

SKYNEWS



Comet C/2022 E3 (ZTF), January 29th, 2023; by Lucky Budd.

Comets and Clouds

At anytime in the night sky there are usually quite a few comets that are being observed, making their way through our solar system. At the moment I am writing this there are twenty-two. Nine at this moment are too close to the Sun to be viewed. Eight of the comets would be the kind of target you'd want the Plaskett Telescope handy to use, provided they were in the right place in the sky. Seven of them could be seen with a 203mm (8") aperture telescope if they were in the right place in the sky in ideal observing conditions for amateur astronomy. One of the comets is bright enough to see with

a pair of binoculars and has apparently even been seen by naked eyes that were obviously better than mine (a moonless night at magnitude 5). It's high up from the horizon and a great target for telescopes.

The comet C/2022 E3 (ZTF) was first discovered by a pair of astronomers, Bryce Bolin and Frank Masci, while they were using the Zwicky Transient Facility last year. It wasn't detected until it had already passed by the orbits of most of the Outer Planets, while it was at slightly less distance from the Sun to Jupiter's orbit. At an apparent magnitude of 17.3 (really faint), it was first believed to be an asteroid. It was missed in an early image taken in 2021 and was then later identified as a comet, after its coma was observed.

This year, it's been a matter of contending with the weather and hoping for some good observing conditions. It hasn't helped that the Moon is shining in its brighter phases as the comet becomes more accessible in brightness itself. By January 16th, the first reports of naked eye observations occurred, but it's not exactly the most visually stunning object in the night sky when viewed this way. All the talk of C/2022 E3 (ZTF) being a great comet for visual observing has been a bit of an exaggeration. Through a pair of binoculars, it appears as a faint puff of light, one that demands the use of a telescope at the very least to gain a greater appreciation. While not as visually stunning as some previously visiting comets, with its green hues it is quite photogenic.

The comet, designated C/2022 E3 (ZTF), is on what is referred to as a long period orbit. To qualify as a long period orbit it has to be over 200 years. Being somewhat of an over achiever, this comet was last in the vicinity of Earth roughly 50 000 years ago. On its previous visit, Homo Sapiens still shared the planet with Neanderthals. It was the beginning of the Upper Paleolithic and the end of the second great migration out of out of Africa; the one that humans today are primarily descended from. This was a time of great advancements in tool making, a process that has continued to this day. Was the comet bright enough in the night sky to have been seen by the hominids of that time? Would they even have given it much thought if they had seen it? Was it cloudy? Very soon, the comet will be lost to view and then chances are quite good that nobody alive today will see it again after it vanishes once more into the edge of our solar system. Short of the comet being imaged by a future deep space mission, the next opportunity to see it again will be in another 50 000 years. Given how far we've come since then and the many challenges we face, one wonders about the world it will return to the next time it comes this way.

Bruce Lane



Editorial Remarks



When one year ends and another begins is all about context. Some of us just celebrated the *Chinese New Year* on January 22nd and are looking forward to the *Year of the Rabbit*. RASC's financial year-end was changed a few years ago from September 30th to December 31st, to bring it in line with our counterparts at RASC National, allowing our financial records to synch up with a bit less hassle. The previous year-end did have the benefit of coinciding with most public outreach expenses being completed before the cold of autumn settled in. The annual general meeting, where we officially elect and appoint new members for the RASC Victoria Council, doesn't happen until at least a month after the financial year-end, to give the treasurer and secretary time to complete their annual reports. The main advantage of having the previous AGMs in October or November was that it gave new council members more time to settle into their roles before things heated up again in the public outreach

schedule. Of course, it also resulted in them being very inactive to begin with and having any administrative momentum they managed early on to be disrupted by the holiday season. This year, we're having the AGM sometime in March. This does walk the event a bit close to the beginning of the public outreach season that begins in earnest on Astronomy Day, which will be happening sometime in May. It's a bit later after the financial year-end than usual to hold the AGM, but what about recent years has been normal?

One important date has been locked in. We're having a special general meeting on Monday, February 13th, to vote on adopting the new by-laws that will mean a structural change to our RASC Victoria Council. To vote on the new by-laws we need as many members attending the meeting as possible to ensure quorum. Members of RASC Victoria should have already received an email with details about this meeting.

In this February and for me as editor my penultimate issue of *SkyNews*, we'll have more recaps from our Centre's activities, a reposted article on *Comets in the Ancient World*, as well as all the astrophotography and articles you've come to expect from the *Victoria Centre SkyNews*.

Bruce Lane:
SkyNews Editor



Astro Café: Hybrid Meetings



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

The first Astro Café of December was hosted by Randy Enkin. It started with the announcement of 7pm future starts for Astro Café, made some additional president's announcements, and gave a presentation on *Sunrise, Sunset and the Path of the*

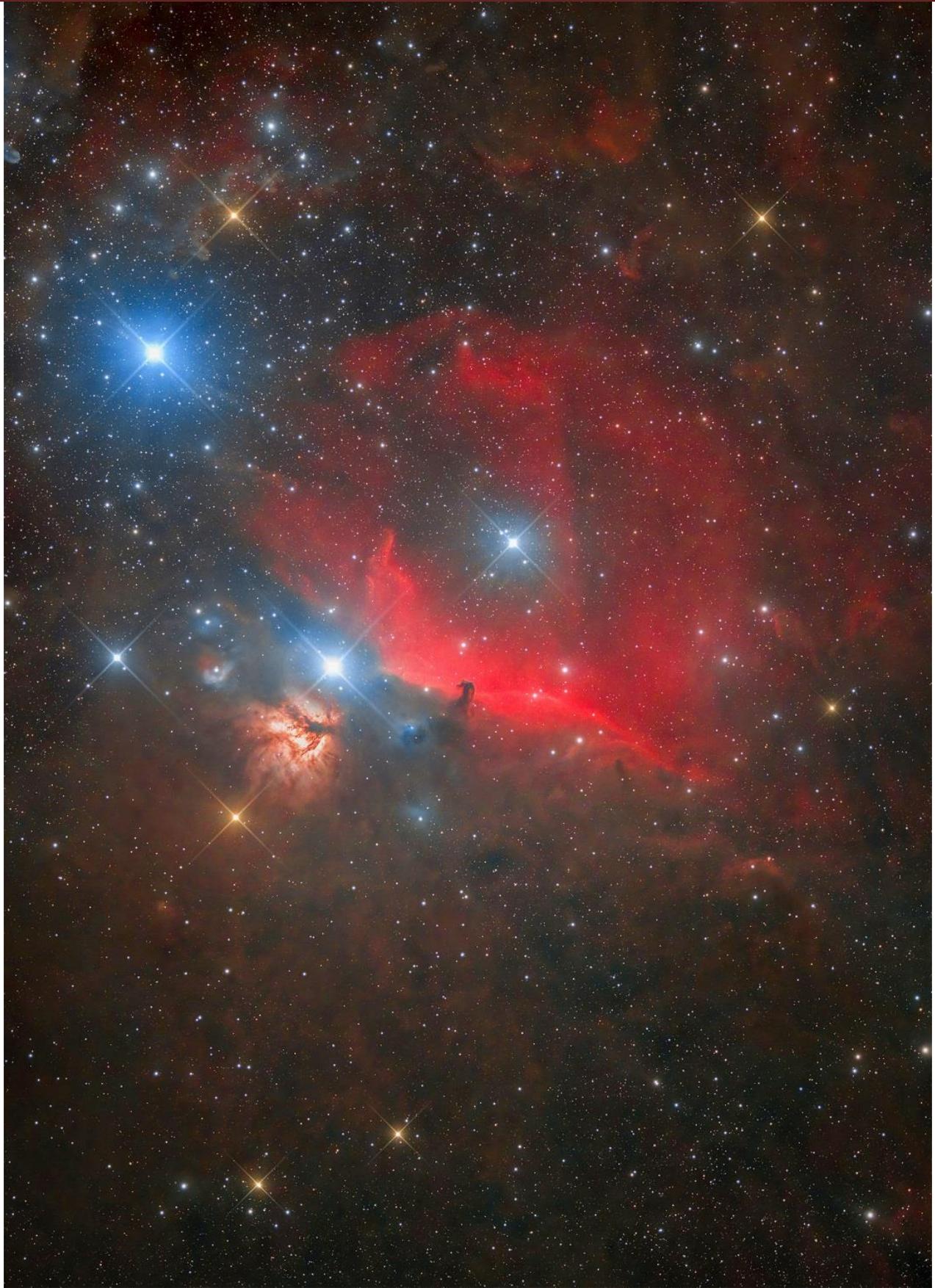
Sun. Reg Dunkley gave a report on the current status of the Victoria Centre Observatory; discussed last month's presentation by Ron Fisher on *Learning Astrophotography*; and gave a presentation on the *Far Side Amateur Astronomers Observing a Supernova*. Dave Payne mentioned the speaker for next week's Astro Café: Laurie Rousseau-Nepton from CFHT; Dave Robinson showed an image from RASC Edmonton; David Lee gave an update on the Special Interest Groups; Lauri Roche talked about the RASC National handbooks and calendars; and there was some talk of upcoming observing opportunities.

For the next Astro Café, Jeff Pivnick introduced special speaker: Dr. Laurie Rousseau-Nepton is an astronomer in residence at the Canada France Hawaii Telescope (CFHT). Jim Hesser talked about Silent Sky playing at the Langham Court Theatre; Randy discussed an upcoming geology presentation and some astronomy observing notes; Laurie again mentioned available RASC National publications; and the evening concluded with talk of astronomy events and general conversation.

The third Astro Café of the month was hosted by Jim Cliffe and he introduced a couple representatives (Brian Robilliard and Ed Nicolas) from the Cowichan Starfinders to promote the 2023 Island Star Party at Bright Angel Park, which requires RASC Victoria take over the event for it to continue. Randy talked about the Venus-Saturn Conjunction and Comet ZTF C/2022 E3; while Lauri Roche talked about the Friends of the Dominion Astrophysical Observatory Saturday night game show themed event.

The last Astro Café of December kicked off with talk about the Special General Meeting on February 13th. Dave Payne showed a picture of Comet C/2022 E3 ZTF; Marjie Welchframe gave a presentation on angular momentum; and Lauri discussed the FDAO Astro Jeopardy and Virtual presentations from RASC National. John McDonald talked about his *Astronomy in Victoria* presentation; Bill Weir brought up planning for a return of the RASC Victoria Annual Picnic at Pearson College; and the meeting came to a close with Chris Gainor giving a report from the American Astronomical Society conference in Seattle.

Bruce Lane



IC434, Horse Head Nebula, January 15th, 2023; by Scott Garrod

Comet C/2022 E3 (ZTF), January 28th, 2023; by Paul Johnson.

Comets in the Ancient World

Like a good many things debated in Ancient Greece, the nature of comets was hotly contested. Pythagoras viewed comets as planets in their own right. Aristotle argued that comets were merely atmospheric aberrations, in part because of their lack of permanence in the night sky to the observer. There many other opinions that where variations on these two ideas, but others took a completely different line of thinking. Anaxagoras hypothesized that comets were an optical illusion caused by planetary conjunctions. During a planetary conjunction, Anaxagoras proposed that the proximity of the planets resulted in a combined image of them stretched out into what is observed as a comet. Democritus, a brilliant thinker, best known for his idea that everything in the Universe was made out of *little atoms*, built on the astronomy teachings of Anaxagoras to champion his comet hypothesis. Because his writings survived to be popularized by later peoples around the Mediterranean, Aristotle's opinions on science (or *natural philosophy* as it was known as until the 19th century) dominated the scientific worldview for over a thousand years. A few centuries later, the Roman thinker, Seneca the Younger would question Aristotle's idea of comets being atmospheric aberrations, pointing to the orbits of these comets as proof that they were heavier objects, made of "*earth-stuff*". It should be noted that even the deepest thinkers of the Ancient World lacked access to the kind of optics we now take for granted.

How comets are viewed as portents of doom or good fortune around the Ancient Mediterranean sometimes depended on which side of the Aegean Sea you were on. While Christianity comes from the Middle East monotheistic traditions, the Christians of Europe took their orders from Papal Rome, so when it came to interpreting comets, they were definitely on the bad omen side of the Aegean Sea. Mithradates had all the showmanship and diplomacy of Alexander the Great, but lacked the military ability to back it up. Instead of becoming a great conqueror, he had to settle with becoming great at managing to survive to an old age as an enemy of Rome, no matter how many times he was defeated in battle.

Mithradates claimed to have been born under a bright comet; something attributed to many legendary figures to the east of the Aegean Sea. He included the symbol of the comet in his coinage, alongside his own image, just in case anyone forgot. The most significant comet, in the year I was born, was the *Mercury Comet*. They really knew how to build muscle cars back then.

Politics also had a lot to do with whether you viewed a comet to be good or bad, given that an omen of extreme change wasn't something most emperors and kings eagerly looked forward to being confronted with. Shortly after the assassination of Julius Caesar, a bright comet appeared in the sky, which Romans believed to be the manifestation of Caesar's soul in the heavens. As his patron's named successor, Octavian had the *Temple of the Comet* built to honour him and then used the popularity of Caesar's cult to help get the support needed to pass his laws, because that's what the *God Caesar* would have wanted. The comet was used as a symbol of divinity throughout the reign of Octavian, better known as Augustus Caesar, to remind everyone of his close relationship to Julius Caesar. Had Octavian not taken the initiative to determine the narrative of the omen, it's likely a rival would have used it as an opportunity to undermine his path to becoming the emperor. Obviously, when Halley's Comet happened in the year that William the Conqueror won his English kingdom, talking about the comet as a portent of doom might have been a poor choice for anyone in the court of the new king. The discussion would have been completely different among the conquered Anglo-Saxons. The comet was included in a scene of the Bayeux Tapestry, shown over the head of King Harold and his nervous retinue, where it was acceptable to be shown as a symbol of doom.



A few years after the fall of Constantinople, the fortunes of Christian Eastern Europe were at a low point, with the Ottomans marching towards the border of Hungary. During the Siege of Belgrade in 1456, Pope Callixtus III is widely reported to have excommunicated Halley's Comet - something he never actually did. What he did order to be done, to counter the comet's *inherent wickedness*, was to have church bells be rung three times each afternoon and that on the first Sunday of the month, have religious processions and sermons about how terrible the Turkish invaders were. The Ottoman army were defeated, after the comet vanished from the sight of observers, but the victory had a lot more to do with an experienced Hungarian general leading a successful counter-attack, wounding the Ottoman Sultan, and forcing him to abandon his plans to invade Europe.

In Ancient China, royal court astrologers recorded astronomical phenomenon over thousands of years, to keep their patrons up to date on the latest omens, similar to the way Babylonian astrologer-priests did. The comet was regarded as a symbol of chaos, which was a less than positive omen for any ruler, except for one. Emperor Ruizhong was made the ruler of China on two occasions, both times as a puppet of a more powerful family member. Ruizhong spent a great deal of effort avoiding potentially fatal confrontations in the royal court, to the point of having multiple abdications. In one instance, he cited a bright comet in the sky as an omen that it would be a great time for him to step down, made even greater that it allowed him to avoid being killed by a close member of his family.

What we dismiss as ancient superstition hasn't always been that ancient. Samuel Clemens, better known as Mark Twain, remarked that just as he had been born in the year of Halley's Comet, he would die when it returned; a thing that actually happened. The prediction becomes a bit less astounding, when it was done a year earlier, at a time when he was acutely aware of his failing health. More recently, when the comet Hale-Bopp shined its brightest in the skies of 1997, the *Heaven's Gate* cult committed mass suicide in the belief that once freed of their material forms, they would all go to a spaceship that was traveling behind the comet. Given the way 2023 is shaping up, if one were to read the appearance of our current celebrity comet as an omen, it probably wouldn't be getting many favourable omen reviews at anyone's court, royal or otherwise.

Bruce Lane

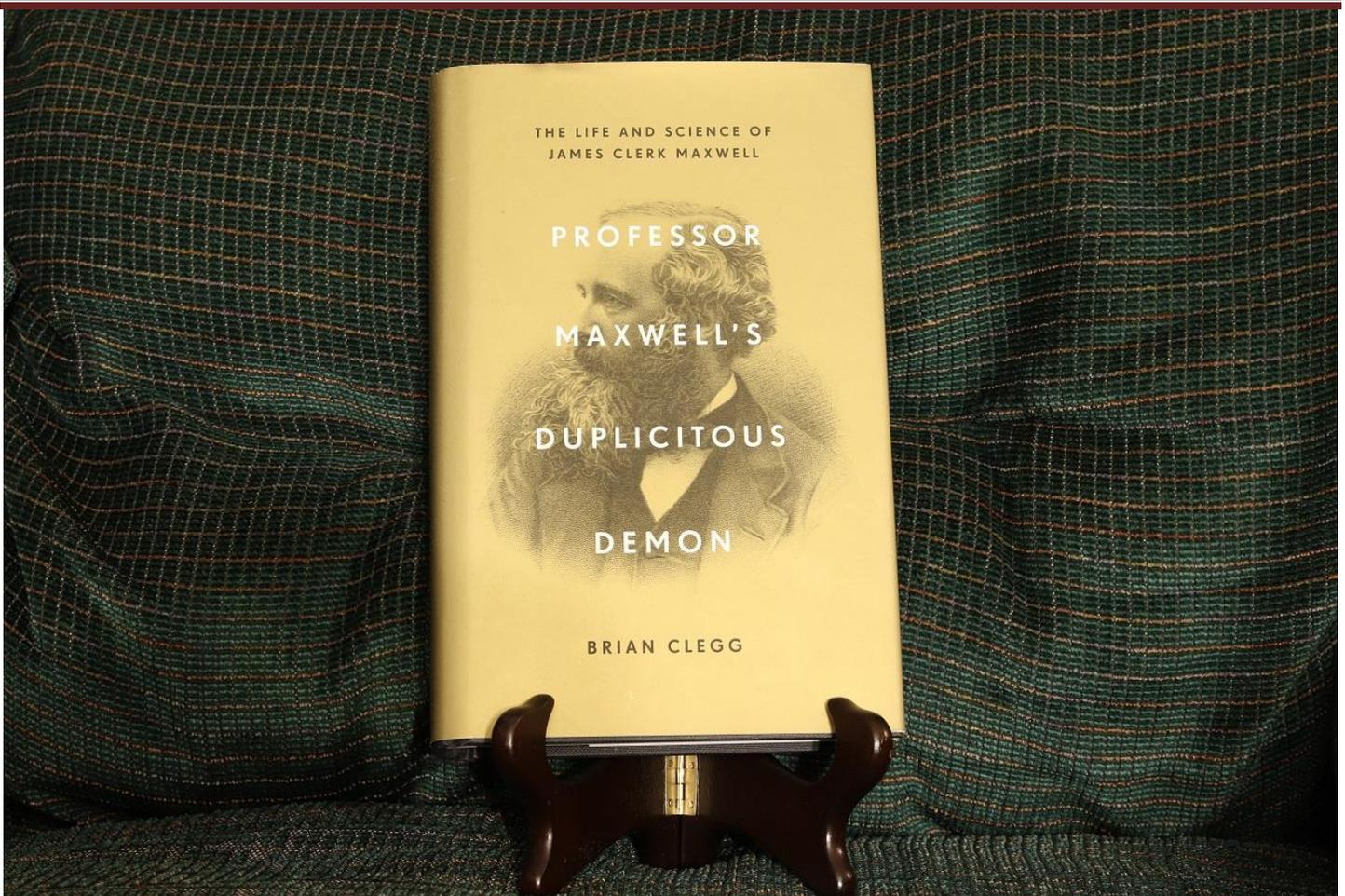
From the Library

The RASC Victoria Centre Library is housed in the Astronomy Department's faculty lounge, located on the 4th floor of the Elliott Building, at the University of Victoria. It contains over 500 titles, curated by Alex Schmid, our RASC Victoria Centre Librarian. Alex is currently running our library in the same way the Greater Victoria Public Library runs its shut-in branch, driving around to do deliveries and pickups for our membership to provide access to books from the collection. For more information or to make a book delivery request, please contact Alex Schmidt at: librarian@victoria.rasc.ca

Our library covers many aspects of astronomy: observing, astrophotography, telescope construction, space exploration, astrophysics, and much more. Normally, the library is opened up during the social gatherings in the faculty lounge, after our monthly meetings, with coffee, juice, and cookies provided by our Centre. In the past I've been doing book reviews of the contents of our Centre's library, but until the resumption of our monthly meetings at the University of Victoria, I'll mostly be doing reviews of the astronomy books from my personal library, ones that can be purchased online or better yet at your local bookstore.

This month we're taking a closer look at *Professor Maxwell's Duplicitous Demon*, by Brian Clegg. Clegg is a science communicator and award-winning author from the United Kingdom, with a degree in Natural Science (specializing in experimental physics) from Cambridge and a second degree in Operational Research from Lancaster University. Brian Clegg has written and continues to write numerous articles for magazines and newspapers, some novels, as well as over forty books on science, including his latest: *Ten Days in Physics that Shook the World*.

Professor Maxwell's Duplicitous Demon is the story of James Clerk Maxwell, a name that should be spoken alongside the likes of Kepler, Newton, and Einstein. It's an enjoyable read, with the unusual choice of a demon narrator in the footnotes, acting as the manifestation of the 2nd Law of Thermodynamics. The style of this footnote narrative is entertaining, and makes the footnotes less intrusive and jarring than how regular footnotes can take you out of what you're reading if you're constantly referring to them. There are also chapter notes in the back of the book.



James Clerk Maxwell was a brilliant academic from an early age, noted for his originality and pursuit of scientific truth. Among his long-time fellow classmates and friends were the likes of Peter Tait, Lewis Campbell (well known classicist and Maxwell's biographer), and William Thomson (Lord Kelvin). His academic beginnings were a balance of emphasis on laboratory experimentation from Edinburgh and the strength of higher mathematics he honed at Cambridge, becoming something new. Instead of using mathematical theory to explain the results of an experiment, Maxwell was creating mathematical theories to resolve scientific problems and then proving them with experiments. Like many of the great minds of his time, he was also inventing new instruments while devising his experiments. Early in his academic career, Maxwell changed the concept of the colour wheel from red, yellow, and blue to red, green, and blue, which has become the standard for modern colour display screens. Unlike almost all the other scientists of his time, Maxwell believed that atoms and molecules were a physical reality, and not just useful concepts for explaining chemistry.

He made a rare foray into astronomy, by trying to understand the composition of the rings of Saturn with a telescope and applying his mathematics. He was able to use a *Fourier analysis* to determine that the rings weren't a fluid. His observations determined that the rings weren't a solid structure, because to rotate the way they did the matter would have to be noticeably more unevenly distributed. Maxwell correctly concluded that the rings had to be composed of much smaller pieces held together by gravity.

When he presented *A Dynamical Theory of the Electromagnetic Field* to the Royal Society in 1864, it was received with confusion and bewilderment. Maxwell was presenting his work to the last generation of scientists who weren't required to be fluent in complex mathematics. His hero, Michael Faraday, with whom he regularly corresponded with and much of whose work he had quantified with his mathematics, referred to Maxwell's mathematical theories as *hieroglyphics*.

In 1871, Maxwell returned to Cambridge as the Chair of Experimental Physics and immediately set about making changes to modernize the faculty. He ordered the building of the Cavendish Laboratory, with a revolutionary design. There was a hall for doing popular demonstrations for the public; a large space for students to do serious lab work; and a special allocation of space for top scientists to do work where they wouldn't be disturbed by intrusions from everybody else. This experimental laboratory has been the site of numerous ground breaking discoveries, including thirty Nobel Prizes (as of 2019). While he was at Cambridge, he also published his *Treatise on Electricity and Magnetism* and *Theory of Heat*. With the invention of the radiometer by William Crookes in 1874, there was finally an instrument to prove Maxwell's theories. James Clerk Maxwell quickly set about presenting a paper about the radiometer to the Royal Society. It would be his last academic work. Soon afterwards, he fell ill and was diagnosed with cancer, finally dying in 1879. One of the greatest minds in the history of science was dead at the age of only forty-eight.

Later, when Michael Pupin traveled to Cambridge from America to seek Maxwell out, he was unaware that the author of the revolutionary work was already dead. He couldn't even find anyone at Cambridge who understood Maxwell's work. Pupin had to travel to Berlin to find someone who did: Hermann von Helmholtz. While not well understood in his own time, Maxwell's works would create a solid foundation for others to build upon. Norbert Wiener, who created the field of cybernetics in the 1940s, credited Maxwell for being the father of what would become *control systems theory*. One of the few pictures in Einstein's study was a portrait of Maxwell. Of him he said: "*There would be no modern physics without Maxwell's electromagnetic equations; I owe more to Maxwell than to anyone.*"

Professor Maxwell's Duplicious Demon is a well written book that should be essential reading for anyone with an interest in the history of science and it's available by order from your local bookstore.

Bruce Lane



LDN1622, Boogeyman, December 20th, 2022; by Scott Garrod

Hill and Dale (Observing on the Island)

January skies were cloudy and cold with a few breaks, but there were enough of those breaks at the right time to allow a number of RASCals to observe and image the comet C/2022 E3 (ZTF). It was certainly a notable *puff ball*, when I viewed it through binoculars, but not something to be stared at without larger optics. Catching the comet was certainly easier towards the end of the month, when it was moving up to a more favourable point in the northern sky that didn't require getting up in the middle of the night. On January 22nd (Chinese New Year!), Chris Purse was among those observing the conjunction of Venus with Saturn, one of the other big observing opportunities of January.

Access to the Victoria Centre Observatory is currently still restricted, due to road construction on Observatory Hill. A reminder that although the VCO belongs to and is for the use of the members of the RASC Victoria Centre. In the *Before Times*, MiCs (Members in Charge) ran both weekly scheduled and unscheduled sessions to take advantage of the weather, but for the foreseeable future observing sessions will be a lot less scheduled and less frequent. The VCO is located on the property of the National Research Council. This means that all visitors to our observatory must be on our observer list and registered with the NRC. To get on the list, just contact Chris Purse (Membership Coordinator) at membership@rasc.victoria.ca and we'll see you up there on the Hill one of these nights in the not too distant future.

Bruce Lane



In Closing

The weather has been a bit on the cloudy and soggy side, with more than our usual share of windstorms, making for the kind of astronomy weather than lends itself to indoor activities. Hopefully, the windstorm that has been forecast to hit Greater Victoria around the time of our special general meeting doesn't interfere too much with the local power grid.

As we get prepared for an increase in astronomy public outreach, it's important to remember that the Pandemic is far from over. There continue to be outbreaks in schools and school closures as a result. Hospitals continue to be crowded and staff overworked. If you are participating in public outreach it would be smart to continue to wear a mask, have a personal bottle of hand sanitizer accessible, and keep your vaccinations up to date. Between poor government messaging about the fact that the Pandemic is not actually over and with the floodgates being opened to travelers, we're going to be dealing with this virus for a very long time to come.

The regular meetings and events hosted by other astronomical societies on Vancouver Island continue, regardless of the weather. The Centre of the Universe and Plaskett Telescope on Observatory Hill are hosting monthly events, with the next evening scheduled for February 25th. Due to the physical site still being closed for road construction this will be an online only event. These public outreach events on Observatory Hill are hosted by the National Research Council and Friends of the Dominion Astrophysical Telescope, with volunteers from the RASC Victoria Centre also taking part. The University of Victoria is hosting weekly Wednesday open house events at the Bob Wright Centre Observatory, from 8-10pm. The Nanaimo Astronomy Society have their next monthly meeting for members scheduled for February 23rd. These events by the Nanaimo group are hybrid events, with both in person and online attendance via ZOOM. The Comox Valley Astronomy Club already had their monthly meeting last week and their next meeting will be at the Courtney Public Library on March 6th.

Bruce Lane: SkyNews Editor

Photography Credits

Cover: Comet, Jan 29, 2023; by Lucky Budd.

Page 2: Comet, Jan 28, 2023; by Lucky Budd.

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

Page 3: Heart, Feb 12, 2018; by PhotoMIX-Company. Free to use under the Pixabay license.

Page 4: Photograph and Design of Astro Cafe Mug, by Joe Carr

Page 5: IC434, Horse Head Nebula, Jan 15, 2023; by Scott Garrod. Askar FMA260/ ZWO asi2600MN Pro/ Ioptron CEM70. 70 X 300 seconds-6 Hours, Shot in RGB, no filters

Page 6: Comet, Jan 28, 2023 Paul Johnson. *10 times 15 seconds star guided Equipment: Filter Astrodon L, Camera QSI632, Mount 900GTO, Scope Newtonian 200mm F4 with 0.7 reducer, Guide scope TMB92L, Guide camera ASI290MM, Software: PixInsight / comet stacked*

Conditions very windy that evening. As clear nights have been few and far between. I didn't want to pass up the opportunity to get an image of this comet. Crossed my fingers and hoped for the best. The short exposures with my fast system resulted in a fair image.

Page 7: Augustus. 27 BC-14 AD. AR Denarius (3.88 gm). Struck circa 19-18 BC. Caesaraugusta mint. CAESAR AVGVSTVS, laureate head right / DIVVS IVLIV[S], comet of eight rays with tail upward. RIC I 37a; BMCRE 323; RSC 98. Image taken Jan 25, 2006; by Carlomorino. This file is licensed under the Creative Commons Attribution-Share Alike 3.0 unported license.

Page 9: Posed Book, "*Professor Maxwell's Duplicitous Demon*", taken in Editor's home on July 15, 2020, by Bruce Lane

Page 10: Third iteration of the Cavendish Laboratory at Cambridge under construction, May 23, 2020; by Pontificalibus. This file is made available under the Creative Commons CC0 1.0 Universal Public Domain Dedication.

Page 11: LDN1622, Boogeyman, Dec 20, 2022; by Scott Garrod. Astro Tech 130 EDT/ ZWO asi2600MC Pro/ Ioptron CEM70 80 X 300 seconds- 6 Hours, 40 min

Page 12: "Goose" Ameraucana chicken, Feb 10, 2023; by Bruce Lane

Page 14: Moon, Jan 4, 2018; by Candiix. Free to use under the Pixabay license.

Call for Article and Photo Submissions for the March Issue

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

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