

## SKYNEWS



Transit of Mercury    Victoria BC    May 9 2016    11:37am PDT

©2016 David Lee

## Hermetic Transit

The Transit of Venus in 2012 was an exciting event, with a lot of attention in Victoria paid to the weather forecasts, hoping the clouds wouldn't ruin the spectacle. While the winds thankfully blew the clouds away, the same winds also made observing difficult and photography even more challenging. The historical, scientific expeditions, like the one undertaken by Captain Cook, help frame the importance of studying the Transit of Venus to better calculate distances within our solar system. Given that the next one is in 2117, it's safe to say that was the last chance for any of us to see it. Between the history, the rarity, and the hype, the Transit of Venus gets all the love.

A few years later and now it's the Transit of Mercury. I've set up my solar filtered, Schmidt-Cassegrain telescope on the deck and imaged as the Sun was high in the sky. Is that a sunspot? Mercury is so tiny, but the planetary dot can quickly be found. I added the T-adaptor/eyepiece get a closer look. This loses a bit of resolution, but I wanted to focus in on the moment where the black dot of Mercury reaches the edge of the Sun. It's still so tiny.

Mercury is at the best of times a rare observing target for amateur astronomers. A big reason is because it's dangerous to go poking around where the Sun is with a telescope that doesn't have a solar filter. You should wait until just after sunset or before sunrise to look at Mercury. Its close orbit to our star means that it's best viewed only a few times a year, when there's more separation between the planet and the Sun. While it's brighter in the night sky than Sirius, the proximity of the Sun makes it hard to get much contrast. Because it's closer to the Sun than we are, we can see its phases change similar to how we observe the Moon. To see any details on the surface of Mercury, you'll need to use some very high magnification and a colour filter. There is a wide range of opinion about what is the best coloured filter for Mercury, likely requiring some experimentation, but a lot of people seem to prefer either the Wratten #23A light red or #21 orange filters. Even under perfect observing conditions, surface features viewed through your telescope are going to be very faint. Due to looking at the planet when it's so close to the horizon, there's a chance that a "detail" you're observing is just an optical illusion in our own atmosphere. This is one planet where multiple observations are necessary to differentiate the planetary details from any atmospheric effects.

Despite the difficulties in making observations of Mercury, it wasn't long after the invention of the telescope when astronomers turned it towards the tiny planet. Tycho Brahe was one of the most accomplished observers of his time. He had access to the best optics available and was very well educated in astronomy, due to being one of the richest people in 17<sup>th</sup> century Denmark. When he wasn't throwing lavish parties - which often included a drunken elk - he was out with his telescope making meticulous records of his observations. One of his favourite targets was Mercury, with the nobleman making 85 recorded observations of the diminutive planet. In temperament, Johannes Kepler resembled a pious monk compared to Tycho Brahe. While their personalities clashed, Tycho was very interested in Kepler's theories and Kepler was obsessed with getting access to Tycho's observing records. Unfortunately for Kepler, Tycho Brahe jealously guarded his records, allowing Kepler to see just enough of his data to keep him from leaving. When Tycho died, Kepler immediately looted his host's astronomy notes and was soon after given Tycho's title of imperial mathematician. Using Tycho's observations, Johannes Kepler was able to predict that the transits of Mercury and Venus would happen within six months of each other in 1631. Sadly, Kepler would never see the results of his calculations, dying from a fever in 1630.

Pierre Gassendi was a French priest with a passion for astronomy. He was very interested in the works of Kepler and used his predictions to make the first recorded observations of Mercury passing in front of the Sun. Two other people claimed to have witnessed this transit, but neither of them made any notes about their observations. Gassendi later attempted to view the Transit of Venus in December, but was unsuccessful because the event happened while it was still dark in Paris. Englishman Jeremy Shakerley was another devotee of Kepler. Shakerley was an amateur mathematician and astronomer, with a keen interest in astrology. He became obsessed with the Transit of Mercury and travelled to India in 1651 to see it. Given that there had only been one recorded transit at that time, Shakerley was certain that more data would help plot Mercury's orbit with higher accuracy. Unfortunately, Shakerley chose a poor location in downtown Surat, with a bad view, and was using deficient optics, so he didn't have great observations. He wrote a letter saying as much that was received



in England. More detailed observations were sent in two later letters that were both lost in transit. Jeremy Shakerley would never return to England, dying a few years later in India under unknown circumstances. Unlike the long periods of time between paired Transits of Venus, astronomers were able to hone their abilities observing the more frequent Mercury transits. Long associated with his voyage to observe the 1769 Transit of Venus in Tahiti, Captain Cook led a later mission the same year to observe the Transit of Mercury from New Zealand. Charles Green, member of the Royal Society and Assistant to the Astronomer Royal, was the lead astronomer for both transit observations. Unfortunately, someone else would have to go through the data he recorded, when the Endeavour finally returned to England. During the voyage home, already suffering from scurvy, Charles Green contracted dysentery and died soon afterwards. Mercury Bay and Cooks Beach are named for the place Captain Cook went ashore in New Zealand, but the plaque placed at Shakespeare Cliff Historical Reserve that commemorates the observing location was sited at the wrong end of the bay. Sometime later, a much smaller plaque was installed in the correct location at the Purangi Regional Reserve. Charles Green was still alive, when Captain Cook named Green Island after him as the captain charted the coast of Queensland, Australia.

For us the next Transit of Mercury will be on November 11<sup>th</sup>. The event will be half over before the Sun is above the horizon at 07:20am, so you'll want to have an unobstructed view of the south-southeast. Due to Mercury's small size, so you'll need a telescope and it will need a solar filter. If you have a clear view of the horizon, you'll be seeing Mercury as a black dot near the middle of the Sun. Mercury will reach the edge of the Sun by 10:03am, when a lot of observers and imagers will be looking for the *black drop effect*. Nathan has organized an unofficial outing for RASC members, to view the Transit of Mercury from the Oak Bay Marina parking lot and cookies have been promised. If you miss this one, there will be 10 more opportunities this century, with the next Transit of Mercury happening just 13 years from now.

*Bruce Lane*

## Editorial Remarks



With the frenzy of activity that was September complete, it's time to settle into the regular schedule of RASC Victoria activity, punctuated by the occasional special event. The event many of us are looking forward to most is the Transit of Mercury, when those of us with telescopes and solar filters will be setting up early in the morning across Greater Victoria, including a gathering of RASCals at Turkey Head (Oak Bay Marina parking lot).

With all the 50<sup>th</sup> anniversary celebrations of the Apollo 11 mission this year, I expect the November, Apollo 12 anniversary to be largely overlooked. Charles Conrad and Alan Bean became the 3<sup>rd</sup> and 4<sup>th</sup> men to walk on the Moon, while Richard Gordon manned the orbiting command module. One of their moon walks took them to Surveyor 3, an unmanned probe sent to the Moon's surface by

NASA two years earlier. The Surveyor program was a proof of concept to show that it was possible to make a safe landing on the Moon, but none of them were designed to return home. Surveyor 3 had an extendable scoop for taking soil samples, a camera, and antennae to transmit data back to Earth. The astronauts took some pictures of Surveyor 3 and brought back some pieces of the probe for study, including its camera. The probe's camera can now be seen on display at the National Air and Space Museum of the Smithsonian Institute in Washington, DC. This remains the first and only time that humans have gone to another world to visit a space vehicle from another mission, although I hope to live long enough to see astronauts take selfies with one of the Mars rovers, before they start looting it for spare parts.

In this issue of *SkyNews*, we'll have more recaps from our Centre's activities, an essay by Bill Kunze, a historical article about the importance of astronomers in World War II, as well as all the astrophotography and articles you've come to expect from the *Victoria Centre SkyNews*.

*Bruce Lane: SkyNews Editor*



Apollo 12 crew: Pete Conrad (left), Dick Gordon, and Al Bean

## President's Message for November

The Canadian astronomical community received a wonderful surprise on October 8th when it was announced that Manitoba native Dr. Jim Peebles would receive the 2019 Nobel Prize for Physics. Jim was born in St. Boniface and obtained a Bachelor Degree in Physics from University of Manitoba in 1958. He then obtained a Phd from Princeton in 1962 and has remained there ever since. He was rewarded for laying a foundation for modern cosmology, including his realization that faint microwave radiation that filled the cosmos 400,000 years after the Big Bang contains crucial clues about what the universe looked like at this primitive stage and how it has evolved since. Dennis Overbye wrote a wonderful account, explaining his discoveries and capturing his character in chapter six of the classic book *The Lonely Hearts of the Cosmos*. Randy Enkin and Jim Hesser delivered a short tribute to Peebles during a recent Astro Cafe. Jim Hesser met Peebles when he was a grad student at Princeton and mentioned that Peebles had spent time at the DAO while on Sabbatical in the early 80's. At that time he boldly predicted that Jim Peebles would receive the Nobel Prize some day. It took almost 4 decades but Hesser was delighted when his prediction was finally verified. There is a joyous YouTube video of the Princeton celebration of this announcement. Check it out.

While Jim Peebles contemplated the biggest picture, most of the Victoria Centre presentations during 2019 have focused on our local Solar System. In February, Dr. Samatha Lawler explored the controversy about a Planet Nine lurking in the



outer reaches of the Solar System. In March, Dr. JJ Kavelaars shared the latest findings for the New Horizon's Flyby of 2014MU69 (Ultima Thule). Dr. Kelsi Springer delivered a public lecture on this rendezvous during a CASCA conference in May. I gave a talk on the Juno mission to Jupiter in May; while in June, Matt Williams explored the feasibility of leaving the Solar System to explore nearby stars. The summer was dominated by reflections on the Apollo moon landing; while in October, Dr. Linda Spilker, Principal Cassini Mission Scientist delivered a fascinating talk on the results of this very successful 13 year exploration of Saturn. Meanwhile, Linda's husband Dr. Tom Spilker, a space mission architect, unveiled plans for a 400 person Space Station ... on the scale of the Empress Hotel. I will try to negotiate a Victoria Centre discount. Some age restrictions may apply.

This Solar System theme continues at the November 13th monthly meeting when Dr. Philip Stooke discusses Lunar discoveries that have been made since Apollo. He has applied his specialty in cartography to the Solar System and has developed a Martian Atlas. He has also mapped the irregular shapes of Martian moons and many asteroids. It will be an interesting talk and we hope to see you there.

One noteworthy Solar System event is the Transit of Mercury, which begins at Sunrise at 7:15 AM on November 11th and ends at 10AM. Because this event occurs very close to Remembrance Day Ceremonies and due to the unfavourable climate for this date the Victoria Centre decided to not heavily promote the Transit. Some Victoria RASCals, however, plan to set up telescopes at Cattle Point (*Ed. location changed to Oak Bay Marina parking lot*) and Mount Tolmie if weather permits.

Speaking of weather, a blocking ridge of high pressure became established in late October ... which is rare for this time of year. This allowed many clear nights and Victoria RASCals made the most of this opportunity. Over 20 participated in the Plaskett Party on October 26th. This interlude also allowed the technical committee to refine the performance of the 16 inch telescope at the Victoria Centre Observatory and it is back in business "bagging photons". Many thanks to all who made that happen. Due to our land use agreement with NRC, you have to be a member of the active observers list to attend these VCO sessions. Please see Chris Purse ([membership@victoria.rasc.ca](mailto:membership@victoria.rasc.ca)) for details.

*Useable Skies*  
*Reg Dunkley*

## A Sense of Wonder

*"It almost seems as if the Universe must in some sense have known we were coming."* ~ Freeman Dyson, Physicist



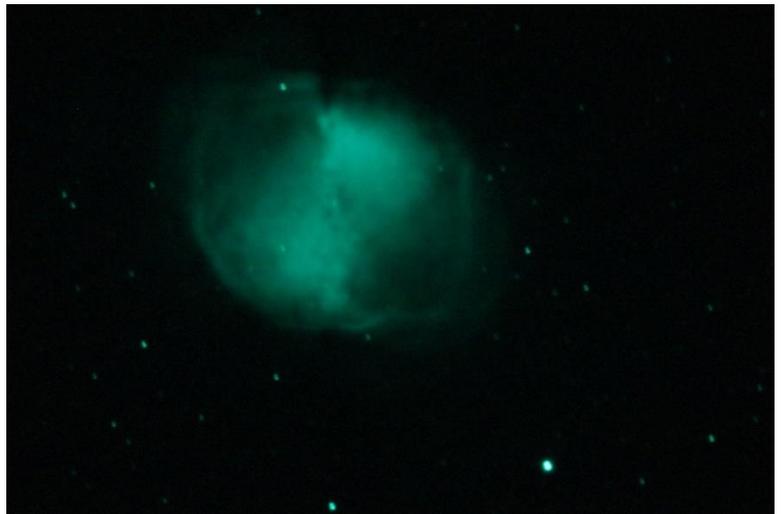
There was, when we were children if we were most fortunate, a sense of awe and wonder of the world. We tried to, in our own fashion, understand it as we made our way out into a greater world of expanding horizons and possibilities. At that early age life is a puzzle, one with numerous small sized pieces. How they fit together is not readily clear. Curiosity is the Swiss Army Knife of the human intellect.

I clearly recall the place where my keen interest in science began. In one of life's serendipitous good fortunes, I was able to regularly visit Yale University's Peabody Museum of Natural History. The extensive dinosaur collection was, in both actual size and scope, quite wonderful. The mineralogy display in its own way was very impressive. The dioramas transported the viewer to worlds both distant in time and location. But it was the active display in the foyer that resonated the most. There, from high above, suspended from the ceiling to just above the inlaid tiles of a compass design on the floor, was a Foucault Pendulum. It seemed to have the ability to magically maintain continual movement. It was of course a real time demonstration of the earth's rotation.

This was a very cool thing for a young boy to experience. It is never too late to revive that innate quality of inquisitiveness. Knowing how the facts, forces and laws found in the natural sciences govern everything in the universe does not preclude having an appreciation of them through a sense of wonder as well. The beauty of an object under scrutiny is not in the least way diminished by the presence of knowledge. On the contrary, it is enriched. All that comprises the cosmos and our intoxicating existence is governed by principles, laws and mathematics. These too are beautiful to us. We live in an age where we have arrived at an understanding of some of the most fundamental phenomena that govern nature. In our lifetime, the breadth and scope of knowledge has expanded in astonishing and unexpected ways.

The nights I spend out under the stars looking at the night sky are special. This includes naked eye viewing as well as outings aided by tripod mounted binoculars or my homebuilt Newtonian reflector telescope. The latter has become over the years, a trustworthy companion. The telescope saw its "first light" back on July 25, 1998 when it was directed to the nearby star Arcturus. When the time arrived for final assembly of the telescope's components after months of careful construction, I was as nervous as an expectant father might be. There was quite a bit of exacting engineering and mathematical calculations required in making each component, particularly the two mirrors. The larger of the pair, a 10-inch parabolic f/6 primary mirror, was ground to tolerances of a hundred thousandths of an inch. The secondary mirror is a two-inch elliptical. It receives the focused gathered light of the primary and redirects it to the eyepiece. The mirrors were made by the experienced and capable talents at Barry Arnold Optics of Sherwood Park, Alberta. Barry's wife Barbara remarked that each new scope's assembly really was like giving birth. You knew how to do it and how you wanted it to turn out, but the results remained uncertain until they were realized.

A solitary night out under the stars leaves me with a definite feeling of mellowness. There is the discovery of new objects such as star clusters or galaxies, sometimes finding them after much "star hopping" in an incredibly small patch of the deep sky. For this level of exploration, I employ very detailed "star charts" which serve as celestial roadmaps. There are also deep sky objects that are much like old friends and gladden the heart each time they are encountered. These relationships can be as nurturing and meaningful as those we share with one another as humans.



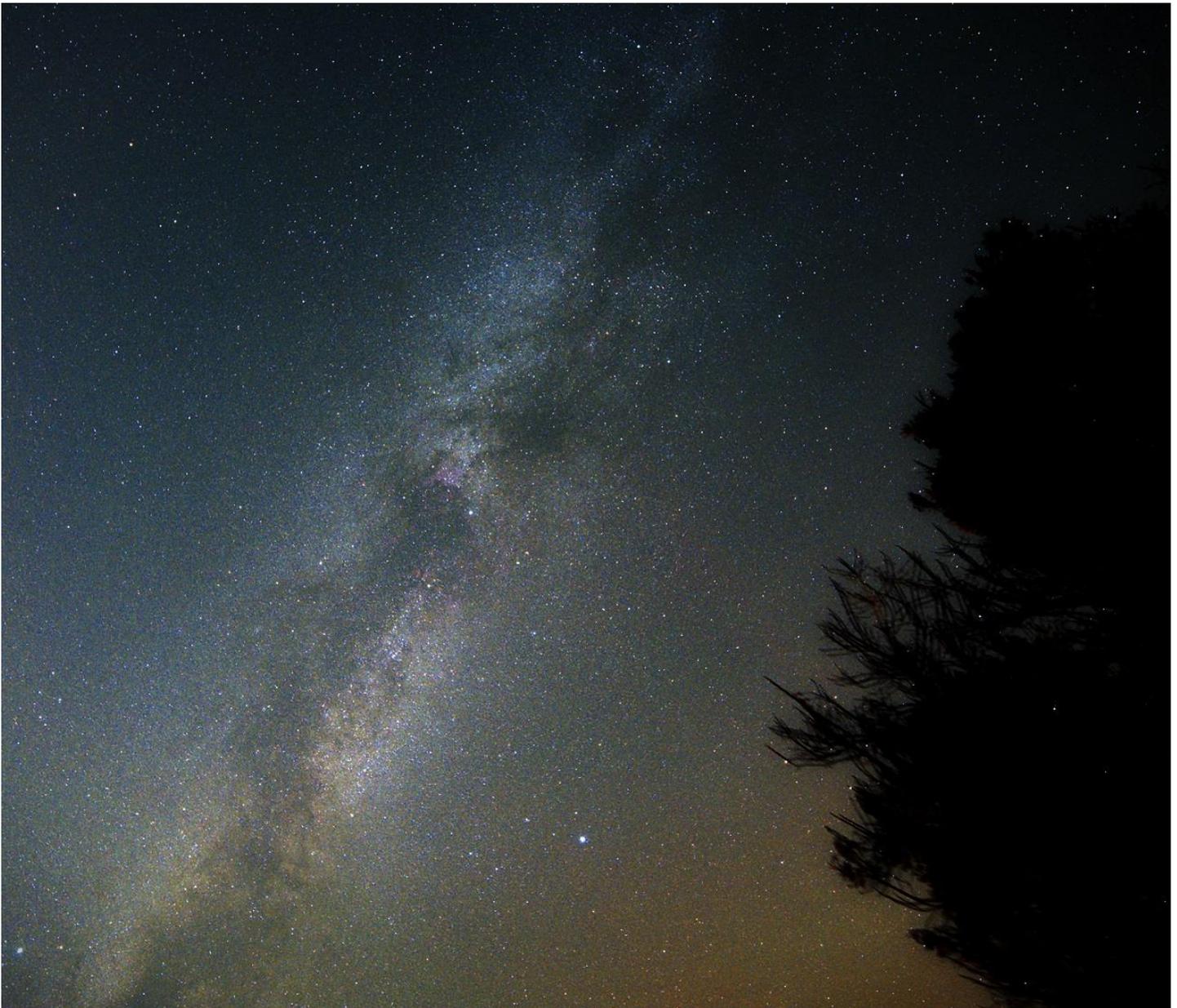
The distances in light years to objects populating the deep sky is staggering. To view something fifty-five million light years away such as the Virgo Super Cluster of galaxies, the one to which our "local group" belongs, and know that the photons of light have been traveling enormous distances toward our eyes at the speed of light since shortly after the dinosaurs checked out is to comprehend something that challenges the imagination. Here's the thing though, it is still in our immediate cosmic neighborhood. It is always huge fun to show someone M13, the Great Globular Cluster in the constellation Hercules. It is 'only' 22,180 light years distant. The light you just viewed, I explain, started out its journey 17,200 years before the Great Pyramid at Giza was built.

Planetary nebulae are the glowing gaseous remnants of expired stars that have been expelled into the interstellar medium. Individual stars or multiple star systems treat the viewer to an array of colors as they burn their hydrogen fuel at different temperatures and rates. The light elements formed at the very beginning of the universe were Hydrogen, Helium and Lithium. All of the other elements that make up our world, that make life possible, were created by numerous generations of red giant and red supergiant stars that lived their lives that ended in novae and super novae. Stellar nucleosynthesis seeded interstellar space not only with newly created heavy elements but also with possibilities. As astronomer Carl Sagan once noted, "We are the universe's way of thinking about itself."

To this mix of wonder and discovery, we can add a deep sense of humility and well-being. The universe we inhabit is beautiful, both visually and in a deeper sense. It is filled with delicate, finely tuned, elegant physical properties, exquisite relationships and events both predictable and random. So, take yourself out under the stars with a blanket for some degree of comfort. Lie on your back. Deposit yourself on a comfortable lawn chair. You need not know the stars' names or those of the constellations in which they reside. These you can find, along with abundant information, in printed form or on the internet if your curiosity is sparked. Begin the journey. Before we arrived at our present ever evolving state of knowledge, there existed a sense of awe and wonder. It links us with the earliest days of our humanity.

This essay was inspired by the cover illustration of the October 1994 issue of Scientific American. It showed an early human being on a hill in Africa, robed and with a staff, gazing at the heavens and a full moon.

*Bill Kunze*



Milky Way, from Plaskett parking lot, by David Lee

## 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, finishing up at the end of May and returning in September. 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 a 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. 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.

Astro Café started the month off with a visit from Bruce McCurdy (RASC Edmonton) giving a talk on his experiences as an observer under the Prairie sky. There was a recap of what was learned at the PixInsight workshop and Chris Purse continued his Handbook 101 series. After a break for Thanksgiving, Astro Café returned with another helping of Handbook 101 and Randy gave a talk on the recent Physics Nobel Prize winners.

*Bruce Lane*

## Monthly Meeting Speaker: Dr. Philip Stooke

7:30 PM, Wednesday, November 13<sup>th</sup>; 2019 Room A104, Bob Wright Centre, University of Victoria



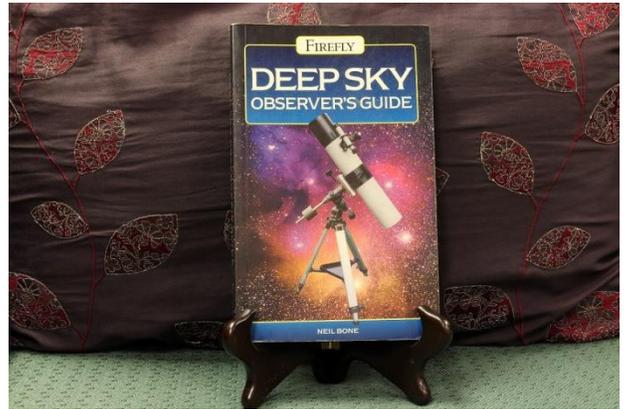
Phil Stooke has looked at missions to the Moon since the Apollo era (NASA's Apollo landings and the Soviet Union's final missions of the early 1970s). After those missions the Moon was left alone for two decades, while space agencies looked further out into the Solar System, but more recently the Moon has returned as a target for exploration. We will look at a series of early lunar orbiters filling in gaps in our knowledge left after Apollo, then missions using more advanced orbiters with modern instruments, and finally a series of landers, some successful and others not. What have we done and where are we going?

Dr. Phil Stooke is a planetary scientist with a PhD from the University of Victoria who has returned to the west coast after 30 years working at Western University, in Ontario. He has worked on mapping asteroids, locating spacecraft landing and impact sites on the Moon and Mars, and depicting the history of exploration of the Moon and Mars.

*Reg Dunkley*

## From the Library

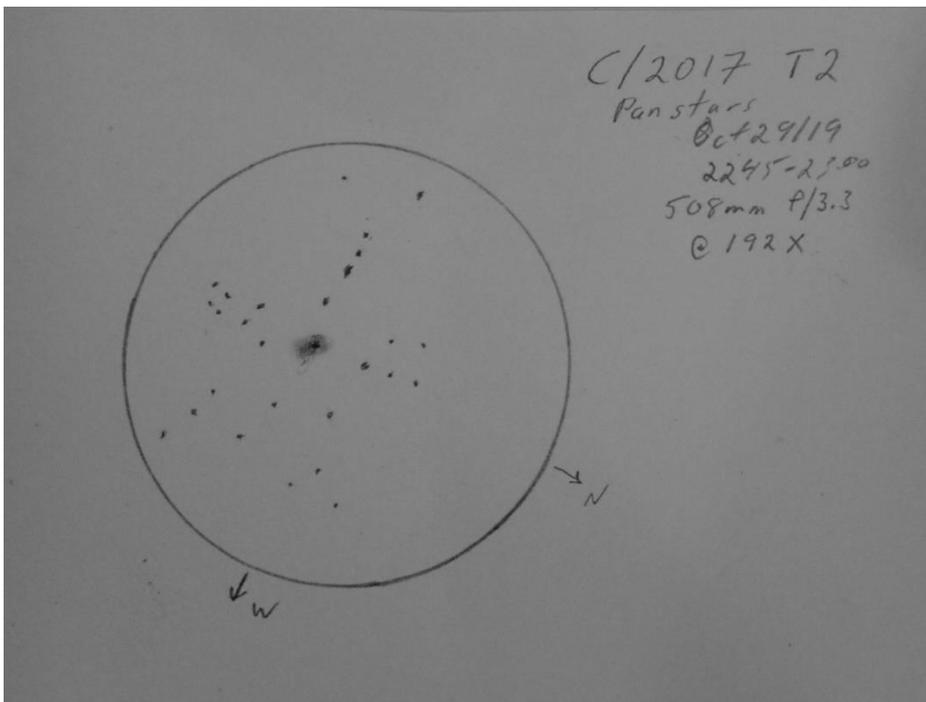
After our monthly meeting, feel free to join your fellow RASCals socializing up in the astronomy faculty lounge on the 4th floor of the Elliott Building, where we have coffee, juice, and cookies. It's also where the RASC Victoria Library is housed, with over 500 titles, curated by Diane Bell, our RASC Victoria Librarian.. 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 **Deep Sky Observer's Guide**, a Firefly book by Neil Bone. There are a number of introductory books available for amateur astronomers and this is certainly one of the better ones. Firefly Books is noted for publishing educational non-fiction books, especially about science and nature, and in particular a great source for astronomy readers. One of the nice things about this - and the other compact Firefly books of this series - is that they're very portable, whether you're tucking it into your bag or your eyepiece case. I liked that *Deep Sky Observer's Guide* introduces the readers to more than just the Messier catalogue list of *faint fuzzies* and that it includes observable targets from both the northern and southern hemispheres. With the focus here on deep space objects, Neil Bone's book is concise and well organized, aimed at beginners interested in doing astronomy as well as those learning about astronomy, and it's available at our Victoria Centre Library.

*Bruce Lane*

## Hill and Dale (Observing on the Island)



The clear October skies came a bit late for our annual star party at St Stephen's Church, but nonetheless members were able to make the most of them on Little Saanich Mountain, Pearson College, at home, or wherever in the Greater Victoria Region that RASCals found themselves observing and imaging the night sky. We had a couple of well attended, weekly observing sessions at the Victoria Centre Observatory, where the weather chose to cooperate. Michel was MIC for the observing session on October 5<sup>th</sup>, which was also International Observe the Moon Day, with Kurt, Randy, Douglas, Pedro, Kathy & Nathan, Chris, Remi, Dan, Joe, and David also in attendance. The bright moonlight limited deep space observing, but those in attendance were able to view both the "X" and "V" features on the Moon, while Nathan found Neptune with

his 8" Dob. Bill Weir (one of his recent comet sketches is above) was also set up for that evening doing sidewalk astronomy outside of My Chosen Café in Metchosin.

On October 26<sup>th</sup>, RASCals took over Little Saanich Mountain, with a combined weekly observing session at the VCO and Plaskett Telescope imaging session. The weather conditions were excellent for observers and astrophotographers alike. Dan Poisey gave a tour of the Plaskett to RASC members and then assisted Michel in running the telescope for an evening of projecting images on a screen and collecting data for later use by RASC Victoria members. Several other people set up their telescopes in the Plaskett parking lot to get different views of the night sky, while Reg and I ran the observing session down below at the Victoria Centre Observatory. At the VCO, we used both the 16" Ritchey-Chretien and 20" Obsession Dobsonian reflector. Several members did some wide field astrophotography with their cameras and some of us did some astrophotography shots with the Ritchey-Chretien to test it after the most recent work by the Tech Committee. A few of us returned to the Hill the following evening to do some more imaging, both wide field on camera tripods and using the Ritchey-Chretien.

October was the first time in a long time that we've been able to make good use of the 16" Ritchey-Chretien telescope at the Victoria Centre Observatory for astrophotography, after a long spell of technical difficulties dating back to last year. The Technical Committee can now focus on fine tuning the tracking of our massive telescope, instead of fighting just to get it to work properly. We should start seeing a lot more astrophotography in the months to come, now that the Ritchey-Chretien scope is back in action. 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 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](mailto:membership@rasc.victoria.ca) and we'll see you up there on the Hill some night soon.

*Bruce Lane*



Orion Nebula (M42), from VCO using 16" Ritchey-Chretien telescope, by Bruce Lane

## Astronomer at War



It's only a few days before Remembrance Day, when many of us look back to remember the sacrifices of our ancestors in the two World Wars and by those in more recent operations overseas, as we seek to make sense of our uncertain world. In modern times, we know about the role of scientists in total war - especially from the dramatic results of the Manhattan Project. There is the myth that wars are responsible for the great breakthroughs of science. The truth is that decades of scientific work are often lost, including work on nuclear power plants, as all efforts were redirected towards getting the atomic bomb before Germany. During these global conflicts of the twentieth century, many scientists were thrown at the problems created by modern warfare, usually at the expense of whatever they were working on at the time.

Armed with a degree in Physics, Walter Orr Roberts went to Harvard as a grad student, where he had the good fortune to have Donald Menzel as his advisor. Menzel was already one of the most accomplished American astronomers of his time and a pioneer in theoretical astrophysics. Walter Roberts assisted Menzel to install a solar telescope at Harvard's Oak Ridge Observatory, putting him in the perfect position to be part of Menzel's next project. While prospecting for a site for a new solar observatory, in the mountains of Colorado, Menzel found the perfect spot, 3511 meters (11 520 feet) above sea level. Menzel negotiated with the Climax Molybdenum Company for a piece of land that would see one of the first high altitude observatories built on it. The Climax Observatory was finished in 1940 and Walter Orr Roberts became its first director.

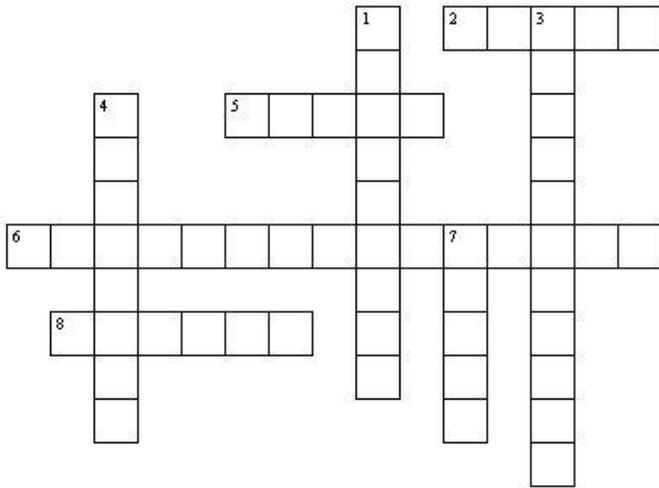
Walter Roberts made daily observations of the Sun, using a 40cm aperture coronagraph, a solar observing device that had only been invented by a Frenchman, Bernard Lyot nine years before Roberts took over operations at the Colorado observatory. Essentially, the coronagraph filters out the unwanted glare of the Sun, so astronomers can view the much fainter edge (corona). This makes it easier for astronomers to observe solar flares and prominences. Before the invention of the coronagraph, observers would have to wait for a solar total eclipse to be able to do this and even then they would only have a couple minutes of viewing time, and then only if the weather cooperated. The solar observatory also had a magnetograph to detect magnetic fields that were present in prominences.

Making use of these new instruments at the Climax Observatory, Walter Roberts discovered that there was a link between solar activity and radio interference here on Earth. The importance of this discovery, made during World War II, caused it to be immediately classified. For the rest of the war Roberts reported his daily observations directly to the US Navy, despite the Climax Observatory being an institution under the authority of Harvard. Because of the critical importance of radios, to coordinate military operations, his reports on solar activity were transmitted to Allied Command in various theatres to ensure no major operations were launched when they would be disrupted by solar activity; effectively jamming their communications. In the lead up to D-Day, Roberts' reports were transmitted daily to nervous planners in England, to ensure that one of the largest amphibious landings of the war didn't become a complete fiasco.

Because of the quality of the work carried out by Walter Roberts, during and after the war, Colorado has become a headquarters for solar astronomy and a number of scientific organizations. Creating a fusion of the sciences of astronomy and meteorology, Robert's work pushed the boundaries of our understanding, especially about the relationship between the Sun and our terrestrial weather. After the war, the Climax Observatory was renamed the *High Altitude Observatory* and would later become an independent institution under Roberts. Walter would go on to found the University Corporation for Atmospheric Research (UCAR) and become the first director of the National Center for Atmospheric Research. After employing astronomy against the Axis Powers in World War II, Walter Roberts spent the last decades of his life applying his scientific knowledge against a new threat to humanity: Climate Change.

*Bruce Lane*

# November Astro Crossword



**ACROSS**

- 2 Name of telescope that recently detected record setting X-Ray burst
- 5 What constellation is the Sun rising in front of during the Transit of Mercury?
- 6 Target from the recent Plaskett session
- 8 Name of a famous German astronomer

**DOWN**

- 1 Currently operational rover on Mars
- 3 Primary instrument used by Walter Roberts at Climax Observatory
- 4 How many years until the next Transit of Mercury?
- 7 Tycho Brahe once lost a duel with a fellow mathematician by this much



## October Astro Crossword Answers

**Across 1:** Alan Bean was the 4<sup>th</sup> man to walk on the Moon; **Across 3:** a reflector was the design of telescope given away as a prize at the Saanich Fair; **Across 5:** Chef de Cuisine is another way to say Executive Chef; **Across 7:** the mesosphere is the layer of the Earth's atmosphere above the stratosphere; and **Across 8:** Apollo 12 landed at Oceanus Procellarum.

**Down 2:** the subject of Saturday night's lecture at the star party was archaeoastronomy; **Down 4:** Cassini orbited Saturn for thirteen Earth years; and **Down 6:** Harriot was the first recorded person to view the Moon through a telescope.

## Astronomical Term of the Month: Lunar Terminator

For regular observers of the Moon it's all about the terminator. The line that divides the portion of the Moon illuminated by the Sun and the portion that's in darkness, results in improved contrast along that line. Every night, the Moon highlights another part of its surface along this line, allowing observers to have a better view of details that would otherwise be lost in the highly reflective surface of our nearest celestial neighbour. It's why the full moon is actually the worst time to make observations of the Moon, since there are no shadows on the surface of a full moon. But along the lunar terminator you can see the shadows of geographical features, allowing you to get a better sense of the peaks and valleys.

*Bruce Lane*

## In Closing



For those of us going outside, to make the most of these clear autumn nights, it's abundantly clear that summer is a distant memory. It's not just cold, it's a wet cold. You might feel ridiculous buying long underwear in Victoria, but you'll feel a lot less ridiculous when you're not dying of hypothermia, late at night up on Little Saanich Mountain. Given that you'll be loitering beside a telescope, I recommend dressing as if it was 5-10 degrees Celsius colder than it actually is. That way you'll be leaving when you decide to and not because you're too cold to stay. So prepare to bundle up and join your fellow amateur astronomers on these less than summery nights. On the bright side you don't have to worry about the mosquitoes.

I'm now going to make what is referred to in social media as a *Call to Action*. Unlike social media influencers, I'm not asking you to click like, share this, smash that subscribe button, or buy merch. OK. I'm obviously not about to tell you to stop buying RASC Victoria merchandise anytime soon, but just remember it was your decision. Did I mention that we just had a recent printing of RASC Victoria T-shirts? What it comes down to is that the continuation of our green and pleasant society requires that our council positions be filled by people like you. Sadly we aren't so fabulously wealthy that we can hire professionals to run it for us. Our vice president position has remained unfilled for nearly a year and that's a problem. It's meant that our president has been forced to do double duty, which is doubly unfair in his first year as centre president to not just have to contend with key administrative positions not being filled, but having to do the extra work himself. We've managed to get by without a public outreach coordinator by doing events either by committee or by having members step up and captain them individually. While this has limited the amount of events we can participate in, it might be a more realistic model going forward. However, the members of our Victoria Centre need to be mindful that the next annual general meeting will be happening in February and a number of council positions will need to be filled. For some of you, it means considering a return to Council after having previously served. For others it's a chance to serve on Council for the first time.

*Bruce Lane: SkyNews Editor*

## Photography Credits

Cover: Transit of Mercury, May 9<sup>th</sup>, 2016, by David Lee

Page 2: Transit of Mercury, using 8" SCT and Ultima-Duo (eyepiece/T-adapter), May 9<sup>th</sup>, 2016, by Bruce Lane

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

Page 4: Apollo 12 astronauts Pete Conrad (left), Dick Gordon, and Al Bean during spacecraft checkout at North American Rockwell Space Division, picture submitted Sept 29th, 1969; scan by Ed Hengeveld; from archives of NASA's Jet Propulsion Laboratory, a division of Caltech in Pasadena, California.

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

Page 5: Crop of Bill Kunze and Dob, August 2019, by Patricia Horlor.

Page 6: Dumbbell Nebula (M27), through Oxygen III filter, using 16" Ritchey-Chretien and 21mm Ultima-Duo (eyepiece/T-adapter). Single exposure for 4 minutes, unguided; Oct 27, 2019, by Bruce Lane

Page 7: Milky Way, Oct 27, 2019 from Plaskett parking lot, by David Lee

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

Page 8: Curiosity at Glen Etive, panorama selfie created from 57 images, using the Mars Hand Lens Imager (MAHLI), with the robotic arm digitally removed from the photo for artistic reasons. Oct 11<sup>th</sup>, 2019; from the NASA's Jet Propulsion Laboratory.

Page 9: Posed Book, "*Deep Sky Observer's Guide*", taken in UVic Astronomy Teacher's Lounge on March 13<sup>th</sup>, 2019, by Bruce Lane

Page 9: Sketch of Comet C/2017 T2 Panstars, from Pearson College, Oct 29<sup>th</sup>, 2019, by Bill Weir.

Page 10: Orion Nebula (M42), from VCO using 16" Ritchey-Chretien telescope, single frame without guiding, Oct 26<sup>th</sup>, 2019; by Bruce Lane

Page 11: Sun through Hydrogen-Alpha Filtered, Lundt solar telescope, June 17<sup>th</sup>, 2014; by Bruce Lane

Page 12: Sliver of Moon, Oct 26, 2019, by Diane Bell

Page 12: Remi and Chris at the VCO, Oct 5th, 2019, by Joe Carr

Page 13: "Raven" (Cuckoo Maran) sunning in the rose garden, Oct 5<sup>th</sup>, 2019; by Bruce Lane

Page 15: Apollo 12, Pete Conrad on the ladder, Nov 19<sup>th</sup>, 1969, picture by Al Bean; processed by Kipp Teague, from NASA Johnson Space Center scans.

## Call for Article and Photo Submissions for December Issue

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

**RASC Victoria Centre Council 2019**

<b>Position</b>	<b>Name</b>	<b>Email</b>
Past President	Chris Purse	<a href="mailto:pastpres@victoria.rasc.ca">pastpres@victoria.rasc.ca</a>
President	Reg Dunkley	<a href="mailto:president@victoria.rasc.ca">president@victoria.rasc.ca</a>
Vice President	<i>Waiting for You</i>	<a href="mailto:vp@victoria.rasc.ca">vp@victoria.rasc.ca</a>
Treasurer	Deborah Crawford	<a href="mailto:treasurer@victoria.rasc.ca">treasurer@victoria.rasc.ca</a>
Secretary	Barbara Lane	<a href="mailto:secretary@victoria.rasc.ca">secretary@victoria.rasc.ca</a>
Librarian	Diane Bell	<a href="mailto:librarian@victoria.rasc.ca">librarian@victoria.rasc.ca</a>
Technical Comm Chair/Sys Admin	Matt Watson	<a href="mailto:admin@victoria.rasc.ca">admin@victoria.rasc.ca</a>
Skynews Editor	Bruce Lane	<a href="mailto:editor@victoria.rasc.ca">editor@victoria.rasc.ca</a>
Public Outreach	By Committee	<a href="mailto:outreach@victoria.rasc.ca">outreach@victoria.rasc.ca</a>
School Outreach	Laurie Roche / Sid Sidhu	
Telescopes	Sid Sidhu	<a href="mailto:telescopes@victoria.rasc.ca">telescopes@victoria.rasc.ca</a>
National Representative	Nelson Walker	<a href="mailto:nationalrep@victoria.rasc.ca">nationalrep@victoria.rasc.ca</a>
Light Pollution Abatement	Dave Robinson	<a href="mailto:lighting@victoria.rasc.ca">lighting@victoria.rasc.ca</a>
Membership Coordinator	Chris Purse	<a href="mailto:membership@victoria.rasc.ca">membership@victoria.rasc.ca</a>
Observing Chairperson	Jim Stillburn	<a href="mailto:obschair@victoria.rasc.ca">obschair@victoria.rasc.ca</a>
Website Content	Joe Carr	<a href="mailto:web@victoria.rasc.ca">web@victoria.rasc.ca</a>
<b>Members at Large</b>		
NRC Liaison	James di Francesco	
Nat RASC Anniversary Wrkg Group	Dr. James Hesser	<a href="mailto:james.Hesser@nrc-cnrc.gc.ca">james.Hesser@nrc-cnrc.gc.ca</a>
FDAO Liaison	Laurie Roche	
UVic Liaison	Alex Schmid	
<b>Other Members at Large</b>	David Lee	Li-Ann Skibo
	Dan Posey	John McDonald

