

NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2019 ISSUE 1 JANUARY FEBRUARY 2019



Paul Sykes Lecture – Sat, Jan 26 @ 7:00pm

The Science Fiction Vision, Featuring Robert J. Sawyer
SFU Burnaby Campus, Room SWH 10081

Robert J. Sawyer—“just about the best science-fiction writer out there,” according to the Denver Rocky Mountain News—sets the stage for thinking about the rapid pace of change that’s coming down the pike by showing how science fiction visions are increasingly becoming real. Captain Kirk’s communicator and tricorder are now embodied in our smartphones; robots have walked off the pages of science fiction into our living rooms; and the Jetson’ hyperconnected lifestyle has become our daily reality. Rob shows why science fiction has been called “the only preventive medicine for Future Shock,” and explains how extrapolative science-fiction thinking and rapid adoption of cutting-edge technologies can aid businesses as they rush to meet the future.

eight writers in history—and the only Canadian—to win all three of the world’s top Science



Fiction awards for best novel of the year: the Hugo, the Nebula, and the John W. Campbell Memorial Award, and he’s the first author in thirty years to receive

a Lifetime Achievement Aurora Award.

His twenty-three novels include *Red Planet Blues*, *Triggers*, *Calculating God*, and the “WWW” trilogy of *Wake*, *Watch*, and *Wonder*, each volume of which separately won the Aurora Award—Canada’s top honour in science fiction—for Best Novel of the Year. The 2009-2010 *ABC TV* series *Flash-Forward* was based on his novel of the same name, and Rob was a scriptwriter for that series.

Rob has given talks at hundreds of venues including the Library of Congress and the National Library of Canada, and been keynote speaker at dozens of events in places as diverse as Los Angeles, Boston, Tokyo, Beijing, and Barcelona. He was born in Ottawa in 1960, and now lives just west of Toronto. *

Robert Sawyer is one of only

Image credit: Bernard Clark

JANUARY 10

Paul Gray from Halifax Center: Supernova Hunting - Past, Present and Future, and the family history of discovery. Room AQ3181.

SFU

FEBRUARY 14

Eric Lanoix, who has worked with the CSA and NASA contractors: Orbital Rendezvous and Capture. Room AQ3181

SFU

MARCH 14

TBA. Watch Meetup for details. Room AQ3181

SFU

Members' Gallery



Solar Eclipse by Andrew Krysa

The August 21, 2017 total solar eclipse from just south of Salem, Oregon, on the path of totality. My partner Ted and I with the total eclipse behind us.

President's Message

I hope you all had a happy holiday season with your family and friends. Now here we are at the beginning of another new year, not yet knowing what new discoveries or wonders might excite us in the months to come.

During the holiday season, on December 27th, I received a phone call from our AOMO

(Antony Overton Memorial Observatory) Chair, Alan Jones, with some bad news. He and his wife, Dale, had visited the AOMO on Boxing Day to see how it had fared during the windstorm that we had on December 20th, which caused such widespread damage here on the west coast. He was happy to report the observatory

had no damage. However, a tree had fallen down across our access road and the power line to our observatory. The tree came to rest on the roof of our privy, cleaving a groove right down the middle. It was a strange mix of bad luck and good luck. Certainly bad luck for our poor

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by Leigh Cummings

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 \$81.00 per year (\$47.00 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.

2019 Vancouver Centre Officers

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Past President Suzanna Nagy

At Large Howard Trotter, Bill Burnyeat

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

<http://rasc-vancouver.com> or
<http://www.rasc.ca/vancouver>
<http://astronomy.meetup.com/131/>
<http://www.facebook.com/RASC.Van>

 @RASC Vancouver

Mailing Address

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Map to Meeting Site



Our Jan-Mar meetings are in room AQ 3181 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).

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outhouse but, in turn, good luck that the outhouse probably saved our power line from being torn completely down. As it was, the power line, though stretched, only suffered minor damage.

On the subject of luck, the

word itself, like many in the English language, can mean slightly different things depending on context. The word itself is considered to have entered the English language from either middle German or middle Dutch. English-speaking people

tend to use it to describe fortune, either good or bad. I like the French word for luck better, "chance." Chance can be quantified by variations in the preverbal coin toss. A coin toss is considered 50/50 because it always has to land on one of two sides.



If tossed enough times, the results should even out. A die has six sides so the odds of a particular number coming up are reduced to 1 in 6, or 10 in 60 rolls.

When we speak of luck, though, we tend to assign it some mystical quality that we either have or do not have. I felt that way when I heard the news about our poor little abode being struck in the middle of its roof by the tree. I have played 6/49 since it came to be on June 12, 1982. The past 36 years have presented me with an enormous amount of chances to pick the correct six numbers. In fact (although I missed a few) it amounts to 3,575 draws. As the odds of winning 6/49 are approximately 1 in 14 million, I might have to wait awhile yet. On the other hand, our little abode seems to have better “luck” as it managed to be on the exact square metre of land in a forest of 5,053 hectares. That

works out to a 1 in 50,529,999 chance of being in the right spot. I picked that spot. It took less than a decade for that number to come up. When Alan told me the news, my first thought was, “What sort of luck is this?” Why can’t I have “luck” at picking 6/49 numbers? Silly thoughts like these are part of being human I guess.

Of course my little story points out the fallacy of thinking of “luck” as a quality of some sort that you have or don’t have. The French Foreign Legionnaires of the 19th century used to believe that “luck” was a commodity you either possessed or didn’t. They thought you could obtain good luck or give it to someone else. You could even trade for luck. If you lost all your luck you would probably die. If we think of luck as just a poor expression of chance, then we realize that any one toss of the die is just as likely to come up with the “win-

ning” number as the next. The odds just point to the long range probability, not the result of any one toss.

This convoluted story brings me to NEOS (Near Earth Objects) and PHOS (Potential Hazardous Objects). On the scale of the Solar System, our Earth, like our outhouse in the forest, is a small target. Although the odds of the Earth being struck by a destructive object from space are very long, they are not zero. We are at a stage in our civilization where we can actually do something about being hit by an asteroid, comet or other object, as long as we are alerted early enough to come up with a plan to prevent it. The big observatories run by professional astronomers can only devote a limited amount of time to observing NEOS. Amateur astronomers can have a big part to play in tracking NEOS and supplying

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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-one-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

January

20 – Lunar eclipse observing at the HR MacMillan Space Centre
26 – Paul Sykes lecture at SFU (see page 1 for details)

March

23 – Night Quest at Pacific Spirit Regional Park

May

11 – Astronomy Day at SFU

June

13 - 16 – RASC General Assembly in Toronto

August

24 - 31 – Merritt Star Quest

October

18 - 20, 25-27 – Manning Park Dark Sky Festival

December

12 – AGM

On board the ISS: David Saint-Jacques

On Dec. 3, 2018 at 6:30am Eastern Time, many of us proudly watched Canadian Astronaut David Saint-Jacques' successful liftoff from Kazakhstan aboard a Russian Soyuz rocket to the International Space Station. The ISS is a space station, or a habitable artificial satellite, in low Earth orbit.

Saint-Jacques was accompanied by NASA astronaut Anne

McClain and cosmonaut Oleg Kononenko of the Russian space agency, Roscosmos.

The 48-year-old astronaut from Saint-Lambert, Quebec is married and a father of two boys, and a girl.

Saint-Jacques is Canada's

ninth astronaut from the Canadian Space Agency (CSA) to fly into space. Not since Commander Chris Hadfield



completed his mission in May, 2013 has a Canadian Astronaut been to the ISS. Saint-Jacques has big shoes to fill, and he acknowledged Hadfield's talent at engaging the public and said he will do his best to bring spaceflight to the

masses—but with his own experiences and perspectives.

“I intend to do the same thing he did, to share my perceptions on space flight and what it means to me.”

Saint-Jacques said his focus will be to show what it's like to live on the space station; it will be his home for about half a year. His social media posts will focus on the human experience and showing the beauty of our home planet.

Prior to his career as an astronaut, Saint-Jacques was an engineer, astrophysicist, and physician. Saint-Jacques also has his commercial pilot's license and speaks five languages

by Hayley Miller

es.

Looking back at Saint-Jacques' many accomplishments, it was no surprise that in May, 2009, Saint-Jacques was selected from over 5000 applicants into the Canadian Space Agency. A few years later, he was accepted to be

one of 14 members of the 20th NASA astronaut class and moved to Houston. This intensive training included scientific and technical briefings, instruction in International Space Station systems, extravehicular activity (EVA), robotics, physiological train-

ing, T-38 flight training, Russian language, and water and wilderness survival training.

In May 2016, Saint-Jacques was selected as a member of ISS Expedition 58/59.

During this assignment, Saint-Jacques will conduct a number of science experiments, with some focusing on the physical effects of the weak gravity astronauts experience in orbit as well as how to provide remote medical care.

Saint-Jacques will be his own main subject, using his medical training to try to develop new programs to keep astronauts healthy in space.

He'll be observing the effects of space on bone density, ocular pressure, and even the brain—all in the hopes of helping NASA figure out how to physically prepare astronauts for a potential mission to Mars.

In 2018, there was a lot of excitement leading up to this mission. Last May, Saint-Jacques left over 100 Let's Talk Science Outreach volunteer coordinators feeling inspired about science, technology, engineering and math (STEM) after speaking with them via videoconference during the 20th annual Let's Talk Science Outreach Conference in London, Ontario. A STEM advocate and mentor, Saint-Jacques answered questions by the post-secondary students and said, "It is inspiring to see

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Image credit: NASA/Aubrey Gemignani



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the engagement and enthusiasm of the volunteers that will help bring space to classrooms during my mission. Their work helps us to foster youth imagination and interest in science, technology, engineering and math (STEM).”

This past summer, a video was made by Saint-Jacques in honour of RASC’s 150th Anniversary. In this video, he acknowledges how RASC has played a key role in educating the public and that the society has led generation after generation of young people to take an interest in astronomy. He also mentions that not

many institutions can boast that they’ve done so much to familiarize the general public with scientific knowledge and discoveries and in the past 150 years RASC has witnessed major developments in observation technologies, the discoveries of galaxies, stars and planets, and advancements in the field of astronomy. Saint-Jacques congratulated all the RASC members and volunteers both past and present and thanked everyone for their dedication. He also said that astronomy has inspired Canadians and filled them with wonder and that the coming years are sure to be exciting.

Saint-Jacques thanked members for their commitment and passion and said he will be thinking of us during his mission.

In another interview last year for Space.com, Saint-Jacques said, “Canadians have so many reasons to be proud of our contributions to our space program. We are part of that club of nations that are pushing the boundaries of humanity.”

I personally will never forget watching the live feed of Saint-Jacques arrival at the ISS. Shortly after arriving, he spoke with Canadian Governor General Julie Payette,

a former astronaut. Saint-Jacques first words from space to the world were, "What a journey and it's just the start. I'm speechless for now. I'm completely blown away but what I've seen over the last six hours. It was incredible and I know you're all with me in my heart."

The great energy of this mission is ongoing thanks to the CSA. It is currently holding a contest for all Elementary and secondary schools to write and convince them why their school loves space more than any other school in Canada. The winning school will have a unique opportunity to speak with Saint-Jacques for 20 min. while he is on board the ISS! The submission period for this contest is from December 20, 2018, to February 28, 2019.

Another contest (which the CSA ended on Dec. 31, 2018) invited Canadians to write an out-of-this-world space-themed children's story. A se-



lection of these stories will be published on the CSA website and could be read by Saint-Jacques from aboard the ISS.

There are many ways to show our support for David Saint-

Jacques on Twitter, Facebook or Instagram but I think writing this article for Nova is also a great way to get a bit more insight to his amazing story!

★

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data to the professionals which will help them classify objects and nail down their orbit to a higher degree of accuracy. Knowing the orbit is the key to predicting any future collision. If you are interested in knowing more, you can check out NASA's site at: <https://www.nasa.gov/vision/universe/watchtheskies/neo.html>

You can also get involved by

reporting new finds and observing data at: <https://minorplanetcenter.net/>

Of course you might just want to try your hand at discovering an unknown asteroid out in the asteroid belt, or maybe an undiscovered minor planet. This is not beyond the realm of amateur astrophotography equipment in this day and age. You can take lessons from our own asteroid observer, Robert Conrad, and

start observing known asteroids before venturing out to find unknown asteroids.

Looking ahead to 2019, we will be hosting a great list of speakers this year thanks to the hard work of our speaker chair, Scott McGillivray. I hope you keep an eye on our web page and Meetup page and attend as many meetings and events as you can. I look forward to seeing you throughout 2019. ★

Space Does Not Look Like That by Derek Miller with introduction by J. Karl Miller

Our son Derek K. Miller, along with a degree in marine biology and a diploma in non-fiction writing, had an eclectic mind and interests in many things, ranging from writing for several magazines, the Vancouver Sun and other publications, and editing books. He also had extensive knowledge of and involvement with science, music, photography, computer technology, web page

programming and administration, astronomy, and several other fields. He was among the first to make use of on-line communications, well before the internet existed in its current form.

This article is a copy of what Derek wrote in his blog about two and a half months before he died of metastatic colorectal cancer at age 41.

Remember the end of *The Empire Strikes Back*, where Leia and Luke, convalescing from surgery to replace his severed hand, gaze out of the window of a Rebel spaceship at the departing Millennium Falcon, with the Galaxy (the far, far away one) spinning slowly in the background? It looked something like the image on the opposite page.

That's a real galaxy, though, called NGC 2841, about 45 million light years away from our own. And neither it nor its Star Wars companion would look anything like that if we were seeing them with our own eyes.

First of all, forget the spinning: it takes our solar system about 225 million years to make one rotation around the core of the Milky Way, so even if you were able to see the whole disk, it would take many human lifetimes to perceive any motion at all. Put another way, the last time we were at this spot in our rotation, Earth was in the middle of the Triassic period, the time of the earliest dinosaurs.

Maybe more importantly, I don't think we could see a galaxy in all its beauty that way at all, because it would probably be too dim for our eyes. Consider that all photos of other galaxies require pretty long exposures, even for sensitive equipment. The Andromeda Galaxy, which you can see in a dark sky with your naked eye as a faint smudge, doesn't show its full shape in a



Vancouver Centre President Leigh Cummings presents the centre's Appreciation Award to Alan Jones for his years of work on the AOMO Observatory

telescope until you collect light for at least a few minutes.

Consider the fact that we're right inside a galaxy, and for most of us living in cities, the Milky Way, which is the view through the thickness of our closest spiral arm, is entirely washed out by light pollution. I don't think my daughters have ever seen it, in fact. You need a pretty dark sky, preferably on a moonless night, to see it properly.

If you were far enough away from a galaxy to see the whole thing, it would be even dimmer, so no matter how dark the sky, to your naked eye it would be much more a large, galaxy-

shaped smudge of light (an impressive smudge indeed, but still smudgy) than the crisp, defined, and detailed colourful disks we see in photos. You might be able to determine its shape, and see the core, but it wouldn't be what Luke, Leia, R2-D2, and C-3PO were gazing at.

People are sometimes disappointed when they look through a telescope at celestial objects. Jupiter, Saturn, the Moon, and the Sun are certainly impressive, but nebulae lack the fantastic colours and flaming tendrils we've come to expect after decades of Hubble Space Telescope images. But those pictures are long exposures, often with artificial

colours displaying wavelengths humans can't even see.

While those images are real, they're not what our eyes see when we look at the light directly.

Still, think about how amazing it is to do anyway: away from city lights, on a dark clear night, preferably at high altitude, you can peer up near the constellations Pegasus and Cassiopeia to find the Andromeda Galaxy, no binoculars or telescope necessary (though they'll make it yet a better experience). When you see it, you know that the light hitting your eyes started its journey two million years ago, before modern humans evolved. ✨





The Triangulum Galaxy (M33) by Phil Lobo

This nearby spiral galaxy is visible with binoculars under dark skies. Although shining at magnitude 5.8, M33 is spread over about 60 arc minutes and therefore has a low surface brightness. In larger telescopes, spiral arms and star forming regions within the galaxy might be glimpsed. At 3 MLY, it is slightly more distant than the Andromeda Galaxy, and is the third largest member of the local group of galaxies. (20x3min exposures, Canon 1000D, 200mm f/3.9 Newtonian)