

NOVA

NEWSLETTER OF THE VANCOUVER CENTRE RASC
VOLUME 2014 ISSUE 1 JANUARY FEBRUARY 2014



Observing Report

by Scott McGillvray

2013 ended with a complete dud named ISON. The “Comet of the Century” became the “most over-publicized, under delivering astronomical event of the century.” A

few RASC members managed to find the magnitude-5 object in the late November dawn, far less prominent than the publicized estimate of full-moon brightness. Unfortunately, we are reminded of ISON any time we open a magazine or calendar printed before December of last year.

2014 promises some more reliable events, including two lunar eclipses on April 14th and October 8th.

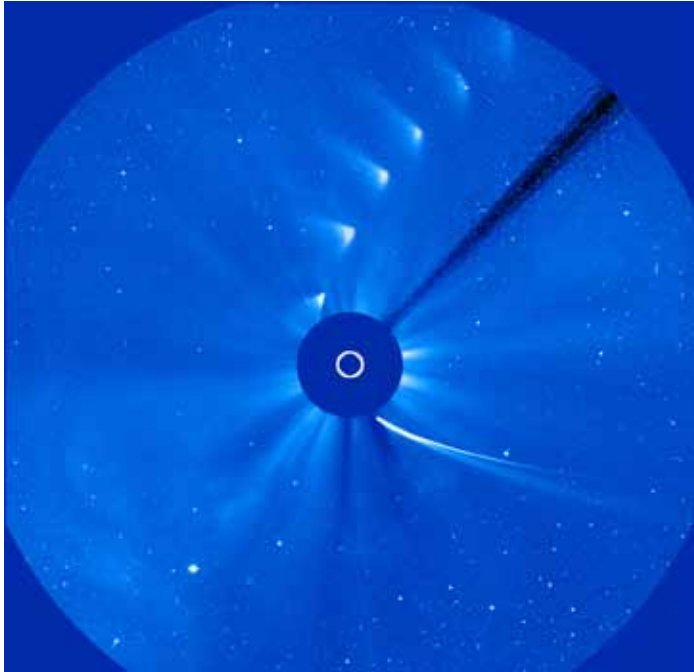
On Saturday, May 24, Earth will pass through the path of the newly discovered comet 209P/LINEAR. The Northern Hemisphere can expect a meteor storm with the

intensity of 100 to 400 meteors per hour centred in the constellation Camelopardalis (between Ursa Major and Cassiopeia.) There will be a number of RASC observing events

throughout the lower mainland that evening.

On October 23, Vancouver will see our first solar eclipse since May of 2012. This is not a total eclipse from anywhere on Earth, but in Vancouver we will see a peak of around 50% occlusion at 2:58pm.

For those adventurous astronomers, April 29 will bring an annual solar eclipse to Antarctica and parts of Australia. *



Comet ISON's last gasp

SOHO (ESA & NASA)

JANUARY 9

Jereny Heyl of UBC: An Astronomer's View of Time. Room location is Hennings 201 (see map on p. 4).



UBC FEBRUARY 13

Barry Davids of SFU/TRIUMF: We are All Stardust: Nuclear Physics in the Cosmos. See Meetup for room details.

SFU

MARCH 13

Catherine Johnson of UBC on learning what the interior of the Moon is like by studying Apollo seismology data. See Meetup for room details.

SFU

SFU

SFU

Members' Gallery



Antenna Galaxies by Scott McGillvray

I'm learning to process FITS files and developed a bunch of Hubble data over Christmas. NGC 4038 and NGC 4039 are two spiral galaxies undergoing a direct collision, spewing off long trails of stars and dust. The image was captured by Hubble using red, green, and blue visible light filters. All raw data courtesy of the Hubble Space Telescope, downloaded at www.spacetelescope.org. Images processed using ESA/ESO/NASA FITS Liberator and Rick Brewster's freeware Paint.NET software.

President's Message

by Mark Eburne

Happy New Year to everyone.

First I would like to welcome all the new members who have joined us for 2014 and welcome back the returning membership. I look forward to interacting with all you at the various events this year.

Secondly, I would like to say thank you to all those councillors who have stepped

down for all the hard work and efforts in 2013 and would like to send out a welcome to those who are joining us for the first time on council. I would encourage all membership to get to know your council. The complete list of the 2014 council is available in this NOVA and on our web site.

Just as important, I would

like to recognise all the volunteers that we are lucky to have at the RASC Vancouver Centre. Without the efforts from each of these volunteers, our events would not be as successful. If you are thinking of getting involved, to help out at our events or work behind the scenes, please let us know.

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About RASC

The RASC Vancouver Centre meets at 7:30 PM on the second Thursday of every month at various locations in Metro Vancouver (see page 1 for meeting locations and page 4 for maps). Guests are always welcome. In addition, the Centre has an observing site where star parties are regularly scheduled.

Membership is currently \$73.00 per year (\$41.00 for persons under 21 years of age) and can be obtained by writing to

the Treasurer at the address on page 5. 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 room P8445.2 of the Physics wing of the Shrum Science Centre at SFU. Please contact a council member for directions.

2014 Vancouver Centre Officers

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Trustees Pomponia Martines
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>

 @RASCvancouver

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Maps to Meeting Sites

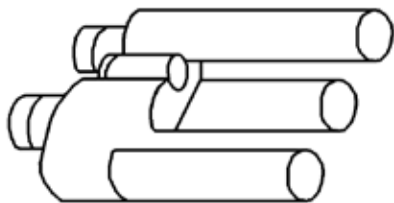


UBC

Our UBC meeting site is in room 201 of the Hennings Building. The main entrance is off Agricultural Rd. (indicated by the arrow on the map at left). Room 201 is up the stairs and on the left.

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

What they're saying about the new



SESQUI-TRINOCULAR^{DC}

by **PESCHER-ENROSE**

"Literally impossible" – Joe Boggs, *BoggsFlogLog.blog*

"You won't believe your eyes" – *Electrodweeb & Night Stalker*

"Theoretically faultless" – *SayNothingNegative.com*

"The name says it all" – *Sky Bling*

"100,000,000,000 stars" – *Skope Dope, Paper Ruiner Publications*

Available at better dealers and *MatoGrosso.com*

continued from page 3

We have several opportunities to make 2014 an even bigger success for everyone.

As always, 2014 is turning out to be an outstanding year for astronomy enthusiasts. Be sure to make time to enjoy some or all of the Vancouver Centre's activities. I encourage you to get connected whichever way you can.

Remember, look up then look around and share your **VIEWS**.

Welcome everyone; clear skies. ✨

Mark Eburne, President,
Royal Astronomical Society of
Canada, Vancouver Centre

2013 Volunteer Appreciation Award

by Suzanna Nagy

The 2013 Volunteer Appreciation Award goes to William Fearon.

William has been a member of the RASC since 1988. That is 25 years if you don't want to do the math.

William has been a member of the Vancouver Centre Council for 20 years and has held the position of Librarian for most of those years, although many of us on Council refer to William more as the Centre's Historian. We are always amazed as to the wealth of Centre history that William shares with us.

To many of us on Council,

William is a good friend. He is always quick to volunteer. He is kind, friendly, and a gentle soul.

Many of you may know William best as the "coffee and cookie guy." For many, many years, William has been responsible for ensuring our coffee and cookies are ready after each Member's Meeting. It is a responsibility that is very much appreciated but often unthanked.

It is a great pleasure to see the 2013 Volunteer Appreciation Award go to such a deserving individual such as William. ★



Your 2014 Vancouver Centre Council

Standing, left to right: Suzanna Nagy, Gordon Farrell, Rick Vandenberg, Scott McGillvray, Leigh Cummings, Terry McComas, William Fearon, Alan Jones, Doug Montgomery, Mark Eburne, Howard Trottier (back), Paul Stewart, Bruce Hutchison.

Kneeling: Rohit Grover, Kenneth Lui



Membership has its Privileges!

New members, did you know? The Vancouver Centre has 8 telescopes available for loan free of charge! We have telescopes ranging from 60mm to 10" diameter. For more information see the Director of Telescopes after the members meeting. The loaner period is for one month, to be returned after the next meeting. Telescopes are not allowed to circulate outside of these meetings. You

can now reserve two different telescopes per year and use what is left at the end of the meeting anytime.

Your greatest opportunity as a member of the RASC is to take advantage of the company of other enthusiasts to increase your knowledge, enjoyment and skill in astronomy.

The best thing you can do to gain the most from your membership is to get ac-

tive! Take in the club meetings; engage other members with questions; come out to observing sessions (also known as "star parties"), and, by all means, volunteer to take part in our many public events.

For the usual observing sites and times, visit our website at <http://rasc-vancouver.com/observing-sites/> or contact the Observing Chair at observing@rasc-vancouver.com.

Upcoming Events

February

1 – Paul Sykes Lecture at SFU. See below for details.

June

25 - 30 – RASC GA in Victoria

August

23 - 31 – Merritt Star Quest

July

July 26 - Aug. 3 – Mt. Kobau Star Party

December

11 – AGM

Paul Sykes Lecture: William Borucki on Kepler Exoplanets

The Royal Astronomical Society of Canada presents *Results from NASA's Kepler Mission* with the mission's visionary and principal investigator, William Borucki. This event is free to attend and open to the public. It will be held at 7:30pm on Saturday, February 1st at Simon Fraser University (see Meetup for room details).

Kepler's mission is to determine whether Earth-size planets in the habitable zone (HZ) of stars like the Sun are common or rare. This information will also be used to develop future missions that will characterize the planetary atmospheres and surfaces of such planets.

Kepler has already discovered over 3500 planetary candidates and found that they have an enormous range of sizes, temperatures, and types of stellar hosts. In particular, exoplanets near the size of Earth's moon to those larger than Jupiter have been found orbiting stars much cooler and smaller than the Sun as



well to stars hotter and often larger than the Sun. Several planets have been discovered orbiting binary stars.

Calculated temperatures for these planets range from those higher than molten lava (~1830K for Kepler-10b) for planets very near their host star to temperatures to those as cold as -70C. However, the Kepler Mission has also found several planets in the HZ of their host star and even found one in the HZ of a binary star.

Masses of those planets with large masses and/or short orbital-periods can be are

being determined by radial velocity and transit timing methods. By combining these results with the sizes obtained from transit photometry, densities of these planets are being calculated. These range from 0.2 gr/cc for Kepler-7b to 8.8 gr/cc for Kepler-10b. These values indicate that their composition range from mostly gas, to water planets, and to iron-rich rocky planets. Surprisingly, a very wide range of densities has been found for closely-packed planets orbiting the same star (Kepler-11). This result implies that contrary to what is observed in our Solar System, the composition (whether rocky, water-rich, or gas) cannot be surmised from the composition of its neighbours or from the amount of insolation.

The many types of discoveries that Kepler has made will be presented as well as the current status of the Mission now that the telescope can no longer point with the precision needed to continue normal operations.

★

Biography: William Borucki

William Borucki joined the National Aeronautics and Space Administration (NASA) in 1962 where he first worked on the Apollo missions, designing the heat shields which protect astronauts during their re-entry into the atmosphere. Following the successful Moon landings, Mr. Borucki went on to study the lightning activity on the planets in our solar system and the possibility that such storms create the biochemical building blocks of life. Using his data, he created mathematical models to predict

the effects of ozone depletion in the Earth's atmosphere due to nitric oxides and Freon.

Beginning in 1984, Mr. Borucki began advocating a space mission to detect Earth-like planets in other solar systems. In the following years, he developed the technology and techniques to detect such planets and proved NASA was ready to begin production on such a mission. On March 7, 2009, NASA launched the Kepler Space Telescope which has discovered 134 confirmed exoplanets and another

3,277 exoplanet candidates.

In 52 years with NASA, Mr. Borucki has received many awards, including the prestigious Henry Draper Medal in 2013 "for his founding concept, unflagging advocacy, and visionary leadership during the development of NASA's Kepler mission, which has uncovered myriad planets and solar systems with unforeseen and surprising properties." The Henry Draper Medal is awarded once every 4 years for investigations in astronomical physics.



VANCOUVER TELESCOPE CENTRE
Serving the Astronomers of Vancouver and British Columbia since 2004

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