

SKYNEWS



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From Moss Rocks
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Next Monthly Meeting
Wed May 9th 2018
Room A104
Bob Wright Centre
UVic Campus

www.victoria.rasc.ca

On the Cover

Moon, Venus and Mercury

By Randy Enkin

New Victoria Centre RASCal Randy Enkin captured this beautiful image from Moss Rocks not far from the home of Astro Cafe at 8PM on Sunday March 18th. The Moon was only 1.5 days old at the time. Venus in the middle and Mercury on the upper right served as striking escorts. Randy used an Olympus 4/3 OMD10 mark 2 camera on a tripod with a 40 mm lens at f/4 and an exposure of 0.77seconds.

When the vast majority gaze at Venus they are totally unaware that a lone Japanese space probe Akatsuki is in orbit around that planet. It has been gathering data and up close imagery for over two years now. An amateur "Astro Imager" from France has recently processed the raw data and created some **spectacular images of our nearest planet. Find out more on page 4.**

President's Report

by Chris Purse

Our tech committee has made further progress with the upgrade to the Victoria Centre Observatory telescope. More equipment has arrived and has necessitated the installation of some different wiring in the mount. Recently, members of the committee held a work party at the VCO to make the changes.

The committee has also prepared the surplus equipment for sale. Please see victoria.rasc.ca/for-sale-observatory-equipment/ for the details of the items for sale and how to make an offer to purchase. The sale is open for the month of April. This is another step forward in the project as realized funds will be used for further purchases of equipment for the VCO.

Late last month, a few of the council members received emails from what appeared to be the president's address. These emails asked the recipient to make an urgent payment on behalf of the centre using personal funds; a promise was made that these funds would be reimbursed by the centre within short order. This was a scam. It does go to show that the criminal

element is out there looking for opportunities to defraud anyone. I mention this as a reminder to all of us to remain vigilant any time we are asked for money by email.

Here are some announcements:

- RASC members may register to attend the CASCA 2018 conference that takes place May 22 – 26. See casca2018.ca/ for more information.
- The Friends of the Dominion Astrophysical Observatory has launched their new website. The new URL is www.thecentreoftheuniverse.net. This is where the information about the Summer Star Parties will be posted.
- The Vancouver Island Regional Science Fair is taking place on April 8 and 9 in the Elliott Building Lecture Wing at the University of Victoria. See web.uvic.ca/~virsf/index.php for more information.
- Our monthly meeting on Wednesday, April 11 at 7:30 p.m. will be in the Elliott Building, room 167, as our regular room is being used for an exam.
- The Science and Technology Awareness Network (STAN) helps promote science and technology education. This year, their conference is on Wednesday, April 11 in Vancouver. The conference web page provides registration and all other details, www.stanrsst.ca/stan-conference. By the way, STAN membership is free; you may be interested in joining STAN especially if you have an interest in science and technology education.

Astronomy Day will take place on Saturday, April 21. The daytime portion will be at the Royal BC Museum and the evening will be the first of the summer star parties at the DAO. If you are not already on the list to volunteer at those events please let Ken, our outreach coordinator, know that you are available. He may be contacted at outreach@victoria.rasc.ca.

See Page 6 for details of Astronomy Day presentations.

April Meeting Presentation: Hot Jupiters, super-Earths, and mini-Neptunes! Oh my!

by **Dr. Henry Ngo**

**Wednesday April 11th 2018 at 7:30 PM
Room 167, Elliot Building.**

No, the lions and tigers and bears have not rebranded! These are categories of exoplanets (planets around other stars). At first, we only knew about a small handful of exoplanets, but they were nothing like the planets from our solar system. As our methods improved, the discoveries kept piling on and now there are several thousand known exoplanets from many different detection techniques. Tonight, I'll give a summary of exoplanet search techniques and what we know so far about these planets. I'll also talk a little bit about my own research and share some experiences from studying some of the largest exoplanets using telescopes on Maunakea and Palomar.

Bio: Dr Henry Ngo is currently a Plaskett Postdoctoral Fellow working for the National Research Council of Canada at the Dominion Astrophysical Observatory. He was born in Mississauga, Ontario but grew up in Richmond, BC. He studied at UBC for his bachelors, Queen's University in Kingston, ON for his Masters and just finished his PhD in Planetary Science at Caltech last summer. Henry and his family are happy to be back in BC and they are loving life on beautiful Vancouver Island!

Upcoming Speakers

Wednesday May 9th, 2018

Karun Thanjavur, *Gravitational Lensing*

Wednesday June 13th 2018

Dr. Joanna Woo, TBD

Wednesday September 12th 2018

Dr. Nienke van der Marel, *Planets: How they form and where to find them*

Wednesday October 10th 2018

Dr Reka Winslow *Planetary Magnetism*



ASTRONOMY CAFE



Our weekly **Astronomy Cafe** is an excellent, informal, way to meet us. New comers are especially encouraged. Click the link for location: <http://victoria.rasc.ca/events/astro-cafe/>

Fairfield Community Centre - 1330
Fairfield Rd. Victoria.

Every Monday at 7:30pm. Contact:
Reg Dunkley for further details:
vp@victoria.rasc.ca



Email Lists

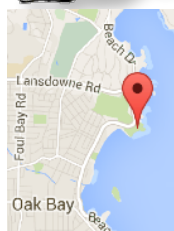
**Observer / CU Volunteers /
Members**

Contact Chris Purse to subscribe
membership@victoria.rasc.ca



New Observers Group

Hosted by Sid Sidhu - 1642 Davies
Road, Highlands. Call 250.391-0540
for information and directions.

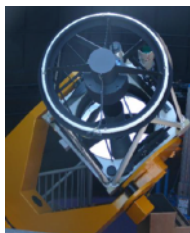


Cattle Point observing in Victoria's
own Urban Dark Sky Park.

Click the link for the date and time of
the next scheduled session
<http://victoria.rasc.ca/events/rascals-cattle-point/>



Victoria Centre Observatory:
**Saturday evenings shifting to
Friday evenings on April 20th**
*Open to those on the Active
Observers list only*
Weather permitting.



UVic 32 Inch Telescope

RASC Victoria Centre Session
Final evening of season is
Friday April 13th. Meet by the
Elevator in the Bob Wright
Centre at 8PM

Membership Report April 2018

Total membership is currently **269**. There are 13 members
in the grace period which means their membership has
expired in the past 2 months. Please contact Chris Purse
(membership@victoria.rasc.ca) if you would like to check
the status of your membership.

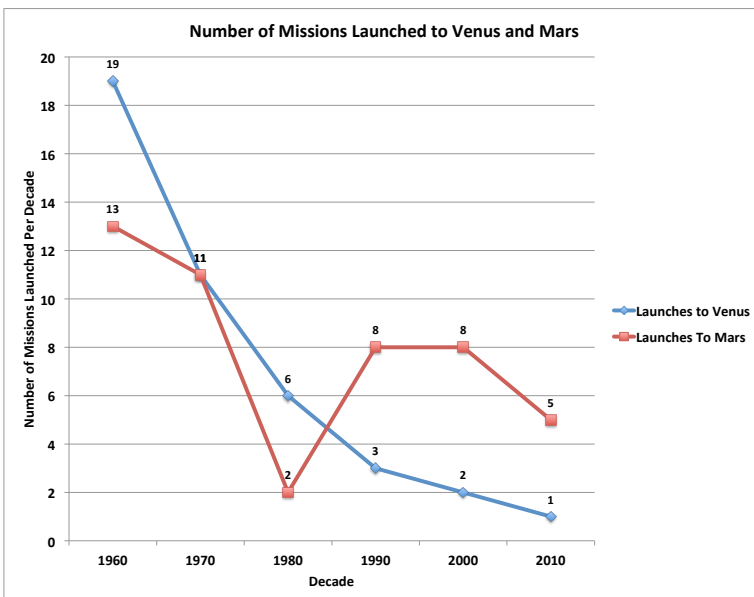
Venus, Our Neglected Neighbour

By Reg Dunkley

Although it is the third brightest object in the sky, Venus, our nearest neighbour, only has one solitary satellite in orbit around that planet. Meanwhile two robots are crawling across the surface of Mars and 6 orbiters are circling overhead. To add insult to injury on the big screen Matt Damon is busy planting potatoes on the Red Planet and the owner of Tesla is promoting a Martian colony.

Why the lopsided interest in Mars? Well it wasn't always like that. Way back in the Sixties our knowledge of both Venus and Mars was very limited. In that decade there were 19 launches to Venus and 13 launches to Mars. Rocketry was much more risky in that era and 12 of the first 13 launches to Venus failed, usually during the "Blast Off" ... which was soon downgraded to the less catastrophic "Lift Off". The graph on the top right reveals that the number of missions to both Venus and Mars decreased between the 1960's and the 1980's. Since the 1990's however there have been **21 Martian missions and only 6 missions to Venus**. Three of these Venus encounters were just gravity assist flybys; Galileo to Jupiter, Cassini to Saturn and Messenger to Mercury. Venus has been relegated to a stepping stone. What happened?

It involves one of the key quests of space exploration ... "Are We Alone?". Since Venus is nearly the same size as the Earth and a bit closer to the Sun it was a promising nearby target. It was the brilliant Soviet **Venera 7** mission that let the cat out of the bag. Venera 7 was the first probe to land on another planet and transmit data back to Earth. It's findings in December 1970 were extremely interesting but not at all appealing. Venera 7 measured that 97% of the atmosphere was made up of carbon dioxide, the surface temperature was a scorching 475 degrees C and that the atmospheric pressure was over 90 times that on Earth. And to make matters worse the clouds are laced with Sulphuric Acid. So Venus was abruptly scratched off the list of life bearing planets and the focus shifted to Mars.



The study of Venus, however, has great scientific value and relevance to Earthlings. It is an example of a runaway green house effect. Since Earthlings are conducting an uncontrolled experiment with the only atmosphere they have it is certainly a valid and very important target to study and understand.

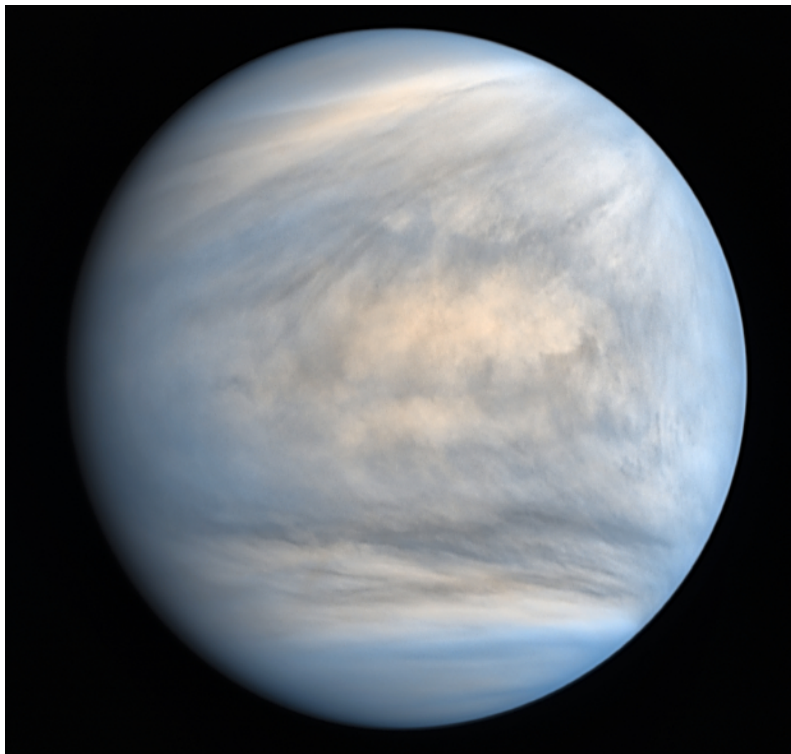
Fortunately there have been some very successful long term missions that monitored Venus. Between 1978 and 1992 the **Pioneer Venus 1** Orbiter gathered data with 17 instruments. Between 1990 and 1994 the Nasa, **Magellan** Radar Orbiter, built out of spare parts from other missions, successfully penetrated the opaque cloud shields and mapped the terrain to a precision of at least 1km. Between 2006 and 2014 the European Space Agency **Venus Express** orbited Venus and employed 7 instruments to monitor the planet. These included a camera that captured Venus in visual, ultra violet and near infrared wavelengths. By tracking cloud motions this mission was able to estimate wind fields at various elevations. In 2015, the **Akatsuki** spacecraft of the Japanese Aerospace Exploration Agency went into orbit around Venus and is currently monitoring the planet with 5 imaging cameras from ultraviolet to mid infrared. The fact that Akatsuki went into orbit at all is quite the adventure and a testament of ingenuity which was described in an article on page 5 of the December 2015 edition, issue 373 of Victoria Centre's SkyNews.

Here are some interesting things that we have learned from all of this probing and monitoring.

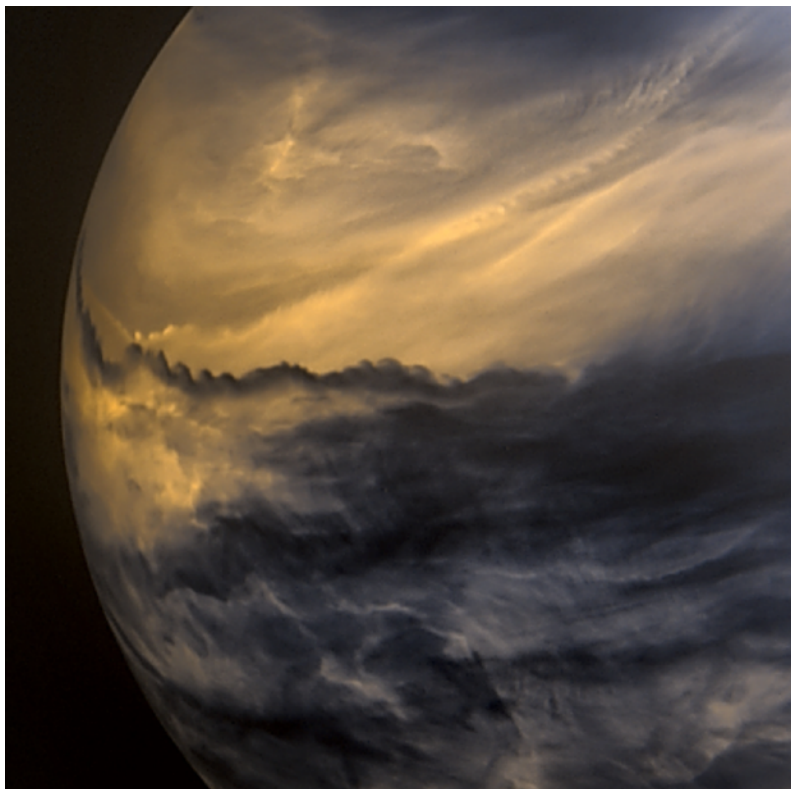
- Venus rotates in the opposite direction from all other planets at a paltry rate of 243 Earth days which is longer than it takes to revolve around the Sun (224.7 Earth days)
- The inclination of it's axis of rotation is only 3 degrees compared to 23.5 degrees on Earth so there are minimal seasonal affects.
- The atmospheric surface pressure on Venus is 92 times greater than that of Earth and the dense clouds reflect 75 % of the sunlight compared to 30 % on Earth. Earth actually absorbs more solar energy than Venus.
- The surface of Venus is smoother than the Earth and there is no evidence of plate tectonics. There are relatively few impact craters which suggests that the surface of Venus is relatively young being freshly covered with lava from volcanoes.
- The magnetic field is extremely weak.
- Winds at cloud top level reach 300 km/h and oppose the direction of rotation. It only takes four days for these clouds to circle Venus.

The cloud motions detected from the Venus Express and Akatsuki are being compared to predictions from global atmospheric models. These models are then being tweaked to obtain closer agreement with the observations. In that way we may better understand what drives the Venusian atmosphere today and how it may have evolved over time. This also has the potential to help us to avoid a runaway greenhouse affect on Earth. Considering the cautionary tail that Venus offers I am concerned that NASA and ESA do not have any future missions to Venus scheduled. The Indian and Russian space agencies however have some plans on the drawing boards.

In the meantime you could become a participant in the Akatsuki mission! French amateur "astro imager" [Damia Bouic](#) obtained image data from the [Akatsuki Archives](#) and developed the beautiful Venusian Cloudscapes on the right. An explanation and more images can be found at [this web site](#). The May Sky & Telescope p.28 describes how you can access NASA image data as well. All you need is free image software like [GIMP](#), the internet and spare time. You too could be on the leading edge of exploring our nearest neighbour!



GLOBAL VIEW OF VENUS IN ULTRAVIOLET FROM AKATSUKI
[JAXA / ISAS / DARTS / Damia Bouic](#)



VENUS NOCTURNAL SIDE IN INFRARED FROM AKATSUKI
[JAXA / ISAS / DARTS / Damia Bouic](#)

Astronomy Day Presentations on Saturday April 21st 2018 Program at Newcombe Conference Hall, Royal BC Museum

11:00 AM

Speaker: **Dr. Samantha Lawler**, NRC Herzberg Astronomy & Astrophysics Research Centre

Title: **Planet 9 or Planet Nein? Discoveries in the Distant Solar System**

Abstract:

To date, over 3,000 small icy worlds have been discovered in the Kuiper Belt. By carefully studying their orbits, we can reconstruct the history of planet formation and migration in our Solar System. We can also use Kuiper Belt orbits to learn about the most distant reaches of the Solar System. I'll talk about results from our recent Kuiper Belt survey using the Canada-France-Hawaii Telescope, and what it tells us about whether there is likely to be an undiscovered giant planet lurking on the edge of the Solar System.

Noon

Knowledge Network Space Suite I

1:00 PM

Speaker: **Dr. Patrick Côté**, NRC Herzberg Astronomy & Astrophysics Research Centre

Title: **CASTOR: A Flagship Canadian Space Telescope**

Abstract:

Since 2012, the Canadian Space Agency has been developing a mission concept for a Canadian-led, wide-field, imaging space telescope: the Cosmological Advanced Survey Telescope for Optical and uv Research (CASTOR). CASTOR is a 1m telescope that would provide ultra-deep, panoramic images at optical and ultraviolet wavelengths. In this talk, I describe the history and revolutionary design of CASTOR, its performance compared to the famed Hubble Space Telescope, and its vast potential for scientific discovery.

2:00 PM

Knowledge Network Space Suite II

3:00 PM

Knowledge Network Space Suite III

Evening Presentation at the DAO Centre of the Universe Auditorium

8:00PM

Speaker: **Daniel Posey**, RASC

Title: **Gateway to the Stars: Science, Civic Identity, and Tourism at the Dominion Astrophysical Observatory (DAO), Victoria B.C. 1903-1941**

Abstract:

The Canadian astrophysics program rapidly developed between 1903 and 1914, leading to the wartime construction of what was hoped to be the world's largest research telescope. Following its announcement the Victoria observatory quickly developed into a widely visited tourism destination, operating an extensive public outreach program. Throughout the 1920s Dominion Astrophysical Observatory staff produced several discoveries on the forefront of astrophysics, further boosting the institution's public image.

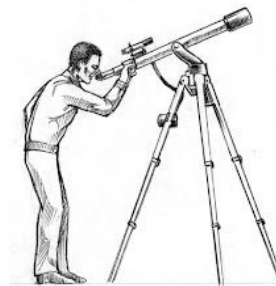
RASC Victoria Centre Council 2017 / 2018

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Astro Cafe	John McDonald	
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FDAO Liaison	Laurie Roche	
UVic Liaison	Alex Schmid	
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	Li-Anne Skibo	
	Dan Posey	

Online Resources

Magazines

[SkyNews](#) Our National RASC Newsletter
[Sky & Telescope](#) Magazine
[Astronomy](#) Magazine
[Astronomy Now](#) Astronomy in the UK
[Amateur Astronomy](#) Magazine
[Astrophotography](#) Magazine



Borrowing Telescopes

The centre has telescopes for new and seasoned observers that members can use. Contact Sid Sidhu

from the email list above.