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## 1. Greetings!

Welcome to the Cowichan Valley StarFinders Astronomy club's "Clear Skies" monthly newsletter.

Our annual Summer BBQ and AGM was on June 23<sup>rd</sup> at the home of Brian and Joanne Robilliard. The event was well attended and many thanks goes out the the Robilliards for their fine hospitality. Nancy K did a fine job recording the evening events. For a detail read of the June 23<sup>rd</sup> Social please refer to the Social Highlights section of this newsletter.

The Outreach officer: this position is **still open to any member wishing to take on this important task. The Public Outreach Officer** - Sets up sidewalk astronomy sessions with the public, Helps in promoting the ISP and, maintains the "Reach For the Stars" school telescope loaner program. Bryon Thompson (who was the club's Outreach Officer for many years) has materials in place for the school loaner program and contacts for media and farmer markets. It would be nice to fill this executive position as a big part of our mandate is to do public outreach . If you are at all interested and would like to know how much time this may entail; then contact Bryon Thompson at [bryonjt@shaw.ca](mailto:bryonjt@shaw.ca).

### Message from theThrone (President)

And no Moe, that doesn't mean that I am using my laptop on the toilet...

Greetings fellow starfinders!!

If you missed the last general meeting you would have missed the hard fought battle over the presidential position, I , Paul Randall reigned victorious...(note to self, stop arriving late to meetings and Do Not say "yes" to the question "will you stand?" I thought they had run out of chairs...)

My first duty shall be to thank Ed Maxfield for his past contributions as president. Ed has been a member, I believe almost from day one of the group and has no doubt witnessed many changes. Thank you again Ed.

I also want to thank all the other members who have stepped forward with their time and expertise to fill positions, together we will get things done and help educate newcomers, learn some new things and have some fun, that's what this is all about. Fun.

So stay tuned, we have the Star party just around the corner and there will be little things for everyone to be involved with to make it happen, and I have a feeling it's going to be a great party.

Now go blow the dust off that coat rack in the corner and do some viewing, perhaps submit some photos for the newsletter, even if it is just of the coat rack... take care all

P.

## Message from the Vice-President

Our last meeting was the AGM and Barbeque. Both the turnout and food were great. We had our elections at this meeting and I agreed to a term as Vice-President.

I would like to personally thank Ed Maxfield , Bryon Thompson (and helper), Ed Nicolas and Paul Randall for their service and commitment to the club over the last year.

Thank you Paul Randall for taking on the position as President  
 Thank you Ed Nicolas for continuing with the Treasurer position  
 Welcome Nancy Kirshfelt to the executive as Secretary (now Paul does not have to worry about arriving late to meetings)  
 Thank you Bryon Thompson for continuing as our Official Newsletter Editor (one of the best Astronomy club newsletters in North America ...in my opinion J)

With some very dedicated volunteers (more are welcome) we are presently working on setting up the 15th Annual Island Star Party.

It took a lot of hard work by many members to check out multiple leads and find a new location. The previous Malahat location was good, but unfortunately the cost and expectations of the rental became too large. It is their loss, I believe. We have found what appears to be an excellent and dark location in Bright Angel Park. This site has been suggested before but it was considered to have a light pollution problem. Testing of the site on Astronomy day and changes to the "yard light" has proven this to be a dark location.

So in six weeks we will be there enjoying the Island Star Party under the dark skies of the Cowichan Valley.

*Brian Robilliard  
 Vice President, Cowichan Valley Starfinders*



At the Island Star Party approximately 10 years ago Sandy Clark Telescope was won as a prize. Since then scope has been providing many a view for first-time observers. We have just been notified that the owner would like to donate it back to Starfinders. We wish to thank him for his wonderful generosity. This brings are club scopes to a total of 5. Which gives us even more motivation into getting the outreach program up and running. Here is a pic of Sandy's Scope

The club had a unique opportunity to do a small observing night for a family visiting from Los Angeles. Thanks to Paul R for organizing this impromptu get together. Dave P and Bryon T came out to help reacquaint the folks with the night sky. They don't get very dark skies in

LA. A father and his young daughter came out and looked through the three telescopes there for the occasion and basically marveled at the dark night sky and the naked eye views of the Milky Way and some familiar constellations. The father found out about us through Fairburn Farms and our Newsletter. Cool huh!

Many thanks to this month's contributors Moe R, Nancy K , Brian R and Bryon T.

*By Freda Eckstein*

" Astronomers, like burglars and jazz musicians, operate best at night"- Miles Kingdon

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## Quick Links

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## 2. Socials

Socials are held on the **4th Wednesday of each month** at the home of Bryon and Freda. See the website for a map.

Please Note: the Socials are **cancelled for July and August 2010**; Have a great summer and we will see you at the next Social on September 22<sup>nd</sup>. The Socials may be suspended until September but this doesn't mean there will not be events that are taking place. Mark your calendars for the RASCals Star Party on August 13-15. Info is posted on the RASC website: <http://victoria.rasc.ca/events/StarParty/>

Please help our RASC friends by printing off a copies of the RASCals Star Party Poster and post in your office, local coffee shop, and give to friends.

Also keep checking your email for inpromtu Sidewalk Astronomy and Star Parties that will be cropping up this summer.

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## AGM Minutes – June 23/10

By Nancy Kirshfelt

We started the evening off with a BBQ at Brian and Joanne Robilliard's home. The view was great and so was the food!

We then moved into the meeting portion of the evening. There were eleven people in attendance for the meeting, ten of whom were members and one visitor who became our newest member. Ed Maxfield welcomed everyone to the meeting. He mentioned that the Star Party that our club co-hosted with the RASC in 2009 was very successful. Ed said that although he has enjoyed being the club president, he would now like to step down and give someone else a turn. The first thing on the agenda was the Financial Report, which was read by Ed Nicholas. It was adopted as read by Ed Maxfield and seconded by Gerry Rozema.

Elections were then held and changes to the executive committee are as follows:

President: Paul Randall  
 Vice-President : Brian Robilliard  
 Treasurer: Ed Nicholas  
 Newsletter: Bryon Thompson  
 Secretary: Nancy Kirshfelt  
 Webmaster: Brian Robilliard  
 Outreach officer: this position is still open. Let us know if you are interested

We then moved into a discussion regarding details of Star Party 2010 at Bright Angel Park.

- An example of a poster was on hand and everyone contributed their comments and suggestions.
- Gerry and Chris are offering to do workshops on Photometry and Kepler's Three Laws of Planetary Motion (measuring exoplanets) on Friday and Saturday.
- Bryon Thompson is home recuperation but is also offering to be a speaker at the Star Party.
- The Planning Committee currently consists of Brian R, Ed N, Moe R., and Paul R. Doug Dulmage offered to be the Media Contact . More members on this committee would be great so if you are interested please contact Brian Robilliard.
- Also needed are volunteers to help with all aspects of the Star Party.
- Gerry is going to look at dates for future Star Parties at Bright Angel so we can book the park now for the next few years.
- Genevieve Singleton, who is a naturalist will be at the party.
- Sandy Clarke's telescope is being donated back to the club. Suggestions were made on what to do with the scope, with the possibility of a raffle being discussed.
- Fees for the Star Party will be decided by the Planning Committee.

The Starfinders meeting for July and August has been cancelled but there is the possibility that some

observing nights will be held. The next meeting of the Cowichan Valley Starfinders will be held in September 2010.

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## 3. Upcoming Events



It is now officially summer and you know what that means? YES STAR PARTIES! The two island star parties are listed below:



### August 13-15, 2010

The RASCals Star Party will be held on Southern Vancouver Island at Metchosin (near Victoria), BC, Canada

For more info refer to the website: <http://victoria.rasc.ca/events/StarParty/>



### September 3-5

Island Star Party will be held at Bright Angel Park, Cowichan Station "The Hub of the Universe" (Near Duncan) B.C., Canada

For more info refer to the website: <http://www.starfinders.ca/starparty.htm>

For more information on other Western Canadian Star Parties, click on the links below:

- [Mount Kobau Star Party](#) - Osoyoos - Aug.7-15th
- [Alberta Star Party](#) - Sept. 10-12th
- [Northern Prairie Starfest](#) - Edmonton RASC - Sept.7-12th
- [Saskatchewan Summer Star Party](#) - Cypress Hills Aug.12-15th

### Now Playing at the National Geographic IMAX Theatre, Victoria

#### Dinosaurs Alive

A global adventure of science and discovery -- featuring the earliest dinosaurs of the Triassic Period to the monsters of the Cretaceous "reincarnated" life-sized for the giant IMAX® screen.

For show times see website: [http://www.imaxvictoria.com/showtimes-rates/index.cfm?movieid=MO\\_20100415154232685499&publicschool=P](http://www.imaxvictoria.com/showtimes-rates/index.cfm?movieid=MO_20100415154232685499&publicschool=P)

#### Hubble. Change How You View Our Universe!

Narrated by Leonardo DiCaprio and vividly captured with IMAX technology, HUBBLE recounts the amazing journey of the most important scientific instrument since Galileo's original telescope and the greatest success in space since the Moon Landing. For show times see website:

<http://www.imaxvictoria.com/index.cfm>

### NASA Launches credit NASA.Com:

**No Launches for July**

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## 4. This Month In History

*Courtesy of: Windows to the Universe*

### July 4 1868 - Birthday of Henrietta Swan Leavitt

Henrietta Swan Leavitt is an American astronomer who was born in Massachusetts in 1868. She is known for her discovery of a type of variable stars named cepheid variables.

### 1910 - Death of Gioavanni Schiaparelli

Gioavanni Schiaparelli was an Italian astronomer who lived between 1835-1910. He observed patterned straight lines on the surface of Mars, and called them "canali", Italian for channels, later misinterpreted as "canals."

### 1934 - Death of Marie Curie

Marie Curie was a Polish physicist and chemist who lived between 1867-1934. Together with her husband, Pierre, she discovered two new elements and studied the x-rays they emitted. She found that the harmful properties of x-rays could be used in medical treatment to kill tumors.

### July 5 1687 - Principia Mathematica published

Isaac Newton published his three-volume work The Philosophiæ Naturalis Principia Mathematica (Latin: "mathematical principles of natural philosophy") which contains the statement of Newton's laws of motion forming the foundation of classical mechanics as well as his law of universal gravitation. This

is seen to be the start of Modern Astronomy.

#### July 8 1695 - Death of Christian Huygens

Christian Huygens was a Dutch physicist and astronomer who lived between 1629-1695. Using a telescope he had made, Huygens first identified Saturn's rings and one of Saturn's moons. Huygens also invented the pendulum clock and proposed the wave theory of light.

#### July 14 1862 - Florence Bascom's birthday

Florence Bascom was one of the first female geologists in the United States and her fellow scientists thought she was one of the nation's most important geologists. She lived from 1862 until 1945.

#### July 15 1943 - Jocelyn Bell Burnell's birthday

Jocelyn Bell Burnell is a British astronomer who was born in 1943. In 1967, when she was a graduate student, she discovered pulsars - stars which emit periodic radio waves. Her professor, Antony Hewish, received the Nobel Prize in Physics for the discovery.

#### July 20 1969 - Armstrong and Aldrin walk on the Moon

"One small step for man, one giant leap for mankind". With these historic words, Armstrong became the first human to set foot on the Moon, at 10:56 pm, leaving his footprint etched in the lunar soil.

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## 5. Cool Pics/Videos

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".

**Editor Note:** *On June 3<sup>rd</sup> Jupiter got dinged again! Jupiter's strong gravitational field often attracts stray comets and asteroids which helps to protect planets in the inner solar system. It is a good thing for our small planet. So small objects smacking into Jupiter is not that uncommon (though seeing them hit in real time IS). Christopher Go of the Phillipines observed the June impact and captured a short video. You can [see the video here](#) if you have a media player that reads WMV files.*

Check out our Photo gallery on the website where you can find pics from past and current Island Star Parties (ISP). Quick link is <http://starfinders.ca/photogallery.htm>

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## 6. Featured Articles

### Articles

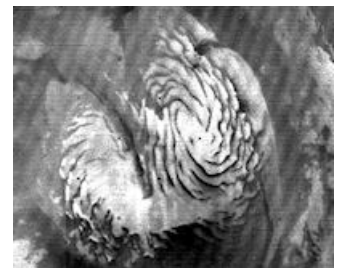
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#### Strange Martian Spirals Explained– June 16/10 credit Science@NASA

Almost 40 years ago, NASA's Mariner 9 spacecraft relayed to Earth the first video images of Mars' northern polar ice cap, revealing a strange pattern of spiral swirls that has puzzled scientists ever since. Using new data from the Mars Reconnaissance Orbiter (MRO), researchers have finally uncovered the secrets of the troughs that snake through the ice cap like a spiraled maze. A 1972-era TV image of Mars' north polar cap.

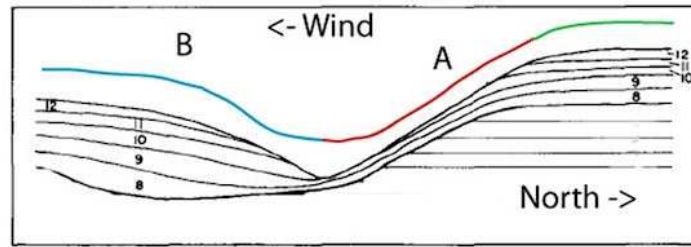
Jack Holt of the University of Texas and his graduate student Isaac Smith used radar data from MRO's Shallow Subsurface Radar to crack the case. Examining the details of this new data set has laid open the ice cap's internal structure, revealing clues to the massive ice troughs' formation. Apparently, the wind did it.



"Radar cross sections reveal layers of ice deposited throughout the ice cap's history," says Holt. "The size and shape of those layers indicate that wind has played a key role in creating and shaping the spiral troughs."

Not only does wind shape the spirals, but also it causes them to move. They rotate





around the north pole, turning like an excruciatingly slow pinwheel, curiously enough, against the wind.

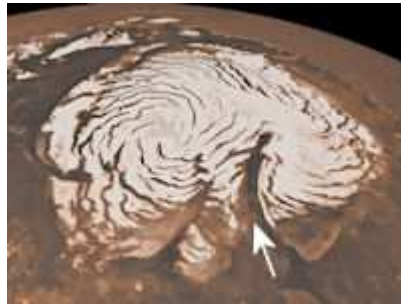
Smith explains the process: "Cold air from the top of the

ice cap sweeps down the slope, gaining speed and picking up water vapor and ice particles along the way. As this wind blows across the trough and starts up the other slope (the cooler side, facing away from the sun), it slows and precipitates the ice it holds. All of this ice is deposited on this cool slope, building it up, so the trough actually grows and migrates, over time, against the wind."

Mystery of the Martian Spirals (Wind Model, 550px). Alan Howard of the University of Virginia first suggested the ice trough migration model based on Viking spacecraft data back in 1982. His theory, that wind erosion and sunlight shape and move the troughs, was never widely accepted, but the new data supports it. The Coriolis force generated by Mars' rotation twists the winds sweeping down from the ice cap. "That explains the troughs' spiral design," says Smith.

Similar formations can be found in Antarctic regions of Earth, but without the spiral shape. "You don't see spirals in Earth's Antarctic ice sheet because local topography there prevents the winds from being steered by the Coriolis force."

The radar data have solved another icy mystery, too--the origin of Chasma Boreale. Chasma Boreale is a Grand Canyon-sized chasm that slashes through the midst of the spiraled troughs. Theories to date suggested that either wind erosion or a single melt event excavated Chasma Boreale within the past 5 to 10 million years. "Not so," says Holt. "The MRO data clearly show the chasm formed [long before the spirals did] in a much older ice sheet dating back billions of years. Due to the shape of that ancient sheet, the chasm grew deeper as newer ice deposits built up around it. Winds sweeping across the ice cap likely prevented new ice from building up inside the chasm [so it never filled up]." The radar data also revealed a second chasm matching Boreale in size. Chasma Boreale is indicated by an arrow in this modern image of the Martian north pole.



"This chasm's never been seen before -- unlike Boreale, it did fill up with ice, probably because it's in a different location. Boreale is closer to the highest points of the ancient ice cap, where the winds are stronger and more consistent."

By discovering that both Chasma Boreale and the ice troughs were shaped by similar processes over different timescales, Holt and Smith answer some questions about Martian climate history. But they're also sparking new ones.

"For a long stretch of Martian history the ice layers were regular and uniform, then there was a distinct period when the spiral ice troughs got started," says Smith. "Something changed. There must have been a very fast (relatively speaking) and powerful change in climate. We still don't know what that change was." "To figure that out, we need to look at the rest of Mars for evidence of other changes at that same time," says Holt. "This is just the tip of the ice berg."

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**Pan-STARRS Asteroid Hunter and Sky Surveyor now Fully Operational**— June 18/10 credit Harvard-Smithsonian Center, Cambridge

Astronomers announced June 16 that the first Panoramic Survey Telescope & Rapid Response System

(Pan-STARRS) telescope, PS1, is fully operational. This innovative facility will be at the frontline of Earth defense by searching for "killer" asteroids and comets. It will map large portions of the sky nightly, making it an efficient sleuth for not just asteroids, but also supernovae and other variable objects.

"Pan-STARRS is an all-purpose machine," said Edo Berger at the Harvard Smithsonian Center for Astrophysics in Cambridge, Massachusetts. "Having a dedicated telescope repeatedly surveying large areas opens up a lot of new opportunities."



Left: Asteroids that cross Earth's orbit, like the one shown in this artist's conception, threaten to impact our planet. The new Pan-STARRS observatory offers our first line of defense, surveying huge swaths of the sky every night looking for moving objects. David A. Aguilar

"PS1 has been taking science-quality data for 6 months, but now we are doing it dusk to dawn every night," said Nick Kaiser from the University of Hawaii Institute for Astronomy (IfA).

Pan-STARRS will map one-sixth of the sky every month. By casting a wide net, it is expected to catch many moving objects within our solar system. Frequent follow-up observations will allow astronomers to track those objects and calculate their orbits, identifying any potential threats to Earth. PS1 also will spot many small, faint bodies in the

outer solar system that hid from previous surveys. "PS1 will discover an unprecedented variety of Centaurs — minor planets between Jupiter and Neptune — trans-Neptunian objects, and comets. The system has the capability to detect planet-sized bodies on the outer fringes of our solar system," said Matthew Holman from the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts.

Pan-STARRS features the world's largest digital camera — a 1,400-megapixel (1.4 gigapixels) monster. With it, astronomers can photograph an area of the sky as large as 36 Full Moons in a single exposure. In comparison, a picture from the Hubble Space Telescope's WFC3 camera spans an area only one-hundredth the size of the Full Moon, albeit at very high resolution. In 2008, Gizmo Watch rated this sensitive digital camera as one of the "20 marvels of modern engineering." "We played as close to the bleeding edge of technology as you can without getting cut," said inventor John Tonry from IfA. Each image, if printed out as a 300-dpi photograph, would cover half a basketball court, and PS1 takes an image every 30 seconds. The amount of data PS1 produces every night would fill 1,000 DVDs.

"As soon as Pan-STARRS turned on, we felt like we were drinking from a fire hose!" said Berger. He added that they are finding several hundred transient objects a month, which would have taken a couple of years with previous facilities.

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### **Super-complex Organic Molecules Found in Interstellar Space** – June 22/10 *credit Royal Astronomical Society, UK*

A team of scientists from the Instituto Astrofísica de Canarias (IAC) and the University of Texas has succeeded in identifying one of the most complex organic molecules yet found in the material between the stars — the so-called interstellar medium. The discovery of anthracene could help resolve a decades-old astrophysical mystery concerning the production of organic molecules in space. "We have detected the presence of anthracene molecules in a dense cloud in the direction of the star Cernis 52 in Perseus, about 700 light-years from the Sun," said Susana Iglesias Groth from the IAC. In her opinion, the next step is to investigate the presence of amino acids. Molecules like anthracene are prebiotic so, when they are subjected to ultraviolet radiation and combined with water and ammonia, they could produce amino acids and other compounds essential for the development of life.

"Two years ago," said Iglesias, "we found proof of the existence of another organic molecule, naphthalene, in the same place, so everything indicates that we have discovered a star formation region rich in prebiotic chemistry." Until now, anthracene had been detected only in meteorites and never in the interstellar medium. Oxidized forms of this molecule are common in living systems and are

biochemically active. On our planet, oxidized anthracene is a basic component of aloe and has anti-inflammatory properties. The new finding suggests that a good part of the key components in terrestrial prebiotic chemistry could be present in interstellar matter.

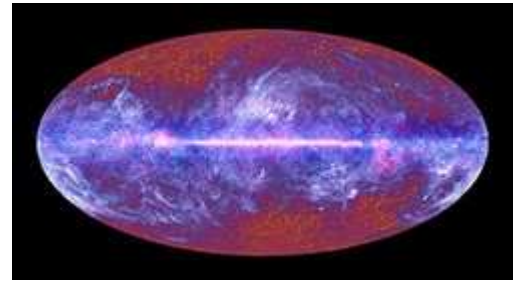
Since the 1980s, hundreds of bands found in the spectrum of the interstellar medium, known as diffuse spectroscopic bands, have been known to be associated with interstellar matter, but their origin has not been identified until now. This discovery indicates that they could result from molecular forms based on anthracene or naphthalene. Since they are widely distributed in interstellar space, they might have played a key role in the production of many of the organic molecules present at the time of the formation of the solar system

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### Planck Unveils The Universe — Now and Then— July 6/10 credit ESA News

The European Space Agency's (ESA) Planck mission has delivered its first all-sky image. It not only provides new insight into the way stars and galaxies form, but also tell us how the universe itself came to life after the Big Bang.

"This is the moment that Planck was conceived for," said David Southwood, director of science and robotic exploration at ESA. "We're not giving the answer. We are opening the door to an Eldorado where scientists can seek the nuggets that will lead to deeper understanding of how our universe came to be and how it works now. The image itself and its remarkable quality is a tribute to the engineers who built and have operated Planck. Now the scientific harvest must begin."



Right: The microwave sky as seen by Planck.

From the closest portions of the Milky Way to the farthest reaches of space and time, the new all-sky Planck image is an extraordinary treasure chest of new data for astronomers. The main disk of our galaxy runs across the center of the image. Immediately striking are the streamers of cold dust reaching above and below the Milky Way. This galactic web is where new stars are being formed, and Planck has found many locations where individual stars are edging toward birth or just beginning their cycle of development.

Less spectacular, but perhaps more intriguing, is the mottled backdrop at the top and bottom. This is the "cosmic microwave background (CMB) radiation." It is the oldest light in the universe, the remains of the fireball out of which our universe sprang into existence 13.7 billion years ago.

While the Milky Way shows us what the local universe looks like now, those microwaves show us what the universe looked like close to its time of creation, before there were stars or galaxies. Here we come to the heart of Planck's mission to decode what happened in that primordial universe from the pattern of the mottled backdrop.

The microwave pattern is the cosmic blueprint from which today's clusters and superclusters of galaxies were built. The different colors represent minute differences in the temperature and density of matter across the sky. Somehow these small irregularities evolved into denser regions that became the galaxies of today.

The CMB covers the entire sky, but most of it is hidden in this image by the Milky Way's emission, which must be digitally removed from the final data in order to see the microwave background in its entirety.

When this work is completed, Planck will show us the most precise picture of the microwave background ever obtained. The big question will be whether the data will reveal the cosmic signature of the primordial period called inflation. This era is postulated to have taken place just after the Big Bang and resulted in the universe expanding enormously in size over an extremely short period.

Planck continues to map the universe. By the end of its mission in 2012, it will have completed four all-sky scans. The first full data release of the CMB is planned for 2012. Before then, the catalog containing individual objects in our galaxy and whole distant galaxies will be released January 2011.



"This image is just a glimpse of what Planck will ultimately see," said Jan Tauber, project scientist at ESA. [back](#)

### **Rosetta Triumphs at Asteroid Lutetia**— July 12/10 credit ESA News

Asteroid Lutetia has been revealed as a battered world of many craters. The European Space Agency's (ESA) Rosetta mission has returned the first close-up images of the asteroid showing it is probably a primitive survivor from the violent birth of the solar system.

The July 10 flyby was a spectacular success with Rosetta performing faultlessly. Closest approach took place at a distance of 1,965 miles (3,162 kilometers).



The images show that Lutetia is heavily cratered, having suffered many impacts during its 4.5 billion years of existence. As Rosetta drew close, a giant bowl-shaped depression stretching across much of the asteroid rotated into view. The images confirm that Lutetia is an elongated body, with its longest side around 81 miles (130 km).

The pictures come from Rosetta's Optical, Spectroscopic, and Infrared Remote Imaging System (OSIRIS) instrument, which combines a wide-angle and a narrow-angle camera. At closest approach, details down to a scale of 200 feet (60 meters) can be seen over the entire surface of Lutetia.

"I think this is a very old object," said Holger Sierks from Max Planck Institute for Solar System Research in Lindau, Germany. "We have seen a remnant of the solar system's creation."

#### **Racing past an asteroid**

Rosetta raced past the asteroid at 9 miles per second (15 km/s), completing the flyby in just a minute. But the cameras and other instruments had been working for hours and, in some cases, days beforehand. Shortly after closest approach, Rosetta began transmitting data to Earth for processing.

Lutetia has been a mystery for many years. Ground telescopes have shown that it presents confusing characteristics. In some respects, it resembles a C-type asteroid, a primitive body left over from the formation of the solar system. In others, it looks like an M-type asteroid. These have been associated with iron meteorites, usually reddish and thought to be fragments of the cores of much larger objects. The new images and data from Rosetta's other instruments will help to decide. Compositional information is needed for that.

#### **Sensors investigate Lutetia**

Rosetta operated a full suite of sensors at the encounter, including remote sensing and in-situ measurements. Some of the payload of its Philae lander was also switched on. Together they looked for evidence of a highly tenuous atmosphere, magnetic effects, and studied the surface composition as well as the asteroid's density. They also attempted to catch any dust grains that may have been floating in space near the asteroid for onboard analysis. The results from these instruments will come later.

The flyby marks the attainment of one of Rosetta's main scientific objectives. The spacecraft will now continue to a 2014 rendezvous with its primary target, Comet Churyumov-Gerasimenko. It will then accompany the comet for months, from near the orbit of Jupiter down to its closest approach to the Sun. In November 2014, Rosetta will release Philae to land on the comet nucleus. [back](#)

### **Space Weather Turns into an International Problem** – July 16/10 credit Science@NASA

Sometimes a problem is so big, one country cannot handle it alone.

That's the message scientists are delivering at today's International Living with a Star (ILWS) meeting in Bremen, Germany, and representatives from more than 25 of the world's most technologically-advanced nations have gathered to hear what they have to say.

"The problem is solar storms—figuring out how to predict them and stay safe from their effects," says

ILWS Chairperson Lika Guhathakurta of NASA headquarters. "We need to make progress on this before the next solar maximum arrives around 2013."

The sun and Earth are separated by 93 million miles of space—a seemingly safe distance. But since the Space Age began, and especially in recent years, there has been a growing realization that 93 million miles really isn't so far apart. Spacecraft and ground-based observatories have shown that Earth is located in the sun's outer atmosphere, buffeted by solar winds and pelted by hail storms of energetic particles. Moreover, the two bodies are actually connected by invisible threads of magnetism. During "reconnection events," which typically happen several times a day, you can trace invisible lines of force all the way from Earth's poles to the surface of the sun.

"The Earth and sun are interconnected. We cannot study them separately anymore," says Guhathakurta. A few years ago, scientists coined the term "heliophysics" to describe the emerging science of the sun-Earth system. As a nod to the importance of the topic, NASA has set up a dedicated Heliophysics Division at HQ in Washington DC, and the United Nations declared 2007 the "International Heliophysical Year" (IHY) in hopes of spurring global involvement in this new field.

Predicting solar activity is a complicated problem, akin in some ways to terrestrial weather forecasting but multiplied in difficulty by the thorny physics of solar plasma and magnetism. Predicting the sun is only half the problem, though; the other half is Earth. How our planet's magnetic field and atmosphere respond to any given solar storm is a magnetohydrodynamical riddle that top scientists struggle to understand even with the aid of Earth's most powerful supercomputers. For these reasons, it is often said that space weather forecasting lags 50 years behind its terrestrial counterpart.

"We need more data--and more ideas," says Guhathakurta. That's why, this week, she is handing over her chairmanship of ILWS to Dr. Ji Wu of the Chinese Academy of Sciences. In addition to leading the ILWS, Wu will spend the next two years harnessing the special talents of the world's most populous country for heliophysics. "We have many scientists and lots of fresh ideas," says Wu. "China will be able to make important contributions in this area."

Another complication is volume. Heliophysics plays out on a stage which is hundreds of millions of miles wide. Simply keeping track of what's going on is a significant challenge. NASA and other space agencies have dozens of spacecraft out there, but they are spread over an enormous volume. "Imagine trying to monitor Earth's oceans with a small number of buoys. You'd miss a lot. That's the situation we're in now with the 'ocean of space,'" says Guhathakurta.

China is about to contribute a space-buoy known as "KuaFu," named after a giant in Chinese mythology who wished to capture the sun. Kuafu will be located at the L1 Lagrange point where it will sample the solar wind upstream from Earth. "We're putting KuaFu at a strategic point in space," says Wu. "The solar wind at L1 is an important input to many science models of the sun-Earth interaction." When KuaFu launches it will join a growing international fleet of spacecraft dedicated to heliophysics. NASA, the European Space Agency, the Russian Federal Space Agency, the Canadian Space Agency, JAXA and China are all making significant contributions.

And just in time...If forecasters are correct, the solar cycle will peak during the years around 2013. And while it probably won't be the biggest peak on record, human society has never been more vulnerable. The basics of daily life—from communications to weather forecasting to financial services—depend on satellites and high-tech electronics. A 2008 report by the National Academy of Sciences warned that a century-class solar storm could cause billions in economic damage. Preparing for a "solar Katrina," launching a new science, harnessing the talents of scientists around the globe: "These are just a few of our goals for this week's meeting," says Guhathakurta. Ambitious? Yes, but in heliophysics thinking big comes with the territory.

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## 7. 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.

**For Sale : Telescope and mount package "offers on \$1800 Cdn "  
Please contact **Gail Roberson 250-715-1116****

**DETAILS:**

### Telescope Optical Tube

- Celestron 8" Schmidt Cassigrain Telescope with XLT coating model year 2002?)
- Tube rings and vixen style dovetail bar to fit scope
- Celestron 25mm Modified Achromat eyepiece
- Celestron 10mm Modified Achromat eyepiece Antares 8x50mm - Finder scope with illuminated reticule and quick release bracket
- Celestron Radial Guider (off axis), model 94176
- Celestron f/6.3 Reducer/Corrector (focal reducer)
- 12.5mm Illuminated Reticule eyepiece (Skywatcher ?)

\* Some scratches on scope, but overall in good condition.

### EQ6 Mount

- Sky Watch EQ-6 Heavy Duty Mount, (black) with EQ-6 SynScan GOTO Upgrade kit
- Steel tripod with 2" legs.
- Two counterweights
- Home made wheel cart (mount sits on top, not attached)
- All cables, chargers and adapters

\* Some paint chips, ran well as of last use. Used for astrophotography

### Software and Manuals

- The Sky Level 1, v.5
- NextStar Observer List, v.2.0.2c
- Imaginovia
- Starry Night Skytheater (DVD)
- Starry Night v. 6 Users Guide
- Starry Night v.6 Companion

### Additional

- USB to Serial adapter (Hap Griffin) for Nikon T-adapter for Nikon
- The Backyard Astronomer, Dickinson and Dyer
- A Guide to the Night Sky, Burnham, Dyer et tel
- Voyages to the Stars and Galaxies, Fraknoi, Morrison, Wolff

We also want to bring your attention to a FREE Telescope! You read it right; Alex Haddad at the Science Department at the Cowichan Secondary has this to offer.

"please pass around to any and all who may be interested in this behemoth. Our offer still stands: **FREE TO A GOOD HOME**" If you are interested in owning this scope, contact Alex at [ahaddad@sd79.bc.ca](mailto:ahaddad@sd79.bc.ca)



George Ball Observatory is looking for a new home  
The RASC Society is offering this astronomical observatory at NO COST to a good home.

The building will require a proper concrete foundation and slab. Due to its size and weight a commercial crane and trailer assembly will be required to lift and deliver it to a new site at the new owners expense. Crane costs and construction work are estimated to be in the \$2,500 to \$3,000 range. Serious inquiries

are welcomed.

For an appointment to view please contact : Bruno Quenneville at (250) 477-2257

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## 8. 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](mailto: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.

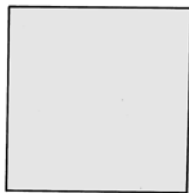
Are you new to astronomy? Want to know the how to find objects in the sky? Or just wondering what that bright object in the evening sky is? Well wonder no more; email [Bryon Thompson](#) our Public Outreach Officer and master of Astronomy 101 basics.

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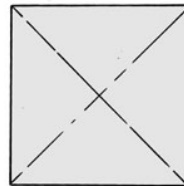
## 9. Kids Korner

For the younger astronomers. We want your input on what you would like to see happening at the club. Tell us a bit about yourself and why you love astronomy. Email the [Editor](#) with your submissions. For the older folks, if you have any ideas that might spark the interest of a young upcoming astronomer, please send your submissions to the editor.

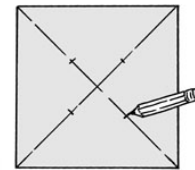
### Make Your Own PinWheel



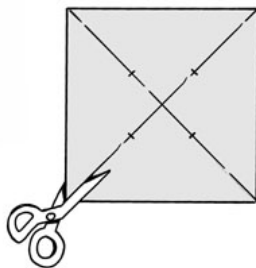
1. Begin with a square of paper.



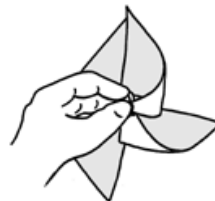
2. Fold your square, corner to corner, then unfold.



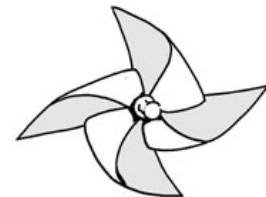
3. Make a pencil mark about 1/3 of the way from center.



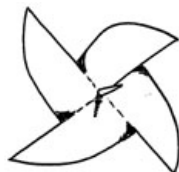
4. Cut along fold lines. Stop at your pencil mark.



5. Bring every other point into the center and stick a pin through all four points.



6. The head of the pin forms the hub of the pinwheel.



7. Turn your pinwheel over - make sure the pin pokes through in the exact center.

8. Roll the pin around in little circles to enlarge the hole a little. This guarantees your pinwheel will spin freely



9. Stick the pin into a thin dowel.  
Hint: Separate your pinwheel from the dowel with two or three beads. Stick the pin through the beads first, then - into the dowel.

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## 10. The Sky This Month

By Bryon Thompson

**Observing Site: Duncan, 48.783°N, 123.700°W**

At the cost of a bit of dark sky, summer warmth accompanies us into our evening viewing sessions throughout this month. Remember to allow yourself a little extra time for your scope to cool down and the all important dark to arrive.

There are a number of planets to see this month but the evening starts off with three special ones. A trio of planets of varying brightness follows the sunsets this month. Venus of course is the brightest of these and the brightest thing in the evening sky by far shining at magnitude -4.1 it looks more like an aircraft's landing light than a planet; it is often mistaken for such. Venus is found in the western end of Leo and by month's end it will have moved to the other side of its host constellation. Venus is getting brighter throughout the month by .2 magnitudes and does so because it is moving closer to Earth by about 22 million miles.

Mars is NOT getting closer to Earth! Here we go again! I was asked by a friend in the parking lot the other day if I knew that Mars was going to get "so close to us that it would appear as big as the full moon.....", I had to cut him off! Yet again I had to explain the truth about this internet hoax. This internet misinformation hoax seems to raise its illiterate head about this time every summer. Mars was closest to Earth a few years ago and even then it was not the size of the full.....oh never mind! Anyway, Mars is NOT getting closer to Earth, but it is visible, albeit at magnitude 1.4 very near to Venus. The colour is a dim ruddy-orange. The colour is about all you can see of the planet unless you have a very large telescope as it spans only about 5" across due to its growing distance. Remember Mars is NOT getting closer to Earth! Whew!

Saturn is the other planet in our July trio. Saturn starts the month about 15° to the left of Mars but the two planets will be only 2° apart by the end of the month. Saturn will take Mars' place next to Venus by the **30th** and on the **31st** all three planets are found within 8° of each other. Saturn's dim appearance doesn't change, shining faintly at magnitude 1.1 partially due to the almost edge on 3° view of the rings. The rings reflect a lot of the sun's light and with only a 3° tilt most of the reflected light now only comes from Saturn's dull yellow cloud tops. Saturn's moons put on a good show on the **27th** when four of them line up within 33" of each other on the big planet's western side. You'll need at least an 8" scope to spot Enceladus and Dione while Rhea and Titan can be seen with much smaller apertures.

Mercury can be seen in the middle of the month but only by those with an unobstructed view to the western horizon. It sits just 6° above the setting sun in the west northwest and glows at magnitude -0.5.

Wait till local midnight to have a look for Neptune low, about 20° in the southeast. The big gas giant can be found in Aquarius near the border with Capricorn 2° northwest of the star Iota Aquarii. You can also target this planet by looking halfway along an imaginary line from Mu Capricorni and 38 Aquarii. At magnitude 7.8 Neptune can be easily spotted with binoculars.

Jupiter rises around midnight local time and shines at magnitude -2.6. It's the brightest object in the morning sky. Watch for the 'big four' to line up on one side of the planet on July **5th, 8th, and 18th**. These are of course Io, Europa, Ganymede, and Callisto.

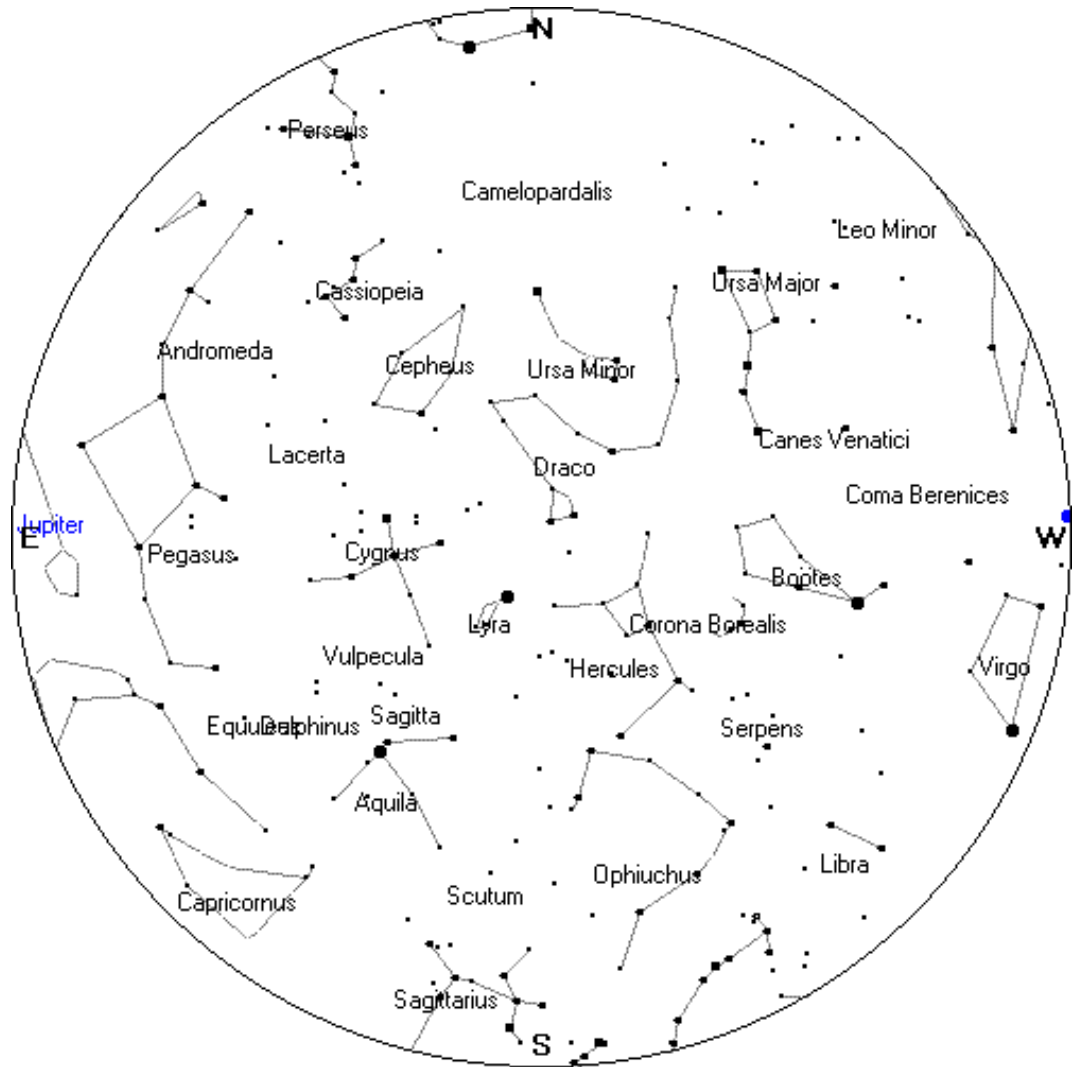
Don't put your binoculars away just yet. Uranus can be a fun 'bino' object to find. Shining dimly at magnitude 5.8 you can even see the outer gas giant with the naked eye if you have a particularly dark clear sky! Use Jupiter to find Uranus. If you look at Jupiter with your binoculars and place it on the left side of your view, you should be able to see two small stars on the right side of that field of view. Uranus is the furthest of these two dots.

A small meteor shower takes place at a bad time this month. The Delta Aquarids peak during the full moon on the **28th**. The shower usually sends us 15 to 20 meteors per hour but with the sky full of moonlight you'll be lucky to see a just a few. If you do however count yourself lucky and hold your breath for next month's Perseids. They happen during the New Moon and should be something this side of spectacular. By the way, I was just kidding about holding your breath. Till next time, remember, astronomy is looking up!



July 4	07:35 PM PDT	Last Quarter Moon
July 5	evening	Three of Jupiter's Moons Line up
July 6	04:00 AM PDT	Earth at aphelion 94.5 Million Miles From Sun
July 8	evening	Three of Jupiter's Moons Line up
July 9	8:00 PM PDT	Venus 1.1° North of Regulus
July 11	12:40 PM PDT	New Moon
July 18	03:11 AM PDT	First Quarter Moon
July 18	evening	Three of Jupiter's Moons Line up
July 25	06:37 PM PDT	Full Moon
July 27	evening	Four of Saturn's Moons Line up
July 28	01:30 AM PDT	South Delta Aquarid Meteor Shower Peaks

Sky Chart —Here's your mid-July midnight sky chart. In order to use the sky chart properly remember the centre of the chart is the sky directly above your head (or the Zenith). Turn the chart so that the direction you are facing is at the bottom of the chart (or pointed toward your toes). The star field directly in front of you will be between the bottom of the chart and the centre.



SkyChart Courtesy of Heavens-Above

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