.

As I was looking through my stack of sketches, I was reminded how in June there was a Sunspot group. They were the first Sunspots in two months. I managed to track that group in white light and H-Alpha, as the Sun rotated for a total of 11 days.

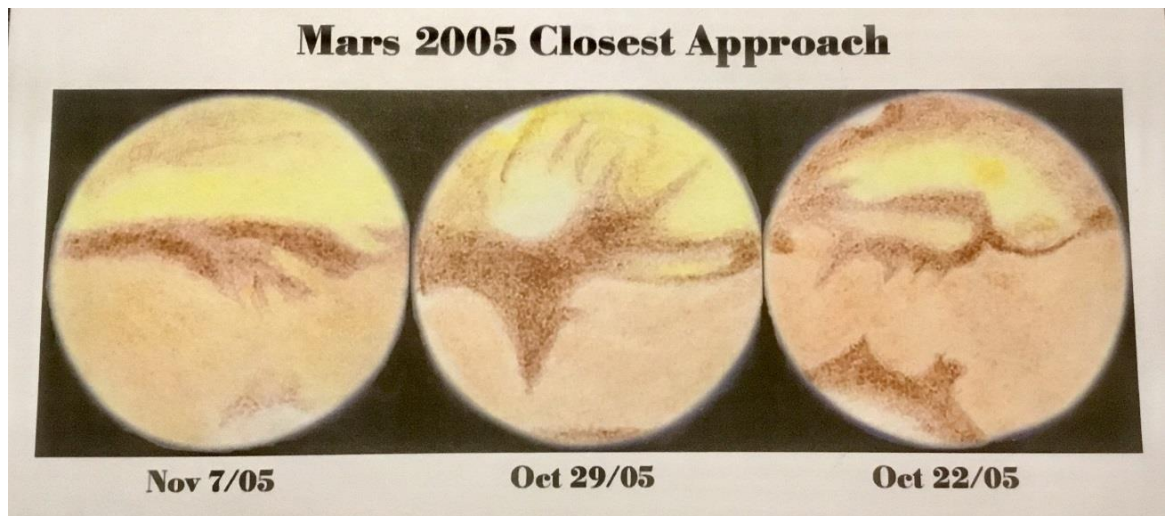
In early June, there was the Annual General Assembly. It was supposed to be held in Vancouver and was much anticipated. Then, as has turned out to be the theme of 2020, it had to be cancelled. Not to be deterred, the organizing committee did a hard pivot and did an amazing job of creating a virtual GA. There were fabulous speakers and I found that the business meeting in a way was more fun than the regular in person ones. The chat room was popping with people from all across the country, checking in with each other, as the boring business was being dealt with. Then for two consecutive weekends, there were several very interesting webinars held on a very wide assortment of topics. It was an amazing job, well done.

Another thing the National Office has done is organize two bi-weekly educational webinars, available through either Zoom or YouTube. Explore the Universe and An Insider's Guide to the Galaxy alternate each Thursday. Because of timing, I've often not been able to catch them live, but luckily they are posted to the RASC YouTube channel so can be watched any time. Links to these can be found on this page of the National Site: <https://www.rasc.ca/covid>. There can also be found a calendar, with links to various Centres that hold their meeting on line or if there is a Speaker Series event. These have been great for filling time this weird summer and they so far seem to be ongoing.

With it staying light so late during the summer, it isn't the best for deep sky observing. Still though, I did manage to get my big scope out to Pearson for some fun times. On one occasion a couple of Victoria folks, Dan and Matt, actually took me up on my repeated offers and ventured out to the slightly darker skies of SW Metchosin. I believe the image Dan produced out of it proved worth the gas money. It's good they came when they did, because students back on the campus might mean increased restrictions for access to the observatory. I'm going to need to look into it and I'll report back.

And now it's the planets. Jupiter and Saturn have been visible for all of the summer, but due to their low altitude over the night, great views

have been fleeting but on occasion still there. Then there's Mars, ah Mars. With the end of summer, Mars has been rising higher and higher, and by October will be prime for viewing. This year, on Oct 6 it will swell to a grand 22.6". That might not seem big, but that's 1/2 the apparent



diameter of Jupiter right now and 25% wider than the apparent diameter of the globe of Saturn. The big advantage is how high in the sky it will be late in the evening. Tune your optics and start observing it now. Details on Mars are subtle, but the more you observe it the more you learn to see those details

on it. Besides that, a Martian day is 40 minutes longer than Earth's. This means that each day you see a slightly different view. It takes about 3 weeks to observe the whole globe. Here is a panel of sketches I did around a similar close approach 15 years ago (seen on previous page). On one of these nights I was actually observing from the doorway into the observatory building, because it was sprinkling rain but Mars was in a clear patch of sky. "You can't dance at the party if you don't go."

That was a fun time.

Now as we head towards autumn, the sky will darken sooner, making getting out and observing so much easier. If the Pearson invites need to be put on hold, there is still always the Cricket Pitch. So stay tuned. I'll let you know where we can go. That's all for now, from South West of Victoria.

Summer is all but a memory now in Greater Victoria, punctuated by some overeager maple leaves getting a head start to the ground. The autumn skies are approaching and with them constellations like Orion, always a welcome sight in the evening sky. Whatever 2020 has left up its sleeve, with the political blood sport season already well underway on both sides of the border, the wheel in the sky will continue turning, beckoning our telescopes to follow.

Bruce Lane

Editorial Remarks



This issue marks the 2nd of the two bonus issues of *SkyNews* published this summer. Before last year, the September issues were actually published in October, so everything was a month off. The October issue - now actually published in October - would normally be the first issue back from the summer break, where we would cover all sorts of goings on over the summer, as well as celebrating the resumption of regular club activities like Astro Café and monthly centre meetings. Like Victoria *SkyNews*, Astro Café continued online throughout the summer, when everything else did not, due to the pandemic lockdown.

We kicked off this issue of *SkyNews* with a patchwork of summer experiences, from your fellow RASCals, stitched together in a quilting-styled article. If you've been paying attention to your emails from the

Victoria Centre, you'll know that underneath the quiet surface of the lockdown beat the active hearts of many amateur astronomers still going out to do observations and imaging under the night sky. The public outreach and official gatherings are on hold for the foreseeable future, but like the *Firefly* theme song goes: *you can't take the sky from me*. Sure, corporations can send up swarms of annoyingly reflective, low orbit satellites and your neighbour can suddenly develop a fascination with 1000W floodlights, to see if they can lure a confused pilot to land in their driveway, but we're still lucky enough to live in a place where you can often relocate to darker skies without packing an overnight bag. It's a luxury a lot of people in the world don't have anymore.

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

Bruce Lane: *SkyNews* Editor

President's Message for September



President's Message September 2020. I don't know about you, but I am not ready to change the calendar to September just yet. The uncertainty introduced by the pandemic and the political drama unfolding south of the border distracted me from making the most of the summer. The restrictions of Covid 19 produced a star party deficit and deprived the Victoria Centre of the social interaction enjoyed when sharing the night skies with others. But the constellations march on and they are indifferent to our plight. So enough snivelling and it is time to count our blessings.

On the Covid front, whether it was our favourable geography, good governance, or good fortune, so far Vancouver Island has experienced relatively few cases when compared to other areas. On the weather front, relatively cool conditions have reduced wild fire smoke and

presented favourable observing and imaging opportunities. On the technological front, Zoom and our tireless hosts (Chris Purse, Barbara and Kurt Lane, and John McDonald) have kept the doors to Astro Cafe open during the summer months. This allowed us to remain connected and share our techniques, images, sketches, and enthusiasm. These sessions were all captured on video, by the kindness of Joe Carr, and posted on the Astronomy Cafe web page (<https://victoria.rasc.ca/astronomy-cafe/>). One antidote to the pandemic was the visit by the beautiful comet C/2020 f3 Neowise. Editor Bruce Lane went the extra mile and prepared bonus issue #420 of the Victoria Centre newsletter, *SkyNews* that showcased images and sketches of comet Neowise and conveyed the joy it generated. Bruce also provided a colourful history of comets of yesteryear and their relationship with the leaders of the day.

The National RASC response to Covid was remarkable. There were so many web offerings that they have developed a very useful weekly email entitled "*What's happening at The RASC?*" which alerts you to regional and national presentations. If you are not already receiving this email, then I encourage you to subscribe here: <https://mailchi.mp/40bf61e41306/subscribe-to-weekly-live-stream-reminders>. In particular, they developed a series of Zoom webinars related to the Explore the Universe program. These and other presentations have been captured and are available on the RASCanada YouTube channel for viewing at your convenience (https://www.youtube.com/results?search_query=rascanada).

As we head into September, the number of Covid cases is on the rise and the rooms at UVic will remain closed. Instead of having a special monthly meeting on Zoom, we plan instead to have one Astro Cafe session each month with an invited speaker. The first presenter, Dr. Phil Groff, executive director of RASC, will attend our Astro Cafe Zoom meeting on Monday September 14th at 7:30 PM. It is a great opportunity to meet Phil and share your thoughts with him.

As the nights continue to lengthen I do hope that you will find time to step out, look up, and marvel.

Useable Skies

Reg Dunkley

Astro Café: Now Online



The weekly social gathering of amateur astronomers on Monday nights, known as Astro Café, continues online. As with many groups, we're finding ways to still function as a Centre, without being able to meet in person. Members are posting their astrophotography, short articles, as well as links to astronomy stories from the Web. The weekly Zoom meetings are now being posted online as videos, allowing many of us (*Ed. myself included*) to view Astro Café sessions, who would otherwise miss it. 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/>

While August had five Mondays, the first was a holiday so the first Astro Café Zoom session was on August 10th. For that session, David Lee showed his images of the conjunction with the Moon and Mars; Randy Enkin gave a presentation of some filters and lunar images; Dorothy Paul gave a detailed talk about yellow coloured astronomy filters (right down to the retinal circuitry of the human eye), Laurie Roche and David Lee talked about their experiences at the Space Educator's Institute virtual conference; Chris Purse gave some information about the Perseid meteor shower and upcoming observing opportunities; Bill Weir talked about the use of Discord chat by RASC National's Perseids observing group; and Reg Dunkley gave a short overview of what was happening in the astronomy community.

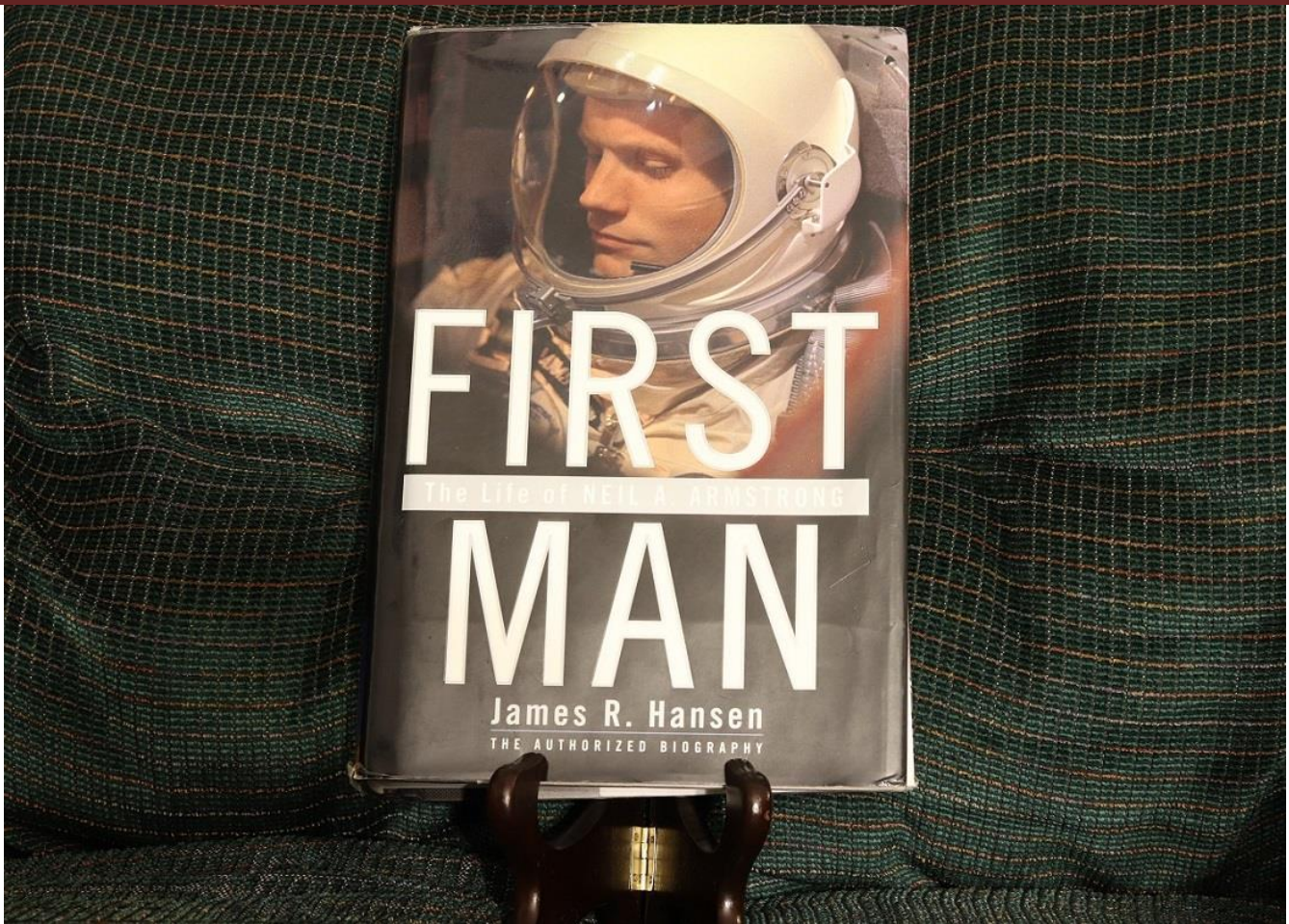
For the next Astro Café, John showed images and video of Jupiter; Sid Sidhu gave a slide show of meteors viewed from his weather camera; David gave a talk on imaging, plate solving, and the merits of using binoculars while your camera and other optics are busy; while Reg gave his weekly summary. On August 24th, Marjie Welchframe showed a short film on astronomy; Randy showed some observations and images of the Andromeda Galaxy; John gave a talk about imaging and processing eclipses on Jupiter of its moons; and Reg gave another summary of what's going on in the astronomy community. For the last Monday of the month, Randy gave a short talk about some telescopes; John talked about his upcoming introduction to astrophotography lecture; David gave a quick explanation of narrow band filters; and our Centre President gave another update.

Bruce Lane

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 Diane Bell, our RASC Victoria Librarian. Our library covers many aspects of astronomy: observing, telescope construction, astrophotography, 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, 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 *First Man: The Life of Neil A. Armstrong*, by James R. Hansen. I have to admit that I've always been a sucker for a good pilot biography. One of my favourite books growing up was *Bush Pilot with a Briefcase: the Happy-Go-Lucky Story of Grant McConachie*. This month's review is a biography about the first human to walk on the Moon and is possibly one of the best pilot biographies ever written. It's incredibly well researched, with an



understanding of the material ensuring that minute details are included with a purpose. It's also very well written. James Hansen has written a number of other acclaimed books on aerospace and NASA, which I am sad to say I have not yet read. His body of work probably had a lot to do with him being chosen to write the only authorized biography of Neil Armstrong. It also seems that Hansen spent so much time with pilots that he ended up writing an award winning book on the history of golf. I'd personally be surprised if there is any US Air Force or naval aviation base that doesn't have a military golf course attached to it.

This biography starts out with some background information about the family who raised him and his early life. One of the things that *First Man* does very well is to dispel many of the myths that have attached themselves to the best known astronaut in history. Neil Armstrong isn't one given over to exaggeration. There was an amateur astronomer who offered local kids views of the Moon, among them young Neil, and a story circulated that this was what made him interested in going to the Moon. Armstrong barely remembered the visit and at the time was much more focused on anything to do with airplanes. He built models, read aviation magazines, and dreamed about flying. His parents bought him a ride in a plane at age six. He got his pilot's license before his driving license, which is not the usual order those things are done in. When he went to preregister for classes at Purdue University, on a naval scholarship, he flew a plane nearly 500km to get there.

First Man goes on to describe in great detail his experiences in flight school and as a jet pilot in the Korean War. This biography goes on in great detail about his career with NACA (National Advisory Committee for Aeronautics), the precursor to NASA. It's an up close view of the Gemini and Apollo programs, culminating in the first Moon landing. Above all, this is a pilot's story and it deals with every aspect of that life. This book was popularized by the movie of the same name and the 50th anniversary of Apollo 11, and rightfully so. *First Man* is essential read, for anyone interested in aviation or the history of space exploration, and it's available by order from your local bookstore.

Bruce Lane

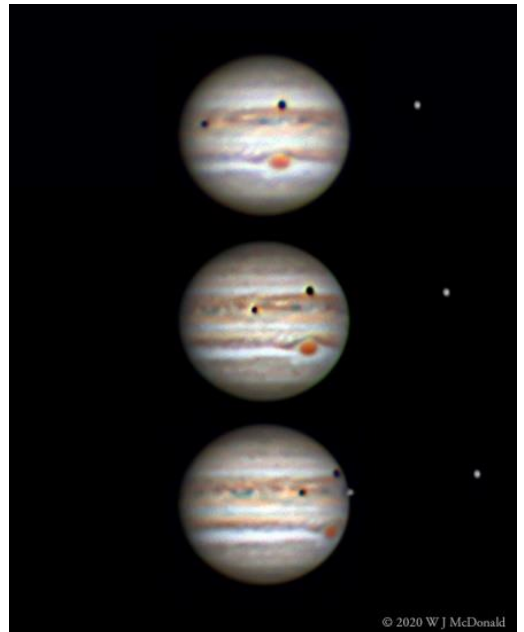


Hill and Dale (Observing on the Island)

While the scheduled weekly observation sessions at the Victoria Centre Observatory are taking a hiatus for the immediate future, there have been many great nights of stargazing available in August and Centre members were taking advantage of them. For astrophotographers and observers with their own gear, the shutdown of Centre activities hasn't slowed them down that much. John McDonald has taken the light pollution of downtown Victoria in stride and focused his efforts on imaging the Moon and planets. Among his planetary projects are a series of images, showing the eclipse shadows on the surface of Jupiter, caused by the moons Io and Ganymede (*seen right*).

Matt and Dan accepted Bill Weir's invitation to run an imaging and observing session at the Pearson College Observatory on August 15th. Dan Posey's image of the Rho Ophiuchi cloud complex (*seen above*) might result in a lot more interest by his fellow Victoria Centre members to drive out to Metchosin, when Bill is there, to make use of their extensive resources and view a different horizon than the one offered by the Victoria Centre Observatory.

We're still waiting to hear word on the status of our 16" Ritchey-Chretien telescope that we shipped to the supplier for repairs a while ago. Our President has also been trying to resolve an unfairly applied duty on our telescope, since it's being returned for repairs not for sale, which will take

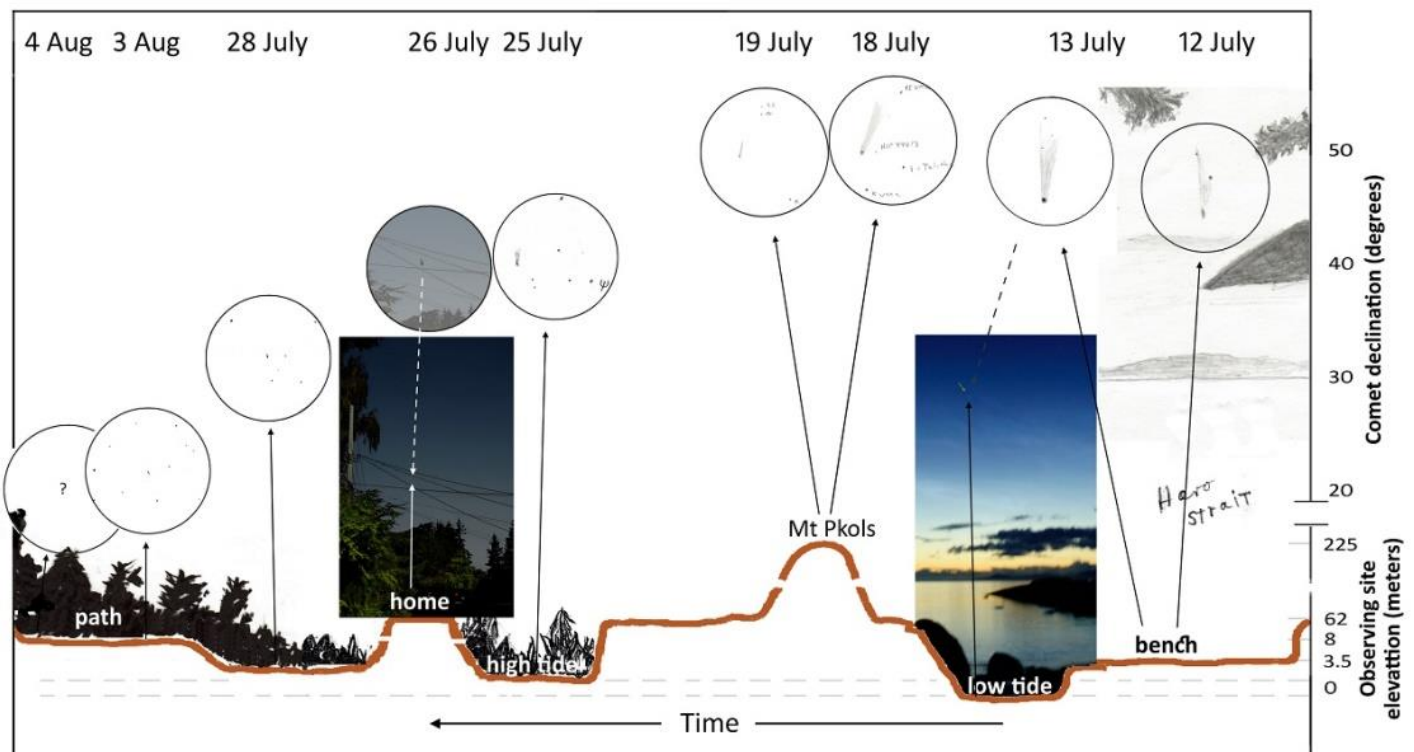


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some time to resolve given the state of the world. We've made an application for access to the VCO and are awaiting a decision from the NRC (National Research Centre), before we can install an interim 12.5" Ritchey-Chretien telescope that was acquired by Reg Dunkley and John McDonald. A proposal is also being considered by the NRC for smaller scale observing sessions at the VCO.

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), it is for the moment closed due to the lockdown. 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 in the future.

Bruce Lane



Comet Chasing Adventures (real and fanciful) and the Discovery of Cosmic Radiation

Never say never. I had decided years ago to not enter any more competitions. Not that those I entered weren't fun – most involved paying a fee to run on scenic trails, which I could have done for free on any other day of the year, but without being handed “free” refreshments along the way! Then, on July 23rd, Nathan Hellner-Mestelman invited us to a friendly competition to track Comet Neowise [C/2020 F3] for as long as possible. He hooked me before I gave it a second thought. I laid out my strategy in my acceptance email: restrict my search for observing sites to a 2 km (horizontal) radius from home, but no restriction vertically, having first confirmed with Nathan that hot air balloons were permissible.

After two false starts, due to insufficient attention to the comet's exact position and speed on its westward course, I realized that it had already passed through the NE “window” on the sky from our porch by the time I started looking! So, fully prepared with information on the comet's RA and declination each day for the coming weeks plotted on star charts, prepared in MegaStar, I loaded my pack with my binoculars, sketch pad and pencils, red flashlight, camera, granola bar,

and water bottle and had the alarm set for 2am. Now, began the wait for the next clear night. Eight minutes after being summoned from deep sleep, the morning of 12 July I was heading out our driveway, with my visor tipped low to block glare from street and other obnoxious lights, for the short walk to Hollydene Point, at the outer end of the rocky east wall of Arbutus Cove. I hoped the Cove's nearly vertical back wall would block the worst of Greater Victoria's sky glow. A bench, 3-4m above the rocky shoreline, offers an expansive view northwest to northeast across Haro Strait, a promising spot for my first view of Comet Neowise. Hollydene Place slopes are so steep that all streetlights are well below eye level. I dared glance up to the night sky and stopped in my tracks: there was the Comet, coma down and tails streaming behind, high above the bright light of Vancouver's sky glow on the distant horizon! Minutes later, comfortably settled on the bench and after ogling Neowise at 1X and through binoculars, I remembered my sketch pad and started my first entry for the competition (Fig.1, 12 July). Over the next 30 days, all but 3 of my encounters with the Comet were from various locations on the east side of Arbutus Cove (Fig1). They were blissful – little extraneous light, no noise pollution; the night as it should be. Two were shared with Miles, my husband and experienced observational astronomer.

The excursions with Miles, to the lookout on Mt Pkols (*Ed. aka Mount Douglas*) were more social, the comet views were good, but the light pollution was not. A 5-year old was much more enthusiastic, looking through our 80mm spotting scope and seeing all four moons of Jupiter, which she named right off, than looking at the comet. My encounter on July 26 was a surprise and could have occurred without leaving our property. Half-an-hour after completing my sketch of the 25th, I paused to look up before turning into our driveway. There, in the light-polluted sky were Alula Borealis and Alula Australis (Nu and Xi UMa), the pair of stars which, with Psi Uma, formed a triangle with the comet (see 25 July sketch, Fig 1)! Neowise must be up there over the road! Sure enough, visible only through binoculars and nicely framed between power lines, provided I hugged our trees to hide a streetlight. Its appearance resembled my last true sighting of the Comet in a relatively dark sky, one week later (Fig 1, Aug 3).

Once the Comet had dimmed past binocular visibility, from local observing sites, I had visualized going vertically. Rising above the denser, light-polluted, lower atmosphere in a hot-air balloon would offer the prospect of watching the comet recede westward through the fall and the opportunity for some deep-sky observing. My two companions would be the balloon operator and Miles, for our second balloon flight together, as guide to the night sky. While this route to continue in the comet-chasing competition turned out to be impractical – no local balloon operator and travel restrictions impeding search for one farther from home - its inspiration came from the role hot-air balloon flights played in settling the hotly debated topic in physics that arose at the beginning of the 20th Century, following the Curries' discovery of radioactivity (1).

The question concerned where the source of radiation measured at Earth's surface came from. If it all came from within our planet's crust, its strength should drop with elevation. In 1909, Theodor Wulf, a believer that it would, climbed the Eiffel Tower (~300 m) with a portable electroscope of his own design (Fig 2) and indeed measured a drop in radiation, but not nearly as great as predicted (2,3). Domenico Pacini improved the design of Wulf's electroscope by making the container "perfectly airtight", to withstand the pressure changes with altitude and electrolytically galvanizing on the inside to reduce the radiation from the walls. Between 1906 and 1910, Pacini measured ionization at different altitudes, from mountains to sea level and below, and concluded "*that a sizable cause of ionization exists in the atmosphere, originating from penetrating radiation, independent of the direct action of radioactive substances in the crust*" (3). Nevertheless, the general consensus continued to favor the Earth's crust as the source of air ionization. The

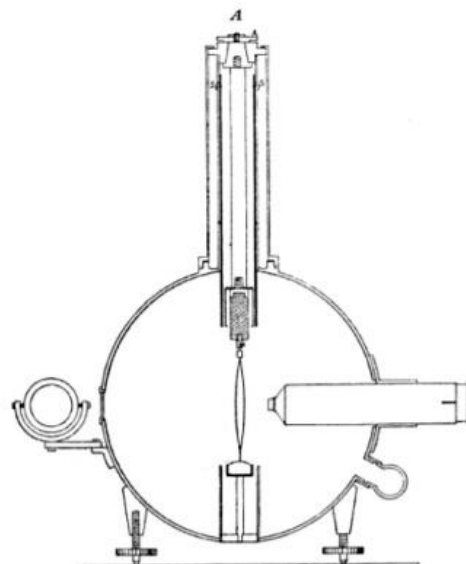


Figure 9: Scheme of the Wulf electroscope (drawn by Wulf himself). The 17 cm diameter cylinder with depth 13 cm was made of Zinc. To the right is the microscope that measures the distance between the two silicon glass wires illuminated using the mirror to the left. According to Wulf, the sensitivity of the instrument, as measured by the decrease of the inter-wire distance, was 1 volt.

<https://arxiv.org/pdf/1208.6527.pdf>

conclusive demonstration of the extra-terrestrial origin of at least part of the ionizing radiation measured on Earth was made by Victor Hess in a series of balloon excursions in 1911-1912 (3) (Fig 3). Hess took two electroscopes of the Wulf - Pacini design (always have a back-up!), their accuracy having been further improved by the addition of a new "sliding lens", to allow focussing on the electroscopes' fibres as they discharged, without moving the eyepiece and hence changing the magnification. Lifting off from Aussig (then in Austria, now in Czech Republic) at 6:15 am on April 7, 1912 on his final flight, Hess rose to 5300m. During that day's partial solar eclipse, he confirmed his measurements from night flights that the substantial atmospheric radiation could not be coming from the Sun. Cosmic radiation from beyond the solar system was confirmed (1). Had Pacini not died in 1934, he surely would have shared the 1936 Nobel Prize in Physics with Victor Hess "for the discovery of cosmic radiation" and Carl Anderson "for his discovery of the positron" (3).

The date of my fanciful balloon flight, as a way to continue comet chasing, was to have been August 7, 2020 to commemorate the 108th anniversary of Victor Hess's publication, summarizing his historic balloon flights (4). Little did I foresee where entering a friendly comet-chasing competition with no set course would take me – from enriched appreciation of a local hangout to, vicariously, the excitement of historical explorations of a century ago.

Fig 1 Graphic summary of my comet chasing adventures. Dates of sketches (made though 8x binoculars, 8 degree field) indicated across top. Horizontal axis: time from right to left. The fluctuating orange line depicts relative elevations of observing sites, given numerically on the vertical axis, lower section. The vertical axis, upper section, gives the comet's declination for each date and time observed (from <https://theskylive.com/planetarium?obj=c2020f3&date=2020-07-25&h=00&m=00#ra|10.234757287163315|dec|38.87774808401342|fov|50>).

Locations along the east side of Arbutus Cove from which sketches were made: bench at Hollydene Point; low tide, at water's edge on beach; high tide, on lowest step of stairs to beach; path, gaps in tree branches on descent to the bench. The extreme apparent size difference of the comet between sketches from Mt Pkols reflects the 1.5 hr difference in time they were made: Shortly before midnight on 18 July, in twilight; as soon as it was dark enough for an adequate binocular view on 19 July, because our neighbours were with us couldn't stay late because they rise early for work. My last definite sighting, through binoculars with averted vision, was 3 Aug. The 4 July "?" in the binocular field indicates the comet in "averted imagination", centered in the star field marking its location at that date and time; the top of the cove's vertical back wall intruded into the binocular field as shown.

Sources:

- 1) 07 APRIL 1912 Victor Hess discovers cosmic rays
<https://timeline.web.cern.ch/victor-hess-discovers-cosmic-rays-0>
- 2) A De Angelis. Atmospheric ionization and cosmic rays: studies and measurements before 1912.
<https://arxiv.org/pdf/1208.6527.pdf>
- 3) Domenico Pacini and the origin of cosmic rays. A forgotten pioneer of the early days of cosmic-ray research.
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- 4) M Perricone. Balloon flight launches Cosmic Education Project.
<https://www.fnal.gov/pub/ferminews/ferminews01-07-27/p3.html>
- 5) B Breisky. On Its Centenary, Celebrating a Ride That Advanced Physics (Use Photo)
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Astronomical Term of the Month: Coriolis force

The Coriolis force, commonly referred to as the Coriolis effect (which refers more to the perception of the Coriolis force), is something that affects objects not connected to the Earth while it rotates on its axis. If you were to fly a plane in a perfect circle over an airport, without visual or navigational instrumentation, in about twenty minutes you wouldn't be over the airport anymore. The Coriolis force also has a strong effect on weather. In the case of hurricanes, the clouds are moving from different directions around strong low pressure centres. This is based on clouds moving faster or slower depending on whether they are moving to or away from the equator, deflecting off the low pressure centre and spinning around it.

Besides being very important to pilots, it's used by the military to correct the aim of long range munitions, whether it's a bullet fired by snipers or a shell from an artillery piece. It was first discussed by Italian scientists to make adjustments to the aim of early artillery in the 17th Century. A great deal of conjecture has been made about what the Coriolis force being responsible for, including that it affects how water spins around a drain. The Coriolis force has nothing to do with how water goes around a drain and any differences have much more to do with the construction of the shape of the water receptacle.

In 1851, Leon Foucault conducted the *Beautiful Experiment* in Paris, using a pendulum to scientifically prove that the Earth rotated on its axis. Shortly after showing the Coriolis force with a large pendulum, Foucault released his Sine Law: $T = 24/\sin q$. The rotation of Earth was reduced to T=hours to complete a circle, sin from trigonometry, and q representing the latitude on Earth. A year later, the engineer and scientist invented the gyroscope to show how the Earth rotated in a new experiment. It wasn't his only great scientific achievement. Working alongside physicist Hippolyte Fizeau, Foucault took the first ever photograph of the Sun. As a lay scientist, he constructed a series of machines to measure the speed of light, resulting in the most accurate measurements of his time. Naturally, when a largely unrecognized scientist shows up the entire scientific establishment, they congratulate him on his genius and welcome him with open arms as one of their own, and support him in his future endeavours, or at least they would in a more perfect universe. French scientists in particular were hostile towards their fellow countryman, often disputing his findings, because he wasn't a proper doctor of science and perhaps because they resented how stupid he made them feel. He wasn't extended an invitation to the Paris Academy of Science until shortly before his death, despite being one of the greatest minds of his time.

Bruce Lane

In Closing



Many of us feel like we've been sitting on our hands since March, with everything put on hold. It's what the members of RASC Victoria did a century ago, during the influenza outbreak, and it's what's needed now. After everything closed down in the spring of 1918, RASC Victoria didn't have any gatherings until well into 1919. That was a time when even amongst the small group of RASCals, it's unlikely that many of them would have even owned their own telescope. Telescopes were generally encased in brass and the playthings of the rich; certainly not something to be owned by members of the middle class. The popularizing of telescope building among the non-gentry would come much later, mainly due to the articles on the subject about and by Russell Porter, which started

around the same time as the Stellafane Convention. We've now arrived at a time when getting a telescope is so easy that the skills of building your own are rapidly becoming a thing of the past.

The RASCals of 1918 didn't have the kind of distractions and resources we now take for granted. There were no podcasts, Zoom sessions, and endless videos to allow them to continue to be educated and entertained. Of course, they didn't waste their time *doomscrolling* on social media either. It would be another year before radio broadcasting began in Canada. They relied on books, newspapers, and their hobbies to while away the time. Victoria was fortunate to have the military base hospital and the Canadian Red Cross, and even more fortunate to have the strongest affiliate of the newly formed Victorian Order of Nurses, who made a point of visiting the poor, disadvantaged, and those living in rural areas during a time that predated universal healthcare.

Victoria was also spared the worst of the Spanish flu, thanks to the very unpopular demands of Dr. Arthur Price, the city's public health authority of the day. While Vancouver was hit hard by influenza, due to a complete disregard for being told how to behave in a pandemic, Victoria's leadership by its health authority, along with a bit more common sense by the public at large, spared the city from the worst of the influenza outbreak, despite having low numbers of healthcare professionals and only a few tiny hospitals. World War I was still being fought, so many doctors and nurses were still serving overseas. Many of the health directives that saved so many lives would be ignored from time to time, resulting in a 2nd and 3rd wave of the epidemic in Victoria. Some prominent churches defied the public health orders and held services anyways, regardless of the risks. Parades and celebrations for the victory of the British Empire in World War I would not be denied in the provincial capital. Restrictions were eased in time for New Year's Eve with disastrous consequences. Had Victorians been a bit more sensible, the cost to human life could have been much less than it was. In response to the disdain of his directives, Dr. Arthur Price gave the following address:

Wake up! Realize that there is a war on, a war in our very midst, an epidemic of influenza. Do not sneer at the enemy. Do not belittle it by calling it 'Flu.' Give it its full name, be serious and realize that the undertakers are busy.

In addition to living in an idyllic climate and being less affected by the pandemic than most, RASCals in Victoria have been pretty spoiled this year when it comes to astronomical events. We're still basking in the afterglow of Comet NEOWISE, and been enjoying some excellent views of Jupiter and Saturn. Hopefully, we'll soon emerge from the wildfire smoke, drifting over the border from our southern neighbours, to begin properly appreciating the opposition of Mars. Many of us have already been imaging and observing our planetary neighbour, now high overhead in the night sky. It certainly got a lot of interest during the recent conjunction with the Moon. The last opposition of Mars was marred by a planetary dust

storm, leading to a lot of disappointment in the astronomy community. Mars will be at its closest to Earth on October 13th, but you should take the opportunity to view it on any clear night leading up to this planetary opposition. You can't always count on the weather that night and this is a time when you can observe surface details on Mars that aren't normally an option for amateur astronomers, when viewing the red planet.

Bruce Lane: SkyNews Editor

Photography Credits

Cover: Lower Sagittarius, July 30, 2020; by Daniel Posey. Image made with 84x30s (42 minutes total) on the Sagittarius region, using a Canon Ra, with Sigma 105mm, at ISO640 and f1.4.

Page 2: John McDonald's best image of Saturn to date, taken August 8th, 2020. ZWO ASI120MM-S camera with filter wheel and TV Powermate to give focal ration f/25, using 8" Edge SCT on AVX mount. Captured 1000 frames in R,G and B filters. Stacked best 45% in Astrostakkert, with postprocessing in Images Plus and Photoshop.

Page 3: Patio Observatory, July 19th, 2020; by John McDonald

Page 3: Astro Masks, Aug 31, 2020, by Diane Bell

Page 4: Crescent Moon, Venus, and Orion, Aug 16th, 2020; by David Lee

Page 5: Sketch of Comet NEOWISE and NGC 5055, Aug 6th, 2020, by Bill Weir

Page 6: Mars Sketches from 2005 Opposition, by Bill Weir

Page 7: Crop of Bruce Lane (SkyNews Editor) at 2013 RASCal Star Party in Metchosin, by Chris Gainor

Page 8: Crop of Reg Dunkley (RASC Victoria President) at 2018 AGM, by Joe Carr

Page 9: Photograph and Design of Astro Cafe Mug, by Joe Carr

Page 10: Posed Book, "First Man", taken in Editor's home on July 15th, 2020, by Bruce Lane

Page 11: Rho Ophiuchi cloud complex, August 16th, 2020; by Daniel Posey. 48.5 minutes (97x30s) of data on the Rho Ophiuchi cloud complex, image made with Canon Ra and Sigma 105mm lens (f1.4, ISO640) mounted on an iOptron Skyguider Pro (unguided).

Page 11: Moon Shadows on Jupiter, August 4th, 2020; by John McDonald. 3 of 20 images of the shadows cast by Io and Ganymede on Jupiter during a double shadow event, 1 near the start, 1 in the middle and 1 at the end. Io can just be made out on the upper two images as a white spot between Ganymede's shadow and Jupiter's red spot. In the lower image Io has just left the planet's disk and shows up clearly. ZWO ASI120MM-S camera with filter wheel and TV Powermate to give focal ration f/25, using 8" Edge SCT on AVX mount. Captured 1000 frames in R,G and B filters. Stacked best 30% in Astrostakkert, with postprocessing in ACR and Photoshop.

Page 15: Untitled Airport/Airplane, June 28th, 2018, by Jan Vašek. Image from Pexabay

Page 16: "Misty" Ameraucana chicken, April 12th, 2020, by Bruce Lane

Page 18: Apollo 14, Ed Mitchell (left) and Al Shepard (right) suited up for altitude tests. 17 September 1970. Scan by Kipp Teague. Courtesy of NASA.

Call for Article and Photo Submissions for October Issue

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

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