

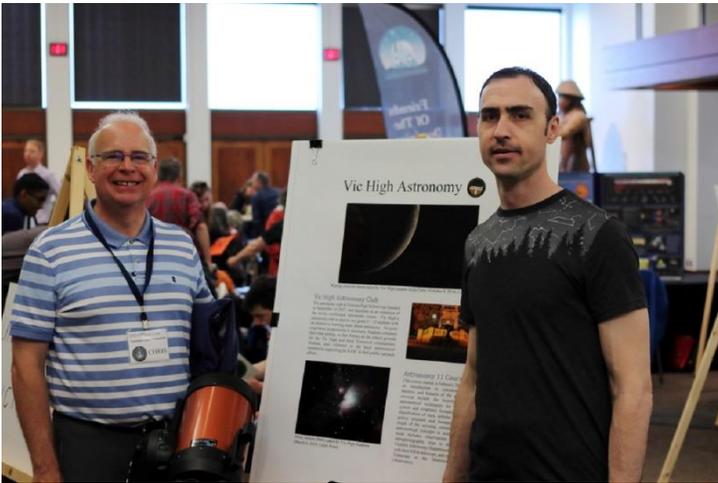


RASC Information Desk for Astronomy Day at the Royal BC Museum, photo by Chris Gainor

## An Astronomy Day of Our Very Own

Western Canadians are often accused of doing things on their own terms and RASC: Victoria Centre is no exception. While the other Centres across Canada are still making their preparations for Astronomy Day, on May 11<sup>th</sup>, we decided to celebrate a couple weeks early. In fact, we've rarely held Astronomy Day events on the designated day, being more concerned with site scheduling and in recent years having the public outreach event coincide with the first of the season's Saturday Nights at the Plaskett Telescope. Essentially, for people accustomed to viewing the light from galaxies that took millions of years to reach their eyepieces, time is relative.

On April 27<sup>th</sup>, the astronomy community of Greater Victoria and beyond descended on the Royal British Columbia Museum for one of our largest public outreach events of the year. While the rain chased the solar telescopes inside, a large group of volunteers continued their work in the museum lobby. The event is organized every year by RASC, but they were joined by: the FDAO (Friends of the Dominion Astrophysical Observatory), the NRC (National Research Council), the University of Victoria Astronomy Department, Camosun College Astronomy Department, Victoria High School



Astronomy Program, Shawnigan Lake School Astronomy Program, and Science Ventures. Astronomer, JJ Kavelaars gave the feature presentation in the Newcombe Auditorium about Ultima Thule and the New Horizons mission. David Lee was the RASCAl in charge of organizing this event for us and broke things down into smaller teams to coordinate the myriad of activities on the lobby floor. We had an information desk, miniature planetarium, astrophotography display, a light pollution education table, a colouring and crafts area for the kids, an assortment of different telescope designs set up for the public to observe “distant” astronomy targets, and solar telescopes outside while the weather was still favourable. Colin Wyatt was behind the table dedicated to teaching

telescope construction and can be seen (*bottom right*) posing with a homemade Foucault’s knife-edge tester. This device was invented by Leon Foucault in the mid-1800s and is still used by amateur astronomers during the mirror grinding process, because it’s both exceptionally accurate and economical.

At 4pm, RASCals packed everything up at the Royal BC Museum, with many of us heading up to Little Saanich Mountain for the second half of Astronomy Day festivities. The Summer Saturday public outreach events are organized by the FDAO, with a large contingent of RASC volunteers. Michel Michaud is often there, as he’s one of the few RASC members authorized to operate the massive Plaskett Telescope, still in use today by the NRC. For the other RASCals, it’s out on the parking lot showing the public the night sky through telescopes of more modest aperture or helping out with the various other activities on the Hill. In addition to the Plaskett Telescope, there is a 16” telescope, in a dome attached to the Centre of the Universe (public outreach building), where you’ll often find Sherry Buttner. For the first of the weekly scheduled speakers for the DAO Saturday Star Parties, Elizabeth Tasker (astrophysicist) got together with Ria Voros (novelist) to give a lecture on *Science & Storytelling: How discoveries of new worlds help tell stories of family*.

The Saturday evenings at the Plaskett Telescope are as enjoyable as they are because of the feeling of comradery among the volunteers and the fact that the members of the public who are there because they wanted to be there. Out on the parking lot, behind our telescopes, there are people I’ve carried on conversations with over the years that I rarely see anywhere else. The conditions for astronomy were excellent, with clear skies and no wind.

At the end of the evening, when went to retrieve my car that I’d parked at the 1.2 meter McKellar Telescope, I ran into Bob Nelson, Vice President of the RASC: Prince George Centre. He invited inside the McKellar Observatory and showed me some of the work he was doing with a remotely operated telescope in Arizona. Bob Nelson led the ambitious, volunteer project to build the Tabor Mountain Observatory, located outside of Prince George, as both a public outreach and club observatory. Last year we sold Prince George our old 14” Schmidt-Cassegrain and it’s currently in service on Tabor Mountain. It just goes to show that you really never know who you’re going to run into on the Hill. For those who missed it this time around, next year’s Astronomy Day is on May 2<sup>nd</sup>. Just don’t expect the RASCals of the Victoria Centre to hold our Astronomy Day events on that particular day.



*Bruce Lane*



Long exposure shot of the Plaskett Telescope parking lot, during Astronomy Day activities, photo by Bruce Lane

## Editorial Remarks



While the Messier Marathon was cancelled due to rain, those of us who volunteered at the annual Vancouver Island Science Fair were overwhelmed by both the enthusiasm and scope of the presentations by young scientists. In times when the daily news can darken a person's heart, taking part in a science fair on this scale is very rejuvenating and gives you little more hope for our collective future.

Astronomy Day seems to have heralded the coming of some exceptional observing weather, so hopefully RASCals will take full advantage to get outside for some night sky viewing and astrophotography. I won't tell the mosquitos if you don't. Plans are already underway for our upcoming RASCAl Star Party, September 27-29<sup>th</sup>, at St Stephen's churchyard. It's a little later than usual, owing to our need to dodge all the

long weekends, but still ensure a new moon for the best astronomy results. At least we'll also dodge the wildfire smoke. In this month's issue of SkyNews, there's an interview with Chris Gainor, the first article in a series about the telescope aperture race, astrophotography images from your fellow RASCals, and all the usual articles you've come to expect.

*Bruce Lane: SkyNews Editor*



Pinwheel Galaxy (M101), by Reg Dunkley

## President's Message for May



April was a momentous month for the astronomical community. On April 10<sup>th</sup>, an image of the shadow of a black hole, at the centre of the enormous galaxy M87, was released to the public. The image itself looked like a glazed donut sitting in a Tim Horton's display case. It was the donut hole that generated the buzz. This was the first direct visual evidence of the existence of a black hole. It was obtained by the Event Horizon Telescope, a collection of 8 facilities distributed around the globe that simultaneously collected data for the same object. The signals, collected at the millimetre wavelength, were combined together using Very Long Baseline Interferometry, a technique first pioneered in Canada in 1967. This array, almost spanning the diameter of the earth, has a remarkable resolution and could detect a grapefruit lying on the lunar surface. Extraordinary precision was required to pull

this off and the fact that it actually worked is cause for great jubilation. It is also a wonderful example of what can be achieved when nations around the globe agree to work together. This is just the first of many remarkable objects that the Event Horizon Telescope will examine. Rumour has it that the black hole at the centre of the Milky Way will be the next target.

April was also a great month for the Victoria Centre. On Saturday the 27th, RASCals rallied at the Royal BC Museum for Astronomy Day 2019. Together with RASC, eight other organizations joined in this celebration of Astronomy. The smooth roll out was a tribute to the excellent planning effort by David Lee and the wonderful cooperation of the RBCM. Four speakers delivered interesting presentations in the adjacent Newcombe Conference Hall. In the evening Victoria RASCals gathered together with their "cousins" in the FDAO to co-host the first Saturday Star Party of the season. The weather was wonderful and there was an impressive array of RASCAL telescopes assembled in the parking lot adjacent to the Plaskett Dome. A heartfelt thanks to all the RASCAL volunteers who helped make Astronomy Day a great success. It was a great launch to the 2019 Outreach Season.



One tireless RASCAl, Lauri Roche could be found setting up on Friday, hosting the children's activity table at the Museum on Astronomy Day and playing a lead role at the Star Party in the evening. This is just one of many examples of Lauri's passion for and devotion to astronomical public outreach and education. Victoria Centre Rascals were thrilled to learn that Lauri will be receiving the prestigious RASC Service Award when she attends the General Assembly in Toronto in June. There have only been two Victoria Centre winners in the last 31 years and Lauri richly deserves this honour!

Speaking of outreach, the Victoria Centre has just acquired a new 40 inch monitor that is ideal for displaying astrophotography at events. During most of the summer it will be situated next to our Victoria Centre welcome table at the Centre of the Universe. This offers a great opportunity to enhance our visual offerings at the welcome table. In addition to showcasing Victoria Centre astro photos it can also be used to demonstrate a host of astronomical topics or sharing those amazing video clips with the public. This could be a lot of fun when all you need is a thumb drive or a lap top to put on a show. Give it your consideration. It could be the next big thing!

Those who attended the presentation by Dr. JJ Kavelaars on Astronomy Day are aware of the important contribution that JJ and the Canadian team made when selecting Ultima Thule for the New Horizons followup mission. A professional conference on the New Horizon's mission will be held at the Victoria Conference Centre in May. At 7PM on Tuesday, May the 14th, Dr. Kelsi Singer will be delivering a free public lecture: *The New Horizons Mission to Pluto and Beyond*. The Victoria Centre will have a table at the Victoria Conference Centre that evening. We hope to see you there!

*Cloudless Nights,*

*Reg Dunkley*

### **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 evening 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.



Last month, we had full variety of offerings, along with all the regular presentations by RASCals of their travels and astrophotography. On the first Monday night, John McDonald gave a short presentation on white dwarfs and Chris Purse continued his series of addressing topics from the Astronomer's Handbook. For the next Astro Cafe, David Lee gave a talk on using tracking mounts for astrophotography; Marjie W. made a presentation about her latest adventures in Egypt and Jordan; and our wayward Victoria RASCAl, Francois Pilote of the Comox Valley Astronomical Club, paid us a visit. On the third Monday of the month, Ken Mallory gave a presentation of our nearest star and once again Chris Purse ran a session of Astronomy Handbook 101. For the Earth Day edition of Astro Café, Randy Enkin gave a talk on black holes and Nathan brought his Science Fair presentation on lunar crater formation. For the final evening the focus was on binoculars. 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

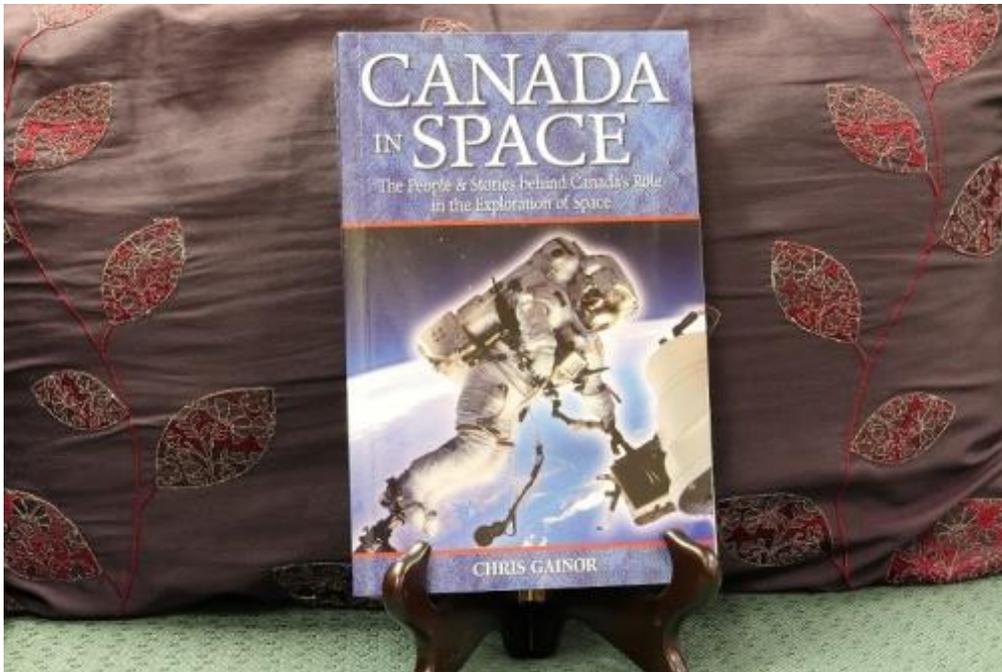
**7:30 PM, Wednesday, May 8<sup>th</sup>; 2019 in Room A104, Bob Wright Centre, University of Victoria  
Members Night!**

For May, the monthly meeting speaker is you or someone like you. The list of speakers and topics hasn't yet been finalized, as of the time this issue of SkyNews was written, but at least once a year there's a night set aside for members to give short presentations during our monthly meetings at UVic. If you don't have anything ready this time around, it's something to give some thought to for next year. Astronomy Café provides similar opportunities to members wanting to do short presentations, but at a smaller venue.

*Bruce Lane*

## From the Library

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



This month we're taking a closer look at **Canada in Space** by **Chris Gainor**, who should be a familiar name to many RASCals. He's been a long time member of our Centre and is currently the National President for RASC. Chris Gainor is also this month's interview for Better Know a RASCal. *Canada in Space* is an informative look at the efforts of both government and our aerospace industry to tackle the new frontier of space. This book focuses on the time between the post-Sputnik space race, with our nation's pioneering aerospace work on satellites, and the early experiences of Canadian astronauts aboard the International Space Station (including Chris Hadfield's 2001 mission to install Canadarm2).

*Bruce Lane*



Rosette Nebula, from Plaskett parking lot, March 30th, 2019; by Clayton Uyeda

### **Hill and Dale (Observing on the Island)**

March ended with an observing session at the Victoria Centre Observatory, where we got our first look through the new 20" Obsession Dobsonian reflector. The quality of these instruments is not in any way overstated, as you could smoothly move the well balanced telescope with one finger. First light on the mirror, as a Centre telescope, was from Sirius and then we moved on to look at a series of Messier objects, including the Orion Nebula. Later, we viewed M42 through an Oxygen III filter and were rewarded with even more structure in the nebula. There was a long ISS pass overhead, which both Charles and Nathan imaged. Nathan and Katherine, Luis and Nina, Reg, Michel, Charles, and I were down at the VCO, while David and Clayton were imaging from the Plaskett parking lot. We all appreciated the work done by Bruno and Kurt, getting the Obsession Dobsonian telescope assembled and collimated in time for that evening's observing session.

After a few weeks of rain and clouds, Joe Carr and Sherry Buttner hosted an observing session up at the VCO. They were joined by Nathan and his father, Martin, Diane, Clayton, Garry, and me. For several observers, it was the first chance to get to use the 20" Obsession Dobsonian telescope, but unfortunately it was under less than ideal conditions. The longer days of springtime collided with the bright, rising Moon, to make it very difficult to see any deep space objects. We did get a nice and possibly last view of the Orion Nebula though, before it sank into the sunset. Clayton did some imaging of the Leo Triplet, from the Plaskett parking lot. Matt and Dan were once more hard at work on the collimation issues plaguing our 16" Ritchey Chretien telescope. RASC Victoria Council has approved funding the crating and shipping of the massive telescope, to send back to the supplier to get worked on. The Technical Committee will be meeting soon to decide on the next step.

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](mailto:membership@rasc.victoria.ca) and we'll see you up there on the Hill some night soon.

*Bruce Lane*

## Aperture Fever



George Ellery Hale was the man to push for the construction of the largest telescopes in the first decades of the 20<sup>th</sup> century. While Hale came from a well off family, unlike the astronomer who oversaw the construction of the Palermo Observatory and accidentally discovered Ceres, Hale was both an experienced astronomer and inventor. When he was still an undergrad at MIT, he invented the spectroheliograph and later used the device to make the discovery that sunspots had powerful magnetic fields. His work furthered our understanding of the well-known 11 and 22 year solar cycles that solar astronomers still focus on today. George Hale would share credit for inventing the spectroheliography with Henri Alexandre Deslandres, a French astronomer who independently made one of his own. Hale went on to become head of the astronomy department at the University of Chicago. His high society connections gave him an edge as a fundraiser, making him the ideal director to oversee the construction of the Yerkes Observatory (paid for by streetcar and railroad car manufacturer, Charles Yerkes). Inspired as a child, by Jules Verne's *From Earth to the Moon* and its 4877mm (192") aperture telescope, George Hale wanted his new observatory to have biggest and best telescopes in the world, but to do this he would need the services of a master optician.

George Willis Ritchey inherited his love of optics, from his father, who was himself both an amateur astronomer and telescope maker. He studied drawing and design at the University of Cincinnati, becoming an assistant at their observatory and spent long hours reading anything he could find about astronomy. He was especially inspired by the astrophotography pioneers, Isaac Roberts and Andrew Commons, both of whom did their best work using reflector telescopes. After he completed his studies at the University of Cincinnati, he took a job teaching woodworking in Chicago; spending his spare time perfecting his mirror grinding skills in his workshop. Ritchey met Hale in 1891, at the first meeting of the Astronomy Society of the Pacific: Chicago Section, hosted by Hale at his private, residential observatory. Five years later, Hale hired Ritchey to work at the Yerkes Observatory.

It's ironic that Hale had already ordered the largest refractor in the world for the observatory, before Ritchey started work there, because the two of them would be among those most responsible for bringing the Great Refractor Era to an end. Hale and Ritchey were both in agreement that the biggest telescopes of the future would be reflectors. Hale's father agreed to pay for their next big project, but died part way through the project, forcing Hale to seek out other donors. There was a lot of opposition against using large reflectors for observatories, but those voices were for the most part silenced when James Keeler gave a makeover to the 914mm (36") Crossley reflector, at the Lick Observatory, using the latest available silvering techniques. It didn't hurt their cause that images made using the newly refurbished Crossley telescope were strategically displayed at the Yerkes Observatory. Ritchey, an avid astrophotographer, made numerous images with the 609mm (24") reflector telescope he built, as a prototype for the larger ones to come. Hale distributed these pictures widely, in the hopes of drumming up more funding for his project. Ritchey also used the giant refractor to take some stunning photos of the Moon, which were widely published.

For their massive reflector telescope, a new observatory was needed and Hale secured funding from the Carnegie Institute. The Mount Wilson Observatory was constructed in the mountains north of Pasadena, California. When the 1524mm (60") glass blank arrived, George Ritchey was hard at work creating the largest operational telescope in the world (the larger Leviathan telescope was no longer in use). Ritchey would make use of the silvering techniques,

pioneered by Leon Foucault, and the Foucault knife-edge test (see February's article of Leon Foucault and the Pendulum for more about this amazing scientist) for periodically checking the precision of the mirror, during the grinding process. Decades earlier, Foucault traveled to Ireland in 1857, to educate the *Irish astronomy mafia* about the benefits of silvering mirrors. Silvering is a significant improvement over speculum, because silver reflects 91% of light versus only 67% of the light being reflected by speculum, but the so-called *Irish astronomy mafia* dismissed his work outright. It's no wonder that Foucault described the famous Leviathan Telescope at Castle Birr as a monstrosity.

Before the 60" mirror saw first light in 1908, Hale and Ritchey were already planning an even larger telescope. Percival Lowell talked with Ritchey about building an 84" reflector telescope for his Lowell Observatory (from where Vesto Slipher would soon discover red shifting galaxies and Clyde Tombaugh would later discover Pluto). When the Lowell Observatory plan fell through, a LA businessman, by the name of John Hooker, stepped up to fund a 100" reflector telescope. Hooker was a huge fan of Ritchey's astrophotography, soon becoming close friends with both Hale and Ritchey. While he didn't do a lot of scientific research, Ritchey was both the most talented and prolific astrophotographer, at both the Yerkes and Mount Wilson observatories, during the decades he spent working for Hale. For his part, Hale took full advantage of the quality of these images in marketing his observatories, especially when there was fundraising to be done (a tradition continued today by organizations like NASA and ESA). Like the 60" telescope before it, the 100" reflector telescope would sit on a bed of mercury, to reduce friction when the 100 ton assembly moved to acquire targets in the night sky. A French glass company, the same one that made the 60" mirror blank, was contracted to build the 100" diameter mirror, for the largest telescope ever created. The new mirror arrived the same year as the 60" reflector became operational. Unfortunately, the long anticipated mirror was flawed by bubbles in the glass, which would make it difficult to safely grind into shape. The glass company unsuccessfully attempted several more glass blanks, but they were even worse than the first attempt. Hale eventually demanded that Ritchey do his best to grind the original mirror blank, after an independent study determined that the flawed mirror was strong enough to survive the shaping process and probably not fall apart when it was being mounted inside the telescope.

The mirror wasn't the only component of the project that was having difficulties. Hale, who had long suffered from mental health issues, was in such a bad state that he had to take leave from the project on several occasions. It didn't help that Hale was building an ambitious observatory that was only partially funded. The extra care need for Ritchey to grind the flawed mirror gave Hale enough time to get the funding from Andrew Carnegie he needed to finally complete the project, with a lot of lobbying from Hooker required to convince Carnegie to loosen his considerable purse strings. Ritchey was also suffering, but mostly at the hands of the astronomer left behind in Hale's absence, Walter Adams, who resented that Ritchey thought of himself as anything more than a simple, blue collar optician. For his part, Ritchey said that the astronomers who thought that building observatory telescopes a simple thing had never built anything themselves. When Ritchey asked Hooker to fund an astrophotography lab, to improve on existing emulsions that were essential for film photography, Hale wasn't consulted and when he found out he flew into an insanity fueled rage. He referred to Ritchey as a traitor and their relationship was forever fractured, thanks largely to Adams doing his best to put Ritchey in a bad light in any of his communication with Hale or anyone else for that matter.

Ritchey continued work on the 100" mirror, weighing in at nearly 4100 kg, but spent a lot of his spare time doing astrophotography with visiting astronomer, Henri Chretien. The two of them imaged Halley's Comet in 1910 and collaborated in the invention of the Ritchey-Chretien telescope during their time together. Ritchey really wanted to use the 100" mirror to create the first Ritchey-Chretien telescope, but Hale not only refused, but also refused to allow the building of smaller Ritchey-Chretien telescopes at the observatory. When Ritchey went to Hooker to talk to him about it, Hale demoted Ritchey to the rank of ordinary workman, waiting until shortly after John Hooker died. Beyond his continued work to complete the 100" mirror, George Ritchey would have nothing more to do with the design of the Hooker Telescope. The telescope that eventually housed the massive mirror did end up having quite a number of problems that needed to be fixed; something Ritchey was quick to point out. Up until then, the partnership to build these great telescopes depended on Ritchey building it and Hale getting the money. Ritchey was not even invited to the first light ceremony for the new Hooker Telescope, despite having personally built almost every telescope on Mount Wilson, and would never be allowed to use the largest telescope in the world for his astrophotography.

Ritchey spent World War I, designing and building optics for the Allies, as well as training airmen how to use them, and soon after the war was over he was fired by Hale. In a speech Hale gave in 1919, for the dedication of the Hooker Telescope, he didn't even mention Ritchey. Not long after firing Ritchey from the Mount Wilson Observatory, Hale retired as director and continued to be plagued by mental illness for the rest of his life. The powerful egos of three men had collided on Mount Wilson and Walter Adams was the chief benefactor of the feud between the once close friends, becoming the second director of the Mount Wilson Observatory, after Hale stepped down. The same month that Ritchey was fired, an astronomer, named Edwin Hubble, arrived at Mount Wilson and began working with the Hooker Telescope.

After being dismissed from Mount Wilson, when George Ritchey wasn't spending his time promoting the Ritchey-Chretien telescope design he was working at his citrus fruit orchard in California. Ritchey went to Paris for work, after Hale and Adams blacklisted him from getting a job at another observatory in the US. Ritchey became the director of the Dina optical laboratory of the Paris Observatory. While he was there he became involved in a project to build a 102" telescope and quickly pushed not only for the construction of a much larger telescope, but one using innovative telescope designs. The two new designs he proposed were for a 2.5 meter Ritchey-Chretien or a 4 meter segmented mirror telescope. Ritchey had both a lot of enthusiastic support and people who thought his plans were lunacy. The runaway budget for the project resulted in Assad Dina's being unable to fund it and another backer couldn't be found. The observatory director, Edouard Balloud was nearing retirement and lacked the energy for a project of this scope, and retired just two years after it had begun. Things went from bad to worse for Ritchey, when someone left a window open during a crucial time in the grinding of a 1.5 meter mirror, causing it to suddenly cool and crack. One of Ritchey's enemies at the Dina Laboratory, Andre Couder, made a point to be the one that Assad Dina heard about the cracked mirror from, telegraphing him at the first opportunity. Ritchey was fired and the dreams of the world's biggest telescope built being a Ritchey-Chretien went with him; while Andre Couder became the new director of the Dina Laboratory. Couder later tried to use the mirror to make a smaller, 82cm Ritchey-Chretien telescope, but the project was never completed. Ritchey's mirror would eventually be used as a replacement mirror for an 81cm reflector for another observatory in France.

While he was in Paris, George Ritchey worked with Henri Chretien to finally construct a 0.8 meter (32") Ritchey-Chretien telescope. Ritchey's enemy, Andre Couder was also in the process of making one and finished his mirror first. The race resulted in Chretien borrowing a mount for their telescope that wasn't ideal for the kind of tracking necessary for astrophotography, but it did allow the two of them to finish ahead of Couder. The first Ritchey-Chretien telescope was exhibited at the French Academy of Sciences, as a proof of concept. Unfortunately, because of the poor choice of mount, the images it created were not of high quality, which made for a poor first showing of the new telescope design. George Ritchey returned to America to once more scrape out a living from his citrus orchard.

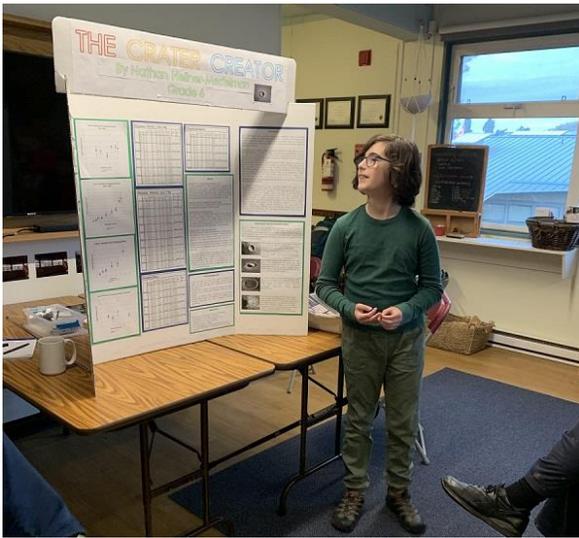
The last telescope George Ritchey built was a one meter, Ritchey-Chretien telescope for the US Naval Observatory, completed in 1934, that was also the first Ritchey-Chretien telescope ever built for an observatory. The naval officers in charge of the project just wanted a telescope built to show up the Royal Navy 36" Yapp telescope built at the Greenwich Observatory. Had the naval administrators been more involved with the American astronomer community, the hatchet job done to the reputation of George Ritchey by Hale and Adams would have very likely prevented this telescope from ever being made. Years after the design was first proposed, the Ritchey-Chretien design continued to be rejected by professional astronomers. Decades later, Ritchey-Chretien telescopes have since been commonly used for observatories both terrestrial and in space, including the Hubble Space Telescope, the Keck Observatory, the Thirty Meter Telescope Observatory (TMT), and our very own Victoria Centre Observatory.



George Ritchey

*Bruce Lane*

## RASCals at the Science Fair



Along with a number of RASC Victoria Centre members volunteering as judges at the Vancouver Island Regional Science Fair, there were a couple of younger RASCals who were contestants. Nathan Hellner-Mestelman's experiment "The Crater Creator" (seen left) on how lunar craters were made was 3<sup>rd</sup> overall in the intermediate age level, won 1<sup>st</sup> prize from RASC Victoria Centre, and a prize from

Quarky Science. William Song (seen right) received an honourable mention from RASC for his work on Sun Spot Cycles. Many of us in the Victoria Centre are familiar with Nathan, having seen him around over the last few years. He's become a regular at Astro Café and he often attends observing sessions at the VCO. William Song was up at Mount Tolmie for January's Lunar Eclipse, imaging the moon through an 8" SCT, using a practically identical setup to my own that set up beside mine. He has since become a member of the Royal Astronomical Society of Canada and Victoria Centre. Both Nathan and William were recently volunteering for Astronomy Day events. As both of them have an interest in astrophotography, we hope to see more of their work in the future.



## Better Know a RASCAl



This is a series of short interviews done with members of the RASC Victoria Centre, to give you a better idea of the different experiences that other amateur astronomers have. Our fifth interview is with Chris Gainor, a long-time member of Council, both at the Centre and National level. He's currently the President of RASC (National), editor of *Quest: the History of Spaceflight*, a published author, and currently under contract by NASA to write the official biography of the Hubble Space Telescope.

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

**Chris:** I joined the RASC at a very young age in 1966 in Edmonton and left a few years later. I rejoined in 1992 in Vancouver, and moved to the Victoria Centre in 1996.

**SkyNews:** What is your first memory of doing astronomy? (with intent)

**Chris:** When I got my first telescope for Christmas in 1965.

**SkyNews:** What was your first telescope

**Chris:** My first was a Tasco refractor, a classic department store telescope. In 1967, I made a 6-inch Newtonian; including grinding the mirror, with a lot of help from Edmonton Centre members and my father. I sold the Tasco to help finance the 6-inch, but unfortunately the 6-inch was a casualty of the various moves I made in life before I got to Victoria.

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

**Chris:** The history of astronomy and my work as President of the RASC.

**SkyNews:** What's your favourite RASC public outreach or "inreach" event and why?

**Chris:** There's so many different Victoria Centre events to enjoy, but I do like our monthly meetings. They are great social and educational events. In Victoria, we are very fortunate to be able to call on the people who work at the DAO and in the UVic Astronomy Department to address our meetings. I also enjoy the annual General Assemblies of the RASC, which bring together lots of friends from across the country. I have been working to make them more fun to attend and less work to organize.

**SkyNews:** What is your favourite book on astronomy?

**Chris:** My favourite book on astronomy is Robert W. Smith's *The Space Telescope*, which tells the story of how the Hubble Space Telescope was promoted and built, while placing HST in the larger context of astronomy in the 20th Century. It provides a lot of inspiration to me as I write my history of HST operations.

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

**Chris:** For many years I have owned a 90 mm ETX, which is great for public outreach and casual observing. More recently I acquired an 8-inch Newtonian telescope built by the late Ernie Pfannenschmidt. I always chuckle when I use that telescope, because Ernie, who was a friend of mine, always preferred refractors to reflectors. That telescope is more useful than the ETX for faint fuzzies, but I need to dedicate more time to become a deep sky observer. When Mars was at opposition, a few months ago, I took out Ernie's 'scope because of his special love for the Red Planet.

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

**Chris:** Computers have revolutionized astronomy as a science and as a hobby. I remember when telescopes had only mechanical drives, and images involved photographic film and its messy paraphernalia. Computers brought along the Internet, and the ease it gives to sharing information and images. More changes are coming, including adaptive optics for amateurs and go-to telescopes that are even easier to use than present day go-to telescopes.

**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)

**Chris:** I've spent many evenings writing books and articles, or doing my work for the RASC. Many of those evenings have come at the expense of observing, and so I hope to start spending more time observing and maybe trying something like a Messier Marathon.

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

**Chris:** I can't imagine my life today without astronomy. Although I've always been interested in spaceflight, astronomy has allowed me to explore space in a real and personal way. In recent years I have been working on my HST history book. I could have never have done that book without the knowledge and connections I have made as an amateur astronomer in the RASC.

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

**Chris:** In Victoria I served as second and first V-P, and then as president. I enjoyed celebrating our Centre's 90th anniversary as president and during that time we started to shift from the idea of getting our own site for a Centre Observatory to the idea of setting up the VCO at the DAO. I don't take any credit for that, but I do remember the many

discussions we had. Our whole executive and council has always pitched in to make sure activities such as our outreach work and our meetings happen, so Council work in Victoria has almost always been a pleasure.

I followed that up with five years as National Rep, and then seven years, so far, on the National Executive. It's been interesting work, but more difficult than Centre work because the RASC is going through a number of changes. Legislative changes obliged us to change our governance structure a few years ago and we are still trying to make those changes work for everyone. SkyNews magazine (*Ed. that other publication*) has become a highly valued membership service, and to maintain that we had to purchase SkyNews four years ago. Now we have the challenge of keeping it going as the world shifts to online publications. And the world we live in is changing. A new generation more accustomed to diversity is coming to the fore, and RASC must adapt to better serve younger people who want to enjoy astronomy.

**SkyNews:** Thanks, Chris. Hopefully, the service of people like you, to both Centre and National councils, inspires more RASCals to take an active role in our own Victoria Council. Hopefully, a few individuals might even decide to fill some vacancies before the current Council executive complete their terms (at the beginning of 2020).

### Astronomical Term of the Month: Catadioptric

Catadioptric telescopes are those that use both refracting (lens) and reflecting (mirror) optics. They are often referred to as compound telescopes or by their individual design names (Schmidt-Cassegrain, Maksutov-Cassegrain, Ritchey-Chretien, etc.) because of the way the word *catadioptric* just rolls off the tongue and then then takes a hard bank off your molars. The combination of lens and mirror helps correct some of the problems encountered by using just a mirror or a lens, while introducing new ones.

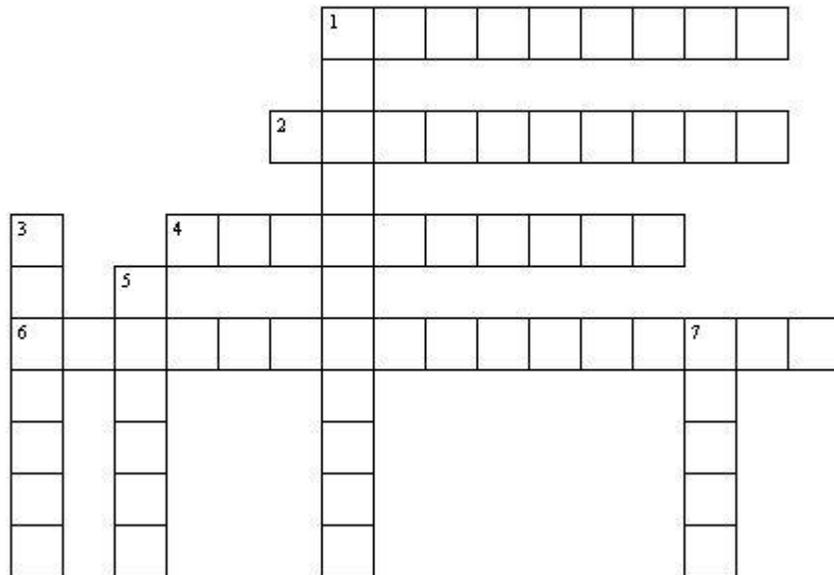
Most catadioptric designs make the telescope tube assembly shorter by using a "folded" light path, introducing one or more extra bounces between the mirrors by the incoming light. This makes the telescope lighter and more portable, but those extra bounces also means a slight loss of light eventually reaching the primary mirror. They tend to have sharper images at the edge of the field of view than a reflector telescope, but the larger secondary mirrors mean less light reaching the primary mirror. Despite the shorter tube, their folded light path creates long focal lengths and the large secondary mirrors make for high focal ratios, requiring better mounting systems to track objects for longer camera exposures. Most designs also have a large, corrector lens on the front of the telescope that tends to be a bit of a dew magnet. Dew shields and dew heaters are very necessary accessories for telescopes with a corrector lens on the front. Telescopes with front corrector lenses sealing the tube also take longer to cool down, than telescopes with an open tube design.

Why use a catadioptric telescope? They cost a lot more than reflector telescopes, but they're more portable and tend to have better optics than reflectors. A high quality refractor performs better, but they can be even more expensive and are limited by their lenses aperture size. You'll likely never see a refractor with an aperture larger than 127-150mm (5-6") that isn't a historical observatory telescope, but you can easily find catadioptric telescopes of larger aperture. 203mm (8") Schmidt-Cassegrains are very common for a reason.



*Bruce Lane*

# May Astro Crossword



**ACROSS**

- 1 Financier of the Dina optical laboratory
- 2 100" telescope on Mount Wilson named after this man
- 4 Name of Lithuanian satellite launched in April
- 6 Name of Nathan's science fair project

**DOWN**

- 1 Name of first Canadian satellite
- 3 Chretien/Hubble is this type of telescope
- 5 Messier initially catalogued M87 as this
- 7 Manufacturer of Chris Gainor's first telescope

**April Astro Crossword Answers**

**Across 3:** Messier object in Pisces is the **Phantom Galaxy**; **Across 5:** the name of a dwarf planet is **Makemake**; **Across 6:** **Nobody** is the name of the current Vice President of the RASC Victoria Centre; **Across 7:** The **Sunflower Galaxy** was a target from the last Plaskett RASC imaging session; **Across 8:** **Reflector** is a type of telescope; **Across 9:** **light pollution** is the enemy of astronomers; and **Across 10:** **Osoyoos** is the location of Jack Newton's bed and breakfast

**Down 1:** the **White Mountains** is one of Dorothy Paul's favourite astronomy destinations; **Down 2:** **Johann Bode** is the name of a German astronomer; and **Down 4:** **Wray Brydon** is the name of a historical telescope in Victoria

**In Closing**



With Astronomy Day in the books, the pace of public outreach events for RASCals has gone into high gear. It also becomes a bit of a balancing act between volunteering up at the Hill for FDAO's Saturday Nights and all of our RASC events, all the way to the Labour Day weekend at the Saanich Fair. Because of the amount of nights the Summer Saturdays events are run increases each year, this is especially so. While volunteering at the Summer Saturdays is very rewarding and highly encouraged, please remember that the organizers of all the other RASC events also need your help to make our collective efforts as a Centre a success.

*Bruce Lane: SkyNews Editor*

## Photography Credits

Page 1: Astronomy Day RASC Information Desk at Royal BC Museum, April 27<sup>th</sup>, 2019, by Chris Gainor

Page 2: Chris Purse with teacher, Jon Geehan at the Victoria High School astronomy program table, Astronomy Day at the Royal BC Museum, April 27<sup>th</sup>, 2019, by Bruce Lane

Page 2: Colin Wyatt with Foucault's knife-edge tester, Astronomy Day at the Museum, April 27<sup>th</sup>, 2019, by Bruce Lane

Page 3: Long exposure of the Plaskett Telescope parking lot for the first Summer Saturday Night of the season, Astronomy Day, April 27<sup>th</sup>, 2019, by Bruce Lane

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

Page 4: M101 Pinwheel Galaxy Closeup, cropped image using Canon T3i and 127mm apochromatic refractor; 161 X 29sec Lights = 78min unguided, 20 Bias Frames, 21 Flats, processed with PixInsight 1.8.6; taken March 5<sup>th</sup>, 2019, by Reg Dunkley

Page 4: Crop of Reg Dunkley (RASC Victoria President) at 2018 AGM, by Joe Carr

Page 5: Laura Hawker's son at craft table, Astronomy Day at the Museum, April 27<sup>th</sup>, 2019, by Laurie Roche

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

Page 6: Posed Book, "Canada in Space, by Chris Gainor", taken at UVic Astronomy Teacher's Lounge on March 13th, 2019, by Bruce Lane

Page 7: Rosette Nebula; from Plaskett parking lot with 150/750 Skywatcher Astrograph/Canon Eos Rebel s11; March 30th, 2019; by Clayton Uyeda

Page 8: Portrait of George Ellery Hale, date and photographer unknown, public domain

Page 10: George Willis Ritchey, on the steps of the Yerkes Observatory, from the Huntington Library/ Carnegie Observatories, date and photographer unknown

Page 11: Nathan with "The Crater Creator" Science Fair presentation at Astro Cafe; April 22<sup>nd</sup>, 2019, by David Lee

Page 11: William with "Sun Spot Cycles" Science Fair presentation; April 8<sup>th</sup>, 2019, by Randy Enkin

Page 11: Crop of Chris Gainor, from National AGM in Victoria, June 28th, 2014, by Bruce Lane

Page 13: Crop of 8" SCT, from campsite at Metchosin Star Party, July 29<sup>th</sup>, 2011; by Bruce Lane

Page 14: Speckled Suffolk Pullet, April 23<sup>rd</sup>, 2019, by Bruce Lane

Page 16: View from above, Astronomy Day at the Museum, April 27<sup>th</sup>, 2019, by Bill Weir

## Call for Article and Photo Submissions for June Issue

SkyNews is looking for submissions of astronomy photos and articles for the June issue of our Victoria Centre's magazine. Send your submissions to [editor@victoria.rasc.ca](mailto:editor@victoria.rasc.ca)

RASC Victoria Centre Council 2018 / 2019

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	Dan Posey	John McDonald



View from Above, Astronomy Day at the Museum, by Bill Weir