NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC

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A Great Get-Together

by J. Karl Miller

One of the rare events in the sky is a conjunction of the two largest planets in our solar system.

I logged into Slooh.com on December 21 to watch their live presentation as this conjunction was in progress. There was also a link to the International Astronomical Center in Abu Dhabi, U.A.E. The image on this page originated there; it was shown during the presentation, Saturn at the upper left, Jupiter lower right.

Jupiter/Saturn conjunction
(image courtesy International Astronomical Center)

One day later, the Simon Fraser University's Trottier Observatory did the same thing through its telescope on line, with assistance by the RASC. I also watched that well done presentation via YouTube.

This conjunction was the result of a particular positioning of Jupiter, Saturn, and Earth in their respective orbits. At the time pictured, the visual separation in the sky of Jupiter and Saturn was about six arc-minutes, which is about one fifth of the apparent diameter of our Moon as we see it from Earth. That essentially "united" the two planets into one brighter "star" when looking with our unaided eyes. In reality, Saturn is about 700 million kilometres "behind" Jupiter from Earth's point of view. For perspective, Jupiter is approximately five times Earth's distance from the Sun; Saturn almost twice as far.

The large planets in our solar system orbit the Sun in approximately the same plane; Earth's orbital plane is taken as the reference. As a result, the Sun's annual apparent motion across the sky from Earth appears to be the same from year to year with very small changes over time. This path is called the Ecliptic. The larger planets have orbital planes which are close to the ecliptic, but deviate from it to vary-

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JANUARY 14 ZOOM	FEBRUARY 11 ZOOM	MARCH 11 ZOOM
Vancouver Centre's own Ian McLennan: Observatory and Planetarium Projects Update. See Meetup for Zoom details.	Speaker TBA. Watch Meetup for updates.	Speaker TBA. Watch Meetup for updates.

RASC Vancouver Centre 2020 Secretary's Report by Suzanna Nagy

Vancouver Centre is in its 89th year and we will be thrilled to be celebrating our 90th anniversary in 2021.

As with all other Centres and our National Office, 2020 was a difficult year. Our public events ended in March and we have had no in-person public events since. The COVID-19 global pandemic drastically changed the way we had to communicate with each other and celebrate astronomy. Zoom lectures and webinars became the only way we could see each other regularly and group observing also went virtual. We very quickly had to learn to transition to a virtual world but in many ways, what we have learned this year will be useful going forward. Thankfully and with the aid of technology, Vancouver Centre has been able to continue with our mission to advance education in astronomy and allied sciences.

Our relationship with Simon Fraser University's Trottier Observatory and its Friday evening Starry Nights has continued and with COVID-19, went virtual. Vancouver Centre has been assisting with members acting as Zoom moderators while the SFU Observatory staff controlled the Observatory telescope remotely and engaged with the public-at-large in the virtual format.

At the start of the pandemic, we had concerns about loss of membership, but Vancouver Centre is happy to say that despite some month to month fluctuations, we did not see an overall loss. In December 2019, we had 282 members and we ended 2020 with 288 members.

As to the 2020 General Assembly—back in the Summer of 2019, the National Office reached out to Vancouver Centre to host 2020 as it was the "west coast's turn" and there had been no Centre stepping forward in the year or two prior as is usual. Council for Vancouver Centre accepted the challenge and with barely 10 months to plan, our amazing Events Coordinator, Hayley Miller, and the equally amazing members of her GA Committee pulled together everything necessary to host the GA in June 2020. However, as we all know, by March of 2020, the COVID-19 global pandemic was upon us and by the end of April, it was apparent that there was no way an in-person General Assembly could go forward. Again, our rock star, Hayley Miller, and her Committee members, with the assistance of the National Office, moved the entire GA virtual and it ended up being a great success despite the setback.

Here is a summary of our events for 2020 (both in-person and virtual). In the Fall, we partnered with the Sunshine Coast RASC and held joint virtual meetings to share speakers:

- January meeting – Anna Hughes, Magnetic Fields Around Dwarf Stars
- February meeting – Dr. Howard Trottier, Art and Science at the Trottier Observatory
- February 21 and the Paul Sykes Memorial Lecture – Mary Beth Laychak, 40th anniversary of the Canada-France-Hawaii Telescope
- March – Girl Guides "Women's Day Career Celebration"
- March/April/May/June – Robert Conrad, Webinar series for Observational Astronomy Basics Part I
- April meeting – Dr. William Wall, Celestial Orbits
- May meeting – Bill Burnyeat, The Early Greek Astronomers
- June – General Assembly
- June/July – Robert Conrad, Webinar series for Observation Astronomy Basics Part II
- July meeting – Various presenters on astrophotography and a Trivia Contest
- September meeting – Charles Ennis, Ancestor's Skies
- October meeting – Dr. Arif Babul, Large Scale Structure of the Universe
- November meeting – Theresa Fisher, Next Generation Biosignatures for Exoplanets
- November/December – Robert Conrad, repeat of Webinar series for Observation Astronomy Basics
- December meeting – Hayley Miller, The Art of Space

Vancouver Centre is looking forward to 2021 with astronomy continuing in the virtual realm for the foreseeable future. ✸

President's Message

by Gordon Farrell

One thing you need to get used to when trying to do astronomy on the "wet" coast is disappointment. If a rare event is expected, there's more than a strong chance the clouds will insert themselves between us and the heavens. And so it was, with this in mind, that plans for the Jupiter-Saturn conjunction on Dec. 21 were debated. If the skies were clear, could it even be seen from SFU (the only telescope we have access to that can do remote observing sessions)? Turns out the answer is yes, if you start observing before the sun sets. So plans were set in motion between our own Hayley Miller and SFU's Joanna Woo to do a special Starry Nights session for that night, with the following night as a backup, just on the off chance the weather did its usual thing.

I had ambitions to photograph the event and planned my own observing session on my roof deck. Nothing too fancy—just

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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 necessarily 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 Trottier Studio in the Chemistry wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

2021 Vancouver Centre Officers

President	Gordon Farrell
	president@rasc-vancouver.com
Vice-President	Alan Jones
	vp@rasc-vancouver.com
Secretary	Suzanna Nagy
	secretary@rasc-vancouver.com
Treasurer	Phil Lobo
	treasurer@rasc-vancouver.com
National Rep.	Vacant
	national@rasc-vancouver.com
Librarian	William Fearon
	library@rasc-vancouver.com
Public Relations	Vacant
	publicrelations@rasc-vancouver.com
LPA	Leigh Cummings
	lpa@rasc-vancouver.com
Dir. of Telescopes	Ken Arthurs
	telescopes@rasc-vancouver.com
Observing	Robert Conrad, Ken Arthurs
	observing@rasc-vancouver.com
Membership	Suzanna Nagy
	membership@rasc-vancouver.com
Virtual Events Coord.	Hayley Miller
	events@rasc-vancouver.com
Education	Robert Conrad, Andrew Krysa
	education@rasc-vancouver.com
AOMO	Alan Jones
	aomo@rasc-vancouver.com
Merchandise	Kyle Dally
	merchandise@rasc-vancouver.com
Webmaster	Ken Jackson
	webmaster@rasc-vancouver.com
Web Specialists	Karambir Singh, Renuka Pampana
	webspecialist2@, webspecialist1@
NOVA Editor	Gordon Farrell
	novaeditor@rasc-vancouver.com
Speakers	Hayley Miller
	speakers@rasc-vancouver.com
Past President	Leigh Cummings
At Large	Bill Burnyeat, Kenneth Lui
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.

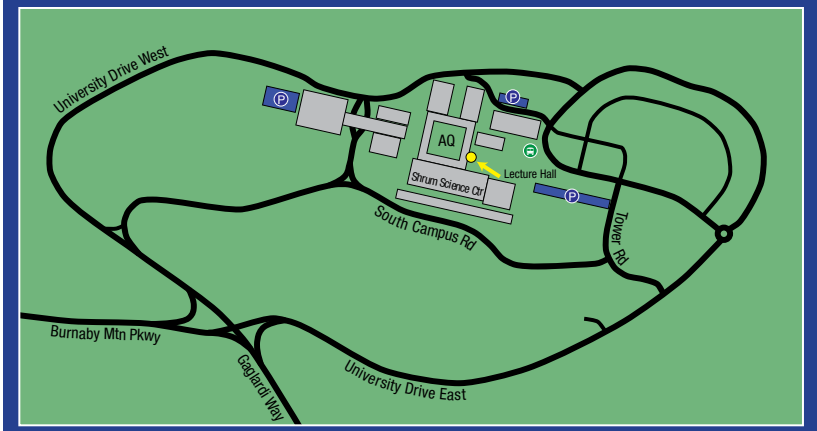
On the Internet

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

Mailing Address

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

Map to Meeting Site



IMPORTANT NOTICE:

Our lectures have moved online until further notice due to COVID-19 and SFU having shut down most on-campus activities.

We will resume our physical lectures at SFU once is it deemed safe to do so.

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my compact 5-inch SCT on a simple tracking mount with eyepieces for visual observing and my DSLR with T-ring adaptor for taking pictures. All that was left to do was wait for the big event.

As expected, the nights leading up to the conjunction were rainy and/or overcast. The outlook for the 21st was grim, but there was hope for the following night. Granted the 22nd was after the closest approach but the conjunction would still be impressive (11 arc-minutes instead of 6.5) so it was a reasonable contingency plan. And a good thing it was because, well, the predictable happened and the night of the 21st was indeed a bust.

But the weather broke on the 22nd and we were ready. At SFU, the live stream was set up and the moderators were all lined up—even our own Scott McGillivray was there to extol the virtues of a good pair of binoculars. At home, I made sure I had everything ready to go well before sunset.

There were wisps of cloud towards the southwest but fingers were crossed they would clear in time. While SFU wasn't so lucky at first (though they did manage to pull something out of the muck with those giant optics) I had better luck and managed to follow the pair from the time it was dark enough to spot them with binoculars until they disappeared behind the trees of the hill to the south of me. Our Education Co-Chairs, Andrew Krysa and Robert Conrad, had similar luck from Porteau Cove (see their photos on the back cover). And the virtual session at SFU did finally get some clear skies and observed the conjunction until it fell below the telescope's minimum tracking altitude at around 5:10pm.

So I guess we'll call that a success (with an asterisk) for the latest big event viewed from the Lower Mainland. While we may not always be so lucky, we will always hope for the best and have contingency plans at the ready!

Oh, and one more thing: I would be remiss if I didn't put out an appeal for members would might be interested in filling two council positions that are empty this year: National Rep. and Public Relations. The National Rep's responsibilities include attending National Council meetings (virtually), reporting the details back to Vancouver Council and representing the interests of Vancouver Centre at the National level. The position of Pubic Relations is what one would expect: reaching out to the public and media about our events and helping to promote amateur astronomy to the general public. If you think either of these positions could be of interest, please reach out to me or any other council member. ✸

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ing degrees. From our Earth-bound point of view, therefore, for them to appear very close together, such as the Jupiter-Saturn conjunction, happens only now and then. Jupiter can even cover (occult) Saturn, but that is a very rare occurrence. It would require that the centres of Earth, Jupiter, and Saturn be exactly on one specific line. The latest Jupiter-Saturn conjunction came very close to that possibility.

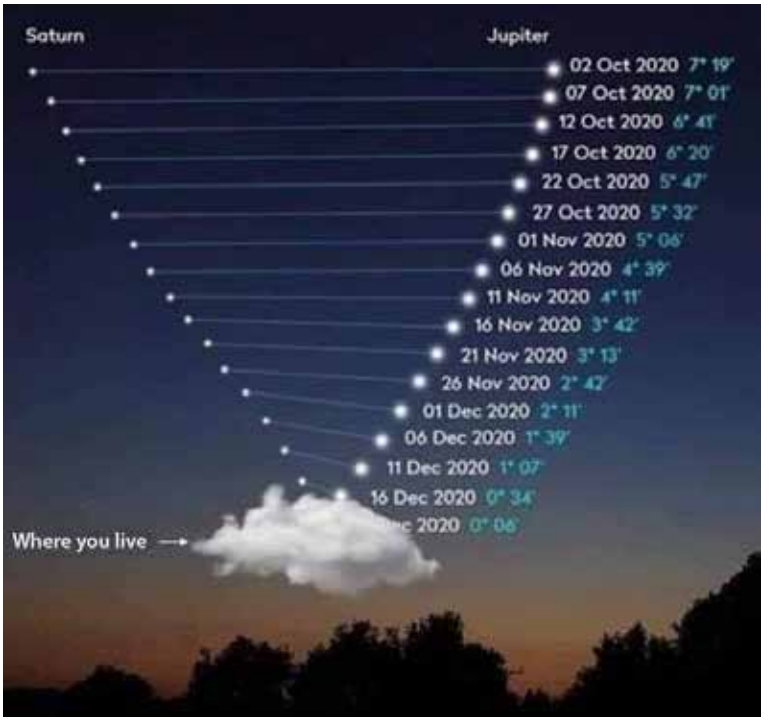


Image credit: Pete Lawrence/Space Australia; cloud aded by unknown artist

The two planets move quite slowly. Jupiter takes about 3 hours for a distance equal to its own diameter, Saturn is even slower. Both move in the same direction. That means the they will be visible in a pair of binoculars at the same time for a number of days. Standard binoculars have fields of view in the order of 5 to 7 degrees. On January 1, 2021, Saturn and Jupiter are about 2 degrees apart, easily within the same binocular field of view. Unfortunately they are positioned so close to the sun at this time that they will set closer to sunset every day, so following both planets is going to get more difficult. For this purpose, use your binoculars only after the sun sets. Never look at the sun directly through binoculars, or even with your unprotected eyes only; permanent eye damage may be the result!

COVID-19 is forcing us to keep separate for the time being, it was a good thing to see at least one "heavenly" get-together. ✸

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

May
TBA – Virtual Astronomy Day at SFU

August
7 - 15 – Mt. Kobau Star Party

September
4 - 12 – Merritt Star Quest

December
12 – AGM

Members' Gallery

Jupiter/Saturn conjunction by Gordon Farrell

Taken the day after the closest approach (due to typical Vancouver weather), this image shows Jupiter with its four, faint Galilean moons on the left and Saturn on the right. Europa and Callisto are barly visible to the upper left of Jupiter and Io and Ganymede to the lower right of it. Saturn's largest moon, Titan, is just barely visible above Saturn if you squint really hard.

Photographed through a Celestron C5 telescope on a tracking mount via a Canon 5D Mark IV attached by a 2" T-adaptor. This is a composite of 20 images stacked in a vain attempt to sharpen the results. Each exposure was 1/60s at ISO 10000. The results were processed in Photoshop, with Jupiter, its moons, and Saturn each processed separately and composed together for the final image.

Robert's Master Astronomy Classes

Join Robert Conrad, learning and development consultant and the RASC Vancouver's Observing Director and Education Co-Director for his series of Master Classes currently in progress. Session 7 will be this coming Sunday, January 17th. All the other previous sessions have been recorded and are available here:

https://drive.google.com/drive/folders/1KjObx5uGH7QXK9_BCu54JoCJMCHrgZ5s?usp=sharing

You can sign up for it on the Vancouver Astronomy Meetup Group:

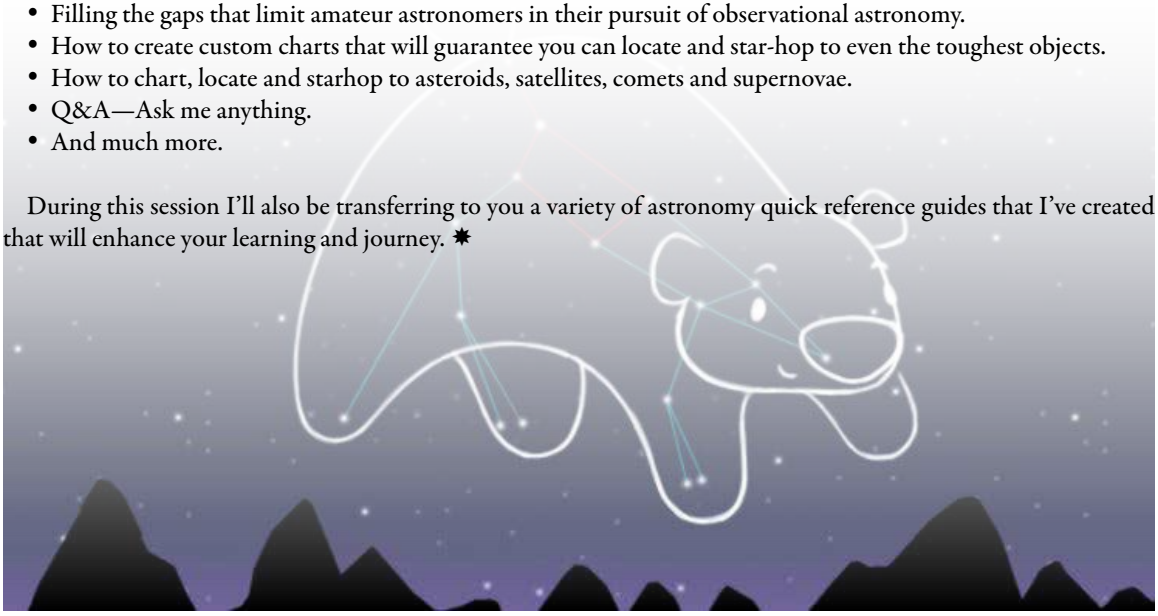
https://www.meetup.com/astronomy-131/

Given that many of us are confined to our homes, I'm going to be delivering an astronomy course that I used to teach at SFU over a series of webinars. This will be the first one. I will also be transferring to you a ton of valuable resources. Not sure how many I will deliver but I'll keep going until I complete the entire course and all your questions are answered. If you stick with these, I promise you that you'll be expert observational astronomers in just a fraction of the time it might take you normally. You'll also get a sneak peek at a book my colleague and I are writing. Happy Stargazing!

In this workshop I'll be providing the basics of observational astronomy as well as some advanced topics.

- Star chart orientation—what telescope companies and books don't tell you.
- How to effectively read and use star charts (including finding the coordinates of any object)
- Understanding star/object brightness/magnitude.
- How to calculate magnification and true field of view and why this matters.
- Why field of view circles are your key to mastering star-hopping.
- Observational astronomy targets—what to view beyond the popular targets and why this is critical to keeping you motivated and interested.
- Using Stellarium (free astronomy software) to predict deep sky object/asteroid/comet/satellite conjunctions.
- Filling the gaps that limit amateur astronomers in their pursuit of observational astronomy.
- How to create custom charts that will guarantee you can locate and star-hop to even the toughest objects.
- How to chart, locate and starhop to asteroids, satellites, comets and supernovae.
- Q&A—Ask me anything.
- And much more.

During this session I'll also be transferring to you a variety of astronomy quick reference guides that I've created that will enhance your learning and journey. ✸



Jupiter/Saturn conjunction

by Andrew Krysa

Taken Dec. 22 from Porteau Cove, the above image shows Jupiter and Saturn in the same field of view. Captured by a DSLR attached to his 10" Dobsonian telescope with a special T-ring.

The other picture at left was taken by a passing photographer and shows a blurry Robert and Andrew at Andrew's telescope with Jupiter and Saturn in perfect focus above the horizon after sunset.