

# RASC SUDBURY CENTRE

Club Website

[www.sudburyastronomyclub.com](http://www.sudburyastronomyclub.com)



Fri October 2, 2020

Time 7:00 pm

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SUDBURY  
CENTRE

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## Sudbury RASC Meeting Agenda Oct 2, 2020 Featuring RASC Executive Director Phil Groff, Ph.D.

1. Welcome  
**Sudbury RASC President – Alan Ward**
2. Why Sudbury is a Great Place for Astronomy  
**Stargazer Steve & Alan Ward will feature major events & projects by our club and it's members over the years**
3. Break (10 min)
4. A Welcome from the RASC National Office  
**“Everything you always wanted to know about RASC but were afraid to ask...”**  
**Phill Groff would like to use this opportunity to get to know us all and give some updates from the National Office and answer any questions we may about RASC.**
5. What's Up Doc? – Upcoming Observing Events  
**Once In a Lifetime Events will be Emphasized**
6. Closing Comments/News Etc.  
**An Open Forum for what you would like to share**



Hmmm...  
If I knew the Earthlings  
were going to destroy it  
themselves I never  
would have bought the Illudium  
Q-36 Space Modulator!

Photos from some of our members

10 inch Meade lx 200  
eyepiece projection  
Canon 6da Astro mod-  
ified  
5 x 15 sec exp 3200  
iso stacked with Regis  
tax and winjupos

Both Jupiter and Mars  
photos taken by  
Robert Pothier  
Sept 19, 2020



From Physics.Org September 29, 2020

To see the full article, click here <https://phys.org/news/2020-09-alignment-plane-solar.html>

A study of comet motions indicates that the solar system has a second alignment plane. Analytical investigation of the orbits of long-period comets shows that the aphelia of the comets, the point where they are farthest from the Sun, tend to fall close to either the well-known ecliptic plane where the planets reside or a newly discovered "empty ecliptic." This has important implications for models of how comets originally formed in the solar system.

In the solar system, the planets and most other bodies move in roughly the same orbital plane, known as the ecliptic, but there are exceptions such as comets. Comets, especially long-period comets taking tens-of-thousands of years to complete each orbit, are not confined to the area near the ecliptic; they are seen coming and going in various directions.

Models of solar system formation suggest that even long-period comets originally formed near the ecliptic and were later scattered into the orbits observed today through gravitational interactions, most notably with the gas giant planets. But even with planetary scattering, the comet's aphelion, the point where it is farthest from the Sun, should remain near the ecliptic. Other external forces are needed to explain the observed distribution.

The solar system does not exist in isolation; the gravitational field of the Milky Way galaxy in which the solar system resides also exerts a small but non-negligible influence. Arika Higuchi, an assistant professor at the University of Occupational and Environmental Health in Japan and previously a member of the NAOJ RISE Project, studied the effects of the galactic gravity on long-period comets through analytical investigation of the equations governing orbital motion.

She showed that when the galactic gravity is taken into account, the aphelia of long-period comets tend to collect around two planes. First the well-known ecliptic, but also a second "empty ecliptic." The ecliptic is inclined with respect to the disk of the Milky Way by about 60 degrees. The empty ecliptic is also inclined by 60 degrees, but in the opposite direction. Higuchi calls this the "empty ecliptic" based on mathematical nomenclature and because initially it contains no objects, only later being populated with scattered comets.

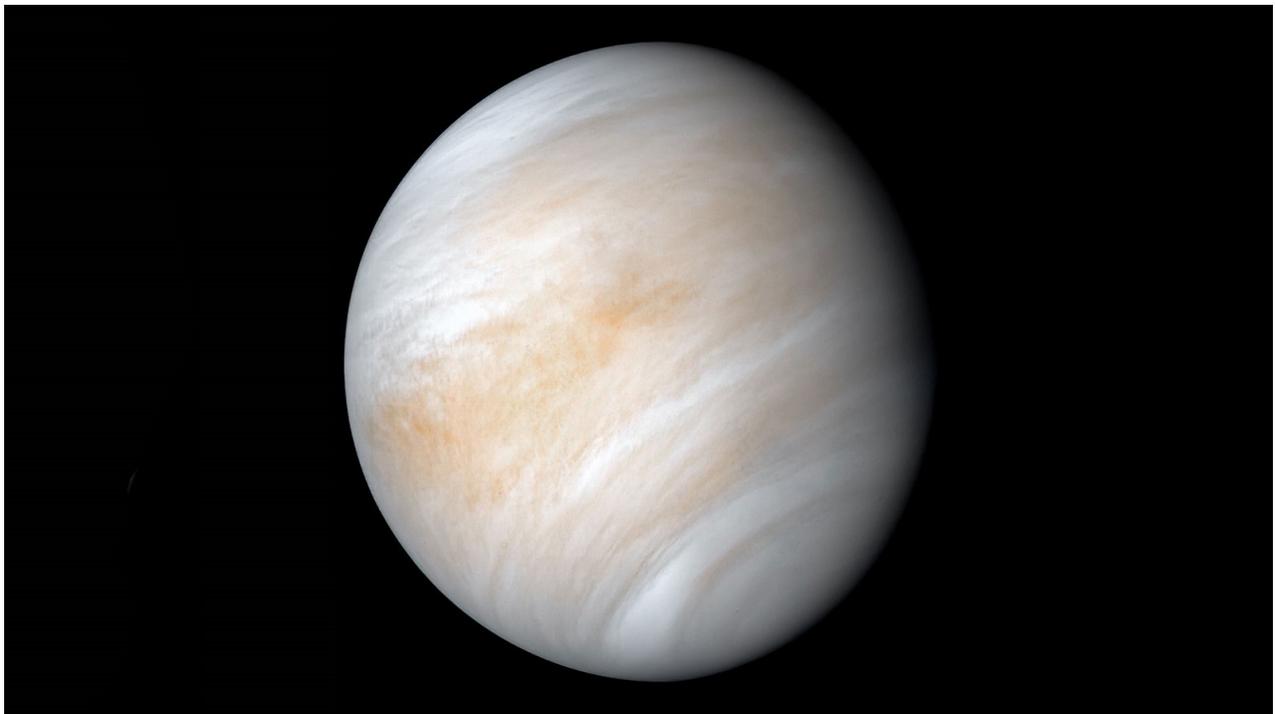
Higuchi confirmed her predictions by cross-checking with numerical computations carried out in part on the PC Cluster at the Center for Computational Astrophysics of NAOJ. Comparing the analytical and computational results to the data for long-period comets listed in NASA's JPL Small Body Database showed that the distribution has two peaks, near the ecliptic and empty ecliptic as predicted. This is a strong indication that the formation models are correct and long-period comets formed on the ecliptic. However, Higuchi cautions, "The sharp peaks are not exactly at the ecliptic or empty ecliptic planes, but near them. An investigation of the distribution of observed small bodies has to include many factors. Detailed examination of the distribution of long-period comets will be our future work. The all-sky survey project known as the Legacy Survey of Space and Time (LSST) will provide valuable information for this study."

**More information:** Arika Higuchi. Anisotropy of Long-period Comets Explained by Their Formation Process, *The Astronomical Journal* (2020). DOI: [10.3847/1538-3881/aba94d](https://doi.org/10.3847/1538-3881/aba94d)

**Journal information:** [\*Astronomical Journal\*](#)

The Mercury-bound BepiColombo spacecraft will fly by Venus on October 15th, and the mission is asking amateurs for their help.

Following article from *Sky & Telescope*, October 1, 2020 by Monica Young



Continued on next page

BepiColombo, a joint mission of the European and Japanese space agencies, is headed for Mercury, due to arrive at the baked planet in late 2025. But Mercury isn't the only planet it will observe.

[The spacecraft will pass by Venus twice](#), first on October 15th and then again on August 11, 2021, using the planet's gravity to boost its journey into the inner part of the solar system. The flybys present the perfect opportunity to observe our intriguing sister planet in conjunction not only with Japan's Akatsuki spacecraft, in orbit since 2015, but also with Earth-based observers.

BepiColombo and Akatsuki will have similar views of Venus, seeing the planet half in daylight and half in night. Earth, on the other hand, will see an almost entirely daylit Venus, providing complementary observations that provide context for what both spacecraft see.

At closest approach, BepiColombo will come about 11,000 kilometers (6,800 miles) from the Venuesian cloudtops. Akatsuki will be a bit farther out in its orbit, seeing the planet from some 324,000 km. Earth will be much farther still, 175 million km (or 1.17 astronomical units) away. Despite the distance, Earth-based observations are perfectly capable of spotting cloud features and even peering through to Venus's surface.

BepiColombo will have 11 instruments operating during the flyby (although not every instrument will be looking down at the planet), and the mission will be coordinating with Akatsuki to take ultraviolet and infrared images. Amateurs can help by observing at ultraviolet wavelengths, imaging the upper cloud layer on the dayside, as well as near-infrared wavelengths (800 nanometers or longer), which penetrate to intermediate cloud layers.

"Amateurs today are able to observe all the interesting altitudes in the Venus atmosphere," says Itziar Garate Lopez (University of the Basque Country, Spain). "The scientific potential for these observations is high."

"BepiColombo will be able to observe fine details, but from the Earth we can have the global context at that very moment and thus investigate whether large and small-scale structures are related to each other," she adds. "We are always on the lookout for new structures or waves at any level of the atmosphere."

As an example, amateur observations combined with Akatsuki images were instrumental in detecting shifting patterns in Venus's middle cloud layers, a result Javier Peralta (then at JAXA) and colleagues published in the [Geophysical Research Letters](#) in 2019.

If you're interested in taking part in the campaign, the missions are looking for observations a couple days before and after the flyby as well as during the flyby itself, currently set for 3:57 UT on October 15th. **Visit the [Planetary Virtual Observatory & Laboratory](http://pvol2.ehu.es/bc/Venus/) at <http://pvol2.ehu.es/bc/Venus/>**

**to find more information on how to participate.**

If any of our members would like to order a 2021 calendar, please go to [www.RASC.ca](http://www.RASC.ca) and place an order in the e-Store. The 2021 Calendar is priced at \$17.95 Cdn. With taxes and shipping, the price will be \$28.48

Tonight, October 1 sees the Harvest Moon Rise at 19:27 and on Friday night, you will be able to see the Moon and Mars withing the same binocular field-of-view

NASA commercial cargo provider Northrop Grumman is targeting Thursday, Oct. 1, for the launch of its 14th resupply mission to the [International Space Station](#). The five-minute launch window opens at 9:38 p.m. EDT.

Loaded with nearly 8,000 pounds of research, crew supplies, and hardware, Northrop Grumman's Cygnus cargo spacecraft will launch on the company's Antares rocket from Virginia Space's Mid-Atlantic Regional Spaceport at [NASA's Wallops Flight Facility](#) in Virginia.

Program Name	Provider	Location	NOTES
<b>Canada</b>			
Astro at Home	Discover the Universe	astro at home discover the universe	Modified teacher training for COVID homeschool
various	Exploring by the Seat of Your Pants	<a href="https://www.youtube.com/playlist?">https://www.youtube.com/playlist?</a>	remote learning provider - lots of videos on space ex-
RASC Toronto Centre	Recordings of talks	<a href="https://rascto.ca/content/watch-our-videos">https://rascto.ca/content/watch-our-videos</a>	Content for science-engaged (i.e. not aimed at K-12)/Live
RASC National	Educational videos	<a href="https://www.youtube.com/user/RASCANADA">https://www.youtube.com/user/RASCANADA</a>	Lots of content
Astronomy By the Bay	Astronomy videos/ views through telescopes	<a href="https://www.youtube.com/channel/UCAEHfOWyL-">https://www.youtube.com/channel/UCAEHfOWyL-</a>	Supported by RASC National
York Universe Radio Program	York University/ Observatory	<a href="http://www.astronomy.fm/">http://www.astronomy.fm/</a>	Weird website, but the show is still going on Mondays at 9
		<a href="http://yorkuniverse.ca">yorkuniverse.ca</a>	Doesn't seem to be up to date.
Cosmos From Your Couch	Dunlap Institute	<a href="http://www.dunlap.utoronto.ca/">http://www.dunlap.utoronto.ca/</a>	General audience talks
<b>Europe</b>			
Virtual Telescope	Italian enthusiasts	<a href="https://www.virtualtelescope.eu/">https://www.virtualtelescope.eu/</a>	
<b>US</b>			
Solar Observing	South Carolina State Museum	<a href="https://livestream.com/boeingobservatory/solar?">https://livestream.com/boeingobservatory/solar?</a>	From a growing list at Dome Dialogues. Some just
World Wide Telescope	American Astronomical Society	<a href="http://www.worldwidetelescope.org">http://www.worldwidetelescope.org</a>	
Astronomical Society of the Pacific Educational Re-	ASP	<a href="https://astrosociety.org/education-outreach/">https://astrosociety.org/education-outreach/</a>	Usually very strong resources.
<b>South America</b>			
ESO webcams	European Southern Observatory	<a href="https://www.eso.org/public/outreach/webcams/">https://www.eso.org/public/outreach/webcams/</a>	

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# STARGAZER STEVE

WHO IS STARGAZER STEVE!!  
and What does he do?

**Steve Dodson** is a fellow amateur astronomer, who as a 2nd grader saved his allowance for a Telescope, and made his first 6-inch scope in grade 8.

As **Stargazer Steve**, he makes Telescopes that are designed to give more observing satisfaction to beginners and experts alike, by focusing on design for performance.

In 1981, already an amateur astronomer with decades of observing experience, Steve built the largest mobile Telescope in Canada, and brought it to the Star Party that launched the Sudbury Astronomy Club.

In the 1990's Steve pioneered high-performance low-cost Reflecting Telescope Kits.

Steve has participated in the building of over 4000 Telescopes, including solo projects and activities with children, Astronomy Clubs and people of all ages.

The International Astronomical Union has named **Asteroid #13822** "**Stevedodson**".

Over **2000 Stargazer Steve Telescopes** have been shipped throughout Canada, the US, and around the World.

More Info at <http://stargazer.isys.ca>  
<http://neo.jpl.nasa.gov/orbits/> (Put 13822 in the blue box)

