

NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2022 ISSUE 4 JULY/AUGUST 2022



Noctilucent Clouds

by Rob Lyons

It was two years ago in the summer of 2020 on a warm summer's night that I was setting up

my telescope to take a photo of comet Neowise that I saw a strange thing in the sky. To the north above Cypress Bowl and Grouse Mountain, I saw clouds that didn't look like any that I had seen before;

they seemed to be almost glowing. A few minutes later they were gone, but not forgotten as I really wanted to know more about what I had seen that night. It would be a full year later,

where again I was setting up my telescope on the roof, when I glanced to the north and saw



that same type of cloud that I witnessed a year earlier. I raced to get my camera and tripod and made it back in time to make a picture before they faded away. The clouds were special and I

looked around to see if there was anyone else sharing this awesome experience with me, but it

seemed I was the only one still awake in the area. Such is the power of photography, the ability to share these wonders with others, and with the addition of storytelling we can also help others have these

experiences for themselves. Here is what I have learned about the elusive and surreal phenomenon in the sky that we know as noctilucent clouds.

continued on page 5

JULY 14

SFU/Zoom

James Webb's First Images, Featuring Dr. Wes Fraser and Dr. Madeline Marshall from the DAO in Victoria. Room AQ 3159 and on Zoom.

SFU

NO MEETING IN AUGUST

SEPTEMBER 8

SFU/Zoom

Dr. Patrick Seitzer from the University of Michigan: Space Debris and Astronomy. Room TBA and on Zoom. See Meetup for details.

SFU

Canada Day at Maple Ridge

by Suzanna Nagy

After a two-year hiatus for COVID-19, Maple Ridge hosted its annual in-person Canada Day celebrations on July 1. As in years past, your Vancouver Centre participated with solar telescopes, displays, and promotional material.

We had six pieces of solar observing equipment on site to engage the public with. A big and heartfelt thank you to the RASC volunteers that participated on our Centre's behalf, those being

William Fearon, Jennifer Kirkey, Karl Miller, Sam Xu, Hayley Miller, Renuka Pampana, Leigh Cummings, Marla Daskis, and myself, Suzanna Nagy.

The event was an obvious success with thousands of people in attendance and hundreds enjoying our solar telescopes and displays. The weather was hot, exceptionally hot that day, and we tried to be prepared with sunscreen, hats, umbrellas, and a tent for shade. We all had lots of fun

and after two years apart, it was a wonderful experience to be together again with fellow astronomy friends.

If you are interested in volunteering at future in-person events such as the upcoming Perseid meteor shower in August, kindly reach out to our events coordinator, Hayley Miller, myself, or any council member. No experience, equipment, or skills is required, just enthusiasm and a willingness to participate. ★



Photos by Leigh Cummings, Suzanna Nagy, Hayley Miller

President's Message

by Alan Jones

Our club appeals to the many varied interests of our membership and to the public that enjoy our outreach programs. It is marvelous to think that we have members interested primarily in one of the many interesting aspects of astronomy. Some members are focused on imaging, col-

lecting data and processing it into images. Others are visual astronomers that enjoy learning the geography of the night sky. The geometry of the asterisms and constellations give us finding markers that lead to the visual treasures for the telescope viewer. There is joy in learning the constel-

lations and how to navigate among them to find treasures to view in a dark sky. Others are excited about viewing our nearest neighbor, the Moon.

Solar viewing can occur in the daytime with small instruments that have specialized filters. The sun is fascinating.

continued on page 4

About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at SFU's Burnaby campus (see map on page 4). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$89.00 per year (\$52.00 for persons under 21 years of age; family memberships also available) and can be obtained online, at a meeting, or by writing

to the Treasurer at the address below. Annual membership includes the invaluable Observer's Handbook, six issues of the RASC Journal, and, of course, access to all of the club events and projects.

For more information regarding the Centre and its activities, please contact our P.R. Director.

NOVA, the newsletter of the Vancouver Centre, RASC, is published on odd-numbered months. Opinions expressed herein are not nec-

essarily those of the Vancouver Centre.

Material on any aspect of astronomy should be e-mailed to the editor or mailed to the address below.

Remember, you are always welcome to attend meetings of Council, held on the first Thursday of every month at 7:30pm in the Trotter Studio in the Chemistry wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

2022 Vancouver Centre Officers

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Shay Pomeroy, Michael Levy

Honourary President J. Karl Miller

Library

The centre has a large library of books, magazines and old NOVAs for your enjoyment. Please take advantage of this club service and visit often to check out the new purchases. Suggestions for future library acquisitions are appreciated.

On the Internet

rasc-vancouver.com
astronomy.meetup.com/131/
www.facebook.com/RASC.Van
www.instagram.com/rascvancouver/

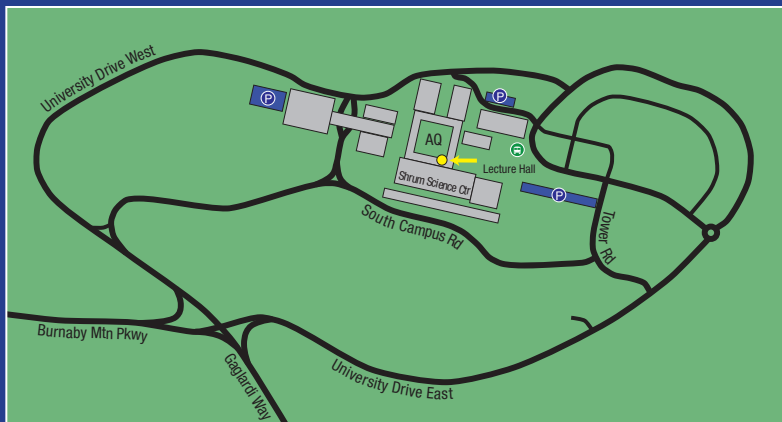


@RASCVancouver

Mailing Address

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Burnaby, B.C.
V5A 4Y0

Map to Meeting Site



Our July meeting is in room AQ 3159 of the Academic Quadrangle, near the southeast corner as indicated by the arrow on the map.

The meeting will also be livestreamed on Zoom.

Pay parking is available at several locations located around campus (indicated as "P" on the map).

continued from page 3

Its surface rotates and it is possible to see this over several different days of observing. Yet other members enjoy our guest lecturers the most. We have the good fortune to have many talented researchers in Canada and the USA willing to tell us about their work. This past year, our guest speakers have been nothing less than outstanding. A big thank-you to them all and to Andrew Ferreira who finds and convinces them to speak to us.

In addition to supporting a wide range of member interests, we aim to inspire the general public through many public outreach events through the year. One of the greatest joys of amateur astronomy is sharing our interest with others. The best way to test and elevate our knowledge up a level is to share it with others. I am always grateful when someone takes an in-

terest in helping me advance my understanding of the night sky and many have helped me along the way. That is why I and many other volunteer members in our club attend outreach events. We are transitioning back to a new normal after over two years of virtual reality. Humans are social, we love to interact and one of the best places to do that is discovering the view through a telescope or discussing with each other what we just learned from a guest lecturer or helping the general public learn how to use a star finder wheel.

All Starry Nights in 2022 with SFU have been successful partnership events. It is great to see our volunteers bring telescopes, set up, and share with public visitors. There is no substitute for the gasp of discovery when someone realizes how beautiful a globular cluster or a galaxy looks

through one of our amateur telescopes.

Last month, for the first time in over two years, we had an in-person lecture at SFU. It was a delight to have Dr. Joanna Woo share with us her passion for her outreach work with the Trottier Observatory and then give us some insights from her research into the mysteries of why older galaxies do not form new stars. I hope that you will join us soon at one of our upcoming monthly meetings in-person. For the time being, we will continue to offer a hybrid on-line version.

Clear Skies,
Alan

P.S.: there is no monthly meeting in August. We take a break in August to view the skies and we hope you can also do the same. See you in September, if not before. ★

continued from page 1

Noctilucent is a rough translation of “night shining” in Latin, and that is because they are only visible during astronomical twilight or what you may know as “blue hour.”

This is the time of night after the Sun has set but before it has become dark — the time when the first stars are making their twinkling appearance. Noctilucent clouds are the highest clouds in our atmosphere, located in the mesosphere some 250 000 feet above the Earth. These clouds appear special because of that height: they are still being lit by the Sun at that distance while

the Earth below has been enveloped by the shadow of night. This special mix of circumstances makes noctilucent clouds appear to glow or be iridescent, taking on a pale blue or silvery



shine. It is not just a certain time of the evening that is required to view these wonders, but also a particular latitude and time of year. Your best chance to see

noctilucent clouds is on a clear, summer night within the latitudes of 50 and 65 degrees. Here in Vancouver we are at 49.28 degrees North, so we are right on the edge, just barely making

the cut! Peak viewing season is mid-May to mid-August, so right now is prime time to get a glimpse of this rare occurrence. Next time you are outside just after sunset on a clear, summer night, look to the north and you just may see some nocti-

lucent clouds.

Images taken June 16th, 2021. Camera: Sony A7RII with a Tamron 28-75mm f/2.8 lens. ISO 640, f/6.3, 13 seconds. ★

Membership has its Privileges!

Are you tired of looking at the same objects again and again (planets, moon, etc.)? Is your telescope collecting dust because it's hard to locate deep sky objects? Would you like to bring your observing to a stellar level? Robert Conrad, our new observing director, revived the Vancouver RASC observing group and invites you to join by sending him an email at observing@rasc-vancouver.com. Some of the benefits of belonging to this group include:

- Hands on training on how to operate the SFU Trottier observatory
- Weekly observing sessions at the observatory or at dark sky locations
- One-on-one coaching on how to locate thousands of objects in the night sky
- Attend small interactive seminars delivered by Robert on a range of topics including failsafe star-hopping, charting challenging objects and understanding the motions of the cosmos
- Learn to make your telescope dance by locating objects such as asteroids, nova, and supernovae
- Spectroscopy and imaging training from Howard Trottier and an opportunity to collaborate on observatory research projects
- Updates on observable sky events happening during the week like asteroid/comet/deep sky conjunctions
- Access to observing guides and lists that Robert created that took hundreds of hours to create and will help with planning observing sessions
- Knowledge and expertise from other observing group members
- Learn how to quickly and efficiently find and star-hop to deep sky objects using a range of binoculars and telescopes

Upcoming Events

August

20 - 28 – Mt. Kobau Star Party

13 – Perseid Meteor Shower at Alder-grove Regional Park

October

21 – Manning Park Dark Sky Weekend (Beginners)

28 – Manning Park Dark Sky Weekend (Advanced)

December

12 – AGM

Life as We Know It

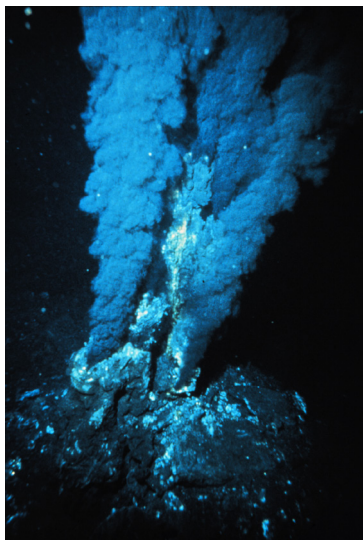
Last Christmas, I received a present from my family: a book by David Attenborough titled *Living Planet, The Web of Life on Earth*. The book was chosen by my granddaughter Meredith. She is in her last year of Marine Biology studies at SFU; obviously, the book relates to that.

There are a number of picture plate sections distributed throughout the book. Among them are excellent images of “black smokers,” located about 3 km below ocean surface, which exude hot, sulphide-laden water, and are the home of several anaerobic species (no sunlight). Nonetheless, they are a form of life “as we know it;” they are still DNA-based.

Here’s a quote from <https://theliquidearth.org/2010/10/black-smokers>:

Black smokers are black chimney shaped formations that are found in large numbers in “hydrothermal vent fields” in the abyssal and hadal zones of the world’s oceans. The fields are hundreds of meters wide usually found where tectonic plates below the ocean are moving, where water seeps down into the rocks where it becomes superheated, before returning to the surface where it clouds on contact with the cold ocean water due to the abundance of dissolved minerals in it. On contact with the cold water, these minerals fall

back to the ocean floor forming a chimney structure around the vent. Because



Wikimedia Commons

A black smoker

of the large amount of sulphides in the superheated water, sulphide ore deposits are usually found at the base of each chimney. Water at the bottom of the ocean is only around 2°C, the water escaping the chimney of the black smoker can be as high as 400°C.

This made me think of the efforts currently being initiated by NASA to send a probe to Europa, the second closest Galilean moon orbiting Jupiter. The name of the probe is *Europa Clipper*. Fly-bys by an earlier probe (called *Galileo*) notwithstanding,

there’s still relatively little known about Europa. This new, in-progress mission, NASA hopes, is going to improve our understanding of that moon. As is quite common, the underlying reason is our search for evidence of possible life elsewhere, other than on Earth. The plan is to launch the probe into space by 2024 to extensively explore Europa from space after arrival in 2031. This multi-orbit exploration will employ a number of various remote-sensing sophisticated sensors.

The moon Europa appears to be covered by a many-kilometre-thick layer of ice showing cracking ice plates on the surface. Past fly-bys detected characteristics of a deep saltwater ocean below the ice layer, exceeding the amount of water in the oceans here on Earth. A future landing probe would attempt to detect biosignatures of life (as we know it—I can’t quite imagine what it would take to recognize a version we *don’t* know).

At 3,120 km diameter, Europa is the smallest of the four Galilean moons (a bit smaller than our Moon). It orbits Jupiter at a distance of about 671,000 km and is in a resonance relationship with the moons Io and Ganymede. It takes two orbits for Io to go around Jupiter to one orbit for Europa, four Io orbits for one Ganymede

by J. Karl Miller

orbit. Jupiter itself has the major gravitational effect. These various interactions create complex gravitational

of Jupiter's icy moon Europa, soaring 124 miles (200 kilometers) above the icy surface. This image was taken near

kilometres) wide. The resolution is 19 feet (6 meters) per picture element. This image was taken on Dec. 16, 1997 by the solid state imaging system camera on NASA's Galileo spacecraft.

NASA has a link to detailed planned activities during a number of Europa Clipper fly-bys. Here it is: <https://europa.nasa.gov/mission/about/>

If you own a pair of reasonably-sized binoculars (7x50, say) you can easily see the four starlike Galilean moons, and follow their orbits around Jupiter over hours and days. Telescopes will afford you a closer view, depending on the telescope's size. Exact positions, times, and names are listed in the *RASC Observer's Handbook*, which contains a multitude of planetary, orbital, and scientific data. It is used by both professional and amateur astronomers. If you are a member of the RASC, the handbook is one of the membership bonuses.

Looking at the Galilean moons,



Close-up of a rugged area on Europa's surface

I'm always amazed to think that Galileo's discovery of these moons had a direct effect on—and is perhaps the actual cause of—the direction our scientific and cultural evolution has taken since then... life as we know it now. ✨

NASA/JPL Caltech/Johns Hopkins APL/Ed Whitman



NASA's Europa Clipper spacecraft

flexing of Europa, which is likely to create heat in Europa's interior (to some degree, other Jovian moons are similarly affected, of course). Perhaps these effects contribute to the cracked appearance of Europa's surface; maybe black smokers exist on Europa also, along with the extremophiles which are the bacterial basis for the existence of the black smoker anaerobic species in our oceans.

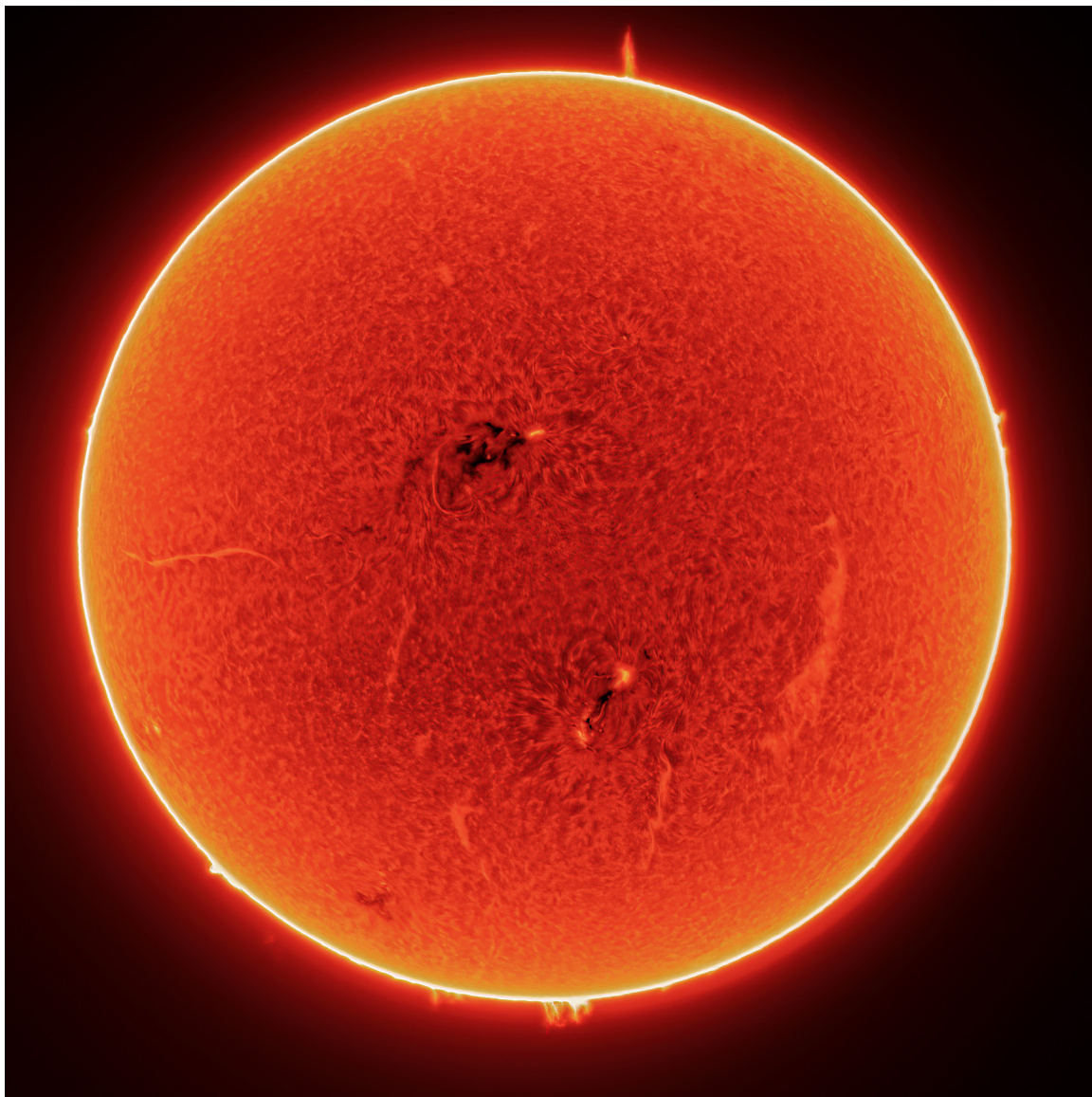
Along with other moons, Europa is also subject to intense radiation which surrounds Jupiter. That situation is not beneficial for life (again, as we know it) on the surface of Europa, but might generate possibilities in the water under the ice shell (maybe turn it into beer?).

Source: NASA/JPL, Published January 8, 2019:

During its twelfth orbit around Jupiter, on Dec. 16, 1997, NASA's Galileo spacecraft made its closest pass

the closest approach point, at a range of 335 miles (560 kilometers) and is the highest resolution picture of Europa obtained by Galileo. The image was taken at a highly oblique angle, providing a vantage point similar to that of someone looking out an airplane window. The features at the bottom of the image are much closer to the viewer than those at the top of the image. Many bright ridges are seen in the picture, with dark material in the low-lying valleys. In the center of the image, the regular ridges and valleys give way to a darker region of jumbled hills, which may be one of the many dark pits observed on the surface of Europa. Smaller dark, circular features seen here are probably impact craters. North is to the right of the picture, and the sun illuminates the surface from that direction. This image, centred at approximately 13 degrees south latitude and 235 degrees west longitude, is approximately 1 mile (1.6

NASA/JPL



Sol, July 11, 2022 by Rob Lyons

Telescope - Daystar Solar Scout 60DS

Mount - SkyWatcher Solarquest

Camera - ASI174MM

Processed in AS3!, IMPPG, Register, and Photoshop