

NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2023 ISSUE 2 MARCH/APRIL 2023



Paul Sykes Lecture – Thu, Mar 9 @ 7:30pm

The Archaeology of Another World: Uncovering our Lunar Cultural Heritage

Dr. Alice Gorman

Room AQ3159 SFU Burnaby Campus and Zoom (see link below)

How would we feel if an industrial machine blew away the first footprints of human beings on another world? If lunar visitors scratched their names into the Apollo 11 landing module and stole the plaque commemorating this achievement on behalf of all humanity?

The Moon is not only the inspiration for mythology, literature, art, and science on Earth. It is the gateway to human exploration in the rest of the Solar System, with resources such as water ice that can be used to fuel rockets to Mars. The major spacefaring nations are proposing to send people back to the Moon, 54 years after the Apollo 11 mission, and this time they plan to stay.

However, the Moon is also the location of significant cultural heritage with over 100 archaeological

sites that show how technology and human behaviour adapted to a new planetary environment. Soon, the



lunar cultural heritage record will be under threat from human activities for the first time. What's going to happen to the extraordinary places and objects left on the Moon, since the first human object, the Soviet Luna 2 space probe, crashed in

1959? In this lecture, space archaeologist Alice Gorman takes us on a journey to find out.

Dr. Alice Gorman is an internationally-recognised leader in the field of space archaeology and author of the award-winning book, *Dr. Space Junk vs the Universe: Archaeology and the Future* (MIT Press, 2019). Her research focuses on the archaeology and heritage of space exploration, including space junk, planetary landing sites, off-Earth mining, and space habitats. In 2022, she co-directed (with Justin Walsh) an archaeological survey on the International Space Station, which was the first archaeological fieldwork ever to take place outside Earth. She is an Associate Professor at Flinders University in Adelaide, Australia, and a heritage consultant with over 25 years experience work-

continued on page 4

MARCH 9

SFU

Our Paul Sykes lecture featuring Dr. Alice Gorman, known for her pioneering work in space archaeology. See Meetup for SFU/Zoom details. **SFU**

APRIL 13

SFU

Our annual "show-and-telescope" event where members show their telescopes and answer questions. See Meetup for SFU/Zoom details. **SFU**

MAY 11

SFU

Speaker TBA. See Meetup for updates, including SFU room location and Zoom link.

SFU

Members' Gallery



Jupiter and Venus Conjunction by Elena Popovici

Taken on the evening of February 14th from English Bay, the mast of this beached sailboat matches the angle of an imaginary line drawn from Jupiter, near the centre-top of the frame, down to Venus, halfway to the southwestern horizon. Taken with a Samsung smartphone.

President's Message

We have some exciting events planned in the next few months. Our March 9th meeting will feature a new look at space exploration through the eyes of an anthropologist from Australia. It's always nice to consider views from a different perspective. Are we leaving space junk pollution behind or valuable historical artifacts? How do we pro-

tect the environment and historical moments along the way? Our April 13th meeting at SFU will be a hands-on telescope demonstration of many types of amateur telescopes and allow our audience to interact with members directly to ask specific questions about those telescopes. On Saturday, May 13, we join SFU Science Rendezvous for Astronomy

Day 2023. We haven't had one of these events in person since COVID. The event is always fun for everyone, especially those of us with a curious mind that enjoys discovering new things all the time. One of my favourite science "displays" is the ice cream made on the spot using liquid nitrogen. We will have solar viewing

continued on page 4

by Alan Jones

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 \$104.00 per year (\$61.10 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.

2023 Vancouver Centre Officers

President Alan Jones
president@rasc-vancouver.com
Vice-President Robert Conrad
vp@rasc-vancouver.com
Secretary Suzanna Nagy
secretary@rasc-vancouver.com
Treasurer Phil Lobo
treasurer@rasc-vancouver.com
National Rep. Nolan Smith
national@rasc-vancouver.com
Librarian William Fearon
library@rasc-vancouver.com
Public Relations Andrew Ferreira
publicrelations@rasc-vancouver.com

LPA Leigh Cummings
lpa@rasc-vancouver.com
Dir. of Telescopes Rick Schneider
telescopes@rasc-vancouver.com
Observing Robert Conrad
observing@rasc-vancouver.com
Membership Marla Daskis
membership@rasc-vancouver.com
Events Coordinator Vacant
events@rasc-vancouver.com
Education Robert Conrad, Andrew Krysa
education@rasc-vancouver.com
VRO Carl Bandura
observatory@rasc-vancouver.com

Merchandise Kyle Dally
merchandise@rasc-vancouver.com
Webmaster Renuka Pampana
webmaster@rasc-vancouver.com
NOVA Editor, Past President Gordon Farrell
novaeditor@rasc-vancouver.com
Speakers Andrew Ferreira
speakers@rasc-vancouver.com
Imaging Rob Lyons
imaging@rasc-vancouver.com
At Large Shay Pomeroy, Michael Levy, Milan B
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/

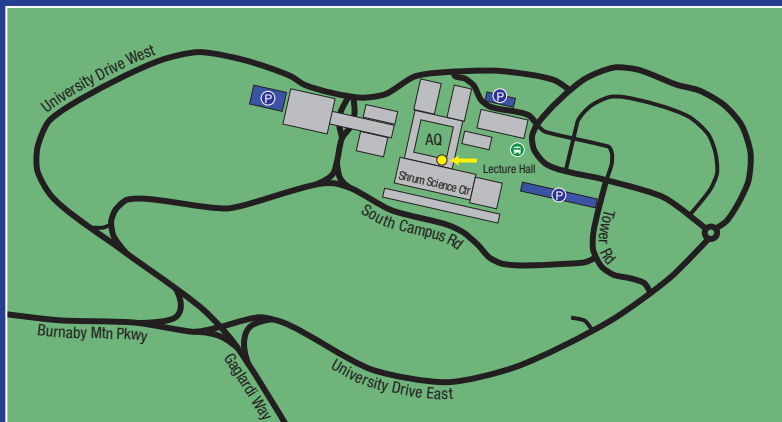


@RASC Vancouver

Mailing Address

RASC Vancouver Centre
PO Box 89608
9000 University High Street
Burnaby, B.C.
V5A 4Y0

Map to Meeting Site



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

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

continued from page 3

and display our meteorite collection along with many other fun activities and displays about astronomy and space exploration. Members can volunteer to join us for a day of fun with the public. Guests are welcome to visit us and the Science departments of SFU on the day.

What can each of us do about light pollution? Sadly, I understand that many people now have never seen the Milky Way, let alone the constellations. Our night skies con-

tinue to deteriorate as our society puts more importance on our computer screens and our indoor comforts. The light pollution at night is unnecessary and it turns out it is harmful. So what can you and I do about it? Years ago, after visiting an International Dark Sky community, my wife and I replaced our front light polluting "coach" lights with Dark Sky approved lighting we bought at Home Depot. We have better usable lighting with nice looking fixtures day and night with-

out light trespassing on our neighbours. I heard as a child that "if everyone swept their sidewalk, the whole world would be clean." Think about this: If everyone replaced their light polluting outdoor lighting, we would have less night light pollution! All I can say is it is worth a try. How can we walk the talk until we set an example and fix our own homes? Let me know if you do this and if it makes you feel any better about doing a little something to reduce light pollution. ★

continued from page 1

ing with indigenous communities in Australia. Gorman is also a Vice-Chair of the Global Expert Group on Sustainable Lunar Activities, a member of the Advisory Council of the Space Industry Association of Australia, and Vice-Chair of the Adelaide Section of the American Institute for Aeronautics and Astronautics. Asteroid 551014 Gorman was named after her in recognition of her work in space archaeology.

This annual lecture is held in me-

moriam of Paul Sykes, who passed away in October of 2005. Paul was an rasc Life Member and avid supporter. Upon his passing, he bequeathed a substantial sum that has kept your Vancouver Centre financially solid for the last 15 years.

Paul was born in Hummelston, Pennsylvania, USA in 1918. He was interested in astronomy at an early age. During his teens, he published his own monthly astronomical column. He was an officer in the United States Air Force, served in the

Pacific during WWII, attaining the rank of captain. Following the war, Paul attended UBC in 1948, earning a degree in physics. He rejoined the U.S. Air Force and attended the Oak Ridge School of Reactor Technology, studying nuclear physics. He worked on the Nerva Project, a nuclear rocket development effort. Thereafter, Paul returned to BC and was appointed a lecturer and administrator in Physics at UBC. He remained there until retirement in 1983. ★

International Astronomy Day

Saturday, May 13, 2023 – 11am to 3:30pm, SFU Burnaby Campus (free parking, East Lot)

by Suzanna Nagy

It is with great enthusiasm that your Council for RASC-Vancouver can announce that we will be celebrating International Astronomy Day once again in-person.

Although International Astronomy Day (IAD) actually falls on Saturday, April 29, as in years past, we will be jointly celebrating IAD and SFU's Science Rendezvous on Saturday, May 13. Mark the date on your calendar!

This joint event will be held at the SFU Burnaby Mountain Campus in the south and east concourses of the Academic Quadrangle. For reference, this is just down the stairs from the Trottier Observatory.

This event is open to all ages and admission is free. Free parking will also be provided for the day in the East Lot nearest the bus loop. Your RASC-Vancouver will be celebrating International Astronomy Day by hosting children's activities, solar

telescopes, the Jim Bernath meteorite and space memorabilia collec-



One of our youth door prizes

tions, Ted Stroman's Moon/Apollo Mission collection, and more.

Your RASC-Vancouver will also be having a free youth door prize of

a telescopes donated by Telescopes Canada (pictured at left) and our Treasurer, Phil Lobo. The prizes will be a Celestron Travel Scope 70s and a Polaroid 168/525 Refractor Telescope. Get your door prize ticket at the Membership Table in the Astronomy Day section of the Academic Quadrangle.

SFU's celebration of Science Rendezvous will also include children's activities, displays, and two Magic Chemistry shows. Registration for those two shows is required but free. Closer to the date, registration particulars will be posted onto SFU's Science Rendezvous webpage located at www.sfu.ca/science/community

A bit of history:

- International Astronomy Day (IAD) was started in 1973 by the Northern California Astronomy Association.

continued on page 6

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 observing director, leads 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

March

9 – Paul Sykes lecture at SFU

August

12 - 20 – Mt. Kobau Star Party

December

14 – AGM

May

13 – Astronomy Day at SFU



New gates were recently purchased for the VRO observatory site in the UBC Research Forest. Marla and Ron pose with the fruits of their labour.

continued from page 5

- IAD is always held on the Saturday closest to the 1st quarter Spring moon, which changes year to year but falls sometime between late April to early May.
- RASC-Van started participating decades ago, going back to the 1980s.
- Science Rendezvous started in Ontario in 2008 as a celebration of STEM at various universities and quickly spread to a celebration cross-country. Simon Fraser University has been participating since approximately 2011. Science Rendezvous is always held on the Saturday of the Mother's Day weekend in May.
- When RASC-Van left the Planetarium and moved our activities up to SFU, our 1st IAD celebration on campus was in 2013. It was a great success with approximately 500 people attending.
- As previously mentioned, dates for IAD fluctuate and in 2014 the date fell on the Mother's Day weekend. We were advised by SFU that we could not host IAD on campus due to the conflict with Science Rendezvous.
- After discussion it agreed that, because both events were science based, RASC-Van and SFU would host IAD and Science Rendezvous together for 2014. The joint event was a massive success with over 2,000 people attending.
- Without hesitation, both SFU and RASC-Van saw the benefit of hosting these two science-based events together. As of 2015, no matter what date IAD officially fell on, going forward both IAD and Science Rendezvous will be celebrated together on the Saturday of the Mother's Day weekend.

Please keep an eye on our website and Meetup page for more information as we get closer to the date. We are looking forward to seeing our entire membership there to join us in celebrating International Astronomy Day 2023. ★

Adventures in Visual Astronomy

by Michael Levy

Paved is the road now, that many past ages no one could travel, Though it indeed required the greatest, most vigilant, labours. Now it allows one to climb the peaks of the unapproached heavens, And to go through to the highest of houses, Divinities' dwellings. Or one may wish to describe heaven's fires, whether fixed of traversing Various paths, and prove their celestial course and position. Thus can the wonders of Jupiter, highest of gods, be established.

— Start of “A Hortatory Ode of Tycho Brahe” from Johannes Kepler’s *Astronomia Nova*.

In Year 14 of Šamaš-šuma-ukin, month XII, on the 4th, Mercury made its first appearance in the west area of the Swallow¹

— Babylonian Astronomical Diary, around 654 BC

Some of my friends wonder why I love gazing at the stars. Even some of the most active members of this club are much more interested in astrophotography than what is called “visual astronomy.” But I love to gaze at the stars. It is reassuring to me that I am part of a long history of gazing at the stars often with a sense of wonder, as illustrated by the Ode of Tycho Brahe. Tycho Brahe died less than a decade before Galileo turned a telescope to the skies. But his observations of the stars and planets are regarded as the most accurate of the time, and were used by Ke-

pler who, of course, ended the reign of “pure circles” when he realized that the planets travelled in ellipses around the sun.

When I was growing up, there were far more stars in the night sky than there are now: light pollution has taken its toll. And although I was always somewhat interested in

position of the Andromeda Galaxy.”

But in today’s skies, at SFU or on my deck in Yaletown, this is almost impossible. Alpheratz is pretty bright, but the other stars, not so much. On the other, part of the joy for me is looking at a bare patch of sky, and then looking again at the same patch with a telescope. Try this



the skies, it was only when I was living in Yaletown, about a dozen years ago, that I bought my first telescope. It was a 6” Newtonian on a German Equatorial mount. After a year or so using it, I became frustrated by the difficulty I had finding targets using star-hopping. It is all very well to read something like this:

“To get to the Andromeda Galaxy, start at Alpheratz and proceed along the chain past Delta Andromedae to Mirach (Beta Andromedae). At Mirach, hang a sharp right turn to Mu Andromedae, and then go past Mu the same distance as Mirach to Mu. That will put you exactly on the

yourself with the Double Cluster. It is amazing!

I finally decided to end the madness, and get a computerized mount, and a quality ‘scope to go with it. I bought a Celestron Edge HD 8” SCT with the AVX mount. (Shout out to the Vancouver Telescope Store, now Markarian Fine Optics, for the help making this choice.) I derived a great deal of pleasure from this telescope. I used it on my Yaletown deck, as Spanish Banks, at SFU Starry Nights, at Merritt once and on Mt. Kobau in August, 2016 (two pictures from there included).

continued on page 8

¹ The Babylonian “Swallow” constellation is made of parts of today’s Pices and Pegasus.

continued from page 7

About five years ago I sold all my gear. Everything. It was a wonderful instrument for my visual observing, but for complex reasons I decided to “retire” this hobby of mine.

Just over three years ago, and again for complex reasons, I decided to start again but with a (hopefully) simpler set up. Instead of an SCT, why not a refractor? I always enjoyed the views through them. No need to fiddle with collimation. And forget the motorized mount—why not an Alt-Az mount with so-called digital setting circles?

And I wanted something light.

I was considering a Stellarvue 4” refractor, carbon-fibre tube to keep the weight down, and I happened to come across a used one at Markarian Fine Optics. I bought it and have been using it since then. Nice! But it was pretty old and had been through some rough times. If you have been to recent Starry Nights at SFU, you may have looked through my scope, and I certainly got compliments on the view. But I did have the nagging feeling that I should have bought a brand new one instead of the used one I got. As it happens, fate, or should I say, carelessness, intervened.

My “push to” set-up worked pretty well for finding objects, but

the lack of tracking was a problem. I typically was getting line-ups of half a dozen people at a time wanted to look through my scope, and I had to constantly nudge it to keep the object we were looking at in view. Following the advice of the people on cloudynights.com, I bought an

and decided that the time had come to get rid of the old beater scope and get a new one. And this time (I promise), I will be very careful during the setup!

(Luckily, I was able to buy a replacement focusing tube from Stellarvue, and the focuser has been repaired.)

A few nights ago, I had my first opportunity to try out my brand new Stellarvue svx102T-R Raptor. I was planning to meet with friends far from the city lights (they were after the comet), but I was told that the winds were really bad at our chosen spot



iOptron AZ Mount Pro. One of its attractions for me was its self-alignment feature. I now live in a house with just a bit of southern sky from my deck, so the usual two or three star alignment procedures would be very tricky. Furthermore, the self-alignment only takes a minute or two, which would be great for the Starry Night events,

My mount arrived, and I decided to try it out. The first time I did this, all went well, but the second time was a disaster! The telescope slid out of the rail during auto-alignment because I had not secured it properly! Argh. The focuser got damaged. Specifically, the rack of the rack and pinion focuser was badly damaged. After getting over the shock, I de-

so I decided to setup on my deck, especially since I needed to be careful and practice with gear that was all new to me. And be very, very careful this time! Now my deck, as I said earlier, is not a good spot, really. It does face south, but I have a monster house to the east, a huge hedge to the west and I am slightly downhill from the house across the lane to the south. Oh yes, I forgot to mention the massive fir tree just west of the meridian. And the street light just to the west of the tree.

But the skies were clear, and seeing was not bad. There was a half moon, and it was cold. In any case, I was eager to look through the scope so I set up while it was still light.

continued on page 10

Comet Hunting in January

by Leigh Cummings

On January 25, I received an email from our secretary, Suzanna, asking council members if anybody would like to join her on the coming week-end to try to observe comet C/2022 E3 ZTF. She told us that she was planning to travel to a new site we had scoped out earlier in Pitt Meadows. It is on the Alouette River Dyke just off Harris Road. I did not answer as I wasn't sure I could make it, however I kept it in mind in hopes I could make it happen.

As it turned out, I was able to attend on Saturday, January 28th around 6pm. It was during the cold snap we had

the mountains behind.

I had purposely packed light equipment for the evening, thinking I did not want to spend a lot of time setting up. I took my Celestron 15 x 70mm binoculars and my Vixen VMC95L which I mounted on my camera tripod. My game plan was to use the 5.5° field of view of my

a distant star cluster or even an elliptical galaxy. It was a fuzzy ball in the sky. I could not make out a tail or any colour to it. I then switched to my telescope, pointed it in the area I had just been looking at and, after a little jiggling around, I found the fuzzy ball. It was a little more distinct than through the binoculars, plus

a steadier view sitting on my tripod, but still no tail or colour visible. What it did allow me to do was offer the view to others with the red dot finder on to help them see where to look. Some had already located it but some were grateful for



The observing site (circled in yellow) on the Alouette River dyke

in late January and, as it was going to be a clear night, I decided to dress with four layers. One thing I forgot was my hand warmers. Before I even got to our observing site, I could tell it was going to be a cold night. The ambient temperature reading on my car's dash was well into the minus before I reached the parking lot. When I pulled into the parking lot, I could see we would not be alone. Suzanna had arrived as well as Carl (Observatory Chair), Andy (RASC member), Phani (Starry Nights attendee), and Suzanna's friend, Stephanie and her husband, Leslie. That tallied to seven brave souls bearing the brunt of a northeast wind flowing down the Pitt Lake valley from the glaciers in

binoculars to hunt down the comet and then do some observing with my Vixen. My choice of telescope was purposeful to suit the evening. The Vixen VMC95L has an open tube front, and has the corrector lens after the secondary, so it lets air flow into the tube and allows it to cool or warm to the outside conditions more quickly than most MAKs or SCTs, and saves on the overall weight of the OTA. By the time I had located the comet with my binoculars, the Vixen was as cold as my hands and ready for steady viewing.

I spotted the comet with my binoculars between the big and little dipper. If you didn't know ahead of time, you could have mistaken it for

a little help.

We also got a nice view of Jupiter, Saturn and the Orion Nebula before the cold turned our thoughts to a warm home. I was beginning to think the comet might be warmer than my extremities. I decided that a 5th layer of clothing would not have gone amiss. Even being able to get into a warm car (thanks to the remote start feature), it seemed to take forever to get feeling back into my hands. In fact, I think I was driving into my driveway before I started to have that tingling feeling like you had as a kid after playing snowballs for too long.

Thank you Suzanna for organizing a fun evening and meeting some new fellow astronomers. ★

continued from page 8

This time I was careful with the mounting the scope, and during the mount's auto-alignment procedure. Any slipping? No. Is diagonal going to fall out? No. Is eyepiece secure? Yes. Will the eyepiece hit the mount when the scope is vertical? No. The auto-alignment routine chooses the brightest object in the sky—this time the moon. So the moon was my first light with the 'scope.

I should mention that I have a reasonable but inexpensive 20mm eyepiece—better ones have since arrived, but were not available for my first light. So here goes—complete the alignment, focus sharply and wham!

Wow! I have never seen the moon's terminator look so good! I swear the crater rims looked taller than I had ever noticed before.

Shadows were crisp, detail was incredible. I left everything running while I went inside to wait for dark.

When I started again, I tried Jupiter, and it was OK, but there was a lot of air turbulence around it (remember that bloody fir tree)! So I swung to the Orion Nebula. Nice! Triangulum nicely separated, stars pinpoint, but nebula not that visible. Now my pizza was ready, so I had dinner, relaxed a bit, and now outdoors, again. Seeing has improved and away I go.

Orion Nebula—really good, especially given my light-polluted skies. Maybe time to get a good light-pollution filter? But still I could see the nebula. M35? Wow—just fabulous. I don't remember this open cluster even having that many stars. Is the Andromeda galaxy even in view from my deck? Yes—there it is, and

it looks as good with my modest 4" refractor from here than it ever did with my 8" SCT. This really surprised me. I expected just a smudge. But there it was, and I could even see some elongation with averted vision. I then tried the double cluster—close to the edge of my house and high up, but I was blown away. I have never experienced such a gorgeous view of them. I was mesmerized.

Now this was a first light learning test, not a serious viewing session, so I did not stay out that long (plus it was really cold), but I have to say that this scope has greatly exceeded my expectations. The stars are sharp, the contrast is really good. I could not be happier. My new (and hopefully better) eyepieces have now arrived, and I cannot wait to give them a try. I will report back. ★



King Tide

by Elena Popovici

The king tide of Jan 14th submerged sections of the False Creek seawall in Yaletown, including the path that curls around Don Vaughan's "Marking High Tide" installation in David Lam Park.

Monthly Dark Hours for Vancouver

by Robert Conrad

| Date - March 2023 (UT -8/-7) | Sunset | Twilight ends | Twilight begins | Sunrise | Moonrise | Moonset | Hrs Dark | Moon % | Prime time |
|------------------------------|---------|---------------|-----------------|---------|----------|----------|----------|--------|--------------------|
| Wednesday, March 1, 2023 | 5:55 PM | 7:41 PM | 5:07 AM | 6:53 AM | 12:44 PM | 5:14 AM | 0:00:00 | 76.1 | None |
| Thursday, March 2, 2023 | 5:57 PM | 7:43 PM | 5:05 AM | 6:51 AM | 12:43 PM | 5:50 AM | 0:00:00 | 83.8 | None |
| Friday, March 3, 2023 | 5:59 PM | 7:45 PM | 5:03 AM | 6:49 AM | 1:48 PM | 6:18 AM | 0:00:00 | 90.3 | None |
| Saturday, March 4, 2023 | 6:00 PM | 7:46 PM | 5:01 AM | 6:47 AM | 2:57 PM | 6:39 AM | 0:00:00 | 95.2 | None |
| Sunday, March 5, 2023 | 6:02 PM | 7:48 PM | 4:59 AM | 6:45 AM | 4:08 PM | 6:56 AM | 0:00:00 | 98.5 | None |
| Monday, March 6, 2023 | 6:03 PM | 7:49 PM | 4:57 AM | 6:43 AM | 5:18 PM | 7:11 AM | 0:00:00 | 98.5 | None |
| Tuesday, March 7, 2023 | 6:05 PM | 7:51 PM | 4:55 AM | 6:41 AM | 6:28 PM | 7:25 AM | 0:00:00 | 99.8 | None |
| Wednesday, March 8, 2023 | 6:07 PM | 7:53 PM | 4:53 AM | 6:39 AM | 7:38 PM | 7:38 AM | 0:00:00 | 99.2 | None |
| Thursday, March 9, 2023 | 6:08 PM | 7:54 PM | 4:51 AM | 6:37 AM | 8:49 PM | 7:52 AM | 0:55:00 | 96.6 | 7:54 PM - 8:49 PM |
| Friday, March 10, 2023 | 6:10 PM | 7:56 PM | 4:48 AM | 6:34 AM | 10:03 PM | 8:08 AM | 2:07:00 | 91.9 | 7:56 PM - 10:03 PM |
| Saturday, March 11, 2023 | 6:11 PM | 7:58 PM | 4:46 AM | 6:32 AM | 11:19 PM | 8:28 AM | 3:21:00 | 85.3 | 7:58 PM - 11:19 PM |
| Sunday, March 12, 2023 | 7:13 PM | 8:59 PM | 5:44 AM | 7:30 AM | 1:39 AM | 9:55 AM | 4:40:00 | 76.9 | 8:59 PM - 1:39 AM |
| Monday, March 13, 2023 | 7:14 PM | 9:01 PM | 5:42 AM | 7:28 AM | 2:58 AM | 10:32 AM | 5:57:00 | 67.0 | 9:01 PM - 2:58 AM |
| Tuesday, March 14, 2023 | 7:16 PM | 9:03 PM | 5:39 AM | 7:26 AM | 4:11 AM | 11:23 AM | 7:08:00 | 55.9 | 9:03 PM - 4:11 AM |
| Wednesday, March 15, 2023 | 7:18 PM | 9:05 PM | 5:37 AM | 7:24 AM | 5:12 AM | 12:32 PM | 8:07:00 | 44.3 | 9:05 PM - 5:12 AM |
| Thursday, March 16, 2023 | 7:19 PM | 9:06 PM | 5:35 AM | 7:22 AM | 5:59 AM | 12:32 PM | 8:29:00 | 32.7 | 9:06 PM - 5:35 AM |
| Friday, March 17, 2023 | 7:21 PM | 9:08 PM | 5:32 AM | 7:20 AM | 6:33 AM | 1:54 PM | 8:24:00 | 21.8 | 9:08 PM - 5:32 AM |
| Saturday, March 18, 2023 | 7:22 PM | 9:10 PM | 5:30 AM | 7:18 AM | 6:58 AM | 3:22 PM | 8:20:00 | 12.6 | 9:10 PM - 5:30 AM |
| Sunday, March 19, 2023 | 7:24 PM | 9:12 PM | 5:28 AM | 7:15 AM | 7:18 AM | 4:51 PM | 8:16:00 | 5.5 | 9:12 PM - 5:28 AM |
| Monday, March 20, 2023 | 7:25 PM | 9:13 PM | 5:25 AM | 7:13 AM | 7:35 AM | 6:18 PM | 8:12:00 | 1.3 | 9:13 PM - 5:25 AM |
| Tuesday, March 21, 2023 | 7:27 PM | 9:15 PM | 5:23 AM | 7:11 AM | 7:51 AM | 7:43 PM | 8:08:00 | 0.1 | 9:15 PM - 5:23 AM |
| Wednesday, March 22, 2023 | 7:28 PM | 9:17 PM | 5:21 AM | 7:09 AM | 8:07 AM | 9:05 PM | 8:04:00 | 1.8 | 9:17 PM - 5:21 AM |
| Thursday, March 23, 2023 | 7:30 PM | 9:19 PM | 5:18 AM | 7:07 AM | 8:25 AM | 10:26 PM | 8:50:00 | 6.2 | 10:26 PM - 5:18 AM |
| Friday, March 24, 2023 | 7:31 PM | 9:21 PM | 5:16 AM | 7:05 AM | 8:47 AM | 11:46 PM | 5:30:00 | 12.8 | 11:46 PM - 5:16 AM |
| Saturday, March 25, 2023 | 7:33 PM | 9:23 PM | 5:13 AM | 7:03 AM | 9:14 AM | 1:04 AM | 4:09:00 | 21.0 | 1:04 AM - 5:13 AM |
| Sunday, March 26, 2023 | 7:35 PM | 9:25 PM | 5:11 AM | 7:01 AM | 9:50 AM | 2:16 AM | 2:55:00 | 30.2 | 2:16 AM - 5:11 AM |
| Monday, March 27, 2023 | 7:36 PM | 9:26 PM | 5:08 AM | 6:58 AM | 10:35 AM | 3:19 AM | 1:49:00 | 40.0 | 3:19 AM - 5:08 AM |
| Tuesday, March 28, 2023 | 7:38 PM | 9:28 PM | 5:06 AM | 6:56 AM | 11:31 AM | 4:11 AM | 0:55:00 | 50.0 | 4:11 AM - 5:06 AM |
| Wednesday, March 29, 2023 | 7:39 PM | 9:30 PM | 5:03 AM | 6:54 AM | 11:30 AM | 4:51 AM | 0:12:00 | 59.8 | 4:51 AM - 5:03 AM |
| Thursday, March 30, 2023 | 7:41 PM | 9:32 PM | 5:01 AM | 6:52 AM | 12:35 PM | 5:22 AM | 0:00:00 | 69.2 | None |
| Friday, March 31, 2023 | 7:42 PM | 9:34 PM | 4:58 AM | 6:50 AM | 1:43 PM | 5:45 AM | 0:00:00 | 77.7 | None |

Vancouver

Total 112:30:00

| Date - April 2023 (UT -7) | Sunset | Twilight ends | Twilight begins | Sunrise | Moonrise | Moonset | Hrs Dark | Moon % | Prime time |
|---------------------------|---------|---------------|-----------------|---------|----------|----------|----------|--------|--------------------|
| Saturday, April 1, 2023 | 7:44 PM | 9:36 PM | 4:56 AM | 6:48 AM | 2:53 PM | 6:03 AM | 0:00:00 | 85.3 | None |
| Sunday, April 2, 2023 | 7:45 PM | 9:38 PM | 4:53 AM | 6:46 AM | 4:03 PM | 6:18 AM | 0:00:00 | 91.6 | None |
| Monday, April 3, 2023 | 7:47 PM | 9:40 PM | 4:50 AM | 6:44 AM | 5:13 PM | 6:32 AM | 0:00:00 | 96.3 | None |
| Tuesday, April 4, 2023 | 7:48 PM | 9:42 PM | 4:48 AM | 6:41 AM | 6:24 PM | 6:45 AM | 0:00:00 | 96.3 | None |
| Wednesday, April 5, 2023 | 7:50 PM | 9:44 PM | 4:45 AM | 6:39 AM | 7:36 PM | 6:59 AM | 0:00:00 | 99.2 | None |
| Thursday, April 6, 2023 | 7:51 PM | 9:46 PM | 4:43 AM | 6:37 AM | 8:50 PM | 7:15 AM | 0:00:00 | 100.0 | None |
| Friday, April 7, 2023 | 7:53 PM | 9:48 PM | 4:40 AM | 6:35 AM | 10:07 PM | 7:33 AM | 0:19:00 | 98.5 | 9:48 PM - 10:07 PM |
| Saturday, April 8, 2023 | 7:54 PM | 9:50 PM | 4:37 AM | 6:33 AM | 11:27 PM | 7:58 AM | 1:37:00 | 94.7 | 9:50 PM - 11:27 PM |
| Sunday, April 9, 2023 | 7:56 PM | 9:53 PM | 4:35 AM | 6:31 AM | 12:48 AM | 8:31 AM | 2:55:00 | 88.7 | 9:53 PM - 12:48 AM |
| Monday, April 10, 2023 | 7:57 PM | 9:55 PM | 4:32 AM | 6:29 AM | 2:04 AM | 9:18 AM | 4:09:00 | 80.5 | 9:55 PM - 2:04 AM |
| Tuesday, April 11, 2023 | 7:59 PM | 9:57 PM | 4:29 AM | 6:27 AM | 3:08 AM | 10:20 AM | 5:11:00 | 70.6 | 9:57 PM - 3:08 AM |
| Wednesday, April 12, 2023 | 8:00 PM | 9:59 PM | 4:26 AM | 6:25 AM | 3:58 AM | 11:37 AM | 5:59:00 | 59.4 | 9:59 PM - 3:58 AM |
| Thursday, April 13, 2023 | 8:02 PM | 10:01 PM | 4:24 AM | 6:23 AM | 4:35 AM | 1:01 PM | 6:23:00 | 47.6 | 10:01 PM - 4:24 AM |
| Friday, April 14, 2023 | 8:03 PM | 10:04 PM | 4:21 AM | 6:21 AM | 5:02 AM | 1:02 PM | 6:17:00 | 35.7 | 10:04 PM - 4:21 AM |
| Saturday, April 15, 2023 | 8:05 PM | 10:06 PM | 4:18 AM | 6:19 AM | 5:22 AM | 2:29 PM | 6:12:00 | 24.7 | 10:06 PM - 4:18 AM |
| Sunday, April 16, 2023 | 8:07 PM | 10:08 PM | 4:16 AM | 6:17 AM | 5:40 AM | 3:54 PM | 6:08:00 | 15.1 | 10:08 PM - 4:16 AM |
| Monday, April 17, 2023 | 8:08 PM | 10:10 PM | 4:13 AM | 6:15 AM | 5:55 AM | 5:17 PM | 6:03:00 | 7.5 | 10:10 PM - 4:13 AM |
| Tuesday, April 18, 2023 | 8:10 PM | 10:13 PM | 4:10 AM | 6:13 AM | 6:11 AM | 6:38 PM | 5:57:00 | 2.5 | 10:13 PM - 4:10 AM |
| Wednesday, April 19, 2023 | 8:11 PM | 10:15 PM | 4:07 AM | 6:11 AM | 6:28 AM | 7:59 PM | 5:52:00 | 0.2 | 10:15 PM - 4:07 AM |
| Thursday, April 20, 2023 | 8:13 PM | 10:17 PM | 4:04 AM | 6:09 AM | 6:48 AM | 9:20 PM | 5:47:00 | 0.6 | 10:17 PM - 4:04 AM |
| Friday, April 21, 2023 | 8:14 PM | 10:20 PM | 4:02 AM | 6:07 AM | 7:12 AM | 10:40 PM | 5:22:00 | 3.5 | 10:40 PM - 4:02 AM |
| Saturday, April 22, 2023 | 8:16 PM | 10:22 PM | 3:59 AM | 6:05 AM | 7:44 AM | 11:56 PM | 4:03:00 | 8.6 | 11:56 PM - 3:59 AM |
| Sunday, April 23, 2023 | 8:17 PM | 10:25 PM | 3:56 AM | 6:04 AM | 8:26 AM | 1:05 AM | 2:51:00 | 15.5 | 1:05 AM - 3:56 AM |
| Monday, April 24, 2023 | 8:19 PM | 10:27 PM | 3:53 AM | 6:02 AM | 9:18 AM | 2:03 AM | 1:50:00 | 23.7 | 2:03 AM - 3:53 AM |
| Tuesday, April 25, 2023 | 8:20 PM | 10:30 PM | 3:50 AM | 6:00 AM | 10:19 AM | 2:49 AM | 1:01:00 | 32.8 | 2:49 AM - 3:50 AM |
| Wednesday, April 26, 2023 | 8:22 PM | 10:32 PM | 3:47 AM | 5:58 AM | 11:27 AM | 3:23 AM | 0:24:00 | 42.4 | 3:23 AM - 3:47 AM |
| Thursday, April 27, 2023 | 8:23 PM | 10:35 PM | 3:45 AM | 5:56 AM | 11:26 AM | 3:49 AM | 0:00:00 | 52.2 | None |
| Friday, April 28, 2023 | 8:25 PM | 10:38 PM | 3:42 AM | 5:54 AM | 12:37 PM | 4:09 AM | 0:00:00 | 61.9 | None |
| Saturday, April 29, 2023 | 8:26 PM | 10:40 PM | 3:39 AM | 5:53 AM | 1:47 PM | 4:25 AM | 0:00:00 | 71.1 | None |
| Sunday, April 30, 2023 | 8:28 PM | 10:43 PM | 3:36 AM | 5:51 AM | 2:56 PM | 4:39 AM | 0:00:00 | 79.7 | None |

Vancouver

Total 84:20:00



NGC 281 - The Pacman Nebula in Cassiopeia by Rob Lyons

This is the first narrowband image created by RASC-Van at the Trottier Observatory. Imaged on the evening of November 15th, 2022. Imaged with the Planewave CDK700 telescope and FLI PL16803 camera. This is the result of 5 hours of total exposure time through hydrogen alpha, sulphur II, and oxygen III narrowband filters.