

SKYNEWS



New Moon through the Trees, by Diane Bell

The Littlest AGM

After changing our society's year end to December 31st, to be more in sync with RASC National and the rest of Western Civilization, the next step was having an annual general meeting, to fulfill our obligations to the BC Society's Act. The February 13th meeting was chosen to do double duty as our monthly meeting and what President Reg Dunkley promised as a 5 minute AGM, to vote on the financials I prepared as the outgoing treasurer.

The dining wasn't what we've come to expect for our annual general meetings. In fact there was no food to be had at all, other than the usual snacks served in the astronomy teacher's lounge for our after meeting social. Having just had our banquet in November, it was considered a bit gauche to have another one so soon, let alone the organizing required to make it happen on short notice. The weather was also unkind, as the meeting was scheduled at the end of a week of snow for the BC South Coast, something local denizens are generally less than prepared for. 19 RASC Victoria members were present and another 16 provided proxy votes so we could achieve quorum (there are currently 285 RASC Victoria Centre members). One of the proxy votes was made from as far away as Tasmania! The SkyNews Editor provided his proxy vote and watched the meeting via UTube, from his home, on the snowy plateau of North Saanich, where his summer tire equipped car remained parked for the week.

Reg's promise of a 5 minute AGM was soon dashed by a proxy question of Sid's, presented by Laurie, casting doubt on the values given for our society's collection of astronomy equipment. The basis of this claim was the Wray-Brydon antique telescope and an outrageous value being suggested for it. The Wray-Brydon, antique telescope certainly wasn't included in this year's calculations of assets and liabilities, but this was because it hasn't been submitted to the Treasurer as part of our Centre's inventory since 2013. Even then, it was at that time estimated to have half the value that was being talked about during the meeting, for a 75 year old donation that has no evidence of ever having been appraised or has any paperwork for its origin that I've ever come across. There are times when having our assets scattered across the Greater Victoria Area can be an issue; especially when occasionally we're relying on people's memories to keep track of it all. On the bright side, there was a lively talk on the subject of how depreciation works, which makes me confident that there are more than a few capable members to step up, whenever Deborah Crawford steps down from her tenure as treasurer.

Dr. Samantha Lawler delivered a good lecture on Planet 9, the hypothetical Kuiper Belt planet that has yet to be found. She gave some background on the discovery of Pluto and its more recent demotion from planetary status; before discussing Kuiper Belt objects and the difficulties on detecting them; and wrapped up her talk with some updates from the New Horizon mission.

It was an interesting gathering, with an unorthodox annual general meeting portion. With such a low attendance this will no doubt become the Woodstock of AGMs, where people not present will later remember being there. I'm also aware that many of you were humming a couple bars of *The Littlest Hobo* after reading the article title and even more of you are doing so now.

Bruce Lane

Editorial Remarks



After a great lunar eclipse event last month and more clear night skies than we're used to, February wasn't quite so forgiving for the local amateur astronomy community. The record setting snowfalls not only disrupted access to our observatory on Little Saanich Mountain, but kept a lot of people inside because of the weather. There were power outages and technical issues with our centre's observatory to add to our observing woes. A few people managed to still get outside to do some observing, especially with their binoculars, which didn't require digging out a patch of snow to use. I'm not saying that the lack of amateur astronomy activity was the incentive to add a crossword puzzle to this issue of SkyNews, but the lack of amateur

astronomy activity was the incentive to add a crossword puzzle to this issue of SkyNews. In this month's issue, we're also continuing our series of stories about the Underdogs of Science, with an article about Vesto Slipher, who for some reason always comes to mind whenever someone starts talking about Hubble.

Bruce Lane: SkyNews Editor

President's Message for March



Normally at the beginning of March, Victoria Centre RASCals are trudging through cherry blossoms. Snow is not an option. So just imagine your puzzled president when he arrived at the VCO on February 27th (seen below). The observing pad was covered with 6 inches of white stuff topped with an icy crust. This unseasonably cold weather tormented tender West Coast RASCals throughout February and almost derailed the Mini AGM of February 13th.

Mini AGM you say? This administrative AGM resulted from trying to make others happy. To streamline financial procedures the Canadian Revenue Agency wanted the Victoria Centre to move our fiscal year end from September 30th to December 31st. When we did that the BC Societies Act insisted that we hold an AGM in 2019. So this "administrative AGM" which covers the three month interval extending from October to December 2018 was scheduled to coincide with the February monthly meeting. This would make the CRA happy and the BC Societies people happy ... but there was a problem.

It all has to do with our bylaws. When the bylaws were recently updated the quorum was boosted from 3 to 25. The architects of these new bylaws never envisioned that the "Garden City" would be paralyzed by snow. Since North Saanich was buried under 2 feet and many members were trapped in unplowed cul de sacs it was looking like the Mini AGM was toast. Fortunately, these very same bylaw architects included a provision for proxy votes. At the last minute, your desperate president e-mailed the membership with a plea for proxies. The first proxy arrived from Tasmania! Nearby RASCals also rallied to the cause. A quorum was established and the first Mini AGM in the 104 year history of the Victoria Centre went ahead. Let us hope that it will also be the last Mini AGM in history as this bureaucratic process is more complicated than astrophysics.

Speaking of "astro" things let's talk about AstroFest 2019. This event, the first of its kind, was held in Nanaimo on February 28th. It was extremely well organized and hosted by the Nanaimo Astronomy Society. The idea was to bring Island astronomers together to share their knowledge and enthusiasm. This mid island rendezvous was well advertised and over 120 attended the event. Nelson Walker, Bill Weir, and I manned the Victoria Centre table, while Lauri Roche and Ben Dorman represented the FDAO. Victoria Centre RASCAl Francois Pilote led a contingent of 5 amateur astronomers from the Comox Valley and RASC Victoria member Mike Krempotic came from Port Alberni. Dennis Crabtree set up the very popular virtual reality system and captivated many.



There were a number of presentations. I provided info on the Victoria Centre, while Nanaimo President Chris Boar described the activities of the Nanaimo Society. In addition to talks at their monthly meeting, they hold many outreach events and like Victoria are swamped by the curious public during eclipses. They also take time to have fun and schedule an annual Beer and Burger night. The Cowichan Valley Starfinders promoted their star party and Nigel Mayes from Shawnigan Lake School described their facility, with its active astronomy program. John and Carol Nemy delivered a spectacular visual presentation of the night sky which featured their Island Stars Observatory, located on Hornby Island. The members of the Nanaimo Astronomy Society were very friendly and hospitable. Several members had roll off roof observatories. Many of the attendees were newbies looking for ways to get involved in astronomy. Bruce Lane, from Quarky Science, donated a nice pair of 25X70 SkyMaster binoculars as a door prize. There was great enthusiasm for this event and it is hoped that it will be repeated. Special thanks must go to Chris Boar, Tony Puerez and Janeane MacGillivray for magically making it all happen.

Cloudless Nights,

Reg Dunkley



Picture from AstroFest 2019, by Bill Weir

Astro Café: Monday Nights, 7:30-9:00pm



Astro Café is a weekly astronomy gathering, for both RASC members and the public alike. It runs on Monday nights, from September to May, with the last session before summer break, on May 27th. Astro Café is primarily a social gathering, with presentations of recent observing sessions, astronomy gear show and tell, discussions about astronomy, and of course coffee and cookies (please remember to bring a reusable mug...perhaps even an Astro Café mug). It's located at the Fairfield-Gonzales Community Association, in one of the portable classrooms tucked in behind the main administration building, at 1330 Fairfield Road.

This month's Astro Café activities, like many things, were affected by the record snowfall in the Greater Victoria Area. The presentations for IAU Women and Girls Astronomy Day were delayed for a week, as one of our Monday nights was lost due to the weather. Reg gave short lecture on Vera Rubin; Randy gave a presentation on Henrietta Leavitt; Barbara gave a talk on notable female astronauts and cosmonauts; and there was even a presentation on what it's like to be married to an amateur astronomer, when it's not a hobby you share. In memory of warmer times, at the last session of the month, Ken Atkinson gave a presentation of his tour at a New Zealand observatory and Joe Carr showed some highlights from his recent Caribbean cruise. Dave Robinson also frequently brings in examples of astrophotography from RASC Edmonton, to show what fellow RASCals are doing in much colder places than here. Always remember that Astro Café is a nice introduction to the amateur astronomy community of Victoria. The lights will be on and a sandwich board out front to let you know where we are.

Bruce Lane

Monthly Meeting Speaker: Dr. J.J. Kavelaars

Exploring a new world on the Edge of the Solar System, New Horizons and 2014 MU69

7:30 PM, Wednesday, March 13th, 2019 in Room A104, Bob Wright Centre, University of Victoria

On January 1st, 2019, NASA's New Horizons spacecraft executed a flawless encounter of the small world, provisionally known as 2014 MU69. Our understandings of the nature of our outer solar system and the processes of planet formation have been transformed by the very first resolved images of 2014 MU69. Now, 2 months after the encounter, imaging and spectroscopy from 2014 MU69 continue to trickle in. Dr. J.J. Kavelaars will describe the processes that enable this historic encounter to occur and the initial results from the spacecraft's imaging.

Dr. JJ Kavelaars received his Ph.D. from the Department of Physics at Queen's University in Kingston, Ontario in 1998. He is an Astronomer at the Dominion Astrophysical Observatory in Victoria and is a member of the Canadian Astronomy Data Centre. Among his areas of interest is the outer solar system, including the Kuiper belt. This specialty has enabled him to assist in selecting a follow up target for the New Horizons spacecraft after it flew by Pluto. While studying irregular planetary satellites, Kavelaars and his team discovered 23 moons surrounding Saturn, Uranus, and Neptune. In 2016, he discovered the sixth known dwarf planet in the solar system.

Reg Dunkley

Upcoming Speaker for RASC Monthly Meetings

Wednesday, April 13th, 2019 Dr. Karun Thanjuvar
Machine Learning and the Big Data Tsunami

Borrowing Telescopes

The RASC Victoria Centre has telescopes for new and seasoned observers that members can use. For more information contact Sid Sidhu at telescopes@victoria.rasc.ca

Hill and Dale (Observing on the Island)



The snowy weather and resulting power outages put a dent in the plans of a lot of amateur astronomers this month. For those lucky enough to catch a peek between the cloudy patches and brave the cold, they were able to get a last look at Comet 46P Wirtanen and a first glimpse of Comet C/2018 Y1 Iwamoto. Bill Weir was generous enough to share a sketch he made of Comet Iwamoto (*seen below-right*), from observations made through a 150mm reflector telescope. The lunar eclipse is behind us, but a lot of people are still taking photos of the Moon. For those of you interested in photographing the night sky, the Moon offers a pretty forgiving subject and doesn't require a lot of gear the way deep space astrophotography does.

For a lot of people in the Vancouver Island astronomy community the place to be was AstroFest, hosted by the Nanaimo Astronomy Society. Also present were representatives from RASC Victoria, the FDAO, the Cowichan Valley Starfinders, and the Island Stars Observatory on Hornby Island. Speakers from the various groups had tables and made presentations; there was a social; and Quarky Science provided the door prize.

At the Victoria Centre Observatory Centre, February meant a continuation of the technical issues that have plagued our Centre's primary telescopes. Matt and Dan have spent a lot of hours trying to fix the collimation issue that our 16" Ritchey-Chretien is having, without any results. The technical committee

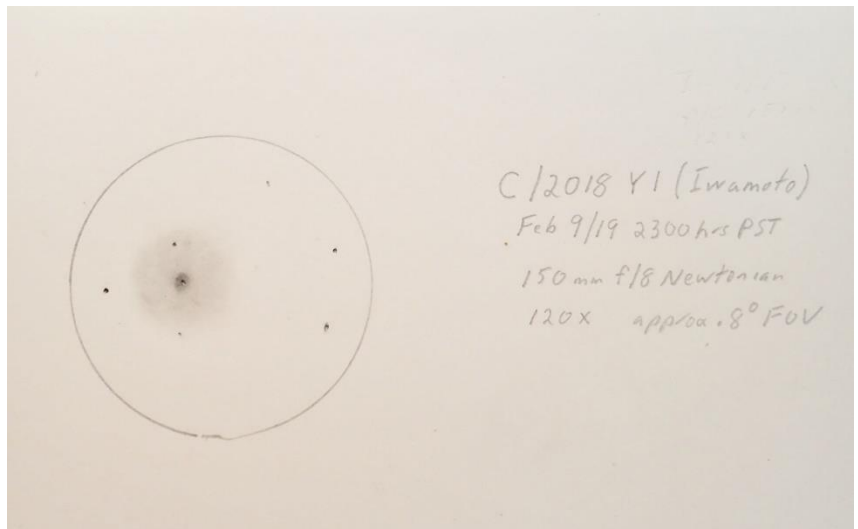
had a meeting, hosted by Bruno, and have ordered a Takahashi collimating telescope to have another go at getting our telescope back in operation. The 20" Obsession Dobsonian reflector also remains in pieces, with the snows and scheduling standing in the way of work parties going up to the Hill to put it together.

A reminder that 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). Because it is located on NRC property, all visitors to our observatory must be on our observer list. 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

New Observers Group

Hosted by Sid Sidhu - 1642 Davies Road, Highlands. Call 250.391-0540 for information and directions.

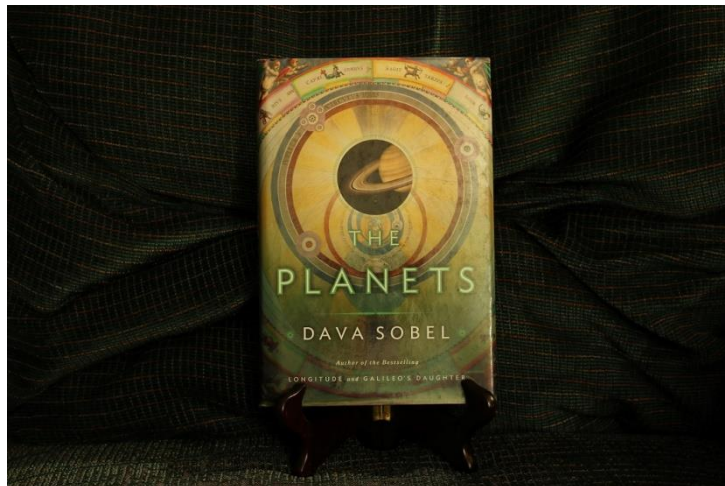




Dan working on the collimation of the Ritchey-Chretien telescope at the VCO, picture by Matt Watson

From the Library

After our monthly meeting, feel free to join your fellow RASCals up socializing in the astronomy faculty lounge on the 4th floor of the Elliott Building, where you can also have coffee, juice, and cookies. It's where our RASC Victoria Library is housed, with over 500 titles, curated by RASC Victoria's Librarian: Diane Bell. Our library covers many aspects of astronomy: observing, astrophotography, telescope construction, space exploration, astrophysics, and much more. Every month, SkyNews will be featuring a new selection from our Centre's library, complete with a brief book review.



This month we're taking a closer look at **"The Planets" by Dava Sobel**. This book brings the reader back to the enthusiasm of grade school, when we first started learning about astronomy and in particular the planets. Sobel is well known for bringing science to the literary community, having written *Longitude*, *Galileo's Daughter*, and *the Glass Universe* (the source material for several recent talks at Astro Café). Her style of writing is both personable and engaging, creating the scientific version of a page turner. It's something ideal for the winter months and a book you can sign out from our very own library.

Bruce Lane

Better Know a RASCaI

We're continuing with our series of interviews done with members of the RASC Victoria Centre, to give you a better idea of the different perspectives and experiences of other amateur astronomers. Our fourth interview is with Joe Carr, who for quite some time has been running the website and Zenfolio astrophotography hosting site for RASC Victoria Centre. He has held a number of different roles on Council over the years, and at one time was both the Treasurer and President (something a multi-role president like Reg can commiserate with). He's participated in a ton of public outreach over the years and is an active astrophotographer. He's also well known for combining amateur astronomy with tourism, and has traveled to see four eclipses during his travels around the world.



SkyNews: How long have you been a member of RASC?

Joe: I was a member of RASC when I was a kid growing up in the Cowichan Valley. My Grade 6 teacher, Mr. Malcolm Riley, took our class out on the playing fields at night to observe the night sky using the Observers Handbook as a guide, along with binoculars, and even some modest telescopes. I credit Mr. Riley for igniting my interest in astronomy, but like many members I know, my childhood passion took a backseat to "life" for several decades. I rediscovered astronomy in 2000, joined the RASC in late 2001, and decided to become a Life Member in 2004. So officially I have been a member of RASC for 18 years.

SkyNews: What was your first telescope?

Joe: I still have my first telescope and tripod, which I bought when I was a kid - one of those awful refractors on a virtually unusable mount. I keep it as a reminder to never inflict such a useless instrument on others.

SkyNews: What's your primary interest these days in astronomy? (public outreach, observing, astrophotography, reading SkyNews, etc.)

Joe: Astrophotography is a passion of mine, but I also enjoy visual observing with binoculars. I love climbing into a zero-G reclining lawn chair and sweeping the summer sky with my Canon IS binoculars from a dark site. My interest in astrophotography grew out of my other lifelong interests: personal computers, photography, appreciating the natural systems, traveling the world, and getting geeky stuff to work. When all these things converged in the early 2000's, I was in nirvana!

SkyNews: What's your favourite RASC public outreach or in-reach event and why?

Joe: Being a member of the Active Observers Group is the best of all worlds for me personally. It is wonderful to be able to drive to Observatory Hill, use Victoria Centre Observatory's (VCO) superb equipment for visual observing or astrophotography, socialize with my fellow RASC members as we enjoy the celestial objects in front of us, and do it all in relative comfort. I also enjoy my participation in the Technical Committee, which keeps me involved in the decision-making and problem solving aspects of running the VCO on behalf of my fellow members.



Planets in the Morning, by David Lee

SkyNews: What is your favourite book on astronomy?

Joe: New Atlas of the Moon by Thierry Legault and Serge Brunier (Firefly Books, 2006) is an amazing work that stands the test of time. It can simply be an eye-popping coffee table book, but it is very useful as an aid to studying the Moon, since the day-by-day large format photos with overlays makes discovering lunar features so easy. The action on the terminator can be a great motivator for new observers of the Moon. This lunar atlas presents gorgeous eye candy to everyone who cracks it open, and makes Earth's satellite an enticing observing target to explore (*Ed. This is one of my favourite books too*).

SkyNews: What's your current telescope(s) and what do you think about it?

Joe: I currently have three telescopes: a Borg 101mm ED f/4.1 Astrograph apochromatic refractor, a Sky-Watcher 6" f/8 Dobsonian, and a Lunt Solar Systems LS60THa/LS50FHa double-stacked solar telescope. I no longer have any "big glass", since as I age, I find I don't have the strength or desire to heave around heavy gear, and those needs are well-served by the VCO's superb 16" TPO Ritchey-Chretien telescope, permanently mounted on the Paramount ME. I use the Lunt solar telescope the most to observe during the daytime - my kind of observing! The Borg Astrograph gives me a superb imaging telescope to use with my modified DSLR camera. The 6" Dob is great for quickly setting up on the front deck or driveway, when I need to get close to a planet or star cluster from the city. All three scopes can be mounted on my Sky-Watcher HEQ5 equatorial tracking mount.

SkyNews: How does technology figure into your experience as an amateur astronomer, beyond the telescope itself?

Joe: As I stated above I am a confirmed geek, so when technology converges and astronomy is involved, I'm likely to be there trying to make it work! I also decided to go paperless about a decade ago, so my observing log is computer-based and available online (see link below to my personal astronomy web page). As Victoria Centre's webmaster, I try to help others fulfill their expectations for their astronomical journey by providing them with the online resources to make their quest easier. I support Victoria Centre's public outreach efforts through the website and social media - ensuring all the important events we offer are well-covered and easy for the public to find online.

SkyNews: What is the next thing you want to do as an amateur astronomer (complete an observing list, familiarize yourself with something, observe an object, astrophotography project, etc)

Joe: I view my interest in astronomy as part of my life, so my astronomical interests are more evolutionary rather than revolutionary. My astronomy interests evolve slowly with a view for the long term. I have observed four total solar eclipses in my lifetime, and I want to add to that roster.

SkyNews: How has being an amateur astronomer made your life better?

Joe: Being a part of RASC Victoria is so rewarding to me personally. I confess that I enjoy the social aspects of astronomy as much as the observing. The members I've met over the last couple of decades have enriched my life, and challenged me to tackle new astronomical projects. I'm sure my positive experiences will continue as long as Victoria Centre continues to thrive and grow. Astronomy also enriches my travel experiences in my lifelong quest to see the world and its people. Celestial objects are visible from a ship's deck in the middle of the Pacific Ocean, from desert camps in Arabia, while on safari in the depths of Africa or Borneo, from 14,000' above the ocean on Mauna Kea in Hawai'i, and even from big cities. At those locations (and many others), I often meet people who share my passion for astronomy, and we share in the sublime experience of the moment.

SkyNews: What are all the Council positions you've held over the years and what's your favourite accomplishment while on Council?

Joe: I'll answer the last question first, since it's the easiest! As Victoria Centre President a decade ago, we were fortunate to be given the opportunity by the National Research Council to finally establish ourselves on Observatory Hill by building our own observatory. Making that opportunity into a reality, and motivating my fellow members to get involved remains my favourite memory of my service to Victoria Centre. The palpable thrill of having long-term RASC members come up to me with their eyes shining with pride once the construction was complete is a memory that continues to make me smile. In addition to being President, I have also filled the roles of: Secretary, Vice-President, Treasurer, Past President, Skynews Editor, and Webmaster.

More info about Joe's interest in astronomy can be found on his personal website - <https://joecarr.ca/interests/astronomy/>

SkyNews: Thanks, Joe. You've certainly been a strong and sensible voice on Council for as long as I've been there. I'm not sure if I would have been able to convince the rest of Council to rein in our out of control spending, with the financial challenges of the National Assembly coming to Victoria, without Joe in my corner in my first council meeting as treasurer.

The Expanding Universe

On August 18-20th, 1914 the American Astronomical Society are holding their summer gathering in Evanston, Illinois. The AAS holds two major meetings a year, one in summer and one in the winter. The normally reclusive, Vesto Slipher is there as a guest speaker, giving a presentation on the findings of his 16 spectrographic plates of galaxies, to show that 11 of the 16 are moving away from us and at great velocity. Vesto Slipher receives a standing ovation from the American Astronomical Society members in attendance and our perception of the Universe will never be the same again.

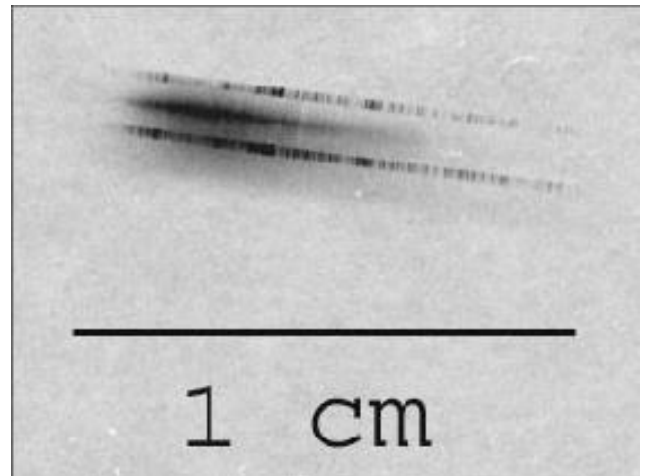
When someone takes an interest in astronomy, they'll often buy a telescope. When someone as rich as Percival Lowell takes an interest in astronomy, they build a private research observatory on a hill. Lowell built his in what became known as Mars Hill in Flagstaff, Arizona. Lowell was adamant about operating completely removed from any interference from the government or any university, in part because he was obsessed with the canals on Mars, something a lot of serious astronomers weren't very supportive of. He was hardly the first person to become a little Mars canal crazy, but he was the only one to fund a major observatory to study



them. Lowell published three books about the idea of Martian civilizations. The money behind promoting those books and views likely had a lot to do with the staying power of that belief in popular culture. The obsession over Mars canals began decades earlier, during the 1877 opposition of Mars, when Giovanni Schiaparelli made a series of observations and published his findings. Schiaparelli referred to some lines he observed on the surface of Mars, as “channels”. The word “channels” was mistranslated into English as “canals”, leading to wild speculation about civilizations on Mars and a few terrible science fiction movies in the second half of the 20th Century. Even now, in the Information Age, you can find corners of the Internet dedicated to unmasking the government cover-up of Martian civilization in the same way people talk about the Earth being flat or how aliens made all our shiny technology (*for more information about this I would instead suggest reading about actual things, because there is a lot of real science out there to learn about*).

Vesto Slipher was hired by Percival Lowell for a short term job in 1901, at the Lowell Observatory on Mars Hill, as a favour to one of Lowell’s former university professors. Vesto Slipher had just completed his doctoral paper, *Spectrum of Mars*, about the planet’s atmosphere. Lowell didn’t really want him and Slipher really wasn’t very interested in searching for cities on Mars. Despite this, Slipher would continue his work at the Lowell Observatory for another 51 years. His brother, Earl Slipher, was perfectly happy studying Mars and he also spent many years working at the Lowell Observatory.

Astronomers, at the turn of the 20th Century, were puzzling over spiral nebulae, as galaxies were then known as, which at that time were believed by most to be objects that existed as part of our own galaxy. Lowell gave Vesto Slipher the use of the latest in spectrograph technology and the Clark 24” refractor to make observations on the rotation of spiral nebulae. Slipher quickly realized that he was also observing the Doppler Effect: the movement of these spiral nebulae in relation to Earth. What was apparent from studying the spectrographs was that the vast majority of the spiral nebulae were red shifted (moving away), compared to very few of them being blue shifted (moving towards us). What was also clear was that these spiral nebulae were red shifting at speeds averaging 2 million kilometers per hour. The idea of spiral nebulae being other galaxies wasn’t new. English astronomer, Thomas Wright published “*Original theory or new hypothesis of the Universe*” in 1750, referring to spiral nebulae as other galaxies, and Immanuel Kant was famous for reading it and repeating Wright’s ideas five years later. By the time he made his presentation to the American Astronomical Society in 1914, Vesto Slipher had completed 16 spectrographs, with only 2 of the spiral nebulae blue shifted (*Andromeda, seen right*). Edwin Hubble was among those in attendance, when Vesto Slipher made his presentation.



Slipher used his mechanical knowledge to further refine the spectrography instruments, at the Lowell Observatory, to complete a total of 25 spectrographs by 1917, when he published his findings in the *Proceedings of the American Philosophical Society*. Sadly, Vesto Slipher wasn’t aware of Einstein’s work on relativity and Einstein was unaware of the work being done by Slipher, or Einstein would have discarded the idea of a cosmological constant. That and I wouldn’t have had to argue with my high school science teacher, when the static universe was presented in the text book as the most accepted cosmology model nearly 70 years later. The *New York Times* did a story in 1921, on Slipher’s spectrograph of NGC 584, red shifting away from us at 2000 kilometers per second. It was becoming very clear that spiral nebulae were much further away from us than previously believed. In 1922, a Russian mathematician, by the name of Alexander Friedmann, would publish equations that fixed Einstein’s own theory, to show an expanding universe. In the same year, Edwin Hubble asked for and received Slipher’s data on spiral nebulae velocities for a book he was writing about relativity. Hubble was slow to connect the dots between red shifting and expansion, because some of Hubble’s own incorrect data didn’t support that finding. Hubble was also looking for equations to make sense of it all and was running into problems because of the accepted age of the Universe was then less than 2 billion years old.



Andromeda Galaxy, by Joe Carr, taken at 2018 Island Star Party, in Bright Angel Park

In 1928, Harold Robertson used Slipher's data to write a paper titled: *"It appears that a relation between red shift and the distance can be established from these data giving a rough verification of Friedmann's prediction"*. Hubble would go on to publish his own findings in 1929, making extensive use of the data of Vesto Slipher and others, but Hubble failed to give Slipher any credit for his work. Later, when Hubble used Slipher's data on the rotation of galaxies, he started giving him credit for that and future uses of his work.

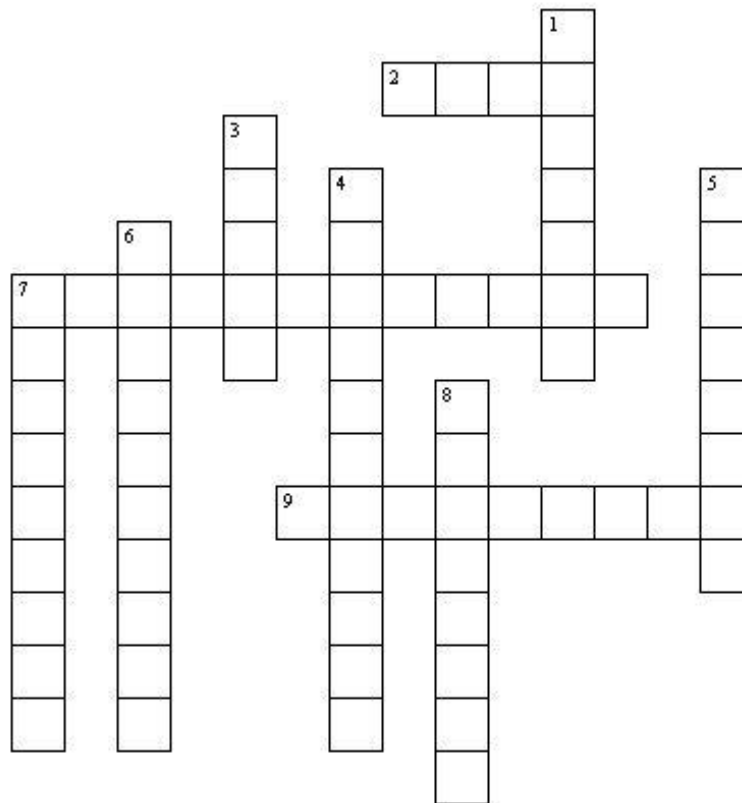
Percival Lowell enthusiastically embraced the hunt for Planet X, hoping its discovery would restore his credibility in the scientific community, but he died in 1916 without having achieved his goal. Vesto Slipher was put in charge of the Lowell Observatory until he retired in 1952. However, between 1916 and 1929, the Lowell Observatory was barely operational; due to Percival Lowell's widow contesting her husband's will and wanting the all the money for herself, instead of it being used to fund his legacy observatory. Once the funding was restored to the Lowell Observatory, Vesto Slipher hired Clyde Tombaugh to the Planet X project and trained him in the use of the equipment being used. Tombaugh was an enthusiastic amateur astronomer, with only a high school education when he was hired on at the Lowell Observatory, but he excelled in his work. Vesto Slipher soon tired of hunting for the elusive Kuiper Belt object and went back to doing spectrographs of galaxies, using the 24" Clark refractor. After ten months of meticulously searching the night sky, with a 13" astrograph telescope, Tombaugh discovered Planet X in 1930 and Pluto became the 9th planet of our Solar System.

Not long afterwards, Clyde Tombaugh left the Lowell Observatory to earn a degree in astronomy, after having already made a major contribution in his chosen field. It's difficult to say if Tombaugh would have been credited with the discovery of Pluto, if someone other than Vesto Slipher was the team lead in the hunt for Planet X at the Lowell Observatory. The history of science has more than its share of uncredited discoveries revealed long after the fact and the ones we know about are likely only the tip of the iceberg.

Because Vesto Slipher spent his entire career working at the Lowell Observatory and the association between that institution and the Mars canal fad, Slipher was likely never given the credit he deserved for changing our perception of the universe. He also wasn't a big self-promoter and tended to shy away from the public limelight. That and it's rare for scientists to enjoy learning that everything they know and have published about is wrong. When Alexander Friedmann corrected Albert Einstein, Einstein's first reaction was a rebuttal, which he soon retracted, after realizing that Friedmann was correct. There is a Slipher crater on the Moon and Mars, as well as asteroid 1766 Slipher, named after both Vesto and his brother Earl, for their combined careers in astronomy.

Bruce Lane

March Astro Crossword



Down:

- 1) Name of deep space objects list that aren't comets
- 3) Prominent constellation in the southern sky at night these days
- 4) Aligning mirrors or lenses on a telescope
- 5) From where Pluto was discovered
- 6) Type of telescope used for photography
- 7) Joe Carr's favourite cookies at Astro Café
- 8) Name of local 1.83 meter telescope

Across:

- 2) Colour of Neptune, when observed through a telescope
- 7) He discovered galaxies were predominantly red shifting away from us
- 9) Author quoted in several recent Astro Café presentations

Astronomical Term of the Month: Collimation

Telescopes with mirrors and lenses require that they are all aligned properly, to ensure that you get a sharply resolved image. Refractor telescopes (should always) come properly collimated from the factory and unless they get dropped down a flight of stairs might never require collimating again. Reflector and catadioptric telescopes both require you to occasionally align the mirrors, some more than others. Reflector telescopes require regular maintenance, aligning the secondary and primary mirrors, but are generally designed to be easy to collimate. Schmidt-Cassegrain, Maksutov, and Ritchey-Chretien telescopes seldom need to be collimated, but these catadioptric telescopes are much more difficult to work on because of their more complex designs.

I often use a laser collimator to quickly collimate my 254mm Dobsonian reflector, but for my 203mm Schmidt-Cassegrain telescope I would require a much more expensive, triple beam laser, to account for its folded light path. With the Schmidt-Cassegrain telescope, there is the added difficulty that when I'm using an unfocused star as a light target for doing my collimation, I'm looking through one end of the telescope and blindly fiddling with a screwdriver at the other end, while trying not to scratch the correcting lens.

Bruce Lane

RASC Victoria Centre Council 2018 / 2019

Position	Name	Email
Past President	Chris Purse	pastpres@victoria.rasc.ca
President	Reg Dunkley	president@victoria.rasc.ca
First Vice President	What do you mean this is still vacant?	vp@victoria.rasc.ca
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FDAO Liaison	Laurie Roche	
UVic Liaison	Alex Schmid	
Observing	David Lee	Li-Ann Skibo
	Dan Posey	John McDonald

In Closing

It was a good month to spend indoors reading, when the power was on, and in between the drudgery of shoveling snow off of the sidewalks and driveways. There were a few clear nights at the end of the month, albeit cold and sometimes very windy nights. The early administrative work of the annual general meeting is behind us. For those of you, who braved the winter crossing of the Malahat to attend the Vancouver Island Astronomy AstroFest, it was reportedly well worthwhile and a great way to end the month. The Nanaimo Astronomy Society played host to the many organizations on the Island involved in the amateur and professional astronomy community, with guest speakers invited to represent the various organizations. They're already talking about doing AstroFest again next year and maybe holding it after March, when the winter driving restrictions on the Malahat ease up. Congratulations to the organizers, especially to Janeane, Tony, and Chris, for making this event happen.

Bruce Lane: SkyNews Editor

Photography Credits

Page 1: New Moon through the Trees, February 6th, 2019; by Diane Bell

Page 2: Crop of Bruce Lane (SkyNews Editor) at 2013 RASCAl Star Party in Metchosin, by Chris Gainor

Page 3: Crop of Reg Dunkley (RASC Victoria President) at 2018 AGM, by Joe Carr

Page 3: VCO still snowbound, February 27th, 2019, by Reg Dunkley

Page 4: Scene at AstroFest, in Nanaimo, February 28th, 2019, by Bill Weir

Page 5: Photograph and Design of Astro Cafe Mug; by Joe Carr

Page 6: Father-in-law using telescope in the snow; taken February 12th, 2019 by Randy Enkin

Page 6: Sketch of Comet Iwamoto, as seen through 150mm reflector telescope, February 9th, 2019, by Bill Weir

Page 7: Dan working on the collimation at the VCO, February 2nd, 2019, by Matt Watson

Page 7: Posed Book, "The Planets, by Dava Sobel"; taken on February 23rd, 2019, by Bruce Lane

Page 8: Crop of Joe Carr, taking delivery of his Tesla car, December, 2015, by Eric Jenkins

Page 9: Planets in the Morning, February 2nd, 2019, by David Lee

Page 10: V.M. Slipper; print from a glass plate negative, Lowell Archives "cropped from family photo 215")

Page 11: Spectrograph of the Andromeda Galaxy, made from the Lowell Observatory, by Vesto Slipher

Page 12: M31, M32, M110 - Andromeda Galaxy, at the Island Star Party in Bright Angel Park, August 10th, 2018, by Joe Carr. This image is a stack of 11 light frames, processed in ImagesPlus 6.5 and ACDSee Photo Studio

Call for Article and Photo Submissions for the April Issue

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