

## Categories

1. [GREETINGS](#)
2. [MEETING HIGHLIGHTS](#)
3. [UPCOMING CLUB EVENTS](#)
4. [WEB NEWS](#)
5. [COOL PICS](#)
6. [FEATURED ARTICLES](#)
7. [BUY AND SELL](#)
8. [ASK AN EXPERT](#)
9. [KIDS KORNER](#)
10. [RASC NEWS](#)
11. [THE SKY THIS MONTH](#)

## Quick Links

[ABOUT THE CLUB](#)

[NEWSLETTER ARCHIVES](#)

[MONTHLY MEETINGS](#)

[RECEIVE ONLINE  
NEWSLETTER](#)

[NEWSLETTER  
SUBMISSIONS AND  
SUGGESTIONS](#)

## Greetings!

Welcome everyone to the Cowichan Valley StarFinders Astronomy club's "Clear Skies" monthly newsletter. In addition to meeting highlights, informative articles by fellow members, news and facts about the club; the newsletter lists upcoming events, web news, the sky this month, cool pics and provides an opportunity to ask an expert. Clear Skies can be mailed to members, by request. It is also available on the club website, in PDF format, for those wishing to read it online or download their own copy to print. An e-mail can also be sent to members notify them when Clear Skies has been posted to the website. To obtain Clear Skies by e-mail go to Quick Links and click on Receive Online Newsletter.

It is with great honour that I carry on the torch as editor. I could never fill the shoes of my predecessors, nor would I want to, each and every editor brings his/her uniqueness to the newsletter and I hope you will find my approach refreshing to say the least.

I've added a bit of color to the newsletter and made a few changes:

- 1) I wanted to personalize our newsletter, after thinking long and hard and trying to come up with some name that would reflect our club I thought it would be fitting to pay tribute to our founder (Frank Ogonoski). So Frank I hope you don't mind that I used your favourite salutation. I think its fitting because it reflects what all amateur astronomers want (aside from a new telescope) which is "Clear Skies" of course.
- 2) navigation – click on any of the links on left hand side to quickly navigate to the category which perks your interest. Click on "back" at the end of each category to return to the links.
- 3) a set of "quick links" have been added to provide quick access to club information. Which can also be found on the CVSF website [Cowichan Valley Star Finders](#).
- 4) I have made it even easier for you to send in your newsletter submissions and suggestions by just clicking on the "Newsletter Submissions and Suggestions" link in the Quick Link section.

Brian Robillard (our official Webmaster) and others have been working hard and have done a great job in developing a new website to tie CVSF members together. We are all busy folks and sometimes getting to the meetings is tough. This newsletter is the next step toward keeping you up to date on what's happening at the club and who knows we may see you at the next meeting.

The only downside of being the editor of Clear Skies is that I've already read it! I used to look forward to Frank's, Uli's and then Norm's publications. So if you can send in your submissions of stories and updates I would be grateful, because then I would at least have something new to read.

Before signing off, I would like to express my gratitude to the folks who have made submissions to this (my first) club newsletter. Many thanks.

*Freda Eckstein*

"Shoot for the moon. Even if you miss, you'll land among the stars". ~Les Brown

[back](#)

## Meeting Highlights

We meet the first Tuesday of each month (except for July and August) at Serious Coffee in Duncan to share ideas and information, go on field trips to interesting places and to enjoy the social side of our hobby. Did you know the club has telescopes which members may borrow? Come out to the meetings to find out more about these and other interesting club facts.

The next meeting is scheduled for **June 5<sup>th</sup> from 6:30 – 8:00 at Serious Coffee in Duncan**. This meeting will focus on planning for the Island Star Party (ISP) so please come out and show your support and sign up for the activities planned for this years party. Remember "more hands make less work".

In May, we held our annual general meeting (AGM). The society act dictates that we need to post the AGM minutes. Norm Willey did a fine job at scribing the minutes.

by Norm Willey, President CVSF

May 5, 2007

MINUTES for COWICHAN VALLEY STARFINDERS ASTRONOMY SOCIETY  
ANNUAL GENERAL MEETING - May 1, 2007, Duncan, BC

### FINANCES

Opening balance on June 1, 2006	\$1372.5
Closing balance on May 1, 2007	\$1361.36
Total Disbursements	\$1873.48
Total Receipts	\$1981.00
Net profit	\$102.17

### BREAKDOWN OF INCOME AND EXPENSES

Island Star Party:	
Income	\$1541.00
Costs	\$889.55
Net	\$651.45

General Costs:	
Service charges	\$ 43.45
Society registration	\$ 25.00
Sandwich board	\$265.55
Calendar purchase	\$135.00
Photocopier	\$316.92
Cowichan Centre Rental	\$125.83
Flowers (Uli's funeral)	\$ 71.18
Subtotal	\$983.93

General Income:	
Dues (12 members)	\$240.00
Calendar sales	\$150.00
Donations	\$ 50.00
Subtotal	\$440.00

### REPORT OF THE DIRECTORS

"SOMEWHERE,  
SOMETHING  
INCREDIBLE IS  
WAITING TO BE  
KNOWN."  
DR. CARL SAGAN

"ASTRONOMY  
COMPELS THE SOUL  
TO LOOK UPWARDS  
AND LEADS US FROM  
THIS WORLD TO  
ANOTHER" - PLATO

For All Your Telescopes  
Needs Contact:

Island Eyepiece and  
Telescope Ltd.

Canada's Source for  
Astronomy since 1995

[Island Eyepiece and  
Telescope Ltd](#)

Book your holidays  
for July 20th & 21st  
and bring the family  
to a weekend of  
camping and  
stargazing at the top  
of the Malahat.

CVSF is hosting the  
12<sup>th</sup> annual The  
Island Star Party

The major event of the 2006-2007 year was the Island Star Party (ISP). Once again this event was held at the Victoria Fish & Game site, on Holker Rd. (Malahat). There were 78 paying attendees, down from 143 in the previous year. A limited amount of advertising was likely the reason for the difference, and is an issue that will need to be addressed in the planning for the 2007 ISP. Despite the reduced attendance the 2006 ISP seemed to go well. Even the weather co-operated!

Sadly, we lost one of our most active members, Uli Steinerstauch, to pancreatic cancer in February. Uli was the newsletter editor for two years, a job he poured much enthusiasm and humour into. We sent a large bouquet of flowers to his funeral, which was well attended by CVSF members. The newsletter job was temporarily picked up by the president. Freda Gale has volunteered to be the newsletter editor for the coming year.

With a declining membership base (12 paying members as of December, 2006) I was quite concerned that the costs of renting a room from the Cowichan Centre would exceed our income from dues. To eliminate this cost I arranged with Serious Coffee to have our monthly meetings in the side room at their Boys Road café. This also meant that Phyllis did not need to make coffee and bring it to the meetings! The downside to this venue, however, is the need to start meetings at 6:30pm and end at 8. The early start is difficult for some members to meet, and the 8pm closing time of Serious Coffee restricts how long a meeting can run. At this time Moe Raven has agreed to search out other venues to fit our requirements.

On Astronomy Day (Saturday April 21), Robert Deane, Moe Raven and myself set up a display at the Farm Market beside Serious Coffee. My telescope was set up for viewing the sun, though it was barely discernible through the cloud haze. We provided quite a few pamphlets on the ISP and the CVSF to people shopping at the Market. I was quite pleased at the response, and feel that we targeted the right audience to promote our club and star party. As we are relatively unknown in the Cowichan Valley, any such displays can only help to promote our club and encourage new membership. Another such display is scheduled for Saturday July 14, one week before the ISP.

Looking to the future year, I would like to promote two initiatives. The first is to implement a more detailed accounting procedure. Our past methods of accounting have been somewhat low key and reflected the size and nature of the club. However, for the 2007 ISP, all paying participants will become registered members of the CVSF. This will effectively balloon our membership. As we will be reporting to a larger membership, I feel it is important that we have a more greater control on financial reporting. To this end, the ISP accounting will be done separately and reported as a PDF file on our web page. It will also be shown in less detail as income and expenses for the CVSF, as the latter is an umbrella organization for the ISP.

The second initiative I wish to see during the coming year, is a spreading out of jobs for the club. We have had a history of one person (the president!) being responsible for too many aspects of the club. This has led to a burn-out factor and is not healthy for the club in general. The discussion at this year's AGM recognized the need to spread out the responsibility, a very encouraging sign for the continued viability of the CVSF.

Directors for the 2007-08 year will be: President Norm Willey, Vice President Ed Maxfield, Treasurer Phyllis Scott, Newsletter Editor Freda Eckstein, Web Master Brian Robilliard. It is through the efforts of these directors, and actively participating members, that our club continues to thrive!

[back](#)

## Upcoming Club Events



June 5th - Planning meeting for the Island Star Party from 6:30 – 8:00 at Serious Coffee in Duncan. 4

In July of each year the CVSF hosts the Island Star Party. This year will be our 12th Annual Island Star Party July 20th & 21st, 2007 held at the Victoria Fish and Game club (at the top of the Malahat). It's a fun weekend open the public with participants from all over North America attending.

Included are lectures, prizes, activities for the young, and many telescopes for everyone to enjoy the night sky. See our website [Cowichan Valley Star Finders](#) for more information.

[back](#)

## Web News

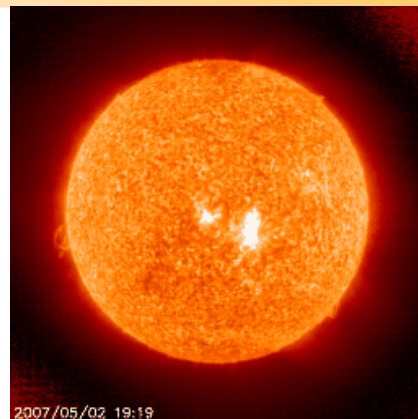
Here's some cool links submitted by our webmaster Brian Robilliard [Editor comment]

It's cloudy and gloomy outside and you have not seen the Sun in days? Well here's a way to get a small fix of solar observing. Just link into SOHO, the solar observing satellite and you can see real time images of the sun.

[Solar and Heliospheric Observatory Homepage](#)

Or for something really cool, or should I say HOT, take a look at this 3D view of a solar eruption.

[http://www.nasa.gov/centers/goddard/mpeg/97986main\\_cmealt\\_640x480.mpeg](http://www.nasa.gov/centers/goddard/mpeg/97986main_cmealt_640x480.mpeg)



On Feb 28, New Horizons came within 1.4 million miles of Jupiter in a gravity assist maneuver designed to trim three years off its travel time to Pluto. Norm Willey passes along this great site[Editor comment]

An interesting review of the New Horizons spacecraft fly passed of Jupiter:

[NASA - Fantastic Flyby of Jupiter](#)

[back](#)

## Cool Pics

Want to show off your latest pics? Well here's your chance; email the editor at [My Cool Pics](#) and we will try to post them in the next edition of "Clear Skies"

[back](#)

## Featured Articles

**New planet could have life** -Copyright 2007 by United Press International. All Rights Reserved.

SANTIAGO, Chile, April 25 (UPI) -- Astronomers in Chile have discovered a planet they described as the "most Earth-like planet outside our solar system."

The UK Express reported that planet Gliese 581 C could support life because its temperature is similar to Earth's and it could have liquid water.

"Because of its temperature and relative proximity, this planet will most probably be a very important target of future space missions dedicated to the search for extra-terrestrial life." Xavier Delfosse of France's Grenoble University told the

Express.

"On the treasure map of the universe one would be tempted to mark this planet with an X."

Swiss, French and Portuguese astronomers found the Gliese 581 C while measuring wavelengths of light at the European Southern Observatory in Chile.

Gliese 581 C is 20.5 light-years from Earth.

[back](#)

**Space telescope makes startling discovery** - Copyright 2007 by United Press International. All Rights Reserved.

PARIS, May 2 (UPI) -- The Hubble Space Telescope has provided evidence representing a major upset for conventional theories that propose a single period for star birth.

The European Space Agency said the telescope, observing globular cluster NGC 2808, has shown three separate generations of stars formed early in the cluster's life.

Of the approximately 150 known globular clusters in our galaxy, NGC 2808 is one of the largest, containing more than 1 million stars held together by gravity.

"The generally accepted view is that all of its stars originated at the same time and place, from the same material and have co-evolved for billions of years," said Luigi Bedin of the European Southern Observatory. "This is the cornerstone on which much of the study of stellar populations has been built."

"We had never imagined that anything like this could happen," said Giampaolo Piotto of the University of Padua, leader of the team that made the discovery.

He said the finding has deep cosmological implications.

The observations are to be detailed in the May 20 issue of the Astrophysical Journal Letters. Hubble is a joint project of the ESA and the National Aeronautics and Space Administration.

[back](#)

**'Twilight zone' discovered around clouds**- Copyright 2007 by United Press International. All Rights Reserved.

GREENBELT, Md., May 4 (UPI) -- U.S. and Israeli researchers say there is a "twilight zone" between clouds and the sun made of particles that are neither wet nor dry.

Scientists from Israel's Weizmann Institute and NASA's Goddard Space Flight Center in Greenbelt, Md., say up to 60 percent of the atmosphere labeled as cloud-free in satellite observations is actually filled with this twilight zone of in-between particles.

"With the highly sensitive Earth-observing instruments NASA has used since 2000, we can distinguish aerosols and clouds in greater detail than ever before," said Goddard's Lorraine Remer in a release. "But the area around clouds has given us trouble. The instruments detected something there, but it didn't match our understanding of what a cloud or an aerosol looked like."

Remer said it appears to be a "transitional zone where clouds are beginning to form or are dying away, and where humidity causes dry particles to absorb water and get bigger."

The researchers say this twilight zone could lead climate scientists to recalculate their best estimates of how Earth's atmosphere holds and reflects solar energy.

## Chandra Sees the Brightest Supernova

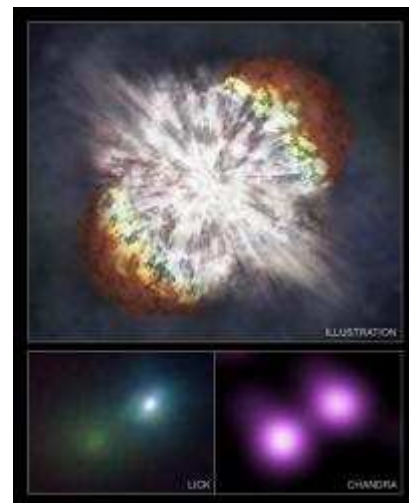
 - Original Source: Chandra News Release May 7/07

NASA's Chandra X-Ray observatory might have observed a brand new kind of supernova, or maybe it's just an unusually bright supernova. Whatever the case, the explosion of SN 2006gy seems to be the brightest supernova ever observed, flaring with 100 times the energy of a typical exploded star.

The team that discovered SN 2006gy think that the original star might have contained 150 times the mass of our Sun; only the first generation of stars that formed after the Big Bang were thought to be this massive. It was the Chandra X-Ray observations that helped distinguish the supernova as originating from a massive star, and not the Type 1A associated with an exploding white dwarf star.

A supernova occurs when a massive star consumes its fuel, loses outward pressure, and collapses inward under its own gravity. But in the case of SN 2006gy, there might be an entirely new process going on here. The precursor star could have been so large that its core produces a large amount of gamma rays. The energy from this radiation is converted into particle and anti-particle pairs, and causes a drop in energy. Without this energy, the star collapses from its own gravity early and detonates as a supernova.

Even though SN 2006gy is the intrinsically brightest supernova ever seen, it exploded in galaxy NGC 1260, which is located about 240 million light-years away - so you need a powerful telescope to see it. The closest star that's in the same category is Eta Carinae, a massive star located only 7500 light-years away. No telescope will be necessary when it explodes.

[back](#)

## Mercury Is Soft In the Middle

 - Original Source: NSF News Release May 3/07

A team of astronomers has discovered that tiny Mercury has a molten core, just like our own planet. The discovery was made using three ground-based radio observatories that bounced radio waves off the planet, and then analyzed the return signals.

Before this research, scientists were divided about the structure of Mercury. Most models predicted that it has an iron-rich core, but it wasn't known if it had completely cooled, or was still liquid inside. Trace quantities of sulfur and other chemicals could have mixed in with the planet while it was forming, and this kept it from completely solidifying over time.

The astronomers first beamed a series of radio waves at the surface of Mercury, and then measured them as they bounced off the surface and returned to Earth. The returned signals were analyzed by a trio of radio telescopes: the Arecibo Observatory in Puerto Rico, NSF's Robert C. Byrd Green Bank Telescope, and the NASA/JPL 70-meter antenna at Goldstone, California.

They were able to detect a wobbling of the signal that was double what you would expect from a planet with a solid core, but exactly the right amount for a planet with a liquid core. Their research is the cover story of the May 4, 2007 edition of the Journal Science.

[back](#)

### The World Loses a NASA Legend – May 4/07

The only astronaut to fly in the Mercury, Gemini and Apollo programs, Wally Schirra, died Thursday of a heart attack at Scripps Green Hospital in La Jolla, CA. He was 84 years old. Schirra's NASA career began with his selection as one of the original seven Mercury astronauts in 1959 and spans the period from America's first tentative steps into space to the missions to the moon.



Flying on the fifth Mercury flight in 1962, Schirra orbited the Earth six times. In 1965, he commanded Gemini 6A, a flight with Tom Stafford that had the historic distinction of being the first rendezvous of two manned, maneuverable spacecraft. Gemini 6A and Gemini 7 flew in formation for five hours, as close as one foot to one another. He also commanded Apollo 7, the first manned Apollo flight. During that 11-day flight in Earth orbit in 1968, he and fellow crewmembers Walt Cunningham and Donn Eisele tested the Apollo systems and proved it was ready to take astronauts to the moon. "With the passing of Wally Schirra, we at NASA note with sorrow the loss of yet another of the pioneers of human spaceflight," NASA Administrator Michael Griffin said. "As a Mercury astronaut, Wally was of a member of the first group of astronauts to be selected, often referred to as the Original Seven."

Image Credit: NASA

[back](#)

### Science fiction may soon become science fact – May 11/07

Astronomers at NASA's Jet Propulsion Laboratory have recently concluded that the upcoming planet-finding mission, SIM PlanetQuest, would be able to detect an Earth-like planet around the star 40 Eridani, a planet familiar to "Star Trek" fans as "Vulcan." 40 Eridani, a triple-star system 16 light-years from Earth, includes a red-orange K dwarf star slightly smaller and cooler than our sun. Vulcan is thought to orbit that dwarf star, called 40 Eridani A.

When pondering the idea that SIM might be able to detect Vulcan, astronomer Dr. Angelle Tanner at Caltech had two questions: Can a planet form around 40 Eridani A? Can SIM detect such a planet?

She consulted a planetary theorist, Dr. Sean Raymond of the University of Colorado, Boulder. "Since the three members of the triple star system are so far away from each other [hundreds of astronomical units - the Earth-Sun distance], I see no reason why an Earth-mass planet would not be able to form around the primary star, 40 Eridani A," he said.

If Vulcan life were to exist on the planet, the orbit of the planet would have to lie in a sweet spot around the star where liquid water could be present on its surface.



**Trivia  
about  
Vulcan**

- Vulcan has a hot, dry climate.
- It is located 16 light-years from Earth.
- "Star Trek" creator Gene Roddenberry endorsed 40 Eridani as Vulcan's sun in a letter published in the July 1991 issue of Sky & Telescope magazine.

*(Sources: Sky & Telescope, StarTrek.com)*

Water is an essential ingredient for any organism to live long and prosper. For 40 Eridani A, this spot, or "habitable zone," is 0.6 astronomical units from the star. That means Vulcans would get to celebrate a birthday about every six months. 8

The SIM PlanetQuest instrument will be so accurate; it could measure the thickness of a nickel at a distance from Earth to the moon. Using a set of mathematical models based on Newton's Laws, Tanner was able to conclude that SIM would be able to definitively determine whether there is an Earth-mass planet orbiting in the habitable zone around 40 Eridani A, and could also determine its orbit.

This is quite an exciting prospect, since NASA's Terrestrial Planet Finder mission, planned for launch after SIM, would not only be able to take a rudimentary "picture" of the planet, but also could search for signatures of life such as methane and ozone.

When asked what life would be like on Vulcan, Tanner speculated that the inhabitants might be pale. "A K dwarf star emits its light at wavelengths which are a bit redder compared to those from the sun, so I wonder whether it's harder to get a tan there," she said.

The results of Tanner's simulations will be submitted for publication in the Publications of the Astronomical Society of the Pacific.

For more information about NASA's search for new worlds, visit the PlanetQuest Web site at <http://planetquest.jpl.nasa.gov>.

[back](#)

## **Astronomers Detect Shadow Of Water World In Front Of Nearby Star** – May 16/07

Science Daily — A team of European astronomers led by Michaël Gillon, a researcher from Liege University, has measured the transit of a Neptune-sized planet around another star. For the first time, the size and density of such a small extra-solar planet has been measured, showing that this planet is made up mainly of water.

The planet was discovered using data from the W. M. Keck Observatory in Mauna Kea, Hawaii.

The star GJ 436, a diminutive star (red dwarf) 30 light-years from the Sun, was known since 2004 to harbour a 22-Earth mass planet, orbiting 4 million kilometers from the star (0.03 Astronomical Units). Observations from the OFXB observatory in St-Luc, Switzerland, showed a periodic dimming of the star due to the passage of the planet in front of it. This event, called a transit, was subsequently confirmed with telescopes at the Wise Observatory in Israel, then precisely measured with the Euler telescope of Geneva University Observatory in Chile.

These measurements show that the planet has a diameter of about 50,000 km; four times that of the Earth. From the size and mass of the planet, the astronomers could infer that it is mainly composed of water. If the planet contained mostly hydrogen and helium – like Jupiter or Saturn – it would be much larger, and if it was made up of rock and iron like Earth, Mars and Venus, it would be much smaller. Michaël Gillon says: "This discovery is an important step towards the detection and study of Earth-like planets."

This water world can either be surrounded by a light envelope of hydrogen and helium, like Neptune and Uranus, or be entirely surrounded by water, like most of Jupiter's satellites. As the planet is close to its host star, its surface temperature is expected to be at least 300 C (600 F). The water in its atmosphere would therefore be in the form of steam. Inside, the water is crushed under intense pressure and adopts states unknown on Earth, except in physicist's laboratories. Says Frédéric Pont: "water has more than a dozen solid states, only one of which is our familiar ice. Under very high pressure, water turns into other solid states denser than both ice and liquid water, just as carbon transforms into diamond under extreme



pressures. Physicists call these exotic forms of water 'Ice VII' and 'Ice X'. If Earth's oceans were much deeper, there would be such exotic forms of solid water at the bottom." Inside GJ 436's planet, this strange ice is moreover heated to many hundred degrees.

The detection of such a « hot ice world » has important consequences. It shows for the first time that planets similar to the "ice giants" Uranus and Neptune in our own Solar System exist at close distances from their star (the planet of GJ436 orbits every 2.6 days). Many of the planets of similar mass detected around other stars by the astronomers may therefore also be composed mainly of water. Some of them will have cooler temperatures, allowing the water on the surface to be liquid. Such planets covered by a single huge ocean have been dubbed "ocean planets" by the specialists.

"The Corot satellite, which started operating at the beginning of this year, has among its main objectives to measure the size of planets like the one we just measured around GJ436, and even smaller. The Corot mission, to which astronomers from Geneva University are active participants, will allow a closer study of ocean planets and telluric planets like our own," says Didier Queloz.

Note: This story has been adapted from a news release issued by University of Liège.

[back](#)

## Buy and Sell

Here's your chance to clean out the closet and find a home for your slightly used treasures. Post your buy and sell items by emailing the [Editor](#) with your details.

[back](#)

## Ask an Expert

Have you been thumbing through the Astronomy or Sky and Telescope magazine and have some questions on the latest and greatest in astronomy gear? Or maybe you're narrowing down your search for just the right telescope and want to know the difference between Dobsonians, Schmidt-Cassegrains, Reflector and Refractors. Well wonder no more, email [Brian Robilliard](#) our resident expert to get the "inside scoop" on what's hot or not in astronomy gear.

Are you seeing double or unable to focus? Chances are you need to collimate your scope. Are you looking for a good eyepiece? Why do you need to know the focal length of your telescope's mirror and how do you determine the focal length? For answers to these and other telescope questions email [Ed Maxfield](#) our expert on telescope tips, hints and suggestions.

Are you new to astronomy? Want to know the how to find objects in the sky? Or just wondering what that bright object in the evening sky is? Have no fear; email [Byron Thompson](#) our Public Outreach Officer and resident expert on Astronomy 101 basics. Byron will be sure to point you in the right direction.

[back](#)

## Kids Korner

For the younger astronomers. We want your input on what you would like to see 10 happening at the club. Tell us a bit about yourself and why you love astronomy. Email the [Editor](#) with your submissions.

### The Oort Cloud - original source Lea Terry BellaOnline's Astronomy Editor

You've probably heard of comets--they're those balls of ice that circle around the Sun with a glowing tail streaming behind them. But do you know where they come from? For many centuries, even astronomers didn't know. Now, they know many comets come from a place called the Oort Cloud. While they still know little about this place, but they have answered a few questions:

Q: What is the Oort Cloud?

A: The Oort Cloud is a circular region that surrounds our solar system. Scientists think it has very dense center, or core. Most of the cloud's comets are in the core, and the rest are in the outside edges of the cloud. The comets found here are called long-period comets, meaning they take a long time to orbit the Sun. There are other kinds of comets, called short-period comets, and many of them come from a place called the Kuiper Belt.

Q: How far away is the Oort Cloud?

A: The Oort Cloud is nearly 30 trillion kilometers (about 18.75 trillion miles) away from the Sun.

Q: How do we know about the Oort Cloud?

A: A Dutch astronomer named Jan Oort predicted the existence of the Oort Cloud. He noticed that comets seemed to come from many different directions. This, he believed, proved that comets came from something that surrounded our Solar System. He used the orbits of 19 comets to determine where they probably came from, and additional information gathered by scientists has confirmed Oort's theory.

Q: How many comets are in the Oort Cloud?

A: Scientists think there are about 6 trillion comets in the Oort Cloud. The total mass of these comets is believed to be about 40 times the mass of Earth.

Q: How did the Oort Cloud form?

A: Scientists aren't sure. They don't think the comets found there were formed there, though. They believe the comets were formed at many different times, and in many different places, but were thrown into the cloud by the huge gravitational field of planets like Jupiter, Saturn, Uranus, and Neptune.

[back](#)

## RASC News

If you're wanting to know what the RASCals are up then tune in to this column in the next newsletter. Ed who has dual priviledges and also attends the monthly meetings of the Victoria Centre - Royal Astronomical Society has kindly offered to bring us up to date on the latest from the RASC.

[back](#)

## The Sky This Month

*By Bryon Thompson*

### Observing Site

Duncan, 48.783°N, 123.700°W

June saves some of the best for last: three planets converge in the sky to form a planetary trio, a dazzler for sky gazers late in the month. A trio is a conjunction so close that the three planets fit inside a circle no more than five degrees across. Venus (magnitude-3.9), Mercury (magnitude-0.2), and Saturn (magnitude 0.2) are all readily visible within the prescribed circle, low in the west-northwestern sky, for

about an hour after sunset from the 23rd until the 29th. Their relative positions, which change from night to night, should be fascinating to watch.

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### Meteor Showers

June Bootids - Best Date: June 27 Constellation to look towards: Bootes

### Lunar Facts – courtesy of David Harper

Once in a Blue Moon ... is a common way of saying not very often, but what exactly is a Blue Moon? According to the popular definition, it is the second Full Moon to occur in a single calendar month.

The average interval between Full Moons is about 29.5 days, whilst the length of an average month is roughly 30.5 days. This makes it very unlikely that any given month will contain two Full Moons, though it does sometimes happen.

On average, there will be 41 months that have two Full Moons in every century, so you could say that once in a Blue Moon actually means once every two-and-a-half years. The blue moon will occur in May, June or July, depending on your time zone. Our Blue Moon occurs on June 30th.

### 01 01h Full Moon.

- 01 11h Moon is 6° south of Jupiter.
- 02 10h Mercury is at greatest eastern elongation (23°).
- 05 23h Jupiter is at opposition.
- 08 12h Moon - Last Quarter.
- 09 02h Venus is at greatest eastern elongation (45°)
- 10 18h Moon is 5° north of Mars.
  
- 12 17h Moon is at perigee.
- 15 03h New Moon.
- 16 09h Moon is 6° north of Mercury.
- 17 04h Earliest sunrise at 50° north latitude.
- 18 14h Venus is occulted by the Moon. (Visible from the U.K.)
- 19 07h Pluto is at opposition.

### 21 18h Summer solstice.

- 22 13h Moon - First Quarter.
- 24 14h Moon is at apogee.
- 25 20h Latest sunset at 50° north latitude.
- 28 12h Moon is 6° south of Jupiter.
- 28 19h Mercury is at inferior conjunction.

### 30 14h Blue Moon (2<sup>nd</sup> full moon).

Did you know February 1865 is the only month in recorded history not to have a full moon?

**Sky Chart** – I printed the chart for June 15<sup>th</sup> at 10:00 pm. After looking at the June 1 and June 30 charts there is not too much difference so I figured I would “take the middle road”. In order to use the sky chart properly, you have to imagine holding the chart above your head to use it, and then the directions are correct.

[back](#)

