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## Greetings!

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

Since we have moved our meetings to our new location we have been having record numbers of members dropping in. I believe it has to do with the wonderful speakers our President has been lining up for us, plus the goodies and great humour of the folks that come out for a social event. I do want to mention of the generosity of Brian R, Ralph M and Robert D for bringing goodies. Wow did we have a feast! It has since been agreed upon that the "Club" will donate the coffee and goodies based on your yearly contributions as members. So Please, just come and enjoy.

Many thanks to this month's contributors:

Moe Raven, Gail Robertson, Bryon Thompson and Ed Maxfield

*Freda Eckstein*

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

### Message from the President:

Ed Maxfield [president@starfinders.ca](mailto:president@starfinders.ca)

We've had a few clear nights in the past month. I hope that everyone took advantage of them. Let's hope that the better weather is will be here soon.

The Star Party is progressing nicely. Our dates are July 4th and 5th. Brenda has agreed to cater the event again. The Star Party committee has been very busy and have come up with some new and innovative ideas. If anyone has any ideas or complaints or ways that we may improve the Star Party please make them known either at the meeting or email/telephone me. All comments are very welcome.

On August 3rd to 10th the Cowichan 2008 North American Indigenous Games will be held in Duncan. There is a possibility that we may be able to host an evening star party for the participants. The location, Cowichan Valley or the Centre of the Universe, and details have not been settled yet. This will be an exciting opportunity to bring astronomy to different cultures from across North America and I'm certain that we could learn as much about native traditions in astronomy as the participants will about modern astronomy. Discussions are still in the early stage.

April's speaker is Chris Gainor; his topic of interest will be announced at the March meeting.

International Astronomy Day is coming up next month and will be celebrated on May 10, 2008. There are two events happening around this special day. Our Club will be hosting a table with solar and regular telescopes and club info at the Downtown Duncan Farmers Market on Saturday May 10<sup>th</sup> complete with "Music From the Stars" provided by Freda Eckstien and Bryon Thompson. Please email [Bryon Thompson](mailto:Bryon.Thompson) or call 743-2412 to volunteer for this local extravaganza. This year's RASC event will be held at the Centre of the Universe (CU). In the past the

daytime event had been held at the Royal BC Museum and the night time event **2** at the CU. This year the entire Victoria event will be held at the CU. I'll post more information as it becomes available.

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## Meeting Highlights

Meetings are held on the **4<sup>th</sup> Wednesday** of each month at the home of Bryon and Freda. See the website for a map or follow these directions.

### **Island Hwy, Mill Bay**

Turn on Frayne Rd towards ocean (Serious Coffee is on the corner)

Turn right on Huckleberry Rd

3rd house on the left across from Springbank road and Mail boxes.

### **Look for the STAR sign**

Please park on Huckleberry or Springbank Rd's.

Call Brian 743-6633 if you need directions

**Our next meeting will be held at 7:30 on WEDNESDAY April 23rd** with Chris Gainor as our featured presenter. Hope to see you all there.

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## February Minutes

*By Gail Robertson*

- Phyllis gave the Treasurer's Report.
- Norm reported that he had received confirmation of the booked dates of the 2008 Star Party, and also basic confirmation that we can get Star Party insurance coverage (approx. \$200).
- Norm suggested that the Vice-President (Bryon Thompson) also be Chairman of the Star Party. Bryon said he was fine with that, and the position will be brought up for finalization at the AGM.
- There was no new business at this time.
- John MacDonald gave an excellent tutorial of astrophotography, with and without a telescope, using interval timers, trackers, etc. He then described in detail processing the photos using stacking software such as Images Plus. Many thanks, John!

For more information about upcoming meetings go to [Starfinders Meetings](#)

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## Upcoming Events

**EARTH HOUR:** Created to take a stand against the greatest threat our planet has ever faced, Earth Hour uses the simple action of turning off the lights for one hour to deliver a powerful message about the need for action on global warming. This simple act has captured the hearts and minds of people all over the world. As a result, at **8pm March 29, 2008** millions of people in some of the world's major capital cities, including Copenhagen, Toronto, Chicago, Melbourne, Brisbane and Tel Aviv will unite and switch off for Earth Hour.

To get the details see <http://www.earthhour.org/> and read our featured article on National Dark Sky Week

**CVSF Public Outreach - Telescope Demonstration:** Volunteers are needed as part of an ongoing outreach program sponsored by CVSF and the Duncan Downtown Farmers Market. Our first in the series will be held on Saturday **April 12<sup>th</sup>** at the Downtown Duncan Farmers Market between 9:00 am to 1:00 pm where we will be hosting a table with solar and regular telescopes. Please email [Bryon Thompson](#)

or call 743-2412 to volunteer your time.

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## 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".

Check out our NEW Photo gallery on the website where you can find pics from the Island Star Party (ISP) 2007. Quick link is <http://starfinders.ca/photos.htm>

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## Featured Articles

### Articles

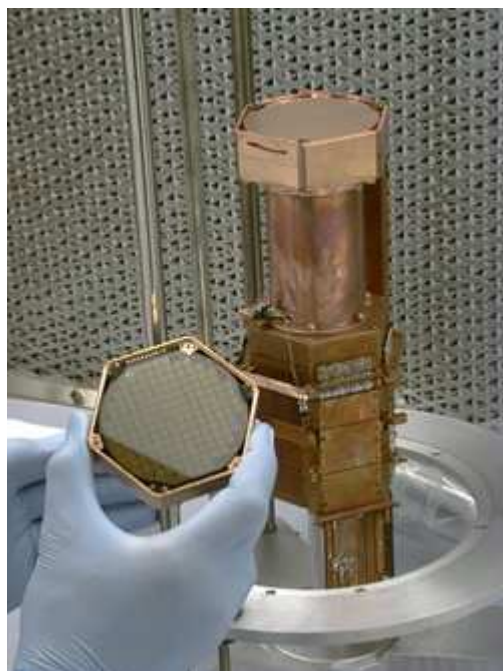
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### **The Search for Dark Matter** – February 27/08 Credit California Institute of Technology

Scientists of the Cryogenic Dark Matter Search (CDMS) experiment, including researchers from the California Institute of Technology, have announced that they have regained the lead in the worldwide race by a number of different research groups to find the particles that make up dark matter. The CDMS experiment, which is being conducted a half-mile underground in a mine in Soudan, Minnesota, again sets the world's best constraints on the properties of dark matter candidates.

Weakly interacting massive particles, or WIMPs, are leading candidates for the building blocks of dark matter, the as-yet-unknown form of matter that accounts for 85 percent of the entire mass of the universe. Hundreds of billions of WIMPs may have passed through your body as you read these sentences.



The CDMS experiment is located in the Soudan Underground Laboratory, shielded from cosmic rays and other particles that could mimic the signals expected from dark matter particles. Scientists operate the ultra-sensitive CDMS detectors under clean-room conditions at a temperature of about .04° C above absolute zero. Physicists believe that WIMPs, if they exist, would travel right through ordinary matter, rarely leaving a trace. If WIMPs were to cross the CDMS detector, occasionally one would hit the nucleus of an atom of the element germanium in the crystal grid of the detector. Like a hammer hitting a bell, the collision would create vibrations of the grid, which scientists would be able to detect. The experiment is sensitive enough to hear WIMPs if they hit the crystal

germanium detector only twice per year.

The scientists did not observe such signals, allowing the CDMS experiment to set

limits on the properties of WIMPs.

Scientists predict that WIMPs might interact with ordinary matter at rates similar to those of low-energy neutrinos, elusive subatomic particles discovered in 1956. But to account for all of the dark matter in the universe and the gravitational pull it produces, WIMPs must have masses about a billion times larger than those of neutrinos. The CDMS collaboration found that if WIMPs have 100 times the mass of protons (about  $100 \text{ GeV}/c^2$ ) they collide with one kilogram of germanium less than a few times per year; otherwise, the CDMS experiment would have detected them.

"With our new result we are leapfrogging the competition," says CDMS co-spokesperson Blas Cabrera, Stanford University. The Department of Energy's Fermi National Accelerator Laboratory hosts the project management for the CDMS experiment. "We have achieved the world's most stringent limits on how often dark matter particles interact with ordinary matter and how heavy they are, in particular in the theoretically favored mass range of more than 40 times the proton mass."

"The CDMS experiment is unique in bringing so many different disciplines to bear on the search for dark matter, from astro- and particle physics in the expected WIMP signature to low-temperature and condensed-matter physics in the operation of our novel detectors," says Sunil Golwala, assistant professor of physics at Caltech. "Our work continues Caltech's long-standing role in the dark matter story, ranging from the first evidence for dark matter obtained by Fritz Zwicky in 1933 to the detailed maps of dark matter made recently by Caltech astronomy colleagues Nick Scoville, Richard Ellis, and Richard Massey."

"Observations made with telescopes have repeatedly shown that dark matter exists. It is the stuff that holds together all cosmic structures, including our own Milky Way. The observation of WIMPs would finally reveal the underlying nature of this dark matter, which plays such a crucial role in the formation of galaxies and the evolution of our universe," says Joseph Dehmer, director of the Division of Physics for the National Science Foundation.

The discovery of WIMPs would require extensions to the theoretical framework known as the standard model of particles and their forces. The CDMS result, presented to the scientific community at the Eighth UCLA Dark Matter and Dark Energy symposium on February 22, tests the viability of new theoretical concepts that have been proposed.

"Our results constrain theoretical models such as supersymmetry and models based on extra dimensions of space-time, which predict the existence of WIMPs," says CDMS project manager Dan Bauer, of DOE's Fermilab. "For WIMP masses expected from these theories, we are again the most sensitive in the world, retaking the lead from the Xenon 10 experiment at the Italian Gran Sasso laboratory. We will gain another factor of three in sensitivity by continuing to take more data with our detector in the Soudan laboratory until the end of 2008."

A new phase of the CDMS experiment with 25 kilograms of germanium is planned for the Sudbury Neutrino Observatory's underground laboratory facility in Canada.

"The 25-kilogram experiment has clear discovery potential," says Fermilab director Pier Oddone. "It covers a lot of the territory predicted by supersymmetric theories."

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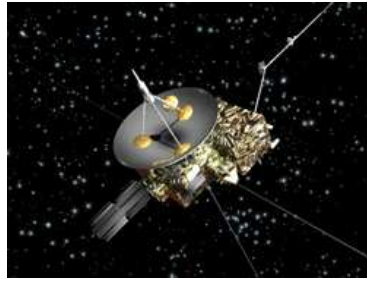
### **Ulysses Mission Coming to a Natural End** - February 25/08 Credit ESA

The mission to study the Sun's poles and the influence of our star on surrounding space is coming to an end.

After more than 17 years in space, almost four times its expected lifetime, the Ulysses mission is finally succumbing to its harsh environment and is likely to finish sometime in the next month or two.

Ulysses is a joint mission between ESA and NASA. It was launched in 1990 from a space shuttle and was the first mission to study the environment of space above and below the poles of the Sun. The reams of data Ulysses has returned have forever changed the way scientists view the Sun and its effect on the space surrounding it.

Ulysses is in a 6-year orbit around the Sun. Its long path through space carries it out to Jupiter's orbit and back again. The further it ventures from the Sun, the colder the spacecraft becomes. If it drops to 2° C, the spacecraft's hydrazine fuel will freeze.



This has not been a problem in the past because Ulysses carries heaters to maintain a workable on-board temperature. The spacecraft is powered by the decay of a radioactive isotope and over the 17-plus years, the power it has been supplying has been steadily dropping. Now, the spacecraft no longer has enough power to run all of its communications, heating and scientific equipment simultaneously.

"We expect certain parts of the spacecraft to reach 2° C pretty soon," says Richard Marsden, ESA's Ulysses Project Scientist and Mission Manager. This will block the fuel pipes, making the spacecraft impossible to maneuver.

Exploring our star's environment is vital if scientists are to build a complete picture of the sun, how it works and its effect on the solar system. In particular, the satellite is studying the solar wind that blows non-stop from the sun and carves a huge bubble in space called the heliosphere. In an attempt to solve this problem, the ESA-NASA project team approved a plan to temporarily shut off the main spacecraft transmitter. This would release 60 watts of power that could be channeled to the science instruments and the heater. When data was to be transmitted back to Earth, the team planned to turn the transmitter back on. Unfortunately, during the first test of this method in January, the power supply to the radio transmitter failed to turn back on.

"The decision to switch the transmitter off was not taken lightly. It was the only way to continue the science mission", says Marsden, who is a 30-year veteran of the project, having worked on it for 12 years before the spacecraft was launched.

After many attempts, the Ulysses project team now considers it highly unlikely that the X-band transmitter will be recovered. They believe the fault can be traced to the power supply, meaning that the extra energy they hoped to gain cannot be routed to the heater and science instruments after all.

So, the spacecraft has lost its ability to send large quantities of scientific data back to Earth and is facing the gradual freezing of its fuel lines. This spells the end of this highly successful mission. "Ulysses is a terrific old workhorse. It has produced great science and lasted much longer than we ever thought it would," says Marsden. "This was going to happen in the next year or two; it has just taken place a little sooner than we hoped". The team plans to continue operating the spacecraft in its reduced capacity for as long as they can over the next few weeks. "We will squeeze the very last drops of science out of it," says Marsden.

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### Spring is Aurora Season- March 5/08 Credit NASA's Goddard

The coming months bring us more than flowers, birds, and warmer weather. For reasons not fully understood by scientists, the weeks around the vernal equinox are prone to Northern Lights. This photograph of an aurora was taken in Wisconsin.

This is a bit of a puzzle. Auroras are caused by solar activity, but the Sun doesn't know what season it is on Earth. So how could one season yield more auroras than another?

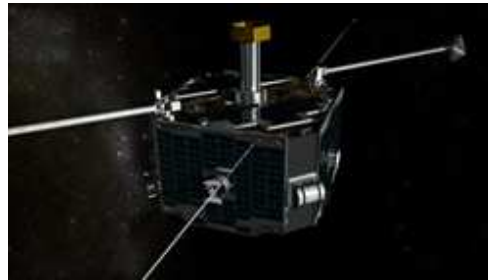
"There's a great deal we don't understand about auroras," says UCLA space physicist Vassilis Angelopoulos. For instance, "Auroras sometimes erupt with little warning and surprising intensity. We call these events sub-storms, and they are a big mystery." What triggers the eruptions? Where is sub-storm energy stored? (It has to gather somewhere waiting to power the outburst.)



And, of course, why springtime?

To answer these questions and others, NASA has deployed a fleet of five spacecraft named THEMIS (short for "Time History of Events and Macroscale Interactions during Substorms") specially instrumented to study auroras. Angelopoulos is the mission's principal investigator.

The THEMIS mission uses five identical spacecrafts to study auroras and the substorms that ignite them. This is an artist's concept of one of the THEMIS probes. NASA/Goddard Space Flight Center's Conceptual Image Lab [View Larger Image] Auroras are more than just pretty lights in the sky. Underlying each display is



a potent geomagnetic storm with possible side effects ranging from satellite malfunctions in orbit to power outages on terra firma.

Telecommunications, air traffic, power grids and GPS systems are all vulnerable. In a society that relies increasingly on space technology, understanding these storms is vital.

Launched in February 2007, THEMIS has already observed one geomagnetic storm with a total energy of 500,000 billion ( $5 \times 10^{14}$ ) Joules. "That's approximately equivalent to the energy of a magnitude 5.5 earthquake," says Angelopoulos. "This storm moved twice as fast as anyone thought possible," crossing an entire polar time zone in 60 seconds flat!

THEMIS may have found the storm's power supply. "The satellites have detected magnetic ropes connecting Earth's upper atmosphere directly to the Sun," says Dave Sibeck, project scientist for the mission at the Goddard Space Flight Center. "We believe that solar wind particles flow in along these ropes, providing energy for geomagnetic storms and auroras." Sibeck likens them to ropes because the magnetic fields in question are organized much like the twisted hemp of a mariner's rope. Solar wind particles flow along the ropes in whirling trajectories leading from the Sun to Earth.

This photograph of an aurora was taken in Alaska. an Curtis of the Geophysical Institute at the University of Alaska. Which brings us back to spring.



It turns out that magnetic connections between the Sun and Earth are favored in springtime. It's a matter of geometry: As Earth goes around in its orbit, Earth's magnetic poles wobble back and forth. (The poles don't really wobble, but the combinations of Earth's 23° polar tilt plus orbital motion makes the poles appear to wobble from the solar point of view.) Around the time of the equinox, Earth's magnetic field is best oriented for connecting-up with the Sun, opening the door for solar wind energy to flow in and spark Northern

But wait, there are two equinoxes, spring and fall, with similar magnetic geometry. Indeed, autumn is aurora season, too. Geomagnetic disturbances are almost twice as likely in spring-fall versus winter-summer, according to historical records.

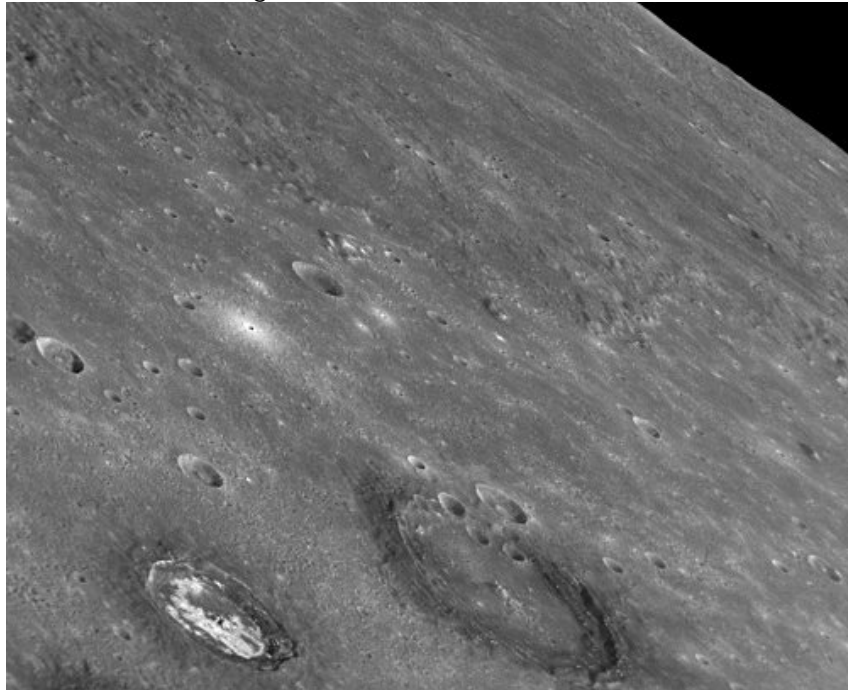
THEMIS is just getting started. The five spacecraft are on a 2-year mission to explore Earth's magnetic field and they are only now settling into their optimum science orbits. "With five satellites, we can map the complex ebb and flow of energy during geomagnetic storms better than any single satellite ever could," points out Angelopolous. "There's no telling what we might learn."

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### Dark Halos Discovered on Mercury- March 7/08 credit NASA

The surprises continue. Scientists studying the harvest of photos from the MESSENGER spacecraft's Jan. 14th flyby of Mercury have found several craters with strange dark halos and one crater with a spectacularly shiny bottom.

"The halos are really exceptional," says MESSENGER science team member Clark Chapman of the Southwest Research Institute in Boulder, Colorado. "We've never seen anything like them on Mercury before and their formation is a mystery." Consider the following:



The two craters at the bottom of the frame are located in Mercury's giant Caloris Basin, a thousand mile wide depression formed billions of years ago when Mercury collided with a comet or asteroid. For scale, the larger of the two is about 40 miles wide. Both craters have dark rims or "halos" and the one on the left is partially filled with an unknown shiny material.

Chapman offers two possible explanations for the halos:

1. **The Layer Cake Theory**--There could be a layer of dark material under the surface of Caloris Basin, resulting in chocolate-colored rims around craters that penetrate to just the right depth. If such a subterranean layer exists, however, it cannot be unique to the Basin. "We've found a number of dark halos outside of Caloris as well—for instance, these two near Mercury's south pole."

2. **The Impact Glass Model**--Thermal energy from the impacts melted some of Mercury's rocky surface. Perhaps molten rock splashed to the edge of the craters where it re-solidified as a dark, glassy substance. Similar "impact melts" are found around craters on Earth and the Moon. If this hypothesis is correct, future

astronauts on Mercury exploring the crater rims would find themselves crunching **8** across fields of tiny glass shards.

Chapman notes that the Moon also has some dark haloed craters--"Tycho is a well-known example." But lunar halos tend to be subtle and/or fragmentary. "The ones we see on Mercury are much more eye-catching and distinct."

The difference may be gravity. Lunar gravity is low. Any dark material flying out of a crater on the Moon travels a great distance, spreading out in a diffusion that can be difficult to see. The surface gravity of Mercury, on the other hand, is more than twice as strong as the Moon's. On Mercury, debris can't fly as far; it lands in concentrated form closer to the impact site where it can catch the attention of the human eye.

Right: Another dark-haloed crater near Mercury's south pole.



None of this explains the shiny-bottomed crater: "That is an even bigger mystery," says Chapman.

Superficially, the bright patch resembles an expanse of ice glistening in the sun, but that's not possible. The surface temperature of the crater at the time of the photo was around 400 degrees Celsius. Perhaps the shiny material is part of another subsurface layer, bright mixed with dark; that would be the Marbled Layer Cake Theory. "I haven't heard any really convincing explanations from our science team," he adds. "We don't yet know what the material is, why it is so bright, or why it is localized in this particular crater."

Fortunately, MESSENGER may have gathered data researchers need to solve the puzzle. Spectrometers onboard the spacecraft scanned the craters during the flyby; the colors they measured should eventually reveal the minerals involved. "The data are still being calibrated and analyzed," says Chapman.

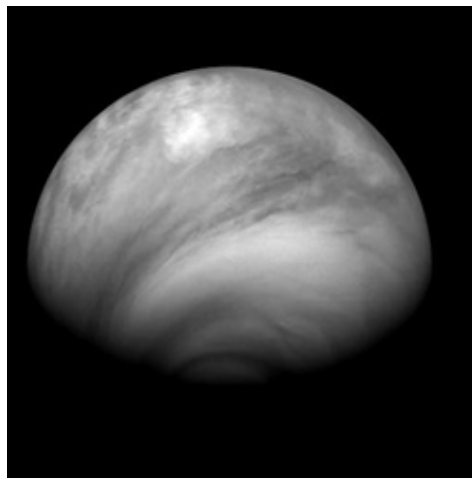
And if those data don't yield an answer....?

There are still two more flybys—one in Oct. 2008 and another in Sept. 2009—before MESSENGER enters Mercury orbit in 2011. In the fullness of time "we'll get to the bottom of this mystery"—and probably many more mysteries yet to be revealed.

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### **A puzzling storm**— March 14/08 Credit ESA

An eye of a hurricane, seen on Venus's south pole, leaves questions for scientists.



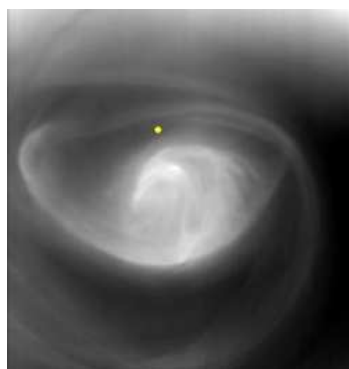
This is a picture of Venus's atmosphere, taken by the Venus Monitoring Camera (VMC) during Venus Express orbit number 458 on July 23, 2007. The view shows the southern hemisphere of the planet. It clearly shows enormous, spiral cloud features that form at mid-latitudes.

Venus Express has constantly been observing the south pole of Venus and has found it to be surprisingly fickle. An enormous structure with a central part that looks like the eye of a hurricane, morphs and changes shape within a matter of days, leaving scientists puzzled.

The eye of the hurricane is at the center of a 2000 km-wide vortex. It was discovered in 1974 by the Mariner 10 spacecraft. There is a similar structure on the planet's north pole, which was observed by the Pioneer Venus mission in 1979.



Venus Express scientists have been studying the structure in the thermal infrared, the wavelength range which reveals the temperature at the cloud-tops. Seen in this wavelength, the core of the vortex appears very bright, probably indicating that a lot of atmospheric gases are moving downward in the region, which creates a depression at the cloud-tops, making the region hotter.



"Simply put, the enormous vortex is similar to what you might see in your bathtub once you have pulled out the plug" says Giuseppe Piccioni, co-Principal Investigator for the Visible and Infrared Thermal Imaging Spectrometer (VIRTIS) on Venus Express, at IASF-INAF, Rome, Italy.

This picture shows a region in the venusian atmosphere about 60 km from the surface, at a wavelength of about 5 micrometers. In this figure, the dipole assumes an eye-like shape and from here until the last image, it is possible to see how its shape evolves rapidly in a span of only 24 hours.

The yellow dot in the image indicates the location of the south pole. In June 2006, the vortex appeared hourglass-shaped, closely matching observations in the north polar region by Pioneer Venus. Now we know that it changes its shape within a matter of days, from orbit to orbit. The image taken on 26 February 2007 shows the classic dipole shape at the center of the vortex, similar to that which has been observed previously. But an image taken a mere 24 hours earlier shows the center of the vortex to be almost circular, indicating that the shape of this feature can change very fast. At other times, it is typically oval.

Scientists are not sure what actually creates the vortex. Colin Wilson, at the University of Oxford, says, "One explanation is that atmospheric gases heated by the Sun at the equator, rise and then move poleward. In the polar-regions, they converge and sink again. As the gases moves towards the poles, they are deflected sideways because of the planet's rotation."

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### The Vanishing Rings of Saturn – March 18/08 Credit NASA

Saturn: jewel of the solar system, taker of breaths, ringed beauty. Even veteran astronomers can't help but gasp when they see her through a small telescope.

Red Alert: Saturn's rings are vanishing.

Around the world, amateur astronomers have noticed the change; Saturn's wide open rings are rapidly narrowing into a thin line. Efrain Morales Rivera sends these pictures taken through a backyard telescope in Aguadilla, Puerto Rico:



The rings have narrowed considerably in the last year," he reports. "The Cassini division (a dark gap in the rings) is getting hard to see."

Four hundred years ago, the same phenomenon puzzled Galileo. Peering through a primitive spy glass, he discovered Saturn's rings in 1610 and immediately wrote to his Medici patrons: "I found another very strange wonder, which I should like to make known to their Highnesses...." He was dumbfounded, however, when the rings winked out little more than a year later.

## What happened?

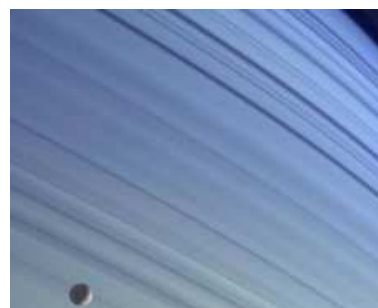
The same thing that's happening now: we're experiencing a "ring plane crossing." As Saturn goes around the sun, it periodically turns its rings edge-on to Earth—once every 14-to-15 years. Because the rings are so thin, they can actually disappear when viewed through a small telescope.

In the months ahead, Saturn's rings will become thinner and thinner until, on Sept. 4, 2009, they vanish. When this happened to Galileo in 1612, he briefly abandoned his study of the planet. Big mistake: ring plane crossings are good times to discover new Saturnian moons and faint outer rings.

It's also a good time to behold Saturn's curiously blue north pole. In 2005 the Cassini spacecraft flew over Saturn's northern hemisphere and found the skies there as azure as Earth itself. Saturn is a planet of golden clouds, but for some reason clouds at high northern latitudes have cleared, revealing a dome of surprising blue.

Right: Cassini's view of Saturn's blue north:

For years, only Cassini has enjoyed this view because from Earth, the blue top of Saturn was hidden behind the rings. No more: "Now that Saturn's rings are only open 8 degrees, we can finally view its northern hemisphere's beautiful teal blue colored belts and zones, which really did look blue through my 10-inch telescope," reports Dan Petersen of Racine, Wisconsin, who took this picture on Feb. 24, 2008.



Galileo never understood the true nature of Saturn's rings. He didn't know that they were a disk-shaped swarm of orbiting moonlets ranging in size from microscopic dust to tumbling houses. (Scientists still aren't sure, but they may be debris from a shattered moon.) He didn't even know the rings were rings. Through his 17th-century telescope, they looked more like ears or planetary lobes of some kind.

Yet, somehow, his intuition guided him to make a correct prediction: "they'll be back," or Italian words to that effect. And he was right. Saturn's rings opened up again and scientists resumed their study. In 1659, Christaan Huygens correctly explained the periodic disappearances as ring plane crossings. In 1660, Jean Chapelain argued that Saturn's rings were not solid, but made instead of many small particles independently orbiting Saturn. His correct suggestion was not widely accepted for nearly two hundred years.



Above: Saturn's rings are wide but very thin. Astronomers using the Hubble Space Telescope captured this image of the rings edge-on in 1995. Star-like objects in the ring plane are icy satellites.

Almost 27 ring plane crossings later, we still marvel at Saturn. Even with rings diminished, she is still a breathtaking sight through the meanest of telescopes. Indeed, this is a good week to look. On Tuesday, March 18th (sky map), and Wednesday, March 19th (sky map), the nearly-full Moon and Saturn will be lined up in the same part of the evening sky. That makes Saturn unusually easy to find: Go outside after sunset and look around for the Moon; Saturn is the bright golden "star" nearby.

Point your telescope and, well, just try not to gasp.

Looking Ahead: If you miss the March 18-19 encounter, try again on April 14-15.

The Moon and Saturn will be close together and the rings even narrower. Mark your calendar! 11

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## 2008 National Dark-Sky Week— March 19/08 Credit International Dark-Sky Association

Help stop light pollution by participating March 29 through April 4.



Light pollution over California and the southwestern U.S. International Dark-Sky Association, Inc.

Observance of the sixth annual National Dark-Sky Week will take place March 29 through April 4. Founded in 2003 by Jennifer Barlow, the event highlights concern for increasing light pollution, the glow from outdoor lights that washes out the stars in the night sky. Endorsed by

the International Dark-Sky Association, American Astronomical Society, and the Astronomical League, event participation grows each year as the public becomes more aware of light pollution and its effects on our everyday lives and the environment.

This year, IDA is encouraging everyone to support the World Wildlife Fund's Earth Hour, occurring on March 29th. In addition, Lights Out America is now supporting Earth Hour. In past years, various "lights out" campaigns, the WWF, the National Audubon Society, and other organizations have promoted events to protect wildlife and conserve energy. Light pollution is a growing threat, and IDA is encouraged by increased public awareness of the problem and the increasing number of events highlighting it every year.

National Dark-Sky Week seeks to deter light pollution by encouraging better overall outdoor lighting practices. Simply turning off unnecessary lighting for one hour or even a week is only a temporary solution. National Dark-Sky Week seeks to educate the public about lighting fixtures that help reduce light pollution by focusing light downward instead of up into the sky. Also, it is important to always turn off lights when they are not needed and to only use the right amount of light.

As cities continue to grow, so does light pollution through poor planning and misuse of outdoor lighting. While light pollution is detrimental to our ability to observe and enjoy the night sky, it also disrupts the surrounding natural environment, wastes energy, and has the potential to cause health problems. "The only way that National Dark-Sky Week can succeed is if more people participate every year," says Barlow. "No significant reduction in light pollution can be made unless a great number of people turn off their lights, shield them, and control how bright they are."

Earth Hour is a global initiative to "turn off the lights" in cities around the world for one hour, starting at 8 p.m. local time on March 29, 2008. Earth Hour will demonstrate that by working together, each one of us can make a positive impact on this global issue. Earth Hour is intended to bring together a diverse group of community, municipal, corporate and non-governmental organizations, to heighten awareness of the impacts of climate change on the world, and to inspire individuals and businesses to take practical action to reduce their own carbon footprint.

These campaigns also encourage the public to attend area star parties or visit a local observatory. But always be careful not to turn out lights that are necessary for public safety, and when going stargazing, carry a red-tinted flashlight and stay in a large group.

Twenty-five cities around the world are confirmed to take part in WWF's Earth Hour climate change: Aalborg, Denmark; Aarhus, Denmark; Adelaide, Australia;

Atlanta, United States; Bangkok, Thailand; Brisbane, Australia; Canberra, Australia; **12** Chicago, United States; Christchurch, New Zealand; Copenhagen, Denmark; Dublin, Ireland; Haifa, Israel; Manila, Philippines; Melbourne, Australia; Montreal, Canada; Odense, Denmark; Ottawa, Canada; Perth, Australia; Phoenix, United States; San Francisco, United States; Suva, Fiji; Sydney, Australia; Tel Aviv, Israel; Toronto, Canada; and Vancouver, Canada.

As Jennifer Barlow observes, "National Dark-Sky Week is a great opportunity to dust off the old telescope from the attic and share in the wonder of the universe that has been part of the human tradition for thousands of years."

*Editor note: for more on light pollution visit the International Dark Sky Association at their site at <http://www.darksky.org/mc/page.do>*

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### Sci-Fi Author Arthur C. Clarke Buried in Brief Funeral – March 22/08

Credit Associated Press



COLOMBO, Sri Lanka (AP) - Science fiction visionary Arthur C. Clarke was buried Saturday to the music of his most famous work, the movie "2001: A Space Odyssey," as tearful mourners spoke of his wish to be remembered as someone who "never grew up."

Clarke, who moved to Sri Lanka in 1956, died at a Colombo hospital Wednesday at age 90 after years of suffering debilitating post-polio syndrome.

In the days since Clarke's death, students, space enthusiasts, politicians and Buddhist monks traveled to his Colombo home to pay their last respects and to salute a man who inspired many of them.

His brief funeral Saturday was held according to his written instructions: "Absolutely no religious rites of any kind, relating to any religious faith, should be associated with my funeral."

The Ekanayake family, with whom the British author lived in the final decades of his life, cried as his coffin was lowered into the grave at the general cemetery in Colombo. His brother, Fred Clarke, and other family members were among the mourners. Some fans and followers also sprinkled soil into the grave.

Music from the 1968 movie "2001," which Clarke wrote with director Stanley Kubrick, was played at the funeral and at Clarke's home before the ceremony.

Tamara Ekanayake, the daughter of Clarke's business partner and longtime friend Hector Ekanayake, made a brief speech at their home before the funeral procession began. She said Clarke's gravestone would be engraved according to his wishes: "Here lies Arthur C. Clarke. He never grew up and did not stop growing."

Born in western England on Dec. 16, 1917, Clarke earlier served in the Royal Air Force during World War II before moving to Sri Lanka.

He won worldwide acclaim with more than 100 books on space, science and the future. Clarke also was credited with coming up with the concept of communications satellites decades before they became a reality.

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## 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.

## Newtonian for Sale

Good permanent Newtonian scope (not portable) with 13 1/2 inch mirror, 4" Steel Alt Azimuth mount with concrete counter balance. Includes various eyepieces. More info contact John MacArthur at [jandlmac@shaw.ca](mailto:jandlmac@shaw.ca)

## Single 8" Meade Looking for an Astronomer

Lonely 8" Meade Newtonian with motorized German equatorial steel post mount is looking for a pair of lovely eyes to spend long nights gazing at the stars together. Includes homemade Dobsonian mount, one 40 mm eyepiece and telescope carrying bag. Asking \$750.00 OBO contact Bryon Thompson at [bryonjt@shaw.ca](mailto:bryonjt@shaw.ca).

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## 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](mailto: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](mailto:Bryon.Thompson) our Public Outreach Officer and master of Astronomy 101 basics.

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## 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.

**The Stargate SG-1 Quiz**- Courtesy of Space.com

Stargate SG-1 sci-fi series is off the air but it doesn't mean you can't reminisce. Take this 12-question quiz and test your knowledge and your folks knowledge of this long-running, award-winning series

<http://www.space.com/php/spacetrivia/index.php?quiz=SGQuiz>

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## RASC News

By Ed Maxfield

Royal Astronomical Society of Canada, Victoria Centre <http://victoria.rasc.ca>

### Meetings

Meetings are held on the second Wednesday of each month except July and August downstairs in the Elliot Bldg at U of Vic.

### Astronomy Café

The Astronomy Café Meets on Monday evenings at Sir James Douglas School on Fairfield Road. We have had some really interesting discussions/speakers/projects lately. On Monday March 17, 2008 we will be holding a Star Party for the whole community. We will have telescopes outside (weather permitting) and telescopes and displays inside.

### Star Party

The tentative dates for the RASC Star Party are August 29th to 31st. Mark your calendars

### New Observatory

The observatory project is close to completion. The building is almost done and the pier has been constructed. For more pictures, see the website.



Geoff give the final approval on the pier

South Wall



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## The Sky This Month

By Bryon Thompson

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

The weather is getting warmer in the evening and as long as the clouds and rain stay away even for a few nights April promises more than spring flowers. Here's hoping you get a chance to do some springtime viewing.

There is not a lot of detail visible on Mar's tiny 6<sup>o</sup> apparent disc unless you have excellent seeing and a large telescope. It is best to view the little red planet with binoculars or the naked eye as the ruddy orange glow is only glowing at 1st magnitude. It is still a wonder to behold as the little planet makes its way thru Gemini past bright Caster and Pollux.

Saturn, the great ringed giant rises early and stands front stage and center throughout the month of April. If our spring sky co-operates, get out and take in a look at the ring system of Saturn. Shining at magnitude 0.4, the rings make Saturn's 19" disc grow up to 44" and are magnificent through a small or large scope. You may be able to catch a glimpse of the planet's shadow on the rings which seem to give the normally 2 dimensional view that added 3 dimensional magical quality. One of my most memorable times viewing happened when I was showing a telescopic view of the shadow of Saturn on its rings to a group of adults new to the wonders of the night sky. A fellow in his late forties stepped up and put his eye to the eyepiece then jumped back, his face lit up and he cried out "It's real! It's really real!" The wonder that we amateurs astronomers are privy to is truly amazing. With all the fabulous images available to use via satellites and the internet, it took the immediacy of the 'eye at the eyepiece' to create the opportunity for that gentlemen to have an eye-opening epiphany, excuse the pun. Enjoy the rings of our distant gas giant while you can. Before the end of the year the rings will all but disappear from view. As both our planets orbit around the sun they will move to an edge on appearance. Watch for Saturn's large moon Titan to pass south of the planet on April 2nd and 18th and north on the 10th and again on the 26th. Even a small scope can pick up some of the other large moons; Rhea, Tethys, Dione, Lapetus (the small black and white wonder). You will need to have a few nights of clear sky and good seeing to watch these little satellites change position relative to the background stars.

Jupiter is an early riser this month becoming visible around 3am and dominating the eastern sky at magnitude -2.2. Over the next 3 months the relative motions of Earth and Jupiter will bring them closer. Jupiter will reach opposition around the time of the Island Star Party. Almost any size telescope will reveal fabulous details of the cloud bands during good seeing. Jupiter, however, remains low in the sky making the reflected light from this gas giant pass through more atmosphere than when it is in the zenith. This degrades the image somewhat but Jupiter and its four large moons Io, Europa, Callisto and Ganymede are still worth seeing none the less.

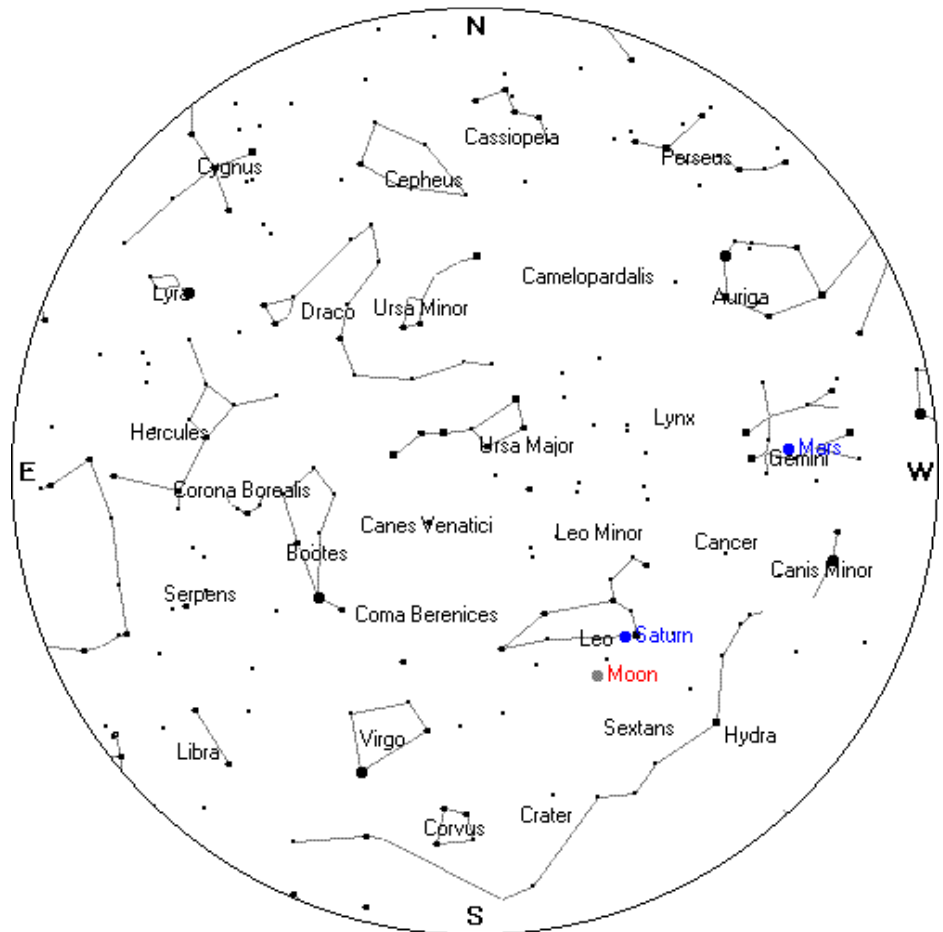
The “blue jewel planet” Neptune can be found in the pre-dawn sky low in the southeast, near Capricornus the Sea Goat. At magnitude 7.9 look for Neptune 2.4° north of Delta Capricorni.

Later in the month try to see the planet Mercury as it chases the setting sun. Mercury only raises its glowing disc 10 above the horizon. The best views of our little inner planet are to be found in next month's sky.

Although next month on May 4th promises one of the best meteor showers seen this year, this month's Lyrids on April 22nd are still worth searching for. The full moon occurs two days before the Lyrids peak so the ambient light will block out all but the brightest meteors. The Eta Aquarids stand a better chance of being more spectacular as they follow a new moon and appear in dark skies. A final challenge is to find asteroid Astraea in Virgo. This 9.4 magnitude rock was largely responsible for the current view of our solar system as having an asteroid belt between Mars and Jupiter. Previous to its discovery by Carl Hencke in 1845, astronomers believed that that region of space was the graveyard of a demised planet as evidenced by the four big previously discovered asteroids Ceres, Pallas, Juno and Vesta. This idea was later corrected to the current view that this area is dominated by large and small asteroids that form a “belt” between the fourth and fifth planets. The challenge to see Astraea is not finding it as it is the brightest object passing through the sparse star field southeast of Virgo. The real challenge is having more than a few nights in a row of clear sky to see this large asteroid move against the background stars. I hope you all have a chance to glimpse this and the many other wonders that our early spring sky can bring. Till next month, remember the sport of astronomy is looking up.

|          |            |                                    |
|----------|------------|------------------------------------|
| April 05 | 05:00pmPST | Asteroid Astraea is at Opposition  |
| April 08 |            | Moon passes through the Pleiades   |
| April 12 | 11:32amPST | First Quarter Moon                 |
| April 16 | 12:00amPST | Mercury is at superior Conjunction |
| April 20 | 03:25amPST | Full Moon                          |
| April 22 | 02:34amPST | Lyrid meteor shower peaks          |
| April 28 | 07:12amPST | Last Quarter Moon                  |

**Sky Chart**—Here's your mid-April 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.



Sky Chart Courtesy of Heavens-Above

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